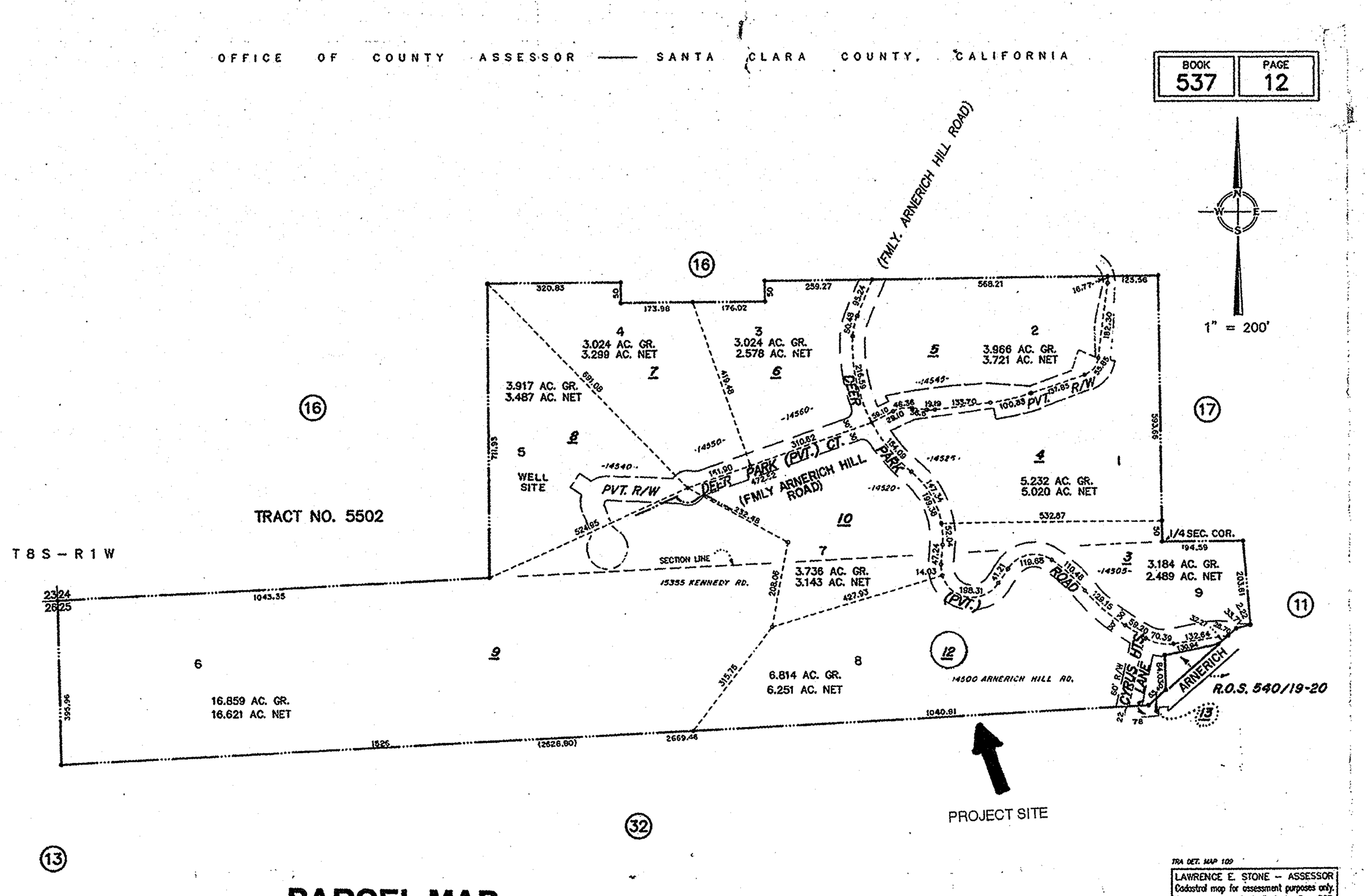


PARCEL MAP
NTS

REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD – APN 537-12-012
LOS GATOS, CALIFORNIA

GENERAL NOTES

LIFE-SAFETY

Provide combustion air for all gas-fired appliances. (CMC Chapter 7)

Vent dryer to outside of building (not to under-floor area). Vent length shall be 14' maximum or vent size shall be increased. (CMC 504.3)

Provide Tempered glass at all hazardous locations per CBC 2406.4 & CRC 308.4

Safety glazing shall be required within 24" of a door edge or within 36" of a stairway, landing or ramp when the bottom edge of the glazing is less than 60" from the floor or walking surface. Safety glazing is required in all fixed and operable panels of swinging, sliding and bi-fold doors.

Skylights shall comply with CRC R 308.6

Safety glazing is required in enclosures and walls facing hot tubs, saunas, steam rooms, showers and tubs where the bottom edge of the glazing is less than 60" from any standing or walking surface.

Fire blocking shall be provided in concealed spaces of stud walls and partitions, including furred spaces, and parallel rows of studs or staggered studs; vertically at floor and ceiling levels, horizontally at intervals not to exceed 10'. Openings around gas vents, ducts, chimneys and fireplaces at ceiling and floor levels shall have fire blocking per CBC 717.1 & CRC 302.11.

Provide minimum 22" x 30" access opening to attic. In attics in which an appliance is installed, an opening and passageway at least as large as the largest component of the appliance shall be required. (CMC 904.11)

Floor and ceiling assemblies shall be draft stopped so that the area of concealed space does not exceed 1000 SF. The draft stops shall divide the concealed space into approximately equal spaces per CBC 718.2 & CRC 302.12.

LIGHT & VENTILATION

Provide ventilation for products of combustion to outside air. (CMC 801.1)

Attic ventilation: 1/150 of attic area. If a Class I or II vapor barrier is applied to warm-in winter side of ceiling, or, if 50% - 80% of the vents are at least 3' above the eaves and the remaining vents are in the eaves then the ratio may be reduced to 1/300. Enclosed rafter spaces shall have cross ventilation (min. 1" clear)

Under-floor space shall have a ventilation opening area of 1/150 square feet of under-floor area. If a Class I vapor retarder is used the ratio may be reduced to 1/1500. One opening shall be placed within 3 feet of each building corner. Openings shall be covered with a covering having openings no greater than 1/4".

Air infiltration, insulation, space heating, space cooling, water heating…etc. shall meet CA Energy Commission Standards.

HERS certification testing is required for Indoor Air Quality.

DOORS, STAIRWAYS AND LANDINGS

Stairways shall comply with CBC 1009 & CRC R311.7

Required egress door shall be side hinged and have a minimum net clear width of 32" and a minimum height of 78".

There shall be a landing at each side of all doors. The landing shall be at least as wide as the door served and 36"min length measured in the direction of travel. There may one step down of no more than 7.75" provided the door does not swing over the landing.

Stairway rise shall be 4" min and 7.75" max. Run shall be 10" min. Headroom shall be 80" min. Width shall be 36" min. Handrails shall be 34" to 38" above tread nosing with openings less than 4" clear.

Enclosed useable space under interior stairs shall be finished with 1/2" gypsum board.

Fire blocking is required in concealed spaces between stair stringers at the top and bottom of the run.

There shall be a floor or landing at the top and bottom of each stairway. Width and length of landings shall be not less than the width of the stairway and shall be at least 36" in the direction of travel. A floor or landing is not required at the top of an interior flight of stairs, including stairs in an enclosed garage, provided a door does not swing over the stairs.

Guardrails shall comply with CBC 1013.4 & CRC R 312. Guards shall be located along open sided walking surfaces, including stairs, ramps, landings, and decks, that are more than 30" above the floor or grade. Required guards shall be not less than 42" above the adjacent walking surface. Except that handrails may be considered as guards at stairways. Openings in guards shall not exceed 4". Handrails shall comply with CBC 1012 & CRC R 311.7

Glazing used in doors, sidelights and panels of the shower enclosure shall be fully tempered, laminated safety glass or approved plastic. Per CRC R308.3 & R308.4.1.

WEATHER & CORROSION DAMAGE PREVENTION MEASURES

Naturally durable wood or preservative treated wood shall be required in the following locations:

a. Wood joists and girders closer than 18" or 12" respectively, to the exposed ground.

b. Wood framing members that rest on concrete or masonry and are less than 8" from the exposed ground.

c. Sills and sleepers on a concrete or masonry slab that is in direct contact with the ground unless separated by an impervious moisture barrier.

d. Wood siding, sheathing and wall framing on the exterior of the building having a clearance of less than 6" from the ground or less than 2" from a horizontal concrete surface.

GARAGE

Common wall between garage and dwelling shall have 5/8" gypsum board applied on the garage side. Garage ceiling with habitable space above shall have 5/8" type 'X' gypsum board applied to the ceiling.

No openings may be provided between a garage and a sleeping room. Other openings shall be equipped with solid wood or steel doors 1-3/8" in thickness and shall be self-closing and self-latching, 20 min. labeled assembly.

Garage floor surfaces shall be of approved noncombustible material.

Appliances and receptacles installed in garages and carports generating a glow, spark, or flame shall be located 18" min. above the floor. Provide protective bollard or other impact barrier. (CMC 307.1)

ELECTRICAL

Do not install electrical panels larger than 16 square inches in rated fire walls. Never install electrical panels in closet. Maintain a clearance of 36" in front of the panels. (CEC 110.26)

Provide a minimum of one 20 Amp receptacle in laundry areas. (CEC 210.52(F))

Kitchens and dining areas must have a minimum of two 20 Amp branch circuits (CEC 210.11). Kitchen counter outlets must be installed in every counter space 12" or wider, not greater than 4' o.c. and within 24" of the end of any counter space. (CEC 210.52)

GFCI outlets are required for all kitchen receptacles that are designed to serve countertop surfaces, in bathroom, in under-floor spaces or below grade level, in exterior outlets, and in all garage outlets not dedicated to a single device or appliance. (CEC 210.8) All dwellings must have at least one exterior outlet at the front and the back of the dwelling. (CEC 210.52(E))

Receptacles must be installed at 12' o.c. maximum in walls. Walls longer than 2 feet and halls longer than 10' must have a receptacle. A receptacle must be provided within 3' of bathroom sinks. (CEC 210.52) . Spacing of kitchen and dining room countertop receptacles shall meet minimum requirements of CEC 210.52(C), Parts 1-5. Bond all metal gas and water pipes to ground. All ground clamps must be accessible and of an approved type. (CEC 250.104)

Furnaces installed in attics and crawl spaces must have an access platform (catwalk in attics), light, light switch, and receptacle in the space. (CMC 904.11)

Smoke detector/ alarms are to be provided with battery back-up and audible in all sleeping areas and shall be hard-wired and inter-connected per CRC R314.5. When alterations, repairs, or additions require a permit, smoke alarms shall be installed where required in new dwellings.

An approved carbon monoxide alarm shall be installed in dwellings within which fuel-burning appliances are installed, and in dwellings with an attached garage. Carbon monoxide detector/ alarms on all habitable levels and shall be hard-wired and inter-connected per CRC R315.1

Arc-Fault Circuit-Interrupter (AFCI) protected receptacles shall be installed in all rooms not requiring GFCI protection. The maximum length of the branch circuit to the AFCI is 50 feet for 14 AWG conductors or 70 feet for a12 AWG conductor.

Receptacles on 120- volt 15 & 20 amp circuits shall be listed tamper resistant. (CEC 406.11) Except when located more than 5.5' above the floor; within cabinets or cupboards; or when part of a luminaire or appliance.

Provide exhaust fans in bathrooms vented to outside and sized as follows: >/= 50 CFM intermittent, >/= 20 CFM continuous. Exhaust fan ratings to be </= 1 sone continuous, </= 3 sones intermittent. Bath fans are to be Energy Star compliant and equipped with humidistat controls for adjustment of relative humidity from 50- to 80%. CalGreen Code 4.506.1

Provide a whole building mechanical exhaust system to outdoor air, with a properly labeled, accessible off/ on switch. Covers or louvers are to have min. R 4.2 insulation. **Whole House Ventilation Calculation** per CEC 150(O) & ASHRAE 62.2: 0.03 X heated area + 7.5 x (# of bedrooms + 1) = minimum required CFM exhaust fan, with 2 sone maximum sound rating.

The whole house fan shall be continuously on, unless there are exterior air contaminates present. The on/off mechanism shall be labeled to identify it as controlling the whole house fan,

Any new appliances (installed as part of any remodel, addition or new construction) shall be Energy Star appliances.

Provide a listed raceway to accommodate a dedicated 208/240-volt branch circuit for electric vehicle charging not less than 1" nominal inside diameter. The raceway shall originate at the main service or subpanel and shall terminate in a listed cabinet, box or enclosure in close proximity to the proposed location of the EV charger. Raceways are required to be continuous at enclosed, inaccessible or concealed areas and spaces. The raceway termination location shall be permanently and visibly marked as "EV CAPABLE". The service panel and/or sub-panel shall provide capacity to install a 40-amp, minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device. The service panel or sub-panel shall identify the overcurrent protective device space(s) reserved for future EV charging as "EV CAPABLE". The charging circuit must be rated for continuous duty at 125% of load. All Electrical Vehicle Supply Equipment (EVSE) shall be installed in accordance with the California Electrical Code.

PLUMBING

Fuel burning water heater is not allowed in bedroom or bathroom unless direct vent type or complying with CPC 505.1.

Water closet shall be located in a space not less than 30" in width with 24" minimum clearance in front. (CPC 407.5)

Provide 18" x 24" foundation access within 20' of plumbing cleanout. (CPC 707.9)

Provide anti-siphon valves on all hose bibs. (CPC 603.4.7) Strap water heater at points within upper and lower third of tank and 4" min. above controls.

Copper, galvanized or plastic piping shall not be installed under building slab. All solder joints to be lead free. Type M copper tubing shall not be used for water piping.

Provide low flow shower heads and water closets consuming 1.28 gallons per flush or less. (CPC 402.2.2). Install chlorine filters on shower heads, or whole house chlorine filter.

Showers and walls above bathtubs with shower heads shall be finished with a smooth, hard non-absorbent surface to a height of at least 72 in. above the drain outlet per CBC 1210.3 & CRC R307.2.

Provide curtain rod or shower door enclosure with tempered safety glazing per CRC R308.4.

Showers and tub-showers shall be provided with individual control valves of the pressure balance, thermostatic, or combination pressure balance/thermostatic mixing valve type that provide scald and thermal shock protection pre CPC 408.3.

All new waterlines ¾" dia. or larger and all new hot waterlines to the kitchen will be insulated per CEnC150(j)2.A & minimum insulation Table 120.3-A.

GREEN BUILDING NOTES

1 Conduct Pre-construction Green Building Conference.

2 Provide Construction Waste Management Plan for 65% Recycling Job Site Construction & Demolition Waste.

3 This project does not include any Fencing.

4 Donate Unused materials.

5 Protect annular spaces around openings in plates at exterior wall per Cal Green sec. 4.505.2.

6 Substitution of solid sawn lumber with engineered lumber for Structural Beams and Headers including non-structural Headers is acceptable. Acquire final approval by Architect & Structural Engineer where applicable.

7 Substitution of Plywood with OSB for sheathing is acceptable. Acquire final approval by Architect & Structural Engineer where applicable.

8 Provide ENERGY STAR rated appliances, typical, provide cut sheets for inspector verification

9 Install built-in recycling center in Kitchen cabinetry.

10 Install Insulation after building is Weather-Tight and outside of the rainy season. Insulation shall be recycled-content, formaldehyde-free fiberglass insulation.

11 Insulate all hot water pipes.

12 Check moisture content materials for walls & floor before enclosure.

13 Cover duct openings/air distribution openings during construction. Clean ducts before occupancy. Use duct mastic on all duct joints.

14 Use Low / No VOC, water based products and solvent-free adhesives and sealers. Install Low VOC carpet systems (where applicable).

15 Develop Homeowner Manual including Green Measures & Benefits.

DEFERRED SUBMITTAL

SUBMITTAL DOCUMENTS FOR DEFERRED SUBMITTAL ITEMS SHALL BE SUBMITTED TO THE ARCHITECT OR ENGINEER OF RECORD, WHO SHALL REVIEW THEM AND FORWARD THEM TO THE BUILDING OFFICIAL WITH A NOTATION INDICATING THAT THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN REVIEWED AND THAT THEY HAVE BEEN FOUND TO BE IN GENERAL CONFORMANCE WITH THE DESIGN OF THE BUILDING. THE DEFERRED SUBMITTAL ITEMS SHALL NOT BE INSTALLED UNTIL THE DESIGN AND SUBMITTAL DOCUMENTS HAVE BEEN APPROVED BY THE BUILDING OFFICIAL. THE FOLLOWING ITEMS WILL BE SUBMITTED SEPARATELY FOR THIS PROJECT:

1 PROVIDE COMPLETE DESIGN CALCULATIONS, DRAWINGS AND SPECIFICATIONS FOR FIRE SPRINKLER SYSTEM FOR APPROVAL PRIOR TO INSTALLATION.

2 PROVIDE DESIGN AND DOCUMENTATION FOR A COMPLETE HEATING SYSTEM. PLANS AND SPECIFICATIONS TO INCLUDE APPLIANCE MODELS, SPECIFICATIONS, BTU VALUES, DUCT LAYOUT, MATERIALS AND SIZES, ETC. HEATING AND/OR AIR-CONDITIONING SYSTEMS SHALL BE SIZED, DESIGNED AND HAVE THE EQUIPMENT SELECTED USING THE FOLLOWING METHODS:

A) THE HEAT LOSS AND HEAT GAIN IS ESTABLISHED ACCORDING TO ANSI/ACCA 2 MANUAL J-2011, ASHRAE HANDBOOKS OR OTHER EQUIVALENT DESIGN SOFTWARE OR METHODS.

B) DUCT SYSTEMS ARE SIZED ACCORDING TO ANSI/ACCA 1 MANUAL D-2014, ASHRAE HANDBOOKS OR OTHER EQUIVALENT DESIGN SOFTWARE OR METHODS.

C) SELECT HEATING AND COOLING EQUIPMENT ACCORDING TO ANSI/ACCA 3 MANUAL S-2014 OR OTHER EQUIVALENT DESIGN SOFTWARE OR METHODS.

HERS NOTE

HERS registered forms are required by installing mechanical contractor for the heat pump system. Installing contractor to register project with HERS provider and submit CF2Rs & CF3Rs to jurisdiction before beginning work; HERS certification is required for indoor air quality ventilation. HERS inspection and certification is required for installation of Kitchen downdraft cooktop exhaust. HERS inspection and certification is required for cooling system; verified SEER, Verified Refrigerant Charge, Airflow in Habitable rooms (SC3.1.4.1.7). HERS inspection and certification is required for Heating System; verified HSPF, verified heat pump rated heating capacity, wall-mounted thermostat in zones greater than 150ft2 (SC3.4.5), ductless indoor units located entirely in conditioned space (SC3.1.4.1.8). Quality Insulation Installation (QII) at Music Room. General Contractor shall meet with the HERS Rater prior to commencement of construction.

GRADING NOTES

1 EXCAVATED MATERIAL SHALL BE PLACED IN THE FILL AREAS DESIGNATED OR SHALL BE HAULED AWAY FROM THE SITE. WHERE FILL MATERIAL IS TO BE PLACED ON NATURAL GRADE IT SHALL BE STRIPPED OF ALL VEGETATION, TO ACHIEVE PROPER BOND WITH THE FILL MATERIAL, THE SURFACE OF THE GROUND SHALL BE SCARIFIED TO A DEPTH OF 6" BEFORE THE FILL IS PLACED. WHERE NATURAL GROUND IS STEEPER THAN 5:1, IT SHALL BE BENCHED AND THE FILL KEYED IN TO ACHIEVE STABILITY. WHERE NEW FILL IS TO BE PLACED ON EXISTING FILL, THE EXISTING FILL SHALL BE REMOVED, UNTIL MATERIAL COMPACTED TO 90% RELATIVE DENSITY IS EXPOSED. THE NEW FILL SHALL BE PLACED PER THESE CONSTRUCTION NOTES. FILL MATERIAL SHAL BE PLACED IN UNIFORM LIFTS NOT EXCEEDING 6" IN COMPACTED THICKNESS. BEFORE COMPACTION BEGINS THE FILL SHALL BE BROUGHT TO A WATER CONTENT THAT WILL PERMIT PROPER COMPACTION BY EITHER (1) AERATING THE FILL IF IT IS TOO WET, OR (2) MOISTENING THE FILL WITH WATER IF IT IS TOO DRY. EACH LIFT SHALL BE THOROUGHLY MIXED BEFORE COMPACTION TO INSURE UNIFORM DISTRIBUTION OF MOISTURE.

2 NO ORGANIC MATERIAL SHALL BE PLACED IN ANY FILL.

3 THE UPPER 12" OF SUB-GRADE BELOW DRIVEWAY OR PARKING AREA SHALL BE COMPACTED TO 90% RELATIVE DENSITY.

4 BUILDING LOCATION AND PAD ELEVATION TO BE DONE BY A LICENSED SURVEYOR OR CIVIL ENGINEER PRIOR TO GRADING.

5 CONTRACTOR TO ARRANGE A PRE-GRADING MEETING WITH THE SANTA CLARA COUNTY INSPECTOR PRIOR TO BEGINNING ANY WORK.

6 NO POTABLE WATER TO BE USED FOR ANY GRADING PURPOSES ON THIS PROJECT.

7 PERMITTED HOURS OF WORK ARE 7:30 AM TO 6:00 PM, MONDAY THROUGH FRIDAY.

8 ALL UTILITIES TO BE UNDERGROUND, TYPICAL. PROVIDE CHECK VALVE ON WATER SERVICE.

ESTIMATED GRADING QUANTITIES

LOCATION	CUT	FILL	MAX. VERT DEPTH
DRIVEWAY	10	10	3 FT
GARAGE/SHOP	108	0	8 FT
HOUSE	0	0	0
POOL CABANA	0	6	3 FT
TOTAL	118 Cu. Yds.	16 Cu. Yds.	

Note: 102 Cu. Yds. of CUT is to be exported from the site to an approved location.

IMPERVIOUS AREA SUMMARY

LOCATION	EXISTING	PROPOSED
PAVING & PATIOS	8405	9455
HOUSE & COV. PORCHES	4238	4238
GARAGE	840	1121
SHOP / STORAGE	0	700
POOL	1000	1000
DECKS	0	175
TOTAL IMPERVIOUS AREA	14483 SF	16689 SF (+2206 SF)

TREE REMOVAL SUMMARY

TREE NUMBER	COMMON NAME	DBH	QUAN.	LOCATION
1	OAK	10"	1	SIDE OF (E) DRIVEWAY
2	OAK	12"	3	SIDE OF (E) DRIVEWAY
3	OAK	12"	3	SIDE OF (E) DRIVEWAY
4	CEDAR	8"	1	BEHIND (E) GARAGE
5	CEDAR	12"	1	BEHIND (E) GARAGE
6	CEDAR	14"	1	BEHIND (E) GARAGE
7	CEDAR	16"	1	BEHIND (E) GARAGE
8	SNAG	16"	1	SIDE OF (E) DRIVEWAY
9	OAK	16"	2	@ (E) POOL TERRACE
10	UNKNOWN	10"	1	ADJACENT TO ENTRY

FIRE DEPARTMENT NOTES

These plans are in compliance with the California Building and Fire Codes (2019 edition) and Santa Clara County Central Fire Protection District Amendments.

Occupancy Classification	R-3 / U
Building Construction	V-B
Fire Rating	**Sprinklered**
SRA	High

This project shall be equipped with a Type 13-D residential fire sprinkler system. Automatic fire sprinkler system shall be installed in accordance with currently adopted edition of NFPA-13D, and adopted standards of the authority having jurisdiction. All fire protection equipment shall be installed per the latest edition of the National Fire Code.

Sprinkler system designer/installer shall submit three (3) sets of plans and calculations for the underground and overhead Residential Automatic Sprinkler System to the Central Fire Protection District for approval. Installation shall follow guide sheet.

Underground Fire Protection System working drawings must be prepared by the designer / installer. These plans shall comply with the UNDERGROUND FIRE PROTECTION SYSTEM INSTALLATION POLICY HANDOUT.

1 The structure is situated within the boundaries of the State Responsibility Area (SRA) and is subject to the requirements contained in CBC Chapter 7-A for construction within the Wildland Interface.

2 Building numbers shall be provided. Numbers shall be a minimum of six (6) inches in height on a contrasting background and visible from the street. Where numbers are not visible from the street, additional numbers shall be installed on a directional sign at the property driveway and the street.

3 Roof coverings shall be no less than Class "B" fire rated roof.

4 Install smoke detectors per CBC sections 907.2.10.1.1 & CRC R 314

5 Install carbon-monoxide detectors per CBC 420 & CRC R 315.2

6 Maintain a 30-foot clearance with non-combustible vegetation around all structures.

7 Electric gates shall be equipped with KNOX key entry system.

8 Job copies of the building and fire system plans and permits must be on-site during inspection.

9 As a condition of submittal of these plans, the submitter, designer and installer certify that these plans and details comply with applicable Specifications, Standards, Codes and Ordinances agree that they are solely responsible for compliance with applicable Specifications, Standards, Codes and Ordinances, and further agree to correct any deficiencies noted by this review, subsequent review, inspection or other source and, to hold harmless and without prejudice, the reviewer and reviewing agency.

Wildland Urban Interface Construction Codes and Standards

Roofs and Roof Edges CBC 705A.1 / CRC R337.5
A non-combustible (tile or metal) or Class "A" roofing assembly is required in SRA – very high fire hazard severity zones. All other areas require Class "B" minimum roof assembly including LRA, SRA-moderate, & SRA-high areas.

Where the roof profile allows a space between the roof covering and the roof decking, the spaces shall be constructed to prevent the intrusion of flames or embers, be fired stopped with approved materials, or have layer of No. 72 cap sheet installed over the combustible decking. Where provided, valley flashing must be not less than 26 gauge galvanized sheet metal over a 36-inch wide No. 72 ASTM cap sheet. Roof gutters shall be provided with non-combustible gutter guards to prevent the accumulation of leaves and debris in the gutter.

Exterior Walls / Siding CRC R337.7.3
Noncombustible, listed ignition-resistant materials, heavy timber, 5/8" Type X gypsum sheathing behind exterior covering, exterior portion of one-hour assembly or log wall construction is allowed.
Note: ignition-resistive materials are those tested by the SFM or ICC-Evaluation Service to have a flame spread rating not over 25, and comply with accelerated weathering tests.

Eaves and Porch Ceilings CRC R337.7.4 / R337.7.5 / R337.7.6
The exposed roof deck under enclosed eaves and the underside of porch ceilings shall be non-combustible, listed ignition-resistant materials, or 5/8" type X gypsum sheathing behind exterior coverings. Solid wood rafter tails on the exposed underside of roof eaves having a minimum 2" nominal Dimension may be unprotected.

Vents CBC 706A / CRC R337.6
Ventilation openings for enclosed attics, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, and underfloor ventilation openings shall be fully covered with Wildland Flame and Ember Resistant (WUI) vents approved and listed by the California State Fire Marshal, or WUI vents listed to ASTM E2886.

Vents shall be permitted to be installed on the underside of eaves and cornices in accordance with all of the following conditions:

The attic space being vented is fully protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 of the California Building Code and;

The exterior wall covering and exposed underside of the eave are of non-combustible material, or ignition-resistant materials as determined in accordance with SFM Standard 12-7A-5 Ignition-Resistant Material the requirements of Section R337.4.3, and the vent is located more than 12 feet from the ground or walking surface of a deck, porch, patio or similar surface.

NOTE: This project has spray foam insulated roof areas, no venting is required. Spray foam insulation applied directly to the underside of the roof sheathing is considered air impermeable and will be used for roofs, enclosed eaves, enclosed roof rakes, and the enclosed spaces at porches.

Windows and Exterior Doors CBC 708A / CRC R337.8
Windows must be insulated glass with a minimum of 1 tempered pane exterior, or be 20 minute rated, or glass block. Exterior doors must be non-combustible, of ignition resistant materials, or 1-3/8" solid core, or have a 20-minute fire resistant rating.

Exterior Decking and Stairs CBC 709A / CRC R337.9
Walking surfaces of decks, porches, balconies, and stairs within 10 ft. of the building must be constructed of non-combustible, fire-retardant treated, of heavy-timber construction. Alternate materials can be used if they are ignition-resistant and pass performance requirements specified by the State Fire Marshal.

Under-floor and Appendages CBC 707A.8 / CRC R337.7.7 / CRC R337.7.8 & CRC R337.7.9
Exposed under-floors, underside of cantilevered or overhanging decks, balconies, and similar appendages shall be non-combustible, ignition-resistant, 5/8" Type X gypsum sheathing behind exterior coverings, exterior portion of 1-hour assembly, meet performance criteria SFM Standard 12-7A-3 or be enclosed to grade.

APPLICABLE CODES

ALL WORK INDICATED ON THE PLANS SHALL COMPLY WITH THE FOLLOWING GOVERNING CODES:

2022 CALIFORNIA BUILDING CODE
2022 CALIFORNIA RESIDENTIAL CODE
2022 CALIFORNIA ELECTRICAL CODE
2022 CALIFORNIA PLUMBING CODES
2022 CALIFORNIA MECHANICAL CODE
2022 CALIFORNIA ENERGY CODE
2022 CALIFORNIA GREEN BUILDING STANDARDS CODE
2022 CALIFORNIA FIRE CODE
SANTA CLARA COUNTY MUNICIPAL & FIRE CODE

PROJECT CONSULTANTS

ARCHITECT	Michael Helm, Architect Michael Helm & Associates 200 Seventh Ave., #110 Santa Cruz, CA 95062 831-476-5386
STRUCTURAL	George Reynolds, S. E. 111 Younglove Ave. Santa Cruz, CA 95060 831-426-3637
ENERGY	Monterey Energy Group 26465 Carmel Rancho Blvd., #8 Carmel, CA 93923 831-372-8328
REHS	Myer Engineering, Inc. 1796 Laurel Glen Road Soquel, CA 95073 831-800-2244
LANDSCAPE	Thomas Scherer Associates P.O. Box 68 Aptos, CA 95001 831-688-8913
SOILS	C2 Earth 750 Camden Ave., STE A Campbell, CA 95008 408-866-5436

ALL SOILS WORK AND FOUNDATION PLACEMENT SHALL COMPLY WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL INVESTIGATION BY C2 EARTH, PROJECT NO. 21137C-01R1, DATED JULY 29, 2022

SHEET INDEX

STORMWATER MANAGEMENT & MAINTENANCE AGREEMENT NOTES

1 THERE ARE NO EXISTING STORMWATER (DRAINAGE) ISSUES ON OR NEAR THE SITE AND THERE ARE NO STORMWATER (DRAINAGE) ISSUES ANTICIPATED RESULTING FROM THE PROPOSED IMPROVEMENTS.

2 THE PROPOSED DEVELOPMENT WILL NOT CAUSE PROBLEMS TO THE NEARBY PROPERTIES.

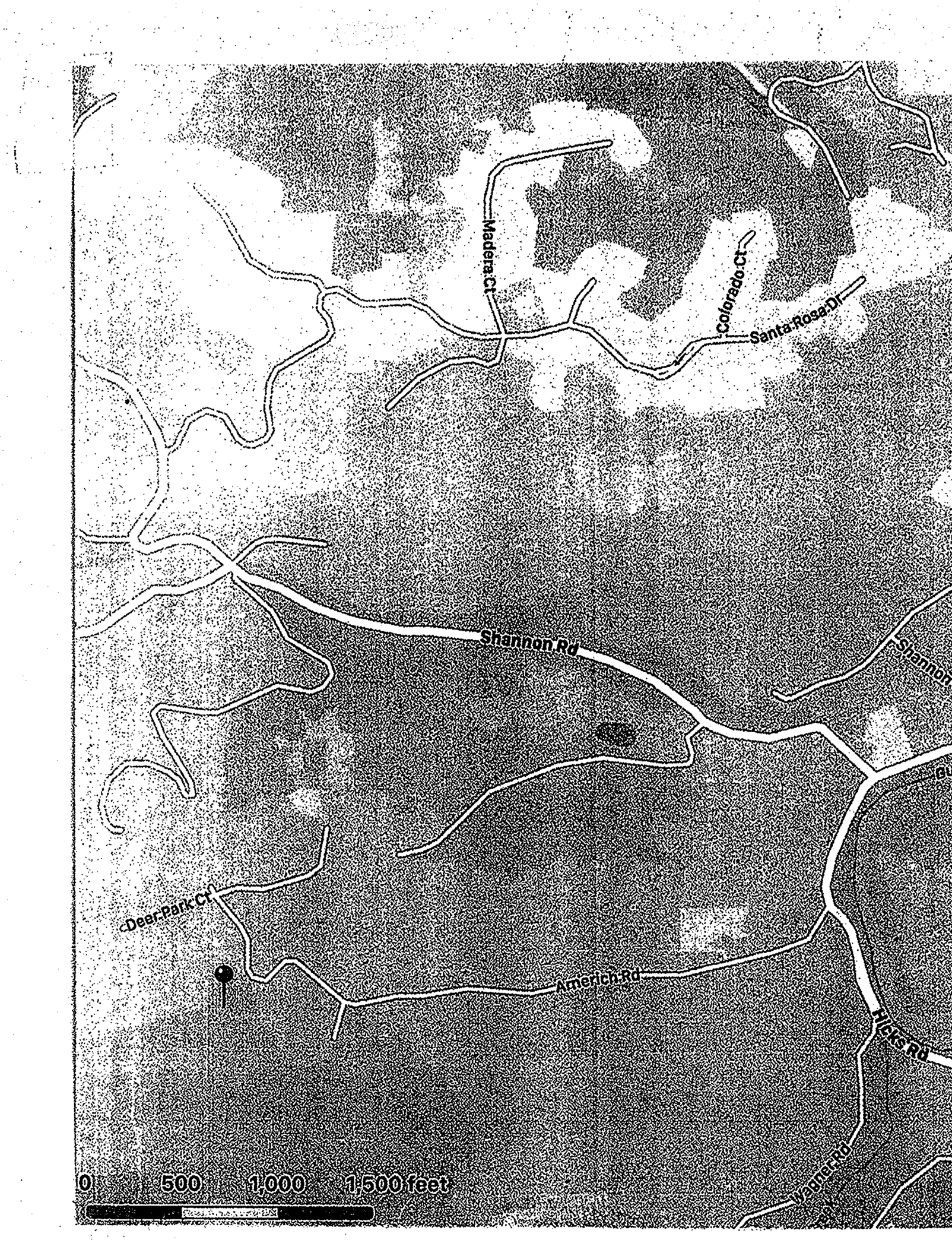
3 THE ON-SITE DRAINAGE WILL BE CONTROLLED IN SUCH A MANNER AS TO NOT INCREASE THE DOWNSTREAM PEAK FLOW OR CAUSE A HAZARD OR PUBLIC NUISANCE.

4 OWNER CONSENTS AND AGREES TO INSPECT AND MAINTAIN ANNUALLY 'PRIOR TO THE RAINY SEASON' THE ON-SITE DRAINAGE SYSTEMS AND STORMWATER MANAGEMENT FACILITIES ON THE SUBJECT PROPERTY.

MAINTENANCE SCHEDULE FOR ON-SITE DRAINAGE SYSTEMS AND STORMWATER MANAGEMENT FACILITIES

1 ROOF GUTTERS AND DOWNSPOUTS – SHALL BE CLEANED AS REQUIRED PRIOR TO RAINY SEASON ANNUALLY.

2 PERCOLATION TRENCHES – INSPECT VIA CLEAN-OUTS / INSPECTION PORTS, DRAIN PIPES AND OVERFLOW RISERS PRIOR TO THE RAINY SEASON ANNUALLY TO ASSURE DRAINAGE PERCOLATION SYSTEMS FUNCTIONS PROPERLY.



VICINITY MAP
NTS

PROJECT DATA

APN	537-12-012
ADDRESS	14500 Arnerich Hill Road, Los Gatos, CA
OWNER	Robert & Katrina Renfrew 14500 Arnerich Hill Road Los Gatos, CA 95070 650-440-3231
ZONING	RHS-20s-d1
OCCUPANCY	R-3/U
CONST. TYPE	V-B
FIRE RATING	**Sprinklered**
SRA	High
PARCEL SIZE	6.814 Acres Gross / 6.251 Acres Net = 272,293 SF

BUILDING AREA

HOUSE - HEATED AREA	EXISTING	PROPOSED
HOUSE - (E) LOWER FLOOR	1387.27	1387.27
HOUSE - (E) MAIN FLOOR	3677.81	3677.81
HOUSE - (P) UPPER FLOOR	0	1078.62
TOTAL HEATED AREA	5065.08 SF	6143.7 SF
(P) ADU	0	700 SF

UN-HEATED AREA	EXISTING	PROPOSED
GARAGE	840	1121
SHOP	0	350
STORAGE	0	350
POOL CABANA	0	306
TOTAL UN-HEATED AREA	840 SF	2127 SF
HOUSE – (E) COV. PORCHES	374	374 SF

FLOOR AREA RATIO (E) 6279.08 + (P) 3065.62 = 9344.7 SF / 272,293 SF = 3.4%

LOT COVERAGE

LOCATION	EXISTING	PROPOSED
HOUSE	4238.69	4238.69
GARAGE	840	1121
SHOP + STORAGE	0	700
POOL	1000	1000
POOL CABANA	0	756
TOTAL LOT COVERAGE	6078.69 SF	7534.69 SF

Areas disrupted during Construction shall be restored to be consistent with native vegetation species and patterns.

PROJECT DESCRIPTION

This project consists of remodeling an existing 5,065 SF Single Family Dwelling and constructing a **new upper floor 3 bedroom, 3 bathroom addition of approximately 1,078 SF**, resulting in a 5 bedroom, 6 bath SFD of approximately 6,143 SF.

This project consists of remodeling an existing 840 SF detached 3-car garage and constructing an **additional garage bay of approximately 281 SF**, resulting in a 4-car garage of approximately 1121 SF.

This project consists of a **new ground floor shop addition of approximately 350 SF and storage addition of approximately 350 SF** to the rear of the existing garage with a **new upper floor ADU of approximately 700 SF** that includes a music/guest room with bathroom.

This project consists of a **new detached accessory structure for a non-heated pool cabana of approximately 756 SF** that includes of a covered sitting area, bathroom, mechanical/storage room and outdoor kitchen with BBQ.

All construction will be predominately of wood frame and WUI compliant.

STORMWATER MANAGEMENT & MAINTENANCE AGREEMENT NOTES

OWNER CONSENTS AND AGREES TO INSPECT AND MAINTAIN ANNUALLY 'PRIOR TO THE RAINY SEASON' THE ON-SITE DRAINAGE SYSTEMS AND STORMWATER MANAGEMENT FACILITIES ON THE SUBJECT PROPERTY.

MAINTENANCE SCHEDULE FOR ON-SITE DRAINAGE SYSTEMS AND STORMWATER MANAGEMENT FACILITIES

1 ROOF GUTTERS AND DOWNSPOUTS – SHALL BE CLEANED AS REQUIRED PRIOR TO RAINY SEASON ANNUALLY.

2 PERCOLATION TRENCHES – INSPECT VIA CLEAN-OUTS / INSPECTION PORTS, DRAIN PIPES AND OVERFLOW RISERS PRIOR TO THE RAINY SEASON ANNUALLY TO ASSURE DRAINAGE PERCOLATION SYSTEMS FUNCTIONS PROPERLY

THERE ARE NO EXISTING STORMWATER (DRAINAGE) ISSUES ON OR NEAR THE SITE AND THERE ARE NO STORMWATER (DRAINAGE) ISSUES ANTICIPATED RESULTING FROM THE PROPOSED IMPROVEMENTS

Santa Clara County REBUILD Determination and Points Allocation [1]

A. Existing Residence

1a Footings[3]	Existing L.F.[2]	New/modified or Removed L.F.	Ratio	Maximum Points	Resulting Points
	455	82	.18		5
1b Slab - structural slabs and basement areas	Existing Area	Replaced/ Modified Area	Ratio		
Subtotal	1387	0	0.00	25	0
2 Walls - interior and exterior in linear feet[4]	Existing L.F.[2]	New/modified or Removed L.F.	Ratio	Maximum Points	Resulting Points
	1502	new, replaced, altered or removed 90.5	.06	50	3
3 Roof[5]	Existing S.F.	Roof S.F.	Ratio	Maximum Points	Resulting Points
	4238	1078	.25	25	7
Existing Residence Subtotal					

B. Proposed Additions

	Area in S.F.	Ratio 1 pt/ 40 S.F. [8]	Sub-Total Points
First floor and upper story additions[6,7]	1078	26.95	27

C. Cumulative rebuild points from permits issued within last 2 years: 0

TOTAL POINT ALLOCATION[9] 42

Footnotes
1 See County Ordinance # NS-1100.113
2 L.F. = Lineal Feet measured to outside face or end of wall or footing. Lengths of intersecting walls or footings at corners may not be double counted.
3 Lineal feet of rectangular footings shall be taken on the longest length. Lineal feet shall also include thickened slab areas for bearing walls.
4 All non-bearing & bearing walls (including framed openings) measured along the double top plate. Includes walls removed between house and addition. Modified walls are walls where the double top plates are altered; the greatest length of either new/modified or demolished walls shall be used
5 Includes all california framing, eaves, rakes, attached outdoor covered areas enclosed by more than 50% of the perimeter and substantial changes to roof framing (i.e. going from a flat ceiling to vaulted ceiling) that substantially changes the roof structural system
6 Points for additions and points for removal of existing roof structures both count, unless the existing roof framing is to remain in place as part of or under the second story addition
7 Additions great than 2000 sq. ft are automatically considered a rebuild, regardless of the points accumulated due to work on the existing structure.
8 Any remaining fraction of points shall be considered one (1) whole point.
9 The project will be classified as a "REBUILD" if the total points exceed 55.

EXISTING WALLS - (EXTERIOR & INTERIOR @ LOWER AND MAIN FLOOR) = 1502 LF
DEMOLISHED WALLS - (EXTERIOR & INTERIOR @ MAIN FLOOR) = 90.5 LF
NEW WALLS - (EXTERIOR & INTERIOR @ MAIN & UPPER FLOOR) = 310 LF

8.15.23 MSH
5-22-24 MSH

Michael Helm, AIA Architect & Associates
200 Seventh Avenue, #110 Santa Cruz, California 95062 (831) 476-5386

LICENSED ARCHITECT MICHAEL S. HELM EXPIRES 11.30.25 C17032 STATE OF CALIFORNIA

REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD – APN 537-12-012
LOS GATOS, CALIFORNIA

COVER SHEET

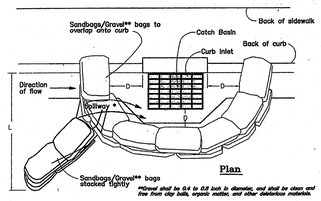
11-14-22

NTS

MSH

2108

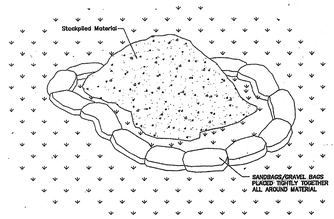
1



Notes:

1. *Catch Basin/Inlet protection shall be installed wherever there is a potential of stormwater or non-stormwater being discharged into it.*
2. *Inlet protection is required along with other pollution prevention measures such as; erosion control, soil stabilization, and measures to prevent tracking onto paved surfaces.*
3. *Modify inlet protection as needed to avoid creating traffic hazards.*
4. *Include inlet protection measures at hillside v–ditches and misc. drainage swales.*
5. *Inlet protection shall be inspected and accumulated sediments removed. Sediment shall be disposed of properly and in a manner that assures that the sediment does not enter the storm drain system.*
6. *Damaged bags shall be replaced immediately.*
7. *Additional sandbag sediment traps shall be placed at intervals as indicated on site plan.*

(A) CATCH BASIN/INLET PROTECTION



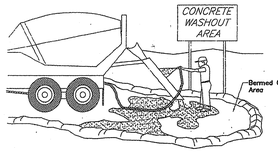
Notes:

Stockpile management procedures and practices are designed to reduce or eliminate air and storm water pollution from stockpiles of soil, and paving materials such as portland cement concrete (PCC) rubble, asphalt concrete (AC), asphalt, concrete rubble, aggregate base, aggregate subbase or pre–mixed aggregate, asphalt binder (i.e. cold mix) and pressure treated wood.

Notes:

1. *Protection of stockpiles is a year–round requirement.*
2. *Locate stockpiles a minimum of 50 feet away from concentrated flows of storm water, drainage courses, and drain inlets.*
3. *Implement wind erosion/transport control practices as appropriate.*
4. *All stockpiles shall be covered, stabilized, or protected with a temporary linear barrier (i.e. sandbags, etc.) prior to the onset of precipitation.*

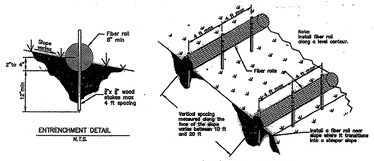
(E) MATERIAL STORAGE



Notes:

1. *Excess and waste concrete shall not be washed into the street or into a drainage system.*
2. *For washout of concrete and mortar products, a designated containment facility of sufficient capacity to retain liquid and solid waste shall be provided on site and disposed of properly off site.*
3. *Slurry from concrete and asphalt saw cutting shall be vacuumed or contained, dried, picked up and disposed of properly.*

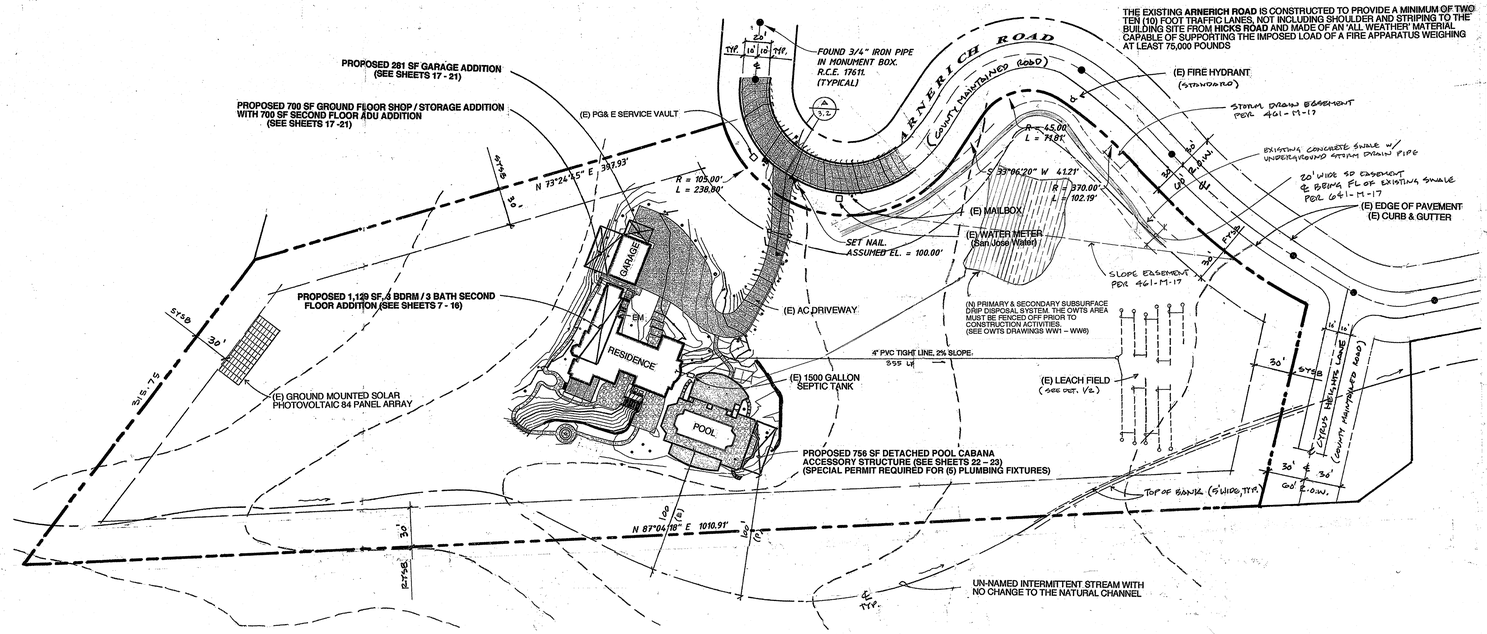
(F) CONCRETE WASTE MANAGEMENT



Notes:

1. *Place along the toe, top, face, and at grade breaks of exposed and erodible slopes.*
2. *Place on the down–slope of exposed soil areas.*
3. *Place around temporary stockpiles.*
4. *Place along the perimeter of a project.*
5. *Slopes greater than 1:5 may require the use of 20 inch diameter fiber rolls at the top of slopes.*
6. *Fiber rolls shall be either prefabricated or rolled tubes of erosion control blankets with a minimum 9 inch diameter.*
7. *Slopes 1:4 or flatter require fiber rolls to be placed no more than 20 feet apart.*
8. *Slopes 1:4 to 1:2 require fiber rolls to be placed no more than 15 feet apart.*
9. *Slopes 1:2 or greater require fiber rolls to be placed no more than 10 feet apart.*
10. *Fiber rolls shall be placed in a 2 to 4 inch deep trench.*
11. *Wooden commercial grade stakes, 2" x 2", shall be used to secure the fiber roll to the ground surface. Stakes shall be a minimum length of 24 inches and driven a minimum of 12 inches.*
12. *A single–stake installation requires the stakes to be placed no more than 2 feet apart.*
13. *If more than one fiber roll is placed in a row, the rolls shall be overlapped, not abutted, a minimum of 1 foot.*

(I) FIBER ROLL



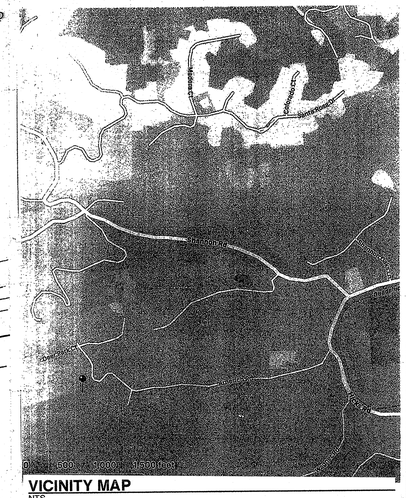
SITE PLAN – OVERALL

SCALE: 1" = 50' - 0"

GRAPHIC SCALE

50' 0' 50' 100'

1 INCH = 50 FEET



VICINITY MAP

NTS

PROJECT DATA

APN	537-12-012
ADDRESS	14500 Arnerich Hill Road, Los Gatos, CA
OWNER	Robert & Katrina Renfrew 14500 Arnerich Hill Road Los Gatos, CA 95070 650-440-3231
ZONING	RHS-20s-d1
OCCUPANCY	R-3/U
CONST. TYPE	V-B
FIRE RATING	**Sprinklered**
SRA	High
PARCEL SIZE	6.814 Acres Gross / 6.251 Acres Net = 272,293 SF

BUILDING AREA

HOUSE - HEATED AREA	EXISTING	PROPOSED
HOUSE - (E) LOWER FLOOR	1387.27	1387.27
HOUSE - (E) MAIN FLOOR	3677.81	3677.81
HOUSE - (P) UPPER FLOOR	0	1078.92
TOTAL HEATED AREA	5065.08 SF	6143.7 SF
(P) ADU	0	700 SF
UN-HEATED AREA	EXISTING	PROPOSED
GARAGE	840	1121
SHOP	0	350
STORAGE	0	350
POOL CABANA	0	306
TOTAL UN-HEATED AREA	840 SF	2127 SF
HOUSE – (E) COV. PORCHES	374	374 SF

FLOOR AREA RATIO (E) 6279.08 + (P) 3065.62 = 9344.7 SF / 272,293 SF = 3.4%

LOT COVERAGE

LOCATION	EXISTING	PROPOSED
HOUSE	4238.69	4238.69
GARAGE	840	1121
SHOP + STORAGE	0	700
POOL	1000	1000
POOL CABANA	0	756
TOTAL LOT COVERAGE	6078.69 SF	7534.69 SF

Areas disrupted during Construction shall be restored to be consistent with native vegetation species and patterns.

EROSION CONTROL NOTES

1. Erosion control planting or permanent landscaping shall be completed by October 15.
2. Permanent landscape areas require auto-irrigation.
3. Hydro-mulching is the best effective seeding method for large areas. Best time for planting is September-October, unless there is a sprinkler system.
4. Broadcast is approved for small areas. In this case apply fertilizer before seeding, after seeding apply straw or hay mulch.
5. Apply erosion control material on all drainage swales, cuts and fill, also any location where any existing vegetation has been removed.
6. If mulching, seeding, or fertilizing manually, mulch with straw or hay at 4000 lbs/acre. Fertilize with Ammonium Phosphate with Sulphur (16-20-0) at 350 lbs/acre. If Hydro-mulching, use wood fiber mulch at 2000 lbs/acre.

GRASS/LEGUME SEED MIX FOR EROSION CONTROL

Seed Mix	Rate of Application
Blando Brome	15 lbs/acre
Rose Clover	12 lbs/acre
Zorro Annual Fescue	3 lbs/acre
Creeping Red Fescue	5 lbs/acre
Apply seed mix at rate of	35 lbs/acre or 8 lbs/ 10,000 Sq. Ft. or 5/ lbs/ 1000 Sq. Ft.
Fertilizer (16-20-0)	350 lbs/acre or 8 lbs/1000 Sq. Ft.

Construction Materials

- All loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.) shall be covered and bermed.
- All chemicals shall be stored in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).
- Exposure of construction materials to precipitation shall be minimized. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
- Best Management Practices to prevent the off-site tracking of loose construction and landscape materials shall be implemented.

Waste Management

- Disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system shall be prevented.
- Sanitation facilities shall be contained (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water, and shall be located a minimum of 70 feet away from an inlet, street or driveway, stream, riparian area or other drainage facility.
- Sanitation facilities shall be inspected regularly for leaks and spills and cleaned or replaced as necessary.
- Cover waste disposal containers at the end of every business day and during a rain event.
- Discharges from waste disposal containers to the storm water drainage system or receiving water shall be prevented.
- Stockpiled waste material shall be contained and securely protected from wind and rain at all times unless actively being used.
- Procedures that effectively address hazardous and non-hazardous spills shall be implemented.
- Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and
- Concrete washout areas and other washout areas that may contain additional pollutants shall be contained so there is no discharge into the underlying soil and onto the surrounding areas.

Vehicle Storage and Maintenance

- Measures shall be taken to prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.
- All equipment or vehicles, which are to be fueled, maintained and stored onsite shall be in a designated area fitted with appropriate BMPs.
- Leaks shall be immediately cleaned and leaked materials shall be disposed of properly.

STORMWATER MANAGEMENT & MAINTENANCE AGREEMENT NOTES

1 THERE ARE NO EXISTING STORMWATER (DRAINAGE) ISSUES ON OR NEAR THE SITE AND THERE ARE NO STORMWATER (DRAINAGE) ISSUES ANTICIPATED RESULTING FROM THE PROPOSED IMPROVEMENTS.

2 THE PROPOSED DEVELOPMENT WILL NOT CAUSE PROBLEMS TO THE NEARBY PROPERTIES.

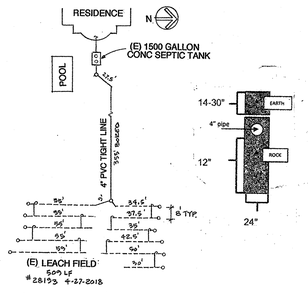
3 THE ON-SITE DRAINAGE WILL BE CONTROLLED IN SUCH A MANNER AS TO NOT INCREASE THE DOWNSTREAM PEAK FLOW OR CAUSE A HAZARD OR PUBLIC NUISANCE.

4 OWNER CONSENTS AND AGREES TO INSPECT AND MAINTAIN ANNUALLY 'PRIOR TO THE RAINY SEASON' THE ON-SITE DRAINAGE SYSTEMS AND STORMWATER MANAGEMENT FACILITIES ON THE SUBJECT PROPERTY.

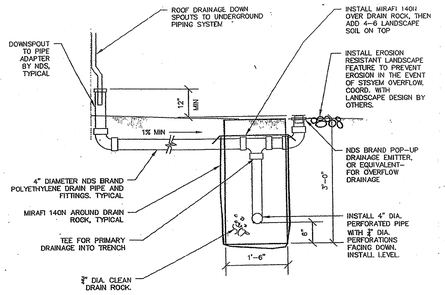
MAINTENANCE SCHEDULE FOR ON-SITE DRAINAGE SYSTEMS AND STORMWATER MANAGEMENT FACILITIES

1 ROOF GUTTERS AND DOWNSPOUTS – SHALL BE CLEANED AS REQUIRED PRIOR TO RAINY SEASON ANNUALLY.

2 PERCOLATION TRENCHES – INSPECT VIA CLEAN-OUTS / INSPECTION PORTS, DRAIN PIPES AND OVERFLOW RISERS PRIOR TO THE RAINY SEASON ANNUALLY TO ASSURE DRAINAGE PERCOLATION SYSTEMS FUNCTIONS PROPERLY.



(1) EXISTING SEPTIC SYSTEM DETAIL



NOTE:
CONSTRUCT PERCOLATION TRENCH SUCH THAT OVERFLOW SIDE IS LEVEL OR SLOPED AT 2% MAX IN ORDER TO PREVENT CONCENTRATED FLOW IN THE EVENT OF SYSTEM OVERFLOW.

(2) DOWNSPOUT TO PERCOLATION TRENCH

ABLE SEPTIC TANK SERVICE
Lic# 617475

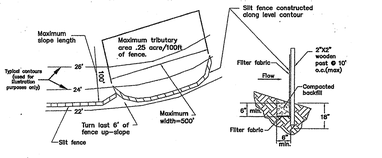
1020 Ruff Drive
San Jose, California 95110
Office (408) 377-0690
Fax (408) 492-1009
24 Hour Emergency Service
(408) 389-4900

SEPTIC TANK INSPECTION REPORT

DATE: 08-26-22 INVOICE NO: 06774
JOB SITE: 14500 Arnerich Rd. Los Gatos, Ca. 95032
BUYERS: n/a OWNERS: Rob & Katrina Renfrew
REALTY COMPANY: n/a AGENT: n/a PHONE: n/a
ADDRESS: n/a FAX: n/a
CUSTOMER HAS CESSPOOL ( ) SUMP ( ) SEPTIC TANK (X)
IS UNIT ALL CONCRETE (X) CONCRETE WITH WOOD ( ) TANK ALL WOOD ( )
IF TANK HAS WOOD TOP, HOW MANY LAYERS: n/a ONE ( ) TWO ( )
CONDITION OF WOOD: n/a GOOD ( ) FAIR ( ) ROTTEN ( )
INLET /OUTLET (ELBOWS): GOOD (X) IF BAD/BROKEN WHICH: INLET ( ) OUTLET ( )
DOES UNIT NEED PUMPING: YES (X) NO ( ) ESTIMATED GALLONS: 1,500
DID ABLE PUMP TANK: YES (X) NO ( ) DATE PUMPED: 08-26-22
DOES LIQUID LEVEL INDICATE LEECHING APPEARS TO BE IN WORKING ORDER: YES (X)
FAILED ( ) OR QUESTIONABLE ( )
ANY EVIDENCE OF SEWAGE OR SEWER WATER BREAKING OUT OF GROUND: YES ( ) NO (X)
MAP LOCATION OF SEPTIC TANK: Septic Tank ↓ Front of House ↓

COMMENTS, IF ANY: *THIS IS NO GUARANTEE ON HOW LONG SYSTEM WILL LAST
Septic tank is in working condition. Leach field passed 30 minute water test. As of 08-26-22 at 10:30 A.M. Septic tank passes inspection.

REPORT COMPLETED BY: Clint Gilbertson



Notes:

1. *Construct the silt fence along a level contour.*
2. *Silt fences shall remain in place until the disturbed area is permanently stabilized.*
3. *Provide sufficient room for runoff to pond behind the fence and allow sediment removal equipment to pass between the silt fence and toe of slope or other obstructions. About 1350 sq. ft. of ponding area shall be provided for every acre draining to the fence.*
4. *Turn the ends of the filter fence uphill to prevent stormwater from flowing around the fence.*
5. *Leave an undisturbed or stabilized area immediately downslope from the fence.*
6. *Do not place in live stream or intermittently flowing channels.*
7. *When standard filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy–duty (0.6 inch) wire staples at least 1.75 inches long, tie wires or hog rings. Filter fabric shall be woven polypropylene geotextile with a minimum width of 36 inches and a minimum tensile strength of 100 lb force.*
8. *Wood stakes shall be commercial quality lumber no less than 2 inch by 2 inch. Wood stakes shall be driven to a depth of no less than 18 inches from surface.*

(H) SILT FENCE

STANDARD BEST MANAGEMENT PRACTICE NOTES

1. Solid and Demolition Waste Management: Provide designated waste collection areas and containers on site away from streets, gutters, storm drains, and waterways, and arrange for regular disposal. Waste containers must be watertight and covered at all times except when waste is deposited. Refer to Erosion & Sediment Control Field Manual, 4th Edition (page C3) or latest.
2. Hazardous Waste Management: Provide proper handling and disposal of hazardous wastes by a licensed hazardous waste material hauler. Hazardous wastes shall be stored and properly labeled in sealed containers constructed of suitable materials. Refer to Erosion & Sediment Control Field Manual, 4th Edition (pages C-5 to C-6) or latest.
3. Spill Prevention and Control: Provide proper storage areas for liquid and solid materials, including chemicals and hazardous substances, away from streets, gutters, storm drains, and waterways. Spill control materials must be kept on site where readily accessible. Spills must be cleaned up immediately and contaminated soil disposed properly. Refer to Erosion & Sediment Control Field Manual, 4th Edition (pages C-7 to C-8, C-13 to C-14) or latest.
4. Vehicle and Construction Equipment Service and Storage: An area shall be designated for the maintenance, where on-site maintenance is required, and storage of equipment that is protected from stormwater run-on and runoff. Measures shall be provided to capture any waste oils, lubricants, or other potential pollutants and these wastes shall be properly disposed of off site. Fueling and major maintenance/repair, and washing shall be conducted off-site whenever feasible. Refer to Erosion & Sediment Control Field Manual, 4th Edition (page C9) or latest.
5. Material Delivery, Handling and Storage: In general, materials should not be stockpiled on site. Where temporary stockpiles are necessary and approved by the County, they shall be covered with secured plastic sheeting or tarp and located in designated areas near construction entrances and away from drainage paths and waterways. Barriers shall be provided around storage areas where materials are potentially in contact with runoff. Refer to Erosion & Sediment Control Field Manual, 4th Edition (pages C-11 to C-12) or latest.
6. Handling and Disposal of Concrete and Cement: When concrete trucks and equipment are washed on-site, concrete wastewater shall be contained in designated containers or in a temporary lined and watertight pit where wasted concrete can harden for later removal. If possible have concrete contractor remove concrete wash water from site. In no case shall fresh concrete be washed into the road right-of-way. Refer to Erosion & Sediment Control Field Manual, 4th Edition (pages C-15 to C-16) or latest.
7. Pavement Construction Management: Prevent or reduce the discharge of pollutants from paving operations, using measures to prevent run-on and runoff pollution and properly disposing of wastes. Avoid paving in the wet season and reschedule paving when rain is in the forecast. Residue from saw-cutting shall be vacuumed for proper disposal. Refer to Erosion & Sediment Control Field Manual, 4th Edition (pages C-17 to C-18) or latest.
8. Contaminated Soil and Water Management: Inspections to identify contaminated soils should occur prior to construction and at regular intervals during construction. Remediating contaminated soil should occur promptly after identification and be specific to the contaminant identified, which may include hazardous waste removal. Refer to Erosion & Sediment Control Field Manual, 4th Edition (pages C-19 to C-20) or latest.
9. Sanitary/Septic Water Management: Temporary sanitary facilities should be located away from drainage paths, waterways, and traffic areas. Only licensed sanitary and septic waste haulers should be used. Secondary containment should be provided for all sanitary facilities. Refer to Erosion & Sediment Control Field Manual, 4th Edition (page C-21) or latest.
10. Inspection & Maintenance: Areas of material and equipment storage sites and temporary sanitary facilities must be inspected weekly. Problem areas shall be identified and appropriate additional and/or alternative control measures implemented immediately, within 24 hours of the problem being identified.

STANDARD EROSION CONTROL NOTES

1. Sediment Control Management:

   Tracking Prevention & Clean Up: Activities shall be organized and measures taken as needed to prevent or minimize tracking of soil onto the public street system. A gravel or proprietary device construction entrance/exit is required for all sites. Clean up of tracked material shall be provided by means of a street sweeper prior to an approaching rain event, or at least once at the end of each workday that material is tracked, or, more frequently as determined by the County Inspector. Refer to Erosion & Sediment Control Field Manual 4th Edition (pages B-31 to B-33) or latest.

   Storm Drain Inlet and Catch Basin Inlet Protection: All inlets within the vicinity of the project and within the project limits shall be protected with gravel bags placed around inlets or other inlet protection. At locations where exposed soils are present, staked fiber roles or staked silt fences can be used. Inlet filters are not allowed due to clogging and subsequent flooding. Refer to Erosion & Sediment Control Field Manual, 4th Edition (pages B-49 to B-51) or latest.

   Storm Water Runoff: No storm water runoff shall be allowed to drain in to the existing and/or proposed underground storm drain system or other above ground watercourses until appropriate erosion control measures are fully installed.

   Dust Control: The contractor shall provide dust control in graded areas as required by providing we suppression or chemical stabilization of exposed soils, providing for rapid clean up of sediments deposited on paved roads, furnishing construction road entrances and vehicle wash down areas, and limiting the amount of areas disturbed by clearing and earth moving operations by scheduling these activities in phases.

   Stockpiling: Excavated soils shall not be placed in streets or on paved areas. Borrow and temporary stockpiles shall be protected with appropriate erosion control measures(tarps, straw bales, silt fences, ect.) to ensure silt does not leave the site or enter the storm drain system or neighboring watercourse.
2. Erosion Control: During the rainy season, all disturbed areas must include an effective combination of erosion and sediment control. It is required that temporary erosion control measures are applied to all disturbed soil areas prior to a rain event. During the non-rainy season, erosion control measures must be applied sufficient to control wind erosion at the site.
3. Inspection & Maintenance: Disturbed areas of the Project's site, locations where vehicles enter or exit the site, and all erosion and sediment controls that are identified as part of the Erosion Control Plans must be inspected by the Contractor before, during, and after storm events, and at least weekly during seasonal wet periods. Problem areas shall be identified and appropriate additional and/ or alternative control measures implemented immediately, within 24 hours of the problem being identified.
4. Project Completion: Prior to project completion and signoff by the County Inspector, all disturbed areas shall be reseeded, planted, or landscaped to minimize the potential for erosion on the subject site.
5. It shall be the Owner's/Contractor's responsibility to maintain control of the entire construction operation and to keep the entire site in compliance with the erosion control plan.
6. Erosion and sediment control best management practices shall be operable year round or until vegetation is fully established on landscaped surfaces.

B-15-23	MSH
5-22-24	MSH

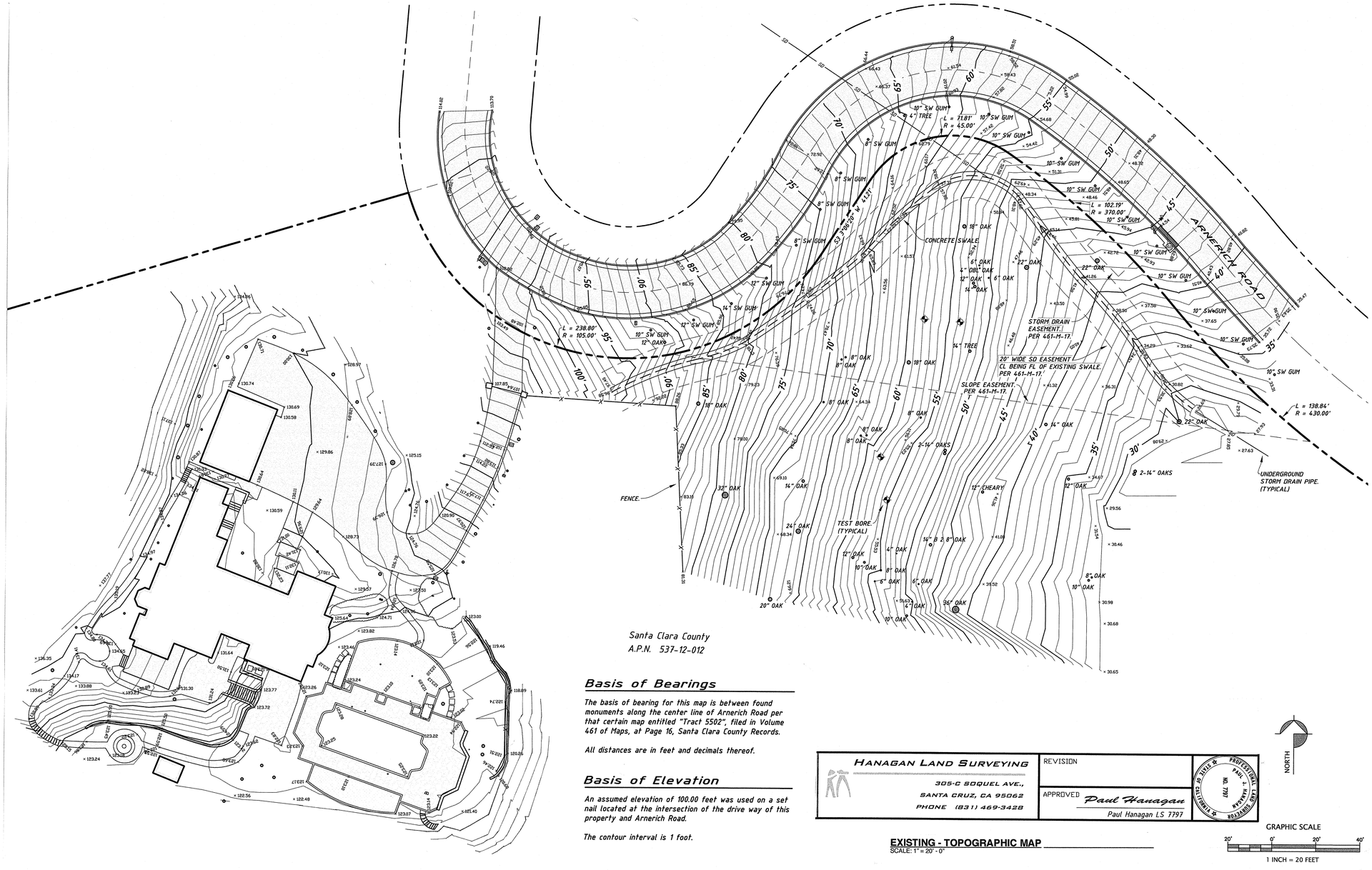
Michael Helm, AIA Architect & Associates
200 Seventh Avenue, #110 Santa Cruz, California 95062 (831) 476-5386

REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD – APN: 537-12-012
LOS GATOS, CALIFORNIA

SITE PLAN OVERALL / EROSION CONTROL / BMP's

11-14-22
1" = 50'-0"
MSH
2108

2.1



Basis of Bearings

The basis of bearing for this map is between found monuments along the center line of Arnerich Road per that certain map entitled "Tract 5502", filed in Volume 461 of Maps, at Page 16, Santa Clara County Records.

All distances are in feet and decimals thereof.

Basis of Elevation

An assumed elevation of 100.00 feet was used on a set nail located at the intersection of the drive way of this property and Arnerich Road.

The contour interval is 1 foot.

HANAGAN LAND SURVEYING
305-C SOQUEL AVE.,
SANTA CRUZ, CA 95062
PHONE (831) 469-3428

REVISION

APPROVED *Paul Hanagan*
Paul Hanagan LS 7797

PROFESSIONAL LAND SURVEYOR PAUL J. HANAGAN No. 7797 STATE OF CALIFORNIA

NORTH

GRAPHIC SCALE
20' 0' 20' 40'
1 INCH = 20 FEET

EXISTING - TOPOGRAPHIC MAP
SCALE: 1" = 20' - 0"

8-15-23	MSH
5-22-24	MSH

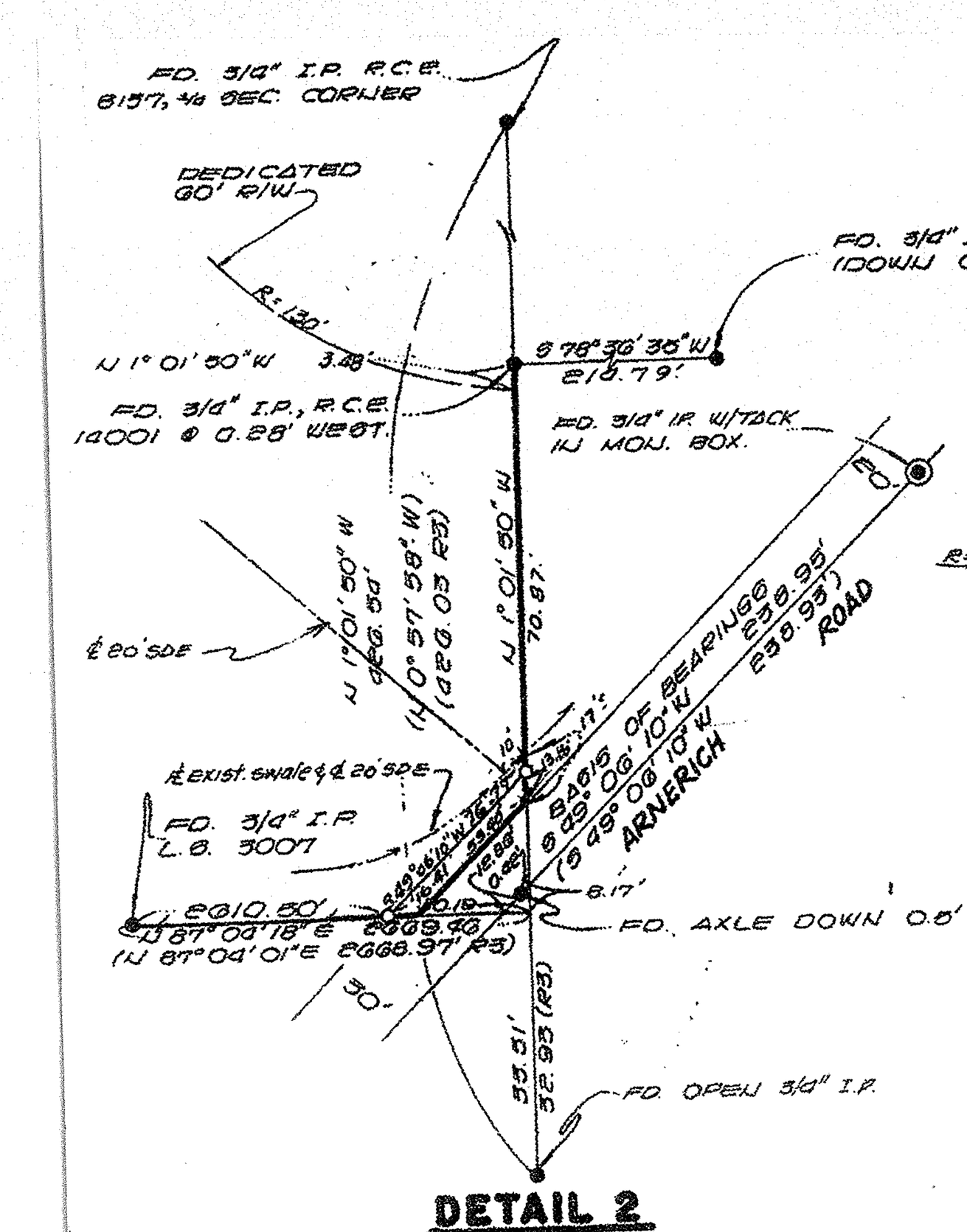
Michael Helm, AIA Architect & Associates
200 Seventh Avenue, #110 Santa Cruz, California 95062 (831) 476-5386

REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD - APN 537-12-012
LOS GATOS, CALIFORNIA

EXISTING TOPOGRAPHY MAP

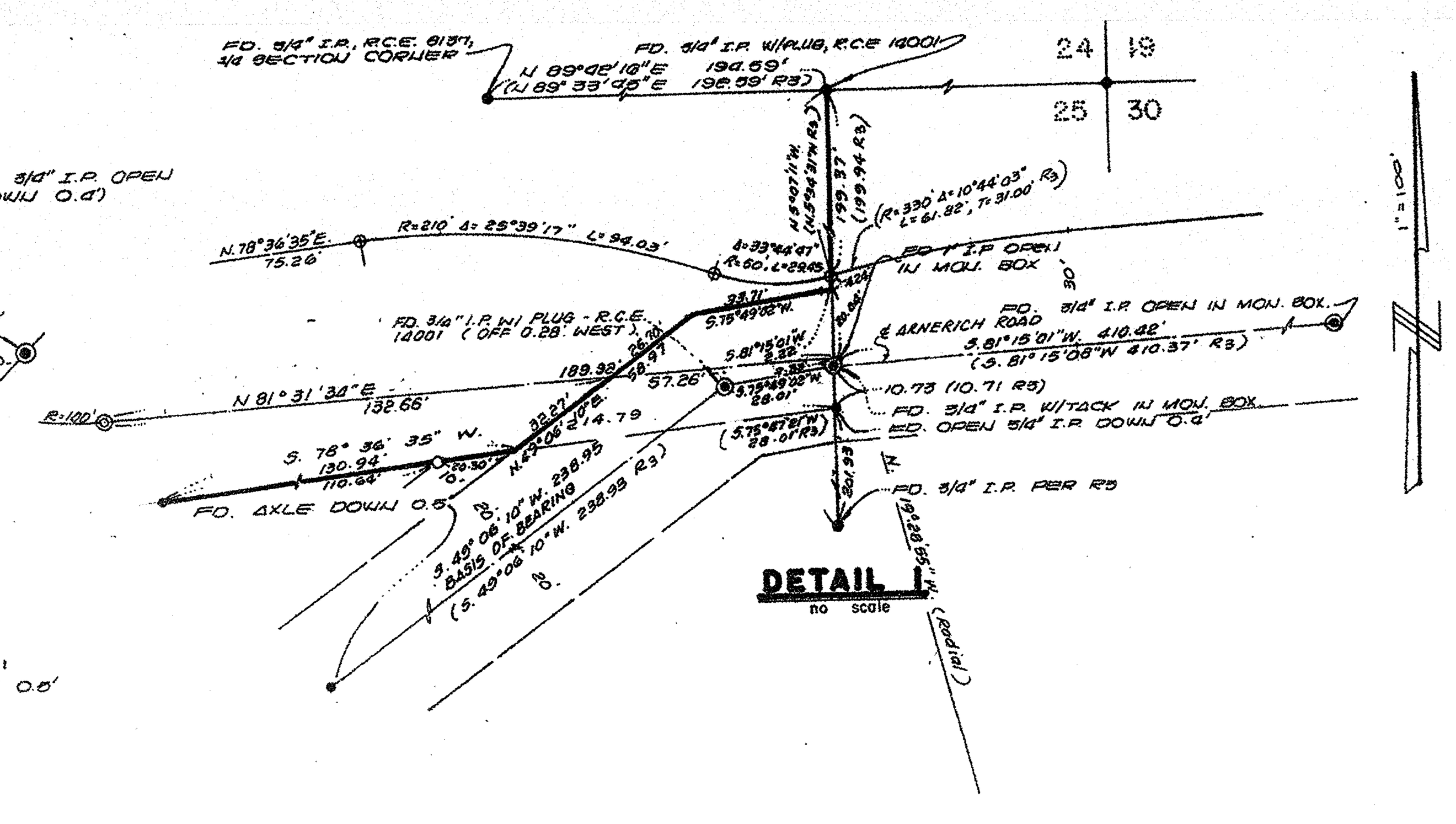
6-27-23	
1" = 20'-0"	
J. KOREA/MSH	
2108	

2.2

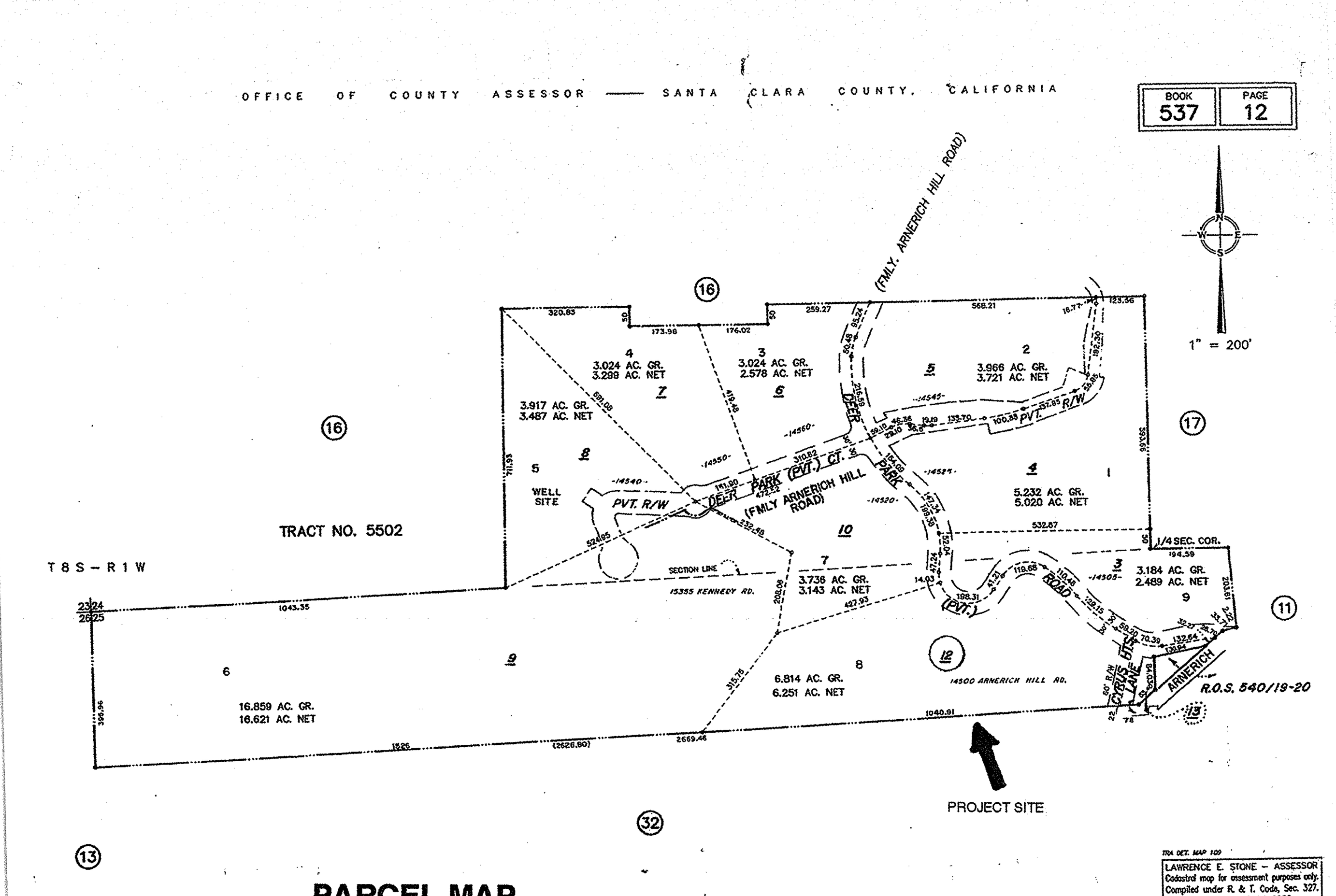


DETAIL 2
no scale

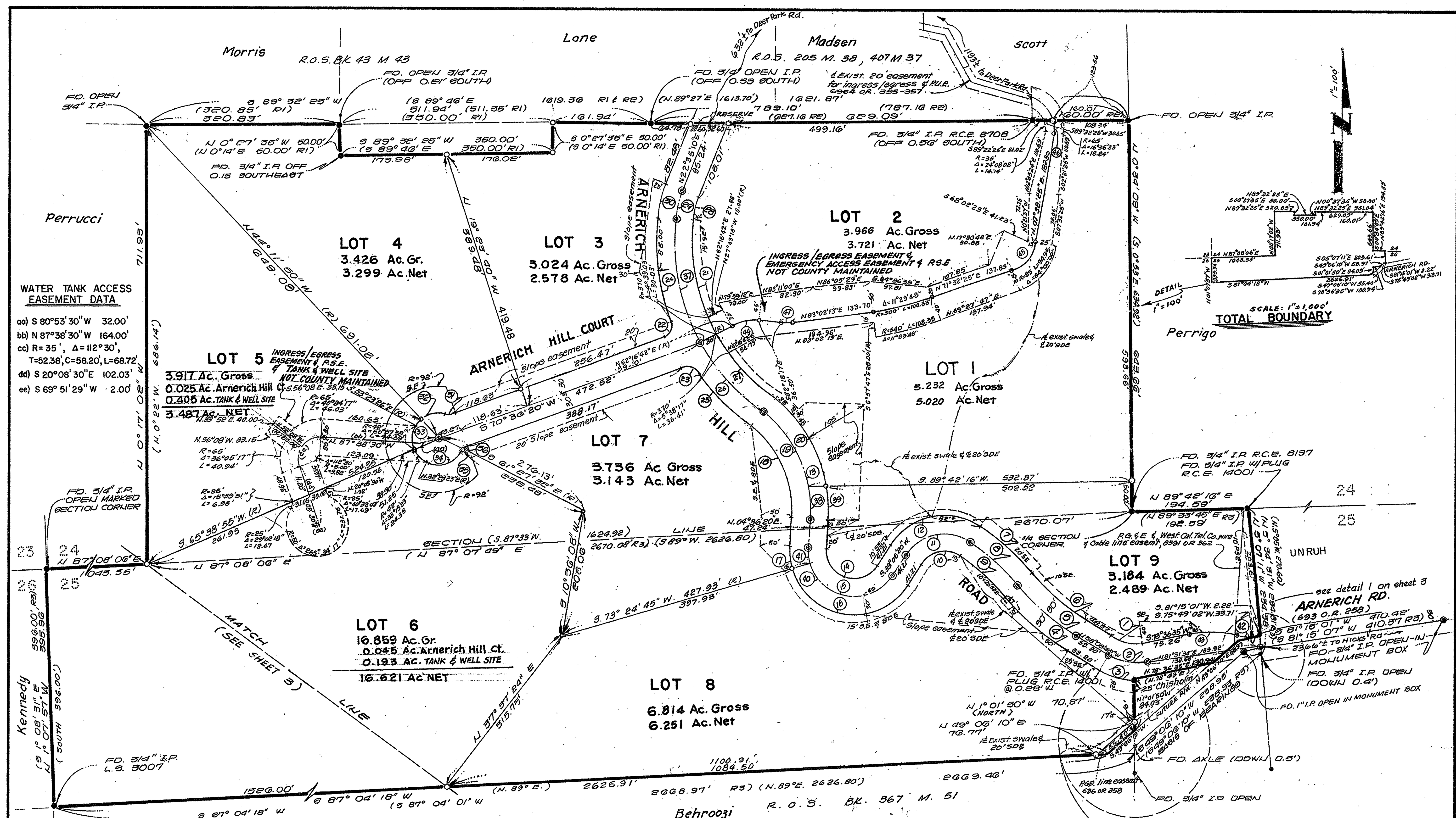
LEGEND
◎ Std. County Survey Monument to be set by June 1980
○ Set 3/4" iron pipe, tagged R.C.E. 17611.
● Found 1" pipe, tagged as shown.
(R) Radial
▬ Distinctive border line
( ) Denotes Record Data./deed B675 O.R. 254
R1 Record of Survey in Bk. 43 O.M. Pg. 43
R2 Record of Survey in Bk. 205 O.M. Pg. 38. Bk. 407 O.M. Pg. 37.
R3 Record of Survey in Bk. 367 O.M. Pg. 51.



DETAIL 1
no scale



PARCEL MAP
NTS



LEGEND
◎ Std. County Survey Monument to be set by June, 1980
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● Found iron pipe, tagged as shown.
(R) Radial
▬ Distinctive border line
( ) Denotes Record Data/deed B675 O.R. 254
(R1) Record of Survey in Bk. 43 O.M., Pg. 43.
(R2) Record of Survey in Bk. 205 O.M. Pg. 38. Bk. 407 O.M. Pg. 37.
(R3) Record of Survey in Bk. 367 O.M. Pg. 51.
— — — slope easement.

BASIS OF BEARINGS

The basis of bearings for this map is the centerline of Arnerich Road, as found monumented and recorded as S49°06'10"W in Book 367 O.M., Page 51, Santa Clara County Records.

Note: The effect of a right of way per deed from L.C. Smith, et ux to Cold Creek Land & Cattle Corp. Recorded Book 0266 O.R. page 664 affects this property, but not locateable per record.

TRACT 5502

BEING A PART OF THE SOUTHWEST 1/4 OF SECTION 24, AND A PART OF THE NORTHWEST 1/4 SECTION AND A PORTION OF LOTS 3 & 4 OF SECTION 25, TOWNSHIP 8S, RANGE 1W, M.D.B.& M.

