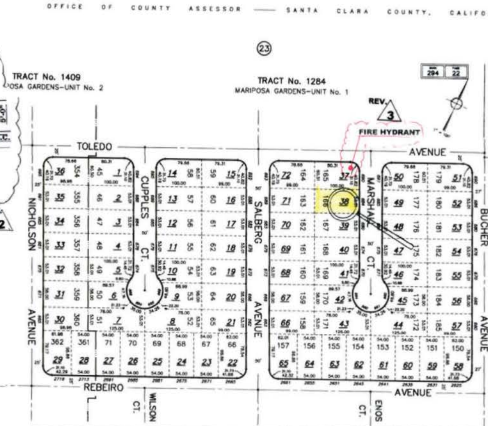
1. EXISTING SIDEWALK NEEDS TO BE REMOVED AND REPLACED TO MATCH THE GRADE OF THE NEW SIDEWALK.
2. THE EXISTING CONCRETE DRIVEWAY NEEDS TO BE REMOVED AND REPLACED TO MATCH THE GRADE OF THE REST OF THE NEW CONCRETE DRIVEWAY.

REV. 2



REV. 3

PROPERTY OVERVIEW

684 MARSHALL CT, SANTA CLARA, CA 95051-5711

Owner and Geographic Information

Primary Owner: SHAH SANTOSH AND PAYALBAHEN (TRUSTEE)

Site Address: 684 MARSHALL CT, SANTA CLARA, CA 95051-5711

Secondary Owner:

Mail Address: 684 MARSHALL CT, SANTA CLARA, CA 95051-5711

APN: 294-22-038

Housing Tract Number: 1284

Lot Number: 166

Page / Grid:

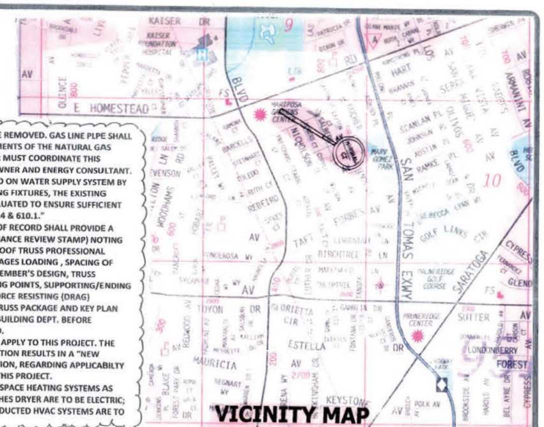
Legal Description:
- Lot Code: 166
- Subdivision: MARIPOSA GARDENS
- Tract Number: 1284
- Legal Brief Description: LOT 166 CITY SANTA CLARA SUBD MARIPOSA GARDENS TR# 1284 TR 1284 LOT 166
- City / Muni / Twp: SANTA CLARA

Property Details

Bedrooms:	3	Year Built:	1954	Square Feet:	1,166
Bathrooms:	2	Garage:	Garage 1	Lot Size:	5,300 SF
Total Rooms:	5	Fireplace:		Number of Units:	0
Zoning:	R1	Pool:		Use Code:	Single Family Residential

REV. 1

PLAN CHECK NOTES:
1. EXISTING GAS METER SHALL BE REMOVED. GAS LINE PLPE SHALL BE CAPPED OFF PER REQUIREMENTS OF THE NATURAL GAS UTILITY PROVIDER. *DESIGNER MUST COORDINATE THIS REQUIREMENT WITH HOMEOWNER AND ENERGY CONSULTANT.
2. "DUE TO ADDITIONAL DEMAND ON WATER SUPPLY SYSTEM BY ADDING ADDITIONAL PLUMBING FIXTURES, THE EXISTING WATER SYSTEM MUST BE EVALUATED TO ENSURE SUFFICIENT WATER IS AVAILABLE, CPC 102.4 & 610.1."
3. THE STRUCTUREAL ENGINEER OF RECORD SHALL PROVIDE A REVIEW LETTER (OR CONFORMANCE REVIEW STAMP) NOTING NO EXCEPTIONS REGARDING ROOF TRUSS PROFESSIONAL DESIGNER CALCULATION PACKAGES LOADING , SPACING OF TRUSSES, OVERALL LAYOUT, MEMBER'S DESIGN, TRUSS OVERALL DIMENSIONS, BEARING POINTS, SUPPORTING/ENDING CONDITIONS, AND LATERAL-FORCE RESISTING (DRAG) (WHERE/IF APPLICABLE).THE TRUSS PACKAGE AND KEY PLAN MUST BE SUBMITTED TO THE BUILDING DEPT. BEFORE FABRICATIION". SEE ATTACHED.
4. NOTE: THE 2023 REACH CODES APPLY TO THIS PROJECT. THE OVERALL SCOPE OF CONSTRUCTION RESULTS IN A "NEW CONSTRUCTION" DETERMINATION, REGARDING APPLICABILTY OF CITY'S 2023 REACH CODES.THIS PROJECT.
5. NEW WATER HEATER AND ALL SPACE HEATING SYSTEMS AS WELL AS KITCHEN STOVE,CLOTHES DRYER ARE TO BE ELECTRIC; ALSO, ENTIRE DUCTWORKFOR DUCTED HVAC SYSTEMS ARE TO BE NEW.



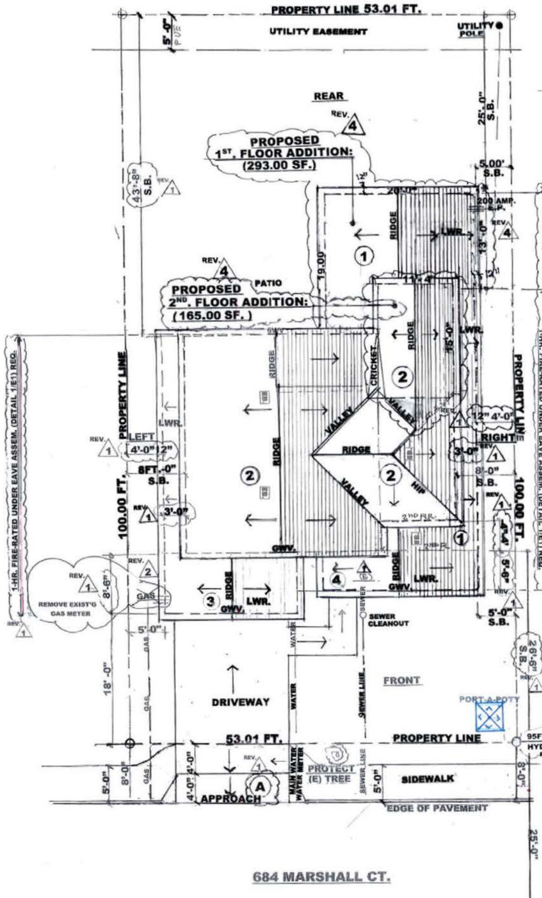
VICINITY MAP

APPROVAL STAMP

RESIDENTIAL HOUSE PLANS
HOMES, REMODELS & ADDITIONS
LOU COSTANZO AND ASSOC.
408 472-9829 (C) 408 264-0220 (O)
1501 SAN GABRIEL WAY, SAN JOSE CA. 95125
loucostanzo@comcast.net
PHILLIP SHENN P.E. CIVIL ENG.
TONY TRUONG P.E. STRUCTURAL ENG.
408 899-0220
FRI ENERGY. CONSULTANTS
NICK BIGNARDI
408 866-1620 408 866-1853
CAMPBELL CALIF.

PROPERTY OWNER:
SANTOSH SHAH 1-312 371-5325
ADDRESS:
648 MARSHALL CT., SANTA CLARA CA. 95050

INSPECTION IS REQUIRED FOR:
1. SHEARWALL AND HOLDDOWNS.
2. HERS CERTIFICATION TO VERIFY ASSUMPTIONS IN THE MODEL...ENERGY CALCULATIONS TO BE REGISTERED, REQUIRED FOR THE FURNACE'S A/C DUCT SEALING, THERMOSTATIC EXPANSION VALVES, REFRIGERANT CHARGE, AIR FLOW MEASUREMENT, IAG, KITCHEN RANGE HOOD AND BUILDING ENVELOPE MEASUREMENTS. VERIFICATION AND DUCT LEAKAGE.



684 MARSHALL CT.

SITE PLAN
SCALE ~ 1/8" = 1'-0"

CENTER OF STREET

EB. EYEBROW ROOF VENT

1. FIRST FLOOR:------------------	(1458.61 SF.)
2. PROP. SECOND FLOOR:----	(1140.32 SF.)
3. ATTACHED GARAGE:-------	(371.76 SF.)
4. ENTRY PORCH:---------------	(137.50 SF.)

PARCEL DATA: (REVISED) 8-12-24

SANTOSH RESIDENCE

1 PARCEL NO:-------------------------		294-22-038
2. YEAR BUILT:-------------------------		1954
3. LOT AREA:---------------------------		5301.00 S.F.
REV. 4 4. PROPOSED BUILDING:-----------		TWO-STORY
5. **SPRINKLER SYSTEM REQUIRED**		
6. ZONING: R1 SGL. FAM. RESIDENCE		
7. TYPE OF CONSTR.:----------------		VB
8. GROUP OCCUPANCY:------------		R-3/U
9. LIVING SPACE:		
EXISTING 1ST. FLOOR:------------		1165.61 SF.
REV. 4 PROP. 1ST. FLR. ADDITION (Revision)		293.00 SF.
TOTAL 1ST. FLR:-------------------		1458.61 SF.
(E) PROP. 2ND.FLR. ADD:	975.32 SF.	
REV. 4 PROP. 2ND. FLR. ADDITION	165.00 SF.	
TOTAL REVISED 2ND. FLR.	1140.32 SF.	1140.32 SF.
TOT. 1ST. & 2ND. FLR. LIV'G:		2598.23 SF.
10. 1ST. FLOOR LIVING:	1458.61 SF.	
EXISTING GARAGE:	371.76 SF.	
COVERED PORCH:	137.50 SF.	
TOTAL:	1967.87 SF.	

11. MAX. 1ST. FLR. SF. ALLOWED:
1674.87 SF. -/- 5301.00 SF. (LOT) = 0.3160 OR 32% COV.
12. MAX. 2ND. FLR. SF. ALLOWED:
1967.87 SF. X .66% = 1298.79 SF. 2ND, FLR. ALLOWED
1140.32 SF. < 1298.79 SF. ALLOW.

REV. 4
NOTE:
1. SPRINKLER SYSTEM IS DEFERRED. BY OTHERS.
2. SPRINKLER SYSTEM REQUIRES A NEW 1"dia. . WATER LINE TO HOUSE. U.N.O.
3.OWNER SHALL CONTACT WATER CO. TO RECEIVE WATER PRESSURE REPORT W/ FIRE HYDRANT LOCATION FOR FIRE DEPT. APPROVAL.

SCOPE OF WORK : 8-12-2024
THE SANTOSH SHAH RESIDENCE.
684 MARSHALL CT., SANTA CLARA
"NEW CONSTRUCTION" W/ALL ELECTRIC PROVISIONS, BUILDING PLAN (2023 CITY REACH CODES).

REV. 4

A. CONTRACTOR PROPOSES TO REVISE AND ADD:(AS A REVISION) A FAMILYROOM ADDITION (293.00 SF.), WITH CHANGE TO KITCHEN LAYOUT, ETC. (N) 1ST. FLOOR:(1165.61 SF. + 293.00 SF. = 1458.61 SF.). RAISE CEILING TO 9FT.-0" HT & CONSTR. 2ND.FLOOR ADDITION. (981.56 SF.) WITH 8FT.-0" CEILING HT., TOTAL LIV.: 2147.17 SF. REMODEL 1ST. FL. (E) BATH, KITCHEN, REMOVE BEDRM. 1 ,TO INCREASE FAMILY ROOM SIZE, LARGER MASTER BR W/ CLOSET, AND BUILD SWITCHBACK STAIRCASE TO PROPOSED 2ND. FLOOR ADDITION.

B. CONSTRUCT TO REVISE & ADD:(AS A REVISION) SITTING RM., BATH, BEDROOM (165.00 SF.)TO THE EXIST'G (975.32 SF.) = 1140.32 SF. TOTAL (E) CONSTRUCT A 2ND. FLOOR ADDITION (975.32 SF.) WITH BEDROOMS 1 & 2 WITH CLOSETS, HALL BATH, MASTER BEDROOM WITH BATH & WALK-IN-CLOSET.
2. HOUSE WILL HAVE NEW HEATING /AC, INSULATION, 50 YR. COMPOSITION ROOF OVER MANUFACTURED ROOF TRUSSES, MFG. WEB FLOOR JOISTS, PLUMBING & ELECTRCAL W/ 200 AMP. E.P. UPDATED AS NEEDED, & STUCCO EXTERIOR. (76/8" (3 LAYERS STUCCO W/ WIRE MESH O/ 2-LAYERS "D" PAPER O/1/2" CDX PLYWOOD.) FINISH AND TRIM.
4. REPLACE WINDOWS/DOORS PER TITLE 24/ENERGY REPORT.

C. ALL WORK SHALL COMPLY WITH:

ALL APPLICABLE CALIFORNIA BUILDING STANDARDS CODES	
BUILDING ENERGY EFFICIENCY/ TITLE STANDARDS	2022
CALGREEN MEASURES	2022
CBC CALIFORNIA BUILDING CODE	2022
CRC CALIFORNIA RESIDENTIAL BLD'G CODE	2022
CEC CALIFORNIA ELECTRICAL CODE	2022
CPC CALIFORNIA PLUMBING CODE	2022
CMC CALIFORNIA MECHANICAL CODE	2022
ASCE AMERICAN SOC. OF CIVIL ENGINEER'G	
ACI AMERICAN CONCRETE INSTITUTE	
ALL LOCAL CODES, REGULATIONS, SETBACK REQUIREMENTS.	

D. OWNER/CONTRACTOR SHALL BE RESPONSIBLE FOR ALL BUILDING INSPECTIONS, SUB-CONTRACTORS, WORKMANSHIP & SCHEDULES.BECOME FAMILIAR WITH ALL SITE CONDITIONS INCLUDING (GRADES, DIMENSIONS & CONDITIONS), BEFORE STARTING CONSTRUCTION.

E. PLAN MAKER: NO PERMITS: PLAN MAKER TAKES NO LIABILITY. ALTHOUGH EVERY PRECAUTION IS TAKEN TO BE ACCURATE, DISCREPANCIES SHALL BE BROUGHT TO HIS ATTENTION FOR CORRECTION IN A TIMELY MANNER. WITH PLAN DELIVERY/ ACCEPTANCE TO HOMEOWNER, LIBILITY IS LIMITED TO FEES CHARGED FOR ARCH. SECTION ONLY. ALL OTHERS: STRUCTURAL/CIVIL ENGINEERS SHALL CAUSE NO LIABILITY TO THE ARCH./ PLAN DESIGNER...

PLAN INDEX 8-12-24 REV. 4

REVISIONS	BY
REV. 1 11-1-23	LC
REV. 2 2-8-24	LC
REV. 4 8-12-24	L.C.

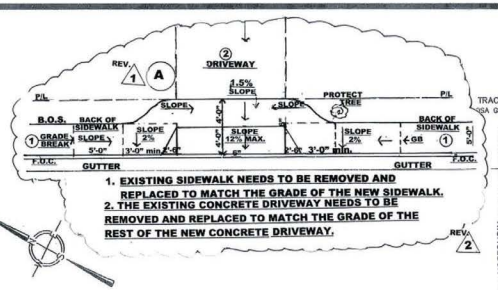
8-12-24
Lou Costanzo

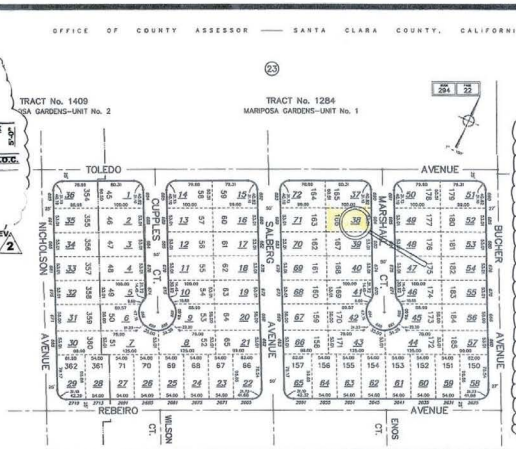
PLAN COMMENTS TO: LOUCOSTANZO@COMCAST.NET 408-472-9829 CELL

A REMODEL FOR 1ST. FLOOR & 2ND. STORY ADDITION FOR:
THE SANTOSH SHAH RESIDENCE
684 MARSHALL CT., SANTA CLARA CA. 95050
PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220
STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

SITE PLAN

DRAWN	LOU COSTANZO
CHECKED	S.C.
DATE	8-12-24
SCALE	1/8" = 1 – 0"
JOB NO.	S2023-8
SHEET	REV. 4 A1R REVISION
OF	SHEETS





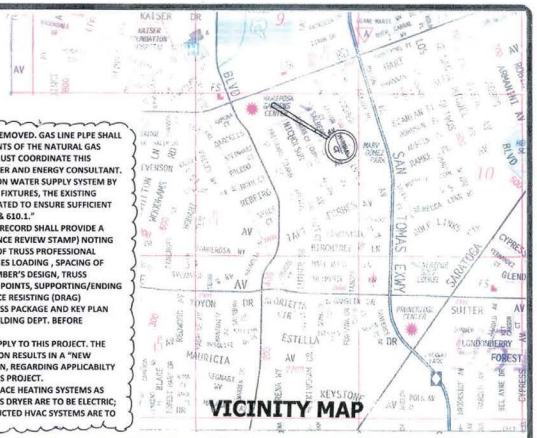
PROPERTY OVERVIEW — 684 MARSHALL CT, SANTA CLARA, CA 95051-5711

Owner and Geographic Information

Primary Owner:	SHAH SANTOSH AND PAYALBAHEN (TRUSTEE)
Site Address:	684 MARSHALL CT, SANTA CLARA, CA 95051-5711
Secondary Owner:	-
Mail Address:	684 MARSHALL CT, SANTA CLARA, CA 95051-5711
APN:	294-22-038
Lot Number:	100
Page / Grid:	
Housing Tract Number:	1284
Lot Code:	100
Subdivision:	MARIPOSA GARDENS
Tract Number:	1284
Legal Brief Description:	LOT 100 CITY SANTA CLARA BUSD MARIPOSA GARDENS TR# 1284 TR 1284 LOT 100
City / Muni / Twp:	SANTA CLARA

Property Details

Bedroom:	3	Year Built:	1954
Bathrooms:	3	Garage:	Garage 1
Total Rooms:	5	Fireplace:	
Zoning:	R1	Pool:	
Square Feet:	1,166		
Lot Size:	5,300 SF		
Number of Units:	0		
Use Code:	Single Family Residential		



REV. 1

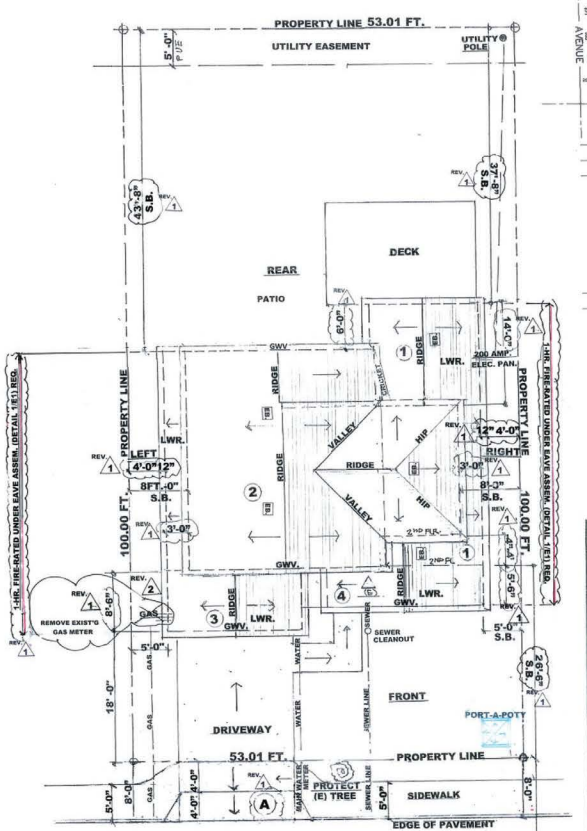
PLAN CHECK NOTES:
1. EXISTING GAS METER SHALL BE REMOVED. GAS LINE PLPE SHALL BE CAPPED OFF PER REQUIREMENTS OF THE NATURAL GAS UTILITY PROVIDER. *DESIGNER MUST COORDINATE THIS REQUIREMENT WITH HOMEOWNER AND ENERGY CONSULTANT.
2. "DUE TO ADDITIONAL DEMAND ON WATER SUPPLY SYSTEM BY ADDING ADDITIONAL PLUMBING FIXTURES, THE EXISTING WATER SYSTEM MUST BE EVALUATED TO ENSURE SUFFICIENT WATER IS AVAILABLE, CPC 102.4 & 610.1."
3. THE STRUCTUREAL ENGINEER OF RECORD SHALL PROVIDE A REVIEW LETTER (OR CONFORMANCE REVIEW STAMP) NOTING NO EXCEPTIONS REGARDING ROOF TRUSS PROFESSIONAL DESIGNER CALCULATION PACKAGES LOADING , SPACING OF TRUSSES, OVERALL LAYOUT, MEMBER'S DESIGN, TRUSS OVERALL DIMENSIONS, BEARING POINTS, SUPPORTING/ENDING CONDITIONS, AND LATERAL-FORCE RESISTING (DRAG) (WHERE/IF APPLICABLE).THE TRUSS PACKAGE AND KEY PLAN MUST BE SUBMITTED TO THE BUILDING DEPT. BEFORE FABRICATIION". SEE ATTACHED.
4. NOTE: THE 2023 REACH CODES APPLY TO THIS PROJECT. THE OVERALL SCOPE OF CONSTRUCTION RESULTS IN A "NEW CONSTRUCTION" DETERMINATION, REGARDING APPLICABILTY OF CITY'S 2023 REACH CODES.THIS PROJECT.
5. NEW WATER HEATER AND ALL SPACE HEATING SYSTEMS AS WELL AS KITCHEN STOVE,CLOTHES DRYER ARE TO BE ELECTRIC; ALSO, ENTIRE DUCTWORKFOR DUCTED HVAC SYSTEMS ARE TO BE NEW.

APPROVAL STAMP

RESIDENTIAL HOUSE PLANS
HOMES, REMODELS & ADDITIONS
LOU COSTANZO AND ASSOC.
408 472-9829 (C) 408 264-0220 (O)
1501 SAN GABRIEL WAY, SAN JOSE CA. 95125
loucostanzo@comcast.net
PHILLIP SHENN P.E. CIVIL ENG.
TONY TRUONG P.E. STRUCTURAL ENG.
408 899-0220
FRI ENERGY. CONSULTANTS
NICK BIGNARDI
408 866-1620 408 866-1853
CAMPBELL CALIF.

PROPERTY OWNER:
SANTOSH SHAH 1-312 371-5325
ADDRESS:
648 MARSHALL CT., SANTA CLARA CA. 95050

INSPECTION IS REQUIRED FOR:
1. SHEARWALL AND HOLDDOWNS.
2. HERS CERTIFICATION TO VERIFY ASSUMPTIONS IN THE MODEL....ENERGY CALCULATIONS TO BE REGISTERED, REQUIRED FOR THE FURNACE'S A/C DUCT SEALING, THERMOSTATIC EXPANSION VALVES, REFRIGERANT CHARGE, AIR FLOW MEASUREMENT, IAG, KITCHEN RANGE HOOD AND BUILDING ENVELOPE MEASUREMENTS. VERIFICATION AND DUCT LEAKAGE.



684 MARSHALL CT.

SITE PLAN

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

EB EYEBROW ROOF VENT

1. FIRST FLOOR:----------	(1165.61 SF.)
2. PROP. SECOND FLOOR:---	(975.32 SF.)
3. ATTACHED GARAGE:------	(371.76 SF.)
4. ENTRY PORCH:----------	(137.50 SF.)

PARCEL DATA

1 PARCEL NO.: ----------	294-22-038
2. YEAR BUILT:- ----------	1954
3. LOT SIZE: ----------	5301.00 SF.
4. PROPOSED BUILDING:----	TWO-STORY
5. SPRINKLER SYSTEM:-----	NONE
6.. ZONING: R1 SINGLE FAM. RES.	
7. TYPE OF CONSTR.----------	VB
8. GROUP OCCUPANCY-------	R-3/U
9. LIVING SPACE:	
EXISTING 1ST. FLR: ----------	1165.61 SF.
PROPOSED 2ND. FLR.---------	975.32 SF.
TOTAL LIVING: (E) + (N):---	2140.93 SF.
EXISTING ATT. GARAGE: --	371.76 SF.
ENTRY PORCH: ----------	137.50 SF.
TOTAL:----------	2650.19 SF.

10. 1ST. FLOOR LIVING: 1165.61 SF.
EXIST'G GARAGE: 371.76 SF.
(E) COV. PORCH: 137.50 SF.
TOTAL: 1674.87 SF.
11. MAX. 2ND. FLR S.F. ALLOWED:(1103.54 SF.)
(1674.87 X .66% = 1105.41 SF.)
975.32 -/- 1105.41 SF. = 0.8823 OR 88% OF ALLOW.
12. F.A.R.:
1674.87 SF. -/- 5301.61 SF. = 0.3160 OR 32%
5301.00 SF. X .40(%) = 2120.04 SF. 1ST. FLOOR
(NO FIRST FLOOR ADDITIONS)

SCOPE OF WORK : THE SANTOSH SHAH RESIDENCE. 7 -31 - 2023
684 MARSHALL CT., SANTA CLARA
"NEW CONSTRUCTION" W/ALL ELECTRIC PROVISIONS.
BUILDING PLAN (2023 CITY REACH CODES).
REV. 1
A. CONTRACTOR PROPOSES TO REMODEL 1ST. FLR. (1165.61 SF.), RAISE CEILING TO 9FT.-0" HT & CONSTR. 2ND FLOOR ADDITION. (981.56 SF.) WITH 8FT.-0" CEILING HT., TOTAL LIV.: 2147.17 SF.
REMODEL 1ST. FL. (E) BATH, KITCHEN, REMOVE BEDRM. 1 ,TO INCREASE FAMILY ROOM SIZE, LARGER MASTER BR W/ CLOSET, AND BUILD SWITCHBACK STAIRCASE TO PROPOSED 2ND. FLOOR ADDITION.
B. CONSTRUCT A 2ND. FLOOR ADDITION (981.56 SF.)
WITH BEDROOMS 1 & 2 WITH CLOSETS, HALL BATH,
MASTER BEDROOM WITH BATH & WALK-IN-CLOSET.
2. HOUSE WILL HAVE NEW HEATING /A/C, INSULATION,
50 YR. COMPOSITION ROOF OVER MANUFACTURED
ROOF TRUSSES, MFG. WEB FLOOR JOISTS, PLUMBING & ELECTRCAL
W/ 200 AMP. E.P. UPDATED AS NEEDED, & STUCCO EXTERIOR.
(7/8" (3 LAYERS STUCCO W/ WIRE MESH O/ 2-LAYERS "D" PAPER
O/1/2" CDX PLYWOOD.) FINISH AND TRIM.
4. REPLACE WINDOWS/DOORS PER TITLE 24/ENERGY REPORT.
C. ALL WORK SHALL COMPLY WITH:
ALL APPLICABLE CALIFORNIA BUILDING STANDARDS CODES
BUILDING ENERGY EFFICIENCY/ TITLE STANDARDS 2022
CALGREEN MEASURES 2022
CBC CALIFORNIA BUILDING CODE 2022
CRC CALIFORNIA RESIDENTIAL BLD'G CODE 2022
CEC CALIFORNIA ELECTRICAL CODE 2022
CPC CALIFORNIA PLUMBING CODE 2022
CMC CALIFORNIA MECHANICAL CODE 2022
ASCE AMERICAN SOC. OF CIVIL ENGINEER'G
ACI AMERICAN CONCRETE INSTITUTE
ALL LOCAL CODES, REGULATIONS, SETBACK REQUIREMENTS.
D. OWNER/CONTRACTOR SHALL BE RESPONSIBLE
FOR ALL BUILDING INSPECTIONS, SUB-CONTRACTORS,
WORKMANSHIP & SCHEDULES.BECOME FAMILIAR WITH ALL
SITE CONDITIONS INCLUDING (GRADES, DIMENSIONS & CONDITIONS),
BEFORE STARTING CONSTRUCTION.
E. PLAN MAKER: NO PERMITS: PLAN MAKER TAKES NO LIABILITY
ALTHOUGH EVERY PRECAUTION IS TAKEN TO BE ACCURATE,
DISCREPANCIES SHALL BE BROUGHT TO HIS ATTENTION FOR
CORRECTION IN A TIMELY MANNER. WITH PLAN DELIVERY/
ACCEPTANCE TO HOMEOWNER, LIBILITY IS LIMITED TO FEES
CHARGED FOR ARCH. SECTION ONLY.
ALL OTHERS: STRUCTURAL/CIVIL ENGINEERS SHALL CAUSE NO
LIABILITY TO THE ARCH./ PLAN DESIGNER..

PLAN INDEX THE SANTOSH SHAH RESIDENCE

REVISIONS	BY
REV. 1 11-1-23	LC
REV. 2 2-8-24	LC

2-8-24 Lou Costanzo

PLAN COMMENTS TO: LOUCOSTANZO@COMCAST.NET 408-472-9829 (C) CELL

7-18-23 Lou Costanzo

A REMODEL FOR 1ST. FLOOR & 2ND. STORY ADDITION FOR:
THE SANTOSH SHAH RESIDENCE
684 MARSHALL CT., SANTA CLARA CA. 95050
PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220
STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

SITE PLAN

DRAWN LOU COSTANZO
CHECKED S.C.
DATE 7 - 18 - 23
SCALE 1/8" = 1 - 0"
JOB NO. S2023-8
SHEET A1
OF SHEETS.

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

CF1R-PRF-01-E (Page 1 of 13)

Project Name: Santosh Shah Residence
Calculation Description: Title 24 Analysis
Calculation Date/Time: 2024-08-20T13:05:58-07:00
Input File Name: 0230532 Santosh Shah Residence.ribd22x

GENERAL INFORMATION			
01	Project Name	Santosh Shah Residence	
02	Run Title	Title 24 Analysis	
03	Project Location	684 Marshall Ct	
04	City	Santa Clara	05 Standards Version: 2022
06	Climate Zone	03051	07 Software Version: EnergyPro 9.3
08	Zip code	95051	09 Front Orientation (deg/ Cardinal): 225
10	Building Type	Single family	11 Number of Dwelling Units: 1
12	Project Scope	Addition and/or Alteration	13 Number of Bedrooms: 3
14	Addition Cond. Floor Area (ft²):	1533.32	15 Number of Stories: 2
16	Existing Cond. Floor Area (ft²):	1183.61	17 Fenestration Average U-factor: 0.3
18	Total Cond. Floor Area (ft²):	2536.93	19 Glazing Percentage (%): 17.97%
20	ADU Bedroom Count	n/a	21 ADU Conditioned Floor Area: n/a
22	Fuel Type	Natural gas	23 No Dwelling Unit: No

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

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

CF1R-PRF-01-E (Page 2 of 13)

Project Name: Santosh Shah Residence
Calculation Description: Title 24 Analysis
Calculation Date/Time: 2024-08-20T13:05:58-07:00
Input File Name: 0230532 Santosh Shah Residence.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	24.62	0	26.73	0	-1.91
Space Cooling	0	31.73	0	30.88	0	0.85
IAQ Ventilation	0	7.01	0	6.91	0	0.1
Water Heating	0	13.62	0	9.71	0	3.91
Self Utilization/Flexibility Credit				0	0	0
Efficiency Compliance Total	0	77.18	0	74.23	0	1.95
Photovoltaics	0			0		
Battery				0		
Flexibility						
Indoor Lighting	0	6.56	0	6.56		
Appl. & Cooking	0	15	0	14.96		
Plug Loads	0	25.52	0	25.52		
Outdoor Lighting	0	1.67	0	1.67		
TOTAL COMPLIANCE	0	125.93	0	121.94		

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

CF1R-PRF-01-E (Page 3 of 13)

Project Name: Santosh Shah Residence
Calculation Description: Title 24 Analysis
Calculation Date/Time: 2024-08-20T13:05:58-07:00
Input File Name: 0230532 Santosh Shah Residence.ribd22x

ENERGY USE INTENSITY				
	Standard Design (kBtu/ft² - yr)	Proposed Design (kBtu/ft² - yr)	Compliance Margin (kBtu/ft² - yr)	Margin Percentage
Gross EUI[1]	13.58	13.07	0.51	3.76
Net EUI[2]	13.58	13.07	0.51	3.76

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.

- Indoor air quality, balanced fan
- IAQ ventilation System: as low as 0.62723 W/CFM
- IAQ Ventilation System Heat Recovery: minimum 58 SRE and 62 ASRE
- IAQ Ventilation System: supply outside air inlet, filter, and HERS+ cover accessible per RASW Reference Manual.
- 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.

- Indoor air quality ventilation
- Minimum Airflow
- Fan Efficacy W/cfm/CFM
- Verified HSPF
- Verified heat pump rated heating capacity
- Duct leakage testing

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
Santosh Shah Residence	2536.93	1	4	3	0	1

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

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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
1st Floor	Conditioned	HVAC System1	1165.61	9	DHW Sys 1	Existing Unchanged
1st Floor Addition	Conditioned	HVAC System1	253	9	DHW Sys 1	New
2nd Floor	Conditioned	HVAC System1	1140.32	8	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
Front Wall	1st Floor	R-0 Wall	225	Front	200	33.5	90	none	Existing	No
Left Wall	1st Floor	R-0 Wall	315	Left	198	36	90	none	Existing	No
Rear Wall	1st Floor	R-0 Wall	45	Back	166	57.5	90	none	Existing	No
Right Wall	1st Floor	R-0 Wall	135	Right	260	40	90	none	Existing	No
Left Wall 2	1st Floor Addition	R-15 Wall	315	Left	152	20	90	Extension	New	n/a
Rear Wall 2	1st Floor Addition	R-15 Wall	45	Back	160	60	90	none	New	n/a
Right Wall 2	1st Floor Addition	R-15 Wall	135	Right	164	0	90	Extension	New	n/a
Front Wall 2	2nd Floor	R-15 Wall	225	Front	296	73.5	90	Extension	New	n/a
Left Wall 3	2nd Floor	R-15 Wall	315	Left	906	24	90	none	New	n/a
Rear Wall 3	2nd Floor	R-15 Wall	45	Back	296	61.5	90	Extension	New	n/a
Right Wall 3	2nd Floor	R-15 Wall	135	Right	160	20	90	none	New	n/a
Interior Surface 1	1st Floor+1st Floor Addition	R-0 Wall1	n/a	n/a	10	0	n/a		Existing	No
Interior Surface 2	1st Floor+1st Floor Addition	R-0 Wall1	n/a	n/a	10	0	n/a		Existing	No

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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
Roof	1st Floor	R-38 Roof Attic	n/a	n/a	249.29	n/a	n/a		New	n/a
Roof 2	2nd Floor	R-38 Roof Attic	n/a	n/a	1140.32	n/a	n/a		New	n/a
Raised Over Garage	2nd Floor	R-19 Floor No Crawlspace	n/a	n/a	229	n/a	n/a		New	n/a
Raised Floor	1st Floor	R-0 Floor Crawlspace	n/a	n/a	1165.61	n/a	n/a		Existing	No
Raised	1st Floor Addition	R-19 Floor Crawlspace	n/a	n/a	293	n/a	n/a		New	n/a
Interior Surface 3	2nd Floor	R-0 Floor No Crawlspace	n/a	n/a	757.56	n/a	n/a		New	No

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 Radiant Barrier	12 Cool Roof	13 Status	14 Verified Existing Condition
Vault	1st Floor Addition	R-30 Roof No Attic	180	n/a	259	0	4	0.1	0.85	No	New	n/a	

ATTIC

01	02	03	04 Roof Rise (x in 12)	05 Roof Reflectance	06 Roof Emittance	07 Radiant Barrier	08 Cool Roof	09 Status	10 Verified Existing Condition
Attic 1st Floor	Attic Roof1st Floor	ventilated	4	0.1	0.85	Yes	No	New	n/a
Attic 2nd Floor	Attic Roof2nd Floor	ventilated	4	0.1	0.85	Yes	No	New	n/a

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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	15 Status	16 Verified Existing Condition
Window	Window	Front Wall	Front	225			1	16.1	0.3	NFRC	0.21	NFRC	Bug Screen	Altered	Yes
Window 2	Window	Front Wall	Front	225			1	16.1	0.3	NFRC	0.21	NFRC	Bug Screen	Altered	No
Window 3	Window	Front Wall	Front	225			1	16.1	0.3	NFRC	0.21	NFRC	Bug Screen	Altered	No
Entry Door	Window	Front Wall	Front	225			1	35	0.3	NFRC	0.21	NFRC	Bug Screen	Altered	No
Existing	Window	Left Wall	Left	315			1	16	0.58	Table 110.6-A	0.65	Table 110.6-B	Bug Screen	Existing	No
Existing Door	Window	Rear Wall	Back	45			1	33.5	0.58	Table 110.6-A	0.65	Table 110.6-B	Bug Screen	Existing	No
Window 4	Window	Rear Wall	Back	45			1	24	0.3	NFRC	0.21	NFRC	Bug Screen	Altered	No
Existing 2	Window	Right Wall	Right	135			1	68	0.58	Table 110.6-A	0.65	Table 110.6-B	Bug Screen	Existing	No
Door	Window	Left Wall 2	Left	315			1	20	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
SGD	Window	Rear Wall 2	Back	45			1	80	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 5	Window	Rear Wall 2	Back	45			1	20	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 6	Window	Front Wall 2	Front	225			1	17.1	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 7	Window	Front Wall 2	Front	225			1	24	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 8	Window	Front Wall 2	Front	225			1	32	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 9	Window	Left Wall 3	Left	315			1	30	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 10	Window	Left Wall 3	Left	315			1	14	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA

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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	15 Status	16 Verified Existing Condition
Window 11	Window	Rear Wall 3	Back	45			1	14	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 12	Window	Rear Wall 3	Back	45			1	24	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 13	Window	Rear Wall 3	Back	45			1	6	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 14	Window	Rear Wall 3	Back	45			1	17.5	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 15	Window	Right Wall 3	Right	135			1	10	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 16	Window	Right Wall 3	Right	135			1	10	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA

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 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-15 Wall	Exterior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-15	None / None	0.095	Inside Finish: Gypsum Board Cavity / Frame: R-15 / 2x4 Exterior Finish: 3 Coat Stucco
R-38 Roof No Attic	Cathedral Ceilings	Wood Framed Ceiling	2x12 @ 16 in. O. C.	R-30	None / None	0.036	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/Sheathing/decking Cavity / Frame: R-30 / 2x12 Inside Finish: Gypsum Board

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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 Wall1	Interior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-0	None / None	0.377	Inside Finish: Gypsum Board Cavity / Frame: no insul. / 2x4 Other Side Finish: Gypsum Board
Attic Roof1st Floor	Attic Roofs	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-0	None / 0	0.644	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/Sheathing/decking Cavity / Frame: no insul. / 2x4
Attic Roof2nd Floor	Attic Roofs	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-0	None / 0	0.644	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/Sheathing/decking Cavity / Frame: no insul. / 2x4
R-0 Floor Crawlspace	Floors Over Crawlspace	Wood Framed Floor	2x12 @ 16 in. O. C.	R-0	None / None	0.216	Floor Surface: Carpeted Floor Deck: Wood Siding/Sheathing/decking Cavity / Frame: no insul. / 2x12
R-19 Floor Crawlspace	Floors Over Crawlspace	Wood Framed Floor	2x10 @ 16 in. O. C.	R-19	None / None	0.096	Floor Surface: Carpeted Floor Deck: Wood Siding/Sheathing/decking Cavity / Frame: R-19 / 2x10
R-38 Roof Attic	Ceilings (below attic)	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-38	None / None	0.025	Over Ceiling Joist: R-38 Fi nsul Ceiling: 5/8" Gypsum Board Inside Finish: Gypsum Board
R-19 Floor No Crawlspace	Exterior Floors	Wood Framed Floor	2x10 @ 16 in. O. C.	R-19	None / None	0.087	Floor Surface: Carpeted Floor Deck: Wood Siding/Sheathing/decking Cavity / Frame: R-19 / 2x10

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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 Floor No Crawlspace	Interior Floors	Wood Framed Floor	2x12 @ 16 in. O. C.	R-0	None / None	0.196	Floor Surface: Carpeted Floor Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x12 Ceiling Below Finish: Gypsum Board

BUILDING ENVELOPE - HERS VERIFICATION

01 Quality Insulation Installation (QII)	02 Building Envelope Air Leakage	03 CFM50	04 CFM50
Not Required	Not Required	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 (b)	10 Status	11 Verified Existing Condition	12 Existing Water Heating System
DHW Sys 1	Domestic Hot Water (DHW)	Standard	DHW Heater 1	1	n/a	None	n/a	DHW Heater 2 (b)	Altered	No	

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	65	Rheem	RHEMHPH 50 RH45T55 (65 gal, 4436)	Outside	1st Floor	1st Floor

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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

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
HVAC System1	Heat pump heating cooling	Heat Pump System 1	1	Heat Pump System 1	1	HVAC Fan 1	Air Distribution System 1	Setback	New	No	

HVAC - HEAT PUMPS

01 Name	02 System Type	03 Number of Units	04 Heating Efficiency Type	05 Heating HSPF/HSPF2/COP	06 Cap 47	07 Cap 17	08 Cooling Efficiency Type	09 SEER/EER2	10 EER/EER2 @95F	11 Zonally Controlled	12 Compressor Type	13 HERS Verification
Heat Pump System 1	Central split HP	1	HSPF	9.5	60000	50000	SEER2/EER2	16	11.7	Not Zonal	Single Speed	Heat Pump System 1 hers Heatpump

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 Heatpump	Required	950	Not Required	Not Required	Not Required	Yes	Yes	Yes

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HVAC - DISTRIBUTION SYSTEMS

01 Name	02 Type	03 Design Type	04 Duct Ins. R-value	05 Duct Location	06 Duct Surface Area	07 Bypass Duct	08 Duct Leakage	09 HERS Verification	10 Status	11 Verified Existing Condition	12 Existing Distribution system	13 New Ducts >= 25 ft
			Supply	Return	Supply	Return						
Air Distribution System 1	Unconditio ned attic	Non-Verified	R-8	R-8	400	n/a	n/a	No Bypass Duct	Sealed and Tested	Air Distribution System 1 hers-dist	New	n/a		n/a

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	5.0	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	0.25	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	0.25

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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
Dom-1(Exempt) 1/1	110	0.623773	Balanced	Yes	58 / 62	Yes	Yes	New

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 - SRE/IAQ Recovery Effectiveness - ASRE	07 IAQ Recovery Effectiveness - ASRE/IAQ Recovery Effectiveness - ASRE

SANTOSH SHAH RESIDENCE
684 MARSHALL COURT
SANTA CLARA, CA 95051

FRI Energy Consultants, LLC
5770 Winfield Blvd #15
San Jose, CA 95123
Phone: 408-866-1620

REV. 4

T24-1

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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: Nicholas Bignardi	Documentation Author Signature:
Company: FRI Energy Consultants, LLC	Signature Date: 08/20/2024
Address: 5770 WINFIELD BLVD SPC 15	CEA/ HERS Certification Identification (If applicable):
City/State/Zip: San Jose, CA 95123	Phone: (408) 866-1620

RESPONSIBLE PERSON'S DECLARATION STATEMENT	
I certify the following under penalty of perjury, under the laws of the State of California: 1. [illegible] 2. [illegible] 3. [illegible]	
Responsible Designer Name: Nicholas Bignardi	Responsible Designer Signature:
Company: FRI Energy Consultants, LLC	Date Signed: 08/20/2024
Address: 5770 WINFIELD BLVD SPC 15	License:
City/State/Zip: San Jose, CA 95123	Phone: (408) 866-1620

[illegible]

Registration Number: 424-P010180711A-000-000-0000000-0000 — Registration Date/Time: 08/20/2024 13:07 — HERS Provider: CHEERS

CA Building Energy Efficiency Standards - 2022 Residential Compliance — Report Version: 2022.0.000 — Schema Version: rev 20220901 — Report Generated: 2024-08-20 13:06:35

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.

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§ 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 to sunlight, 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. *

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§ 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)1Gii.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). *

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§ 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 mustbe 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."

Electric and Energy Storage Ready:

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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."

*Exceptions may apply.

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HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

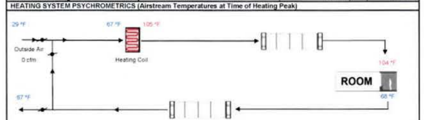
Project Name: Santosh Shah Residence — Date: 8/20/2024
System Name: HVAC System — Floor Area: 2,599

ENGINEERING CHECKS	
Number of Systems	1
Heating System	
Output per System	60,000
Total Output (Btuh)	60,000
Output (Btuh/sqft)	23.1
Cooling System	
Output per System	1
Total Output (Btuh)	1
Total Output (Tons)	0.0
Total Output (Btuh/sqft)	0.0
Total Output (sqft/Ton)	31,187,160.0
Air System	
CFM per System	0
Airflow (cfm)	0
Airflow (cfm/sqft)	0.00
Airflow (cfm/Ton)	0.0
Outside Air (%)	0.0%
Outside Air (cfm/sqft)	0.00
Note: values above given at ARI conditions	

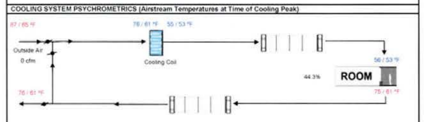
SYSTEM LOAD	COIL COOLING PEAK CFM	COIL COOLING PEAK Sensible	COIL COOLING PEAK Latent	COIL HTG. PEAK CFM	COIL HTG. PEAK Sensible
Total Room Loads	1,241	25,750	871	951	36,623
Return Vented Lighting		0			
Return Air Ducts		1,005			1,735
Return Fan		0			0
Ventilation	0	0	0	0	0
Supply Fan		0			0
Supply Air Ducts		1,005			1,735
TOTAL SYSTEM LOAD		27,759	871		40,094

HVAC EQUIPMENT SELECTION	Sensible	Latent		Sensible
Ducted Heat Pump	1	0		40,586
Total Adjusted System Output (Adjusted for Peak Design conditions)	1	0		40,586
TIME OF SYSTEM PEAK	Aug 3 PM			Jan 1 AM

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



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SANTOSH SHAH RESIDENCE
684 MARSHALL COURT
SANTA CLARA, CA 95051

REV. 3

T24-2

H. EXHAUST FANS (EXCLUDES KITCHEN EXHAUST HOOD) SWITCHED SEPARATE FROM LIGHT'G (OR UTILIZE A DEVISE WHERE LIGHTING CAN BE TURNED OFF WHILE THE FAN IS RUNNING).
I. UNDER CABINET: SEPARATE SWITCHING FOR ANY (INCLUDING KITCHEN LIGHTING) FROM OTHER LIGHTING SYSTEMS. CEC 150.0(k)2L
J. ALL OUTDOOR LIGHTING, HIGH EFFICACY, WITH MANUAL OFF SWITCH AND ONE OF THE FOLLOWING: CEC 150(k)3

1. PHOTO CONTROL AND MOTION SENSOR
2. PHOTO CONTROL AND AUTOMATIC TIME SWITCH CONTROL.
3. ASTRONOMICAL TIME SWITCH CONTROL
4. ENERGY MANAGEMENT CONTROL SYSTEMS. HIGH EFFICACY LUMINAIRES OR COMPLY WITH EXCEPTIONS: ALL KITCHEN TO BE LED HIGH EFFICACY (CEILING,UNDER CABINET. KITCHEN: LIGHT'G ARE HIGH EFFICACY LUMINARIES OR COMPLY WITH THE EXCEPTIONS AS FOLLOWS: ALL KITCHEN LIGHTING SHALL BE LED HIGH EFFICACY (CEILING & UNDER CABINETS)

1. AT LEAST 50% OF THE INSTALLED WATTAGE MUST BE HIGH EFFICACY.
2. HIGH EFFICACY LIGHTING MUST BE SWITCHED SEPARATELY FROM LOW EFFICACY LIGHTING.
3. LIGHTING IN AREAS ADJECENT TO THE KITCHEN, INCLUDING BUT NOT LIMITED TO DINING AND NOOK AREAS ARE CONSIDERED KITCHEN LIGHTING IF THEY ARE NOT SEPARATELY SWITCHED FROM KITCHEN LIGHTING.
4. **BATHROOM LIGHTING:**

ALL LIGHTING SHALL BE HIGH EFFICACY WITH AT LEAST ONE BATHROOM LIGHT TO BE CONTROLED BY A VACANCY SENSOR.

OTHER ROOMS: BEDROOMS, HALLWAYS, DINING, ETC., \ SHALL HAVE HIGH EFFICACY LUMINARIES OR COMPLY WITH EXCEPTIONS: PROVIDE DIMMER SWITCH, PROVIDE A (MANUEL–ON OCCUPANCY SENSOR THAT COMPLIES WITH CEC SEC. 110.9 (b) AND SHALL NOT HAVE A CONTROL THAT ALLOWS THE LUMINARIES TO BE TURNED ON AUTOMATICALLY OR THAT HAS AN OVERRIDE ALLOWING THE LUMINARIES TO BE ALWAYS ON). CLOSETS HAVING LESS THAN 70 SF. ARE EXEMPT FROM LIGHTING REQUIREMENTS.

OUTDOOR LIGHTING: ALL LIGHTS PERMANENTLY MOUNTED TO EXTERIOR SHALL BE HIGH EFFICACY OR COMPLY WITH A CONTROL WITH MOTION SENSOR WITH INTEGRAL PHOTO CONTROL. LIGHTING NOT ATTACHED TO BUILDINGS, & LANDSCAPE LIGHTING, ARE EXEMPT.

2022 ENERGY / TITLE 24

1. INSULATION IN ROOF/CEILING CONSTRUCTION MUST BE AT LEAST R22 (MAX. "U" VALUE OF 0.043) (150.0(a)1).
2. NEW DUCT TOTAL LEAKAGE SHALL BE 5% OR LESS (150.0 (m)11b1),
3. INSTALLED AIR-CONDITIONER AND ANY HERST PUMP SYSTEMS SHALL BE EQUIPPED WITH LIQUID LINE FILTER DRIERS AS SPECIFIED BY MANUFACTURER'S INSTRUCTIONS. (150.0(h)3B).
4. STORAGE HOT WATER HEATERS NO LONGER NEED TO BE EXTERNALLY WRAPPED (150.0(j)1).
5. ALL LUMINAIRES SHALL BE HIGH- EFFICACY (150.0(k)1A).
6. ALL INSTALLED LUMUNARIES MUST BE HIGH-EFFICACY LIGHT SOURCES AND ELIMINATES PREVIOUS KITCHEN WATTAGE CALCULATIONS.
7. HIGH EFFICACY SCREW- BASED LUMINARIES WITH LIGHT SOURCE OR LAMPS ARE ALLOWED THAT MEET JA8(COMPLIANT LIGHTING THAT MEET ELEVATED TEMPERATURE REQUIREMENTS) 150.0(k) BUT CANNOT BE USED AS RECESSED DOWNLIGHT'G IN CEILINGS.
6. ISOLATION VALVE IS REQUIRED FOR INSTANTANEOUS WATER HEATER (T.W.H.) THAT HAVE A MINIMUNM INPUT OF 6.8 KBTU/HR (110.3(c) 7). WITH EXTERIOR W.P. GFIC 120V. OUTLET WITH IN 3FT.

WHOLE HOUSE FAN (WHF): WHEN REQUIRED MUST COMPLY WITH TOTAL AIR FLOW OF AT LEAST 1.5 CFM/FT. 2 AND HAVE 1 SQUARE FT. OF ATTIC VENT FREE AREA FOR EACH 750 CFM (150.1(c)12).

HVAC AND WATER HEATING

LIQUID LINE FILTER DRYERS ARE REQUIRED FOR NEW HVAC SYSTEMS OR REPLACED CONDENSERS WHEN PROVIDED BY MFG. OF THE SYSTEM.

DUCTS AND AIR DISTRIBUTION SYSTEMS

R6 OR R8 INSULATION, IN UNCONDITIONED SPACE REQUIRED, DEPENDING ON ZONE. REFER TO TITLE 24 ENERGY REPORT

TOILET: CONTRACTOR SHALL SUPPLY TEMPORARY SANITARY FIELD TOILET FOR USE BY ALL CONSTRUCTION PERSONNEL, AND MUST PROVIDE FOR REGULAR CLEANING AND MAINTENANCE OF TOILET AT ALL TIMES DURNING THE LENGTH OF CONSTRUCTION,

JOB SITE CLEANING:

CONTRACTOR SHALL AT ALL TIMES, THROUGHOUT THE BUILDING PROCESS, MAINTAIN THE JOB SITE AREA, KEEPING IT CLEAR OF TRASH, DEBRIS, HAZARDESS DEBRIS, AND SHALL PROTECT ALL ADJACENT PROPERTY OF DAMAGE, SOILING, PAINT OVER SPRAY, ETC., AREA SHALL BE LEFT BROOM CLEAN EVERYDAY UPON INSPECTION.

CONTRACTOR:

1. SHALL PERFORM ALL LABOR AND INSTALL ALL MATERIALS IN A TIMELY MANNER FROM BEGINNING TO COMPLETING PROJECT.
2. BE RESPONSIBLE FOR ALL SUB CONTRACTOS, THEIR SCHEDULES AND WORKMANSHIP.
3. SHALL BECOME FAMILIAR WITH ALL APPROVED CONSTRUCTION PLANS, & SITE CONDITIONS BEFORE STARTING CONSTRUCTION.

