COMBO-SOLAR HEATER AND TANK SCHEDULE

SYMBOL	SERVICE	LOCATION	MFG'R	MODEL	CAPACITY	HTG. MBTUH		ELECT. CHART. @ 60HZ				WT. LBS	PANELS REQD.	SOLAR PANEL MAKE & MODEL	
						TOTAL	HTG. HW MODULE	V	ø	PMP H.P.	EQ. FLA				
SHW-1	DHW-HHW SYSTEM	MECH. ROOM	VERSA-HYDRO	PHE-199 -119S	119 GAL.	199	135	120	1	(2) FRAC.	7.5	1,450	4	VERSA-HYDRO FP-40SC [4'x10 EACH']	MODULATING GAS VALVE, VENT TERMINATION KIT
ST-1	DHW-HHW SYS.-STOR.TANK	MECH. ROOM	VERSA-HYDRO	PHE-199 -119S	119 GAL.										

① PROVIDE A COMPLETE TURN-KEY SYSTEM INCLUDING MASTER DDC CONTROL, VERSAHYDRO TOTAL CONTROL

② STAINLESS STEEL TANK

③ FACTORY MOUNTING RACK FOR 36 DEGREE MOUNTING ANGLE

④ PROVIDE VIBRATION ISOLATION & FLEX CONNECTIONS

DWELLING HEATER SCHEDULE

SYMBOL	SERVICE	LOCATION	QTY.	MFG'R	MODEL	C.F.M.	EXT. S.P. H_2O	ENT. AIR °F		AMB. AIR °F	HTG. CAP MBH		ELECT. DATA 115V, 1ø @ 60 HZ.		O.S.A. INFILT	WT. LBS.	
								D.B.	W.B.		GPM	MBH	WATTS				
HTR-1	COMFORT HEATING	KICKSPACE	SEE PLANS	MYSON	WH-III 9000	124	0.0"	80.0	63.8	40	3	5.6	40		15	20	①
HTR-2	COMFORT HEATING	WALL	SEE PLANS	MYSON	LO-LINE 14-10	124	0.0"	80.0	63.8	40	3	10.2	40		15	40	①

① INCLUDE REMOTE DIGITAL THERMOSTAT W/ TIME-OFF OCCUP. SENSOR

FAN SCHEDULE

SYM	SERVICE	LOCATION	QTY.	MFG'R	MODEL	TYPE	C.F.M.	TOTAL S.P. H_2O	MAX TIP SPD.	DRIVE	FAN R.P.M.	MOTOR 60 HZ.			SONES	WT. LBS.	REMARKS
												H.P.	V.	ø			
TE-1	UNISEX TOILETS 108,110	CEILING	2	BROAN	744	FAN-LIGHT	70	0.10"	–	DIRECT	1100	34 WATTS	120	1	1.5	10	W/SOLID STATE SPEED CONTROL, B.D.D., OCC. SENS. & WALL CAP
EF-1 TE-2	LAUNDRY & DWELLING	CEILING	10	BROAN	744-SFL	FAN-LGHT HUMIDITY SENSING	70	0.10"	–	DIRECT	1100	34 WATTS	120	1	1.5	10	W/SOLID STATE SPEED CONTROL, B.D.D., & WALL CAP
EF-2	WORKSHPS STORG. 1ST FLR	CEILING SUSP.	2	BROAN	L300MG	CABINET	310	0.125"	–	DIRECT	1145	232 WATTS	↓	↓	3.0	25	W/ELEC. SPEED CONTROL, B.D.D., 8 HR. TIME SWITCH, EPOXY-COATED METAL GRILLE & WALL CAP
EF-3	MAIN WORKSHP	CEILING SUSP.	1	BROAN	L500MG	CABINET	450	0.25"	–	DIRECT	1145	232 WATTS	↓	↓	3.2	32	W/ELEC. SPEED CONTROL, B.D.D., 8 HR. TIME SWITCH, EPOXY-COATED METAL GRILLE & WALL CAP
													↓	↓			
EF-5	ELECT./ ROOM	CEILING	1	BROAN	GC-420	CABINET	260	0.25"	–	DIRECT	1100	170 WATTS	↓	↓	3.4	75	W/ELEC. SPEED CONTROL, B.D.D., HONEYWELL LINE VOLT.T'STAT, EPOXY-COATED METAL GRILLE & WALL CAP

GENERAL NOTES

1. PLATFORMS, CURBS & FLASHINGS FOR MECHANICAL EQUIPMENT SHALL BE FURNISHED & INSTALLED BY THE GENERAL CONTRACTOR, UNLESS NOTED OTHERWISE.
2. THE MECHANICAL CONTRACTOR MUST VERIFY & COORDINATE ALL FLOORS, WALL & ROOF OPENINGS W/GENERAL CONTRACTOR PRIOR TO INSTALLATION OF EQUIPMENT & DUCTWORK. (SEE STRUCTURAL DRAWINGS)
3. REFER TO ARCHITECTURAL PLAN DRAWINGS FOR EXACT LOCATIONS OF AIR DISTRIBUTION DEVICES.
4. INSIDE OF PLENUMS, DUCTS ETC., BEHIND ALL AIR DISTRIBUTION DEVICES SHALL BE PAINTED FLAT BLACK
5. DESIGN CRITERIA, SANTA BARBARA C.O. (City Offices), CALIFORNIA:

SUMMER:			WINTER:	
OUTSIDE:	90 DEG. FDB	70 DEG. FWB	OUTSIDE:	42 DEG. FDB
INSIDE:	78 DEG. FDB	30-80% + RH	INSIDE:	65 DEG. FDB

6. ALL LOW VOLTAGE (24 V.) WIRING BY CONTROL CONTRACTOR.ALL LOW VOLTAGE WIRING SHALL BE IN CONDUIT. ALL CONDUIT BY ELECTRIC CONTRACTOR.
7. THE AIR CONDITIONING CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACQUISITION & PAYMENT OF ALL PERMITS & INSPECTIONS REQUIRED & RELATED FEES FOR THIS INSTALLATION. ALL WORK SHALL COMPLY WITH STATE AND LOCAL CODES. (2001 CALIFORNIA MECHANICAL CODE-C.M.C.)
8. SPIRAL SEAM G.I. ROUND DUCTWORK MAY BE INTERCHANGED WITH THE SQ. OR RECT. DUCTWORK (IN CONCEALED SPACES ONLY) AT CONTRACTOR'S OPTION, SPACE PERMITTING.
9. PROVIDE A 3/4" MIN. PRIMARY & SECONDARY CONDENSATE DRAIN FROM EACH FAN COIL UNIT TO A CITY APRROVED RECEPTOR.
10. CODE APPROVED (WITH SCRIM CLOTH) FLEXIBLE DUCT MAY BE USED IN CONCEALED SPACES FOR PLENUM AND DIFFUSER CONNECTIONS WITH ENGINEERS APPROVAL. MAXIMUM 7'-0" LONG.
11. ALL CONNECTIONS BETWEEN A.C. UNITS/FANS AND DUCTWORK, OR PUMPS AND PIPING, SHALL HAVE FIREPROOF, HEAVY DUTY FLEX-CONNECTIONS (CITY APPROVED) WITH 3" MIN. CLEARANCE & METAL SUNSHIELD FOR ALL WEATHER EXPOSED CONNECTIONS. ISOLATE ALL H.V.A.C. UNITS/FANS & EQUIPMENT FROM STRUCTURE WITH APPROVED ISOLATION MOUNTS.
12. ALL WEATHER EXPOSED EQUIPMENT, ETC., SHALL BE COMPLETELY WEATHERPROOFED.
13. MANUAL VOLUME DAMPER SHALL BE PROVIDED IN ALL DUCT TAKE-OFFS TO INDIVIDUAL CEILING DIFFUSERS, REGISTERS AND GRILLES. ALL MANUAL VOLUME DAMPERS SHALL BE ACCESSIBLE, OR PROVIDED WITH A REMOTE OPERATING DEVICE
14. S.E.E.R., H.S.P.F., & C.O.P. & A.F.U.E. RATING OF EACH H.V.A.C. UNIT SHALL COMPLY WITH CALIFORNIA ENERGY COMMISION (C.E.C.) STANDARDS.
15. ALL S.A. & R.A. DUCTS, AS INDICATED ON THE DRAWINGS, SHALL BE LINED WITH 1"(R-4.2) OR 2"(R-8.0)THICK, 1-1/2 LB. DENSITY FIBERGLASS WITH VINYL FACE TO AIR STREAM. SEAL ALL RAW EDGES. ALL OTHER S.A. & R.A DUCTS SHALL BE WRAPPED WITH 1 LB. DENSITY FIBERGLASS INSULATION 1-1/2" THICK S.A. & R.A. WIRED IN PLACE. PROVIDE VAPOR BARRIER ON INSULATION.
16. FURNISH COMPLETE MAINTENANCE INFORMATION. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY STATED & INCORPORATED ON A READILY ACCESSIBLE LABEL.
17. GAS BURNING APPLIANCES TO BE EQUIPPED WITH STATE APPROVED I.I.D.
18. GAS BURNING APPLIANCES TO BE INSTALLED IN ACCORDANCE WITH THE AGA APPROVED CONDITIONS & MANUFACTURER'S INSTALLATION REQUIREMENTS.
19. .
20. .
21. ALL O.S.A. INTAKES AND EXHAUST FANS TO BE PROVIDED WITH BACK DRAFT DAMPERS.
22. TRANSVERSE JOINTS ON DUCTWORK SHALL BE SEALED WITH "CASCOTE", OR AN APPROVED EQUAL.
23. EACH NEW A.C. SYSTEM SHALL BE CONTROLLED BY A TIME SWITCH, AS PER C.E.C.
24. NOT USED.
25. ALL DUCTWORK SHALL COMPLY WITH CHAPTER 6 C.M.C.
26. ALL DUCT INSULATION SHALL BE AS PER TABLE 6-4 C.M.C.
27. FIRE DAMPERS SHALL BE AS PER SECTION 606, C.M.C.
28. DUCT SMOKE DETECTORS SHALL BE PROVIDED PER SECTION 609, C.M.C. MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL DUCT SMOKE DETECTORS. ELECTRICAL TO PROVIDE POWER WIRING TO DETECTOR. EXCEPTION FOR FULL COVERAGE SMOKE DETECTION SYSTEM.
29. CONTRACTOR SHALL SUBMIT FOR APPROVAL ANY EQUIPMENT OR MATERIALS THAT DEVIATE FROM THE CONTRACT DOCUMENTS.
30. SPECIFICATIONS ARE A PART OF THIS CONTRACT. CONTRACTOR SHALL REQUEST SPECIFICATIONS IF NONE ARE PROVIDED PRIOR TO BID.
31. CONTRACTOR SHALL VISIT THE JOB-SITE & EXAMINE EXISTING CONDITIONS PRIOR TO COMPLETION OF BID.
32. PROVIDE CLEAR PLASTIC LOCKING COVERS FOR ALL THERMOSTATS.

TITLE 24 NOTES-2008 BUILDING ENERGY EFFICIENCY STANDARDS TITLE 24 PART 1 AND 6

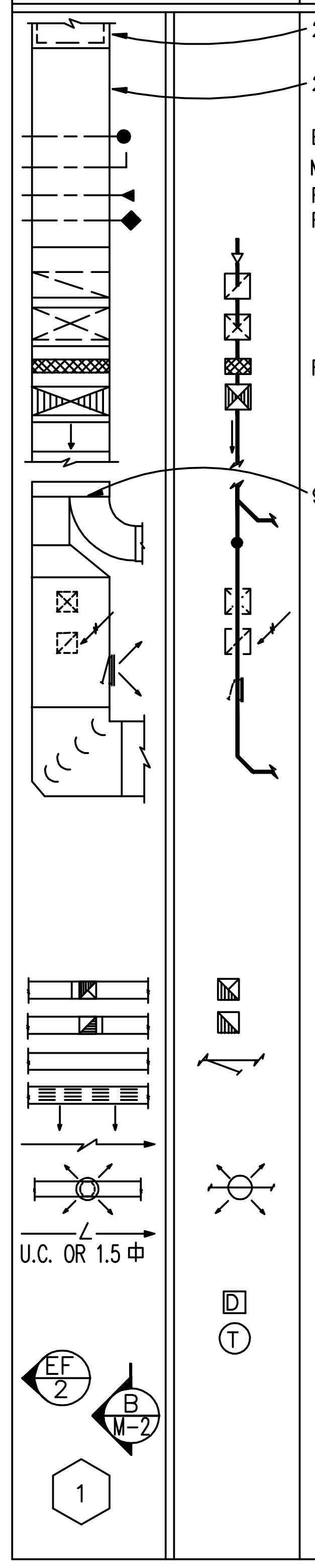
1. ALL HVAC SYSTEMS AND EQUIPMENT SHALL COMPLY WITH SECTION 112 TITLE 24 PART 6.
2. OUTSIDE AIR VENTILATION SHALL BE PROVIDED PER SECTION 121 TITLE 24 PART 6.
3. SPACE CONDITIONING EQUIPMENT CONTROLS SHALL COMPLY WITH SECTION 122 TITLE 24 PART 6.
4. PIPING INSULATION SHALL BE PROVIDED PER SECTION 123 TITLE 24 PART 6.
5. AIR DUCT DISTRIBUTION SYSTEMS SHALL MEET THE REQUIREMENTS OF SECTION 124 TITLE 24 PART 6.
6. MECHANICAL SYSTEMS ACCEPTANCE DOCUMENTATION SHALL BE PROVIDED BY THE CONTRACTOR PER SECTION 125 TITLE 24 PART 6.
7. CONTRACTOR SHALL REVIEW ALL TITLE 24 COMPLIANCE DOCUMENTATION FOR ANY THIRD PARTY VERIFICATION REQUIREMENTS THAT MAY BE APPLICABLE TO THIS PROJECT.

THE 2008 CALIFORNIA ENERGY CONSERVATION STANDARDS HAVE BEEN REVIEWED AND THE DESIGN COMPLIES WITH THESE STANDARDS.

SHEET METAL DUCT & FITTING GAUGES

MAX. DIA. OR WIDTH OF DUCT & FITTING	G.I. SHEET METAL GAUGES	1 1/2" WIDE DUCT HANGER
12"& SMALLER	26	18 GA. MIN. @ MAX. 10FT. O.C.
13" THRU 30"	24	18 GA. MIN. @ MAX. 10FT. O.C.
31" THRU 54"	22	18 GA. MIN. @ MAX. 10FT. O.C.