MH engineering Co.
253 Sixth Street
Hollister, California 95023

Sheet 2 of 3 Sheets 140-34, 35-50 Job No. MH77281

Book 461 of Maps, Pages 16, 17 + 18 3.28.80

17

8.15.23	MSH
5.22.24	MSH

Michael Helm, AIA Architect & Associates
200 Seventh Avenue, #110 Santa Cruz, California 95062 (831) 476-5386

REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD – APN 537-12-012
LOS GATOS, CALIFORNIA

Subdivision Map
Parcel Map

6.27.23
NTS
MSH
2108

2.3

GRADING CALCULATIONS

DRIVEWAY

CUT 13'X33' ÷ 2 = 214.5 SF X 2.5' ÷ 2 = 268 CU.FT ÷ 27 = 9.9 CU.YDS CUT
AVGED DEPTH

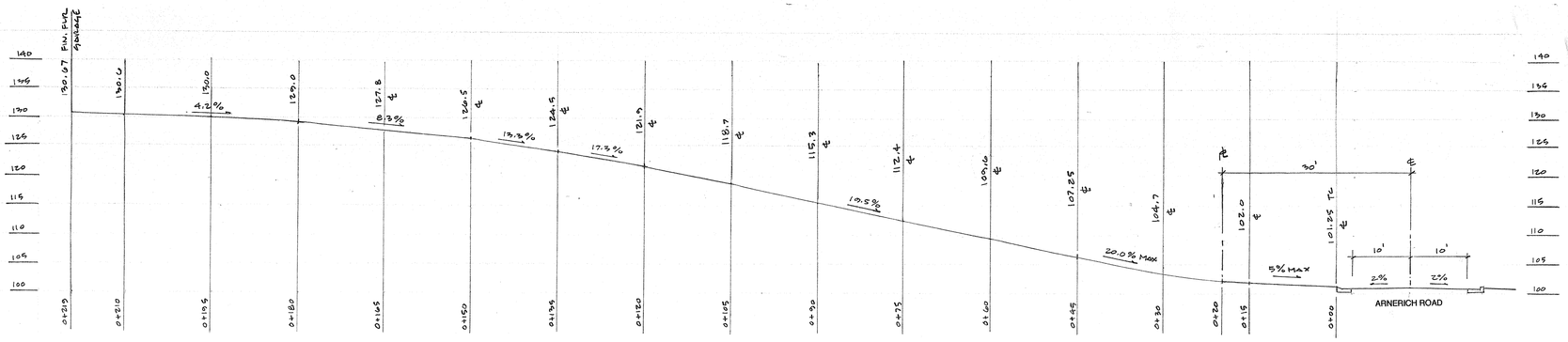
FILL 6'X30' = 180 SF X 3' ÷ 2 = 270 CU.FT ÷ 27 = 10 CU.YDS FILL
AVGED DEPTH

GARAGE/SHOP

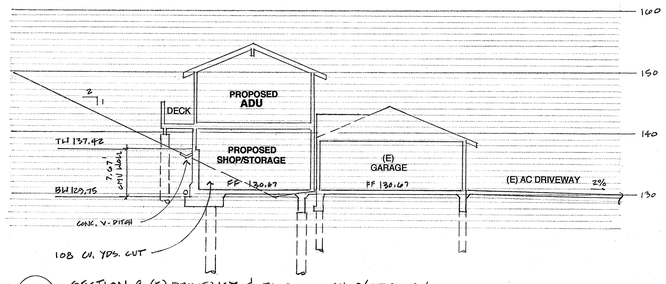
CUT 48.5'X15' = 727.5 SF X 8' ÷ 2 = 2910 CU.FT ÷ 27 = 107.7 CU.YDS CUT
AVGED DEPTH

CABANA

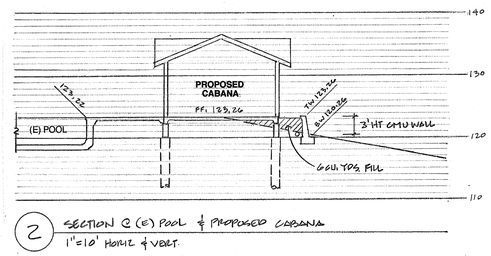
FILL 13.5'X 24' ÷ 2 = 162 SF X 2' ÷ 2 = 162 CU.FT ÷ 27 = 6 CU.YDS FILL
AVGED DEPTH



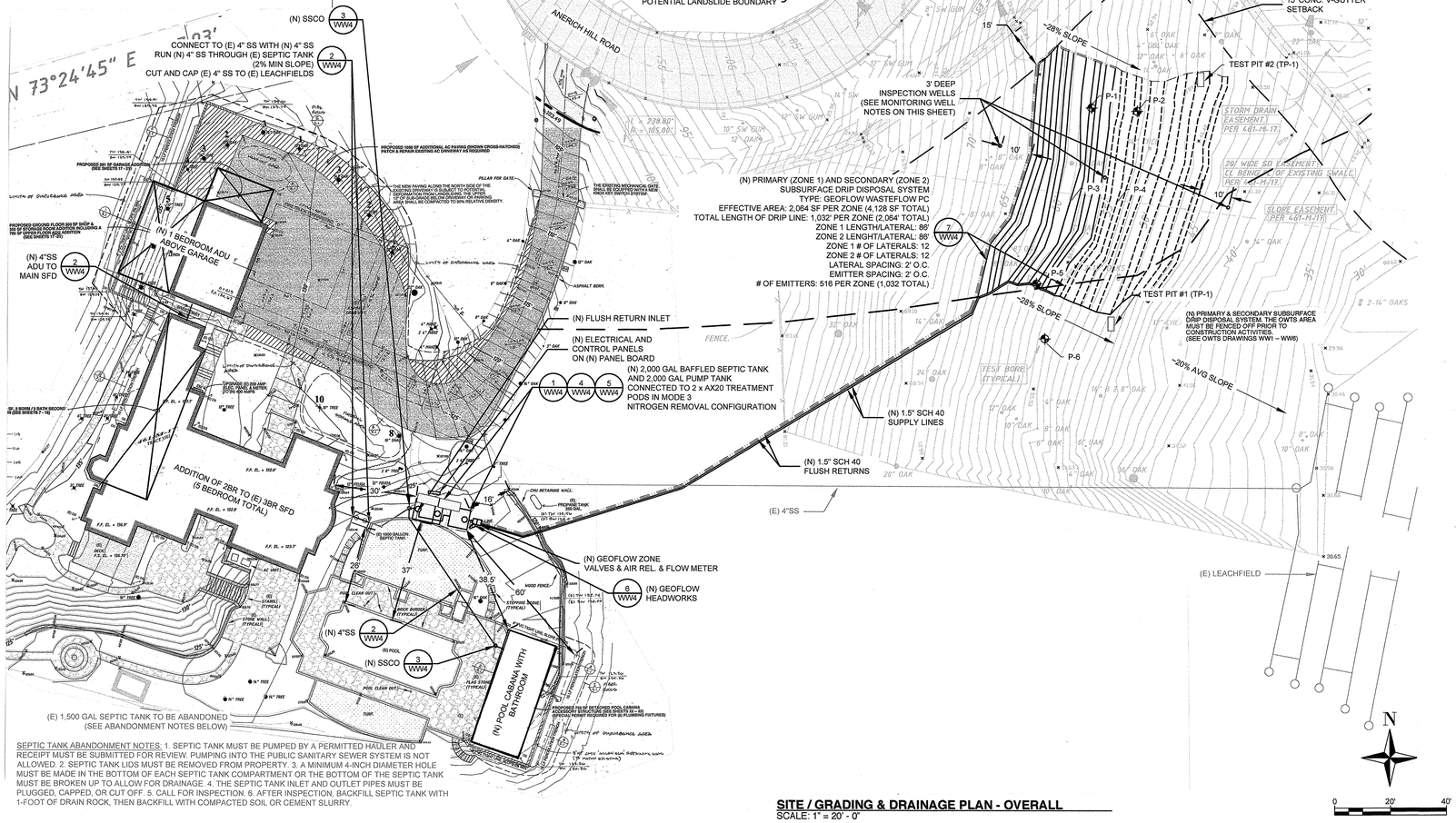
CENTERLINE PROFILE OF DRIVEWAY
SCALE: 1" = 10' - 0" HORIZONTAL & VERTICAL



1 SECTION C (E) DRIVEWAY & PROPOSED SHOP/STORAGE/ADU ADDITION
1" = 10' HORIZ & VERT.



2 SECTION C (E) POOL & PROPOSED CABANA
1" = 10' HORIZ & VERT.



SEPTIC TANK ABANDONMENT NOTES: 1. SEPTIC TANK MUST BE PUMPED BY A PERMITTED HAULER AND RECEIPT MUST BE SUBMITTED FOR REVIEW. PUMPING INTO THE PUBLIC SANITARY SEWER SYSTEM IS NOT ALLOWED. 2. SEPTIC TANK LIDS MUST BE REMOVED FROM PROPERTY. 3. A MINIMUM 4-INCH DIAMETER HOLE MUST BE MADE IN THE BOTTOM OF EACH SEPTIC TANK COMPARTMENT OR THE BOTTOM OF THE SEPTIC TANK MUST BE BROKEN UP TO ALLOW FOR DRAINAGE. 4. THE SEPTIC TANK INLET AND OUTLET PIPES MUST BE PLUGGED, CAPPED, OR CUT OFF. 5. CALL FOR INSPECTION. 6. AFTER INSPECTION, BACKFILL SEPTIC TANK WITH 1-FOOT OF DRAIN ROCK, THEN BACKFILL WITH COMPACTED SOIL OR CEMENT SLURRY.

SITE / GRADING & DRAINAGE PLAN - OVERALL
SCALE: 1" = 20' - 0"

5.22.24 MEH

Michael Helm, AIA Architect & Associates
200 Seventh Avenue, #110 Santa Cruz, California 95062 (831) 476-5386

REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD – APN 537-12-012
LOS GATOS, CALIFORNIA

OVERALL - SITE / GRADING & DRAINAGE

8-15-23
1"=20'-0"
MEH
2108

3.1

FAR SUMMARY

GROSS LOT AREA (8.96 ACRES)	390,298 SF
NET LOT AREA	390,298
FLOOR AREA CALCULATIONS	
HOUSE – (E) LOWER FLOOR	1387.27
HOUSE – (E) MAIN FLOOR	3677.81
HOUSE – (P) UPPER FLOOR	1078.62
ATTIC, COUNTABLE	N/A
BASEMENT, COUNTABLE	N/A
(E) COVERED PORCHES	374
SUBTOTAL	6517.7 SF
(E) GARAGE	840
(P) GARAGE	281
(P) SHOP	350
(P) STORAGE	350
SUBTOTAL	1821 SF
(P) ADU	700 SF
(P) POOL CABANA (ACCESSORY STRUCTURE)	306 SF
TOTAL	9344.7 SF

FLOOR AREA RATIO (E) 6279.08 + (P) 3065.62 = 9344.7 SF / 390,298 SF = 2.3%

FAR DIAGRAMS AND CALCULATIONS SHOWN ON SHEETS 7, 9, 20 & 22

PROPOSED 1050 SF ADDITIONAL AC PAVING (SHOWN CROSS-HATCHED) PATCH & REPAIR EXISTING AC DRIVEWAY AS REQUIRED

THE NEW PAVING ALONG THE NORTH SIDE OF THE EXISTING DRIVEWAY IS SUBJECT TO POTENTIAL DEFORMATION FROM LANDSLIDING. THE UPPER 12" OF SUB-GRADE BELOW DRIVEWAY OR PARKING AREA SHALL BE COMPACTED TO 90% RELATIVE DENSITY.

THE EXISTING MECHANICAL GATE SHALL BE EQUIPPED WITH A NEW KNOX KEY SWITCH SYSTEM

THE AC DRIVEWAY SHALL BE RE-CONSTRUCTED TO PROVIDE A MINIMUM UNOBSTRUCTED HORIZONTAL CLEARANCE OF FOURTEEN (14) FEET WIDE, AND UNOBSTRUCTED VERTICAL CLEARANCE OF THIRTEEN FEET, SIX INCHES (13'-6") AND CAPABLE OF SUPPORTING THE IMPOSED LOAD OF A FIRE APPARATUS WEIGHING AT LEAST 75,000 POUNDS

PROPOSED 281 SF GARAGE ADDITION (SEE SHEETS 17 - 21)

PROPOSED GROUND FLOOR 350 SF SHOP & 350 SF STORAGE ROOM ADDITION INCLUDING A 700 SF UPPER FLOOR ADU ADDITION (SEE SHEETS 17 -21)

PROPOSED 1,078 SF, 3 BDRM / 3 BATH SECOND FLOOR ADDITION (SEE SHEETS 7 - 16)

PROPOSED 758 SF DETACHED POOL CABANA ACCESSORY STRUCTURE (SEE SHEETS 22 – 23) (SPECIAL PERMIT REQUIRED FOR (5) PLUMBING FIXTURES)

TREE REMOVAL SUMMARY

TREE NUMBER	COMMON NAME	DBH	QUAN.	LOCATION
1	OAK	10"	1	SIDE OF (E) DRIVEWAY
2	OAK	12"	3	SIDE OF (E) DRIVEWAY
3	OAK	12"	3	SIDE OF (E) DRIVEWAY
4	CEDAR	8"	1	BEHIND (E) GARAGE
5	CEDAR	12"	1	BEHIND (E) GARAGE
6	CEDAR	14"	1	BEHIND (E) GARAGE
7	CEDAR	18"	1	BEHIND (E) GARAGE
8	SNAG	16"	1	SIDE OF (E) DRIVEWAY
9	OAK	16"	2	@ (E) POOL TERRACE
10	UNKNOWN	10"	1	ADJACENT TO ENTRY

ARNERICH ROAD (60' R.O.W.)

CENTERLINE PROFILE @ (E) DRIVEWAY APPROACH
1"=20' HORIZ.
1"=10' VERT
(CONFORMS W/ SD4 & SD4A)

Basis of Bearings

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All distances are in feet and decimals thereof.

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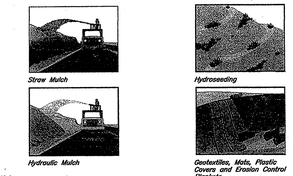


Straw Mulch | *Hydroseeding* | *Hydraulic Mulch* | *Geotextiles, Mats, Plastic Covers and Erosion Control Blankets*

Notes:
1. *Soil/Slope stabilization practices shall be designed to preserve existing vegetation where feasible and to revegetate open areas as soon as feasible after grading. These control practices shall include temporary seeding, permanent seeding, mulching, sod stabilization, vegetative buffer strips, protection of trees, or other soil stabilization practices.*
2. *Soil stabilization shall be implemented on all inactive disturbed areas from October 1 thru May 30 and on all disturbed areas during a rain event or potential rain.*
3. *Stabilization practices shall control/prevent erosion from the forces of wind and water.*
4. *Stabilization practices shall be implemented in conjunction with sediment trapping/filtering practices and practices to reduce the tracking of sediment onto paved roads.*
5. *When using straw mulching, the minimum application shall be 2 tons/acre. Mulch must be anchored immediately to minimize loss by wind or water.*
6. *When using hydroseeding/mulching, the minimum, application of wood fiber shall be 1,500 lbs/acre, that does not contain more than 50 percent newsprint.*
7. *For seeding recommendations, contact: USDA, Natural Resources Conservation Service at 5000 California Avenue, Bakersfield, CA 93309–0725. Phone: (661) 326–0967.*
8. *When using hydraulic mulch, the application shall be between 1 to 2 tons per acre.*
9. *Geotextiles, mats, plastic covers and erosion control blankets should be considered when disturbed soils may be particularly difficult to stabilize.*
10. *For geotextiles, mats, and erosion control blankets, installation should be in accordance with manufactures recommendations. Typically overlap of geotextiles/mats edges is 2 to 3 in. and stapled every 4 in. When blankets are to be spliced, place blankets end–over–end (shingle style) with 6 in. overlap and staple through overlapped area, approximately 12 in. apart.*

(D) EROSION CONTROL

Lots shall be graded to drain surface water away from foundation walls. The grade shall fall a minimum of 6 inches within the first 10 feet. Where lot lines, walls, slopes or other physical barriers prohibit 6 inches of fall within 10 feet, drains or swales shall be constructed to ensure drainage away from the structure.

STORMWATER MANAGEMENT & MAINTENANCE AGREEMENT NOTES

1 THERE ARE NO EXISTING STORMWATER (DRAINAGE) ISSUES ON OR NEAR THE SITE AND THERE ARE NO STORMWATER (DRAINAGE) ISSUES ANTICIPATED RESULTING FROM THE PROPOSED IMPROVEMENTS.

2 THE PROPOSED DEVELOPMENT WILL NOT CAUSE PROBLEMS TO THE NEARBY PROPERTIES.

3 THE ON-SITE DRAINAGE WILL BE CONTROLLED IN SUCH A MANNER AS TO NOT INCREASE THE DOWNSTREAM PEAK FLOW OR CAUSE A HAZARD OR PUBLIC NUISANCE.

4 OWNER CONSENTS AND AGREES TO INSPECT AND MAINTAIN ANNUALLY PRIOR TO THE RAINY SEASON THE ON-SITE DRAINAGE SYSTEMS AND STORMWATER MANAGEMENT FACILITIES ON THE SUBJECT PROPERTY.

MAINTENANCE SCHEDULE FOR ON-SITE DRAINAGE SYSTEMS AND STORMWATER MANAGEMENT FACILITIES

1 ROOF GUTTERS AND DOWNSPOUTS – SHALL BE CLEANED AS REQUIRED PRIOR TO RAINY SEASON ANNUALLY.

2 PERCOLATION TRENCHES – INSPECT VIA CLEAN-OUTS / INSPECTION PORTS, DRAIN PIPES AND OVERFLOW RISERS PRIOR TO THE RAINY SEASON ANNUALLY TO ASSURE DRAINAGE PERCOLATION SYSTEMS FUNCTIONS PROPERLY.

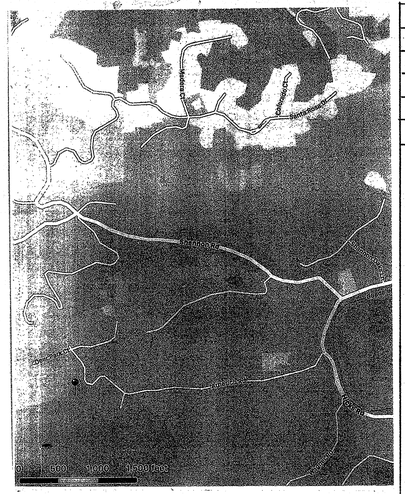
REVISION

APPROVED *Paul Hanagan*
Paul Hanagan LS 7797

PROFESSIONAL LAND SURVEYOR PAUL HANAGAN NO. 7797 STATE OF CALIFORNIA

SITE / GRADING & DRAINAGE PLAN
SCALE: 1" = 10' - 0"

GRAPHIC SCALE
10' 0' 10' 20'
1 INCH = 10 FEET



VICINITY MAP
NTS

PROJECT DATA

APN	537-12-012
ADDRESS	14500 Arnerich Hill Road, Los Gatos, CA
OWNER	Robert & Katrina Renfrew 14500 Arnerich Hill Road Los Gatos, CA 95070 650-440-3231
ZONING	RHS-20s-d1
OCCUPANCY	R-3/U
CONST. TYPE	V-B
FIRE RATING	**Sprinklered**
SRA	High
PARCEL SIZE	6.814 Acres Gross / 6.251 Acres Net = 272,293 SF

BUILDING AREA

	EXISTING	PROPOSED
HOUSE - HEATED AREA		
HOUSE - (E) LOWER FLOOR	1387.27	1387.27
HOUSE - (E) MAIN FLOOR	3677.81	3677.81
HOUSE - (P) UPPER FLOOR	0	1078.62
TOTAL HEATED AREA	5065.08 SF	6143.7 SF
(P) ADU	0	700 SF
UN-HEATED AREA	EXISTING	PROPOSED
GARAGE	840	1121
SHOP	0	350
STORAGE	0	350
POOL CABANA	0	306
TOTAL UN-HEATED AREA	840 SF	2127 SF
HOUSE – (E) COV. PORCHES	374	374 SF

FLOOR AREA RATIO (E) 6279.08 + (P) 3065.62 = 9344.7 SF / 272,293 SF = 3.4%

LOT COVERAGE

LOCATION	EXISTING	PROPOSED
HOUSE	4238.69	4238.69
GARAGE	840	1121
SHOP + STORAGE	0	700
POOL	1000	1000
POOL CABANA	0	756
TOTAL LOT COVERAGE	6078.69 SF	7534.69 SF

Areas disrupted during Construction shall be restored to be consistent with native vegetation species and patterns.

PROJECT DESCRIPTION

This project consists of remodeling an existing 5,065 SF Single Family Dwelling and constructing a **new upper floor 3 bedroom, 3 bathroom addition of approximately 1,078 SF,** resulting in a 5 bedroom, 6 bath SFD of approximately 6,143 SF.

This project consists of remodeling an existing 840 SF detached 3-car garage and constructing an **additional garage bay of approximately 281 SF,** resulting in a 4-car garage of approximately 1121 SF.

This project consists of a **new ground floor shop addition of approximately 350 SF and storage addition of approximately 350 SF** to the rear of the existing garage with a **new upper floor ADU of approximately 700 SF** that includes a music/guest room with bathroom.

This project consists of **a new detached accessory structure for a non-heated pool cabana of approximately 758 SF** that includes of a covered sitting area, bathroom, mechanical/storage room and outdoor kitchen with BBQ.

All construction will be predominately of wood frame and WUI compliant.

GRADING NOTES

1 EXCAVATED MATERIAL SHALL BE PLACED IN THE FILL AREAS DESIGNATED OR SHALL BE HAULED AWAY FROM THE SITE. WHERE FILL MATERIAL IS TO BE PLACED ON NATURAL GRADE IT SHALL BE STRIPPED OF ALL VEGETATION, TO ACHIEVE PROPER BOND WITH THE FILL MATERIAL. THE SURFACE OF THE GROUND SHALL BE SCARIFIED TO A DEPTH OF 6" BEFORE THE FILL IS PLACED. WHERE NATURAL GROUND IS STEEPER THAN 5:1, IT SHALL BE BENCHED AND THE FILL KEYED IN TO ACHIEVE STABILITY. WHERE NEW FILL IS TO BE PLACED ON EXISTING FILL, THE EXISTING FILL SHALL BE REMOVED, UNTIL MATERIAL COMPACTED TO 90% RELATIVE DENSITY IS EXPOSED. THE NEW FILL SHALL BE PLACED PER THESE CONSTRUCTION NOTES. FILL MATERIAL SHAL BE PLACED IN UNIFORM LIFTS NOT EXCEEDING 6" IN COMPACTED THICKNESS. BEFORE COMPACTION BEGINS THE FILL SHALL BE BROUGHT TO A WATER CONTENT THAT WILL PERMIT PROPER COMPACTION BY EITHER (1) AERATING THE FILL IF IT IS TOO WET, OR (2) MOISTENING THE FILL WITH WATER IF IT IS TOO DRY. EACH LIFT SHALL BE THOROUGHLY MIXED BEFORE COMPACTION TO INSURE UNIFORM DISTRIBUTION OF MOISTURE.

2 NO ORGANIC MATERIAL SHALL BE PLACED IN ANY FILL.

3 THE UPPER 12" OF SUB-GRADE BELOW DRIVEWAY OR PARKING AREA SHALL BE COMPACTED TO 90% RELATIVE DENSITY.

4 BUILDING LOCATION AND PAD ELEVATION TO BE DONE BY A LICENSED SURVEYOR OR CIVIL ENGINEER PRIOR TO GRADING.

5 CONTRACTOR TO ARRANGE A PRE-GRADING MEETING WITH THE SANTA CLARA COUNTY INSPECTOR PRIOR TO BEGINNING ANY WORK.

6 NO POTABLE WATER TO BE USED FOR ANY GRADING PURPOSES ON THIS PROJECT.

7 PERMITTED HOURS OF WORK ARE 7:30 AM TO 6:00 PM, MONDAY THROUGH FRIDAY.

8 ALL UTILITIES TO BE UNDERGROUND, TYPICAL. PROVIDE CHECK VALVE ON WATER SERVICE.

ESTIMATED GRADING QUANTITIES

LOCATION	CUT	FILL	MAX. VERT DEPTH
DRIVEWAY	10	10	3 FT
GARAGE/SHOP	108	0	8 FT
HOUSE	0	0	0
POOL CABANA	0	6	3 FT
TOTAL	118 Cu. Yds.	16 Cu. Yds.	

Note: 102 Cu. Yds. of CUT is to be exported from the site to an approved location.

IMPERVIOUS AREA SUMMARY

LOCATION	EXISTING	PROPOSED
PAVING & PATIOS	8405	9455
HOUSE & COV. PORCHES	4238	4238
GARAGE	840	1121
SHOP / STORAGE	0	700
POOL	1000	1000
DECKS	0	175
TOTAL IMPERVIOUS AREA	14483 SF	16689 SF (+2206 SF)

8.15.23	MSH
5.22.24	MSH

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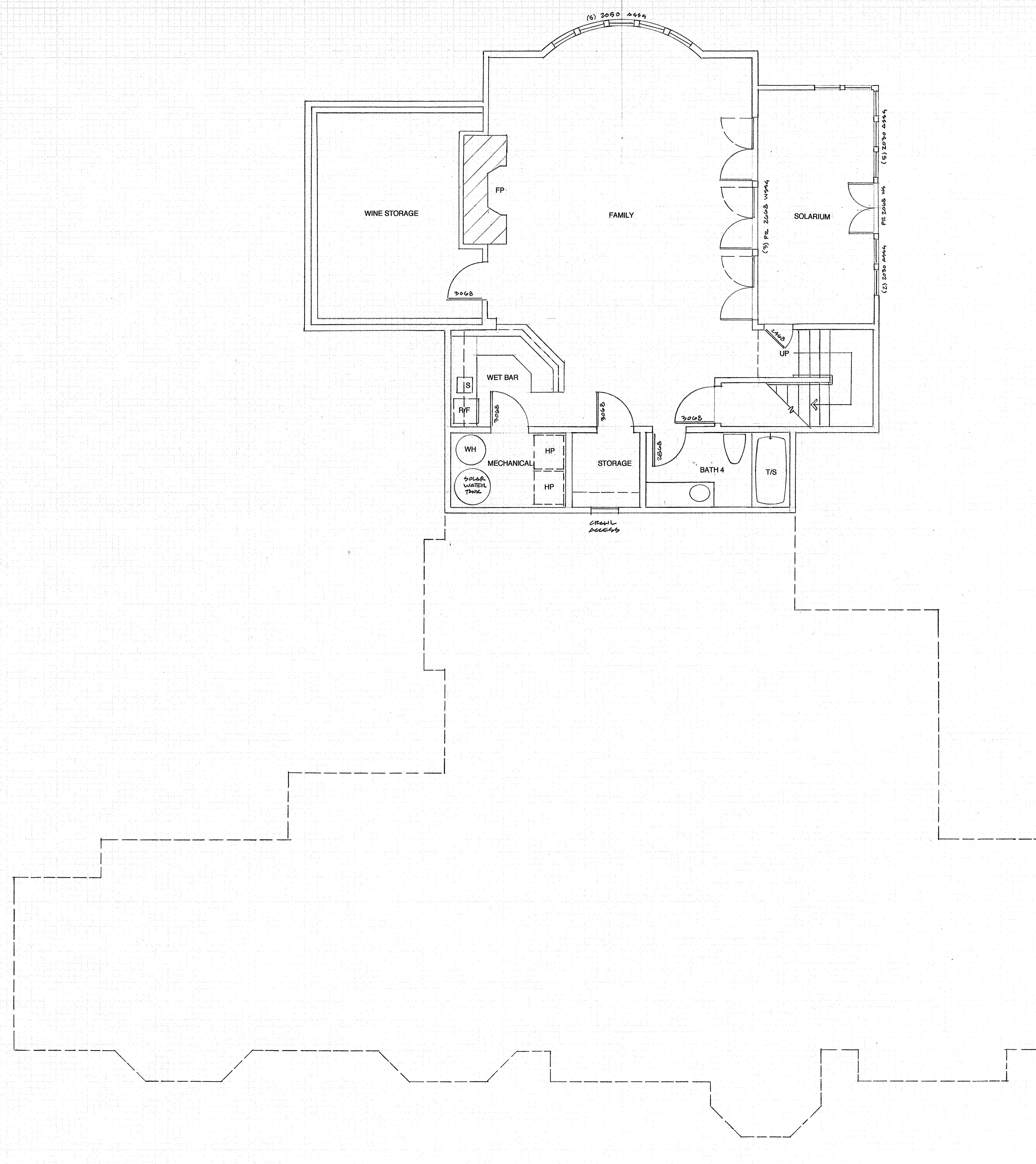
HANAGAN LAND SURVEYING
305-C SOQUEL AVE.
SANTA CRUZ, CA 95062
PHONE (831) 469-3421

REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD – APN 537-12-012
LOS GATOS, CALIFORNIA

SITE / GRADING & DRAINAGE PLAN

11-14-22
1"=10'-0"
MSH
2108

3.2



EXISTING – LOWER FLOOR PLAN
SCALE: 1/4" = 1'- 0"

REVISIONS	BY
8.15.23	MJH
5-22-24	MJH

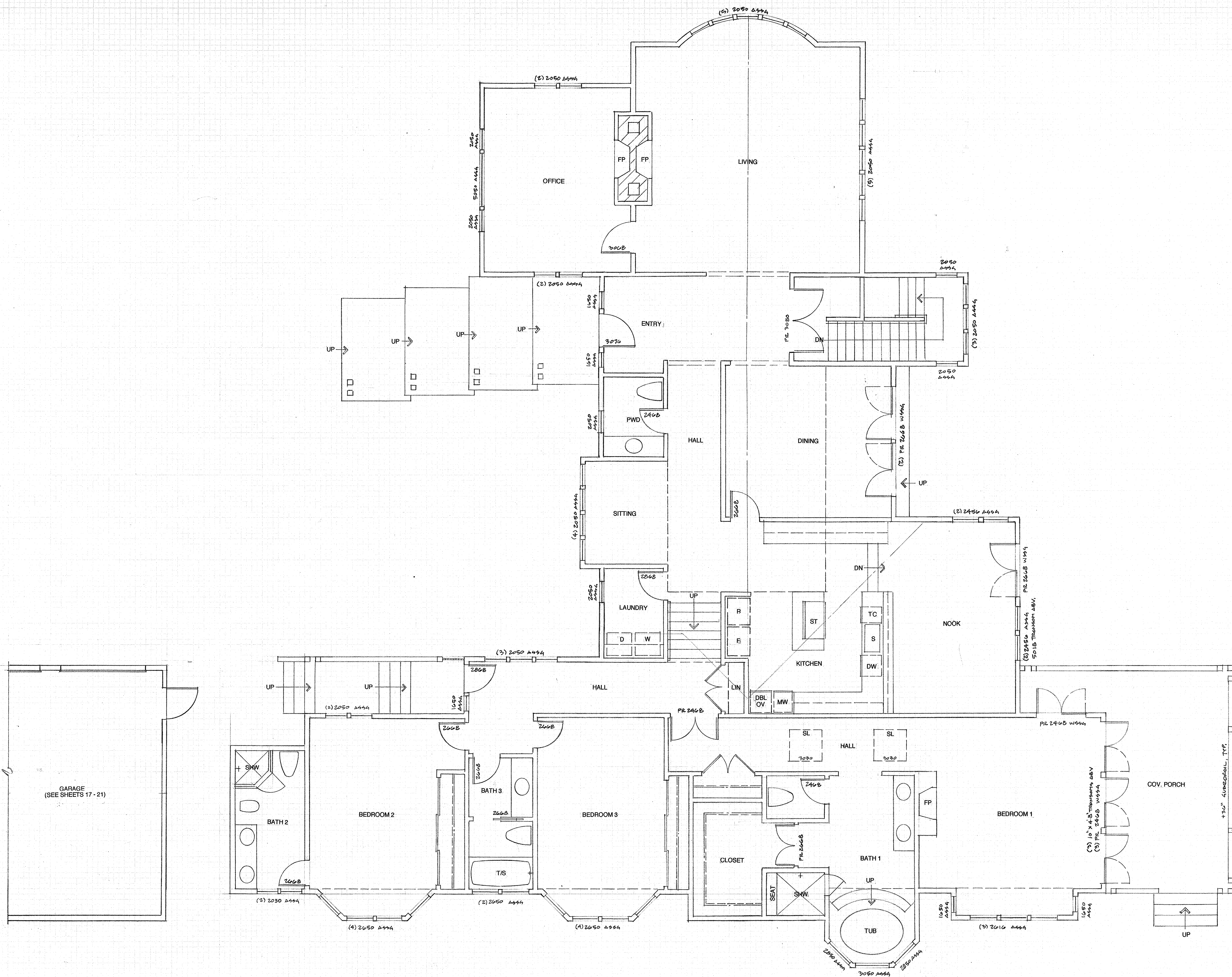
Michael Helm, AIA Architect & Associates
200 Seventh Avenue, #110 Santa Cruz, California 95062 (831) 476-5386

REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD – APN 537-12-012
LOS GATOS, CALIFORNIA

EXISTING - LOWER FLOOR PLAN

DATE	11.14.22
SCALE	1/4" = 1'-0"
DRAWN	MJH
JOB	2108
SHEET	4
OF	SHEETS

STOCKDRAFTING FORM NO 10157



EXISTING – MAIN FLOOR PLAN
SCALE: 1/4" = 1'- 0"

REVISIONS	BY
8·16·23	MH
5·22·24	MH

Michael Helm, AIA Architect & Associates
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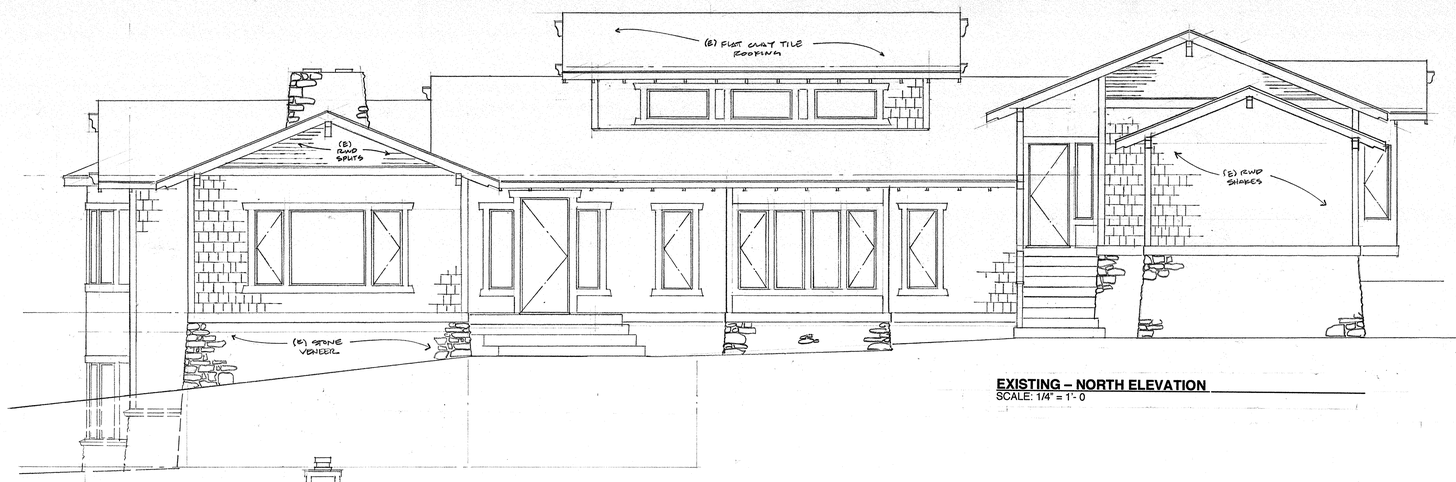
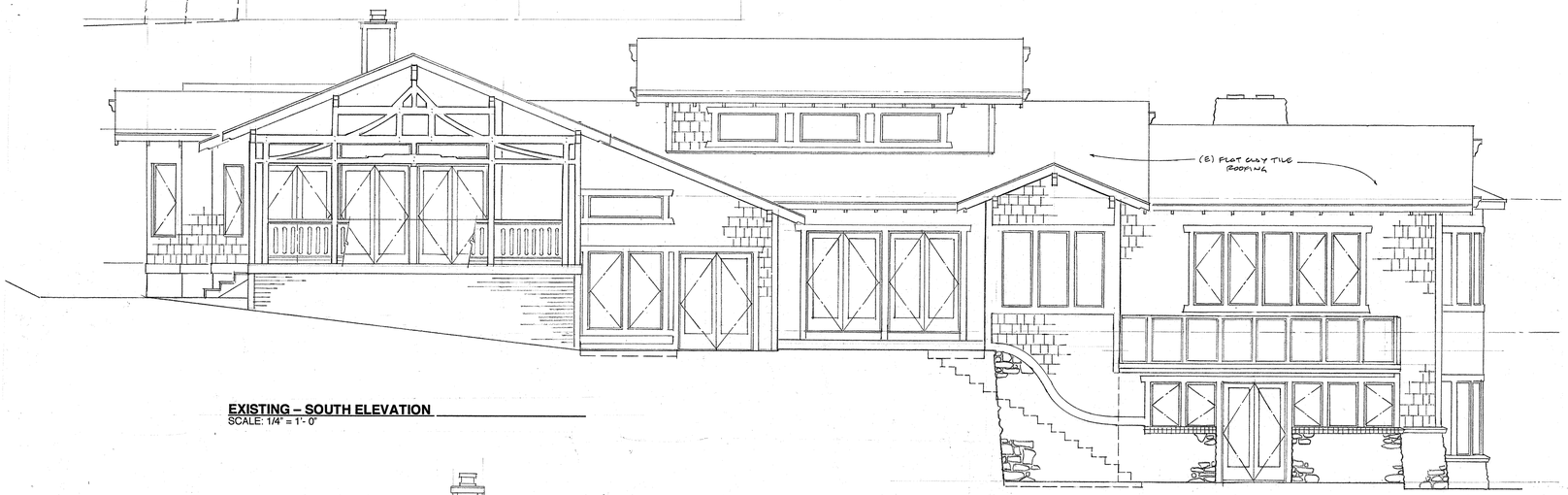
REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD - APN 537-12-012
LOS GATOS, CALIFORNIA

EXISTING - MAIN FLOOR PLAN

DATE	11·14·22
SCALE	1/4" = 1'-0"
DRAWN	MH
JOB	2108
SHEET	5
OF	SHEETS

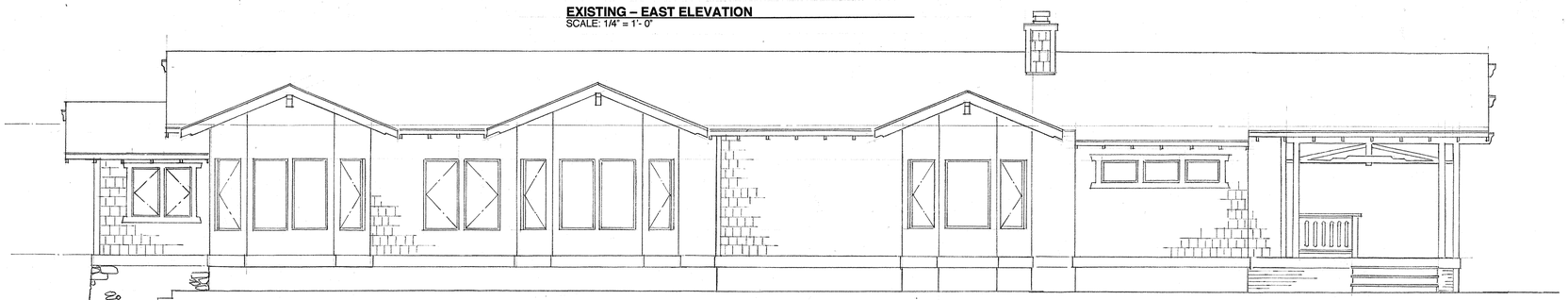


EXISTING – NORTH ELEVATION
SCALE: 1/4" = 1'- 0



EXISTING – SOUTH ELEVATION
SCALE: 1/4" = 1'- 0"

EXISTING – EAST ELEVATION
SCALE: 1/4" = 1'- 0"



EXISTING – WEST ELEVATION
SCALE: 1/4" = 1'- 0"

EXISTING - MATERIALS SCHEDULE

FOUNDATIONS	8" wide perimeter concrete stem wall with 15" wide footing & 12" diameter redundant piers 8' deep @ ± 7 feet o.c.
CONCRETE SLABS	4" thick concrete slab w/ 6X6 10/10 wire mesh on 2" sand on 10 mil vapor barrier on 4" crushed rock.
FLOORS	2X10FJ's@ 16" o.c., with ¾" T&G plywood subfloor glued and nailed w/ 10d @ 6" o.c. edges & 10" o.c. field, U.N.O. with R-19 batt insulation.
WALLS	Hand sawn redwood shingles on Dbl. layer 15 lb. felt on 3/8" CDX plywood sheathing, nailed w/ 8d @ 6" o.c. edges and 12" o.c. field, U.N.O., on 2 X 4 studs @ 16" o.c. with R-11 high density batt insulation, 1/2" gypsum wallboard interior finish, typical. Battered river rock stone veneer at foundation.
ROOF	Flat clay tile over Dbl. layer 30 lb. felt on 5/8" CDX plywood sheathing nailed w/ 10d @ 6" o.c. edges and 12" o.c. field, U.N.O., to 2 X 8 Rafters @ 16" o.c. with R-19 batt insulation.
GUTTERS & DOWNSPOUTS	16 oz. copper beveled gutters w/ 2" X3" rectangular downspouts deposit into existing landscaped areas.
ROOF / WALL FLASHINGS	16 oz. copper where shown or required. Pan flash @ ext. door sills with 16 oz. copper solder all joints, typical
WINDOWS & EXT. GLASS DRS.	Aluminum sash with single glazed leaded art glass with screens at all operable windows.
INSULATION	FLOORS — R-19 fiberglass batts EXT. WALLS — R-11 high density fiberglass batts INT. WALLS — 3-1/2" fiberglass sound batts ROOFS — R-19 fiberglass batts

8-15-23 MSH
5-22-24 MSH

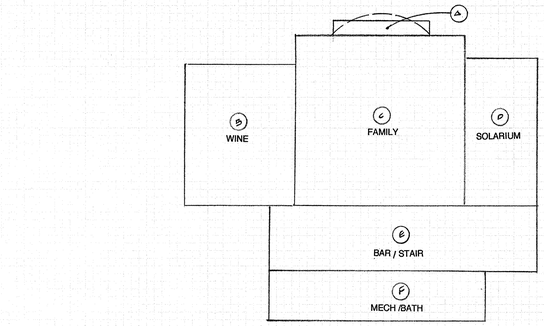
Michael Helm, AIA Architect & Associates
200 Seventh Avenue, #110 Santa Cruz, California 95062 (831) 476-5386

REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD - APN 537-12-012
LOS GATOS, CALIFORNIA

EXISTING - EXTERIOR ELEVATIONS

11-14-22
1/4"=1'-0"
MSH
2108

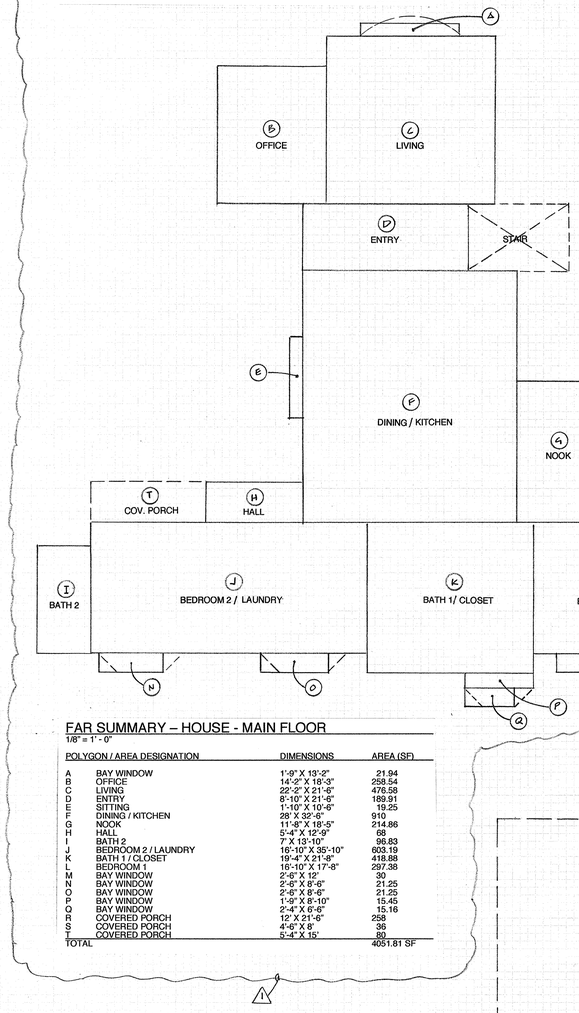
6



FAR SUMMARY – HOUSE - LOWER FLOOR

1/8" = 1' - 0"

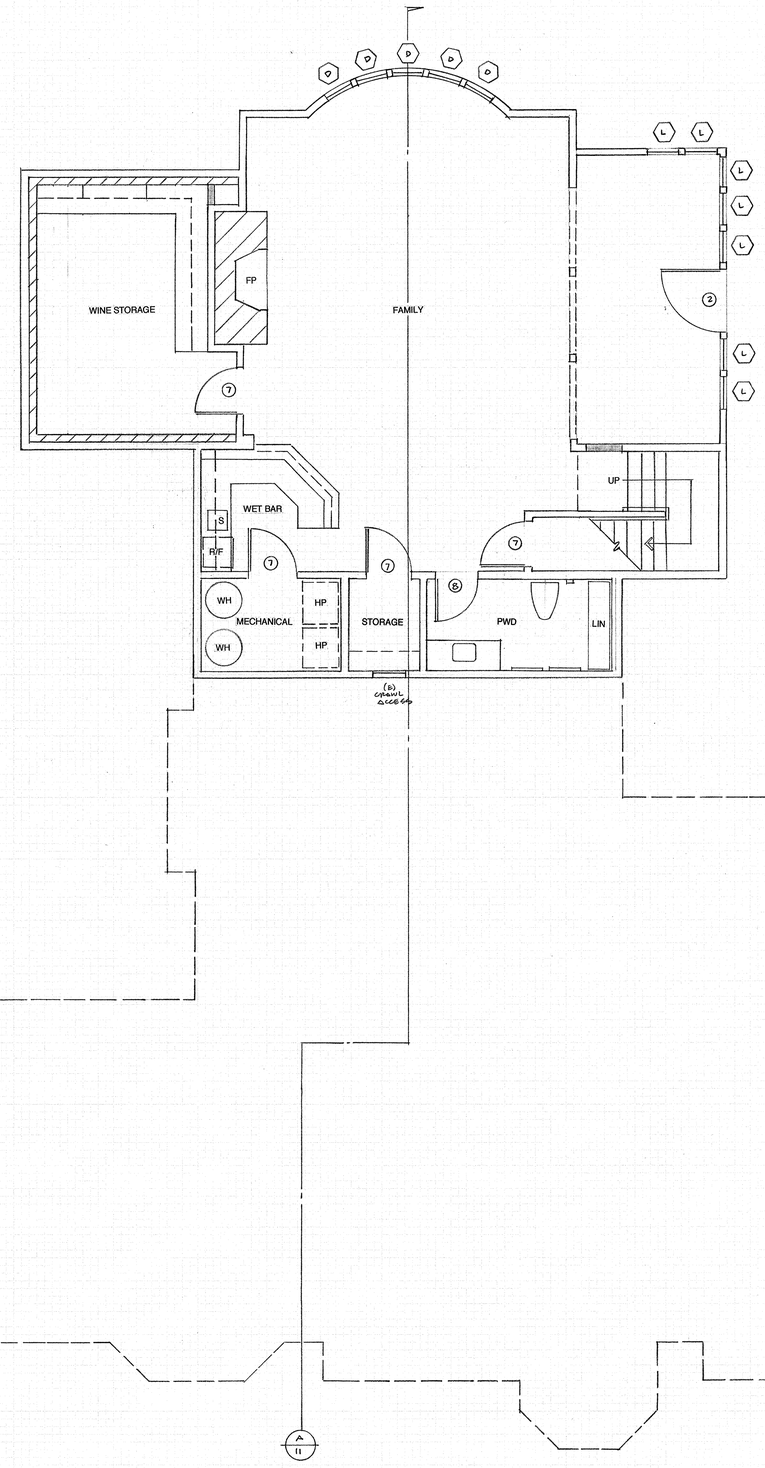
POLYGON / AREA DESIGNATION		DIMENSIONS	AREA (SF)
A	BAY WINDOW	1'-9" X 13'-2"	21.94
B	WINE	14'-2" X 18'-3"	258.54
C	FAMILY	22'-2" X 21'-6"	476.58
D	SOLARIUM	9'-8" X 19'-4"	186.88
E	BAR / STAIR	8'-10" X 34'-9"	306.95
F	MECH / BATH	7' X 28'	196
TOTAL			1387.27 SF



FAR SUMMARY – HOUSE - MAIN FLOOR

1/8" = 1' - 0"

POLYGON / AREA DESIGNATION		DIMENSIONS	AREA (SF)
A	BAY WINDOW	1'-9" X 19'-9"	21.94
B	OFFICE	14'-2" X 18'-3"	258.54
C	LIVING	22'-2" X 21'-6"	476.58
D	ENTRY	8'-10" X 21'-6"	189.91
E	SITTING	1'-10" X 10'-6"	19.25
F	DINING / KITCHEN	28' X 32'-6"	910
G	NOOK	11'-8" X 18'-5"	214.86
H	HALL	5'-4" X 12'-9"	68
I	BATH 2	7' X 13'-10"	96.83
J	BEDROOM 2 / LAUNDRY	16'-10" X 35'-10"	603.19
K	BATH 1 / CLOSET	19'-4" X 21'-8"	418.88
L	BEDROOM 1	16'-10" X 17'-8"	297.38
M	BAY WINDOW	2'-6" X 12"	30
N	BAY WINDOW	2'-6" X 8'-6"	21.25
O	BAY WINDOW	2'-6" X 8'-6"	21.25
P	BAY WINDOW	1'-9" X 8'-10"	15.45
Q	BAY WINDOW	2'-4" X 6'-6"	15.16
R	COVERED PORCH	12' X 21'-6"	258
S	COVERED PORCH	4'-6" X 8'	36
T	COVERED PORCH	5'-4" X 15'	80
TOTAL			4051.81 SF



PROPOSED – LOWER FLOOR PLAN

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

DOOR SCHEDULE – HOUSE ADDITION

SYM	SIZE	TYPE	QUAN.	REMARKS
1	3076	Exterior, Custom Entry door	1	Stain Grade, Low-E dbl. insulated **Tempered glass**
2	4068	Exterior, Custom door	1	Paint Grade, Low-E dbl. **insulated Tempered glass**
3	2868	Exterior single lite French door	1	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
4	Pair 2668	Exterior single lite French doors	3	Clad/Wood Sash, Low-E dbl. **insulated Tempered glass**
5	4W 3080	Exterior single lite XOOX Sliding Patio doors	1	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
6	Pair 2868	Exterior single lite XO Sliding Patio door	2	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
7	3068	Interior S.C., 3-Panel	9	Stain Grade, by Sun Mountain, Inc.
8	2868	Interior S.C., 3-Panel	12	Stain Grade, by Sun Mountain, Inc.
9	Pair 2668	Interior S.C., 3-Panel	1	Stain Grade, by Sun Mountain, Inc.
10	Pair 2268	Interior S.C., 3-Panel	1	Stain Grade, by Sun Mountain, Inc.
11	Pair 1868	Interior S.C., 3-Panel	1	Stain Grade, by Sun Mountain, Inc.
12	4W 2668	Interior S.C., 3-Panel Sliding Bi-pass Closet doors	1	Stain Grade, by Sun Mountain, Inc. Use heavy duty track & rollers
13	3W 2868	Interior S.C., 3-Panel Sliding Bi-pass Closet doors	2	Stain Grade, by Sun Mountain, Inc. Use heavy duty track & rollers
14	3W 2668	Interior S.C., 3-Panel Sliding Bi-pass Closet doors	1	Stain Grade, by Sun Mountain, Inc. Use heavy duty track & rollers
15	6070	Bi-Pass Sliding Shower Doors	1	3/8" Clear 'Frameless' **Tempered glass**, Provide shop drawings for approval
16	5670	Bi-Pass Sliding Shower Doors	1	3/8" Clear 'Frameless' **Tempered glass**, Provide shop drawings for approval
17	6076	Custom Shower Enclosure	1	3/8" Clear 'Frameless' **Tempered glass**, Provide shop drawings for approval
18	4070	Custom Shower Enclosure	2	3/8" Clear 'Frameless' **Tempered glass**, Provide shop drawings for approval

WINDOW SCHEDULE – HOUSE ADDITION

SYM	SIZE	TYPE	QUAN.	REMARKS
A	2456	Casement	4	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
B	2850	Casement	2	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
C	2650	Casement	4	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
D	2050	Casement	26	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
E	1650	Casement	2	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
F	2630	Casement	4	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
G	2840	Casement	2	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
H	2640	Casement	3	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
I	2040	Casement	4	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
J	2636	Casement	10	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
K	2426/2426 2450/2450	Fixed Transom over Dbl. Casement	1	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass** Mulled together
L	2030	Casement	7	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
M	5050	Fixed	1	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
N	4650	Fixed	1	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
O	3050	Fixed	1	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
P	2050	Fixed	5	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
Q	1650	Fixed	3	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
R	2616	Fixed	3	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
S	5018	Fixed	1	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
T	4020	Fixed	6	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
U	5018	Fixed	1	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**

Jeld-Wen – Clad Wood sash windows & doors overall standards comply with ANSI/ AAMA/ WDMA/CSA101/I.S.2 / A440-05 / A440-08 / A40-11

a. All units are Gold Label tested & certified with label attached to frame per AAMA standards per CRC, Section 609.3, installation per AAMA 2400
b. All insulated glass units conform to ASTM E2188 / E2190, NFRC certified and labeled.
c. Safety Glazing testing and labeling per CRC, Sections 308.1 & 308.4
d. Energy testing and certification per CEnC, Section 110.6
e. Verify rough openings and window / door sizes prior to ordering.

Note: The NFRC label which states the required U-value and SGHC for all fenestration products shall not be removed prior to inspection or the removal by a building inspector and shall reflect the values listed in the energy report.

REVISIONS	BY
1 11-28-22	MSH
8-15-23	MSH
5-22-24	MSH

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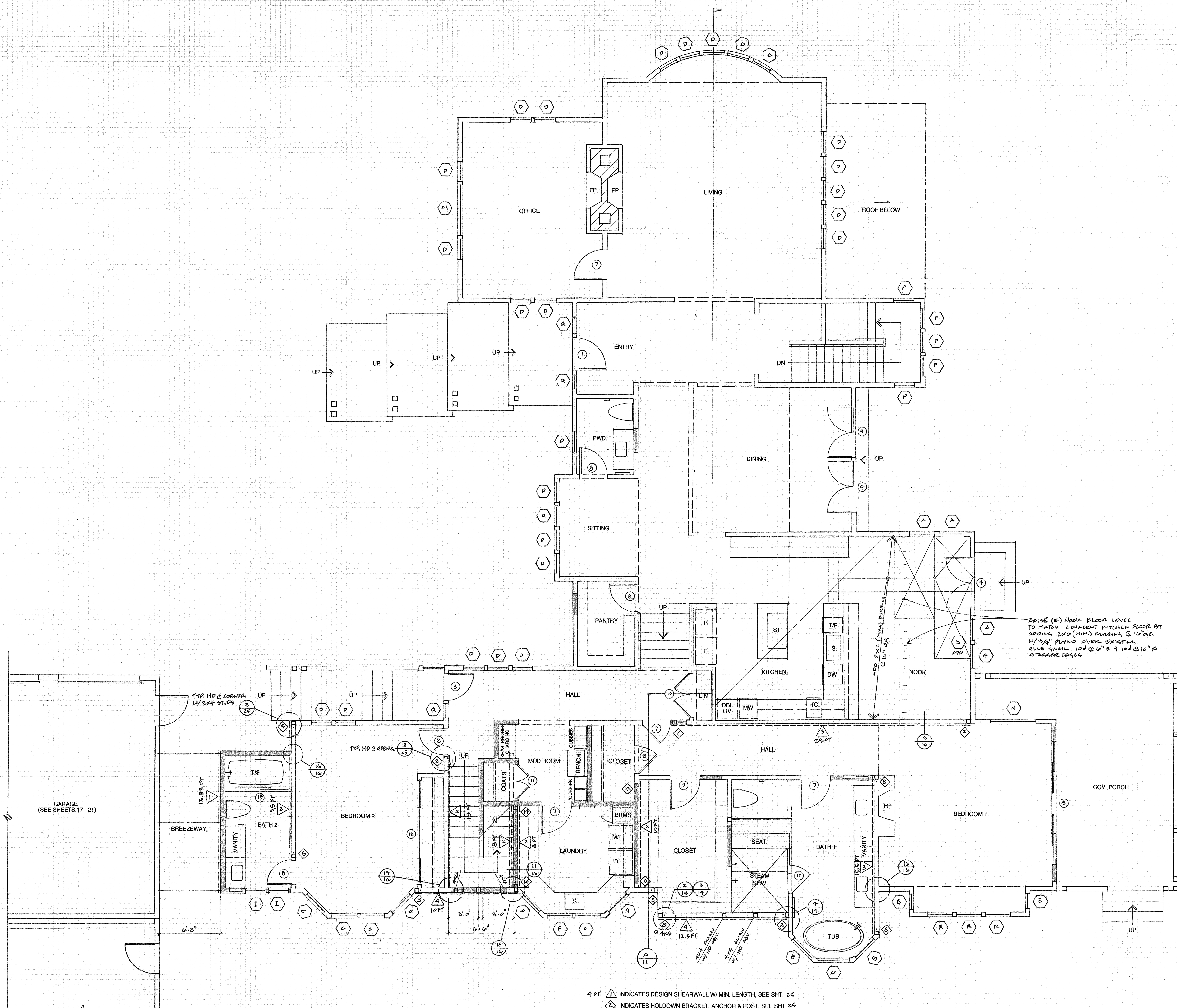
REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARMERICH HILL ROAD, APN 537-12-012
LOS GATOS, CALIFORNIA

PROPOSED - LOWER FLOOR PLAN

DATE 11-14-22
SCALE 1/4" = 1'-0"
DRAWN MSH
JOB 2108
SHEET 7
OF SHEETS



4 FT (1) INDICATES DESIGN SHEARWALL W/ MIN. LENGTH, SEE SHT. 26
(2) INDICATES HOLDOWN BRACKET, ANCHOR & POST, SEE SHT. 25

PROPOSED – MAIN FLOOR PLAN
SCALE: 1/4" = 1'-0"

REVISIONS	BY
8.16.23	MAH
5-22-24	MAH

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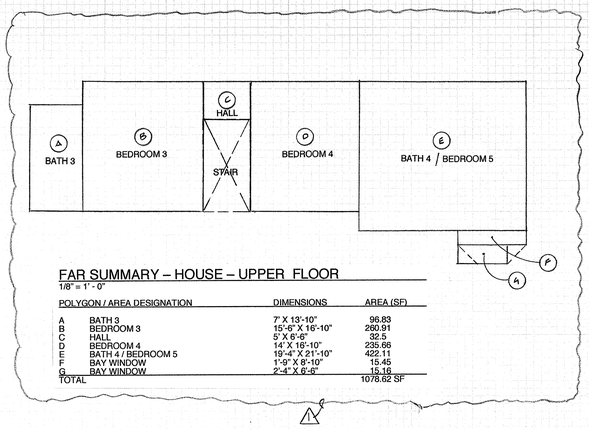
REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD - APN 537-12-012
LOS GATOS, CALIFORNIA

PROPOSED – MAIN FLOOR PLAN

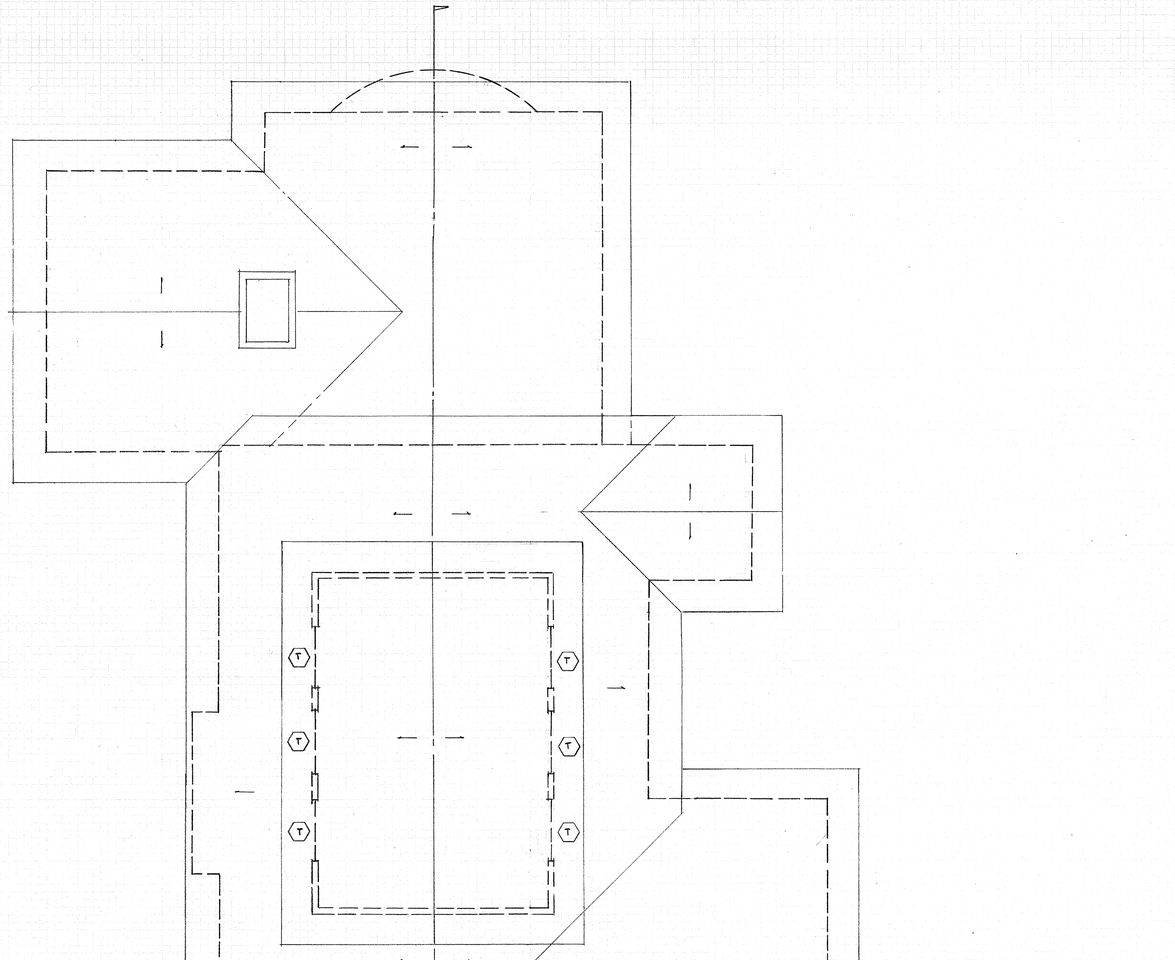
DATE	11.14.22
SCALE	1/4" = 1'-0"
DRAWN	MAH
JOB	2108
SHEET	8
OF	SHEETS

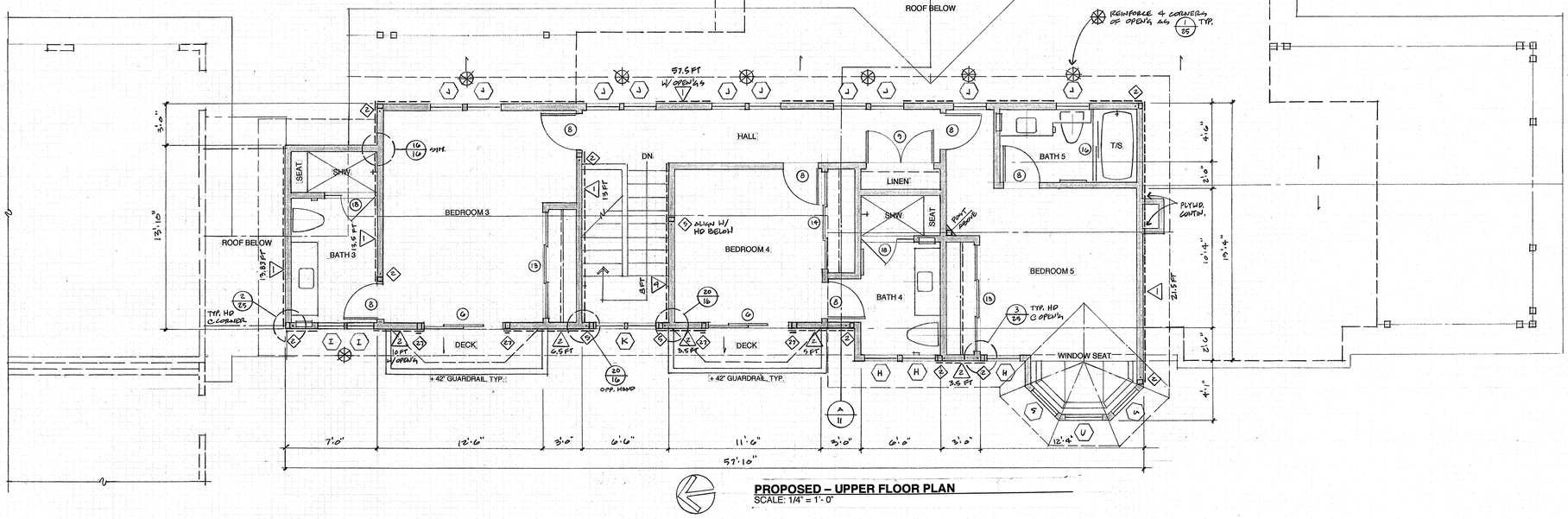


FAR SUMMARY – HOUSE – UPPER FLOOR

1/8" = 1' - 0"

POLYGON / AREA DESIGNATION		DIMENSIONS	AREA (SF)
A	BATH 3	7' X 13'-10"	96.83
B	BEDROOM 3	15'-6" X 16'-10"	260.91
C	HALL	5' X 6'-6"	32.5
D	BEDROOM 4	14' X 16'-10"	235.66
E	BATH 4 / BEDROOM 5	19'-4" X 21'-10"	422.11
F	BAY WINDOW	1'-9" X 8'-10"	15.45
G	BAY WINDOW	2'-4" X 6'-6"	15.16
TOTAL			1078.62 SF





PROPOSED – UPPER FLOOR PLAN

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

REVISIONS	BY
1 11-28-22	MSH
8-15-23	MSH
5-22-24	MSH

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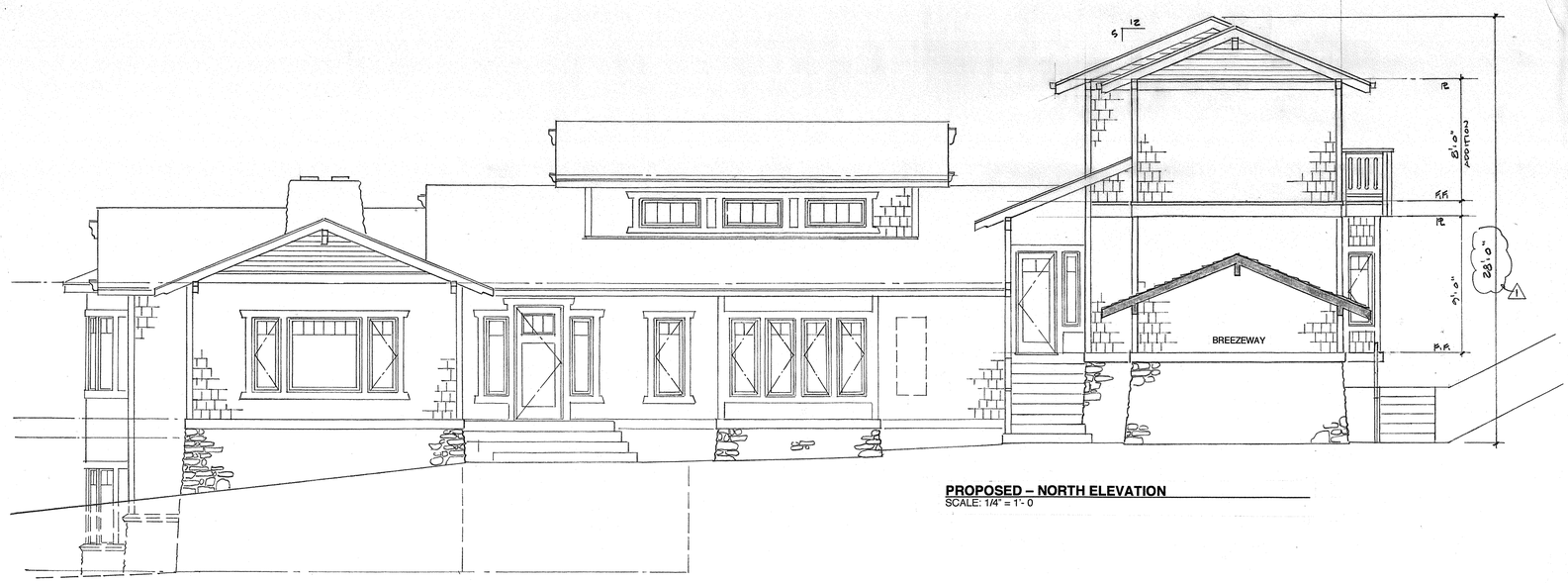
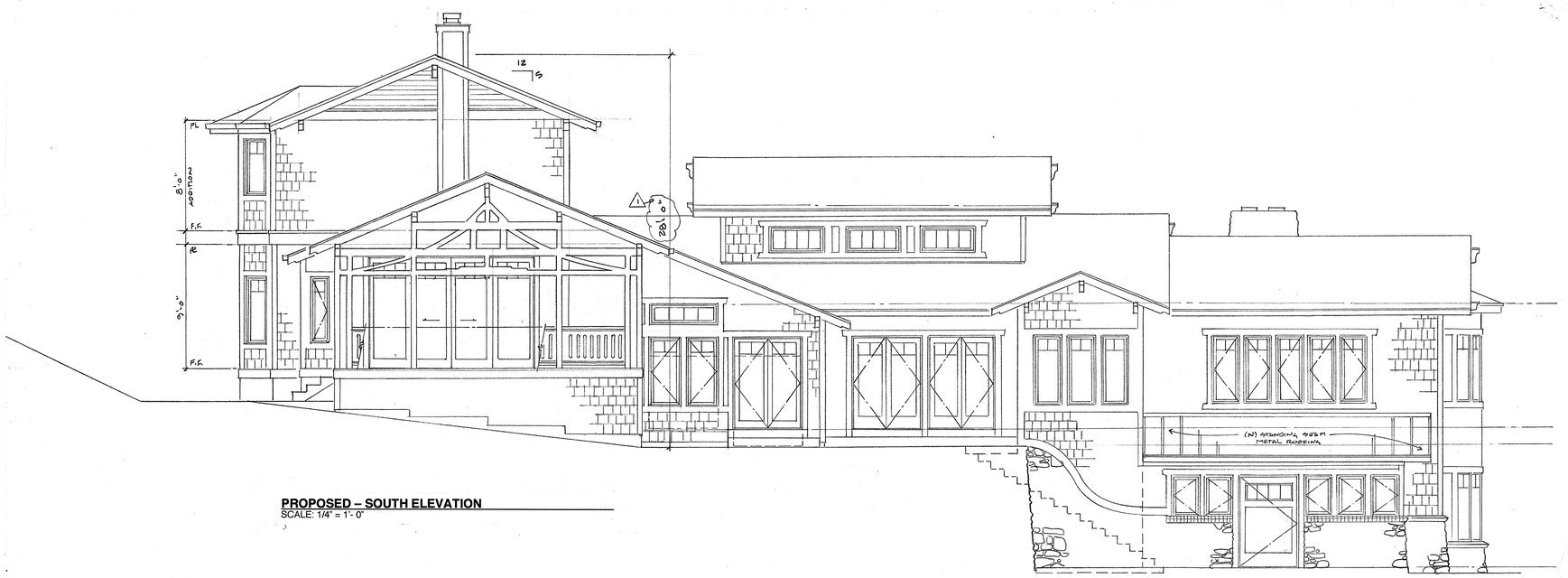
REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD – APN 537-12-012
LOS GATOS, CALIFORNIA

PROPOSED - UPPER FLOOR PLAN

DATE	11.14.22
SCALE	1/4"=1'-0"
DRAWN	MSH
JOB	2108
SHEET	9
OF	SHEETS



PROPOSED – NORTH ELEVATION
SCALE: 1/4" = 1'- 0



PROPOSED – SOUTH ELEVATION
SCALE: 1/4" = 1'- 0"

PROPOSED – WEST ELEVATION
SCALE: 1/4" = 1'- 0"

STANDING SEAM METAL ROOFING

Peterson Aluminum Corp., PAC-CLAD 18" wide snap-clad 24 gauge Standing Seam Metal Roofing. UL-580 Class 90 wind uplift, UL-Class A fire rated, installation per mfg. Specs over Dbl layer 30 lb. Felt over 5/8" CDX plywood sheathing nailed w/ 10d @ 6" o.c. edges and 12" o.c. field, U.N.O., to 2X Rafters @ 24" o.c. or 2X Pre-fabricated trusses @ 24" o.c. with R-30 closed cell polyurethane spray foam insulation. Underlayment shall comply with ASTM D226 Type I; ASTM Type I, II, III or IV; ASTM D6757, and shall bear a label indicating compliance to the standard designation. **Eave construction shall meet SFM 12-7A-3 requirements.**

CONSTRUCTION SCHEDULE - HOUSE ADDITION

FOUNDATIONS	24" wide X 24" deep concrete grade beam with 2 - #5 bars T & B w/ #3 ties @ 12" o.c. CONCRETE SLABS: 5" thick concrete slab w/ #4 bars @ 16" o.c. each way, on 15 mil vapor barrier (Stego Wrap or equal) on 6" crushed rock. CONCRETE MIX: Substitute Portland Cement with recycled flyash, 35% by volume, typical. Keep receipts for Inspector verification. TREATED LUMBER: Substitute ACQ pressure treatment for CCA products, typical. FORM BOARDS: Clean and re-use for scaffolding, forms, blocking, etc… FORM RELEASE AGENT: Use Non-toxic soy based 0-VOC form release agent by BIO-GUARD CO. or Architect approved equal.
FLOORS	TJI's @ 16" o.c., with ¾" T&G plywood subfloor glued and nailed w/ 10d @ 6" o.c. edges & 10" o.c. field, U.N.O. with R-19 batt insulation.
WALLS	5/16" James Hardie fiber cement horizontal siding or shingles over 'TYVEK' house wrap on 5/8" Type 'X' exterior gypsum sheathing on 7/16" CDX plywood or OSB sheathing, nailed w/10d @ 6" o.c. edges and 12" o.c. field, U.N.O., on 2 X 6 studs @ 16" o.c. with R-23 high density batt insulation, 1/2" gypsum wallboard interior finish, typical. Use low/No VOC exterior/interior paints. **Wall construction shall meet SFM12-7A-1 requirements.**
ROOF	Class B (min.) flat clay tile (to match existing), install per mfg. specs over Dbl. layer 30 lb. felt over 5/8" CDX plywood sheathing nailed w/ 10d @ 6" o.c. edges and 12" o.c. field, U.N.O., to 2X Rafters @ 24" o.c. with R-30 closed cell polyurethane spray foam insulation. Underlayment shall comply with ASTM D226 Type I; ASTM Type I, II, III or IV; ASTM D6757, and shall bear a label indicating compliance to the standard designation. **Eave construction shall meet SFM 12-7A-3 requirements.**
GUTTERS & DOWNSPOUTS	16 oz. copper beveled gutters w/ 2" diameter round downspouts deposit into existing landscaped areas. **Gutters shall be provided with leaf/debris protection.**
ROOF / WALL FLASHINGS	16 oz. copper where shown or required. Pan flash all ext. door sills with 16 oz. copper solder all joints, typical
WINDOWS & EXT. GLASS DRS.	Jeld-Wen – Alum. Clad/Wood sash with Dbl. insulated **Tempered** Low-E glass, provide screens at all operable windows. **Exterior door assemblies shall conform to SFM 12-7A-1 requirements.**
INSULATION	FLOORS: R-19 fiberglass batts EXT. WALLS: R-23 high density fiberglass batts INT. WALLS: 3-1/2" fiberglass sound batts ROOFS: R-30 closed cell polyurethane spray foam
ROOF JACKS	Provide neoprene gaskets and 16 oz. copper roof jack / rain cap, typical. All exhaust vents shall be located a min. of 4' from or 1' above all roof or wall openings per CMC. All plumbing vents shall be located a min. of 10' from or 3' above all roof or wall openings per CPC.
WALL PENETRATIONS	Use weatherproofing wall jacks by QUICKFLASH or approved equal for plumbing, electrical and mechanical penetrations.
PAINTS, STAINS, ADHESIVES & SEALERS	Use Low / No VOC, water based products and solvent-free adhesives, typical.
PLUMBING	Install Low-flow toilets. Install Low-flow shower heads with chlorine filters.
CABINETS & TRIM	Use formaldehyde-free particle board and MDF by MEDITE or approved equal for all cabinets and trim applications

14500 ARNERICH RD, LOS GATOS
Project Address

AR 22-2476
Project File Number

537-12-012
APN

1 Color/Materials Board*

Roof PETERSON ALUM. CORP, 18"WIDE, 24GA, PAC-CLAD STANDING SEAM METAL ROOFING
Manufacture & Material / Product Name, Number
DARK BRONZE
REFLECTIVITY 0.29

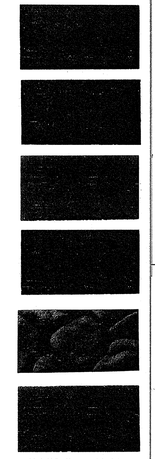
Door & Window Frames, Railings
JELD-WEN CLAD-WOOD
Manufacture / Number
Color Name, LRV CHESTNUT BRONZE LRV 6%

Trim JAMES HARDIE - FIBER CEMENT - PAINTED
Manufacture / Number SHERWIN WILLIAMS
Color Name, LRV OLIVE SW1166, LRV 30%

Exterior Walls JAMES HARDIE - FIBER CEMENT HORIZONTAL LAP OR SHINGLE SIDING - PAINTED
Manufacture / Number SHERWIN WILLIAMS
Color Name, LRV CARDAMOM SW2727, LRV 7%

Architectural Accents (Ex. Stone Veneer)
TAHOE RIVER ROCK (EXISTING TO REMAIN)
Manufacture / Number N/A
Color Name, LRV N/A

Retaining Walls (E) RIVER ROCK (SEE ABOVE) (P) STUCCO FINISH - PAINTED
Manufacture / Number SHERWIN WILLIAMS
Color Name, LRV OLIVE SW1166, LRV 30%



1	AR 11-28-22 MSH
	8-15-23 MSH
	5-22-24 MSH

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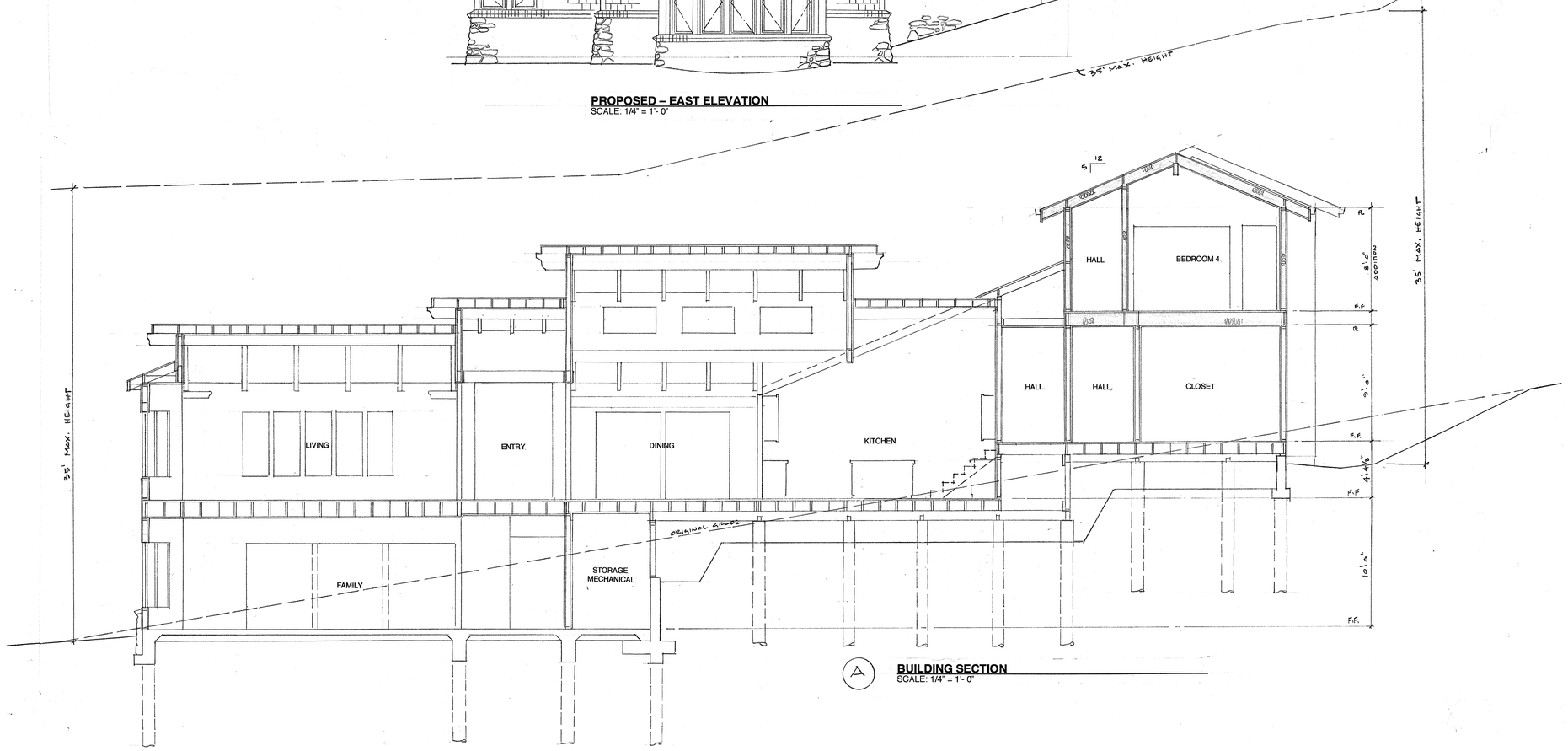
REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE – APN 537-12-012
14500 ARNERICH HILL ROAD
LOS GATOS, CALIFORNIA

PROPOSED - EXTERIOR ELEVATIONS

11.14.22
1/4"=1'-0"
MSH
2108

10

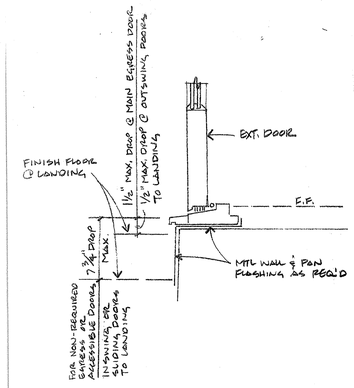
PROPOSED – EAST ELEVATION
SCALE: 1/4" = 1'- 0"



A **BUILDING SECTION**
SCALE: 1/4" = 1'- 0"

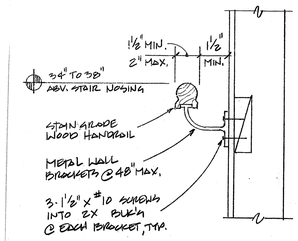
CONSTRUCTION SCHEDULE - HOUSE ADDITION

FOUNDATIONS	24" wide X 24" deep concrete grade beam with 2 - #5 bars T & B w/ #3 ties @ 12" o.c. CONCRETE SLABS: 5" thick concrete slab w/ #4 bars @ 16" o.c. each way, on 15 mil vapor barrier (Stego Wrap or equal) on 6" crushed rock. CONCRETE MIX: Substitute Portland Cement with recycled flyash, 35% by volume, typical. Keep receipts for Inspector verification. TREATED LUMBER: Substitute ACQ pressure treatment for CCA products, typical. FORM BOARDS: Clean and re-use for scaffolding, forms, blocking, etc... FORM RELEASE AGENT: Use Non-toxic soy based 0-VOC form release agent by BIO-GUARD CO. or Architect approved equal.
FLOORS	TJI's @ 16" o.c., with ¾" T&G plywood subfloor glued and nailed w/ 10d @ 6" o.c. edges & 10" o.c. field, U.N.O. with R-19 batt insulation.
WALLS	5/16" James Hardie fiber cement horizontal siding or shingles over 'TYVEK' house wrap on 5/8" Type 'X' exterior gypsum sheathing on 7/16" CDX plywood or OSB sheathing, nailed w/10d @ 6" o.c. edges and 12" o.c. field, U.N.O., on 2 X 6 studs @ 16" o.c. with R-23 high density batt insulation, 1/2" gypsum wallboard interior finish, typical. Use low/No VOC exterior/interior paints. **Wall construction shall meet SFM12-7A-1 requirements.**
ROOF	Class B (min.) flat clay tile (to match existing), install per mfg. specs over Dbl. layer 30 lb. felt over 5/8" CDX plywood sheathing nailed w/ 10d @ 6" o.c. edges and 12" o.c. field, U.N.O., to 2X Rafters @ 24" o.c. with R-30 closed cell polyurethane spray foam insulation. Underlayment shall comply with ASTM D226 Type I; ASTM Type I, II, III or IV; ASTM D6757, and shall bear a label indicating compliance to the standard designation. **Eave construction shall meet SFM 12-7A-3 requirements.**
GUTTERS & DOWNSPOUTS	16 oz. copper beveled gutters w/ 2" diameter round downspouts deposit into existing landscaped areas. **Gutters shall be provided with leaf/debris protection.**
ROOF / WALL FLASHINGS	16 oz. copper where shown or required. Pan flash all ext. door sills with 16 oz. copper solder all joints, typical
WINDOWS & EXT. GLASS DRS.	Jeld-Wen – Alum. Clad/Wood sash with Dbl. insulated **Tempered** Low-E glass, provide screens at all operable windows. **Exterior door assemblies shall conform to SFM 12-7A-1 requirements.**
INSULATION	FLOORS — R-19 fiberglass batts EXT. WALLS — R-23 high density fiberglass batts INT. WALLS — 3-1/2" fiberglass sound batts ROOFS — R-30 closed cell polyurethane spray foam
ROOF JACKS	Provide neoprene gaskets and 16 oz. copper roof jack / rain cap, typical. All exhaust vents shall be located a min. of 4' from or 1' above all roof or wall openings per CMC. All plumbing vents shall be located a min. of 10' from or 3' above all roof or wall openings per CPC.
WALL PENETRATIONS	Use weatherproofing wall jacks by QUICKFLASH or approved equal for plumbing, electrical and mechanical penetrations.
PAINTS, STAINS, ADHESIVES & SEALERS	Use Low / No VOC, water based products and solvent-free adhesives, typical.
PLUMBING	Install Low-flow toilets. Install Low-flow shower heads with chlorine filters.
CABINETS & TRIM	Use formaldehyde-free particle board and MDF by MEDITE or approved equal for all cabinets and trim applications



NOTE: EVERY LANDING SHALL HAVE A DIMENSION OF 36 INCHES MINIMUM IN THE DIRECTION OF TRAVEL. THE FINISHED SURFACE OF THE EXTERIOR LANDING AT THE MAIN EGRESS DOOR SHALL NOT BE GREATER THAN 1-1/2 INCHES BELOW THE TOP OF THE THRESHOLD. EXTERIOR LANDINGS AT DOORS THAT ARE NOT THE MAIN EGRESS SHALL NOT BE MORE THAN 7-3/4 INCHES BELOW THE TOP OF THE THRESHOLD. 1/2 INCH MAXIMUM DROP AT OUTSWING DOORS.

1 EXTERIOR THRESHOLD



2 INTERIOR HANDRAIL

1	Apr 11-25-22 MSH
2	8-15-23 MSH
3	5-22-24 MSH

Michael Helm, AIA Architect & Associates
200 Seventh Avenue, #110 Santa Cruz, California 95062 (831) 476-5386

REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD – APN 537-12-012
LOS GATOS, CALIFORNIA

PROPOSED - EXTERIOR ELEVATIONS
BUILDING SECTION

11.14.22
1/4"=1'-0"
MSH
2108

11

ELECTRICAL NOTES

General

1 All Electrical work to comply with the latest adopted edition of the California Electrical Code.

2 Electrical contractor to submit load calculations and panel diagrams to the Building Department prior to beginning work.

3 Do not install electrical panels larger than 16 square inches in rated fire walls. Maintain a clearance of 36" in front of the panels.

4 Bond all metal gas and water pipes to ground. All ground clamps must be accessible and of an approved type. (CEC 250.104)

5 All joints and penetrations to be caulked and sealed.

Circuits

1 Central heating equipment shall be supplied by an individual branch circuit. Verify electrical requirements for all mechanical equipment.

2 All exterior, garage, kitchen and bathroom circuits shall be on GFCI circuits. Combination AFCI/GFCI outlets are required at kitchen and laundry areas.

3 All branch circuits that supply 125-volt, single-phase, 15- and 20-ampere outlets (i.e. receptacles, lights, smoke alarms, etc.) to be protected by Arc-Fault Circuit Interrupter (AFCI) listed to provide protection of the entire branch circuit per CEC 210-12(B) in kitchens, laundry rooms, family rooms, dining rooms, living rooms, bedrooms, closets, hallways, and similar living spaces. CEC 210.12

4 One 20A circuit shall be provided to supply the bathroom receptacle outlets. Such circuit shall have no other outlets CEC 210.11(C).

5 Provide two small appliance branch circuits for Kitchen refrigerator and counter outlets only, not to include outside plugs, range hood, disposal, dishwasher or microwave.

6 Provide a dedicated 20 amp circuit to serve the required bathroom outlets. This circuit cannot serve any other receptacles, lights, fans, etc... Exception: where the circuit supplies a single bathroom, outlets for other equipment within the bathroom shall be permitted.

7 Provide a dedicated 20 amp circuit to supply laundry receptacle outlets. Dryer and cooking units shall have a four-prong outlet with four conductor wires with an insulated neutral.