11. **WATER CLOSETS :** TO BE **LOW FLUSH 1.28 GAL.** / FLUSH MAX.
12. **URNIALS: ≤ 0.5 GAL. / FLUSH MAX.**
13. **MULTIBLE SHOWER HEADS: 1.8 GPM.** COMBINED OR W/OTHER OUTLETS; CONTROLLED BY ONE VALVE (TOGETHER) CGBSC 4.303.1.3.2
14. **LAV. FAUCETS** REQUIRE MAX. **1.2 GPM** AT 60 PSI, MIN. 0.8 20 PSI PER SEC. 402.1.2 CPC AND TABLE 4.303.2 OF 2022 CGBC.
15. **KITCHEN FAUCETS:** NOT TO EXCEED **1.8 GAL.** / MIN. MEASURED AT 60 PSI, PER SEC. 402.1.2 OF 2022 CPC & TABLE 4.0303.2 OF CGBC.
16. **SHOWERS ARE NOT TO EXCEED 1.8 GPM** MEASURED AT 80 PSI. PER CGBSC SEC. 4.303.1.3.1
17. **ISLAND VENT'G**: ISLAND SINK TO COMPLY W/SEC. 909 CPC

MANDATORY MEASURE 2022 TITLE 24

1. **INSULATION REQUIRED**: (U.O.N.) SEE TITLE 24/ENERGY REPORT CEILINGS: R38, WALLS: R15, VAULT'D CEILING: R38, FLOORS: R19,
2. 3" THICK BLOWN IN AIR-TIGHT FOAM IN ALL RAFTER BAYS AT RAFTERS FRAMED INTO EACH OTHER. OVER UNHEATED SPACE R19. SLAB INSULATION FOR LIVING (REQ.'D) WHERE APPLIES.
3. **DOORS AND WINDOWS:** TO BE WEATHERSTRIPPED, CERTIFIED, LABELED, DESIGNED TO PREVENT AIR LEAKAGE. ALL NEW WINDOWS, FRENCH DOORS AND SLIDING GLASS DOORS MUST BE LABELED WITH CERTIFIED U-VALUE AND HAVE INFILTRATION CERTIFICATION. "U" VALUE 0.25 SHGC 0.28 OR 0.29 (SEE TITLE 24)
4. **DUCTS** CONSTRUCTED, INSTALLED AND SEALEDTO COMPLY WITH CMC 2016. INSULATE DUCTS TO R4.2… ASBESTOS FREE….
5. **ALL JOINTS** AND PENETRATION SHALL BE CAULKED AND SEALED, W/EXPANDING URETHANE-RECOMMANDED.
6. **EXHAUST FANS** AND FAN SYSTEMS TO HAVE BACKDRAFT OR AUTOMATIC DAMPERS.
7. **MASONRY AND FACTORY BUILT FIREPLACES** TO HAVE TITE CLOSEABLE FITTED METAL OR GLASS DOORS WITH OUTSIDE AIR. CONTINUOUS BURNING PILOT LIGHTS PROHIBITED.
8. INSULATE ALL HOT WATER PIPE R4. INSULATE 5 FT. COLD WATER PIPE AT THE WATER HEATER WITH R4, INSULATE ANY RECIRCULATING PIPES W/ R-4. SEE TITLE 24 ENERGY REPORT
9. ALL GLAZING SHALL BE DOUBLE. SEE CF-1R FOR "U" VALUES. WINDOWS ARE SHOWN ON PLAN. FRENCH AND SLIDING DOOS WITH GLASS ARE SHOWN ON PLAN.
10. HOT WATER HEATER, IF USED. INTERIOR INSULATION + EXTERIOR BLANKET TO EQUIL R-16, CERT. BY CEC, AMER. GUF 433 T, 40-75 GAL. PROVIDE WATER HEATER PRESSURE AND TEMPERATURE RELIEF VALVE WITH TERMINATION TO OUTSIDE OF STRUCTURE.
11. ALL SHOWER HEADS AND FAUCETS SHALL BE CERTIFIED BY CEC. AND TO BE DECIDED UPON.
12. GENERAL LIGHTING FOR KITCHEN AND ROOMS WITH WATER CLOSETS TO BE HIGH EFFICACY. **2022 CA. ENERGY CODE 150.0(k)**
13. RECESSED FIXTURES MUST BE LISTED AS IC (INSULATION COVERED) AND COVERED WITH INSULATION IN ATTIC.
14. ALL INSULATION SHALL BE CEC CERTIFIED & INSTALLED TO MEET FLAME SPREAD & SMOKE DENSITY REQUIREMENTS OF 2-5311.
15. **PROVIDE SAFETY GLAZ'G** IN AND WITHIN 24" HORIZONTAL OF DOORS/WINDOWS PER 2022 CRC.
16. **SHOWER DOORS** TO BE MIN. 24" WIDE, (22" MIN.AND TEMPERED), SWING OUTWARD OR SLIDE, AND BE SAFETY GLAZING MATERIAL. PROVIDE HARD NON-ABSORBENT FINISH AT SHOWERS AT LEAST 72" ABOVE DRAIN INLET (IE. MARBLE OR TILE) CRC R307 & CPC 411.6)

ROOFING AND FLASHING: CBC 2022

1. SEC. 1507.9.9 VALLEY FLASHING: SEC. 1507.2 ASPHALT SHINGLES. 28 GA.GAV., CORRISION RESISTANT FLASHING AND SHALL NOT EXTEND MORE THAN 8" FROM CENTER LINE EACH WAY., END LAP OF NOT LESS THAN 4", CONSIST OF WOVEN SHINGLES /MFG. INSTRUCTIONS.
   USE MIN 36" UNDER LAYMENT OVER ONE LAYER 15# FELT THE FULL LENGTH OF THE VALLEY
2. SEC. 1508.3 METAL SHINGLES: USE NO 28 GA. CORISSION RESISTANT METAL FLASHING, 8" FR. CENTER LINE EA. WY, WITH 36" UNDER LAYMENT WITH 15# UNDER, END LAP 4', PER MFG. INSTRUCTIONS. WITH A SPLASH DIVERTER RIB NOT LESS THAN ¾" HIGH AT THE FLOW LINE FORMED AS PART OF FLASHING.
3. 1508.3 ASBESTOS-CEMENT SHINGLES, SLATE SHINGLES, AND CLAY AND CONCRETE TILE: USE NO. 28 GA. CORR. RES. METAL FLSHING, EXTENDING 11 " EA. WAY FR. CENTER LINE WITH DIVERTER RIB NOT LESS THAN 1" HIGH AT THE FLOW LINE FORMED , END LAP 4". RUN 15# FELT AS UNDERLAYMENT…ETC….
4. 1507.8.8 OTHER FLASHING: AT JUNCTION AND VERTICAL SURFACES, FLASHING AND COUNTER FLASHING BY ROOF'G MFG. INSTRUCTIONS AND WHEN METAL SHALL BE NOT LESS THAN 26GA. GALV., CORRISION-RESISTANT METAL.

SKYLIGHTS:

1. VS VELUX NER 216 OPERABLE

VENTILATION:(SEE CALCULATIONS ON ELEVATION PAGE)

2. **UNDER FLOOR VENTING:** PROVIDE ONE S.F. OF SCREEN'D CROSS VENTILATION PER 150 S.F. OF CRAWL SPACE. (NONE FOR CONC. SLAB

LIGHTING REQUIREMENTS: -

ALL LIGHTING SHALL BE HIGH EFFICACY

2022 CA. ENERGY CODE SEC. 150(k)

WHICH INCLUDE THE FOLLOWING:

A. ALL LIGHTING AS HIGH EFFICACY (IE. PIN BASE CFL: PULSE-START MH, HPS, GU-24 SOCKETS OTHER THAN LEDS. LED LUMINAIRES WITH INTERNAL SOURCE, ETC) CEC TABLE 150.0-A.
B. SCREW-BASED PERMANETLY INSTALLED LIGHT FIXTURES MUST CONTAIN SCREW-BASED JA8 (JOIONT APPENDEX 8)COMPLIANT LAMPS. JA8 COMPLIANT LIGHT SOURCES MUST BE MARKED AS "JA8-2016" OR "JA8-2016-F" OR "JA8-2016- E" LUMINAIRES ARE APPROPRIATE FOR USE IN INCLOSED LUMINAIRES) . CEC 150.0(k)C.
C. ALL JA8 COMPIANT LIGHT SOURCES IN THE FOLLOWING LOCATIONS ARE CONTROLLED BY VACANCY SENSORS OR DIMMERS (EXCEPTION: CLOSETS LESS THAN 70 SF. AND HALLWAYS) CEC CODE 150.0(k)(2K):
   1. CEILING RECESSED DOWN LIGHT LUMINAIRES
   2. LED LUMINAIRES WITH INTEGRAL SOURCES
   3. PIN-BASED LED LAMPS IE. MR16 AR-111. ETC.)
   4. GU-24 BASED LED LIGHT SOURCES.
D. ALL BATHROOM LIGHTING TO BE HIGH EFFICACY WITH AT LEAST ONE LUMINAIRY TO BE CONTROLLED BY A VACANCY SENSOR.
E. IN GARAGE AT LEAST ONE FIXTURE CONTROLLED BY A VACANCY SENSOR. CEC 150.0(k)2J
F. AT LEAST ONE FIXTURE IN EA. LAUNDRY ROOM CONTROLLED BY A VACANCY SENSOR. CEC 150.0(k)2J
G. AT LEAST ONE FIXTURE IN UTILITY ROOM CONTROLLED BY A VACANCY SENSOR CEC 150.0(k)2J

MORE BUILDING CODES:

1.. COMMON WALLS BETWEEN LIVING SPACE AND GARAGE SHALL BE 1 HOUR AND HAVE 5/8 GWB TYPE (X) FROM SOLE PLATE THROUGH TO PLYWOOD ROOF SHEATHING. ALSO, ON CEILINGS, SUPPORTING POSTS AND, BEAMS. USE 1 HR. FIRERATED, 1 5/8" S.C. DOOR BETWEEN HOUSE AND GARAGE WITH SELF-CLOSING DEVICE.
2. **STAIRCASES:** PROVIDE 5/8" "X" GWB AT WALLS AND CEILING UNDER STAIRCASE .
3. **HANDRAILS.** SEE 2019 CRC. SHALL EXTEND FULL LENGTH OF STAIRS AND 6" PAST ENDS AT TOP AND BOTTOM…36" HIGH….
4. **BEDROOM EGRESS:** 44" SILL HEIGHT MAX., 5.7 S.F. CLEAR OPEN'G, 20" WIDE, AND 24" HIGH.
5. **FIREPLACE CHIMNEY**: MIN. HT. SHALL BE 2' ABOVE 10' DISTANCE TO ANY PORTION OF ROOF.
6. **LANDING**: PROVIDE 36" DEEP, FULL WIDTH OF EXTERIOR DOORS.

MECHANICAL:

A. **FIREPLACES & STOVES & FURNACES: UL APPROVED.** PROVIDE A CHIMNEY SPARK ARRESTOR W/ ½" X ½" WIRE MESH MAX. 18" DEEP AND WIDTH OF FIREPLACE HEARTH (8" MIN.EA. SIDE). WHERE F.P.OPENING IS LARGER THAN 6' HEARTH EXTENDS 20" MIN. IN FRONT OF F.P. & 12" EA. SIDE OF OPEN'G. WITH NON-COMBUSTIBLE MATERIAL TO BE 3/8" THICK.
B. **FURNACE AND WATER HEATER PLATFORMS** IN GARAGE SHALL BE 18" HIGH AND TO **SEC. 904.10 2019 CMC.**
C. **GAS FURNACE LOCATED IN ATTIC:** SHALL HAVE MODEL LISTED FOR ATTIC INSTALLATION, WITH MIN. 22"X 30"ATTIC ACCESS, ONE ELECTRIC OUTLET AND LIGHTING FIXTURE CONTROLLED BY A SWITCH LOCATED AT THE ATTIC ACCESS AND A 36" WIDE ¾" PLYWOOD WORKING PLATFORM.
D. **VENTILATION IN LAUNDRY: 2022 CMC. 504.4, 504.4.1, 504.2.1**
E. **DRYER:** SHALL HAVE A SMOOTH METAL EXHAUST VENT EQUIPPED WITH A BACKDRAFT DAMPER WITH NO SCREEN. DUCT WIDTH SHALL BE LIMITED TO 14 FT. WITH 2 - 90 DEGREE ELBOWS FROM/ TO POINT OF TERMINATION. REDUCE LENGTH 2 FT. FOR EACH ADDITIONAL ELBOW USED IN EXCESS OF TWO FT. **2022 CMC SEC. 504.2.2**
F. **TERMINATION OF ALL ENVIRONMENTAL AIR** DUCTS SHALL BE A MINIMUM OF 3ft. AWAY FROM ANY OPENINGS INTO BUILDING STRUCTURE (DRYERS, BATH, AND UTILITY FANS MUST BE 3 FT. AWAY FROM DOORS,WINDOWS, OPENING SKYLIGHTS OR ATTIC VENTS. 2022 CMC **SEC. 504.5**
G. **KITCHEN HOOD** HAS PER CODE A MIN. 100 CFM EXHAUST RATE, BACKDRAFT DAMPER, IF HOOD IS PART OF INTERMITTENT WHOLE HOUSE FAN VENTILATION SYSTEM PER ASHRAE 62.2, MAX. SOUND RATING OF 3-SONES IS ALLOWED AT 00 CFM PER 62.2 AND PER 2016 ENERGY CODE. BATHROOM FANS HAVE A MIN. 50 CFM EXHAUST RATE, AND FAN TO HAVE MIN. BACKDRAFT DAMPER. IF FAN IS PART OF WHOLE HOUSE VENTILATION SYSTEM PER ASHRAE 62.2, MAX. SOUND RATING 3-SONES IS ALLOWED AT 100 CFM PER ASHRAE 62.2 & 2022 ENERGY CODE. PROVIDE ENERGY COMPLIANT APPLIANCES

ELECTRICAL SERVICE: 200 AMP UP TO 4000 SF., 300 AMP. @ 4-5000 SF.)

1. **AN ARCH-FAULT CIRCUIT INTERRUPTOR (AFCI) PROTECTOR**: OUTLETS/DEVICES SHALL BE INSTALLED IN KITCHENS, FAMILY, DINING, LIVING ROOMS, PARLOR, LIBRARIES, DENS, BEDROOMS, SUNROOMS, RECREATION ROOMS, CLOSETS, HALLWAYS, OR SIMILIAR ROOMS OR AREAS PER CEC 2022 210.12 (B)
2. **ALL RECEPTICALS** TO BE **TAMPER PROOF** SHALL BE INSTALLED AS SPECIFIED IN **2022 CEC** ARTICAL 406.12 (A) THROUGH (C)
3. PROVIDE SEPARATE ELEC. CIRCUITS FOR: LAUNDRY: 20 AMP. CIRCUIT, BATHROOM: PROVIDE 20 AMP. CIRCUIT. KITCHEN: PROVIDE (2) 20 AMP. SMALL APPLIANCE CIRCUITS. FURNACE: FAU MOTOR, GARBAGE DISPOSAL AND DISH WASHER.
4. LIGHTING IN A TUB/SHOWER LOCATION SHALL BE WATERPROOF PER ARTICLE 410.10 (A & B) **CEC 2022**
5. **ALL LIGHTING** IN BATHROOMS MUST BE HIGH EFFICANCY.
6. **JETTED, SPAS & HOT TUBS** REQUIRE A GFIC OUTLET, **2022 CEC SEC. 680.71** ON SEPARATE CIRCUIT AND A READILY ACCESSABLE HATCH SHALL BE PROVIDED TO ACCESS OUTLET. SEC. 680.73, SHALL COMPLY WITH A GFCI PROTECTOR REQUIRED FOR ELEC. RECEPTACLES IN BATHROOM LIGHTING FIXTURES AND NEW OUTLETS OVER OR WITHIN 5' OF A SPA, HOT TUB SHALL BE A MIN. 7'-6" ABOVE MAX. WATER LEVEL AND PROTECTED BY GFCI. INSTALL WALL SWITCHES MIN. 5 FT. FROM INSIDE OF SPAS AND HOT TUBS.
7. **SMOKE DETECTOR/CARBON MONOXIDE AC/DC ALARMS** AT BOTTOM AND TOP OF STAIRCASE, WITH SMOKE DETECTOR IN EACH BEDROOM SEE **2022 CRC.** WITH PRIMARY POWER SOURCE BACKUP, INTERCONNECTED PER SEC. **R315 2022 CRC.**

FOR ALARM MANTENANCE AND REPLACEMENT REFER TO SECTION **R314.3.2 2022 CRC.**

8. MICROWAVE, GARBAGE DISPOSAL, DISH WASHER, TRASH COMPACTOR AND REFRIFERATOR/SUB ZERO TO BE ON A SEPARATE CIRCUIT.
9. FIRST SWITCH AT ALL ENTRANCES TO KITCHEN SHALL BE FOR UNDER CABINET HIGH EFFICACY LIGHT FIXTURES.
10. EXT. ELECTRICAL TO BE SUITABLE FOR DAMP LOCATIONS.
11. CLOSET LIGHTS SHALL COMPLY WITH ARTICLE **410.16 CEC.** OR
12. LIGHTING IN KITCHEN TO BE HIGH EFFICACY. **2022 CEC 150.0**

PLUMBING NOTES 2022 CPC

1. **CLEANOUT**, TO SERVICE KITCHEN SINK IS REQUIRED , WITHIN 2 FT. OF BUILDING FOUNDATION ON EXTERIOR OF BUILDING. SHOW ALL CLEANOUTS LOCATED MORE THAN 20FT. FROM CRAWL HOLE.
2. PROVIDE A 4 INCH SEWER LINE TO SERVICE 4 WATER CLOSETS
3. MAIN FOR WATER: SIZE BASED ON TOTAL FIXTURES USED.
4. KITCHEN ISLAND SINK: VENTING TO COMPLY WITH SEC. 909 2019 CPC
5. SANITATION REQUIRES CHECK VALVE PROTECTION THE DWELLING WASTE LINES SHALL COMPLY WITH SECTION 710.1 CPC 2022 (WASTE LINE ON 2ND. FLOOR ARE PROHIBITED FROM RUNNING THROUGH CHECK VALVE.)
6. WATER CLOSET COMPARTMENT MUST BE A MIN. 30" CLEAR WIDE, WITH 24" CLEAR TO THE FRONT.
7. SHOWERS TO HAVE NON ABSORBANT SURFACE 72" ABOVE THE DRAIN. R307 CRC 2022
8. WATER TANK HEATER SHALL BE SEISMIC ANCHORED PER 2022 CPC WITH PRESSURE TEMP & RELIEF VALVE TERMINATING TO EXTERIOR.
9. INSTALL NON REMOVEABLE BACK FLOW PREVENTERS ALL NEW HOSE BIBS PER 2022 CPC.
10. PLUMBING VENTS TO BE MIN. 10FT. FROM OPERABLE SKYLIGHTS.

GENERAL NOTES: CRC 2022

THESE NOTES ARE GENERAL IN NATURE.

THEY ARE INTENDED TO SET MINIMUM STANDARDS FOR CONSTRUCTION. WHERE CONFLICTS BETWEEN NOTES, DRAWINGS AND CODES ARISE, THE MORE STRINGENT WILL GOVERN. WRITTEN DIMENSIONS GOVERN OVER SCALING. REPORT DISCREPANCIES TO PLANMAKER/ARCHITECT OF ANY HIDDEN EXISTING CONDITIONS BEFORE WORK IS STARTED AND FINAL CONTRACT IS CONCLUDED.

ALL WORK SHALL BE OF HIGHEST QUALITY AND IN ACCORDANCE WITH **2022 CALIFORNIA RESIDENTIAL BUILDING CODES, & 2022 CBC, CEC, CMC, CPC, ENERGY CODE /TITLE 24** & **CALGREEN MANDATORY MEASURES, 2022 FIRE CODES**, AND LOCAL CODES & REGULATIONS, INCLUDING ALL SETBACK REQUIREMENTS.

THE CIVIL ENGINEER, LICENSED LAND SURVEYOR SHALL LOCATE PROPERTY LINES AND EASEMENTS AND CERTIFY SETBACKS, ETC.

CONV. CONSTR. PROVISIONS AS STATED, **2022 CRC,** HAVE BEEN APPLIED TO THE DESIGN AND STRUCTURAL CALCULATIONS. NOTIFY DESIGNER/ARCHITECT/STRUCTURAL ENGINEER FOR FINAL INSPECTION UPON COMPLETION OF PROJECT.

CONCRETE: 2022 CBC, CRC R402.2

REFER TO S0 FOR STRUCTURAL NOTES AND DETAILS.

1. MINIMUM COMPRESSIVE STRENGTH SHALL BE 2500 PSI PER CBC 404. 1.2.3 PSI @ 28 DAYS. MINIMUM CEMENT CONTENT IS 5.5 SAKS PER YARD. AND SLABS ON GRADE TO BE 5 SAKS PER YARD. MAX. SLUMP 4".
2. PROVIDE KEYED CONTROL JOINTS IN ALL INTERIOR SLABS ON GRADE @ 20' O.C. EA. WAY MAX. PROVIDE ¾" TOOLED JOINTS AT 5' O.C. , ½" PREMOLDED EXPANSION JOINTS @ 30' O.C. IN ALL EXTERIOR WALKS AND SLABS. PLACE AND CURE PER ACI.

SITE:

1. PROVIDE WOOD EARTH SEPARATION PER 2022 CBC. SOIL MUST BE 8", MIN. BELOW WOOD FRAMING. WHEN USING GALVANIZ ED FLASHING, PROVIDE AN AIR SPACE BETWEEN WOOD AND FLASHING TO ALLOW FOR AIR MOVEMENT. PROVIDE GALVANIZED TERMITE FLASHING AT ALL EXTERIOR ENTRANCE AREAS.
2. PROVIDE POSITIVE DRAINAGE **CRC R401.3,** 5% AWAY FROM PERIMETER FOUNDATION WALLS AT 10 FT.

FOUNDATION:

1. ALL FOOTINGS TO BE LEVELED & TO BEAR ON COMPACTED SUBGRADE , MIN. 18" BELOW NATURAL, OR 18" BELOW LOWEST ADJACENT GRADE (WHICH IS LOWEST). CLEAN ALL FOOTINGS BY HAND. (U.O.N.)
2. USE NATIVE FILL ONLY.
3. **WEEP SCREED** REQUIRED AT TOP OF FOUNDATION ON ALL STUCCO WALLS AT CONVENTIONAL AND SLAB CONSTRUCTION.

REFORCING STEEL:

1. ALL REFORCING STEEL TO BE A-615 GRADE 60 PER CRC 404. 1.2.3.7.1. ALL SLABS: #4 REBAR AT 18" O.C. EA. WAY. PLACE ALL REFORCING PER ACI CODES. LAP ALL CONTINUOUS BARS 40 IN. MINUMIN. DOUBLE UP BARS IN WALLS AROUND OPENINGS. PROVIDE CORNER BARS 2' X 2' TO MATCH HORIZONTAL AT ALL CORNERS. SEE S0 (STRUCTURAL NOTES)
2. PROVIDE 3" CLEARANCE FOR SURFACES POURED AGAINST EARTH AND MIN. 1.5" ELSEWHERE. SEE PLAN.

CARPENTRY:

1. MUDSILLS SHALL BE 3X PRESSURE TREATED DOUGLAS FIR STANDARD. UNLESS OTHERWISE NOTED. (U.N.O.) S.S.D.
2. FLOOR AND ROOF PLYWOOD SHALL BE DFFA GRADE MARKED, CD OR BETTER, EXTERIOR GLUE. STAND. BD. APPROVED. SEE PLAN.
3. ALL 2X4 (OR 2 X 6) FRAMING SHALL BE DF #2 GRADE. SEE STRUCTURAL DESIGN FOR ALL FRAMING.
4. MINIMUM FRAMING NAILING TO CONFORM WITH **CBC 2022 TABLE 2304.10.1** FASTENING SCHEDULE. BLOCK JOISTS AT ALL SUPPORTS. DBL. JOIST W/2 16d @ 12" O.C. & USE STRONGBACKS EQUIL TO THE SIZE OF THE CEILING JOIST. PROVIDE BLOCKING AT 8FT. O.C. FOR 2X12 RAFTERS AND 2X14 FLR. JOIST.
5. PLYWOOD (T) & (G) FLOOR SHEATHING SHALL BE ¾" AND SECURRED WITH "GRABBER" #8 POINTED SCREWS 2 ½" LG. AT 6'' O.C. (EDGES) AND 10" O.C. (FIELD). SEE STRUCTURAL DESIGN. 1/2" ROOF PLYWOOD SHEATING SHALL BE LAID WITH GRAIN OF THE OUTER PILES PERPENDICULAR TO THE FRAMING MEMBERS AND END JOIST SHALL BE STAGGERED. TYPICAL NAILING WILL BE 8d NAILS AT 6" O.C. (EDGES) & 12" O.C. (FIELD). PLYWOOD WALL SHEATHING SHALL BE NAILED WITH 8d @ 6" O.C. (EDGES) & 12" O.C. (FIELD). UNLESS NOTED OTHERWISE BY STRUCTURAL ENG. THE FIELD GLUED FLOOR SYSTEM SHALL BE INSTALLED ACCORDING TO THE RECOMMENDATIONS OF THE AMERICAN PLYWOOD SYSTEM.
6. STRUCTURAL BEAMS PER STRUCTURAL DESIGN ENGINEER. SEE STRUCTURAL DESIGN.
7. EXTERIOR WOOD SIDING INSTALLED OVER 15# FELT OR APPROVED BUILDING PAPER: 14-1 KRAFT PAPER OR UL 55 A ASPHALT SATURATED RAG FELT. STUCCO SHALL HAVE 3-COATS OVER WIRE MESH AND 2-LAYERS "D" WATERPROOF PAPER.
8. USE DOUBLE TRIMMERS & SILL FOR OPENINGS 8' OR GREATER. DOUBLE TOP PLATES LAP MINIMUM 48" (REQUIRE A MIN. OF 8-16d NAILS ON EACH SIDE OF THE SPLICE PER CRC R602.10.6). SEE STRUCTURAL DESIGN FOR ALL HEADER SIZES. INSTALL Z BAR OR GI FLASHING OVER ALL TRIM, DOORS, AND BELLYBANDS. INSTALL WP PAPER OVER FLASHING.
9. SEIMIC STRAP TOP PLATES AROUND WALLCORNERS, OR WHERE LAPPING 48" IS NOT POSSIBLE. PROVIDE MIN. 8-16d NAILS ON EA. SIDE OF SPLICE)
10. SOLID BLOCK AT THE ENDS OF ALL JOISTS AND RAFTERS OVER ALL BEARING WALLS. STRUTS TO PURLINS, HIPS AND RIDGES 45" MIN.
11. **INSTALL FIRE STOPS** PER **CRC R302.4.1.2** AT FLOOR, CEILING, FURRED SPACES AND AT 10' INTERVALS UP WALLS U.N.O.
12. **PROTECT WATER AREAS** SUBJECT TO WATER SPLASH PER CODE. PROVIDE WATERPROOF PAPER OR FELT OVER AND UNDER METAL FLASHINGS. PREVENT DRYROT.
13. **DO NOT NOTCH** OR CUT ANY STRUCTURAL MEMBER UNLESS NOTED AND APPROVED BY STRUCTURAL ENGINEER OF RECORD.
14. **BOLT HOLES** SHALL BE NOMINAL DIA. OF THE BOLT PLUS 1/16. POST/BM CONNECTIONS TO HAVE POSITIVE ATTACHMENT. SEE STRUCTURAL DESIGN.
15. USE 3 X 3 X 0.229 GI WASHERS AT ALL WOOD ANCHOR BOLT CONNECTIONS UNLESS STEEL PLATE IS SPECIFIED. S.S.D.
16. LAP TOP PLATES 48" WITH A MIN. OF 8-16d NAILS PROVIDED ON EACH SIDE OF SPLICE PER CRC R602.10.6
17. FIREPLACE HEARTH FLOOR TO BE NON-COMBUSTIBLE.

REVISIONS	BY

A REMODEL FOR 1[ST]. FLOOR & 2[ND]. STORY ADDITION FOR:

THE SANTOSH SHAH RESIDENCE

684 MARSHALL CT., SANTA CLARA CA. 95050

PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220

STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

PLAN COMMENTS TO:
LOUCOSTANZO@COMCAST.NET
408-472-9829 CELL

7-18-23
2-5-24
Lou Costanzo

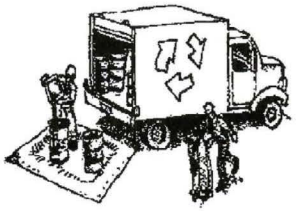
2022 CRC GENERAL NOTES

DRAWN	LOU COSTANZO
CHECKED	S.C.
DATE	7 - 18 - 23
SCALE	NONE
JOB NO	S2023-8
SHEET	GN
OF SHEETS	2022

Construction Best Management Practices (BMPs)

Construction projects are required to implement year-round stormwater BMPs.

Materials & Waste Management



Non-Hazardous Materials

- ❑ Berm and cover stockpiles of sand, dirt or other construction material with tarps when rain is forecast or when they are not in use.
- ❑ Use (but don't overuse) reclaimed water for dust control.
- ❑ Ensure dust control water doesn't leave site or discharge to storm drains.

Hazardous Materials

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

Waste Management

- ❑ Cover and maintain dumpsters. Check frequently for leaks. Place dumpsters under roofs or cover with tarps or plastic sheeting secured around the outside of the dumpster. A plastic liner is recommended to prevent leaks. Never clean out a dumpster by hosing it down on the construction site.
- ❑ Place portable toilets away from storm drains. Make sure they are in good working order. Check frequently for leaks.
- ❑ Dispose of all wastes and demolition debris properly. Recycle materials and wastes that can be recycled, including solvents, water-based paints, vehicle fluids, broken asphalt and concrete, wood, and cleared vegetation.
- ❑ Dispose of liquid residues from paints, thinners, solvents, glues, and cleaning fluids as hazardous waste.
- ❑ Keep site free of litter (e.g. lunch items, cigarette butts).
- ❑ Prevent litter from uncovered loads by covering loads that are being transported to and from site.

Construction Entrances and Perimeter

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

Equipment Management & Spill Control

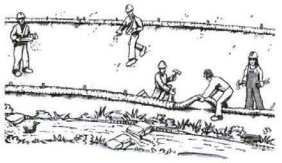
Maintenance and Parking

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

Spill Prevention and Control

- ❑ Keep spill cleanup materials (e.g., rags, absorbents and cat litter) available at the construction site at all times.
- ❑ Maintain all vehicles and heavy equipment. Inspect frequently for and repair leaks. Use drip pans to catch leaks until repairs are made.
- ❑ Clean up leaks, drips and other spills immediately and dispose of cleanup materials properly.
- ❑ Use dry cleanup methods whenever possible (absorbent materials, cat litter and/or rags).
- ❑ Sweep up spilled dry materials immediately. Never attempt to "wash them away" with water, or bury them.
- ❑ Clean up spills on dirt areas by digging up and properly disposing of contaminated soil.
- ❑ Report significant spills to the appropriate local spill response agencies immediately. If the spill poses a significant hazrd to human health and safety, property or the environment, you must report it to the State Office of Emergency Services. (800) 852-7550 (24 hours).

Earthmoving



Grading and Earthwork

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

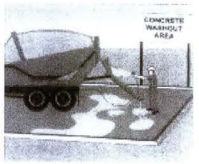
Contaminated Soils

- ❑ If any of the following conditions are observed, test for contamination and contact the Regional Water Quality Control Board:
  - Unusual soil conditions, discoloration, or odor.
  - Abandoned underground tanks.
  - Abandoned wells
  - Buried barrels, debris, or trash.
- ❑ If the above conditions are observed, document any signs of potential contamination and clearly mark them so they are not distrurbed by construction activities.

Landscaping

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

Concrete Management and Dewatering



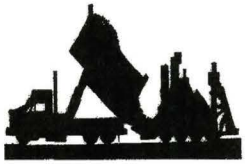
Concrete Management

- ❑ Store both dry and wet materials under cover, protected from rainfall and runoff and away from storm drains or waterways. Store materials off the ground, on pallets. Protect dry materials from wind.
- ❑ Wash down exposed aggregate concrete only when the wash water can (1) flow onto a dirt area; (2) drain onto a bermed surface from which it can be pumped and disposed of properly; or (3) block any storm drain inlets and vacuum washwater from the gutter. If possible, sweep first.
- ❑ Wash out concrete equipment/trucks offsite or in a designated washout area onsite, where the water will flow into a temporary waste pit, and make sure wash water does not leach into the underlying soil. (See CASQA Construction BMP Handbook for properly designed concrete washouts.)

Dewatering

- ❑ Discharges of groundwater or captured runoff from dewatering operations must be properly managed and disposed. When possible, send dewatering discharge to landscaped area or sanitary sewer. If discharging to the sanitary sewer, call your local wastewater treatment plant.
- ❑ Divert run-on water from offsite away from all disturbed areas.
- ❑ When dewatering, notify and obtain approval from the local municipality before discharging water to a street gutter or storm drain. Filtration or diversion through a basin, tank, or sediment trap may be required.
- ❑ In areas of known or suspected contamination, call your local agency to determine whether the ground water must be tested. Pumped groundwater may need to be collected and hauled off-site for treatment and proper disposal.

Paving/Asphalt Work



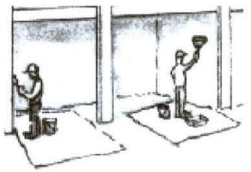
Paving

- ❑ Avoid paving and seal coating in wet weather or when rain is forecast, to prevent materials that have not cured from contacting stormwater runoff.
- ❑ Cover storm drain inlets and manholes when applying seal coat, slurry seal, fog seal, or similar materials.
- ❑ Collect and recycle or properly dispose of excess abrasive gravel or sand. Do NOT sweep or wash it into gutters.

Sawcutting & Asphalt/Concrete Removal

- ❑ Protect storm drain inlets during saw cutting.
- ❑ If saw cut slurry enters a catch basin, clean it up immediately.
- ❑ Shovel or vacuum saw cut slurry deposits and remove from the site. When making saw cuts, use as little water as possible. Sweep up, and properly dispose of all residues.

Painting & Paint Removal



Painting Cleanup and Removal

- ❑ Never clean brushes or rinse paint containers into a street, gutter, storm drain, or stream.
- ❑ For water-based paints, paint out brushes to the extent possible, and rinse into a drain that goes to the sanitary sewer. Never pour paint down a storm drain.
- ❑ For oil-based paints, paint out brushes to the extent possible and clean with thinner or solvent in a proper container. Filter and reuse thinners and solvents. Dispose of excess liquids as hazardous waste.
- ❑ Sweep up or collect paint chips and dust from non-hazardous dry stripping and sand blasting into plastic drop cloths and dispose of as trash.
- ❑ Chemical paint stripping residue and chips and dust from marine paints or paints containing lead, mercury, or tributyltin must be disposed of as hazardous waste. Lead based paint removal requires a state-certified contractor.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

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

Defrost System

Homeshield™ Defrosting System
No negative pressure is created by air exhausted to the outdoors since the air is recirculated into the house, helping to prevent any backdraft.

Discretion (Factory setting)	Outdoor Temperature*					
	-5°C to -15°C / 23°F to 5°F		-15°C to -27°C / 5°F to -17°F		-27°C and less / -17°F and less	
CFM	Air recovered (in minutes)	Defrost (in minutes)	Air recovered (in minutes)	Defrost (in minutes)	Air recovered (in minutes)	Defrost (in minutes)
0 to 59	32	7	25	7	20	10
60 to 90	50	7	35	7	25	10
91 and more	22	7	18	7	16	10

*Outdoor temperature is read by a thermistor located inside the unit, next to fresh air from outdoor port.

Plus	Outdoor Temperature*					
	-5°C to -15°C / 23°F to 5°F		-15°C to -27°C / 5°F to -17°F		-27°C and less / -17°F and less	
CFM	Air recovered (in minutes)	Defrost (in minutes)	Air recovered (in minutes)	Defrost (in minutes)	Air recovered (in minutes)	Defrost (in minutes)
0 to 59	28	7	20	7	18	10
60 to 90	45	7	28	7	20	10
91 and more	18	7	14	7	12	10

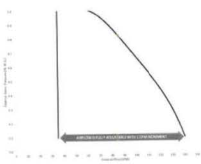
*Outdoor temperature is read by a thermistor located inside the unit, next to fresh air from outdoor port.

Fan Curves with Virtuo

Thanks to Virtuo Air Technology™, no need to balance the unit manually. Both PMSM motors are controlled by an artificial intelligence performing 120 readings per minute then processing this information to maintain the requested airflow.

For typical installation, Virtuo will ensure a balanced ventilation at every selected speed regardless of the weather conditions, the type of connection, the variable speed furnace/AHU, the stack effect, the filter clogging and so on. This results in peace of mind for installers and users knowing that the unit will always remain balanced and that it will maintain its maximum heat/energy recovery efficiency.

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
25	0.1	64	136	66	140	66	140
50	0.2	62	131	64	136	64	136
75	0.3	59	125	61	129	61	129
100	0.4	56	119	58	123	58	123
125	0.5	53	112	55	117	55	117
150	0.6	49	104	50	106	50	106
175	0.7	45	95	46	97	46	97
200	0.8	40	85	41	87	41	87
225	0.9	36	76	37	78	37	78
250	1.0	28	59	29	61	29	61



Energy Performance

Supply Temperature		Net Airflow		Power Consumed Watts	Sensible Recovery Efficiency	Adjusted Sensible Recovery Efficiency	Apparent Sensible Effectiveness*
°C	°F	L/s	CFM				
Heating							
0	32	30	64	33	68	71	72
0	32	43	90	47	63	66	68
0	32	52	110	69	58	62	64
-25	-13	30	64	33	60	62	72

*Data not certified by HVI.

Requirements and Standards

- UL 1812 compliant (safety)
- Could be installed in compliance with CSA F326
- Performance tested as per CSA C439 Standard
- Compliant with Prop 65

Project:	Remarks
Location:	
Part no.:	
Qty.:	
Submitted by: Date:	

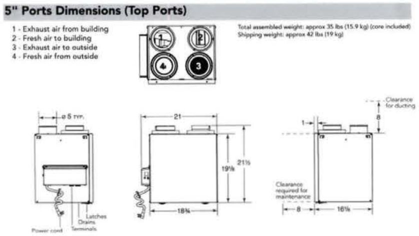
BROAN HVI

Broan-NuTone LLC, 926 West State Street, Hartford, WI 53027 1-800-558-1711
www.broan-nutone.com
B130d210719F

5" Ports Dimensions (Top Ports)

1 - Exhaust air from building
2 - Fresh air to building
3 - Exhaust air to outside
4 - Fresh air from outside

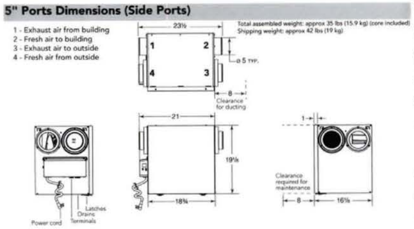
Total assembled weight: approx 35 lbs (15.9 kg) (core included)
Shipping weight: approx 42 lbs (19 kg)



5" Ports Dimensions (Side Ports)

1 - Exhaust air from building
2 - Fresh air to building
3 - Exhaust air to outside
4 - Fresh air from outside

Total assembled weight: approx 35 lbs (15.9 kg) (core included)
Shipping weight: approx 42 lbs (19 kg)



Dimensions shown in inches

REV. 4

BROAN

Fresh Air Systems - 130 CFM

HRV
Top ports: B130H65RT
Side ports: B130H65RS
35 to 131 CFM @ 0.2 in. w.g.
35 to 119 CFM @ 0.4 in. w.g.

TITLE 24 · HRAI · UL · 5 Parts/Motor · HRV Core · Made in Canada · HVI Certified

Visit www.broan-nutone.com for complete warranty text.

Introducing the industry's most advanced residential fresh air system, created to offer a universal platform specifically designed and improved to make contractors life easier and more profitable while delivering constant superior air quality.

- Thanks to the Virtuo Air Technology™, the airflow calibration and auto-balancing are achieved quickly and maintained throughout the life of the product
- Select the desired CFM (from 35 to 130 CFM) using the very first integrated LCD screen. The airflow is then set up automatically
- Integrated electronic airflow measurement device with real time LCD
- Integrated diagnostic tool
- Equipped with PMSM ECM motors for a very low power consumption
- Suspended installation (chains included)
  OR
- Wall-mount installation (universal brackets included)
  - installation with 2 brackets
  - installation with 4 brackets

Unit Description

- SRE of 68% at 32°F and 60% at -13°F (64 CFM)
- Ports size: 5"
- Recirculation mode
- Recirculation defrost
- Painted door, corrosion resistant galvanized body
- One-piece molded insulation shell, no air leakage (expanded polystyrene; UL 94 HF-1 certified)
- Virtuo constant airflow and auto-balancing device (patent pending)
- Motorized dampers (no additional backdraft dampers required)
- Integrated "snap-in" drain system installed in seconds with no additional parts (drain hose included)
- 6' power cord
- Unit electrical characteristics: 120 volts, 60 Hz, 2.5 A, 110 W
- Sound: 70.0 dBA at 115 CFM @ 0.4 in. w.g.
  60.1 dBA at 64 CFM @ 0.2 in. w.g.

Controls

AUTOMATIC · SPEED SELECTOR · ADVANCED TOUCHSCREEN · 20-40-60 DELUXE

There are 4 optional main controls and 2 optional auxiliary controls available. Refer to Wall Control specification sheet for more information.

Core

- Polypropylene crossflow core, impact resistant
  Dimensions: 12" × 12" × 9" (30.5 cm × 30.5 cm × 23 cm)

Filters

- MERV 8 grade washable standard filter (included)
- Optional MERV13 grade filter part no. V24285

Options

- Complete line of registers and diffusers
- Compatible with the Tandem transition (part no. VTYIK1) (for units producing up to 110 CFM only)

Product specifications subject to change without notice.

City of Santa Clara — The Center of What's Possible

Building Division: 408-615-2440
Email: Building@santaclaraca.gov
Permit Center: 408-615-2420
Email: PermitCenter@santaclaraca.gov
Automated Inspection Scheduling System: 408-615-2400

2022 CALIFORNIA GREEN BUILDING STANDARD CODE (CGC) RESIDENTIAL CHECKLIST

New residential buildings shall be designed to include the green building mandatory measures specified in this checklist. This checklist shall also 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 the specific area of the addition or alteration.

BUILDING PERMIT NO.: BLD2
ADDRESS: **684 MARSHALL CT., SANTA CLARA CA. 95050**

MANDATORY MEASURES SPECIFIED (Please check boxes below)

Feature or Measure	Yes
SITE DEVELOPMENT (CGC 4.106)	
Storm water drainage and retention during construction. A plan shall be developed and shall be implemented to manage storm water drainage during construction per CGC 4.106.2.	■
Grading and paving. Construction plans shall indicate how site grading or a drainage system will manage all surface water flows to keep water from entering buildings per CGC 4.106.3.	■
Electric vehicle (EV) charging for new one- and two- family dwellings and town-houses with attached private garages and/or parking spaces not assigned to a dwelling unit, and ADU/JADU without additional parking but with electrical panel upgrades or new panels. Provide capability for electric vehicle charging with minimum required Level 1 EV Ready, Level 2 EV Ready, Low Power Level 2 EV Ready as specified in CGC 4.106.4.1 as amended by City of Santa Clara Reach Code Ordinance No.2056 (CSC 2023 Reach Code) section 15.38.040. *Identification*: The raceway termination location shall be permanently and visibly marked as "Level 2 EV-READY" per CGC 4.106.4.1.1 as amended by CSC 2023 Reach Code section 15.38.040.	■
Electric vehicle (EV) charging for new multifamily dwellings, affordable housing, hotels, motels, and new residential parking facilities. Provide electric vehicle infrastructure and capability for electric vehicle charging with minimum required Level 2 EV Charger, Level 1 EV Ready, Level 2 EV Ready, Low Power Level 2 EV Ready, EV Capable as specified in CSC 2023 Reach Code section 15.38.040 and *2022 California Green Code* section 4.106.4.2, whichever is more stringent.	☐
110v Electrical Outlet at Bicycle Parking: All multifamily residential developments shall include secured bicycle parking with 110v electrical outlets per CSC 2023 Reach Code section 15.38.040.	☐
Location: EVCS shall be located adjacent to an accessible parking space, and/or on an accessible route, per CGC 4.106.4.2.2.1.1.	☐
Dimension: Each EV ready space or EVCS shall be minimum 18 ft long and 9 ft wide. One in every 25 charging spaces, but not less than one, shall have an 8 ft wide access aisle. A 5 ft wide minimum aisle shall be permitted provided the minimum width of the EV space is 12 feet. Surface slope for this EV space and the aisle shall not exceed 2.083% slope in any direction, per CGC 4.106.4.2.2.1.2.	☐
Accessibility: EV Ready and EVCS spaces shall comply with the accessibility provision for EV Charging stations in *California Building Code* Chapter 11A (section 1109A) and Chapter 11B, per CGC 4.106.4.2.2.1.3.	☐
EV Ready Space Signage: EV ready spaces shall be identified by signage or pavement markings, in compliance with Caltrans Traffic Operations Policy Directive 13-01 (Zero Emission Vehicle Signs and Pavement Marking) or its successor(s), per CGC 4.106.4.2.5.	☐
Automatic load management system (ALMS) may be installed to increase the number of EV chargers or the amperage or voltage beyond the minimum requirements in this code. The option does not allow for installing less electrical panel capacity than would be required without ALMS, per CGC 4.106.4.2.2 as amended by CSC 2023 Reach Code section 15.38.040.	☐
Electric vehicle (EV) charging for additions or alterations of parking facilities serving existing multifamily buildings. When new parking facilities are added, or electrical systems or lighting of existing parking facilities are added or altered and the work requires a building permit, minimum 10% of total added/altered parking spaces shall be electrical vehicle charging spaces capable of supporting future Level 2 electric vehicle supply equipment (EVSE) per CGC 4.106.4.3.	☐
ENERGY EFFICIENCY (CGC 4.201)	
California Energy Code. The building's construction shall meet or exceed the requirements of the 2022 *California Building Energy Efficiency Standards* per CGC 4.201.1.	■
WATER EFFICIENCY AND CONSERVATION	
INDOOR WATER USE (CGC 4.303)	
Water conserving plumbing fixtures and fittings. Plumbing fixtures (water closets and urinals) and fittings (faucets, showerheads, pre-rinse spray valves) shall comply with the prescriptive requirements of Section 4.303.1.1 through 4.303.1.4.5.	■
Water closets: The effective flush volume of all water closets shall not exceed 1.28 gallons per flush (CGC 4.303.1.1).	■
Urinals: The effective flush volume of wall-mounted urinals shall not exceed 0.125 gallons per flush, and all other urinals shall not exceed 0.5 gallons per flush (CGC 4.303.1.2).	■
Showerheads. The flow rate for single showerhead and multiple showerheads serving one shower shall not exceed 1.8 gallons per minute at 80 psi and shall be certified to the performance criteria of the U.S. EPA WaterSense Specification (CGC 4.303.1.3).	■
Residential lavatory faucets. The flow rate shall not be more than 1.2 gallons per minute at 60 psi, and not less than 0.8 gallons per minute at 20 psi (CGC 4.303.1.4.1).	■
Lavatory faucets in common and public use areas. The flow rate shall not exceed 0.5 gallons per minute at 60 psi (CGC 4.303.1.4.2).	☐
Metering Faucets. The flow rate shall not deliver more than 0.2 gallons per cycle (CGC 4.303.1.4.3).	■
Kitchen Faucets. The flow rate shall not exceed 1.8 gallons per minute at 60 psi (CGC 4.303.1.4.4).	■
Pre-rinse Spray Valves. When installed, shall meet the requirements of Title 20 of the *California Code of Regulations*, and shall be equipped with an integral automatic shutoff (CGC 4.303.1.4.5).	☐
Submeters for multifamily buildings and dwelling units in mixed-use residential/commercial buildings. Submeters shall be installed to measure water usage of individual rental dwelling units in accordance with the *California Plumbing Code* per CBC 4.303.2.	☐
Standards for plumbing fixtures and fittings. Plumbing fixtures and fittings shall meet the applicable standards referenced in Table 1701.1 of the *California Plumbing Code* per CGC 4.303.3.	■
OUTDOOR WATER USE (CGC 4.304)	
Outdoor potable water use in landscape areas. Residential developments shall comply with the City's Water Service and Use Rules and Regulations, Item No. 24, as adopted by Santa Clara City Code Section 13.15.180, or the California Model Water Efficient Landscape Ordinance (MWELO), whichever is more stringent, per CGC 4.304.1.	■
ENHANCED DURABILITY AND REDUCED MAINTENANCE (CGC 4.406)	
Rodent proofing. Annular spaces around pipes, electric cables, conduits or other openings in sole/bottom plates at exterior walls shall be rodent proofed by closing such openings with cement mortar, concrete masonry, or similar method acceptable to the City per CGC 4.406.1.	■
CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING (CGC 4.408)	
Construction waste management. Recycle and/or salvage for reuse a minimum of 65% of nonhazardous construction and demolition waste in accordance with Section 4.408.2, 4.408.3, or 4.408.4, or meet a more stringent local construction and demolition waste management ordinance (CGC 4.408.1).	■
BUILDING MAINTENANCE AND OPERATION (CGC 4.410)	
An operation and maintenance manual shall be provided to the building occupant or owner per CGC 4.410.1.	☐
Recycling by occupants. Where 5 or more multifamily dwelling units are constructed on a building site, provide readily accessible areas that serve all buildings on the site and are identified for depositing, storage and collection of nonhazardous materials for recycling per CGC 4.410.2.	☐
ENVIRONMENTAL QUALITY (CGC 4.503)	
Gas fireplace. Any installed gas fireplaces shall be a direct-vent sealed-combustion type per CGC 4.503.1.	☐
Woodstoves. 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 per CGC 4.503.1. Woodstoves and pellet stoves shall also comply with Santa Clara City Code Chapter 15.65.	☐
POLLUTANT CONTROL (CGC 4.504)	
Covering of duct openings and 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, sheetmetal, or other methods acceptable to the City to reduce the amount of water, dust or debris, which may enter the system per CGC 4.504.1.	■
Adhesives, sealants and caulks shall meet the VOC or other toxic compound limits per CGC 4.504.2.1.	■
Paints, stains and other coatings shall comply with VOC limits per CGC 4.504.2.2.	■
Aerosol paints and coatings shall meet the product-weighted MIR limits for ROC and other requirements per CGC 4.504.2.3.	■
Verification. Documentation shall be provided, at the request of the Building Division, to verify that compliant VOC-limit finish materials have been used per CGC 4.504.2.4.	■
Carpet systems. All carpet installed in the building interior shall meet the testing and product requirements of CGC 4.504.3.	☐
Resilient flooring systems. Where resilient flooring is installed, at least 80% of the floor area receiving resilient flooring shall comply with the requirements of CGC 4.504.4.	■
Composite wood products. Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the building shall comply with low formaldehyde emissions standards and requirements per CGC 4.504.5.	■
INTERIOR MOISTURE CONTROL (CGC 4.505)	
Concrete slab foundations. Vapor retarder and capillary break shall be installed if a slab-on-grade foundation system is used. The use of a 4" thick base of ½" or larger clean aggregate under a 10-mil vapor retarder with joints lapped not less than 6" shall be provided per CGC 4.505.2, CRC R506.2.2, CRC R506.2.3 and CBC Section 1805.	☐
Moisture content of building material. Building materials with visible signs of water damage shall not be installed. Wall and floor framing shall not be enclosed when the framing members exceed 19% moisture content. Moisture content shall be checked prior to finish material being applied per CGC 4.505.3.	■
INDOOR AIR QUALITY AND EXHAUST (CGC 4.506)	
Bathroom exhaust fans. Each bathroom shall be mechanically ventilated using ENERGY STAR compliant fans ducted to the exterior and equipped with humidity controls system per CGC 4.506.1.	■
ENVIRONMENTAL COMFORT (CGC 4.507)	
Heating and air-conditioning system shall be sized, designed and have their equipment selected using the following methods per CGC 4.507.2: 1. Heat Loss/Heat Gain values in accordance with ANSI/ACCA 2 Manual J-2016, ASHRAE handbook or equivalent. 2. Duct systems are sized according to ANSI/ACCA 1 Manual D-2016, ASHRAE handbook or equivalent. 3. Select heating and cooling equipment in accordance with ANSI/ACCA 3 Manual S-2014 or equivalent.	■
INSTALLER AND SPECIAL INSPECTOR QUALIFICATION (CGC 702)	
Installer training. HVAC system installers shall be trained and certified in the proper installation of HVAC systems including ducts and equipment by a recognized training or certification program per CGC 702.1.	■
Special inspection. Special inspectors employed by the City must be qualified and able to demonstrate competence in the discipline they are inspecting per CGC 702.2.	■
VERIFICATION (CGC 703)	
Documentation. Upon request, verification of compliance with this code may include construction documents, plans, specifications, builder or installer certification, inspection reports, or other methods acceptable to the building department which will show substantial conformance per CGC 703.1.	■

Responsible Designer's Declaration Statement	Contractor Declaration Statement
I hereby certify that this project has been designed to meet the requirements of the 2022 California Green Building Standards Code.	I hereby certify, as the builder or installer under the permit listed herein, that this project will be constructed to meet the requirements of the California Green Building Standards Code.
Name: **LOU COSTANZO**	Name:
Signature: Lou Costanzo	Signature:
Date: **7 - 18 - 23**	Date:
Company: **LOU COSTANZO DESIGN & ASSOC.**	License:
Address: **1501 SAN GABRIEL WAY,**	Address:
City: **SAN JOSE CA. 95125** State: Zip:	City: State: Zip:

REVISIONS	BY
REV. 4 8-12-24	L.C.

PLAN COMMENTS TO: LOUCOSTANZO@COMCAST.NET 408-472-3829 CELL

7-18-23
12-18-24
Lou Costanzo

A REMODEL FOR 1ST FLOOR & 2ND STORY ADDITION FOR:
THE SANTOSH SHAH RESIDENCE
684 MARSHALL CT., SANTA CLARA CA. 95050
PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220
STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

CITY OF SANTA CLARA CALGREEN MANDATORY MEASURES/CHECKLIST 2022-23

DRAWN: LOU COSTANZO
CHECKED: S.C.
DATE: 7 - 18 - 23
SCALE: NONE
JOB NO.: S2023-8
SHEET: **CMMC**
OF SHEETS

[CRC 314.4&6, 315.5&6]

LIGHTING;

Electrical – Lighting:

- All installed lighting shall be high efficacy. [CNC 150.0(k)1A]
- Under-cabinet lighting must be switched separately from other lighting. [CNC 150.0(k)2G]

KITCHENS

Electrical – Lighting:

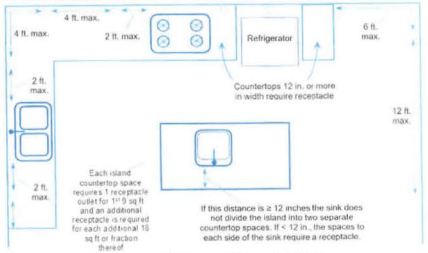
- All installed lighting shall be high efficacy. [CNC 150.0(k)1A]
- must be switched separately from other lighting. [CNC 150.0(k)2G]

Electrical – Branch Circuits:

- A minimum of two 20-amp small appliance branch circuits are required to serve countertop andwall receptacles in the kitchen, pantry and dining room [CEC 210.11(C)(1)]. No built-in appliances are allowed on these circuits (except an electric clock or the ignition of a gas range)
- Individual (dedicated) circuits are required for garbage disposals, microwaves, compactors, anddishwashers [CEC210.19(A)(1)(b)].
- AFCI (arc-fault circuit-interrupter) protection is required for all 120V 15-& 20-amp branch circuits supplying kitchen outlets or devices. [CEC 210.12(A)]

Electrical – Receptacles:

- Receptacles shall be installed at each countertop space ≥ 12 in. in width. Receptacles shall be installed so that no point along the wall line is more than 24 inches horizontally from an outlet in that space [CEC 210.52(C)(1)]. The maximum spacing between receptacles, measured on the wall-countertop line, is 48 inches.



- All receptacles serving kitchen countertop surfaces shall have GFCI protection [210.8A6]
- Countertop receptacles shall not be installed in a face up position [CEC 406.5(E)]. Listed "pop-up" receptacles are allowed [CEC 210.52(C)(5)]. Receptacles or strip outlets can be installed on the underside of the cabinet above the countertop if within 20 inches of the countertop
- Dishwashers require GFCI protection, including 240-volt dishwashers. [CEC 210.8(A)7), 422.5(A)7)]
- All GFCI device controls must be in readily accessible locations. Or-bets behind a dishwasher are not readily accessible. GFCI protection can be provided by using a GFCI circuit breaker
- All general purpose and countertop receptacles must be tamper resistant. [CEC 406.12(A)]
- All 125-volt through 250-volt receptacles installed in kitchen countertops and within 6 ft of sink shall have ground-fault circuit-interrupter protection for personnel. [CEC210.8(A)]
- At least one receptacle required within 2 ft of the outer end of peninsula. A peninsula countertop shall be measured from the connected perpendicular wall. [CEC 210.52 (C)(2)(b)]
- Receptacles shall not be installed in a face-up position in the area below a sink [CEC 406.5(G)(2)]
- Corner sinks separate the space on each side when the distance between the corner and the sink is < 18 inches. If ≥ 18 in., the 2 ft. / 4 ft. rule continues behind the sink [CEC 210.52(C)(1)].