LEGEND



SYMBOL	ABBREV.	DESCRIPTION
	22 x 12 (L)	ACOUSTICALLY LINED DUCTWORK OR PLENUM; SIZES GIVEN ARE SHEET METAL
	22 x 10	DUCT DIMENSIONS:FIRST DIM.IS PLAN VIEWED AND/OR HORIZONTAL, SECOND DIM. IS DEPTH AND/OR VERTICAL
	B.D.D.	BACKDRAFT DAMPER
	M.V.D.	MANUAL VOLUME DAMPER
	F.D.	FIRE DAMPER
	F.S.D.	FIRE SMOKE DAMPER
	TRANS.	TRANSITION
		RETURN LOOKING AWAY FROM VIEWER
		SUPPLY LOOKING AWAY FROM VIEWER
	FLEX.CONN.	FLEXIBLE CONNECTION
		SUPPLY DUCT LOOKING TOWARD VIEWER
		INCLINED RISE OR DROP IN DIRECTION OF AIR FLOW
		BREAK IN DUCT RUN FOR DRAWING CLARIFICATION
	9"TH.	THROAT SIZE,NET.
	P.O.C.	POINT OF CONNECTION
	C.D.	SUPPLY DIFFUSER (ARROW INDICATES DIRECTION OF AIR FLOW)
	C.R.	EXHAUST OR RETURN REGISTER (C.G.-GRILLE)
	T.R.	TOP REGISTER W/ EXTRACTER (T.G.-GRILLE)
	B.R.	BOTTOM REGISTER W/ EXTRACTER (B.G.-GRILLE)
	T.V.	MITERED ELBOW W/ DOUBLE THICKNESS AIRFOIL TYPE TURNING VANES
	C.F.M.	CUBIC FEET PER MINUTE
	S.A.	SUPPLY AIR
	R.A.	RETURN AIR
	O.S.A.	OUTSIDE AIR
	M.A.	MIXED AIR
	A.P.	ACCESS PANEL (CEILING)
	EXH.	EXHAUST DUCT (IN SECTION)
		RETURN DUCT (IN SECTION)
	A.D.	ACCESS DOOR
	L.D.	STRIP TYPE DIFUSERS (ARROWS INDICATE DIRECTION OF AIR FLOW) (PLENUM SHOWN SOLID)
		EXHAUST,RETURN,OR TRANSFER AIR
	C.D.	ROUND CEILING DIFFUSER
	U.C.	UNDERCUT OR LOUVER
	D.L.	DOOR LOUVER W/ GROSS AREA
	S.D.	SMOKE DETECTOR
	T'STAT	THERMOSTAT
	U.N.O.	UNLESS NOTED OTHERWISE
		EQUIPMENT REFERENCE
		SECTION REFERENCE
		AIR DISTRIBUTION DEVICE

MECHANICAL ABBREVIATIONS

ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION
ABV.	**ABOVE**	**HDR.**	**HEADER**
BEL.	**BELOW**	**@**	**AT**
DN.	**DOWN**	**W/**	**WITH**
FR.	**FROM**	**CONN.**	**CONNECT, CONNECTION**
X.	**EXISTING**	**LBS.**	**POUNDS**
FLR.	**FLOOR**	**POC**	**POINT OF CONNECTION**
CLG.	**CEILING**	**FIN.**	**FINISH**
N.I.C.	**NOT IN CONTRACT**	**DBL.**	**DOUBLE**
EL./ELEV.	**ELEVATION**	**ASSY.**	**ASSEMBLY**
℄	**CENTERLINE**	**CONT.**	**CONTINUATION**
CONTR.	**CONTRACTOR**	**VTR**	**VENT THRU ROOF**
TYP.	**TYPICAL**	**GRD**	**GRADE**
S.P.	**STATIC PRESSURE**	**PRESS**	**PRESSURE**
GPM	**GALLONS PER MINUTE**	**MAX./MIN.**	**MAXIMUM/MINIMUM**
AP	**ACCESS PANEL**	**O.C.**	**ON CENTER**
WT.	**WEIGHT**	**F.S.**	**FLOOR SINK**
O.B.D.	**OPPOSED BLADE DAMPER**	**F.A.**	**FREE AREA**

AIR DISTRIBUTION TYPE SCHEDULE

SYMBOL	TYPE & DESCRIPTION	MAKE & MODEL
SEE KEY NOTES	4 INCH ROUND ALUMINUM VENT LOUVER W/ STAINLESS STEEL INSECT SCREEN" (STANDARD CLEAR SATIN ANODIZED)	SEIHO #SFX4-N
SEE KEY NOTES	8 INCH ROUND ALUMINUM VENT LOUVER W/ STAINLESS STEEL INSECT SCREEN" (STANDARD CLEAR SATIN ANODIZED)	SEIHO #SFX8-N
SEE KEY NOTES	4 INCH ROUND ALUMINUM DRYER VENT CAP W/ INTEGRAL DAMPER (STANDARD CLEAR SATIN FINISH)	SEIHO #SFZC-4

NOTE: ALL AIR DISTRIBUTION DEVICE FINISHES SHALL BE AS DIRECTED BY ARCHITECT

MACY
ARCH
ITEC
TURE

315 Linden Street
San Francisco, CA 94102
Tel 415 551 7630
Fax 415 551 7601
www.macyarchitecture.com

STAMP

MARK VINCENT TSUKAMOTO
NO. 27994
EXP. 06/30/14

CONSULTANTS

Dozal & Assoc.
26123 Singer Pl.
Stevenson Ranch, CA
91381
T.661.993.3343

PROJECT

SANTA BARBARA CENTER FOR ART, SCIENCE & TECHNOLOGY

513 GARDEN STREET
SANTA BARBARA, CA 93101

ISSUES / REVISIONS

•

SHEET TITLE

MECHANICAL LEGEND, SCHEDULES, NOTES

DATE 04/1/13
PHASE ISSUE FOR BID SET
SCALE NONE

FULL SIZE

SHEET

M1.0

PERFORMANCE CERTIFICATE: Residential (Part 1 of 5) CF-1R

Project Name SBCAST	Building Type ☐ Single Family ☐ Addition Alone ☒ Multi Family ☐ Existing+ Addition/Alteration	Date 9/5/2012

Project Address	California Energy Climate Zone	Total Cond. Floor Area	Addition	# of Stories
513 Garden Street Santa Barbara	CA Climate Zone 06	3,888	n/a	3

FIELD INSPECTION ENERGY CHECKLIST

☐ Yes ☒ No HERS Measures -- If Yes, A CF-4R must be provided per Part 2 of 5 of this form.

☒ Yes ☐ No Special Features -- If Yes, see Part 2 of 5 of this form for details.

INSULATION

Construction	Type	Cavity	Area (ft²)	Special Features (see Part 2 of 5)	Status
Wall	Wood Framed	R-19	7,128		New
Roof	Wood Framed Attic	R-30	3,888		New

FENESTRATION

Orientation	Area(ft²)	U-Factor	SHGC	Overhang	Sidefins	Exterior Shades	Status
Front (N)	432.0	0.710	0.73	none	none	Bug Screen	New
Left (E)	72.0	0.710	0.73	none	none	Bug Screen	New
Right (W)	360.0	0.710	0.73	none	none	Bug Screen	New

HVAC SYSTEMS

Qty.	Heating	Min. Eff	Cooling	Min. Eff	Thermostat	Status
1	Combined Hydronic	see DHW	No Cooling	13.0 SEER	Setback	New
8	Combined Hydronic	see DHW	No Cooling	13.0 SEER	Setback	New

HVAC DISTRIBUTION

Location	Heating	Cooling	Duct Location	Duct R-Value	Status
System 1	Ducted	Ducted	Attic, Ceiling Ins, vented	8.0	New
System 2	Ducted	Ducted	Attic, Ceiling Ins, vented	8.0	New

WATER HEATING

Qty.	Type	Gallons	Min. Eff	Distribution	Status
1	Large Gas	150	0.84	Kitchen Pipe Ins	New

EnergyPro 5.1 by EnergySoft User Number: 20573 ID: 00071 Page 1 of 8

PERFORMANCE CERTIFICATE: Residential (Part 2 of 5) CF-1R

Project Name SBCAST	Building Type ☐ Single Family ☐ Addition Alone ☒ Multi Family ☐ Existing+ Addition/Alteration	Date 9/5/2012

SPECIAL FEATURES INSPECTION CHECKLIST

The enforcement agency should pay special attention to the items specified in this checklist. These items require special written justification and documentation, and special verification to be used with the performance approach. The enforcement agency determines the adequacy of the justification, and may reject a building or design that otherwise complies based on the adequacy of the special justification and documentation submitted.

Multiple Dwelling Units are served by a common water heater. Verify DHW details.

The DHW System Glowcore GWH150 includes a Solar Savings Fraction (69.0%) for solar thermal water heating as calculated from the equations in Residential ACM Appendix RG section RG 3.4. See also section 6.3 of the Residential ACM.

The DHW System Glowcore GWH150 is a non-NAECA large storage gas water heater. Verify DHW details.

The HVAC System Heating Only - No Cooling does not include a cooling system, field verification is not necessary.

The HVAC System System 1 is a Combined Hydronic System that uses a Boiler for DHW and Space Heating. System details are on Part 5 of the CF-1R.

The HVAC System Heating Only - No Cooling does not include a cooling system, field verification is not necessary.

The HVAC System System 2 is a Combined Hydronic System that uses a Boiler for DHW and Space Heating. System details are on Part 5 of the CF-1R.

HERS REQUIRED VERIFICATION

Items in this section require field testing and/or verification by a certified HERS Rater. The inspector must receive a completed CF-4R form for each of the measures listed below for final to be given.

EnergyPro 5.1 by EnergySoft User Number: 20573 ID: 00071 Page 2 of 8

PERFORMANCE CERTIFICATE: Residential (Part 3 of 5) CF-1R

Project Name SBCAST	Building Type ☐ Single Family ☐ Addition Alone ☒ Multi Family ☐ Existing+ Addition/Alteration	Date 9/5/2012

ANNUAL ENERGY USE SUMMARY

TDV (kBtu/ft²-yr)	Standard	Proposed	Margin
Space Heating	9.91	9.47	0.44
Space Cooling	5.51	13.32	-7.81
Fans	3.39	5.50	-2.11
Domestic Hot Water	37.52	11.76	25.75
Pumps	6.87	6.87	0.00
Totals	63.19	46.93	16.27
Percent Better Than Standard:			25.7 %

BUILDING COMPLIES - NO HERS VERIFICATION REQUIRED

		Ext. Walls/Roof	Wall Area	Fenestration Area
Building Front Orientation:	(N) 0 deg	(N)	4,752	432
Number of Dwelling Units:	9.00	(E)	1,620	72
Fuel Available at Site:	Natural Gas	(S)	0	0
Raised Floor Area:	0	(W)	1,620	360
Slab on Grade Area:	0	Roof	3,888	0
Average Ceiling Height:	10.0			
Fenestration Average U-Factor:	0.71		TOTAL:	864
Average SHGC:	0.73		Fenestration/CFA Ratio:	22.2 %

REMARKS

STATEMENT OF COMPLIANCE

This certificate of compliance lists the building features and specifications needed to comply with Title 24, Parts 1 the Administrative Regulations and Part 6 the Efficiency Standards of the California Code of Regulations.

The documentation author hereby certifies that the documentation is accurate and complete.

Documentation Author

Company 2Flow Engineering for Dozal & Associates
Address 26123 Singer Place
City/State/Zip Stevenson Ranch, CA
Name Luis Dozal
Phone 661-993-6630
Signed Date 9/5/2012

The individual with overall design responsibility hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application, and recognizes that compliance using duct design, duct sealing, verification of refrigerant charge, insulation installation quality, and building envelope sealing require installer testing and certification and field verification by an approved HERS rater.

Designer or Owner (per Business & Professions Code)

Company Macy Architecture
Address 315 Union Street
City/State/Zip San Francisco, CA 94102
Name Mark Macy
Phone 415-551-7630
Signed License # Date

EnergyPro 5.1 by EnergySoft User Number: 20573 ID: 00071 Page 3 of 8

CERTIFICATE OF COMPLIANCE: Residential (Part 4 of 5) CF-1R

Project Name SBCAST	Building Type ☐ Single Family ☐ Addition Alone ☒ Multi Family ☐ Existing+ Addition/Alteration	Date 9/5/2012

OPAQUE SURFACE DETAILS

Surface Type	Area	U-Factor	Insulation Cavity	Exterior	Frame	Interior	Frame	Azm	Tilt	Status	Joint Appendix 4	Location/Comments
Wall	236	0.074	R-19					0	90	New	4.3.1-A5	Zone 1
Wall	172	0.074	R-19					90	90	New	4.3.1-A5	Zone 1
Wall	244	0.074	R-19					0	90	New	4.3.1-A5	Zone 1
Wall	140	0.074	R-19					270	90	New	4.3.1-A5	Zone 1
Roof	432	0.031	R-30					0	18	New	4.2.1-A20	Zone 1
Wall	1,888	0.074	R-19					0	90	New	4.3.1-A5	Zone 2
Wall	1,376	0.074	R-19					90	90	New	4.3.1-A5	Zone 2
Wall	1,952	0.074	R-19					0	90	New	4.3.1-A5	Zone 2
Wall	1,120	0.074	R-19					270	90	New	4.3.1-A5	Zone 2
Roof	3,456	0.031	R-30					0	18	New	4.2.1-A20	Zone 2

FENESTRATION SURFACE DETAILS

ID	Type	Area	U-Factor[1]		SHGC[2]		Azm	Status	Glazing Type	Location/Comments
1	Window	28.0	0.710	Default	0.73	Default	0	New	Double Metal Clear	Zone 1
2	Window	8.0	0.710	Default	0.73	Default	90	New	Double Metal Clear	Zone 1
3	Window	20.0	0.710	Default	0.73	Default	0	New	Double Metal Clear	Zone 1
4	Window	40.0	0.710	Default	0.73	Default	270	New	Double Metal Clear	Zone 1
5	Window	224.0	0.710	Default	0.73	Default	0	New	Double Metal Clear	Zone 2
6	Window	64.0	0.710	Default	0.73	Default	90	New	Double Metal Clear	Zone 2
7	Window	160.0	0.710	Default	0.73	Default	0	New	Double Metal Clear	Zone 2
8	Window	320.0	0.710	Default	0.73	Default	270	New	Double Metal Clear	Zone 2

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value
(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