8 Provide a listed raceway to accommodate a dedicated 208/240-volt branch circuit for electric vehicle charging not less than 1" nominal inside diameter. The raceway shall originate at the main service or sub panel and shall terminate in a listed cabinet, box or enclosure in close proximity to the proposed location of the EV charger. Raceways are required to be continuous at enclosed, inaccessible or concealed areas and spaces. The raceway termination location shall be permanently and visibly marked as "EV CAPABLE". The service panel and/or subpanel shall provide capacity to install a 40-amp, minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device. The service panel or subpanel shall identify the overcurrent protective device space(s) reserved for future EV charging as "EV CAPABLE". The EV Charging circuit must be rated for continuous duty at 125% of load. All Electrical Vehicle Supply Equipment (EVSE) shall be installed in accordance with the California Electrical Code.

Switches

1 Electrical receptacle outlets, switches and controls (including controls for heating, ventilation and air conditioning) intended to be used by occupants shall be located no more than 48 inches measured from the top of the outlet box and not less than 15 inches measured from the bottom of the outlet box above the finish floor. Doorbell buttons, when installed, shall not exceed more than 48 inches above the exterior floor or landing.

2 Dimmers or vacancy sensors shall control all luminaires required to have light source compliant with Reference Joint Appendix JA8 per Table 150.0-A. Light fixtures in hallways, bathrooms, walk-in closets, garages, laundry rooms & utility rooms, at least one installed luminaire shall be controlled by an occupancy or vacancy sensor providing automatic-off functionality per CA Energy Standard 150.0(k)2.E.

3 Exterior outdoor lighting attached to any building shall be high efficacy and must include manual on/off switch with a photocell and motion sensor or a photocontrol and automatic time switch control or an astronomical time switch control or an energy Management Control System per CENC 150.0(k)3.

Receptacles

1 Receptacles on 125-volt 15 & 20 amp circuits shall be listed tamper resistant. (CEC 406.12) Except when located more than 5.5' above the floor; within cabinets or cupboards; or when part of a luminaire or appliance.

2 Receptacles must be installed at 12' o.c. maximum in walls. Walls longer than 2 feet and halls longer than 10' must have a receptacle. A receptacle must be provided within 3' of bathroom sinks. (CEC 210.52). Spacing of kitchen and dining room countertop receptacles shall meet minimum requirements of CEC 210.52(C), Parts 1-5.

3 Ground-Fault Circuit-Interrupter (GFCI) protected receptacles shall be installed in bathrooms, garages, outdoors, crawl spaces, kitchen, unfinished basements, and receptacles within 6 ft. of the outside edge of laundry, utility, and wet sinks. All dwellings must have at least one exterior outlet at the front and the back of the dwelling. (CEC 210.52(E)

4 GFCI outlets are required for all kitchen receptacles that are designed to serve countertop surfaces, in bathroom, in under-floor spaces or below grade level, in exterior outlets, and in all garage outlets not dedicated to a single device or appliance. (CEC 210.8)

5 Arc-Fault Circuit-Interrupter (AFCI) protected receptacles shall be installed in all rooms not requiring GFCI protection. The maximum length of the branch circuit to the AFCI is 50 feet for 14 AWG conductors or 70 feet for a 12 AWG conductor. Arc-fault circuit interrupter protection must be provided in accordance with CEC 210.12(A), (B) and (C). AFCI devices shall be installed in readily accessible locations. (A) Where Required. All 15A or 20A, 120V branch circuits in dwelling units supplying outlets or devices in kitchens, family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways, laundry areas, or similar rooms or areas. Cabinetry or being dedicated to appliances does not exempt requirement.

6 Exterior Outlets @ Grade: At least one readily accessible outlet from grade and not more than 6-1/2 feet above grade level shall be installed at the front and back of dwelling, be GFCI protected, and have a weatherproof enclosure.

7 Exterior Outlets @ Balconies, Decks, and Porches: Each balcony, deck, and porch shall have at least one readily accessible outlet not more than 6-1/2 feet above the walking surface, be GFCI protected, and have a weatherproof enclosure.

Light Fixtures

1 Lighting in bathrooms, walk-in closets, garages, laundry rooms & utility rooms, at least one installed luminaire shall be controlled by an occupancy or vacancy sensor providing automatic-off functionality per CA Energy Standard 150.0(k)2E.

2 Lighting in all habitable spaces shall have dimmer controls per CA Energy Standard 150.0(k)2F.

3 All installed lighting shall be high efficacy in accordance with Table 150.0-A of the California Energy Code. Exterior outdoor lighting shall be high efficacy and must include manual on/off switch with a photocell and motion sensor or a photocontrol and automatic time switch control or an astronomical time switch control or an energy Management Control System per CENC 150.0(k)3.

4 All installed lighting shall be California Energy Commission certified to qualify as high efficacy and controlled by either an occupancy / vacancy sensor or dimmer switch per CENC 150.0(k)2A-G.

5 All recessed light fixtures shall be IC listed per CEnC 150.0(k)1C.

6 Fixtures installed in wet or damp locations shall be installed so that water cannot enter or accumulate in wiring compartments, lamp holders, or other electrical parts. Fixtures in wet or damp locations will be marked for such use. Lighting fixtures located within 3 feet horizontally and 8 feet vertically of the bathtub rim or shower stall threshold shall be listed for a damp location, or listed for wet locations where subject to shower spray per CEC 410.10.

JA8 marking is required for the following:

7 All lighting must be high efficacy. High efficacy luminaires may require JA8-2016 or JA8- 20160-E labeling. Per CEnC 150.0(k)1A, 150.0(K)1G, 150.0(K)2K Table 150.0-A

8 Fixtures recessed into ceilings shall be listed for zero clearance insulation contact (IC) have a label that certifies that the fixture is airtight with air leakage less than 2.0CFMN at 75 Pascal's (AT), be sealed with a gasket or caulk to the ceiling, have an accessible ballasts/drivers if hardwired, and not contain a screw base socket. They shall contain light sources that comply with Reference Joint Appendix JA8, including the elevated temperature requirements, and that are marked "JA8-2108-E" Per CenC 150.0(K)(1)(C).

9 Recessed Down-light Luminaires in Ceilings: Recessed downlight luminaires in ceilings must be installed per CEnC150.0(k)1C, be listed IC rated, labeled for air leakage less than 2.0 CFM, be sealed with a gasket or caulk to the ceiling, have accessible ballasts/drivers if hardwired, not contain a screw base sockets, comply with JA8, and marked JA8-2016-E as specified in Reference Appendix JA8.

10 Screw Based Luminaires: Screw based luminaires shall be high efficacy and controlled by dimmers or vacancy sensors. Installed lamps shall be marked with 'JA8-2026' or JA8-2016-E' as specified in Reference Joint appendix JA8. Light sources not marked 'JA8-2016-E' shall not be installed in enclosed luminaires.

11 A GU-24 lamp fitting is a 2-pin connector for compact fluorescent lamps (CFL) or LED lamps that use bayonet mount-like twist-lock 2-pin connector instead of an Edison screw fitting.

12 Any light source not otherwise listed above and certified to the Commission as complying with Joint Appendix 8.

Alarms

1 Contractor must install or verify the existence of smoke alarms and carbon monoxide alarms outside each bedroom as well as one on every level. An additional smoke alarm is required inside each bedroom. Alarms in existing areas where access to the area above the ceiling is not possible may be powered by a D/C battery source. In the areas of new construction or existing rooms where the area above the ceiling is accessible, alarms must be powered by an A/C power source with a battery back-up and be interconnected.(CRC 314, 315).

2 Smoke detector/ alarms are to be provided with battery back-up and audible in all sleeping areas and shall be hard-wired and inter-connected per CRC R314.5. Smoke alarms shall be located more than 36 inches clear from heating supply registers per NFPA 72, Section 29.8.3.4 (6), and bathroom doors per NFPA 72, Section 29.8.3.4 (5), CRC R314.3.3.

3 An approved carbon monoxide alarm shall be installed in dwellings within which fuel-burning appliances are installed, and in dwellings with an attached garage. Carbon monoxide detector/ alarms on all habitable levels and shall be hard-wired and inter-connected per CRC R315.1.

4 Where more than one smoke alarm is required to be installed within an individual dwelling unit in accordance with CRC R314.3, the alarm devices shall be inter-connected in such a manner that the actuation of one alarm will activate all of the alarms in the individual dwelling unit. Physical inter-connection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm. The alarms shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

HVAC

1 Provide exhaust fans in kitchen and each bathroom vented to outside and sized as follows. Kitchen: >/= 100 CFM intermittent, >/= 5 ACh continuous with a tested static pressure of .25 wc, rated @ =/<3 sones. Fans to be attached to a minimum 5" diameter smooth duct, <70 lin. ft., subtract 15' of allowed length for each elbow.
Bathrooms: >/= 50 CFM intermittent, >/= 20 CFM continuous with a tested static pressure of .25 wc, rated @ =/<3 sones. Fans to be attached to a minimum 4" diameter smooth duct, <70 lin. ft., subtract 15' of allowed length for each elbow.
Exhaust fan ratings to be </= 1 sone continuous, </= 3 sones intermittent.
Bath fans to be Energy Star compliant and equipped with humidistat controls for adjustment of relative humidity from 50 to 80%, per CalGreen code 4.506.1.

2 Bathroom exhaust fans shall be switched separately from lighting system per CA Energy Code 150.0(k)2B.

3 Provide a whole-building mechanical exhaust system to outdoor air at the minimum rate of 70 CFM with a tested static pressure of .25 wc, rated @ =/<3 sones. Fans to be attached to a minimum 5" diameter smooth duct, <70 lin. ft., subtract 15' of allowed length for each elbow. System to have an accessible off/on switch that is properly labeled. Covers and louvers for the whole house ventilation fan(s) shall be provided so that they close when the system is turned off. Covers or louvers shall have min. R 4.2 insulation value. Switch for fan must be labeled such as "Fan is to be left on to ensure indoor air quality".

WHOLE HOUSE VENTILATION CALCULATION per CEC 150 (O) & ASHRAE 62.2

0.03 X 7101 SF Htd. Area + 7.5 X (5 bedrms + 1) = 258 CFM req'

4 The thermal capacity of electric floor warming matt in bathrooms shall not exceed 2 Kilowatts or 7,000 BTU/HR and shall be controlled by a time-limiting device not exceeding 30 minutes. Provide a dedicated circuit with GFCI protection.

5 Furnaces installed in attics and crawl spaces must have an access platform (catwalk in attics), light, light switch, and receptacle in the space.

VENTILATION NOTES

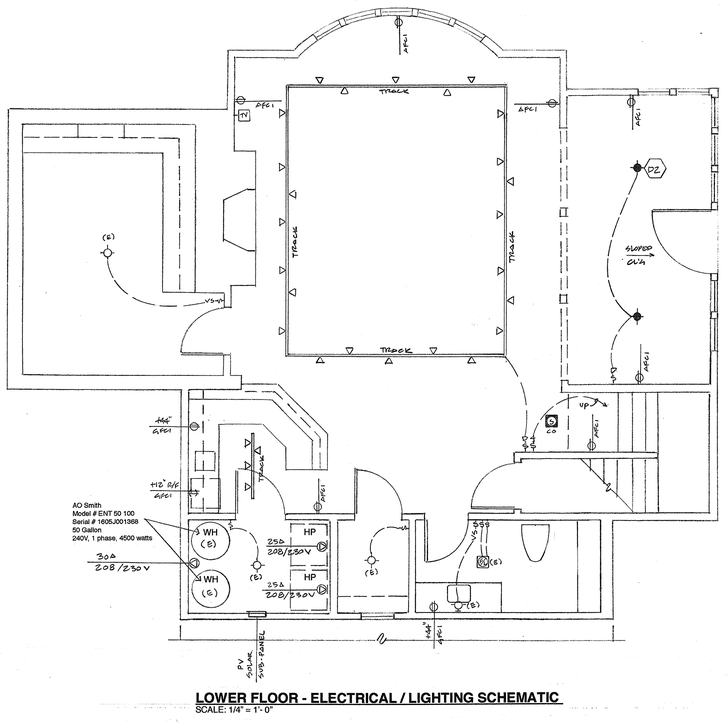
1 All **bathroom fans** are to be used for **Local Ventilation Exhaust**. Minimum 50 CFM fan tested at a static pressure of .25 wc and rated @ 3 sones or less required to be installed. Fan must be attached to a minimum 4" duct and no longer than 70' of **flex** duct. Subtract 15' of allowed length for each elbow.

2 All **kitchen range hoods** are to be used for **Local Ventilation Exhaust**. Minimum 180 CFM tested at a static pressure of .25 wc and rated @ 3 sones or less required to be installed. Fan must be attached to a minimum 5" **smooth** duct and no longer than 85'. Subtract 15' of allowed length for each elbow.

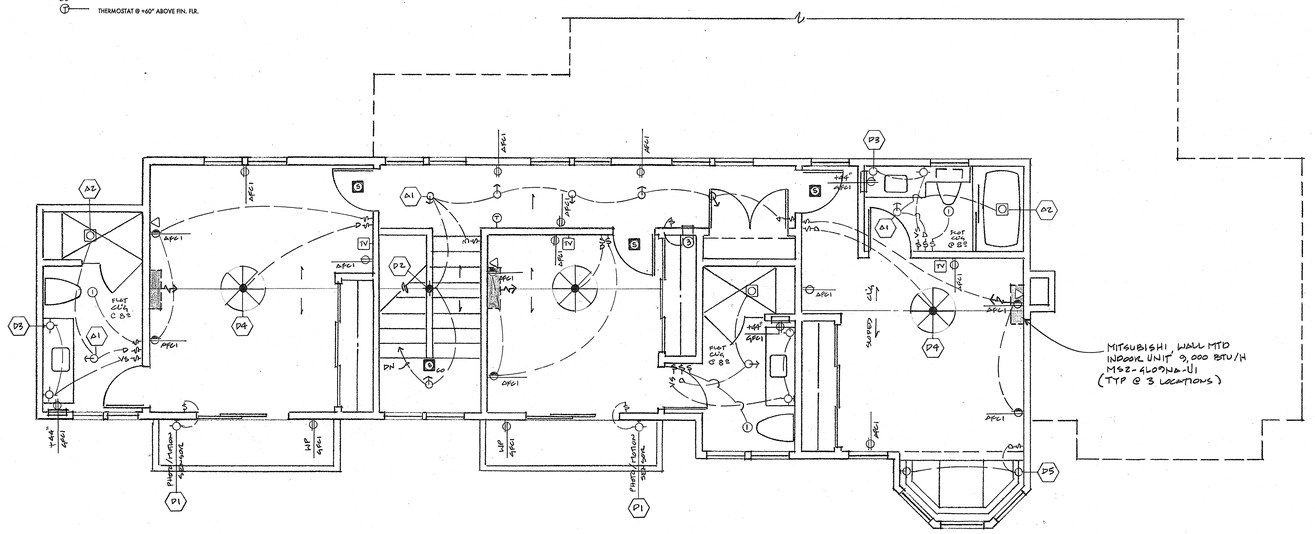
3 This fan is to be used for **Whole Building Ventilation**. Minimum 70 CFM fan tested at a static pressure of .25 wc and rated @ 1 sone or less required to be installed. Fan must be attached to a minimum 5" duct and no longer than 70'. Subtract 15' of allowed length for each elbow. Switch for fan must be labeled to indicate the fan's required function such as "Fan is to be left on to ensure indoor air quality".

ELECTRICAL SYMBOL LEGEND

- DUPLEX OUTLET, +12" ABOVE FIN. FLR.,TAMPER RESISTANT, TYPICAL
- DUPLEX OUTLET W/ ARC FAULT INTERRUPT CIRCUIT
- DUPLEX OUTLET W/ GROUND FAULT INTERRUPT CIRCUIT
- DUPLEX OUTLET W/ GROUND FAULT & ARC FAULT INTERRUPT CIRCUIT
- DUPLEX OUTLET W/ WATERPROOF COVER
- DUPLEX OUTLET W/ ½ SWITCHED
- SPECIAL PURPOSE 220 V. OUTLET
- LIGHT SWITCH, +42" ABOVE FIN. FLR. TYPICAL
- LIGHT SWITCH, 3 WAY
- LIGHT SWITCH W/ DIMMER
- LIGHT SWITCH W/ VACANCY SENSOR
- LIGHT, CEILING SURFACE MOUNTED
- LIGHT, WALL SURFACE MOUNTED
- LIGHT, PENDANT
- LIGHT, RECESSED DOWNLIGHT
- LIGHT, RECESSED WALL WASHER
- LIGHT, RECESSED ADJUSTABLE
- LIGHT, RECESSED STEP
- LIGHT, LINEAR STRIP
- FAN/ LIGHT COMBO
- EXHAUST FAN
- GARBAGE DISPOSER
- TELEPHONE OUTLET
- TV OUTLET
- DATA OUTLET
- SMOKE DETECTOR
- COMBO SMOKE/ CO DETECTOR
- THERMOSTAT @ +60" ABOVE FIN. FLR.



LOWER FLOOR - ELECTRICAL / LIGHTING SCHEMATIC
SCALE: 1/4" = 1'- 0"



UPPER FLOOR - ELECTRICAL / LIGHTING SCHEMATIC
SCALE: 1/4" = 1'- 0"

M-SERIES SUBMITTAL DATA: MXZ-3C30NAZ
MULTI-INDOOR INVERTER HEAT-PUMP SYSTEM — MITSUBISHI ELECTRIC

Job Name:
System Reference: Date:


Outdoor Unit: MXZ-3C30NA

ACCESSORIES
- 3/8" x 1/2" Port Adapter (MAC-A454JP-E)
- 1/2" x 3/8" Port Adapter (MAC-A465JP-E)
- 1/2" x 5/8" Port Adapter (MAC-A462JP-E)
- 1/4" x 3/8" Port Adapter (PAC-493PI)
- 3/8" x 5/8" Port Adapter (PAC-SG76RJ-E)
- M-NET Adapter (PAC-IF01MT-E)
- Base Heater (PAC-645BH-E)

(For data on specific indoor units, see the MXZ-C Technical and Service Manual.)

Specifications			Model Name
	Unit Type		MXZ-3C30NAZ
Cooling* (Non-ducted / Ducted)	Rated Capacity	Btu/h	28,400 / 27,400
	Capacity Range	Btu/h	12,600-28,400 / 12,600-27,400
	Rated Total Input	W	2,660 / 2,860
Heating at 47°F* (Non-ducted / Ducted)	Rated Capacity	Btu/h	28,600 / 27,600
	Capacity Range	Btu/h	11,400-38,000 / 11,400-35,000
	Rated Total Input	W	2,100 / 2,220
Heating at 17°F* (Non-ducted/Ducted)	Rated Capacity	Btu/h	16,000 / 15,100
	Rated Total Input	W	2,120 / 2,140
Power Supply			
Electrical Requirements			208 / 230V, 1-Phase, 60 Hz
Voltage	Indoor - Outdoor S1-S2	V	AC 208 / 230
	Indoor - Outdoor S2-S3	V	DC ±24
Compressor			INVERTER-driven Scroll Hermetic
Fan Motor (ECM)		F.L.A.	2.43
Sound Pressure Level	Cooling	dB(A)	52
	Heating		56
Exterior Finish			
Refrigerant Lines			
Refrigerant Pipe Size O.D. — Sight Ports	Liquid (High Pressure)	In (mm)	1/4 (12.7)
	Gas (Low Pressure)		A: 1/2 (8.35) B,C: 3/8 (9.52)
Max. Refrigerant Line Length		Ft (m)	230 (70)
Max. Piping Length for Each Indoor Unit		Ft (m)	82 (25)
Max. Refrigerant Pipe Height Difference	If ISU is Above ODU	Ft (m)	49 (15)
	If ISU is Below ODU		49 (15)
Refrigerant Control			Electronic Control
Refrigerant			R410A

*Rating Conditions per AHRI Standard:
Cooling:Indoor 80°F (27°C) DB/67°F (19°C) WB / Outdoor 95°F (35°C) DB / 75°F (24°C) WB
Heating at 47°F: Indoor 70°F (21°C) DB / Outdoor 47°F (8°C) DB/43°F (6°C) WB
Cooling:Outdoor 95°F (35°C) DB / 75°F (24°C) WB
Heating at 47°F / Outdoor 17°F (-8°C) DB / 15°F (-9°C) WB

OPERATING RANGE:

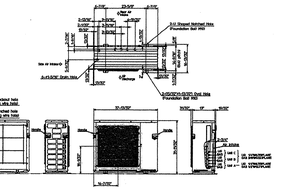
	Outdoor
Cooling	14 to 115° F (-10 to 46° C) DB
Heating	5 to 60° F (-15 to 18° C) WB

ENERGY EFFICIENCIES:

Indoor Unit Type	SEER	EER	HSPF	COP @ 47°F	COP @ 17°F
Non-ducted (09 + 09 + 09)	19.0	10.6	10.6	3.90	2.77
Ducted and Non-ducted	17.6	10.1	10.1	3.77	2.78
Ducted (09 + 09 + 09)	16.2	9.6	9.6	3.64	2.78

NOTES:
- Minimum of two Indoor Units must be connected to the MXZ-3C30NAZ.
- Minimum installed capacity cannot be less than 12,000 Btu/h.
- Total connected capacity must not exceed 130% of outdoor unit capacity.
- System can operate with only one Indoor Unit turned on.
- Information provided at 208/230V.
- For Reference:
  - MXZ-C Technical & Service Manual for detailed specifications and additional information per Indoor Unit Combination.
  - MXZ Series Multi-Zone Indoor/Outdoor Combination Table for allowed unit combinations.

MVZ CONNECTION RULES:
- Only 1 MVZ may be used on any system.
- When an MVZ is connected, total connected capacity must be 100% or less.
- When an MVZ is connected, no P-Series indoor units can be used (PCA, PLA, or PEAD).



M-SERIES SUBMITTAL DATA: MSZ-GL09NA-U1
9,000 BTUH WALL-MOUNTED INDOOR UNIT FOR MXZ-C MULTI-ZONE HEAT-PUMP SYSTEMS — MITSUBISHI ELECTRIC

Job Name:
System Reference: Date:


Indoor Unit: MSZ-GL09NA-U1 — Wireless Remote Controller

ACCESSORIES:
Indoor Unit
- Condensate Pump (BlueDiamond X87-711/721: 115/230V)
- Condensate Pump (Sauermann 9/30-115/230; 115/230V)
- Anti-Allergy Enzyme Filter (MAC-408FT-E)
- Platinum Catalyst Deodorizing Filter (MAC-308FT-E)
- Drain Pan Level Sensor (DPL32)

Controls
- Wireless Controller (MHK1)
- Wired Remote Controller PAR-31MAA (Requires MAC-333IF-E)
- Wireless Interface for kumo cloud™ (MAC-WHS01WF-E)
- Thermostat Interface (PAC-US644CN-1)

SPECIFICATIONS:

Rated Capacity*		
Cooling*	Btuh / W	9,000
Heating at 47°F*	Btuh / W	10,900

Rating Conditions per AHRI Standard:
Cooling: Indoor: 80°F (27°C) DB / 67°F (19°C) WB, Outdoor: 95° F(35° C)DB / 75° F(24° C)WB
* Heating at 47°F : Indoor: 70°F (21°C)DB / 60°F (16° C)WB, Outdoor: 47° F (8° C)DB / 43°F (6° C)WB

For data on specific indoor units (all ducted, all non-ducted, and both ducted and non-ducted) combinations, see the MXZ Technical and Service Manual.

Applications should be restricted to comfort cooling only; equipment cooling applications are not recommended for low-ambient temperature conditions.

Electrical Requirements			208 / 230V, 1-Phase, 60 Hz
Minimum Circuit Ampacity (MCA)		A	1.0
Blower Motor (ECM)		F.L.A	0.76
Blower Motor Output		W	30
Field Drainpipe Size O.D.		in.(mm)	5/8 (15)
Air Flow Rate (Quiet - Lo - Med - Hi - Super Hi - Powerful)			
Cooling	DRY	CFM	145-170-237-321-399
	WET		109-134-201-266-364
Heating	DRY		145-170-237-321-406
Sound Pressure Level (Quiet - Lo - Med - Hi - Powerful)			
Cooling		dB(A)	19-22-30-37-43
Heating			19-22-30-37-43
External Dimensions (H x W x D)		in.(mm)	11-5/8 x 31-7/16 x 9-1/8 (295 x 798 x 232)
Net Weight		Lbs.(kg)	29 (12)
External Finish			Munsell 1.0Y 9.2 / 0.2
Refrigerant Piping (Flared)			
Liquid (High Pressure)		in.(mm)	1/4 (6.35)
Gas (Low Pressure)			3/8 (9.52)

MITSUBISHI ELECTRIC COOLING & HEATING
1340 Satellite Boulevard, Suwanee, GA 30024
Toll Free: 800-433-4822 www.mehvac.com

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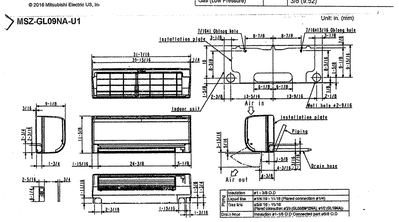
MSZ-GL09NA-U1



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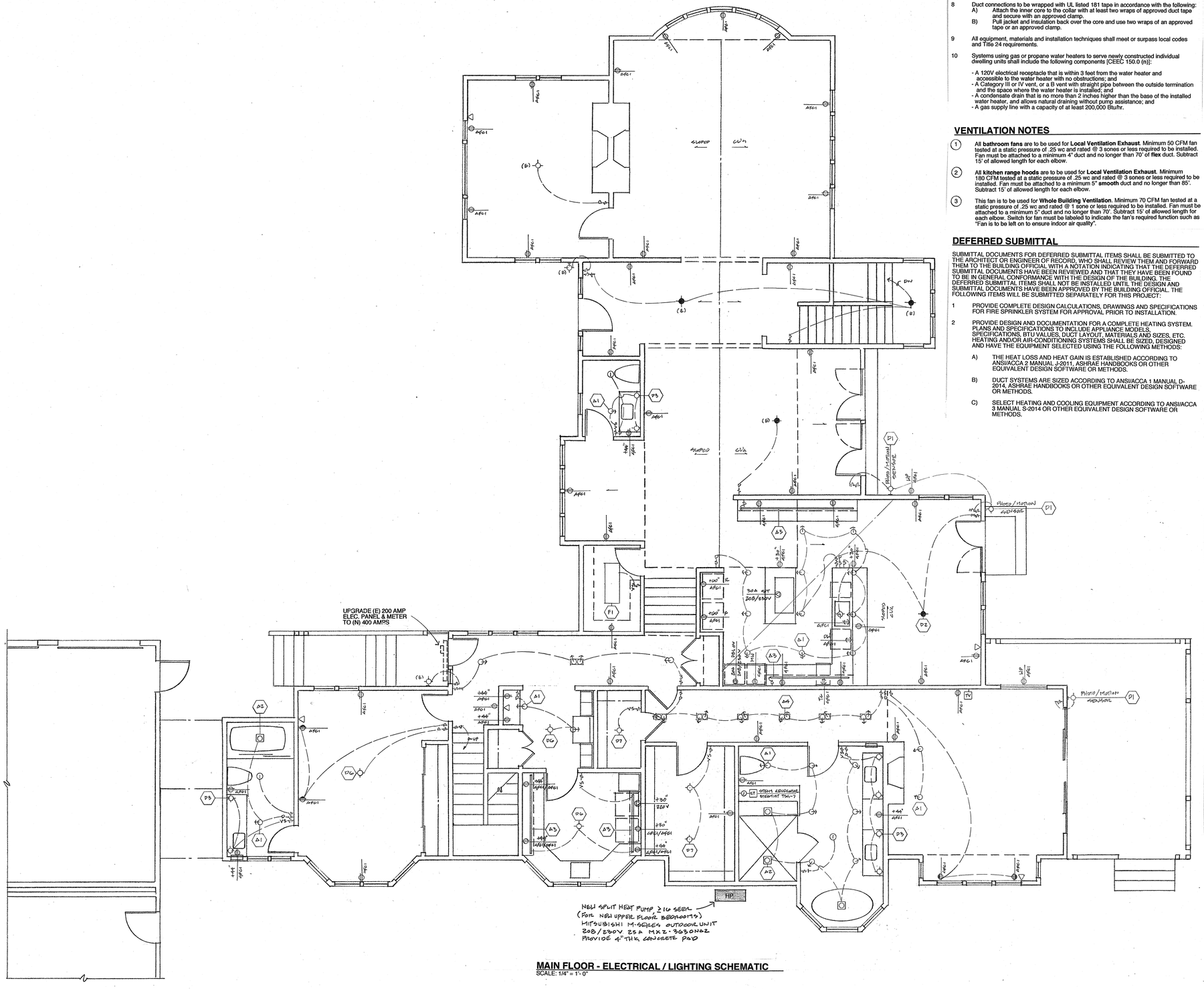
8-15-23 MSH
5-22-24 MSH

REMODEL & ADDITIONS TO THE: RENFREW RESIDENCE
14500 ARNERICH HILL ROAD – APN 537-12-012
LOS GATOS, CALIFORNIA

Lower Floor - Electrical Schematic
Upper Floor - Electrical Schematic

11.14.22
1/4"=1'-0"
MSH
2108

12



MAIN FLOOR - ELECTRICAL / LIGHTING SCHEMATIC

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

MECHANICAL NOTES

1. The System shall be installed in accordance with the latest edition of the California Mechanical Code. Provide all equipment shown on drawings and as needed for a complete and working system. Use Manufacturer as scheduled or Equal approved by the Architect. Install all equipment in accordance with the Manufacturer's instructions and within all applicable codes and standards. Maintain Manufacturer's required clearances around equipment. Contractor shall provide and install all controls necessary to operate the system as required by the California Energy Efficiency Standards.
2. For the purpose of clarity and legibility, these drawings are essentially diagrammatic to the extent that many offsets, bends, special fittings and exact locations are not indicated. Contractor shall verify all conditions at the site before proceeding with installation. It is the responsibility of the Contractor to install the system such that the integrity of the building is maintained.
3. All exhaust fans and fan systems must have damper controls.
4. All joints and penetrations must be sealed.
5. Mechanical equipment and water heaters must be certified and labeled by the California Energy Commission.
6. Termination of all environmental air ducts shall be a minimum of 3 feet from any openings into the building (ie., dryers, bath & utility fans, etc., must be 3 feet away from doors, windows, opening skylights, or attic vents) CMC 504.5.
8. Duct connections to be wrapped with UL listed 181 tape in accordance with the following:
   A) Attach the inner core to the collar with at least two wraps of approved duct tape and secure with an approved clamp.
   B) Pull jacket and insulation back over the core and use two wraps of an approved tape or an approved clamp.
9. All equipment, materials and installation techniques shall meet or surpass local codes and Title 24 requirements.
10. Systems using gas or propane water heaters to serve newly constructed individual dwelling units shall include the following components [CEEC 150.0 (n)]:
    - A 120V electrical receptacle that is within 3 feet from the water heater and accessible to the water heater with no obstructions; and
    - A Category III or IV vent, or a B vent with straight pipe between the outside termination and the space where the water heater is installed; and
    - A condensate drain that is no more than 2 inches higher than the base of the installed water heater, and allows natural draining without pump assistance; and
    - A gas supply line with a capacity of at least 200,000 Btu/hr.

VENTILATION NOTES

1. All **bathroom fans** are to be used for **Local Ventilation Exhaust**. Minimum 50 CFM fan tested at a static pressure of .25 wc and rated @ 3 sones or less required to be installed. Fan must be attached to a minimum 4" duct and no longer than 70' of **flex** duct. Subtract 15' of allowed length for each elbow.
2. All **kitchen range hoods** are to be used for **Local Ventilation Exhaust**. Minimum 180 CFM tested at a static pressure of .25 wc and rated @ 3 sones or less required to be installed. Fan must be attached to a minimum 5" **smooth** duct and no longer than 85'. Subtract 15' of allowed length for each elbow.
3. This fan is to be used for **Whole Building Ventilation**. Minimum 70 CFM fan tested at a static pressure of .25 wc and rated @ 1 sone or less required to be installed. Fan must be attached to a minimum 5" duct and no longer than 70'. Subtract 15' of allowed length for each elbow. Switch for fan must be labeled to indicate the fan's required function such as "Fan is to be left on to ensure indoor air quality".

DEFERRED SUBMITTAL

SUBMITTAL DOCUMENTS FOR DEFERRED SUBMITTAL ITEMS SHALL BE SUBMITTED TO THE ARCHITECT OR ENGINEER OF RECORD, WHO SHALL REVIEW THEM AND FORWARD THEM TO THE BUILDING OFFICIAL WITH A NOTATION INDICATING THAT THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN REVIEWED AND THAT THEY HAVE BEEN FOUND TO BE IN GENERAL CONFORMANCE WITH THE DESIGN OF THE BUILDING. THE DEFERRED SUBMITTAL ITEMS SHALL NOT BE INSTALLED UNTIL THE DESIGN AND SUBMITTAL DOCUMENTS HAVE BEEN APPROVED BY THE BUILDING OFFICIAL. THE FOLLOWING ITEMS WILL BE SUBMITTED SEPARATELY FOR THIS PROJECT:

1. PROVIDE COMPLETE DESIGN CALCULATIONS, DRAWINGS AND SPECIFICATIONS FOR FIRE SPRINKLER SYSTEM FOR APPROVAL PRIOR TO INSTALLATION.
2. PROVIDE DESIGN AND DOCUMENTATION FOR A COMPLETE HEATING SYSTEM. PLANS AND SPECIFICATIONS TO INCLUDE APPLIANCE MODELS, SPECIFICATIONS, BTU VALUES, DUCT LAYOUT, MATERIALS AND SIZES, ETC. HEATING AND/OR AIR-CONDITIONING SYSTEMS SHALL BE SIZED, DESIGNED AND HAVE THE EQUIPMENT SELECTED USING THE FOLLOWING METHODS:
   A) THE HEAT LOSS AND HEAT GAIN IS ESTABLISHED ACCORDING TO ANSI/ACCA 2 MANUAL J-2011, ASHRAE HANDBOOKS OR OTHER EQUIVALENT DESIGN SOFTWARE OR METHODS.
   B) DUCT SYSTEMS ARE SIZED ACCORDING TO ANSI/ACCA 1 MANUAL D-2014, ASHRAE HANDBOOKS OR OTHER EQUIVALENT DESIGN SOFTWARE OR METHODS.
   C) SELECT HEATING AND COOLING EQUIPMENT ACCORDING TO ANSI/ACCA 3 MANUAL S-2014 OR OTHER EQUIVALENT DESIGN SOFTWARE OR METHODS.

LIGHTING FIXTURE SCHEDULE – HOUSE

Tag	Description
A1	Recessed 4" adjustable retractable LED downlight. Manufacturer: WAC Lighting, Precision Multiples, 3000K Housing, MT-4LD116N-S-30-BK Trim, MT-4LD116T-WT Remarks: Order with bar hangers
A2	Recessed 4" LED shower light. Manufacturer: Halo, **To be determined** Lamp & Mfg: 3000K Remarks: Order with bar hangers
A3	Surface mounted under cabinet task LED light. Manufacturer: WAC Lighting, Line, 3000K Lamp & Mfg: 30" LN-LED30-30AL 24" LN-LED24-30-AL 12.25" LN-LED12-30-AL
A4	Recessed adjustable retractable multiple LED downlights. Manufacturer: WAC Lighting, Precision Multiples, 3000K Housing, MT-4LD116N-S-30-BK Trim, MT-4LD416T-WT Remarks: Order with bar hangers
F1	Surface Mounted 1.5' X 4' LED Wrap Around Manufacturer: Lithonia, LBL4 LP835 Lamp & Mfg: 3500K, 41 watt light engine, 4564 Nom. Lumens
D1	Wall mounted LED exterior light fixture. Manufacturer: **To be determined by Owner** Remarks: Provide photo/motion sensor on exterior circuits, Verify location of sensor prior to installation **Owner approval required prior to ordering.**
D2	Pendant mounted LED decorative light fixture. Manufacturer: **To be determined by Owner**
D3	Wall mounted LED decorative bath strip light. Manufacturer: WAC Lighting, Brink, WS-77618-AL Remarks: Mount vertically, **To be Owner Approved**
D4	Pendant mounted ceiling fan. Manufacturer: **To be determined by Owner**
D5	Wall mounted LED decorative sconce light fixture. Manufacturer: **To be determined by Owner**
D6	Ceiling surface mounted LED decorative light fixture. Manufacturer: **To be determined by Owner**
D7	Ceiling surface mounted LED decorative light fixture. Manufacturer: **To be determined by Owner**

PLUMBING NOTES

1. The Plumbing System shall be installed in accordance with the latest edition of the Plumbing Code. Provide all equipment as shown on drawings and as needed for a complete and working system. Use Manufacturer as scheduled or Equal approved by the Architect. Install all equipment in accordance with the Manufacturer's instructions and within all applicable codes and standards.
2. Provide clean outs for every aggregate change in direction exceeding 135 degrees. If the water supply pressure exceeds 80 PSI, install an approved pressure regulator in an accessible location to reduce the service pressure to 60 PSI or less. Hose bibbs shall be protected by a backflow prevention device. Pressure relief valve shall extend to the outside of the building and terminate not more than two feet nor less than six inches above the ground and pointed downward.
3. Waste lines shall be ABS. Water supply piping shall be Type L copper below grade and Type L copper or PEX tubing within the building. Gas piping shall be Schedule 40 black iron.
4. For the purpose of clarity and legibility, these drawings are essentially diagrammatic to the extent that many offsets, bends, special fittings and exact locations are not indicated. Contractor shall verify all conditions at the site before proceeding with installation. It is the responsibility of the Contractor to install the system such that the integrity of the building is maintained.
5. Provide pressure balance, thermostatic or combination pressure balance/thermostatic mixing valves at showers and tub-showers that provide scald and thermal shock protection (120 F max.). Verify at rough plumbing inspection per CPC sec. 408.3.
6. All building water supply systems in which quick acting valves (washing machines, dishwashers, etc., are installed, shall be provided with devices to absorb high pressures resulting from the quick closing of these valves.
7. Water lines shall be insulated per CA Energy Code as follows;
   Install a minimum 1.5 inch thick insulation on all hot water pipes, all piping with a nominal diameter of 3/4 inch or larger, piping associated with recirculation systems regardless of pipe diameter, and cold water pipes for the first 5 feet from a storage tank, piping buried below grade, all hot water pipes from heating source to kitchen fixtures. Hot water pipes buried below grade must be installed in a waterproof and non-crushable casing or sleeve. Insulation outside conditioned space shall be protected per CEnC 150.0(j)2., Table 120.3-A, CPC 609.11
8. Provide "DSA Certified" earthquake actuated shut-off valve at gas meter or regulator.
9. No domestic dishwashing machine shall be directly connected to a drainage system or food waste disposer without the use of an approved dishwasher air gap fitting on the discharge side of the dishwashing machine. Listed air gaps shall be installed with the flood-level (FL) marking at or above the flood level of the sink or drainboard, whichever is higher. CPC 807.3
10. Control valves and shower heads shall be located on the sidewall of shower compartment or otherwise arranged so that the shower head does not discharge directly at the entrance to the compartment and the bather can adjust the valves prior to stepping into the shower spray per CPC 408.9

PLUMBING FIXTURE MAXIMUM FLOW RATES

TOILET	1.28 GPF
LAVATORY FAUCETS	1.2 GPM @ 60 PSI
TUB / SHOWER VALVES	1.8 GPF @ 80 PSI
KITCHEN FAUCETS	1.8 GPM @ 60 PSI

PLUMBING FIXTURE CONNECTION SCHEDULE

SYMBOL	TYPE	WASTE	VENT	HOT	COLD
LV	LAVATORY	1-1/2"	1-1/2"	1/2"	1/2"
WC	TOILET	3"	2"	-	1/2"
T/SH	TUB / SHOWER	2"	1-1/2"	1/2"	1/2"
KS	KITCHEN SINK	2"	1-1/2"	1/2"	1/2"
WS	WASHER	1-1/2"	1-1/2"	1/2"	1/2"
HB	HOSE BIBB				3/4"

FINISH SCHEDULE NOTES

1. VERIFY ALL FINISHES WITH OWNER
2. ALL CLOSET FLOORING AND BASEBOARDS SHALL MATCH THE ADJACENT ROOM
3. PROVIDE A SMOOTH, HARD, NON-ABSORBENT SURFACE OVER MOISTURE RESISTANT UNDERLAYMENT TO A HEIGHT OF 72" ABOVE THE DRAIN OUTLET IN ALL SHOWER AND TUB LOCATIONS.
4. UNDERLYING BASE FOR ALL TILE SHALL BE CEMENT, FIBER-CEMENT OR GLASS MAT GYPSUM BACKER BOARDS IN COMPLIANCE WITH ASTM C1178, C1288 OR C1325 AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. IT SHALL BE USED AS A BASE FOR WALL TILE IN TUB AND SHOWER AREAS AND AS CEILING PANELS IN SHOWER AREAS.

HERS NOTE

HERS registered forms are required by installing mechanical contractor for the heat pump system. Installing contractor to register project with HERS provider and submit CF2Rs & CF3Rs to jurisdiction before beginning work; HERS certification is required for indoor air quality ventilation. HERS inspection and certification is required for installation of Kitchen downdraft cooktop exhaust. HERS inspection and certification is required for cooling system; verified SEER, Verified Refrigerant Charge, Airflow in Habitable rooms (SC3.1.4.1.7). HERS inspection and certification is required for Heating System; verified HSPF, verified heat pump rated heating capacity, wall-mounted thermostat in zones greater than 150ft2 (SC3.4.5), ductless indoor units located entirely in conditioned space (SC3.1.4.1.8), Quality Insulation Installation (QII) at Music Room. General Contractor shall meet with the HERS Rater prior to commencement of construction.

8.15.23	MSH
5.22.24	MSH

Michael Helm, AIA Architect & Associates
200 Seventh Avenue, #110 Santa Cruz, California 95062 (831) 476-5386

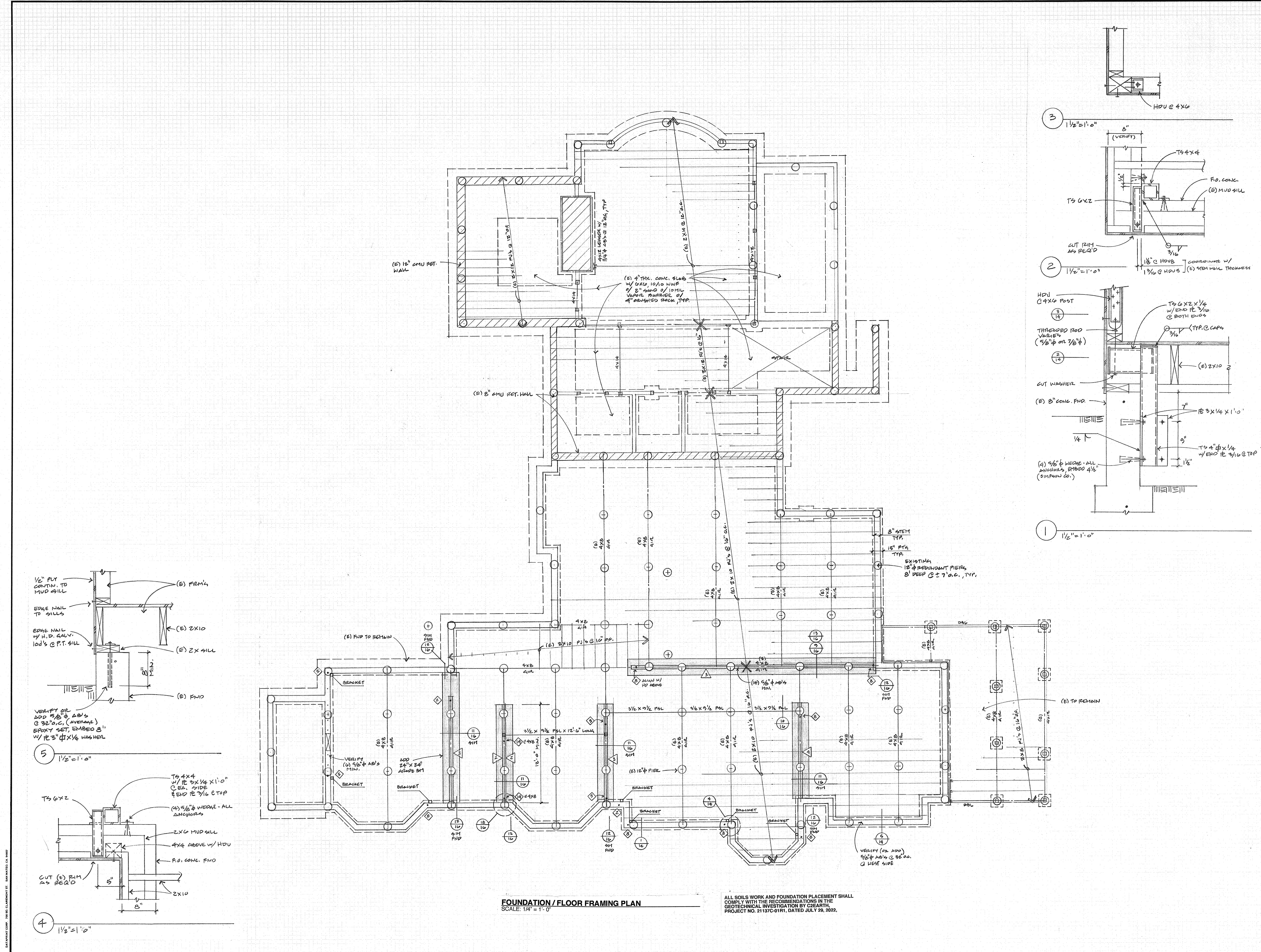
REGISTERED ARCHITECT MICHAEL S. HELM EXPIRES 11-30-25 STATE OF CALIFORNIA

REMODEL & ADDITIONS TO THE
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD – APN 537-12-012
LOS GATOS, CALIFORNIA

MAIN FLOOR - ELECTRICAL SCHEMATIC

11.14.22
1/4"=1'-0"
MSH
2108

13



FOUNDATION / FLOOR FRAMING PLAN

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

ALL SOILS WORK AND FOUNDATION PLACEMENT SHALL COMPLY WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL INVESTIGATION BY C2EARTH, PROJECT NO. 21137C-01R1, DATED JULY 29, 2022.

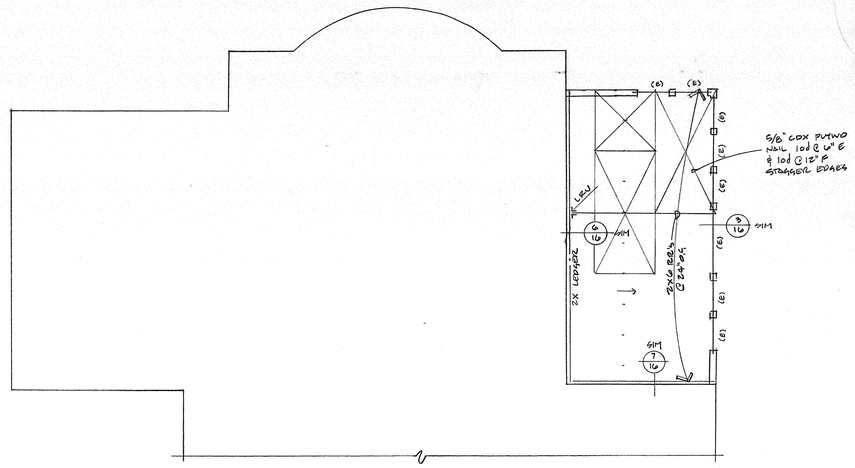
REVISIONS	BY
8.15.23	MGH
5.22.24	MGH

Michael Helm, AIA Architect & Associates
200 Seventh Avenue, #110 Santa Cruz, California 95062 (831) 476-5386

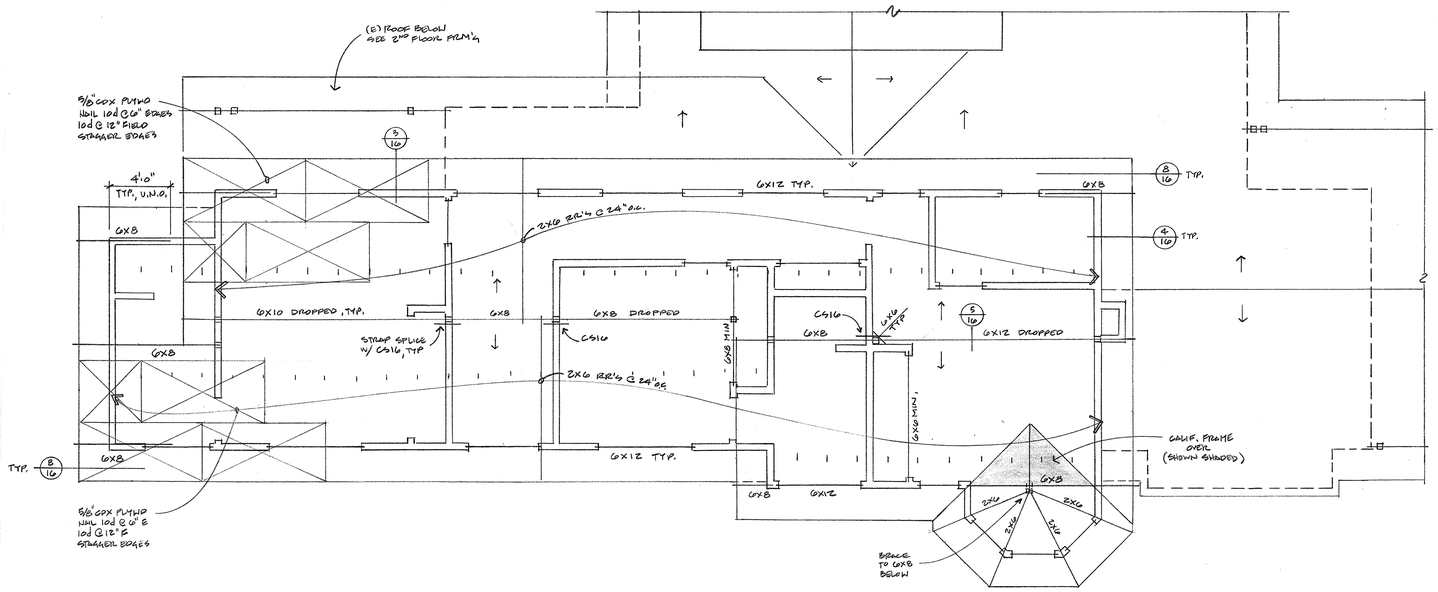
REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD – APN 537-12-012
LOS GATOS, CALIFORNIA

FOUNDATION / FLOOR FRAMING PLAN

DATE 11.14.22
SCALE 1/4"=1'-0"
DRAWN MGH
JOB 2108
SHEET 14
OF SHEETS



ROOF FRAMING PLAN
SCALE: 1/4" = 1'-0"



ROOF FRAMING PLAN
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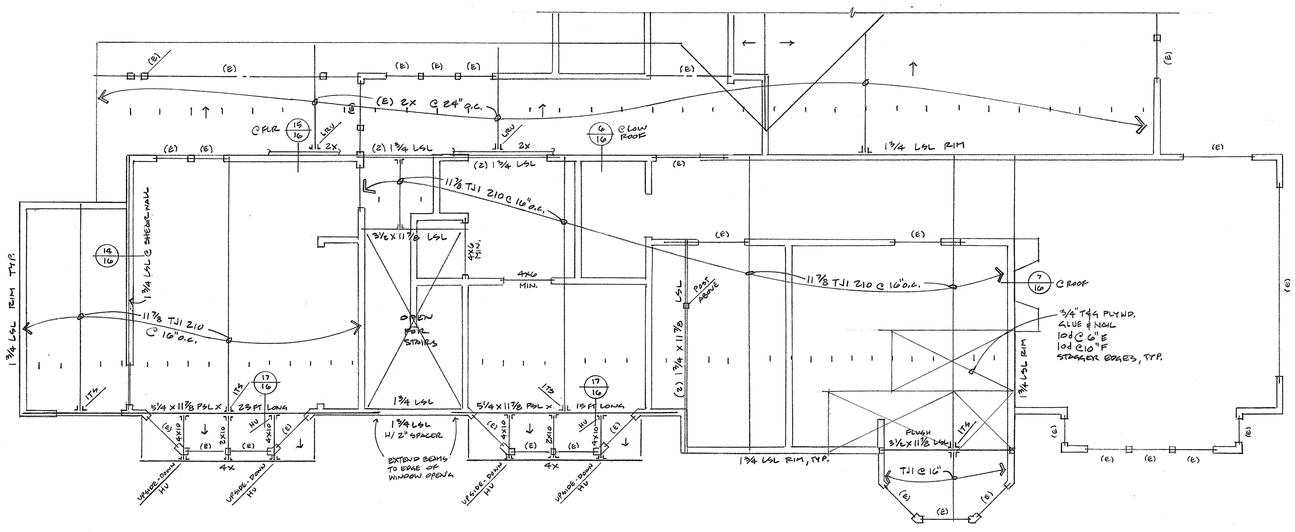


UPPER FLOOR FRAMING PLAN
SCALE: 1/4" = 1'-0"

Michael Helm, AIA Architect & Associates
200 Seventh Avenue, #110 Santa Cruz, California 95062 (831) 476-5386

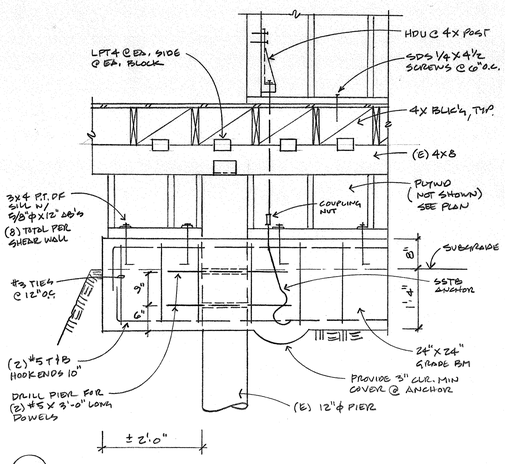
8.15.23	MSH
5.22.24	MSH

REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARMERTH HILL ROAD - APN 537-12-012
LOS GATOS, CALIFORNIA

UPPER FLOOR FRAMING PLAN
ROOF FRAMING PLAN

11.14.22
1/4" = 1'-0"
MSH
2108

15



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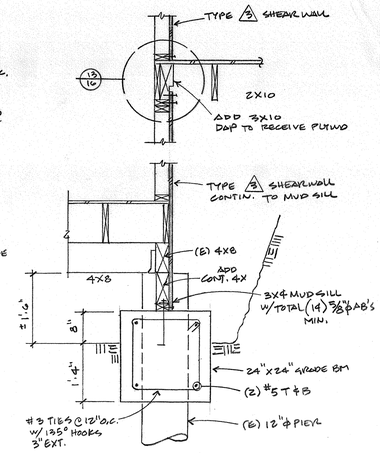

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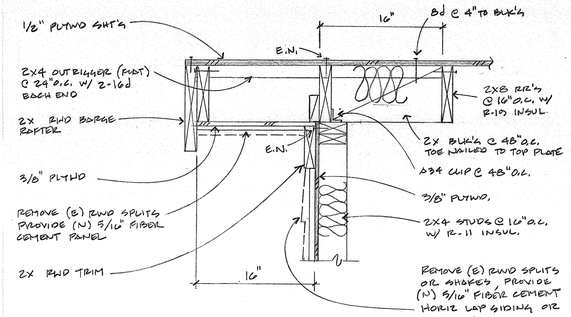
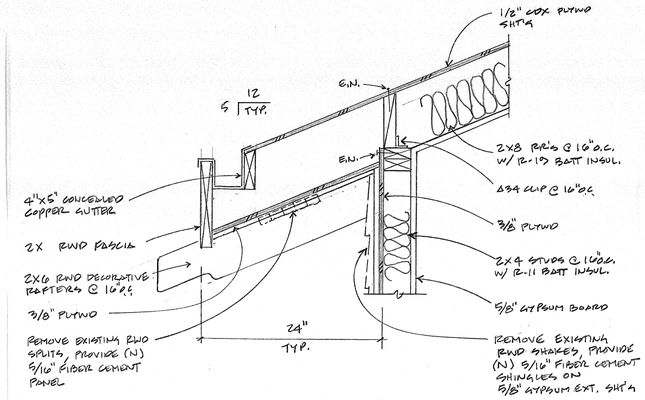


2 EXISTING RAKE
1 1/2" = 1'-0"



1 EXISTING EAVE
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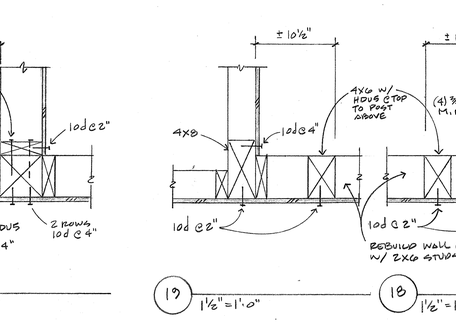

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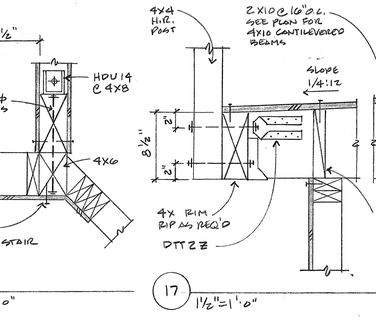

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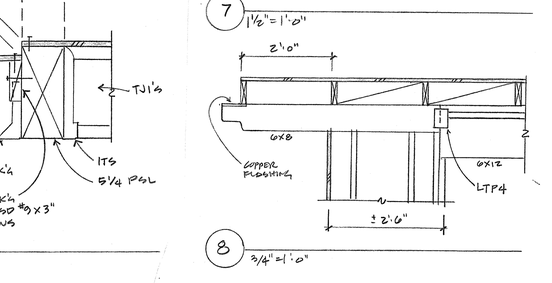

4 RAKE @ NEW CONSTRUCTION
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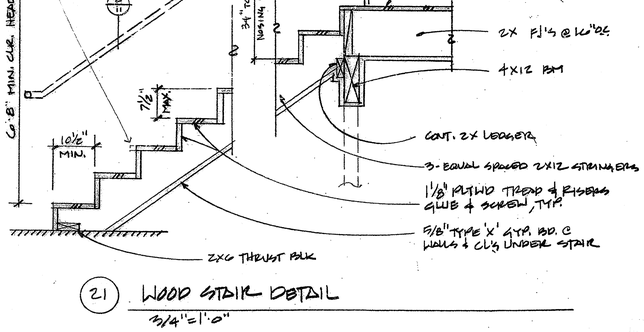

3 TYPICAL EAVE @ NEW CONSTRUCTION
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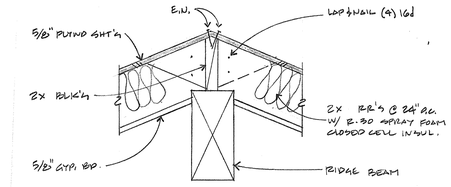

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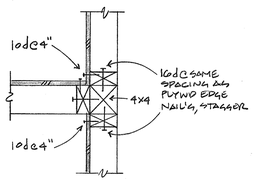

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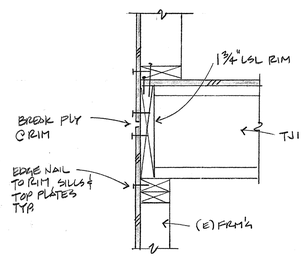

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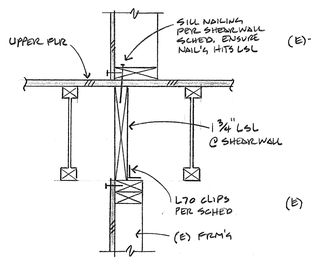

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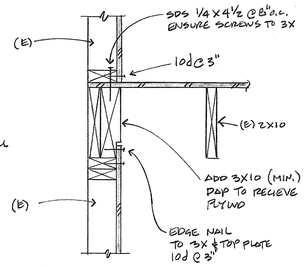

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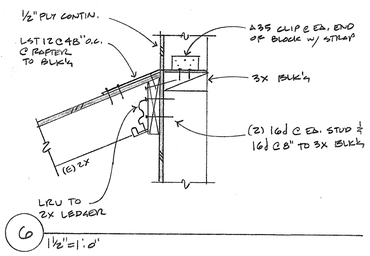

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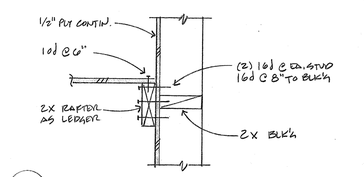
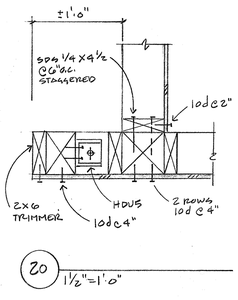


7 1 1/2" = 1'-0"

8 3/4" = 1'-0"

21 WOOD STAIR DETAIL
3/4" = 1'-0"



20 1 1/2" = 1'-0"

19 1 1/2" = 1'-0"

18 1 1/2" = 1'-0"

17 1 1/2" = 1'-0"

5 RIDGE @ NEW CONSTRUCTION
1 1/2" = 1'-0"

8.15.23	MSH
5.22.24	MSH

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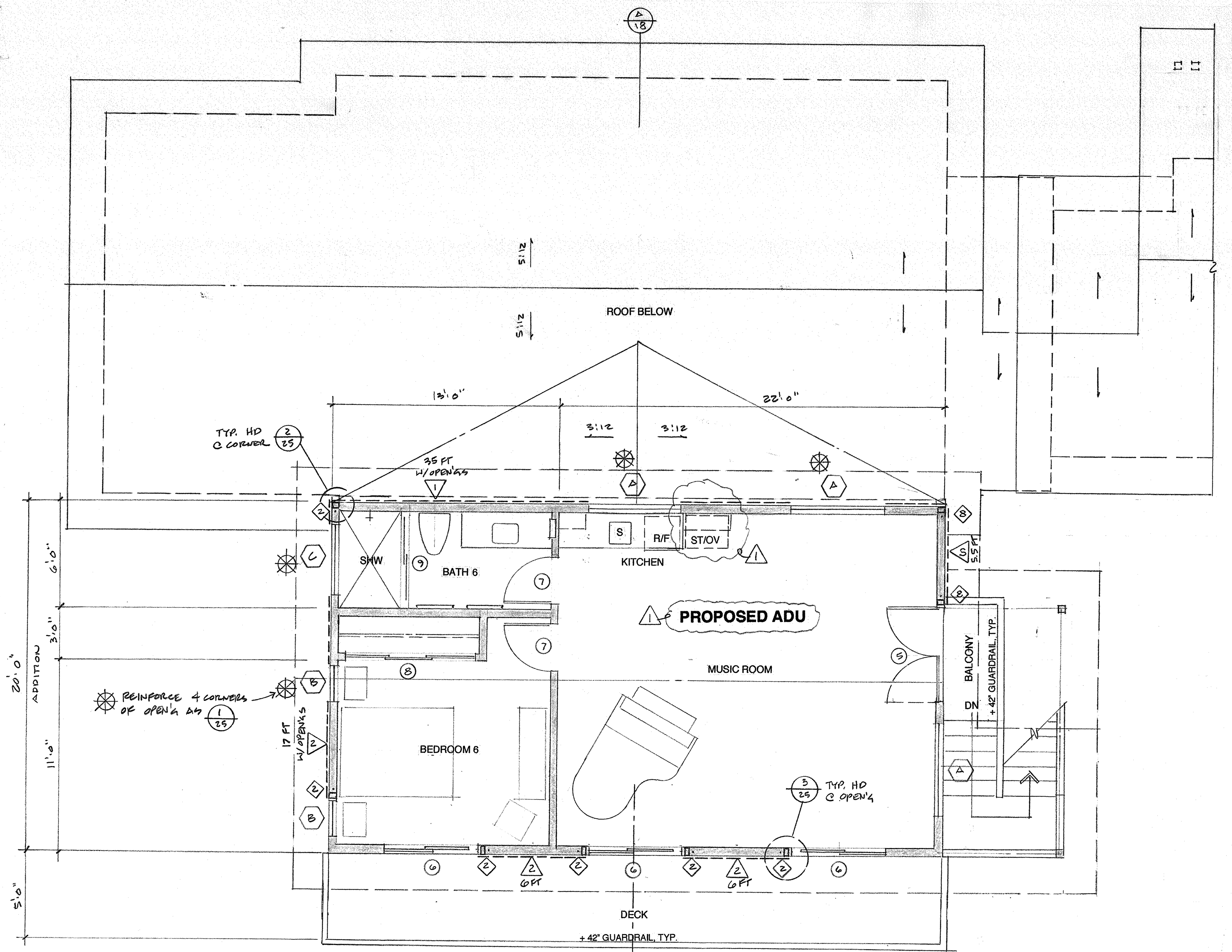
REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD - APN 537-12-012
LOS GATOS, CALIFORNIA

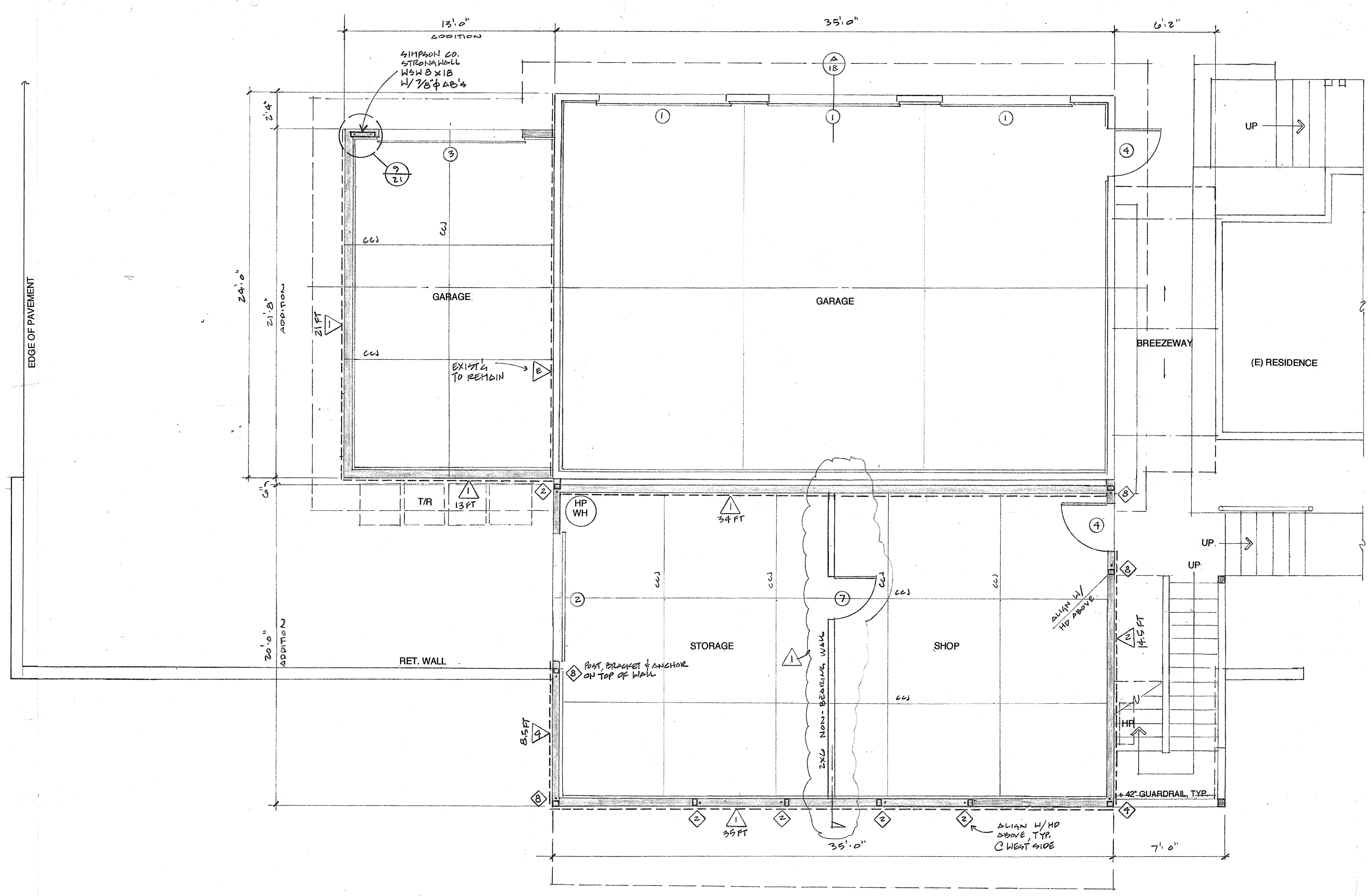
CONSTRUCTION DETAILS

11.14.22	
AS NOTED	
MSH	
2108	

16



PROPOSED – GARAGE / SHOP UPPER FLOOR PLAN 700 SF
SCALE: 1/4" = 1'- 0"



PROPOSED – GARAGE / SHOP LOWER FLOOR PLAN 700 SF
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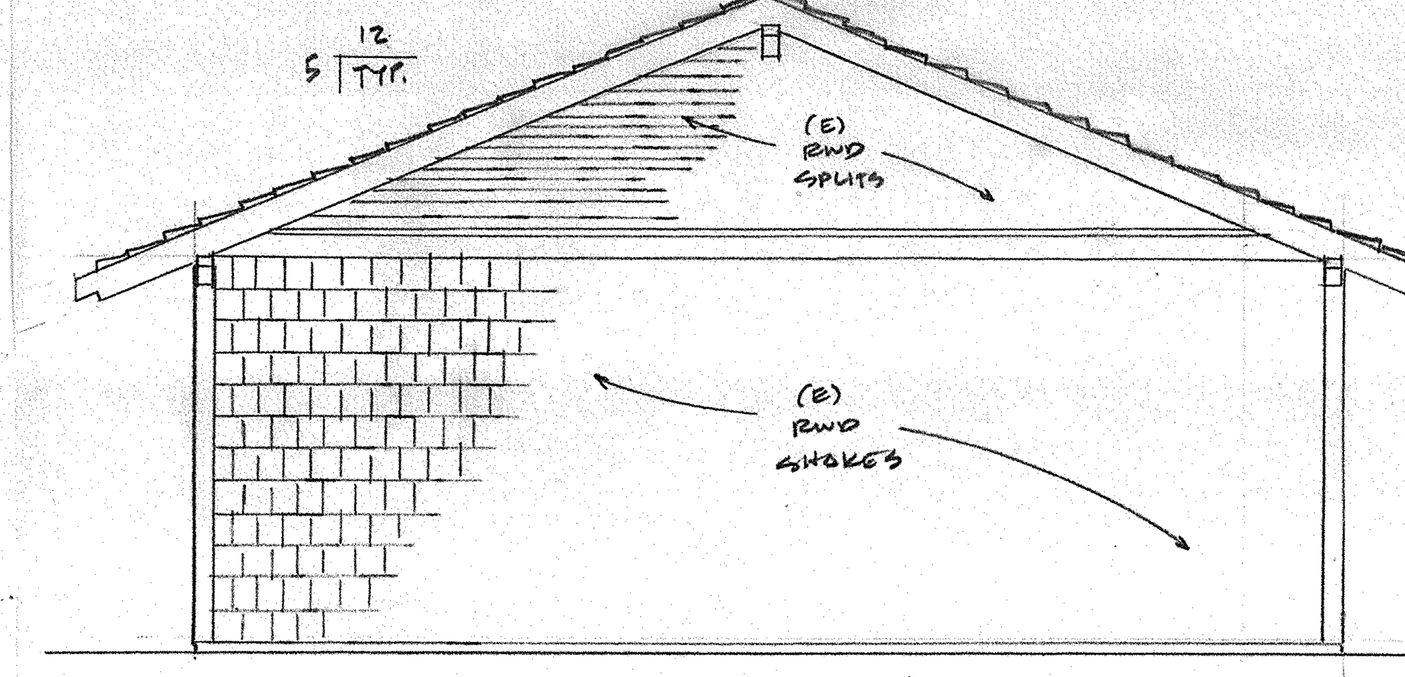
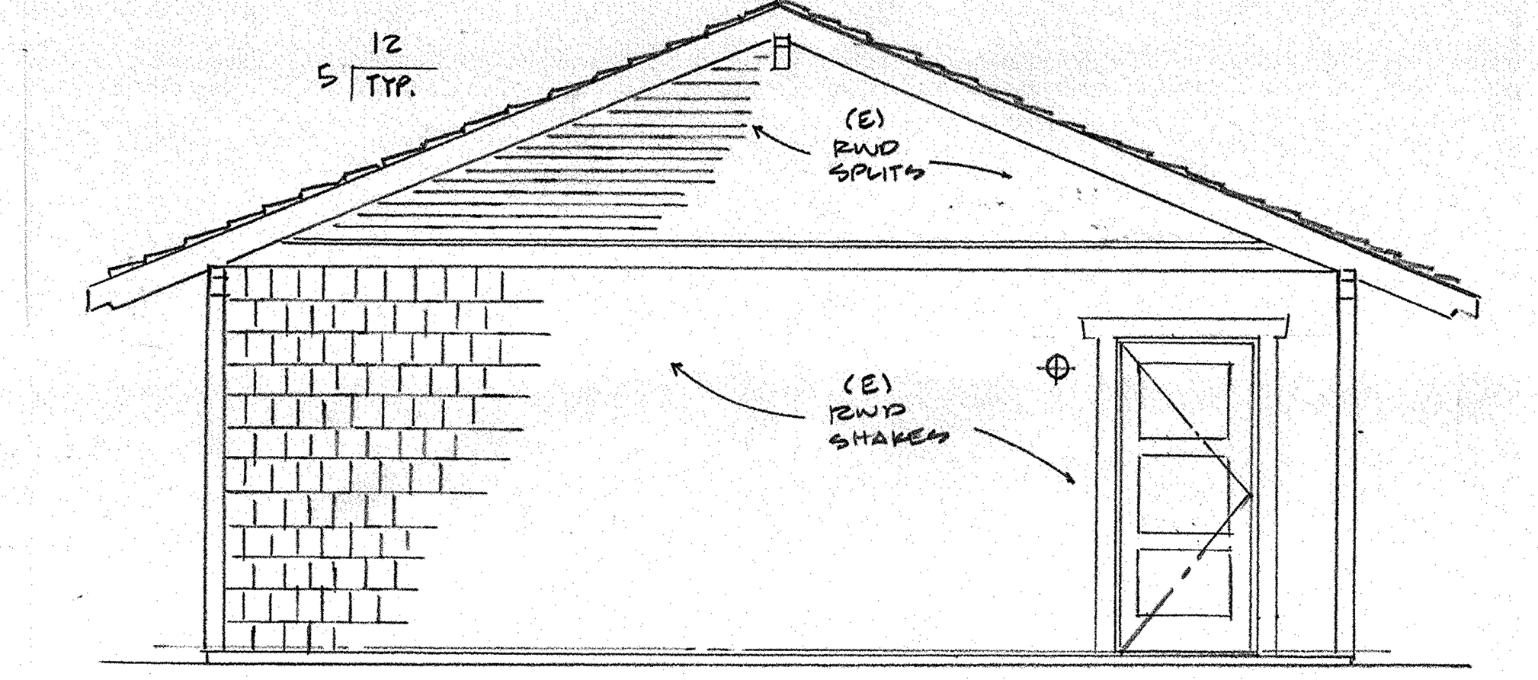


EXISTING – NORTH ELEVATION
SCALE: 1/4" = 1'- 0"



EXISTING – SOUTH ELEVATION
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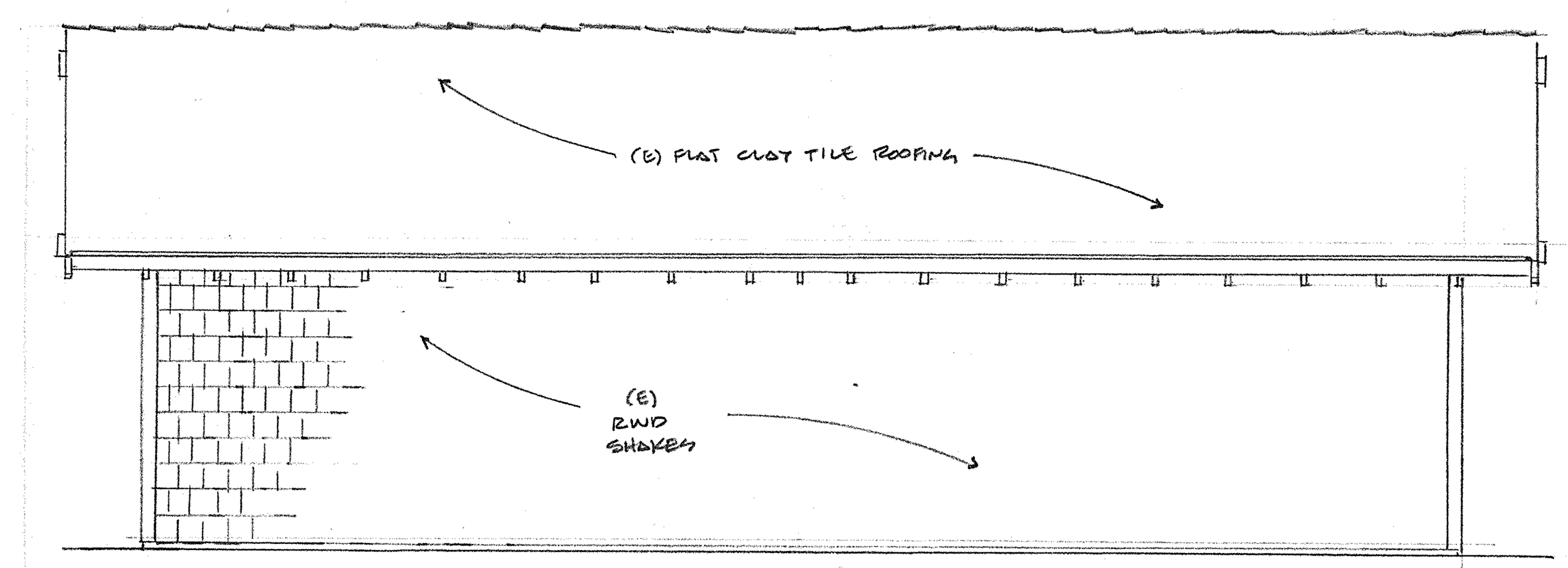

EXISTING – WEST ELEVATION
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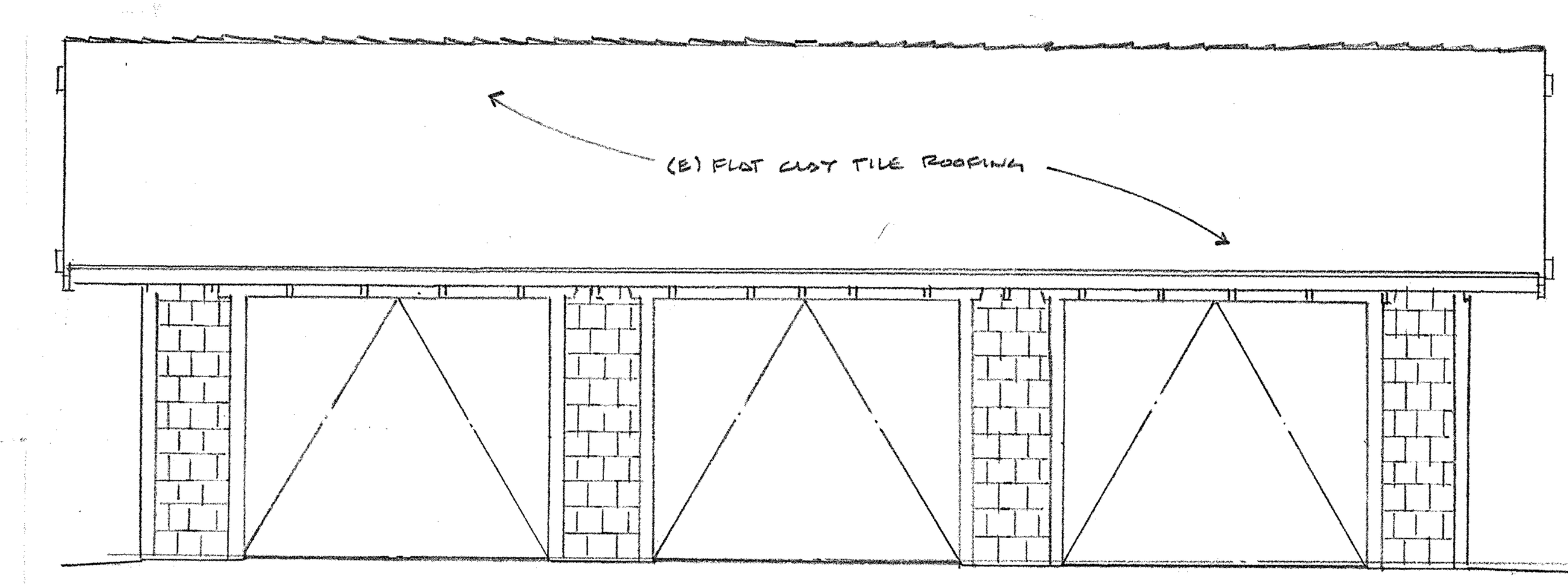
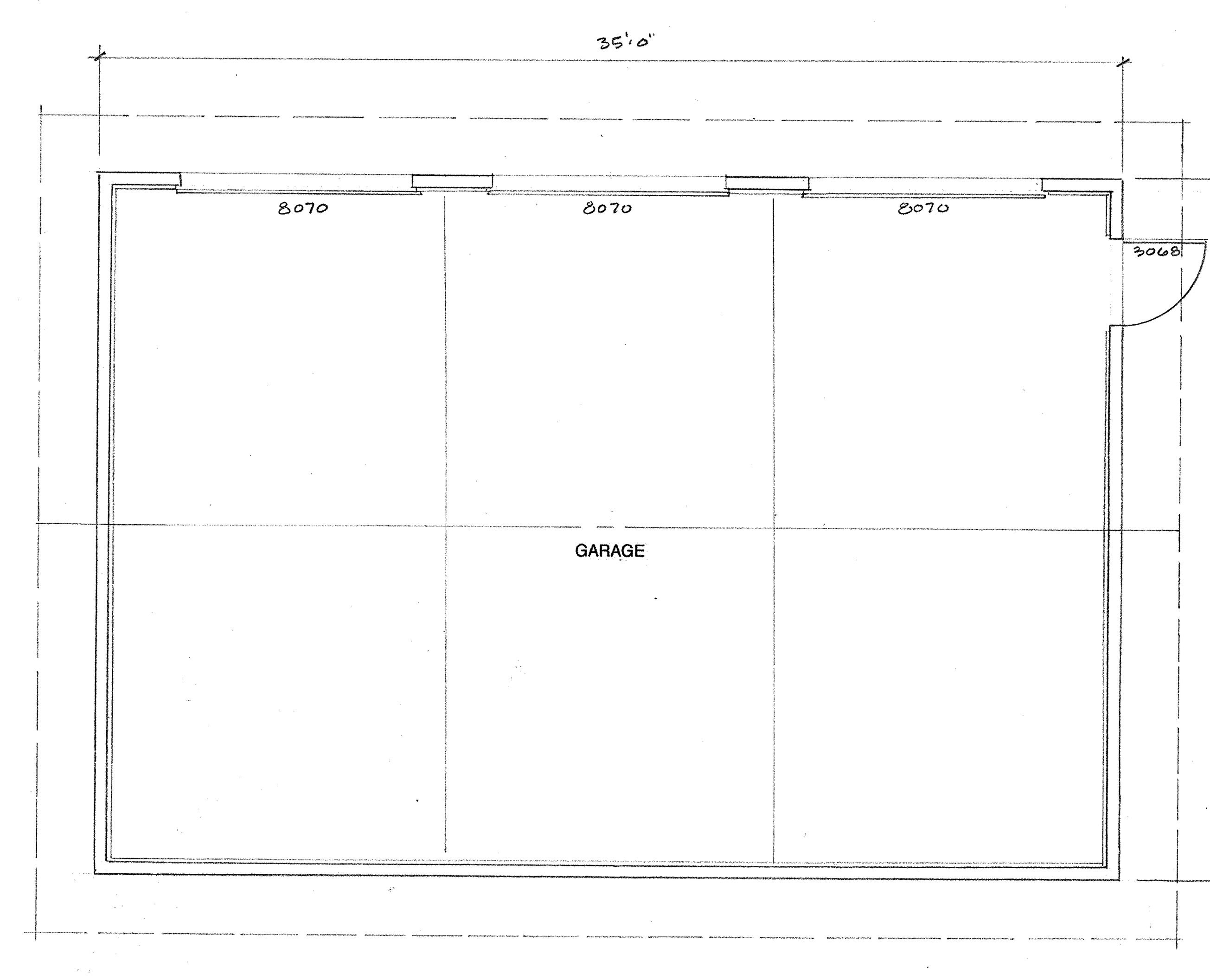


EXISTING – EAST ELEVATION
SCALE: 1/4" = 1'- 0"



EXISTING – GARAGE FLOOR PLAN
SCALE: 1/4" = 1'- 0"

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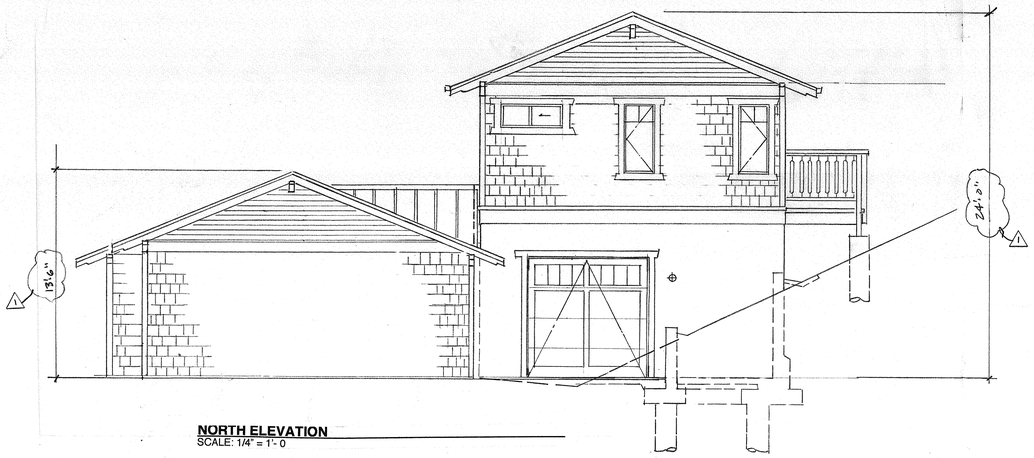
200 Seventh Avenue, #110 Santa Cruz, California 95062 (831) 476-5386

REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD – APN 537-12-012
LOS GATOS, CALIFORNIA

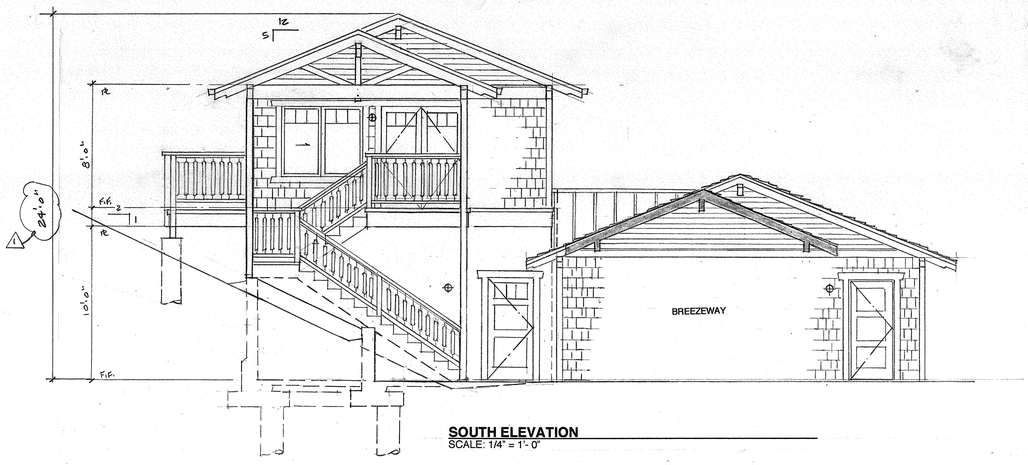
EXISTING – GARAGE FLOOR PLAN
– GARAGE EXT. ELEVATIONS
PROPOSED – GARAGE/SHOP FLR. PLANS
– ADU FLOOR PLAN

11.14.22
1/4" = 1'-0"
MSH
2108

17



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



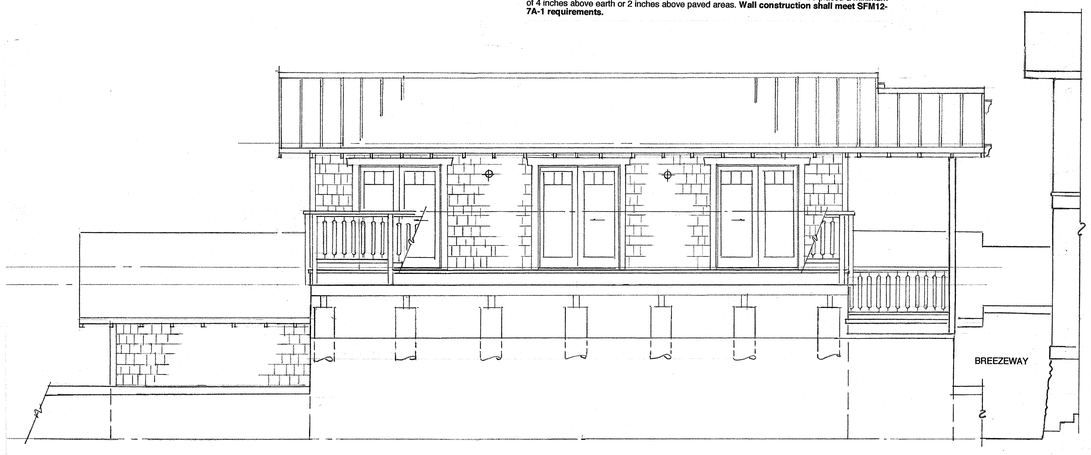
SOUTH ELEVATION
SCALE: 1/4" = 1'- 0"

STUCCO NOTE

3 coat, 7/8" Stucco finish over two layers of grade 'D' paper on 'TYVEK' house wrap on 7/16" CDX plywood or OSB sheathing, nailed w/10d @ 6" o.c. edges and 12" o.c. field, U.N.O., on 2 X 6 studs @ 16" o.c. with R-21 high density batt insulation. Provide a minimum 26 gauge galvanized corrosion resistant weep screed with a minimum vertical attachment of 3-1/2" provided at or below the foundation plate line at the exterior walls. The screed shall be placed a minimum of 4 inches above earth or 2 inches above paved areas. **Wall construction shall meet SFM12-7A-1 requirements.**

STANDING SEAM METAL ROOFING

Peterson Aluminum Corp., PAC-CLAD 18" wide snap-clad 24 gauge Standing Seam Metal Roofing, UL-580 Class 90 wind uplift, UL-Class A fire rated, installation per mfg. Specs over Dbl layer 30 lb. Felt over 5/8" CDX plywood sheathing nailed w/ 10d @ 6" o.c. edges and 12" o.c. field, U.N.O., to to 2X Rafters @ 24" o.c. or 2X Pre-fabricated trusses @ 24" o.c. with R-30 closed cell polyurethane spray foam insulation. Underlayment shall comply with ASTM D226 Type I; ASTM Type I, II, III or IV; ASTM D6757, and shall bear a label indicating compliance to the standard designation. **Eave construction shall meet SFM 12-7A-3 requirements.**



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

Color/Materials Board

Roof PETERSON ALUM. CORP., 18" WIDE, 24 GA., PAC-CLAD STANDING SEAM METAL ROOFING
Manufacture & Material — DARK BRONZE
Product Name, Number — REFLECTIVITY 0.29

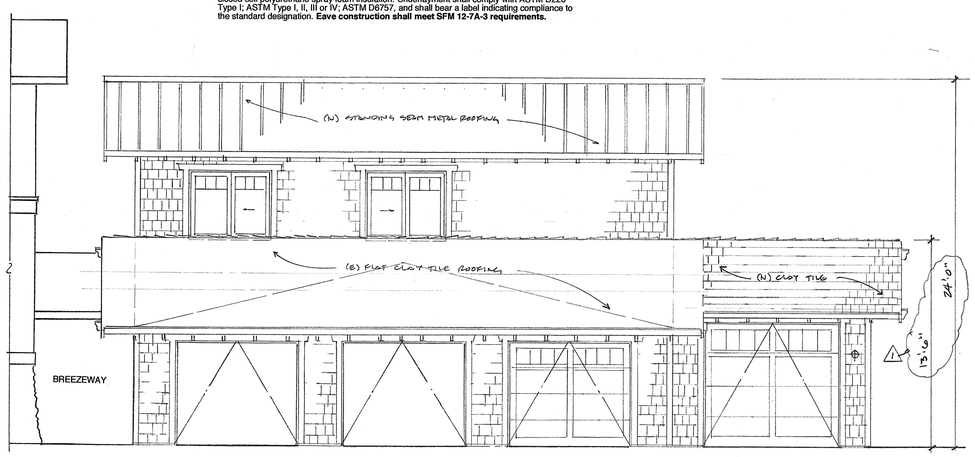
Door & Window Frames, Railings
JELD-WEN CLAD-WOOD
Manufacture / Number
Color Name, LRV — CHESTNUT BRONZE LRV 6%

Trim JAMES HARDIE - FIBER CEMENT - PAINTED
Manufacture / Number — SHERWIN WILLIAMS
Color Name, LRV — OLIVE SW1166, LRV 30%

Exterior Walls JAMES HARDIE - FIBER CEMENT HORIZONTAL LAP OR SHINGLE SIDING - PAINTED
Manufacture / Number — SHERWIN WILLIAMS
Color Name, LRV — CARDAMOM SW2737, LRV 7%

Architectural Accents (Ex. Stone Veneer)
TAHOE RIVER ROCK (EXISTING, TO REMAIN)
Manufacture / Number — N/A
Color Name, LRV — N/A

Retaining Walls (E) RIVER ROCK (SEE ABOVE)
(P) STUCCO FINISH - PAINTED
Manufacture / Number — SHERWIN WILLIAMS
Color Name, LRV — OLIVE SW1166, LRV 30%



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

PLUMBING FIXTURE MAXIMUM FLOW RATES

TOILET	1.28 GPF
LAVATORY FAUCETS	1.2 GPM @ 60 PSI
TUB / SHOWER VALVES	1.8 GPF @ 80 PSI
KITCHEN FAUCETS	1.8 GPM @ 60 PSI

PLUMBING FIXTURE CONNECTION SCHEDULE

SYMBOL	TYPE	WASTE	VENT	HOT	COLD
LV	LAVATORY	1-1/2"	1-1/2"	1/2"	1/2"
WC	TOILET	3"	2"	-	1/2"
T/SH	TUB / SHOWER	2"	1-1/2"	1/2"	1/2"
KS	KITCHEN SINK	2"	1-1/2"	1/2"	1/2"
WS	WASHER	1-1/2"	1-1/2"	1/2"	1/2"
HB	HOSE BIBB				3/4"

FINISH SCHEDULE NOTES

1 VERIFY ALL FINISHES WITH OWNER

2 ALL CLOSET FLOORING AND BASEBOARDS SHALL MATCH THE ADJACENT ROOM

3 PROVIDE A SMOOTH, HARD, NON-ABSORBENT SURFACE OVER MOISTURE RESISTANT UNDERLAYMENT TO A HEIGHT OF 72" ABOVE THE DRAIN OUTLET IN ALL SHOWER AND TUB LOCATIONS.