- On islands and peninsulas only, receptacles are allowed on the side of the cabinet, not more than 12 inches below the countertop and with no overhanging countertop greater than 6 inches [CEC 210.52(C)(5)exc.]
- An island or peninsula is considered divided into separate countertop spaces when a sink or range is installed and does not have 12-inches of space behind it. See the diagram on page 2
- Bar-type counters are considered wall space. Wallspaces ≥ 2 ft. require receptacles so that no portionof the wall is more than 4 ft. from a receptacle outlet, measured at the floorwall line.[CEC 210.52(A)(1) &(2)]
- A range hood / microwave combination can be cord-and-plug connected if the circuit is an individual (dedicated) branch circuit. The receptacle outlet shall be a single type, not a duplexreceptacle that would accept two plugs [CEC 422.16(B)(4)].

Kitchen Plumbing:

- Dishwashers shall be connected with an approved drainage air gap devices located above theflood level rim of the sink [CPC 807.3]
- Newly installed kitchen faucets shall not exceed 1.8 gallons per minute [GRN 4.303.1.4.4]. All Existing plumbing fixtures not included in the scope of new work shall be replaced if necessary to comply with SB407 Plumbing Fixtures Replacement requirements – See Water ConservationCertification Form.
- A gas test is required on all piping modifications of at least 10 PSI for 15 minutes. A maximum 15 PSI gauge is required for the gas test. [CPC 1213.3]
- Gas lines that run under a slab shall run through an approved, vented, gas tight conduit. [CPC 1210.1.6]
- An accessible shutoff valve shall be installed outside each appliance and ahead of the union connected thereto and in addition to any valve on the appliance. [CPC 1212.6]
- Appliance gas flexible connectors shall be ist and of minimum length but not to exceed 6 feet. [CPC 1212.3]
- All hot water pipes require insulation to be at least the thickness of the pipe diameter [CPC 609.12, 609.12.2]

Kitchen Mechanical:

- A mechanical permit is required to replace a kitchen exhaust hood that includes an outside air vent. The vent must terminate on the building exterior at least 3 ft. from other openings into the building [CMC 502.2.1]
- A mechanical exhaust directly to the outdoors shall be provided in each kitchen. Range hoods exhaust rate shall be at least 100 CFM. Mechanical exhaust fans including downdraft appliances shall have exhaust rate at least 300 CFM. [CMC 405.4, 405.4.1]
- A ducted residential exhaust hood is required and shall be constructed of metal with a smooth interior surface. Flexible (corrugated) ducting is not allowed for exhaust hoods. Provide back draft protection. [CMC 504.1.1, 504.3]
- Minimum 30" vertical clearance above cooktop surface to combustibles or metal cabinets. [CMC 922.3]

BATHROOMS

Bath Electrical:

- All installed lighting shall be high efficacy. [CNC 150.0(k)1A]
- At least one light shall be controlled by a vacancy sensor (a manual-on, automatic-off occupancy sensor). [CNC 150.0(k)2AJ]
- Exhaust fans must be switched separate from lighting, with the exception that lighting integral to an exhaust fan can be on the same switch if the fan is controlled by a humidistat that continues its operation after the light is off.
- All receptacle outlets in bathrooms shall be GFCI protected [CEC 210.8(A)(1)].
- All receptacle outlets in bathrooms shall be tamper resistant [CEC 406.12(A)].
- When a bathtub or shower stall is in an area not technically considered a bathroom (by the definitions in the electrical code), receptacles within 6 ft. of the tub/shower stall must be GFCI- protected. [CEC210.8(A)(9)].
- A receptacle outlet is required within 3 feet of each wash basin location. It may be on the wall, or an adjacent partition, or on the face or side of the cabinet not more than 12 inches below the top of the basin [CEC 210.52(D)].
- Receptacles cannot be face-up in a vanity surface. listed pop-up receptacles are allowed [CEC 406.5(E) & 210.52(D)]
- A minimum of one 120-volt, 20-amp circuit is required for the receptacle outlet(s) within 3 ft of the outside edge of the sink basin in the bathroom(s). This circuit can share multiple bathroom receptacles within 3 ft of edge of sink basin or countertops and similar work surfaces but can have no other outlets, including lights [CEC 210.11(C)(3), 210.52(D)]. However, if a 20-amp circuit serves only one
- Bathroom, lights and fans can be on the same circuit with the receptacles in that bathroom [CEC 210.11(C)(3) exception]
- Hydro-massage tubs require an individual (dedicated) branch circuit and readily accessible GFCI protection [CEC 680.71]. An access door is required and must be large enough to remove the motor and pump. Cord-connected equipment must have the receptacle facing the opening and be no more than one foot behind the access hatch [CEC 680.73].

- Recessed light fixtures in shower enclosures must be listed for a damp or wet location [CEC 410.10(A)]
- Pendant light fixtures, track lights, and paddle fans shall not be installed lower than 8 feet above the flood-level rim of a tub, including the area 3 feet past the edge of the tub [CEC 410.10(D)].
- Electrical panels shall not be installed in bathrooms [CEC 240.24(E)].
- All 125-volt through 250-volt receptacles installed in bathrooms, within 6 ft of bathtub or shower enclosure, within 6 ft of any sink, and indoor damp locations shall have ground-fault circuit-interrupter protection for personnel [CEC210.8(A)]
- Switches and receptacles are not allowed in bathtub or shower spaces. Receptacles shall not be installed

Bathroom Plumbing, General:

- All hot water pipes require insulation thickness to be at least equal to the pipe diameter [CPC 609.12, 609.12.2]
- Newly installed plumbing fixtures shall be water-conserving in compliance with the California Plumbing Code and Green Building Standards.
  - Water closets shall not exceed 1.28 gallons perflush [CPC 411.2, CGBSC 4.303.1.1]
  - Showerheads shall not exceed 1.8 GPM at 80 psi [CPC 408.2.1, CGBSC 4.303.1.3]
  - Lavatory faucets shall not exceed 1.2 GPM at 60 PSI. [CPC 407.2.2]
  - All Existing plumbing fixtures not included in the scope of new work shall be replaced if necessary to comply with SB407 Plumbing Fixtures Replacement requirements – See Water Conservation Certification Form.

Bathroom Plumbing, Shower:

- Shower stalls require a minimum of 1024 sq. inches and a 30" circle must fit from the back of the finished shower wall to middle of the dam. Shower doors must swing out and must be at least 22" wide. [CPC 408.5, 408.6] The curb may encroach on these size requirements. All surfaces shall be waterproof up to 72 inches above the drain inlet [CRC R307.2]
- Safety glass (tempered or laminated) is required for all glass shower doors and partitions and for windows in walls facing the tub or shower and located less than 60 inches above the standing surface of the tub/shower and within 60 inches horizontally [CRC R308.4 (1)&(5)]
- Showers require a minimum 2 inch drain and trap [CPC Table 702.1].

Bathroom Plumbing, Toilets & Bidets:

- Toilets and bidets require a minimum 15 inches of clearance from the center line of the bowl to each side, and 24 inches of clearance from the front edge of the bowl [CPC 402.5].
- Lavatory sinks require a minimum of 24 inches front clearance [CPC 402.5]
- The maximum water temperature to a shower or tub/shower combination is 120°F. The water heater thermostat cannot be used as the control for this temperature. Valves shall provide scald and thermal shock protection, and be pressure-balanced, thermostatic, or combination pressure-balancedthermostatic mixing in accordance with ASSE 1016 or ASME A112.18.1/CSA B125.1. [CPC 408.3.2]

Mechanical:

- Mechanical ventilation is required in all bathrooms with tubs or showers. Operable window is not an accepted way of providing bathroom exhaust for humidity control. [CMC 405.3, CGBSC 4.506.1, CRC 303.3.1] The fan must move aminimum 50 CFM of air and be separately switched from the lighting. Fans that operate continuously can be 20 CFM. [CMC 405.3, 405.3.1] The duct must terminate on the exterior not less than 3 feet from openings into the building, 3 ft from a property line or 10 ft from a forced air inlet. [CMC 502.2.1]
- Bathrooms with no tub or shower (half baths) do not require mechanical ventilation if they are provided with a window at least 3 sq. ft. half of which is openable.[CRC R303.3].

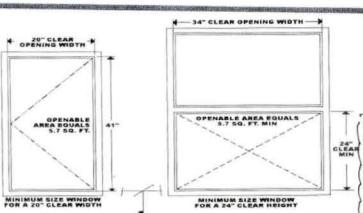
Tile & Backing:

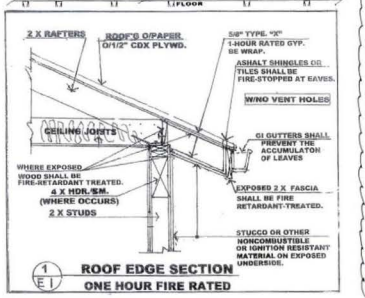
- Water-resistant gypsum board (purple board) can be used as a tile backer board in areas that are not subject to direct exposure to water or high humidity [CRC R702.3.7.1]. Examples would be a wall behind a toilet or above a vanity countertop. Purple board cannot be used in a shower for direct application of tile. It can be used in showers behind a water-resistive membrane with mortar bed and lath. Other acceptable materials for application of tile in showers include cement board, fiber-cement or glass mat gypsum backers [CRC R702.4.2]
- Bathtub and shower floors and walls above bathtubs with installed shower heads and in shower compartments shall be finished with a nonabsorbent surface. Such wall surfaces shall extend to a height of not less than 6 feet above the floor. [CRC R307.2]
- See CPC 408.7 for information on lining for shower and receptors

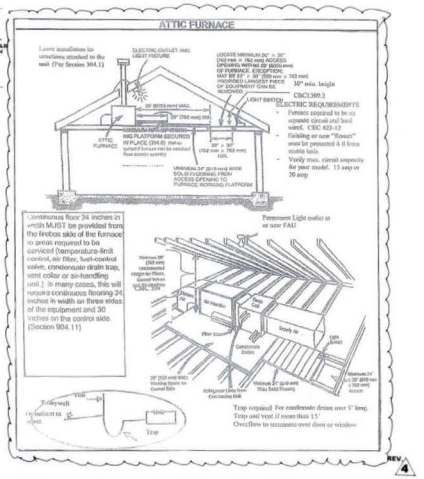
Laundry Rooms

Electrical:

- All new or altered lighting shall be high efficacy. [CNC 150.0(k)1A]
- At least one light shall be controlled by a vacancy sensor (a manual-on, automatic-off occupancy sensor) [CNC 150.0(k)2AJ
- All 125-volt through 250-volt receptacles in laundry areas require GFCI protection, including but not limited to the clothes washer and dryer receptacle. [CEC 210.8(A)(10)]
- All non-locking type 125-volt, 15- and 20-ampere receptacle outlets shall be listed tamper-resistant, except those within dedicated space for an appliance not easily moved from one place to another (behind clothes washer). [CEC 406.12(A)]
- A separate 20-amp circuit is required for the laundry equipment. The lights and other receptacles in the room cannot be on that circuit [CEC 210(C)(2)].
- All circuits supplying outlets or devices in the laundry area (including laundry areas in garages)must be AFCI protected [CEC210.12(A)]





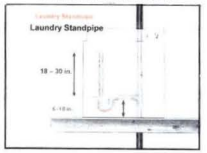


Plumbing:

- Clothes washer standpipes must be 2-inch diameter. The weir of the trap must be roughed in 6 – 18 inches above the floor, the standpipe must be a minimum of 18 and a maximum of 30 inches above the trap [CPC 804.1].

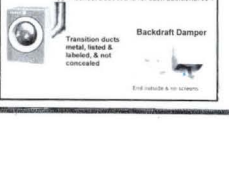
Mechanical:

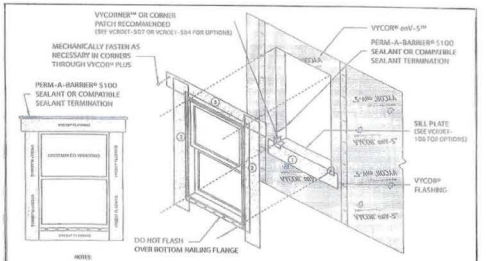
- Clothes dryers in closets require a minimum of 100 sq. in. of opening for makeup air,which can be supplied by louvers or undercutting the door [CMC 504.4.1]
- Dryer ducts must be smooth-walled rigid metal at least 4-inch diameter and not more than 14 feet in length. Two 90□ bends are allowed within the 14 ft. and for 90□bend in excess of two deduct 2 ft from allowed 14 ft length for each additional bend [CMC 504.4.2.1]
- Ducts may not pass through plenums or be shared with other systems or vents. They cannot be connected with screws that penetratethe duct interior. [CMC 504.4]
- Dryer ducts must terminate on the building exterior in a backdraft damper. Screens or louvers cannotbe installed [CMC 504.4]
- Flexible transition ducts (connectors) between the dryer and the metal ductare allowed in lengths up to 6 feet and cannot be concealed within construction [CMC 504.4.2.2 exception]. They must be UL listed and labeled (L&L) as dryer transition ducts, and cannot be plastic.

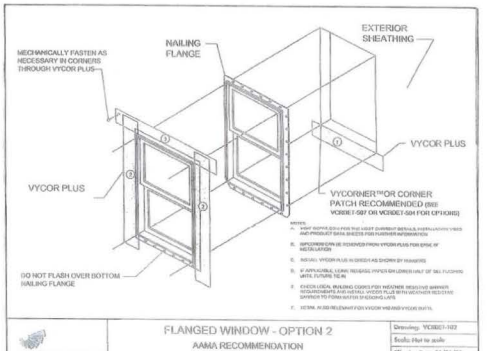


Dryer Exhaust Ducts

The Consumer Product Safety Commission (CPSC) estimates that up to 16,000 home fires a year originate at clothes dryers. Common causes of these fires are lint buildup from improperly installed or maintained exhaust ducts. Ducts must be rigid metal. Screws should not penetrate the duct as they accumulate lint which leads to blockage. Join ducts with the male end in the direction of air flow.







REVISIONS	BY

PLAN COMMENTS TO: LOUCOSTANZO@COM CAST.NET (408) 829 CELL

7-18-23

A REMODEL FOR 1ST, FLOOR & 2ND, STORY ADDITION FOR:

THE SANTOSH SHAH RESIDENCE

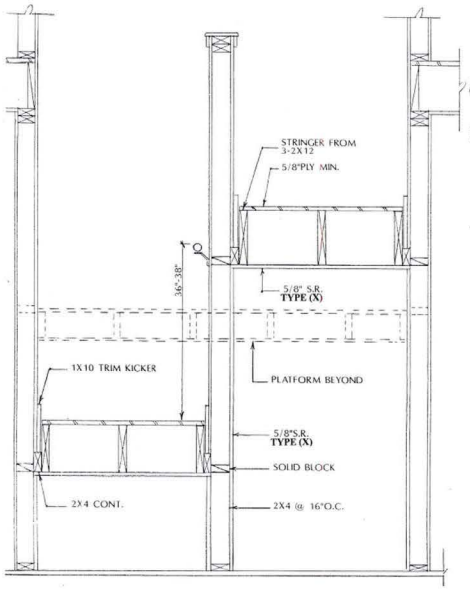
684 MARSHALL CT., SANTA CLARA CA. 95050

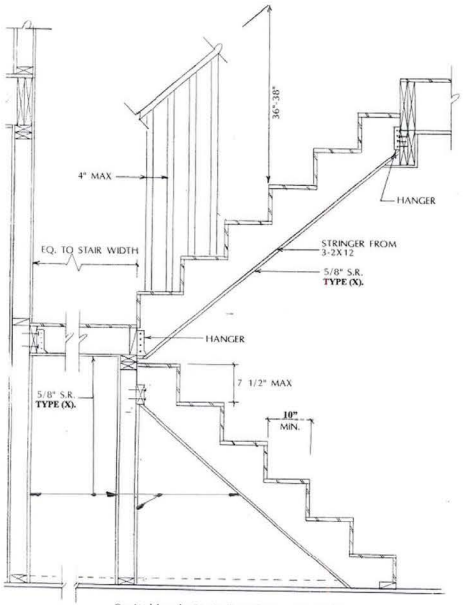
PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220

STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

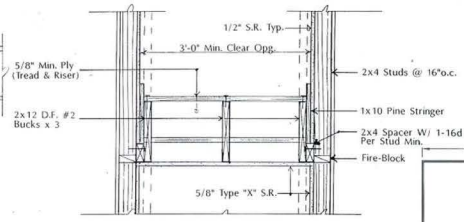
NOTES

DRAWN: LOU COSTANZO
CHECKED: S.C.
DATE: 7 - 18 - 23
SCALE: NONE
JOB NO.: S2023-8
SHEET: E1
OF SHEETS

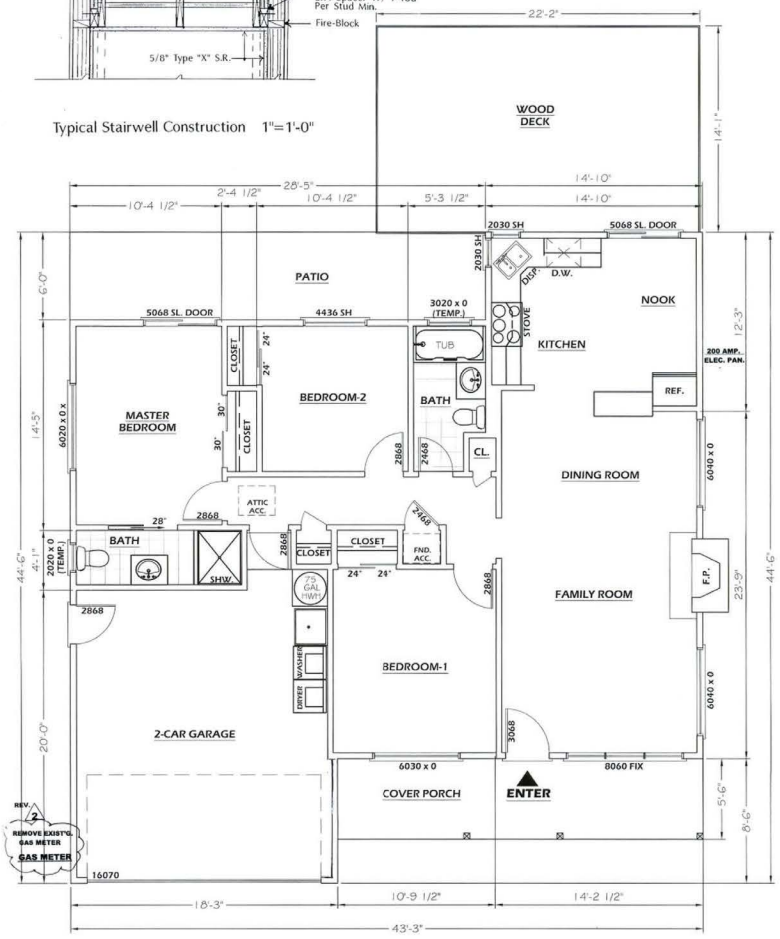




Switchback Stair Framing 1"=1'-0"

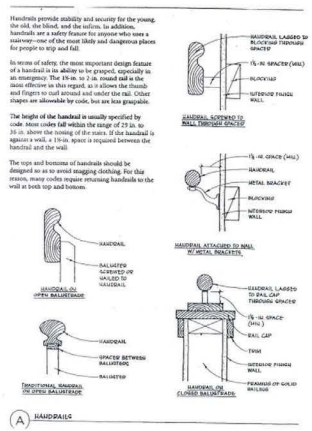


Typical Stairwell Construction 1"=1'-0"



EXISTING FIRST FLOOR PLAN

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



Handrails provide stability and security for the young, the old, the blind, and the infirm. In addition, handrails are a safety feature for anyone who uses a stairway—one of the most likely and dangerous places for people to trip and fall.

In terms of safety, the most important design feature of a handrail is its ability to be grasped, especially in an emergency. The 1¾-in. to 2-in. round rail is the most effective in this regard, as it allows the thumb and fingers to curl around and under the rail. Other shapes are allowable by code, but are less graspable.

The height of the handrail is usually specified by code. Most codes fall within the range of 29 in. to 38 in. above the nosing of the stairs. If the handrail is against a wall, a 1½-in. space is required between the handrail and the wall.

The tops and bottoms of handrails should be designed so as to avoid snagging clothing. For this reason, many codes require returning handrails to the wall at both top and bottom.

A HANDRAILS

"ASHRAE 62.2 COMPLIANCE"

2022 CALIFORNIA ENERGY EFFICENCY NEW/REBUILD RESIDENTIAL STRUCTURES, AND THOSE WITH ADDITIONS OF 1000 S.F. OR LARGER COMPLYING WITH ASHRAE 62.2 VENTILATION & ACCEPTABLE INDOOR AIR QUALITY IN LOW RISE RESIDENTIAL BUILDINGS.

A. WHOLE HOUSE VENTILATION:

1. CONTINUOSLY OPERATING FAN(S) SEE LOCATION ON A4
2140.93 SF. WITH 4 BEDROOMS
S.F./100 + (7.5 X NO. OF BEDRMS + 1) = CFM
2141.00 SF./100= 21.41 + 37.5 (7.5 X 5 = 37.5)
21.41 + 37.5 = 58.91 CFM OR 60 CFM
RESULTS: INSTALL (1) 60 CFM CONTINUOUS FAN IN STAIR WELL CEILING. SEE SHEET A4

B. LOCAL EXHAUST:

1. KITCHEN EXHAUST FAN WITH 5 AIR CHANGES PER HOUR, IN HOOD OVER STOVE, DUCTED TO EXTERIOR.
2. LAUNDRY/UTILITY EXHAUST: NOT REQUIRED, CLOTHES DRYER TO EXHAUST TO EXTERIOR.
3. BATHROOM EXHAUST: ALL FANS MUST BE 20 CFM MINIMUM, ONLESS OTHERWISE NOTED ON PLAN.

C. MISCELLANEOUS:

1. MAKE UP AIR: GRAVITY APPLIANCES:
WATER HEATER: DIRECT VENT
FORCED AIR FURNACES: DIRECT VENT
2. GAS FIREPLACE INSERTS WITH DIRECT VENTS N/A
2. CLOTHES DRYERS VENTED TO EXTERIOR
REV. 1 3. FILTRATION: FORCED HVAC SYSTEM REQUIRES: MERV 13 FILTER, SIZED FOR A MAX PRESSURE DROP OF 0.1 WATER COUMN.
4. SOUND RATING:
a. CONTINUOUS OPERAT'G FANS: MUST HAVE SONE RATING OF 1.0 OR LESS.
b. 400 CFM FANS: SONE RATING OF 3.0 OR LESS.
NOTE: SONE RATINGS DO NOT APPLY TO IN-LINE FANS WITH MORE THAN 4 FT. OF DUCT TO THE INTAKE GRILL.
THE ABOVE INFORMATION IS ONLY FOR THE APPROVAL OF THIS PLAN FOR 1'ST. & 2ND. STORY (E) + (N) ADDITIONS.
THE MECHANICAL DESIGN ASPECTS WILL BE REVIEWED IN THE FIELD FOR THIS PROJECT.
PROJECT: THE SANTOSH SHAH RESIDENCE
684 MARSHALL CT., SANTA CLARA CA., 95051
RE: ASHRAE 62.2 COMPLIANCE. DATED 7-18-2023

Revision	By

PLAN COMMENTS TO: LOU@COSTANZO.COM
CAST MET
408-472-9929 CELL
7-18-23
Lou Costanzo

A REMODEL FOR 1ST, FLOOR & 2ND. STORY ADDITION FOR:
THE SANTOSH SHAH RESIDENCE
684 MARSHALL CT., SANTA CLARA CA. 95050
PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220
STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

EXISTING FIRST FLOOR PLAN

DRAWN: LOU COSTANZO
CHECKED: S.C.
DATE: 7 - 18 - 23
SCALE: 1/4" = 1'-0"
JOB NO.: S2023-8
SHEET: **A2**
OF SHEETS

City of Santa Clara
The Center of What's Possible

Building Division: 408-615-2440
Email: Building@santaclaraca.gov
Permit Center: 408-615-2420
Email: PermitCenter@santaclaraca.gov
Automated Inspection Scheduling System: 408-615-2400

NEW CONSTRUCTION DETERMINATION FOR ALL-ELECTRIC PROVISIONS OF THE 2023 REACH CODES

When an addition to and/or alteration of a project exceeds certain thresholds, the City identifies the project as "**New Construction**" for the purposes of All-Electric Building provisions as defined by the City's 2023 Reach Codes. This worksheet is designed to assist and clarify the term; "**New Construction**" as it relates to the additions and/or alterations of existing buildings and structures.

NEW CONSTRUCTION *: For the purposes of All-Electric Building requirements, "newly constructed buildings" shall include the buildings defined in Section 100.1 (2022 California Energy Code) as well as newly constructed additions and improvements in existing buildings where more than 50 percent of the exterior walls are removed or 50 percent of the wall plate height is raised. The Chief Building Official shall make the final determination regarding the application of this section.

* As defined by City Ordinance 2056 – City of Santa Clara 2023 Reach Codes

Notes:

- ***Exterior walls*** are bearing or non-bearing walls that are used to enclose a building and have weather exposed surfaces.
- ***Removed walls*** are walls above the foundation that are permanently removed, torn out and rebuilt in the same location, or become interior walls as result of an addition or alteration.
- ***Raising the plate height of the exterior walls:***
  - A second story addition, including offset walls, is considered the raising of a plate height. The total linear feet of the second story addition exterior wall shall be used towards the calculations below.

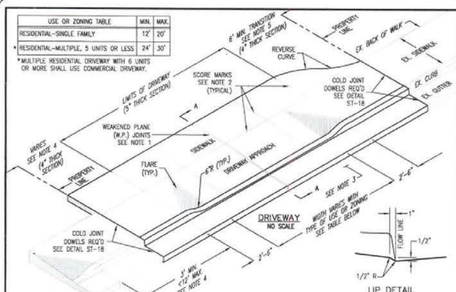
CALCULATIONS OF REMOVED EXTERIOR WALL AND RAISING THE PLATE HEIGHT OF THE EXTERIOR WALL:		
Total linear feet of existing exterior walls to be removed above the foundation:	175.00 LF.	(A)
Total linear feet of new exterior walls of the second story addition:	134.00 LF.	(B)
(C) = The greater of (A) or (B)	175.00 LF.	(C)
Total linear feet of the existing exterior walls above the foundation:	175.00 LF.	(D)
DETERMINE IF YOUR PROJECT IS A NEWLY CONSTRUCTED ADDITIONS AND/OR ALTERATION:		
Calculate (E)% = (C) / (D) 175.00 LF. -/- 175.00 LF. = 100% **Note: The project is a "Newly Constructed Building" if ratio (E) is greater than 50%**	100% %	(E)

REV. 1

REV. 1

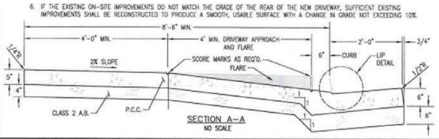
USE OR ZONING TABLE	MIN.	MAX.
RESIDENTIAL-SINGLE FAMILY	12'	20'
* RESIDENTIAL-MULTIPLE, 5 UNITS OR LESS	24'	30'

* MULTIPLE RESIDENTIAL DRIVEWAY WITH 6 UNITS OR MORE SHALL USE COMMERCIAL DRIVEWAY.



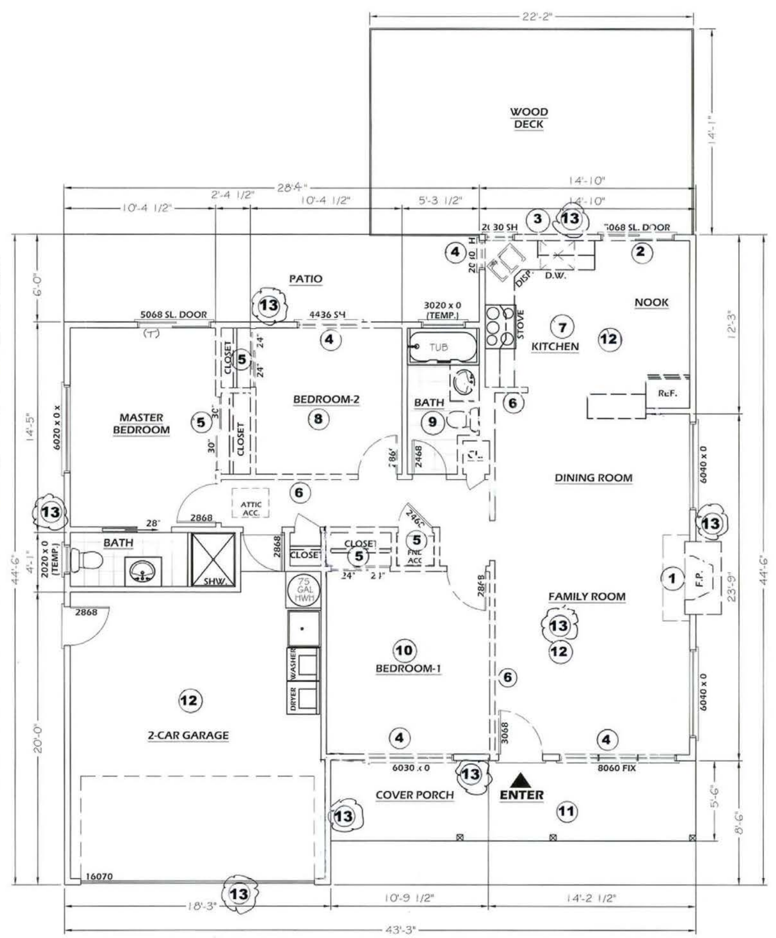
NOTES:

1. W.P. JOINTS REQUIRED ON CENTERLINE FOR DRIVEWAYS 12' TO 20' WIDE. DRIVEWAYS 24' TO 30' WIDE SHALL HAVE 2 W.P. JOINTS EVENLY SPACED (AT 1/3 AND 2/3 POINTS).
2. PLACE SCORE MARKS AT 1/4 POINTS ON DRIVEWAYS 12' TO 20' WIDE AND AT 1/6 POINTS ON DRIVEWAYS 24' TO 30' WIDE. SCORE MARK REQUIRED AT DRIVEWAY SLOPE BREAK PARALLEL TO EXISTING FACE OF CURB.
3. 18" WIDE BAND OF PAVEMENT SHALL BE REMOVED AND REPLACED. SEE NOTE 5 OF GENERAL NOTES (APPENDIX) FOR REQUIREMENTS.
4. WHERE THE DISTANCE BETWEEN NEW DRIVEWAY LIMIT AND PROPERTY LINE IS LESS THAN 6 FEET AT THE BACK OF DRIVEWAY AND THERE IS AN ADJACENT DRIVEWAY LESS THAN 12 FEET DISTANCE AWAY, THE SIDEWALK SHALL NOT TRANSITION. NEW SIDEWALK SHALL TERMINATE AT PROPERTY LINE OR ADJACENT DRIVEWAY TO MAINTAIN ADA PATHWAY.
5. WHERE THE DISTANCE BETWEEN NEW DRIVEWAY LIMIT AND PROPERTY LINE IS EQUAL TO OR GREATER THAN 6 FEET AT THE BACK OF DRIVEWAY AND THERE IS NO ADJACENT DRIVEWAY WITHIN 12 FEET DISTANCE OF NEW DRIVEWAY, THE SIDEWALK SHALL TRANSITION FROM BACK OF DRIVEWAY TO EXISTING SIDEWALK.
6. IF THE EXISTING ON-SITE IMPROVEMENTS DO NOT MATCH THE GRADE OF THE REAR OF THE NEW DRIVEWAY, SUFFICIENT EXISTING IMPROVEMENTS SHALL BE RECONSTRUCTED TO PRODUCE A SMOOTH, USABLE SURFACE WITH A CHANGE IN GRADE NOT EXCEEDING 10%.



SECTION A–A
NO SCALE

DRAWN BY:	K. TRAN	RESIDENTIAL DRIVEWAY WITH ATTACHED SIDEWALK	ST-4
CHECKED BY:	V. LUCHESSI		
APPROVED BY:	F. AMIN		
DATE:	SEPTEMBER 2020	CITY OF SANTA CLARA	PAGE: 4



DEMO FLOOR PLAN

SCALE ~ ¼" = 1' – 0"

DEMO/CONSTRUCTION NOTES:

THE SANTOSH SHAH RESIDENCE

1. **DEMO (E) MASONRY FIREPLACE W/STACK**
2. **REMOVE PATIO SL. DOOR.**
3. **REMOVE 2030 DH WIN. & OPEN WALL FOR (N) WIN.**
4. **REMOVE WINDOW**
5. **DEMO (E) CLOSET/WALLS**
6. **REMOVE WALL**
7. **REMOVE (E) KITCHEN**
8. **REMOVE BEDROOM 2**
9. **REMOVE BATHROOM WITH TUB/SH.,W.C. & SINK.**
10. **REMOVE BEDROOM 1**
11. **DEMO PORCH STRUCTURE.**
12. **DEMO ROOF/CEILING STRUCTURE**
13. **REMOVE INT. GYP. BD., ELECTRICAL & EXT. STUCCO FOR ENTIRE HOUSE.** (REV. 2)

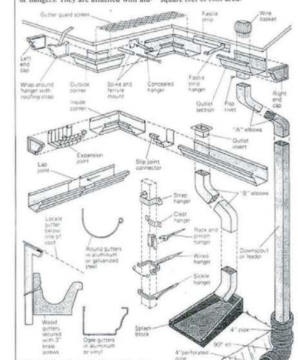
Gutters and downspouts

Gutters collect the water runoff from a roof and direct it into downspouts or leaders, which bring it to the ground. Most gutters and downspouts are now made of aluminum or vinyl.

The pieces of the gutter system, shown below, are purchased and laid out on the ground beneath the wall where they will be installed. They assemble by sliding together, creating a 1½- to 2-inch overlap, which should always step down toward the downspouts. Gutter-sealant mastic and pop rivets, and sometimes slip joint connectors, are used to connect the sections. A chalk line is snapped on the wall to guide installation. Though many gutters are installed level, it is best to slope them 1/16 inch per foot to aid drainage.

The gutter is held in place by brackets or hangers. They are attached with aluminum nails or screws to the fascia or to the rafter ends every 32 inches (the spacing of the rafters). New free-floating systems allow gutters held by brackets to slide as they expand and contract with changes in temperature. The gutter should be attached beneath the line of the roof, so that ice sliding off can clear the gutter. Basket strainers are placed over the outlets to prevent leaves and debris from clogging the downspouts, or the entire length of the gutter can be covered with a screen.

Downspouts are assembled and then attached to the gutter. They should lie flush against the wall, to which they are strapped. The downspouts must be large enough to accommodate the runoff of the roof. In general, 1 square inch of downspout suffices for each 100 square feet of roof area.



Exploded views show methods by which gutters and downspouts are typically installed. Note the different types of connectors for expansion, lap, and slip joints, and the variety of special hangers.

Revision	By
REV. 2 2 – 8 - 24	LC

A REMODEL FOR 1ST. FLOOR & 2ND. STORY ADDITION FOR:

THE SANTOSH SHAH RESIDENCE

684 MARSHALL CT., SANTA CLARA CA. 95050

PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220

STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

PLAN COMMENTS TO:
LOUCOSTANZO@COMCAST.NET
408-472-9829 CELL

7-18-23
2-8-24
Lou Costanzo

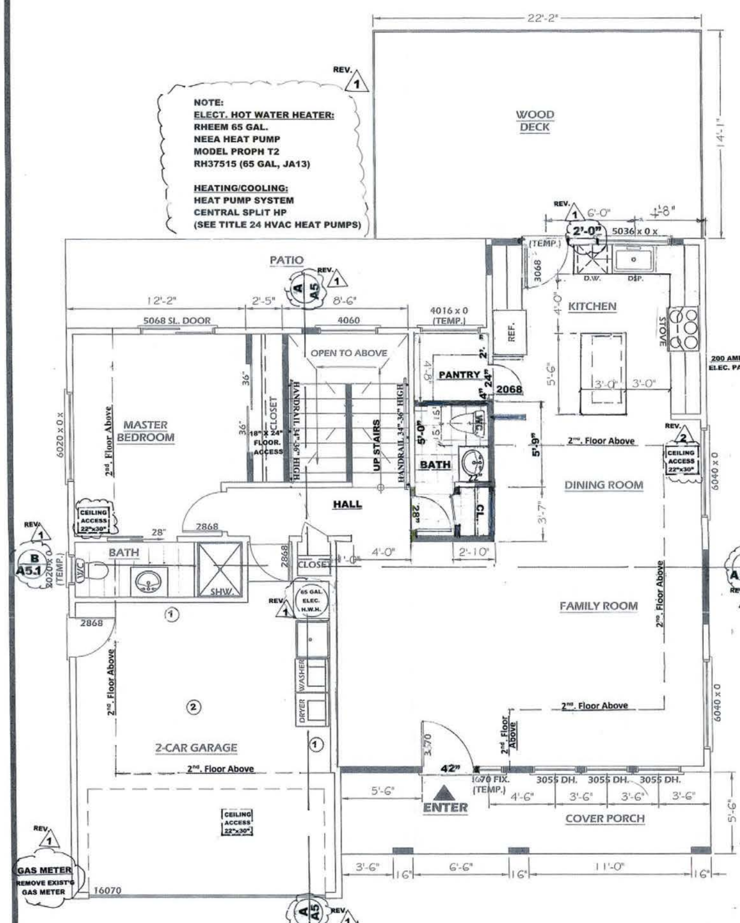
DEMOLITION PLAN

DRAWN	LOU COSTANZO
CHECKED	S.C.
DATE	7 - 18 - 23
SCALE	1/4" = 1'-0"
JOB NO.	S2023-8
SHEET	A2.1

OF SHEETS

NOTE:
ELECT. HOT WATER HEATER:
RHEEM 65 GAL.
NEEA HEAT PUMP
MODEL PROPH T2
RH37515 (65 GAL, JA13)

HEATING/COOLING:
HEAT PUMP SYSTEM
CENTRAL SPLIT HP
(SEE TITLE 24 HVAC HEAT PUMPS)



WALL LEGEND

(new wall symbol)	NEW 2x4 DF STUD WALL @ 16" O.C.
(existing wall symbol)	EXISTING 2x STUD WALL

(1.) **OPENINGS BETWEEN GARAGE AND RESIDENCE LIVING** SHALL BE EQUIPPED WITH SOLID DOOR NOT LESS THAN 1- 3/8" THICKNESS, SOLID OR HONEYCOMB STEEL DOORS NOT LESS THAN 1-3/8" OR 20 MIN. FIRE- RATED DOORS SHALL BE SELF-CLOSING AND SELF LATCHING. CRC SEC. 302.5.1

(2.) **PROVIDE 5/8" TYPE (X) GYPSUM BOARD** ON GARAGE WALLS COMMON WITH LIVING FROM MUDSILL THROUGH TO ROOF PLYWOOD, OR CEILING AND 2-LAYERS OF ½" TYPE (X) GYP.BD. WHERE CEILING IS COVERED BY 2ND. FLOOR LIVING.

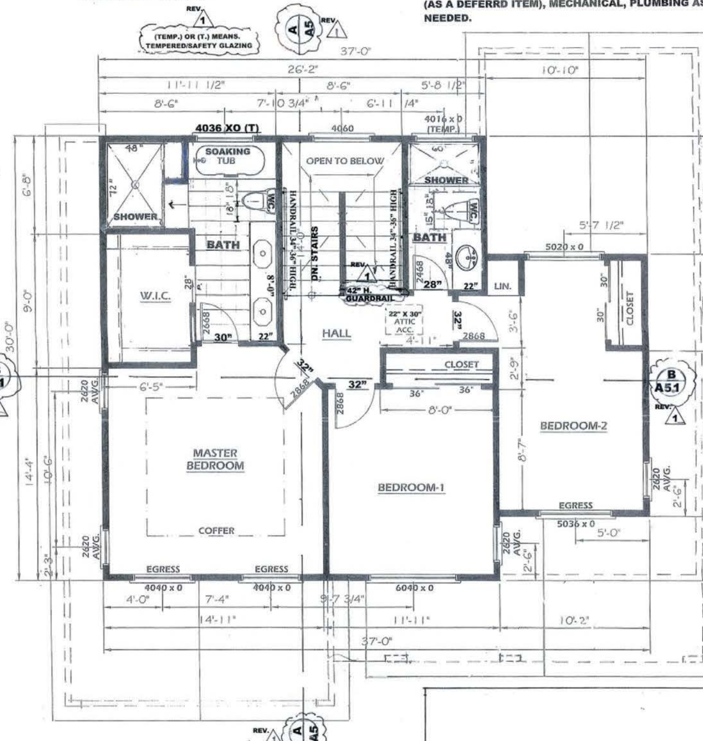
EXISTING / PROPOSED FIRST FLOOR PLAN

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

R303.1 BATHROOM EXHAUST FANS
EACH BATHROOM CONTAINING A BATHTUB, SHOWER OR TUB/SHOWER COMBINATIONSHALL BE MECHANICALLY VENTILATED FOR PURPOSES OF HUMIDITY CONTROL IN ACCORDANCE WITH THE CMC CHAPTOR 4. MINIMUM 50 CFM AND HUMIDITY CONTROLLED.
CPC 402 .5 SETTING WATER CLOSET
WATER CLOSET AND BIDETS. SHALL HAVE 15" FROM CENTER TO SIDE WALLS AND THE CLEAR SPACE IN FRONT NOT LESS THAN 24 INCHES.
CPC408.5 SHOWER DOORS
SHOWER DOORS SHALL OPEN SO AS TO MAINTAIN NOT LESS THAN 22 INCHES UNOBSTRUCTED OPENING FOR EGRESS .
CPC 408.6 SHOWER COMPARTMENT
SHOWER PAN DIMENSIONS SHALL HAVE A MINIMUM 1024 S.I. AND ALSO CAPABLE OF ENCOMPASSING A 30 INCH CIRCLE.
CPC 408.9 LOCATION OF VALVES AND HEADS
CONTROL VALVES AND SHOWER HEADS SHALL BE LOCATED SO THAT THE HEAD DOES NOT DISCHARGE DIRECTLY AT THE ENTRANCE TO THE COMPARTMENT.
KITCHEN EXHAUST; 100 CFM

CONSTRUCTION NOTES:
THE SELECTED CONTRACTOR SHALL:
1. REMOVE ALL ROOF/CEILING STRUCTURES
2. REMOVE EXTERIOR STUCCO FOR NEW
3. REMOVE ALL EXISTING INSULATION FOR NEW.
4. RIM EXISTING WALLS WITH 4X12 BM. S.S.D. TO RAISE 1ST. FLOOR PLATE HEIGHT/CEILING TO 9'-0".
5. CONSTRUCT NEW COVERED PORCH/ROOF.
6. BUILD SWITCHBACK STAIRS; OPEN TO ABOVE.
7. BUILD 2ND. FLOOR ADDITION W/8'-0" PLATE HT. WITH 14" OPEN WEB. FLOOR JOISTS AND MFG. ROOF TRUSS/CEILING STRUCTURE.
8. REPLACE WINDOWS, ETC. & DOORS.
9. FOLLOW TITLE 24/ENERGY REPORT FOR FURN/AC, INSULLATION, ENERGY CODE RECOMMENDATIONS, AND LOCATE AC FAN AT REAR OF HOUSE.
10. ELECTRICAL, 200 AMP. E.P., 100 AMP. S.P., 60 AMP. OUTLET INSTALLED FOR ROOF SOLAR SYSTEM (AS A DEFERRD ITEM), MECHANICAL, PLUMBING AS NEEDED.

REV. 1
(TEMP.) OR (T.) MEANS. TEMPERED/SAFETY GLAZING



NOTE: FOR EGRESS WINDOWS AT BEDROOMS:
WINDOW MUST HAVE:
1. A MINIMUM NET CLEAR OPENING OF 5.7 SQ. FT. (GRADE-FLOOR OPENINGS SHALL BE MIN. 5 SQ. FT.)
2. MINIMUM NET CLEAR OPENING HEIGHT OF 24 INCHES.
3. MINIMUM NET CLEAR OPENING WIDTH OF 20 INCHES.
4. BOTTOM CLEAR OPENING: NOT MORE THAN 44 INCHES ABOVE THE FLOOR AND OPENS DIRECTLY TO STREET, PUBLIC ALLEY, YARD OR COURT THAT OPENS TO A PUBLIC WAY.

REV. 1
GUARDRAIL AT HALL STAIRS:
MIN. GUARDRAIL HEIGHT MUST BE 42" ABOVE FINISHED FLOOR (R312.1.2).
GUARDS' OPENING SPACING MUST BE INDICATED NOT TO ALLOW PASSAGE OF A 4" SPEAR (R312.1.3).
REFERENCE NOTE "L" ON SHEET A5.

PROPOSED SECOND FLOOR PLAN

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

FOR GAS PIPE SIZING AND ELECTRICAL LOAD CALCULATIONS
DESIGN BUILT APPROACH!. THE GENERAL CONTRACTOR AND LICENCED PLUMBING, ELECTRICAL & MECHANICAL SUBCONTRACTORS SHALL SUBMIT THEIR OWN CALCULATIONS/ONE LINE DIAGRAMS WHEN PULLING PERMITS.

1. **SMOKE ALARMS: CRC 314:** INSTALL IN EACH SLEEPING ROOM; OUTSIDE EACH SEPARATE BEDROOM IN THE IMMEDIATE VACINITY OF THE BEDROOMS; & ON EACH ADDITONAL STORY OF THE DWELLING INCLUDUNG BASEMENTS AND HABITUAL ATTICS.
2. **CARBON MONOXIDE ALARMS CRC 315:** INSTALL CO ALARMS OUTSIDE OF EACH SEPARATE DWELLING UNIT SLEEPING AREA IN THE IMMEDIATE VACINITY OF THE BEDROOMS; AND ON EVERY LEVEL OF THE DWELLING UNIT , INCLUDING BASEMENTS. (TOP AND BOTTOM OF STAIRCASE LANDINGS)
   ALSO, ROOMS ARE TO HAVE PRIMARY POWER SOURCE FROM BUILDING, HAVE BATTERY BACKUP AND ARE TO BE INTERCONNECTED SEC. R315 OF 2022 CRC. CODE.
3. **LIGHT PANELS:** IN FRONT ENTRY DOOR WINDOWS WITHIN 36" OF THE INSIDE ACTIVATING DEVICES SHALL BE OF LAMINATED SECURITY GLASS (NOT TEMP. GLASS) WHICH IS A MIN. 1/4" THICK W/ 0.06 VINYL INTERLAYER OR 1/4" POLYCARBONATE SECURITY SHEETS OR EQUIVALENT.
4. 4 X 12 DF #1 HEADERS: OPENINGS, WINDOW DOOR(U.O.N.).
5. **ALL CABINETS, MECHANICALS BY OTHERS.**
6. **ALL FINISH REQUIREMENTS BY OTHERS**
7. **HEIGHT** OF COMBUSTABLE MATERIAL ABOVE KITCHEN RANGE TO BE 30 IN. UNPROTECTED OR 24 IN. PROTECTED.
8. **MAX. FLOOR HT. CHANGE @ DOOR IS 3/4 IN. @ UNDER FLOOR ACCESS:** 18 INCHES, 24 INCHES CLEAR WITHOUT PIPE OR INTERFERENCE. 2022 CRC SEC. R408.4
9. **ATTIC ACCESS** TO UNOCCUPIED AREA OPEN'G NOT LESS THAN **22 IN. X 30 IN.** WIDTH NOT LESS THAN **30 INCHES HEADROOM.** 2022 CRC SEC. 807.1
10. **EMERGENCY ESCAPE WINDOWS / SLEEPING ROOMS:**
    A. EGRESS OPENING TO BE MEASURED NOT MORE THAN BOTTOM OF SILL **44" ABOVE FINISHED FLOOR MAX).**
    B. MIN. NET CLEAR **OPERABLE AREA: 5.7 S.F.** R310.2.1
    C. MIN. NET CLEAR **OPERABLE WIDTH: 20 IN.** R310.2.1
    D. MIN. NET CLEAR **OPERABLE HEIGHT: 24 IN.** R310.2.1
11. **ALL WINDOWS, FRENCH AND SLIDING PATIO DOORS SHALL** HAVE DOUBLE GLAZING, WEATHERSTRIPPED, AND FLASHED. TEMPERED GLASS SHALL BE AFFIXED WITH A PERMANENT LABEL.
12. **MECHANICAL VENTILATION SYSTEMS WITH HUMIDIFY SENSORS,** MUST SUPPLY 5 CHANGES PER HOUR IN BATHRMS, LAUNDRY ROOM. BUT IN OTHER HABITABLE AREAS, 2-CHANGES PER HOUR ARE REQ.
13. **BATHROOMS:**
    BATHROOM EXHAUST FANS R303.1 :
    EACH BATHROOM CONTAINING A BATHTUB, SHOWER OR TUB/SHOWER COMBINATION SHALL BE MECHANICALLY VENTILATED FOR THE PURPOSES OF HUMIDITY CONTROL WITH CHAPTOR 4 MINIMUM 50 CFM AND HUMIDITY CONTROLED.
    SETTING WATER CLOSETS CPC 402.5
    WATER CLOSET AND BEDETS SHALL HAVE 15" FROM CENTER OF SIDEWALLS AND THE CLEAR SPACE IN FRONT OF 24 INCHES.
    SHOWERS: CPC 408.5:
    SHOWER DOORS SHALL OPEN SO AS TO MAINTAIN NOT LESS THAN 22 INCHES OF UNOBSTRUCTED OPENING OF EGRESS.
    SHOWER COMPARTMENT CPC 408.6 :
    SHOWER PAN DIMENSIONS SHALL HAVE A MINIMUM OF 1024 S.I. AND ALSO CAPABLE OF ENCOMPASSING A 30 INCH CIRCLE.
    TUB/SHOWER VALVES SHALL BE PRESSURE BALANCED WITH TEMP. RATING SET AT 120 DEGREES F. (49C) OR LESS
    LOCATION OF SHOWER VALVES & HEADS CPC 408.9
    CONTROL VALVES & SHOWER HEADS SHALL BE LOCATED WHERE THE SHOWER HEAD DOES NOT DISCHARGE DIRECTLY INTO THE ENTRANCE TO THE COMPARTMENT.
    SHOWER STALLS/ COMPARTMENT & **TUB ENCLOSURES** MUST CONFORM WITH THE REQUIREMENTS CPC 411.7, FOR DRAINAGE 411.9, SH. PANS, RECEPTORS 411.8 THRESHOLD 2" DEEP, 1024 SQ. IN. MIN. DOORS AND PANELS OF SHOWERS AND BATHTUB ENCLOSURES SHALL BE FULLY TEMPERED, LAMINATED SAFETY GLASS OR APPROVED PLASTIC. PROVIDE SAFETY GLASS AT WINDOWS IN TUB/SHOWER AREA WITHIN 60" ABOVE BATHTUB/SHOWER DRAIN INLET.
    TILE WALLS O/ ½" CEMENTIOUS OR GYPSUM BOARD APPROVED, SUCH AS WONDERBOARD OR DUROCK FROM FLOOR TO CEILING AROUND TUB/SHOWER AREA,WATER BARRIER/TILE TO BE 72" ABOVE FINISHED FLOOR OF SHOWER/TUB SURFACE. SECTION R307.2 OF 2019 CRC. USE ½ IN. PURPLE BD. FOR LAUNDRY/WASHER AREA.
14. **KITCHEN FAUCETS** ARE NOT TO EXCEED **1.8 GAL.** PER MIN. AT **60 PSI** SEC.402.1.2 2022 CPC & TABLE 4.303.2 CGBC.
15. **WATER CLOSETS (TOILETS):** **1.28 GAL.** / FLUSH
16. **LAV. FAUCETS** REQ. MAX. **1.2 GPM AT 60 PSI,** MIN. 0.8 GPM @ 20PSI SEC.402.1.2 2022 TABLE 4.303.2 2022 CGBC
17. **SHOWERS:** 2022 CGBSC SEC. 4303.1.3.1
    SINGLE SHOWER HEAD: **1.8 GPM AT 80 PSI**
    MULTIPLE SHOWER HEADS: COMBINED FLOW RATE AT ALL SHOWER HEADS AND/OR OTHER SHOWER OUTLETS CONTROLED BY A SINGLE VALVE **1.8 GPM AT 80 PSI** 2022 CGBSC SEC. 4303.1.3.2
18. **JETTED TUBS** REQUIRE AGFCI OUTLET ON SEP. CIRCUIT AND A READILY ACCESSABLE HATCH PROVIDED TO ACCESS OUTLET. . 2022 CRC SEC. R409.0-6
19. **WATER HEATER** SHALL BE SIESMICALLY ANCHORED. THE UPPER TO INCLUDE ANCHORS OR STRAPS AT POINTS WITHIN THE UPPER AND LOWER ONE THIRD OF ITS VERTICAL DIMENSION, THE LOWER STRAP/ANCHORS LOCATED TO MAINTAIN A MINIMUM DISTANCE OF 4 INCHES ABOVE THE CONTROLS. 2022 CPC 508.2.
20. **TANKLESS WATER HEATER. (SEE TWH PAGE.)**
21. **CLOTHES DRYER EXHAUST VENT** 2022 CMC 504.4 - 504.4.2.2 IN LAUNDRY, SHALL BE EQUIPPED WITH EXHAUST DUCT TO OUTSIDE, CONSTRUCTED OF SMOOTH, RIDGID METALLIC MATERIAL WITH A BACKDRAFT DAMPER WITH NO SCREEN. (ANY DEVISE ADDED TO VENT DUCT MUST HAVE ITS APPROVAL LISTING INFORMATION DENOTED ON DRAWINGS). DUCT LENGTH SHALL BE LIMITED TO 14 FT. LONG WITH TWO 90 DEGREE ELBOWS, FROM DRYER TO POINT OF TERMINATION. REDUCE THIS LENGTH BY TWO FT. FOR EVERY ELBOW IN EXCESS OF 2.
22. **GLASS DOORS** & WINDOWS SUBJECT TO HUMAN IMPACT MUST HAVE SAFETY GLASS OR PROTECTIVE GRILL, OR PUSH BUTTON.
23. **PROVIDE HEATIING EQUIPMENT SUFFICIENT TO MEET 2022 CRC, CEC, CMC REQUIREMENTS FORCED AIR FURNACE LOCATED IN ATTIC:** PROVIDE A MIN. **CEILING ACCESS OF 30"X 30"** CONSTRUCT A **36" WIDE ACCESS PLATFORM** PATH FROM ACCESS TO F.A.U. AND SUPPLY AN **ELECTRICAL RECEPTICAL** AT THE F.A.U., AND A **LIGHT FIXTURE** THAT IS SWITCHED AT THE ACCESS OPENING.
24. **WALL SURFACES BEHIND CERAMIC TILE** OR OTHER FINISHED WALL SURFACES SHALL BE MATERIALS NOT ADVERSELY AFFECTED BY WATER OR DAMP CONDITIONS. IF GYPSUM BOARD IS USED IT MUST BE APPROVED W.B.
25. **NOTE PLUMBING, MECHANICAL REQUIREMENTS:** PLUMBING FIXTURES AND MECHANICAL EQUIPMENT ARE SHOWN SCHEMATICALLY. INSTALLATIONS/WORK SHALL BE THE CONTRACTOR / OWNER RESPONSIBITY.
26. **OPEN'G DOOR BETWEEN LIVING/GARAGE** SHALL BE 1-3/8" SOLID WOOD., SELF-CLOSING, TIGHT FITTING.
27. **FLOORS AND LANDINGS AT EXT. DOORS** R 311.3
    1. 7-1/4" BELOW TOP OF THRESHOLD.
    2. NOT MORE THAN 1-1/2" LOWER THAN TOP OF general THRESHOLD 36" IN DIRECTION OF TRAVEL.
    WIDTH: NOT LESS THAN WIDTH OF DOOR.
28. **FOOTING HEIGHT:** 12 INCHES + ½ INCH PER FT. TO STREET CURB MIN. FOOTING HT.; 5% DRAINAGE – R401.3; R403.1.7.3
29. **FIRE DEPARTMENT ACCESS** PROVIDED & MAINTAINED SERVICEABLE PRIOR /& DURING CONSTRUCTION.