EXTERIOR SHADING DETAILS

ID	Exterior Shade Type	SHGC	Window Hgt	Window Wd	Overhang Len	Overhang Hgt	Overhang LExt	Overhang RExt	Left Fin Dist	Left Fin Len	Left Fin Hgt	Right Fin Dist	Right Fin Len	Right Fin Hgt
1	Bug Screen	0.76												
2	Bug Screen	0.76												
3	Bug Screen	0.76												
4	Bug Screen	0.76												
5	Bug Screen	0.76												
6	Bug Screen	0.76												
7	Bug Screen	0.76												
8	Bug Screen	0.76												

EnergyPro 5.1 by EnergySoft User Number: 20573 ID: 00071 Page 4 of 8

CERTIFICATE OF COMPLIANCE: Residential (Part 5 of 5) CF-1R

Project Name SBCAST	Building Type ☐ Single Family ☐ Addition Alone ☒ Multi Family ☐ Existing+ Addition/Alteration	Date 9/5/2012

BUILDING ZONE INFORMATION

System Name	Zone Name	Floor Area (ft²) New	Existing	Altered	Removed	Volume	Year Built
System 1	Dwelling #301A Accessible	432				4,320	
System 2	Typical Dwelling	432				4,320	
	Totals	3,888	0	0	0		

HVAC SYSTEMS

System Name	Qty.	Heating Type	Min. Eff.	Cooling Type	Min. Eff.	Thermostat Type	Status
System 1	1	Combined Hydronic	see below	No Cooling	13.0 SEER	Setback	New
System 2	8	Combined Hydronic	see below	No Cooling	13.0 SEER	Setback	New

HVAC DISTRIBUTION

System Name	Heating	Cooling	Duct Location	Duct R-Value	Ducts Tested?	Status
System 1	Ducted	Ducted	Attic, Ceiling Ins, vented	8.0	☐	New
System 2	Ducted	Ducted	Attic, Ceiling Ins, vented	8.0	☐	New
					☐	
					☐	
					☐	

WATER HEATING SYSTEMS

System Name	Qty.	Type	Distribution	Rated Input (Btuh)	Tank Cap. (gal)	Energy Factor or RE	Standby Loss or Pilot	Ext. Tank Insul. R-Value	Status
Glowcore GWH150	1	Large Gas	Central System	150,000	150	0.84	0.00 %	n/a	New

MULTI-FAMILY WATER HEATING DETAILS

Control	Qty.	HP	Hot Water Piping Length (ft) Plenum	Outside	Buried	Add ½" Insulation
Timer+Temp	1	0.3	0	100	0	☐
						☐
						☐
						☐
						☐

HYDRONIC HEATING SYSTEM PIPING

System Name	Pipe Length	Pipe Diameter	Insul. Thick.
Glowcore GWH150	100	0.50	0.50

EnergyPro 5.1 by EnergySoft User Number: 20573 ID: 00071 Page 5 of 8

MANDATORY MEASURES SUMMARY: Residential (Page 1 of 3) MF-1R

Project Name SBCAST	Date 9/5/2012

NOTE: Low-rise residential buildings subject to the Standards must comply with all applicable mandatory measures listed, regardless of the compliance approach used. More stringent energy measures listed on the Certificate of Compliance (CF-1R, CF-1R-ADD, or CF-1R-ALT Form) shall supersede the items marked with an asterisk (*) below. This Mandatory Measures Summary shall be incorporated into the permit documents, and the applicable features shall be considered by all parties as minimum component performance specifications whether they are shown elsewhere in the documents or in this summary. Submit all applicable sections of the MF-1R Form with plans.

Building Envelope Measures:

§116(a)1: Doors and windows between conditioned and unconditioned spaces are manufactured to limit air leakage.

§116(a)4: Fenestration products (except field-fabricated windows) have a label listing the certified U-Factor, certified Solar Heat Gain Coefficient (SHGC), and infiltration that meets the requirements of §10-111(a).

§117: Exterior doors and windows are weather-stripped; all joints and penetrations are caulked and sealed.

§118(a): Insulation specified or installed meets Standards for Insulating Material. Indicate type and include on CF-6R Form.

§118(i): The thermal emittance and solar reflectance values of the cool roofing material meets the requirements of §118(i) when the installation of a Cool Roof is specified on the CF-1R Form.

*§150(a): Minimum R-19 insulation in wood-frame ceiling or equivalent U-factor.

§150(b): Loose fill insulation shall conform with manufacturer's installed design labeled R-Value.

*§150(c): Minimum R-13 insulation in wood-frame wall or equivalent U-factor.

*§150(d): Minimum R-13 insulation in raised wood-frame floor or equivalent U-factor.

§150(f): Air retarding wrap is tested, labeled, and installed according to ASTM E1677-95(2000) when specified on the CF-1R Form.

§150(g): Mandatory Vapor barrier installed in Climate Zones 14 or 16.

§150(l): Water absorption rate for slab edge insulation material alone without facings is no greater than 0.3%; water vapor permeance rate is no greater than 2.0 perm/inch and shall be protected from physical damage and UV light deterioration.

Fireplaces, Decorative Gas Appliances and Gas Log Measures:

§150(e)1A: Masonry or factory-built fireplaces have a closable metal or glass door covering the entire opening of the firebox.

§150(e)1B: Masonry or factory-built fireplaces have a combustion outside air intake, which is at least six square inches in area and is equipped with a with a readily accessible, operable, and tight-fitting damper and or a combustion-air control device.

§150(e)2: Continuous burning pilot lights and the use of indoor air for cooling a firebox jacket, when that indoor air is vented to the outside of the building, are prohibited.

Space Conditioning, Water Heating and Plumbing System Measures:

§110-§113: HVAC equipment, water heaters, showerheads, faucets and all other regulated appliances are certified by the Energy Commission.

§113(c)5: Water heating recirculation loops serving multiple dwelling units and High-Rise residential occupancies meet the air release valve, backflow prevention, pump isolation valve, and recirculation loop connection requirements of §113(c)5.

§115: Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces, household cooking appliances (appliances with an electrical supply voltage connection with pilot lights that consume less than 150 Btu/hr are exempt), and pool and spa heaters.

§150(h): Heating and/or cooling loads are calculated in accordance with ASHRAE, SMACNA or ACCA.

§150(i): Heating systems are equipped with thermostats that meet the setback requirements of Section 112(c).

§150(j)1A: Storage gas water heaters rated with an Energy Factor no greater than the federal minimal standard are externally wrapped with insulation having an installed thermal resistance of R-12 or greater.

§150(j)1B: Unfired storage tanks, such as storage tanks or backup tanks for solar water-heating system, or other indirect hot water tanks have R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.

§150(j)2: First 5 feet of hot and cold water pipes closest to water heater tank, non-recirculating systems, and entire length of recirculating sections of hot water pipes are insulated per Standards Table 150-B.

§150(j)2: Cooling system piping (suction, chilled water, or brine lines),and piping insulated between heating source and indirect hot water tank shall be insulated to Table 150-B and Equation 150-A.

§150(j)2: Pipe insulation for steam hydronic heating systems or hot water systems >15 psi, meets the requirements of Standards Table 123-A.

§150(j)3A: Insulation is protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind.

§150(j)3A: Insulation for chilled water piping and refrigerant suction lines includes a vapor retardant or is enclosed entirely in conditioned space.

§150(j)4: Solar water-heating systems and/or collectors are certified by the Solar Rating and Certification Corporation.

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MANDATORY MEASURES SUMMARY: Residential (Page 2 of 3) MF-1R

Project Name SBCAST	Date 9/5/2012

§150(m)1: All air-distribution system ducts and plenums installed, are sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used

§150(m)1: Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.

§150(m)2D: Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.

§150(m)7: Exhaust fan systems have back draft or automatic dampers.

§150(m)8: Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.

§150(m)9: Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.

§150(m)10: Flexible ducts cannot have porous inner cores.

§150(o): All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. Window operation is not a permissible method of providing the Whole Building Ventilation required in Section 4 of that Standard.

Pool and Spa Heating Systems and Equipment Measures:

§114(a): Any pool or spa heating system shall be certified to have: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater; a permanent weatherproof plate or card with operating instructions; and shall not use electric resistance heating or a pilot light.

§114(b)1: Any pool or spa heating equipment shall be installed with at least 36" of pipe between filter and heater, or dedicated suction and return lines, or built-up connections for future solar heating.

§114(b)2: Outdoor pools or spas that have a heat pump or gas heater shall have a cover.

§114(b)3: Pools shall 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.

§150(p): Residential pool systems or equipment meet the pump sizing, flow rate, piping, filters, and valve requirements of §150(p).

Residential Lighting Measures:

§150(k)1: High efficacy luminaires or LED Light Engine with Integral Heat Sink has an efficacy that is no lower than the efficacies contained in Table 150-C and is not a low efficacy luminaire as specified by §150(k)2.

§150(k)3: The wattage of permanently installed luminaires shall be determined as specified by §130(d).

§150(k)4: Ballasts for fluorescent lamps rated 13 Watts or greater shall be electronic and shall have an output frequency no less than 20 kHz.

§150(k)5: Permanently installed night lights and night lights integral to a permanently installed luminaire or exhaust fan shall contain only high efficacy lamps meeting the minimum efficacies contained in Table 150-C and shall not contain a line-voltage socket or line-voltage lamp holder; OR shall be rated to consume no more than five watts of power as determined by §130(d), and shall not contain a medium screw-base socket.

§150(k)6: Lighting integral to exhaust fans, in rooms other than kitchens, shall meet the applicable requirements of §150(k).

§150(k)7: All switching devices and controls shall meet the requirements of §150(k)7.

§150(k)8: A minimum of 50 percent of the total rated wattage of permanently installed lighting in kitchens shall be high efficacy. EXCEPTION: Up to 50 watts for dwelling units less than or equal to 2,500 ft2 or 100 watts for dwelling units larger than 2,500 ft2 may be exempt from the 50% high efficacy requirement when: all low efficacy luminaires in the kitchen are controlled by a manual on occupant sensor, dimmer, energy management system (EMCS), or a multi-scene programmable control system; and all permanently installed luminaries in garages, laundry rooms, closets greater than 70 square feet, and utility rooms are high efficacy and controlled by a manual-on occupant sensor.

§150(k)9: Permanently installed lighting that is internal to cabinets shall use no more than 20 watts of power per linear foot of illuminated cabinet.

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MANDATORY MEASURES SUMMARY: Residential (Page 3 of 3) MF-1R

Project Name SBCAST	Date 9/5/2012

§150(k)10: Permanently installed luminaires in bathrooms, attached and detached garages, laundry rooms, closets and utility rooms shall be high efficacy.
EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by a manual-on occupant sensor certified to comply with the applicable requirements of §119.
EXCEPTION 2: Permanently installed low efficacy luminaires in closets less than 70 square feet are not required to be controlled by a manual-on occupancy sensor.

§150(k)11: Permanently installed luminaires located in rooms or areas other than in kitchens, bathrooms, garages, laundry rooms, closets, and utility rooms shall be high efficacy luimnaires. EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided they are controlled by either a dimmer switch that complies with the applicable requirements of §119, or by a manual-on occupant sensor that complies with the applicable requirements of §119. EXCEPTION 2: Lighting in detached storage building less than 1000 square feet located on a residential site is not required to comply with §150(k)11.

§150(k)12: Luminaires recessed into insulated ceilings shall be listed for zero clearance insulation contact (IC) by Underwriters Laboratories or other nationally recognized testing/rating laboratory; and have a label that certifies the lumiunaire is airtight with air leakage less then 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283; and be sealed with a gasket or caulk between the luminaire housing and ceiling.

§150(k)13: Luminaires providing outdoor lighting, including lighting for private patios in low-rise residential buildings with four or more dwelling units, entrances, balconies, and porches, which are permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy. EXCEPTION 1: Permanently installed outdoor low efficacy luminaires shall be allowed provided that they are controlled by a manual on/off switch, a motion sensor not having an override or bypass switch that disables the motion sensor, and one of the following controls: a photocontrol not having an override or bypass switch that disables the photocontrol; OR an astronomical time clock not having an override or bypass switch that disables the astronomical time clock; OR an energy management control system (EMCS) not having an override or bypass switch that allows the luminaire to be always on EXCEPTION 2: Outdoor luminaires used to comply with Exception1 to §150(k)13 may be controlled by a temporary override switch which bypasses the motion sensing function provided that the motion sensor is automatically reactivated within six hours. EXCEPTION 3: Permanently installed luminaires in or around swimming pool, water features, or other location subject to Article 680 of the California Electric Code need not be high efficacy luminaires.

§150(k)14: Internally illuminated address signs shall comply with Section 148; OR not contain a screw-base socket, and consume no more than five watts of power as determined according to §130(d).

§150(k)15: Lighting for parking lots and carports with a total of for 8 or more vehicles per site shall comply with the applicable requirements in Sections 130, 132, 134, and 147. Lighting for parking garages for 8 or more vehicles shall comply with the applicable requirements of Sections 130, 131, 134, and 146.

§150(k)16: Permanently installed lighting in the enclosed, non-dwelling spaces of low-rise residential buildings with four or more dwelling units shall be high efficacy luminaires. EXCEPTION: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with the applicable requirements of §119.