4 UNDERLYING BASE FOR ALL TILE SHALL BE CEMENT, FIBER-CEMENT OR GLASS MAT GYPSUM BACKER BOARDS IN COMPLIANCE WITH ASTM C1178, C1288 OR C1325 AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. IT SHALL BE USED AS A BASE FOR WALL TILE IN TUB AND SHOWER AREAS AND AS CEILING PANELS IN SHOWER AREAS.

VENTILATION NOTES

1 All **bathroom fans** are to be used for **Local Ventilation Exhaust**. Minimum 50 CFM fan tested at a static pressure of .25 wc and rated @ 3 sones or less required to be installed. Fan must be attached to a minimum 4" duct and no longer than 70' of **flex** duct. Subtract 15' of allowed length for each elbow.

DOOR SCHEDULE – SHOP / GARAGE

SYM	SIZE	TYPE	QUAN.	REMARKS
1	8070	'Carriage Style' Sectional Garage Door	3	Paint Grade w/ 4-lite **Tempered glass panel** w/ elec. auto opener
2	8080	'Carriage Style' Sectional Garage Door	1	Paint Grade with **Tempered glass panel** w/ elec. auto opener
3	9080	'Carriage Style' Sectional Garage Door	1	Paint Grade with **Tempered glass panel** w/ elec. auto opener
4	3068	Exterior S.C., 3-Panel	2	Paint Grade, with **Tempered glass panel**
5	Pair 2868	Exterior single lite French doors	1	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
6	5468	Exterior single lite OX Sliding Patio Doors	3	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
7	2868	Interior S.C., 3-Panel	3	Stain Grade, by Sun Mountain, Inc.
8	3W - 2868	Interior S.C., 3-Panel Sliding Bi-pass Closet Doors	1	Stain Grade, by Sun Mountain, Inc.
9	5670	Bi-Pass Sliding Shower Doors	1	3/8" Clear 'Frameless' **Tempered glass**, Provide shop drawings for approval

WINDOW SCHEDULE – SHOP / GARAGE

SYM	SIZE	TYPE	QUAN.	REMARKS
A	2046	OX Slider	3	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
B	2046	Casement	2	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
C	4016	OX Slider	1	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**

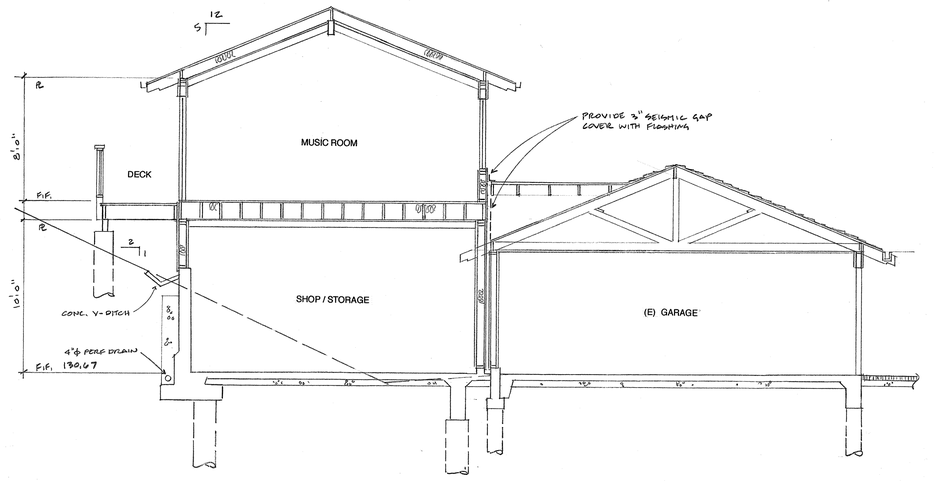
Jeld-Wen – Clad Wood sash windows & doors overall standards comply with ANSI/ AAMA/ WDMA/CSA101/1.S.2 / A440-05 / A440-08 / A40-11

a. All units are Gold Label tested & certified with label attached to frame per AAMA standards per CRC, Section 609.3, installation per AAMA 2400
b. All insulated glass units conform to ASTM E2188 / E2190, NFRC certified and labeled.
c. Safety Glazing testing and labeling per CRC, Sections 308.1 & 308.4
d. Energy testing and certification per CEnC, Section 110.6
e. Verify rough openings and window / door sizes prior to ordering.

Note: The NFRC label which states the required U-value and SGHC for all fenestration products shall not be removed prior to inspection or the removal by a building inspector and shall reflect the values listed in the energy report.

CONSTRUCTION SCHEDULE – GARAGE / SHOP

FOUNDATIONS	12" wide X 27" deep concrete grade beam with 2 - #5 bars T & B w/ #3 ties @ 6" o.c. on 18" diameter drilled piers X 8' deep (min.) CONCRETE SLABS: 5" thick concrete slab w/ #4 bars @ 16" o.c. each way, on 15 mil vapor barrier (Stego Wrap or equal) on 6" crushed rock. CONCRETE MIX: Substitute Portland Cement with recycled flyash, 35% by volume, typical. Keep receipts for inspector verification. TREATED LUMBER: Substitute ACQ pressure treatment for CCA products, typical. FORM BOARDS: Clean and re-use for scaffolding, forms, blocking, etc... FORM RELEASE AGENT: Use Non-toxic soy based 0-VOC form release agent by BIO-QUARD CO. or Architect approved equal.
FLOORS	TJI's @ 16" o.c., with ¾" T&G plywood subfloor glued and nailed w/ 10d @ 6" o.c. edges & 10" o.c. field, U.N.O. with R-19 batt insulation.
LOWER WALLS	7/8" Stucco finish over two layers of grade 'D' paper on 'TYVEK' house wrap on 7/16" CDX plywood or OSB sheathing, nailed w/10d @ 6" o.c. edges and 12" o.c. field, U.N.O., on 2 X 6 stude @ 16" o.c. with R-21 high density batt insulation, 1/2" gypsum wallboard interior finish, typical. Use low/No VOC exterior/interior paints. **Wall construction shall meet SFM12-7A-1 requirements.**
UPPER WALLS	5/16" James Hardie fiber cement horizontal siding or shingles over 'TYVEK' house wrap on 5/8" Type 'X' exterior gypsum sheathing on 7/16" CDX plywood or OSB sheathing, nailed w/10d @ 6" o.c. edges and 12" o.c. field, U.N.O., on 2 X 6 studs @ 16" o.c. with R-23 high density batt insulation, 1/2" gypsum wallboard interior finish, typical. Use low/No VOC exterior/interior paints. **Wall construction shall meet SFM12-7A-1 requirements.**
ROOF	Class B (min.) standing seam metal roofing, install per mfg. specs over Dbl. layer 30 lb. felt over 5/8" CDX plywood sheathing nailed w/ 10d @ 6" o.c. edges and 12" o.c. field, U.N.O., to 2X Pre-fabricated trusses @ 24" o.c. with R- 30 closed cell polyurethane spray foam insulation. Underlayment shall comply with ASTM D226 Type I; ASTM Type I, II, III or IV; ASTM D6757, and shall bear a label indicating compliance to the standard designation. **Eave construction shall meet SFM 12-7A-3 requirements.**
GUTTERS & DOWNSPOUTS	16 oz. copper beveled gutters w/ 2" diameter round downspouts deposit into existing landscaped areas. **Gutters shall be provided with leaf/debris protection.**
ROOF / WALL FLASHINGS	16 oz. copper where shown or required. Pan flash all ext. door sills with 16 oz. copper solder all joints, typical
WINDOWS & EXT. GLASS DRS.	Jeld-Wen – Alum. Clad/Wood sash with Dbl. insulated **Tempered** Low-E glass, provide screens at all operable windows. **Exterior door assemblies shall conform to SFM 12-7A-1 requirements.**
INSULATION	FLOORS — R-19 fiberglass batts EXT. WALLS — R-23 high density fiberglass batts INT. WALLS — 3-1/2" fiberglass sound batts ROOFS — R-30 closed cell polyurethane spray foam
ROOF JACKS	Provide neoprene gaskets and 16 oz. copper roof jack / rain cap, typical. All exhaust vents shall be located a min. of 4' from or 1' above all roof or wall openings per CMC. All plumbing vents shall be located a min. of 10' from or 3' above all roof or wall openings per CPC.
WALL PENETRATIONS	Use weatherproofing wall jacks by QUICKFLASH or approved equal for plumbing, electrical and mechanical penetrations.
PAINTS, STAINS, ADHESIVES & SEALERS	Use Low / No VOC, water based products and solvent-free adhesives, typical.
PLUMBING	Install Low-flow toilets. Install Low-flow shower heads with chlorine filters.
CABINETS & TRIM	Use formaldehyde-free particle board and MDF by MEDITE or approved equal for all cabinets and trim applications



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

Michael Helm, AIA Architect & Associates
200 Seventh Avenue, #110 Santa Cruz, California 95062 (831) 476-5386

1 11-28-22	MH
8-15-23	MH
5-22-24	MH

REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD – APN 537-12-012
LOS GATOS, CALIFORNIA

garage/shop - ext. elevations

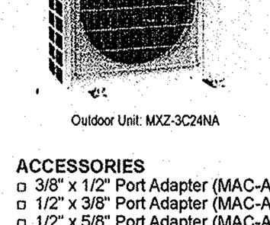
11.14.22
1/4"=1'-0"
MEH
2103

18

M-SERIES — SUBMITTAL DATA: MXZ-3C30NA2
MULTI-INDOOR INVERTER HEAT-PUMP SYSTEM — MITSUBISHI ELECTRIC

Job Name:

System Reference: Date:



Outdoor Unit: MXZ-3C24NA

ACCESSORIES
- 3/8" x 1/2" Port Adapter (MAC-A454JP-E)
- 1/2" x 3/8" Port Adapter (MAC-A455JP-E)
- 1/2" x 5/8" Port Adapter (MAC-A456JP-E)
- 1/4" x 3/8" Port Adapter (PAC-493PI)
- 3/8" x 5/8" Port Adapter (PAC-SG76RJ-E)
- M-NET Adapter (PAC-IF01MNT-E)
- Base Heater (PAC-645BH-E)

(For data on specific indoor units, see the MXZ-C Technical and Service Manual.)

Specifications			Model Name
Unit Type			MXZ-3C30NA2
Cooling* (Non-ducted / Ducted)	Rated Capacity	Btu/h	28,400 / 27,400
	Capacity Range	Btu/h	12,600-28,400 / 12,600-27,400
	Rated Total Input	W	2,680 / 2,860
Heating at 47°F* (Non-ducted / Ducted)	Rated Capacity	Btu/h	28,600 / 27,600
	Capacity Range	Btu/h	11,400-36,000 / 11,400-35,000
	Rated Total Input	W	2,150 / 2,220
Heating at 17°F* (Non-ducted/Ducted)	Rated Capacity	Btu/h	16,000 / 15,100
	Rated Total Input	W	2,120 / 2,140
Electrical Requirements	Power Supply	Voltage, Phase, Hertz	208 / 230V, 1-Phase, 60 Hz
	Recommended Fuse/Breaker Size	A	25
	MCA	A	22.1
Voltage	Indoor - Outdoor S1-S2	V	AC 208 / 230
	Indoor - Outdoor S2-S3	V	DC ±24
Compressor			INVERTER-driven Scroll Hermetic
Fan Motor (ECM)		F.L.A.	2.43
Sound Pressure Level	Cooling	dB(A)	52
	Heating		56
External Dimensions (H x W x D)		In (mm)	31-11/32 x 37-13/32 x 13 (796 x 950 x 330)
Net Weight		Lbs (kg)	137 (62)
External Finish			Munsell 3.0Y 7.8/1.1
Refrigerant Pipe Size O.D. — Eight Ports	Liquid (High Pressure)	In (mm)	1/4 (12.7)
	Gas (Low Pressure)		A: 1/2 (6.35) ; B,C: 3/8 (9.52)
Max. Refrigerant Line Length		Ft (m)	230 (70)
Max. Piping Length for Each Indoor Unit		Ft (m)	82 (25)
Max. Refrigerant Pipe Height Difference	If IDU is Above ODU	Ft (m)	49 (15)
	If IDU is Below ODU		49 (15)
Connection Method			Flared/Flared
Refrigerant			R410A

*Rating Conditions per AHRI Standard:
Cooling | Indoor: 80°F (27°C) DB / 67°F (19°C) WB
Cooling | Outdoor: 95°F (35°C) DB / 23.9°C (75°F) WB
Heating at 47°F | Indoor: 70°F (21°C) DB / 60°F (16°C) WB
Heating at 47°F | Outdoor: 47°F (8°C) DB / 43°F (6°C) WB
Heating at 17°F | Indoor: 70°F (21°C) DB
Heating at 17°F | Outdoor: 17°F (-8°C) DB / 15°F (-9°C) WB

OPERATING RANGE:

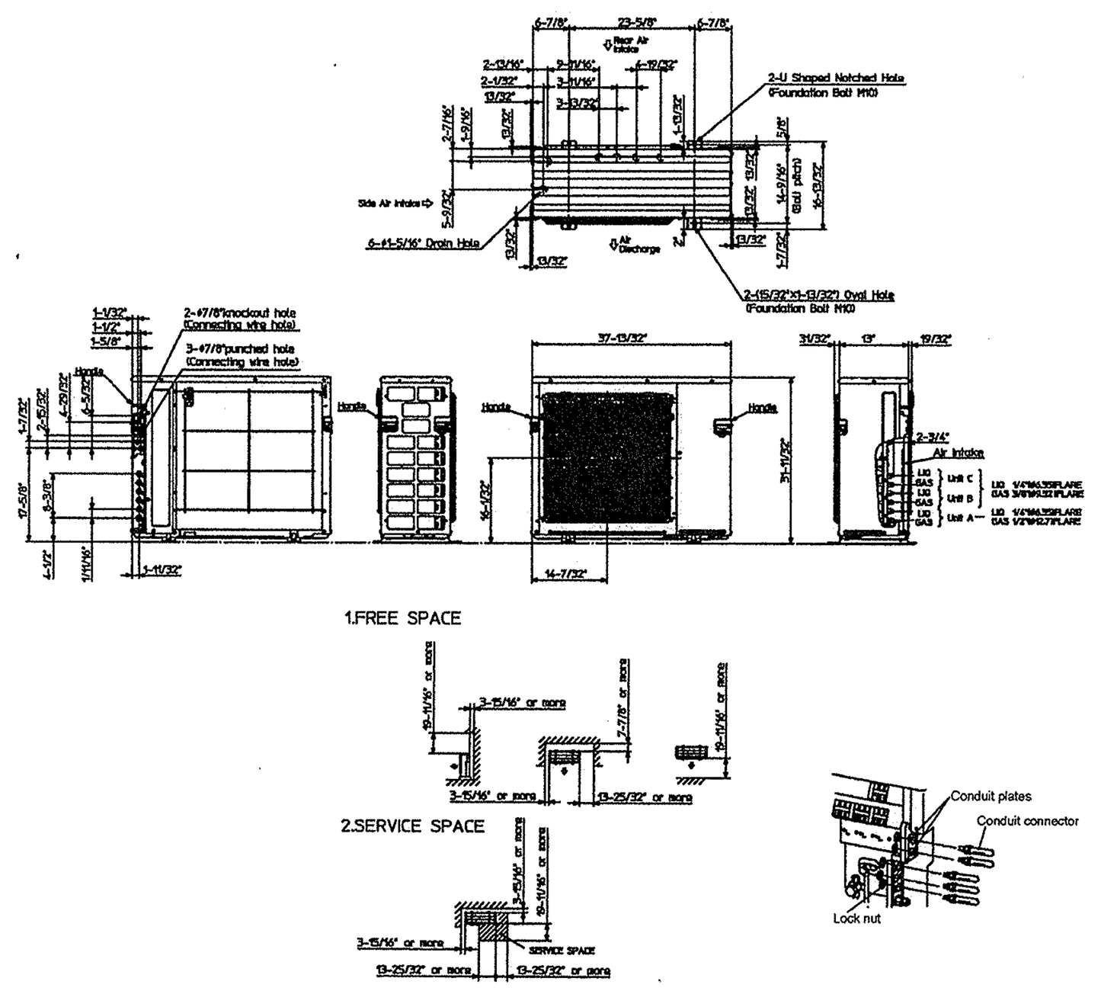
	Outdoor
Cooling	14 to 115° F (−10 to 46° C) DB
Heating	5 to 65° F (−15 to 18° C) WB

ENERGY EFFICIENCIES:

Indoor Unit Type	SEER	EER	HSPF	COP @ 47°F	COP @ 17°F
Non-ducted (06 + 06 + 09)	19.0	10.6	10.6	3.90	2.77
Ducted and Non-ducted	17.6	10.1	10.1	3.77	2.78
Ducted (09 + 09 + 09)	16.2	9.6	9.6	3.64	2.78

NOTES:
- Minimum of two Indoor Units must be connected to the MXZ-3C30NA2.
- Minimum installed capacity cannot be less than 12,000 Btu/h.
- Total connected capacity must not exceed 130% of outdoor unit capacity.
- System can operate with only one Indoor Unit turned on.
- Information provided at 208/230V.
- For Reference:
  - MXZ-C Technical & Service Manual for detailed specifications and additional information per Indoor Unit Combination.
  - MXZ Series Multi-Zone Indoor/Outdoor Combination Table for allowed unit combinations.

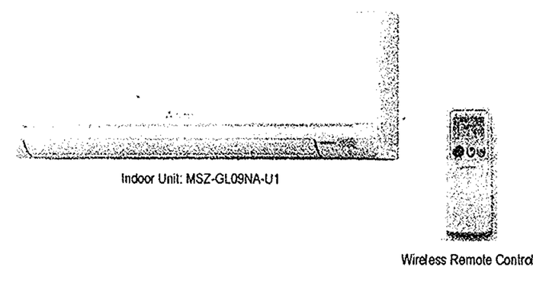
MVZ CONNECTION RULES:
- Only 1 MVZ may be used on any system.
- When an MVZ is connected, total connected capacity must be 100% or less.
- When an MVZ is connected, no P-Series indoor units can be used (PCA, PLA, or PEAD).



M-SERIES — SUBMITTAL DATA: MSZ-GL09NA-U1
9,000 BTU/H WALL-MOUNTED INDOOR UNIT FOR MXZ-C MULTI-ZONE HEAT-PUMP SYSTEMS — MITSUBISHI ELECTRIC

Job Name:

System Reference: Date:



Indoor Unit: MSZ-GL09NA-U1

Wireless Remote Controller

SPECIFICATIONS:

Rated Capacity*			
Cooling[1]	Btu/h / W	9,000	
Heating at 47° F[2]	Btu/h / W	10,900	

Rating Conditions per AHRI Standard:
[1] Cooling | Indoor: 80° F(27° C)DB / 67° F(19° C)WB; Outdoor: 95° F(35° C)DB / 75° F(24° C)WB
[2] Heating at 47°F | Indoor: 70° F (21° C)DB / 60° F (16° C)WB; Outdoor: 47° F (8° C)DB / 43° F (6° C)WB

For data on specific indoor units (all ducted, all non-ducted, and both ducted and non-ducted) combinations, see the MXZ Technical and Service Manual.

Applications should be restricted to comfort cooling only; equipment cooling applications are not recommended for low ambient temperature conditions.

Electrical Power Requirements	208 / 230V, 1-Phase, 60 Hz		
Minimum Circuit Ampacity (MCA)	A	1.0	
Blower Motor (ECM)	F.L.A.	0.76	
Blower Motor Output	W	30	
Field Drainpipe Size O.D.	In.(mm)	5/8 (15)	
Airflow Rate (Quiet - Lo - Med - Hi - Super Hi)			
Cooling	DRY	CFM	145-170-237-321-399
	WET		109-134-201-286-364
Heating	DRY		145-170-237-321-406
Sound Pressure Level (Quiet - Lo - Med - Hi - Super Hi)			
Cooling	dB(A)	19-22-30-37-43	
Heating		19-22-30-37-43	
External Dimensions (H x W x D)	In.(mm)	11-5/8 x 31-7/16 x 9-1/8 (295 x 798 x 232)	
Net Weight	Lbs.(kg)	29 (12)	
External Finish	Munsell 1.0Y 9.2 / 0.2		
Refrigerant Piping (Flared)			
Liquid (High Pressure)	In.(mm)	1/4 (6.35)	
Gas (Low Pressure)		3/8 (9.52)	

ACCESSORIES:

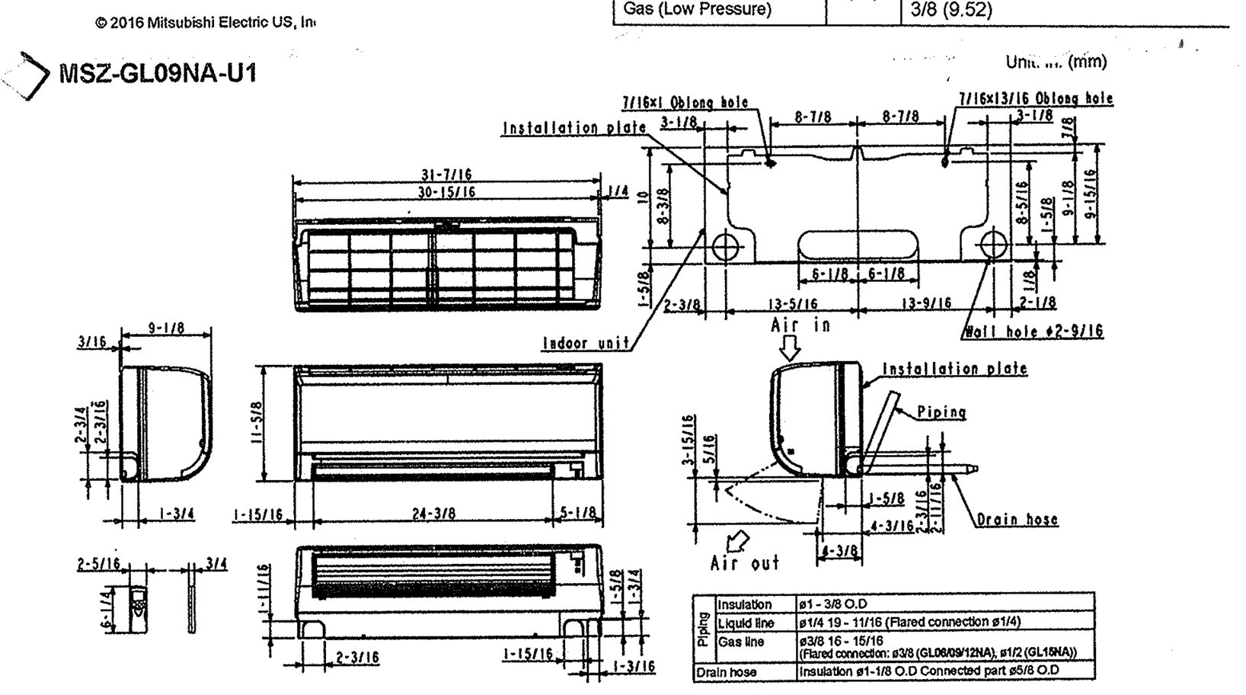
Indoor Unit
- Condensate Pump (BlueDiamond X87-711/721; 115/230V)
- Condensate Pump (Sauermann SI30-115/230; 115/230V)
- Anti-Allergy Enzyme Filter (MAC-408FT-E)
- Platinum Catalyst Deodorizing Filter (MAC-308FT-E)
- Drain Pan Level Sensor (DPLS2)

Controls
- Wireless Controller (MHK1)
- Wired Remote Controller PAR-31MAA (Requires MAC-333IF-E)
- Wireless Interface for kumo cloud™ (PAC-WHS01WF-E)
- Thermostat Interface (PAC-US444CN-1)

MITSUBISHI ELECTRIC
COOLING & HEATING

1340 Satellite Boulevard. Suwanee, GA 30024
Toll Free: 800-433-4822 www.mehvac.com

MSZ-GL09NA-U1



A. O. Smith | COMMERCIAL-GRADE RESIDENTIAL ELECTRIC WATER HEATERS

VOLTEX® HYBRID ELECTRIC HEAT PUMP WATER HEATER

The Voltex Hybrid Electric heat pump water heater from A. O. Smith is the most cost effective energy-efficient option available for consumers who want to save money on their utility bills. Voltex can reduce water heating costs up to 73% and provide payback in 2-3 years. With annual savings of $306 or more, there is no better way to go green than Voltex.

HOW DO THEY WORK?
Absorb ambient heat from the surrounding air to heat water using a compressor and "Environmentally-Friendly" R134a refrigerant
- Self-contained heat pump unit is integrated into the top of the tank
- Multiple operating modes to maximize efficiency and performance

QUALIFIES FOR MANY STATE AND LOCAL UTILITY REBATES - CHECK WWW.DSIREUSA.ORG

INCREASED ENERGY EFFICIENCY
- Improved efficiency designed in, to ensure available hot water at the lowest possible cost. Up to a 3.45 Uniform Energy Factor (UEF) Rating conserves energy and meets ENERGY STAR® qualifications

CHOICE OF OPERATING MODES
- Select from Efficiency, Hybrid, or Electric modes to match heating requirements to environmental conditions.
- Hybrid mode automatically adjusts between compressor and element, depending upon heat requirements.
- Vacation mode reduces operating costs and provides freeze protection during extended absence

BACKUP ELECTRIC ELEMENTS
- Long-lasting backup heating elements help heat water according to environmental conditions, demand, and the chosen operating mode

COREGARD™ ANODE ROD
- Our anode rods have a stainless steel core that extends the life of the anode rod allowing superior tank protection far longer than standard anode rods
- 66 and 80 gallon models have dual anodes for added protection.

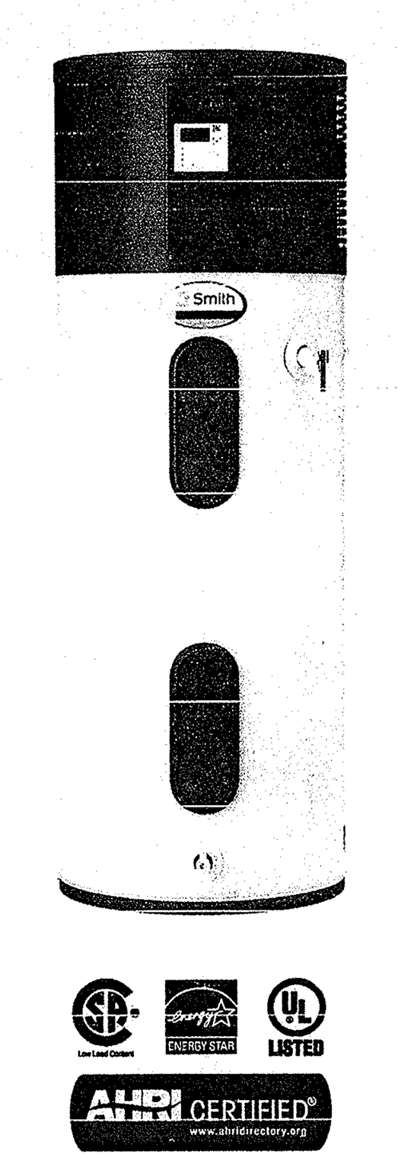
DRY FIRE PROTECTION
- Control system checks to ensure the tank is full of water during start up to prevent dry firing the heating elements

ELECTRONIC USER INTERFACE
- User-friendly electronic interface allows easy control of temperature setting, operating mode, and communicates diagnostics
- Easy to read temperature display (see back) shows temperature in °F or °C
- Advanced diagnostics convey error messages for service purposes. The last four error messages are saved in the control system memory.

OTHER FEATURES
- Ideal for basements or garage installations; the compressor transfers heat to the water while dehumidifying and cooling the ambient air
- Washable air filter is easily removed for routine cleaning

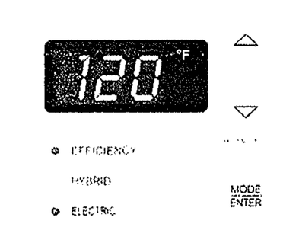
OPTIONAL AIR DUCT ADAPTER KIT
- Permits installation in confined spaces

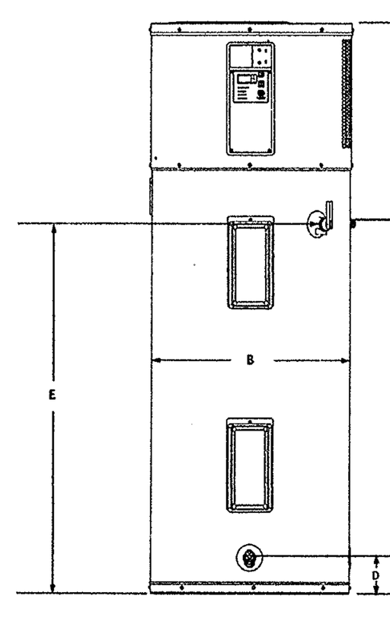
TEN YEAR LIMITED WARRANTY
- For complete information, consult written warranty or go to hotwater.com



Model Number	Nominal Capacity	Rated Storage Volume	UEF	First Hour Rating (Gallons)	Dimensions in Inches A	B	C	D	E	Approx. Shipping Weight (lbs)	Warranty Term
HPTU-50N	50	46	3.45	66	63	22	40-5/8	3-3/4	40-1/2	196	10
HPTU-66N	66	67	3.45	79	61	27	38	4	38	289	10
HPTU-80N	80	82	3.45	86	69	27	46	4	46	307	10

Requires 30 amp breaker.
Top T&P option not available.





ELECTRONIC USER INTERFACE
- User friendly, easy to read display.
- LEDs clearly indicate the current operating mode.
- Easily select operating mode:
  - Efficiency
  - Hybrid
  - Electric
  - Vacation
- Display communicates current status, mode and set point, and displays error messages when applicable.

EFFICIENCY MODE
- Utilizes the heat pump for all water heating.
- Automatically reverts to heating element if ambient air or water temperatures are outside optimal operating range for heat pump.

HYBRID MODE
- Utilizes the heat pump or heating element, depending on demand.

ELECTRIC MODE
- Standard electric water heater operation.

VACATION MODE
- One touch operation maintains tank temperature of 60°F (15.6°C) during vacation or extended absence to reduce operating costs and provide freeze protection.
- Programmable up to 99 days.

OTHER FEATURES:
- Sacrificial anode to protect against tank corrosion.
- Environmentally-friendly non-CFC foam insulation.
- Durable, enhanced-flow brass drain valve.
- CSA certified and ASME rated temperature & pressure relief valve.

OPERATING REQUIREMENTS:
- Requires provision for condensate draining; if a suitable drain is not available, a condensate pump is required.
- 208/240 VAC 60Hz single phase 30 amp power supply.

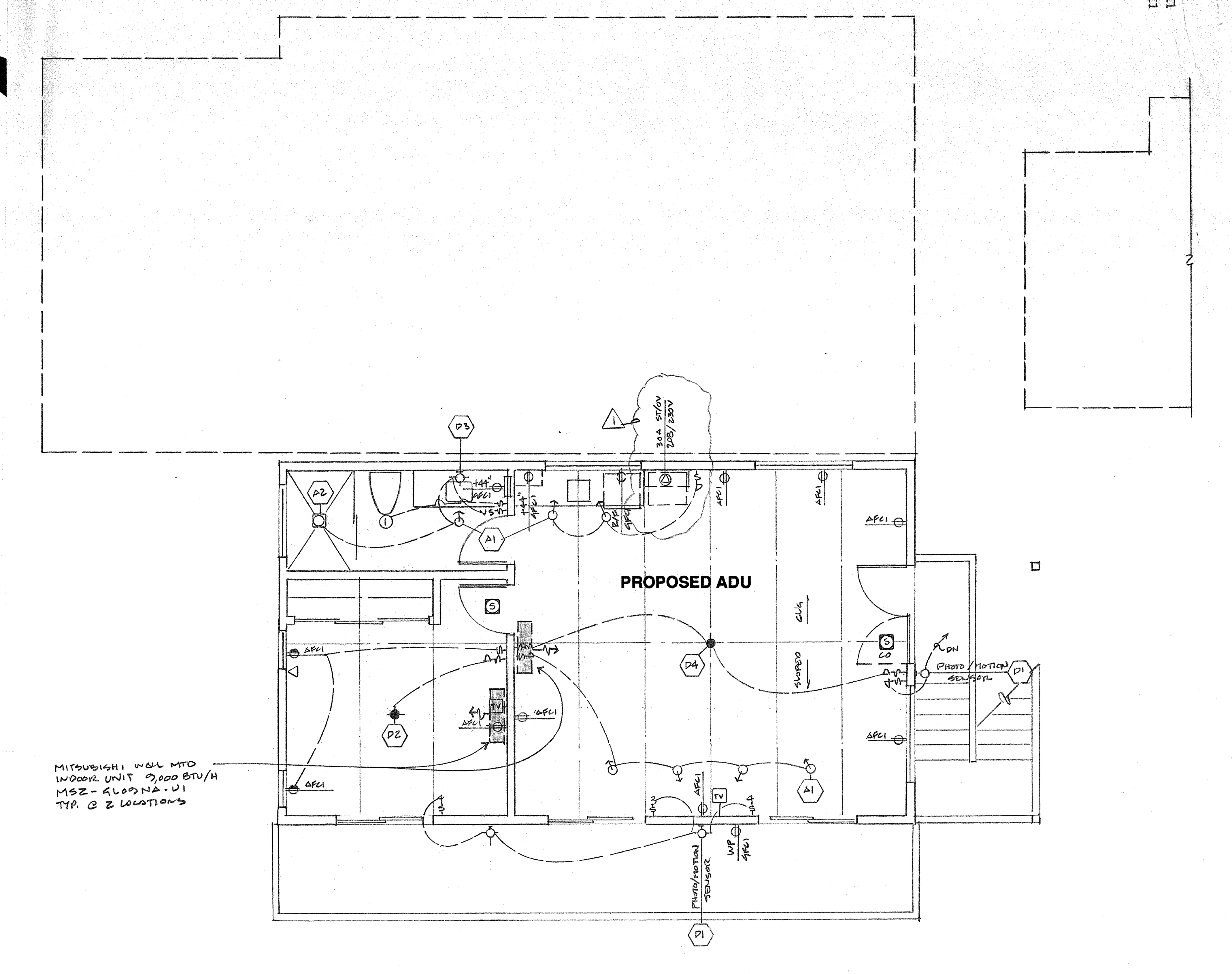
For Technical Information, call 800-527-1953. A. O. Smith Corporation reserves the right to make product changes or improvements without prior notice.

www.hotwater.com | 800-527-1953 Toll-Free USA

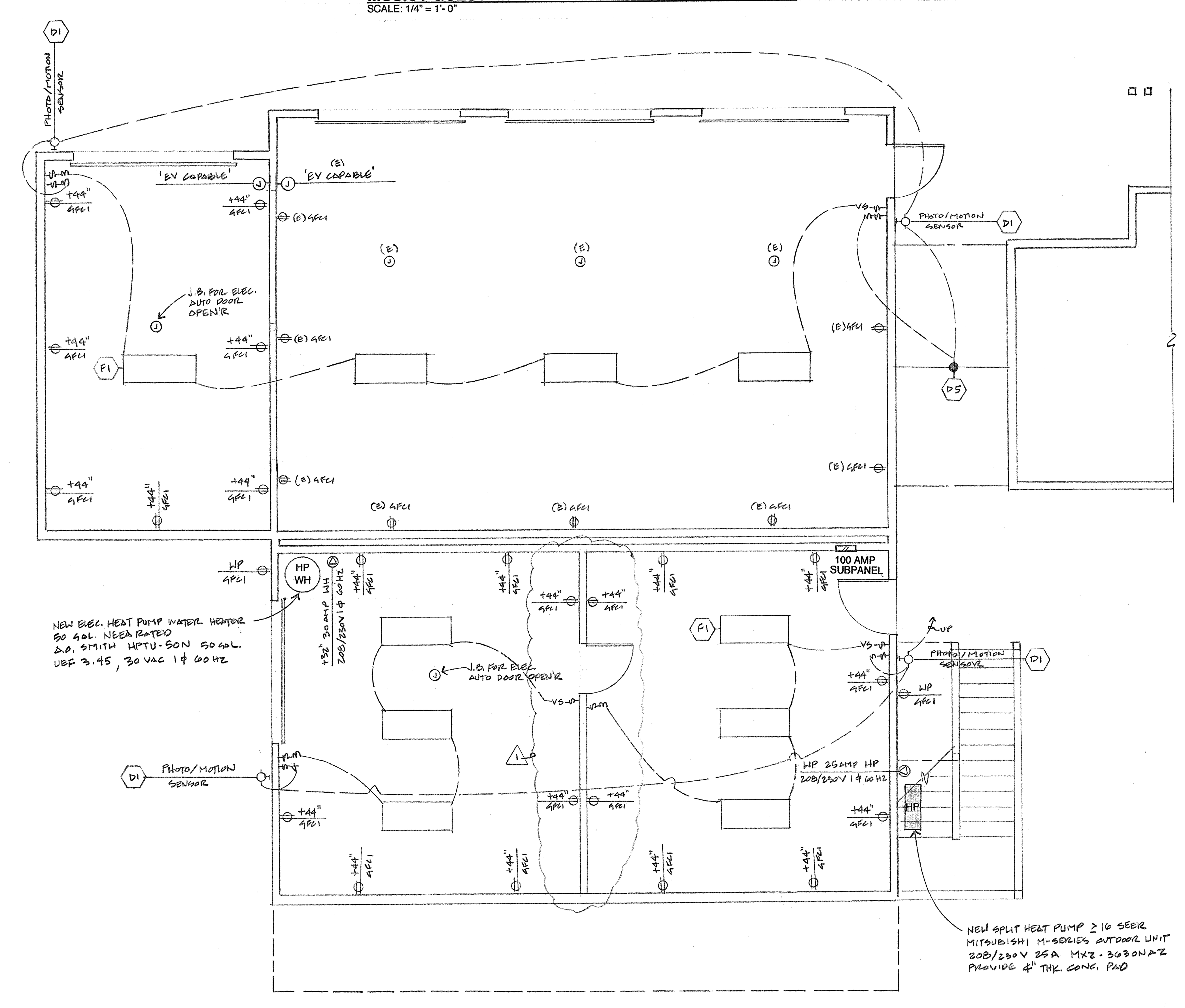
Page 2 of 2
AOSXE50007

ELECTRICAL SYMBOL LEGEND

- DUPLEX OUTLET, +12" ABOVE FIN. FLR.,TAMPER RESISTANT, TYPICAL
- AFCI — DUPLEX OUTLET W/ ARC FAULT INTERRUPT CIRCUIT
- GFCI — DUPLEX OUTLET W/ GROUND FAULT INTERRUPT CIRCUIT
- AFCI/GFCI — DUPLEX OUTLET W/ GROUND FAULT & ARC FAULT INTERRUPT CIRCUIT
- WP — DUPLEX OUTLET W/ WATERPROOF COVER
- DUPLEX OUTLET W/ ½ SWITCHED
- SPECIAL PURPOSE 220 V. OUTLET
- LIGHT SWITCH, +42" ABOVE FIN. FLR. TYPICAL
- LIGHT SWITCH, 3 WAY
- LIGHT SWITCH W/ DIMMER
- LIGHT SWITCH W/ VACANCY SENSOR
- LIGHT, CEILING SURFACE MOUNTED
- LIGHT, WALL SURFACE MOUNTED
- LIGHT, PENDANT
- LIGHT, RECESSED DOWNLIGHT
- LIGHT, RECESSED WALL WASHER
- LIGHT, RECESSED ADJUSTABLE
- LIGHT, RECESSED STEP
- LIGHT, LINEAR STRIP
- FAN/ LIGHT COMBO
- EXHAUST FAN
- GARBAGE DISPOSER
- TELEPHONE OUTLET
- TV OUTLET
- DATA OUTLET
- SMOKE DETECTOR
- COMBO SMOKE/ CO DETECTOR
- THERMOSTAT @ +60" ABOVE FIN. FLR.



MUSIC / GUEST- ELECTRICAL / LIGHTING SCHEMATIC
SCALE: 1/4" = 1'- 0"



GARAGE / SHOP- ELECTRICAL / LIGHTING SCHEMATIC
SCALE: 1/4" = 1'- 0"

LIGHTING FIXTURE SCHEDULE

Tag	Description
A1	Recessed 4" adjustable retractable LED downlight.
	Manufacturer: WAC Lighting, Precision Multiples, 3000K Housing, MT-4LD116N-S-30-BK Trim, MT-4LD116T-WT
	Remarks: Order with bar hangers
A2	Recessed 4" LED shower light with drop opal lens.
	Manufacturer: Halo, **To be determined**
	Lamp & Mfg: 3500K
	Remarks: Order with bar hangers
F1	Surface Mounted 1.5' X 4' LED Wrap Around
	Manufacturer: Lithonia, LBL4 LP835
	Lamp & Mfg: 3500K, 41 watt light engine, 4564 Nom. Lumens
D1	Wall mounted LED exterior light fixture.
	Manufacturer: **To be determined by Owner**
	Remarks: Provide photo/motion sensor on exterior circuits, Verify location of sensor prior to installation Owner approval required prior to ordering.
D2	Pendant mounted LED decorative light fixture.
	Manufacturer: **To be determined by Owner**
D3	Wall mounted LED decorative bath strip light.
	Manufacturer: WAC Lighting, Brink, WS-77618-AL
	Remarks: Mount horizontally, **To be Owner Approved**
D4	Pendant mounted LED decorative light fixture.
	Manufacturer: **To be determined by Owner**
D5	Pendant mounted LED decorative exterior light fixture.
	Manufacturer: **To be determined by Owner**

Provide a listed raceway to accommodate a dedicated 208/240-volt branch circuit for electric vehicle charging not less than 1" nominal inside diameter. The raceway shall originate at the main service or sub panel and shall terminate in a listed cabinet, box or enclosure in close proximity to the proposed location of the EV charger. Raceways are required to be continuous at enclosed, inaccessible or concealed areas and spaces. The raceway termination location shall be permanently and visibly marked as "EV CAPABLE". The service panel and/or subpanel shall provide capacity to install a 40-amp, minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device. The service panel or subpanel shall identify the overcurrent protective device space(s) reserved for future EV charging as "EV CAPABLE". The EV Charging circuit must be rated for continuous duty at 125% of load. All Electrical Vehicle Supply Equipment (EVSE) shall be installed in accordance with the California Electrical Code.

Revisions: 11.28.22 MSH; 8.15.23 MSH; 5.22.24 MSH

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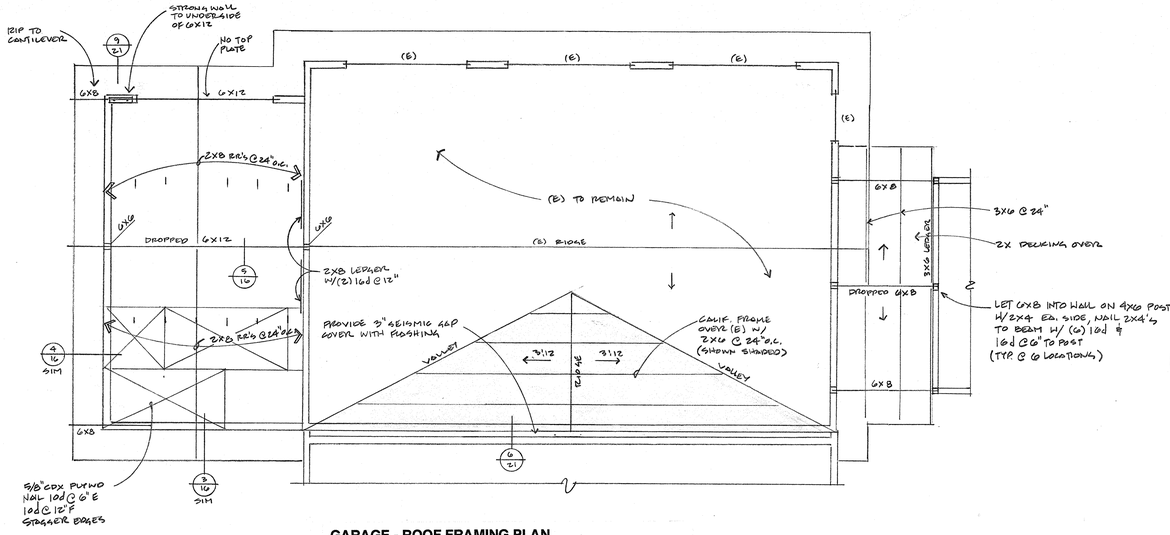
200 Seventh Avenue, #110 Santa Cruz, California 95062 (831) 476-5386

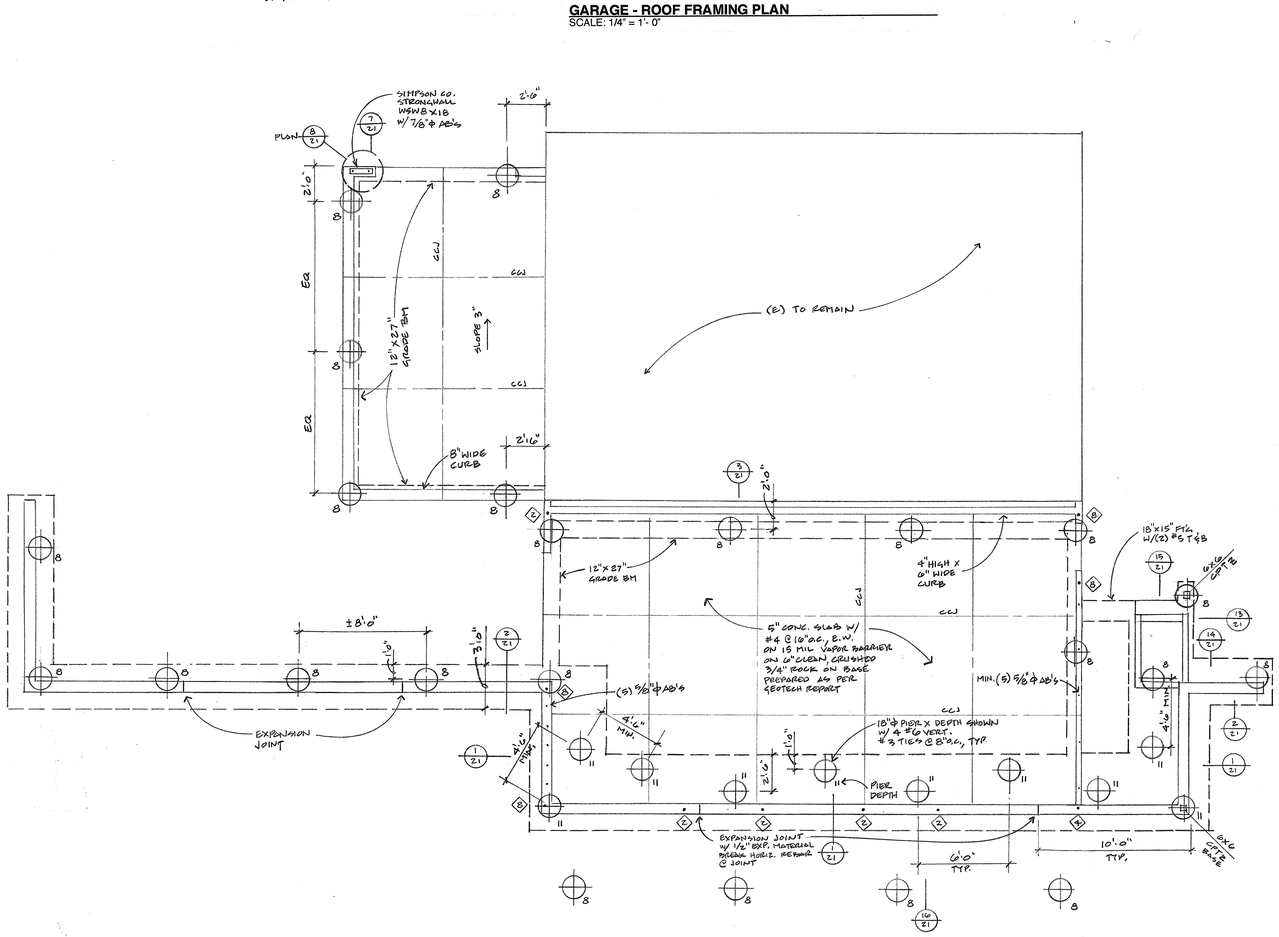
REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD - APN 537-12-012
LOS GATOS, CALIFORNIA

GARAGE / SHOP ELECTRICAL SCHEMATIC
MUSIC / GUEST ELECTRICAL SCHEMATIC

11.14.22
1/4" = 1'-0"
MSH
2108



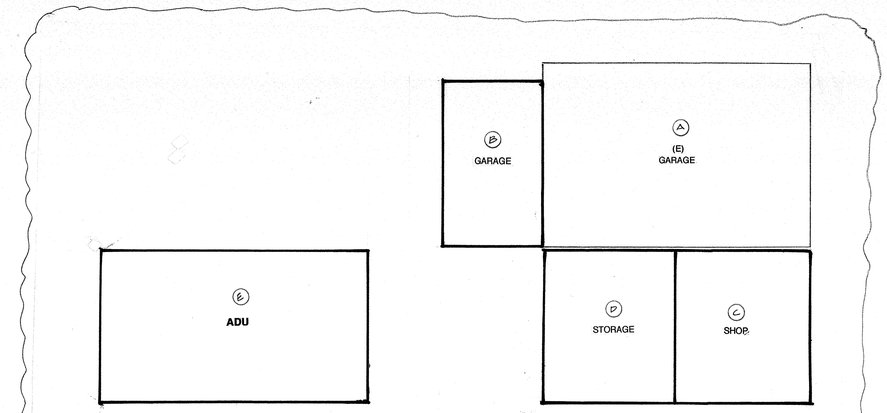
GARAGE - ROOF FRAMING PLAN
SCALE: 1/4" = 1'- 0"



GARAGE / SHOP / STORAGE FOUNDATION PLAN
SCALE: 1/4" = 1'- 0"

NOTED PIER DEPTHS ARE MINIMUM EMBEDMENTS INTO SUPPORTIVE MATERIAL. GEOTECHNICAL ENGINEER MUST OBSERVE AT THE TIME OF PIER DRILLING. PROVIDE TWO WORKING DAYS NOTICE.

ALL SOILS WORK AND FOUNDATION PLACEMENT SHALL COMPLY WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL INVESTIGATION BY C2EARTH, PROJECT NO. 21137C-01R1, DATED JULY 29, 2022,

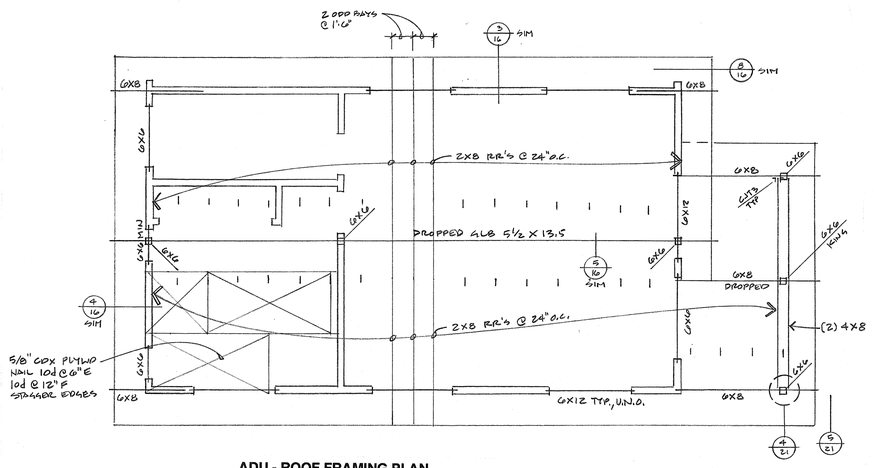


FAR SUMMARY – ADU @ UPPER FLOOR
1/8" = 1'- 0"

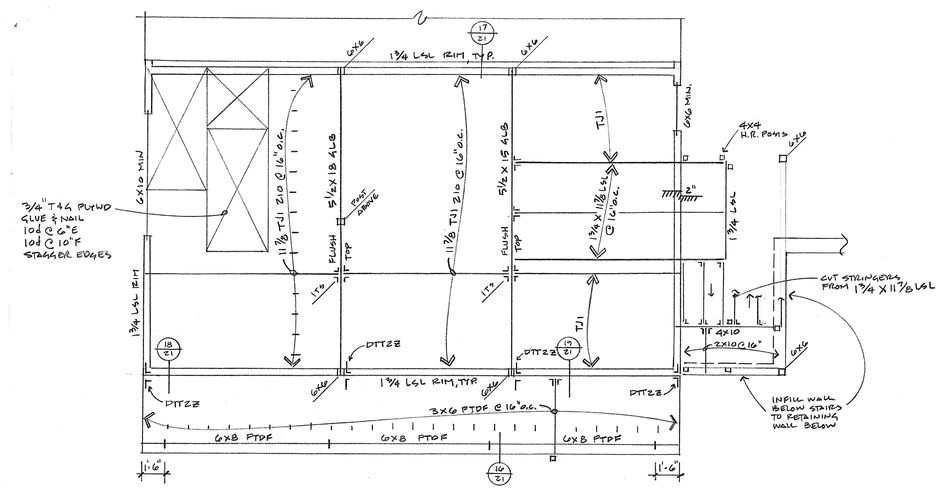
POLYGON / AREA DESIGNATION		DIMENSIONS	AREA (SF)
E	PROPOSED – ADU	20' X 35'	700
TOTAL			700 SF

FAR SUMMARY – GARAGE / SHOP / STORAGE
1/8" = 1'- 0"

POLYGON / AREA DESIGNATION		DIMENSIONS	AREA (SF)
A	EXISTING - GARAGE	24' X 35'	840
B	PROPOSED - GARAGE	21'-8" X 13'	281
C	PROPOSED – SHOP	17'-6" X 20'	350
D	PROPOSED – STORAGE	17'-6" X 20'	350
TOTAL			1821 SF



ADU - ROOF FRAMING PLAN
SCALE: 1/4" = 1'- 0"



ADU - FLOOR FRAMING PLAN
SCALE: 1/4" = 1'- 0"

Michael Helm, AIA Architect & Associates
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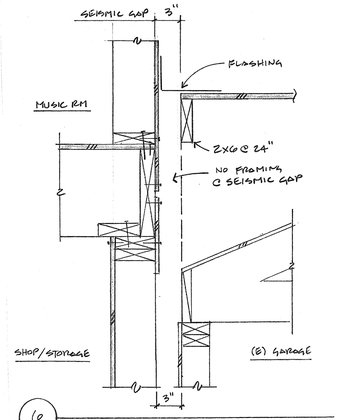
1	AFC 11-28-22	MH
	8.15.23	MH
	5.22.24	MH

REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD – APN 537-12-012
LOS GATOS, CALIFORNIA

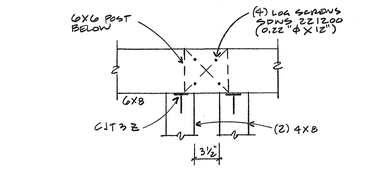
GARAGE / SHOP - FOUNDATIONS
GARAGE / SHOP - ROOF FRAMING
ADU - FLOOR FRAMING
ADU - ROOF FRAMING

11.14.22
1/4"=1'-0"
MH
2108

20



6 1½"=1'-0"



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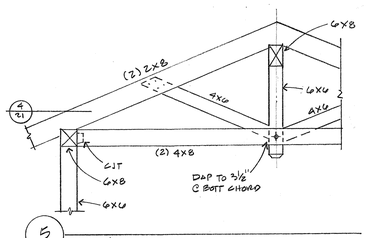
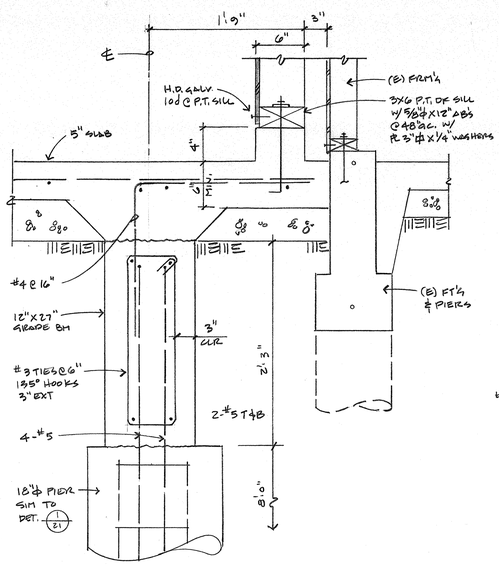


5 1½"=1'-0"



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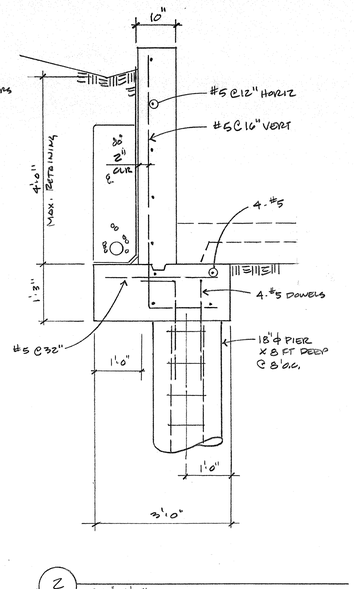
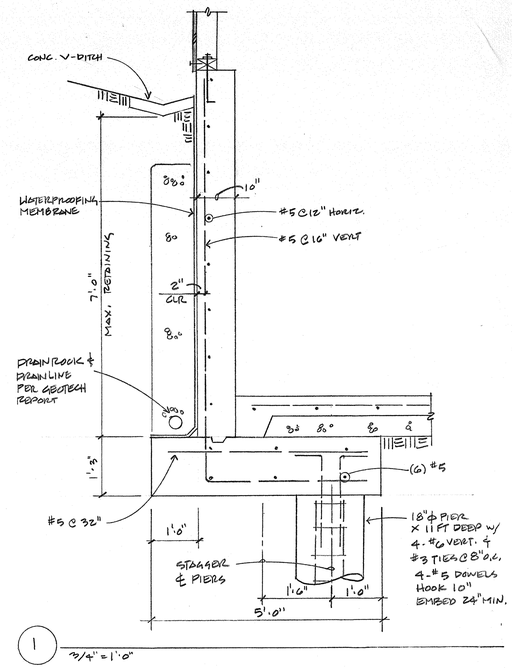


2 3/4"=1'-0"



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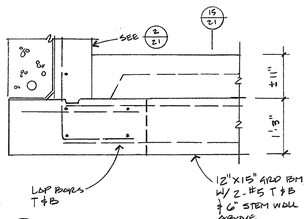

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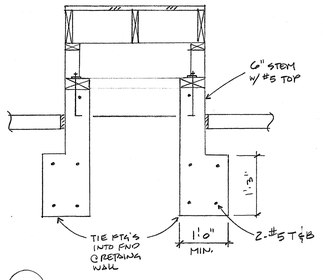

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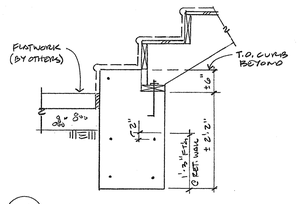

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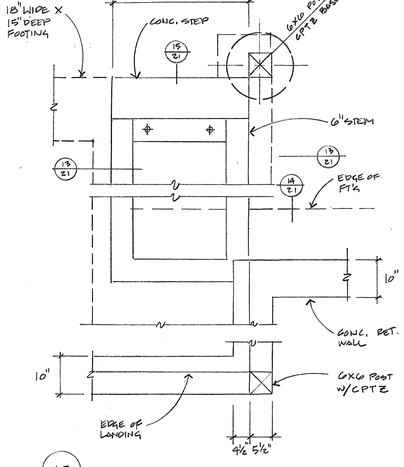

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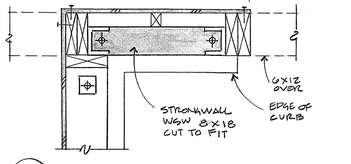

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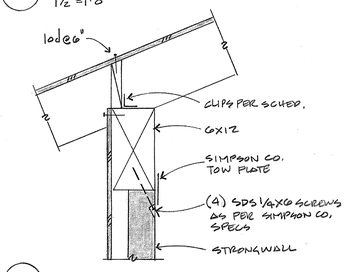

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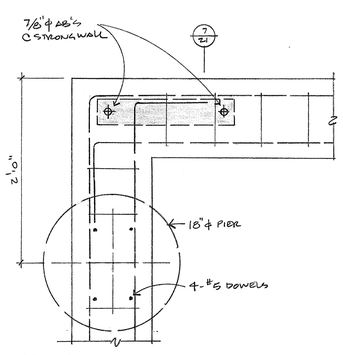
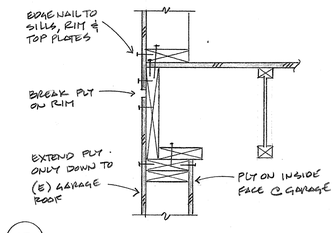


8 1½"=1'-0"



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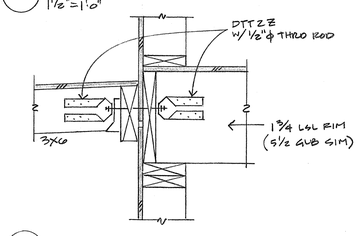

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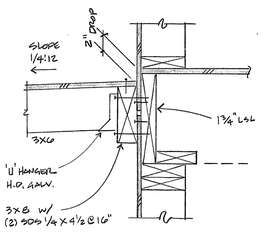
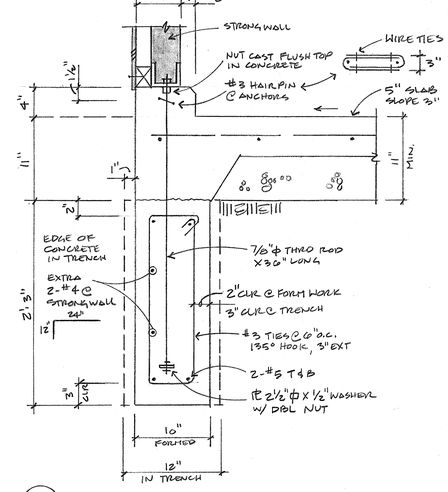


19 1½"=1'-0"

16 1½"=1'-0"



7 1½"=1'-0"

8.15.23	MSH
5.22.24	MSH

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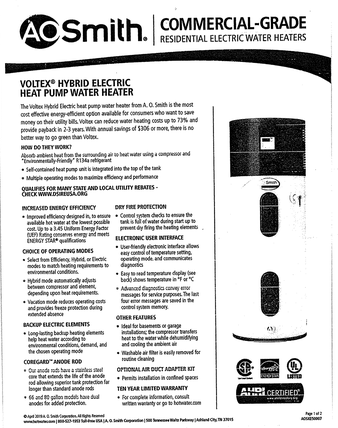
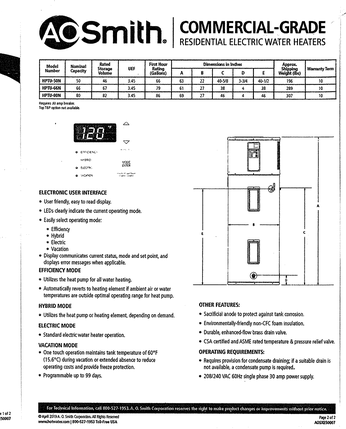
REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD – APN 537-12-012
LOS GATOS, CALIFORNIA

CONSTRUCTION DETAILS

11.14.22	
AS NOTED	
MSH	
2108	

21





ELECTRICAL SYMBOL LEGEND

- DUPLEX OUTLET, +12" ABOVE FIN. FLR.,TAMPER RESISTANT, TYPICAL
- DUPLEX OUTLET W/ ARC FAULT INTERRUPT CIRCUIT
- DUPLEX OUTLET W/ GROUND FAULT INTERRUPT CIRCUIT
- DUPLEX OUTLET W/ GROUND FAULT & ARC FAULT INTERRUPT CIRCUIT
- DUPLEX OUTLET W/ WATERPROOF COVER
- DUPLEX OUTLET W/ ½ SWITCHED
- SPECIAL PURPOSE 220 V. OUTLET
- LIGHT SWITCH, +42" ABOVE FIN. FLR. TYPICAL
- LIGHT SWITCH, 3 WAY
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- LIGHT SWITCH W/ VACANCY SENSOR
- LIGHT, CEILING SURFACE MOUNTED
- LIGHT, WALL SURFACE MOUNTED
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- LIGHT, RECESSED WALL WASHER
- LIGHT, RECESSED ADJUSTABLE
- LIGHT, RECESSED STEP
- LIGHT, LINEAR STRIP
- FAN/ LIGHT COMBO
- EXHAUST FAN
- GARBAGE DISPOSER
- TELEPHONE OUTLET
- TV OUTLET
- DATA OUTLET
- SMOKE DETECTOR
- COMBO SMOKE/ CO DETECTOR
- THERMOSTAT @ +60" ABOVE FIN. FLR.

LIGHTING FIXTURE SCHEDULE – POOL CABANA

Tag — Description

A1 — Surface mounted Monopoint LED light fixture with 2.7" round canopy with piston head.
Manufacturer: Pure Edge Lighting, 3000K

A2 — Recessed 4" LED shower light with drop opal lens.
Manufacturer: Halo, **To be determined**
Lamp & Mfg: 3500K
Remarks: Order with bar hangers

A3 — Surface mounted under cabinet task LED light.
Manufacturer: WAC Lighting, Line, 3000K
Lamp & Mfg: 30" LN-LED30-30AL
24" LN-LED24-30-AL
12.25" LN-LED12-30-AL

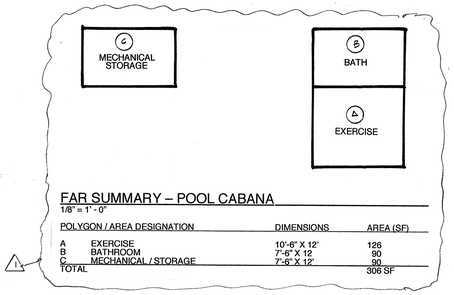
F1 — Surface Mounted 1.5' X 4' LED Wrap Around
Manufacturer: Lithonia, LBL4 LP835
Lamp & Mfg: 3500K, 41 watt light engine, 4564 Nom. Lumens

D1 — Pendant mounted LED decorative light fixture.
Manufacturer: **To be determined by Owner**
Remarks: Owner approval required prior to ordering.

D2 — Ceiling mounted LED decorative light fixture.
Manufacturer: **To be determined by Owner**:
Remarks: Owner approval required prior to ordering.

D3 — Wall mounted LED decorative bath strip light.
Manufacturer: WAC Lighting, Brink, WS-77618-AL
Remarks: Mount vertically, **To be Owner Approved**

D4 — Pendant mounted ceiling fan.
Manufacturer: **To be determined by Owner**
Remarks: Owner approval required prior to ordering.



FAR SUMMARY – POOL CABANA

1/8" = 1'-0"

POLYGON / AREA DESIGNATION		DIMENSIONS	AREA (SF)
A	EXERCISE	10'-6" X 12'	126
B	BATHROOM	7'-6" X 12'	90
C	MECHANICAL / STORAGE	7'-6" X 12'	90
TOTAL			306 SF

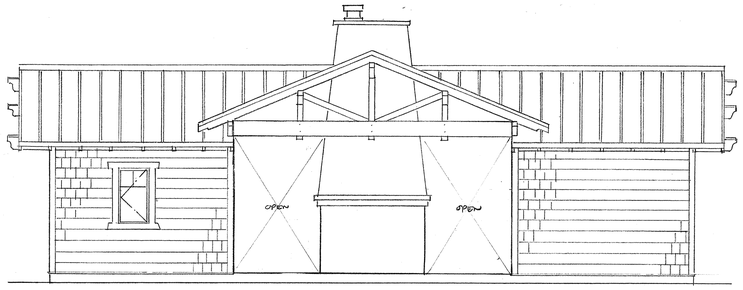
Color/Materials Board*

Roof Peterson Alum. Corp., 18" wide, 24 ga. PAC-CLAD standing seam metal roofing
Manufacture & Material / Product Name, Number: Dark Bronze Reflectivity 0.29

Door & Window Frames, Railings
JELD-WEN clad-wood
Manufacture / Name
Color Name, LRV: Chestnut Bronze LRV 6%

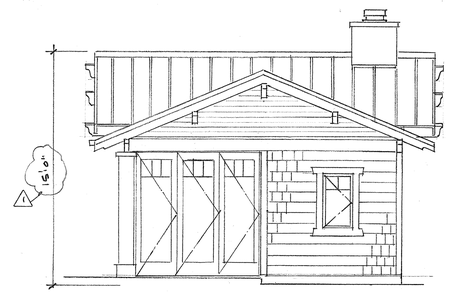
Trim James Hardie - Fiber cement - painted
Manufacture / Number
Color Name, LRV: Sherwin Williams Olive SW1146, LRV 30%

Exterior Walls James Hardie - Fiber cement Horizontal lap or Shingle siding - painted
Manufacture / Number
Color Name, LRV: Sherwin Williams Cardamom SW2727, LRV 7%



EAST ELEVATION

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

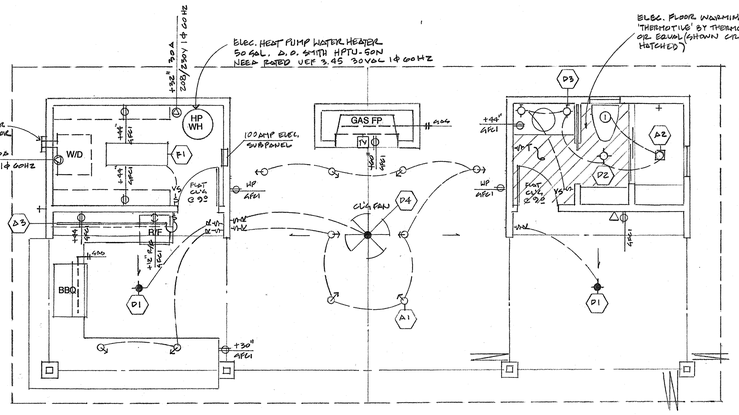


SOUTH ELEVATION

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

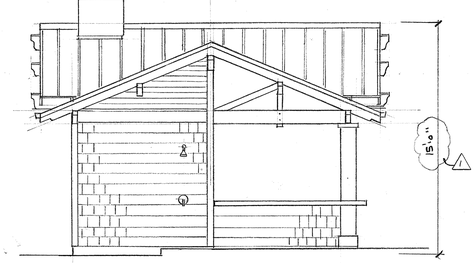
STANDING SEAM METAL ROOFING

Peterson Aluminum Corp., PAC-CLAD 18" wide snap-clad 24 gauge Standing Seam Metal Roofing, UL-580 Class 90 wind uplift, UL-Class A fire rated, installation per mfg. Specs over Dbl layer 30 lb. Felt over 5/8" CDX plywood sheathing nailed w/ 10d @ 6" o.c. edges and 12" o.c. field, U.N.O., to 2X Rafters @ 24" o.c. or 2X Pre-fabricated trusses @ 24" o.c. with R-30 closed cell polyurethane spray foam insulation. Underlayment shall comply with ASTM D226 Type I; ASTM Type I, II, III or IV; ASTM D6757, and shall bear a label indicating compliance to the standard designation. **Eave construction shall meet SFM 12-7A-3 requirements.**



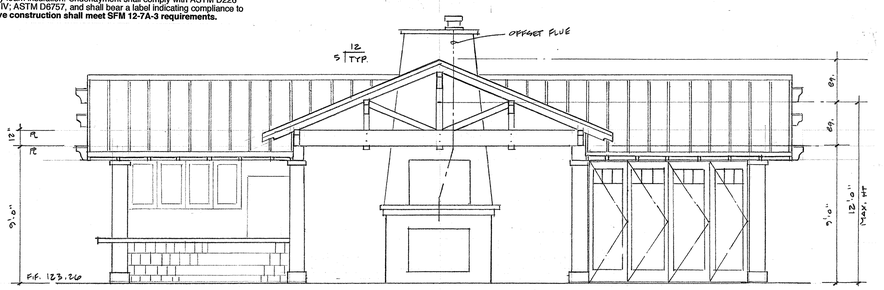
ELECTRICAL SCHEMATIC

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



NORTH ELEVATION

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



WEST ELEVATION

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

PLUMBING NOTES

1 The Plumbing System shall be installed in accordance with the latest edition of the Plumbing Code. Provide all equipment as shown on drawings and as needed for a complete and working system. Use Manufacturer as scheduled or Equal approved by the Architect. Install all equipment in accordance with the Manufacturer's instructions and within all applicable codes and standards.

2 Provide clean outs for every aggregate change in direction exceeding 135 degrees. If the water supply pressure exceeds 80 PSI, install an approved pressure regulator in an accessible location to reduce the service pressure to 60 PSI or less. Hose bibbs shall be protected by a backflow prevention device. Pressure relief valve shall extend to the outside of the building and terminate not more than two feet nor less than six inches above the ground and pointed downward.

3 Waste lines shall be ABS. Water supply piping shall be Type L copper below grade and Type L copper or PEX tubing within the building. Gas piping shall be Schedule 40 black iron.

4 For the purpose of clarity and legibility, these drawings are essentially diagrammatic to the extent that many offsets, bends, special fittings and exact locations are not indicated. Contractor shall verify all conditions at the site before proceeding with installation. It is the responsibility of the Contractor to install the system such that the integrity of the building is maintained.

5 Provide pressure balance, thermostatic or combination pressure balance/thermostatic mixing valves at showers and tub-showers that provide scald and thermal shock protection (120 F max.). Verify at rough plumbing inspection per CPC sec. 408.3.

6 All building water supply systems in which quick acting valves (washing machines, dishwashers, etc., are installed, shall be provided with devices to absorb high pressures resulting from the quick closing of these valves.

7 Water lines shall be insulated per CA Energy Code as follows; Install a minimum 1.5 inch thick insulation on all hot water pipes, all piping with a nominal diameter of 3/4 inch or larger, piping associated with recirculation systems regardless of pipe diameter, and cold water pipes for the first 5 feet from a storage tank, piping buried below grade, all hot water pipes from heating source to kitchen fixtures. Hot water pipes buried below grade must be installed in a waterproof and non-crushable casing or sleeve. Insulation outside conditioned space shall be protected per CEnC 150.0(j)2., Table 120.3-A, CPC 609.11

8 Provide "DSA Certified" earthquake actuated shut-off valve at gas meter or regulator.

9 No domestic dishwashing machine shall be directly connected to a drainage system or food waste disposer without the use of an approved dishwasher air gap fitting on the discharge side of the dishwashing machine. Listed air gaps shall be installed with the flood-level (FL) marking at or above the flood level of the sink or drainboard, whichever is higher. CPC 807.3

10 Control valves and shower heads shall be located on the sidewall of shower compartment or otherwise arranged so that the shower head does not discharge directly at the entrance to the compartment and the bather can adjust the valves prior to stepping into the shower spray per CPC 408.9

PLUMBING FIXTURE MAXIMUM FLOW RATES

TOILET	1.28 GPF
LAVATORY FAUCETS	1.2 GPM @ 60 PSI
TUB / SHOWER VALVES	1.8 GPF @ 80 PSI
KITCHEN FAUCETS	1.8 GPM @ 60 PSI

PLUMBING FIXTURE CONNECTION SCHEDULE

SYMBOL	TYPE	WASTE	VENT	HOT	COLD
LV	LAVATORY	1-1/2"	1-1/2"	1/2"	1/2"
WC	TOILET	3"	2"	-	1/2"
T/SH	TUB / SHOWER	2"	1-1/2"	1/2"	1/2"
KS	KITCHEN SINK	2"	1-1/2"	1/2"	1/2"
WS	WASHER	1-1/2"	1-1/2"	1/2"	1/2"
HB	HOSE BIBB				3/4"

DOOR SCHEDULE – POOL CABANA

SYM	SIZE	TYPE	QUAN.	REMARKS
1	2868	Exterior S.C., 3-Panel	1	Stain Grade, by Sun Mountain, Inc.
2	2868	Interior S.C., 3-Panel	1	Stain Grade, by Sun Mountain, Inc.
3	2868	Interior S.C., 3-Panel Pocket Door	1	Stain Grade, by Sun Mountain, Inc.
4	8070	Exterior, 3W Bi-fold	2	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
5	10870	Exterior, 4W Bi-fold	1	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**
6	5470	Bi-Pass Sliding Shower Doors	1	3/8" Clear 'Frameless' Tempered glass, Provide shop drawings for approval

WINDOW SCHEDULE– POOL CABANA

SYM	SIZE	TYPE	QUAN.	REMARKS
A	2036	Casement	2	Clad/Wood Sash, Low-E dbl. insulated **Tempered glass**

Jeld-Wen – Clad Wood sash windows & doors overall standards comply with ANSI/ AAMA/ WDMA/CSA101/I.S.2 / A440-05 / A440-08 / A40-11

a. All units are Gold Label tested & certified with label attached to frame per AAMA standards per CRC, Section 609.3, Installation per AAMA 2400
b. All insulated glass units conform to ASTM E2188 / E2190, NFRC certified and labeled.
c. Safety Glazing testing and labelling per CRC, Sections 308.1 & 308.4
d. Energy testing and certification per CEnC, Section 110.6
e. Verify rough openings and window / door sizes prior to ordering.

Note: The NFRC label which states the required U-value and SGHC for all fenestration products shall not be removed prior to inspection or the removal by a building inspector and shall reflect the values listed in the energy report.

FINISH SCHEDULE NOTES

1 VERIFY ALL FINISHES WITH OWNER

2 ALL CLOSET FLOORING AND BASEBOARDS SHALL MATCH THE ADJACENT ROOM

3 PROVIDE A SMOOTH, HARD, NON-ABSORBENT SURFACE OVER MOISTURE RESISTANT UNDERLAYMENT TO A HEIGHT OF 72" ABOVE THE DRAIN OUTLET IN ALL SHOWER AND TUB LOCATIONS.

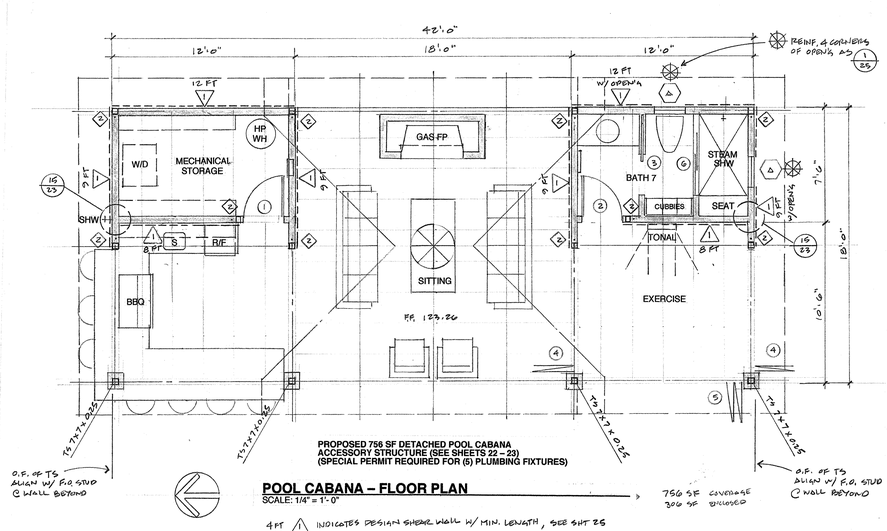
4 UNDERLYING BASE FOR ALL TILE SHALL BE CEMENT, FIBER-CEMENT OR GLASS MAT GYPSUM BACKER BOARDS IN COMPLIANCE WITH ASTM C1178, C1288 OR C1325 AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. IT SHALL BE USED AS A BASE FOR WALL TILE IN TUB AND SHOWER AREAS AND AS CEILING PANELS IN SHOWER AREAS.

VENTILATION NOTES

1 All **bathroom fans** are to be used for **Local Ventilation Exhaust**. Minimum 50 CFM fan tested at a static pressure of .25 wc and rated @ 3 sones or less required to be installed. Fan must be attached to a minimum 4" duct and no longer than 70' of **flex** duct. Subtract 15' of allowed length for each elbow.