Revision	By
REV. 1 2 - 8 -24	LC

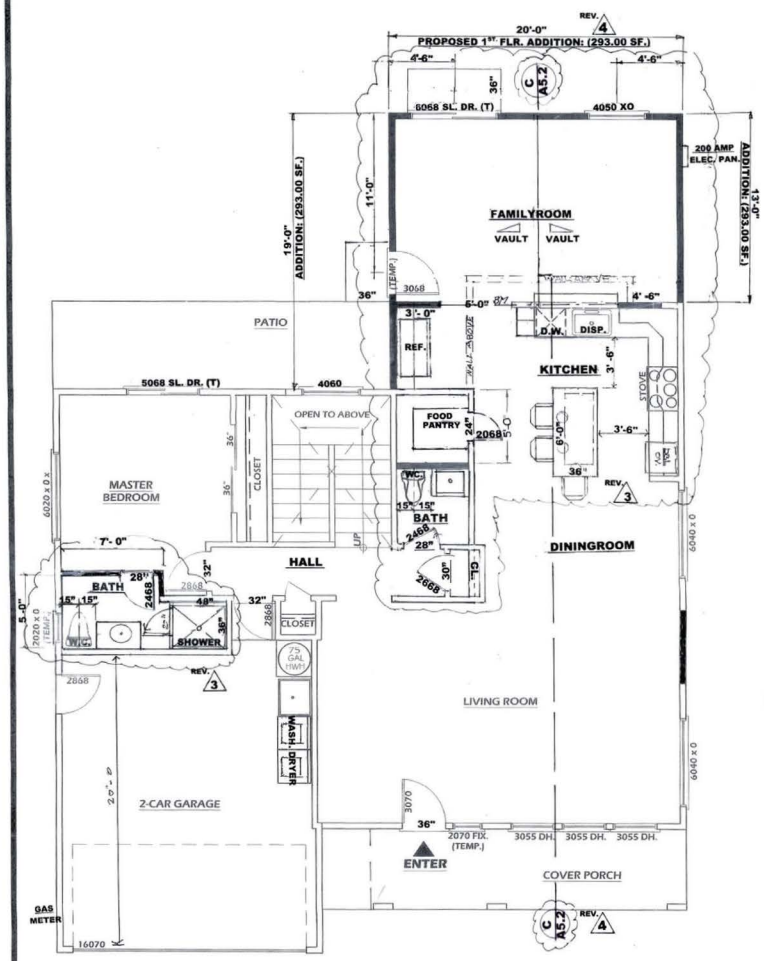
A REMODEL FOR 1ST. FLOOR & 2ND. STORY ADDITION FOR:
THE SANTOSH SHAH RESIDENCE
684 MARSHALL CT., SANTA CLARA CA. 95050
PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220
STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

PLAN COMMENTS TO:
LOUCOSTANZO@COMCAST.NET
408-472-9829 CELL
7-18-23
2-8-24
Lou Costanzo

PROPOSED FIRST AND SECOND FLOOR PLANS

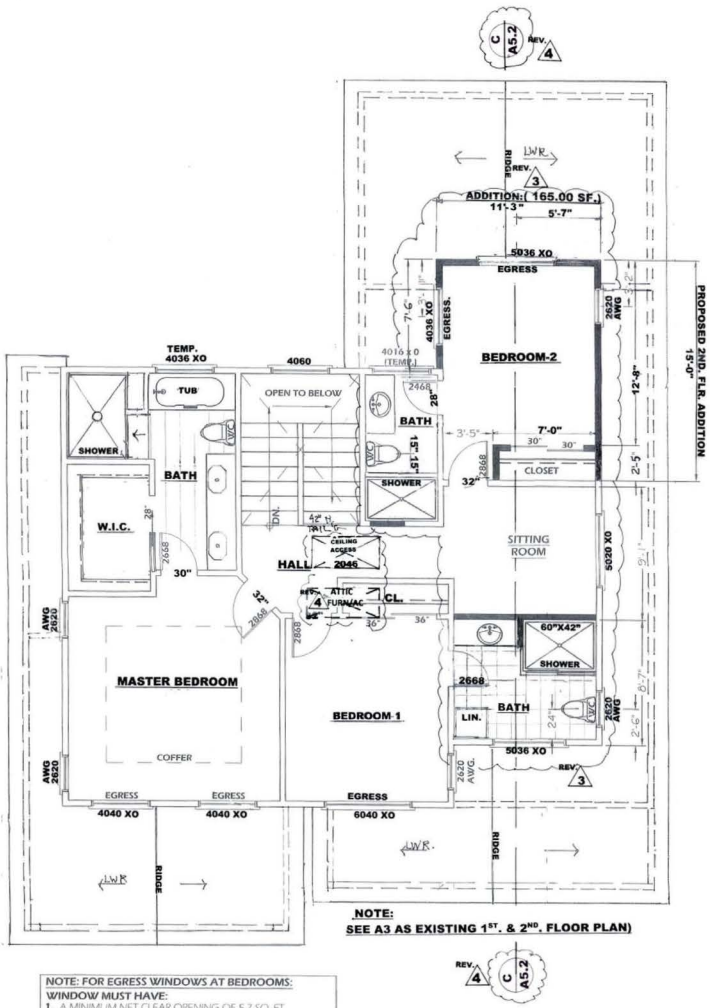
DRAWN	LOU COSTANZO
CHECKED	S.C.
DATE	7 - 18 - 23
SCALE	1/4" = 1'-0"
JOB NO.	S2023-8
SHEET	A3

OF SHEETS



EXISTING / PROPOSED FIRST FLOOR PLAN

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



NOTE:
SEE A3 AS EXISTING 1ST. & 2ND. FLOOR PLAN)

PROPOSED SECOND FLOOR PLAN

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

NOTE: FOR EGRESS WINDOWS AT BEDROOMS:

WINDOW MUST HAVE:

1. A MINIMUM NET CLEAR OPENING OF 5.7 SQ. FT. (GRADE-FLOOR OPENINGS SHALL BE MIN. 5 SQ. FT.)
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APPROVAL STAMP

OTHER GENERAL NOTES: 2022

1. **SMOKE ALARMS: CRC 314:** INSTALL IN EACH SLEEPING ROOM; OUTSIDE EACH SEPARATE BEDROOM IN THE IMMEDIATE VACINITY OF THE BEDROOMS; & ON EACH ADDITONAL STORY OF THE DWELLING INCLUDING BASEMENTS AND HABITUAL ATTICS.
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   ALSO, ROOMS ARE TO HAVE PRIMARY POWER SOURCE FROM BUILDING, HAVE BATTERY BACKUP AND ARE TO BE INTERCONNECTED SEC. R315 OF 2021 CRC CODE.
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7. **HEIGHT** OF COMBUSTABLE MATERIAL ABOVE KITCHEN RANGE TO BE 30 IN. UNPROTECTED OR 24 IN. PROTECTED.
8. **MAX. FLOOR HT. CHANGE @ DOOR IS 3/4 IN. @**
   UNDER FLOOR ACCESS: 18 INCHES, 24 INCHES CLEAR WITHOUT PIPE OR INTERFERENCE. 2021 CRC SEC. R408.4
9. **ATTIC ACCESS** TO UNOCCUPIED AREA OPEN'G NOT LESS THAN **22 IN. X 30 IN.** WIDTH NOT LESS THAN **30 INCHES**
   HEADROOM 2022 CRC SEC. 807.1
10. **EMERGENCY ESCAPE WINDOWS / SLEEPING ROOMS:**
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    SHOWER STALLS/ COMPARTMENT & **TUB**
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    TILE WALLS OF ¼" CEMENTIOUS OR GYPSUM BOARD APPROVED, SUCH AS WONDERBOARD OR DUROCK FROM FLOOR TO CEILING AROUND TUB/SHOWER AREA. WATER BARRIER/TILE TO BE 72" ABOVE FINISHED FLOOR OF SHOWER/TUB SURFACE. SECTION R307.2 OF 2019 CRC. USE ½ IN. PURPLE BD. FOR LAUNDRY/WASHER AREA.
14. **KITCHEN FAUCETS** ARE NOT TO EXCEED **1.8 GAL.** PER MIN. AT **60 PSI** SEC.402.1.2 2022 CPC & TABLE 4.303.2 CGBC
15. **WATER CLOSETS (TOILETS): 1.28 GAL.** / FLUSH
16. **LAV. FAUCETS** REQ. MAX. **1.2 GPM AT 60 PSI,** MIN. 0.8 GPM @ 20PSI SEC.402.1.2 2022 TABLE 4.303.2 2022 CGBC
17. **SHOWERS:** 2022 CGBSC SEC. 4303.1.3.1
    SINGLE SHOWER HEAD: 1.8 GPM AT 80 PSI
    MULTIPLE SHOWER HEADS: COMBINED FLOW RATE AT ALL SHOWER HEADS AND/OR OTHER SHOWER OUTLETS CONTROLED BY A SINGLE VALVE **1.8 GPM AT 80 PSI**
    2022 CGBSC SEC. 4303.1.3.2
18. **JETTED TUBS** REQUIRE AGFCI OUTLET ON SEP. CIRCUIT AND A READILY ACCESSABLE HATCH PROVIDED TO ACCESS OUTLET.. 2022 CBC SEC. R309.6
19. **WATER HEATER** SHALL BE SIESMICALLY ANCHORED. THE UPPER TO INCLUDE ANCHORS OR STRAPS AT POINTS WITHIN THE UPPER AND LOWER ONE THIRD OF ITS VERTICAL DIMENSION, THE LOWER STRAP/ANCHORS LOCATED TO MAINTAIN A MINIMUM DISTANCE OF 4 INCHES ABOVE THE CONTROLS. 2022 CPC 508.2
20. **TANKLESS WATER HEATER. (SEE TWH PAGE.)**
21. **CLOTHES DRYER EXHAUST VENT** 2022 CMC 504.4 - 504.4.2.2 IN LAUNDRY, SHALL BE EQUIPPED WITH EXHAUST DUCT TO OUTSIDE, CONSTRUCTED OF SMOOTH, RIDGID METALLIC MATERIAL WITH A BACKDRAFT DAMPER WITH NO SCREEN. (ANY DEVISE ADDED TO VENT DUCT MUST HAVE ITS APPROVAL LISTING INFORMATION DENOTED ON DRAWINGS) DUCT LENGTH SHALL BE LIMITED TO 14 FT. LONG WITH TWO 90 DEGREE ELBOWS, FROM DRYER TO POINT OF TERMINATION. REDUCE THIS LENGTH BY TWO FT. FOR EVERY ELBOW IN EXCESS OF 2.
22. **GLASS DOORS** & WINDOWS SUBJECT TO HUMAN IMPACT MUST HAVE SAFETY GLASS OR PROTECTIVE GRILL, OR PUSH BUTTON.
23. **PROVIDE HEATING EQUIPMENT SUFFICIENT TO MEET 2022 CRC, CEC, CMC REQUIREMENTS**
    FORCED AIR FURNACE LOCATED IN ATTIC: PROVIDE A MIN. **CEILING ACCESS OF 30"X 30"** CONSTRUCT A **30" WIDE ACCESS PLATFORM** PATH FROM ACCESS TO F.A.U. AND SUPPLY AN **ELECTRICAL RECEPTICAL** AT THE F.A.U., AND A **LIGHT FIXTURE** THAT IS SWITCHED AT THE ACCESS OPENING.
24. **WALL SURFACES BEHIND CERAMIC TILE** OR OTHER FINISHED WALL SURFACES SHALL BE MATERIALS NOT ADVERSELY AFFECTED BY WATER OR DAMP CONDITIONS. IF GYPSUM BOARD IS USED IT MUST BE APPROVED W.B.
25. **NOTE PLUMBING, MECHANICAL REQUIREMENTS:** PLUMBING FIXTURES AND MECHANICAL EQUIPMENT ARE SHOWN SCHEMATICALLY. INSTALLATIONS/WORK SHALL BE THE CONTRACTOR / OWNER RESPONSIBITY.
26. **OPEN'G DOOR BETWEEN LIVING/GARAGE** SHALL BE **1-3/8"** SOLID WOOD., SELF-CLOSING, TIGHT FITTING.
27. **FLOORS AND LANDINGS AT EXT. DOORS** R 311.3
    1. 7-3/4" BELOW TOP OF THRESHOLD.
    2. NOT MORE THAN 1-1/2" LOWER THAN TOP OF general THRESHOLD 36" IN DIRECTION OF TRAVEL
    WIDTH: NOT LESS THAN WIDTH OF DOOR.

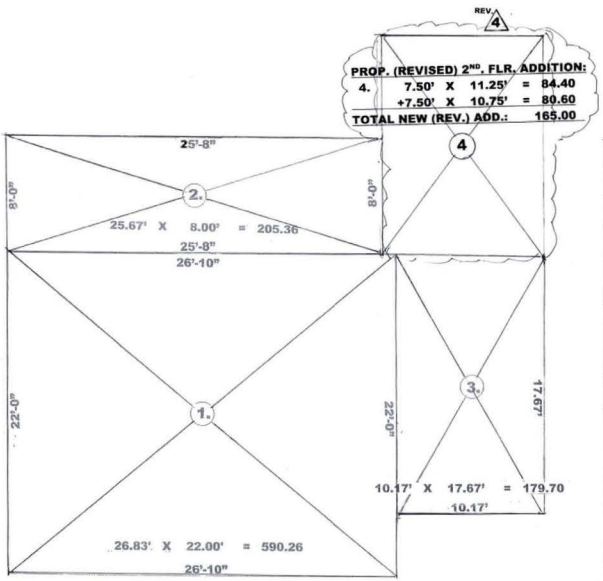
Revision	By
REV. 4 8 - 12 - 24	L.C.

PLAN COMMENTS TO:
LOU COSTANZO/DESIGN
CAST. NET
408-472-9829 CELL
Lou costanzo 8-12-24

A REMODEL FOR 1ST. FLOOR & 2ND. FLOOR ADDITION FOR:
THE SANTOSH SHAH RESIDENCE
684 MARSHALL CT., SANTA CLARA CA. 95050
PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220
STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

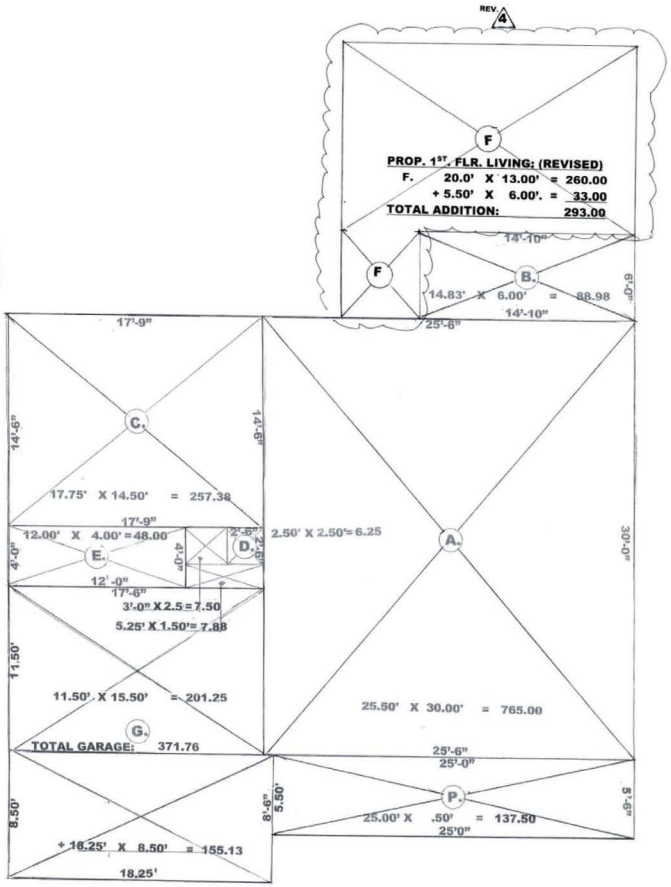
PROPOSED FIRST AND SECOND FLOOR PLANS

DRAWN: LOU COSTANZO
CHECKED: S. C.
DATE: 8 - 12 - 24
SCALE: 1/4" = 1'-0"
JOB NO.: S2023-8
SHEET: A3R REVISION REV. 4
OF SHEETS



PROPOSED 2ND. FLOOR ADDITION

Scale~ ½" = 1'-0"



FIRST FLOOR PLAN

SCALE~ ¼" = 1'-0"

(NOTE: SEE A3.1 FOR (E) PLAN CALCULATIONS)

FLOOR PLAN CALCULATIONS

SCALE 1/4"=1'-0"

REV. 4

PLAN CALCULATIONS: (REVISED) 8-12-24

THE SANTOSH SHAH RESIDENCE

SYM.	SIZE	SF.	TOTAL SF.
EXISTING FIRST FLOOR LIVING:			
A.	25.50' X. 30.00'	= 765.00	
B.	14.83' X 6.00'	= 88.98	
C.	17.75' X 14.50'	= 257.38	
D.	2.50' X 2.50'	= 6.25	
E.	12.00'. X 4.00'	= 48.00	
TOTAL(E) 1ST. FLR. LIVING: 1165.61			1165.61
REV. 4 **PROP. 1ST. FLR. LIVING: (REVISED)**			
F.	20.0' X 13.00'	= 260.00	
	+ 5.50' X 6.00'.	= 33.00	
TOTAL ADDITION:		293.00	293.00
TOTAL (REV.)FIRST FLOOR LIVING:			1458.61
(E)PROPOSED 2ND. FLOOR ADDITION:			
1.	26.83' X 22.00'	= 590.26	
2.	25.67' X 8.00'	= 205.36	
3.	10.17' X 17.67'	= 179.70	
TOTAL (E) ADDITION:		= 975.32.	975.32
PROP. (REVISED) 2ND. FLR. ADDITION:			
4.	7.50' X 11.25'	= 84.40	
	+7.50' X 10.75'	= 80.60	
TOTAL NEW (REV.) ADD.:		165.00	165.00
TOTAL 2ND. FLR. ADDITIONS:			1140.32 1140.32
TOTAL 1ST. & 2ND. FLOOR LIVING:			2598.23
TOTAL (E) GARAGE SF.		371.76	
TOTAL PORCH:		137.50	
TOTAL NON-LIVING:		509.26	

RESULT: TOT. 1ST. & 2ND. FLR. LIVING ADDIT'S:
293.00 + 1140.32 = 1433.32 SF.
1ST. FLR. LIV. GAR. +POR.
1674.87SF. -/- 5301 SF. (LOT) = 0.3159 OR 32%
1ST. FLR. LIV. + ADD.+ GAR. +POR.
1967.87SF. -/- 5301 SF. (LOT) = 0.3712 OR 37% OK

1967.87SF. X .66% = 1298.79 SF. ALLOWED 2ND. FLOOR.

REVISIONS	BY
REV. 4 8 - 12 -24	L.C.

PLAN COMMENTS TO: LOUCOSTANZO@COMCAST.NET 408-472-9829 CELL

8-12-24 LOU COSTANZO

A REMODEL FOR 1ST. FLOOR & 2ND. STORY ADDITION FOR:

THE SANTOSH SHAH RESIDENCE

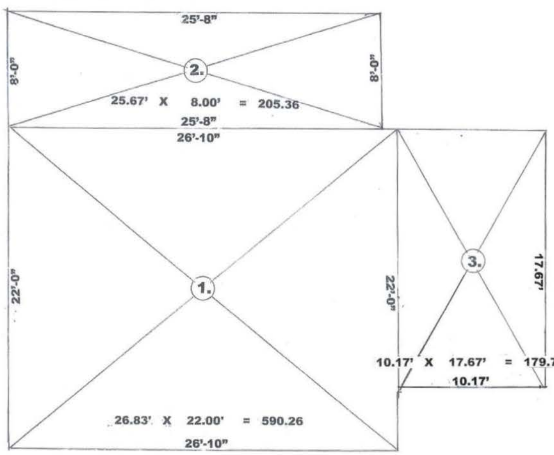
684 MARSHALL CT., SANTA CLARA CA. 95050

PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220

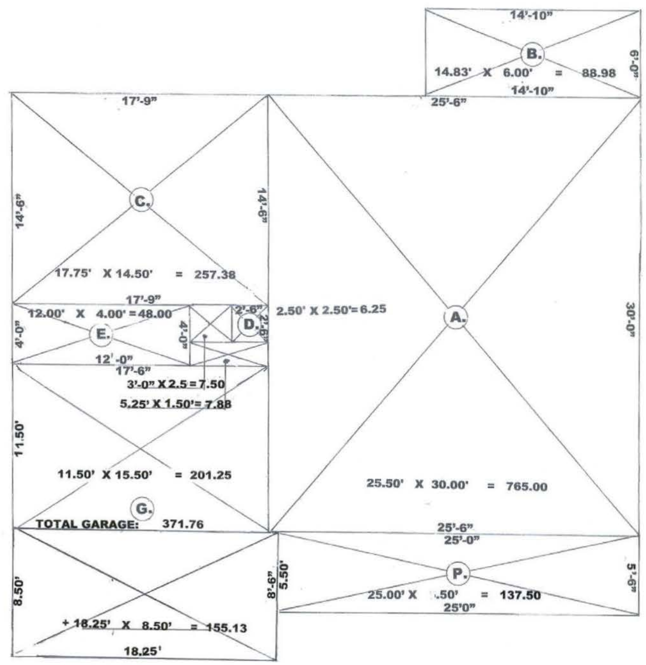
STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

FLOOR PLAN CALCULATIONS

DRAWN: LOU COSTANZO
CHECKED: S.C.
DATE: 8 - 12 - 24
SCALE: ¼" = 1' - 0"
JOB NO.: S2023-8
SHEET: A3.1R REVISION REV. 4
OF SHEETS



PROPOSED 2ND. FLOOR ADDITION
Scale~ ¼" = 1'-0"



FIRST FLOOR PLAN
SCALE~ ¼" = 1'-0"

PLAN CALCULATIONS: THE SANTOSH SHAH RESIDENCE

SYM.	SIZE	S.F.	TOTAL S.F.
EXISTING 1ST. FLOOR LIVING:			
A.	25.50' X 30.00'	= 765.00	
B.	14.83' X 6.00'	= 88.98	
C.	17.75' X 14.50'	= 257.38	
D.	2.50' X 2.50'	= 6.25	
E.	12.00' X 4.00'	= 48.00	
TOTAL 1ST. FLOOR LIVING:		1165.61	1165.61
G. GARAGE:			
	+ 18.25' X 8.50'	= 155.13	
	+ 11.50' X 15.50'	= 201.25	
	+ 3.00' X 2.50'	= 7.50	
	+ 5.25' X 1.50'	= 7.88	
TOTAL GARAGE:		371.76	371.76
P. PORCH:			
	25.00' X 5.50'	= 137.50	137.50
TOTAL LIVING + GARAGE + PORCH:			1674.87
1744.87 SF. X .66(%) = 1151.61 S.F. (ALLOWED)			
PROPOSED 2ND. FLOOR ADDITION:			
1.	26.83' X 22.00'	= 590.26	
2.	25.67' X 8.00'	= 205.36	
3.	10.17' X 17.67'	= 179.70	
TOTAL PROP. 2ND FLOOR:		975.32	975.32
TOTAL (E) 1ST. FLOOR LIVING:			1165.61
TOTAL PROPOSED LIVING:			2140.93

(2.nd. flr.) (66% 1st. fl.)
975.32 SF. -/- 1105.41 SF. = 0.8823 OR 89%
5301 SF.(LOT) X .40 = 2120.40 SF. ALLOWED 1ST. FLOOR
(1st. flr. Lv.+ gar.+ porch)
1674.87 SF. -/- 5301.00 SF. (LOT) = 0.3159 OR 32%

FLOOR PLAN CALCULATIONS
SCALE 1/4"=1'-0"

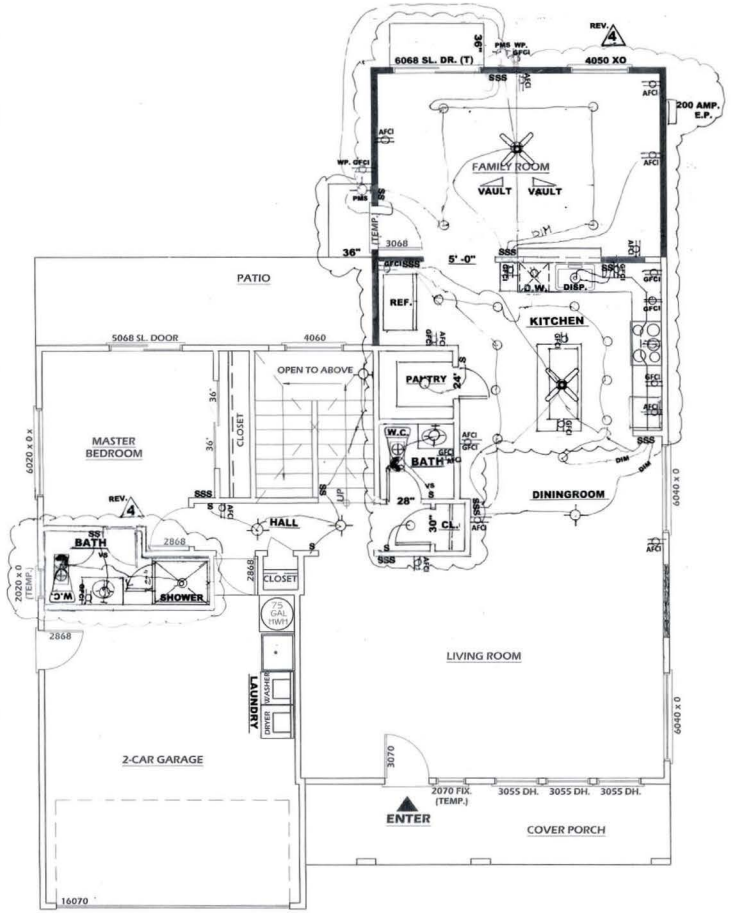
REVISIONS	BY

A REMODEL FOR 1ST. FLOOR & 2ND. STORY ADDITION FOR:
THE SANTOSH SHAH RESIDENCE
684 MARSHALL CT., SANTA CLARA CA. 95050
PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220
STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

PLAN COMMENTS TO:
LOUCOSTANZO@COMCAST.NET
408-472-9829 CELL
7-18-23
2-8-24
Lou Costanzo

FLOOR PLAN CALCULATIONS

DRAWN: LOU COSTANZO
CHECKED: S.C.
DATE: 7 - 18 - 23
SCALE: 1/4" = 1'-0"
JOB NO.: S2023-8
SHEET: **A3.1**
OF SHEETS



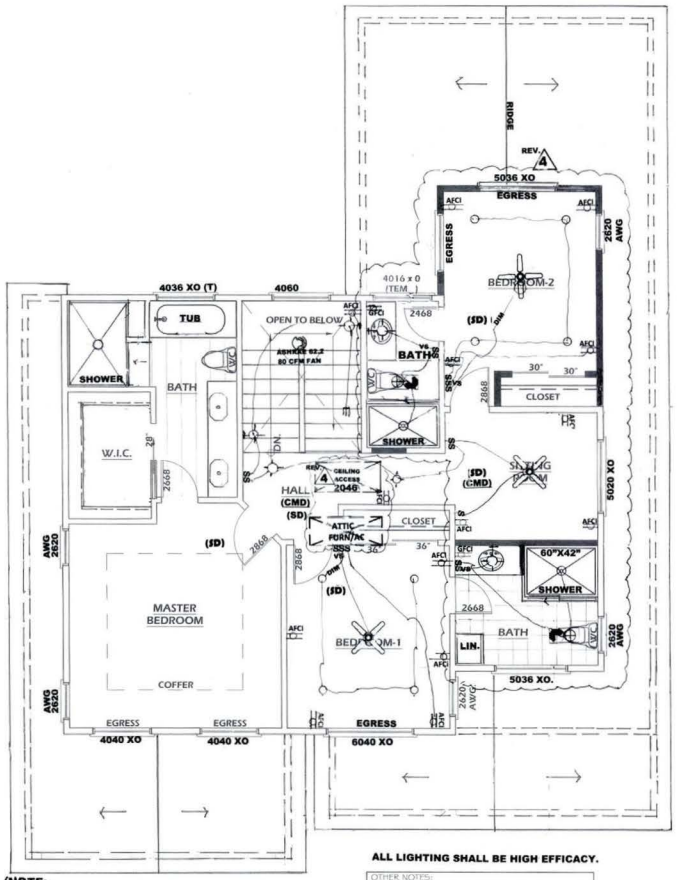
WALL LEGEND

NEW 2x4 DF STUD WALL @ 16" O.C.

EXISTING 2x STUD WALL

PROPOSED FIRST FLOOR ELECTRICAL PLAN

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



(NOTE: SEE A4 AS EXIST'G 1ST. & 2ND. FLR. ELECTRICAL PLAN)

ALL LIGHTING SHALL BE HIGH EFFICACY.

OTHER NOTES:

1. A CARBON MONOXIDE ALARM IS TO BE INSTALLED IN THE HALLWAY SERVING THE SLEEPING AREA. (R315.2 2013 CBC) THE SYMBOL WILL LOOK LIKE THIS: CMA

2. AN ARC FAULT PROTECTION IS REQUIRED FOR ALL ROOMS (BEDROOM, LIVINGROOMS, HALLS, DININGROOMS, CLOSETS ETC.) (210.12 (B) C.E.C.2013)

3. ALL RECEPTACLES SHALL BE "TAMPER RESISTANT" PER ARTICLE 406.11 C.E.C. 2013

PROPOSED SECOND FLOOR ELECTRICAL PLAN

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

ELECTRICAL SYMBOLS

- DUPLEX WALL OUTLET
- AFCI ARC-FAULT-CIRCUIT INTERRUPTER OUTLET (EXCEPTION: LAUNDRY CLOTHES DRYER)
- GFCI GROUND-FAULT CERCUIT OUTLET
- DUPLEX WALL SWITCHED OUTLET
- C CEILING DUPLEX OUTLET
- F SINGLE PLUG RECESSED FLOOR OUTLET
- 220V S.C. 220 V. CLOTHES DRYER/OVENPLUG - IN
- W.P. EXT. WEATHERPROOF DUPLEX OUTLET

ALL LIGHTING SHALL BE HIGH EFFICACY

- S LIGHT SWITCH
- S3 3-WAY LIGHT SWITCH
- S VS VACANCY SENSOR
- SOS OCCUPANCY SENSOR LIGHT SWITCH
- S DIM DIMMER LIGHT SWITCH W/LED
- SLVD LOW VOLTAGE DIMMER SWITCH
- S3 DIM 3-WAY DIMMER SWITCH
- EXT. BOX FOR WALL MTD. LIGHT FIXTURE
- EXT. BOX FOR SURFACE LIGHT FIXTURE
- LED FOR UNDER CABINET LIGHTING
- C CHANDALIER LIGHT FIXTURE
- FR FAN RATED
- CEIL'G RECESSED LED LIGHT FIX. 8" 6",4",3".
- FL FIXTURE FLUOR. (4- TUBE LIGHT FIX.)
- ASHRAE 62.2 (ASHRAE 62) 100 CFM FAN OR 80 CFM OR 60 CFM
- DOOR BELL (CHIMES)
- TV TELEVISION
- PANASONIC CEILING EXHAUST FAN
- PANASONIC EXHAUST FAN W/ LIGHT REQUIRES 2-SWITCHES AND HUMIDIFIR (BATHROOMS)
- LED LED LIGHT'G (UNDER-CABINET LIGHTING)
- (SD) SMOKE DETECTOR: SEC. R315 CRC 2019. HARD- WIRED W/BATTERY BACKUP.
- (CMD) CARBON MONIXIDE DET. SEC. R315 CRC 2019

(HIGH EFFICACY EXTERIOR FIXTURES) PMS PHOTO-MOTION SENSOR CONTROLLED OUTDOOR LIGHTING SHALL BE HIGH EFFICACY, CONTROLLED BY ONE OF THE FOLLOWING:
1. PHOTOMOTION& CONTROL SENSORS.
2. PHOTOSENSOR & AUTO. CONTROL TIME SWITCH.
3. ASTRONOMICAL TIME SWITCH
4. EMCS ENENGY MANAGEM'T CONTROL SYSTEMS

- 300 EXT. ELEC. PANEL 300 AMP.
- 200 EXT. ELEC. PANEL 200 AMP.
- 150 EXT. ELEC. PANEL 150 AMP.
- 100 AMP SUB PAN 100 AMP
- CEILING FAN

APPROVAL STAMP

Revision	By
REV. 4 8 - 12 -24	L.C.

PLAN COMMENTS TO: LOUCOSTANZO@COM CAST.NET 408-472-8829 CELL

Lou Costanzo 8-12-24

A REMODEL FOR 1ST. FLOOR & 2ND. FLOOR ADDITION FOR:

THE SANTOSH SHAH RESIDENCE

684 MARSHALL CT., SANTA CLARA CA. 95050

PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220

STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

PROPOSED FIRST & SECOND FLOORS ELECTRICAL PLAN

DRAWN: LOU COSTANZO
CHECKED: S. C.
DATE: 8 - 12 - 24
SCALE: 1/4" = 1'-0"
JOB NO.: S2023-8
SHEET: A4R REVISION
REV. 4
OF SHEETS

OTHER ELECTRICAL NOTES

1. **RECESSED LIGHTING IN BATHROOM** AREAS...GFIC... REFER TO PLAN 'S GENERAL NOTES.
2. **ELECTRICAL DEVICES** ARE SHOWN SCHEMATICALLY AND SHALL BE THE CONTRACTOR/OWNER RESPONSIBILITY FOR WORK/COMPLIANCE TO CODE SEC. CRC R105.8
3. **ELECTRICAL SERVICE:** SHALL BE LOCATED IN THE VACINITY OF THE CLOSEST DISTANCE TO UTILITY SERVICE.
4. **KITCHEN** FOR SMALL APPLIANCES. CONTRACTOR TO **PROVIDE TWO 20 AMP. CIRCUITS**
5. **INTERIOR SUB PANELS** SHALL NOT BE LOCATED IN THE VICINITY OF EASILY IGNITABLE MATERIALS...SUCH AS CLOTHES CLOSETS
6. **LIGHTING REQUIREMENTS IN COMPLIANCE WITH: 2022 CA ENERGY CODE SEC.150(k)** WHICH INCLUDE THE FOLLOWING:
   A. ALL LIGHTING AS HIGH EFFICACY. (IE. PIN-BASE CFL: PULSE-START MH,HPS,GU-24 SOCKETS OTHER THAN LED'S, LED LUMINAIRES WITH INTEGRAL SOURCE, ETC.) CEC TABLE 150.0-A
   B. SCREW-BASED PERMANENTLY INSTALLED LIGHT FIXTURES MUST CONTAIN SCREW-BASED JA8 (JOINT APPENDEX 8) COMPLIANT LAMPS.JA8 COMPLIANT LIGHT SOURCES MUST BE MARKED AS "JA8-2019" OR "JA8-2022 E"(JA8-2022-E" LUMINAIRESARE DEEMED APPROPIATE FOR USE IN ENCLOSED LUMINAIRES) CEC 150.0(k)G
   C. ALL JA8 COMPLIANT LIGHT SOURCES IN THE FOLLOWING LOCATIONS ARE CONTROLLED BY VACANCY SENSORS OR DIMMERS (EXCEPT CLOSETS LESS THAN 70 SF. AND HALLWAYS) CEC 150(k)(2k): 1. CEILING RECESSED DOWNLIGHT LUMINAIRES 2. LED LUMINAIRES WITH INTEGRAL SOURCES 3. PIN-BASED LED LAMPS (ie. MR16, AR-111. ETC.) 4. GU-24 BASED LED LIGHT SOURCES
   D. ALL BATHROOM LIGHTING SHALL BE HIGH EFFICACY WITH AT LEAST ONE BATHROOM LIGHT TO BE CONTROLLED BY A VACANCY SENSOR.
   E. AT LEAST ONE FIXTURE IN GARAGE CONTROLLED BY A VACANCY SENSOR CEC 150(k)2J
   F. AT LEAST ONE FIXTURE IN LAUNDRY CONTROLLED BY A VACANCY SENSOR CEC 150(k)2J
   G. AT LEAST ONE FIX. IN UTILITY ROOM CONTROLLED BY A VACANCY SENSOR 150(k)2j
   H. EXHAUST FANS (EXCLUDES KITCHEN EXHAUST HOODS) SWITCHED SEPARATELY FROM LIGHTING (OR UTILIZE A DEVISE WHERE LIGHTING CAN BE TURNED OFF WHILE THE FAN IS RUNNING)
   I. SEPARATE SWITCHING FOR ANY UNDER CABINET LIGHTING (INL. KITCHEN LIGHTING) FROM OTHER LIGHTING SYSTEMS. CEC 150(k)2L
   J. OUTDOOR LIGHTING AS HIGH EFFICACY WITH MANUAL ON/OFF SWITCH AND ONE OF THE FOLLOWING: 1. PHOTO CONTROL AND MOTION SENSOR 2. PHOTOCONTROL AND AUTOMATIC TIME SWITCH CONTROL 3. ASTRONOMICAL TIME SWITCH CONTROL
   4. ENERGY MANAGEMENT CONTROL SYSTEMS.
7. **LIGHTING** IN ALL **BEDROOM** AREAS, **HALLWAYS** SHALL
   A. PROVIDE DIMMER SWITCH.
   B. PROVIDE MANUAL ON OCCUPANCY SENSOR AND MOTION SENSOR THAT COMPLIES WITH AND SHALL NOT HAVE A MOTION CONTROL THAT ALLOWS THE LUMINARIES TO BE TURNED ON AUTOMATICALLY OR HAS AN OVERRIDE ALLOWING THE LUMINARIES TO BE ALWAYS ON.
   C. CLOSETS LESS THAN 70 SF. ARE EXCEMPT FROM LIGHTING REQUIREMENTS.
   D. LUMINARIES IN INSULATED CEILINGS SHALL BE IC RATED & AIRTIGHT (AT) FOR ALL RECESSED LUMINARIES
8. TERMINATION OF ALL **ENVIRONMENTAL AIR DUCTS** SHALL BE A MIN. OF 3 FEET FROM ANY OPENINGS INTO THE BUILDING (I.E.) DRYERS, BATHROOMS, AND UTILITY FANS, AND MUST BE 3 FT. AWAY FROM DOORS, WINDOWS, OPEN'G SKYLIGHTS, OR ATTIC VENTS).

Electric Vehicle Supply Equipment (EVSE)
California Electrical Code (CEC), Green Building Code (GBC), California Residential Code (CRC), California Building Code (CBC)

- **Submittal Requirements** for an EV charging system installed in the garage, carport or outdoors shall provide the following information:
  1) Type of charging system (level 1, level 2, etc.)
  2) Size of EVSE electrical circuit (most level 2 chargers require a minimum 40-amp 2-pole circuit)
  3) Size of the existing electrical service and load calculation (to determine if a service upgrade will be required).
  4) A floor plan / plot plan showing the location of the EVSE.
  5) Specify the type of receptacle on the plan.
  6) All electrical materials must be listed by a Nationally Recognized Testing Laboratory, such as UL, ETL, CSA, etc.
  7) Provide manufacturer specifications of charging equipment
- **Some electric vehicles** include AC-DC conversion equipment in the vehicle, and these plug into standard electrical receptacles that are installed for that purpose. Others have the AC-DC conversion equipment mounted to the wall, and a cord with an Electric Vehicle Connector (J1772 standard) is connected to the vehicle.
- **Each outlet** installed for the purpose of charging electric vehicles shall be supplied by an individual branch circuit. Each circuit shall have no other outlets. (CEC 625.40)
- **All receptacles** installed for the connection of electric vehicle charging shall have ground-fault circuit-interruption protection for personnel. (CEC 625.54)
- **Branch Circuit** conductors shall be sized for continuous duty of not less than 125% of the maximum load of the equipment. (CEC 625.41)
- **Disconnecting Means** for equipment rated more than 60 amperes or more than 150 volts to ground, the disconnecting means shall be provided and installed in a readily accessible location. The disconnect means shall be lockable with CEC 110.25 (CEC 625.43)
- **Newly constructed** one- and two-family dwellings and townhouses with attached private garages shall comply with EV infrastructure requirements in accordance with the California Green Building Code (CRC 309.8, GBC 4.106.4)
  1. In private garages with two or more parking spaces, install one Level 2 EV Ready Space and one Level 1 EV Ready Space.
  2. For each dwelling unit with only one parking space, install a Level 2 EV Ready Space

REV. 1
PROVIDE GFCI/AFCI PROTECTION FOR OUTLET THAT SUPPLIES DISHWASHER CEC SEC 210.8(D).THE GFCI BUTTON OF RECEPITICAL MUST BE ACCESSIBLE (NOT BEHIND APPLIANCE).

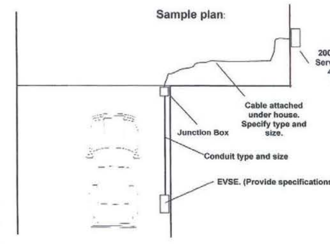
REV. 1
NOTE: ALL NEW 15-20-AMPERE, 125- & 250-VOLT NON-LOCKING-TYPE, RECEPTACLE OUTLETS SHALL BE LISTED TAMPER-RESISTANT RECEPTACLES, (CEC 406.12), UNLESS RECEPTACLE IS PART OF AN APPLIANCE OR INSTALLED HIGHER THAN 5.5 FT. ABOVE THE FLOOR. FOR ALL EXCEPTIONS REFER TO CEC

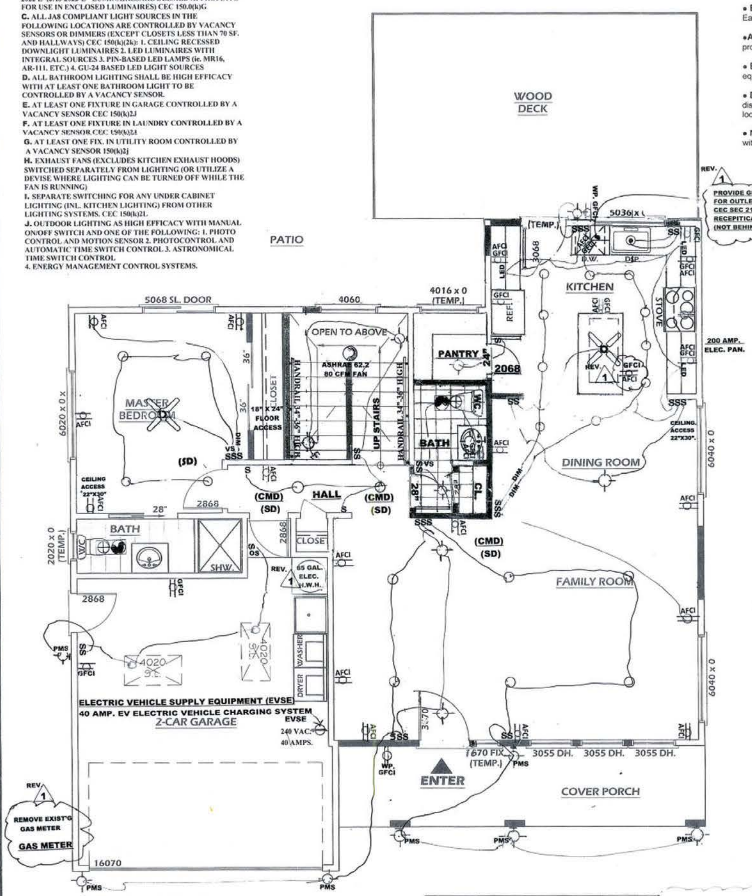
Definitions: Level 1 EV Ready, Level 2 EV Ready

- Level 1 EV Ready Space: A parking space served by a complete electric circuit with a minimum of 110/120 volt, 20-ampere capacity including electrical panel capacity, overprotection device, a minimum 1"diameter raceway that may include multiple circuits as allowed by the California Electrical Code, wiring, and either a) a receptacle labelled "Electric Vehicle Outlet" with at least a 1/2" font adjacent to the parking space, or b) electric vehicle supply equipment (EVSE).
- LEVEL 2 EV Ready Space: A parking space served by a complete electric circuit with 208/240 volt, 40-ampere capacity including electrical panel capacity, overprotection device, a minimum 1" diameter raceway that may include multiple circuits as allowed by the California Electrical Code, wiring, and either a) a receptacle labelled "Electric Vehicle Outlet" with at least a 1/2" font adjacent to the parking space, or b) electric vehicle supply equipment (EVSE) with a minimum output of 30 amperes.

When EVSE are installed, the vehicle stall served by the EVSE is defined by California Building Code Section 202 as an Electric Vehicle Charging Station (EVCS), and the primary purpose of the vehicle stall is for charging of electric vehicles. California Building Code Part 2 Chapter 11B and the Americans with Disabilities Act establish requirements to provide accessible EV charging. Chapter 11B sets prescriptive requirements for the quantity and attributes of accessible spaces.

Sample plan:





WALL LEGEND

NEW 2x4 DF STUD WALL @ 16" O.C.

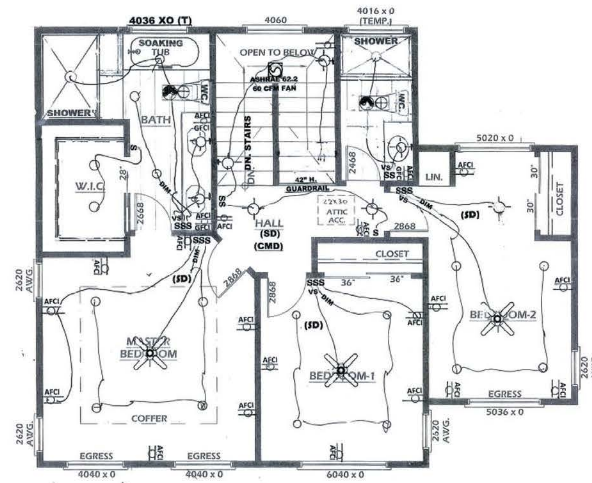
EXISTING 2x STUD WALL

REV. 1
NOTE:
ELECT. HOT WATER HEATER:
RHEEM 65 GAL.
NEEA HEAT PUMP
MODEL PROPH T2
RH37515 (65 GAL, JA13)

HEATING/COOLING:
HEAT PUMP SYSTEM
CENTRAL SPLIT HP
(SEE TITLE 24 HVAC HEAT PUMPS)

PROPOSED FIRST FLOOR ELECTRICAL PLAN

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



FOR GAS PIPE SIZING AND ELECTRICAL LOAD CALCULATIONS
DESIGN BUILT APPROACH! THE GENERAL CONTRACTOR AND LICENCED PLUMBING, ELECTRICAL & MECHANICAL SUBCONTRACTORS SHALL SUBMIT THEIR OWN CALCULATIONS/ONE LINE DIAGRAMS WHEN PULLING PERMITS.

SMOKE ALARMS CRC 314
INSTALL SMOKE ALARMS IN EACH SLEEPING BEDROOM; OUTSIDE EACH SEPARATE BEDROOM IN THE IMMEDIATE VACINITY OF THE BEDROOMS; AND ON EACH ADDITIONAL STORY OF THE DWELLING INCLUDING BASEMENTS AND HABITAL ATTICS.

CARBON MONOXIDE ALARMS CRC 315
INSTALL CO ALARMS OUTSIDE OF EACH SEPARATE DWELLING UNIT SLEEPING AREA IN THE IMMEDIATE VACINITY OT THE BEDROOMS; AND ON EVERY LEVEL OF THE DWELLING UNIT, INCLUDING BASEMENTS.

PROPOSED SECOND FLOOR ELECTRICAL PLAN

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

ELECTRICAL SYMBOLS

- DUPLEX WALL OUTLET
- AFCI ARC-FAULT-CIRCUIT INTERRUPTER OUTLET (EXCEPTION: LAUNDRY CLOTHES DRYER)
- GFCI GROUND-FAULT CERCUIT OUTLET
- DUPLEX WALL SWITCHED OUTLET
- C CEILING DUPLEX OUTLET
- F SINGLE PLUG RECESSED FLOOR OUTLET
- 220V S.C. 220 V. CLOTHES DRYER/OVENPLUG - IN
- W.P. EXT. WEATHERPROOF DUPLEX OUTLET

ALL LIGHTING SHALL BE HIGH EFFICACY

- S LIGHT SWITCH
- S3 3-WAY LIGHT SWITCH
- S VS VACANCY SENSOR
- SOS OCCUPANCY SENSOR LIGHT SWITCH
- S DIM DIMMER LIGHT SWITCH W/LED
- SLVD LOW VOLTAGE DIMMER SWITCH
- S3 DIM 3-WAY DIMMER SWITCH
- EXT. BOX FOR WALL MTD. LIGHT FIXTURE
- EXT. BOX FOR SURFACE LIGHT FIXTURE
- LED FOR UNDER CABINET LIGHTING
- (C) FR CHANDALIER LIGHT FIXTURE FAN RATED
- CEIL'G RECESSED LED LIGHT FIX. 8" 6",4",3".
- (FL) FIXTURE FLUOR. 4-TUBE LIGHT FIX.
- ASHRAE 62.2 (ASHRAE 62) 100 CFM FAN OR 80 CFM OR 60 CFM
- DOOR BELL (CHIMES)
- TV TELEVISION
- PANASONIC CEILING EXHAUST FAN
- PANASONIC EXHAUST FAN W/ LIGHT REQUIRES (2-SWITCHES AND HUMIDIFIR (BATHROOMS)
- LED LED LIGHT'G (UNDER-CABINET LIGHTING)
- (SD) SMOKE DETECTOR: SEC. R315 CRC 2019. HARD- WIRED W/BATTERY BACKUP.
- (CMD) CARBON MONIXIDE DET. SEC. R315 CRC 2019

(HIGH EFFICACY EXTERIOR FIXTURES)
PMS PHOTO-MOTION SENSOR CONTROLLED
OUTDOOR LIGHTING SHALL BE HIGH EFFICACY, CONTROLLED BY ONE OF THE FOLLOWING:
1. PHOTOMOTION& CONTROL SENSORS.
2. PHOTOSENSOR & AUTO. CONTROL TIME SWITCH.
3. ASTRONOMICAL TIME SWITCH
4. EMCS ENENGY MANAGEM'T CONTROL SYSTEMS

- 300 EXT. ELEC. PANEL 300 AMP.
- 200 EXT. ELEC. PANEL 200 AMP.
- 150 EXT. ELEC. PANEL 150 AMP.
- 100 AMP SUB PAN 100 AMP
- CEILING FAN

Revision	By
REV. 1 2 - 8 - 24	LC

A REMODEL FOR 1ST. FLOOR & 2ND. STORY ADDITION FOR:
THE SANTOSH SHAH RESIDENCE
684 MARSHALL CT., SANTA CLARA CA. 95050
PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220
STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

PLAN COMMENTS TO: LOUCOSTANZO@COMCAST.NET 408-472-9829 CELL
7-18-23
2-8-24
Lou Costanzo

PROPOSED FIRST & SECOND FLOORS ELECTRICAL PLAN

DRAWN	LOU COSTANZO
CHECKED	S.C.
DATE	7 - 18 - 23
SCALE	1/4" = 1'-0"
JOB NO.	S2023-8
SHEET	A4

OF SHEETS

62. **FLOOR BM. 9:** 5.25" X 14.0" 2.25 PSL BM. W/BC TO HEADER S.S.D.
63. **FLOOR BM. 10:** 3.5" X 14.0" 2.2E PSL BM. W/BC & HGUS4 12 HANGER & FACS MT. & BC TO HDR./FLOOR BM.4X4 POST BM. SUPPORT.

BALLOON FRAMING WALL AT STAIRCASE:

64. 2 X 6" DF#2 STUDS @ 16" O.C. (UNO) S.S.D.
65. DBL 2X6 DF #2 TOP PLATE
66. 2 X 6 DF # 2 BOTTOM PLATE

TYPICAL STAIR CONSTRUCTION: [STAIRWELL OPEN TO ABOVE]

A. STAIR SLOPE AND RUN TO 17" +.
B. 3- 2" X 12" DF#1 STRINGERS
C. 2 X SPACER W/16d's @ EACH STUD.
D. 3/4" CDX PLYWOOD FOR STEP/RISER.
E. STEP: 12 INCHES, 10 INCHES MIN.
F. NOSE: 1 INCH
G. RISE: 7.5"
H. 2 X 4 DF#2 CLEAT W/3- 16'S
I. 2 X FIRE BLOCKING AT 8FT. MAX.
J. USE 5/8" TYPE (X) GYP. BOARD ON UNDERSIDE OF STAIRCASE.
K. HANDRAIL W/2 X BLOCKING AT 34"-36" HIGH, 1 1/2" SPACED BETWEEN WALL AND HANDRAIL WITH METAL BRACKETS.
L. 2ND. FLOOR 42" PONY WALL W/2 X 6" FINISHED CAP S.S.D. OR RAILING/WITH BALUSTRADE 42". HIGH. SPACED < 3 3/4".

NOTE: ANY ROOF OVERHANG INTO SETBACKS & WITHIN 4FT. OF PROPERTY LINE SHALL HAVE UNDEREAVE FIRE-PROTECTION. SEE DET.1 /E1

FOUNDATION

35. 2"X 6" PTDF MUDSILL WITH 5/8" A.B. @ 48" O.C. U.N.O. S.S.D.
36. 4"X 6" PTDF GIRDERS TYP. S.S.D.
37. GRADE SOIL AWAY FROM FDN. 5% AT 10-0"
38. 5" THICK CONC. SLAB W/#4 BARS AT 16" O.C. EA. WAY @ MIDSPAN O/ 15 MIL. MOISTURE BARRIER O/ 6" 3/4" CLEAN CRUSHED ROCK. SSD.
39. DBL. 2 X BLOCKING UNDER WALLS S.S.D.
40. 26 GA. G.I. FLASHING
41 PREFAB COLLECTOR TRUSS PER MFG.
42. 2 X 4 BLOCK'G
43. STAIRCASE BEYOND
44. WALL BEYOND SEE S.S.D.
45. STC CLIPS @ 32" O.C. TO CLIP INTERIOR WALLS TO TRUSSES/BLKG
46. 2-2 X BLOCKING UNDER 1ST. FLOOR WALLS
47. 2 X BLOCKING
48. 2 X FIRE BLOCKING AT 8FT.
49. 2 X 8' DF#1 F.J. @ 16" O.C. S.S.D.
50. MST STRAP S.S.D.
51. 8 INCHES CLEAR FROM SOIL, MINIMUM, TO WOOD STRUCTURE.
52. 18 INCHES DEEP TO BOTTOM OF FOUNDATION
53. 18 INCHES MIN. FROM BOTTOM OF F.J. TO SOIL

FLOOR BEAM LIST

54. FLOOR BM. 1: 5.25" X 14.0" 2.2E PSL BM. W/HGUS5.50/12 FACE MT. HANGER & EPCZ'S HANG. BM. CONN. & 4 X 6 DF#1. POST. BM. SUPPORT
55. FLOOR BM. 2: 5.25" X 14.0" 2.2E PSL BM. W/HGUS5.50/12 FACE MT. HANGER & EPCZ'S HANG. BM. CONN. & 4X6" DF1 POST BM. SUPPORT
56. FLOOR BM. 3: 5.25" X 14.0" 2.2E PSL BM. W/ EPCZ'S &PCZ'S POST CAP
57. FLOOR BM. 4: 3.5" X 14.0" 2.2E PSL BM. W/HGUS4 12 HANG. S.S.D.
58. FLOOR BM. 5: 5.25" X 14.0" 2.2E PSL BM. S.S.D.
59. FLOOR BM. 6: 3.5" X 14.0" 2.2E PSL BM. S.S.D.
60. FLOOR BM. 7: 3.5" X 14.0" 2.2E PSL BM. S.S.D.
61. FLOOR BM. 8: 3.5" X 14.0" 2.2E PSL BM. S.S.D.