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315 Linden Street
San Francisco, CA 94102
Tel 415 551 7630
Fax 415 551 7601
www.macyarchitecture.com

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CONSULTANTS
Dozal & Assoc.
26123 Singer Pl.
Stevenson Ranch, CA
91381
T.661.993.3343

PROJECT
SANTA BARBARA CENTER FOR
ART, SCIENCE & TECHNOLOGY
513 GARDEN STREET
SANTA BARBARA, CA 93101

ISSUES / REVISIONS
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DATE 04/1/13
PHASE ISSUE FOR BID SET
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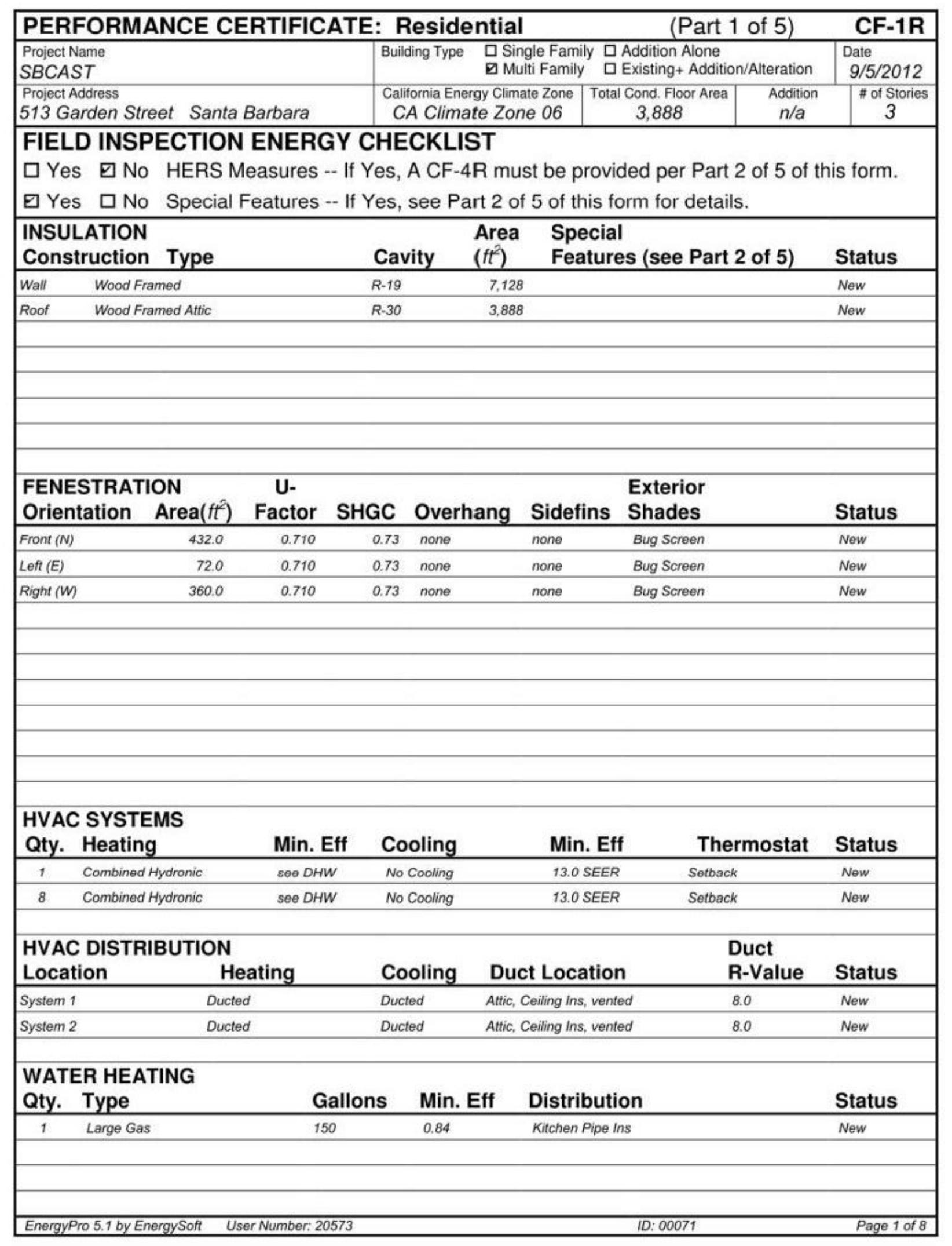


PERFORMANCE CERTIFICATE: Residential (Part 1 of 5) CF-1R

Project Name SBCAST	Building Type ☐ Single Family ☐ Addition Alone ☑ Multi Family ☐ Existing+ Addition/Alteration	Date 9/5/2012

Project Address	California Energy Climate Zone	Total Cond. Floor Area	Addition	# of Stories
513 Garden Street Santa Barbara	CA Climate Zone 06	3,888	n/a	3

FIELD INSPECTION ENERGY CHECKLIST

☐ Yes ☑ No HERS Measures -- If Yes, A CF-4R must be provided per Part 2 of 5 of this form.

☑ Yes ☐ No Special Features -- If Yes, see Part 2 of 5 of this form for details.

INSULATION

Construction	Type	Cavity	Area (ft²)	Special Features (see Part 2 of 5)	Status
Wall	Wood Framed	R-19	7,128		New
Roof	Wood Framed Attic	R-30	3,888		New

FENESTRATION

Orientation	Area(ft²)	U-Factor	SHGC	Overhang	Sidefins	Exterior Shades	Status
Front (N)	432.0	0.710	0.73	none	none	Bug Screen	New
Left (E)	72.0	0.710	0.73	none	none	Bug Screen	New
Right (W)	360.0	0.710	0.73	none	none	Bug Screen	New

HVAC SYSTEMS

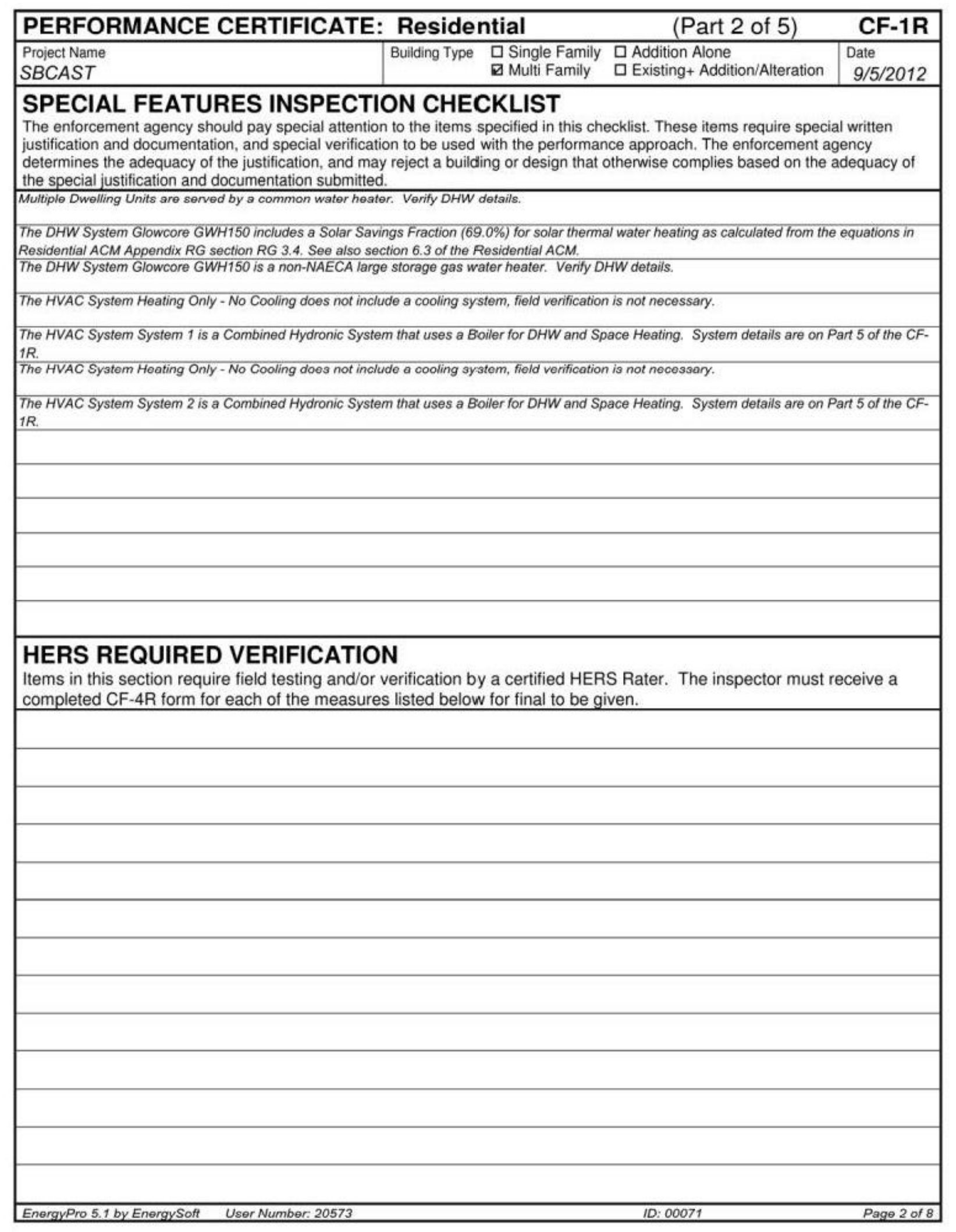
Qty.	Heating	Min. Eff	Cooling	Min. Eff	Thermostat	Status
1	Combined Hydronic	see DHW	No Cooling	13.0 SEER	Setback	New
8	Combined Hydronic	see DHW	No Cooling	13.0 SEER	Setback	New

HVAC DISTRIBUTION

Location	Heating	Cooling	Duct Location	Duct R-Value	Status
System 1	Ducted	Ducted	Attic, Ceiling Ins, vented	8.0	New
System 2	Ducted	Ducted	Attic, Ceiling Ins, vented	8.0	New

WATER HEATING

Qty.	Type	Gallons	Min. Eff	Distribution	Status
1	Large Gas	150	0.84	Kitchen Pipe Ins	New



PERFORMANCE CERTIFICATE: Residential (Part 2 of 5) CF-1R

Project Name SBCAST	Building Type ☐ Single Family ☐ Addition Alone ☑ Multi Family ☐ Existing+ Addition/Alteration	Date 9/5/2012

SPECIAL FEATURES INSPECTION CHECKLIST

The enforcement agency should pay special attention to the items specified in this checklist. These items require special written justification and documentation, and special verification to be used with the performance approach. The enforcement agency determines the adequacy of the justification, and may reject a building or design that otherwise complies based on the adequacy of the special justification and documentation submitted.

Multiple Dwelling Units are served by a common water heater. Verify DHW details.

The DHW System Glowcore GWH150 includes a Solar Savings Fraction (69.0%) for solar thermal water heating as calculated from the equations in Residential ACM Appendix RG section RG 3.4. See also section 6.3 of the Residential ACM.

The DHW System Glowcore GWH150 is a non-NAECA large storage gas water heater. Verify DHW details.

The HVAC System Heating Only - No Cooling does not include a cooling system, field verification is not necessary.

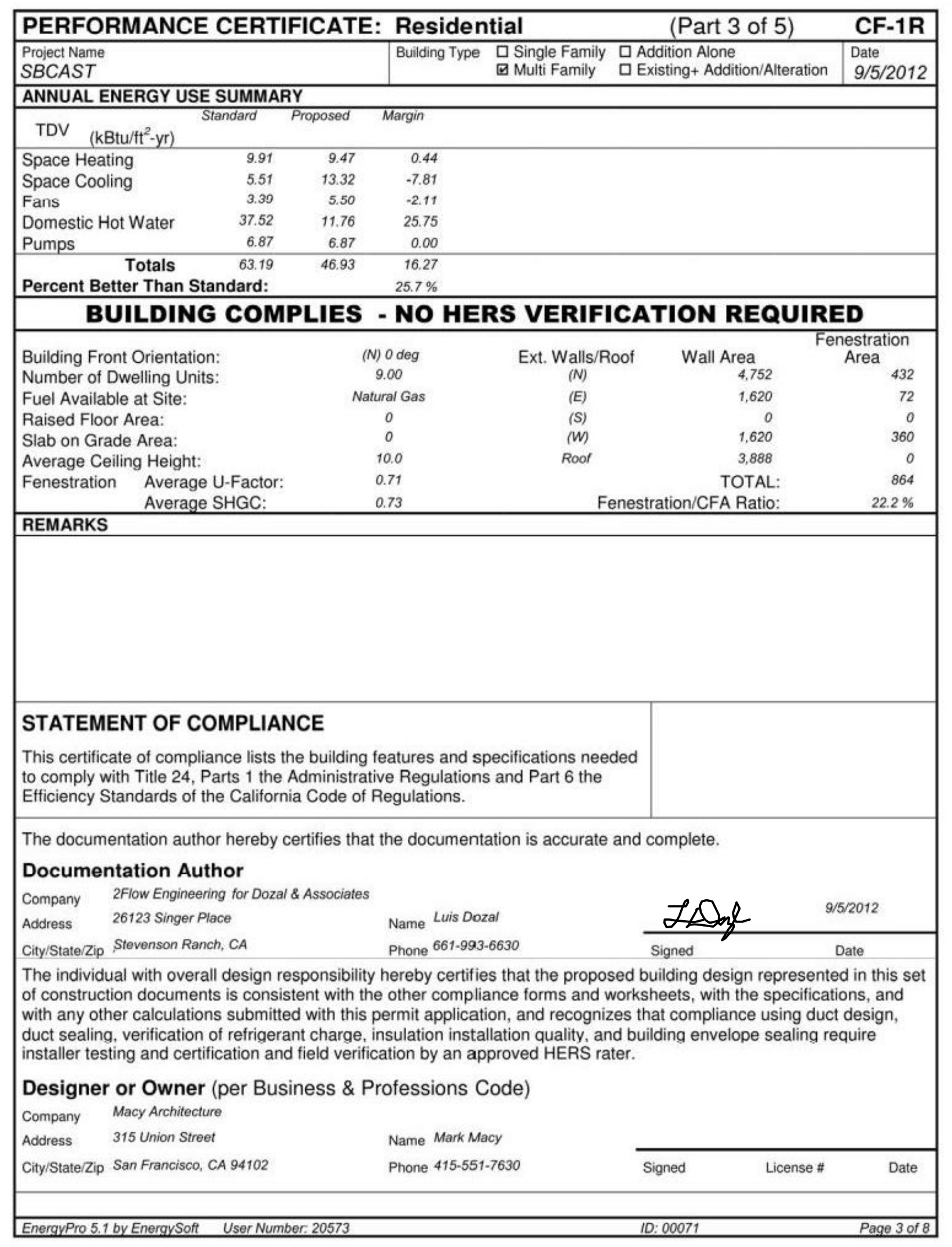
The HVAC System System 1 is a Combined Hydronic System that uses a Boiler for DHW and Space Heating. System details are on Part 5 of the CF-1R.

The HVAC System Heating Only - No Cooling does not include a cooling system, field verification is not necessary.

The HVAC System System 2 is a Combined Hydronic System that uses a Boiler for DHW and Space Heating. System details are on Part 5 of the CF-1R.

HERS REQUIRED VERIFICATION

Items in this section require field testing and/or verification by a certified HERS Rater. The inspector must receive a completed CF-4R form for each of the measures listed below for final to be given.