CONSTRUCTION SCHEDULE – POOL CABANA

FOUNDATIONS	12" wide X 27" deep concrete grade beam with 2 - #5 bars T & B w/ #3 ties @ 6" o.c. on 18" diameter drilled piers X 8' deep (min.) CONCRETE SLABS: 5" thick concrete slab w/ #4 bars @ 18" o.c. each way, on 15 mil vapor barrier (Stego Wrap or equal) on 6" crushed rock. CONCRETE MIX: Substitute Portland Cement with recycled flyash, 35% by volume, typical. Keep receipts for Inspector verification. TREATED LUMBER: Substitute ACQ pressure treatment for CCA products, typical. FORM BOARDS: Clean and re-use for scaffolding, forms, blocking, etc… FORM RELEASE AGENT: Use Non-toxic soy based 0-VOC form release agent by BIO-GUARD CO. or Architect approved equal.
FLOORS	Flagstone on mortar bed on 5" thick concrete slab w/ #4 bars @ 16" o.c. each way, on 15 mil vapor barrier on 6" crushed rock.
WALLS	5/16" James Hardie fiber cement horizontal siding over 'TYVEK' house wrap on 5/8" Type 'X' exterior gypsum sheathing on 7/16" CDX plywood or OSB sheathing, nailed w/10d @ 6" o.c. edges and 12" o.c. field, U.N.O., on 2 X 6 studs @ 16" o.c. with R-23 high density batt insulation, 1/2" gypsum wallboard interior finish, typical. Use low/No VOC exterior/interior paints. **Wall construction shall meet SFM12-7A-1 requirements.**
ROOF	Class B (min.) standing seam metal roofing, install per mfg. specs over Dbl. layer 30 lb. felt over 1/2" CDX plywood sheathing, w/ #6 X 1-1/2" screws @ 6" o.c. edges & 12" o.c. field over 2X decking on 3X6 Rafters @ 24" o.c.. Underlayment shall comply with ASTM D226 Type I; ASTM Type I, II, III or IV; ASTM D6757, and shall bear a label indicating compliance to the standard designation.
GUTTERS & DOWNSPOUTS	16 oz. copper beveled gutters w/ 2" diameter round downspouts deposit into existing landscaped areas. **Gutters shall be provided with leaf/debris protection.**
ROOF / WALL FLASHINGS	16 oz. copper where shown or required. Pan flash all ext. door sills with 16 oz. copper solder all joints, typical
WINDOWS & EXT. GLASS DRS.	Jeld-Wen – Alum. Clad/Wood sash with Dbl. insulated **Tempered** Low-E glass, provide screens at all operable windows. **Exterior door assemblies shall conform to SFM 12-7A-1 requirements.**
INSULATION	EXT. WALLS R-23 high density fiberglass batts
ROOF JACKS	Provide neoprene gaskets and 16 oz. copper roof jack / rain cap, typical. All exhaust vents shall be located a min. of 4' from or 1' above all roof or wall openings per CMC. All plumbing vents shall be located a min. of 10' from or 3' above all roof or wall openings per CPC.
WALL PENETRATIONS	Use weatherproofing wall jacks by QUICKFLASH or approved equal for plumbing, electrical and mechanical penetrations.
PAINTS, STAINS, ADHESIVES & SEALERS	Use Low / No VOC, water based products and solvent-free adhesives, typical.
PLUMBING	Install Low-flow toilets. Install Low-flow shower heads with chlorine filters.
CABINETS & TRIM	Use formaldehyde-free particle board and MDF by MEDITE or approved equal for all cabinets and trim applications



PROPOSED 756 SF DETACHED POOL CABANA
ACCESSORY STRUCTURE (SEE SHEETS 22 – 23)
(SPECIAL PERMIT REQUIRED FOR (5) PLUMBING FIXTURES)

POOL CABANA – FLOOR PLAN

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

4 FF ⚠1 INDICATES DESIGN SHEAR WALL W/ MIN. LENGTH, SEE SHT 25
⚠2 INDICATES HOLDOWN BRACKET, ANCHOR & POST, SEE SHT 25

756 SF COVERAGE
306 SF ENCLOSED

	AR	
1	11.22.22	MSH
	8.15.23	MSH
	5.22.24	MSH

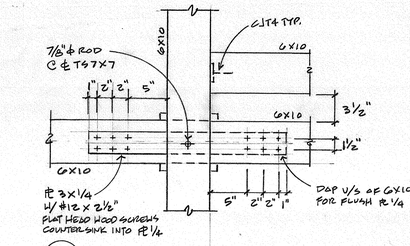
Michael Helm, AIA Architect & Associates
200 Seventh Avenue, #110 Santa Cruz, California 95062 (831) 476-5386

REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD, APN 537-12-012
LOS GATOS, CALIFORNIA

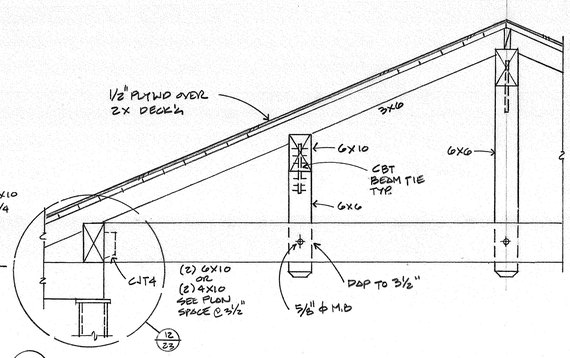
CABANA - FLOOR PLANS EXTERIOR ELEVATIONS

11.14.22
1/4"=1'-0"
MSH
2108

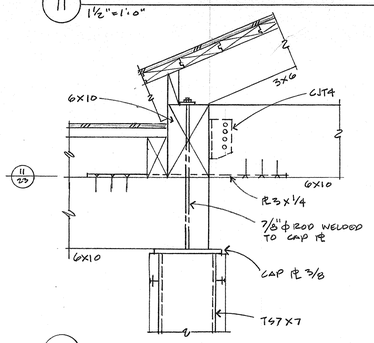
22



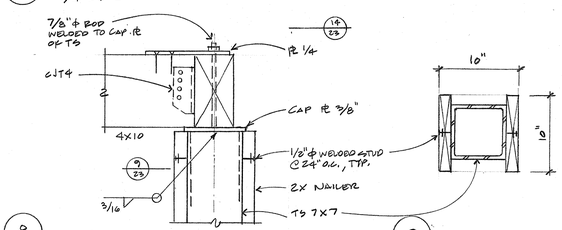
11 1½"=1'-0"



7 ¾"=1'-0"

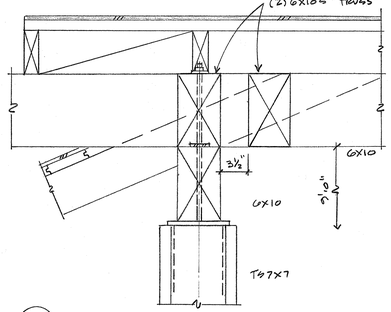


12 1½"=1'-0"

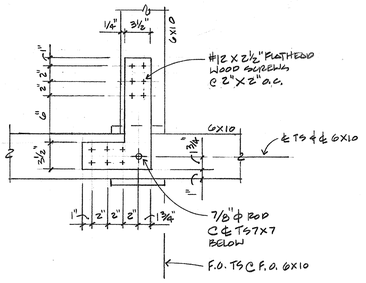


8 1½"=1'-0"

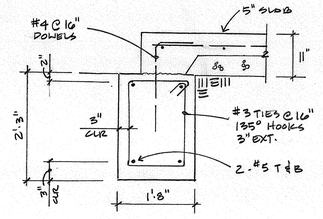
9 1½"=1'-0"



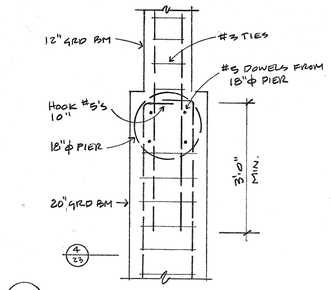
13 1⅛"=1'-0"



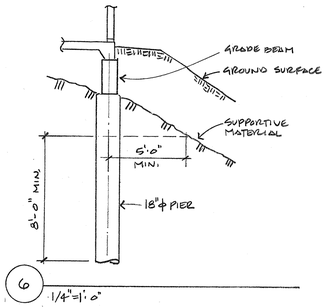
10 1½"=1'-0"



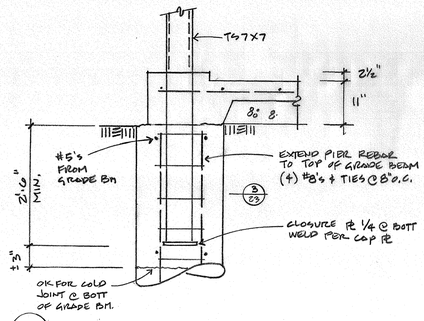
4 ¾"=1'-0"



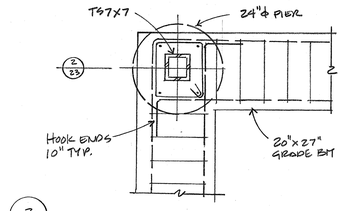
5 ¾"=1'-0"



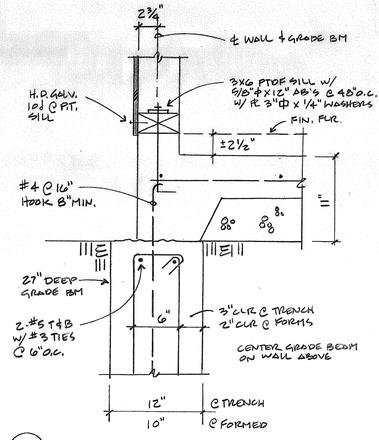
6 1/4"=1'-0"



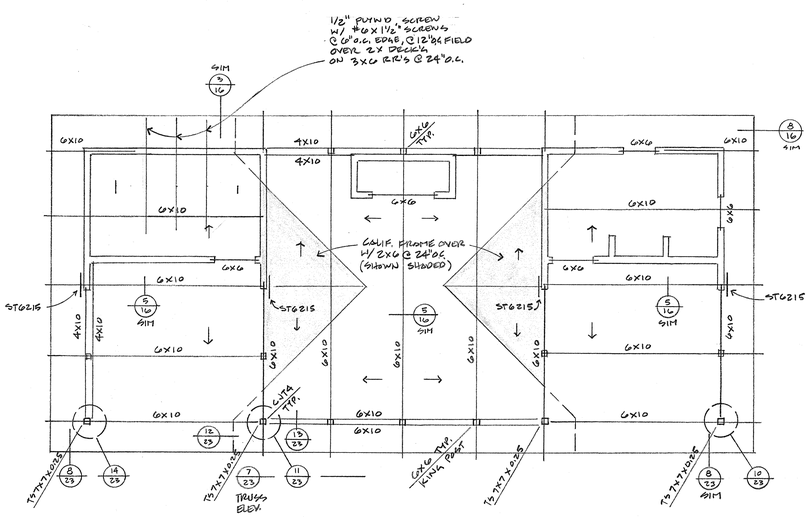
2 3/4"=1'-0"



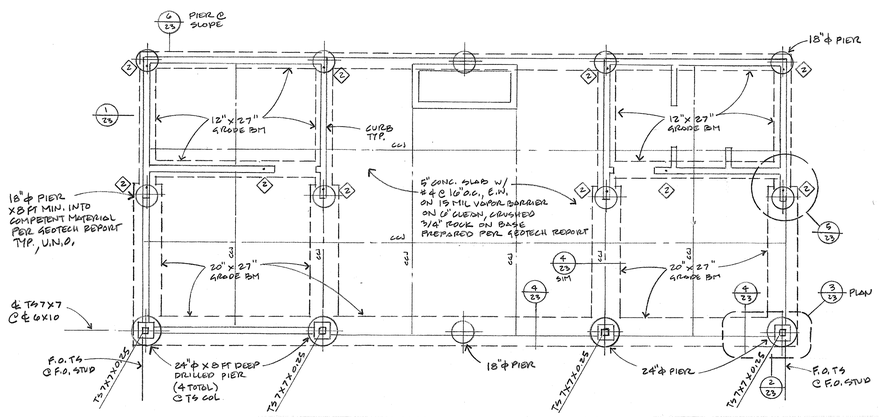
3 ¾"=1'-0"



1 1½"=1'-0"



POOL CABANA - ROOF FRAMING PLAN
SCALE: 1/4" = 1'- 0"



POOL CABANA - FOUNDATION PLAN
SCALE: 1/4" = 1'- 0"

ALL SOILS WORK AND FOUNDATION PLACEMENT SHALL COMPLY WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL INVESTIGATION BY C2EARTH, PROJECT NO. 21137C-01R1, DATED JULY 29, 2022.

NOTED PIER DEPTHS ARE MINIMUM EMBEDMENTS INTO SUPPORTIVE MATERIAL. GEOTECHNICAL ENGINEER MUST OBSERVE AT THE TIME OF PIER DRILLING. PROVIDE TWO WORKING DAYS NOTICE.

8.18.23	MSH
5.22.24	MSH

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REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD – APN 537-12-012
LOS GATOS, CALIFORNIA

Pool Cabana - Foundation Plan
Pool Cabana - Roof Framing

11.14.22	
1/4"=1'-0"	
MSH	
2108	

23

QUIK-SHIELD® 118

Ultra-Efficient Closed-Cell Spray Foam

QUIK-SHIELD® 118 is the first Ultra-Efficient closed-cell, spray foam on the market today. It is specially formulated to increase jobsite efficiency, decrease labor and overhead costs, reduce jobsite risk, and deliver the lowest cost installed.

FEATURE-RICH:

- Ultra lift—up to 8" applications
- Robust Formulation
- ✓ Long-Range Application

EXCEPTIONAL CONTRACTOR VALUE:

- Up to 50% increase in jobsite efficiency
- Keeps making good foam, even under adverse conditions
- Up to 20' application range

APPROVALS/ COMPLIANCE:

- CCRR-1068
- IBC, IRC, IECC: 2009, 2012, 2015
- AC377 compliant
- Appendix X compliant - no ignition barrier needed
- Type IV construction
- Class 1– ASTM E-84
- E-84, NFPA 285, E-119

***TYPICAL PHYSICAL PROPERTIES*:**	***PROCEDURE***	***VALUES***
Core Density (minimum, lb/ft³)	D-1622	1.9 - 2.0
Water Vapor Permeance at 1.2" (perms/in)	E-96	0.93
Water Absorption (%)	D-2842	1
Dimensional Stability (%)	D-2126	<3
Tensile Strength (psi)	D-1623	>22
Compressive Strength (psi)	D-1621	25
Air Leakage (L/s.m²)	E-283	<0.02
Air Permeance at 1" (L/s.m²)	E2178-13	<0.02
THERMAL BARRIER		
DC 315 (wet mils)	NFPA 286	20
RELATIVE INSULATION VALUES (aged):		
R-value at 1"		6.3
R-value per inch at >3.5"		6.5

INDUSTRY LEADING TEMPERATURES:

- Continuous use temperature can be as high as 220°F (125°C) and It is dimensionally stable down to -80°F (-61°C).
- Solid performance in all climates, including extreme heat and cold, and high humidity.

PACKAGING:

275 Gallon Tote
55 Gallon Drum

HANDLING PROPERTIES at 77°F (25°C):	***A SIDE (ISO)***	***B SIDE (RESIN)***
Viscosity, cps	250±50	550±100
Specific Gravity	1.23	1.22

FINISHED PRODUCT COLOR:

White to off-white (UV exposure will cause discoloration, discoloration by itself is not a sign of product damage)

RECOMMENDED PROCESSING INFOMATION (ADDITIONAL DETAILS ON BACK):	
Dispensing Ratio	1:1
Hose Heaters	115-140°F (46-60° C)
Primary Heaters (A&B)	115-140°F (46-60° C)
Dynamic Pressure (A&B)	1000 psi minimum
Static Pressure (A&B)	1100-1600 psi
Ambient Temperature*	25 - 120°F (-4 - 54° C)
Drum Conditioning Temperature	95 - 80°F (72 - 27° C)

*Temperatures outside this range are possible, contact SWD for more information

LEED INFORMATION:

- Quik-Shield® 118 has a minimum of 9% total renewable/recycle content
- 2.3% pre-consumer recycled
- 5.2% post-consumer recycled
- 1.6% rapidly renewable
- IEQ Credit- Low Emitting Materials

MIXING (ADDITIONAL DETAILS ON BACK):

- Do not mix
- Do not recirculate

RECOMMENDED STORAGE AND SHELF LIFE (ADDITIONAL DETAILS ON BACK):

- Storage temperatures 40-100°F** (4-38° C). See back for preconditioning of material.
- Shelf life from date of manufacture (unopened containers):
  - *A-Side (iso): 12 months*
  - *B-Side (resin): 6 months*
- Keep container tightly sealed.
- Store out of direct sunlight, in a cool dry place, avoid freezing.

*Properties achieved in a lab environment at 77°F. Field conditions may cause variation in properties.

** Caution: if the drum temperature is 80°F (26.6°C) or higher, use caution when opening the drum! The contents will be under pressure.

PREPARATION OF SUBSTRATES

Providing the proper substrate is the responsibility of the owner, the owner's appointed representative, the contractor, and/or inspector. The following are manufacturer's recommendations. However, other preparation techniques may be required given unique/specialized application circumstances. Contact SWD for technical questions.

It is recommended to remove dust, dirt, oil, paint, and alternative polymers from all surfaces prior to applying SWD products.

See SWD specifications or SPFA guidelines for further details on substrate prep.

WOOD.

- Ensure wood is relatively dry and protect surfaces from contamination.
- Water or oil present may cause poor adhesion or excessive foaming.
- Fill large voids with appropriate backer rods or appropriate fillers.
- If additional information is required, contact an SWD representative for more details.

STEEL & OTHER METALS

- It is the responsibility of the contractor/end user to determine proper adhesion and suitability through field testing. Blasting and/or priming is not always required. If additional information is required, contact an SWD representative for more details.

CONCRETE

- If applying foam to concrete, the concrete surface should be structurally sound, clean, and dry/cured (typically 28 days).
- Fill large voids with appropriate backer rods or appropriate fillers.
- Blasting and/or priming is not always required. It is the responsibility of the contractor/end user to determine proper adhesion and suitability. If additional information is required, contact an SWD representative for more details.

PREVIOUSLY APPLIED FOAM or OTHER POLYMERS

- As practical, remove previously applied foam and other polymer products. Application of product over existing materials should be performed only after adhesion/compatibility is verified by the contractor and accepted by the building owner or owner's appointed representative.

WIRING & PLUMBING:

- Quik-Shield® 118 is fully compatible with CPVC piping systems (Paschal Engineering Study for the SPFA)
- Quik-Shield® 118 is compatible with typical electrical wiring coverings.

PROCESSING

1. It is recommended to precondition material to 55-80°F prior to application. Material may thicken at lower temperatures which can cavitate pumps.
2. Do not mix.
3. Product should be sprayed with a high pressure plural-component proportioner capable of a minimum of 1000psi dynamic pressure and a maximum pressure differential of 2000psi between resin and isocyanate.
4. Static pressure is typically set between 1100 and 1600psi.
5. Primary heaters and hose heaters are typically set between 115 - 140°F. Higher temperatures are utilized in winter months, lower temperatures are utilized in summer months.
6. Proper application temperature setting is the responsibility of the end user. Equipment temperature varies and can be dependent on equipment, hose length, elevation, ambient temperature, substrate temperature humidity, and other factors. If additional information is required, contact an SWD representative for more details.

APPLICATION

1. Clean surfaces according to "Preparation of Substrates" section.
2. If priming, follow manufacturer recommendations. Ensure primer is adequately cured prior to application.
3. Substrate temperatures should be between 25-120°F. Flashing is recommended at lower temperatures. Higher and lower application temperatures are possible, contact an SWD representative for more details.
4. Flush an adequate amount of material through the lines/gun prior to spraying desired surface when changing between systems. Flush amount will be dependent on prior system used. If additional information is required, contact an SWD representative for more details.
5. Do not recirculate.
6. Do not exceed a 9 inch lift per pass. It is the responsibility of the contractor to determine when the first layer has cooled sufficiently for additional passes. SWD recommends waiting a minimum of 20 minutes.
7. Before application, test material to ensure that material sprays, cures, and hardens properly.
8. Inspect applied material intermittently to ensure no problems exist. If problems are detected, discontinue application and inspect all substrates, equipment, gun, and liquid material for problem source(s).

CLEANING AND MAINTENANCE

1. Spray equipment must be maintained in proper operating condition. Failure to adequately maintain spray equipment may result in poor product performance. Refer to your equipment manufacturer's maintenance procedures for more details.
2. Contact SWD for long-term equipment storage recommendations.

ARCHITECTURAL SPECIFICATIONS

GENERAL REQUIREMENTS

The Work under this contract includes furnishing all labor, equipment's, appliances, and materials required for construction of this home in strict accordance with these specifications and the applicable drawings subject to the terms of the contract.

GENERAL CONDITIONS

1. Before commencing any work under this contract, the CONTRACTOR shall have in his possession the necessary and required insurance as governed by the State of California; policies as follows:

   a. Workmen's Compensation Insurance's: This policy shall cover the full liability of the contractor and his workmen. Each sub-contractor shall be required to provide the same for his workmen.

   b. Public Liability Insurance: This policy shall cover the full liability and claims for damages for personal injury including accidental death.

2. The Construction of this building shall comply with all applicable requirements and regulations set forth by the latest of the California Building Code; and all applicable requirements and regulations set forth by Labor Codes and local Ordinances.

3. The CONTRACTOR shall inspect the site and familiarize himself with all local conditions and take full responsibility for maintaining ingress to and egress from the site at all times.

4. Temporary water and electricity shall be provided by the CONTRACTOR and he shall pay all installation and meter charges.

5. Temporary toilet facilities shall be installed and maintained by the CONTRACTOR.

6. The CONTRACTOR shall provide, procure, and pay for all building permits required for the execution of the contract and the completion of the job.

7. During the execution of the work called for on the plans and in these specifications, the CONTRACTOR will be held responsible for any and all damage to existing adjacent property, structures, sidewalks, curbs, and gutters.

8. Upon the completion of the work, the building shall be broom cleaned and ready for occupancy. Finished surfaces scratched or damaged shall be refinished, resurfaced or replaced, as the case may be. The entire premises shall be clean and free from all debris and evidence of construction. Temporary facilities, construction and equipment shall be removed.

9. All concrete slabs, walls and driveways shall be adequately protected from damage from any source until acceptance of the work.

10. The CONTRACTOR shall check and verify drawings as to scale and dimensions; and if errors appear in the drawings or conflicts in these specifications, the CONTRACTOR shall bring them to the attention of the OWNER.

11. THE CONTRACTOR shall layout the building in accordance with the general location of the building as shown on the drawings. The CONTRACTOR shall furnish all engineering services necessary to the proper layout and construction of the building.

12. The CONTRACTOR shall make no deviations from the drawings unless such deviations are approved by the OWNER.

EXCAVATION, GRADING, AND PAVING

See plans for extent of work. In general, this consists of preparing the site, excavation of foundation trenches, all fills and backfills, removal of excess material to areas designated, spreading same and finish grading and paving on areas designated. Slope finish grade to drain away from building. All filled areas are to be keyed into hillside and compacted as required.

CONCRETE WORK

1. MATERIALS

   The quality of the materials used in the concrete and the quality of the concrete shall conform to the physical and chemical properties as specified in C.B.C.

   a. Reinforcing wire Welded wire fabric 6" x 6" #10 (ASTM A185)
   b. Design mix for 2,500 pounds per square inch concrete at 28 days. (unless noted otherwise)
   c. Sill anchors to be 5/8" x 12" anchor bolts embedded 9" minimum, and located 3'-0" O.C. for two story structures and 4'-0" O.C. for single story structures. Place anchors within 12" of corners.
   d. Reinforcing steel shall be deformed, intermediate grade, conforming to ASTM A615-40

FIREPLACE AND BLOCK WORK

See plans for extent of masonry work to be included in this building OWNER is to select type of rocks or bricks prior to construction. The Masonry Contractor will design the lintel and flue as required by code.

FRAMING MATERIALS

All framing lumber shall be graded in conformance with the West Coast Lumber Inspection Bureau Grading Rules No. 16 as amended to date. Grades to be as follows unless noted otherwise on the plans:

1. Mudsills-foundation grade redwood or equivalent treated materials.
2. Posts and Beams- 4" & thicker D.F. #1(Para. 130-b) F.O.H.C.
3. Joists and rafters- 2" to 4" thick, 6" & wider construction grade Douglas Fir #2 (Para. 123-c)
4. Girders- construction grade Douglas Fir #1
5. Studs- construction grade Douglas Fir #2 (Para 121-c)
6. Plywood Flooring - 3/4" Douglas Fir T & G exterior plywood CDX
7. Sub-flooring- Douglas Fir 2" x 6" T & G utility decking
8. Exposed beams- Douglas Fir #1 select F.O.H.C. (Para. 130-b)
9. Exposed ceiling -select Pine T & G decking
10. Exterior decking- select "A" grade Redwood
11. Sheathing Paper- #30 Bldg. paper Kraft type or equal

GENERAL FRAMING NOTES

1. Floors to be level within 3/16" ± all around.
2. Structural members shall not be cut for pipes, etc. unless specifically shown or noted.
3. Provide washers for all bolts.
4. Use aluminum or galvanized nails for all exterior siding or trim.
5. Use anchor hold type nails for all plywood flooring.
6. All plywood floors and exterior decking to be glued with P.L-400 or equal.
7. Use cement coated 16^{d} sinker nails for framing.
8. Provide an 18" x 24" minimum access area to underside of home.
9. Provide access for bath sub trap; 20' maximum distance to all plumbing in crawl area.
10. All stairways to have a maximum rise of 8" and a minimum tread width of 10". Provide headroom clearance of 7'-0" min. Install handrails as required 34" to 38" above treads.
11. Unless indicated otherwise all headers are to be 4" x 12" D.F. #2.
12. Double floor joists under all parallel wall partitions.
13. All required handrails are to be 36" high and constructed to withstand a horizontal force of 20 pounds per lineal foot, applied at the top of the railing. Maximum spacing in handrails shall not exceed 6".
14. Provide an attic access of a t least 22" x 30".
15. Open flame for furnace and water heater shall be 18" above floor level if they are to be located in the garage.
16. Provide combustion air for furnace and water heaters required. Combustion air intakes to be located within 6" of floor and ceiling. Provide 6" clearance between furnace and combustibles.
17. If home has an underfloor crawl area, provide 2 square feet of vent space per each 25 linear feet of exterior wall.
18. Provide fire blocking at floor, ceiling, coves, and mid-height of walls over 10'-0" in height.
19. Provide 50 square inches of fixed vents per car to outside air within 6" of garage floor.

TRIM WORK

All external fascias shall be scarfed. No butt joints or spaced boards will be allowed. All trim connections should be tight and fit flush against the exterior.

All exterior redwood decking is to be installed in a craftsmanlike manner. Sand all mitered corners and exposed edges. Remove all sharp edges from handrails.

WOOD BASE:

CLOSETS:

a. Shelves - 3/4" plywood or particle board with glued-on solid edge or plastic lid. Solid pine shelves may be used as a substitute.
b. Clothes Pole-Hardwood 1-5/8" diameter. Provide an intermediate support for spans longer than 4'-0".
c. Hook Strip - 1" x 4" acts also as shelf support.
d. Floor:

UNDERLAYMENT: Use 3/8" particle board under all resilient flooring except for slab areas. Nail 3" at edge 1/2" in and 6" in field each way.

DRYWALL:

Includes a complete gypsum board wall and ceiling installation as indicated on the drawings. Wall board shall be 5/8" recessed edge type board such as manufactured by U.S. Gypsum Co. or equal. Nails 5d-15 1/4 gauge, cement coated, flathead, 1 5/8" long. Taping, "Perfstape" joint reinforcing tape and cement as manufactured by U.S. Gypsum Co. Use 5/8", type"X" one hour fire-rated gypsum board between garage and home where indicated on the drawings, and under stairways.

All Exterior corners to have metal edges. The best workmanship and construction practices are required. In the event the Drywall Contractor finds crooked walls or bad joints occurring in the frame structure then these should not be covered but brought to the attention of the CONTRACTOR so they may be fixed prior to covering with drywall. Special care must be taken to protect and preserve the finish wood surfaces. All doors and window sills to be trimmed flush with openings. All scraps to be hauled away within 3 days of hanging. Do not break joints at plates in stairwells, header connections, or at plates on two story high walls. All recessed kitchen lights to have clean straight lines. Keep sheetrock within 3/16" of all rough in boxes.

THERMAL INSULATION:

Roof: R-30 CLOSED CELL SPRAY POLYURETHANE FOAM

Ceiling: R-30 BATTS

Walls: R-23 HIGH DENSITY BATTS

Floor: R-19 BATTS

Weather-stripping: At all windows and doors, typical.

Special Notes: Provide 3-1/2" sound insulation between floors and in walls around all bathrooms, all bedrooms and laundry room.

SHEET METAL:

All sheet metal shall be 16 Oz. Copper unless indicated otherwise on the drawings. Sheet metal work includes chimney saddles, gutters, downspouts, flashing, counter flashing and all other sheet metal not specifically a part of other trades. Fabrication and installation in accordance with the best workmanship standards is required. Soldered joints shall have continuous solder and be watertight. Free edges projecting from adjoining surfaces shall have metal bent on itself. Nails shall be copper.

Downspouts shall be of round design unless noted otherwise. Offsets shall be fully soldered. Connection to gutter shall be rigid and watertight. Fascia gutter to be straight with all intersection soldered. Do not use short pieces.

Provide vents to kitchen fans, bath fans, gas ranges, gas heaters, and any other areas indicated on the drawings.

SPECIAL NOTES:

ROOFING:

SPECIAL NOTES: MATCH (E) FLAT CLAY TILE

METAL ROOFING COLOR TO BE OWNER/ARCHITECT APPROVED

DOORS:

See drawings for size, location, and type of doors needed. Interior doors shall be 1 3/4" solid core type unless indicated otherwise. Provide 1 3/4" solid core door with self-closing hinge between home and garage. Sliding doors shall have tempered glass panels with operable screen panel. Sizes as indicated on drawings. Pocket door frames to be Nordal or equal.

SPECIAL NOTES:

WINDOWS:

JELD-WEN

See drawings for size and location of windows. Windows to be ⧸⧹ or approved equal. Provide screens for all openings. Windows shall be straight, plumb, and true, and shall operate easily without binding.

SPECIAL NOTES:

FIXED GLASS:

See drawings for size and location of fixed glass. All glazing shall be guaranteed water tight and any glass which leaks shall be re-glazed. Size glass to meet minimum C. B. C. requirements.

SPECIAL NOTES:

SHOWER DOORS AND MIRRORS:

See drawings for size and location of shower doors and mirrors. Shower doors to have approved shatter-proof glass. Mirrors to be 1/4" polished plate glass.

SPECIAL NOTES: 3/8" CLR FRAMELESS STAR-FIRE TEMP. GL.

PROVIDE SHOP DWG'S FOR APPROVAL

HARDWARE:

An allowance of $ 5,000 is to be made for finish hardware. This is to include all door knobs, cabinet handles, door, pulls, towel bars, paper holders, etc.

SPECIAL NOTES: TO BE OWNER APPROVED

EMTEK OR EQUAL

PAINTING:

MATERIALS: Paint materials shall be as manufactured by the Kelly-Moore Co. or an approved equal, unless otherwise noted.

WORKMANSHIP: No painting or finishing shall be done under conditions which jeopardize the quality of the work. Surfaces to be finished shall be in proper condition to receive same. Each coat shall be applied at the proper consistency, free of runs, sags, brush marks, spattering, or any other evidence of poor workmanship. Surfaces shall be sanded smooth. Nail holes and imperfections in the wood shall be filled with material of the same color as the finish. All items having factory finish will not be painted. All other surfaces shall be painted or finished whether specifically mentioned herein or not.

EXTERIOR SURFACES: Wood siding, trim, fascia, decks, beams, railings, treat with a semi-transparent or heavy body penetrating stain unless noted otherwise. Exterior doors use two coats of exterior type spar varnish. Prime all galvanized metal and coat with exterior flat enamel.

INTERIOR SURFACES: Natural woods use semi-transparent stain and sealer. Cabinets and wood doors to be sanded, stained, sealed, and lacquered. Drywall in kitchen and bath areas to be sealed and stippled. Other drywall areas to have one coat of interior flat latex wall finish. Special care should be taken to preserve natural woodwork. Work shall be neat, clean and accurate so as not to damage finish of natural wood surfaces. All surfaces not intended to have paint shall be left in clean condition.

SPECIAL NOTES:

TILE:

Tile shall be installed in accordance with the best methods and construction practices. Tiles are to be soaked before applying and joints are to be kept neat, symmetrical and all lines true and straight. Joints and tile shall be thoroughly washed. Owner to select color.

SPECIAL NOTES: TO BE OWNER APPROVED

FLOORING MATERIALS:

An allowance of $ 85/SQ.YD. is to be made for floor coverings. This is to include all resilient flooring, carpets, and wood floors used in the project. Ceramic tile floors are not included in this allowance.

SPECIAL NOTES:

KITCHEN APPLIANCES:

Furnish and install the following: ENERGY STAR COMPLIANT TO BE OWNER APPROVED

PLUMBING:

The Plumbing Contractor shall design and install a complete plumbing system as indicated on the drawings. Pipes shall be sized adequately to accommodate the fixtures served. The Plumbing Contractor shall make all necessary connections to utilities shown on plot plan and install all piping, etc. required. Stop valves should be at each fixture or appliance. Plumb system for future soft water system. Plumb for a least 4 exterior hose bibs or more if the size of the house indicates. Provide plumbing for automatic dishwasher. Provide a pressure relief valve at water heater. Provide a pressure reducer if water pressure exceeds 50 PSI.

SPECIAL NOTES:

ELECTRICAL:

The Electrical Contractor will design his system for a complete and operating system. The drawings show only the location and type of outlets, lighting, including control switches. No extra charges will be paid for furnishing items not specified in the plans but required by the local electrical codes. Provide doorbell as standard item. Provide all recessed, under counter, and soffit lighting if indicated on plans.

ELECTRICAL FIXTURES:

Provide an allowance of $ 100/PER for fixtures not specified on plans and normal installation.

HEATING SYSTEM:

This system to be designed and installed by the Contractor doing the installation. Type of system:

ELECTRIC HEAT PUMP (SEE MECHANICAL SCHEMATICS)

GENERAL NOTES:

1. The CONTRACTOR and all sub-contractors shall guarantee and be responsible for and make good all defects due to faults of labor or materials in the work included in the contract for one year following the completion of the structure.

2. All sub-contractors will be responsible for damages caused by: poor workmanship, system failures, breakage, or their employees' irresponsibilities that cause additional time and expense to the general contractor. Sub-contractors will be charged for such items as they may occur for a period of one year after the home is completed.

8.15.23 MSH
5.22.24 MSH

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REMODEL & ADDITIONS TO THE
RENFREW RESIDENCE
14500 ARRETCH HILL ROAD - APN 537-12-012
LOS GATOS, CALIFORNIA

ARCH'L INTERIOR SPECIFICATIONS

11.14.22
NTS
MSH
2108

GENERAL

WHERE NOTED, SPECIAL INSPECTION AND TESTING SHALL BE PROVIDED BY A QUALIFIED INDEPENDANT SPECIAL INSPECTION AND TESTING AGENCY. THE SPECIAL INSPECTION AND TESTING AGENCY SHALL BE SELECTED FROM THE BUILDING DEPARTMENT'S APPROVED RECOGNITION LIST. SITE VISITS BY GEORGE REYNOLDS AND ASSOCIATES, STRUCTURAL ENGINEERS ARE NOT SPECIAL INSPECTIONS.

NO STRUCTURAL MEMBER SHALL BE CUT OR NOTCHED UNLESS SPECIFICALLY SHOWN, NOTED, OR APPROVED BY THE STRUCTURAL ENGINEER. ALL WORK SHALL COMPLY WITH THE 2022 CALIFORNIA BUILDING CODE, AND ALL APPLICABLE LOCAL CODES AND ORDINANCES.

CONTRACTOR SHALL SUBMIT COPIES OF TEST AND INSPECTION REPORTS TO THE ENGINEER AND BUILDING DEPARTMENT.

FOUNDATIONS

ALL GRADING AND SITE WORK SHALL BE DONE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT BY G2 EARTH, REPORT #HR53 (JULY 2022)

THE CONTRACTOR SHALL NOTIFY THE GEOTECHNICAL ENGINEER'S OFFICE A MINIMUM OF 48 HOURS PRIOR TO ALL FOOTING EXCAVATIONS TO ENSURE THAT THE ANTICIPATED SOIL AND ROCK CONDITIONS ARE CONSISTENT WITH THOSE NOTED IN THE GEOTECHNICAL REPORT. THE GEOTECHNICAL ENGINEER IS TO BE RETAINED TO PROVIDE OBSERVATION OF THE SITE PREPARATION AND RECOMPACTION, THE FOOTING EXCAVATIONS, AND THE PLACEMENT AND COMPACTION OF THE BASE ROCK.

THE GEOTECHNICAL ENGINEER SHALL PROVIDE A LETTER OF ACCEPTANCE FOR ALL FOUNDATION PREPARATION, BACKFILL, COMPACTION , ETC., PRIOR TO THE PLACEMENT OF ANY FOUNDATION CONCRETE. HE SHALL ALSO PREPARE A FINAL COMPREHENSIVE REPORT FOR THE BUILDING DEPARTMENT STATING THAT ALL WORK WAS DONE PER HIS GEOTECHNICAL REPORT, AND WHAT, IF ANY CHANGES WERE DONE DURING FOUNDATION CONSTRUCTION THAT WERE DIFFERENT FROM THE REVIEWED GEOTECHNICAL REPORT.

THE CONTRACTOR SHALL DIRECTLY CONTACT THE GEOTECHNICAL ENGINEER TO COORDINATE SITE VISITS, OBSERVATIONS, TESTS, ETC. THAT ARE REQUIRED BY THEIR OFFICE.

EXCAVATIONS SHALL CONFORM AS NEARLY AS POSSIBLE TO THE NEAT LINES REQUIRED BY THE SIZE AND SHAPE OF THE FOOTINGS SHOWN ON THE DRAWINGS. FOOTINGS SHALL BE CAST IN EARTH TRENCHES WITHOUT FORMING. OVER EXCAVATION SHALL BE BACK FILLED WITH CONCRETE. WET TRENCHES IMMEDIATELY BEFORE PLACING CONCRETE.

IF FILL IS REQUIRED, IT SHALL BE COMPACTED WITH OBSERVATION AND COMPACTION TESTING PERFORMED BY A REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER. PROVIDE NON-EXPANSIVE FILL AND PERFORM GRADING IN ACCORDANCE WITH GEOTECHNICAL REQUIREMENTS.

CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY SLOPES, TRENCHES, AND FOUNDATIONS EXCAVATED AT THE SITE AND THE DESIGN OF ANY REQUIRED TEMPORARY SHORING. SHORING, BRACING, AND BENCHING SHALL BE PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH THE STRICTEST GOVERNING SAFETY STANDARDS.

ALL FILL AREAS UNDER BUILDING AND PARKING AREAS SHALL BE COMPACTED TO MINIMUM 90 % DENSITY AND CERTIFIED BY A GEOTECHNICAL ENGINEER. PROVIDE NON-EXPANSIVE FILL AND PERFORM GRADING IN ACCORDANCE WITH GEOTECHNICAL REPORT.

DEEP EXCAVATIONS SHALL BE CUT AND SUPPORTED PER DIRECTION OF GEOTECHNICAL ENGINEER. DRILLED PIER HOLES SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER, WHO WILL DETERMINE THEIR FINAL DEPTH. NOTIFY STRUCTURAL ENGINEER BEFORE SHORTENING ANY PIERS. ALL GROUND WATER SHALL BE REMOVED FROM THE PIER HOLES PRIOR TO PLACING CONCRETE.

FOOTING EXCAVATIONS SHALL BE OBSERVED BY THE PROJECT GEOTECHNICAL ENGINEER PRIOR TO PLACING REINFORCING STEEL.

FOOTINGS SHALL NOT HAVE PLUMBING, CONDUIT, OR OTHER PENETRATIONS WITHOUT THE PRIOR APPROVAL BY GEORGE REYNOLDS AND ASSOCIATES, STRUCTURAL ENGINEERS. SUPPLEMENTAL REINFORCING AND / OR OTHER MODIFICATIONS SHALL BE REQUIRED FOR FOOTING PENETRATIONS PER THE DIRECTION OF GEORGE REYNOLDS AND ASSOCIATES, STRUCTURAL ENGINEERS.

DO NOT BACK FILL STEM WALL / PIERS OR REMOVE SHORING UNTIL 75% DESIGN STRENGTH HAS BEEN OBTAINED.

FOOTINGS SHALL NOT BE EXPOSED AT THE LOWEST FINISH GRADE.

DIMENSIONS

DIMENSIONS, UNLESS OTHERWISE SHOWN, ARE TO THE CENTER LINE OF COLUMNS AND BEAMS OR ROUGH CONCRETE SURFACES.

CONTRACTOR SHALL VERIFY, AND BE RESPONSIBLE FOR, ALL DIMENSIONS AND CONDITIONS ON THE JOB. NOTIFY THIS OFFICE OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN ON THESE DRAWINGS PRIOR TO ANY CONSTRUCTION.

CONCRETE

CONCRETE WORK SHALL CONFORM TO ALL REQUIREMENTS OF ACI 318-(LATEST EDITION), "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE", EXCEPT AS MODIFIED BELOW:

ALL CONCRETE SHALL BE REGULAR WEIGHT HARD ROCK, AND HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI (FOR QUALITY CONTROL ONLY). MAXIMUM SLUMP SHALL BE FOUR INCHES. USE TYPE II CEMENT PER ASTM C150. MAXIMUM AGGREGATE SIZE SHALL BE ¾ INCH.

THE WATER / CEMENT RATIO FOR ALL CONCRETE POURED DIRECTLY ONTO THE VAPOR BARRIER SHALL BE 0.45

CONCRETE FOR SITE FLATWORK SHALL HAVE A MINIMUM OF 2500 PSI, 28-DAY COMPRESSIVE STRENGTH. SPECIAL INSPECTION IS NOT REQUIRED FOR CONCRETE OR SITE FLATWORK, UNLESS NOTED OTHERWISE.

PLACE CONCRETE IN LAYERS NOT EXCEEDING 18 INCHES IN DEPTH. FREE FALL OF CONCRETE SHOULD NOT EXCEED 5 FEET IN UNEXPOSED WORK NOR 3 FEET IN EXPOSED WORK. PLACE CONCRETE IN LEVEL LIFTS THROUGHOUT FORM WORK RECEIVING THE MATERIAL.

ALL CONCRETE WORK SHALL BE CAST-IN-PLACE UNLESS NOTED OTHERWISE. ALL FORMS SHALL BE THOROUGHLY MOISTENED BEFORE CONCRETE IS PLACED.

BEFORE DEPOSITING NEW CONCRETE ON OR AGAINST SET CONCRETE, CLEAN, SATURATE, AND SLUSH A COAT OF CONCRESIVE LIQUID 1001LPL BY MASTER BUILDERS OVER THE EXISTING CONCRETE, PER MANUFACTURER'S INSTRUCTIONS.

CONSTRUCTION JOINT CONTACT SURFACES SHALL BE ROUGHENED TO ¼".

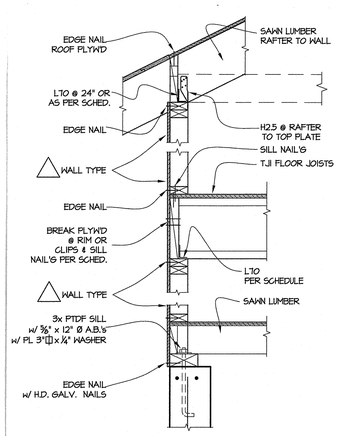
CONSOLIDATE ALL CONCRETE BY VIBRATION, SPADING, RODDING OR FORKING. THOROUGHLY WORK CONCRETE AROUND REINFORCEMENT AND EMBEDDED ITEMS. ELIMINATE ALL AIR OR STONE POCKETS WHICH MAY CAUSE HONEYCOMBING, PITTING OR PLANES OF WEAKNESS.

OPERATE VIBRATORS ONLY WITH EXPERIENCED PERSONNEL. LIMIT DURATION OF VIBRATION TO THAT NECESSARY TO PRODUCE SATISFACTORY CONSOLIDATION WITHOUT CAUSING OBJECTIONABLE SEGREGATION. DO NOT INSERT VIBRATOR INTO LOWER COURSES THAT HAVE BEGUN TO SET. UNDER NO CONDITION IS VIBRATOR TO BE PLACED AGAINST REINFORCING STEEL.

MINIMUM ANCHOR BOLT IS 5/8" DIA. X 12" @ 48" O.C. WITH A MINIMUM OF TWO BOLTS PER SILL PIECE, WITHIN 12" OF EACH END, BUT NO CLOSER THAN 4" FROM EACH END. ANCHOR BOLTS LESS THAN 1-1/2" FROM SILL EDGE SHALL BE REPLACED WITH EPOXY SET ANCHOR BOLT (EMBED 6" MIN). PROVIDE PL 3" SQUARE x ¼" WASHER WITH ALL ANCHOR BOLTS. ALL BOLTS & PLATES SHALL BE HOT DIP GALVANIZED. MINIMUM ANCHOR BOLT EMBEDMENT SHALL BE 8 INCHES.

SET ALL POST BASES FLUSH WITH TOP OF CONCRETE.

EXPANSION ANCHOR BOLTS AND POWER DRIVEN NAILS SHALL NOT BE INSTALLED UNTIL CONCRETE HAS REACHED DESIGN STRENGTH.



7 TYPICAL SHEAR TRANSFER DETAILS

REINFORCING STEEL

FURNISH AND ERECT REINFORCING STEEL IN ACCORDANCE WITH THE ACI MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES.

USE DEFORMED REINFORCED BAR PER ASTM A615. FOR #3 BAR AND SMALLER, USE GRADE 40. FOR #4 BAR AND LARGER, USE GRADE 60.

ALL REINFORCEMENT SHALL BE CONTINUOUS. STAGGER SPLICES IN ADJACENT BARS. CONTACT SPLICES SHALL LAP 40 DIAMETERS MINIMUM.

HOLD REINFORCEMENT IN ITS TRUE HORIZONTAL AND / OR VERTICAL POSITION WITH DEVICES SUFFICIENT TO PREVENT DISPLACEMENT.

REINFORCING STEEL SHALL NOT BE WELDED. NO EXCEPTIONS.

SUPPORT HORIZONTAL STEEL AT BOTTOM OF FOOTING ON MORTAR BLOCKS. MINIMUM 3-INCH CLEARANCE FOR SURFACES POURED AGAINST EARTH, 2" CLEARANCE AT FORMED SURFACES EXPOSED TO EARTH, AND MINIMUM 1.5 INCH U.N.O.

STRUCTURAL STEEL

ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN CONFORMANCE WITH THE AISC MANUAL OF STEEL CONSTRUCTION (LATEST EDITION).

ALL STRUCTURAL STEEL WIDE FLANGE SHAPES SHALL CONFORM TO ASTM A-572 GRADE 50, WITH SPECIAL REQUIREMENTS PER AISC TECHNICAL BULLETIN #3, DATED MARCH 1987. ALL STEEL CHANNELS, ANGLES, PLATES, AND BARS SHALL CONFORM TO ASTM A-36. ALL TUBE COLUMNS SHALL CONFORM TO ASTM A-500, GRADE B. ALL PIPE COLUMNS SHALL CONFORM TO ASTM A-53 GRADE B.

THE ALIGNMENT OF COLUMNS SHALL BE WITHIN THE TOLERANCES SPECIFIED IN THE AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES.

PROVIDE SPECIAL INSPECTION FOR ALL WELDING CONFORMING TO C.B.C. SECTION 1704.3 ALL WELDED MOMENT CONNECTIONS SHALL BE INSPECTED AND NONDESTRUCTIVE TESTED AS PER C.B.C. SECTIONS 1705.5.2 AND SECTION 1703. ALL WELDING SHALL BE MADE BY E70XX LOW HYDROGEN ELECTRODES.

WELD SIZES SHOWN ARE MINIMUM AND MAY HAVE TO BE INCREASED ACCORDING TO THE LIMITATIONS STATED IN THE AISC SECTION J2.

METAL PRIMER SHALL CONFORM WITH FEDERAL SPECIFICATION TT-P-645A FOR SHOP COAT PAINT. APPLY ONE COAT TO ALL SURFACES EXCEPT AT AREAS OF FIELD WELDING, HIGH STRENGTH BOLTING AND WHERE EMBEDDED IN CONCRETE. FIELD PAINT ALL EXPOSED FIELD WELDS.

ALL ANCHOR BOLTS AND THREADED RODS SHALL BE A307 STEEL, U.N.O.

ALL BOLTED STEEL CONNECTIONS SHALL BE MADE WITH A325N BOLTS U.N.O.

ALL NUTS SHALL BE INSTALLED OVER PLATE WASHERS OR HEAVY CUT WASHERS.

ALL STRUCTURAL STEEL TO BE EMBEDDED IN CONCRETE OR TO RECEIVE FIREPROOFING MATERIAL SHALL BE CLEAN AND FREE OF PAINT, OIL, OR DIRT.

PROVIDE ENGINEER WITH STEEL SHOP DRAWINGS TO AVOID ERRORS.

ALL WELDING SHALL BE ELECTRIC ARC PER AWS D1.1 LATEST EDITION, WITH E70XX ELECTRODE.

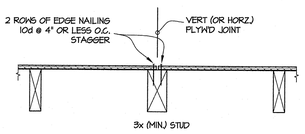
PROVIDE WELDERS CERTIFIED FOR THE TYPE OF WELD CALLED FOR ON DRAWING AS PER CALIFORNIA BUILDING CODE (C.B.C. 1704.3) REQUIREMENTS.

REFER TO SHEAR TRANSFER DETAILS							
SHEAR WALL TYPE	PLYWD	EDGE NAIL'G	FIELD NAIL'G	SHEAR TRANSFER		BLK'G @ FLOOR	ANCHOR BOLTS
				SILL NAIL	L70 CLIPS		
1	½" CDX	10d @ 6"	10d @ 12"	16d @ 4"	24" O.C.	2x	⅝" Ø @ 48"
2*	½" CDX	10d @ 4"	10d @ 12"	16d @ 3"	16" O.C.	4x	⅝" Ø @ 32"
3*	½" CDX	10d @ 3"	10d @ 12"	(2) x 16d @ 4"	12" O.C.	4x	⅝" Ø @ 24"
4*	½" CDX	10d @ 2"	10d @ 12"	(2) x 16d @ 4"	10" O.C.	4x	⅝" Ø @ 18"
5*	¾" CDX	10d @ 2"	10d @ 12"	SEE DETAILS →			

NOTE: - BLOCK ALL EDGES OF PLYWD
* - PROVIDE 3x (MIN.) STUDS & BLK'G @ ALL PLYWD BUTT JOINTS AS PER DETAIL 8/25

- DO NOT BREAK PLYWD SKIN BY OVERDRIVING NAILS
- PRE-DRILL AS REQ'D TO AVOID SPLITTING SILLS, ETC.
- SHEAR TRANSFER BLOCKS & CLIPS MAY BE OMITTED IF PLYWD @ SHEAR WALL IS CONTINUOUS PAST FLOOR FRAMING (I.E. @ EXTERIOR WALLS)

6 SHEAR WALL SCHEDULE



5 PLYW'D JOINT DETAIL

27	MST27 @ 4x POST. LAP & NAIL TO BEAM IN FLOOR BELOW
2	HDU2 @ 4x POST w/ ⅝" Ø THROUGH FLOOR TO BRACKET @ POST BELOW OR SSTB24 ANCHOR @ NEW FND OR ⅝" Ø ROD TO CUSTOM BRACKET AS DETAIL 1, 2, & 4 ON SHT 14
5	HDU5 @ 4x POST w/ ⅝" Ø THROUGH FLOOR TO BRACKET @ POST BELOW OR SSTB24 ANCHOR @ NEW FND OR ⅝" Ø ROD TO CUSTOM BRACKET AS DETAIL 1, 2, & 4 ON SHT 14
8	HDU8 @ 4x POST w/ ⅞" Ø ROD THROUGH FLOOR TO BRACKET @ POST BELOW OR SSTB28 ANCHOR @ NEW FOUNDATION OR ⅞" Ø ROD TO CUSTOM BRACKET AS DETAILS 1, 2 & 4 ON SHT. 14
14	HDU14 @ 4x8 POST w/ SBI x 30 ANCHOR AS DETAIL 12/16

1. LOCATE HD's AT ENDS OF SHEAR PANELS
2. EDGE NAIL SHEAR WALL PLYWD TO ALL POSTS @ HD's
3. HARDMOUNT ANCHORS TO FORMWORK PRIOR TO CONCRETE POUR
4. USE SIMPSON CO. "SET-XP" EPOXY OR APPROVED EQUAL (AS REQ'D)

4 HOLDOWN SCHEDULE

TIMBER

ALL WOOD BOLT CONNECTIONS SHALL HAVE A WASHER UNLESS A STEEL PLATE IS SPECIFIED. NO COUNTERSINKING PERMITTED WITHOUT ENGINEER'S APPROVAL.

LUMBER SHALL CONFORM TO GRADING RULES OF WWPA, W.C.L.I.B. RULES #17, OR OTHER PER C.B.C. 2303.1. MAXIMUM MOISTURE CONTENT SHALL NOT EXCEED 19%.

ALL EXPOSED JOISTS, BEAMS, & GLULAMS SHALL HAVE A PRESSURE PRESERVATIVE TREATMENT UNLESS ALL-HEART REDWOOD IS SPECIFIED.

ALL FIELD CUTS AND DRILLED HOLES FOR EXPOSED MEMBERS SHALL BE TREATED IN ACCORDANCE WITH AMERICAN WOOD PRESERVERS ASSOCIATION AWPA M4.

LUMBER SHALL BE GRADE MARKED DOUGLAS FIR.

JOISTS, LEDGERS, PURLINS, AND BEAMS	NO.1 OR BETTER
RAFTERS AND POSTS	NO.1 OR BETTER
STUDS, SILLS, & PLATES	NO.2 OR BETTER

ALL SILLS AND FRAMING MEMBERS IN CONTACT WITH CONCRETE SHALL BE PRESSURE-TREATED DOUGLAS FIR. THE PRESERVATIVE TREATMENT UTILIZED SHALL BE PERFORMED IN ACCORDANCE WITH AWPA STANDARD C-2.

THE MANUFACTURE AND FABRICATION OF ANY STRUCTURAL GLUED LAMINATED TIMBER SHALL BE UNDER THE SUPERVISION OF QUALIFIED PERSONNEL. PROVIDE APA-EWS CERTIFICATES TO THE APPLICABLE BUILDING INSPECTOR.

PROVIDE A.I.T.C. CERTIFICATE WITH ALL GLULAM BEAMS. PROVIDE NO CAMBER WITH GLULAM BEAMS UNLESS NOTED OTHERWISE. PROVIDE (24F-V4) STRESS GRADE UNLESS NOTED OTHERWISE.

ALL HANGERS, ETC. SHALL BE ATTACHED DIRECTLY TO THE FRAMING MEMBERS. DO NOT NAIL HARDWARE OVER PLYWOOD OR SHIMS, U.N.O.

OSB PANELS MAY BE USED IN LIEU OF PLYWOOD FOR GREEN POINTS OR ECONOMIC REASONS. ALL NOTES FOR PLYWOOD APPLY TO SUBSTITUTED OSB PANELS.

ALL PLYWOOD SHEATHING APPLIED TO WALLS, FLOORS, AND / OR ROOFS SHALL HAVE A ⅛-INCH GAP BETWEEN ADJACENT SHEETS.

TYPICAL PLYWOOD NAILING: SET ALL NAIL GUNS TO AVOID BREAKING THE TOP PLYWOOD LAYER. USE A HAMMER TO SEAT NAILS FLUSH TO THE PLYWOOD. NAILS THAT BREAK THE SURFACE OF THE PLYWOOD ARE UNACCEPTABLE AND REQUIRE SUPPLEMENTAL NAILS. NAILS SHALL BE ¾" MINIMUM FROM THE PLYWOOD EDGES AND SHALL BE INSTALLED PERPENDICULAR TO THE PLYWOOD SURFACE. NAILS LOCATED TOO CLOSE TO A PANEL EDGE ARE UNACCEPTABLE AND REQUIRE SUPPLEMENTAL NAILS. NUMEROUS NAILING VIOLATIONS WILL VOID THE SHEET AND REQUIRE THE PANEL TO BE REPLACED.

ROOF PLYWOOD SHALL BE OF THICKNESS AS PER PLANS WITH A MIN. A.P.A. RATING OF 24 / 0 U.N.O. MIN. NAILING IS TO BE 10d @ 6" O.C. INTERMEDIATE FRAMING U.N.O. UNSUPPORTED PLY EDGES SHALL BE SUPPORTED BY BLOCKING OR PLYWOOD CLIPS.

FLOOR AND DECK PLYWOOD SHALL BE ¾" WITH A MIN. A.P.A. RATING OF 40 / 20, U.N.O. WHERE NOTED ON THE PLANS, DECK PLYWOOD SHALL HAVE A C-C EXTERIOR EXPOSURE RATING. OTHERWISE, EXPOSURE 1 CDX PLYWOOD SHALL BE USED. MIN. NAILING IS TO BE 10d @ 6" O.C. EACH EDGE. EACH SHEET, AND 10d @ 10" O.C. AT INTERMEDIATE FRAMING U.N.O. UNSUPPORTED PLYWOOD EDGES SHALL BE EITHER T&G OR SUPPORTED BY BLOCKING. FLOOR PLYWOOD SHALL BE GLUED TO SUPPORTING JOISTS AND BLOCKING.

ALL ROOF AND FLOOR PLYWOOD SHALL BE APPLIED WITH THE FACE GRAIN ORIENTED PERPENDICULAR TO THE DIRECTION OF THE SUPPORTIVE FRAMING U.N.O.

ALL FLOORS AND ROOFS SHALL BE CONSTRUCTED WITH PLYWOOD SHEETS NOT LESS THAN FOUR FEET BY EIGHT FEET. EACH PANEL SHALL BE AT LEAST 24 INCHES IN WIDTH. THE ADJACENT SHEET MAY HAVE TO BE TRIMMED TO ACCOMODATE THIS REQUIREMENT. PANELS LESS THAN 24 INCHES IN WIDTH SHALL HAVE ALL EDGES SUPPORTED BY EITHER FRAMING MEMBERS OR BLOCKING.

ALL ROOF OR FLOOR FRAMING SHALL BE 3-INCH NOMINAL OR WIDER AND NAILS SHALL BE STAGGERED WHERE DIAPHRAGM NAILS ARE SPACED 2 INCHES, 2½ AND 3 INCHES ON CENTER AS PER TABLE 2306.2.1(1) OF THE 2019 C.B.C.

THE EDGES OF ALL SHEAR WALL PLYWOOD PANELS SHALL BE BLOCKED WITH A MINIMUM OF 2x MATERIAL. EACH PANEL SHALL BE AT LEAST 24 INCHES IN WIDTH -- THE ADJACENT SHEET MAY HAVE TO BE TRIMMED TO ACCOMMODATE THIS REQUIREMENT. ALL SHEAR WALL PANEL EDGES SHALL BE BACKED WITH 3x MATERIAL WHERE DESIGNATED, PER C.B.C. TABLE 2306.3

PLYWOOD SHEAR WALL HOLDOWN LOCATIONS: THE NEW HOLDOWN LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE. THE HOLDOWNS AND HOLDOWN STUDS SHALL BE LOCATED AS CLOSE TO THE SHEAR WALL ENDS AS POSSIBLE, U.N.O. HOLDOWNS AND HOLDOWN STUDS SHALL NOT BE LOCATED GREATER THAN 12-INCHES FROM THE END OF THE SHEAR WALL, U.N.O.

ALL SOLID-SAWN RECTANGULAR LUMBER BEAMS, RAFTERS AND JOISTS SHALL BE SUPPORTED LATERALLY TO PREVENT ROTATION OR LATERAL DISPLACEMENT IN ACCORDANCE WITH N.D.S. 3.3.3

ROOF JOISTS OR RAFTERS OF MORE THAN 8-INCH DEPTH SHALL BE PROVIDED WITH BRIDGING EVERY 10 FEET. BRIDGING SHALL BE IN ACCORDANCE WITH N.D.S. 3.3.3

ALL BLOCKING SHALL BE FIRMLY ATTACHED TO THE SUPPORTING FRAMING WITH TOE NAILS OR FRAMING CLIPS.

USE COMMON NAILS. WHERE NOT SPECIFIED OTHERWISE, THE NAILING REQUIREMENTS OF CBC PERTAIN.

USE STRONG-TIE METAL CONNECTORS BY SIMPSON CO., OR APPROVED EQUAL. PROVIDE NAILING AS PER SIMPSON CO. SPECIFICATIONS.

ALL FRAMING HARDWARE AND FASTENERS EXPOSED TO WEATHER OR AT PRESSURE TREATED LUMBER SHALL BE HOT-DIPPED GALVANIZED 2.0 oz/S.F., STAINLESS STEEL OR SILICON BRONZE.

BOLT HOLES SHALL BE NOMINAL DIAMETER OF BOLT PLUS 1/16 INCH. ALL WOOD BOLT CONNECTIONS SHALL HAVE A WASHER UNLESS STEEL PLATE IS SPECIFIED. DO NOT COUNTERSINK.

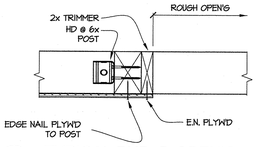
TYPICAL TOP PLATE SPLICE: MINIMUM LAP SHALL BE FOUR FEET LONG NAILED WITH 16d @ 4" O.C. UNLESS NOTED OTHERWISE.

PROVIDE DOUBLE JOIST UNDER ALL PARALLEL WALLS U.N.O.

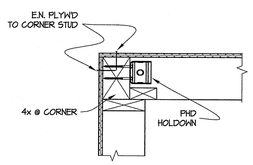
FOR SHEAR WALL NAILING, ANCHOR BOLTS, AND SHEAR TRANSFER NAILING, SEE SHEAR WALL SCHEDULE.

MANUFACTURED WOOD PRODUCTS SUPPLIED BY (WEYERHAEUSER ILEVEL (OR APPROVED EQUAL) SHALL BE "SILENT FLOOR SYSTEM" TJI FLOOR JOISTS, (1.5E & 1.3E) TIMBERSTRAND LSL BEAMS, (1.9E) MICRO=LAM LVL, AND (2.0E) PARALLAM PSL IN THE PLANS. PROVIDE ALL BLOCKING, BRACING, WEB STIFFENER'S & FILLER BLOCKS @ WEBS AS REQUIRED BY MANUFACTURER & BUILDING CODE FOR A COMPLETE STRUCTURAL SYSTEM.

GLULAM BEAMS (24 F-V4) OF WIDTHS 3 ½" & 5 ½" SHALL BE "X-BEAMS" AS SUPPLIED BY ROSBORO SPRINGFIELD, OR. PHONE: 1-888-323-2304, info@rosboro.com OR APPROVED EQUAL



3 TYPICAL PHD @ OPEN'G



2 TYPICAL PHD @ CORNER

EPOXY CONNECTIONS

USE "SIMPSON" SET-XP EPOXY FOR ALL EPOXYSET THREADED RODS, BOLTS, AND / OR REINFORCING BARS SET INTO CONCRETE. EPOXY INJECTION SHALL BE PERFORMED IN ACCORDANCE WITH THE MANUFACTURER'S PROCEDURES. PROVIDE SPECIAL INSPECTION DURING THE INSTALLATION OF THE ANCHORS, IN ACCORDANCE WITH SECTION 1704.4 OF THE 2022 C.B.C.

"SIMPSON" SET ET, ETF, AND / OR ETR EPOXY SHALL NOT BE USED IN SUBSTITUTION FOR "SIMPSON" SET-XP EPOXY. THE USE OF "SIMPSON" ET, ETF, AND / OR ETR EPOXY IS UNACCEPTABLE AND WILL BE REJECTED.

OMISSIONS

CONTRACTOR SHALL FAMILIARIZE HIMSELF / HERSELF WITH ALL CONDITIONS OF THE PROJECT AND BE RESPONSIBLE FOR ALL WORK REQUIRED TO COMPLETE THE PROJECT EVEN IF NOT SPECIFICALLY MENTIONED ON DRAWINGS.

IN THE EVENT THAT CERTAIN FEATURES OF THE WORK ARE NOT FULLY SHOWN ON THE DRAWINGS OR CALLED FOR IN THE GENERAL NOTES, THEN THEIR CONSTRUCTION SHALL BE OF THE SAME CHARACTER AS FOR SIMILAR CONDITIONS THAT ARE SHOWN OR CALLED FOR.

SPECIAL INSPECTIONS & TESTING

1. SPECIAL GRADING, EXCAVATION, AND FILLING
   - ☒ PERIODIC INSPECTION - PER GEOTECHNICAL ENGINEER
   - ☒ SUBGRADE TESTS
   - ☒ COMPACTION TESTS
2. STRUCTURAL WELDING
   - PERIODIC VISUAL INSPECTION
     - ☒ FILLET WELDS ≤ ¾"
   - CONTINUOUS VISUAL INSPECTION
     - ☒ ALL WELDING > 5/16"
     - ☐ REINFORCING STEEL - NOT PERMITTED
     - ☐ OTHER
3. SHEAR WALL NAIL'G:
   - ☒ ALL WALLS NAILED @ 4" O.C. OR LESS

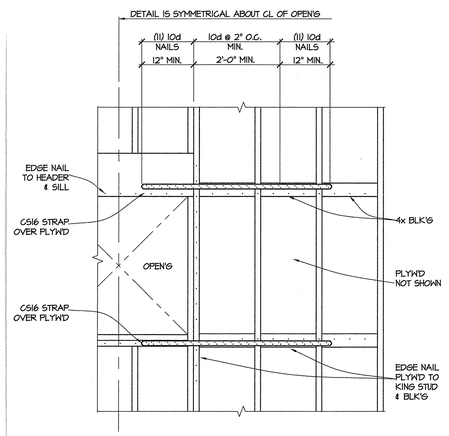
NOTES:
A. SPECIAL INSPECTIONS DO NOT NEGATE THE C.B.C. REQUIREMENTS FOR THE APPLICABLE BUILDING DEPARTMENT INSPECTIONS.
B. REFER TO THE GENERAL NOTES FOR MORE INFORMATION.
C. SITE VISITS BY G. REYNOLDS AND ASSOC. WILL ONLY BE CONSIDERED "SPECIAL INSPECTIONS" WHEN ALLOWED BY THE BUILDING DEPT. (LIMITED TO INSPECTIONS OF EPOXY SET ANCHORS AND NAILING OF PLYWOOD SHEAR WALLS) AND ARRANGED WITH THE OWNER / CONTRACTOR PRIOR TO THE SITE VISIT.

PROJECT DESIGN INFORMATION:

ROOF LIVE LOAD:	20 PSF
FLOOR LIVE LOAD:	40 PSF
ALLOWABLE SOIL BEARIG CAPACITY: PER GEOTECH. REPORT	PIER & GRADE BEAM (SEE REPORT)

WIND AND EARTHQUAKE DESIGN DATA
PURSUANT TO 2022 C.B.C. SECTIONS 1603.1.4 AND 1603.1.5

BASIC WIND SPEED:	110 MPH
WIND EXPOSURE:	'B'
RISK CATEGORY	II
SEISMIC IMPORTANCE FACTOR	1.0
Ss	2.447
S1	0.888
SITE CLASS	D
Sds	1.958
SITE DESIGN CATEGORY	D
DESIGN BASE SHEAR BEDROOM ADD.	24,300 LBS
MUSIC / SHOP	12,250 LBS
CABANA	6,100 LBS
Cs	0.30
R	6.5
ANALYSIS PROCEDURE USED.	ASD
BASIC SEISMIC FORCE-RESISTING SYSTEM: LIGHT FRAMED WALLS SHEATHED WITH WOOD STRUCTURAL PANELS	



1 REINFORCED OPEN'G

8·15·23	NSH
5·22·24	NSH

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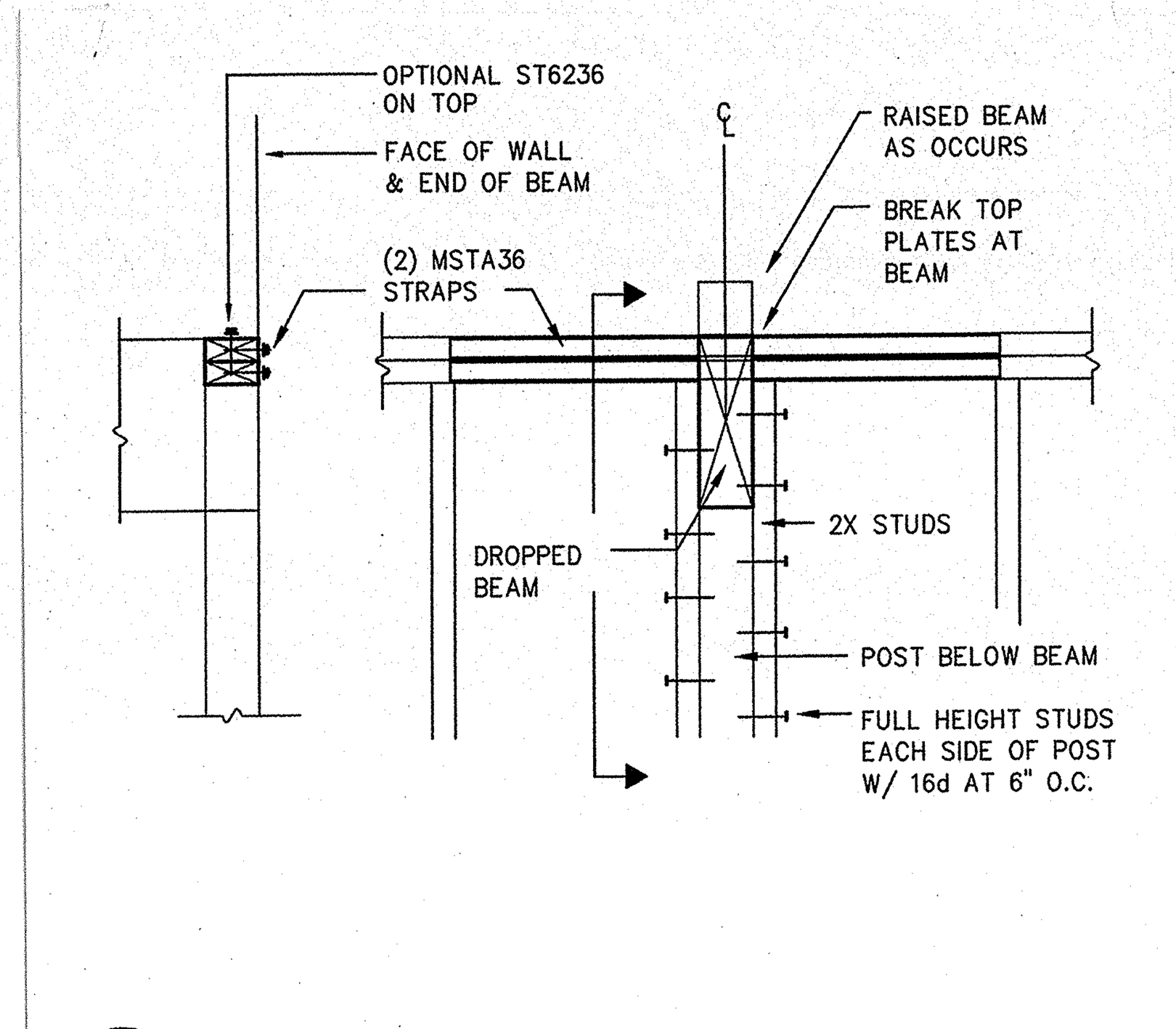
GRReynolds & Associates
STRUCTURAL ENGINEERS
831 426 3837
117 Youngpool Avenue
Santa Cruz, CA 95060

REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD - APN 537-12-012
LOS GATOS, CALIFORNIA

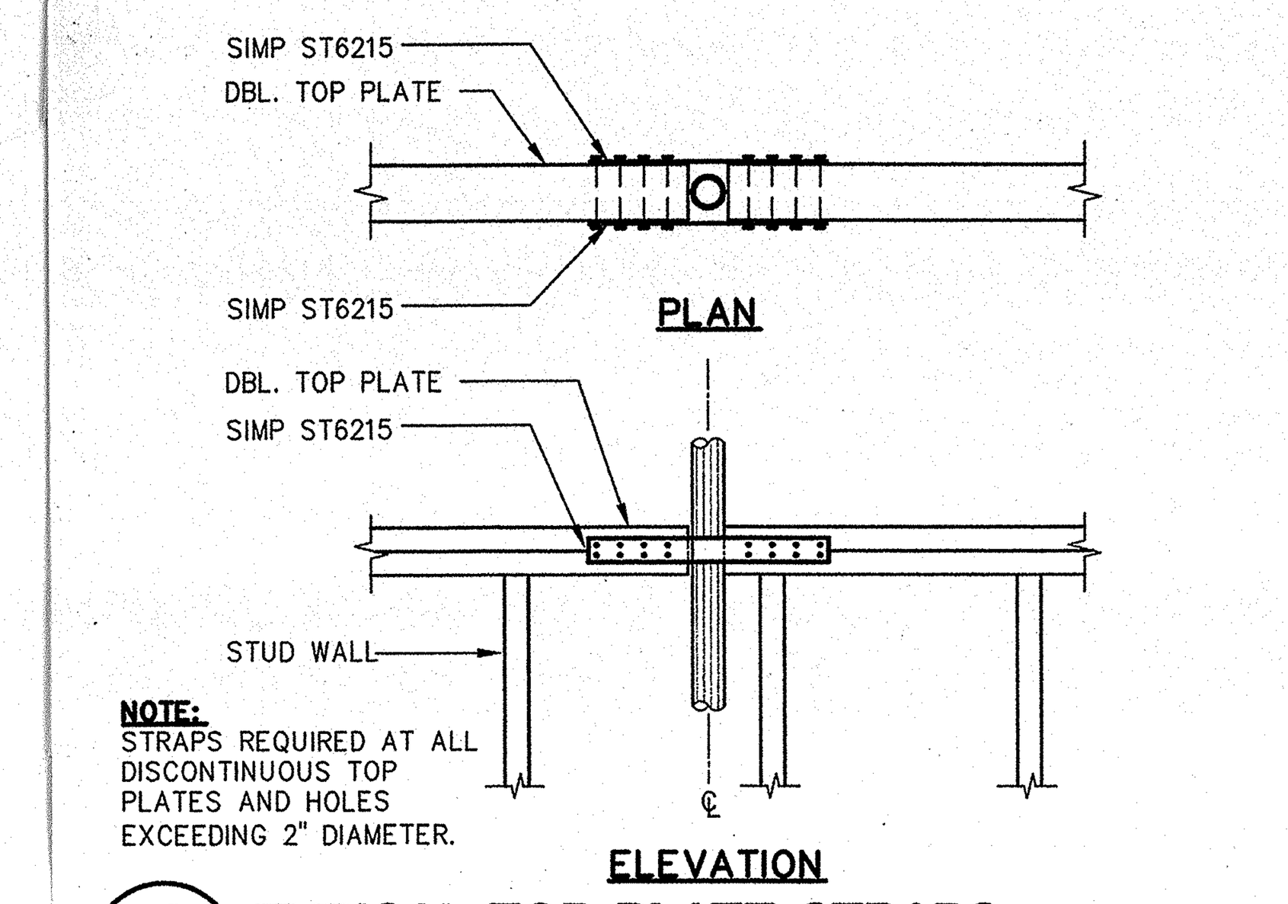
STRUCTURAL SPECIFICATIONS & NOTES
S1

11·14·22
NTS
MSH GR
2108/2221

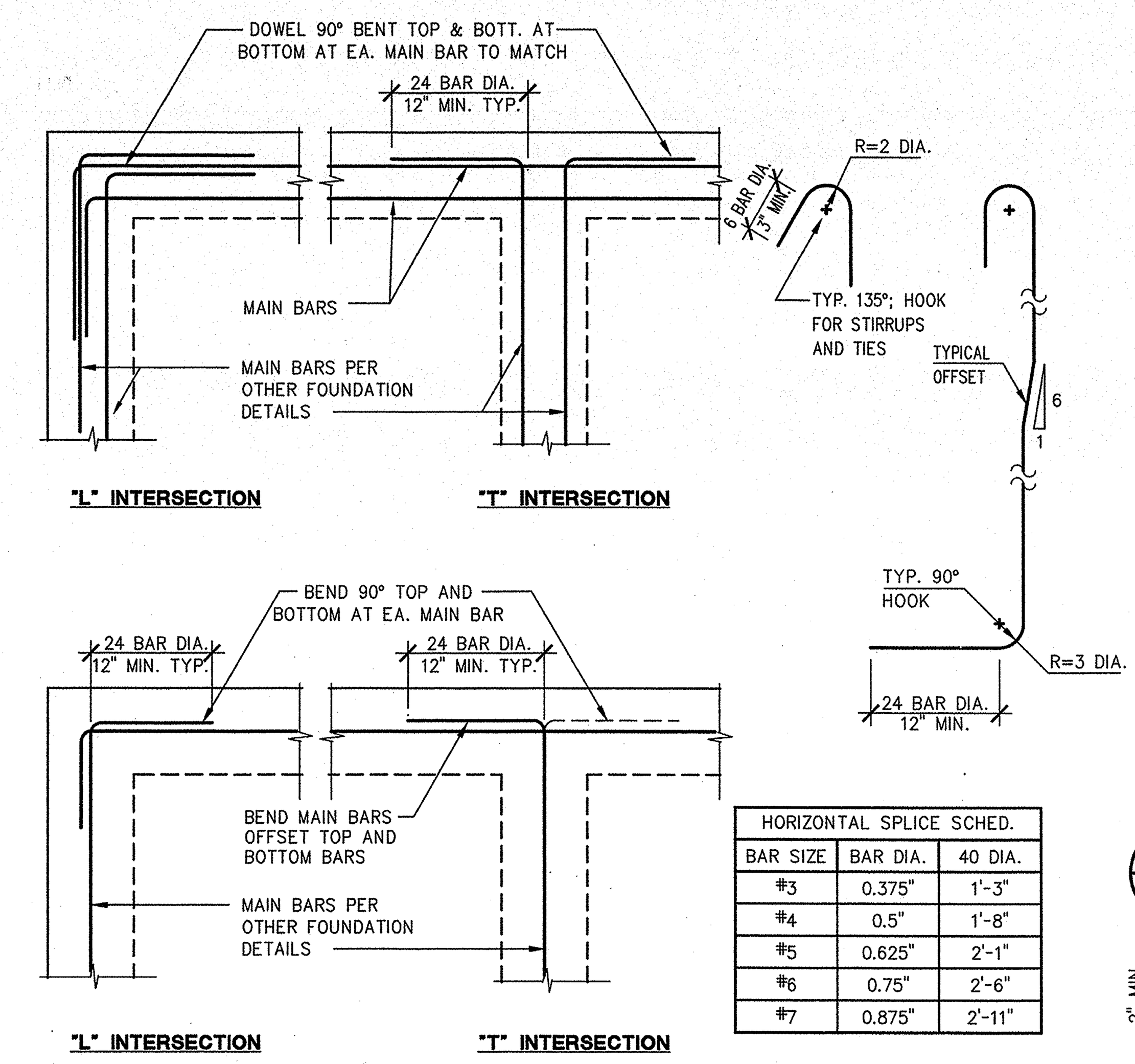
25



14 TYPICAL TOP PLATE SPLICE AT BEAM CONNECTION

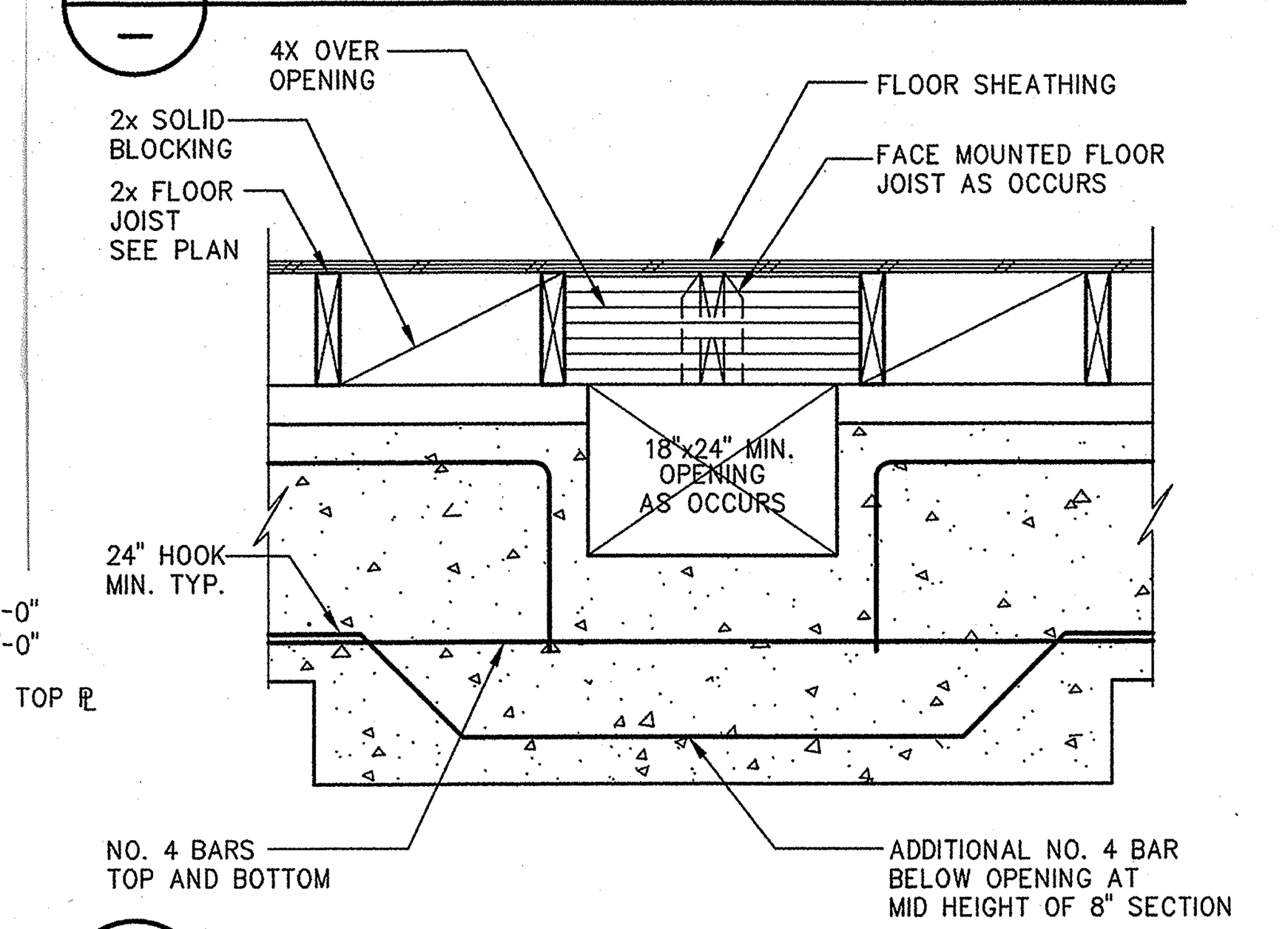


10 TYPICAL TOP PLATE STRAPS

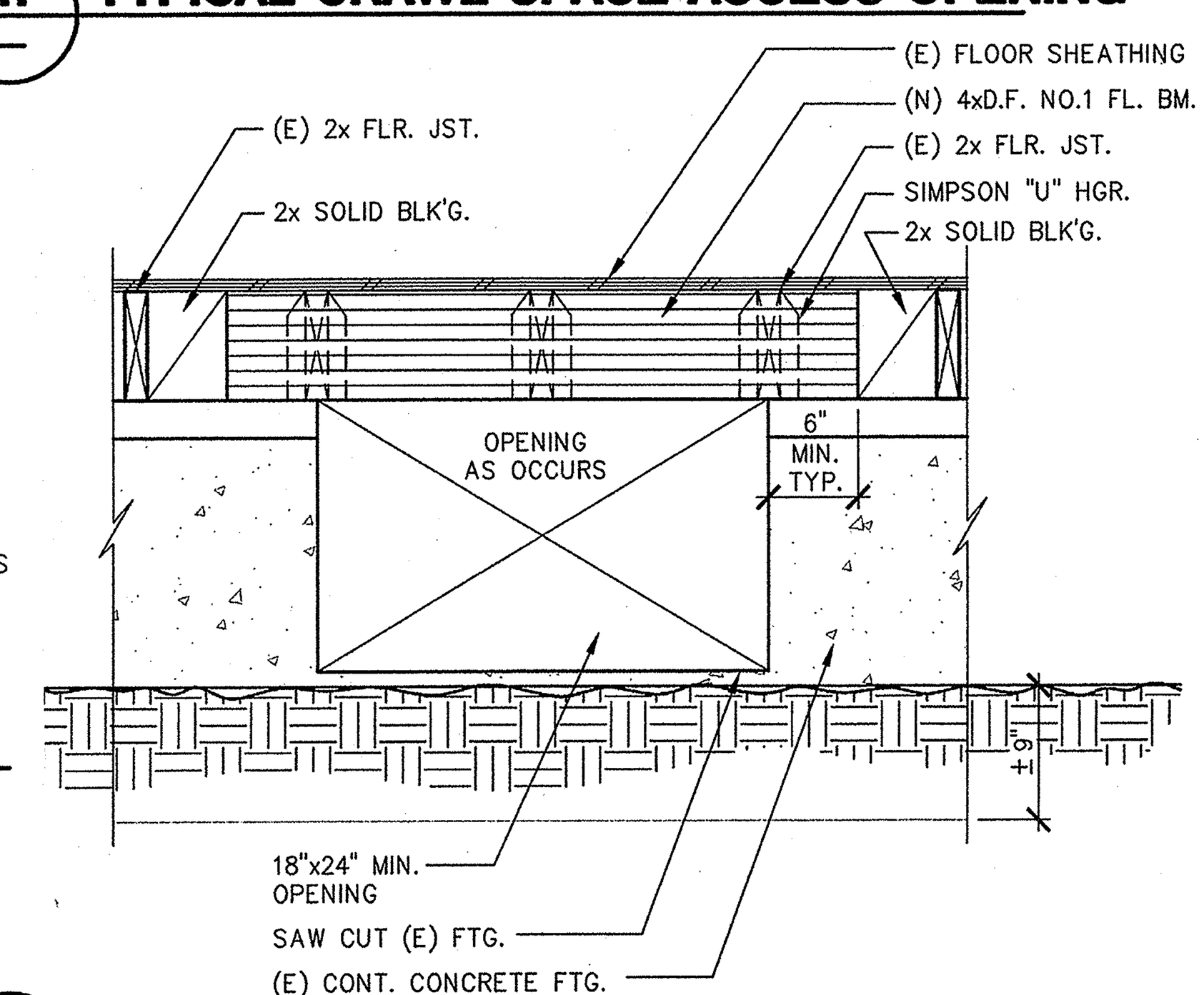


HORIZONTAL SPLICE SCHED.		
BAR SIZE	BAR DIA.	40 DIA.
#3	0.375"	1'-3"
#4	0.5"	1'-8"
#5	0.625"	2'-1"
#6	0.75"	2'-6"
#7	0.875"	2'-11"

7 TYP. HORIZONTAL CONCRETE REINFORCEMENT

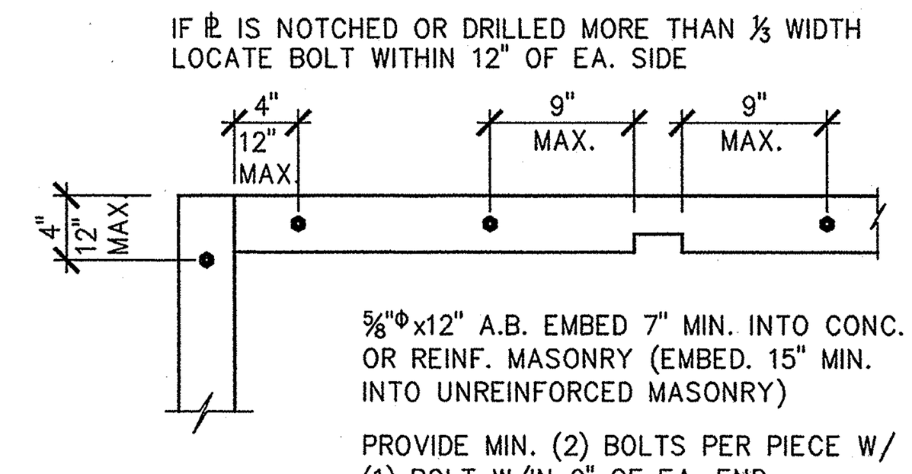


11 TYPICAL CRAWL SPACE ACCESS OPENING



12 TYPICAL CRAWL SPACE ACCESS OPENING

IF ℄ IS NOTCHED OR DRILLED MORE THAN ½ WIDTH LOCATE BOLT WITHIN 12" OF EA. SIDE



⅝"Φx12" A.B. EMBED 7" MIN. INTO CONC. OR REINF. MASONRY (EMBED. 15" MIN. INTO UNREINFORCED MASONRY)

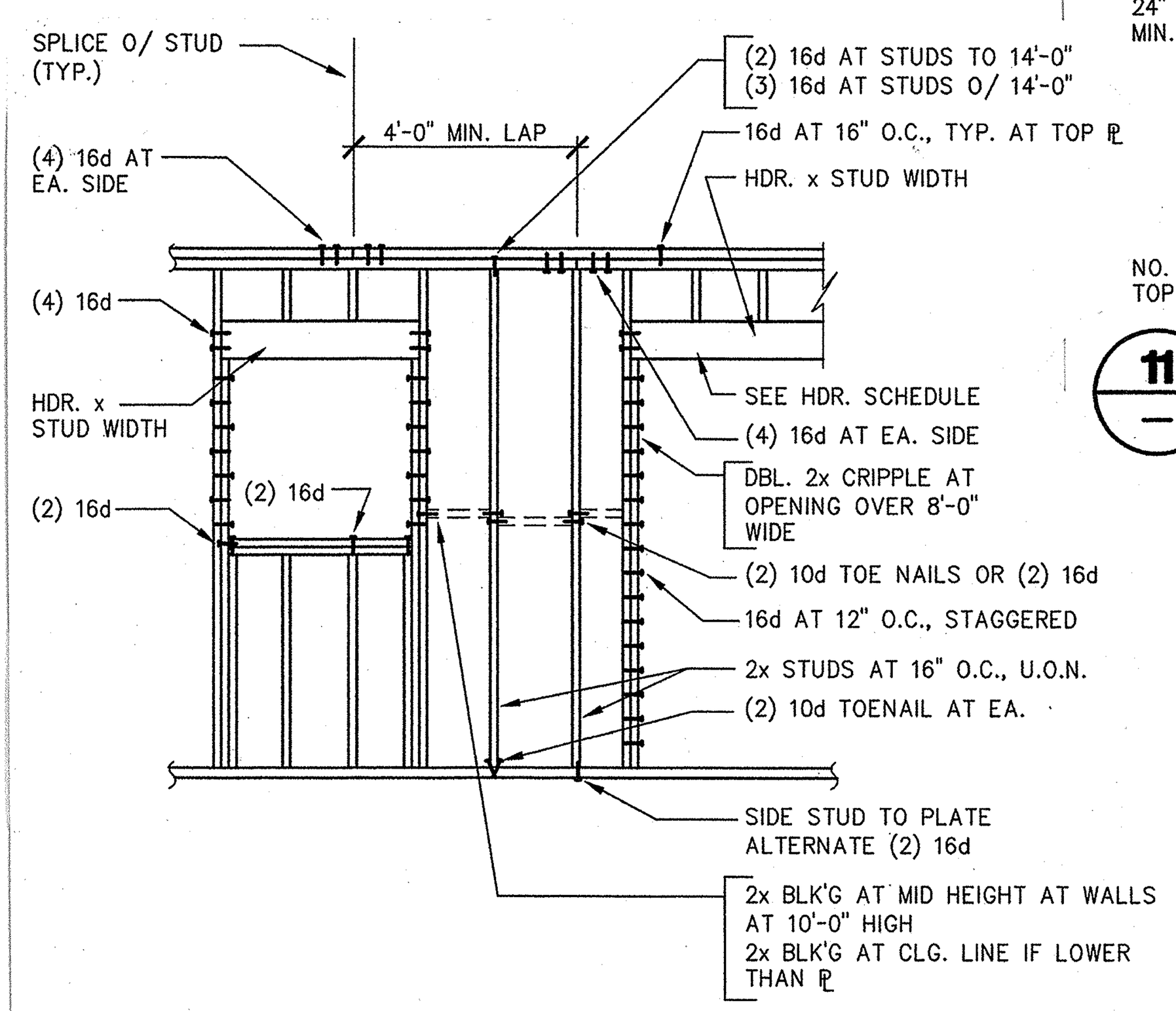
PROVIDE MIN. (2) BOLTS PER PIECE W/ (1) BOLT W/IN 9" OF EA. END.

SPACE A.B.'s AT 48" O.C. FOR ONE STORY AND 48" O.C. AT TWO STORY BUILDING AREAS.