ROOF/ CEILING: **THE SANTOSH SHAH RESIDENCE**

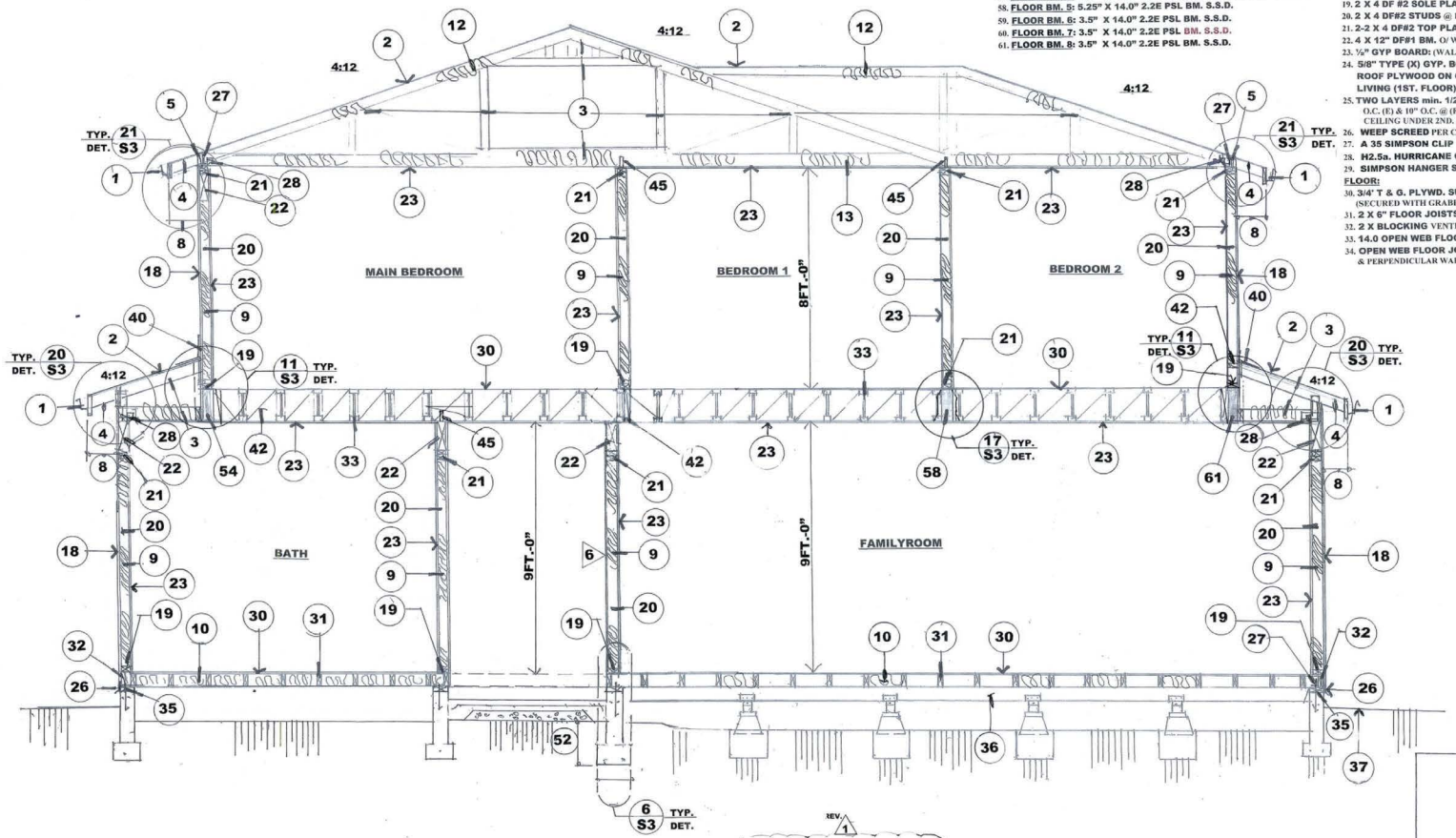
1. GI GUTTER O/ 2X FASCIA W/DOWNSPOUTS TO FRENCH DRAIN. TYP.
2. 50 YR. PRESIDENTIAL (C) COMP. ROOF'G IC ES ESR 1389 O/ 2 layers OF 30# FELT O/ ½" CDX/ FOIL-BACKED, A.P.A. RATED. PLYWD (NAIL W/ 8d'S @ 6" O.C. (E) 12" O.C. (FIELD). SECURE ROOF'G WITH CORRISION RESISTANT FASTENERS (CRC R905.2.5 & R905.2.6)
3. MFG. TRUSSES BY ADVANTAGE TRUSS CO. @ 24" O.C. SEE ATTACHED FOR DESIGNS AND CALCS.
4. ½" T & G DECK'G @ EAVES, OVER- HANGS & PORCH CEIL'G. (U.O.N.)
5. 2 X BLOCKING VENTED W/3-2"dia. HOLES EA. BLOCK W/#4 MESH) U.N.O.
6. 2 X 4" OUTRIGGERS @ 24" O.C. TYP.
7. 2 X 8" MIN. BARGE(END) RAFTERS OPTIONAL
8. 12" OVERHANGS & 12" EAVES. TYP. U.O.N.
9. R-15 BATT. INSULATION (EXT. & INTERIOR WALLS)
10. R-19 BATT. INSULATION (FLOOR) & RAISED FLR. W/NO CRAWSPACE.
11. R-30 BATT. INSULATION: CEILING
12. R-19 INSULATION: (ROOF RAFTER/TRUSS BAYS)
13. R-38 BATT. INSULATION (CEILING)
14. 2 X 6" DF#2 STUDS @ 16" O.C. PLUMBING WALLS.
15. 2-2 X 6 DF#2 TOP PLATE TYP.
16. 2 X 6 SOLE PLATE
17. 48" X 96" X 5.16" HARDIE HZ5 CEDAR MILL VERTICAL PANEL SIDING WITH BATTEN (OPTIONAL TO STUCCO) O/2 - LAYERS "D" PAPER O/ 1/2" CDX PLYWD. NAIL W/ 8d'S @ 6" O.C. & 12" O.C.
18. 7/8" STUCCO (3- LAYERS W/ WIRE MESH) OVER 2- LAYERS "D" PAPER O/ 1/2" CDX PLYWD. (NAIL WITH 8d NAILS @ 6" NDS., 12" FIELD O/ 1/2" CDX PLWD. (NAIL w/ 8d NAILS @ 6" O.C. ENDS, & 12" OC. FIELD

WALLS:

19. 2 X 4 DF #2 SOLE PLATE: SECURE 16d's @ 16" O. C. ,S.S.D
20. 2 X 4 DF#2 STUDS @ 16" O.C. TYPICAL
21. 2-2 X 4 DF#2 TOP PLATE TYP.
22. 4 X 12" DF#1 BM. O/ WINDOWS/DOORS U.O.N. S.S.D.
23. ½" GYP BOARD: (WALLS) & 5/8" FOR (CEILINGS)
24. 5/8" TYPE (X) GYP. BOARD FROM THE SILL PLATE THROUGH TO ROOF PLYWOOD ON GARAGE WALLS COMMON WITH LIVING (1ST. FLOOR) AND
25. TWO LAYERS min. 1/2" TYPE (X) GYP. BD. WITH 2" S.S. SCREWS @ 6" O.C. (E) & 10" O.C. @ (F) FOR GARAGE CEILING UNDER 2ND. FLOOR. (USE FIRE RATED CAULKING)
26. WEEP SCREED PER CODE (4" TO GRADE & 2" TO CONCRETE SLAB)
27. A 35 SIMPSON CLIP
28. H2.5a, HURRICANE CLIP @ EA. TRUSS
29. SIMPSON HANGER S.S.D.

FLOOR:

30. 3/4" T & G. PLYWD. SUB. FLOOR A.P.A. RATED "STURD - I FLR." (SECURED WITH GRABBER #8 SCREWS @ 6" O.C. (ENDS) & 10" O.C. (FIELD)
31. 2 X 6" FLOOR JOISTS @ 16" O.C. TYP. S.S.D. 1ST.FLOOR
32. 2 X BLOCKING VENTED @ 1SF. 150 SF. (16"X6" OR 14" X6" SCREE'D VENTS)
33. 14.0 OPEN WEB FLOOR JOISTS @ 16" O.C. S.S.D
34. OPEN WEB FLOOR JOIST & / 2 X BLOCKING UNDER ALL NEW PARALLEL & PERPENDICULAR WALLS



REV. 1

SECTION B-B

SCALE ~ ½" = 1' -0"

REVISIONS	BY
REV. 1 2 - 8 - 24	LC

PLAN COMMENTS TO: LOU@LOUCOSTANZO.COM CAST. NET 408-472-9939 CELL

7-18-23
2-8-24
Lou Costanzo

A REMODEL FOR 1ST. FLOOR & 2ND. STORY ADDITION FOR:

THE SANTOSH SHAH RESIDENCE

684 MARSHALL CT., SANTA CLARA CA. 95050

PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220

STRUCTURAL ENGINEER: TONY TRUONG PE. 408 896-0220

SECTIONS

DRAWN: LOU COSTANZO
CHECKED: S.C.
DATE: 7 - 18 - 23
SCALE: ½" = 1'-0"
JOB NO.: S2023-8
SHEET: **A5.1**
OF SHEETS

TYPICAL STAIR CONSTRUCTION: [STAIRWELL OPEN TO ABOVE]

A. **STAIR SLOPE AND RUN TO 17° ±.**
B. **3- 2" X 12" DF#1 STRINGERS**
C. **2 X SPACER W/16d's @ EACH STUD.**
D. **3/4" CDX PLYWOOD FOR STEP/RISER.**
E. **STEP: 12 INCHES, 10 INCHES MIN.**
F. **NOSE: 1 INCH**
G. **RISE: 7.5"**
H. **2 X 4 DF#2 CLEAT W/3- 16'S**
I. **2 X FIRE BLOCKING AT 8FT. MAX.**
J. **USE 5/8" TYPE (X) GYP. BOARD ON UNDERSIDE OF STAIRCASE.**
K. **HANDRAIL W/2 X BLOCKING AT 34"-38" HIGH, 1 1/2" SPACED BETWEEN WALL AND HANDRAIL WITH METAL BRACKETS.**
L. **2ND. FLOOR 42" PONY WALL W/2 X 6" FINISHED CAP S.S.D. OR RAILING/WITH BALUSTRADE 42". HIGH. SPACED < 3 3/4".**

NOTE: ANY ROOF OVERHANG INTO SETBACKS & WITHIN 4FT. OF PROPERTY LINE SHALL HAVE UNDEREAVE FIRE-PROTECTION. SEE DET.1 /E1

FLOOR BEAM LIST

54. **FLOOR BM. 1: 5.25" X 14.0" 2.2E PSL BM.** W/HGUS5.50/12 FACE MT. HANGER & EPCZ'S HANG. BM. CONN. & 4 X 6 DF#1. POST. BM. SUPPORT
55. **FLOOR BM. 2: 5.25" X 14.0" 2.2E PSL BM.** W/HGUS5.50/12 FACE MT. HANGER & EPCZ'S HANG. BM. CONN. & 4X6" DF1 POST BM. SUPPORT
56. **FLOOR BM. 3: 5.25" X 14.0" 2.2E PSL BM.** W/ EPCZ'S &PCZ'S POST CAP
57. **FLOOR BM. 4: 3.5" X 14.0" 2.2E PSL BM.** W/HGUS4 12 HANG. S.S.D.
58. **FLOOR BM. 5: 5.25" X 14.0" 2.2E PSL BM. S.S.D.**
59. **FLOOR BM. 6: 3.5" X 14.0" 2.2E PSL BM. S.S.D.**
60. **FLOOR BM. 7: 3.5" X 14.0" 2.2E PSL BM. S.S.D.**
61. **FLOOR BM. 8: 3.5" X 14.0" 2.2E PSL BM. S.S.D.**
62. **FLOOR BM. 9: 5.25" X 14.0" 2.25 PSL BM.** W/BC TO HEADER S.S.D.
63. **FLOOR BM. 10: 3.5" X 14.0" 2.2E PSL BM.** W/BC & HGUS4 12 HANGER & FAC5 MT. & BC TO HDR./FLOOR BM.4X4 POST BM. SUPPORT.

BALLOON FRAMING WALL AT STAIRCASE:

64. **2 X 6" DF#2 STUDS @ 16" O.C. (UNO) S.S.D.**
65. **DBL 2X6 DF #2 TOP PLATE**
66. **2 X 6 DF # 2 BOTTOM PLATE**

FOUNDATION

35. **2"X 6" PTDF MUDSILL** WITH 5/8" A.B. @ 48" O.C. U.N.O. S.S.D.
36. **4"X 6" PTDF GIRDERS TYP. S.S.D.**
37. **GRADE SOIL** AWAY FROM FDN. 5% AT 10-0"
38. **5" THICK CONC. SLAB** W/#4 BARS AT 16" O.C. EA. WAY @ MIDSPAN O/ 15 MIL. MOISTURE BARRIER O/ 6" 3/4" CLEAN CRUSHED ROCK. SSD.
39. **DBL. 2 X BLOCKING UNDER WALLS S.S.D.**
40. **26 GA. G.I. FLASHING**
41. **PREFAB COLLECTOR TRUSS PER MFG.**
42. **2 X 4 BLOCK'G**
43. **STAIRCASE BEYOND**
44. **WALL BEYOND SEE S.S.D.**
45. **STC CLIPS @ 32" O.C.** TO CLIP INTERIOR WALLS TO TRUSSES/BLKG
46. **2-2 X BLOCKING UNDER 1ST. FLOOR WALLS**
47. **2 X BLOCKING**
48. **2 X FIRE BLOCKING AT 8FT.**
49. **2 X 8' DF#1 F.J. @ 16" O.C. S.S.D.**
50. **MST STRAP S.S.D.**
51. **8 INCHES CLEAR FROM SOIL,** MINIMUM, TO WOOD STRUCTURE.
52. **18 INCHES DEEP TO BOTTOM OF FOUNDATION**
53. **18 INCHES MIN. FROM BOTTOM OF F.J. TO SOIL**

SIDING WITH BATTEN (OPTIONAL TO STUCCO) O/2 - LAYERS "D" PAPER O/ 1/2" CDX PLYWD. NAIL W/ 8d'S @ 6" O.C. & 12" O.C.

18. **7/8" STUCCO** (3- LAYERS W/ WIRE MESH) OVER 2- LAYERS "D" PAPER O/ 1/2" CDX PLYWD. (NAIL WITH 8d NAILS @ 6" NDS., 12" FIELD O/ 1/2" CDX PLWD. (NAIL w/ 8d NAILS @ 6" O.C. ENDS, & 12" OC. FIELD

WALLS:

19. **2 X 4 DF #2 SOLE PLATE:** SECURE 16d's @ 16" O. C. S.S.D
20. **2 X 4 DF#2 STUDS** @ 16" O.C. TYPICAL
21. **2-2 X 4 DF#2 TOP PLATE** TYP.
22. **4 X 12" DF#1 BM.** O/ WINDOWS/DOORS U.O.N. S.S.D.
23. **½" GYP BOARD:** (WALLS) & **5/8" FOR** (CEILINGS)
24. **5/8" TYPE (X) GYP. BOARD FROM THE SILL PLATE THROUGH TO ROOF PLYWOOD ON GARAGE WALLS COMMON WITH LIVING (1ST. FLOOR) AND**
25. **TWO LAYERS min. 1/2" TYPE (X) GYP. BD.** WITH 2" S.S. SCREWS @ 6" O.C. (E) & 10" O.C. @ (F) FOR GARAGE CEILING UNDER 2ND. FLOOR. (USE FIRE RATED CAULKING)
26. **WEEP SCREED** PER CODE (4" TO GRADE & 2" TO CONCRETE SLAB)
27. **A 35 SIMPSON CLIP**
28. **H2.5a. HURRICANE CLIP @ EA. TRUSS**
29. **SIMPSON HANGER S.S.D.**

FLOOR:

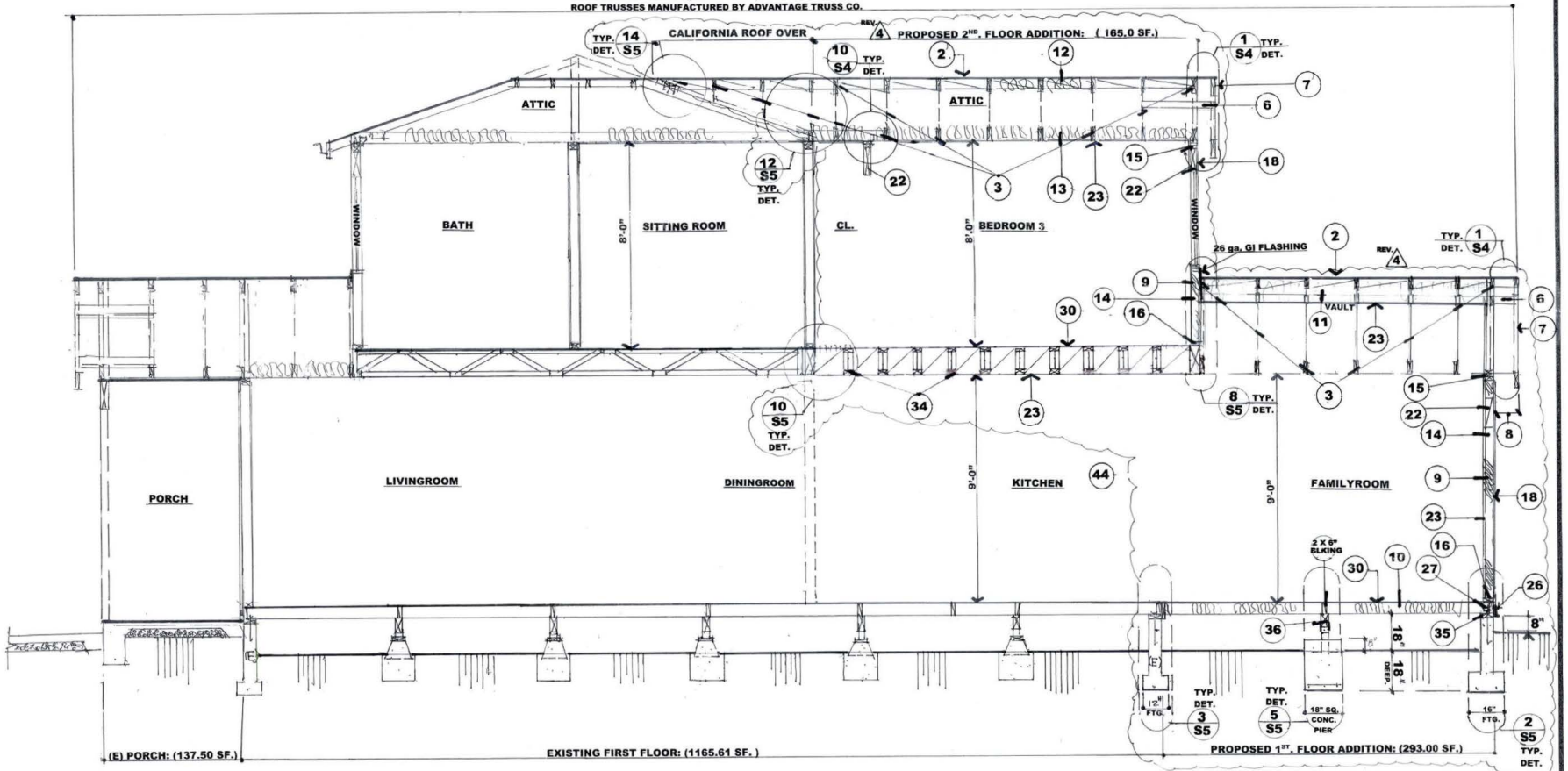
30. **3/4" T & G. PLYWD. SUB. FLOOR A.P.A. RATED "STURD - I FLR."** (SECURED WITH GRABBER #8 SCREWS @ 6" O.C. (ENDS) & 10" O.C. (FIELD)
31. **2 X 6" FLOOR JOISTS @ 16" O.C. TYP. S.S.D. 1ST.FLOOR**
32. **2 X BLOCKING** VENTED @ 1SF. 150 SF. (16"X6" OR 14" X6" SCREE'D VENTS)
33. **14.0 OPEN WEB FLOOR JOISTS @ 16" O.C. S.S.D**
34. **OPEN WEB FLOOR JOIST & / 2 X BLOCKING** UNDER ALL NEW PARALLEL & PERPENDICULAR WALLS

APPROVAL STAMP

ROOF/ CEILING: **THE SANTOSH SHAH RESIDENCE**

1. **GI GUTTER** O/ 2X FASCIA W/DOWNSPOUTS TO FRENCH DRAIN. TYP.
2. **50 YR. PRESIDENTIAL (C) COMP. ROOF'G** IC ES ESR 1389 O/ **2 layers** OF 30# FELT O/ ½" CDX/ FOIL-BACKED, A.P.A. RATED. PLYWD (NAIL W/ 8d'S @ 6" O.C. (E) 12" O.C. (FIELD). SECURE ROOF'G WITH **CORRISION** RESISTANT FASTENERS (CRC **R905.2.5 & R905.2.6)**
3. **MFG. TRUSSES BY ADVANTAGE TRUSS CO.** @ 24" O.C. SEE ATTACHED FOR DESIGNS AND CALCS.
4. **½" T & G DECK'G** @ EAVES, OVER- HANGS & PORCH CEIL'G. (U.O.N.)
5. **2 X BLOCKING VENTED** W/3-2"dia. HOLES EA. BLOCK W/#4 MESH) **U.N.O.**
6. **2 X 4" OUTRIGGERS @ 24" O.C. TYP.**
7. **2 X 8" MIN. BARGE(END) RAFTERS** OPTIONAL
8. **12" OVERHANGS & 12" EAVES. TYP. U.O.N.**
9. **R-15 BATT. INSULATION (EXT. & INTERIOR WALLS)**
10. **R-19 BATT. INSULATION (FLOOR) & RAISED FLR. W/NO CRAWSPACE.**
11. **R-30 CLOSED CELL INSULATION**
12. **R-19 INSULATION: (ROOF RAFTER/TRUSS BAYS)**
13. **R-38 BATT. INSULATION (CEILING)**
14. **2 X 6" DF#2 STUDS @ 16" O.C.** PLUMBING WALLS.
15. **2-2 X 6 DF#2 TOP PLATE TYP.**
16. **2 X 6 SOLE PLATE**
17. **48" X 96" X 5.16" HARDIE HZ5 CEDAR MILL VERTICAL PANEL**

50 YEAR "A" COMPOSITION ROOF'G, ICC ES ESER 1389 TYP.
O/30# FELT O/ 1/2" CDX, FOILBACKED, PLYWOOD. NAIL W/ 8d's @ 6" O.C. (ENDS) & 12" O.C. (FIELD). SECURE WITH CORROSION RESISTANT FASTENERS (CRC R905.2.5) OVER ENGINEERED ROOF TRUSSES MANUFACTURED BY ADVANTAGE TRUSS CO.



SECTION C-C

SCALE ~ ½" = 1" - 0"

REVISIONS		BY
REV.		
4	8 - 12 -24	L.C.

A REMODEL FOR 1ST. FLOOR & 2ND. STORY ADDITION FOR:
THE SANTOSH SHAH RESIDENCE
684 MARSHALL CT., SANTA CLARA CA. 95050
PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220
STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

PLAN COMMENTS TO: LOU@LOUCOSTANZO.COM CAST.NET 408-472-9829 CELL

8-12-24 Lou Costanzo

PLAN SECTIONS

DRAWN: LOU COSTANZO
CHECKED: S.C.
DATE: 8 - 12 - 24
SCALE: ½" = 1'-0"
JOB NO.: S2023-8
SHEET: A5.2R REV. 4
REVISION
OF SHEETS

1. Revise Table R602.3(1) as follows:

TABLE R602.3(1)
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER	SPACING OF FASTENERS
		Roof	
1	Blocking between joists or rafters to top plate, toe nail	3-8d (2 ½" x 0.113")	-
2	Ceiling joists to plate, toe nail	3-8d (2 ½" x 0.113")	-
3	Ceiling joist not attached to parallel rafter, laps over partitions, face nail	3-10d	-
4	Collar tie to rafter, face nail, or 1-1/4" x 20 gage ridge strap	3-10d (3" x 0.128")	-
5	Rafter to plate, toe nail	2-16d (3 ½" x 0.135")	-
6	Roof rafters to ridge, valley or hip rafters: toe nail face nail	 4-16d (3 ½" x 0.135") 3-16d (3 ½" x 0.135")	-
		Wall	
7	Built-up corner studs –face nail	10d (3" x 0.128")	24" o.c.
8	Abutting studs at intersecting wall corners, face nail	16d (3 ½" x 0.135")	12"oc
9	Built-up header, two pieces with ½"spacer	16d (3½" × □0.135")	16" o.c. along each edge
10	Continued header, two pieces	16d (3½" × □0.135")	16" o.c. along each edge
11	Continuous header to stud, toe nail	4-8d (2 ½" x 0.113")	-
12	Double studs, face nail	10d (3" x 0.128")	24" o.c.
13	Double top plates, face nail	10d (3" x 0.128")	24" o.c
14	Double top plates, minimum 24-inch offset of end joints, face nail in lapped area	8-16d (3½" × □0.135")	-
15	Sole plate to joist or blocking, face nail	16d (3½" × □0.135")	16" o.c.
16	Sole plate to joist or blocking at braced wall panels	3-16d (3½" × □0.135")	16" o.c.
17	Stud to sole plate, toe nail	3-8d (2 ½" x 0.113") or 2-16d (3½" × □0.135")	-
18	Top or sole plate to stud, end nail	2-16d (3½" × □0.135")	-
19	Top plates, laps at corners and intersections, face nail	2-10d (3" x 0.128")	-
20	1" brace to each stud and plate, face nail	2-8d (2 ½" x 0.113") 2 staples 1¾"	-
21	1" × 6" sheathing to each bearing, face nail	2-8d (2 ½" x 0.113") 2 staples 1¾"	-
22	1" × 8" sheathing to each bearing, face nail	2-8d (2 ½" x 0.113") 3 staples 1¾"	-
23	Wider than 1" × 8" sheathing to each bearing, face nail	3-8d (2 ½" x 0.113") 4 staples 1¾"	-
24	Joist to sill or girder, toe nail	3-8d (2 ½" x 0.113")	-
25	Rim joist to top plate, toe nail (roof applications also)	8d (2 ½" x 0.113")	6" o.c.
26	Rim joist or blocking to sill plate, toe nail	8d (2 ½" x 0.113")	6" o.c.
27	1" × 6" subfloor or less to each joist, face nail	24 27 2-8d (2 ½" x 0.113") 2 staples 1¾"	-
28	2" subfloor to joist or girder, blind and face nail	2-16d (3½" × □0.135")	-
29	2" planks (plank & beam – floor & roof)	2-16d (3½" × □0.135")	at each bearing
30	Built up girders and beams, 2-inch lumber layers	10d (3" x 0.128")	Nail each layer as follows: 32"□o.c. at top and bottom and staggered. Two nails at ends and at each splice.
31	Ledger strip supporting joists or rafters	3-16d (3½" × □0.135")	At each joist or rafter

(Remainder of table unchanged except item numbers)

63. **FLOOR BM. 10: 3.5" X 14.0" 2.2E PSL BM.** W/BC & HGUS4 12 HANGER & FACS MT. & BC TO HDR./FLOOR BM.4X4 POST BM. SUPPORT.

BALLOON FRAMING WALL AT STAIRCASE: REV. 1

64. **2 X 6" DF#2 STUDS @ 16" O.C. (UNO) S.S.D.**
65. **DBL 2X6 DF #2 TOP PLATE**
66. **2 X 6 DF # 2 BOTTOM PLATE**

TYPICAL STAIR CONSTRUCTION: [STAIRWELL OPEN TO ABOVE]

A. **STAIR SLOPE AND RUN TO 17" ±.**
B. **3- 2" X 12" DF#1 STRINGERS**
C. **2 X SPACER W/16d's @ EACH STUD.**
D. **3/4" CDX PLYWOOD FOR STEP/RISER.**
E. **STEP: 12 INCHES, 10 INCHES MIN.**
F. **NOSE: 1 INCH**
G. **RISE: 7.5"**
H. **2 X 4 DF#2 CLEAT W/3- 16'S**
I. **2 X FIRE BLOCKING AT 8FT. MAX.**
J. **USE 5/8" TYPE (X) GYP. BOARD ON UNDERSIDE OF STAIRCASE.**
K. **HANDRAIL W/2 X BLOCKING AT 34"-36" HIGH, 1 1/2" SPACED BETWEEN WALL AND HANDRAIL WITH METAL BRACKETS.**
L. **2ND. FLOOR 42" PONY WALL W/2 X 6" FINISHED CAP S.S.D. OR RAILING/WITH BALUSTRADE 42". HIGH. SPACED < 3 3/4".**

NOTE: ANY ROOF OVERHANG INTO SETBACKS & WITHIN 4FT. OF PROPERTY LINE SHALL HAVE UNDEREAVE FIRE-PROTECTION. SEE DET.1 /E1

ROOF/ CEILING: **THE SANTOSH SHAH RESIDENCE**

1. **GI GUTTER** O/ 2X FASCIA W/DOWNSPOUTS TO FRENCH DRAIN. TYP.
2. **50 YR. PRESIDENTIAL (C) COMP. ROOF'G** IC ES ESR 1389 O/ **2 layers** OF 30# FELT O/ ½" CDX/ FOIL-BACKED, A.P.A. RATED. PLYWD (NAIL W/ 8d'S @ 6" O.C. (E) 12" O.C. (FIELD). SECURE ROOF'G WITH **CORRISION** RESISTANT FASTENERS (CRC **R905.2.5 & R905.2.6**)
3. **MFG. TRUSSES BY ADVANTAGE TRUSS CO.** @ 24" O.C. SEE ATTACHED FOR DESIGNS AND CALCS.
4. **½" T & G DECK'G** @ EAVES, OVER- HANGS & PORCH CEIL'G. (U.O.N.)
5. **2 X BLOCKING VENTED** W/3-2"dia. HOLES EA. BLOCK W/#4 MESH) **U.N.O.**
6. **2 X 4" OUTRIGGERS @ 24" O.C. TYP.**
7. **2 X 8" MIN. BARGE(END) RAFTERS** OPTIONAL
8. **12" OVERHANGS & 12" EAVES. TYP. U.O.N.**
9. **R-15 BATT. INSULATION (EXT. & INTERIOR WALLS)**
10. **R-19 BATT. INSULATION (FLOOR) & RAISED FLR. W/NO CRAWSPACE.**
11. **R-30 BATT. INSULATION: (VAULTED CEILING)**
12. **R-19 INSULATION: (ROOF RAFTER/TRUSS BAYS)**
13. **R-38 BATT. INSULATION (CEILING)**
14. **2 X 6" DF#2 STUDS @ 16" O.C.** PLUMBING WALLS.
15. **2-2 X 6 DF#2 TOP PLATE TYP.**
16. **2 X 6 SOLE PLATE**
17. **48" X 96" X 5.16" HARDIE HZ5 CEDAR MILL VERTICAL PANEL SIDING WITH BATTEN** (OPTIONAL TO STUCCO) O/2 - LAYERS "D" PAPER O/ 1/2" CDX PLYWD. NAIL W/ 8d'S @ 6" O.C. & 12" O.C.
18. **7/8" STUCCO** (3- LAYERS W/ WIRE MESH) OVER 2- LAYERS "D" PAPER O/ 1/2" CDX PLYWD. (NAIL WITH 8d NAILS @ 6" NDS., 12" FIELD O/ 1/2" CDX PLWD. NAIL w/ 8d NAILS @ 6" O.C. ENDS, & 12" OC. FIELD

WALLS:

19. **2 X 4 DF #2 SOLE PLATE:** SECURE 16d's @ 16" O. C. ,S.S.D
20. **2 X 4 DF#2 STUDS** @ 16" O.C. TYPICAL
21. **2-2 X 4 DF#2 TOP PLATE** TYP.
22. **4 X 12" DF#1 BM.** O/ WINDOWS/DOORS U.O.N. S.S.D.
23. **½" GYP BOARD:** (WALLS) & **5/8" FOR** (CEILINGS)
24. **5/8" TYPE (X) GYP. BOARD FROM THE SILL PLATE THROUGH TO ROOF PLYWOOD ON GARAGE WALLS COMMON WITH LIVING (1ST. FLOOR) AND**
25. **TWO LAYERS min. 1/2" TYPE (X) GYP. BD.** WITH 2" S.S. SCREWS @ 6" O.C. (E) & 10" O.C. @ (F) FOR GARAGE CEILING UNDER 2ND. FLOOR. (USE FIRE RATED CAULKING)
26. **WEEP SCREED** PER CODE (4" TO GRADE & 2" TO CONCRETE SLAB)
27. **A 35 SIMPSON CLIP**
28. **H2.5a. HURRICANE CLIP @ EA. TRUSS**
29. **SIMPSON HANGER S.S.D.**

FLOOR:

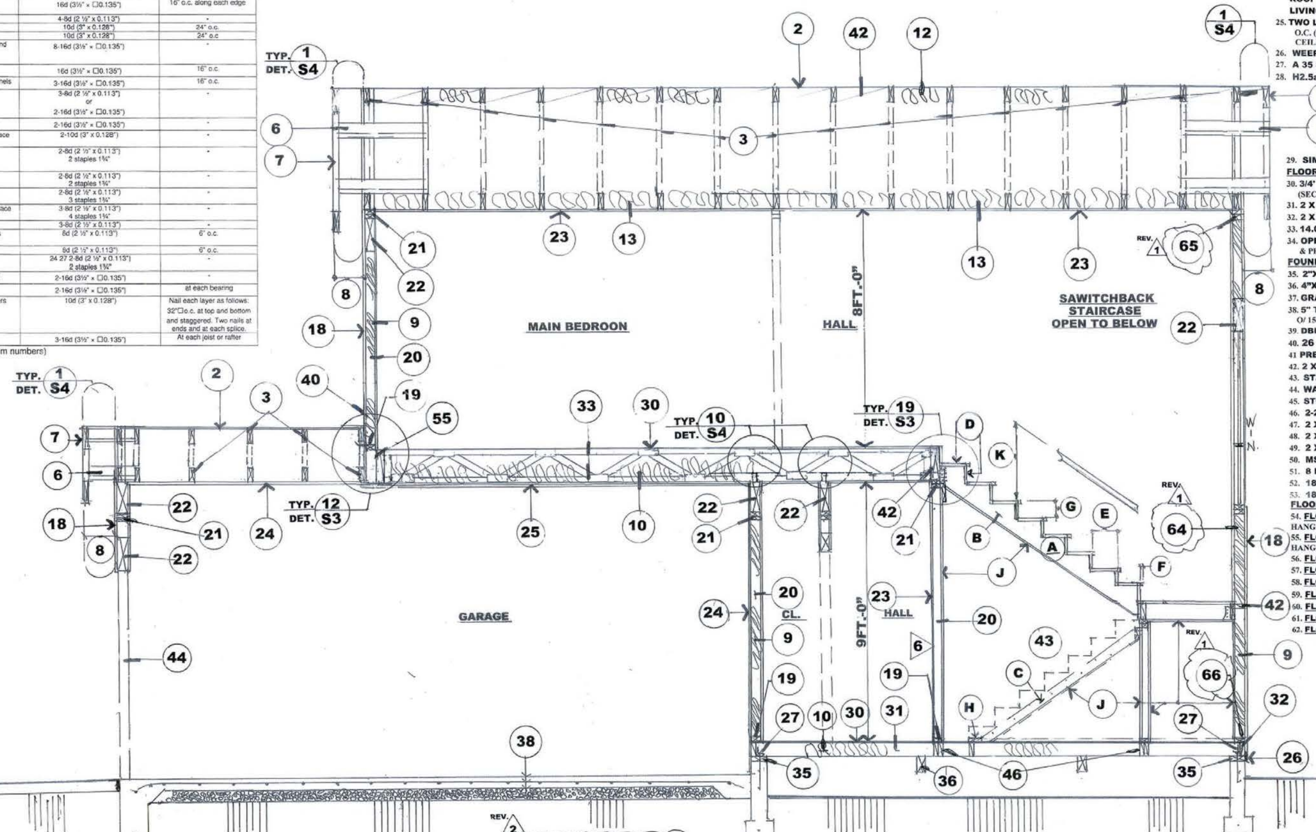
30. **3/4' T & G. PLYWD. SUB. FLOOR A.P.A. RATED "STURD - I FLR."** (SECURED WITH GRABBER #8 SCREWS @ 6" O.C. (ENDS) & 10" O.C. (FIELD)
31. **2 X 6" FLOOR JOISTS @ 16" O.C. TYP. S.S.D. 1ST.FLOOR**
32. **2 X BLOCKING** VENTED @ 1SF. 150 SF. (16"X6" OR 14" X6" SCREE'D VENTS)
33. **14.0 OPEN WEB FLOOR JOISTS @ 16" O.C. S.S.D**
34. **OPEN WEB FLOOR JOIST & / 2 X BLOCKING** UNDER ALL NEW PARALLEL & PERPENDICULAR WALLS

FOUNDATION

35. **2"X 6" PTDF MUDSILL** WITH 5/8" A.B. @ 48" O.C. U.N.O. S.S.D.
36. **4"X 6" PTDF GIRDERS TYP. S.S.D.**
37. **GRADE SOIL** AWAY FROM FDN. 5% AT 10-0"
38. **5" THICK CONC. SLAB** W/#4 BARS AT 16" O.C. EA. WAY @ MIDSPAN O/ 15 MIL. MOISTURE BARRIER O/ 6" 3/4" CLEAN CRUSHED ROCK. SSD.
39. **DBL. 2 X BLOCKING UNDER WALLS S.S.D.**
40. **26 GA. G.I. FLASHING**
41. **PREFAB COLLECTOR TRUSS PER MFG.**
42. **2 X 4 BLOCK'G** W/ 2-16d's @ EA. ROOF TRUSS.
43. **STAIRCASE BEYOND**
44. **WALL BEYOND SEE S.S.D.**
45. **STC CLIPS @ 32" O.C.** TO CLIP INTERIOR WALLS TO TRUSSES/BLKG
46. **2-2 X BLOCKING UNDER 1ST. FLOOR WALLS**
47. **2 X 6" BLOCKING W/A35 FLAT CLIPS**
48. **2 X FIRE BLOCKING AT 8FT.**
49. **2 X 8' DF#1 F.J. @ 16" O.C. S.S.D.**
50. **MST STRAP S.S.D.**
51. **8 INCHES CLEAR FROM SOIL,** MINIMUM, TO WOOD STRUCTURE.
52. **18 INCHES DEEP TO BOTTOM OF FOUNDATION**
53. **18 INCHES MIN. FROM BOTTOM OF F.J. TO SOIL**

FLOOR BEAM LIST

54. **FLOOR BM. 1: 5.25" X 14.0" 2.2E PSL BM.** W/HGUS5.50/12 FACE MT. HANGER & EPCZ'S HANG. BM. CONN. & 4 X 6 DF#1. POST. BM. SUPPORT
55. **FLOOR BM. 2: 5.25" X 14.0" 2.2E PSL BM.** W/HGUS5.50/12 FACE MT. HANGER & EPCZ'S HANG. BM. CONN. & 4X6" DF1 POST BM. SUPPORT
56. **FLOOR BM. 3: 5.25" X 14.0" 2.2E PSL BM.** W/ EPCZ'S &PCZ'S POST CAP
57. **FLOOR BM. 4: 3.5" X 14.0" 2.2E PSL BM.** W/HGUS4 12 HANG. S.S.D.
58. **FLOOR BM. 5: 5.25" X 14.0" 2.2E PSL BM. S.S.D.**
59. **FLOOR BM. 6: 3.5" X 14.0" 2.2E PSL BM. S.S.D.**
60. **FLOOR BM. 7: 3.5" X 14.0" 2.2E PSL BM. S.S.D.**
61. **FLOOR BM. 8: 3.5" X 14.0" 2.2E PSL BM. S.S.D.**
62. **FLOOR BM. 9: 5.25" X 14.0" 2.25 PSL BM.** W/BC TO HEADER S.S.D.



SECTION A-A
SCALE ~ ½" = 1" – 0"

REVISIONS	BY
REV. 1 2 - 8 - 24	LC

A REMODEL FOR 1ST. FLOOR & 2ND. STORY ADDITION FOR:
THE SANTOSH SHAH RESIDENCE
684 MARSHALL CT., SANTA CLARA CA. 95050

PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220
STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220
PLAN COMMENTS TO: LOUCOSTANZO@COMCAST.NET 408-472-9829 CELL

7-18-23
2-8-24
Lou Costanzo

SECTIONS

DRAWN LOU COSTANZO
CHECKED S.C.
DATE 7 - 18 - 23
SCALE ½" = 1'-0"
JOB NO. S2023-8
SHEET **A5**
OF SHEETS

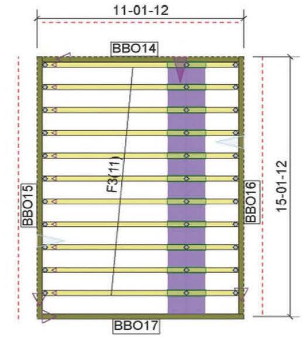
684 Marshall Court

Job# 627-23F /

Revised 9/4/24

Advantage Truss Company LLC
LIC#992539
831-635-0377
2025 San Juan Rd, Hollister, CA 95023

FLOOR TRUSSES



ABOVE PLACEMENT PLAN PROVIDED FOR TRUSS PLACEMENT ONLY. REFER TO TRUSS CALCULATIONS AND ENGINEERED DRAWINGS FOR ALL FURTHER INFORMATION. BUILDING DESIGNER/ENGINEER OF RECORD RESPONSIBLE FOR ALL NON-TRUSS TO TRUSS CONNECTIONS. BUILDING DESIGNER/ENGINEER OF RECORD TO REVIEW AND APPROVE OF ALL DESIGNS PRIOR TO CONSTRUCTION.

BUILDER:		DRAWN BY:	E.M.
PROJECT TITLE:	# 627-23	CHECKED BY:	
PLAN:	Floor Truss	ISSUE DATE:	09/18/23
DELIVERY LOCATION:	684 Marshall Ct. Santa Clara, CA	REVISION:	

Advantage Truss Company LLC
LIC#992539
831-635-0377
2025 San Juan Rd, Hollister, CA 95023

All designs property of ADVANTAGE TRUSS CO LLC. All designs null and void if not fabricated by ADVANTAGE TRUSS CO LLC.

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BUILDER:		DRAWN BY:	E.M.
PROJECT TITLE:	# 627-23	CHECKED BY:	
PLAN:	Roof Truss	ISSUE DATE:	09/18/23
DELIVERY LOCATION:	684 Marshall Ct. Santa Clara, CA	REVISION:	

Advantage Truss Company LLC
LIC#992539
831-635-0377
2025 San Juan Rd, Hollister, CA 95023

All designs property of ADVANTAGE TRUSS CO LLC. All designs null and void if not fabricated by ADVANTAGE TRUSS CO LLC.

REVISIONS	BY

A REMODEL FOR 1ST. FLOOR & 2ND. STORY ADDITION FOR:

THE SANTOSH SHAH RESIDENCE

684 MARSHALL CT., SANTA CLARA CA. 95050

PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220

STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

PLAN COMMENTS TO:
LOUCOSTANZO@COMCAST.NET
408-472-9829 CELL
9-18-23
2-8-24
Lou Costanzo

Advantage Truss Company LLC
831-635-0377
2025 San Juan Rd, Hollister, CA 95023

DRAWN	EM
CHECKED	EM
DATE	9-18-23
SCALE	
JOB NO.	627-23
SHEET	A6

OF SHEETS

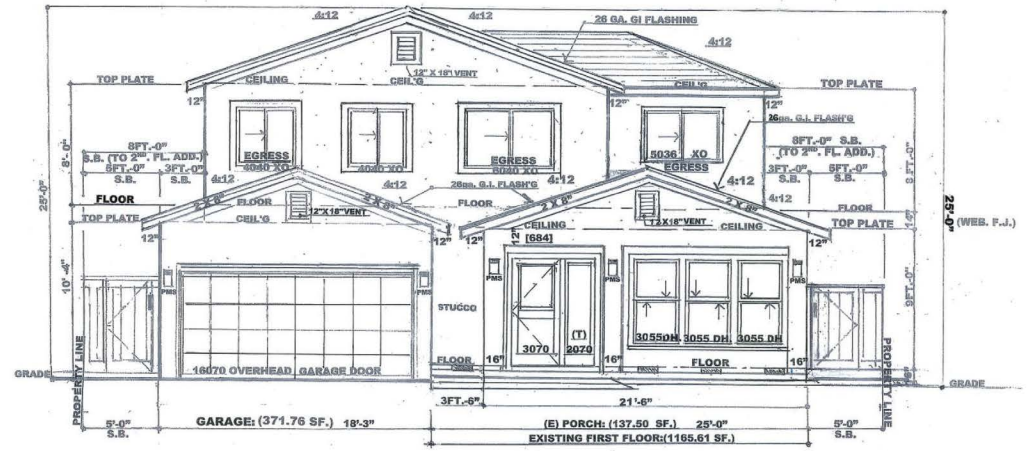
VENTILATION CALCULATIONS

THE SANTOSH SHAH RESIDENCE

1. SUB FLOOR: 1165.61 SF. + 293.00 ADD. =1459.00 SF.
   1459.00 SF.-/- 150.00 SF. = 9.73 X 144 = 1401.12S.I.
   (VERIFY & PROVIDE) 16" X 6" FDN. SIZE
   14" x 6" = 84 S.I. WITH EFF. 52 S.I. /VENT PER MFG. SPECS
   1401.12 S.I. -/- 52.0 S.I. = 26.94 OR 27 FDN.VENTS
   (VERIFY OR PROVIDE FDN VENTS)
2. GARAGE ATTIC VENTILATION: 189.63 SF.
   (8.5' X 18.3'=155.13 SF.) + (11.5' X 3.0'=34.5 SF.) =
   189.63 SF. -/- 300 = 0.63 SF. X 144 = 91.01 -/- 2 = 45.41 S.I.
   INSTALLED AT LEVEL:
   WITHIN 3FT. ABOVE WALL TOP PLATE 45.41 S.I.
   (FIRE-RATED EAVES):
   (NO UNDER EAVE BLOCK'G HOLES ALLOWED)
   INSTALL (1) MASTER FLOW ROOF VENT @ 60 S.I.
   60.0 S.I. > 45.41 S.I. OK.
   WITHIN 3 FT. BELOW RIDGE
   PROVIDE (1) WALL VENT 12" X 18" = 216 S.I.
   216 S.I. X .60 EFF. = 129.6
   129.6 S.I. > 45 S.I. OK.
   TOTAL GARAGE ATTIC VENTILATION:
   (1) MASTER FLOW ROOF VENT
   (1) EAVE WALL VENT
3. FIRST FLOOR (LIVING) ATTIC:
   LEFTSIDE: 57.0 SF. INSTALL
   WITHIN 3FT. ABOVE WALL TOP PLATE
   (FIRE-RATED UNDER EAVE BLK'G VENTS)
   (NO UNDER EAVE BLK'G VENTS ALLOWED).
   3'-0" X 19'-0" = 57.0 SF. -/- 150 = .38 X 144 = 54.72 S.I.
   INSTALL: (1) MASTER FLOW VENT = 60 S.I.
   60 S.I. > 54.72 S.I. OK.
   RIGHTSIDE: 53.01 SF. (FIRE-RATED UNDER EAVES)
   18.67' X 3.0' = 53.01 SF. -/- 150 = 0.3534 X 144 = 50.9 S.I.
   INSTALL (1) MASTER FLOW VENT = 60 S.I.
   (NO UNDER EAVE BLK'G VENT HOLES ALLOWED).
   60 S.I. S.I. > 50.9 S.I. OK.
   FRONT: 106.25 SF. (4.25' X 25.00' = 106.25 SF.)
   106.25 -/- 300 = 0.3542 X 144 = 51.0 -/- 2 = 25.5 S.I.
   WITHIN 3 FT. ABOVE TOP PLATE: 25.5 S.I.
   PROVIDE (1) VENTED SCREEN BLOCK:
   @ 22" X 4" = 88 S.I. X .60 EFF. = 52.8 S.I.
   1 X 52.8 S.I. = 52.8 S.I. > 25.50 S.I.
   WITHIN 3 FT. OF RIDGE: 25.50 S.I.
   INSTALL (1) EYEBROW VENT @ 100 S.I.
   100 S.I. > 25.50 S.I. OK

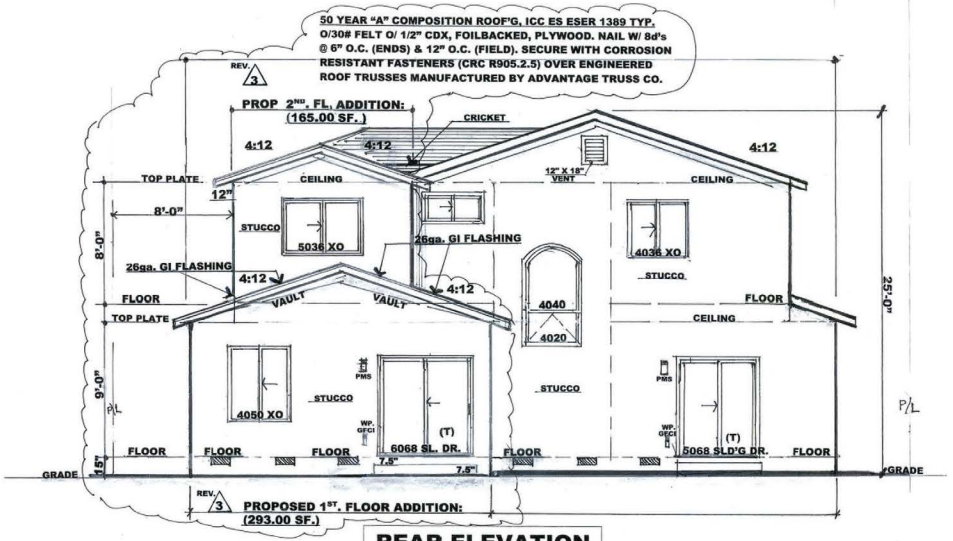
REAR:
FAMILYRM . ATTIC: 293.00 SF. USE SMALL CELL FOAM.
WITHIN 3 FT. OF WALL TOP PLATE: 49.83 S.I.
PROVIDE (1) SCREEN'D BLOCK VENT:
22" X 4" = 88 S.I. X .60 EFF. = 52.8 S.I. PER VENTED BLOCK.
52.8 S.I. > 49.83 S.I. OK.
WITHIN 3 FT. OF RIDGE: 49.83 S.I.
PROVIDE (1) EYEBROW VENT @ 100 S.I.
100 S.I. > 49.83 S.I. OK
TOTAL FIRST FLOOR ATTIC VENTILATION:
(1) EYEBROW VENT
(12) SCREEN'D VENTS

4. SECOND FLOOR ATTIC VENTILATION: 1140.32 SF.
   1140.32 SF. -/- 300 = 3.80 X 144 = 547.35 S.I. -/- 2 = 273.68 S.I.
   WITHIN 3FT. BELOW RIDGE: 273.68 S.I.
   12" X 18" GABLE WALL VENT
   12" X 18" = 216 S.I. X .60 EFF. = 129.5 S.I. PER VENT
   PROVIDE (3) GABLE VENTS
   129.5 X 2 = 259.0 S.I. 388.5 S.I. > 234.0 S.I. OK
   WITHIN 3FT. ABOVE WALL TOP PLATE: 234.0 S.I.
   PROVIDE (3) EYEBROW VENTS @ 100 S.I. NET EA.
   300 S.I. > 234.0 S.I. OK
   TOTAL SECOND FLOOR ROOF VENTILATION:
   (2) GABLE WALL VENTS
   (3) EYEBROW VENTS
5. PORCH ATTIC: 115.50 SF.
   (21'-0" X 5'-6" = 115.50 S.F.)
   115.5 S.I. -/- 300 = 0.39 X 144 = 55.44 S.I. -/- 2 = 27.72 S.I.
   WITHIN 3 FT. ABOVE WALL TOP PLATE
   (FIRE-RATED UNDER EAVE VENT BLK'G REQ.)
   PROVIDE (1) ROOF VENT @ 30 S.I.
   30 S.I. > 27.72 S.I. OK
   WITHIN 3FT. OF RIDGE: 27.72 S.I.
   INSTALL (1)12" X 18" GWV = 129.50 S.I.
   129.50 S.I. > 27.72 S.I. OK
   (FOR ARCH. APPEARANCE)



FRONT ELEVATION

SCALE ~ ¼' = 1' – 0"



REAR ELEVATION

SCALE ~ ¼" = ` 1'- 0"

REVISIONS		BY
REV. 3	8-12-24	L.C.