PERFORMANCE CERTIFICATE: Residential (Part 3 of 5) CF-1R

Project Name SBCAST	Building Type ☐ Single Family ☐ Addition Alone ☑ Multi Family ☐ Existing+ Addition/Alteration	Date 9/5/2012

ANNUAL ENERGY USE SUMMARY

TDV (kBtu/ft²-yr)	Standard	Proposed	Margin
Space Heating	9.91	9.47	0.44
Space Cooling	5.51	13.32	-7.81
Fans	3.39	5.50	-2.11
Domestic Hot Water	37.52	11.76	25.75
Pumps	6.87	6.87	0.00
Totals	63.19	46.93	16.27
Percent Better Than Standard:			25.7 %

BUILDING COMPLIES - NO HERS VERIFICATION REQUIRED

		Ext. Walls/Roof	Wall Area	Fenestration Area
Building Front Orientation:	(N) 0 deg			
Number of Dwelling Units:	9.00	(N)	4,752	432
Fuel Available at Site:	Natural Gas	(E)	1,620	72
Raised Floor Area:	0	(S)	0	0
Slab on Grade Area:	0	(W)	1,620	360
Average Ceiling Height:	10.0	Roof	3,888	0
Fenestration Average U-Factor:	0.71		TOTAL:	864
Average SHGC:	0.73		Fenestration/CFA Ratio:	22.2 %

REMARKS

STATEMENT OF COMPLIANCE

This certificate of compliance lists the building features and specifications needed to comply with Title 24, Parts 1 the Administrative Regulations and Part 6 the Efficiency Standards of the California Code of Regulations.

The documentation author hereby certifies that the documentation is accurate and complete.

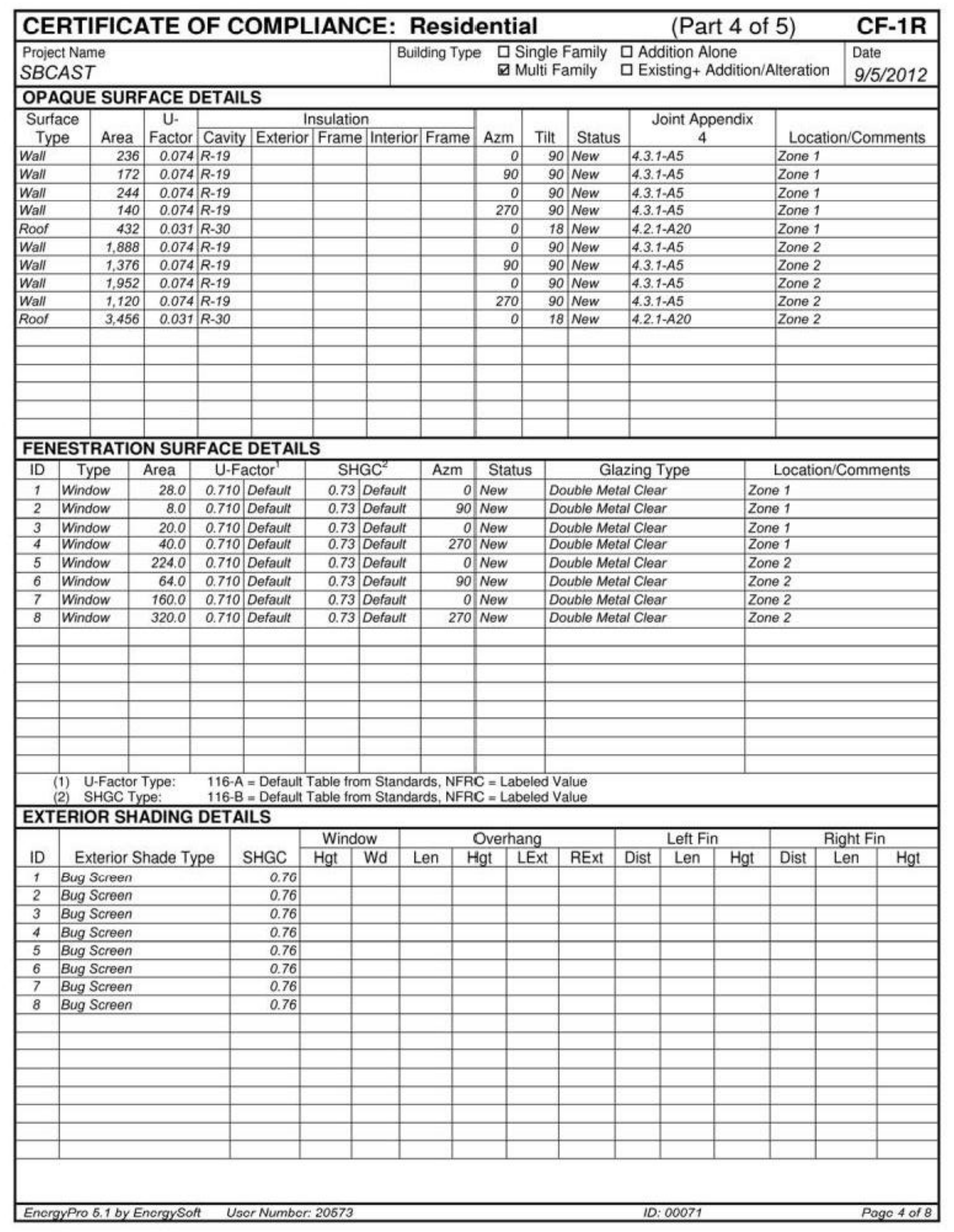
Documentation Author

Company 2Flow Engineering for Dozal & Associates
Address 26123 Singer Place
City/State/Zip Stevenson Ranch, CA
Name Luis Dozal
Phone 661-993-6630
Signed LDozal
Date 9/5/2012

The individual with overall design responsibility hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application, and recognizes that compliance using duct design, duct sealing, verification of refrigerant charge, insulation installation quality, and building envelope sealing require installer testing and certification and field verification by an approved HERS rater.

Designer or Owner (per Business & Professions Code)

Company Macy Architecture
Address 315 Union Street
City/State/Zip San Francisco, CA 94102
Name Mark Macy
Phone 415-551-7630
Signed License # Date



CERTIFICATE OF COMPLIANCE: Residential (Part 4 of 5) CF-1R

Project Name SBCAST	Building Type ☐ Single Family ☐ Addition Alone ☑ Multi Family ☐ Existing+ Addition/Alteration	Date 9/5/2012

OPAQUE SURFACE DETAILS

Surface Type	Area	U-Factor	Insulation Cavity	Exterior	Frame	Interior	Frame	Azm	Tilt	Status	Joint Appendix 4	Location/Comments
Wall	236	0.074	R-19					0	90	New	4.3.1-A5	Zone 1
Wall	172	0.074	R-19					90	90	New	4.3.1-A5	Zone 1
Wall	244	0.074	R-19					0	90	New	4.3.1-A5	Zone 1
Wall	140	0.074	R-19					270	90	New	4.3.1-A5	Zone 1
Roof	432	0.031	R-30					0	18	New	4.2.1-A20	Zone 1
Wall	1,888	0.074	R-19					0	90	New	4.3.1-A5	Zone 2
Wall	1,376	0.074	R-19					90	90	New	4.3.1-A5	Zone 2
Wall	1,952	0.074	R-19					0	90	New	4.3.1-A5	Zone 2
Wall	1,120	0.074	R-19					270	90	New	4.3.1-A5	Zone 2
Roof	3,456	0.031	R-30					0	18	New	4.2.1-A20	Zone 2

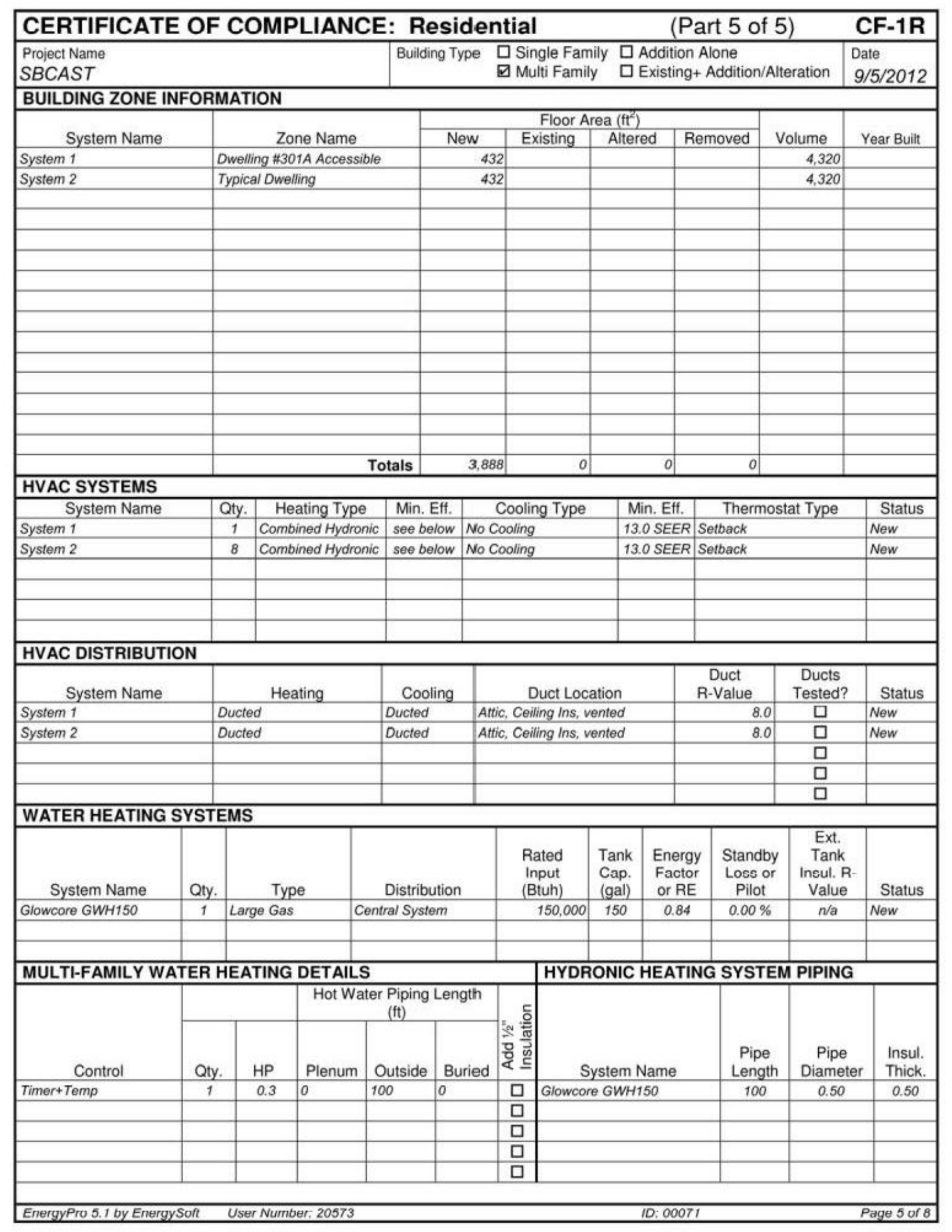
FENESTRATION SURFACE DETAILS

ID	Type	Area	U-Factor[1]		SHGC[2]		Azm	Status	Glazing Type	Location/Comments
1	Window	28.0	0.710	Default	0.73	Default	0	New	Double Metal Clear	Zone 1
2	Window	8.0	0.710	Default	0.73	Default	90	New	Double Metal Clear	Zone 1
3	Window	20.0	0.710	Default	0.73	Default	0	New	Double Metal Clear	Zone 1
4	Window	40.0	0.710	Default	0.73	Default	270	New	Double Metal Clear	Zone 1
5	Window	224.0	0.710	Default	0.73	Default	0	New	Double Metal Clear	Zone 2
6	Window	64.0	0.710	Default	0.73	Default	90	New	Double Metal Clear	Zone 2
7	Window	160.0	0.710	Default	0.73	Default	0	New	Double Metal Clear	Zone 2
8	Window	320.0	0.710	Default	0.73	Default	270	New	Double Metal Clear	Zone 2

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value
(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

EXTERIOR SHADING DETAILS

			Window		Overhang				Left Fin			Right Fin		
ID	Exterior Shade Type	SHGC	Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt
1	Bug Screen	0.76												
2	Bug Screen	0.76												
3	Bug Screen	0.76												
4	Bug Screen	0.76												
5	Bug Screen	0.76												
6	Bug Screen	0.76												
7	Bug Screen	0.76												
8	Bug Screen	0.76												



CERTIFICATE OF COMPLIANCE: Residential (Part 5 of 5) CF-1R

Project Name SBCAST	Building Type ☐ Single Family ☐ Addition Alone ☑ Multi Family ☐ Existing+ Addition/Alteration	Date 9/5/2012

BUILDING ZONE INFORMATION

		Floor Area (ft²)					
System Name	Zone Name	New	Existing	Altered	Removed	Volume	Year Built
System 1	Dwelling #301A Accessible	432				4,320	
System 2	Typical Dwelling	432				4,320	
	Totals	3,888	0	0	0		

HVAC SYSTEMS

System Name	Qty.	Heating Type	Min. Eff.	Cooling Type	Min. Eff.	Thermostat Type	Status
System 1	1	Combined Hydronic	see below	No Cooling	13.0 SEER	Setback	New
System 2	8	Combined Hydronic	see below	No Cooling	13.0 SEER	Setback	New

HVAC DISTRIBUTION

System Name	Heating	Cooling	Duct Location	Duct R-Value	Ducts Tested?	Status
System 1	Ducted	Ducted	Attic, Ceiling Ins, vented	8.0	☐	New
System 2	Ducted	Ducted	Attic, Ceiling Ins, vented	8.0	☐	New
					☐	
					☐	
					☐	