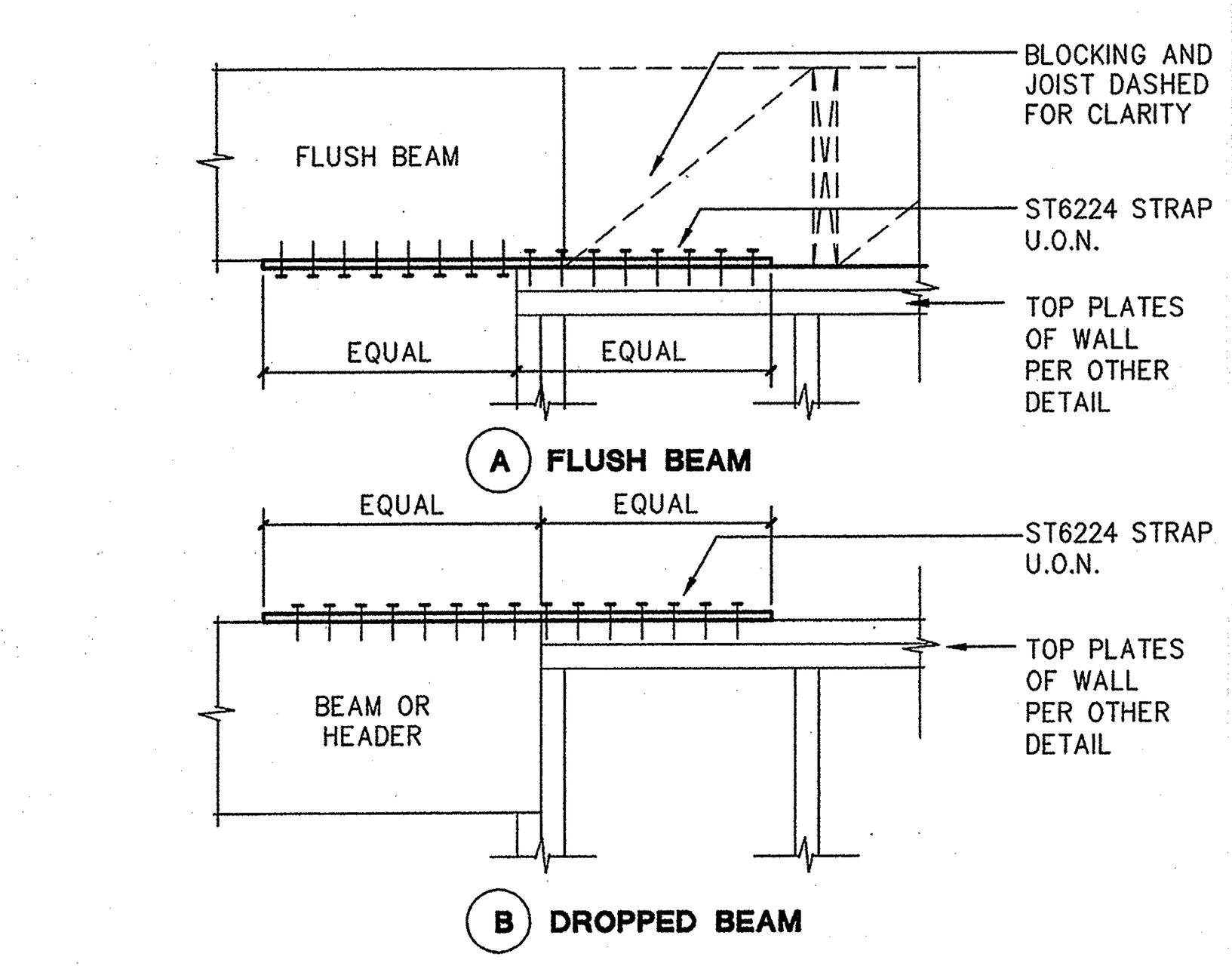
A NUT AND 3"x3"x¼" STL. PLATE WASHER ON EA. BOLT

MUDSILL SHALL BE 3x P.T.D.F. No. 1 (U.O.N.)

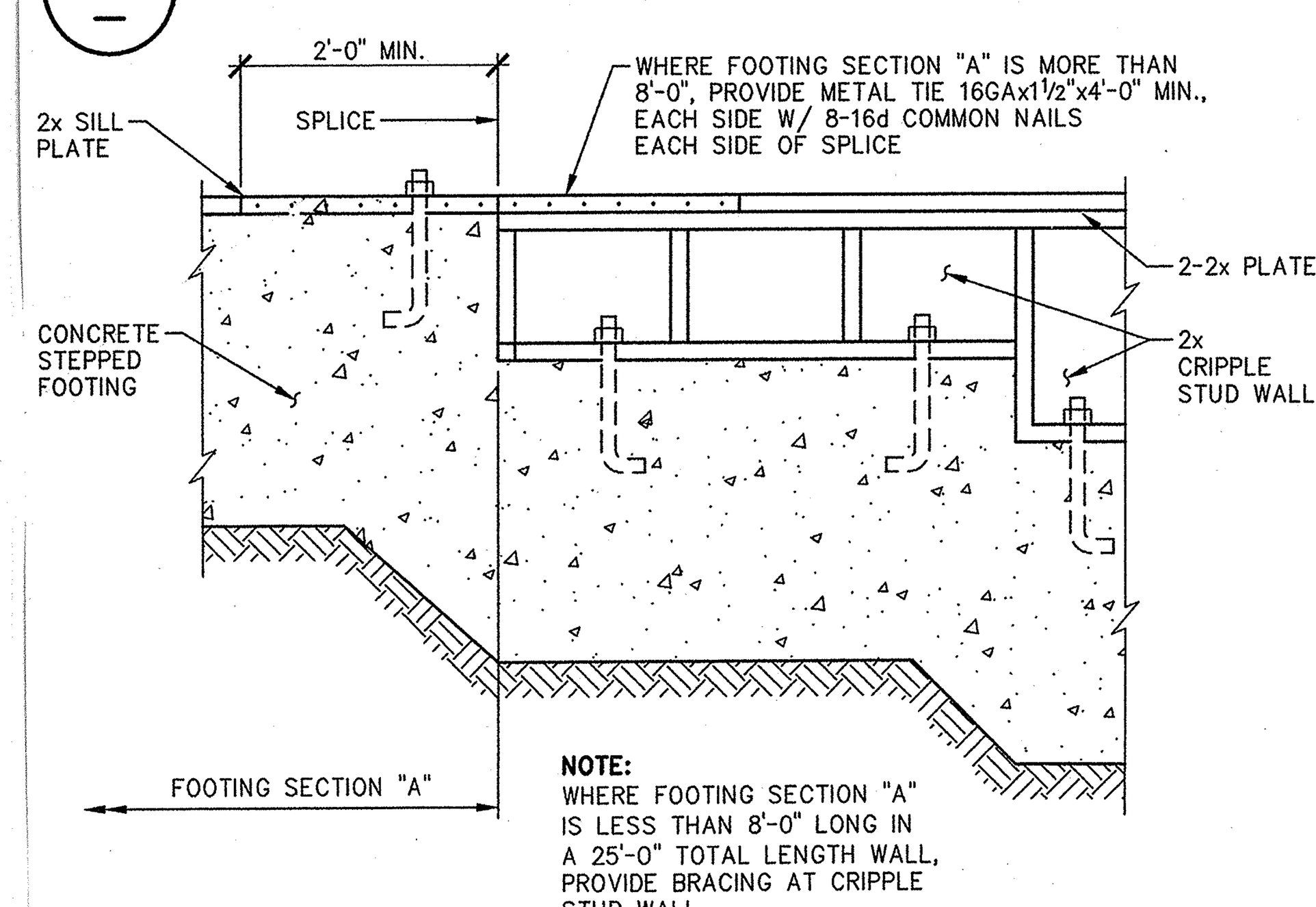
8 SILL PLATE DETAIL



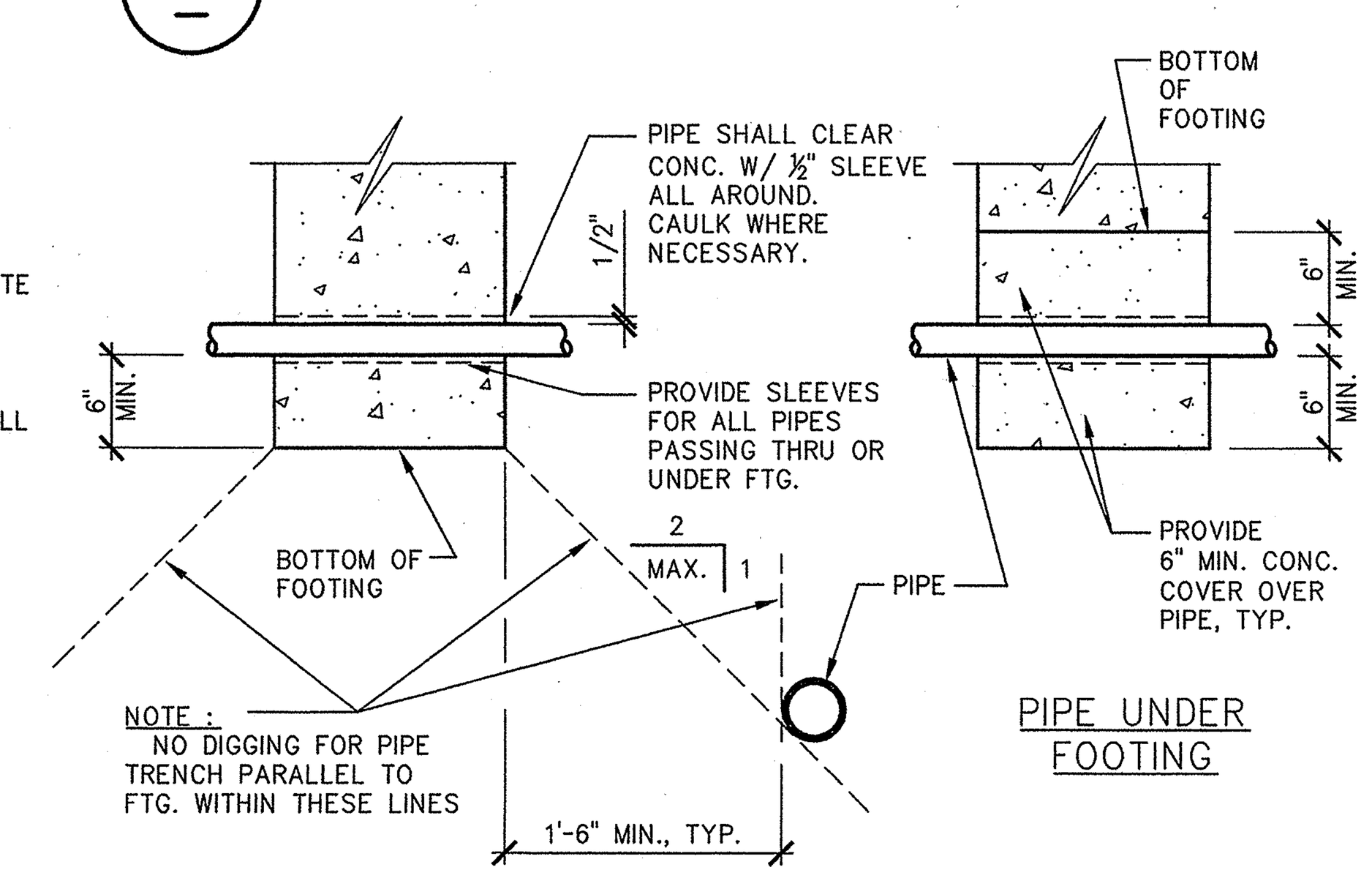
15 TYPICAL STUD WALL DETAIL



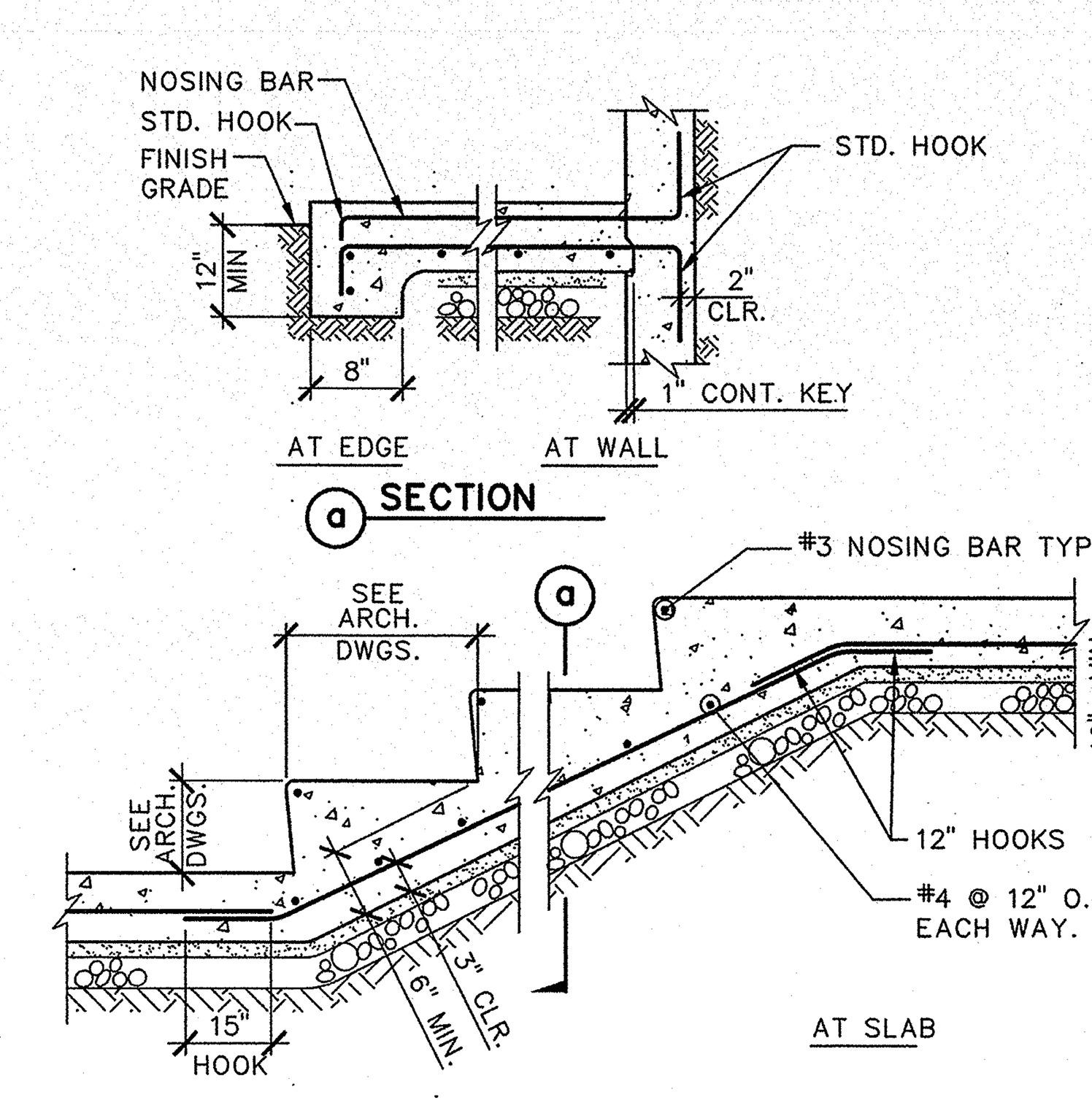
16 TYPICAL SHEAR COLLECTOR STRAP



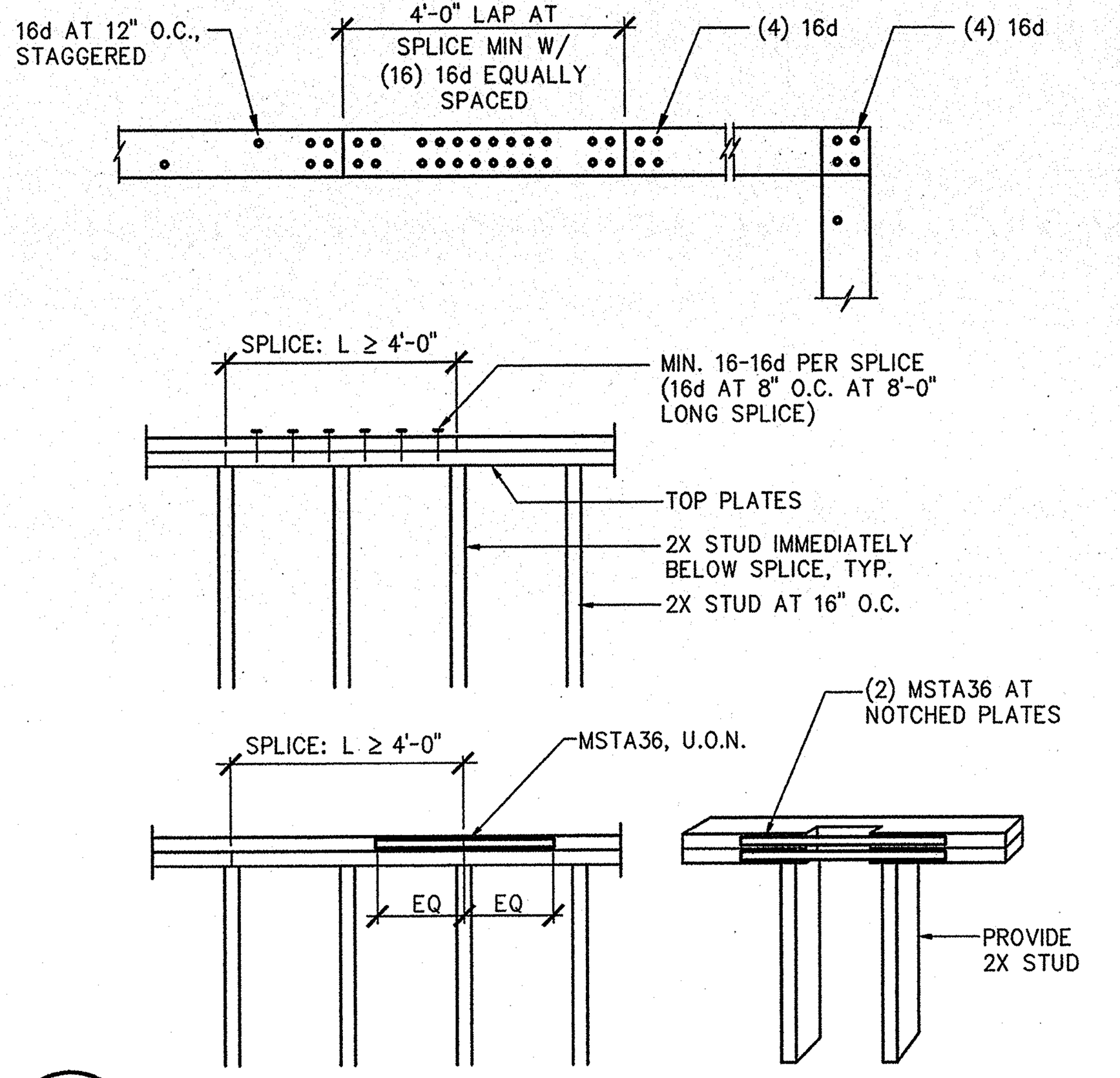
13 STEPPED FOOTING CONNECTION



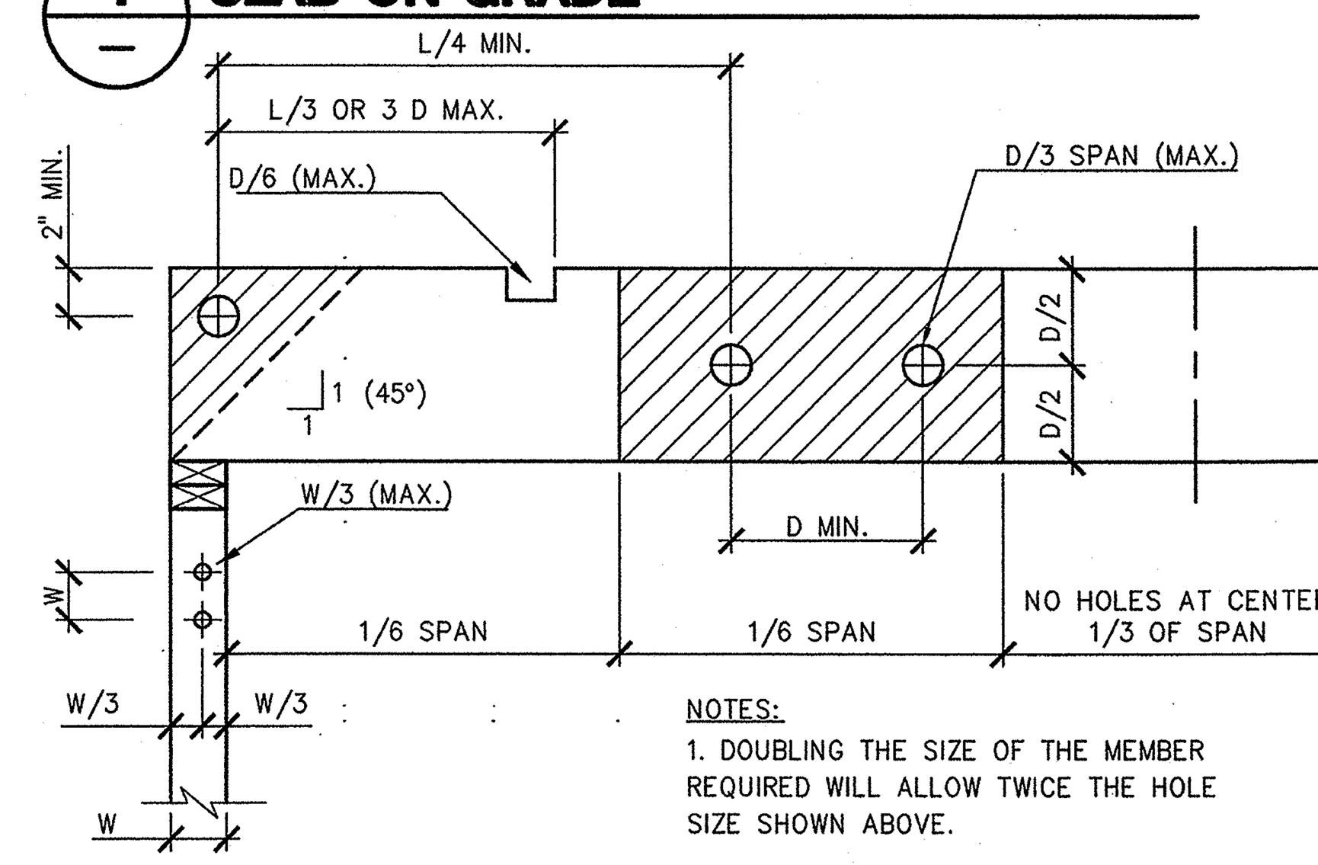
9 PIPE THRU FTG. AND PARALLEL TO FTG.



4 SLAB ON GRADE

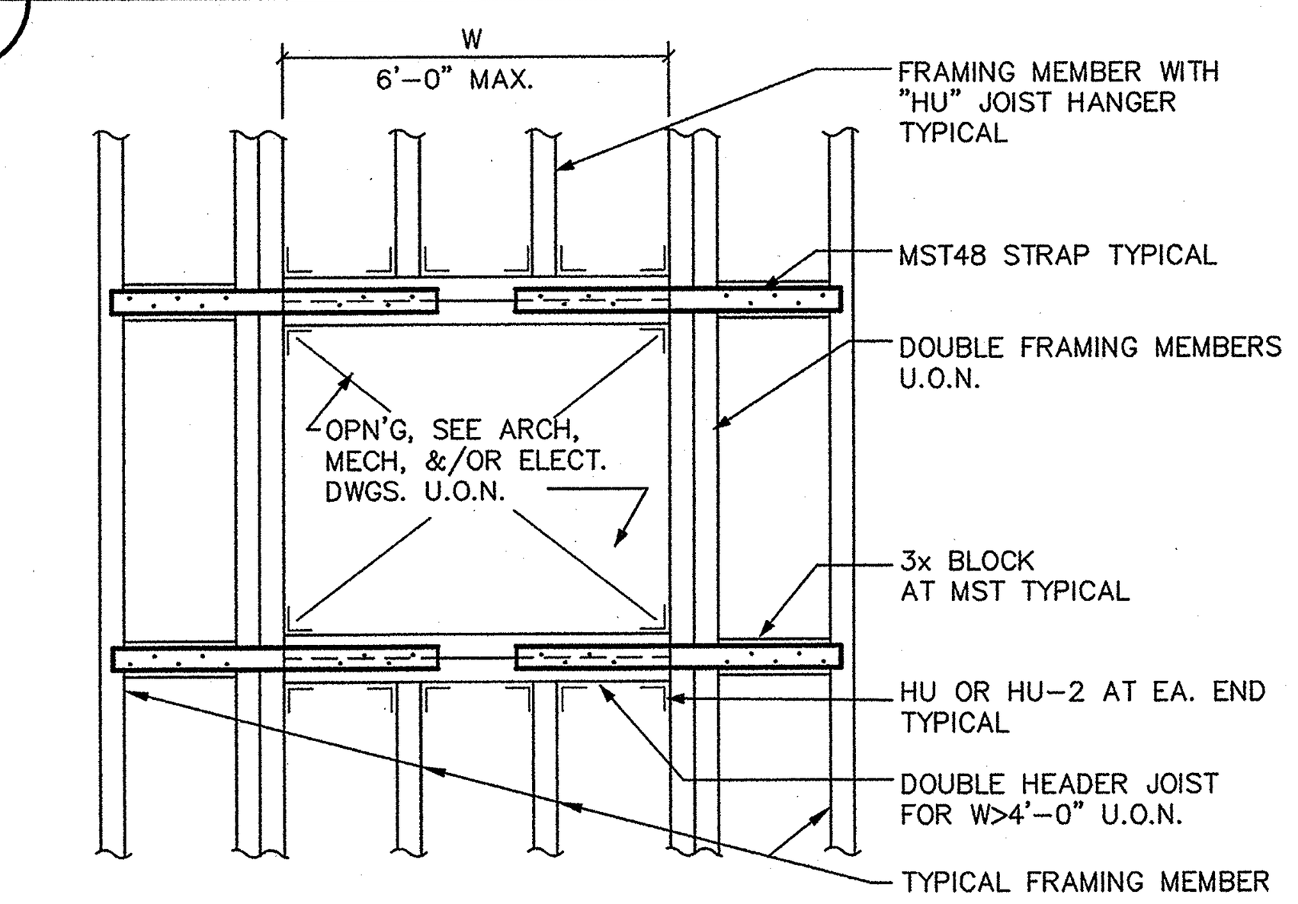


1 TYPICAL TOP PLATE SPLICE



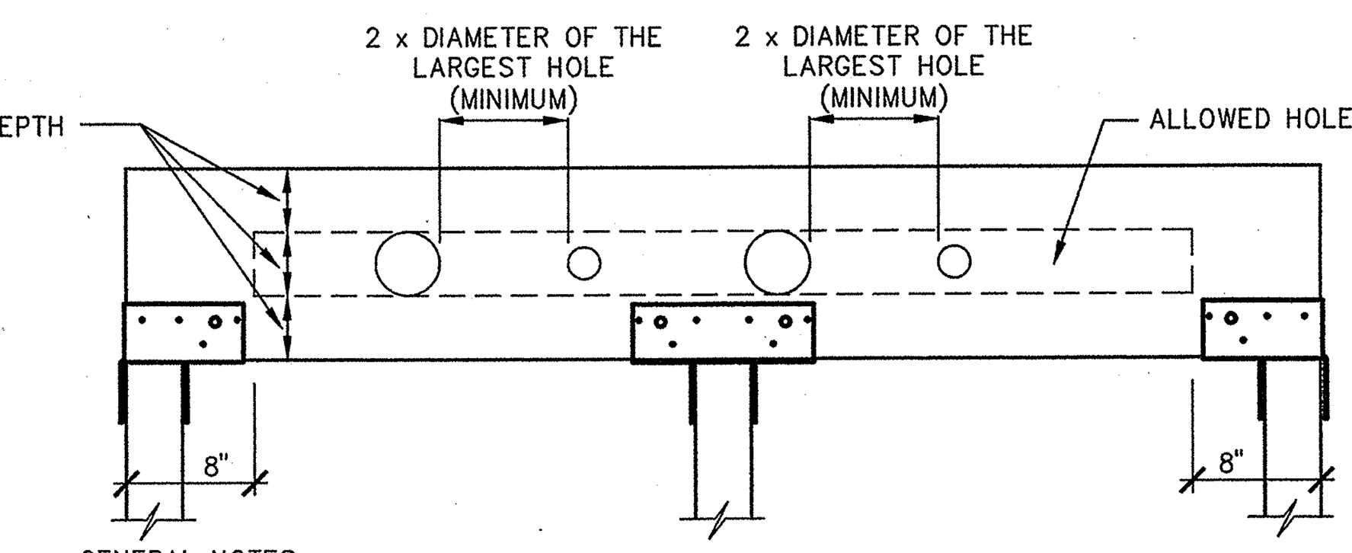
NOTES:
1. DOUBLING THE SIZE OF THE MEMBER REQUIRED WILL ALLOW TWICE THE HOLE SIZE SHOWN ABOVE.
2. STUDS MAY NOT BE NOTCHED IN ANY CASE.

5 HOLES & NOTCHES AT JOIST & STUD



2 OPENING IN FRAME AROUND HORIZ. DIAPHRAGM SEE PLAN FOR LOCATION

1.55E TIMBERSTRAND® LSL HEADERS AND BEAMS

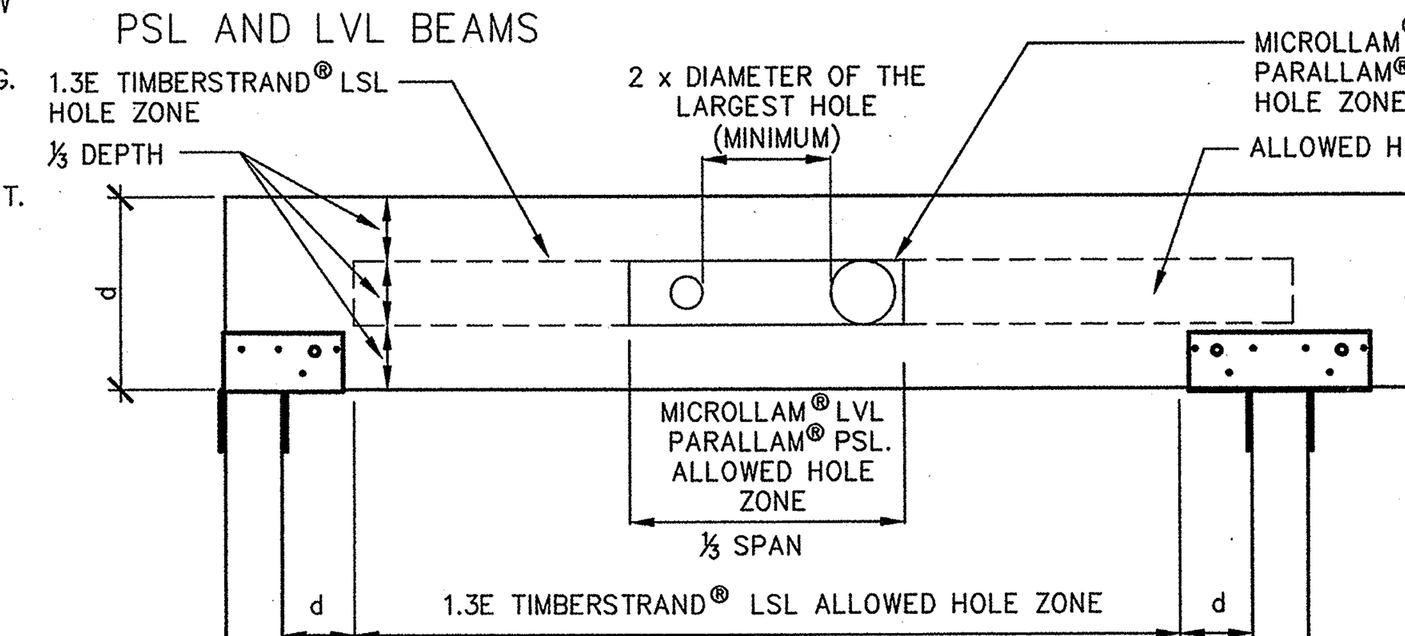


HEADER DEPTH	MAXIMUM ROUND HOLE SIZE
9¼"-9½"	3"
11¼"-11⅞"	3⅝"
14" TO 16"	4⅝"

GENERAL NOTES:
No rectangular holes
No holes in headers or beams in plank orientation

SEE ILLUSTRATION FOR ALLOWED HOLE ZONE

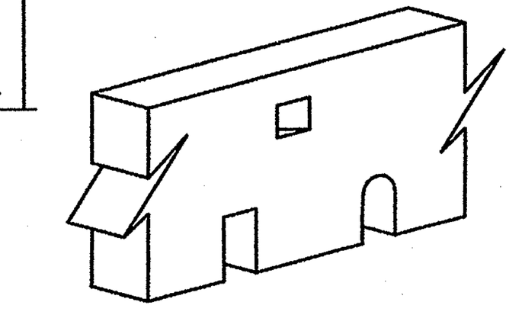
PSL AND LVL BEAMS



BEAM DEPTH	MAXIMUM ROUND HOLE SIZE
4⅜"	1"
5½"	1¾"
7¼" TO 20"	2"

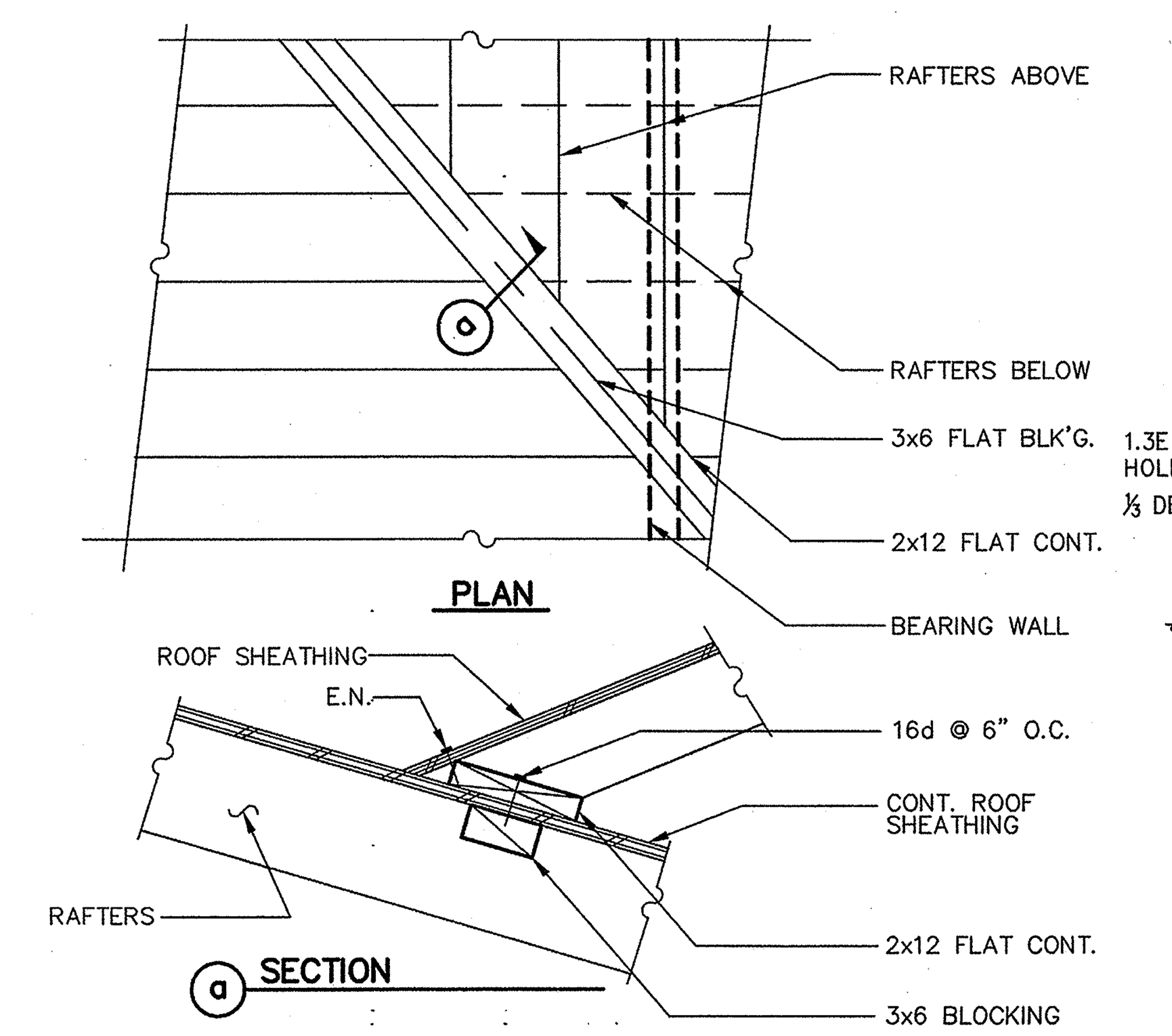
SEE ILLUSTRATION FOR ALLOWED HOLE ZONE

GENERAL NOTES:
Allowed hole zone suitable for uniformly loaded headers and beams only.
No rectangular holes
No holes in cantilevers.
No holes in headers or beams in plank orientation

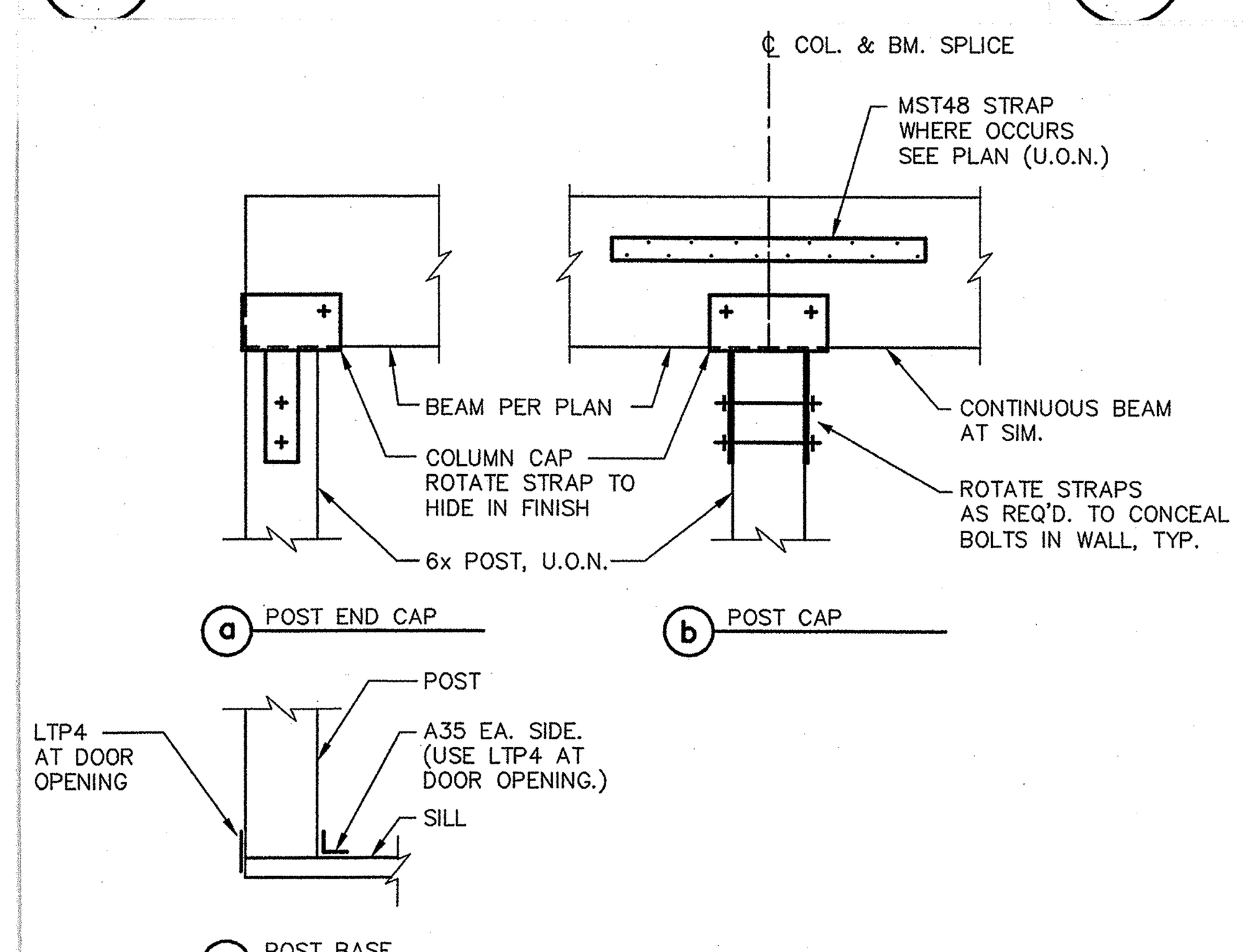


DO NOT cut, notch, or drill holes in headers except as indicated in the illustrations and tables above.

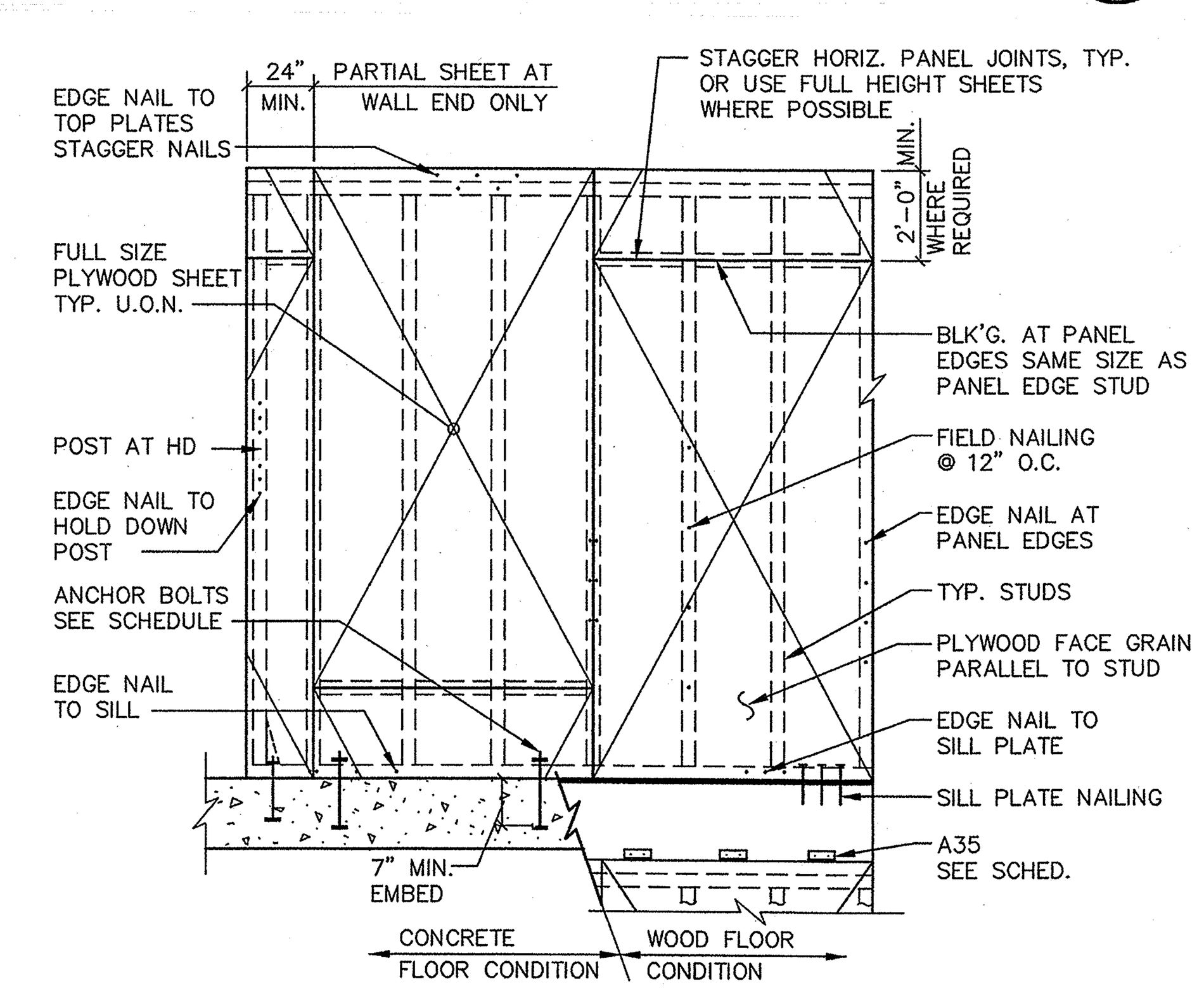
3 ALLOWABLE HOLES



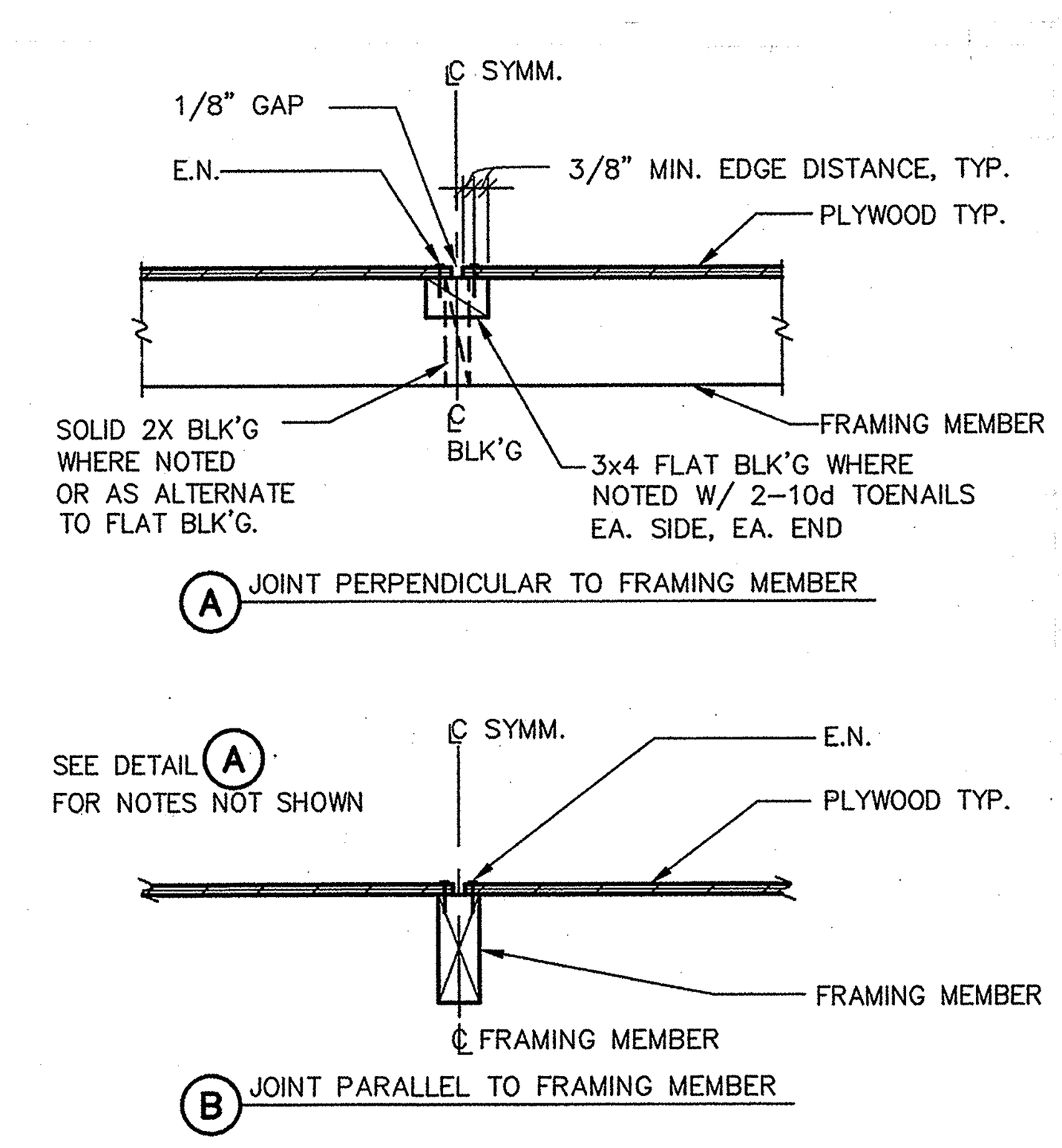
6 TYPICAL CALIFORNIA FRAMING



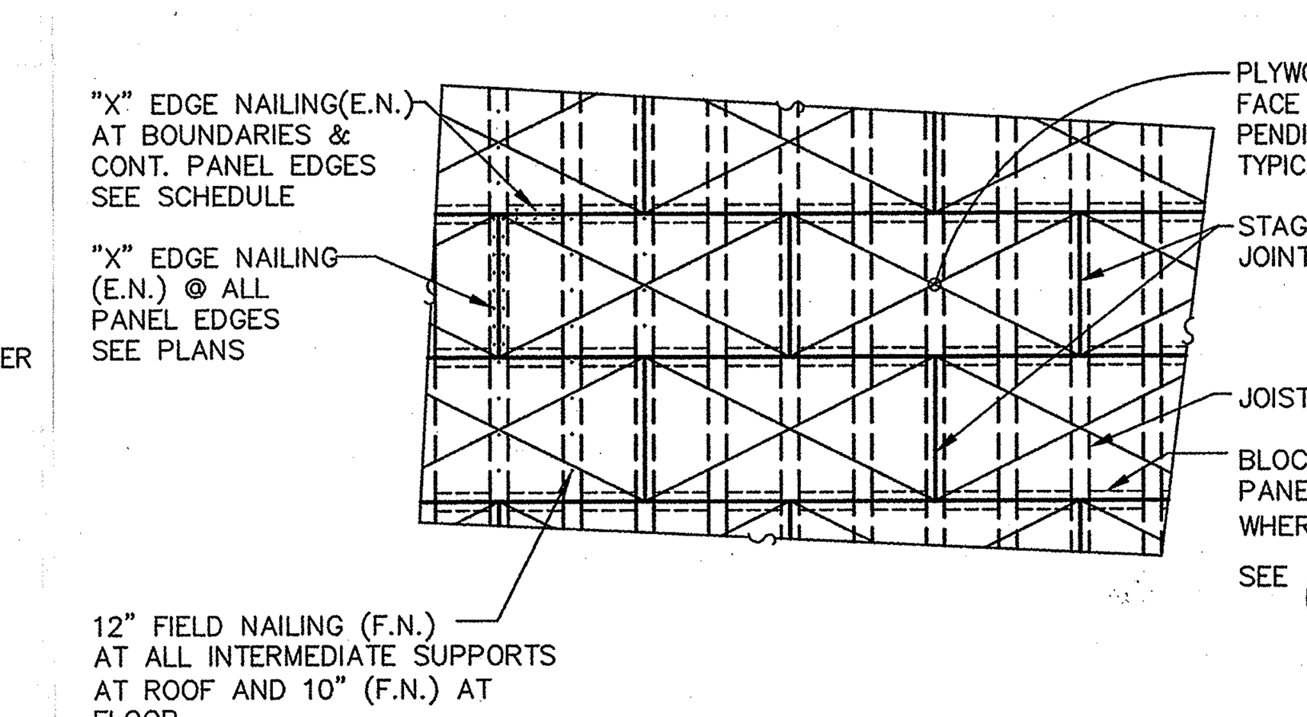
21 BEAM AND POST CONNECTION



20 SHEAR WALL FRAMING ELEVATION

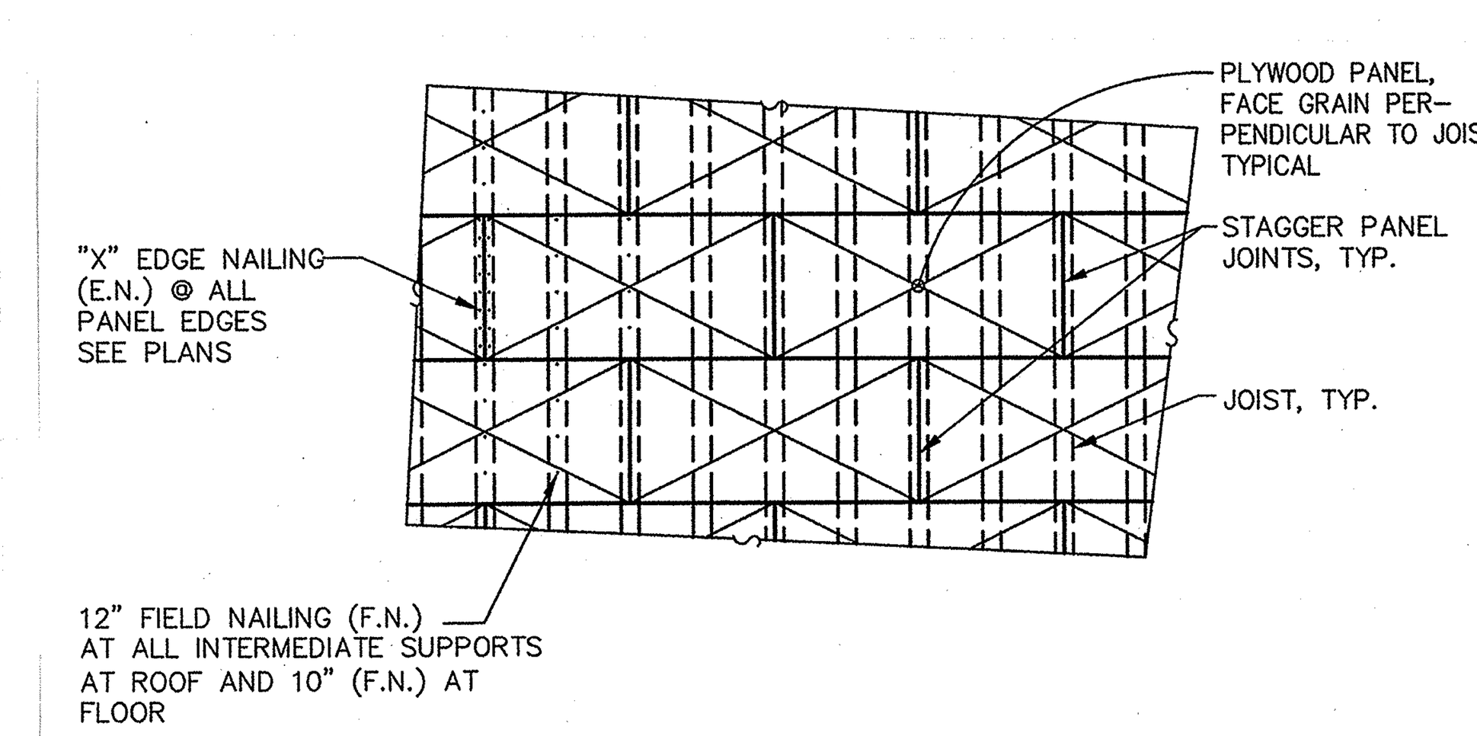


19 PLYWOOD NAILING



NOTES
1. USE 10d COMMON NAILS AT FLOORS; 8d COMMON NAILS AT ROOFS.
2. GLUE PLYWOOD TO FLOOR FRAMING MEMBERS PRIOR TO NAILING.
3. MINIMUM PLYWOOD WIDTH IS 24".
4. SEE GENERAL NOTES FOR PLYWOOD THICKNESS & GRADE.

18 PLYWOOD SHEATHING AT ROOF AND FLOORS REQUIRING SPECIAL BLOCKING AND EDGE NAIL SEE PLAN FOR LOCATION



NOTES
1. USE 10d COMMON NAILS AT FLOORS; 8d COMMON NAILS AT ROOFS.
2. GLUE PLYWOOD TO FLOOR FRAMING MEMBERS PRIOR TO NAILING.
3. MINIMUM PLYWOOD WIDTH IS 24".
4. SEE GENERAL NOTES FOR PLYWOOD THICKNESS & GRADE.

17 PLYWOOD SHEATHING AT ROOF AND FLOORS UNBLOCKED

8-15-23 MSH
6-22-24 MSH

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REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD - APN 537-12-012
LOS GATOS, CALIFORNIA

CONSTRUCTION DETAILS

11-14-22
AS NOTED
MSH
2108

26

MAIN RESIDENCE ENERGY COMPLIANCE

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD
CF1R-PRF-01-E (Page 1 of 12)
Project Name: Renfrew Residence
Calculation Description: Title 24 Analysis
Calculation Date/Time: 2024-05-24T09:22:22-07:00
Input File Name: 22-570 Renfrew E+A+A (2022 Code) - VS2.ribd22x

GENERAL INFORMATION

01	Project Name	Renfrew Residence			
02	Run Title	Title 24 Analysis			
03	Project Location	14500 Arnerich Hill Road			
04	City	Los Gatos	05	Standards Version	2022
06	Zip code	95032	07	Software Version	EnergyPro 9.2
08	Climate Zone	4	09	Front Orientation (deg/ Cardinal)	8
10	Building Type	Single family	11	Number of Dwelling Units	1
12	Project Scope	Addition and/or Alteration	13	Number of Bedrooms	5
14	Addition Cond. Floor Area (ft²)	1129	15	Number of Stories	3
16	Existing Cond. Floor Area (ft²)	5272	17	Fenestration Average U-factor	0.32
18	Total Cond. Floor Area (ft²)	6401	19	Glazing Percentage (%)	20.11%
20	ADU Bedroom Count	n/a	21	ADU Conditioned Floor Area	n/a
22	Fuel Type	Propane	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

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD
CF1R-PRF-01-E (Page 2 of 12)
Project Name: Renfrew Residence
Calculation Description: Title 24 Analysis
Calculation Date/Time: 2024-05-24T09:22:22-07:00
Input File Name: 22-570 Renfrew E+A+A (2022 Code) - VS2.ribd22x

ENERGY USE SUMMARY

Energy Use	Standard Design Source Energy (EDR1) (kBtu/ft² -yr)	Standard Design TDV Energy (EDR2) (kTDV/ft² -yr)	Proposed Design Source Energy (EDR1) (kBtu/ft² -yr)	Proposed Design TDV Energy (EDR2) (kTDV/ft² -yr)	Compliance Margin (EDR1)	Compliance Margin (EDR2)
Space Heating	0	25.92	0	22.99	0	2.93
Space Cooling	0	27.72	0	28	0	-0.28
IAQ Ventilation	0	2.6	0	2.6	0	0
Water Heating	0	37.31	0	37.31	0	0
Self Utilization/Flexibility Credit						
Efficiency Compliance Total	0	93.55	0	90.9	0	2.65
Photovoltaics		0		0		
Battery				0		
Flexibility						
Indoor Lighting	0	3.97	0	3.97		
Appl. & Cooking	0	8.85	0	8.85		
Plug Loads	0	11.87	0	11.87		
Outdoor Lighting	0	1.06	0	1.06		
TOTAL COMPLIANCE	0	119.3	0	116.65		

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD
CF1R-PRF-01-E (Page 3 of 12)
Project Name: Renfrew Residence
Calculation Description: Title 24 Analysis
Calculation Date/Time: 2024-05-24T09:22:22-07:00
Input File Name: 22-570 Renfrew E+A+A (2022 Code) - VS2.ribd22x

ENERGY USE INTENSITY

	Standard Design (kBtu/ft² - yr)	Proposed Design (kBtu/ft² - yr)	Compliance Margin (kBtu/ft² - yr)	Margin Percentage
Gross EUI[1]	12.13	11.77	0.36	2.97
Net EUI[2]	12.13	11.77	0.36	2.97

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.
- Ducts in crawl space
- Variable capacity heat pump compliance option (verification details from VCHP Staff report, Appendix B, and RA3)
- Recirculating with non-demand control (continuous pumping)

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
- Indoor air quality ventilation
- Minimum Airflow
- Verified SEER/SEER2
- Verified Refrigerant Charge
- Airflow in habitable rooms (SC3.1.4.1.7)
- Fan Efficacy Watts/CFM
- Verified HSPF
- Verified heat pump rated heating capacity
- Wall-mounted thermostat in zones greater than 150 ft2 (SC3.4.5)
- Ductless indoor units located entirely in conditioned space (SC3.1.4.1.8)
- Duct leakage testing

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD
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Input File Name: 22-570 Renfrew E+A+A (2022 Code) - VS2.ribd22x

BUILDING - FEATURES INFORMATION

01 Project Name	02 Conditioned Floor Area (ft²)	03 Number of Dwelling Units	04 Number of Bedrooms	05 Number of Zones	06 Number of Ventilation Cooling Systems	07 Number of Water Heating Systems
Renfrew Residence	6401	1	5	2	0	1

ZONE INFORMATION

01 Zone Name	02 Zone Type	03 HVAC System Name	04 Zone Floor Area (ft²)	05 Avg. Ceiling Height	06 Water Heating System 1	07 Status
Existing House	Conditioned	Ducted Heatpumps1	5272	10.63	DHW Sys 1	Existing Unchanged
Addition Only	Conditioned	Ductless Heatpumps2	1129	9.75	DHW Sys 1	New

OPAQUE SURFACES

01 Name	02 Zone	03 Construction	04 Azimuth	05 Orientation	06 Gross Area (ft²)	07 Window and Door Area (ft2)	08 Tilt (deg)	09 Wall Exceptions	10 Status	11 Verified Existing Condition
FWall/E	Existing House	R-11 Wall	8	Front	1230.8	216.2	90	none	Existing	No
LWall/E	Existing House	R-11 Wall	98	Left	1534.5	220.3	90	none	Existing	No
BWall/E	Existing House	R-11 Wall	188	Back	1230.8	398.1	90	none	Existing	No
RWall/E	Existing House	R-11 Wall	278	Right	1534.5	178.9	90	none	Existing	No
FWall	Addition Only	R-23 Wall	8	Front	234	0	90	none	New	n/a
LWall	Addition Only	R-23 Wall	98	Left	462.6	87.5	90	none	New	n/a
BWall	Addition Only	R-23 Wall	188	Back	234	0	90	none	New	n/a
RWall	Addition Only	R-23 Wall	278	Right	462.6	186.3	90	none	New	n/a
Raised Floor/E	Existing House	R-19 Floor Crawlspace	n/a	n/a	2561	n/a	n/a		Existing	No
Partition Floor	Addition Only	R-19 Floor No Crawlspace	n/a	n/a	1129	n/a	n/a		New	n/a

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD
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OPAQUE SURFACES - CATHEDRAL CEILINGS

01 Name	02 Zone	03 Construction	04 Azimuth	05 Orientation	06 Area (ft²)	07 Skylight Area (ft²)	08 Roof Rise (x in 12)	09 Roof Reflectance	10 Roof Emittance	11 Cool Roof	12 Status	13 Verified Existing Condition	14 Existing Construction
Roof/E	Existing House	R-19 Roof	0	n/a	3129.5	0	5	0.1	0.85	No	Existing	No	
Roof	Addition Only	R-30 Roof	0	n/a	1225.1	0	5	0.1	0.85	No	New	n/a	

FENESTRATION / GLAZING

01 Name	02 Type	03 Surface	04 Orientation	05 Azimuth	06 Width (ft)	07 Height (ft)	08 Mult.	09 Area (ft²)	10 U-factor	11 U-factor Source	12 SHGC	13 SHGC Source	14 Exterior Shading	15 Status	16 Verified Existing Condition
FG/A	Window	FWall/E	Front	8			1	216.2	0.32	NFRC	0.26	NFRC	Bug Screen	Altered	No
LG/A	Window	LWall/E	Left	98			1	220.3	0.32	NFRC	0.26	NFRC	Bug Screen	Altered	No
BG/A	Window	BWall/E	Back	188			1	293.8	0.32	NFRC	0.26	NFRC	Bug Screen	Altered	No
BG/N	Window	BWall/E	Back	188			1	104.3	0.32	NFRC	0.26	NFRC	Bug Screen	New	NA
RG/A	Window	RWall/E	Right	278			1	162.9	0.32	NFRC	0.26	NFRC	Bug Screen	Altered	No
RG/N	Window	RWall/E	Right	278			1	16	0.32	NFRC	0.26	NFRC	Bug Screen	New	NA
LG	Window	LWall	Left	98			1	87.5	0.32	NFRC	0.26	NFRC	Bug Screen	New	NA
RG	Window	RWall	Right	278			1	186.3	0.32	NFRC	0.26	NFRC	Bug Screen	New	NA

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SLAB FLOORS

01 Name	02 Zone	03 Area (ft²)	04 Perimeter (ft)	05 Edge Insul. R-value and Depth	06 Edge Insul. R-value and Depth	07 Carpeted Fraction	08 Heated	09 Status	10 Verified Existing Condition
Slab-on-Grade/E	Existing House	1452	171.5	none	0	80%	No	Existing	No

OPAQUE SURFACE CONSTRUCTIONS

01 Construction Name	02 Surface Type	03 Construction Type	04 Framing	05 Total Cavity R-value	06 Interior / Exterior Continuous R-value	07 U-factor	08 Assembly Layers
R-11 Wall	Exterior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-11	None / None	0.103	Inside Finish: Gypsum Board; Cavity / Frame: R-11 / 2x4; Exterior Finish: Wood Siding/sheathing/decking
R-23 Wall	Exterior Walls	Wood Framed Wall	2x6 @ 16 in. O. C.	R-23	None / None	0.066	Inside Finish: Gypsum Board; Cavity / Frame: R-23 / 2x6; Exterior Finish: All Other Siding
R-19 Roof	Cathedral Ceilings	Wood Framed Ceiling	2x8 @ 16 in. O. C.	R-19	None / None	0.053	Roofing: 15 PSF (Heavy Ballast or Pavers); Roof Deck: Wood Siding/sheathing/decking; Cavity / Frame: R-19 / 2x8; Inside Finish: Gypsum Board
R-30 Roof	Cathedral Ceilings	Wood Framed Ceiling	2x10 @ 16 in. O. C.	R-30	None / None	0.037	Roofing: 15 PSF (Heavy Ballast or Pavers); Roof Deck: Wood Siding/sheathing/decking; Cavity / Frame: R-30 / 2x10; Inside Finish: Gypsum Board

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OPAQUE SURFACE CONSTRUCTIONS

01 Construction Name	02 Surface Type	03 Construction Type	04 Framing	05 Total Cavity R-value	06 Interior / Exterior Continuous R-value	07 U-factor	08 Assembly Layers
R-19 Floor Crawlspace	Floors Over Crawlspace	Wood Framed Floor	2x8 @ 16 in. O. C.	R-19	None / None	0.047	Floor Surface: Carpeted; Floor Deck: Wood Siding/sheathing/decking; Cavity / Frame: R-19 / 2x8
R-19 Floor No Crawlspace	Interior Floors	Wood Framed Floor	2x8 @ 16 in. O. C.	R-19	None / None	0.046	Floor Surface: Carpeted; Floor Deck: Wood Siding/sheathing/decking; Cavity / Frame: R-19 / 2x8; Ceiling Below Finish: Gypsum Board

BUILDING ENVELOPE - HERS VERIFICATION

01 Quality Insulation Installation (QII)	02 High R-value Spray Foam Insulation	03 Building Envelope Air Leakage	04 CFM50	05 CFM50
Not Required	Not Required	N/A	n/a	n/a

WATER HEATING SYSTEMS

01 Name	02 System Type	03 Distribution Type	04 Water Heater Name	05 Number of Units	06 Solar Heating System	07 Compact Distribution	08 HERS Verification	09 Water Heater Name (#)	10 Status	11 Verified Existing Condition	12 Existing Water Heating System
DHW Sys 1	Domestic Hot Water (DHW)	Recirculation System Non-Demand Control	DHW Heater 1	2	n/a	None	n/a	DHW Heater 1 (2)	Existing	No	

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WATER HEATERS

01 Name	02 Heating Element Type	03 Tank Type	04 # of Units	05 Tank Vol. (gal)	06 Heating Efficiency Type	07 Efficiency	08 Rated Input Type	09 Input Rating or Pilot	10 Tank Insulation R-value (Int/Ext)	11 Standby Loss or Recovery Eff	12 1st Hr. Rating or Flow Rate	13 Tank Location	14 Status	15 Verified Existing Condition
DHW Heater 1	Electric Resistance	Small Storage	2	50	EF	0.93	kW	12	0	93	n/a	Outside	Existing	No

WATER HEATING - HERS VERIFICATION

01 Name	02 Pipe Insulation	03 Parallel Piping	04 Compact Distribution	05 Compact Distribution Type	06 Recirculation Control	07 Shower Drain Water Heat Recovery
DHW Sys 1 - 1/2	Not Required	Not Required	Not Required	None	Not Required	Not Required

SPACE CONDITIONING SYSTEMS

01 Name	02 System Type	03 Heating Unit Name	04 Heating Equipment Count	05 Cooling Unit Name	06 Cooling Equipment Count	07 Fan Name	08 Distribution Name	09 Required Thermostat Type	10 Status	11 Verified Existing Condition	12 Existing HVAC System
Ducted Heatpumps1	Heat pump heating cooling	Heat Pump System 1	2	Heat Pump System 1	2	HVAC Fan 1	Air Distribution System 1	Setback	New	No	
Ductless Heatpumps2	Heat pump heating cooling	Heat Pump System 2	3	Heat Pump System 2	3	n/a	n/a	Setback	New	No	

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD
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Input File Name: 22-570 Renfrew E+A+A (2022 Code) - VS2.ribd22x

HVAC - HEAT PUMPS

01 Name	02 System Type	03 Number of Units	04 Heating: Heating Efficiency Type	05 Heating: HSPF/HSPF2/COP	06 Heating: Cap 47	07 Heating: Cap 17	08 Cooling: Cooling Efficiency Type	09 Cooling: SEER/SEER2	10 Cooling: EER/EER2/CEER	11 Zonally Controlled	12 Compressor Type	13 HERS Verification
Heat Pump System 1	Central split HP	2	HSPF	10	60000	52500	EERSEER	17	10.5	Not Zonal	Single Speed	Heat Pump System 1-hers-htpump
Heat Pump System 2	VCHP-ductless	3	HSPF	8.5	27000	23580	EERSEER	14	10	Not Zonal	Single Speed	Heat Pump System 2-hers-htpump

HVAC HEAT PUMPS - HERS VERIFICATION

01 Name	02 Verified Airflow	03 Airflow Target	04 Verified EER/EER2	05 Verified SEER/SEER2	06 Verified Refrigerant Charge	07 Verified HSPF/HSPF2	08 Verified Heating Cap 47	09 Verified Heating Cap 17
Heat Pump System 1-hers-htpump	Required	350	Not Required	Required	Yes	Yes	Yes	Yes
Heat Pump System 2-hers-htpump	Not Required	0	Not Required	Not Required	Yes	No	Yes	Yes

VARIABLE CAPACITY HEAT PUMP COMPLIANCE OPTION - HERS VERIFICATION

01 Name	02 Certified Low-Static VCHP System	03 Airflow to Habitable Rooms	04 Ductless Units in Conditioned Space	05 Wall Mount Thermostat	06 Air Filter Sizing & Pressure Drop Rating	07 Low Leakage Ducts in Conditioned Space	08 Minimum Airflow per RA3.3 and SC3.3.3.4.1	09 Certified non-continuous Fan	10 Indoor Fan not Running Continuously
Heat Pump System 2	Not required	Required	Required	Required	Not required	Not required	Not required	Not required	Not required

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD
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HVAC - DISTRIBUTION SYSTEMS

01 Name	02 Type	03 Design Type	04 Duct Ins. R-value: Supply	05 Duct Ins. R-value: Return	06 Duct Location: Supply	07 Duct Location: Return	08 Surface Area: Supply	09 Surface Area: Return	10 Bypass Duct	11 Duct Leakage	12 HERS Verification	13 Status	14 Verified Existing Condition	15 Existing Distribution system	16 New Ducts >= 25 ft
Air Distribution System 1	Unconditioned crawl space	Non-Verified	R-8	R-8	Crawl Space	Crawl Space	n/a	n/a	No Bypass Duct	Sealed and Tested	Air Distribution System 1-hers-dist	Alteration	No		No

HVAC DISTRIBUTION - HERS VERIFICATION

01 Name	02 Duct Leakage Verification	03 Duct Leakage Target (%)	04 Verified Duct Location	05 Verified Duct Design	06 Buried Ducts	07 Deeply Buried Ducts	08 Low-leakage Air Handler	09 Low Leakage Ducts Entirely in Conditioned Space
Air Distribution System 1-hers-dist	Yes	10.0	Not Required	Not Required	Not Required	Credit not taken	Not Required	No

HVAC - FAN SYSTEMS

01 Name	02 Type	03 Fan Power (Watts/CFM)	04 Name
HVAC Fan 1	HVAC Fan	0.58	HVAC Fan 1-hers-fan

HVAC FAN SYSTEMS - HERS VERIFICATION

01 Name	02 Verified Fan Watt Draw	03 Required Fan Efficacy (Watts/CFM)
HVAC Fan 1-hers-fan	Required	0.58

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD
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INDOOR AIR QUALITY (IAQ) FANS

01 Dwelling Unit	02 Airflow (CFM)	03 Fan Efficacy (W/CFM)	04 IAQ Fan Type	05 Includes Heat/Energy Recovery?	06 IAQ Recovery Effectiveness - SRE/ASRE	07 Includes Fault Indicator Display?	08 HERS Verification	09 Status
SFam IAQVentRpt	201	0.35	Exhaust	No	n/a / n/a	No	Yes	

HERS RATER VERIFICATION OF EXISTING CONDITIONS

INDOOR AIR QUALITY (IAQ) FANS - VERIFIED AND ALTERED

01 Name	02 Airflow (CFM)	03 Fan Efficacy (W/CFM)	04 IAQ Fan Type	05 Includes Heat/Energy Recovery?	06 IAQ Recovery Effectiveness - SREIAQ Recovery Effectiveness - SRE	07 IAQ Recovery Effectiveness - ASREIAQ Recovery Effectiveness - ASRE
Dwelling Unit 0/0	201	0.35	Exhaust	No	n/a	n/a

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD
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Input File Name: 22-570 Renfrew E+A+A (2022 Code) - VS2.ribd22x

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

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

Documentation Author Name: Michael Hafner	Documentation Author Signature: Michael Hafner
Company: Monterey Energy Group	Signature Date: 2024-05-24 09:24:04
Address: 26465 Carmel Rancho Blvd. #8	CEA/ HERS Certification Identification (If applicable): R19-18-30020
City/State/Zip: Carmel, CA 93923	Phone: 831-372-8328

CABEC California Association of Building Energy Consultants CERTIFIED ENERGY ANALYST

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:
1. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design identified on this Certificate of Compliance.
2. I certify that the energy features and performance specifications identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
3. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.

Responsible Designer Name: Michael Helm	Responsible Designer Signature: [signature]
Company: Michael Helm & Associates	Date Signed: 2024-05-24 09:42:56
Address: 200 Seventh Ave., #110	License: NA
City/State/Zip: Santa Cruz, CA 95062	Phone: 831-476-5386

Digitally signed by CalCERTS. This digital signature is provided in order to secure the content of this registered document, and in no way implies Registration Provider responsibility for the accuracy of the information.

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MUSIC ROOM ENERGY COMPLIANCE

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD
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Project Name: Renfrew Music Room Addition
Calculation Description: Title 24 Analysis
Calculation Date/Time: 2024-05-24T09:19:59-07:00
Input File Name: 22-571 Renfrew Music Room Add. (2022 Code) - VS2.ribd22x

GENERAL INFORMATION

01	Project Name	Renfrew Music Room Addition			
02	Run Title	Title 24 Analysis			
03	Project Location	14500 Arnerich Hill Road			
04	City	Los Gatos	05	Standards Version	2022
06	Zip code	95032	07	Software Version	EnergyPro 9.2
08	Climate Zone	4	09	Front Orientation (deg/ Cardinal)	98
10	Building Type	Single family	11	Number of Dwelling Units	1
12	Project Scope	Newly Constructed Addition	13	Number of Bedrooms	3
14	Addition Cond. Floor Area (ft²)	700	15	Number of Stories	1
16	Existing Cond. Floor Area (ft²)	5272	17	Fenestration Average U-factor	0.3
18	Total Cond. Floor Area (ft²)	5972	19	Glazing Percentage (%)	33.04%
20	ADU Bedroom Count	n/a	21	ADU Conditioned Floor Area	n/a
22	Fuel Type	All electric	23	No Dwelling Unit:	No

ADDITION ALONE - Project Analysis Parameters

01 Existing Area (excl. new addition) (ft2)	02 Addition Area (excl. existing) (ft2)	03 Total Area (ft2)	04 Existing Bedrooms	05 Addition Bedrooms	06 Total Bedrooms
5272	700	5972	2	1	3

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

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD
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Calculation Description: Title 24 Analysis
Calculation Date/Time: 2024-05-24T09:19:59-07:00
Input File Name: 22-571 Renfrew Music Room Add. (2022 Code) - VS2.ribd22x

ENERGY USE SUMMARY

Energy Use	Standard Design Source Energy (EDR1) (kBtu/ft² -yr)	Standard Design TDV Energy (EDR2) (kTDV/ft² -yr)	Proposed Design Source Energy (EDR1) (kBtu/ft² -yr)	Proposed Design TDV Energy (EDR2) (kTDV/ft² -yr)	Compliance Margin (EDR1)	Compliance Margin (EDR2)
Space Heating	0	9.75	0	8.56	0	1.19
Space Cooling	0	34.04	0	30.57	0	3.47
IAQ Ventilation	0	0	0	0	0	0
Water Heating	0	28.41	0	21.84	0	6.57
Self Utilization/Flexibility Credit						
Efficiency Compliance Total	0	72.2	0	60.97	0	11.23
Photovoltaics		0		0		
Battery				0		
Flexibility						
Indoor Lighting	0	6.25	0	6.25		
Appl. & Cooking	0	34.13	0	34.03		
Plug Loads	0	53.43	0	53.43		
Outdoor Lighting	0	9.68	0	9.68		
TOTAL COMPLIANCE	0	175.69	0	164.36		

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD
CF1R-PRF-01-E (Page 3 of 9)
Project Name: Renfrew Music Room Addition
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Input File Name: 22-571 Renfrew Music Room Add. (2022 Code) - VS2.ribd22x

ENERGY USE INTENSITY

	Standard Design (kBtu/ft² - yr)	Proposed Design (kBtu/ft² - yr)	Compliance Margin (kBtu/ft² - yr)	Margin Percentage
Gross EUI[1]	18.86	17.65	1.21	6.42
Net EUI[2]	18.86	17.65	1.21	6.42

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.
- Window overhangs and/or fins
- Variable capacity heat pump compliance option (verification details from VCHP Staff report, Appendix B, and RA3)
- Northwest Energy Efficiency Alliance (NEEA) rated heat pump water heater; specific brand/model, or equivalent, must be installed

HERS FEATURE SUMMARY

The following is a summary of the features that must be field-verified by a certified HERS Rater as a condition for meeting the modeled energy performance for this computer analysis. Additional detail is provided in the building tables below. Registered CF2Rs and CF3Rs are required to be completed in the HERS Registry
- Quality insulation installation (QII)
- Verified Refrigerant Charge
- Airflow in habitable rooms (SC3.1.4.1.7)
- Verified heat pump rated heating capacity
- Wall-mounted thermostat in zones greater than 150 ft2 (SC3.4.5)
- Ductless indoor units located entirely in conditioned space (SC3.1.4.1.8)

ZONE INFORMATION

01 Zone Name	02 Zone Type	03 HVAC System Name	04 Zone Floor Area (ft²)	05 Avg. Ceiling Height	06 Water Heating System 1	07 Status
Entire Music Room	Conditioned	Ductless Heatpumps1	700	10	DHW Sys 1	New

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD
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Input File Name: 22-571 Renfrew Music Room Add. (2022 Code) - VS2.ribd22x

OPAQUE SURFACES

01 Name	02 Zone	03 Construction	04 Azimuth	05 Orientation	06 Gross Area (ft²)	07 Window and Door Area (ft2)	08 Tilt (deg)	09 Wall Exceptions	10 Status
FWall	Entire Music Room	R-23 Wall	98	Front	280	45	90	none	New
LWall	Entire Music Room	R-23 Wall	188	Left	200	55.8	90	none	New
BWall	Entire Music Room	R-23 Wall	278	Back	280	106.493	90	none	New
RWall	Entire Music Room	R-23 Wall	8	Right	200	24	90	none	New
Attic/E	__Garage__	R-0 Attic	n/a	n/a	1121	n/a	n/a		Existing
Partition Floor	Entire Music Room	R-19 Floor No Crawlspace	n/a	n/a	700	n/a	n/a		New
FWall/E	__Garage__	R-0 Garage Wall	98	Front	454	0	90	none	Existing
LWall/E	__Garage__	R-0 Garage Wall	188	Left	397	0	90	none	Existing
BWall/E	__Garage__	R-0 Garage Wall	278	Back	454	0	90	none	Existing
RWall/E	__Garage__	R-0 Garage Wall	8	Right	397	0	90	none	Existing

OPAQUE SURFACES - CATHEDRAL CEILINGS

01 Name	02 Zone	03 Construction	04 Azimuth	05 Orientation	06 Area (ft²)	07 Skylight Area (ft²)	08 Roof Rise (x in 12)	09 Roof Reflectance	10 Roof Emittance	11 Cool Roof
Roof	Entire Music Room	R-38 Roof	0	n/a	759.6	0	5	0.1	0.85	No

ATTIC

01 Name	02 Construction	03 Type	04 Roof Rise (x in 12)	05 Roof Reflectance	06 Roof Emittance	07 Radiant Barrier	08 Cool Roof
Attic __Garage__	Attic Garage Roof Cons	Ventilated	5	0.1	0.85	No	No

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FENESTRATION / GLAZING

01 Name	02 Type	03 Surface	04 Orientation	05 Azimuth	06 Width (ft)	07 Height (ft)	08 Mult.	09 Area (ft²)	10 U-factor	11 U-factor Source	12 SHGC	13 SHGC Source	14 Exterior Shading
A/A	Window	FWall	Front	98	5	4.5	2	45	0.3	NFRC	0.24	NFRC	Bug Screen
5/A	Window	LWall	Left	188			1	55.8	0.3	NFRC	0.24	NFRC	Bug Screen
6/6/6	Window	BWall	Back	278	5.33	6.66	3	106.49	0.3	NFRC	0.24	NFRC	Bug Screen
B/B/C	Window	RWall	Right	8			1	24	0.3	NFRC	0.24	NFRC	Bug Screen

OVERHANGS AND FINS

01 Window	02 Overhang: Depth	03 Overhang: Dist Up	04 Overhang: Left Extent	05 Overhang: Right Extent	06 Overhang: Flap Ht.	07 Left Fin: Depth	08 Left Fin: Top Up	09 Left Fin: Dist L	10 Left Fin: Bot Up	11 Right Fin: Depth	12 Right Fin: Top Up	13 Right Fin: Dist R	14 Right Fin: Bot Up
A/A	2	1	0	0	0	0	0	0	0	0	0	0	0
6/6/6	2	1	0	0	0	0	0	0	0	0	0	0	0

SLAB FLOORS

01 Name	02 Zone	03 Area (ft²)	04 Perimeter (ft)	05 Edge Insul. R-value and Depth	06 Edge Insul. R-value and Depth	07 Carpeted Fraction	08 Heated
Slab-on-Grade/E	__Garage__	1821	185	none	0	0%	No

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OPAQUE SURFACE CONSTRUCTIONS

01 Construction Name	02 Surface Type	03 Construction Type	04 Framing	05 Total Cavity R-value	06 Interior / Exterior Continuous R-value	07 U-factor	08 Assembly Layers
R-0 Garage Wall	Exterior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-0	None / None	0.361	Inside Finish: Gypsum Board; Cavity / Frame: no insul. / 2x4; Exterior Finish: 3 Coat Stucco
R-23 Wall	Exterior Walls	Wood Framed Wall	2x6 @ 16 in. O. C.	R-23	None / None	0.066	Inside Finish: Gypsum Board; Cavity / Frame: R-23 / 2x6; Exterior Finish: All Other Siding
R-38 Roof	Cathedral Ceilings	Wood Framed Ceiling	2x12 @ 16 in. O. C.	R-38	None / None	0.029	Roofing: Light Roof (Metal Tile); Tile Gap: present; Roof Deck: Wood Siding/sheathing/decking; Cavity / Frame: R-38 / 2x12; Inside Finish: Gypsum Board
Attic Garage Roof Cons	Attic Roofs	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-0	None / 0	0.412	Roofing: Light Roof (Metal Tile); Tile Gap: present; Roof Deck: Wood Siding/sheathing/decking; Cavity / Frame: no insul. / 2x4
R-0 Attic	Ceilings (below attic)	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-0	None / None	0.481	Cavity / Frame: no insul. / 2x4; Inside Finish: Gypsum Board
R-19 Floor No Crawlspace	Interior Floors	Wood Framed Floor	2x12 @ 16 in. O. C.	R-19	None / None	0.044	Floor Surface: Carpeted; Floor Deck: Wood Siding/sheathing/decking; Cavity / Frame: R-19 / 2x12; Ceiling Below Finish: Gypsum Board

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BUILDING ENVELOPE - HERS VERIFICATION

01 Quality Insulation Installation (QII)	02 High R-value Spray Foam Insulation	03 Building Envelope Air Leakage	04 CFM50	05 CFM50
Required	Not Required	N/A	n/a	n/a

WATER HEATING SYSTEMS

01 Name	02 System Type	03 Distribution Type	04 Water Heater Name	05 Number of Units	06 Solar Heating System	07 Compact Distribution	08 HERS Verification	09 Water Heater Name (#)
DHW Sys 1	Domestic Hot Water (DHW)	Standard	DHW Heater 1	1	n/a	None	n/a	DHW Heater 1 (1)

WATER HEATERS - NEEA HEAT PUMP

01 Name	02 # of Units	03 Tank Vol. (gal)	04 NEEA Heat Pump Brand	05 NEEA Heat Pump Model	06 Tank Location	07 Duct Inlet Air Source	08 Duct Outlet Air Source
DHW Heater 1	1	50	Rheem	PROPH50 T2 RH37515 (50 gal, JA13)	TankZone	__Garage__	__Garage__

WATER HEATING - HERS VERIFICATION

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

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SPACE CONDITIONING SYSTEMS

01 Name	02 System Type	03 Heating Unit Name	04 Heating Equipment Count	05 Cooling Unit Name	06 Cooling Equipment Count	07 Fan Name	08 Distribution Name	09 Required Thermostat Type
Ductless Heatpumps1	Heat pump heating cooling	Heat Pump System 1	2	Heat Pump System 1	2	n/a	n/a	Setback

HVAC - HEAT PUMPS

01 Name	02 System Type	03 Number of Units	04 Heating: Heating Efficiency Type	05 Heating: HSPF/HSPF2/COP	06 Heating: Cap 47	07 Heating: Cap 17	08 Cooling: Cooling Efficiency Type	09 Cooling: SEER/SEER2	10 Cooling: EER/EER2/CEER	11 Zonally Controlled	12 Compressor Type	13 HERS Verification
Heat Pump System 1	VCHP-ductless	2	HSPF	8.5	27000	23580	EERSEER	14	10	Not Zonal	Single Speed	Heat Pump System 1-hers-htpump

HVAC HEAT PUMPS - HERS VERIFICATION

01 Name	02 Verified Airflow	03 Airflow Target	04 Verified EER/EER2	05 Verified SEER/SEER2	06 Verified Refrigerant Charge	07 Verified HSPF/HSPF2	08 Verified Heating Cap 47	09 Verified Heating Cap 17
Heat Pump System 1-hers-htpump	Not Required	0	Not Required	Not Required	Yes	No	Yes	Yes

VARIABLE CAPACITY HEAT PUMP COMPLIANCE OPTION - HERS VERIFICATION

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

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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

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

Documentation Author Name: Michael Hafner	Documentation Author Signature: Michael Hafner
Company: Monterey Energy Group	Signature Date: 2024-05-24 09:22:33
Address: 26465 Carmel Rancho Blvd. #8	CEA/ HERS Certification Identification (If applicable): R19-18-30020
City/State/Zip: Carmel, CA 93923	Phone: 831-372-8328

CABEC California Association of Building Energy Consultants CERTIFIED ENERGY ANALYST

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:
1. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design identified on this Certificate of Compliance.
2. I certify that the energy features and performance specifications identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
3. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.

Responsible Designer Name: Michael Helm	Responsible Designer Signature: [signature]
Company: Michael Helm & Associates	Date Signed: 2024-05-24 09:42:56
Address: 200 Seventh Ave., #110	License: NA
City/State/Zip: Santa Cruz, CA 95062	Phone: 831-476-5386

Digitally signed by CalCERTS. This digital signature is provided in order to secure the content of this registered document, and in no way implies Registration Provider responsibility for the accuracy of the information.