A REMODEL FOR 1ST. FLOOR & 2ND. FLOOR ADDITION FOR:

THE SANTOSH SHAH RESIDENCE

684 MARSHALL CT., SANTA CLARA CA. 95050

PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220

STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

PLAN COMMENTS TO: LOUCOSTANZO@COMCAST.NET 408-472-5923 CELL

lou costanzo

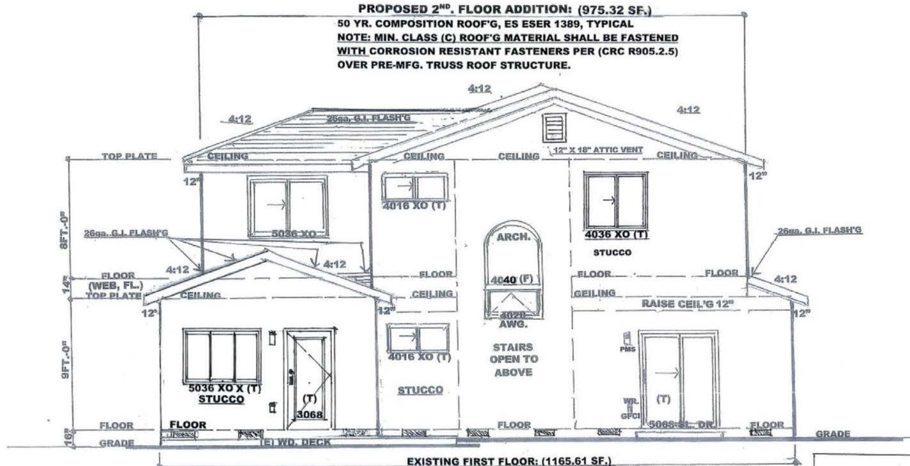
ELEVATIONS

DRAWN	LOU COSTANZO
CHECKED	S.C.
DATE	8 - 12 - 24
SCALE	1/4" = 1'-0"
JOB NO.	S2023-8
SHEET	A7R REVISION REV. 3
OF	SHEETS

VENTILATION CALCULATIONS

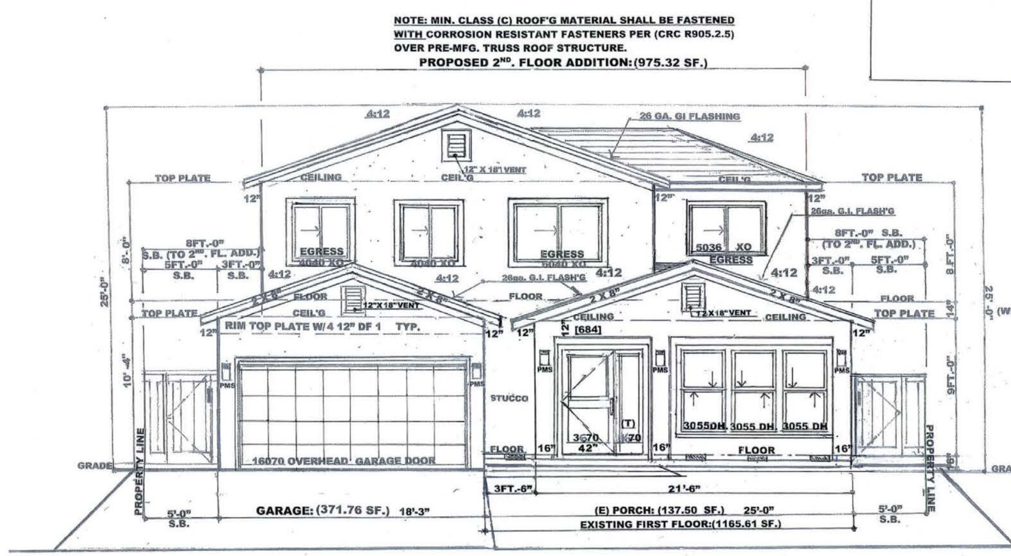
THE SANTOSH SHAH RESIDENCE

1. SUB FLOOR: 1165.61 SF.
   1165.61 SF.-/- 150.00 SF. = 7.77 X 144 = 1119.00 S.I.
   (VERIFY & PROVIDE) 16" X 6" FDN. SIZE
   14" x 6" = 84 S.I. WITH EFF. 52 S.I. /VENT PER MFG. SPECS
   1119.00 S.I. -/- 52.0 S.I. = 21.52 OR 22 FDN.VENTS
   (VERIFY OR PROVIDE FDN VENTS)
2. GARAGE ATTIC VENTILATION: 189.63 SF.
   (8.5' X 18.3'=155.13 SF.) + (11.5' X 3.0'=34.5 SF.) =
   189.63 SF. -/- 300 = 0.63 SF. X 144 = 91.01 -/- 2 = 45.41 S.I.
   INSTALLED AT LEVEL:
   WITHIN 3FT. ABOVE WALL TOP PLATE 45.41 S.I. REV. 1
   (FIRE-RATED EAVES):
   (NO UNDER EAVE BLOCK'G HOLES ALLOWED)
   INSTALL (1) MASTER FLOW ROOF VENT @ 60 S.I.
   60.0 S.I. > 45.41 S.I. OK.
   WITHIN 3 FT. BELOW RIDGE
   PROVIDE (1) WALL VENT 12" X 18" = 216 S.I.
   216 S.I. X .60 EFF. = 129.6
   129.6 S.I. > 45 S.I. OK.
   TOTAL GARAGE ATTIC VENTILATION:
   (1) MASTER FLOW ROOF VENT
   (1) EAVE WALL VENT
3. FIRST FLOOR (LIVING) ATTIC:
   LEFTSIDE: 57.0 SF. INSTALL REV. 1
   WITHIN 3FT. ABOVE WALL TOP PLATE
   (FIRE-RATED UNDER EAVE BLK'G VENTS)
   (NO UNDER EAVE BLK'G VENTS ALLOWED).
   3'-0" X 19'-0' = 57.0 SF. -/- 150 = .38 X 144 = 54.72 S.I.
   INSTALL: (1) MASTER FLOW VENT = 60 S.I.
   60 S.I. > 54.72 S.I. OK.
   RIGHTSIDE: 53.01 SF. (FIRE-RATED UNDER EAVES)
   18.67' X 3.0' = 53.01 SF. -/- 150 = 0.3534 X 144 = 50.9 S.I.
   INSTALL (1) MASTER FLOW VENT = 60 S.I.
   (NO UNDER EAVE BLK'G VENT HOLES ALLOWED).
   60 S.I. S.I. > 50.9 S.I. OK.
   FRONT: 106.25 SF. (4.25' X 25.00' = 106.25 SF.)
   106.25 -/- 300 = 0.3542 X 144 = 51.0 -/- 2 = 25.5 S.I.
   WITHIN 3 FT. ABOVE TOP PLATE: 25.5 S.I.
   PROVIDE (1) VENTED SCREEN BLOCK:
   @ 22" X 4" = 88 S.I. X . 60 EFF. = 52.8 S.I.
   1 X 52.8 S.I. = 52.8 S.I. > 25.50 S.I.
   WITHIN 3 FT. OF RIDGE: 25.50 S.I.
   INSTALL (1) EYEBROW VENT @ 100 S.I.
   100 S.I. > 25.50 S.I. OK
   REAR: KITCHEN ATTIC:
   14.0 X 14.83 = 207.62 SF. -/- 300 = 0.69 X 144 = 99.65 S.I.
   99.65 S.I. -/- 2 = 49.83 S.I.
   WITHIN 3 FT. OF WALL TOP PLATE: 49.83 S.I.
   PROVIDE (1) SCREEN'D BLOCK VENT:
   22" X 4" = 88 S.I. X .60 EFF. = 52.8 S.I. PER VENTED BLOCK.
   52.8 S.I. > 49.83 S.I. OK.
   WITHIN 3 FT. OF RIDGE: 49.83 S.I.
   PROVIDE (1) EYEBROW VENT @ 100 S.I.
   100 S.I. > 49.83 S.I. OK
   TOTAL FIRST FLOOR ATTIC VENTILATION:
   (1) EYEBROW VENT
   (12) SCREEN'D VENTS
4. SECOND FLOOR ATTIC VENTILATION: 975.32 SF.
   975.32 SF. -/- 300 = 3.25 X 144 = 468 S.I. -/- 2 = 234.0 S.I.
   WITHIN 3FT. BELOW RIDGE: 234.0 S.I.
   12" X 18" GABLE WALL NENT
   12" X 18" = 216 S.I. X .60 EFF. = 129.5 S.I. PER VENT
   PROVIDE (2) GABLE VENTS
   129.5 X 2 = 259.0 S.I. 259.0 S.I. > 234.0 S.I. OK
   WITHIN 3FT. ABOVE WALL TOP PLATE: 234.0 S.I.
   PROVIDE (3) EYEBROW VENTS @ 100 S.I. NET EA.
   300 S.I. > 234.0 S.I. OK
   TOTAL SECOND FLOOR ROOF VENTILATION:
   (2) GABLE WALL VENTS
   (3) EYEBROW VENTS
5. PORCH ATTIC: 115.50 SF.
   (21'-0" X 5'-6" = 115.50 S.F.)
   115.5 S.I. -/- 300 = 0.39 X 144 = 55.44 S.I. -/- 2 = 27.72 S.I.
   WITHIN 3 FT. ABOVE WALL TOP PLATE
   (FIRE-RATED UNDER EAVE VENT BLK'G REQ.)
   PROVIDE (1) ROOF VENT @ 30 S.I.
   30 S.I. > 27.72 S.I. OK
   WITHIN 3FT. OF RIDGE: 27.72 S.I.
   INSTALL (1)12" X 18" GWV = 129.50 S.I.
   129.50 S.I. > 27.72 S.I. OK
   (FOR ARCH. APPEARANCE)



REAR ELEVATION

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



FRONT ELEVATION

SCALE ~ 1/4" = 1' – 0"

REVISIONS	BY
REV. 1 2 - 8 - 24	LC

A REMODEL FOR 1ST. FLOOR & 2ND. STORY ADDITION FOR:

THE SANTOSH SHAH RESIDENCE

684 MARSHALL CT., SANTA CLARA CA. 95050

PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220

STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

PLAN COMMENTS TO: LOUCOSTANZO@COMCAST.NET 408-472-9829 CELL

7-18-23
2-8-24
Lou Costanzo

ELEVATIONS

DRAWN: LOU COSTANZO
CHECKED: S.C.
DATE: 7 - 18 - 23
SCALE: 1/4" = 1'-0"
JOB NO.: S2023-8
SHEET: A7
OF SHEETS

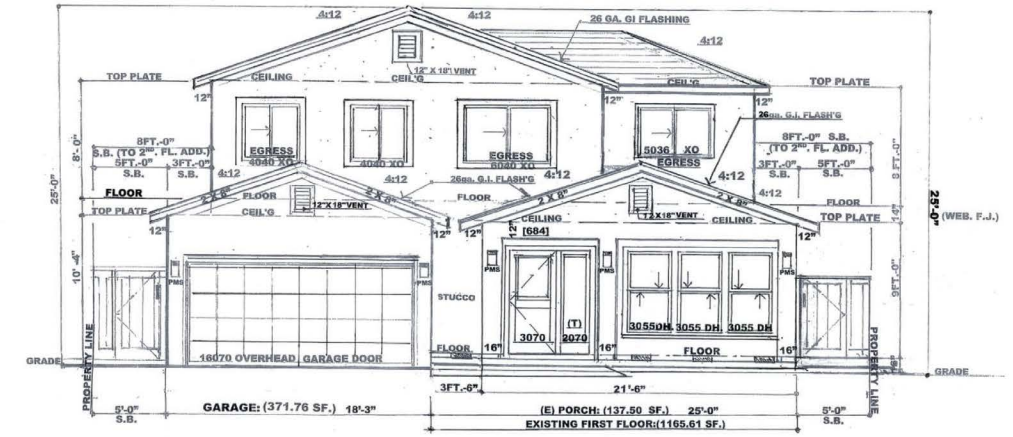
VENTILATION CALCULATIONS

THE SANTOSH SHAH RESIDENCE

1. SUB FLOOR: 1165.61 SF. + 293.00 ADD. =1459.00 SF.
   1459.00 SF.-/- 150.00 SF. = 9.73 X 144 = 1401.12S.I.
   (VERIFY & PROVIDE) 16" X 6" FDN. SIZE
   14" x 6" = 84 S.I. WITH EFF. 52 S.I. /VENT PER MFG. SPECS
   1401.12 S.I. -/- 52.0 S.I. = 26.94 OR 27 FDN.VENTS
   (VERIFY OR PROVIDE FDN VENTS)
2. GARAGE ATTIC VENTILATION: 189.63 SF.
   (8.5' X 18.3'=155.13 SF.) + (11.5' X 3.0'=34.5 SF.) =
   189.63 SF. -/- 300 = 0.63 SF. X 144 = 91.01 -/- 2 = 45.41 S.I.
   INSTALLED AT LEVEL:
   WITHIN 3FT. ABOVE WALL TOP PLATE 45.41 S.I.
   (FIRE-RATED EAVES):
   (NO UNDER EAVE BLOCK'G HOLES ALLOWED)
   INSTALL (1) MASTER FLOW ROOF VENT @ 60 S.I.
   60.0 S.I. > 45.41 S.I. OK.
   WITHIN 3 FT. BELOW RIDGE
   PROVIDE (1) WALL VENT 12" X 18" = 216 S.I.
   216 S.I. X .60 EFF. = 129.6
   129.6 S.I. > 45 S.I. OK.
   TOTAL GARAGE ATTIC VENTILATION:
   (1) MASTER FLOW ROOF VENT
   (1) EAVE WALL VENT
3. FIRST FLOOR (LIVING) ATTIC:
   LEFTSIDE: 57.0 SF. INSTALL
   WITHIN 3FT. ABOVE WALL TOP PLATE
   (FIRE-RATED UNDER EAVE BLK'G VENTS)
   (NO UNDER EAVE BLK'G VENTS ALLOWED).
   3'-0" X 19'-0" = 57.0 SF. -/- 150 = .38 X 144 = 54.72 S.I.
   INSTALL: (1) MASTER FLOW VENT = 60 S.I.
   60 S.I. > 54.72 S.I. OK.
   RIGHTSIDE: 53.01 SF. (FIRE-RATED UNDER EAVES)
   18.67' X 3.0' = 53.01 SF. -/- 150 = 0.3534 X 144 = 50.9 S.I.
   INSTALL (1) MASTER FLOW VENT = 60 S.I.
   (NO UNDER EAVE BLK'G VENT HOLES ALLOWED).
   60 S.I. S.I. > 50.9 S.I. OK.
   FRONT: 106.25 SF. (4.25' X 25.00' = 106.25 SF.)
   106.25 -/- 300 = 0.3542 X 144 = 51.0 -/- 2 = 25.5 S.I.
   WITHIN 3 FT. ABOVE TOP PLATE: 25.5 S.I.
   PROVIDE (1) VENTED SCREEN BLOCK:
   @ 22" X 4" = 88 S.I. X . 60 EFF. = 52.8 S.I.
   1 X 52.8 S.I. = 52.8 S.I. > 25.50 S.I.
   WITHIN 3 FT. OF RIDGE: 25.50 S.I.
   INSTALL (1) EYEBROW VENT @ 100 S.I.
   100 S.I. > 25.50 S.I. OK

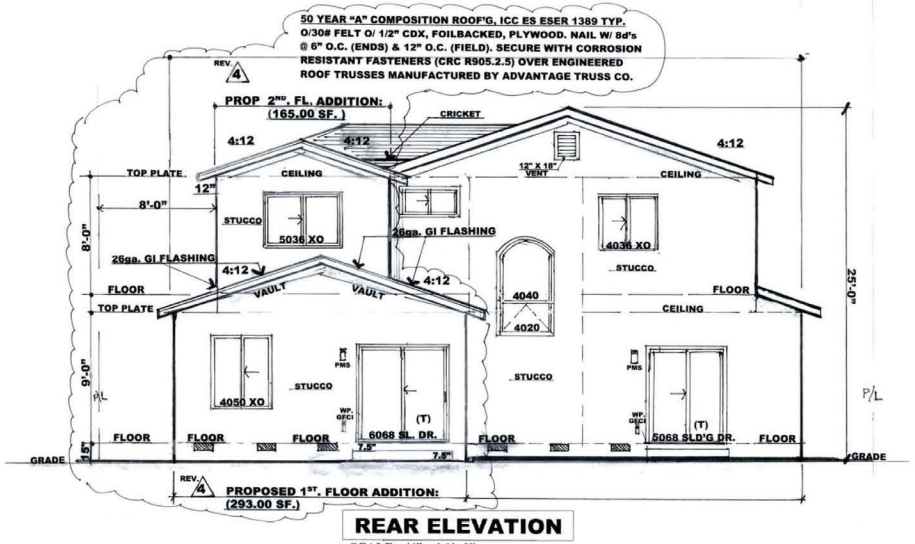
REAR:
FAMILYRM . ATTIC: 293.00 SF. USE SMALL CELL FOAM.
WITHIN 3 FT. OF WALL TOP PLATE: 49.83 S.I.
PROVIDE (1) SCREEN'D BLOCK VENT:
22" X 4" = 88 S.I. X .60 EFF. = 52.8 S.I. PER VENTED BLOCK.
52.8 S.I. > 49.83 S.I. OK.
WITHIN 3 FT. OF RIDGE: 49.83 S.I.
PROVIDE (1) EYEBROW VENT @ 100 S.I.
100 S.I. > 49.83 S.I. OK
TOTAL FIRST FLOOR ATTIC VENTILATION:
(1) EYEBROW VENT
(12) SCREEN'D VENTS

4. SECOND FLOOR ATTIC VENTILATION: 1140.32 SF.
   1140.32 SF. -/- 300 = 3.80 X 144 = 547.35 S.I. -/- 2 = 273.68 S.I.
   WITHIN 3FT. BELOW RIDGE: 273.68 S.I.
   12" X 18" GABLE WALL VENT
   12" X 18" = 216 S.I. X .60 EFF. = 129.5 S.I. PER VENT
   PROVIDE (3) GABLE VENTS
   129.5 X 2 = 259.0 S.I. 388.5 S.I. > 234.0 S.I. OK
   WITHIN 3FT. ABOVE WALL TOP PLATE: 234.0 S.I.
   PROVIDE (3) EYEBROW VENTS @ 100 S.I. NET EA.
   300 S.I. > 234.0 S.I. OK
   TOTAL SECOND FLOOR ROOF VENTILATION:
   (2) GABLE WALL VENTS
   (3) EYEBROW VENTS
5. PORCH ATTIC: 115.50 SF.
   (21'-0" X 5'-6" = 115.50 S.F.)
   115.5 S.I. -/- 300 = 0.39 X 144 = 55.44 S.I. -/- 2 = 27.72 S.I.
   WITHIN 3 FT. ABOVE WALL TOP PLATE
   (FIRE-RATED UNDER EAVE VENT BLK'G REQ.)
   PROVIDE (1) ROOF VENT @ 30 S.I.
   30 S.I. > 27.72 S.I. OK
   WITHIN 3FT. OF RIDGE: 27.72 S.I.
   INSTALL (1)12" X 18" GWV = 129.50 S.I.
   129.50 S.I. > 27.72 S.I. OK
   (FOR ARCH. APPEARANCE)



FRONT ELEVATION

SCALE ~ ¼" = 1' – 0"



REAR ELEVATION

SCALE ~ ¼" = ` 1'- 0"

REVISIONS	BY
REV. 4 8-12-24	L.C.

A REMODEL FOR 1ST. FLOOR & 2ND. FLOOR ADDITION FOR:

THE SANTOSH SHAH RESIDENCE

684 MARSHALL CT., SANTA CLARA CA. 95050

PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220

STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

PLAN COMMENTS TO: LOUCOSTANZO@COMCAST.NET 408 264-0220 CELL

Lou Costanzo

ELEVATIONS

DRAWN	LOU COSTANZO
CHECKED	S.C.
DATE	8 - 12 - 24
SCALE	1/4" = 1'-0"
JOB NO.	S2023-8
SHEET	A7R REVISION REV. 4
OF	4 SHEETS

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD — CF1R-PRF-01-E

Project Name: Santosh Shah Residence — **Calculation Date/Time:** 2024-08-20T13:05:58-07:00 — (Page 6 of 13)

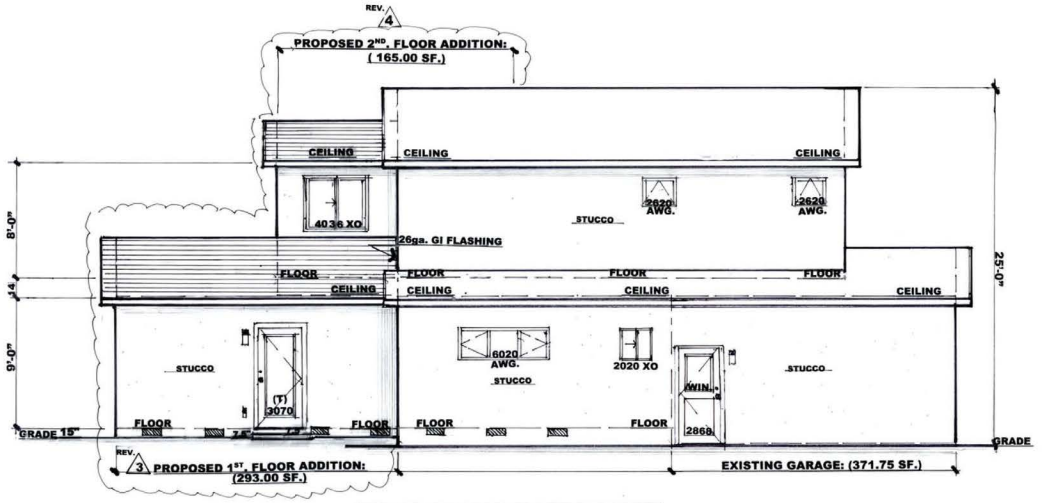
Calculation Description: Title 24 Analysis — **Input File Name:** 0230532 Santosh Shah Residence.ribd22x

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
Window	Window	Front Wall	Front	225			1	16.3	0.3	NFRC	0.21	NFRC	Bug Screen	Altered	No
Window 2	Window	Front Wall	Front	225			1	16.3	0.3	NFRC	0.21	NFRC	Bug Screen	Altered	No
Window 3	Window	Front Wall	Front	225			1	16.3	0.3	NFRC	0.21	NFRC	Bug Screen	Altered	No
Entry Door	Window	Front Wall	Front	225			1	35	0.3	NFRC	0.21	NFRC	Bug Screen	Altered	No
Existing	Window	Left Wall	Left	315			1	16	0.58	Table 110.6-A	0.65	Table 110.6-B	Bug Screen	Existing	No
Existing Door	Window	Rear Wall	Back	45			1	33.5	0.58	Table 110.6-A	0.65	Table 110.6-B	Bug Screen	Existing	No
Window 4	Window	Rear Wall	Back	45			1	24	0.3	NFRC	0.21	NFRC	Bug Screen	Altered	No
Existing 2	Window	Right Wall	Right	135			1	48	0.58	Table 110.6-A	0.65	Table 110.6-B	Bug Screen	Existing	No
Door	Window	Left Wall 2	Left	315			1	20	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
SGD	Window	Rear Wall 2	Back	45			1	40	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 5	Window	Rear Wall 2	Back	45			1	20	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 6	Window	Front Wall 2	Front	225			1	17.5	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 7	Window	Front Wall 2	Front	225			1	24	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 8	Window	Front Wall 2	Front	225			1	32	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 9	Window	Left Wall 3	Left	315			1	10	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 10	Window	Left Wall 3	Left	315			1	14	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA

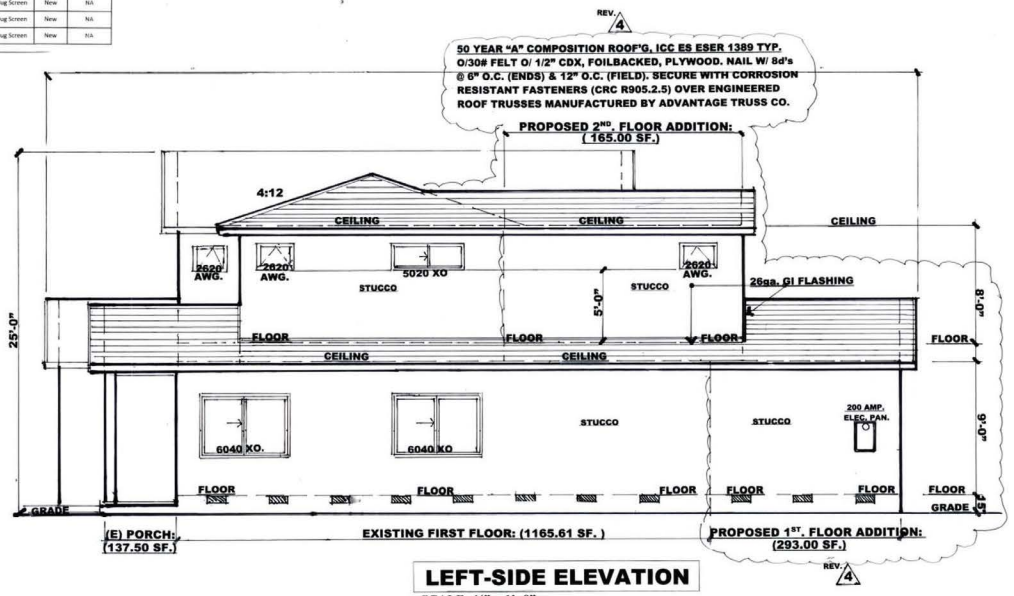
FENESTRATION / GLAZING

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
Window 11	Window	Rear Wall 3	Back	45			1	14	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 12	Window	Rear Wall 3	Back	45			1	24	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 13	Window	Rear Wall 3	Back	45			1	6	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 14	Window	Rear Wall 3	Back	45			1	17.5	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 15	Window	Right Wall 3	Right	135			1	10	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 16	Window	Right Wall 3	Right	135			1	10	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA



RIGHT-SIDE ELEVATION

SCALE ~ ¼" = 1' – 0"



LEFT-SIDE ELEVATION

SCALE~ ¼" = 1'- 0"

REVISIONS	BY
REV. 4 8 - 12 -24	L.C

A REMODEL FOR 1ST. FLOOR & 2ND. FLOOR ADDITION FOR:

THE SANTOSH SHAH RESIDENCE

684 MARSHALL CT., SANTA CLARA CA. 95050

PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220

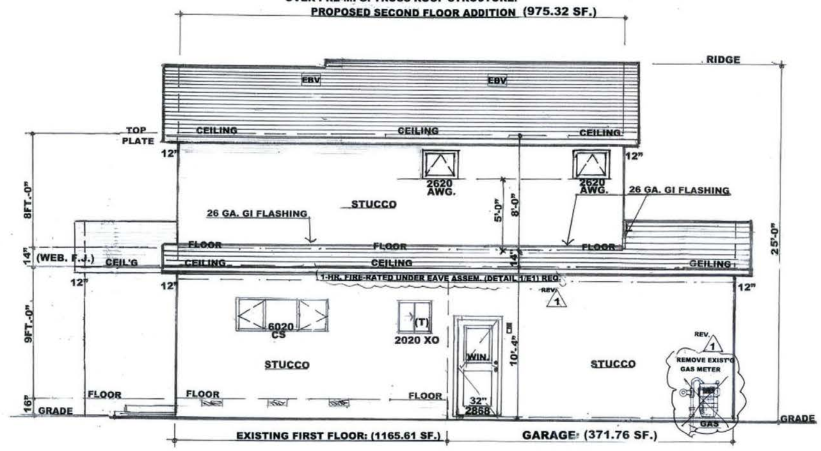
STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

PLAN COMMENTS TO: LOUCOSTANZO@COMCAST.NET 408-472-9829 CELL

Lou Costanzo

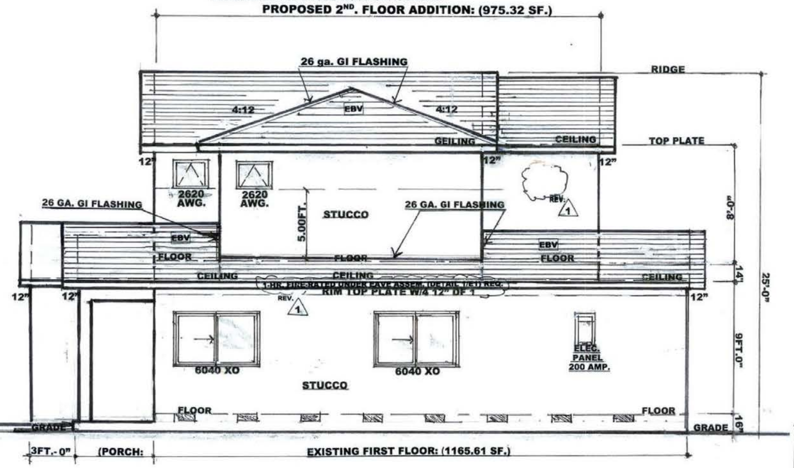
ELEVATIONS

DRAWN	LOU COSTANZO
CHECKED	S.C.
DATE	8 - 12 - 24
SCALE	1/4" = 1'-0"
JOB NO.	S2023-8
SHEET	A8R REVISION REV. 4
OF	SHEETS



LEFT ELEVATION

SCALE ~ ¼" = 1' - 0"



RIGHT ELEVATION

SCALE ~ ¼" = 1' - 0"

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD — CF1R-PRF-01E (Page 5 of 11)

Project Name: Santosh Shah Residence — Calculation Date/Time: 2024-02-21T13:03:11-08:00

Calculation Description: Title 24 Analysis — Input File Name: 0230532 Santosh Shah Residence.ribd22x

ATTIC

01	02	03	04	05	06	07	08	09	10
Name	Construction	Type	Roof Rise (x in 12)	Roof Reflectance	Roof Emittance	Radiant Barrier	Cool Roof	Status	Verified Existing Condition
Attic 1st Floor	Attic Roof1st Floor	Ventilated	4	0.1	0.85	Yes	No	New	n/a
Attic 2nd Floor	Attic Roof2nd Floor	Ventilated	4	0.1	0.85	Yes	No	New	n/a

FENESTRATION / GLAZING

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Name	Type	Surface	Orientation	Azimuth	Width (ft)	Height (ft)	Mult.	Area (ft²)	U-factor	U-factor Source	SHGC	SHGC Source	Exterior Shading	Status	Verified Existing Condition
Window	Window	Front Wall	Front	225			1	16.3	0.3	NFRC	0.21	NFRC	Bug Screen	Altered	No
Window 2	Window	Front Wall	Front	225			1	16.3	0.3	NFRC	0.21	NFRC	Bug Screen	Altered	No
Window 3	Window	Front Wall	Front	225			1	16.3	0.3	NFRC	0.21	NFRC	Bug Screen	Altered	No
Entry Door	Window	Front Wall	Front	225			1	20	0.3	NFRC	0.21	NFRC	Bug Screen	Altered	No
Existing	Window	Left Wall	Left	315			1	16	0.58	Table 110.6-A	0.65	Table 110.6-B	Bug Screen	Existing	No
Existing Door	Window	Rear Wall	Back	45			1	33.5	0.58	Table 110.6-A	0.65	Table 110.6-B	Bug Screen	Existing	No
Window 4	Window	Rear Wall	Back	45			1	24	0.3	NFRC	0.21	NFRC	Bug Screen	Altered	No
Window 5	Window	Rear Wall	Back	45			1	6	0.3	NFRC	0.21	NFRC	Bug Screen	Altered	No
Window 6	Window	Rear Wall	Back	45			1	17.5	0.3	NFRC	0.21	NFRC	Bug Screen	Altered	No
Glass Door	Window	Rear Wall	Back	45			1	20	0.3	NFRC	0.21	NFRC	Bug Screen	Altered	No
Existing 2	Window	Right Wall	Right	135			1	48	0.58	Table 110.6-A	0.6[illegible]	Table 110.6-B	Bug Screen	Existing	No
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Name	Type	Surface	Orientation	Azimuth	Width (ft)	Height (ft)	Mult.	Area (ft²)	U-factor	U-factor Source	SHGC	SHGC Source	Exterior Shading	Status	Verified Existing Condition
Window 7	Window	Front Wall 2	Front	225			1	17.5	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 8	Window	Front Wall 2	Front	225			1	24	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 9	Window	Front Wall 2	Front	225			1	32	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 10	Window	Left Wall 2	Left	315			1	10	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 11	Window	Rear Wall 2	Back	45			1	24	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 12	Window	Rear Wall 2	Back	45			1	24	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 13	Window	Rear Wall 2	Back	45			1	6	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 14	Window	Rear Wall 2	Back	45			1	10	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA
Window 15	Window	Right Wall 2	Right	135			1	50	0.3	NFRC	0.21	NFRC	Bug Screen	New	NA

REVISIONS	BY
REV. 1 2 - 8 - 24	LC

PLAN COMMENTS TO: LOUCOSTANZO@COMCAST.NET 408-472-9829 CELL

7-18-23
2-8-24

A REMODEL FOR 1ST. FLOOR & 2ND. STORY ADDITION FOR:

THE SANTOSH SHAH RESIDENCE

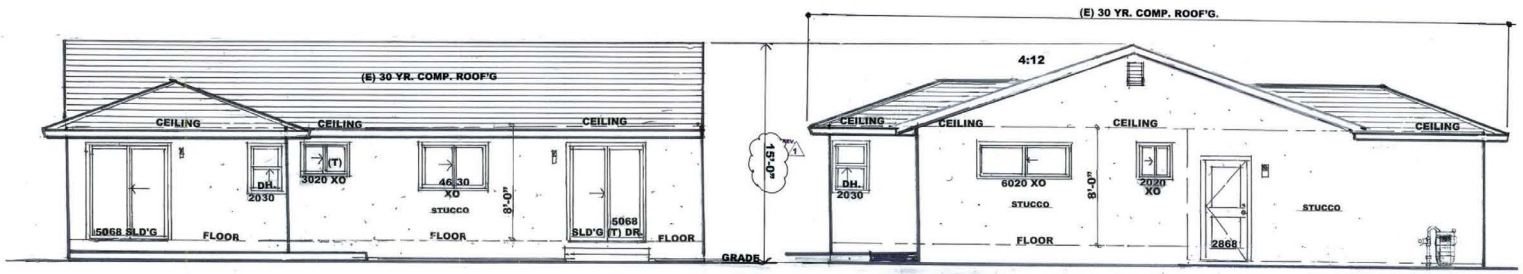
684 MARSHALL CT., SANTA CLARA CA. 95050

PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220

STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

ELEVATIONS

DRAWN	LOU COSTANZO
CHECKED	S.C.
DATE	7 - 18 - 23
SCALE	1/4" = 1'-0"
JOB NO.	S2023-8
SHEET	A8
OF	SHEETS



REAR ELEVATION
SCALE ~ ¼" = ` 1'- 0"

LEFT ELEVATION
SCALE ~ ¼" = 1' – 0"

FRONT ELEVATION
SCALE ~ ¼" = 1' – 0"

RIGHT ELEVATION
SCALE ~ ¼" = 1' – 0"

EXISTING ELEVATIONS
SCALE ~ ¼" = 1'-0

REVISIONS	BY
REV. 1 11-1-23	LC
REV. 1 2 - 8 -24	LC

PLAN COMMENTS TO: LOU@LOUCOSTANZO.COM CAST.NET 408-472-9929 CELL

7-18-23 2-8-24 Lou Costanzo

A REMODEL FOR 1ST. FLOOR & 2ND. FLOOR ADDITION FOR:
THE SANTOSH SHAH RESIDENCE
684 MARSHALL CT., SANTA CLARA CA. 95050
PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220
STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

EXISTING ELEVATIONS

DRAWN: LOU COSTANZO
CHECKED: S.C.
DATE: 7 - 18 - 23
SCALE: 1/4" = 1'-0"
JOB NO.: S2023-8
SHEET: **A9**
OF SHEETS

CHAPTER 9
ROOF ASSEMBLIES

User note:

About this chapter: Chapter 9 addresses the design and construction of roof assemblies. A roof assembly includes the roof deck, substrate or thermal barrier, insulation, vapor retarder and roof covering. This chapter provides the requirement for wind resistance of roof coverings. The types of roof covering materials and installation addressed by Chapter 9 are: asphalt shingles, clay and concrete tile, metal roof shingles, mineral-surfaced roll roofing, slate and slate-type shingles, wood shakes and shingles, built-up roofs, metal roof panels, modified bitumen roofing, thermoset and thermoplastic single-ply roofing, sprayed polyurethane foam roofing, liquid applied coatings and photovoltaic shingles. Chapter 9 also provides requirements for roof drainage, flashing, above-deck thermal insulation, rooftop-mounted photovoltaic systems and recovering or replacing an existing roof covering.

SECTION R901 GENERAL

R901.1 Scope. The provisions of this chapter shall govern the design, materials, construction and quality of roof assemblies.

SECTION R902 FIRE CLASSIFICATION

R902.1 Roofing covering materials. Roofs shall be covered with materials as set forth in Sections R904 and R905. *A minimum Class A, B or C roofing shall be installed in areas designated by this section* or where the edge of the roof is less than 3 feet (914 mm) from a lot line. Class A, B and C roofing required by this section to be listed shall be tested in accordance with UL 790 or ASTM E108.

Exceptions:

1. Class A roof assemblies include those with coverings of brick, masonry and exposed concrete roof deck.
2. Class A roof assemblies include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile, or slate installed on noncombustible decks.
3. Class A roof assemblies include minimum 16 ounces per square foot copper sheets installed over combustible decks.
4. Class A roof assemblies include slate installed over underlayment over combustible decks.

R902.1.1 Roof coverings within very-high fire hazard severity zones. *The entire roof covering of every existing structure where more than 50 percent of the total roof area is replaced within any one-year period, the entire roof covering of every new structure, and any roof covering applied in the alteration, repair or replacement of the roof of every existing structure, shall be a fire-retardant roof covering that is at least Class A.*

Exception: *The requirements shall not apply in any jurisdiction that adopts the model ordinance approved by the State Fire Marshal pursuant to Section 51189 of the Government Code or an ordinance that substantially conforms to the model ordinance and transmits a copy to the State Fire Marshal.*

R902.1.2 Roof coverings within state responsibility areas. *The entire roof covering of every existing structure where more than 50 percent of the total roof area is replaced within any one-year period, the entire roof covering of every new structure, and any roof covering applied in the alteration, repair or replacement of the roof of every existing structure, shall be a fire-retardant roof covering that is at least Class B.*

Exception: *Areas designated as moderate fire hazard severity zones.*

R902.1.3 Roof coverings in all other areas. *The entire roof covering of every existing structure where more than 50 percent of the total roof area is replaced within any one-year period, the entire roof covering of every new structure, and any roof covering applied in the alteration, repair or replacement of the roof of every existing structure, shall be a fire-retardant roof covering that is at least Class C.*

R902.1.4 Roofing requirements a wildland-urban interface fire area. *Roofing requirements for structures located in a wildland-urban interface fire area shall also comply with Section R337.5.*

R902.2 Fire-retardant-treated shingles and shakes. Fire-retardant-treated wood shakes and shingles *are wood shakes and shingles complying with UBC Standard 15-3 or 15-4 which are impregnated by the full-cell vacuum-pressure process with fire-retardant chemicals, and which have been qualified by UBC Standard 15-2 for use on Class A, B or C roofs. Fire-retardant-treated wood shakes and shingles shall comply with ICC-ES EG107 and with the weathering requirements contained in Health and Safety Code Section 13132.7 (j). Each bundle shall bear labels from an ICBO accredited quality control agency identifying their roof-covering classification and indicating their compliance with ICC-ES EG107 and with the weathering requirements contained in Health and Safety Code Section 13132.7 (j).*

Health and Safety Code Section 13132.7 (j) No wood roof covering materials shall be sold or applied in this state unless both of the following conditions are met:

(1) The materials have been approved and listed by the State Fire Marshal as complying with the requirements of this section.

(2) The materials have passed at least five years of the 10-year natural weathering test. The 10-year natural weathering test required by this subdivision shall be conducted in accordance with Standard 15-2 of the 1994 edition of the Uniform Building Code at a testing facility recognized by the State Fire Marshal.

R902.3 Building-integrated photovoltaic product. Building-integrated photovoltaic products installed as the roof covering shall be tested, listed and labeled for fire classification in accordance with Section R902.1 *through R902.1.4.*

R902.4 Rooftop-mounted photovoltaic panel systems. Rooftop-mounted photovoltaic panel systems installed on or above the roof covering shall be tested, listed and identified with a fire classification in accordance with UL 1703 and UL 2703. Class A, B or C photovoltaic panel systems and modules shall be installed *areas designated by this section,* in jurisdictions designated by law as requiring their use or where the edge of the roof is less than 3 feet (914 mm) from a lot line.

SECTION R903 WEATHER PROTECTION

R903.1 General. Roof decks shall be covered with approved roof coverings secured to the building or structure in accordance with the provisions of this chapter. Roof assemblies shall be designed and installed in accordance with this code and the approved manufacturer's instructions such that the roof assembly shall serve to protect the building or structure.

R903.2 Flashing. Flashings shall be installed in a manner that prevents moisture from entering the wall and roof through joints in copings, through moisture permeable materials and at intersections with parapet walls and other penetrations through the roof plane.

R903.2.1 Locations. Flashings shall be installed at wall and roof intersections, wherever there is a change in roof slope or direction and around roof openings. A flashing shall be installed to divert the water away from where the eave of a sloped roof intersects a vertical sidewall. Where flashing is of metal, the metal shall be corrosion resistant with a thickness of not less than 0.019 inch (0.5 mm) (No. 26 galvanized sheet).

R903.2.2 Crickets and saddles. A cricket or saddle shall be installed on the ridge side of any chimney or penetration more than 30 inches (762 mm) wide as measured perpendicular to the slope. Cricket or saddle coverings shall be sheet metal or of the same material as the roof covering.

Exception: Unit skylights installed in accordance with Section R308.6 and flashed in accordance with the manufacturer's instructions shall be permitted to be installed without a cricket or saddle.

R903.3 Coping. Parapet walls shall be properly coped with noncombustible, weatherproof materials of a width not less than the thickness of the parapet wall.

R903.4 Roof drainage. Unless roofs are sloped to drain over roof edges, roof drains shall be installed at each low point of the roof.

R903.4.1 Secondary (emergency overflow) drains or scuppers. Where roof drains are required, secondary emergency overflow roof drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason. Overflow drains having the same size as the roof drains shall be installed with the inlet flow line located 2 inches (51 mm) above the low point of the roof, or overflow scuppers having three times the size of the roof drains and having a minimum opening height of 4 inches (102 mm) shall be installed in the adjacent parapet walls with the inlet flow located 2 inches (51 mm) above the low point of the roof served. The installation and sizing of overflow drains, leaders and conductors shall comply with Sections 1106 and 1108 of the *California Plumbing Code,* as applicable.

SECTION R904 MATERIALS

R904.1 Scope. The requirements set forth in this section shall apply to the application of roof covering materials specified herein. Roof assemblies shall be applied in accordance with this chapter and the manufacturer's installation instructions. Installation of roof assemblies shall comply with the applicable provisions of Section R905.

R904.2 Compatibility of materials. Roof assemblies shall be of materials that are compatible with each other and with the building or structure to which the materials are applied.

R904.3 Material specifications and physical characteristics. Roof covering materials shall conform to the applicable standards listed in this chapter.

R904.4 Product identification. Roof covering materials shall be delivered in packages bearing the manufacturer's identifying marks and approved testing agency labels required. Bulk shipments of materials shall be accompanied by the same information issued in the form of a certificate or on a bill of lading by the manufacturer.

SECTION R905 REQUIREMENTS FOR ROOF COVERINGS

R905.1 Roof covering application. Roof coverings shall be applied in accordance with the applicable provisions of this section and the manufacturer's installation instructions. Unless otherwise specified in this section, roof coverings shall be installed to resist the component and cladding loads specified in Table R301.2(2), adjusted for height and exposure in accordance with Table R301.2(3).

R905.1.1 Underlayment. Underlayment for asphalt shingles, clay and concrete tile, metal roof shingles, mineral-surfaced roll roofing, slate and slate-type shingles, wood shingles, wood shakes, metal roof panels and photovoltaic shingles shall conform to the applicable standards listed in this chapter. Underlayment materials required to comply with ASTM D226, D1970, D4869 and D6757 shall bear a label indicating compliance to the standard designation and, if applicable, type classification indicated in Table R905.1.1(1). Underlayment

shall be applied in accordance with Table R905.1.1(2). Underlayment shall be attached in accordance with Table R905.1.1(3).

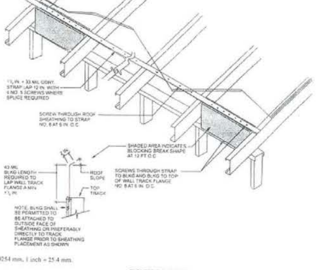
Exceptions:

1. As an alternative, self-adhering polymer-modified bitumen underlayment complying with ASTM D1970 installed in accordance with both the underlayment manufacturer's and roof covering manufacturer's instructions for the deck material, roof ventilation configuration and climate exposure for the roof covering to be installed, shall be permitted.
2. As an alternative, a minimum 4 inch-wide (102 mm) strip of self-adhering polymer-modified bitumen membrane complying with ASTM D1970, installed in accordance with the manufacturer's installation instructions for the deck material, shall be applied over all joints in the roof decking. An approved underlayment for the applicable roof covering for maximum ultimate design wind speeds, V_{ult}, less than 140 miles per hour shall be applied over the entire roof over the 4-inch-wide (102 mm) membrane strips.
3. As an alternative, two layers of underlayment complying with ASTM D226 Type II or ASTM D4869 Type III or Type IV shall be permitted to be installed as follows in 3.1–3.4:
   - 3.1. Apply a 19-inch-wide (483 mm) strip of underlayment parallel with the eave. Starting at the eave, apply 36-inch-wide (914 mm) strips of underlayment felt, overlapping successive sheets 19 inches (483 mm). End laps shall be 4 inches (102 mm) and shall be offset by 6 feet (1829 mm).
   - 3.2. The underlayment shall be attached with corrosion-resistant fasteners in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at side and end laps.
   - 3.3. Underlayment shall be attached using metal or plastic cap nails with a nominal cap diameter of not less than 1 inch (25 mm). Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25 mm). Minimum thickness of the outside edge of plastic caps shall be 0.035 inch (0.89 mm).
   - 3.4. The cap nail shank shall be not less than 0.083 inch (2.11 mm) for ring shank cap nails and 0.091 inch (2.31 mm) for smooth shank cap nails. Cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than $3/4$ inch (19 mm) into the roof sheathing.

TABLE R905.1.1(1) UNDERLAYMENT TYPES

ROOF COVERING	SECTION	MAXIMUM ULTIMATE DESIGN WIND SPEED, V_{ult} < 140 MPH	MAXIMUM ULTIMATE DESIGN WIND SPEED, V_{ult} ≥ 140 MPH
Asphalt shingles	R905.2	ASTM D226 Type I ASTM D4869 Type I, II, III or IV ASTM D6757	ASTM D226 Type II ASTM D4869 Type III or Type IV ASTM D6757
Clay and concrete tile	R905.3	ASTM D226 Type II ASTM D2626 Type I ASTM D6380 Class M mineral-surfaced roll roofing	ASTM D226 Type II ASTM D2626 Type I ASTM D6380 Class M mineral-surfaced roll roofing
Metal roof shingles	R905.4	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type III or Type IV
Mineral-surfaced roll roofing	R905.5	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type III or Type IV
Slate and slate-type shingles	R905.6	ASTM D226 Type I ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type III or Type IV
Wood shingles	R905.7	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type III or Type IV
Wood shakes	R905.8	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type III or Type IV
Metal panels	R905.10	Manufacturer's instructions	ASTM D226 Type II ASTM D4869 Type III or Type IV
Photovoltaic shingles	R905.16	ASTM D4869 Type I, II, III or IV ASTM D6757	ASTM D4869 Type III or Type IV ASTM D6757

For SI: 1 mile per hour = 0.447 m/s.



For SI: 1 mil = 0.0254 mm, 1 inch = 25.4 mm.

FIGURE R804.3.7.2 ROOF BLOCKING DETAIL

R905.1.2 Ice barriers. In areas where there has been a history of ice forming along the eaves causing a backup of water as designated in Table R301.2(1), an ice barrier shall be installed for asphalt shingles, metal roof shingles, mineral-surfaced roll roofing, slate and slate-type shingles, wood shingles and wood shakes. The ice barrier shall consist of not fewer than two layers of underlayment cemented together, or a self-adhering polymer-modified bitumen sheet shall be used in place of normal underlayment and extend from the lowest edges of all roof surfaces to a point not less than 24 inches (610 mm) inside the exterior wall line of the building. On roofs with slope equal to or greater than eight units vertical in 12 units horizontal (67-percent slope), the ice barrier shall also be applied not less than 36 inches (914 mm) measured along the roof slope from the eave edge of the building.

Exception: Detached accessory structures not containing conditioned floor area.

R905.2 Asphalt shingles. The installation of asphalt shingles shall comply with the provisions of this section.

R905.2.1 Sheathing requirements. Asphalt shingles shall be fastened to solidly sheathed decks.

R905.2.2 Slope. Asphalt shingles shall be used only on roof slopes of two units vertical in 12 units horizontal (17-percent slope) or greater. For roof slopes from two units vertical in 12 units horizontal (17-percent slope) up to four units vertical in 12 units horizontal (33-percent slope), double underlayment application is required in accordance with Section R905.1.1.

R905.2.3 Underlayment. Underlayment shall comply with Section R905.1.1.

R905.2.4 Asphalt shingles. Asphalt shingles shall comply with ASTM D3462.

R905.2.4.1 Wind resistance of asphalt shingles. Asphalt shingles shall be tested in accordance with ASTM D7158. Asphalt shingles shall meet the classification requirements of Table R905.2.4.1 for the appropriate ultimate design wind speed. Asphalt shingle packaging shall bear a label to indicate compliance with ASTM D7158 and the required classification in Table R905.2.4.1.

Exception: Asphalt shingles not included in the scope of ASTM D7158 shall be tested and labeled in accordance with ASTM D3161. Asphalt shingle packaging shall bear a label to indicate compliance with ASTM D3161 and the required classification in Table R905.2.4.1.

R905.2.5 Fasteners. Fasteners for asphalt shingles shall be galvanized steel, stainless steel, aluminum or copper roofing nails, minimum 12-gage [0.105 inch (3 mm)] shank with a minimum $3/8$-inch-diameter (9.5 mm) head, complying with ASTM F1667, of a length to penetrate through the roofing materials and not less than $3/4$ inch (19.1 mm) into the roof sheathing. Where the roof sheathing is less than $3/4$ inch (19.1 mm) thick, the fasteners shall penetrate through the sheathing.

R905.2.6 Attachment. Asphalt shingles shall have the minimum number of fasteners required by the manufacturer's approved installation instructions, but not less than four fasteners per strip shingle or two fasteners per individual shingle. Where the roof slope exceeds 21 units vertical in 12 units horizontal (21:12, 175-percent slope), shingles shall be installed in accordance with the manufacturer's approved installation instructions.

R905.2.7 Ice barrier. Where required, ice barriers shall comply with Section R905.1.2.

R905.2.8 Flashing. Flashing for asphalt shingles shall comply with this section and the asphalt shingle manufacturer's approved installation instructions.

R905.2.8.1 Base and cap flashing. Base and cap flashing shall be installed in accordance with manufacturer's instructions. Base flashing shall be of either corrosion-resistant metal of minimum nominal 0.019-inch (0.5 mm) thickness or mineral-surfaced roll roofing weighing not less than 77 pounds per 100 square feet (4 kg/m²). Cap flashing shall be corrosion-resistant metal of minimum nominal 0.019-inch (0.5 mm) thickness.

TABLE R905.2.4.1 CLASSIFICATION OF ASPHALT ROOF SHINGLES

MAXIMUM ULTIMATE DESIGN WIND SPEED, V_{ult} FROM FIGURE R301.2(5)A (mph)	MAXIMUM BASIC WIND SPEED, V_{ASD} FROM TABLE R301.2.1.3 (mph)	ASTM D7158[a] SHINGLE CLASSIFICATION	ASTM D3161 SHINGLE CLASSIFICATION
110	85	D, G or H	A, D or F
116	90	D, G or H	A, D or F
129	100	G or H	A, D or F
142	110	G or H	F
155	120	G or H	F
168	130	H	F
181	140	H	F
194	150	H	F

For SI: 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s.

a. The standard calculations contained in ASTM D7158 assume Exposure Category B or C and a building height of 60 feet or less. Additional calculations are required for conditions outside of these assumptions.

R905.2.8.2 Valleys. Valley linings shall be installed in accordance with the manufacturer's instructions before applying shingles. Valley linings of the following types shall be permitted:

1. For open valleys (valley lining exposed) lined with metal, the valley lining shall be not less than 24 inches (610 mm) wide and of any of the corrosion-resistant metals in Table R905.2.8.2.
2. For open valleys, valley lining of two plies of mineral-surfaced roll roofing, complying with ASTM D3909 or ASTM D6380 Class M, shall be permitted. The bottom layer shall be 18 inches (457 mm) and the top layer not less than 36 inches (914 mm) wide.
3. For closed valleys (valley covered with shingles), valley lining of one ply of smooth roll roofing complying with ASTM D6380 and not less than 36 inches wide (914 mm) or valley lining as described in Item 1 or 2 shall be permitted. Self-adhering polymer-modified bitumen underlayment complying with ASTM D1970 shall be permitted in lieu of the lining material.

R905.2.8.3 Sidewall flashing. Base flashing against a vertical sidewall shall be continuous or step flashing and shall be not less than 4 inches (102 mm) in height and 4 inches (102 mm) in width and shall direct water away from the vertical sidewall onto the roof or into the gutter. Where siding is provided on the vertical sidewall, the vertical leg of the flashing shall be continuous under the siding. Where anchored masonry veneer is provided on the vertical sidewall, the base flashing shall be provided in accordance with this section and counterflashing shall be provided in accordance with Section R703.8.2.2. Where exterior plaster or adhered masonry veneer is provided on the vertical sidewall, the base flashing shall be provided in accordance with this section and Section R703.6.3.

R905.2.8.4 Other flashing. Flashing against a vertical front wall, as well as soil stack, vent pipe and chimney flashing, shall be applied in accordance with the asphalt shingle manufacturer's printed instructions.

R905.2.8.5 Drip edge. A drip edge shall be provided at eaves and rake edges of shingle roofs. Adjacent segments of drip edge shall be overlapped not less than 2 inches (51 mm). Drip edges shall extend not less than $1/4$ inch (6.4 mm) below the roof sheathing and extend up back onto the roof deck not less than 2 inches (51 mm). Drip edges shall be mechanically fastened to the roof deck at not more than 12 inches (305 mm) o.c. with fasteners as specified in Section R905.2.5. Underlayment shall be installed over the drip edge along eaves and under the drip edge along rake edges.

R905.3 Clay and concrete tile. The installation of clay and concrete tile shall comply with the provisions of this section.

R905.3.1 Deck requirements. Concrete and clay tile shall be installed only over solid sheathing or spaced structural sheathing boards.

R905.3.2 Deck slope. Clay and concrete roof tile shall be installed on roof slopes of two and one-half units vertical in 12 units horizontal (25-percent slope) or greater. For roof slopes from two and one-half units vertical in 12 units horizontal (25-percent slope) to four units vertical in 12 units horizontal (33-percent slope), double underlayment application is required in accordance with Section R905.3.3.

R905.3.3 Underlayment. Underlayment shall comply with Section R905.1.1.

R905.3.4 Clay tile. Clay roof tile shall comply with ASTM C1167.

R905.3.5 Concrete tile. Concrete roof tile shall comply with ASTM C1492.

R905.3.6 Fasteners. Nails shall be corrosion resistant and not less than 11-gage, $5/16$-inch (11 mm) head, and of sufficient length to penetrate the deck not less than $3/4$ inch (19 mm) or through the thickness of the deck, whichever is less. Attaching wire for clay or concrete tile shall not be smaller than 0.083 inch (2 mm). Perimeter fastening areas include three tile courses but not less than 36 inches (914 mm) from either side of hips or ridges and edges of eaves and gable rakes.

TABLE R905.2.8.2 VALLEY LINING MATERIAL

MATERIAL	MINIMUM THICKNESS (inches)	GAGE	WEIGHT (pounds)
Cold-rolled copper	0.0216 nominal	—	ASTM B370, 16 oz. per square foot
Lead-coated copper	0.0216 nominal	—	ASTM B101, 16 oz. per square foot
High-yield copper	0.0162 nominal	—	ASTM B370, 12 oz. per square foot
Lead-coated high-yield copper	0.0162 nominal	—	ASTM B101, 12 oz. per square foot
Aluminum	0.024	—	—
Stainless steel	—	28	—
Galvanized steel	0.0179	26 (zinc coated G90)	—
Zinc alloy	0.027	—	—
Lead	—	—	$2^1/_2$
Painted terne	—	—	20

For SI: 1 inch = 25.4 mm, 1 pound = 0.454 kg.

R905.3.7 Application. Tile shall be applied in accordance with this chapter and the manufacturer's installation instructions, based on the following:

1. Climatic conditions.
2. Roof slope.
3. Underlayment system.
4. Type of tile being installed.

Clay and concrete roof tiles shall be fastened in accordance with this section and the manufacturer's installation instructions. Perimeter tiles shall be fastened with not less than one fastener per tile. Tiles with installed weight less than 9 pounds per square foot (0.4 kg/m²) require not less than one fastener per tile regardless of roof slope. Clay and concrete roof tile attachment shall be in accordance with the manufacturer's installation instructions where applied in areas where the ultimate design wind speed exceeds 130 miles per hour (58 m/s) and on buildings where the roof is located more than 40 feet (12 192 mm) above grade. In areas subject to snow, not less than two fasteners per tile are required. In other areas, clay and concrete roof tiles shall be attached in accordance with Table R905.3.7.

TABLE R905.3.7 CLAY AND CONCRETE TILE ATTACHMENT

SHEATHING	ROOF SLOPE	NUMBER OF FASTENERS
Solid without battens	All	One per tile
Spaced or solid with battens and slope < 5:12	Fasteners not required	—
Spaced sheathing without battens	5:12 ≤ slope < 12:12	One per tile/every other row
	12:12 ≤ slope < 24:12	One per tile

R905.3.8 Flashing. At the juncture of roof vertical surfaces, flashing and counterflashing shall be provided in accordance with this chapter and the manufacturer's installation instructions and, where of metal, shall be not less than 0.019 inch (0.5 mm) (No. 26 galvanized sheet gage) corrosion-resistant metal. The valley flashing shall extend not less than 11 inches (279 mm) from the centerline each way and have a splash diverter rib not less than 1 inch (25 mm) in height at the flow line formed as part of the flashing. Sections of flashing shall have an end lap of not less than 4 inches (102 mm). For roof slopes of three units vertical in 12 units horizontal (25-percent slope) and greater, valley flashing shall have a 36-inch-wide (914 mm) underlayment of one layer of Type I underlayment running the full length of the valley, in addition to other required underlayment. In areas where the average daily temperature in January is 25°F (-4°C) or less, metal valley flashing underlayment shall be solid-cemented to the roofing underlayment for slopes less than seven units vertical in 12 units horizontal (58-percent slope) or be of self-adhering polymer-modified bitumen sheet.