WATER HEATING SYSTEMS

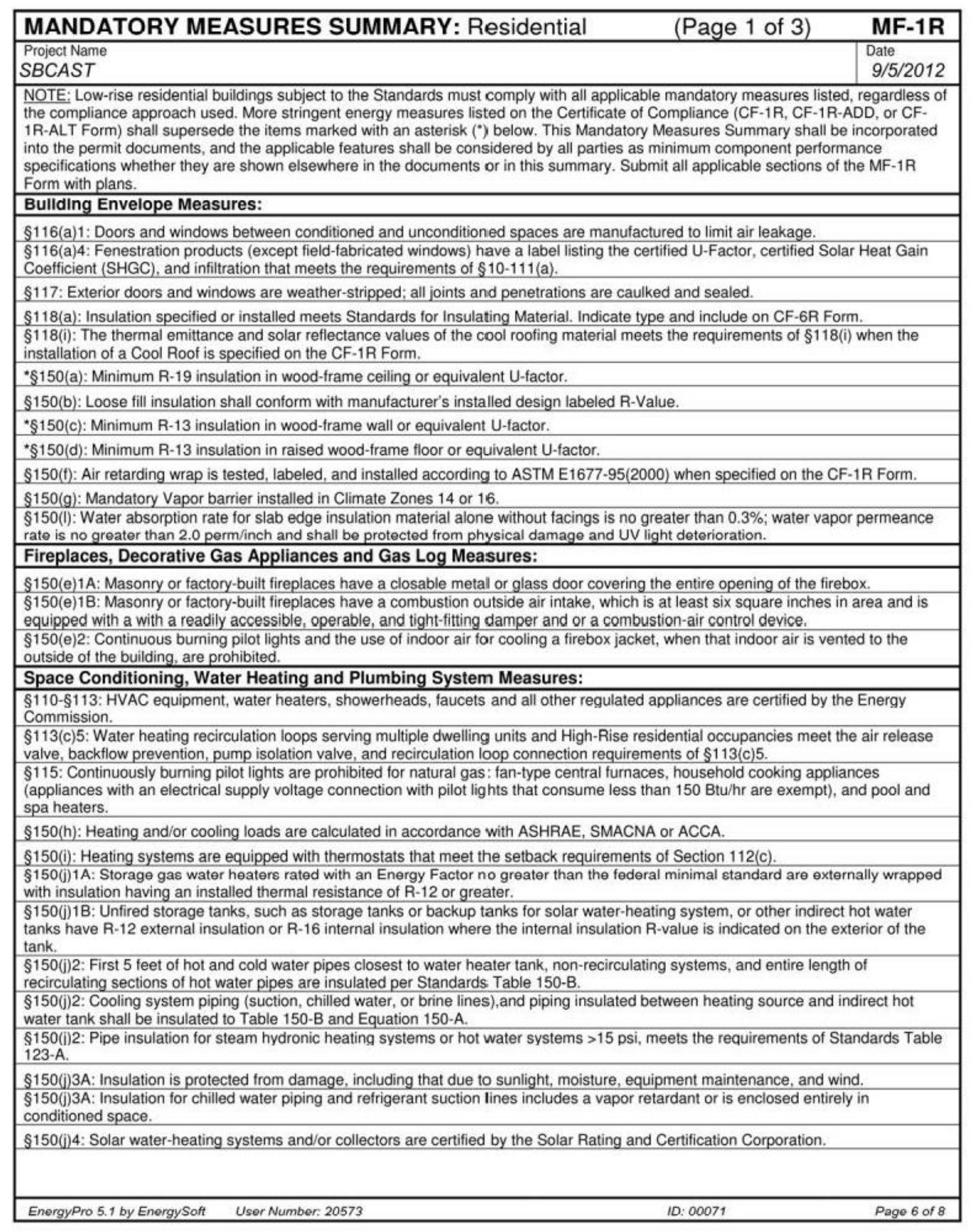
System Name	Qty.	Type	Distribution	Rated Input (Btuh)	Tank Cap. (gal)	Energy Factor or RE	Standby Loss or Pilot	Ext. Tank Insul. R-Value	Status
Glowcore GWH150	1	Large Gas	Central System	150,000	150	0.84	0.00 %	n/a	New

MULTI-FAMILY WATER HEATING DETAILS

			Hot Water Piping Length (ft)			
Control	Qty.	HP	Plenum	Outside	Buried	Add ½" Insulation
Timer+Temp	1	0.3	0	100	0	☐
						☐
						☐
						☐
						☐

HYDRONIC HEATING SYSTEM PIPING

System Name	Pipe Length	Pipe Diameter	Insul. Thick.
Glowcore GWH150	100	0.50	0.50



MANDATORY MEASURES SUMMARY: Residential (Page 1 of 3) MF-1R

Project Name SBCAST Date 9/5/2012

NOTE: Low-rise residential buildings subject to the Standards must comply with all applicable mandatory measures listed, regardless of the compliance approach used. More stringent energy measures listed on the Certificate of Compliance (CF-1R, CF-1R-ADD, or CF-1R-ALT Form) shall supersede the items marked with an asterisk (*) below. This Mandatory Measures Summary shall be incorporated into the permit documents, and the applicable features shall be considered by all parties as minimum component performance specifications whether they are shown elsewhere in the documents or in this summary. Submit all applicable sections of the MF-1R Form with plans.

Building Envelope Measures:

§116(a)1: Doors and windows between conditioned and unconditioned spaces are manufactured to limit air leakage.

§116(a)4: Fenestration products (except field-fabricated windows) have a label listing the certified U-Factor, certified Solar Heat Gain Coefficient (SHGC), and infiltration that meets the requirements of §10-111(a).

§117: Exterior doors and windows are weather-stripped; all joints and penetrations are caulked and sealed.

§118(a): Insulation specified or installed meets Standards for Insulating Material. Indicate type and include on CF-6R Form.

§118(i): The thermal emittance and solar reflectance values of the cool roofing material meets the requirements of §118(i) when the installation of a Cool Roof is specified on the CF-1R Form.

*§150(a): Minimum R-19 insulation in wood-frame ceiling or equivalent U-factor.

§150(b): Loose fill insulation shall conform with manufacturer's installed design labeled R-Value.

*§150(c): Minimum R-13 insulation in wood-frame wall or equivalent U-factor.

*§150(d): Minimum R-13 insulation in raised wood-frame floor or equivalent U-factor.

§150(f): Air retarding wrap is tested, labeled, and installed according to ASTM E1677-95(2000) when specified on the CF-1R Form.

§150(g): Mandatory Vapor barrier installed in Climate Zones 14 or 16.

§150(l): Water absorption rate for slab edge insulation material alone without facings is no greater than 0.3%; water vapor permeance rate is no greater than 2.0 perm/inch and shall be protected from physical damage and UV light deterioration.

Fireplaces, Decorative Gas Appliances and Gas Log Measures:

§150(e)1A: Masonry or factory-built fireplaces have a closable metal or glass door covering the entire opening of the firebox.

§150(e)1B: Masonry or factory-built fireplaces have a combustion outside air intake, which is at least six square inches in area and is equipped with a with a readily accessible, operable, and tight-fitting damper and or a combustion-air control device.

§150(e)2: Continuous burning pilot lights and the use of indoor air for cooling a firebox jacket, when that indoor air is vented to the outside of the building, are prohibited.

Space Conditioning, Water Heating and Plumbing System Measures:

§110-§113: HVAC equipment, water heaters, showerheads, faucets and all other regulated appliances are certified by the Energy Commission.

§113(c)5: Water heating recirculation loops serving multiple dwelling units and High-Rise residential occupancies meet the air release valve, backflow prevention, pump isolation valve, and recirculation loop connection requirements of §113(c)5.

§115: Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces, household cooking appliances (appliances with an electrical supply voltage connection with pilot lights that consume less than 150 Btu/hr are exempt), and pool and spa heaters.

§150(h): Heating and/or cooling loads are calculated in accordance with ASHRAE, SMACNA or ACCA.

§150(i): Heating systems are equipped with thermostats that meet the setback requirements of Section 112(c).

§150(j)1A: Storage gas water heaters rated with an Energy Factor no greater than the federal minimal standard are externally wrapped with insulation having an installed thermal resistance of R-12 or greater.

§150(j)1B: Unfired storage tanks, such as storage tanks or backup tanks for solar water-heating system, or other indirect hot water tanks have R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.

§150(j)2: First 5 feet of hot and cold water pipes closest to water heater tank, non-recirculating systems, and entire length of recirculating sections of hot water pipes are insulated per Standards Table 150-B.

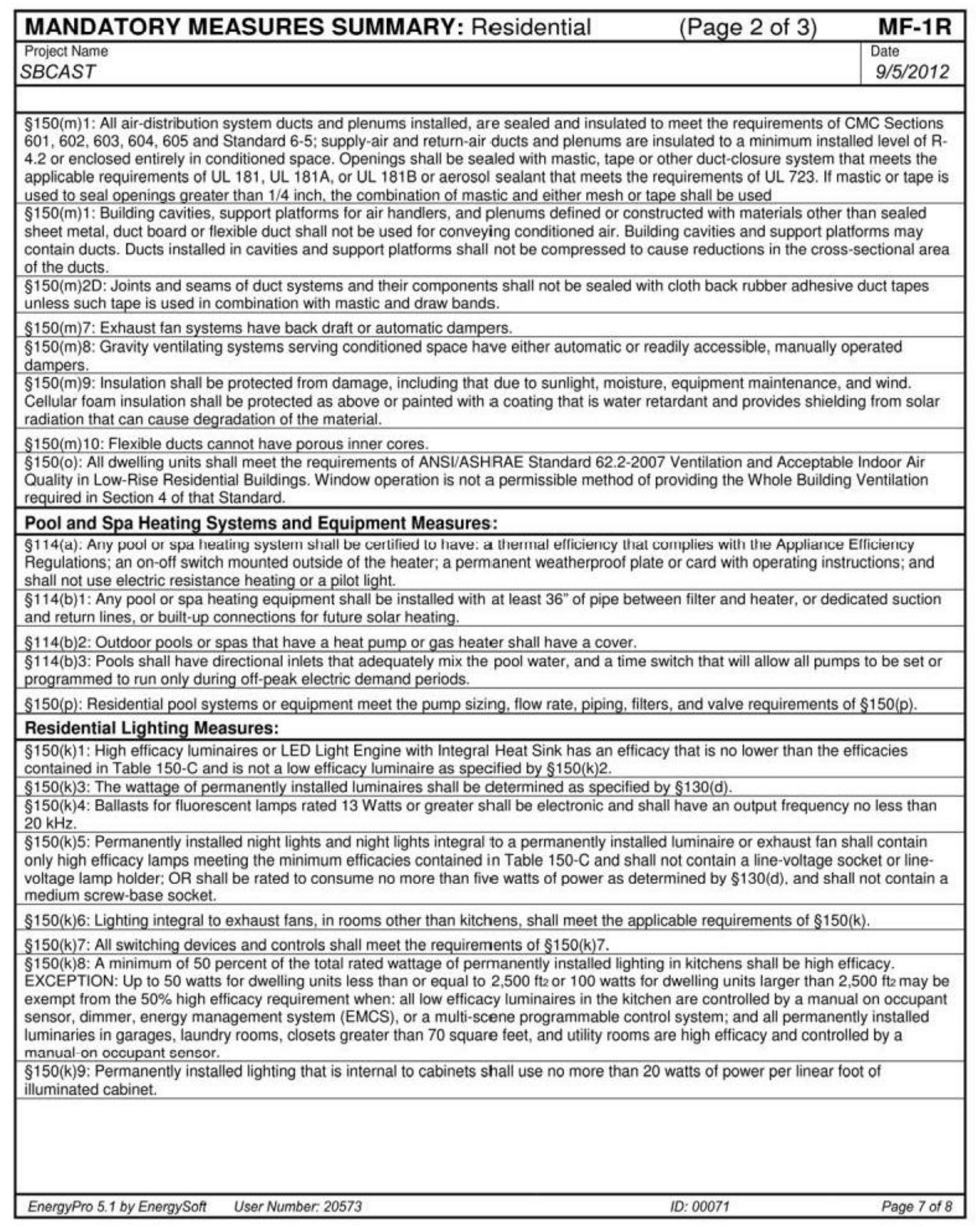
§150(j)2: Cooling system piping (suction, chilled water, or brine lines),and piping insulated between heating source and indirect hot water tank shall be insulated to Table 150-B and Equation 150-A.

§150(j)2: Pipe insulation for steam hydronic heating systems or hot water systems >15 psi, meets the requirements of Standards Table 123-A.

§150(j)3A: Insulation is protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind.

§150(j)3A: Insulation for chilled water piping and refrigerant suction lines includes a vapor retardant or is enclosed entirely in conditioned space.

§150(j)4: Solar water-heating systems and/or collectors are certified by the Solar Rating and Certification Corporation.



MANDATORY MEASURES SUMMARY: Residential (Page 2 of 3) MF-1R

Project Name SBCAST Date 9/5/2012

§150(m)1: All air-distribution system ducts and plenums installed, are sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used

§150(m)1: Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.

§150(m)2D: Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.

§150(m)7: Exhaust fan systems have back draft or automatic dampers.

§150(m)8: Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.

§150(m)9: Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.

§150(m)10: Flexible ducts cannot have porous inner cores.

§150(o): All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. Window operation is not a permissible method of providing the Whole Building Ventilation required in Section 4 of that Standard.

Pool and Spa Heating Systems and Equipment Measures:

§114(a): Any pool or spa heating system shall be certified to have: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater; a permanent weatherproof plate or card with operating instructions; and shall not use electric resistance heating or a pilot light.

§114(b)1: Any pool or spa heating equipment shall be installed with at least 36" of pipe between filter and heater, or dedicated suction and return lines, or built-up connections for future solar heating.

§114(b)2: Outdoor pools or spas that have a heat pump or gas heater shall have a cover.

§114(b)3: Pools shall 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.

§150(p): Residential pool systems or equipment meet the pump sizing, flow rate, piping, filters, and valve requirements of §150(p).

Residential Lighting Measures:

§150(k)1: High efficacy luminaires or LED Light Engine with Integral Heat Sink has an efficacy that is no lower than the efficacies contained in Table 150-C and is not a low efficacy luminaire as specified by §150(k)2.

§150(k)3: The wattage of permanently installed luminaires shall be determined as specified by §130(d).

§150(k)4: Ballasts for fluorescent lamps rated 13 Watts or greater shall be electronic and shall have an output frequency no less than 20 kHz.