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5.22.24	MSH

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LOS GATOS, CALIFORNIA

ENERGY COMPLIANCE FORMS

11.14.22

NTS

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2108

2022 Single-Family Residential Mandatory Requirements Summary

NOTE: Single-family residential buildings subject to the Energy Codes must comply with all applicable mandatory measures, regardless of the compliance approach used. Review the respective section for more information.
(04/2022)

Building Envelope:

§ 110.6(a)1:	**Air Leakage.** Manufactured fenestration, exterior doors, and exterior pet doors must limit air leakage to 0.3 CFM per square foot or less when tested per NFRC-400, ASTM E283, or AAMA/WDMA/CSA 101/I.S.2/A440-2011. *
§ 110.6(a)5:	**Labeling.** Fenestration products and exterior doors must have a label meeting the requirements of § 10-111(a).
§ 110.6(b):	**Field fabricated exterior doors and fenestration** products must use U-factors and solar heat gain coefficient (SHGC) values from Tables 110.6-A, 110.6-B, or JA4.5 for exterior doors. They must be caulked and/or weather-stripped.
§ 110.7:	**Air Leakage.** All joints, penetrations, and other openings in the building envelope that are potential sources of air leakage must be caulked, gasketed, or weather stripped.
§ 110.8(a):	**Insulation Certification by Manufacturers.** Insulation must be certified by the Department of Consumer Affairs, Bureau of Household Goods and Services (BHGS).
§ 110.8(g):	**Insulation Requirements for Heated Slab Floors.** Heated slab floors must be insulated per the requirements of § 110.8(g).
§ 110.8(i):	**Roofing Products Solar Reflectance and Thermal Emittance.** The thermal emittance and aged solar reflectance values of the roofing material must meet the requirements of § 110.8(i) and be labeled per §10-113 when the installation of a cool roof is specified on the CF1R.
§ 110.8(j):	**Radiant Barrier.** When required, radiant barriers must have an emittance of 0.05 or less and be certified to the Department of Consumer Affairs.
§ 150.0(a):	**Roof Deck, Ceiling and Rafter Roof Insulation.** Roof decks in newly constructed attics in climate zones 4 and 8-16 area-weighted average U-factor not exceeding U-0.184. Ceiling and rafter roofs minimum R-22 insulation in wood-frame ceiling; or area-weighted average U-factor must not exceed 0.043. Rafter roof alterations minimum R-19 or area-weighted average U-factor of 0.054 or less. Attic access doors must have permanently attached insulation using adhesive or mechanical fasteners. The attic access must be gasketed to prevent air leakage. Insulation must be installed in direct contact with a roof or ceiling which is sealed to limit infiltration and exfiltration as specified in § 110.7, including but not limited to placing insulation either above or below the roof deck or on top of a drywall ceiling. *
§ 150.0(b):	**Loose-fill Insulation.** Loose fill insulation must meet the manufacturer's required density for the labeled R-value.
§ 150.0(c):	**Wall Insulation.** Minimum R-13 insulation in 2x4 inch wood framing wall or have a U-factor of 0.102 or less, or R-20 in 2x6 inch wood framing or have a U-factor of 0.071 or less. Opaque non-framed assemblies must have an overall assembly U-factor not exceeding 0.102. Masonry walls must meet Tables 150.1-A or B. *
§ 150.0(d):	**Raised-floor Insulation.** Minimum R-19 insulation in raised wood framed floor or 0.037 maximum U-factor. *
§ 150.0(f):	**Slab Edge Insulation.** Slab edge insulation must meet all of the following: have a water absorption rate, for the insulation material alone without facings, no greater than 0.3 percent; have a water vapor permeance no greater than 2.0 perm per inch; be protected from physical damage and UV light deterioration; and, when installed as part of a heated slab floor, meet the requirements of § 110.8(g).
§ 150.0(g)1:	**Vapor Retarder.** In climate zones 1 through 16, the earth floor of unvented crawl space must be covered with a Class I or Class II vapor retarder. This requirement also applies to controlled ventilation crawl space for buildings complying with the exception to §150.0(d).
§ 150.0(g)2:	**Vapor Retarder.** In climate zones 14 and 16, a Class I or Class II vapor retarder must be installed on the conditioned space side of all insulation in all exterior walls, vented attics, and unvented attics with air-permeable insulation.
§ 150.0(q):	**Fenestration Products.** Fenestration, including skylights, separating conditioned space from unconditioned space or outdoors must have a maximum U-factor of 0.45; or area-weighted average U-factor of all fenestration must not exceed 0.45. *

Fireplaces, Decorative Gas Appliances, and Gas Log:

§ 110.5(e)	**Pilot Light.** Continuously burning pilot lights are not allowed for indoor and outdoor fireplaces.
§ 150.0(e)1:	**Closable Doors.** Masonry or factory-built fireplaces must have a closable metal or glass door covering the entire opening of the firebox.
§ 150.0(e)2:	**Combustion Intake.** Masonry or factory-built fireplaces must have a combustion outside air intake, which is at least six square inches in area and is equipped with a readily accessible, operable, and tight-fitting damper or combustion-air control device. *
§ 150.0(e)3:	**Flue Damper.** Masonry or factory-built fireplaces must have a flue damper with a readily accessible control. *

Space Conditioning, Water Heating, and Plumbing System:

§ 110.0-§ 110.3:	**Certification.** Heating, ventilation, and air conditioning (HVAC) equipment, water heaters, showerheads, faucets, and all other regulated appliances must be certified by the manufacturer to the California Energy Commission. *
§ 110.2(a):	**HVAC Efficiency.** Equipment must meet the applicable efficiency requirements in Table 110.2-A through Table 110.2-N. *
§ 110.2(b):	**Controls for Heat Pumps with Supplementary Electric Resistance Heaters.** Heat pumps with supplementary electric resistance heaters must have controls that prevent supplementary heater operation when the heating load can be met by the heat pump alone; and in which the cut-on temperature for compression heating is higher than the cut-on temperature for supplementary heating, and the cut-off temperature for compression heating is higher than the cut-off temperature for supplementary heating.
§ 110.2(c):	**Thermostats.** All heating or cooling systems not controlled by a central energy management control system (EMCS) must have a setback thermostat. *
§ 110.3(c)3:	**Insulation.** Unfired service water heater storage tanks and solar water-heating backup tanks must have adequate insulation, or tank surface heat loss rating.
§ 110.3(c)6:	**Isolation Valves.** Instantaneous water heaters with an input rating greater than 6.8 kBtu per hour (2 kW) must have isolation valves with hose bibbs or other fittings on both cold and hot water lines to allow for flushing the water heater when the valves are closed.

2022 Single-Family Residential Mandatory Requirements Summary

§ 110.5:	**Pilot Lights.** Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces; household cooking appliances (except appliances without an electrical supply voltage connection with pilot lights that consume less than 150 Btu per hour); and pool and spa heaters. *
§ 150.0(h)1:	**Building Cooling and Heating Loads.** Heating and/or cooling loads are calculated in accordance with the ASHRAE Handbook, Equipment Volume, Applications Volume, and Fundamentals Volume; the SMACNA Residential Comfort System Installation Standards Manual; or the ACCA Manual J using design conditions specified in § 150.0(h)2.
§ 150.0(h)3A:	**Clearances.** Air conditioner and heat pump outdoor condensing units must have a clearance of at least five feet from the outlet of any dryer.
§ 150.0(h)3B:	**Liquid Line Drier.** Air conditioners and heat pump systems must be equipped with liquid line filter driers if required, as specified by the manufacturer's instructions.
§ 150.0(j)1:	**Water Piping, Solar Water-heating System Piping, and Space Conditioning System Line Insulation.** All domestic hot water piping must be insulated as specified in § 609.11 of the California Plumbing Code. *
§ 150.0(j)2:	**Insulation Protection.** Piping insulation must be protected from damage, including that due to sunlight, moisture, equipment' maintenance, and wind as required by §120.3(b). Insulation exposed to weather must be water retardant and protected from UV light (no adhesive tapes). Insulation covering chilled water piping and refrigerant suction piping located outside the conditioned space must include, or be protected by, a Class I or Class II vapor retarder. Pipe insulation buried below grade must be installed in a waterproof and non-crushable casing or sleeve.
§ 150.0(n)1:	**Gas or Propane Water Heating Systems.** Systems using gas or propane water heaters to serve individual dwelling units must designate a space at least 2.5' x 2.5' x 7' suitable for the future installation of a heat pump water heater, and meet electrical and plumbing requirements, based on the distance between this designated space and the water heater location; and a condensate drain no more than 2" higher than the base of the water heater
§ 150.0(n)3:	**Solar Water-heating Systems.** Solar water-heating systems and collectors must be certified and rated by the Solar Rating and Certification Corporation (SRCC), the International Association of Plumbing and Mechanical Officials, Research and Testing (IAPMO R&T), or by a listing agency that is approved by the executive director.

Ducts and Fans:

§ 110.8(d)3:	**Ducts.** Insulation installed on an existing space-conditioning duct must comply with § 604.0 of the California Mechanical Code (CMC). If a contractor installs the insulation, the contractor must certify to the customer, in writing, that the insulation meets this requirement.
§ 150.0(m)1:	**CMC Compliance.** All air-distribution system ducts and plenums must meet CMC §§ 601.0-605.0 and ANSI/SMACNA-006-2006 HVAC Duct Construction Standards Metal and Flexible 3rd Edition. Portions of supply-air and return-air ducts and plenums must be insulated to R-6.0 or higher; ducts located entirely in conditioned space as confirmed through field verification and diagnostic testing (RA3.1.4.3.8) do not require insulation. Connections of metal ducts and inner core of flexible ducts must be mechanically fastened. Openings must be sealed with mastic, tape, or other duct-closure system that meets the applicable UL requirements, or aerosol sealant that meets UL 723. The combination of mastic and either mesh or tape must be used to seal openings greater than ¼". If mastic or tape is used. Building cavities, air handler support platforms, and plenums designed or constructed with materials other than sealed sheet metal, duct board or flexible duct must not be used to convey conditioned air. Building cavities and support platforms may contain ducts; ducts installed in these spaces must not be compressed. *
§ 150.0(m)2:	**Factory-Fabricated Duct Systems.** Factory-fabricated duct systems must comply with applicable requirements for duct construction, connections, and closures; joints and seams of duct systems and their components must not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.
§ 150.0(m)3:	**Field-Fabricated Duct Systems.** Field-fabricated duct systems must comply with applicable requirements for: pressure-sensitive tapes, mastics, sealants, and other requirements specified for duct construction.
§ 150.0(m)7:	**Backdraft Damper.** Fan systems that exchange air between the conditioned space and outdoors must have backdraft or automatic dampers.
§ 150.0(m)8:	**Gravity Ventilation Dampers.** Gravity ventilating systems serving conditioned space must have either automatic or readily accessible, manually operated dampers in all openings to the outside, except combustion inlet and outlet air openings and elevator shaft vents.
§ 150.0(m)9:	**Protection of Insulation.** Insulation must be protected from damage due tosunlight, moisture, equipment maintenance, and wind. Insulation exposed to weather must be suitable for outdoor service (e.g., protected by aluminum, sheet metal, painted canvas, or plastic cover). Cellular foam insulation must be protected as above or painted with a water retardant and solar radiation-resistant coating.
§ 150.0(m)10:	**Porous Inner Core Flex Duct.** Porous inner cores of flex ducts must have a non-porous layer or air barrier between the inner core and outer vapor barrier.
§ 150.0(m)11:	**Duct System Sealing and Leakage Test.** When space conditioning systems use forced air duct systems to supply conditioned air to an occupiable space, the ducts must be sealed and duct leakage tested, as confirmed through field verification and diagnostic testing, in accordance with Reference Residential Appendix RA3.1.
§ 150.0(m)12:	**Air Filtration.** Space conditioning systems with ducts exceeding 10 feet and the supply side of ventilation systems must have MERV 13 or equivalent filters. Filters for space conditioning systems must have a two inch depth or can be one inch if sized per Equation 150.0-A. Clean-filter pressure drop and labeling must meet the requirements in §150.0(m)12. Filters must be accessible for regular service. Filter racks or grilles must use gaskets, sealing, or other means to close gaps around the inserted filters to and prevents air from bypassing the filter. *

2022 Single-Family Residential Mandatory Requirements Summary

§ 150.0(k)1G:	**Screw based luminaires.** Screw based luminaires must contain lamps that comply with Reference Joint Appendix JA8. *
§ 150.0(k)1H:	**Light Sources in Enclosed or Recessed Luminaires.** Lamps and other separable light sources that are not compliant with the JA8 elevated temperature requirements, including marking requirements, must not be installed in enclosed or recessed luminaires.
§ 150.0(k)1I:	**Light Sources in Drawers, Cabinets, and Linen Closets.** Light sources internal to drawers, cabinetry or linen closets are not required to comply with Table 150.0-A or be controlled by vacancy sensors provided that they are rated to consume no more than 5 watts of power, emit no more than 150 lumens, and are equipped with controls that automatically turn the lighting off when the drawer, cabinet or linen closet is closed.
§ 150.0(k)2A:	**Interior Switches and Controls.** All forward phase cut dimmers used with LED light sources must comply with NEMA SSL 7A.
§ 150.0(k)2B:	**Interior Switches and Controls.** Exhaust fans must be controlled separately from lighting systems. *
§ 150.0(k)2A:	**Accessible Controls.** Lighting must have readily accessible wall-mounted controls that allow the lighting to be manually turned on and off. *
§ 150.0(k)2B:	**Multiple Controls.** Controls must not bypass a dimmer, occupant sensor, or vacancy sensor function if the dimmer or sensor is installed to comply with § 150.0(k).
§ 150.0(k)2C:	**Mandatory Requirements.** Lighting controls must comply with the applicable requirements of § 110.9.
§ 150.0(k)2D:	**Energy Management Control Systems.** An energy management control system (EMCS) may be used to comply with dimming, occupancy, and control requirements if it provides the functionality of the specified control per § 110.9 and the physical controls specified in § 150.0(k)2A.
§ 150.0(k)2E:	**Automatic Shutoff Controls.** In bathrooms, garages, laundry rooms, utility rooms and walk-in closets, at least one installed luminaire must be controlled by an occupancy or vacancy sensor providing automatic-off functionality. Lighting inside drawers and cabinets with opaque fronts or doors must have controls that turn the light off when the drawer or door is closed.
§ 150.0(k)2F:	**Dimmers.** Lighting in habitable spaces (e.g., living rooms, dining rooms, kitchens, and bedrooms) must have readily accessible wall-mounted dimming controls that allow the lighting to be manually adjusted up and down. Forward phase cut dimmers controlling LED light sources in these spaces must comply with NEMA SSL 7A.
§ 150.0(k)2K:	**Independent controls.** Integrated lighting of exhaust fans shall be controlled independently from the fans. Lighting under cabinets or shelves, lighting in display cabinets, and switched outlets must be controlled separately from ceiling-installed lighting.
§ 150.0(k)3A:	**Residential Outdoor Lighting.** For single-family residential buildings, outdoor lighting permanently mounted to a residential building, or to other buildings on the same lot, must have a manual on/off switch and either a photocell and motion sensor or automatic time switch control) or an astronomical time clock. An energy management control system that provides the specified control functionality and meets all applicable requirements may be used to meet these requirements.
§ 150.0(k)4:	**Internally illuminated address signs.** Internally illuminated address signs must either comply with § 140.8 or consume no more than 5 watts of power.
§ 150.0(k)5:	**Residential Garages for Eight or More Vehicles.** Lighting for residential parking garages for eight or more vehicles must comply with the applicable requirements for nonresidential garages in §§ 110.9, 130.0, 130.1, 130.4, 140.6, and 141.0.

Solar Readiness:

§ 110.10(a)1:	**Single-family Residences.** Single-family residences located in subdivisions with 10 or more single-family residences and where the application for a tentative subdivision map for the residences has been deemed complete and approved by the enforcement agency, which do not have a photovoltaic system installed, must comply with the requirements of § 110.10(b)-(e).
§110.10(b)1A:	**Minimum Solar Zone Area.** The solar zone must have a minimum total area as described below. The solar zone must comply with access, pathway, smoke ventilation, and spacing requirements as specified in Title 24, Part 9 or other parts of Title 24 or in any requirements adopted by a local jurisdiction. The solar zone total area must be comprised of areas that have no dimension less than 5 feet and are no less than 80 square feet each for buildings with roof areas less than or equal to 10,000 square feet or no less than 160 square feet each for buildings with roof areas greater than 10,000 square feet. For single-family residences, the solar zone must be located on the roof or overhang of the building and have a total area no less than 250 square feet. *
§ 110.10(b)2:	**Azimuth.** All sections of the solar zone located on steep-sloped roofs must have an azimuth between 90-300° of true north.
§ 110.10(b)3A:	**Shading.** The solar zone must not contain any obstructions, including but not limited to: vents, chimneys, architectural features, and roof mounted equipment.
§ 110.10(b)3B:	**Shading.** Any obstruction located on the roof or any other part of the building that projects above a solar zone must be located at least twice the horizontal distance of the height difference between the highest point of the obstruction and the horizontal projection of the nearest point of the solar zone, measured in the vertical plane. *
§ 110.10(b)4:	**Structural Design Loads on Construction Documents.** For areas of the roof designated as a solar zone, the structural design loads for roof dead load and roof live load must be clearly indicated on the construction documents.
§ 110.10(c):	**Interconnection Pathways.** The construction documents must indicate: a location reserved for inverters and metering equipment and a pathway reserved for routing of conduit from the solar zone to the point of interconnection with the electrical service; and for single-family residences and central water-heating systems, a pathway reserved for routing plumbing from the solar zone to the water-heating system.
§ 110.10(d):	**Documentation.** A copy of the construction documents or a comparable document indicating the information from § 110.10(b)-(c) must be provided to the occupant.
§ 110.10(e)1:	**Main Electrical Service Panel.** The main electrical service panel must have a minimum busbar rating of 200 amps.
§ 110.10(e)2:	**Main Electrical Service Panel.** The main electrical service panel must have a reserved space to allow for the installation of a double pole circuit breaker for a future solar electric installation. The reserved space must be permanently marked as "For Future Solar Electric."

2022 Single-Family Residential Mandatory Requirements Summary

§ 150.0(m)13:	**Space Conditioning System Airflow Rate and Fan Efficacy.** Space conditioning systems that use ducts to supply cooling must have a hole for the placement of a static pressure probe, or a permanently installed static pressure probe in the supply plenum. Airflow must be ≥ 350 CFM per ton of nominal cooling capacity, and an air-handling unit fan efficacy ≤ 0.45 watts per CFM for gas furnace air handlers and ≤ 0.58 watts per CFM for all others. Small duct high velocity systems must provide an airflow ≥ 250 CFM per ton of nominal cooling capacity, and an air-handling unit fan efficacy ≤ 0.62 watts per CFM. Field verification testing is required in accordance with Reference Residential Appendix RA3.3. *

Ventilation and Indoor Air Quality:

§ 150.0(o)1:	**Requirements for Ventilation and Indoor Air Quality.** All dwelling units must meet the requirements of ASHRAE Standard 62.2, Ventilation and Acceptable Indoor Air Quality in Residential Buildings subject to the amendments specified in § 150.0(o)1. *
§ 150.0(o)1B:	**Central Fan Integrated (CFI) Ventilation Systems.** Continuous operation of CFI air handlers is not allowed to provide the whole-dwelling unit ventilation airflow required per §150.0(o)1C. A motorized damper(s) must be installed on the ventilation duct(s) that prevents all airflow through the space conditioning duct system when the damper(s) is closed andcontrolled per §150.0(o)1Biii&iv. CFI ventilation systems must have controls that track outdoor air ventilation run time, and either open or close the motorized damper(s) for compliance with §150.0(o)1C.
§ 150.0(o)1C:	**Whole-Dwelling Unit Mechanical Ventilation for Single-Family Detached and townhouses .** Single-family detached dwelling units, and attached dwelling units not sharing ceilings or floors with other dwelling units, occupiable spaces, public garages, or commercial spaces must have mechanical ventilation airflow specified in § 150.0(o)1Ci-iii.
§ 150.0(o)1G:	**Local Mechanical Exhaust.** Kitchens and bathrooms must have local mechanical exhaust; nonenclosed kitchens must have demand-controlled exhaust system meeting requirements of §150.0(o)1Giii,enclosed kitchens and bathrooms can use demand-controlled or continuous exhaust meeting §150.0(o)1Giii-iv. Airflow must be measured by the installer per §150.0(o)1Gv, and rated for sound per §150.0(o)1Gvi. *
§ 150.0(o)1H&I:	**Airflow Measurement and Sound Ratings of Whole-Dwelling Unit Ventilation Systems.** The airflow required per § 150.0(o)1C must be measured by using a flow hood, flow grid, or other airflow measuring device at the fan's inlet or outlet terminals/grilles per Reference Residential Appendix RA3.7. Whole-Dwelling unit ventilation systems must be rated for sound per ASHRAE 62.2 §7.2 at no less than the minimum airflow rate required by §150.0(o)1C.
§ 150.0(o)2:	**Field Verification and Diagnostic Testing.** Whole-Dwelling Unit ventilation airflow, vented range hood airflow and sound rating, and HRV and ERV fan efficacy must be verified in accordance with Reference Residential Appendix RA3.7. Vented range hoods must be verified per Reference Residential Appendix RA3.7.4.3 to confirm if it is rated by HVI or AHAM to comply with the airflow rates and sound requirements per §150.0(o)1G

Pool and Spa Systems and Equipment:

§ 110.4(a):	**Certification by Manufacturers.** Any pool or spa heating system or equipment must be certified to have all of the following: compliance with the Appliance Efficiency Regulations and listing in MAEDbS; an on-off switch mounted outside of the heater that allows shutting off the heater without adjusting the thermostat setting; a permanent weatherproof plate or card with operating instructions; and must not use electric resistance heating. *
§ 110.4(b)1:	**Piping.** Any pool or spa heating system or equipment must be installed with at least 36 inches of pipe between the filter and the heater, or dedicated suction and return lines, or built-in or built-up connections to allow for future solar heating.
§ 110.4(b)2:	**Covers.** Outdoor pools or spas that have a heat pump or gas heater must have a cover.
§ 110.4(b)3:	**Directional Inlets and Time Switches for Pools.** Pools must have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.
§ 110.5:	**Pilot Light.** Natural gas pool and spa heaters must not have a continuously burning pilot light.
§ 150.0(p):	**Pool Systems and Equipment Installation.** Residential pool systems or equipment must meet the specified requirements for pump sizing, flow rate, piping, filters, and valves. *

Lighting:

§ 110.9:	**Lighting Controls and Components.** All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements of § 110.9. *
§ 150.0(k)1A:	**Luminaire Efficacy.** All installed luminaires must meet the requirements in Table 150.0-A, except lighting integral to exhaust fans, kitchen range hoods, bath vanity mirrors, and garage door openers; navigation lighting less than 5 watts; and lighting internal to drawers, cabinets, and linen closets with an efficacy of at least 45 lumens per watt.
§ 150.0(k)1B:	**Screw based luminaires.** Screw based luminaires must contain lamps that comply with Reference Joint Appendix JA8. *
§ 150.0(k)1C:	**Recessed Downlight Luminaires in Ceilings.** Luminaires recessed into ceilings must not contain screw based sockets, must be airtight, and must be sealed with a gasket or caulk. California Electrical Code § 410.116 must also be met.
§ 150.0(k)1D:	**Light Sources in Enclosed or Recessed Luminaires.** Lamps and other separable light sources that are not compliant with the JA8 elevated temperature requirements, including marking requirements, must not be installed in enclosed or recessed luminaires.
§ 150.0(k)1E:	**Blank Electrical Boxes.** The number of electrical boxes that are more than five feet above the finished floor and do not contain a luminaire or other device shall be no more than the number of bedrooms. These boxes must be served by a dimmer, vacancy sensor control, low voltage wiring, or fan speed control.
§ 150.0(k)1F:	**Lighting Integral to Exhaust Fans.** Lighting integral to exhaust fans (except when installed by the manufacturer in kitchen exhaust hoods) must meet the applicable requirements of § 150.0(k). *

2022 Single-Family Residential Mandatory Requirements Summary

§ 150.0(s)	**Energy Storage System (ESS) Ready.** All single-family residences must meet all of the following: Either ESS-ready interconnection equipment with backed up capacity of 60 amps or more and four or more ESS supplied branch circuits, or a dedicated raceway from the main service to a subpanel that supplies the branch circuits in § 150.0(s); at least four branch circuits must be identified and have their source collocated at a single panelboard suitable to be supplied by the ESS, with one circuit supplying the refrigerator, one lighting circuit near the primary exit, and one circuit supplying a sleeping room receptacle outlet; main panelboard must have a minimum busbar rating of 225 amps; sufficient space must be reserved to allow future installation of a system isolation equipment/transfer switch within 3' of the main panelboard, with raceways installed between the panelboard and the switch location to allow the connection of backup power source.
§ 150.0(t)	**Heat Pump Space Heater Ready.** Systems using gas or propane furnaces to serve individual dwelling units must include: A dedicated unobstructed 240V branch circuit wiring installed within 3' of the furnace with circuit conductors rated at least 30 amps with the blank cover identified as "240V ready;" and a reserved main electrical service panel space to allow for the installation of a double pole circuit breaker permanently marked as "For Future 240V use."
§ 150.0(u)	**Electric Cooktop Ready.** Systems using gas or propane cooktop to serve individual dwelling units must include: A dedicated unobstructed 240V branch circuit wiring installed within 3' of the cooktop with circuit conductors rated at least 50 amps with the blank cover identified as "240V ready;" and a reserved main electrical service panel space to allow for the installation of a double pole circuit breaker permanently marked as "For Future 240V use."
§ 150.0(v)	**Electric Clothes Dryer Ready.** Clothes dryer locations with gas or propane plumbing to serve individual dwelling units must include: A dedicated unobstructed 240V branch circuit wiring installed within 3' of the dryer location with circuit conductors rated at least 30 amps with the blank cover identified as "240V ready;" and a reserved main electrical service panel space to allow for the installation of a double pole circuit breaker permanently marked as "For Future 240V use."

8.15.23 MSH
5.22.24 MSH

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2022 LOW-RISE RESIDENTIAL MANDATORY MEASURES

11.14.22
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AIA California

2022 CALIFORNIA GREEN BUILDING STANDARDS CODE
RESIDENTIAL MANDATORY MEASURES, SHEET 1 (January 2023)

Y = YES
N/A = NOT APPLICABLE
RESPON. PARTY = RESPONSIBLE PARTY (ie: ARCHITECT, ENGINEER, OWNER, CONTRACTOR, INSPECTOR ETC.)

Y | N/A | RESPON. PARTY

CHAPTER 3
GREEN BUILDING
SECTION 301 GENERAL

301.1 SCOPE. Buildings shall be designed to include the green building measures specified as mandatory in the application checklists contained in this code. Voluntary green building measures are also included in the application checklists and may be included in the design and construction of structures covered by this code, but are not required unless adopted by a city, county, or city and county as specified in Section 101.7.

301.1.1 Additions and alterations. [HCD] The mandatory provisions of Chapter 4 shall be applied to additions or alterations of existing residential buildings where the addition or alteration increases the building's conditioned area, volume, or size. The requirements shall apply only to and/or within the specific area of the addition or alteration.

The mandatory provision of Section 4.106.4.2 may apply to additions or alterations of existing parking facilities or the addition of new parking facilities serving existing multifamily buildings. See Section 4.106.4.3 for application.

Note: Repairs including, but not limited to, resurfacing, restriping and repairing or maintaining existing lighting fixtures are not considered alterations for the purpose of this section.

Note: On and after January 1, 2014, residential buildings undergoing permitted alterations, additions, or improvements shall replace noncompliant plumbing fixtures with water-conserving plumbing fixtures. Plumbing fixture replacement is required prior to issuance of a certificate of final completion, certificate of occupancy or final permit approval by the local building department. See Civil Code Section 1101.1, et seq., for the definition of a noncompliant plumbing fixture, types of residential buildings affected and other important enactment dates.

301.2 LOW-RISE AND HIGH-RISE RESIDENTIAL BUILDINGS. [HCD] The provisions of individual sections of CALGreen may apply to either low-rise residential buildings high-rise residential buildings, or both. Individual sections will be designated by banners to indicate where the section applies specifically to low-rise only (LR) or high-rise only (HR). When the section applies to both low-rise and high-rise buildings, no banner will be used.

SECTION 302 MIXED OCCUPANCY BUILDINGS

302.1 MIXED OCCUPANCY BUILDINGS. In mixed occupancy buildings, each portion of a building shall comply with the specific green building measures applicable to each specific occupancy.

Exceptions:
1. [HCD] Accessory structures and accessory occupancies serving residential buildings shall comply with Chapter 4 and Appendix A4, as applicable.
2. [HCD] For purposes of *CAL*Green, live/work units, complying with Section 419 of the *California Building Code*, shall not be considered mixed occupancies. Live/Work units shall comply with Chapter 4 and Appendix A4, as applicable.

DIVISION 4.1 PLANNING AND DESIGN

ABBREVIATION DEFINITIONS:

HCD	Department of Housing and Community Development
BSC	California Building Standards Commission
DSA-SS	Division of the State Architect, Structural Safety
OSHPD	Office of Statewide Health Planning and Development
LR	Low Rise
HR	High Rise
AA	Additions and Alterations
N	New

CHAPTER 4
RESIDENTIAL MANDATORY MEASURES

SECTION 4.102 DEFINITIONS
4.102.1 DEFINITIONS
The following terms are defined in Chapter 2 *(and are included here for reference)*

FRENCH DRAIN. A trench, hole or other depressed area loosely filled with rock, gravel, fragments of brick or similar pervious material used to collect or channel drainage or runoff water.

WATTLES. Wattles are used to reduce sediment in runoff. Wattles are often constructed of natural plant materials such as hay, straw or similar material shaped in the form of tubes and placed on a downflow slope. Wattles are also used for perimeter and inlet controls.

4.106 SITE DEVELOPMENT
4.106.1 GENERAL. Preservation and use of available natural resources shall be accomplished through evaluation and careful planning to minimize negative effects on the site and adjacent areas. Preservation of slopes, management of storm water drainage and erosion controls shall comply with this section.

4.106.2 STORM WATER DRAINAGE AND RETENTION DURING CONSTRUCTION. Projects which disturb less than one acre of soil and are not part of a larger common plan of development which in total disturbs one acre or more, shall manage storm water drainage during construction. In order to manage storm water drainage during construction, one or more of the following measures shall be implemented to prevent flooding of adjacent property, prevent erosion and retain soil runoff on the site.

1. Retention basins of sufficient size shall be utilized to retain storm water on the site.
2. Where storm water is conveyed to a public drainage system, collection point, gutter or similar disposal method, water shall be filtered by use of a barrier system, wattle or other method approved by the enforcing agency.
3. Compliance with a lawfully enacted storm water management ordinance.

Note: Refer to the State Water Resources Control Board for projects which disturb one acre or more of soil, or are part of a larger common plan of development which in total disturbs one acre or more of soil.

(Website: https://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.html)

4.106.3 GRADING AND PAVING. Construction plans shall indicate how the site grading or drainage system will manage all surface water flows to keep water from entering buildings. Examples of methods to manage surface water include, but are not limited to, the following:

1. Swales
2. Water collection and disposal systems
3. French drains
4. Water retention gardens
5. Other water measures which keep surface water away from buildings and aid in groundwater recharge.

Exception: Additions and alterations not altering the drainage path.

4.106.4 Electric vehicle (EV) charging for new construction. New construction shall comply with Sections 4.106.4.1 or 4.106.4.2 to facilitate future installation and use of EV chargers. Electric vehicle supply equipment (EVSE) shall be installed in accordance with the *California Electrical Code,* Article 625.

Exceptions:
1. On a case-by-case basis, where the local enforcing agency has determined EV charging and infrastructure are not feasible based upon one or more of the following conditions:
1.1 Where there is no local utility power supply or the local utility is unable to supply adequate power.
1.2 Where there is evidence suitable to the local enforcing agency substantiating that additional local utility infrastructure design requirements, directly related to the implementation of Section 4.106.4, may adversely impact the construction cost of the project.
2. Accessory Dwelling Units (ADU) and Junior Accessory Dwelling Units (JADU) without additional parking facilities.

4.106.4.1 New one- and two-family dwellings and townhouses with attached private garages. For each dwelling unit, install a listed raceway to accommodate a dedicated 208/240-volt branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or other enclosure in close proximity to the proposed location of an EV charger. Raceways are required to be continuous at enclosed, inaccessible or concealed areas and spaces. The service panel and/or subpanel shall provide capacity to install a 40-ampere 208/240-volt minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.

Exemption: A raceway is not required if a minimum 40-ampere 208/240-volt dedicated EV branch circuit is installed in close proximity to the proposed location of an EV charger at the time of original construction in accordance with the *California Electrical Code.*

4.106.4.1.1 Identification. The service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging as "EV CAPABLE". The raceway termination location shall be permanently and visibly marked as "EV CAPABLE".

DIVISION 4.2 ENERGY EFFICIENCY

4.201 GENERAL
4.201.1 SCOPE. For the purposes of mandatory energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory standards.

DIVISION 4.3 WATER EFFICIENCY AND CONSERVATION

4.303 INDOOR WATER USE
4.303.1 WATER CONSERVING PLUMBING FIXTURES AND FITTINGS. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the sections 4.303.1.1, 4.303.1.2, 4.303.1.3, and 4.303.4.4.

Note: All noncompliant plumbing fixtures in any residential real property shall be replaced with water-conserving plumbing fixtures. Plumbing fixture replacement is required prior to issuance of a certificate of final completion, certificate of occupancy, or final permit approval by the local building department. See Civil Code Section 1101.1, et seq., for the definition of a noncompliant plumbing fixture, types of residential buildings affected and other important enactment dates.

4.303.1.1 Water Closets. The effective flush volume of all water closets shall not exceed 1.28 gallons per flush. Tank-type water closets shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Tank-type Toilets.

Note: The effective flush volume of dual flush toilets is defined as the composite, average flush volume of two reduced flushes and one full flush.

4.303.1.2 Urinals. The effective flush volume of wall mounted urinals shall not exceed 0.125 gallons per flush. The effective flush volume of all other urinals shall not exceed 0.5 gallons per flush.

4.303.1.3 Showerheads.

4.303.1.3.1 Single Showerhead. Showerheads shall have a maximum flow rate of not more than 1.8 gallons per minute at 80 psi. Showerheads shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Showerheads.

4.303.1.3.2 Multiple showerheads serving one shower. When a shower is served by more than one showerhead, the combined flow rate of all the showerheads and/or other shower outlets controlled by a single valve shall not exceed 1.8 gallons per minute at 80 psi, or the shower shall be designed to only allow one shower outlet to be in operation at a time.

Note: A hand-held shower shall be considered a showerhead.

4.303.1.4 Faucets.

4.303.1.4.1 Residential Lavatory Faucets. The maximum flow rate of residential lavatory faucets shall not exceed 1.2 gallons per minute at 60 psi. The minimum flow rate of residential lavatory faucets shall not be less than 0.8 gallons per minute at 20 psi.

4.303.1.4.2 Lavatory Faucets in Common and Public Use Areas. The maximum flow rate of lavatory faucets installed in common and public use areas (outside of dwellings or sleeping units) in residential buildings shall not exceed 0.5 gallons per minute at 60 psi.

4.303.1.4.3 Metering Faucets. Metering faucets when installed in residential buildings shall not deliver more than 0.2 gallons per cycle.

4.303.1.4.4 Kitchen Faucets. The maximum flow rate of kitchen faucets shall not exceed 1.8 gallons per minute at 60 psi. Kitchen faucets may temporarily increase the flow above the maximum rate, but not to exceed 2.2 gallons per minute at 60 psi, and must default to a maximum flow rate of 1.8 gallons per minute at 60 psi.

Note: Where complying faucets are unavailable, aerators or other means may be used to achieve reduction.

4.303.1.4.5 Pre-rinse spray valves.
When installed, shall meet the requirements in the *California Code of Regulations*, Title 20 (Appliance Efficiency Regulations), Sections 1605.1 (h)(4) Table H-2, Section 1605.3 (h)(4)(A), and Section 1607 (d)(7) and shall be equipped with an integral automatic shutoff.

FOR REFERENCE ONLY: The following table and code section have been reprinted from the *California Code of Regulations*, Title 20 (Appliance Efficiency Regulations),Section 1605.1 (h)(4) and Section 1605.3 (h)(4)(A).

TABLE H-2

STANDARDS FOR COMMERCIAL PRE-RINSE SPRAY VALUES MANUFACTURED ON OR AFTER JANUARY 28, 2019

PRODUCT CLASS [spray force in ounce force (ozf)]	MAXIMUM FLOW RATE (gpm)
Product Class 1 (≤ 5.0 ozf)	1.00
Product Class 2 (> 5.0 ozf and ≤ 8.0 ozf)	1.20
Product Class 3 (> 8.0 ozf)	1.28

Title 20 Section 1605.3 (h)(4)(A): Commercial prerinse spray values manufactured on or after January 1, 2006, shall have a minimum spray force of not less than 4.0 ounces-force (ozf)[113 grams-force(gf)]

4.303.3 Standards for plumbing fixtures and fittings. Plumbing fixtures and fittings shall be installed in accordance with the *California Plumbing Code*, and shall meet the applicable standards referenced in Table 1701.1 of the *California Plumbing Code*.

NOTE:
THIS TABLE COMPILES THE DATA IN SECTION 4.303.1, AND IS INCLUDED AS A CONVENIENCE FOR THE USER.

TABLE - MAXIMUM FIXTURE WATER USE

FIXTURE TYPE	FLOW RATE
SHOWER HEADS (RESIDENTIAL)	1.8 GMP @ 80 PSI
LAVATORY FAUCETS (RESIDENTIAL)	MAX. 1.2 GPM @ 60 PSI MIN. 0.8 GPM @ 20 PSI
LAVATORY FAUCETS IN COMMON & PUBLIC USE AREAS	0.5 GPM @ 60 PSI
KITCHEN FAUCETS	1.8 GPM @ 60 PSI
METERING FAUCETS	0.2 GAL/CYCLE
WATER CLOSET	1.28 GAL/FLUSH
URINALS	0.125 GAL/FLUSH

4.304 OUTDOOR WATER USE
4.304.1 OUTDOOR POTABLE WATER USE IN LANDSCAPE AREAS. Residential developments shall comply with a local water efficient landscape ordinance or the current California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO), whichever is more stringent.

NOTES:

1. The Model Water Efficient Landscape Ordinance (MWELO) is located in the *California Code Regulations,* Title 23, Chapter 2.7, Division 2. MWELO and supporting documents, including water budget calculator, are available at: https://www.water.ca.gov/

DIVISION 4.4 MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

4.406 ENHANCED DURABILITY AND REDUCED MAINTENANCE
4.406.1 RODENT PROOFING. Annular spaces around pipes, electric cables, conduits or other openings in sole/bottom plates at exterior walls shall be protected against the passage of rodents by closing such openings with cement mortar, concrete masonry or a similar method acceptable to the enforcing agency.

4.408 CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING
4.408.1 CONSTRUCTION WASTE MANAGEMENT. Recycle and/or salvage for reuse a minimum of 65 percent of the non-hazardous construction and demolition waste in accordance with either Section 4.408.2, 4.408.3 or 4.408.4, or meet a more stringent local construction and demolition waste management ordinance.

Exceptions:

1. Excavated soil and land-clearing debris.
2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist or are not located reasonably close to the jobsite.
3. The enforcing agency may make exceptions to the requirements of this section when isolated jobsites are located in areas beyond the haul boundaries of the diversion facility.

4.408.2 CONSTRUCTION WASTE MANAGEMENT PLAN. Submit a construction waste management plan in conformance with Items 1 through 5. The construction waste management plan shall be updated as necessary and shall be available during construction for examination by the enforcing agency.

1. Identify the construction and demolition waste materials to be diverted from disposal by recycling, reuse on the project or salvage for future use or sale.
2. Specify if construction and demolition waste materials will be sorted on-site (source separated) or bulk mixed (single stream).
3. Identify diversion facilities where the construction and demolition waste material collected will be taken.
4. Identify construction methods employed to reduce the amount of construction and demolition waste generated.
5. Specify that the amount of construction and demolition waste materials diverted shall be calculated by weight or volume, but not by both.

4.408.3 WASTE MANAGEMENT COMPANY. Utilize a waste management company, approved by the enforcing agency, which can provide verifiable documentation that the percentage of construction and demolition waste material diverted from the landfill complies with Section 4.408.1.

Note: The owner or contractor may make the determination if the construction and demolition waste materials will be diverted by a waste management company.

4.408.4 WASTE STREAM REDUCTION ALTERNATIVE [LR]. Projects that generate a total combined weight of construction and demolition waste disposed of in landfills, which do not exceed 3.4 lbs./sq.ft. of the building area shall meet the minimum 65% construction waste reduction requirement in Section 4.408.1

4.408.4.1 WASTE STREAM REDUCTION ALTERNATIVE. Projects that generate a total combined weight of construction and demolition waste disposed of in landfills, which do not exceed 2 pounds per square foot of the building area, shall meet the minimum 65% construction waste reduction requirement in Section 4.408.1

4.408.5 DOCUMENTATION. Documentation shall be provided to the enforcing agency which demonstrates compliance with Section 4.408.2, items 1 through 5, Section 4.408.3 or Section 4.408.4..

Notes:

1. Sample forms found in "A Guide to the California Green Building Standards Code (Residential)" located at www.hcd.ca.gov/CALGreen.html may be used to assist in documenting compliance with this section.
2. Mixed construction and demolition debris (C & D) processors can be located at the California Department of Resources Recycling and Recovery (CalRecycle).

4.410 BUILDING MAINTENANCE AND OPERATION
4.410.1 OPERATION AND MAINTENANCE MANUAL. At the time of final inspection, a manual, compact disc, web-based reference or other media acceptable to the enforcing agency which includes all of the following shall be placed in the building:

1. Directions to the owner or occupant that the manual shall remain with the building throughout the life cycle of the structure.
2. Operation and maintenance instructions for the following:
   a. Equipment and appliances, including water-saving devices and systems, HVAC systems, photovoltaic systems, electric vehicle chargers, water-heating systems and other major appliances and equipment.
   b. Roof and yard drainage, including gutters and downspouts.
   c. Space conditioning systems, including condensers and air filters.
   d. Landscape irrigation systems.
   e. Water reuse systems.
3. Information from local utility, water and waste recovery providers on methods to further reduce resource consumption, including recycle programs and locations.
4. Public transportation and/or carpool options available in the area.
5. Educational material on the positive impacts of an interior relative humidity between 30-60 percent and what methods an occupant may use to maintain the relative humidity level in that range.
6. Information about water-conserving landscape and irrigation design and controllers which conserve water.
7. Instructions for maintaining gutters and downspouts and the importance of diverting water at least 5 feet away from the foundation.
8. Information on required routine maintenance measures, including, but not limited to, caulking, painting, grading around the building, etc.
9. Information about state solar energy and incentive programs available.
10. A copy of all special inspections verifications required by the enforcing agency or this code.
11. Information from the Department of Forestry and Fire Protection on maintenance of defensible space around residential structures.
12. Information and/or drawings identifying the location of grab bar reinforcements.

DIVISION 4.5 ENVIRONMENTAL QUALITY

SECTION 4.501 GENERAL
4.501.1 Scope
The provisions of this chapter shall outline means of reducing the quality of air contaminants that are odorous, irritating and/or harmful to the comfort and well being of a building's installers, occupants and neighbors.

SECTION 4.502 DEFINITIONS
5.102.1 DEFINITIONS
The following terms are defined in Chapter 2 *(and are included here for reference)*

AGRIFIBER PRODUCTS. Agrifiber products include wheatboard, strawboard, panel substrates and door cores, not including furniture, fixtures and equipment (FF&E) not considered base building elements.

COMPOSITE WOOD PRODUCTS. Composite wood products include hardwood plywood, particleboard and medium density fiberboard. "Composite wood products" does not include hardboard, structural plywood, structural panels, structural composite lumber, oriented strand board, glued laminated timber, prefabricated wood I-joists or finger-jointed lumber, all as specified in California Code of regulations (CCR), title 17, Section 93120.1.

DIRECT-VENT APPLIANCE. A fuel-burning appliance with a sealed combustion system that draws all air for combustion from the outside atmosphere and discharges all flue gases to the outside atmosphere.

MAXIMUM INCREMENTAL REACTIVITY (MIR). The maximum change in weight of ozone formed by adding a compound to the "Base Reactive Organic Gas (ROG) Mixture" per weight of compound added, expressed to hundredths of a gram ($g\ O^3/g$ ROC).
Note: MIR values for individual compounds and hydrocarbon solvents are specified in CCR, Title 17, Sections 94700 and 94701.

MOISTURE CONTENT. The weight of the water in wood expressed in percentage of the weight of the oven-dry wood.

PRODUCT-WEIGHTED MIR (PWMIR). The sum of all weighted-MIR for all ingredients in a product subject to this article. The PWMIR is the total product reactivity expressed to hundredths of a gram of ozone formed per gram of product (excluding container and packaging).
Note: PWMIR is calculated according to equations found in CCR, Title 17, Section 94521 (a).

REACTIVE ORGANIC COMPOUND (ROC). Any compound that has the potential, once emitted, to contribute to ozone formation in the troposphere.

VOC. A volatile organic compound (VOC) broadly defined as a chemical compound based on carbon chains or rings with vapor pressures greater than 0.1 millimeters of mercury at room temperature. These compounds typically contain hydrogen and may contain oxygen, nitrogen and other elements. See CCR Title 17, Section 94508(a).

4.503 FIREPLACES
4.503.1 GENERAL. Any installed gas fireplace shall be a direct-vent sealed-combustion type. Any installed woodstove or pellet stove shall comply with U.S. EPA New Source Performance Standards (NSPS) emission limits as applicable, and shall have a permanent label indicating they are certified to meet the emission limits. Woodstoves, pellet stoves and fireplaces shall also comply with applicable local ordinances.

4.504 POLLUTANT CONTROL
4.504.1 COVERING OF DUCT OPENINGS & PROTECTION OF MECHANICAL EQUIPMENT DURING CONSTRUCTION. At the time of rough installation, during storage on the construction site and until final startup of the heating, cooling and ventilating equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheet metal or other methods acceptable to the enforcing agency to reduce the amount of water, dust or debris which may enter the system.

4.504.2 FINISH MATERIAL POLLUTANT CONTROL. Finish materials shall comply with this section.

4.504.2.1 Adhesives, Sealants and Caulks. Adhesives, sealant and caulks used on the project shall meet the requirements of the following standards unless more stringent local or regional air pollution or air quality management district rules apply:

1. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable or SCAQMD Rule 1168 VOC limits, as shown in Table 4.504.1 or 4.504.2, as applicable. Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and tricloroethylene), except for aerosol products, as specified in Subsection 2 below.
2. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than 1 pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of *California Code of Regulations*, Title 17, commencing with section 94507.

4.504.2.2 Paints and Coatings. Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Suggested Control Measure, as shown in Table 4.504.3, unless more stringent local limits apply. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories listed in Table 4.504.3 shall be determined by classifying the coating as a Flat, Nonflat or Nonflat-High Gloss coating, based on its gloss, as defined in subsections 4.21, 4.36, and 4.37 of the 2007 California Air Resources Board, Suggested Control Measure, and the corresponding Flat, Nonflat or Nonflat-High Gloss VOC limit in Table 4.504.3 shall apply.

4.504.2.3 Aerosol Paints and Coatings. Aerosol paints and coatings shall meet the Product-weighted MIR Limits for ROC in Section 94522(a)(2) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(e)(1) and (f)(1) of *California Code of Regulations*, Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8, Rule 49.

4.504.2.4 Verification. Verification of compliance with this section shall be provided at the request of the enforcing agency. Documentation may include, but is not limited to, the following:

1. Manufacturer's product specification.
2. Field verification of on-site product containers.

TABLE 4.504.1 - ADHESIVE VOC LIMIT[1,2]

(Less Water and Less Exempt Compounds in Grams per Liter)

ARCHITECTURAL APPLICATIONS	VOC LIMIT
INDOOR CARPET ADHESIVES	50
CARPET PAD ADHESIVES	50
OUTDOOR CARPET ADHESIVES	150
WOOD FLOORING ADHESIVES	100
RUBBER FLOOR ADHESIVES	60
SUBFLOOR ADHESIVES	50
CERAMIC TILE ADHESIVES	65
VCT & ASPHALT TILE ADHESIVES	50
DRYWALL & PANEL ADHESIVES	50
COVE BASE ADHESIVES	50
MULTIPURPOSE CONSTRUCTION ADHESIVE	70
STRUCTURAL GLAZING ADHESIVES	100
SINGLE-PLY ROOF MEMBRANE ADHESIVES	250
OTHER ADHESIVES NOT LISTED	50
SPECIALTY APPLICATIONS	
PVC WELDING	510
CPVC WELDING	490
ABS WELDING	325
PLASTIC CEMENT WELDING	250
ADHESIVE PRIMER FOR PLASTIC	550
CONTACT ADHESIVE	80
SPECIAL PURPOSE CONTACT ADHESIVE	250
STRUCTURAL WOOD MEMBER ADHESIVE	140
TOP & TRIM ADHESIVE	250
SUBSTRATE SPECIFIC APPLICATIONS	
METAL TO METAL	30
PLASTIC FOAMS	50
POROUS MATERIAL (EXCEPT WOOD)	50
WOOD	30
FIBERGLASS	80

1. IF AN ADHESIVE IS USED TO BOND DISSIMILAR SUBSTRATES TOGETHER, THE ADHESIVE WITH THE HIGHEST VOC CONTENT SHALL BE ALLOWED.

2. FOR ADDITIONAL INFORMATION REGARDING METHODS TO MEASURE THE VOC CONTENT SPECIFIED IN THIS TABLE, SEE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 1168.

TABLE 4.504.2 - SEALANT VOC LIMIT

(Less Water and Less Exempt Compounds in Grams per Liter)

SEALANTS	VOC LIMIT
ARCHITECTURAL	250
MARINE DECK	760
NONMEMBRANE ROOF	300
ROADWAY	250
SINGLE-PLY ROOF MEMBRANE	450
OTHER	420
SEALANT PRIMERS	
ARCHITECTURAL	
NON-POROUS	250
POROUS	775
MODIFIED BITUMINOUS	500
MARINE DECK	760
OTHER	750

TABLE 4.504.3 - VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS[2,3]

GRAMS OF VOC PER LITER OF COATING, LESS WATER & LESS EXEMPT COMPOUNDS

COATING CATEGORY	VOC LIMIT
FLAT COATINGS	50
NON-FLAT COATINGS	100
NONFLAT-HIGH GLOSS COATINGS	150
SPECIALTY COATINGS	
ALUMINUM ROOF COATINGS	400
BASEMENT SPECIALTY COATINGS	400
BITUMINOUS ROOF COATINGS	50
BITUMINOUS ROOF PRIMERS	350
BOND BREAKERS	350
CONCRETE CURING COMPOUNDS	350
CONCRETE/MASONRY SEALERS	100
DRIVEWAY SEALERS	50
DRY FOG COATINGS	150
FAUX FINISHING COATINGS	350
FIRE RESISTIVE COATINGS	350
FLOOR COATINGS	100
FORM-RELEASE COMPOUNDS	250
GRAPHIC ARTS COATINGS (SIGN PAINTS)	500
HIGH TEMPERATURE COATINGS	420
INDUSTRIAL MAINTENANCE COATINGS	250
LOW SOLIDS COATINGS[1]	120
MAGNESITE CEMENT COATINGS	450
MASTIC TEXTURE COATINGS	100
METALLIC PIGMENTED COATINGS	500
MULTICOLOR COATINGS	250
PRETREATMENT WASH PRIMERS	420
PRIMERS, SEALERS, & UNDERCOATERS	100
REACTIVE PENETRATING SEALERS	350
RECYCLED COATINGS	250
ROOF COATINGS	50
RUST PREVENTATIVE COATINGS	250
SHELLACS	
CLEAR	730
OPAQUE	550
SPECIALTY PRIMERS, SEALERS & UNDERCOATERS	100
STAINS	250
STONE CONSOLIDANTS	450
SWIMMING POOL COATINGS	340
TRAFFIC MARKING COATINGS	100
TUB & TILE REFINISH COATINGS	420
WATERPROOFING MEMBRANES	250
WOOD COATINGS	275
WOOD PRESERVATIVES	350
ZINC-RICH PRIMERS	340

1. GRAMS OF VOC PER LITER OF COATING, INCLUDING WATER & EXEMPT COMPOUNDS

2. THE SPECIFIED LIMITS REMAIN IN EFFECT UNLESS REVISED LIMITS ARE LISTED IN SUBSEQUENT COLUMNS IN THE TABLE.

3. VALUES IN THIS TABLE ARE DERIVED FROM THOSE SPECIFIED BY THE CALIFORNIA AIR RESOURCES BOARD, ARCHITECTURAL COATINGS SUGGESTED CONTROL MEASURE, FEB. 1, 2008. MORE INFORMATION IS AVAILABLE FROM THE AIR RESOURCES BOARD.

TABLE 4.504.5 - FORMALDEHYDE LIMITS[1]

MAXIMUM FORMALDEHYDE EMISSIONS IN PARTS PER MILLION

PRODUCT	CURRENT LIMIT
HARDWOOD PLYWOOD VENEER CORE	0.05
HARDWOOD PLYWOOD COMPOSITE CORE	0.05
PARTICLE BOARD	0.09
MEDIUM DENSITY FIBERBOARD	0.11
THIN MEDIUM DENSITY FIBERBOARD[2]	0.13

1. VALUES IN THIS TABLE ARE DERIVED FROM THOSE SPECIFIED BY THE CALIF. AIR RESOURCES BOARD, AIR TOXICS CONTROL MEASURE FOR COMPOSITE WOOD AS TESTED IN ACCORDANCE WITH ASTM E 1333. FOR ADDITIONAL INFORMATION, SEE CALIF. CODE OF REGULATIONS, TITLE 17, SECTIONS 93120 THROUGH 93120.12.

2. THIN MEDIUM DENSITY FIBERBOARD HAS A MAXIMUM THICKNESS OF 5/16" (8 MM).

DIVISION 4.5 ENVIRONMENTAL QUALITY (continued)
4.504.3 CARPET SYSTEMS. All carpet installed in the building interior shall meet the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.2, January 2017 (Emission testing method for California Specification 01350)

See California Department of Public Health's website for certification programs and testing labs.

https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx.

4.504.3.1 Carpet cushion. All carpet cushion installed in the building interior shall meet the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.2, January 2017 (Emission testing method for California Specification 01350)

See California Department of Public Health's website for certification programs and testing labs.

https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx.

4.504.3.2 Carpet adhesive. All carpet adhesive shall meet the requirements of Table 4.504.1.

4.504.4 RESILIENT FLOORING SYSTEMS. Where resilient flooring is installed , at least 80% of floor area receiving resilient flooring shall meet the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.2, January 2017 (Emission testing method for California Specification 01350)

See California Department of Public Health's website for certification programs and testing labs.

hhttps://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx.

4.504.5 COMPOSITE WOOD PRODUCTS. Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the buildings shall meet the requirements for formaldehyde as specified in ARB's Air Toxics Control Measure for Composite Wood (17 CCR 93120 et seq.), by or before the dates specified in those sections, as shown in Table 4.504.5

4.504.5.1 Documentation. Verification of compliance with this section shall be provided as requested by the enforcing agency. Documentation shall include at least one of the following:

1. Product certifications and specifications.
2. Chain of custody certifications.
3. Product labeled and invoiced as meeting the Composite Wood Products regulation (see CCR, Title 17, Section 93120, et seq.).
4. Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269, European 636 3S standards, and Canadian CSA 0121, CSA 0151, CSA 0153 and CSA 0325 standards.
5. Other methods acceptable to the enforcing agency.

4.505 INTERIOR MOISTURE CONTROL
4.505.1 General. Buildings shall meet or exceed the provisions of the *California Building Standards Code.*

4.505.2 CONCRETE SLAB FOUNDATIONS. Concrete slab foundations required to have a vapor retarder by California Building Code, Chapter 19, or concrete slab-on-ground floors required to have a vapor retarder by the California Residential Code, Chapter 5, shall also comply with this section.

4.505.2.1 Capillary break. A capillary break shall be installed in compliance with at least one of the following:

1. A 4-inch (101.6 mm) thick base of 1/2 inch (12.7mm) or larger clean aggregate shall be provided with a vapor barrier in direct contact with concrete and a concrete mix design, which will address bleeding, shrinkage, and curling, shall be used. For additional information, see American Concrete Institute, ACI 302.2R-06.
2. Other equivalent methods approved by the enforcing agency.
3. A slab design specified by a licensed design professional.

4.505.3 MOISTURE CONTENT OF BUILDING MATERIALS. Building materials with visible signs of water damage shall not be installed. Wall and floor framing shall not be enclosed when the framing members exceed 19 percent moisture content. Moisture content shall be verified in compliance with the following:

1. Moisture content shall be determined with either a probe-type or contact-type moisture meter.Equivalent moisture verification methods may be approved by the enforcing agency and shall satisfy requirements found in Section 101.8 of this code.
2. Moisture readings shall be taken at a point 2 feet (610 mm) to 4 feet (1219 mm) from the grade stamped end of each piece verified.
3. At least three random moisture readings shall be performed on wall and floor framing with documentation acceptable to the enforcing agency provided at the time of approval to enclose the wall and floor framing.

Insulation products which are visibly wet or have a high moisture content shall be replaced or allowed to dry prior to enclosure in wall or floor cavities. Wet-applied insulation products shall follow the manufacturers' drying recommendations prior to enclosure.

4.506 INDOOR AIR QUALITY AND EXHAUST
4.506.1 Bathroom exhaust fans. Each bathroom shall be mechanically ventilated and shall comply with the following:

1. Fans shall be ENERGY STAR compliant and be ducted to terminate outside the building.
2. Unless functioning as a component of a whole house ventilation system, fans must be controlled by a humidity control.
   a. Humidity controls shall be capable of adjustment between a relative humidity range less than or equal to 50% to a maximum of 80%. A humidity control may utilize manual or automatic means of adjustment.
   b. A humidity control may be a separate component to the exhaust fan and is not required to be integral (i.e., built-in)

Notes:

1. For the purposes of this section, a bathroom is a room which contains a bathtub, shower or tub/shower combination.
2. Lighting integral to bathroom exhaust fans shall comply with the *California Energy Code.*

4.507 ENVIRONMENTAL COMFORT
4.507.2 HEATING AND AIR-CONDITIONING SYSTEM DESIGN. Heating and air conditioning systems shall be sized, designed and have their equipment selected using the following methods:

1. The heat loss and heat gain is established according to ANSI/ACCA 2 Manual J - 2011 (Residential Load Calculation), ASHRAE handbooks or other equivalent design software or methods.
2. Duct systems are sized according to ANSI/ACCA 1 Manual D - 2014 (Residential Duct Systems), ASHRAE handbooks or other equivalent design software or methods.
3. Select heating and cooling equipment according to ANSI/ACCA 3 Manual S - 2014 (Residential Equipment Selection), or other equivalent design software or methods.

Exception: Use of alternate design temperatures necessary to ensure the system functions are acceptable.

Y | N/A | RESPON. PARTY

CHAPTER 7
INSTALLER & SPECIAL INSPECTOR QUALIFICATIONS

702 QUALIFICATIONS
702.1 INSTALLER TRAINING. HVAC system installers shall be trained and certified in the proper installation of HVAC systems including ducts and equipment by a nationally or regionally recognized training or certification program. Uncertified persons may perform HVAC installations when under the direct supervision and responsibility of a person trained and certified to install HVAC systems or contractor licensed to install HVAC systems. Examples of acceptable HVAC training and certification programs include but are not limited to the following:

1. State certified apprenticeship programs.
2. Public utility training programs.
3. Training programs sponsored by trade, labor or statewide energy consulting or verification organizations.
4. Programs sponsored by manufacturing organizations.
5. Other programs acceptable to the enforcing agency.

702.2 SPECIAL INSPECTION [HCD]. When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition to other certifications or qualifications acceptable to the enforcing agency, the following certifications or education may be considered by the enforcing agency when evaluating the qualifications of a special inspector:

1. Certification by a national or regional green building program or standard publisher.
2. Certification by a statewide energy consulting or verification organization, such as HERS raters, building performance contractors, and home energy auditors.
3. Successful completion of a third party apprentice training program in the appropriate trade.
4. Other programs acceptable to the enforcing agency.

Notes:
1. Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.
2. HERS raters are special inspectors certified by the California Energy Commission (CEC) to rate homes in California according to the Home Energy Rating System (HERS).

[BSC] When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition, the special inspector shall have a certification from a recognized state, national or international association, as determined by the local agency. The area of certification shall be closely related to the primary job function, as determined by the local agency.

Note: Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.

703 VERIFICATIONS
703.1 DOCUMENTATION. Documentation used to show compliance with this code shall include but is not limited to, construction documents, plans, specifications, builder or installer certification, inspection reports, or other methods acceptable to the enforcing agency which demonstrate substantial conformance. When specific documentation or special inspection is necessary to verify compliance, that method of compliance will be specified in the appropriate section or identified applicable checklist.

8.15.23	MSH
5-22-24	MSH

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LICENSED ARCHITECT MICHAEL S. HELM C12699 EXPIRES 11.30.25 STATE OF CALIFORNIA

REMODEL & ADDITIONS TO THE:
RENFREW RESIDENCE
14500 ARNERICH HILL ROAD – APN 537-12-012
LOS GATOS, CALIFORNIA

GREEN BUILDING STANDARDS

11.14.22
NTS
MSH
2108

ABBREVIATIONS

Ø	DIAMETER	MAX	MAXIMUM
		MEP	MECHANICAL/ELECTRICAL/PLUMBING
AB	AGGREGATE BASE	MH	MANHOLE
ABDN	ABANDONED	MIN	MINIMUM
AC	ACRE, ASPHALT CONCRETE	MIPT	MALE IRON PIPE THREAD
ACP	ASBESTOS CEMENT PIPE	MJ	MECHANICAL JOINT
ACM	ASBESTOS CONTAINING MATERIAL	MPVC	MIDPOINT OF VERTICAL CURVE
AD	AREA DRAIN	MON	MONUMENT
AGG	AGGREGATE		
ALGN	ALIGNMENT	N	NORTHING COORDINATE
ARV	AIR RELEASE VALVE	(N)	NEW
ASB	AGGREGATE SUBBASE	NC	NORMALLY CLOSED
ASPH	ASPHALT	NIC	NOT IN CONTRACT
		NO	NUMBER
BC	BEGIN CURVE	NTS	NOT TO SCALE
BEG	BEGIN		
BFP	BACK FLOW PREVENTER		
BLDC	BUILDING CORNER	OHE	OVERHEAD ELECTRIC
BLDG	BUILDING	O.R.	OFFICIAL RECORDS
BMP	BEST MANAGEMENT PRACTICES		
BOD	BOTTOM OF DOCK	(P)	PROPOSED
BOL	BOLLARD	P	PAVEMENT ELEVATION
BSW	BACK OF SIDEWALK	PA	PLANTER AREA
BVC	BEGIN VERTICAL CURVE	PB	PULL BOX
BW	FINISHED GRADE AT BOTTOM OF WALL	PCC	POINT OF COMPOUND CURVATURE PORTLAND CEMENT CONCRETE
C	CONCRETE OR CIVIL	PE	PLAIN END
CB	CATCH BASIN	PED	PEDESTRIAN
C&G	CURB AND GUTTER	PERF	PERFORATED
CG&S/W	CURB, GUTTER & SIDEWALK	PH	POTHOLE
CI	CAST IRON OR CURB INLET	PID	POINT ID
CIP	CAST IRON PIPE	PIV	POST INDICATOR VALVE
CL	CENTERLINE	PL	PROPERTY LINE
CLR	CLEAR	PM	PARKING METER
CLSM	CONTROLLED LOW-STRENGTH MATERIAL	PMH	POWER MANHOLE
CMN	COMMUNICATION	PO	PUSH-ON
CMP	CORRUGATED METAL PIPE	POC	POINT ON CURVE
CO	CLEAN OUT	POI	POINT OF INTERSECTION
CONC	CONCRETE	PP	POWER POLE
CONST	CONSTRUCTION OR CONSTRUCT	PRC	POINT OF REVERSE CURVATURE
CONF	CONFORM TO EXISTING	PRV	PRESSURE REDUCING VALVE
CSC	CITY OF SANTA CLARA	PRUE	PRIVATE UTILITY EASEMENT
CU	CUBIC	PT	POINT OF TANGENCY
CY	CUBIC YARD	PUE	PUBLIC UTILITY EASEMENT
		PVC	POLYVINYL CHLORIDE PIPE
D=	DELTA (CURVE)		
DCDA	DOUBLE CHECK DETECTOR ASSEMBLY	R	RIGHT
DEMO	DEMOLISH	R=	RADIUS (CURVE)
DEPT	DEPARTMENT	RC	RELATIVE COMPACTION
DET	DETAIL	RCP	REINFORCED CONCRETE PIPE
DI	DROP INLET, DUCTILE IRON	RJ	RESTRAINED JOINT
DIA	DIAMETER	RP	RADIUS POINT
DIP	DUCTILE IRON PIPE	RPBFP	REDUCED PRESSURE BACKFLOW PREVENTER
DOM	DOMESTIC	RPPA R	EDUCED PRESSURE PRINCIPLE ASSEMBLY
DW	DOMESTIC WATER	RSC	RECEIVING AND SUPPORT CENTER
DWG	DRAWING	RW	RECYCLED WATER
		R/W, ROW	RIGHT OF WAY
E	EASTING COORDINATE, ELECTRIC		
EC	END CURVE	S	SOUTH, SLOPE
EG	EXISTING GRADE	S.A.D.	SEE ARCHITECTURAL DRAWINGS
EL, ELEV	ELEVATION	SD	STORM DRAIN
ELEC	ELECTRICAL	SDCB	STORM DRAIN CATCH BASIN
EP	EDGE OF PAVEMENT	SDI	STORM DRAIN INLET
EVA	EMERGENCY VEHICLE ACCESS	SDMH	STORM DRAIN MANHOLE
EX,EXIST, (E)	EXISTING	SDCO	STORM DRAIN CLEANOUT
		S.E.D.	SEE ELECTRICAL DRAWINGS
(F)	FUTURE	SF	SILT FENCE
FA	FIRE ALARM	SG	SUBGRADE
F/C,FC	FACE OF CURB	SHLDR	SHOULDER
FD	FOUND	SHT	SHEET
FDC	FIRE DEPARTMENT CONNECTION	SL	STREETLIGHT
FF,FFE	FINISHED FLOOR ELEVATION	S.L.D.	SEE LANDSCAPE DRAWINGS
FG	FINISH GRADE	SMH	SIGNAL MANHOLE
FH	FIRE HYDRANT	S.M.D	SEE MECHANICAL DRAWINGS
FIPT	FEMALE IRON PIPE THREAD	S.P.D	SEE PLUMBING DRAWINGS
FL	FLOW LINE, FLANGE	SS	SANITARY SEWER
FLG	FLANGE	S.S.D.	SEE STRUCTURAL DRAWINGS
FM	FLOWMETER/FORCE MAIN	SSD	SUBSURFACE DRIP
FOUND	FOUNDATION	SSCO	SANITARY SEWER CLEANOUT
FS	FINISHED SURFACE	SSFM	SANITARY SEWER FORCE MAIN
FT	FOOT, FEET	SSMH	SANITARY SEWER MANHOLE
FW	FIRE WATER	SSPS	SANITARY SEWER PUMP STATION
		STA	STATION
G	GAS, GROUND ELEVATION	STD	STANDARD
GB	GRADE BREAK	STL	STEEL
GI	GALVANIZED IRON	S/W	SIDEWALK
GRD, G	GROUND	SVP	SILICON VALLEY POWER
GV	GATE VALVE		
		T	TELEPHONE
HMA	HOT MIX ASPHALT	TC	TOP OF CURB
HORIZ	HORIZONTAL	TD	TRENCH DRAIN
HT	HEIGHT	TEL	TELEPHONE
HP	HIGH POINT	TEMP	TEMPORARY
		TFC	TOP FACE OF CURB
INV	INVERT	THK	THICK
INST	INSTALL	TOD	TOP OF DOCK
IRR	IRRIGATION	TOE	TOE OF SLOPE
		TW,TOW	TOP OF WALL
JP	JOINT POLE	TS	TOP OF SLAB
JT	JOINT TRENCH	TYP	TYPICAL
		UON	UNLESS OTHERWISE NOTED
L	LEFT	U/G	UNDERGROUND
L=	LENGTH (CURVE)		
LF	LINEAR FEET	VC	VERTICAL CURVE
LAT	LATERAL		
LIP	LIP OF GUTTER	W	WEST, WATER
LP	LIGHT POLE, LOW POINT	WM	WATER METER
LPFH	FIRE HYDRANT	WV	WATER VALVE
LS	LANDSCAPE	WWF	WELDED WIRE FABRIC
LSA	LANDSCAPE ARCHITECT	W/	WITH
MA	MEDICAL AIR	YDS	YARDS

CIVIL SYMBOLS LEGEND

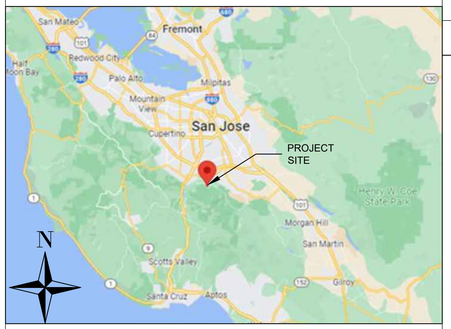
SURVEY TOPO AND SITE IMPROVEMENTS

- 6" CURB & GUTTER
- EDGE OF AC PAVEMENT
- 6" VERTICAL CURB
- DW — DOMESTIC WATER MAIN
- E — ELECTRIC LINE
- FL — FLUSH LINE
- FM — FORCE MAIN
- G — GAS LINE
- IRR — IRRIGATION LINE
- OH — OVERHEAD WIRES
- OHE — OVERHEAD ELECTRIC
- OHT — OVERHEAD TELEPHONE
- RW — RECYCLED WATER
- SS — SANITARY SEWER LINE
- SD — STORM DRAIN LINE
- SL — STREET LIGHT CONDUIT
- C — TELECOMMUNICATIONS
- TEL — TELEPHONE LINE
- TV — TELEVISION LINE
- W — WATER LINE
- UGE — UNDERGROUND ELECTRIC
- TRENCH DRAIN
- METAL BEAM GUARD RAIL
- SILT FENCE
- CHAIN LINK FENCE
- FLOW LINE
- # — CONTOUR ELEVATION LINE
- CENTER LINE
- PROPERTY LINE
- MONUMENT LINE
- EASEMENT LINE
- TC 24.52 / FG — FINISH GRADE
- 2.0% — SURFACE DRAINAGE SLOPE
- x 95.94 — SPOT ELEVATION
- GRADE BREAK
- LIMIT OF WORK/GRADING
- IRRIGATION BOX
- GM — GAS METER
- G — GAS VALVE
- WM — WATER METER
- W — WATER VALVE
- WATER METER OR BFP
- FIRE HYDRANT
- FDC — FIRE DEPARTMENT CONNECTION
- WATER TAPPING SADDLE
- SSMH — SEWER MANHOLE
- SEWER CLEANOUT
- SEWER LAMP HOLE
- SEWER VENT
- SDMH — STORM DRAIN MANHOLE
- CB — CATCH BASIN
- DI — DRAINAGE INLET
- SDMH — STORM DRAIN CLEANOUT
- E — ELECTRIC VAULT COVER
- PB — PULL BOX
- HVE — HIGH VOLTAGE ELECTRIC
- T — TELEPHONE MANHOLE
- POWER POLE
- GUY — GUY WIRE & ANCHOR
- JP — JOINT POLE
- STREET LIGHT
- ELECTROLIER
- TRAFFIC SIGNAL
- TS — TRAFFIC SIGNAL
- PEDESTRIAN LIGHT
- PEDESTRIAN PUSH BUTTON
- DET — CROSSWALK DETECTOR
- SL — STREET LIGHT PULLBOX
- SIGN (AS NOTED)
- THRUST BLOCK
- CAP
- GATE VALVE
- BUTTERFLY VALVE
- DEMO
- WELL
- PUMP
- BALL VALVE
- ACTUATED BALL VALVE
- SOLENOID VALVE
- AIR/VACUUM BREAKER
- PRESSURE REGULATOR
- SSD FILTER
- ISOLATION VALVE
- CHECK VALVE
- FLOW METER
- PRESSURE GAUGE
- PRESSURE SWITCH
- FLOAT VALVE

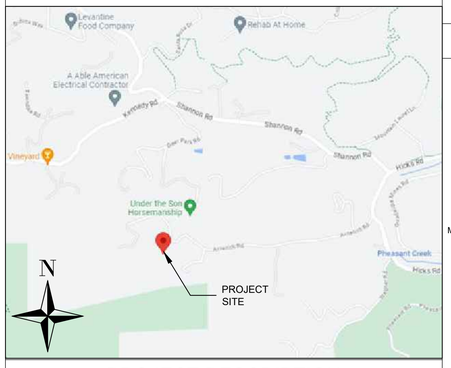
ANNOTATION

- 1 — KEYNOTE
- 1 — DEMOLITION NOTE
- DETAIL INDICATOR (1 / C-501: DETAIL NUMBER; SHEET NUMBER ON WHICH DETAIL APPEARS)
- SECTION INDICATOR (A / C-301: SECTION LETTER; SHEET NUMBER ON WHICH SECTION APPEARS)

SITE VICINITY



SITE LOCATION



PROJECT DESCRIPTION

GENERAL: NEW REPLACEMENT OWTS
BASIS: SFD BEDROOM ADU AND POOL CABANA ADDITIONS

JUSTIFICATION FOR ALTERNATIVE OWTS DESIGN:
THERE IS A LIMITING CLAY LAYER STARTING AT 3' BELOW GROUND LEVEL (BGL), AND MYER ENGINEERING PROPOSES ENHANCED (SUPPLEMENTAL) TREATMENT THAT PRODUCES EFFLUENT QUALITY OF LESS THAN 30 MG/L BOD, TSS AND TN, FOLLOWED BY SUBSURFACE DRIP DISPERSAL INSTALLED TO A MAXIMUM DEPTH OF 8" BGL, TO MEET THE SEPARATION REQUIREMENTS TO THIS LIMITING LAYER.

GENERAL SHEET NOTES

1. ABBREVIATIONS AND SYMBOLS ON THIS SHEET APPLY ONLY TO THE CIVIL DRAWINGS, REFER TO OTHER DISCIPLINES FOR APPLICABLE ABBREVIATIONS AND SYMBOLS NOT PROVIDED HERE.
2. THIS IS A STANDARD ABBREVIATION AND LEGEND SHEET, THEREFORE, SOMEABBREVIATIONS AND LEGEND SYMBOLS MAY APPEAR ON THIS SHEET AND MAY NOT BE UTILIZED ON THIS PROJECT.
3. DO NOT SCALE DRAWINGS.
4. ALL WORK AND MATERIALS SHALL BE IN FULL ACCORDANCE WITH THE CURRENTLY REQUIRED VERSION OF THE FOLLOWING CODE:
   - 4.1. CALIFORNIA BUILDING CODE
   - 4.2. CALIFORNIA PLUMBING CODE
   - 4.3. CALIFORNIA MECHANICAL CODE
   - 4.4. CALIFORNIA ELECTRICAL CODE
   - 4.5. ALL APPLICABLE LOCAL, STATE, AND FEDERAL CODES AND ORDINANCES
5. NOTHING ON THE ENCLOSED DRAWINGS IS TO BE CONSTRUED AS REQUIRING OR PERMITTING WORK THAT IS CONTRARY TO THE CODES, ORDINANCES, OR REGULATIONS DESCRIBED ABOVE.
6. ANY DEVIATIONS FROM THE PROPOSED PLANS SHALL BE DISCUSSED WITH THE PROJECT ENGINEER PRIOR TO MAKING CHANGES IN THE FIELD.

INDEX

PROJECT DESIGN AND OPERATION NOTES

DESIGN FLOWS, VOLUMES, AND TREATMENT

FACILITY TYPE: RESIDENTIAL
UNIT FLOW BASIS: # OF BEDROOMS
OF UNITS: 5 BEDROOMS + 1 BEDROOM ADU + POOL CABANA
DESIGN FLOWS: 825 GPD
TREATMENT CATEGORY: ENHANCED/ALTERNATIVE
NEW TREATMENT TANK VOLUME: 2,000 GALLONS
NEW PUMP TANK VOLUME: 2,000 GALLONS
TREATMENT SYSTEM: ORENCO ADVANTEX AX20 2-POD, MODE 3
WASTEWATER STRENGTH: DOMESTIC RESIDENTIAL STRENGTH
DOMESTIC STRENGTH DEFINITION: <220 MG/L BOD, <60 MG/L TSS, <60 MG/L TN

SOIL TESTING RESULTS AND DISPOSAL DESIGN

SITE TEST PITS (SOIL PROFILES):
MYER ENGINEERING OBSERVED THE SOIL CHARACTERISTICS OF 2 TEST PITS EXCAVATED TO DEPTHS OF 12' AND 13' BELOW GROUND LEVEL (BGL). THE LOCATION OF THE TEST PITS IS PROVIDED ON THE PROJECT DESIGN PLANS. THE FOLLOWING SOIL PROFILE WAS OBSERVED:

TEST PIT #1 (TP-1)
0'-15" BGL: DARK BROWN LOAMY TOPSOIL
15"- 40" BGL: BROWNISH GREY CLAY W/ MEDIUM TO COARSE GRAIN SAND AND GRAVEL, MOIST
40"- 9' BGL: LIGHT BROWN LOAMY CLAY W/ ROCK CLASTS 1" TO 3" SIZE
9'- 12' BGL: LIGHT BROWN SANDY CLAY W/ FRACTURED SHALE (1" TO 4" SIZE)
GROUNDWATER WAS NOT ENCOUNTERED, AND GROUNDWATER INDICATORS WERE NOT PRESENT.

TEST PIT #2 (TP-2)
0'-15" BGL: DARK BROWN LOAMY TOPSOIL
15'- 6' BGL: DARK BROWN CLAY W/ SILT, SAND AND GRAVEL, MOIST
6'- 13' BGL: LIGHT BROWN SANDY CLAY W/ FRACTURED SHALE (1" TO 4" SIZE)
GROUNDWATER WAS NOT ENCOUNTERED, AND GROUNDWATER INDICATORS WERE NOT PRESENT.

SITE PERCOLATION TEST:
TEST HOLE #1 (P-1): DEPTH = 1', RATE = 18.5 MPI
TEST HOLE #2 (P-2): DEPTH = 1', RATE = 34.3 MPI
TEST HOLE #3 (P-3): DEPTH = 1', RATE = 12 MPI
TEST HOLE #4 (P-4): DEPTH = 1', RATE = 27.9 MPI
TEST HOLE #5 (P-5): DEPTH = 1', RATE = 60 MPI
TEST HOLE #6 (P-6): DEPTH = 1', RATE = 60 MPI

ADJUSTED STABILIZED MPI: R X 1.4=
TEST HOLE #1 (P-1): DEPTH = 1', RATE = 25.9 MPI
TEST HOLE #2 (P-2): DEPTH = 1', RATE = 48.0 MPI
TEST HOLE #3 (P-3): DEPTH = 1', RATE = 16.8 MPI
TEST HOLE #4 (P-4): DEPTH = 1', RATE = 39.0 MPI
TEST HOLE #5 (P-5): DEPTH = 1', RATE = 84.0 MPI
TEST HOLE #6 (P-6): DEPTH = 1', RATE = 84.0 MPI
AVERAGE ADJUSTED STABILIZED RATE= 49.6 MPI

DESIGN AREA APPLICATION RATE FOR SUBSURFACE DRIP: 0.4 GPD/SF
DESIGN PRIMARY EFFECTIVE LEACHING AREA: 2,064 SF
DESIGN SECONDARY EFFECTIVE AREA: 2,064 SF

SEE SHEETS WW3 AND WW4 FOR SYSTEM SIZING CALCULATIONS AND DETAILS

WATER SUPPLY: SAN JOSE WATER (PUBLIC)

OWNER IS RESPONSIBLE FOR GENERAL OPERATION AND MAINTENANCE OF THE WASTEWATER SYSTEM

THE SEPTIC/WASTEWATER SYSTEM SHALL BE INSTALLED BY A QUALIFIED PROFESSIONAL.

No.	Revision/Issue	Date

COVER SHEET

Renfrew Site Improvement Project
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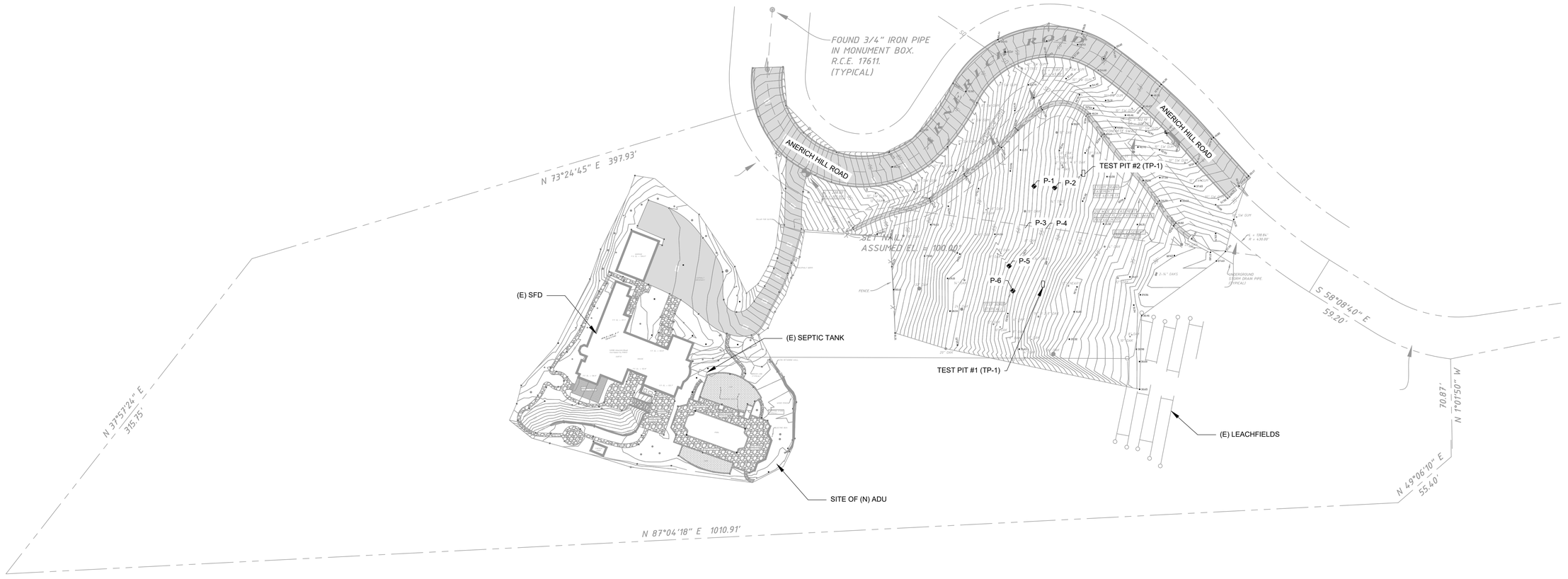
EXP 03/31/25
CIVIL
STATE OF CALIFORNIA

Drawn By	Checked By
PEM	PEM
Project No. 202304	Scale AS SHOWN
Date JUNE 2024	

Sheet No.
WW1
1 OF 6

PEM 6/3/2024 MYE_Renfrew_OWTS Plans.dwg



1 EXISTING SITE LAYOUT
SCALE: 1" = 40'

N

0 40' 80'

No.	Revision/Issue	Date

EXISTING SITE LAYOUT

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Sheet No. WW2	

Total field

Total Quantity of effluent to be disposed per day	825	gallons / day
Hydraulic loading rate	0.4	gallons / sq.ft. / d
Minimum Dispersal Field Area	2,063	square ft.
Total Dispersal Field Area	4,128	square ft.

Flow per zone

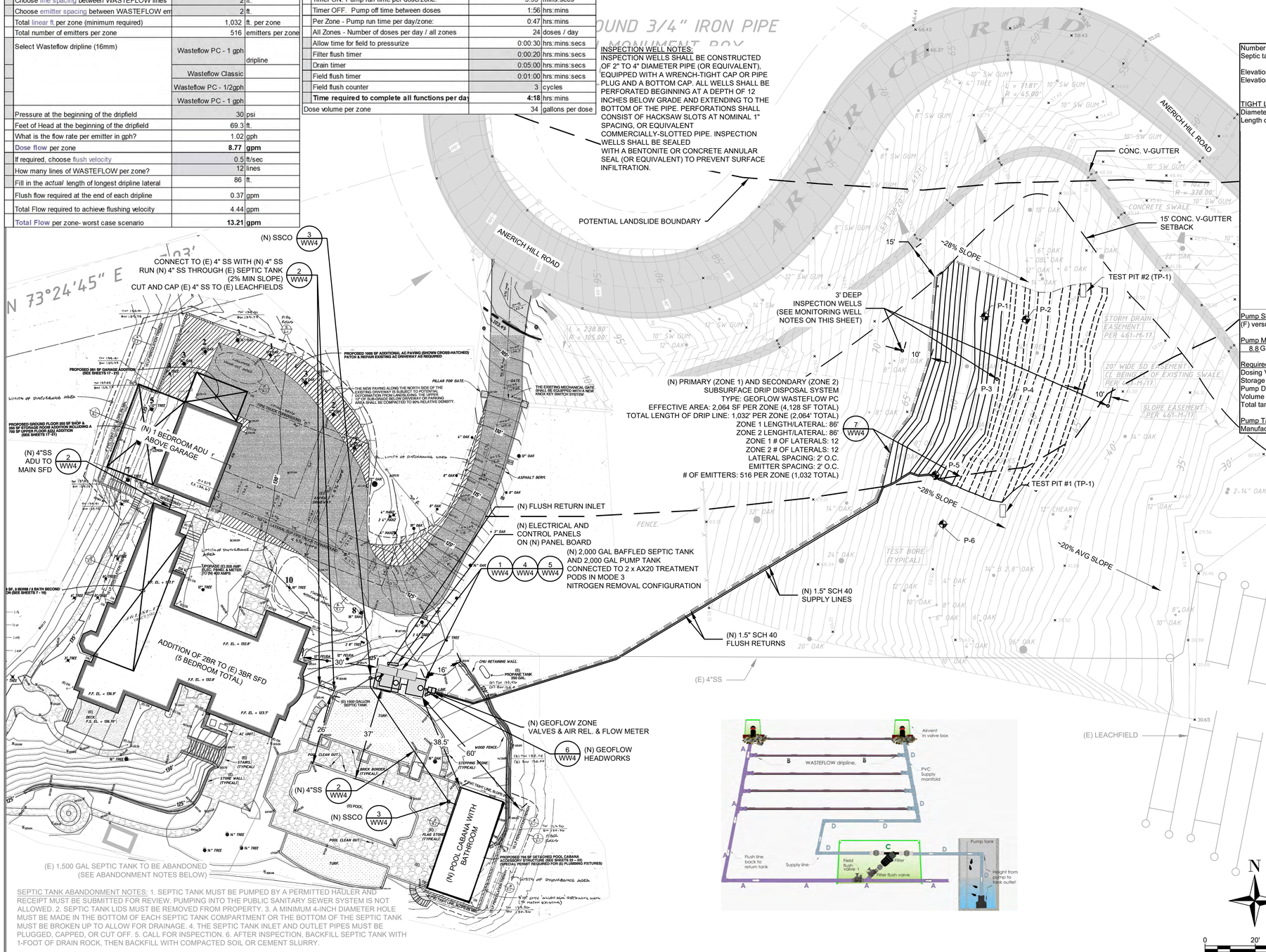
Number of Zones	2	zone(s)
Dispersal area per zone	2,064	square ft.
Choose line spacing between WASTEFLOW lines	2	ft.
Choose emitter spacing between WASTEFLOW em	2	ft.
Total linear ft per zone (minimum required)	1,032	ft. per zone
Total number of emitters per zone	516	emitters per zone
Select Wasteflow dripline (16mm)	Wasteflow PC - 1 gph	dripline
	Wasteflow Classic	
	Wasteflow PC - 1/2gph	
	Wasteflow PC - 1 gph	
Pressure at the beginning of the dripfield	30	psi
Feet of Head at the beginning of the dripfield	69.3	ft.
What is the flow rate per emitter in gph?	1.02	gph
Dose flow per zone	**8.77**	**gpm**
If required, choose flush velocity	0.5	ft/sec
How many lines of WASTEFLOW per zone?	12	lines
Fill in the *actual* length of longest dripline lateral	86	ft.
Flush flow required at the end of each dripline	0.37	gpm
Total Flow required to achieve flushing velocity	4.44	gpm
Total Flow per zone- worst case scenario	**13.21**	**gpm**

Select Filters and zone valves

Select Filter Type	BioDisc Filter	
Recommended Filter (item no.)	BioDisc Filter-150	1.5in < 30 gpm
Select Zone Valve Type	Electric Solenoid	-
Recommended Zone Valve (item no.)	SVLVB-100	1-in. Solenoid valve

Dosing

Number of doses per day / zone:	12	doses
Timer ON. Pump run time per dose/zone:	3.55	mins:secs
Timer OFF. Pump off time between doses	1:56	hrs:mins
Per Zone - Pump run time per day/zone:	0:47	hrs:mins
All Zones - Number of doses per day / all zones	24	doses / day
Allow time for field to pressurize	0:00:30	hrs:mins:secs
Filter flush timer	0:00:20	hrs:mins:secs
Drain timer	0:05:00	hrs:mins:secs
Field flush timer	0:01:00	hrs:mins:secs
Field flush counter	3	cycles
Time required to complete all functions per day	**4:18**	hrs:mins
Dose volume per zone	34	gallons per dose



1 OWTS PLAN
SCALE: 1" = 20'

Number of bedrooms 2 Total square footage of living space TBD
Septic tank size 2,000 GAL Installed drainfield 4,128 SQFT SSD Expansion drainfield INSTALLED = 2,064 SQFT PRIMARY + 2,064 SQFT SECONDARY (EXPANSION)

Elevation of highest drainfield (ft) NA - DOWNHILL
Elevation of pump off (ft) - NA - DOWNHILL
Total lift (Ft Head) = 0 (A)

TIGHT LINE
Diameter of tight line (inches) 1.5"
Length of tight line from pump to upper drainfield (ft) NA (B)

****SEE GEOFLOW SPREADSHEET BELOW FOR TOTAL DYNYAMIC HEAD (TDH) CALCULATIONS**

****SEE PUMP CURVE ON DETAILS SHEET (WW4)**

Pump Size:
(F) versus GPM = Pump Size (refer to pump curve)

Pump Model: (Attach Pump Curve)
8.8 GPM at 97.5 (G) (ft of head: from pump curve) Manufacturer/Model ORENCO PF1007

Required Capacity in Gallons

Dosing Volume	34 GAL
Storage Capacity (1 ½ days)	1,312 GAL
Pump Displacement	8 GAL
Volume from tank bottle to pump base	72 GAL
Total tank capacity	2,000 GAL (2,200 GAL MAX)

Pump Tank Information
Manufacturer CHAPIN PRE-CAST Size 2,000 GAL Gallons per inch 36 AVG.

ction 2	Ft of head	Pressure
Flush line - Losses through return line		
Select Pipe from dropdown menu	PVC schedule 40	
Select Flush Line Diameter	1-1/2" inch	
Length of return line	340 ft.	
Equivalent length of fittings	10 ft.	
Elevation change. (if downhill enter 0)	**0** ft.	
Pressure loss in 100 ft of pipe	0.17 ft.	0.08 psi
Total pressure loss from end of dripline to return tar	*0.6 ft.*	0.26 psi
Dripline - Losses through Wasteflow dripline		
Length of longest dripline lateral	**86** ft.	
Minimum dosing pressure required at end of dripline	23.10 ft.	10.00 psi
Loss through dripline during flushing	1.29 ft.	0.559 psi
Total minimum required dripline pressure	*24.39 ft.*	10.56 *psi*
B. Minimum Pressure required at begginning of dripfield		
CALCULATED pressure required at beginning of dri	*25.00 ft.*	10.82 *psi*
SPECIFIED pressure at beginning of dripfield (from	**69.3 ft.**	30.00 *psi*
Great! SPECIFIED Pressure is greater than CALCULATED Pressure requirement. Go to next step		
Drip components - Losses through headworks		
Filter	11.6 ft.	5.00 psi
Zone valve pressure loss (not in diagram)	2.31 ft.	1.00 psi
Flow meter pressure loss (not in diagram)	1.00 ft.	0.43 psi
Other pressure losses	5.00 ft.	2.16 psi
Total loss through drip components	**19.86 ft.**	8.60 psi
Supply line - Minimum Pressure head required to get from pump tank to top of dripfield		
Select Pipe from dropdown menu	PVC schedule 40	
Select Supply line diameter	1-1/2" inch	
Length of supply line	250 ft.	
Equivalent length of fittings	5 ft.	
Height from pump to tank outlet	5 ft.	
Elevation change. (if downhill enter 0)	0 ft.	
Pressure loss/gain in 100 ft. of pipe	1.31 ft.	0.57 psi
Total gain or loss from pump to field	***8.3 ft.***	3.61 psi
Total dynamic head	**97.5 ft.**	42.21 *psi*
Pump capacity * - Field Flush Flow	**13.2 gpm**	42.21 *psi*
- Field Dose Flow	**8.8 gpm**	
- Filter Flush Flow	**- gpm**	- *psi*
Pump Model Number	**See Plan/Details**	
Voltz / Hp / phase	**See Plan/Details**	

No.	Revision/Issue	Date

WASTEWATER SYSTEM PLAN

Renfrew Site Improvement Project
14500 Arnerich Hill Road
Los Gatos CA 95032
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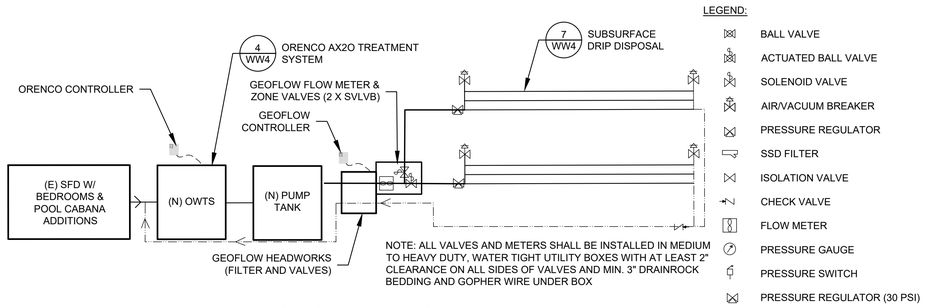
PEM	PEM
Project No. 202304	Scale AS SHOWN
Date JUNE 2024	

Sheet No.
WW3
3 OF 6

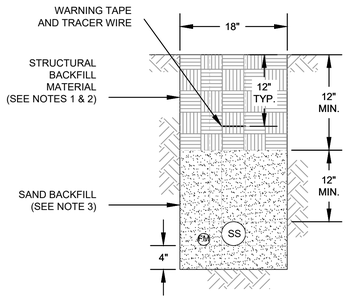


LEGEND:

- BALL VALVE
- ACTUATED BALL VALVE
- SOLENOID VALVE
- AIR/VACUUM BREAKER
- PRESSURE REGULATOR
- SSD FILTER
- ISOLATION VALVE
- CHECK VALVE
- FLOW METER
- PRESSURE GAUGE
- PRESSURE SWITCH
- PRESSURE REGULATOR (30 PSI)

1 WASTEWATER TREATMENT AND DISPOSAL SYSTEM SCHEMATIC

SCALE: AS DIMENSIONED

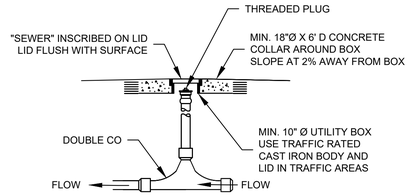


UTILITY TRENCH NOTES:

1. UTILITY TRENCH STRUCTURAL BACKFILL UNDER DRIVEWAYS AND ROADS SHALL BE COMPACTED TO 95% RELATIVE COMPACTION.
2. UTILITY TRENCH STRUCTURAL BACKFILL UNDER NON-TRAFFIC AREAS SHALL BE COMPACTED TO 90% RELATIVE COMPACTION.
3. ALL SAND BACKFILL SHALL BE COMPACTED TO 90% RELATIVE COMPACTION.
4. SS=SANITARY SEWER
5. SANITARY SEWER LINES SHALL BE INSTALLED WITH A 10' MINIMUM SEPARATION FROM ALL POTABLE WATER LINES.
6. IF SANITARY SEWER AND WATER LINES MUST CROSS, THE SANITARY SEWER SHALL BE LOCATED AT LEAST 2' BELOW THE WATER LINE.