R905.4 Metal roof shingles. The installation of metal roof shingles shall comply with the provisions of this section.

R905.4.1 Deck requirements. Metal roof shingles shall be applied to a solid or closely fitted deck, except where the roof covering is specifically designed to be applied to spaced sheathing.

R905.4.2 Deck slope. Metal roof shingles shall not be installed on roof slopes below three units vertical in 12 units horizontal (25-percent slope).

R905.4.3 Underlayment. Underlayment shall comply with Section R905.1.1.

R905.4.3.1 Ice barrier. Where required, ice barriers shall comply with Section R905.1.2.

R905.4.4 Material standards. Metal roof shingle roof coverings shall comply with Table R905.10.3(1). The materials used for metal roof shingle roof coverings shall be naturally corrosion resistant or be made corrosion resistant in accordance with the standards and minimum thicknesses listed in Table R905.10.3(2).

R905.4.5 Application. Metal roof shingles shall be secured to the roof in accordance with this chapter and the approved manufacturer's installation instructions.

R905.4.6 Flashing. Roof valley flashing shall be of corrosion-resistant metal of the same material as the roof covering or shall comply with the standards in Table R905.10.3(1). The valley flashing shall extend not less than 8 inches (203 mm) from the centerline each way and shall have a splash diverter rib not less than $3/4$ inch (19 mm) in height at the flow line formed as part of the flashing. Sections of flashing shall have an end lap of not less than 4 inches (102 mm). The metal valley flashing shall have a 36-inch-wide (914 mm) underlayment directly under it consisting of one layer of underlayment running the full length of the valley, in addition to underlayment required for metal roof shingles. In areas where the average daily temperature in January is 25°F (-4°C) or less, the metal valley flashing underlayment shall be solid-cemented to the roofing underlayment for roof slopes under seven units vertical in 12 units horizontal (58-percent slope) or self-adhering polymer-modified bitumen sheet.

R905.5 Mineral-surfaced roll roofing. The installation of mineral-surfaced roll roofing shall comply with this section.

R905.5.1 Deck requirements. Mineral-surfaced roll roofing shall be fastened to solidly sheathed roofs.

R905.5.2 Deck slope. Mineral-surfaced roll roofing shall not be applied on roof slopes below one unit vertical in 12 units horizontal (8-percent slope).

R905.5.3 Underlayment. Underlayment shall comply with Section R905.1.1.

R905.5.3.1 Ice barrier. Where required, ice barriers shall comply with Section R905.1.2.

R905.5.4 Material standards. Mineral-surfaced roll roofing shall conform to ASTM D3909 or ASTM D6380, Class M.

R905.5.5 Application. Mineral-surfaced roll roofing shall be installed in accordance with this chapter and the manufacturer's instructions.

R905.6 Slate shingles. The installation of slate shingles shall comply with the provisions of this section.

SECTION R806 ROOF VENTILATION

R806.1 Ventilation required. Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain or snow. Ventilation openings shall have a least dimension of $1/16$ inch (1.6 mm) minimum and $1/4$ inch (6.4 mm) maximum. Ventilation openings having a least dimension larger than $1/4$ inch (6.4 mm) shall be provided with corrosion-resistant wire cloth screening, hardware cloth, perforated vinyl or similar material with openings having a least dimension of $1/16$ inch (1.6 mm) minimum and $1/4$ inch (6.4 mm) maximum. Openings in roof framing members shall conform to the requirements of Section R802.7. Required ventilation openings shall open directly to the outside air and shall be protected to prevent the entry of birds, rodents, snakes and other similar creatures.

R806.2 Minimum vent area. The minimum net free ventilating area shall be $1/150$ of the area of the vented space.

Exception: The minimum net free ventilation area shall be $1/300$ of the vented space provided both of the following conditions are met:

1. In Climate Zones *14 and 16,* a Class I or II vapor retarder is installed on the warm-in-winter side of the ceiling.
2. Not less than 40 percent and not more than 50 percent of the required ventilating area is provided by ventilators located in the upper portion of the attic or rafter space. Upper ventilators shall be located not more than 3 feet (914 mm) below the ridge or highest point of the space, measured vertically. The balance of the required ventilation provided shall be located in the bottom one-third of the attic space. Where the location of wall or roof framing members conflicts with the installation of upper ventilators, installation more than 3 feet (914 mm) below the ridge or highest point of the space shall be permitted.

R806.3 Vent and insulation clearance. Where eave or cornice vents are installed, blocking, bridging and insulation shall not block the free flow of air. Not less than a 1-inch (25 mm) space shall be provided between the insulation and the roof sheathing and at the location of the vent.

R806.4 Installation and weather protection. Ventilators shall be installed in accordance with manufacturer's instructions. Installation of ventilators in roof systems shall be in accordance with the requirements of Section R903. Installation of ventilators in wall systems shall be in accordance with the requirements of Section R703.1.

R806.5 Unvented attic and unvented enclosed rafter assemblies. Unvented attics and unvented enclosed roof framing assemblies created by ceilings that are applied directly to the underside of the roof framing members and structural roof sheathing applied directly to the top of the roof framing members/rafters, shall be permitted where all the following conditions are met:

1. The unvented attic space is completely within the building thermal envelope.
2. Interior Class I vapor retarders are not installed on the ceiling side (attic floor) of the unvented attic assembly or on the ceiling side of the unvented enclosed roof framing assembly.
3. Where wood shingles or shakes are used, a minimum $1/4$-inch (6.4 mm) vented airspace separates the shingles or shakes and the roofing underlayment above the structural sheathing.
4. In *California Climate Zones 14 and 16,* any air-impermeable insulation shall be a Class II vapor retarder, or shall have a Class II vapor retarder coating or covering in direct contact with the underside of the insulation.
   - *4.1. A Class I or Class II vapor retarder shall be installed on the indirectly conditioned space side of all insulation in an unvented attic with air-permeable insulation for condensation control.*

   See the California Energy Code, Figure 100.1-A — California Climate Zones.
5. Insulation shall comply with Item 5.3 and either Item 5.1 or 5.2:
   - 5.1. Item 5.1.1, 5.1.2, 5.1.3 or 5.1.4 shall be met, depending on the air permeability of the insulation directly under the structural roof sheathing. *No insulation shall be required when roof tiles, wood shingles or wood shakes, or any other roofing system using battens and no continuous underlayment is installed. A continuous underlayment shall be considered to exist if sheathing, roofing paper or any continuous layer having a perm rate of no more than one perm under the dry cup method is present.*
     - 5.1.1. Where only air-impermeable insulation is provided, it shall be applied in direct contact with the underside of the structural roof sheathing.
     - 5.1.2. Where air-permeable insulation is installed directly below the structural sheathing, rigid board or sheet insulation shall be installed directly above the structural roof sheathing in accordance with the R-values in Table R806.5 for condensation control.
     - 5.1.3. Where both air-impermeable and air-permeable insulation are provided, the air-impermeable insulation shall be applied in direct contact with the underside of the structural roof sheathing in accordance with Item 5.1.1 and shall be in accordance with the R-values in Table R806.5 for condensation control. The air-permeable insulation shall be installed directly under the air-impermeable insulation.
     - 5.1.4. Alternatively, sufficient rigid board or sheet insulation shall be installed directly above the structural roof sheathing to maintain the monthly average temperature of the underside of the structural roof sheathing above 45°F (7°C). For calculation purposes, an interior air temperature of 68°F (20°C) is assumed and the exterior air temperature is assumed to be the monthly average outside air temperature of the three coldest months.
   - 5.2. In Climate Zones *3-15,* air-permeable insulation installed in unvented attics shall meet the following requirements:
     - 5.2.1. An approved vapor diffusion port shall be installed not more than 12 inches (305 mm) from the highest point of the

REVISIONS	BY

2022 CALIFORNIA RESIDENTIAL ROOF ASSEMBLIES & VENTILATION BUILDING CODE

A REMODEL FOR 1ST. FLOOR & 2ND. STORY ADDITION FOR:

THE SANTOSH SHAH RESIDENCE

684 MARSHALL CT., SANTA CLARA CA. 95050

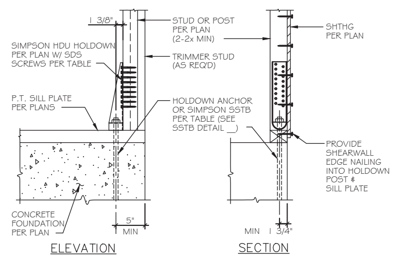
PLAN: LOU COSTANZO 1501 SAN GABRIEL WAY, S.J. 95125 408-264-0220

STRUCTURAL ENGINEER: TONY TRUONG PE. 408 899-0220

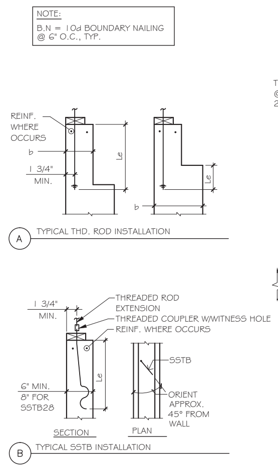
PLAN COMMENTS TO: LOUCOSTANZO@COMCAST.NET 408-472-9829 CELL

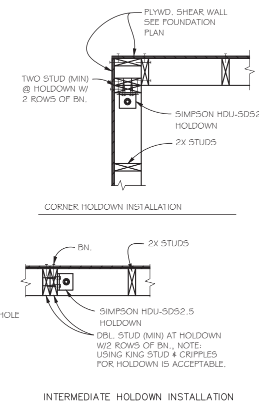
7-18-23
2-8-24
Lou Costanzo

DRAWN: LOU COSTANZO
CHECKED: S.C.
DATE: 7 - 18 - 23
SCALE: NONE
JOB NO.: S2023-8
SHEET: **A10**
OF SHEETS



NOTE:
B.N = 10d BOUNDARY NAILING @ 6" O.C., TYP.

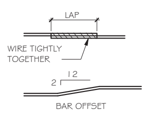




HOLDOWN SIZE	OPTION A: THRD. ROD WITH DBL NUT/WASHER				OPTION B: SIMPSON SSTB ANCHOR BOLT		
	ANCHOR BOLT SIZE	MIN. EMBED.(Le) 6"≤b<10"	MIN. EMBED.(Le) b≥10"	REMARKS	ANCHOR BOLT SIZE*	MIN. EMBED. (Le)	REMARKS
HDU2	5/8" DIA. THD. ROD	12	12	SEE (A) PROVIDE DBL NUT AND STANDARD WASHER AT BOTTOM	SSTB20	16	FOR INSTALLATION REQUIREMENTS SEE (B) REFER TO SIMPSON CATALOG FOR ADDL. REQUIREMENTS
HDU5	5/8" DIA. THD. ROD	16	16		SSTB24	18	
HDU6	7/8" DIA. THD. ROD	18	18		SSTB28	24	

SIMPSON SDS3 WOOD SCREWS SCHEDULE		
WOOD SCREW TYPE	WOOD SCREW DESCRIPTION	No. of WOOD SCREW
SDS 1/4"x 3	1/4" Ø X 3"	10
SDS 1/4"x 3	1/4" Ø X 3"	18
SDS 1/4"x 3	1/4" Ø X 3"	24

1 HOLDOWN ANCHOR BOLT SCHEDULE

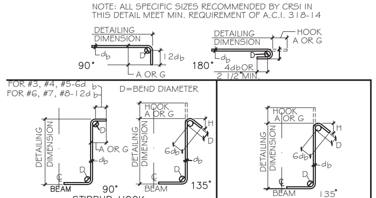


MINIMUM LAP LENGTH FOR REINFORCING BARS (UNLESS OTHERWISE NOTED)		
BAR SIZE	LAP : FT. - IN. TOP BARS	OTHER BARS
#3	2'-3"	1'-10"
#4	3'-1"	2'-5"
#5	3'-10"	3'-0"
#6	5'-0"	3'-10"
#7	6'-10"	5'-3"
#8	8'-11"	7'-0"
#9	11'-4"	8'-10"
#10	14'-4"	11'-0"
#11	17'-9"	13'-7"

NOTES:
1. TOP BARS ARE HORIZ. BARS SO PLACED THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE BARS.
2. LAP LENGTHS ARE BASED ON Fc=3000psi AND Fy=60000psi

2 TYP. CONC. REBAR SPLICES

NOTE: ALL SPECIFIC SIZES RECOMMENDED BY CRSI IN THIS DETAIL MEET MIN. REQUIREMENT OF A.C.I. 318-14



BAR SIZE	D	90° A OR G	135° A OR G	135° APPROX.H
#3	1 1/2"	4"	4"	2 1/2"
#4	2"	4 1/2"	4 1/2"	3"
#5	2 1/2"	6"	5 1/2"	3 3/4"
#6	4 1/2"	1'-0"	7 3/4"	4 1/2"
#7	5 1/4"	1'-2"	9"	5 1/4"
#8	6"	1'-4"	10 1/4"	6"

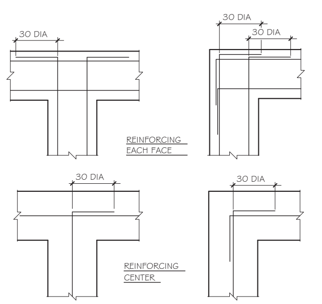
135° SEISMIC HOOK			
SIZE	D	A OR G	APPROX.H
#3	1 1/2"	4 1/4"	3"
#4	2"	4 1/2"	3"
#5	2 1/2"	5 1/2"	3 3/4"
#6	4 1/2"	7 3/4"	4 1/2"
#7	5 1/4"	9"	5 1/4"
#8	6"	10 1/4"	6"

BAR SIZES	D=FINISHED INSIDE BEND DIAMETER STANDARD HOOKS	STIRRUP/TIE HOOKS
#3, #4, #5	$6d_b$	$4d_b$
#6, #7, #8	$6d_b$	$6d_b$
#9, #10, #11	$8d_b$	$8d_b$
#14, #18	$10d_b$	$10d_b$

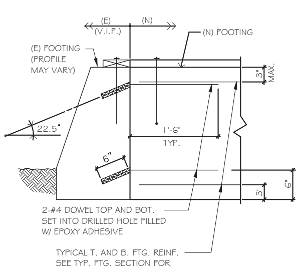
d_b = NOMINAL BAR DIAMETER

BAR SIZE	DIMENSIONS OF STANDARD 180° HOOKS, ALL GRADES: A OR B	J	D	DIMENSIONS OF STANDARD 90° HOOKS, ALL GRADES: A OR G	D
#3	5"	3"	2 1/4"	6"	2 1/4"
#4	6"	4"	3"	8"	3"
#5	7"	5"	3 3/4"	10"	3 3/4"
#6	8"	6"	4 1/2"	1'-0"	4 1/2"
#7	10"	7"	5 1/4"	1'-2"	5 1/4"
#8	11"	8"	6"	1'-4"	6"
#9	1'-3"	11 3/4"	9 1/2"	1'-7"	9 1/2"
#10	1'-5"	1'-1 1/4"	10 3/4"	1'-10"	10 3/4"
#11	1'-7"	1-2 3/4"	12"	2'-0"	12"
#14	2'-3"	1'-9 3/4"	18 1/4"	2'-7"	18 1/4"
#18	3'-0"	2'-4 1/2"	24"	3'-5"	24"

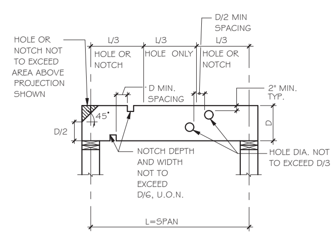
3 STANDARD REBAR HOOKS



4 CONCRETE FTG. INTERSECTION

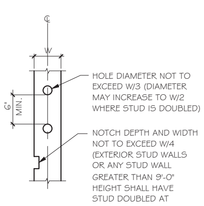


5 TYPICAL FOOTING SPLICE



NOTE:
1. HOLES AND NOTCHES SHALL BE DONE IN A CRAFTSMAN LIKE MANNER AND SHALL NOT EXCEED DIMENSIONS NOTED.
2. SOLID SAWN BEAMS OR GLU-LAM BEAMS SHALL NOT BE DRILLED OR NOTCHED UNLESS APPROVED IN ADVANCE BY STRUCTURAL ENGR..

6 JOIST NOTCHING OR DRILLING (SOLID SAWN LUMBER)



NOTES:
1. POSTS SHALL NOT BE NOTCHED AND HOLE DIAMETERS SHALL NOT EXCEED W/3.
2. HOLES OR NOTCHES EXCEEDING THESE LIMITATIONS ARE NOT TO BE ALLOWED UNLESS APPROVED IN ADVANCE BY THE STRUCTURAL ENGINEER.

7 STUD NOTCHING OR DRILLING

CONCRETE NOTES

1. CONCRETE STRENGTH - PROVIDE CONCRETE WITH THE FOLLOWING STRENGTHS AT THE LOCATIONS NOTED. MIX DESIGN, SLUMP, AIR ENTRAINMENT, AGGREGATE SIZE, ETC. SHALL BE IN CONFORMANCE WITH THE A.C.I. CODE, LATEST EDITION.

LOCATION	STRENGTH (PSI @ 28 DAYS)
FOUNDATION	2500
BUILDING SLABS-ON-GRADE	2500
EXTERIOR WALKWAYS ON GRADE (see notes under reinforcing below)	2500

ALL CONCRETE SHALL BE HARD ROCK (150 PCF) AND CONTAIN 4% AIR ENTRAINMENT.

2. REINFORCING STEEL - ASTM A615 WITH THE FOLLOWING STRENGTHS:

SIZE	STRENGTH
#3 AND SMALLER	GRADE 40 (fy = 40000psi)
#4 AND LARGER	GRADE 60 (fy = 60000psi)

NOTE: EXTERIOR WALKWAYS, WHERE NOT SPECIFICALLY NOTED ON THE THE FOUNDATION PLAN, SHALL BE 4" THICK, HAVE A MINIMUM 4" COMPACTED "CLASS II" BASE, AND SHALL BE REINFORCED WITH 6x6-W1.9xW1.9 WELDED WIRE FABRIC LOCATED AT MID DEPTH.

3. FABRICATE AND PLACE REINFORCEMENT IN ACCORDANCE WITH ACI PUBLICATION SP-66, ACI DETAILING MANUAL - LATEST EDITION.
4. PLACE CONCRETE IN COMPLIANCE WITH ACI 318-14. ALL CONCRETE SHALL BE MECHANICALLY VIBRATED.
5. CONCRETE COVER FOR REINFORCEMENT FOR NON-PRESTRESSED, CAST IN PLACE CONCRETE SHALL BE AS FOLLOWS:

CONDITION	COVER
CAST AGAINST EARTH	3"
EXPOSED TO WEATHER	
#5 AND SMALLER	1 1/2"
#6 AND LARGER	2"
SLAB-ON-GRADE	2"

6. EMBEDS - ALL ITEMS TO BE CAST INTO CONCRETE SUCH AS REINFORCING DOWELS, BOLTS, ANCHORS, PIPES, SLEEVES, ETC., SHALL BE SECURELY AND ACCURATELY POSITIONED INTO THE FORMS PRIOR TO PLACING THE CONCRETE.
7. CONSTRUCTION JOINTS - THE CONTRACTOR SHALL OBTAIN THE ENGINEER'S APPROVAL FOR CONCRETE CONSTRUCTION JOINT LOCATIONS. REINFORCING STEEL DETAILING MAY CHANGE AND THE CONTRACTOR MAY BE RESPONSIBLE FOR ADDITIONAL EXPENSES AS A RESULT.

EPOXY NOTES

1. ALL REINFORCING DOWELS OR THREADED ROD DOWELS INDICATED IN THE CONSTRUCTION DOCUMENTS TO BE "SET INTO HOLES FILLED WITH EPOXY ADHESIVE" SHALL BE GOVERNED BY THE PROVISIONS OF THIS SECTION AS WELL AS THE SPECIFIC INSTALLATION PROVISIONS REQUIRED BY THE PRODUCT MANUFACTURER AND APPLICABLE I.C.B.O. EVALUATION REPORT REQUIREMENTS.
2. ACCEPTABLE PRODUCTS ARE AS FOLLOWS:
   A. SIMPSON SET "XP" (ICC ESR # 2508)
3. PROVIDE DRILLED HOLES OF DIAMETER AND DEPTH SPECIFIED BY THE PRODUCT MANUFACTURER FOR THE DOWEL SIZE SPECIFIED IN THE CONSTRUCTION DOCUMENTS OR OF DIAMETER AND DEPTH SPECIFIED IN THE CONTRACT DOCUMENTS, WHICHEVER IS GREATER WHEN DEPTH OF EMBEDMENT IS CONSIDERED. THOROUGHLY CLEAR HOLE OF CONCRETE DUST WITH BRUSH AND OIL-FREE COMPRESSED AIR. INJECT ADHESIVE PER MANUFACTURER'S SPECIFICATION.
4. ENCOUNTERING EXISTING REINFORCING DURING DRILLING - CONTRACTOR SHALL NOT DRILL THROUGH REINFORCING IN EXISTING CONRETE. ADJUST ANGLE OF HOLE OR RELOCATE HOLE +/- 1" AWAY FROM PREVIOUS LOCATION. CONTACT STRUCTURAL ENGINEER WHERE THE AFOREMENTIONED REMEDY CANNOT BE UTILIZED.

GENERAL NOTES

1. ALL WORK SHALL BE CARRIED OUT BY A CALIFORNIA LICENSED CONTRACTOR(S). ALL CONSTRUCTION PROCEDURES SHALL CONFORM TO OSHA STANDARDS.
2. THE CONTRACT DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISH STRUCTURE. UNLESS OTHERWISE SHOWN, THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES.
3. ALL HOLES DRILLED FOR BOLTS SHALL BE 1/16 INCH LARGER THAN THE BOLT DIAMETER EXCEPT AS NOTED ON PLANS. THE TIGHTENING OF THE BOLTS SHALL NOT DAMAGE EXISTING OR NEW FRAMING ELEMENTS. ALL BOLTS AND THREADED RODS SHALL HAVE HEAVY NUTS AND WASHERS.
4. TYPICAL NOTES AND DETAILS ARE PROVIDED TO COVER GENERAL CONSTRUCTION CONDITIONS. THE GENERAL CONTRACTOR SHALL FOLLOW THOSE DETAILS AND NOTES PERTAINING TO THE SPECIFIC NATURE OF THE WORK TO BE PERFORMED.
5. NOTES AND DETAILS ON THESE STRUCTURAL DRAWINGS SHALL APPLY UNLESS SPECIFICALLY SHOWN OR NOTED OTHERWISE. DETAILS ARE SHOWN IN DIAGRAMMATIC FORM AND ARE NOT TO BE SCALED (SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONS, ELEVATIONS, SLOPES, FINISHES, ETC.). CONSTRUCTION DETAILS NOT SHOWN OR NOTED SHALL BE SIMILAR TO DETAILS SHOWN FOR SIMILAR CONDITIONS. ALL WORK OR CONSTRUCTION SHALL COMPLY WITH THE 2022 CRC AND 2021 IBC AND ALL OTHER APPLICABLE REGULATIONS AND SAFETY REQUIREMENTS.
6. DISCREPANCIES - THE GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, AND EXISTING CONDITIONS (WHERE APPLICABLE) AT THE JOB SITE AS WELL AS THE PROVISIONS OF THE ENTIRE CONSTRUCTION DOCUMENTS AND BRING TO THE ARCHITECT'S/ ENGINEER'S ATTENTION ANY DISCREPANCY. IN THE EVENT OF A DISCREPANCY IN THE STRUCTURAL CONSTRUCTION DOCUMENTS, THE NOTE OR DETAIL UTILIZING THE STRICTER REQUIREMENT SHALL APPLY.
7. EXCAVATION, SHORING, AND BRACING - IT SHALL BE THE GENERAL CONTRACTOR'S SOLE RESPONSIBILITY TO DESIGN AND PROVIDE ADEQUATE SHORING, BRACING, FORM WORK, ETC., AS REQUIRED FOR PROTECTION OF LIFE AND PROPERTY, TO SUPPORT ANY CONSTRUCTION LOADS, AND TO MAINTAIN ALL BUILDING COMPONENTS SAFELY IN PLACE PRIOR TO THEIR FINAL ASSEMBLY AND ANCHORAGE INTO THE COMPLETED STRUCTURE.
8. INSPECTIONS - ALL INSPECTION AND TESTING SHALL BE PERFORMED ACCORDING TO BUILDING CODE AND/OR LOCAL BUILDING DEPARTMENT REQUIREMENTS.
9. COORDINATION - REFER TO THE ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND ALL OTHER PERTINENT DRAWINGS FOR THE SIZE AND LOCATION OF PIPE, VENT, DUCT AND OTHER OPENINGS AND DETAILS NOT SHOWN ON THESE STRUCTURAL DRAWINGS. ALL DIMENSIONS ARE TO BE CHECKED AND VERIFIED WITH THE ARCHITECTURAL DRAWINGS.
10. TRUSS BRACING - THE GENERAL CONTRACTOR SHALL VERIFY THE REQUIRED TRUSS BRACING WITH THE TRUSS MANUFACTURE.

TIMBER NOTES

LUMBER SCHEDULE: (UNLESS OTHERWISE NOTED ON FRAMING PLANS)

1.

USE	SIZE / TYPE	SPECIES	GRADE
LIGHT FRAMING	2"-4" THICK 2"-6" WIDE	DF	NO.2
ROOF JOIST/ CEILING JOIST	2"-4" THICK 5" AND WIDER	DF	NO.2
BEAM/POST	ANY	DF	NO.1
SILL	ANY	DF	PRES. TRTD. #2
PSL BEAM	2.2 E (ICC ESR# 1387)	(TRUSS JOIST MACMILLAN)	
HARDY FRAME	ICC # ESR 2089		

2. PLYWOOD SHEATHING - IN COMPLIANCE WITH U.S. PRODUCT STANDARD PSI, LATEST EDITION.

   OSB SHEATHING - UPON APPROVAL OF THE STRUCTURAL ENGINEER OSB SHEATHING MAY BE SUBSTITUTED FOR PLYWOOD SHEATHING PROVIDED THE OSB SHEATHING CONFORMS TO NATIONAL EVALUATION REPORT NER QA397 AND AMERICAN PLYWOOD ASSOCIATION PERFORMANCE RATING STANDARD NER 108.

   INSTALLATION WORKMANSHIP SHALL CONFORM TO MANUFACTURER'S INSTRUCTIONS IN THE UNIT AND TO AMERICAN PLYWOOD ASSOCIATION'S DESIGN/CONSTRUCTION GUIDE "RESIDENTIAL AND COMMERCIAL" PROCEDURES.
3. NOTCHING, BORING, AND CUTTING OF WOOD MEMBERS SHALL NOT BE ALLOWED EXCEPT AS PROVIDED FOR IN THE 2022 CALIFORNIA BUILDING CODE OR APPROVED BY THE STRUCTURAL ENGINEER.
4. NAILS - COMMON TYPE WITH SIZE AND SPACING IN COMPLIANCE WITH 2022 CALIFORNIA BUILDING CODE TABLE 2304.10.1. OR AS SPECIFIED ON THE DRAWINGS, WHICHEVER SPECIFICATION IS STRICTER. NAILS SHALL NOT PENETRATE FACE OF PLYWOOD SHEETS MORE THAN FLUSH WITH THE SURFACE. PLYWOOD SHEETS SHALL BE REPLACED WHERE NAILS HAVE PENETRATED THE FACE OF THE PLYWOOD. NAILS SHALL BE FULL ROUND-HEAD NAILS (CLIPPED HEAD NAILS, T-NAILS, ETC. SHALL NOT BE ALLOWED).
5. MACHINE BOLTS - ASTM A307 QUALITY INSTALLED THROUGH HOLES 1/16" LARGER THAN SIZE OF BOLT. USE STANDARD CUT WASHERS UNDER HEAD AND NUT UNLESS OTHERWISE NOTED. COUNTERSINK WHERE SPECIFIED NOT MORE THAN THICKNESS OF HEAD AND WASHER. RETIGHTEN PRIOR TO ENCLOSING.
6. LAG SCREWS - INSTALLATION SAME AS FOR MACHINE BOLTS BUT WITH PILOT HOLES 2/3 DIAMETER OF SCREW ROOT. LEAD HOLES SHALL BE UTILIZED EQUAL TO LENGTH AND DIAMETER OF SMOOTH PORTION OF SHANK WHERE SPLITTING IS ANTICIPATED.
7. SHEET METAL FASTENERS - TYPE AS INDICATED ON DRAWINGS BY SIMPSON COMPANY (OR EQUIVALENT) UTILIZING ALL SPECIFIED NAILS OR BOLTS. REFER TO MANUFACTURER'S SPECIFICATIONS FOR ADDITIONAL INSTALLATION REQUIREMENTS WHERE NOT SHOWN OR NOTED.

STRUCTURAL DESIGN CRITERIA:

1. DESIGN LOADS AND REQUIREMENTS: 2022 CBC, 2022 CRC 2021 IBC, ASCE 7-16

REQUIRED INSPECTIONS BY STRUCTURAL ENGINEER

THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE WITH THE STRUCTURAL ENGINEER THE FOLLOWING REQUIRED INSPECTIONS. AT LEAST 48 HOURS NOTICE SHALL BE GIVEN TO THE ENGINEER PRIOR TO TIME OF REQUIRED REVIEW.

1. CONCRETE FOOTINGS & STRUCTURAL EMBEDS ALL REINFORCEMENT AND STRUCTURAL EMBEDS TO BE IN PLACE AND INSPECTED PRIOR TO PLACING CONCRETE.
2. INSTALLATION OF RETROFIT HOLD DOWN(S) & ANCHOR BOLT (S).
3. ROUGH STRUCTURAL FRAMING - ALL STRUCTURAL FRAMING MEMBERS AND STRUCTURAL HARDWARE TO BE IN PLACE AND INSPECTED PRIOR TO CONCEALMENT.
4. ROOF, AND WALL PLYWOOD - ALL PLYWOOD EDGE AND FIELD NAILING TO BE IN PLACE AND INSPECTED PRIOR TO CONCEALMENT.
5. STRUCTURAL OBSERVATION FOR SHEAR-WALL NAILING OF 4 INCHES OR LESS

NOTE: PERIODIC INSPECTIONS ARE REQUIRED

Revisions	By

TRUONG DESIGN
500 E CALAVERES BLVD. SUITE 218
MILPITAS, CA 95035
Email: truongdesigns@gmail.com

ENGINEER'S SIGNATURE

A REMODEL 1st AND 2nd FLOOR ADDITIONS:
SANTOSH SHAH RESIDENCE
648 MASHALL COURT
SANTA CLARA, CA 95051

STRUCTURAL NOTES AND DETAILS

Date:	8-27-24
Scale:	AS NOTED
Engineer:	T.T.
Reviewed:	P.S.
Job:	S-2024-24
Sheet:	S0

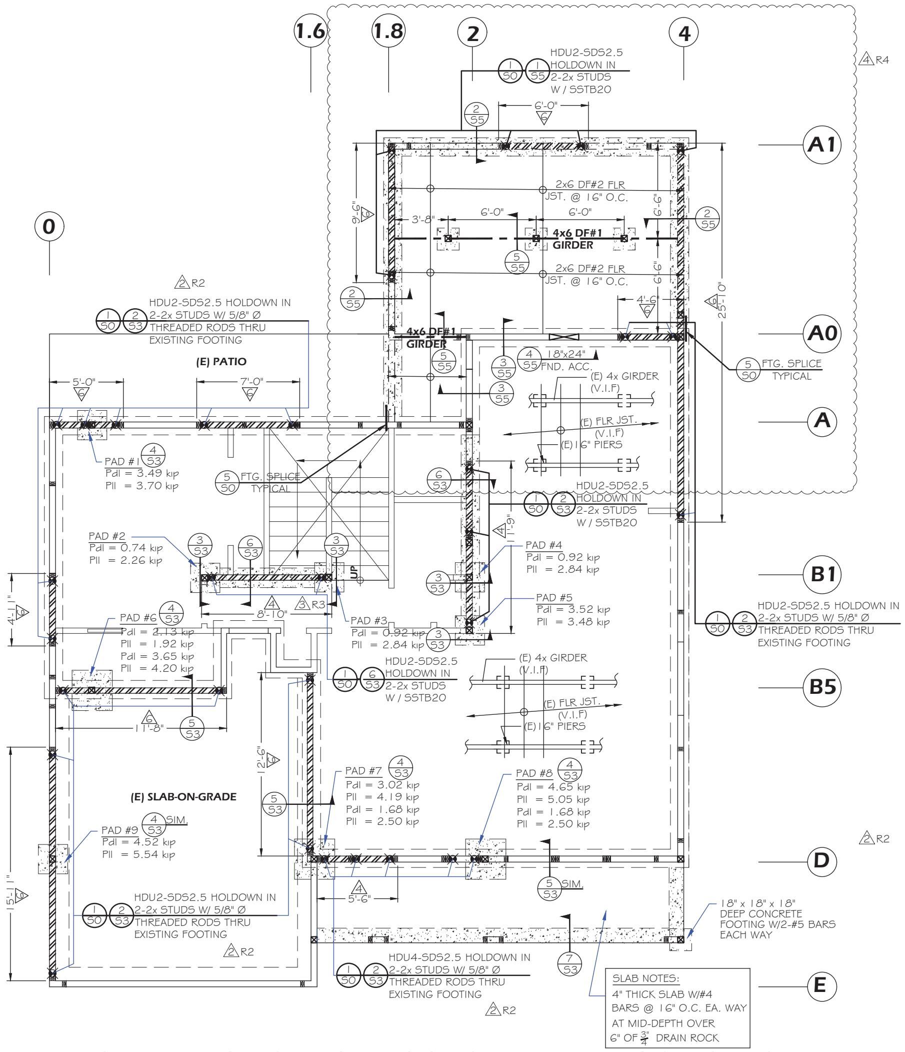
of Sheets

NOTES

1. THE NEW FOUNDATION AT THE NEW ADDITIONS ARE DESIGN PER CRC-2022 MINIMUM (1,500 PSF) (CRC TABLE R401.4.1) ALLOWABLE BEARING. THE NEW FOUNDATIONS ARE DESIGN WITHOUT A SOIL REPORT, HOWEVER, IF THE CITY REQUIRED A SOIL REPORT FOR THIS PROJECT. THE OWNER SHALL PROVIDE ONE. IN THE FUTURE IF THERE ARE ANY SETTLEMENTS AND CRACKS TO THE NEW FOUNDATIONS LOCATION. THE ENGINEER OF RECORD AND TRUONG DESIGN SHALL NOT TAKE ANY RESPONSIBILITY FOR THESE RESULT.

NOTES:

1. CONTRACTOR SHALL VERIFY EXISTING FOUNDATIONS IS CONVENTIONAL AND NOT A PIER AND GRADE BEAM FOUNDATION. CONTRACTOR SHALL ALERT STRUCTURAL ENGINEER IF EXISTING FOUNDATION IS PIER AND GRADE BEAM PRIOR TO CONSTRUCTION.
2. ALL FRAMING MEMBERS AND CONNECTORS EXPOSED TO WEATHER CONDITIONS SHALL BE PRESURE TREATED AND HOT DIPPED GALVANIZED FOR CONNECTORS.
3. ALL ANCHOR EDGE DISTANCE FROM CONCRETE EDGE SHALL BE 2 INCHES MINIMUM (UNLESS NOTIFY OTHERWISE), TYPICAL.



FOUNDATION & FIRST FLOOR SHEAR-WALLS & HOLDOWN PLANS

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

SHEARWALL SCHEDULE (BLOCK ALL PANEL EDGES)

WALL SYMBOL	PLYWOOD THICKNESS	NAILING: BOUNDARIES (B.N) PANEL EDGES (P.E.N)	NAILING: INTERMEDIATE	NAILING: SILL NAILING	ANCHOR BOLTS (AB's) IN 2x PLATE W/ 3"x3"x 1/4" PL WASHER	ANCHOR BOLTS (AB's) IN 3x PLATE W/ 3"x3"x 1/4" PL WASHER	SHEAR TRANSFER A35 CLIP AT BLKG TO 2x DBL TOP PL
6	1/2" (MIN)	8d @ 6" O.C.	8d @ 12" O.C.	16d @ 6" O.C.	5/8"Ø @ 48"	-	24" O.C.
4	1/2" (MIN)	10d @ 4" O.C.	10d @ 12" O.C.	SDS 1/4" x 6" SIMPSON LAG SCREWS @ 8" O.C IN 3x BLKG'S (MIN.)	5/8"Ø @ 32"	-	16" O.C.
3	1/2" (MIN)	2-ROWS OF 10d @ 3" O.C. IN 4x4 STUD	10d @ 12" O.C. IN 4x4 STUD	2-ROWS OF SDS 1/4" x 6" SIMPSON LAG SCREWS @ 4" O.C IN 4x BLKG'S	-	5/8"Ø @ 24"	12" O.C.

NOTE: A MINIMUM OF TWO SILL ANCHORS ARE TO BE PROVIDED PER PLATE, AND THAT THEY ARE TO BE LOCATED NOT MORE THAN 12-INCHES OR LESS THAN SEVEN BOLT DIAMETERS FROM THE ENDS AS REQUIRED BY (CRC R403.1.6.)

PADS DIMENSION:

1. **PAD #2, #3, #4**
   2'-0" x 2'-0" x 18" DEEP
   PAD W/ 3-#5 EACH WAY
2. **PAD #1, #5**
   2'-6" x 2'-6" x 18" DEEP
   PAD W/ 4-#5 EACH WAY
3. **PAD #6, #7, #9**
   3'-3" x 3'-3" x 18" DEEP
   PAD W/ 5-#5 EACH WAY
3. **PAD #8**
   3'-6" x 3'-6" x 18" DEEP
   PAD W/ 5-#5 EACH WAY

LEGEND

- INDICATE SHEAR-WALLS
- INDICATE NEW FOUNDATION
- INDICATE EXISTING FOUNDATION
- HDU_2 - $SDS_{2.5}$ HOLD DOWN
- 2-2x STUD OR 4x POST

DESIGN CRITERIA:

1. SCOPE: A REMODEL AND ADDITION OF 1st AND 2nd STORY

ROOF DL = 14.5 psf: ROOF LL = 20.0 psf; EXTERIOR WALL DL = 16.0 psf
FLOOR DL = 12.0 psf: FLOOR LL = 40.0 psf; INTERIOR WALL DL = 8.0 psf

MINIMUM ALLOWABLE BEARING: 1,500 psf. (CRC TABLE 401.4.1)

SEISMIC DESIGN:

Risk Category:	II
Seismic importance factor:	Ie = 1
Mapped spectral response acceleration parameters:	Ss = 1.500 g, 0.2 sec. S1 = 0.600 g, 1.0 sec.
Design spectral response acceleration parameters:	Sds = 1.200, Sd1 = 0.680
Maximum considered Earthquake Acceleration:	Sms = 1.500, Sm1 = 1.020
Seismic design catagory:	D
Site Class:	D
Basic seismic force resisting system:	Bearing Wall Systems (Light framed walls sheathed w/plywood)
Design base shear:	9.86 kips 3 R3
Seismic response coefficient:	Cs = 0.1846
Response modification coefficient:	R = 6.5
Analysis Procedure used:	Equivalent Lateral Force Procedure

WIND DEISGN:

Wind Speed: 95 mph
Risk category: II
Wind Exposure: B
Horizontal pressure: 24.1 psf (max)

EPOXY TIE ADHESIVE SYSTEM

SIMPSON SET "XP" (ICC ESR # 2508)

SPECIAL INSPECTION

SPECIAL INSPECTION OF RETROFIT HOLDOWNS BOLTS TO BE PERFORMED BY PROJECT DESIGN/STRUCTURAL ENGINEER. LETTER VERIFYING INSPECTION TO BE ON SITE FOR CITY FIELD INSPECTOR AT TIME OF SHEAR WALL INSPECTION.

NOTES

1. CONTINUOUS SPREAD FOOTINGS - CONTRACTOR SHALL OVEREXCAVATION A MINIMUM OF TWELVE INCHES BELOW THE BOTTOM OF THE NEW SPREAD FOOTINGS AND REPLACEMENT WITH NON-EXPENSIVE ENGINEERED FILL OR LEAN CONCRETE. (SEE SOIL REPORT)
2. SURFACE DRAINAGE - ADJACENT TO ANY BUILDINGS, THE GROUND SURFACE SHOULD SLOPE AT LEAST 4 PERCENT AWAY FROM THE FOUNDATIONS WITHIN 5 FEET OF THE PERIMETER. IMPERVIOUS SURFACES SHOULD HAVE A MINIMUM GRADIENT OF 2 PERCENT AWAY FROM THE FOUNDATION. (SEE SOIL REPORT)
3. SURFACE WATER SHOULD BE DIRECTED AWAY FROM ALL BUILDINGS INTO DRAINAGE SWALES, OR INTO A SURFACE DRAINAGE SYSTEM (I.E. CATCH BASINS AND SOLID DRAIN LINE). "TRAPPED" PLANTING AREAS SHOULD NOT BE CREATED NEXT TO ANY BUILDINGS WITHOUT PROVIDING MEANS FOR DRAINAGE. (SEE SOIL REPORT)
4. ALL ROOF EAVES SHOULD BE LINED WITH GUTTERS. THE DOWNSPOUTS SHOULD BE CONNECTED TO SOLID DRAIN LINES, OR SHOULD DISCHARGE ONTO PAVED SURFACES WHICH DRAIN AWAY FROM THE STRUCTURE. THE DOWNSPOUTS MAY BE CONNECTED TO THE SAME DRAIN LINE AS ANY CATCH BASINS, BUT SHOULD NOT CONNECT TO ANY PERFORATED PIPE DRAINAGE SYSTEM. (SEE SOIL REPORT)

FOUNDATION / FIRST FLOOR PLAN NOTES

1. CONFIRM ALL DIMENSIONS AND ELEVATIONS WITH THE LATEST ARCHITECTURAL DRAWINGS. ALERT THE ARCHITECT OF ANY DISCREPANCY. DO NOT SCALE THE STRUCTURAL DRAWINGS.
2. REFER TO STRUCTURAL NOTES ON SHEET S0.
3. FOR TYPICAL CONCRETE REBAR SPLICES REFER TO DETAIL 2/S0.
4. FOR TYPICAL REINFORCING AT FOUNDATION INTERSECTION, REFER TO DETAIL 5/S0.
5. FOR STANDARD REBAR HOOKS, REFER TO DETAIL 3/S0.
6. FOR TYPICAL FOOTING SPLICE, REFER TO DETAIL 5/S0.
7. FOR PIPE THROUGH FOOTING, REFER TO DETAIL 1/S3.
8. NONE
9. FOR STUD AND JOIST DRILLING OR NOTCHING, REFER TO DETAILS 6 AND 7/S0.
10. FOR TYPICAL FLOOR OPENING, REFER TO DETAIL 7/S4.
11. FOR SHEAR WALL PLYWOOD, REFER TO DETAIL 4/S4.
12. FOR FLOOR PLYWOOD, REFER TO DETAIL 5/S4.
13. SHEATH ALL EXTERIOR WALLS WITH 1/2" CDX EXPOSURE 1, A.P.A. RATED PLYWOOD WITH 8d AT 6" O.C. (EDGE, P.E.N.) 12" O.C. FIELD. ALL EDGES ARE TO BE NAILED TO 2x BLOCKING MINIMUM. PROVIDE PLYWOOD EDGE NAILING (P.E.N.) TO ALL POSTS, DOUBLE TOP PLATES, BOTTOM SOLE PLATES, MUD SILLS, EDGE JOISTS, JOIST END BLOCKS, AND OTHER LOCATIONS NOTED IN THE DRAWINGS.
13. SHEATH FLOOR WITH 3/4" T&G A.P.A. RATED "STURD-I-FLOOR", EXPOSURE 1 PLYWOOD WITH FACE GRAIN PERPENDICULAR TO JOISTS WITH ADHESIVE TO BEARING SURFACES AND T&G JOINTS WITH No. 8 x 2" GRABBER WOOD SCREW AT 6" O.C. (EDGES, P.E.N.), 10" O.C. (FIELD). STAGGER END SPLICES.
14. ALL POSTS SHOWN ☒ AND KING POSTS SHOWN ☐ SHALL BE 4x STUD WALL THICKNESS, U.O.N. (S.A.D. FOR STUD WALL THICKNESS'). TYPICAL POST TO BEAM CONNECTIONS SHALL BE EPC'S @ ENDS & PC'S @ INTERIOR SUPPORTS, U.O.N. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SELECTING THE CORRECT POST CAP SIZE. PLYWOOD SHALL BE USED WHERE SHIMMING IS REQUIRED.

Revisions	By
2 3-20-24	T.T.
3 4-03-24	T.T.
4 8-27-24	T.T.

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FOUNDATION & FIRST FLOOR SHEAR-WALLS & HOLDOWN PLANS

Date: 8-27-24
Scale: AS NOTED
Engineer: T.T.
Reviewed: P.S.
Job: S-2024-24
Sheet: S1
of Sheets

BEAMS SCHEDULE: (NOTE: CONTRACTOR SHALL VERIFY ALL ACTUAL SPAN OF FLOOR, RIDGE AND CEILING BEAMS)						
DESCRIPTION	SPAN	BEAM SIZE	HANGER (FACE MOUNT)	MAX. LOAD (lbs.)	BEAM TO COLUMN (CONN.)	BEAM SUPPORT
FLOOR BEAM #1	11'-6"	5.25" x 14.0" 2.2E PSL BM.	HGUS5.50/12	9600	EPCZ'S AND FACE MOUNT HANGER	4x6 DF#1 POST
FLOOR BEAM #2	18'-3"	5.25" x 14.0" 2.2E PSL BM.	HGUS5.50/12	9600	EPCZ'S AND FACE MOUNT HANGER	4x6 DF#1 POST
FLOOR BEAM #3	18'-0"	5.25" x 14.0" 2.2E PSL BM.	-	-	EPCZ'S AND PCZ'S POST CAP	4x6 DF#1 POST
FLOOR BEAM #4	7'-8"	3.5" x 14.0" 2.2E PSL BM.	HGUS412	-	EPCZ'S AND FACE MOUNT HANGER	4x6 DF#1 POST
FLOOR BEAM #5	15'-7"	5.25" x 14.0" 2.2E PSL BM.	HGUS5.50/12	-	EPCZ'S AND FACE MOUNT HANGER	4x6 DF#1 POST
FLOOR BEAM #6	11'-8"	3.5" x 14.0" 2.2E PSL BM.	-	-	EPCZ'S AND PCZ'S POST CAP	4x6 DF#1 POST
FLOOR BEAM #7	9'-7"	3.5" x 14.0" 2.2E PSL BM.	-	-	EPCZ'S AND PCZ'S POST CAP	4x6 DF#1 POST
FLOOR BEAM #8	17'-3"	3.5" x 14.0" 2.2E PSL BM.	HGUS412	-	FACE MOUNT HANGER	FLOOR BEAMS
FLOOR BEAM #9	14'-10"	5.25" x 14.0" 2.2E PSL BM.	"BC" TO HEADER	-	EPCZ'S AND "BC" TO HEADER	4x6 DF#1 POST
FLOOR BEAM #10	13'-9"	3.5" x 14.0" 2.2E PSL BM.	"BC" AND HGUS412	-	FACE MOUNT AND "BC" TO HEADER	FLOOR BEAM
FLOOR BEAM #11	11'-0"	3.5" x 14.0" 2.2E PSL BM.	HGUS412	-	EPCZ'S AND FACE MOUNT HANGER	4x6 DF#1 POST
FLOOR BEAM #12	7'-6"	3.5" x 14.0" 2.2E PSL BM.	HGUS412	-	EPCZ'S AND FACE MOUNT HANGER	4x6 DF#1 POST
FLOOR BEAM #13	15'-6"	3.5" x 14.0" 2.2E PSL BM.	HGUS412	-	FACE MOUNT HANGER	FLOOR BEAM
FLOOR BEAM #14	20'-0"	5.25" x 14.0" 2.2E PSL BM.	"BC" AND HGUS412	-	FACE MOUNT AND "BC" TO HEADER	4x6 DF#1 POST

4 R4

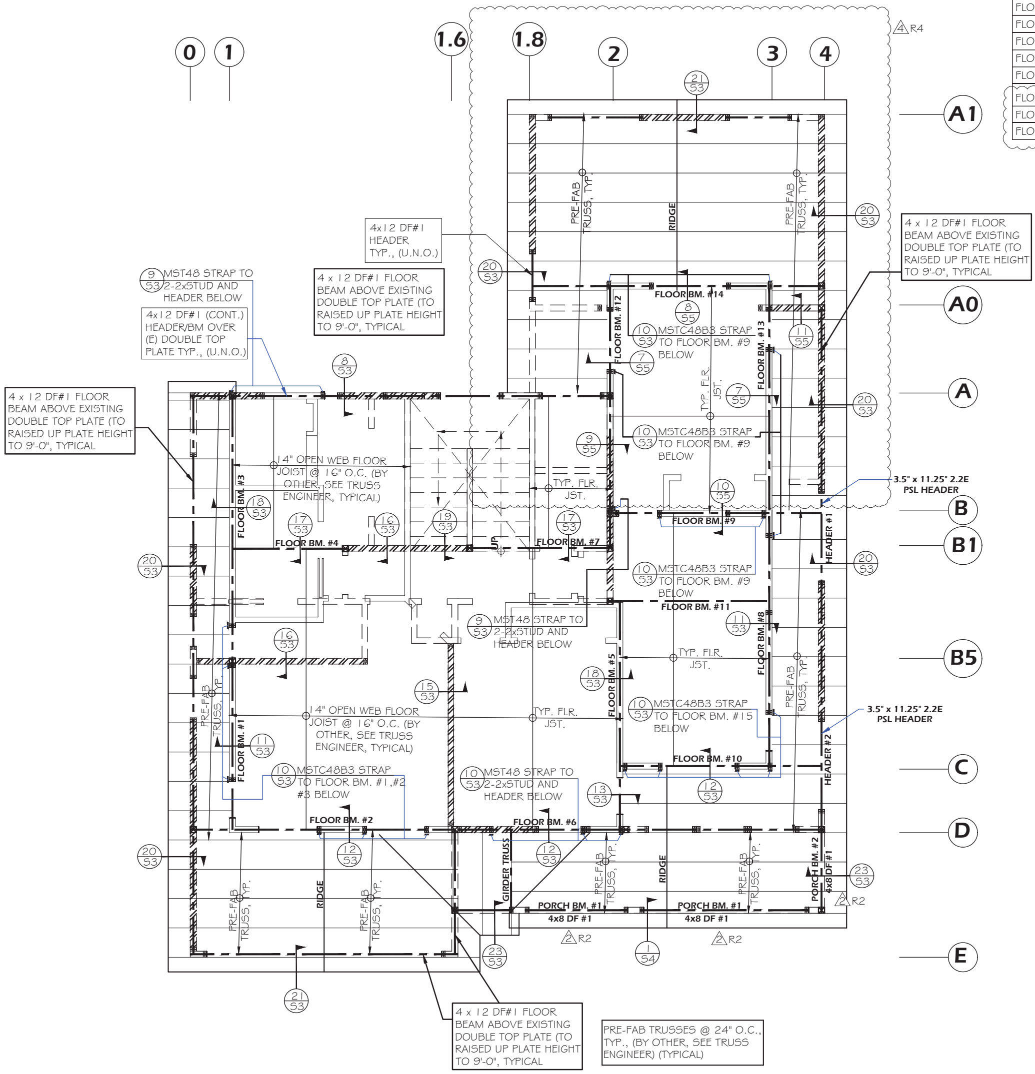
LEGEND

INDICATE SHEAR-WALLS

INDICATE HARDY FRAME

NOTES:

1. OPEN WEB FLOOR JOIST AND / OR 2 x BLOCKING UNDER ALL NEW PARALLEL AND PERPENDICULAR PARTITION WALLS.



SECOND FLOOR & LOWER ROOF FRAMING PLANS AND TIE-DOWN

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

SECOND FLOOR FRAMING PLANS NOTES

1. CONFIRM ALL DIMENSIONS AND ELEVATIONS WITH THE LATEST ARCHITECTURAL DRAWINGS. ALERT THE ARCHITECT OF ANY DISCREPANCY. DO NOT SCALE THE STRUCTURAL DRAWINGS.
2. REFER TO STRUCTURAL NOTES ON SHEET S0.
3. FOR STUD AND JOIST DRILLING OR NOTCHING, REFER TO DETAILS 6 AND 7/S0.
4. FOR DOUBLE TOP PLATE SPLICE, REFER TO DETAIL 9/S4.
5. FOR TYPICAL WALL FRAMED OPENINGS, REFER TO DETAIL 8/S4.
6. FOR TYPICAL ROOF/FLOOR OPENING, REFER TO DETAIL 6 AND 7/S4.
7. FOR SHEAR WALL PLYWOOD, REFER TO DETAIL 4/S4.
8. FOR ROOF/FLOOR PLYWOOD, REFER TO DETAIL 5/S4.
9. SHEATH NEW ROOF WITH 1/2" CDX. EXPOSURE 1, A.P.A. RATED PLYWOOD WITH FACE GRAIN PERPENDICULAR TO RAFTERS WITH 8d AT 6" O.C. (EDGES, P.E.N.) 12" O.C. (FIELD). STAGGER SHEET END SPLICES. (ROOF PLYWOOD MAY BE APPLIED DIRECTLY OVER (E) ROOF SHTG.)
10. SHEATH ALL EXTERIOR WALLS WITH 1/2" CDX EXPOSURE 1, A.P.A. RATED PLYWOOD WITH 8d AT 6" O.C. (EDGE, P.E.N.) 12" O.C. FIELD. ALL EDGES ARE TO BE NAILED TO 2x BLOCKING MINIMUM. PROVIDE PLYWOOD EDGE NAILING (P.E.N.) TO ALL POSTS, DOUBLE TOP PLATES, BOTTOM SOLE PLATES, MUD SILLS, EDGE JOISTS, JOIST END BLOCKS, AND OTHER LOCATIONS NOTED IN THE DRAWINGS.
11. SHEATH FLOOR WITH 3/4" T&G A.P.A. RATED "STURD-I-FLOOR", EXPOSURE 1 PLYWOOD WITH FACE GRAIN PERPENDICULAR TO JOISTS WITH ADHESIVE TO BEARING SURFACES AND T&G JOINTS WITH No. 8 x 3" WOOD SCREW GRABBER AT 6" O.C. (EDGES, P.E.N.), 10" O.C. (FIELD). STAGGER END SPLICES.
12. ALL POSTS SHOWN ☒ AND KING POSTS SHOWN ☐ SHALL BE 4x STUD WALL THICKNESS, U.O.N. (S.A.D. FOR STUD WALL THICKNESS). TYPICAL POST TO BEAM CONNECTIONS SHALL BE EPC'S @ ENDS & PCS @ INTERIOR SUPPORTS, U.O.N. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SELECTING THE CORRECT POST CAP SIZE. PLYWOOD SHALL BE USED WHERE SHIMMING IS REQUIRED.

Revisions	By
3 3-20-24	T.T.
4 8-27-24	T.T.