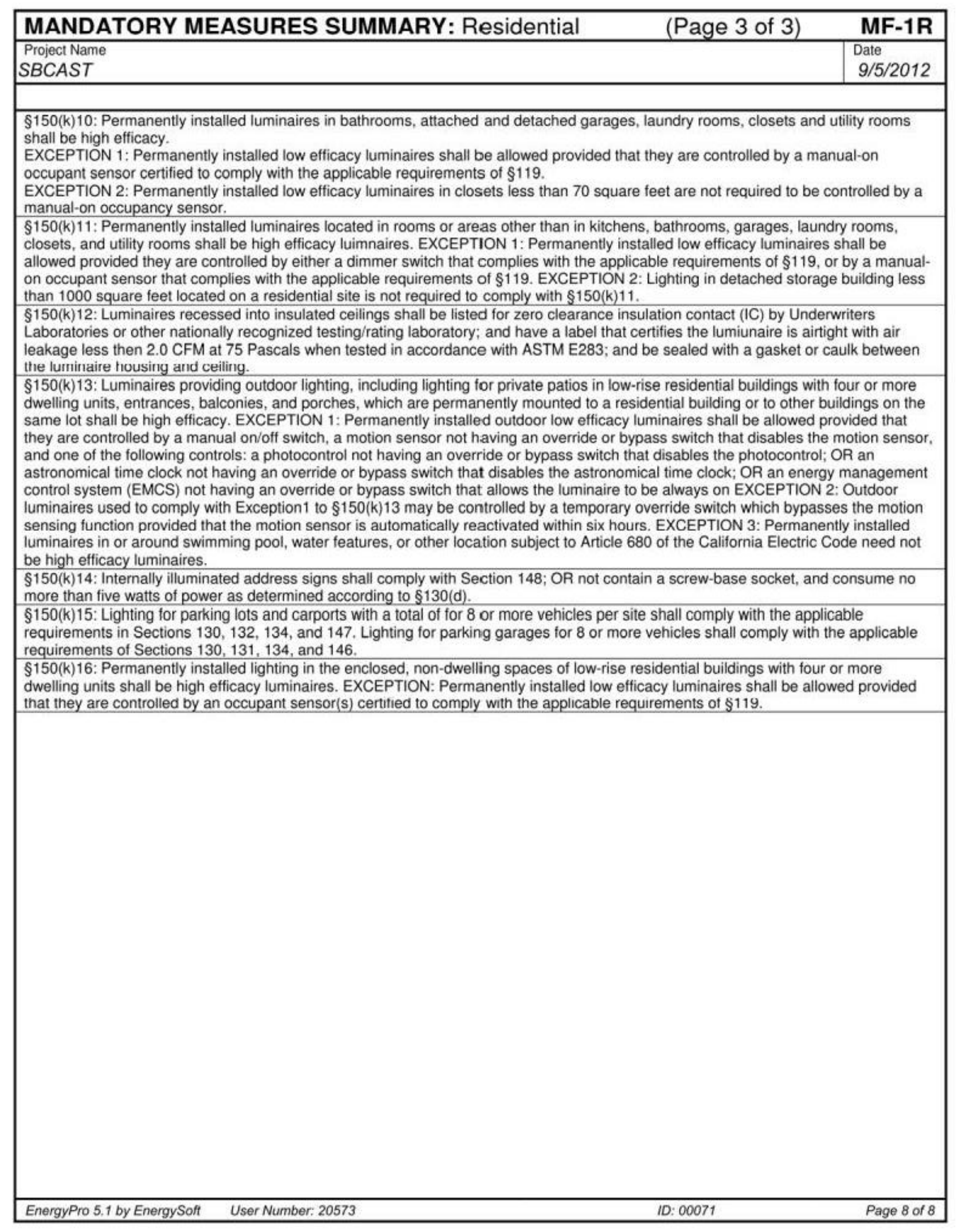
§150(k)5: Permanently installed night lights and night lights integral to a permanently installed luminaire or exhaust fan shall contain only high efficacy lamps meeting the minimum efficacies contained in Table 150-C and shall not contain a line-voltage socket or line-voltage lamp holder; OR shall be rated to consume no more than five watts of power as determined by §130(d), and shall not contain a medium screw-base socket.

§150(k)6: Lighting integral to exhaust fans, in rooms other than kitchens, shall meet the applicable requirements of §150(k).

§150(k)7: All switching devices and controls shall meet the requirements of §150(k)7.

§150(k)8: A minimum of 50 percent of the total rated wattage of permanently installed lighting in kitchens shall be high efficacy. EXCEPTION: Up to 50 watts for dwelling units less than or equal to 2,500 ft2 or 100 watts for dwelling units larger than 2,500 ft2 may be exempt from the 50% high efficacy requirement when: all low efficacy luminaires in the kitchen are controlled by a manual on occupant sensor, dimmer, energy management system (EMCS), or a multi-scene programmable control system; and all permanently installed luminaries in garages, laundry rooms, closets greater than 70 square feet, and utility rooms are high efficacy and controlled by a manual-on occupant sensor.

§150(k)9: Permanently installed lighting that is internal to cabinets shall use no more than 20 watts of power per linear foot of illuminated cabinet.



MANDATORY MEASURES SUMMARY: Residential (Page 3 of 3) MF-1R

Project Name SBCAST Date 9/5/2012

§150(k)10: Permanently installed luminaires in bathrooms, attached and detached garages, laundry rooms, closets and utility rooms shall be high efficacy.
EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by a manual-on occupant sensor certified to comply with the applicable requirements of §119.
EXCEPTION 2: Permanently installed low efficacy luminaires in closets less than 70 square feet are not required to be controlled by a manual-on occupancy sensor.

§150(k)11: Permanently installed luminaires located in rooms or areas other than in kitchens, bathrooms, garages, laundry rooms, closets, and utility rooms shall be high efficacy luimnaires. EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided they are controlled by either a dimmer switch that complies with the applicable requirements of §119, or by a manual-on occupant sensor that complies with the applicable requirements of §119. EXCEPTION 2: Lighting in detached storage building less than 1000 square feet located on a residential site is not required to comply with §150(k)11.

§150(k)12: Luminaires recessed into insulated ceilings shall be listed for zero clearance insulation contact (IC) by Underwriters Laboratories or other nationally recognized testing/rating laboratory; and have a label that certifies the lumiunaire is airtight with air leakage less then 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283; and be sealed with a gasket or caulk between the luminaire housing and ceiling.

§150(k)13: Luminaires providing outdoor lighting, including lighting for private patios in low-rise residential buildings with four or more dwelling units, entrances, balconies, and porches, which are permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy. EXCEPTION 1: Permanently installed outdoor low efficacy luminaires shall be allowed provided that they are controlled by a manual on/off switch, a motion sensor not having an override or bypass switch that disables the motion sensor, and one of the following controls: a photocontrol not having an override or bypass switch that disables the photocontrol; OR an astronomical time clock not having an override or bypass switch that disables the astronomical time clock; OR an energy management control system (EMCS) not having an override or bypass switch that allows the luminaire to be always on EXCEPTION 2: Outdoor luminaires used to comply with Exception1 to §150(k)13 may be controlled by a temporary override switch which bypasses the motion sensing function provided that the motion sensor is automatically reactivated within six hours. EXCEPTION 3: Permanently installed luminaires in or around swimming pool, water features, or other location subject to Article 680 of the California Electric Code need not be high efficacy luminaires.

§150(k)14: Internally illuminated address signs shall comply with Section 148; OR not contain a screw-base socket, and consume no more than five watts of power as determined according to §130(d).

§150(k)15: Lighting for parking lots and carports with a total of for 8 or more vehicles per site shall comply with the applicable requirements in Sections 130, 132, 134, and 147. Lighting for parking garages for 8 or more vehicles shall comply with the applicable requirements of Sections 130, 131, 134, and 146.

§150(k)16: Permanently installed lighting in the enclosed, non-dwelling spaces of low-rise residential buildings with four or more dwelling units shall be high efficacy luminaires. EXCEPTION: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with the applicable requirements of §119.

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315 Linden Street
San Francisco, CA 94102
Tel 415 551 7630
Fax 415 551 7601
www.macyarchitecture.com

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STAMP

CONSULTANTS
Dozal & Assoc.
26123 Singer Pl.
Stevenson Ranch, CA
91381
T.661.993.3343

PROJECT
SANTA BARBARA CENTER FOR
ART, SCIENCE & TECHNOLOGY
513 GARDEN STREET
SANTA BARBARA, CA 93101

ISSUES / REVISIONS
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TITLE 24 DOCUMENTS
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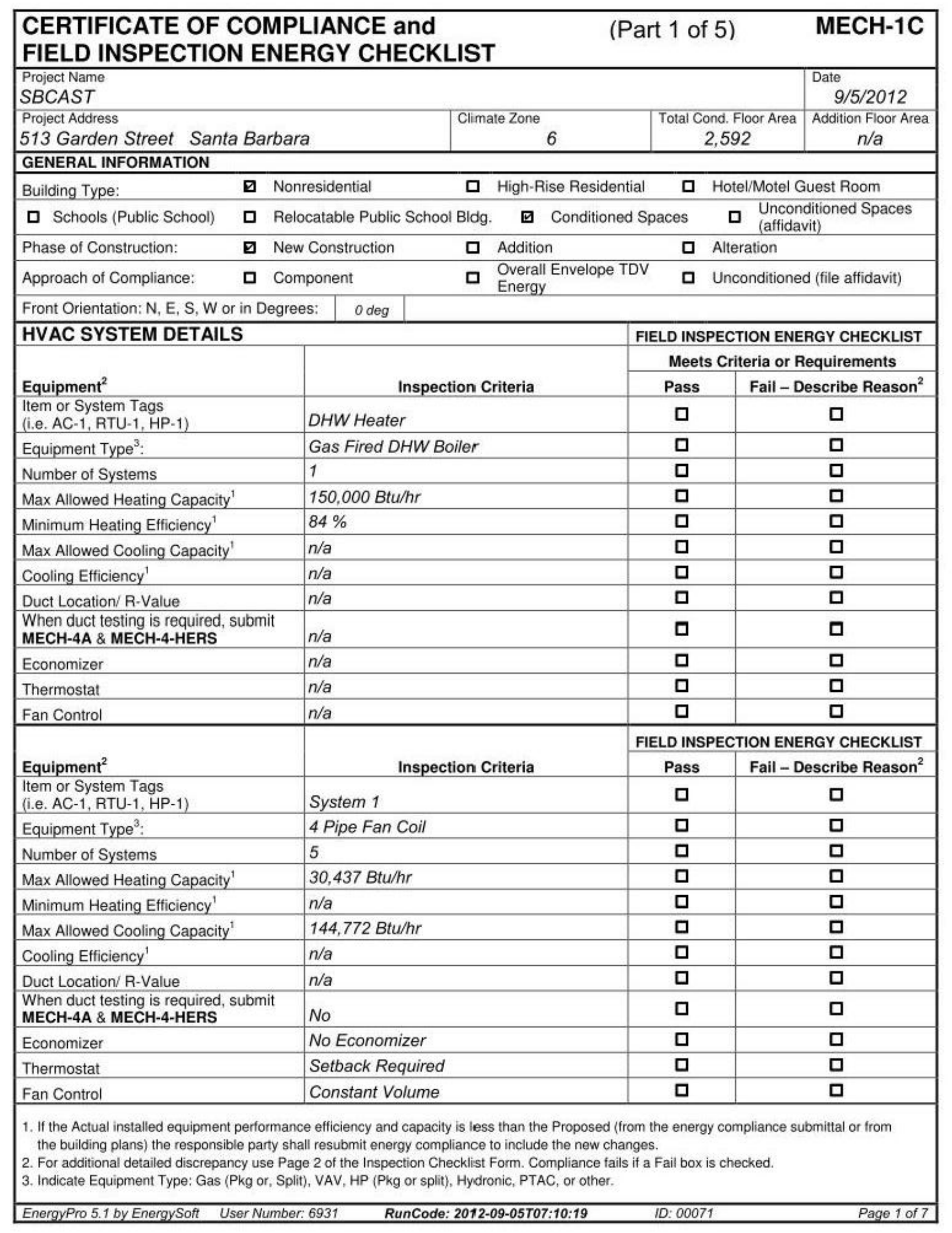


CERTIFICATE OF COMPLIANCE and FIELD INSPECTION ENERGY CHECKLIST (Part 1 of 5) MECH-1C

Project Name *SBCAST*			Date *9/5/2012*
Project Address *513 Garden Street Santa Barbara*	Climate Zone *6*	Total Cond. Floor Area *2,592*	Addition Floor Area *n/a*

GENERAL INFORMATION

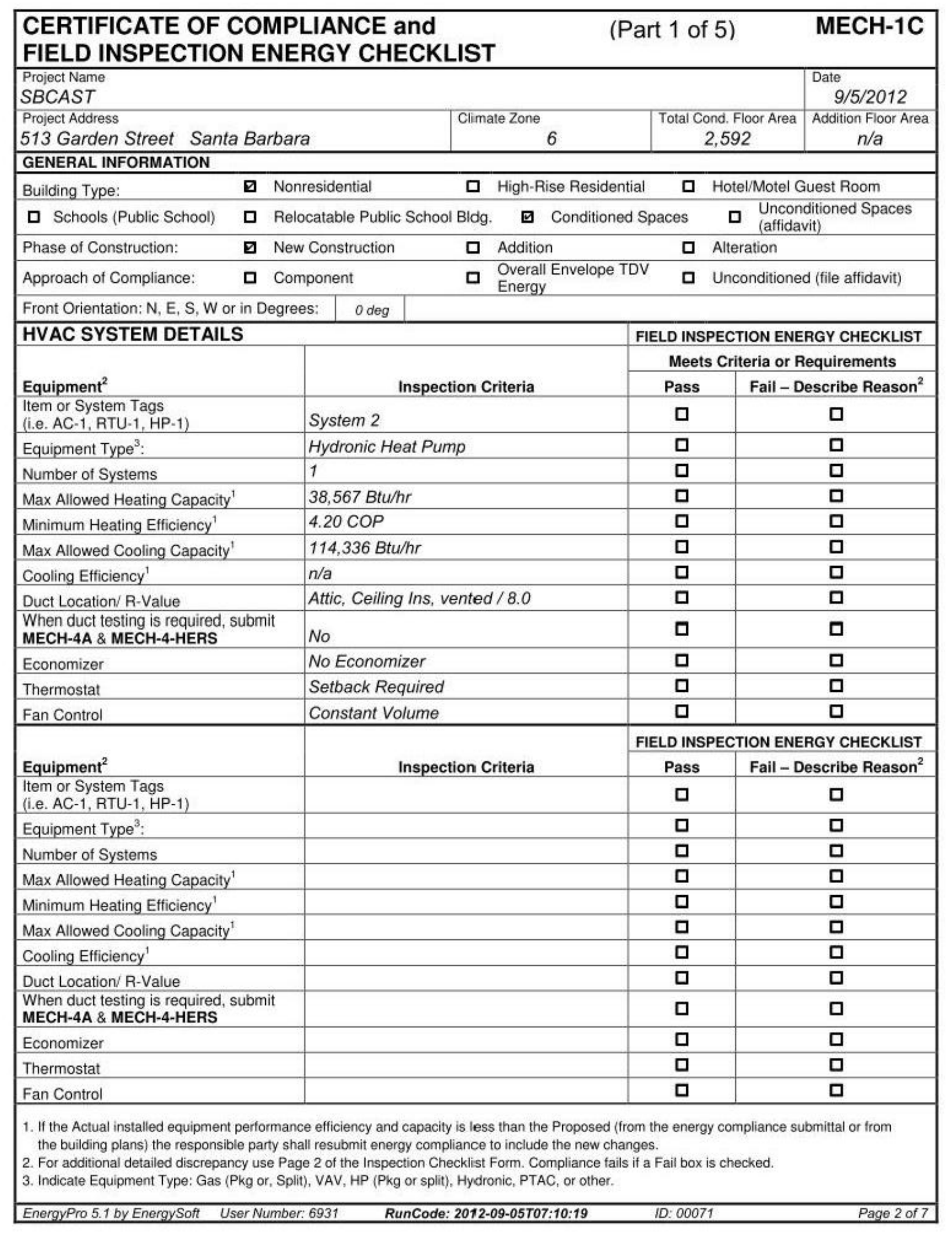
Building Type:	☒ Nonresidential	☐ High-Rise Residential	☐ Hotel/Motel Guest Room
☐ Schools (Public School)	☐ Relocatable Public School Bldg.	☒ Conditioned Spaces	☐ Unconditioned Spaces (affidavit)
Phase of Construction:	☒ New Construction	☐ Addition	☐ Alteration
Approach of Compliance:	☐ Component	☐ Overall Envelope TDV Energy	☐ Unconditioned (file affidavit)
Front Orientation: N, E, S, W or in Degrees:	*0 deg*		