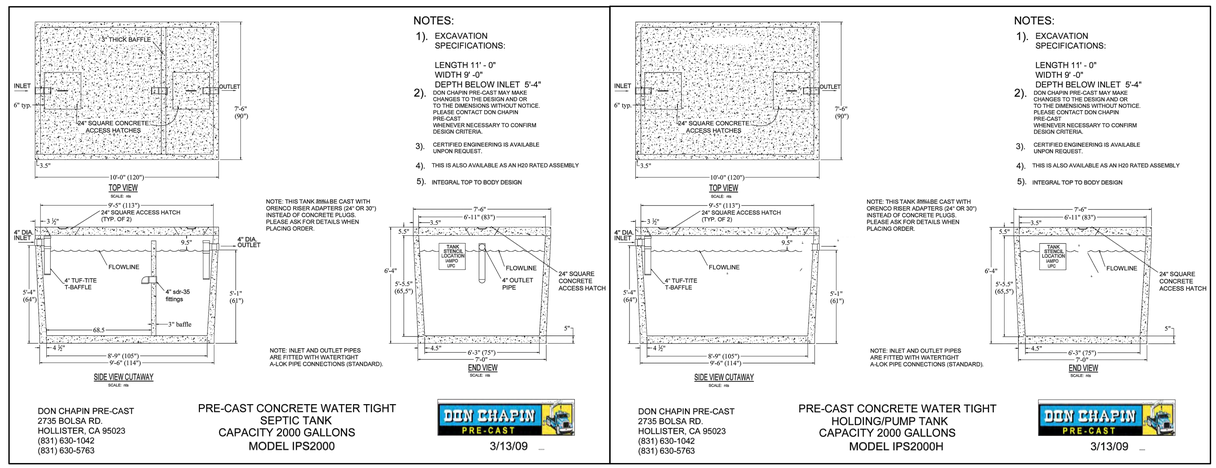
2 SS UTILITY TRENCH DETAIL

SCALE: AS DIMENSIONED



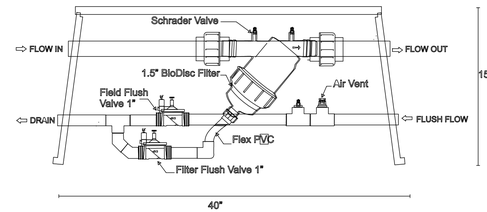
3 SS CLEANOUT

SCALE: AS DIMENSIONED



5 2,000 GAL SEPTIC TANK AND 1,000 GAL PUMP TANK (CHAPIN PRE-CAST OR EQUIV)

SCALE: AS DIMENSIONED

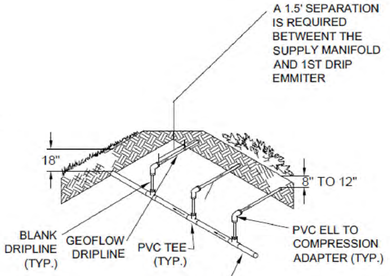


Enclosure Top Opening -30 x17"
Enclosure Bottom Opening -40 x27"

GEOFLOW 1.5in BIODISC SPORTY HEADWORKS SURFACE FLUSH

WHW 1.5" DISC FILTER
Automatic Surface Flush

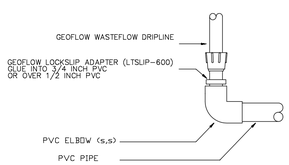
not to scale



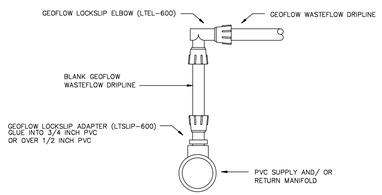
END FEED/ FLUSH MANIFOLD

6 GEOFLOW HEADWORKS

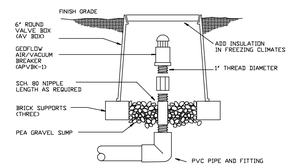
SCALE: AS DIMENSIONED



GEOFLOW MANIFOLD CONNECTION (PVC TO ADAPTER) SECTION Not To Scale



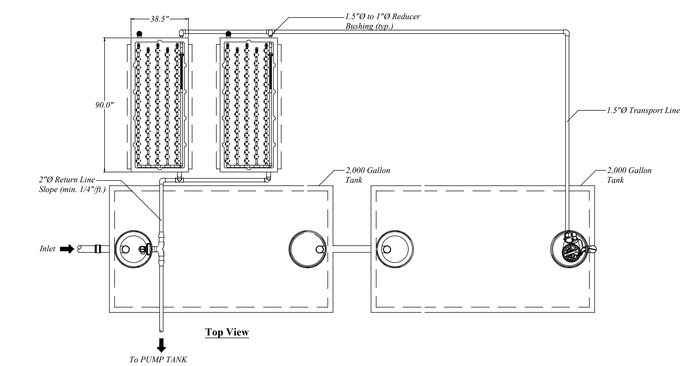
GEOFLOW LOCKSLIP ELBOW TO LOCKSLIP ADAPTER CONNECTION SECTION Not To Scale

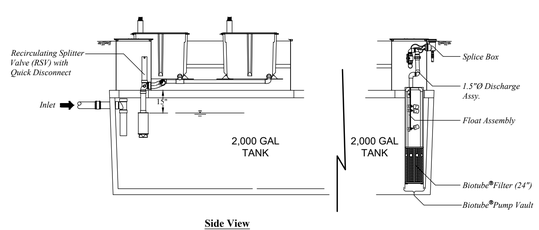


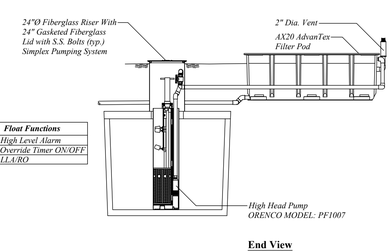
GEOFLOW 1" AIR/VACUUM BREAKER (PLUMBED TO PVC) SECTION Not To Scale

7 SUBSURFACE DRIP (SSD) GEOFLOW DETAILS

SCALE: AS DIMENSIONED



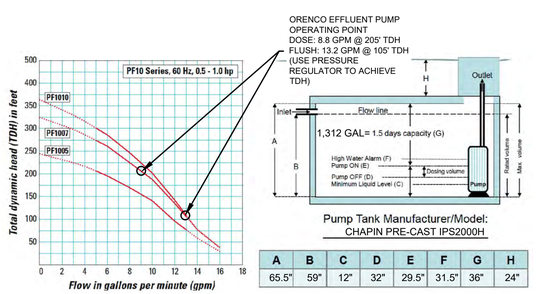




Float Functions	
Y	High Level Alarm
G	Override Timer ON/OFF
W	LLA/RO

4 ADVANTEX 2-POD AX20 MODE 3A ENHANCED TREATMENT SYSTEM (WITH 2,000 GALLON WATERTIGHT SEPTIC TANK)

SCALE: AS DIMENSIONED



ORENCO EFFLUENT PUMP
OPERATING POINT
DOSE: 8.8 GPM @ 205' TDH
FLUSH: 13.2 GPM @ 105' TDH
(USE PRESSURE REGULATOR TO ACHIEVE TDH)

Pump Tank Manufacturer/Model:
CHAPIN PRE-CAST IPS2000H

A	B	C	D	E	F	G	H
65.5"	59"	12"	32"	29.5"	31.5"	36"	24"

8 PUMP SYSTEM DETAILS

SCALE: AS DIMENSIONED

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WASTEWATER SYSTEM SCHEMATIC AND DETAILS

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Sheet No. WW4	

GENERAL SPECIFICATIONS

THE FOLLOWING SPECIFICATIONS ARE FOR THE INSTALLATION OF THE ENHANCED WASTEWATER TREATMENT SYSTEM AT THE LOCATION SPECIFIED IN THE BORDER OF THESE DESIGN PLANS. THE ACCOMPANIED PLANS PRESENT THE GENERAL LAYOUT, PLUMBING CONFIGURATION, AND CONSTRUCTION DETAILS.

MATERIAL SPECIFICATIONS

THE FOLLOWING ARE MATERIAL SPECIFICATIONS FOR THE WASTEWATER SYSTEM COMPONENTS. ALL MATERIALS USED FOR THE CONSTRUCTION OF THIS PROJECT SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS AND AS DESCRIBED IN THE ACCOMPANIED PLANS OR AN ENGINEER APPROVED EQUIVALENT.

1. SUBSURFACE TANKS

THE SUBSURFACE TANKS INCLUDE THE 2,000 GALLON CONCRETE WATER-TIGHT SEPTIC TANK (TREATMENT TANK) AND THE 2,000 GALLON CONCRETE WATER-TIGHT PUMP TANK.

1.1. DIMENSIONS, FITTING SIZES AND LOCATIONS, AND OPTIONAL ACCESSORIES SHALL BE INCLUDED AS SHOWN ON TANK DRAWINGS. THE TANK SHALL BE WATERTIGHT AND TESTED IN THE FIELD AFTER INSTALLATION.

1.2. PRODUCT STORAGE. THE SUBSURFACE TANKS SHALL BE CAPABLE OF STORING SEPTAGE LIMITED TO THE COLLECTION AND STORAGE OF HUMAN SOLID OR LIQUID ORGANIC WASTE.

1.3. PIPING. SDR35 PVC PIPE, SCHEDULE 40 PVC PIPE, OR ABS PIPE SHALL BE USED FOR INLET AND OUTLET PIPING AS SHOWN ON DRAWINGS. ALL PIPING SHALL BE FACTORY SEALED TO ENABLE FIELD TIGHTNESS TESTING WITH AT LEAST ONE PIPE OPENING PROVIDED WITH A THREADED FITTING FOR CONNECTING A PRESSURE TEST MANIFOLD.

1.4. ACCESS OPENINGS. ALL ACCESS OPENINGS SHALL BE 30 INCHES IN DIAMETER OR LARGER AS SHOWN ON THE PLANS, SHALL BE MANUFACTURED OF FIBERGLASS, CONCRETE OR CAST IRON WITH RESPECT TO SPECIFIED TRAFFIC RATING. LOCATIONS SHALL BE AS SHOWN ON TANK DRAWINGS. EACH MANHOLE SHALL HAVE A WATERTIGHT RISER TO FINISH GRADE.

1.5. RISERS. RISERS SHALL BE REQUIRED FOR ACCESS TO INTERNAL VAULTS AND ACCESS INTO THE TANKS FOR SEPTAGE PUMPING. ALL RISERS SHALL BE CONSTRUCTED WITH WATERTIGHT SEALS PROVIDED. RISERS SHALL BE A MINIMUM OF 30" IN NOMINAL DIAMETER WHEN THE DEPTH OF BURY IS 36" OR GREATER. TO ENSURE PRODUCT COMPATIBILITY, RISERS, LIDS, AND ATTACHMENT COMPONENTS SHALL BE SUPPLIED BY A SINGLE MANUFACTURER AND, WHERE APPLICABLE, SHALL BE FACTORY EQUIPPED WITH THE FOLLOWING:

1.5.1. ADHESIVE. WHEN BONDING TO THE RISER RINGS, AN EPOXY PROVIDED BY THE MANUFACTURER SHALL BE USED. ADHESIVES AND SEALANTS SHALL BE WATERPROOF, CORROSION RESISTANT, AND APPROVED FOR THE INTENDED APPLICATION. THE RISER-TO-TANK CONNECTION SHALL BE WATERTIGHT AND STRUCTURALLY SOUND. THE RISER-TO-TANK CONNECTION SHALL BE CAPABLE OF WITHSTANDING A VERTICAL UPLIFT OF 5,000 POUNDS TO PREVENT RISER SEPARATION DUE TO TANK SETTLEMENT, FROST HEAVE, AND VEHICLE TRAFFIC OVER THE TANK.

1.5.2. LIDS. ONE LID SHALL BE FURNISHED WITH EACH ACCESS RISER. LIDS SHALL BE WATERPROOF, CORROSION RESISTANT, AND UV RESISTANT. LIDS SHALL BE FLAT, WITH NO NOTICEABLE UPWARD DOME. LIDS SHALL NOT ALLOW WATER TO POND ON THEM. LIDS SHALL FORM A WATERTIGHT SEAL WITH THE TOP OF RISER. TRAFFIC-RATED LIDS SHALL BE CAPABLE OF WITHSTANDING A TRUCK WHEEL LOAD (36 SQUARE INCHES) OF 2500 POUNDS FOR 60 MINUTES WITH A MAXIMUM VERTICAL DEFLECTION OF 1-1/2". LIDS SHALL BE PROVIDED WITH TAMPER-RESISTANT STAINLESS STEEL FASTENERS AND A TOOL FOR FASTENER REMOVAL. TAMPER-RESISTANT FASTENERS INCLUDE RECESSED DRIVES, SUCH AS HEX, TORX, AND SQUARE. FASTENERS THAT CAN BE REMOVED WITH COMMON SCREWDRIVERS, SUCH AS SLOTTED AND PHILLIPS, OR FASTENERS THAT CAN BE REMOVED WITH STANDARD TOOLS, SUCH AS PLIERS OR CRESCENT WRENCHES, ARE NOT CONSIDERED TAMPER-RESISTANT. TO PREVENT A TRIPPING HAZARD, FASTENERS SHALL NOT EXTEND ABOVE THE SURFACE OF THE LID.

1.5.3. RISER INSTALLATION. RISER INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

2. PIPING AND FITTINGS

THE TYPE OF PIPE MATERIALS AND FITTINGS SHALL BE AS DESIGNATED ON THE PLANS AND SHALL COMPLY WITH THE FOLLOWING:

2.1. FITTINGS AND COUPLINGS
THE FITTINGS AND COUPLINGS FOR PVC PIPES SHALL BE THREADED OR SLIP-FITTED TAPERED SOCKET SOLVENT WELD. THREADED ADAPTERS SHALL BE PROVIDED WITH SOCKET PIPE FOR CONNECTIONS TO THREADED PIPE.

3. VALVES

3.1. GENERAL
VALVES SHALL BE OF THE SIZE, TYPE, AND CAPACITY DESIGNATED ON THE PLANS OR IN THE SPECIFICATIONS AND SHALL COMPLY WITH THE REQUIREMENTS SPECIFIED HEREIN. ALL VALVES ON PRESSURIZED PORTIONS OF THE SYSTEM SHALL BE CAPABLE OF SATISFACTORY PERFORMANCE AT WORKING PRESSURE OF 150 PSI. ALL VALVES ON GRAVITY PORTIONS OF THE SYSTEM SHALL BE RATED FOR AT LEAST TWICE THE ESTIMATED STATIC HEAD ABOVE THE VALVE. VALVES SHALL BE DESIGNED TO PERMIT DISASSEMBLY TO REPLACE SEALING COMPONENTS WITHOUT REMOVAL OF THE VALVE BODY FROM THE PIPELINE, SUCH AS TRUE UNION BALL VALVES AND CHECK VALVES.

4. PUMP SYSTEMS

ALL PUMP SYSTEMS SHALL BE INSTALLED PER MANUFACTURER RECOMMENDATIONS. IF THERE IS A CONFLICT BETWEEN MANUFACTURER RECOMMENDATIONS, AND THE DESIGN PLANS, THE PROJECT ENGINEER SHALL BE CONTACTED FOR APPROVAL OF INSTALLATION CONFIGURATION.

5. ADDITIONAL COMPONENTS

ALL COMPONENTS SHALL BE INSTALLED PER MANUFACTURER RECOMMENDATIONS. IF THERE IS A CONFLICT BETWEEN MANUFACTURER RECOMMENDATIONS, AND THE DESIGN PLANS, THE PROJECT ENGINEER SHALL BE CONTACTED FOR APPROVAL OF INSTALLATION CONFIGURATION.

7. SUBSURFACE DRIP SYSTEM

THE SUBSURFACE DRIP SYSTEM SHALL PROVIDE ADDITIONAL TREATMENT AND DISPOSAL OF THE WASTEWATER. THE SYSTEM SHALL BE CONSTRUCTED PER MANUFACTURER RECOMMENDATIONS AND AS SHOWN ON PLANS.

7.1. SOIL COVER
THE SOIL COVER (CAP) SHALL BE PLACED OVER THE MOUND SYSTEM TO PROVIDE A SUBSTRATE FOR VEGETATION AND REDUCE EROSION CONTROL. THE SOIL SHALL BE A SANDY LOAM TO INCREASE THE POTENTIAL FOR AIR THROUGH THE DEPTH OF THE SOIL.

CONSTRUCTION SPECIFICATIONS

THE CONSTRUCTION OF THE PROJECT SHALL CONFORM TO THE PLANS AND FOLLOWING SPECIFICATIONS. ALL NECESSARY CONSTRUCTION PERMITS SHALL BE OBTAINED PRIOR TO COMMENCEMENT OF ALL SITE WORK.

1. PRECONSTRUCTION CONFERENCE

THE CONTRACTOR SHALL HAVE A PRECONSTRUCTION MEETING WITH THE ENGINEER AND OWNER AT LEAST ONE WEEK PRIOR TO COMMENCEMENT OF SITE WORK. THE ENGINEER SHALL BE CONTACTED 48 HOURS PRIOR TO THE MEETING CONFERENCE. THE MEETING SHOULD BE CONDUCTED TO REVIEW THE DESIGN, MATERIAL, AND CONSTRUCTION SPECIFICATIONS. ALL CONTRACTOR PROPOSED REVISIONS IN THE DESIGN SHALL BE APPROVED BY THE ENGINEER. THE INSTALLATION MUST BE INSPECTED BY THE ENGINEER FOR CONFORMANCE TO THE DESIGN.

2. STAKING

THE CONTRACTOR WILL PROVIDE SUFFICIENT HORIZONTAL AND VERTICAL CONTROL FOR INSTALLATION OF THE WORK AT DATUM POINTS NECESSARY TO ESTABLISH ALIGNMENT AND GRADE. THE PROTECTION AND CARE OF THE STAKES ONCE SET, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

3. EXCAVATION

ALL EXCAVATION WORK SHALL BE MADE TO THE LINES, GRADES AND DIMENSIONS SHOWN IN THE ACCOMPANIED PLANS. EXCAVATIONS SHALL BE PERFORMED IN THE DAY AND IN A MANNER THAT MINIMIZES EROSION, FLOODING AND SEDIMENTATION. EXCAVATED SOILS THAT ARE TO BE STOCKPILED ON-SITE SHALL BE PLACED IN A LOCATION AND MANNER THAT MINIMIZES EROSION AND CONTROLS SEDIMENTATION.

THE CONTRACTOR SHALL TAKE EXTRA PRECAUTION WHERE EXCAVATION EQUIPMENT MAY ENCOUNTER EXISTING UNDERGROUND UTILITIES AND OTHER FACILITIES OF ANY NATURE. CONTRACTOR SHALL PERSON HIS OPERATION IN SUCH A MANNER AND SHALL EXERCISE THE GREATEST OF CARE SO AS NOT TO INJURE IN ANY MANNER EXISTING UNDERGROUND UTILITIES, MAINS OR FACILITIES OF ANY NATURE. SHOULD THE CONTRACTOR INJURE, BREAK OR DAMAGE EXISTING UNDERGROUND UTILITIES, MAINS, OR FACILITIES OF ANY NATURE IN ANY MANNER, THEY SHALL REPAIR THE SAME AT THEIR OWN EXPENSE. IF IT DOES NOT APPEAR FEASIBLE THAT THE CONTRACTOR CAN MAKE NEEDED REPAIRS, THEN SUCH REPAIRS SHALL BE MADE BY THE OWNER AND THE CONTRACTOR SHALL BE CHARGED FOR SUCH REPAIRS.

4. POLLUTION CONTROL

4.1. WATER POLLUTION
THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL PERMITTING REQUIREMENTS RELEVANT TO THE CONSTRUCTION OF THE PROJECT ARE MET AT ALL TIMES. ACTIONS BY THE CONTRACTOR, THE SUBCONTRACTORS OR EMPLOYEES THEREOF RESULTING IN NONCOMPLIANCE OF PERMITTING REQUIREMENTS MAY BE GROUNDS FOR TERMINATION OF THIS CONTRACT.

4.2. NOISE POLLUTION
IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO KEEP NOISE POLLUTION, DUE TO THESE CONSTRUCTION ACTIVITIES, AS LOW AS POSSIBLE.

4.3. SOIL CONTAMINATION
THE CONTRACTOR SHALL NOT ALLOW REGULATED MATERIALS TO SPILL ON THE PROJECT SITE. ANY SPILLAGE OR REGULATED MATERIALS RESULTING FROM THE CONTRACTOR'S OPERATION SHALL BE REMOVED IMMEDIATELY BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

4.4. STORAGE OF REGULATED MATERIALS
THE STORAGE AND USE OF ANY REGULATED MATERIALS SHALL MEET ALL REQUIREMENTS OF LOCAL, STATE, AND FEDERAL REGULATORY AGENCIES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO SATISFY THE REQUIREMENTS OF ANY REGULATORY AGENCY FOR THE STORAGE, MONITORING, USAGE, TRANSPORTATION, SAFETY, REPORTING, OR ANY OTHER REQUIREMENTS REGARDING THE MANAGEMENT OF REGULATED MATERIALS ON AND OFF THE PROJECT SITE.

5. SITE WORK

5.1. MOBILIZATION
THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PREPARATORY WORK AND PLACEMENT OF MATERIALS IN A STAGING AREA REQUIRED FOR CONSTRUCTION OPERATIONS INCLUDING, BUT NOT LIMITED TO, THOSE NECESSARY FOR THE MOVEMENT OF PERSONNEL, EQUIPMENT, SUPPLIES, AND INCIDENTALS TO THE PROJECT SITE; FOR THE ESTABLISHMENT OF FACILITIES NECESSARY FOR WORK ON THE PROJECT; PROVIDING POLLUTION CONTROL MEASURES; AND FOR ALL OTHER WORK AND OPERATIONS WHICH MUST BE PERFORMED.

THE CONTRACTOR SHALL PROVIDE MATERIALS, NOT SPECIFICALLY DESCRIBED BUT REQUIRED FOR PROPER COMPLETION OF THE WORK OF THIS SECTION, AS SELECTED BY THE CONTRACTOR SUBJECT TO THE APPROVAL OF THE COUNTY.

5.2. CLEARING AND GRUBBING
CLEAR THE SITE AS SHOWN ON THE DRAWINGS AND AS SPECIFIED IN THIS SECTION. CLEARING AND GRUBBING SHALL CONSIST OF ALL WORK INCLUDING, BUT NOT LIMITED TO, SALVAGED MATERIALS REMOVAL, PROVIDING AND INSTALLING TEMPORARY EROSION CONTROL, AND PLACEMENT OF TREES, TREE BRANCHES, TREE STUMPS, BRUSH, ROOTS, BOULDERS, SHRUBS, SEDIMENT, AND ALL OBJECTIONABLE MATERIALS IN AN AGREED UPON LOCATION ADJACENT TO THE WORK SITE.

EXAMINE THE AREAS AND CONDITIONS UNDER WHICH THE WORK OF THIS SECTION WILL BE PERFORMED. CORRECT CONDITIONS DETRIMENTAL TO TIMELY AND PROPER COMPLETION OF THE WORK. DO NOT PROCEED UNTIL UNSATISFACTORY CONDITIONS ARE CORRECTED.

ALL WASTES DISPOSAL SHALL BE CONDUCTED AS FOLLOWS:
A. REMOVE WASTE FROM CLEARING OPERATIONS.
B. DISPOSE OF AWAY FROM THE SITE IN A LEGAL MANNER.
C. DO NOT STORE OR PERMIT DEBRIS TO ACCUMULATE ON THE JOB SITE.
D. DO NOT BURN DEBRIS AT THE SITE.

6. DELETERIOUS MATERIALS

MATERIALS CONTAINING AN EXCESS OF 5% (BY WEIGHT) OF VEGETATION OR OTHER DELETERIOUS MATTER MAY BE UTILIZED IN AREAS OF LANDSCAPING OR OTHER NON-STRUCTURAL FILLS. DELETERIOUS MATERIAL INCLUDES ALL VEGETATIVE AND NON-MINERAL MATTER, AND ALL NON-REDUCIBLE STONE, RUBBLE AND/OR MINERAL MATTER OF GREATER THAN 6 INCHES.

7. UTILITY TRENCHES

A. A SELECT, NONCORROSIVE, GRANULAR, EASILY COMPACTED MATERIAL SHOULD BE USED AS BEDDING AND SHADING IMMEDIATELY AROUND UTILITY PIPES. THE SITE SOILS MAY BE USED FOR TRENCH BACKFILL ABOVE THE SELECT MATERIAL. IF OBTAINING COMPACTION IS DIFFICULT WITH THE SITE SOILS, USE OF A MORE EASILY COMPACTED SAND MAY BE DESIRABLE. THE UPPER FOOT OF BACKFILL IN LANDSCAPED OR OTHER OPEN AREAS SHOULD CONSIST OF NATIVE MATERIAL TO REDUCE THE POTENTIAL FOR SEEPAGE OF WATER INTO THE BACKFILL.
B. TRENCH BACKFILL IN THE UPPER 12 INCHES OF SUBGRADE BENEATH AREAS TO RECEIVE PAVEMENT SHOULD BE COMPACTED TO A MINIMUM OF 95 PERCENT OF MAXIMUM DRY DENSITY. TRENCH BACKFILL IN OTHER AREAS SHOULD BE COMPACTED TO A MINIMUM OF 90 PERCENT OF MAXIMUM DRY DENSITY. JETTING OF UTILITY TRENCH BACKFILL SHOULD NOT BE ALLOWED.

8. PIPE INSTALLATION

8.1. GENERAL
PIPE SHALL BE JOINED BY SOCKET TYPE SOLVENT-WELDED FITTINGS OR THREADED FITTINGS. PLASTIC PIPE SHALL BE CUT SQUARE, EXTERNALLY CHAMFERED APPROXIMATELY 10 TO 15 DEGREES, AND ALL BURRS AND FINS REMOVED. SOLVENT-WELDED JOINTS SHALL BE MADE IN ACCORDANCE WITH ASTM D 2855. THE SOLVENT RECOMMENDED BY THE MANUFACTURER SHALL BE USED.

CARE SHALL BE EXERCISED IN ASSEMBLING A PIPELINE WITH SOLVENT WELDED JOINTS SO THAT STRESS ON PREVIOUSLY MADE JOINTS IS AVOIDED. HANDLING OF THE PIPES FOLLOWING JOINTING, SUCH AS LOWERING THE ASSEMBLED PIPELINE INTO THE TRENCH, SHALL NOT OCCUR PRIOR TO THE SET TIMES SPECIFIED BY THE MANUFACTURER.
SOLVENTS SHALL BE APPLIED TO PIPE ENDS IN SUCH A MANNER THAT NO MATERIAL IS DEPOSITED ON THE INTERIOR SURFACE OF THE PIPE OR EXTRUDED INTO THE INTERIOR OF THE PIPE DURING JOINTING. EXCESS CEMENT ON THE EXTERIOR OF THE JOINT SHALL BE WIPED CLEAN IMMEDIATELY AFTER ASSEMBLY.

THREADED PIPE JOINTS SHALL BE MADE USING TEFLON TAPE OR OTHER APPROVED JOINTING MATERIAL. SOLVENT SHALL NOT BE USED WITH THREADED JOINTS. PLASTIC PIPE WHICH HAS BEEN NICKED, SCARRED, OR OTHERWISE DAMAGED SHALL BE REMOVED AND REPLACED. PLASTIC PIPE SHALL BE SNAKED FROM SIDE TO SIDE IN THE TRENCH TO ALLOW 1 FOOT OF EXPANSION AND CONTRACTION PER 100 FEET OF STRAIGHT RUN.
THE PIPELINE SHALL NOT BE EXPOSED TO WATER FOR 24 HOURS AFTER THE LAST SOLVENT-WELDED JOINT IS MADE.

8.2 GRAVITY PIPE
GRAVITY PIPE FOR WASTEWATER SHALL PROVIDE 2 FT VERTICAL AND 10 FT HORIZONTAL CLEARANCE FROM WATER LINES, AND SHALL CROSS SUCH LINES AS NEARLY AS POSSIBLE TO 90 DEGREES, IF CROSSING CAN NOT BE AVOIDED.

PIPE SLOPES SHALL NOT BE LESS THAN 2% FOR 4"Ø PIPE. PIPES SHALL ENTER AND LEAVE CONNECTIONS AS CLOSE TO PARALLEL AS POSSIBLE, BUT IN NO WAY TO EXCEED AN ANGLE OF 45°. 90° TEE CONNECTIONS ARE NOT ALLOWED.

8.3 GENERAL TRENCHING
EXCAVATION OF PIPE TRENCHES SHALL FOLLOW NEAT AND PARALLEL LINES, WITH TRENCH WIDTH, IN GENERAL, TO BE ONE FOOT, WITH SUCH WIDENING, AS REQUIRED TO PLACE VALVES AND FITTINGS WITH A MINIMUM OF 4 INCH CLEARANCE TO TRENCH WALL. THE TRENCH SHALL BE NO LESS THAN 24 INCHES DEEP, EXCEPT WHEN IT IS NECESSARY, TO AVOID UNDERGROUND OBSTRUCTIONS OR ROCKY CONDITIONS. IN ALL CASES, THE PIPE SHALL BE PLACED ON A BEDDING OF IMPORTED OR NATIVE MATERIAL PROVIDING CONTINUOUS SUPPORT THROUGHOUT ITS LENGTH.

BACKFILL FOR THE PIPE TO THE TOP OF THE PIPE PLUS 4 INCHES SHALL BE SELECTED OR IMPORTED SANDY MATERIAL, FREE OF STONE, CLAY, LIMBS OR OTHER DELETERIOUS MATERIALS IN EXCESS OF 1/2 INCH MAXIMUM DIMENSION, PLACED AND TAMPED AND/OR PADDLED ABOUT THE PIPE TO ENSURE PROPER BEDDING PRIOR TO COMPLETION OF TRENCH FILL. THE REMAINING BACKFILL SHALL BE PLACED AT 90% RELATIVE COMPACTION.

9. FLUSHING AND TESTING

AFTER COMPLETION, ALL PIPELINES SHALL BE THOROUGHLY FLUSHED TO REMOVE DIRT, SCALE, OR OTHER MATERIAL. AFTER FLUSHING, THE LINE SHALL BE PRESSURE TESTED. ALL EQUIPMENT, MATERIALS AND LABOR NECESSARY TO PERFORM THE TESTS SHALL BE FURNISHED BY THE CONTRACTOR AND ALL TESTS SHALL BE CONDUCTED IN THE PRESENCE OF THE OWNER OR ENGINEER.

THE CONTRACTOR SHALL PERFORM A TEST TO DEMONSTRATE THAT THE TANKS AND BASINS ARE WATER TIGHT. THE INLET AND OUTLET PIPES OF THE TANKS SHALL BE CAPPED AND THE TANKS SHALL BE COMPLETELY FILLED WITH WATER. THE WATER LEVEL SHALL REMAIN CONSTANT FOR MORE THAN 24 HOURS, OR DURATION BY THE REVIEWING AGENCY JURISDICTION, WHICHEVER IS GREATER, TO DETERMINE IF IT IS WATER TIGHT.

10. OPERATIONAL TEST

THE PERFORMANCE OF ALL COMPONENTS OF THE SYSTEMS SHALL BE EVALUATED BY THE CONTRACTOR.

DURING THE TEST PERIOD AND AT LEAST 15 DAYS PRIOR TO FINAL INSPECTION, THE SYSTEM SHALL OPERATE SATISFACTORILY DURING SUCH PERIOD. ALL NECESSARY REPAIRS, REPLACEMENTS, AND ADJUSTMENTS SHALL BE MADE UNTIL ALL EQUIPMENT, ELECTRICAL WORK, CONTROLS, AND INSTRUMENTATION ARE FUNCTIONING IN ACCORDANCE WITH THE CONTRACTORS DOCUMENTS OR MANUFACTURER SPECIFICATIONS.

11. AS-BUILT DRAWINGS

THE CONTRACTOR SHALL PROVIDE THE OWNER WITH A SET OF AS-BUILT DRAWINGS OF THE LAYOUT AND CONSTRUCTION OF THE SYSTEM.

12. OTHER ITEMS

ANY PROCEDURES NOT NOTED OR INCLUDED IN THE ENGINEERING PLANS OR SPECIFICATIONS SHALL BE APPROVED BY THE PROJECT ENGINEER PRIOR TO IMPLEMENTATION.

13. CONSTRUCTION INSPECTION.

13.1. AT A MINIMUM, INSPECTION OF THE DRIP DISPERSAL SYSTEM INSTALLATION SHOULD INCLUDE THE FOLLOWING. THIS IS IN ADDITION TO INSPECTION WORK REQUIREDFOR THE TREATMENT SYSTEM. JOINT INSPECTION BY THE DESIGNER, CONTRACTOR, AND DEH MAY BE REQUIRED.
13.1.1. PRE-CONSTRUCTION INSPECTION WHERE THE CONSTRUCTION STAKING OR MARKING OF THE DRIP LINES, SUPPLY AND RETURN PIPING, PUMP SYSTEM AND APPURTENANCES IS PROVIDED AND CONSTRUCTION PROCEDURES DISCUSSED;
13.1.2. WATER TIGHTNESS OF EFFLUENT DOSING (PUMP) TANK;
13.1.3. DRIP FIELD LAYOUT, PIPING MATERIALS AND INSTALLATION, AND ALL ASSOCIATED VALVES AND CONNECTIONS;
13.1.4. HYDRAULIC TESTING OF THE DRIP SYSTEM;
13.1.5. FUNCTIONING AND SETTING OF ALL CONTROL DEVICES; AND
13.1.6. FINAL INSPECTION TO VERIFY THAT ALL CONSTRUCTION ELEMENTS ARE IN CONFORMANCE WITH THE APPROVED PLANS, SPECIFICATIONS, AND MANUFACTURE RECOMMENDATIONS; ALL INSPECTION WELLS ARE INSTALLED; AND EROSION CONTROL HAS BEEN COMPLETED.

14. MANAGEMENT REQUIREMENTS

14.1. RECOMMENDED MINIMUM PROCEDURES AND FREQUENCY FOR INSPECTION, MAINTENANCE, MONITORING AND REPORTING ACTIVITIES FOR SUBSURFACE DRIP DISPERSAL SYSTEMS ARE OUTLINED IN TABLE DD-2.

15. OPERATING PERMITS (PER SANTA CLARA COUNTY ORDINANCE SECTION B11-92)

15.1. (A) IN ADDITION TO AN INSTALLATION PERMIT, AN OPERATING PERMIT IS REQUIRED FOR ALL ALTERNATIVE OWTS, INCLUDING THOSE INSTALLED IN CONNECTION WITH THE REPAIR OR UPGRADE OF EXISTING OWTS AS WELL AS THOSE FOR NEW CONSTRUCTION. GENERAL REQUIREMENTS PERTAINING TO OPERATING PERMITS ARE AS FOLLOWS:
15.1.1. (1) THE OPERATING PERMIT WILL BE ISSUED BY THE DIRECTOR FOLLOWING: A.COMPLETION OF CONSTRUCTION OF THE ALTERNATIVE OWTS; B.SATISFACTORY COMPLIANCE WITH THE INSTALLATION PERMIT REQUIREMENTS; AND C.PAYMENT OF APPLICABLE FEES. OPERATING PERMITS ARE NON-TRANSFERABLE.
15.1.2. (2) AFTER INITIAL ISSUANCE, THE OPERATING PERMIT IS REQUIRED TO BE RENEWED PERIODICALLY, THE STANDARD RENEWAL PERIOD BEING ONE YEAR. THE DIRECTOR MAY ESTABLISH CONDITIONS ALLOWING THE TIME PERIOD BETWEEN RENEWALS TO BE EXTENDED FOR CERTAIN TYPES OF OWTS BASED ON A RECORD OF FAVORABLE PERFORMANCE OR OTHER FACTORS WARRANTING A REDUCTION IN SYSTEM OVERSIGHT BY DEH. PROVISIONS FOR ADJUSTING THE OPERATING PERMIT RENEWAL PERIOD SHALL BE PRESCRIBED BY THE DIRECTOR IN THE ONSITE SYSTEMS MANUAL. OPERATING PERMITS MUST ALSO BE RENEWED AT THE TIME OF CHANGE IN PROPERTY OWNERSHIP.
15.1.3. (3) OPERATING PERMITS ARE INTENDED TO SERVE AS THE BASIS FOR VERIFYING THE ADEQUACY OF ALTERNATIVE OWTS PERFORMANCE AND ENSURING ON-GOING MAINTENANCE. PERMIT CONDITIONS SHALL INCLUDE MONITORING AND INSPECTION REQUIREMENTS, PERMIT DURATION, AND OTHER PROVISIONS AS PRESCRIBED BY THE DIRECTOR IN THE ONSITE SYSTEMS MANUAL OR AS DEEMED APPROPRIATE BY THE DIRECTOR ON A CASE-BY-CASE BASIS.
15.1.4. (4) RENEWAL OF AN OPERATING PERMIT REQUIRES:A.PAYMENT OF THE APPLICABLE FEES, UPON RECEIPT OF NOTICE FROM THE DIRECTOR; ANDB.SUBMISSION OF THE RESULTS OF REQUIRED SYSTEM INSPECTION AND MONITORING.
15.1.5. (5) FAILURE TO PAY THE REQUIRED FEE OR SUBMIT THE SPECIFIED MONITORING AND INSPECTION INFORMATION, OR FAILURE TO UNDERTAKE ANY REQUIRED CORRECTIVE WORK SPECIFIED BY THE DIRECTOR MAY BE CAUSE FOR ISSUANCE OF A CITATION, PENALTY FEES, NON-RENEWAL AND/OR REVOCATION OF THE OPERATING PERMIT BY THE DIRECTOR. THE DIRECTOR MAY PLACE A LIEN ON THE PROPERTY FOR RECOVERY OF ANY ASSOCIATED ABATEMENT COSTS AND UNPAID FEES.
15.1.6. (6) A CERTIFIED COPY OF THE FOLLOWING SHALL BE RECORDED AGAINST THE PROPERTY IN THE OFFICE OF THE COUNTY RECORDER OF SANTA CLARA COUNTY:A.INITIAL OPERATING PERMIT ISSUED FOR THE SYSTEM;B.REISSUANCE OF OPERATING PERMIT TO NEW OWNERS; ANDC.NOTICES OF WITHDRAWAL OF ANY OPERATING PERMIT.

15.2. (B) OTHER USES OF OPERATING PERMITS. AN OPERATING PERMIT MAY ALSO BE UTILIZED FOR CIRCUMSTANCES OTHER THAN ALTERNATIVE OWTS, SUCH AS FOR LARGER FLOW OWTS (> 2,500 GPD), IN CONNECTION WITH HOLDING TANK EXEMPTIONS OR WHERE, IN THE OPINION OF THE DIRECTOR, THE TYPE, SIZE, LOCATION OR OTHER ASPECTS OF A PARTICULAR OWTS INSTALLATION WARRANT THE ADDITIONAL LEVEL OF OVERSIGHT PROVIDED BY AN OPERATING PERMIT. IN SUCH CASES, THE ISSUANCE AND SCOPE OF OPERATING PERMITS WILL BE ISSUED IN ACCORDANCE WITH THE GENERAL REQUIREMENTS LISTED IN SECTION B11-92(A)(1) THROUGH (A)(6) ABOVE, AND ANY ADDITIONAL REQUIREMENTS PRESCRIBED BY THE DIRECTOR IN THE ONSITE SYSTEMS MANUAL FOR PARTICULAR CIRCUMSTANCES.

16. PERFORMANCE MONITORING AND REPORTING.

16.1. (A) A MONITORING PROGRAM WILL BE ESTABLISHED FOR EACH ALTERNATIVE OWTS AS A CONDITION OF THE OPERATING PERMIT AT THE TIME OF PERMIT ISSUANCE, AND MAY BE AMENDED AT THE TIME OF PERMIT RENEWAL. SAID MONITORING SHALL BE PERFORMED TO ENSURE THAT THE ALTERNATIVE OWTS IS FUNCTIONING SATISFACTORILY TO PROTECT WATER QUALITY AND PUBLIC HEALTH AND SAFETY. THE MONITORING PROGRAM WILL BE IN ACCORDANCE WITH GUIDELINES IN THE ONSITE SYSTEMS MANUAL AND MAY ALSO INCORPORATE RECOMMENDATIONS OF THE SYSTEM DESIGNER, MANUFACTURER, OR THIRD-PARTY REVIEWER.
16.2. (B) MONITORING REQUIREMENTS WILL VARY DEPENDING UPON THE SPECIFIC TYPE OF ALTERNATIVE OWTS IN ACCORDANCE WITH GUIDELINES IN THE ONSITE SYSTEMS MANUAL.
16.3. (C) THE REQUIRED FREQUENCY OF MONITORING WILL BE IN ACCORDANCE WITH GUIDELINES IN THE ONSITE SYSTEMS MANUAL. MONITORING FREQUENCY MAY BE INCREASED IF, IN THE OPINION OF THE DIRECTOR, SYSTEM PROBLEMS ARE EXPERIENCED.
16.4. (D) MONITORING OF ALTERNATIVE OWTS SHALL BE CONDUCTED BY OR UNDER THE SUPERVISION OF ONE OF THE FOLLOWING:
16.4.1. (1) REGISTERED CIVIL ENGINEER;
16.4.2. (2) PROFESSIONAL GEOLOGIST;
16.4.3. (3) REGISTERED ENVIRONMENTAL HEALTH SPECIALIST; OR
16.4.4. (4) OTHER ONSITE WASTEWATER MAINTENANCE PROVIDER REGISTERED WITH THE DEPARTMENT OF ENVIRONMENTAL HEALTH AND MEETING QUALIFICATIONS AS ESTABLISHED IN THE ONSITE SYSTEMS MANUAL. REGISTRATION SHALL ENTAIL:
16.4.4.1. A. DOCUMENTATION OF REQUIRED QUALIFICATIONS;
16.4.4.2. B. PARTICIPATION IN ANNUAL TRAINING/REVIEW CONDUCTED BY THE DIRECTOR; AND
16.4.4.3. C. PAYMENT OF AN ANNUAL FEE ESTABLISHED BY THE BOARD OF SUPERVISORS.
16.4.4.4. ADDITIONALLY, THE DIRECTOR MAY REQUIRE THIRD-PARTY OR COUNTY MONITORING OF ANY ALTERNATIVE OWTS WHERE DEEMED NECESSARY BECAUSE OF SPECIAL CIRCUMSTANCES, SUCH AS THE COMPLEXITY OF THE SYSTEM OR THE SENSITIVE NATURE OF THE SITE. THE COSTS FOR SUCH ADDITIONAL MONITORING WOULD BE THE RESPONSIBILITY OF THE OWNER.
16.5. (E) MONITORING RESULTS SHALL BE SUBMITTED TO THE DIRECTOR IN ACCORDANCE WITH REPORTING GUIDELINES PROVIDED IN THE ONSITE SYSTEMS MANUAL. THE MONITORING REPORT SHALL BE SIGNED BY THE PARTY RESPONSIBLE FOR THE MONITORING. NOTWITHSTANDING FORMAL MONITORING REPORTS, THE DIRECTOR SHALL BE NOTIFIED IMMEDIATELY OF ANY SYSTEM PROBLEMS OBSERVED DURING SYSTEM INSPECTION AND MONITORING THAT THREATEN PUBLIC HEALTH OR WATER QUALITY.
16.6. (F) IN ADDITION TO REGULAR INSPECTION AND MONITORING ACTIVITIES, POST-SEISMIC INSPECTION AND EVALUATION OF ALTERNATIVE OWTS LOCATED IN HIGH-RISK SEISMIC AREAS WILL BE REQUIRED IN THE EVENT OF AN EARTHQUAKE CAUSING SIGNIFICANT GROUND SHAKING IN THE REGION, AS DETERMINED BY THE DIRECTOR IN CONSULTATION WITH THE COUNTY GEOLOGIST. THE DIRECTOR WILL BE RESPONSIBLE FOR ISSUING APPROPRIATE NOTICES WHEN SUCH INSPECTIONS ARE REQUIRED; THOSE CONDUCTING THE INSPECTIONS WILL BE REQUIRED TO REPORT THE INSPECTION RESULTS TO THE DIRECTOR. THE PURPOSE OF SUCH INSPECTIONS WILL BE TO ASSESS AND DOCUMENT ANY DAMAGE TO THE OWTS AND TO IMPLEMENT CORRECTIVE MEASURES, AS NEEDED, IN A TIMELY MANNER. POST-SEISMIC INSPECTION SHALL BE IN ACCORDANCE WITH REQUIREMENTS PRESCRIBED BY THE DIRECTOR, IN CONSULTATION WITH THE COUNTY GEOLOGIST, AND CONTAINED IN THE ONSITE SYSTEMS MANUAL.
16.7. (G)THE DIRECTOR WILL, FROM TIME-TO-TIME, COMPILE AND REVIEW MONITORING AND INSPECTION RESULTS FOR ALTERNATIVE OWTS AND, AT LEAST EVERY TWO YEARS, WILL PROVIDE A SUMMARY OF RESULTS TO THE SAN FRANCISCO BAY AND CENTRAL COAST REGIONAL WATER QUALITY CONTROL BOARDS. BASED ON THIS REVIEW, THE DIRECTOR MAY REQUIRE CORRECTIVE ACTION FOR SPECIFIC PROPERTIES OR CERTAIN TYPES OF ALTERNATIVE OWTS, OR GENERAL CHANGES IN MONITORING AND INSPECTION REQUIREMENTS.

EROSION CONTROL NOTES:

GENERAL. THE CONTRACTOR SHALL INSTALL, MAINTAIN AND INSPECT EROSION CONTROL AND TEMPORARY STORMWATER CONTROL MEASURES TO CONTROL SEDIMENT AND RUNOFF IN ACCORDANCE WITH THESE PLANS AND THE LOCAL JURISDICTION.

1.1. THE CONSTRUCTION OF THIS PROJECT IS NOT EXPECTED TO OCCUR DURING THE WINTER SEASON (OCTOBER 15TH THROUGH APRIL 15TH).

1.2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL BMP INSTALLATION AND MAINTENANCE.

1.3. ALL GRADING SHALL CONFORM TO THE LOCAL GRADING ORDINANCE, EROSION CONTROL ORDINANCES, AND CALIFORNIA BUILDING CODE.

1.4. ALL DISTURBED SURFACES SHALL BE PREPARED AND MAINTAINED TO CONTROL EROSION AND TO ESTABLISH NATIVE OR NATURALIZED VEGETATIVE GROWTH COMPATIBLE WITH THE AREA. THIS CONTROL SHALL CONSIST OF: A. EFFECT TEMPORARY PLANTING SUCH AS RYE GRASS, SOME OTHER FAST-GERMINATION SEED, AND MULCHING WITH STRAW AND/OR OTHER SLOPE STABILIZATION MATERIAL; B) PERMANENT PLANTING OF NATIVE OR NATURALIZED DROUGHT RESISTANT SPECIES OF SHRUBS, TREES, OR OTHER VEGETATION, PURSUANT TO THE COUNTY'S LANDSCAPE CRITERIA, WHEN THE PROJECT IS COMPLETED; C) MULCHING, FERTILIZING, WATERING OR OTHER METHODS MAY BE REQUIRED TO ESTABLISH NEW VEGETATION, ON SLOPES LESS THAN 20%, TOPSOIL SHOULD BE STOCKPILED AND REAPPLIED.

SEED AND MULCH. ALL AREAS ON- AND OFF-SITE EXPOSED DURING CONSTRUCTION ACTIVITIES, IF NOT PERMANENTLY LANDSCAPED PER PLAN, SHALL BE PROTECTED BY MULCHING AND/OR HAND BROADCASTING OF THE FOLLOWING STERIL, WEED FREE, SEED MIX AND INCORPORATED OVER ALL DISTURBED SLOPES:

BROMUS CARINATUS 10#/ACRE
LEYMUS TRITICOIDES 8#/AC.
HORDEUM BRACHYANTHERUM 5#/AC.
FESTUCA RUBRA 8#/AC.
DESCHAMPSIA CESPITOSA 8#/AC.

THE MIX/APPLICATION SHALL ALSO CONTAIN:
- FERTILIZER (6-3-3) SHALL BE HAND BROADCAST AND INCORPORATED AT 30-LB/ACRE OVER ENTIRE AREA.
- MYCHORRHIZAL FUNGI SHALL BE ADDED AT 50 LB/ ACRE.
- IF HYDROSEEDING, ADD MULCH AND TACKIFIER TO ABOVE.

ALL EXCAVATED MATERIAL SHALL BE REMOVED TO AN APPROVED DISPOSAL SITE OR DISPOSED OF ON-SITE IN A MANNER THAT WILL NOT CAUSE EROSION.

CONCRETE WASHOUT. TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE LOCATED A MINIMUM OF 50 FEET FROM STORM DRAIN INLETS, OPEN DRAINAGE FACILITIES, AND WATERCOURSES. THE CONCRETE WASHOUT FACILITY SHALL BE BELOW GRADE AND CONSTRUCTED WITH A MINIMUM LENGTH AND MINIMUM WIDTH OF 10 FEET. TEMPORARY CONCRETE FACILITIES SHALL BE CONSTRUCTED AND MAINTAINED IN SUFFICIENT QUANTITY AND SIZE TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS. THE WASHOUT SHALL HAVE A 10 MIL POLYETHYLENE PLASTIC LINER. WHEN CONCRETE WASHOUT FACILITIES ARE NO LONGER REQUIRED FOR THE WORK, THE HARDENED CONCRETE AND MATERIALS FOR THE WASHOUT SHALL BE REMOVED AND DISPOSED OF. HOLES, DEPRESSIONS, OR OTHER GROUND DISTURBANCES CAUSED BY THE REMOVAL OF THE CONCRETE WASHOUT SHOULD BE BACKFILLED AND REPAIRED.

OTHER PROVISIONS. IF CONSTRUCTION OCCURS BETWEEN OCTOBER 15TH AND APRIL 15TH, EXPOSED SOIL NOT INVOLVED IN IMMEDIATE CONSTRUCTION ACTIVITY SHALL BE PROTECTED FROM EROSION AT ALL TIMES. AFTER APRIL 15TH, EROSION CONTROL MEASURES SHALL BE IN PLACE DURING INCLEMENT WEATHER.

EROSION CONTROL MEASURES SHALL BE KEPT IN PLACE BY THE CONTRACTOR UNTIL NATIVE VEGETATION HAS BEEN ESTABLISHED AND PROVIDES NECESSARY SLOPE COVER (MINIMUM 70% COVER).


Orenco Systems — Technical Data Sheet

PF-Series Submersible Effluent Pumps: 3-Phase, 60-Hz, 4-inch (100-mm)

Applications

Our 3-phase, 4-inch (100-mm) Submersible Effluent Pumps are designed to transport screened effluent (with low TSS counts) from septic tanks or separate dosing tanks. These pumps are constructed of lightweight, corrosion-resistant stainless steel and engineered plastics, and all are field-serviceable and repairable with common tools. They're also CSA- and UL-certified to U.S. and Canadian safety standards for effluent pumps.

Orenco's Effluent Pumps are used in a variety of applications, including pressurized drainfields, packed-bed filters, mounds, aerobic units, effluent irrigation, effluent sewers, wetlands, lagoons, and more. These pumps are designed to be used with a Biotube® pump vault or after a secondary treatment system.

Features/Specifications

To specify this pump for your installation, require the following:
- Minimum 24-hour run-dry capability (liquid end) with no deterioration in pump life or performance*
- 1/8-inch (3-mm) bypass orifice to ensure flow recirculation for motor cooling and to prevent air bind
- Liquid-end repair kits available for better long-term cost of ownership
- TRI-SEAL™ floating impeller design on 10, 20, and 30 gpm (0.6, 1.3, and 1.9 L/sec) models; floating stack design on 50 and 75 gpm (3.2 and 4.7 L/sec) models
- Franklin Electric Super Stainless motor, rated for continuous use and frequent cycling
- Type SOOW 600-V motor cable

* Not applicable for 5-hp (3.73 kW) models

Standard Models

See specifications chart, pages 2-3, for a list of standard pumps. For a complete list of available pumps, call Orenco.

Product Code Diagram

PF 10 07 3 2 CV - 50

- Cord length, ft (m): Blank = 10 (3), 30 = 30 (9), 50 = 50 (15)
- Check valve: Blank = no internal check valve, CV = internal check valve*
- Voltage, nameplate: 2 = 230, 200 = 200, 4 = 460
- Frequency: 3 = three-phase, 60 Hz
- Horsepower (kW): 05 = ½ hp (0.37), 07 = ¾ hp (0.56), 10 = 1 hp (0.75), 15 = 1½ hp (1.11), 20 = 2 hp (1.50), 30 = 3 hp (2.24), 50 = 5 hp (3.73)
- Nominal flow, gpm (L/sec): 10 = 10 (0.6), 20 = 20 (1.3), 30 = 30 (1.9), 50 = 50 (3.2), 75 = 75 (4.7)
- Pump, PF Series

* Available for 10 gpm (0.6 L/sec), 1/2 hp (0.37 kW) only

Powered by Franklin Electric

LR80980
LR2053896

Worksheet 3 - Parts List

Qty	Units	Item Number	Description
Dripline			
2,064	ft.	WFPC16-4-24	Wasteflow PC . 1 gph, 24 in. emitter spacing
Airvent and box			
4	ea.	APVBK-1	1" airvent for use on zones less than 50gpm
4	ea.	AV BOX 6 inch	6" round box
Pressure Regulators - Use to keep pressure from being too high			
2	ea.	Select	Restricts pressure from exceeding required pressure. Required with Classic dripline.
Controllers			
1	ea.		Select Controller from list left
Pre-assembled Headworks			
Select from cell with		BioDisc Filter	
0	-	WHWS-V-1F-A	Sporty Headworks box & guts with 1" Vortex Filter. Automatic flush
1	ea.	BIODISC Filter Headworks	-
0	-	GEOVAC filter Headworks	-
* **Solenoid Flush valves** - Select only if Headworks is not selected above			
	ea.	SVLV-B-100	Flush valves
* **Filters** - Select only if Headworks is not selected above			
	ea.	BioDisc Filter-150	0
* **Pressure Gauges** - Select only if Headworks is not selected above			
	ea.	PG-25-Lead	Presssure gauge with lead
Flow Meters			
1	ea.	Flow Meter - Digital Display	Select Flow Meter
Zone valves -			
2	ea.	SVLVB-100	1" Solenoid valve. 24V,FPT,Normally closed.
Dripline fittings - Quantities below are estimates only.			
48	ea.	LTSLIP-600	Lockslip Adapter. 3/4" PVC slip to Wasteflow dripline
8	ea.	LTC-600	This adds 2 couplings for each coil ordered.
	ea.	LTTEE-600	Lockslip Tee. Fits 16mm Wasteflow dripline
	ea.	LTELL-600	Lockslip Elbow. Fits 16mm Wasteflow dripline
	ea.	LTFlex-R-18	18" flex PVC riser with 1 lockslip adapter. Used for risers
	ea.	LTFlex-L-36	36" flex PVC with 2 lockslip adapters. Used for risers or loops
Check Valves - Check design for quantities			
	ea.	CV-B-10	1" True Union ball check PVC/Viton
	ea.	Spring check	Select size from drop down menu left
Unions			
	ea.	Unions	0

Recommended minimum procedures and frequency for inspection, maintenance, monitoring and reporting activities for subsurface drip dispersal systems are outlined in **Table DD-2.**

Table DD-2. Drip Dispersal System Management Requirements

	Work	Frequency
Inspection	• Conduct routine visual observations of drip field, downslope area and surroundings for wet areas, pipe leaks or damage, soil erosion, drainage issues, abnormal vegetation, gophers or other problems. • Conduct routine physical inspections of system components, including valves, filters, and headworks box(es). • Perform special inspections of drip field at time of any landscaping work or other digging in drip field area. • Perform inspections of dosing pump(s) and appurtenances (per O&M manual and Performance Evaluation Guidelines, Part 5 of this Manual). • Record observations.	• Every 6 to 12 months.
Maintenance	• Manually remove and clean filter. • Clean and check operation of pressure reducing valves. • Clean flush valves and vacuum release valves.	• Clean filter every 6 months. • Other maintenance annually.
Water Monitoring & Sampling	• Measure and record water levels in dispersal field monitoring wells, as applicable, per permit requirements. • Obtain and analyze water samples from dispersal field monitoring wells, as applicable, per permit requirements.	• According to permit conditions, if applicable.
Reporting	• Report findings to DEH per permit requirements. • Standard report to include dates, monitoring well and other data collected, work performed, corrective actions taken, and performance summary. • Report public health/water quality emergency to DEH immediately.	• According to permit conditions, typically every 1 to 2 years, depending on system size, usage, history, location.

No.	Revision/Issue	Date

WASTEWATER SYSTEM SPECIFICATIONS

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REGISTERED PROFESSIONAL ENGINEER
PAUL MYER
C 80522
EXP 03/31/25
CIVIL
STATE OF CALIFORNIA

Drawn By	Checked By
PEM	PEM
Project No.	**Scale**
202304	AS SHOWN
Date	
JUNE 2024	

Sheet No.
WW5

Orenco Systems — Technical Data Sheet

Access Risers – Ultra-Rib™

Applications

Orenco's Access Risers provide access to septic tank openings and can be cast into the tops of concrete tanks, bonded in place, or bolted down using a riser-to-tank adapter. They can also be used as valve enclosures.

General

Orenco Ultra-Rib™ Access Risers are constructed of ribbed PVC pipe and are available in 12-in. (300-mm), 18-in. (450-mm), and 24-in. (600-mm) diameters. They can be ordered in 3-in. (76.2-mm) increments in lengths up to 13 ft (3.96 m) for 12-in. (300-mm) and 18-in. (450-mm) diameter risers, and up to 14-ft (4.27 m) for 24-in. (600-mm) diameter risers. Orenco Ultra-Rib riser pipe is also available in truckload quantities. A complete line of Orenco pipe-cutting tools makes it easy to fabricate risers in your shop or in the field.

Standard Models

RR12XX, RU18XX, RR24XX

Product Code Diagram

R R 24 30" + TBD + TBD

Discharge assembly or grommet option:
Blank = No discharge grommet
HD = Pre-drilled for HDA125
HD2 = Pre-drilled for HDA200
10 = 1-in. (25-mm)
12 = 1¼-in. (32-mm)
15 = 1½-in. (38-mm)
20 = 2-in. (51-mm)

Connector/splice box option
Blank = No grommet or splice box
CLK = Pre-drilled for ClickTight™
S = 1-in. (25-mm) grommet installed
L = 1¼-in. (32-mm) grommet installed
SX = Pre-drilled for Orenco® external splice box†
S1 = SB1 attached
S2 = SB2 attached
S3 = SB3 attached
S4 = SB4 attached
L5 = SB5 attached
L6 = SB6 attached
SX = Pre-installed hub for external splice box*
XS = Explosion-proof splice box for simplex pumps‡
XD = Explosion-proof splice box for duplex pumps‡
XT = Explosion-proof splice box for triplex pumps‡

Riser height, 3-in. (76-mm) increments standard

Riser diameter:
12 = 12-in. (300-mm)*
18 = 18-in. (450-mm)*
24 = 24-in. (600-mm)

Riser type code:
R = 12-in. (300-mm) and 24-in. (600-mm) diameters
U = 18-in. (450-mm) diameter
PU = Bulk Ultra-Rib™ pipe, all diameters

Riser, Ultra-Rib™

* Not intended for use over pump vaults
† Minimum riser height 18-in. (457-mm)
‡ For Class I Division 1 environments

Materials of Construction

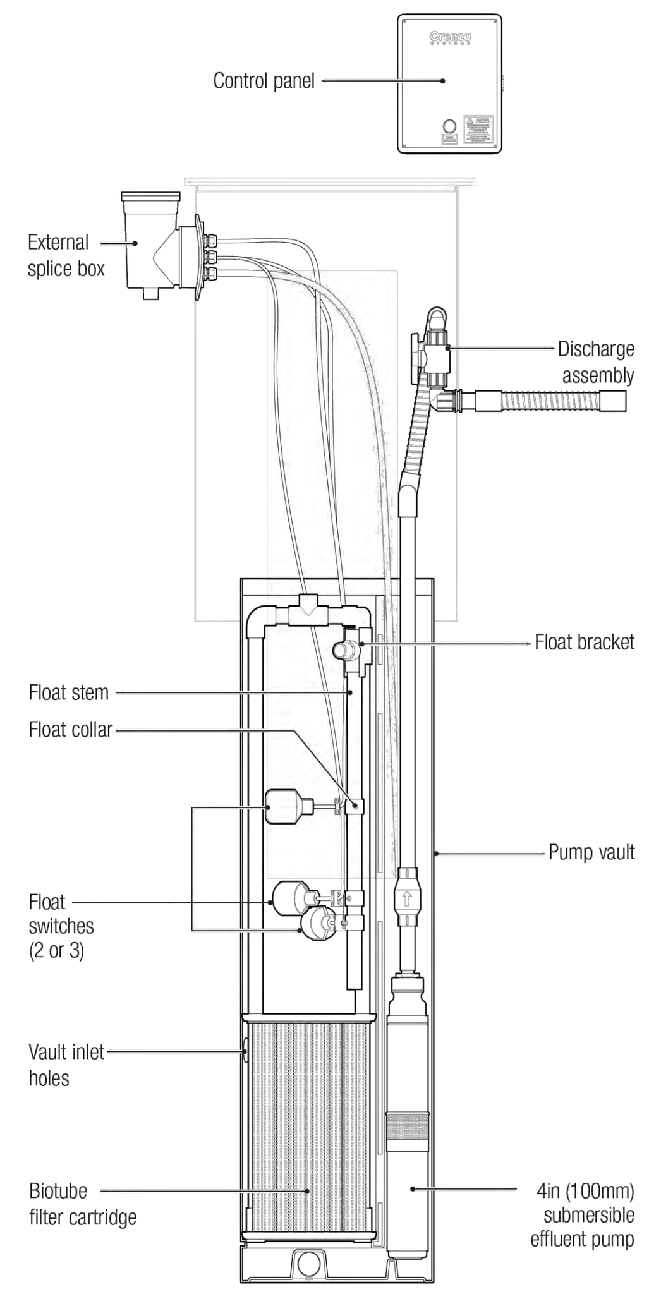
Ultra-Rib™ PVC Pipe: PVC

Specifications

Model	RR12XX	RU18XX	RR24XX
I.D., in. (mm)	11.74 (298)	17.65 (448)	23.50 (597)
Wall thickness – excluding ribs, in. (mm)	0.10 (3)	0.19 (5)	0.25 (6)
O.D. – including ribs, in. (mm)	13.13 (334)	19.44 (494)	25.63 (651)
Weight, lbs/ft (kg/m)	5 (7.4)	11 (16.4)	19 (28.3)

Orenco Water — Technical Data Sheet

Biotube® ProPak™ 60Hz Pump Package



Biotube ProPak 60Hz Pump Package

Applications

The Biotube ProPak Pump Package is designed to filter and pump effluent from a one- or two-compartment septic tank or pump tank to gravity or pressurized dispersal.

Packages for on-demand dosing or timed dosing at 10, 20, 30, and 50gpm (0.6, 1.3, 1.9, and 3.2L/sec) and 50Hz are available.

General

Orenco's Biotube ProPak Pump Package makes it simple to select and install the correct pump and controls package. Its patented Biotube pump vault technology eliminates the need for separate dosing tanks. The pump vault also allows removal of the effluent filter for cleaning with no need to remove the pump vault or pump, which simplifies servicing.

For more information on specific ProPak components and options, see the following Orenco technical documents:

- *S-Series Simplex Control Panels* (NTD-CP-S-1)
- *MVP Simplex Control Panels* (NTD-CP-MVP-1)
- *External Splice Box* (NTD-SBEX-1)
- *Splice Boxes* (NTD-SB-SB-1)
- *Discharge Assemblies* (NTD-HV-HV-1)
- *HDA Discharge Assemblies* (NTD-HDA-1)
- *PF-Series Submersible Effluent Pumps: 1-Phase, 60-Hz, 4-inch* (100-mm) (NTD-PU-PF-1)
- *PVA-Series 4-in. (100-mm) Submersible Effluent Pumps* (NTD-PU-PVA-1)
- *Universal Biotube Pump Vaults* (NTD-PVU-1)
- *PVP-Series Biotube Pump Vaults* (NTD-PVU-3)
- *PV-Series Biotube Pump Vaults* (NTD-PVU-2)

Orenco Water — Fact Sheet

Flow Rates and Cleaning Intervals

Flow rates for effluent filters need to be tied to service intervals in order to be meaningful. Not all filter manufacturers make this connection clear. Filters with very low Total Flow Areas (which plug up easily) cannot handle very high flow rates unless they are cleaned frequently.

Graphs 2a and 2b show the relationship between Orenco's effluent filter models (residential and commercial), design flow, and the "mean time between cleaning." The larger the filter and the smaller the flow, the longer you can go between cleanings.

Based on maintenance records, we know that our standard 4in (100mm) FT0444-36 residential filter has an average maintenance interval in excess of 10 years, when used with typical residential flows.

Level of Filtration

A good filter has a LARGE Total Flow Area to prevent premature filter clogging, along with many SMALL individual openings or holes, to prevent the passing of biosolids. That's what's meant by a good "level of filtration."

Some competitors compare their 1⁄16in (1.6mm) slots to our 1⁄8in diameter (3.2mm) holes, hoping you'll assume that their slots offer better filtration. But the proof is in TSS reduction. Our field test data from thousands of installations using filters with 1⁄8in diameter (3.2mm) holes prove that our effluent filters reduce Total Suspended Solids by an average of two-thirds (we also offer 1⁄16in diameter holes).

Performance Verification

Our new PSC06 (1/8in mesh) filters are NSF46 certified. We also have long-term user data to back up how well our effluent filters work over time.

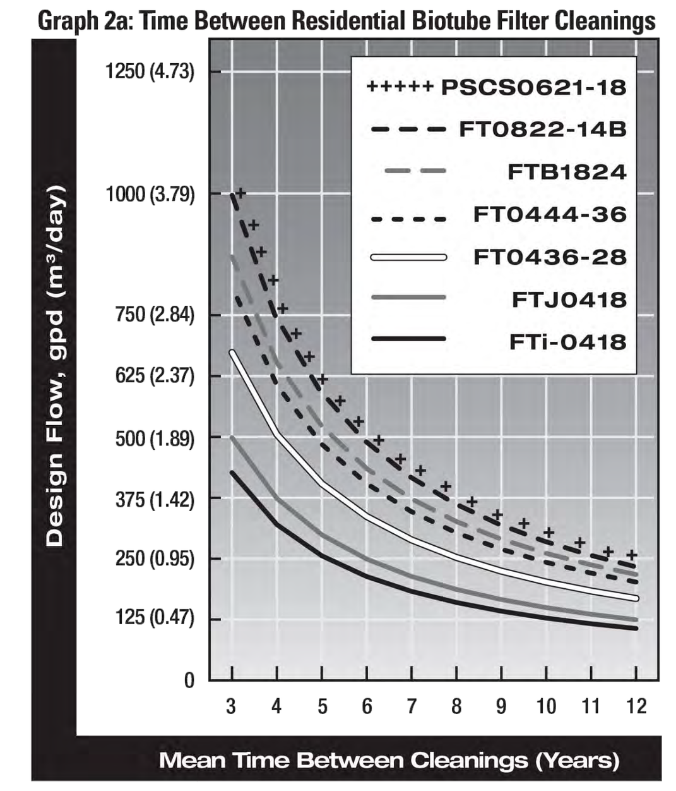
Alarm Feature

Orenco's residential filters offer an alarm as an option.

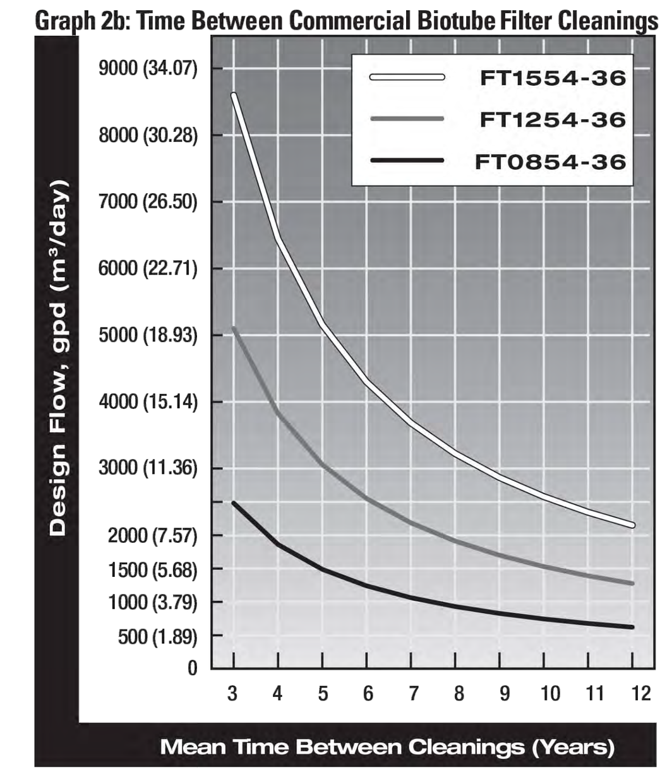
Lifetime Warranty

Orenco's Biotube effluent filters come with a lifetime warranty when used in residential applications.

Graph 2a: Time Between Residential Biotube Filter Cleanings



Graph 2b: Time Between Commercial Biotube Filter Cleanings



Orenco Water — Technical Data Sheet

AdvanTex® AX20 Textile Filter

Applications

Orenco's AdvanTex AX20 Treatment System is an innovative technology for onsite treatment. The heart of the system is the modular AdvanTex AX20 filter, a sturdy, watertight basin filled with an engineered textile material. This lightweight, highly absorbent textile material treats a tremendous amount of wastewater in a small space.


AdvanTex AX20 Textile Filter

Features/Specifications

To specify this product, require the following:

- Non-skid lid surface
- Easily removable and serviceable fixed-film textile media (a polyester plastic), operated in an unsaturated condition
- Consistent media quality
- Completely serviceable manifold
- Watertight construction and corrosion-proof materials
- Multiple inlet and vent locations available for flexible orientation of the unit
- Foam-core lid with insulation value of R-6 (RSI-1.1)

Product Code Diagram

AX 20 - [ ] - [ ]

Application options:
Blank = Residential (includes AX-VENT only)
COM = Commercial (includes antibuoyancy flanges only)

Lid color options:
Blank = Green
B = Brown

20ft² (1.9m²) nominal treatment area

AdvanTex® Treatment System

Related Information

See *AdvanTex Air Vents Technical Data Sheet*, NTD-ATX-VENT-1 for information on air vents.

Physical Specifications*

Filter basin length, in (mm)	91 (2311)
Width, in (mm)	40 (1016)
Height, in (mm)	31 (787)
Area (footprint), ft² (m²)	20 (1.85)
Filter dry weight, lb (kg)	383 (174)

** Nominal values provided. See AdvanTex Treatment System drawings for exact dimensions.*

AdvanTex Treatment Systems are listed to NSF/ANSI Standards 40 and 245 for Class I Systems.

All product and performance assertions are based on proper design, installation, operation, and maintenance according to Orenco's current published documentation.

Orenco Systems — Technical Data Sheet

VeriComm® AX20B Control Panels

Applications

VeriComm® AX20B remote telemetry control panels are used in AdvanTex® AX20 Treatment Systems with two pumps for timed recirculation and pump discharge. Coupled with the web-based VeriComm Monitoring System, these affordable control panels give the ability to remotely monitor and control treatment system operation, with real-time efficiency to wastewater system operators and maintenance organizations, while remaining invisible to the homeowner. AX20B panels allow remote operators to change system parameters, including timer settings, from the web interface. Interlocked controls prevent recirculation pump operation if there is a high-level alarm on the discharge side.


Typical AX20B VeriComm® Control Panel
Standard Models: VCOM AX20B1, VCOM AX20B2

Features

Three Operating Modes
- "Start-Up Mode" collects trend data and establishes operating standards during the first 30 days of operation
- "Normal Mode" manages day-to-day functions
- "Test Mode" suspends data collection and alarm reporting during installation and service

Data Collection and Utilization
- Compiles data logs of system conditions and events such as pump run times, pump cycles, and alarm conditions

Troubleshooting and Diagnostic Logic
- Reports suspected component failures, which then trigger alarms

Features, cont.

Advanced Control Logic
- Activates system diagnostics in the event of a float failure or malfunction and maintains normal system operation until servicing can occur

Communication and Alarm Management
- Provides remote telemetry and a web-based monitoring application for communication and alarm management (see *VeriComm Monitoring System*, NTD-CP-VCOM-1)
- Updates point values (including timer settings) and queued changes during each host communication session
- Contacts with host monthly; more frequently during alarm conditions

Multiple Communication Methods
- Call-In to VeriComm® Host (phone line or optional high speed internet)
  – Signals critical fault conditions that require immediate attention (e.g., pump failure) through automatic alarm notifications
  – Signals less-critical fault conditions (e.g., stuck float switch) through automatic alert notifications and triggers the panel's troubleshooting logic and alternative operating mode
  – Sends updates through automatic update notifications, including alarm updates or all-clear notifications following alarms/alerts, as well as normally scheduled monthly panel reports
  – Allows manual, forced communication from panel to host for updating point values and receipt of queued changes
- Real-Time, Manual Direct Panel Connection
  – Allows a local operator real-time access to detailed logged data and the ability to change point values through direct connection via RS-232 serial port from a laptop or Android® device with optional Bluetooth® kit
  – Allows a local operator to initiate an auto-answer mode in real-time to access detailed logged data and the ability to change point values via direct, forced communication at the site

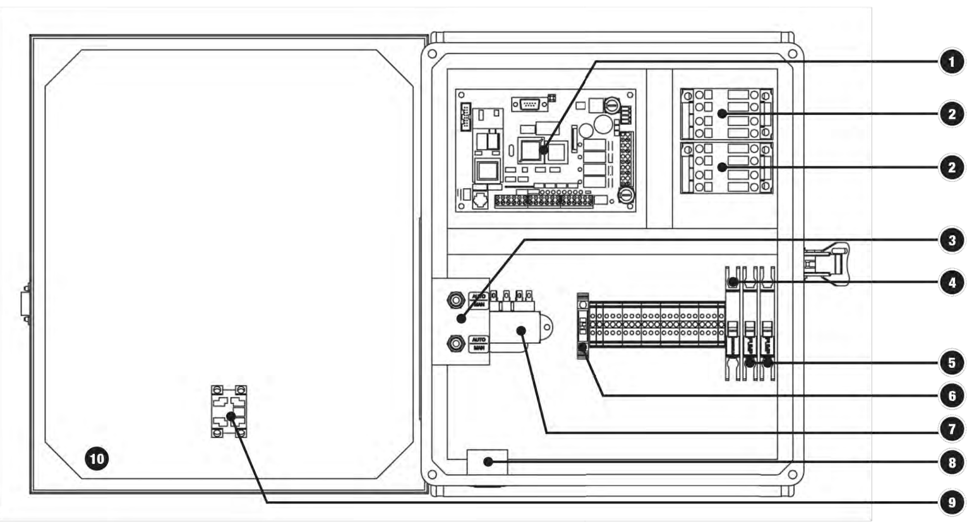
Open-architecture software with password security is used during real-time, manual connections. Orenco offers BT-VCOM software as an option, but VeriComm panels require no proprietary software. VT100 protocol allows access and control from a Mac or PC computer using a simple communication program (e.g., Windows® HyperTerminal), with multilevel password protection ensuring that only qualified personnel can access the panel's data.

Status Light Indicators
– Flashing green LED for normal operation
– Yellow LEDs for status of digital inputs
– Red LEDs for status of digital outputs and modem activity

UL-recognized and FCC-approved

For more information, try our online demo at www.vericomm.net (no password required).

Orenco Systems — Technical Data Sheet



Standard Components

Feature	Specifications
1. VeriComm® Remote Telemetry Unit*	ATRTU-100: 36/18 VAC (center tap transformer); 8 digital inputs, 4 analog inputs, 4 digital outputs, 0 analog outputs, on-board modem (2400 baud); LED input and output indicators; 1-year battery backup of data and program settings
2. Motor-Start Contactors	120 V, 16 FLA, 1 hp (0.75 kW), 60 hz; 2.5 million cycles at FLA (5 million at 50% of FLA) 240 V, 16 FLA, 3 hp (2.24 kW), 60 hz; 2.5 million cycles at FLA (5 million at 50% of FLA)
3. Toggle Switch	Single-pole, single-throw, momentary manual switch; 20 A, 3/4 hp (0.75 kW)
4. Controls Circuit Breaker	10 A, OFF/ON switch; single-pole 120 V; DIN rail mounting with thermal magnetic tripping characteristics (240 V units are available for international markets)
5. Pump Circuit Breaker	20 A, OFF/ON switch; single-pole 120 V or double-pole 240 V; DIN rail mounting with thermal magnetic tripping characteristics
6. Fuse	250 VAC, 1 A
7. Transformer	120 VAC primary, 36 VCT @ 0.85 A secondary
8. Audible Alarm	95 dB at 24 in. (610 mm), warble-tone sound
9. Visual Alarm	7⁄8-in. (22-mm) diameter red lens; "Push-to-silence;" UL Type 4X rated, 1 W LED light, 120 V
10. Panel Enclosure	Measures 13.51 in. high × 11.29 in. wide × 5.58 in. deep (343 × 287 × 135 mm). UL Type 4X rated. Constructed of UV-resistant fiberglass; hinges and latch are stainless steel.

**See VeriComm® Monitoring System (NTD-CP-VCOM-1) for details.*

Optional Components

Feature	Specification(s)	Product Code Adder
Pump Run Lights	7⁄8-in. (22-mm) diameter green lens. UL Type 4X rated, 1 W LED light, 120 V	PRL
Heater	Anti-condensation heater; self-adjusting: radiates additional wattage as temperature drops	HT
Programmable Timer	Discharge pump timed dosing	PT
UV Disinfection Compatibility	UV grounded power circuit and alarm contacts; pump disable upon UV failure	UV

Additional options available on a custom basis. Contact Orenco Controls for more information.

WASTEWATER SYSTEM SPECIFICATIONS CONTINUED

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14500 Arnerich Hill Road
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REGISTERED PROFESSIONAL ENGINEER PAUL MYER C 80522 EXP 03/31/25 CIVIL STATE OF CALIFORNIA

Drawn By	Checked By
PEM	PEM
Project No. 202304	Scale AS SHOWN
Date JUNE 2024	
Sheet No. WW6	6 OF 6

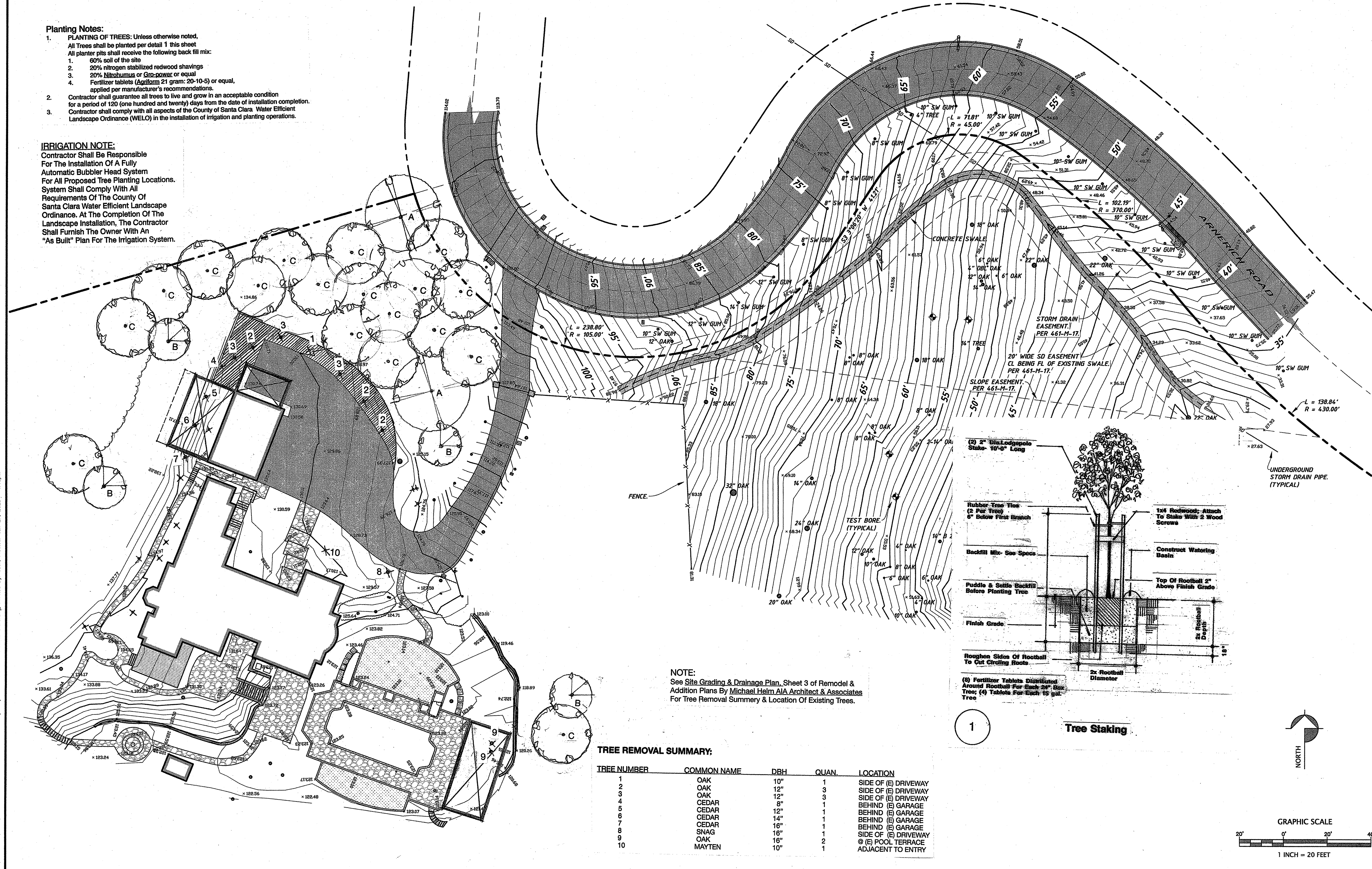
No.	Revision/Issue	Date

Planting Schedule:
TREE REPLACEMENT SUMMARY

Symbol	Botanical Name	Common Name	Size	H20	#
Trees:					
A	Acer macrophyllum	Big Leaf Maple	24" Box Std.	M	2
B	Aesçulus californica	California Buckeye	24" Box Multi.	VL	4
C	Quercus agrifolia	Coast Live Oak	24" Box Std.	VL	18

Planting Notes:
1. PLANTING OF TREES: Unless otherwise noted, All Trees shall be planted per detail 1 this sheet. All planter pits shall receive the following back fill mix:
   1. 60% soil of the site
   2. 20% nitrogen stabilized redwood shavings
   3. 20% Nitrohumus or Gro-power or equal
   4. Fertilizer tablets (Agriform 21 gram: 20-10-5) or equal, applied per manufacturer's recommendations.
2. Contractor shall guarantee all trees to live and grow in an acceptable condition for a period of 120 (one hundred and twenty) days from the date of installation completion.
3. Contractor shall comply with all aspects of the County of Santa Clara Water Efficient Landscape Ordinance (WELO) in the installation of irrigation and planting operations.

IRRIGATION NOTE:
Contractor Shall Be Responsible For The Installation Of A Fully Automatic Bubbler Head System For All Proposed Tree Planting Locations. System Shall Comply With All Requirements Of The County Of Santa Clara Water Efficient Landscape Ordinance. At The Completion Of The Landscape Installation, The Contractor Shall Furnish The Owner With An "As Built" Plan For The Irrigation System.



1 Tree Staking

NOTE:
See Site Grading & Drainage Plan, Sheet 3 of Remodel & Addition Plans By Michael Helm AIA Architect & Associates For Tree Removal Summery & Location Of Existing Trees.

TREE REMOVAL SUMMARY:

TREE NUMBER	COMMON NAME	DBH	QUAN.	LOCATION
1	OAK	10"	1	SIDE OF (E) DRIVEWAY
2	OAK	12"	3	SIDE OF (E) DRIVEWAY
3	OAK	12"	3	SIDE OF (E) DRIVEWAY
4	CEDAR	8"	1	BEHIND (E) GARAGE
5	CEDAR	12"	1	BEHIND (E) GARAGE
6	CEDAR	14"	1	BEHIND (E) GARAGE
7	CEDAR	16"	1	BEHIND (E) GARAGE
8	SNAG	16"	1	SIDE OF (E) DRIVEWAY
9	OAK	16"	2	@ (E) POOL TERRACE
10	MAYTEN	10"	1	ADJACENT TO ENTRY

NORTH

GRAPHIC SCALE
20' 0' 20' 40'
1 INCH = 20 FEET

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sheet title
Tree Replacement Plan

project
RENFREW RESIDENCE
14500 Arnerich Road
Santa Clara, CA 95032
A.P.N. 537-12-012

revisions

date 8-24-2023
drawn TS
sheet no
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of