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SECOND FLOOR & LOWER ROOF FRAMING PLAN AND TIE-DOWN

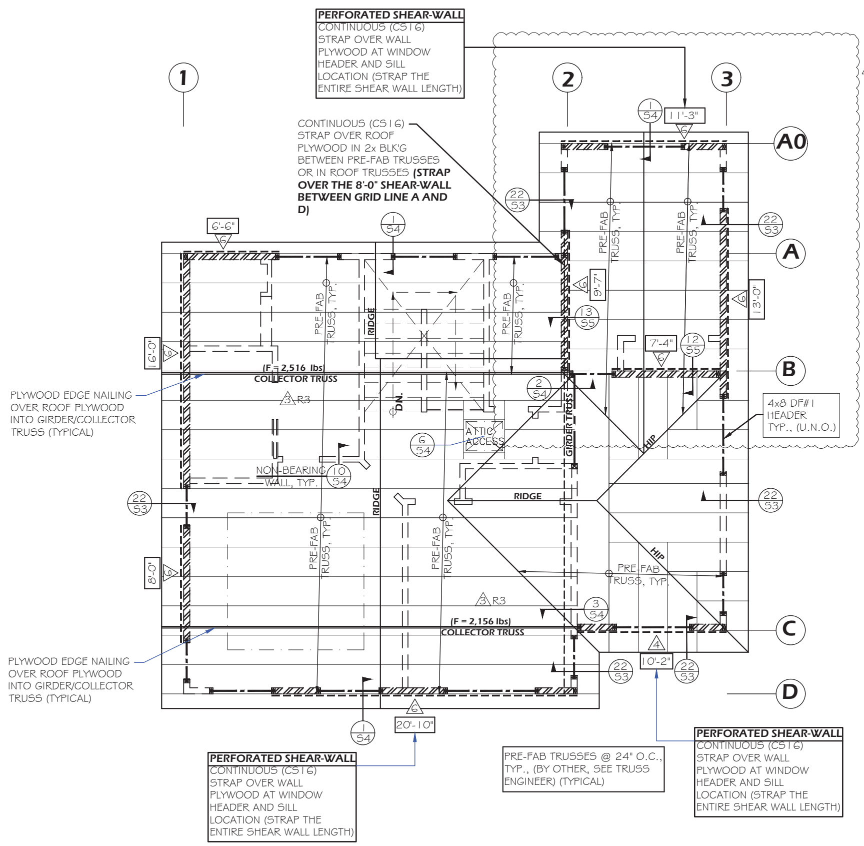
Date:	8-27-24
Scale:	AS NOTED
Engineer:	T.T.
Reviewed:	P.S.
Job:	S-2024-24
Sheet:	S2

of Sheets

SHEARWALL SCHEDULE (BLOCK ALL PANEL EDGES)					
WALL SYMBOL	PLYWOOD THICKNESS	NAILING			SHEAR TRANSFER CLIP FROM 2x BLOCK TO DOUBLE TOP PLATE
		BOUNDARIES (B.N) PANEL EDGES (P.E.N)	INTERMEDIATE	SILL NAILING	
6	1/2" (MIN) "CDX" PLWD.	8d @ 6" O.C.	8d @ 12" O.C.	16d @ 6" O.C.	A35 CLIP @ 24" O.C.
4	1/2" (MIN)	10d @ 4" O.C.	10d @ 12" O.C.	SDS 1/4" x 6" SIMPSON LAG SCREWS @ 8" O.C IN 3x BLKG'S (MIN.)	A35 CLIP @ 16" O.C.

LEGEND

- INDICATE SHEAR-WALLS
- X'-X" / X — INDICATE SHEAR-WALL (S) TYPE AND LENGTH



ROOF FRAMING PLAN

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

ROOF FRAMING PLANS NOTES

1. CONFIRM ALL DIMENSIONS AND ELEVATIONS WITH THE LATEST ARCHITECTURAL DRAWINGS. ALERT THE ARCHITECT OF ANY DISCREPANCY. DO NOT SCALE THE STRUCTURAL DRAWINGS.
2. REFER TO STRUCTURAL NOTES ON SHEET S0.
3. FOR STUD AND JOIST DRILLING OR NOTCHING, REFER TO DETAILS 6 AND 7/S0.
4. FOR DOUBLE TOP PLATE SPLICE, REFER TO DETAIL 9/S4.
5. FOR TYPICAL WALL FRAMED OPENINGS, REFER TO DETAIL 8/S4.
6. FOR TYPICAL ROOF OPENING, REFER TO DETAIL 6/S4.
7. FOR SHEAR WALL PLYWOOD, REFER TO DETAIL 4/S4.
8. FOR ROOF PLYWOOD, REFER TO DETAIL 5/S4.
9. SHEATH NEW ROOF WITH 1/2" CDX. EXPOSURE 1, A.P.A. RATED PLYWOOD WITH FACE GRAIN PERPENDICULAR TO RAFTERS WITH 8d AT 6" O.C. (EDGES, P.E.N.) 12" O.C. (FIELD). STAGGER SHEET END SPLICES. (ROOF PLYWOOD MAY BE APPLIED DIRECTLY OVER (E) ROOF SHTG.)
10. SHEATH ALL EXTERIOR WALLS WITH 1/2" CDX EXPOSURE 1, A.P.A. RATED PLYWOOD WITH 8d AT 6" O.C. (EDGE, P.E.N.) 12" O.C. FIELD. ALL EDGES ARE TO BE NAILED TO 2x BLOCKING MINIMUM. PROVIDE PLYWOOD EDGE NAILING (P.E.N.) TO ALL POSTS, DOUBLE TOP PLATES, BOTTOM SOLE PLATES, MUD SILLS, EDGE JOISTS, JOIST END BLOCKS, AND OTHER LOCATIONS NOTED IN THE DRAWINGS.
11. ALL POSTS SHOWN ☒ AND KING POSTS SHOWN ☐ SHALL BE 4x STUD WALL THICKNESS, U.O.N. (S.A.D. FOR STUD WALL THICKNESS'). TYPICAL POST TO BEAM CONNECTIONS SHALL BE EPC'S @ ENDS & PC'S @ INTERIOR SUPPORTS, U.O.N. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SELECTING THE CORRECT POST CAP SIZE. PLYWOOD SHALL BE USED WHERE SHIMMING IS REQUIRED.

Revisions	By
4 4-3-24	T.T.
6 8-27-24	T.T.

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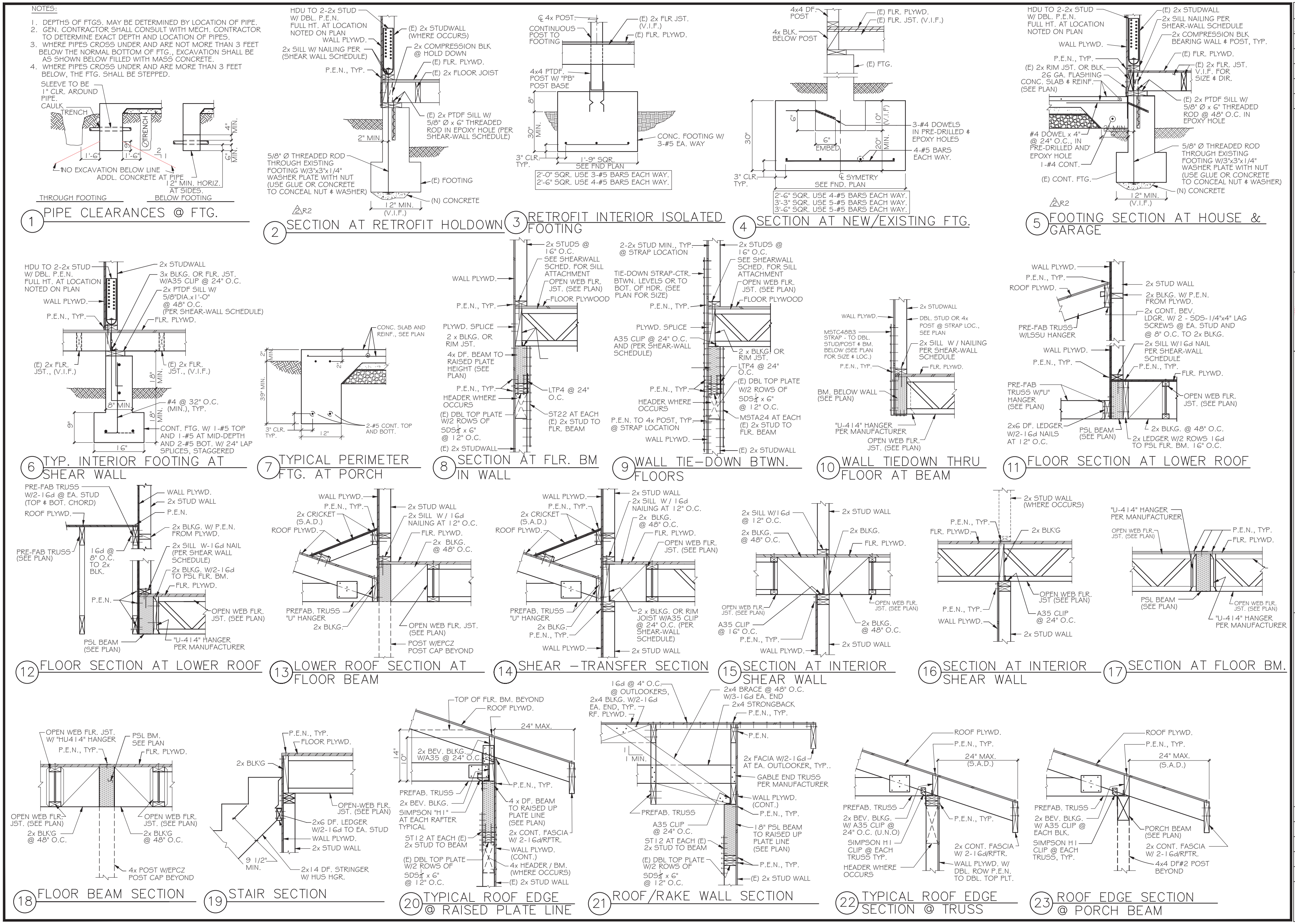
ROOF FRAMING PLAN

Date:	8-27-24
Scale:	AS NOTED
Engineer:	T.T.
Reviewed:	P.S.
Job:	S-2024-24
Sheet:	S2.1

of Sheets


NOTES:
1. DEPTHS OF FTGS. MAY BE DETERMINED BY LOCATION OF PIPE.
2. GEN. CONTRACTOR SHALL CONSULT WITH MECH. CONTRACTOR TO DETERMINE EXACT DEPTH AND LOCATION OF PIPES.
3. WHERE PIPES CROSS UNDER AND ARE NOT MORE THAN 3 FEET BELOW THE NORMAL BOTTOM OF FTG., EXCAVATION SHALL BE AS SHOWN BELOW FILLED WITH MASS CONCRETE.
4. WHERE PIPES CROSS UNDER AND ARE MORE THAN 3 FEET BELOW, THE FTG. SHALL BE STEPPED.
1 PIPE CLEARANCES @ FTG.
2 SECTION AT RETROFIT HOLDOWN
3 RETROFIT INTERIOR ISOLATED FOOTING
4 SECTION AT NEW/EXISTING FTG.
5 FOOTING SECTION AT HOUSE & GARAGE
6 TYP. INTERIOR FOOTING AT SHEAR WALL
7 TYPICAL PERIMETER FTG. AT PORCH
8 SECTION AT FLR. BM IN WALL
9 WALL TIE-DOWN BTWN. FLOORS
10 WALL TIEDOWN THRU FLOOR AT BEAM
11 FLOOR SECTION AT LOWER ROOF
12 FLOOR SECTION AT LOWER ROOF
13 LOWER ROOF SECTION AT FLOOR BEAM
14 SHEAR -TRANSFER SECTION
15 SECTION AT INTERIOR SHEAR WALL
16 SECTION AT INTERIOR SHEAR WALL
17 SECTION AT FLOOR BM.
18 FLOOR BEAM SECTION
19 STAIR SECTION
20 TYPICAL ROOF EDGE @ RAISED PLATE LINE
21 ROOF/RAKE WALL SECTION
22 TYPICAL ROOF EDGE SECTION @ TRUSS
23 ROOF EDGE SECTION @ PORCH BEAM

Revisions	By
R2 3-20-24	T.T

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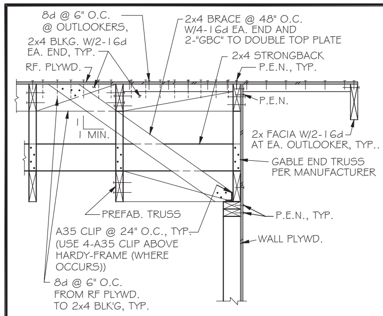
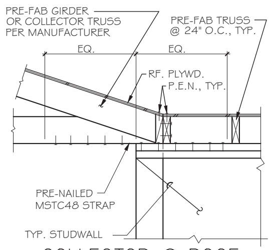
STRUCTURAL DETAILS

Date:	8-27-24
Scale:	AS NOTED
Engineer:	T.T.
Reviewed:	P.S.
Job:	S-2024-24
Sheet:	S3

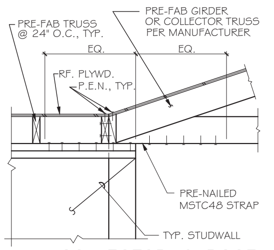
of Sheets



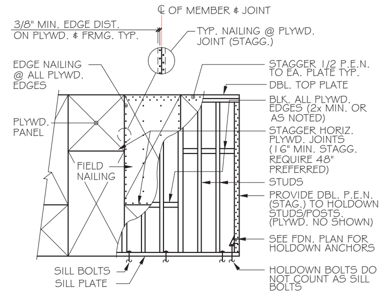
1 ROOF/RAKE WALL SECTION



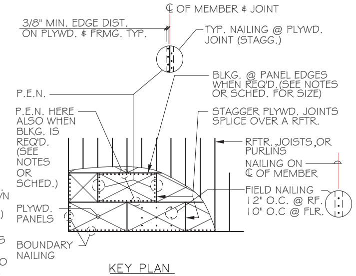
2 COLLECTOR @ ROOF



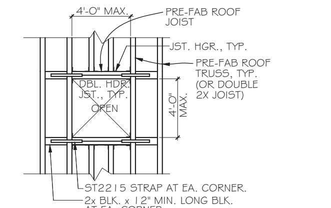
3 COLLECTOR @ ROOF



4 PLYWOOD SHEAR WALLS



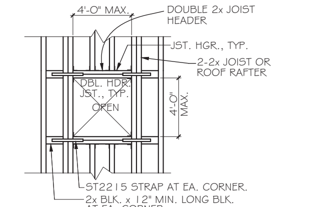
5 ROOF/FLOOR PLYWOOD



NOTES:

1. PROVIDE PLYWD. EDGE NAIL'G TO PRE-FAB ROOF TRUSS, HDR. JST. AND CORNER BLOCKS.
2. DETAIL IS APPLICABLE TO MAX. DIMEN. SHOWN.
3. USE SIMPSON LUS26 &LUS26-2 JOIST HANGERSS AS REQ'D.
4. SEE ARCHITECHTURAL DRAWING FOR SIZE AND LOCATION.

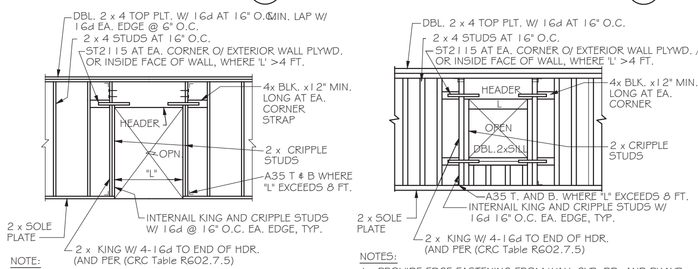
6 TYP. ROOF FRAMED OPENING 4'–0" MAX.



NOTES:

1. PROVIDE PLYWD. EDGE NAIL'G TO PRE-FAB ROOF TRUSS, HDR. JST. AND CORNER BLOCKS.
2. DETAIL IS APPLICABLE TO MAX. DIMEN. SHOWN.
3. USE SIMPSON LUS26 &LUS26-2 JOIST HANGERSS AS REQ'D.
4. SEE ARCHITECHTURAL DRAWING FOR SIZE AND LOCATION.

7 TYP. FLOOR FRAMED OPENING 4'–0" MAX.



NOTE:

1. PROVIDE EDGE FASTENING FROM WALL GYP. BD. AND PLYWD. TO HDR., KING AND CRIPPLE STUDS AND CORNER BLOCKS.
2. REFER TO C.R.C. TABLE 2304.10.1 FOR ADDITIONAL NAILING

NOTES:

1. PROVIDE EDGE FASTENING FROM WALL GYP. BD. AND PLYWD. TO HDR., KING AND CRIPPLE STUDS AND CORNER BLOCKS.
2. REFER TO C.R.C. TABLE 2304.10.1 FOR ADDITIONAL NAILING

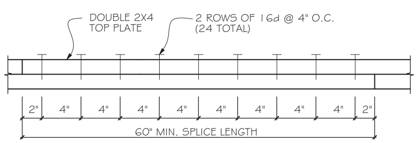
8 TYPICAL WALL FRAMED OPNG.

CRC 2022 TABLE R602.7.5

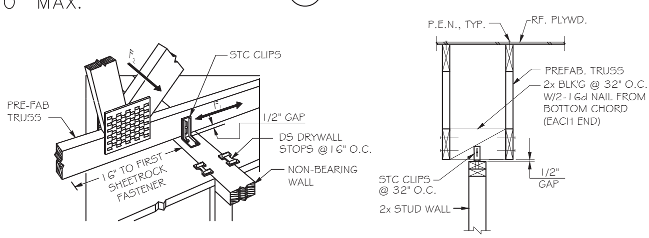
MINIMUM NUMBER OF FULL HEIGHT STUDS AT EACH END OF HEADERS IN EXTERIOR WALLS

HEADER SPAN (feet)	MAXIMUM STUD SPACING (inches) [per Table R602.3(5)]
	16
≤ 3'	1
4'	2
8'	3
12'	5
16'	6

HEADER SPAN (feet)	NUMBER OF 2x CRIPPLE STUDS BELOW HEADER
4'	1
6'	1
8'	1
10'	2
12'	2



9 DOUBLE TOP PLATE SPLICE



TYPICAL AT ALL PERPENDICULAR INTERIOR WALLS

TYPICAL AT ALL PARALLEL INTERIOR WALLS

10 SECTION AT NON-BEARING WALL

1. Revise Table R602.3(1) as follows:

TABLE R602.3(1)
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER[a,b,c]	SPACING OF FASTENERS
	Roof		
1	Blocking between joists or rafters to top plate, toe nail	3-8d (2 ½" x 0.113")	-
2	Ceiling joists to plate, toe nail	3-8d (2 ½" x 0.113")	-
3	Ceiling joist not attached to parallel rafter, laps over partitions, face nail	3-10d	-
4	Collar tie to rafter, face nail, or 1-1/4" x 20 gage ridge strap	3-10d (3" x 0.128")	-
5	Rafter to plate, toe nail	2-16d (3 ½ "x 0.135")	-
6	Roof rafters to ridge, valley or hip rafters: toe nail face nail	4-16d (3 ½" x 0.135") 3-16d (3 ½" x 0.135")	-
	Wall		
7	Built-up corner studs –face nail	10d (3" x 0.128")	24" o.c.
8	Abutting studs at intersecting wall corners, face nail	16d (3 ½" x 0.135")	12"oc
9	Built-up header, two pieces with ½"spacer	16d (3½" × □0.135")	16" o.c. along each edge
10	Continued header. two pieces	16d (3¼" × □0.135")	16" o.c. along each edge
11	Continuous header to stud, toe nail	4-8d (2 ½" x 0.113")	-
12	Double studs, face nail	10d (3" x 0.128")	24" o.c.
13	Double top plates, face nail	10d (3" x 0.128")	24" o.c
14	Double top plates, minimum 24-inch offset of end joints, face nail in lapped area	8-16d (3½" × □0.135")	-
15	Sole plate to joist or blocking, face nail	16d (3½" × □0.135")	16" o.c.
16	Sole plate to joist or blocking at braced wall panels	3-16d (3½" × □0.135")	16" o.c.
17	Stud to sole plate, toe nail	3-8d (2 ½" x 0.113") or 2-16d (3½" × □0.135")	-
18	Top or sole plate to stud, end nail	2-16d (3½" × □0.135")	-
19	Top plates, laps at corners and intersections, face nail	2-10d (3" x 0.128")	-
20	1" brace to each stud and plate, face nail	2-8d (2 ½" x 0.113") 2 staples 1¾"	-
21	1" × 6" sheathing to each bearing, face nail	2-8d (2 ½" x 0.113") 2 staples 1¾"	-
22	1" × 8" sheathing to each bearing, face nail	2-8d (2 ½" x 0.113") 3 staples 1¾"	-
23	Wider than 1" × 8" sheathing to each bearing, face nail	3-8d (2 ½" x 0.113") 4 staples 1¾"	-
24	Joist to sill or girder, toe nail	3-8d (2 ½" x 0.113")	-
25	Rim joist to top plate, toe nail (roof applications also)	8d (2 ½" x 0.113")	6" o.c.
26	Rim joist or blocking to sill plate, toe nail	8d (2 ½" x 0.113")	6" o.c.
27	1" × 6" subfloor or less to each joist, face nail	24 27 2-8d (2 ½" x 0.113") 2 staples 1¾"	-
28	2" subfloor to joist or girder, blind and face nail	2-16d (3½" × □0.135")	-
29	2" planks (plank & beam – floor & roof)	2-16d (3½" × □0.135")	at each bearing
30	Built up girders and beams, 2-inch lumber layers	10d (3" x 0.128")	Nail each layer as follows: 32"□o.c. at top and bottom and staggered. Two nails at ends and at each splice.
31	Ledger strip supporting joists or rafters	3-16d (3½" × □0.135")	At each joist or rafter

(Remainder of table unchanged except item numbers)

Revisions	By

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A REMODEL 1st AND 2nd FLOOR ADDITIONS:

SANTOSH SHAH RESIDENCE

648 MASHALL COURT
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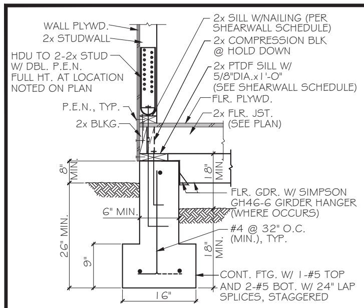
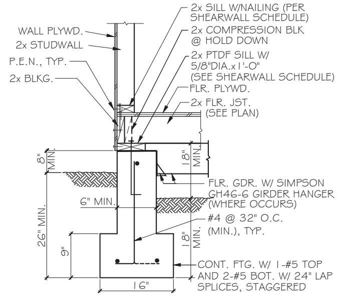
STRUCTURAL DETAILS

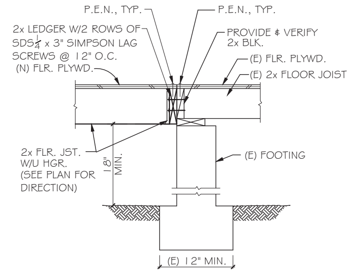
Date:	8-27-24
Scale:	AS NOTED
Engineer:	T.T.
Reviewed:	P.S.
Job:	S-2024-24
Sheet:	S4
of	Sheets



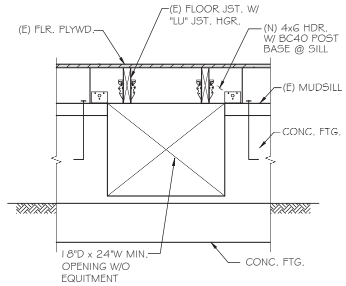
1 TYP. PERIMETER FOOTING AT HOLDOWN



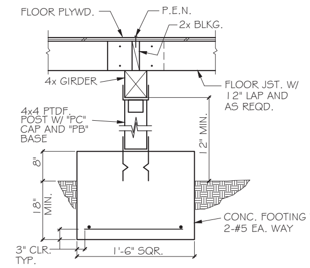
2 TYP. PERIMETER FOOTING



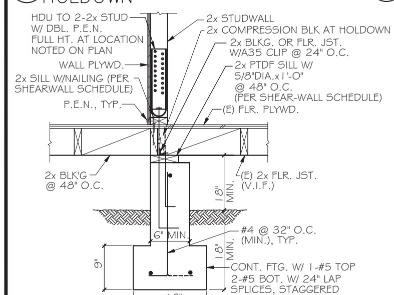
3 SECTION AT LEDGER/EXISTING



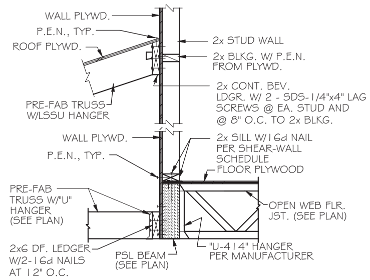
4 CRAWLSPACE ACCESS OPENING AT EXISTING FOOTING



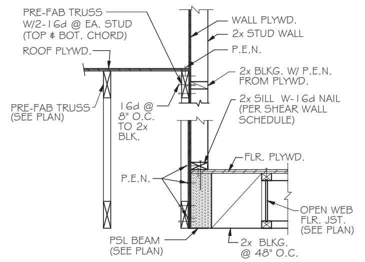
5 TYP. INTERIOR ISOLATED FOOTING



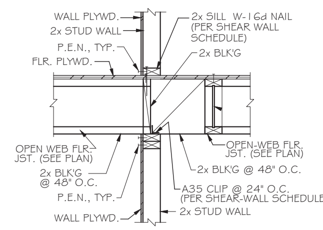
6 TYP. INTERIOR FOOTING AT SHEAR WALL



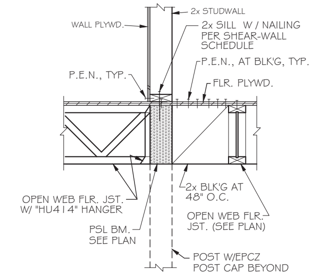
7 FLOOR SECTION AT LOWER ROOF



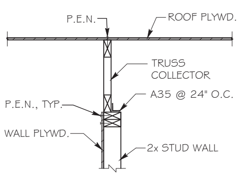
8 FLOOR SECTION AT LOWER ROOF



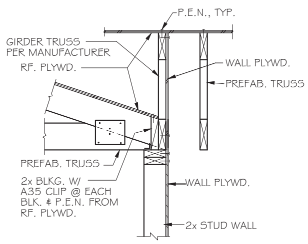
9 SECTION AT INTERIOR SHEAR WALL



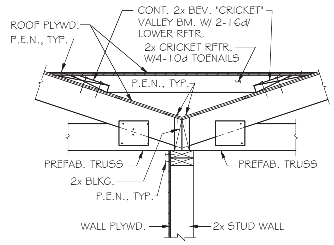
10 FLOOR BEAM SECTION AT SHEAR-WALL



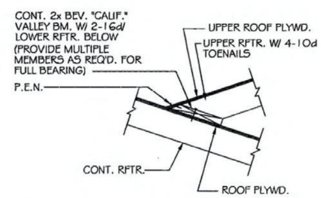
11 ROOF TRUSS COLLECTOR



12 TRUSS CONN. @ INT. SHEAR-WALL



13 SHEAR TRANSFER AT TRUSS



14 "CALIF." VALLEY SEC.

Revisions	By
1 8-27-24	T.T

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ENGINEER'S SIGNATURE

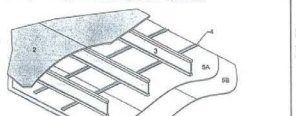
A REMODEL 1st AND 2nd FLOOR ADDITIONS:
SANTOSH SHAH RESIDENCE
648 MASHALL COURT
SANTA CLARA, CA 95051

STRUCTURAL DETAILS

Date:	8-27-24
Scale:	AS NOTED
Engineer:	T.T.
Reviewed:	P.S.
Job:	S-2024-24
Sheet:	S5 R4
of	Sheets

FIRE-RATED WOOD-FRAME WALL AND FLOOR/CEILING ASSEMBLIES 19

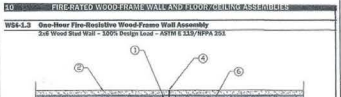
WU-1.6 One-Hour Fire-Resistive Ceiling Assembly
Floor/Ceiling - 100% Design Load - 1 Hour Rating - ASTM E 119 / NFPA 251



1. **Floor Topping (optional, not shown):** Gypsum concrete, lightweight or normal concrete topping.
2. **Floor Sheathing:** Minimum 23/32 inch thick tongue-and-groove wood sheathing (Exposure 1). Installed per code requirements with minimum 8d common nails.
3. **Structural Members:** Wood I-joists spaced a maximum of 24 inches on center.
   Minimum I-joist flange depth: 1-5/16 inches — Minimum I-joist flange area: 1.95 inches²
   Minimum I-joist web thickness: 3/8 inch — Minimum I-joist depth: 9-1/2 inches
   See ASTM D 5055-07 for qualification requirements.
4. **Resilient Channels**: Minimum 0.019 inch thick galvanized steel resilient channel attached perpendicular to the bottom flange of the I-joists with one 1-1/4 inch drywall screw. Channels spaced a maximum of 16 inches on center (24 inches on center when I-joists are spaced a maximum of 16 inches on center).
5. **Gypsum Wallboard:** Two layers of minimum 1/2 inch Type X gypsum wallboard attached with the long dimension perpendicular to the resilient channels as follows:
   5a. Wallboard Base Layer: Base layer of wallboard attached to resilient channels using 1-1/4 inch Type S drywall screws at 12 inches on center.
   5b. Wallboard Face Layer: Face layer of wallboard attached to resilient channels through base layer using 1-5/8 inch Type S drywall screws spaced 12 inches on center. Edge joints of wallboard face layer offset 24 inches from those of base layer. Additionally, wallboard face layer attached to base layer with 1-1/2 inch Type G drywall screws spaced 8 inches on center, placed 1-1/2 inches from face layer end joints.
6. **Finish System (not shown):** Face layer joints covered with tape and coated with joint compound. Screw heads covered with joint compound.

FIRE-RATED WOOD-FRAME WALL AND FLOOR/CEILING ASSEMBLIES 10

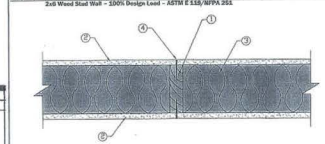
WS6-1.3 One-Hour Fire-Resistive Wood-Frame Wall Assembly
2x6 Wood Stud Wall – 100% Design Load – ASTM E 119/NFPA 251



1. Framing - Nominal 2x6 wood studs, spaced 16 in. o.c., double top plates, single bottom plate .
2. Interior Sheathing - 5/8 in. Type X gypsum wallboard, 4 ft. wide, applied horizontally. Horizontal joints are unblocked. Horizontal application of wallboard represents the direction of least fire resistance as opposed to vertical application.
3. Exterior Sheathing - 7/16 in. wood structural panels (oriented strand board), applied vertically, horizontal joints blocked
4. Gypsum Fasteners - 2-1/4 in. #6 Type S drywall screws, spaced 12 in. o.c.
5. Panel Fasteners - 6d common nails (bright) - 12 in. o.c. in the field, 6 in. o.c. panel edges
6. Insulation - 5-1/2 in. thick mineral wool insulation (2.5 pcf, nominal)
7. Joints and Fastener Heads - Wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound

FIRE-RATED WOOD-FRAME WALL AND FLOOR/CEILING ASSEMBLIES 9

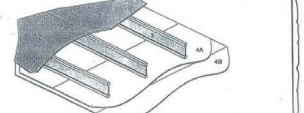
WS6-1.2 One-Hour Fire-Resistive Wood-Frame Wall Assembly
2x6 Wood Stud Wall – 100% Design Load – ASTM E 119/NFPA 251



1. Framing - Nominal 2x6 wood studs, spaced 16 in. o.c., double top plates, single bottom plate
2. Sheathing - 5/8 in. Type X gypsum wallboard, 4 ft. wide, applied horizontally. Horizontal joints are unblocked. Horizontal application of wallboard represents the direction of least fire resistance as opposed to vertical application.
3. Insulation - 5-1/2 in. thick mineral wool insulation (2.5 pcf, nominal)
4. Fasteners - 2-1/4 in. #6 Type S drywall screws, spaced 12 in. o.c.
5. Joints and Fastener Heads - Wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound

FIRE-RATED WOOD-FRAME WALL AND FLOOR/CEILING ASSEMBLIES 18

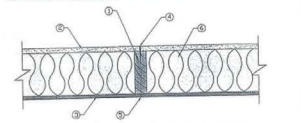
WU-1.9 One-Hour Fire-Resistive Ceiling Assembly
Floor/Ceiling - 100% Design Load - 1 Hour Rating - ASTM E 119 / NFPA 251



1. **Floor Topping (optional, not shown):** Gypsum concrete, lightweight or normal concrete topping.
2. **Floor Sheathing:** Minimum 23/32 inch thick tongue-and-groove wood sheathing (Exposure 1). Installed per code requirements with minimum 8d common nails.
3. **Structural Members:** Wood I-joists spaced a maximum of 24 inches on center.
   Minimum I-joist flange depth: 1-1/2 inches — Minimum I-joist flange area: 2.25 inches²
   Minimum I-joist web thickness: 3/8 inch — Minimum I-joist depth: 9-1/4 inches
   See ASTM D 5055-07 for qualification requirements.
4. **Gypsum Wallboard:** Two layers of minimum 1/2 inch Type C gypsum wallboard attached with the long dimension perpendicular to the I-joists as follows:
   4a. Wallboard Base Layer: Base layer of wallboard attached to bottom flange of I-joists using 1 inch Type S drywall screws at 12 inches on center. End joints of wallboard centered on bottom flange of the I-joist and staggered.
   4b. Wallboard Face Layer: Face layer of wallboard attached to bottom flange of I-joists through base layer using 1-5/8 inch Type S drywall screws spaced 12 inches on center on intermediate joists and 8 inches on center at end joints. Edge joints of wallboard face layer offset 24 inches from those of base layer. End joints centered on bottom flange of I-joists and offset a minimum of 48 inches from those of base layer. Additionally, wallboard face layer attached to base layer with 1-1/2 inch Type G drywall screws spaced 8 inches on center with a 4" staggger, placed 6 inches from face layer end joints.
5. **Finish System (not shown):** Face layer joints covered with tape and coated with joint compound. Screw heads covered with joint compound.

FIRE-RATED WOOD-FRAME WALL AND FLOOR/CEILING ASSEMBLIES 12

WS6-1.5 One-Hour Fire-Resistive Wood-Frame Wall Assembly
2x6 Wood Stud Wall – 100% Design Load – ASTM E 119/NFPA 251



1. Framing - Nominal 2x6 wood studs, spaced 16 in. o.c., double top plates, single bottom plate
2. Interior Sheathing - 5/8 in. Type X gypsum wallboard, 4 ft. wide, applied vertically. All panel edges backed by framing or blocking.
3. Exterior Sheathing - 3/8 in. wood structural panels (oriented strand board), applied vertically, horizontal joints blocked
4. Gypsum Fasteners - 2-1/4 in. #6 Type S drywall screws, spaced 7 in. o.c.
5. Panel Fasteners - 6d common nails (bright) - 12 in. o.c. in the field, 6 in. o.c. panel edges
6. Insulation - R-19 fiberglass insulation
7. Joints and Fastener Heads - Wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound

FIRE-RATED WOOD-FRAME WALL AND FLOOR/CEILING ASSEMBLIES 2

Table 1 One-Hour Fire-Rated Loadbearing Wood-Frame Wall Assemblies

Assemblies Rated From both Sides

Studs	Insulation	Sheathing on Both Sides	Fasteners	Details
2x4 @ 16" o.c.	3½" mineral wool batts	5/8" Type X Gypsum Wallboard (H)	2½" #6 Type S drywall screws @ 12" o.c.	WS4-1.1
2x6 @ 16" o.c.	(none)	5/8" Type X Gypsum Wallboard (H)	2½" #6 Type S drywall screws @ 7" o.c.	WS6-1.1
2x6 @ 16" o.c.	5½" mineral wool batts	5/8" Type X Gypsum Wallboard (H)	2½" #6 Type S drywall screws @ 12" o.c.	WS6-1.2
2x6 @ 16" o.c.	R-19 fiberglass insulation	5/8" Type X Gypsum Wallboard (V)	2½" #6 Type S drywall screws @ 12" o.c.	WS6-1.6

Assemblies Rated From One Side (Fire on Interior Only)

Studs	Insulation	Sheathing	Fasteners	
2x4 @ 16" o.c.	3½" mineral wool batts	I 5/8" Type X Gypsum Wallboard (H)	2½" #6 Type S drywall screws @ 12" o.c.	WS4-1.2
		E 3/8" wood structural panels (V)	6d common nails @ 6" edge/12" field	
2x4 @ 16" o.c.	4 mil polyethylene / 3½" mineral wool batts	I 5/8" Type X Gypsum Wallboard (V)	6d cement coated box nails @ 7" o.c.	WS4-1.3
		E ½" Fiberboard (V)	1½" roofing nails @ 3" edge/6" field	
		3/8" hardboard shiplapped panel siding	8d galv. nails @ 4" edge/8" field	
2x6 @ 16" o.c.	5½" mineral wool batts	I 5/8" Type X Gypsum Wallboard (H)	2½" #6 Type S drywall screws @ 12" o.c.	WS6-1.3
		E 7/16" wood structural panels (V)	6d common nails @ 6" edge/12" field	
2x6 @ 16" o.c.	R-19 fiberglass insulation	I 5/8" Type X Gypsum Wallboard (V)	2½" #6 Type S drywall screws @ 12" o.c.	WS6-1.6
		E 3/8" wood structural panels (V)	6d common nails @ 6" edge/12" field	

H- applied horizontally with vertical joints over studs — I- Interior sheathing
V- applied vertically with vertical joints over studs — E- Exterior sheathing

Table 2 Two-Hour Fire-Rated Loadbearing Wood-Frame Wall Assemblies

Assemblies Rated From Both Sides

Studs	Insulation	Sheathing on Both Sides	Fasteners	Details
2x6 @ 24" o.c.	3½" mineral wool batts	B 5/8" Type X Gypsum Wallboard (H)	2½" #6 Type S drywall screws @ 24" o.c.	WS6-2.1
		F 5/8" Type X Gypsum Wallboard (H)	2½" #6 Type S drywall screws @ 8" o.c.	

H- applied horizontally with vertical joints over studs
B- Base layer sheathing — F- Face layer sheathing

Table 3 One-Hour Fire-Rated Wood Floor/Ceiling Assemblies

Wood I-Joist Assemblies

Joists	Insulation	Furring	Ceiling Sheathing	Fasteners	Details
I-joists @ 24" o.c. Min. flange depth: 1-1/2" Min. flange area: 3.25 sq. in. Min. web thickness: 3/8" Min. I-joist depth: 9 1/4"	1-1/2" mineral wool batts (2.5 pcf-nominal) Resting on flat-shaped channels	Flat-shaped channels	F 5/8" Type C Gypsum Wallboard (GWB)	1-1/4" Type S drywall screws spaced 12" o.c. in GWB field spaced 8" o.c. at GWB end joints *(see fastening details)*	WU-1.1
I-joists @ 24" o.c. Min. flange depth: 1-1/2" Min. flange area: 3.25 sq. in. Min. web thickness: 7/16" Min. I-joist depth: 9 1/4"	1-1/2" mineral wool batts (2.5 pcf-nominal) Resting on resilient channels	Resilient channels	F 5/8" Type C Gypsum Wallboard (GWB)	1" Type S drywall screws spaced 12" o.c. in GWB field spaced 8" o.c. at GWB end joints *(see fastening details)*	WU-1.2
I-joists @ 24" o.c. Min. flange depth: 1-5/16" Min. flange area: 2.25 sq. in. Min. web thickness: 3/8" Min. I-joist depth: 9 1/4"	2" mineral wool batts (3.0 pcf-nominal) Resting on 1x4 cutting strips	Resilient channels	F 5/8" Type C Gypsum Wallboard (GWB)	1-1/8" Type S drywall screws spaced 7" o.c. in GWB field spaced 7" o.c. at GWB end joints *(see fastening details)*	WU-1.3
I-joists @ 24" o.c. Min. flange depth: 1-1/2" Min. flange area: 3.45 sq. in. Min. web thickness: 3/8" Min. I-joist depth: 9 1/4"	1" mineral wool batts (6 pcf-minimal) Resting on flat-shaped channels under I-joist bottom flange	Flat-shaped channels supported by CSC clips	F 1/2" Type C Gypsum Wallboard (GWB)	1" Type S drywall screws spaced 12" o.c. in GWB field spaced 8" o.c. at GWB end joints *(see fastening details)*	WU-1.4
I-joists @ 24" o.c. Min. flange depth: 1-1/2" Min. flange area: 2.25 sq. in. Min. web thickness: 3/8" Min. I-joist depth: 9 1/4"	(none)	Resilient channels	B 1/2" Type C Gypsum Wallboard (GWB)	1" Type S drywall screws spaced 12" o.c. in GWB field spaced 12" o.c. at GWB end joints	WU-1.5
			F 1/2" Type C Gypsum Wallboard (GWB)	1-1/8" Type S drywall screws spaced 12" o.c. in GWB field spaced 8" o.c. at GWB end joints 1-1/2" Type G drywall screws spaced 8" o.c. at GWB end joints *(see fastening details)*	
I-joists @ 24" o.c. Min. flange depth: 1-5/16" Min. flange area: 1.95 sq. in. Min. web thickness: 3/8" Min. I-joist depth: 9-1/2"	(none)	Resilient channels	B 1/2" Type X Gypsum Wallboard (GWB)	1-1/8" Type S drywall screws spaced 12" o.c. in GWB field spaced 12" o.c. at GWB end joints	WU-1.8
			F 1/2" Type X Gypsum Wallboard (GWB)	1-5/8" Type S drywall screws spaced 12" o.c. in GWB field spaced 12" o.c. at GWB end joints 1-1/2" Type G drywall screws spaced 8" o.c. at GWB end joints *(see fastening details)*	
I-joists @ 24" o.c. Min. flange depth: 1-1/2" Min. flange area: 2.25 sq. in. Min. web thickness: 3/8" Min. I-joist depth: 9-1/4"	Fiberglass batts Resting on resilient channels	Resilient channels	B 1/2" Type X Gypsum Wallboard (GWB)	1-1/8" Type S drywall screws spaced 12" o.c. in GWB field spaced 12" o.c. at GWB end joints	WU-1.7
			F 1/2" Type X Gypsum Wallboard (GWB)	1-5/8" Type S drywall screws spaced 12" o.c. in GWB field spaced 12" o.c. at GWB end joints 1-1/2" Type G drywall screws spaced 8" o.c. at GWB end joints *(see fastening details)*	

B- Base layer sheathing — F- Face layer sheathing

Table 4 Two-Hour Fire-Rated Wood Floor/Ceiling Assemblies

Wood I-Joist Assemblies

Joists	Insulation	Furring	Ceiling Sheathing	Fasteners	Details
I-joists @ 24" o.c. Min. flange depth: 1-1/2" Min. flange area: 2.25 sq. in. Min. web thickness: 3/8" Min. I-joist depth: 9-1/4"	3-1/2" fiberglass insulation Supported by stay wires spaced 12" o.c.	(none)	B 5/8" Type C Gypsum Wallboard (GWB)	1-5/8" Type S drywall screws spaced 12" o.c. in GWB field spaced 12" o.c. at GWB end joints	WU-2.1
		Flat-shaped channels	M 5/8" Type C Gypsum Wallboard (GWB)	1" Type S drywall screws spaced 12" o.c. in GWB field spaced 8" o.c. at GWB end joints *(see fastening details)*	
			F 5/8" Type C Gypsum Wallboard (GWB)		

B- Base layer sheathing (direct attached) — M- Middle layer sheathing — F- Face layer sheathing

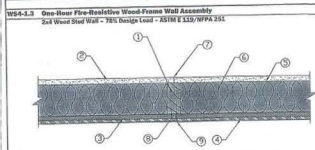
FIRE-RATED WOOD-FRAME WALL AND FLOOR/CEILING ASSEMBLIES 21

WU-2.1 Two-Hour Fire-Resistive Ceiling Assembly
Floor/Ceiling - 100% Design Load - 2 Hour Rating - ASTM E 119 / NFPA 251

1. **Floor Topping (optional, not shown):** Gypsum concrete, lightweight or normal concrete topping.
2. **Floor Sheathing:** Minimum 23/32 inch thick tongue-and-groove wood sheathing (Exposure 1). Installed per code requirements.
3. **Insulation:** Minimum 3-1/2 inch thick unfaced fiberglass insulation fitted between I-joists supported by stay wires spaced 12 inches on center.
4. **Structural Members:** Wood I-joists spaced a maximum of 24 inches on center.
   Minimum I-joist flange depth: 1-1/2 inches — Minimum I-joist flange area: 2.25 inches²
   Minimum I-joist web thickness: 3/8 inch — Minimum I-joist depth: 9-1/4 inches
   See ASTM D 5055-07 for qualification requirements.
5. **Furring Channels:** Minimum 0.0179 inch thick galvanized steel hat-shaped furring channels, attached perpendicular to I-joists using 1-5/8 inch long drywall screws. Furring channels spaced 16 inches on center (furring channels tend to support the second and third layers of gypsum wallboard).
6. **Gypsum Wallboard:** Three layers of minimum 5/8 inch Type C gypsum wallboard as follows:
   6a. Wallboard Base Layer: Base layer of wallboard attached to bottom flange of I-joists using 1-5/8 inch Type S drywall screws at 12 inches on center with the long dimension of wallboard perpendicular to I-joist. End joints of wallboard centered on bottom flange of the I-joist and staggered from end joints in adjacent sheets.
   6b. Wallboard Middle Layer: Middle layer of wallboard attached to furring channels using 1 inch Type S drywall screws spaced 12 inches on center with the long dimension of wallboard perpendicular to furring channels. End joints staggered from end joints in adjacent sheets.
   6c. Wallboard Face Layer: Face layer of wallboard attached to furring channels through middle layer using 1-5/8 inch Type S drywall screws spaced 8 inches on center. Edge joints of face layer of wallboard offset 24 inches from those of middle layer. End joints of face layer of wallboard staggered with respect to the middle layer.
7. **Finish System (not shown):** Face layer joints covered with tape and coated with joint compound. Screw heads covered with joint compound.

FIRE-RATED WOOD-FRAME WALL AND FLOOR/CEILING ASSEMBLIES 7

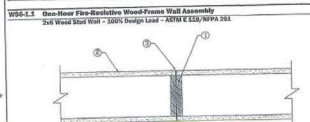
WS4-1.3 One-Hour Fire-Resistive Wood-Frame Wall Assembly
2x4 Wood Stud Wall – 78% Design Load – ASTM E 119/NFPA 251



1. Framing - Nominal 2x4 wood studs, spaced 16 in. o.c., double top plates, single bottom plate
2. Interior Sheathing - 5/8 in. Type X gypsum wallboard, 4 ft. wide, applied vertically, unblocked
3. Exterior Sheathing - 1/2 in. fiberboard sheathing. *Alternate construction - minimum 1/2 in. lumber siding or 1/2 in. wood based sheathing.*
4. Exterior Siding - 5/8 in. hardboard shiplap edge panel siding. *Alternate construction - lumber, wood based, vinyl or aluminum siding.*
5. Vapor Barrier - 4-mil polyethylene sheeting
6. Insulation - 3-1/2 in. thick mineral wool insulation (2.5 pcf, nominal)
7. Gypsum Fasteners - 6d cement coated box nails spaced 7 in. o.c.
8. Fiberboard Fasteners - 1-1/2 in. galvanized roofing nails - 6 in. o.c. in the field, 3 in. o.c. panel edges
9. Hardboard Fasteners - 8d galvanized nails - 8 in. o.c. in the field, 4 in. o.c. panel edges
10. Joists and Fastener Heads - Wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound

FIRE-RATED WOOD-FRAME WALL AND FLOOR/CEILING ASSEMBLIES 8

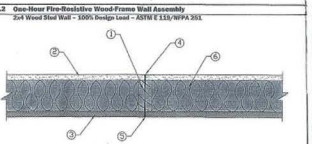
WS6-1.1 One-Hour Fire-Resistive Wood-Frame Wall Assembly
2x6 Wood Stud Wall – 100% Design Load – ASTM E 119/NFPA 251



1. Framing - Nominal 2x6 wood studs, spaced 16 in. o.c., double top plates, single bottom plate
2. Sheathing - 5/8 in. Type X gypsum wallboard, 4 ft. wide, applied horizontally. Horizontal joints are unblocked. Horizontal application of wallboard represents the direction of least fire resistance as opposed to vertical application.
3. Fasteners - 2-1/4 in. #6 Type S drywall screws, spaced 7 in. o.c.
4. Joints and Fastener Heads - Wallboard joints covered with paper tape and joint compound, fastener heads covered with [illegible]

FIRE-RATED WOOD-FRAME WALL AND FLOOR/CEILING ASSEMBLIES 6

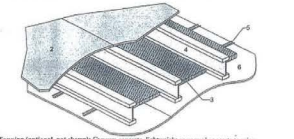
WS4-1.2 One-Hour Fire-Resistive Wood-Frame Wall Assembly
2x4 Wood Stud Wall – 100% Design Load – ASTM E 119/NFPA 251



1. Framing - Nominal 2x4 wood studs, spaced 16 in. o.c., double top plates, single bottom plate
2. Interior Sheathing - 5/8 in. Type X gypsum wallboard, 4 ft. wide, applied horizontally. Horizontal joints are unblocked. Horizontal application of wallboard represents the direction of least fire resistance as opposed to vertical application.
3. Exterior Sheathing - in. wood structural panels (oriented strand board), applied vertically, horizontal joints blocked
4. Gypsum Fasteners - 2-1/4 in. #6 Type S drywall screws, spaced 12 in. o.c.
5. Panel Fasteners - 6d common nails (bright) - 12 in. o.c. in the field, 6 in. o.c. panel edges
6. Insulation - 3-1/2 in. thick mineral wool insulation (2.5 pcf, nominal)
7. Joints and Fastener Heads - Wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound

FIRE-RATED WOOD-FRAME WALL AND FLOOR/CEILING ASSEMBLIES 14

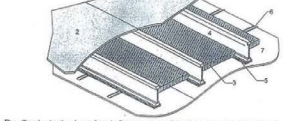
WU-3.1 One-Hour Fire-Resistive Ceiling Assembly
Floor/Ceiling - 100% Design Load - 1 Hour Rating - ASTM E 119 / NFPA 251



1. **Floor Topping (optional, not shown):** Gypsum concrete, lightweight or normal concrete topping.
2. **Floor Sheathing:** Minimum 23/32 inch thick tongue-and-groove wood sheathing (Exposure 1). Installed per code requirements with minimum 8d common nails and glued to joist top flanges with AFG-01 construction adhesive.
3. **Insulation:** Minimum 1-1/2 inch thick mineral wool insulation batts – 2.5 pcf (nominal), supported by furring channels.
4. **Structural Members:** Wood I-joists spaced a maximum of 24 inches on center.
   Minimum I-joist flange depth: 1-1/2 inches — Minimum I-joist flange area: 5.25 inches²
   Minimum I-joist web thickness: 3/8 inch — Minimum I-joist depth: 9-1/4 inches
   See ASTM D 5055-07 for qualification requirements.
5. **Furring Channels:** Minimum 0.018 inch thick galvanized steel hat-shaped furring channels, attached perpendicular to I-joists using 1-5/8 inch long drywall screws. Furring channels spaced 16 inches on center and doubled at each wallboard end joint extending to the next joint.
6. **Gypsum Wallboard:** Minimum 5/8 inch thick Type C gypsum wallboard installed with long dimension perpendicular to furring channels and fastened to each channel with minimum 1-1/8 inch long Type S drywall screws. Fasteners spaced 12 inches on center in the field of the wallboard, 8 inches on center at wallboard end joints, and 3/4 inches from panel edges and ends. End joints of wallboard staggered.
7. **Finish System (not shown):** Face layer joints covered with tape and coated with joint compound. Screw heads covered with joint compound.

FIRE-RATED WOOD-FRAME WALL AND FLOOR/CEILING ASSEMBLIES 16

WU-3.3 One-Hour Fire-Resistive Ceiling Assembly
Floor/Ceiling - 100% Design Load - 1 Hour Rating - ASTM E 119 / NFPA 251



1. **Floor Topping (optional, not shown):** Gypsum concrete, lightweight or normal concrete topping.
2. **Floor Sheathing:** Minimum 23/32 inch thick tongue-and-groove wood sheathing (Exposure 1). Installed per code requirements.
3. **Insulation:** Minimum 2 inch thick mineral wool insulation batts – 3.5 pcf (nominal), supported by setting strip edges, friction-fitted between the sides of the I-joist flanges.
4. **Structural Members:** Wood I-joists spaced a maximum of 24 inches on center.
   Minimum I-joist flange depth: 1-5/16 inches — Minimum I-joist flange area: 2.25 inches²
   Minimum I-joist web thickness: 3/8 inch — Minimum I-joist depth: 9-1/4 inches
   See ASTM D 5055-07 for qualification requirements.
5. **Setting Strips:** Minimum 1x4 (nominal) wood setting strips attached with 1-1/2 inch long drywall screws at 24 inches on center along the bottom flanges of I-joist creating a ledge to support insulation.
6. **Resilient Channels:** Minimum 0.019 inch thick galvanized steel resilient channels, attached perpendicular to I-joists using 1-7/8 inch long drywall screws. Resilient channels spaced 16 inches on center and doubled at each wallboard end joint extending to the next joint.
7. **Gypsum Wallboard:** Minimum 5/8 inch thick Type C gypsum wallboard installed with long dimension perpendicular to furring channels and fastened to each channel with minimum 1-1/8 inch long Type S drywall screws. Fasteners spaced 7 inches on center and 3/4 inches from panel edges and ends. End joints of wallboard staggered.
8. **Finish System (not shown):** Face layer joints covered with tape and coated with joint compound. Screw heads covered with joint compound.

FIRE-RATED WOOD-FRAME WALL AND FLOOR/CEILING ASSEMBLIES 17

WU-3.4 One-Hour Fire-Resistive Ceiling Assembly
Floor/Ceiling - 100% Design Load - 1 Hour Rating - ASTM E 119 / NFPA 251

1. **Floor Topping (optional, not shown):** Gypsum concrete, lightweight or normal concrete topping.
2. **Floor Sheathing:** Minimum 23/32 inch thick tongue-and-groove wood sheathing (Exposure 1). Installed per code requirements with minimum 8d common nails.
3. **Insulation:** Minimum 1 inch thick mineral wool insulation batts – 6 pcf (nominal), with width equal to the on-center spacing of the I-joists. Batts installed on top of furring channels and under bottom flange of I-joists with the sides butted against support clips. Abutted ends of batts centered over furring channels with batts tightly butted at all joints.
4. **Structural Members:** Wood I-joists spaced a maximum of 24 inches on center.
   Minimum I-joist flange depth: 1-1/2 inches — Minimum I-joist flange area: 3.45 inches²
   Minimum I-joist web thickness: 3/8 inch — Minimum I-joist depth: 9-1/4 inches
   See ASTM D 5055-07 for qualification requirements.
5. **Furring Channels:** Minimum 0.019 inch thick galvanized steel hat-shaped furring channels, attached perpendicular to I-joists spaced 24 inches on center. At channel splices, adjacent pieces overlapped a minimum of 6 inches and tied with a double strand of No. 18 gage galvanized steel wire at each end of the overlap. Channels secured to I-joists with Simpson Type CSC support clips at each intersection with the I-joists. Clips nailed to the side of I-joist bottom flange with one 1-1/2 inch long No. 11 gage nail. A row of furring channel located on each side of wallboard end joints and spaced 2.25 inches from the end joint (4.5 inches on center).
6. **Gypsum Wallboard:** Minimum 1/2 inch thick Type C gypsum wallboard. Wallboard installed with long dimension perpendicular to furring channels and fastened to each channel with minimum 1 inch long Type S drywall screws. Fasteners spaced 12 inches on center in the field of the wallboard, 6 inches on center at wallboard end joints, and 3/4 inches from panel edges and ends. End joints of wallboard staggered. For staggered wallboard end joints, furring channels centered a minimum of 6 inches beyond each end of the joint.
7. **Finish System (not shown):** Face layer joints covered with tape and coated with joint compound. Screw heads covered with joint compound.

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DRAWN
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CHECKED
S.C.
DATE
7 - 18 - 23
SCALE
NONE
JOB NO.
S2023-8
SHEET
ONE-HOUR
FIRE RATED ASSEMBLY
OF SHEETS