HVAC SYSTEM DETAILS

		FIELD INSPECTION ENERGY CHECKLIST	
		Meets Criteria or Requirements	
Equipment[2]	**Inspection Criteria**	**Pass**	**Fail – Describe Reason**[2]
Item or System Tags (i.e. AC-1, RTU-1, HP-1)	*DHW Heater*	☐	☐
Equipment Type[3]:	*Gas Fired DHW Boiler*	☐	☐
Number of Systems	*1*	☐	☐
Max Allowed Heating Capacity[1]	*150,000 Btu/hr*	☐	☐
Minimum Heating Efficiency[1]	*84 %*	☐	☐
Max Allowed Cooling Capacity[1]	*n/a*	☐	☐
Cooling Efficiency[1]	*n/a*	☐	☐
Duct Location/ R-Value	*n/a*	☐	☐
When duct testing is required, submit **MECH-4A** & **MECH-4-HERS**	*n/a*	☐	☐
Economizer	*n/a*	☐	☐
Thermostat	*n/a*	☐	☐
Fan Control	*n/a*	☐	☐

		FIELD INSPECTION ENERGY CHECKLIST	
Equipment[2]	**Inspection Criteria**	**Pass**	**Fail – Describe Reason**[2]
Item or System Tags (i.e. AC-1, RTU-1, HP-1)	*System 1*	☐	☐
Equipment Type[3]:	*4 Pipe Fan Coil*	☐	☐
Number of Systems	*5*	☐	☐
Max Allowed Heating Capacity[1]	*30,437 Btu/hr*	☐	☐
Minimum Heating Efficiency[1]	*n/a*	☐	☐
Max Allowed Cooling Capacity[1]	*144,772 Btu/hr*	☐	☐
Cooling Efficiency[1]	*n/a*	☐	☐
Duct Location/ R-Value	*n/a*	☐	☐
When duct testing is required, submit **MECH-4A** & **MECH-4-HERS**	*No*	☐	☐
Economizer	*No Economizer*	☐	☐
Thermostat	*Setback Required*	☐	☐
Fan Control	*Constant Volume*	☐	☐

1. If the Actual installed equipment performance efficiency and capacity is less than the Proposed (from the energy compliance submittal or from the building plans) the responsible party shall resubmit energy compliance to include the new changes.
2. For additional detailed discrepancy use Page 2 of the Inspection Checklist Form. Compliance fails if a Fail box is checked.
3. Indicate Equipment Type: Gas (Pkg or, Split), VAV, HP (Pkg or split), Hydronic, PTAC, or other.



CERTIFICATE OF COMPLIANCE and FIELD INSPECTION ENERGY CHECKLIST (Part 1 of 5) MECH-1C

Project Name *SBCAST*			Date *9/5/2012*
Project Address *513 Garden Street Santa Barbara*	Climate Zone *6*	Total Cond. Floor Area *2,592*	Addition Floor Area *n/a*

GENERAL INFORMATION

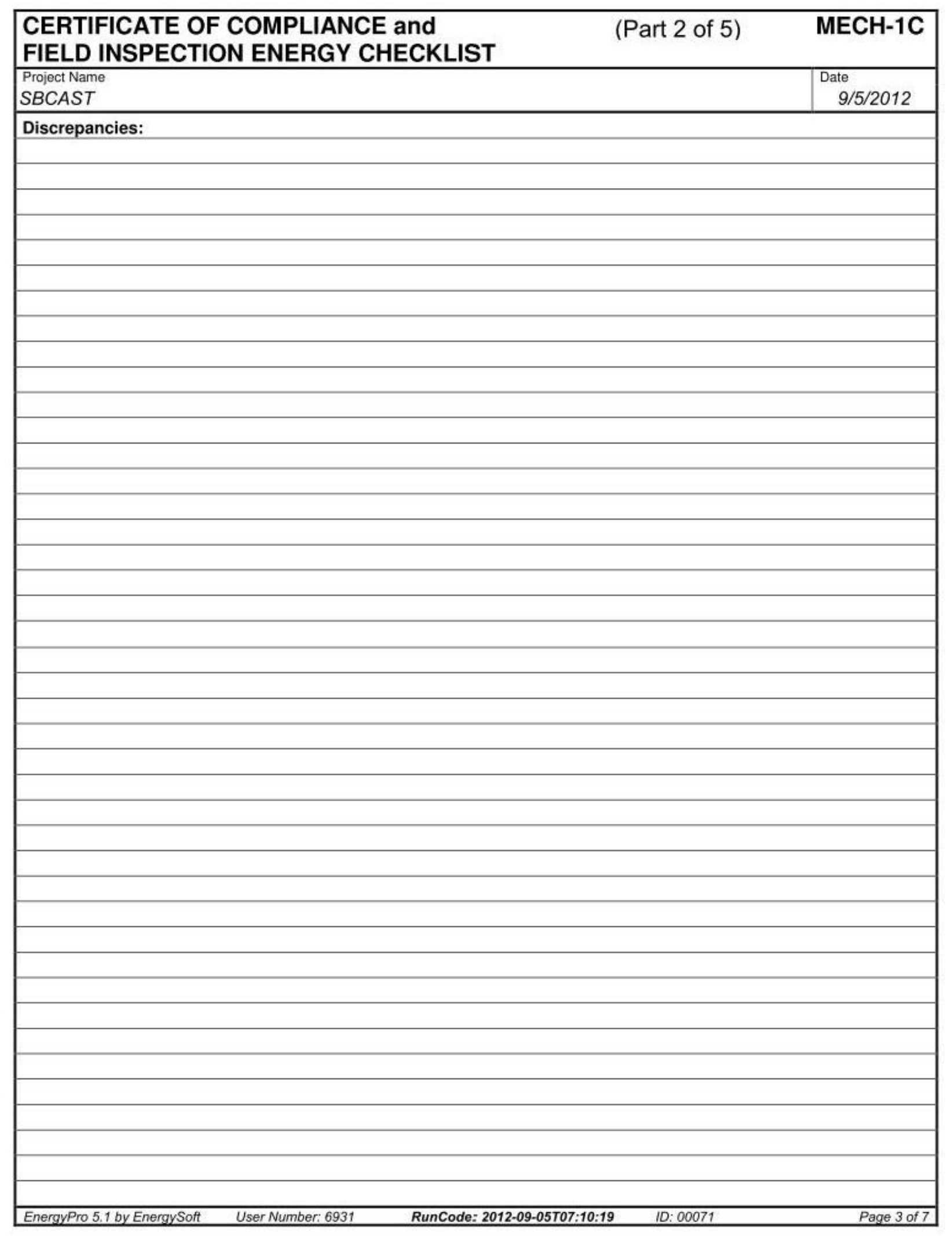
Building Type:	☒ Nonresidential	☐ High-Rise Residential	☐ Hotel/Motel Guest Room
☐ Schools (Public School)	☐ Relocatable Public School Bldg.	☒ Conditioned Spaces	☐ Unconditioned Spaces (affidavit)
Phase of Construction:	☒ New Construction	☐ Addition	☐ Alteration
Approach of Compliance:	☐ Component	☐ Overall Envelope TDV Energy	☐ Unconditioned (file affidavit)
Front Orientation: N, E, S, W or in Degrees:	*0 deg*		

HVAC SYSTEM DETAILS

		FIELD INSPECTION ENERGY CHECKLIST	
		Meets Criteria or Requirements	
Equipment[2]	**Inspection Criteria**	**Pass**	**Fail – Describe Reason**[2]
Item or System Tags (i.e. AC-1, RTU-1, HP-1)	*System 2*	☐	☐
Equipment Type[3]:	*Hydronic Heat Pump*	☐	☐
Number of Systems	*1*	☐	☐
Max Allowed Heating Capacity[1]	*38,567 Btu/hr*	☐	☐
Minimum Heating Efficiency[1]	*4.20 COP*	☐	☐
Max Allowed Cooling Capacity[1]	*114,336 Btu/hr*	☐	☐
Cooling Efficiency[1]	*n/a*	☐	☐
Duct Location/ R-Value	*Attic, Ceiling Ins, vented / 8.0*	☐	☐
When duct testing is required, submit **MECH-4A** & **MECH-4-HERS**	*No*	☐	☐
Economizer	*No Economizer*	☐	☐
Thermostat	*Setback Required*	☐	☐
Fan Control	*Constant Volume*	☐	☐

		FIELD INSPECTION ENERGY CHECKLIST	
Equipment[2]	**Inspection Criteria**	**Pass**	**Fail – Describe Reason**[2]
Item or System Tags (i.e. AC-1, RTU-1, HP-1)		☐	☐
Equipment Type[3]:		☐	☐
Number of Systems		☐	☐
Max Allowed Heating Capacity[1]		☐	☐
Minimum Heating Efficiency[1]		☐	☐
Max Allowed Cooling Capacity[1]		☐	☐
Cooling Efficiency[1]		☐	☐
Duct Location/ R-Value		☐	☐
When duct testing is required, submit **MECH-4A** & **MECH-4-HERS**		☐	☐
Economizer		☐	☐
Thermostat		☐	☐
Fan Control		☐	☐

1. If the Actual installed equipment performance efficiency and capacity is less than the Proposed (from the energy compliance submittal or from the building plans) the responsible party shall resubmit energy compliance to include the new changes.
2. For additional detailed discrepancy use Page 2 of the Inspection Checklist Form. Compliance fails if a Fail box is checked.
3. Indicate Equipment Type: Gas (Pkg or, Split), VAV, HP (Pkg or split), Hydronic, PTAC, or other.

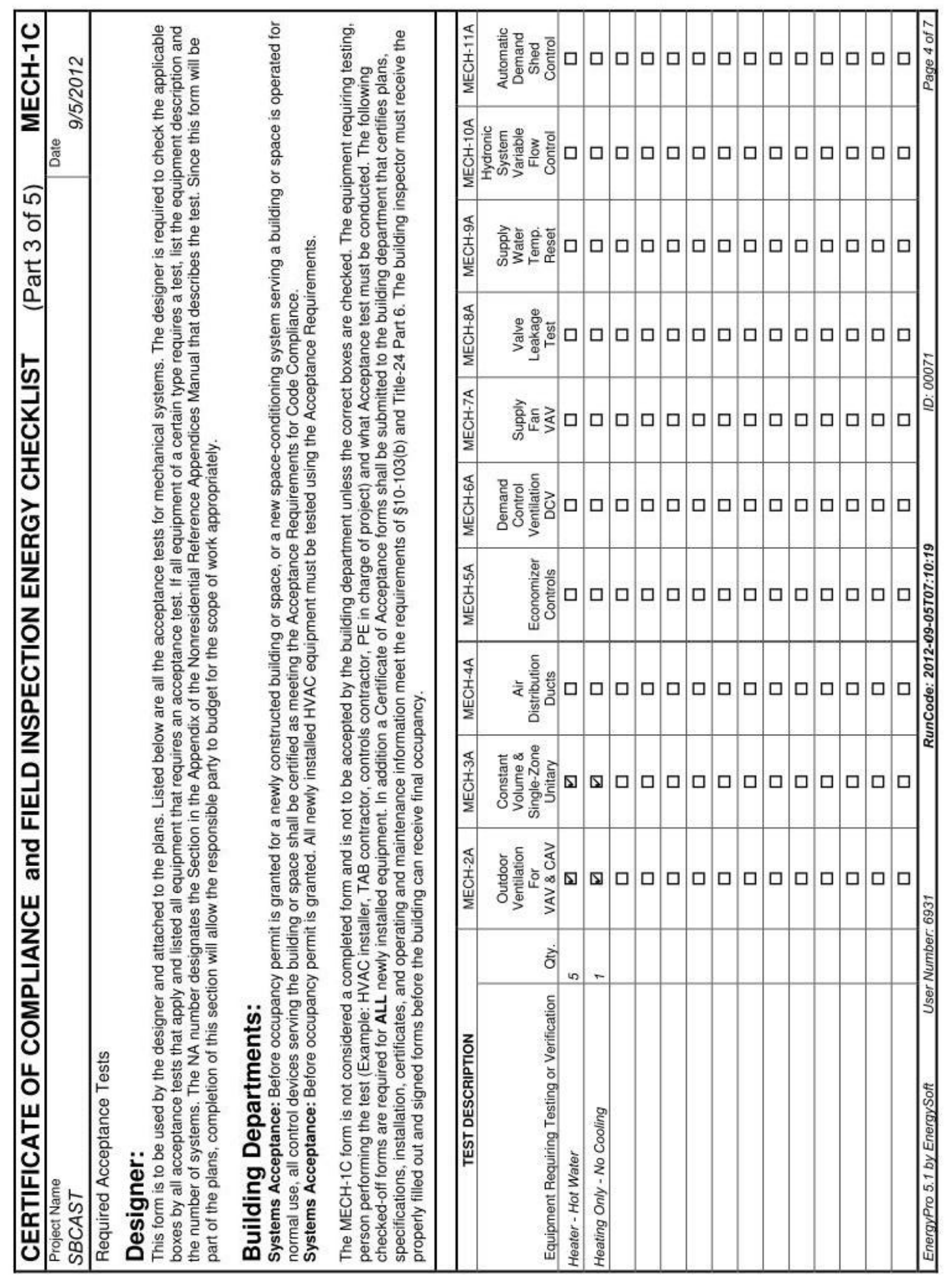


CERTIFICATE OF COMPLIANCE and FIELD INSPECTION ENERGY CHECKLIST (Part 2 of 5) MECH-1C

Project Name *SBCAST*

Date *9/5/2012*

Discrepancies:



CERTIFICATE OF COMPLIANCE and FIELD INSPECTION ENERGY CHECKLIST (Part 3 of 5) MECH-1C

Project Name *SBCAST*

Date *9/5/2012*

Required Acceptance Tests

Designer:

This form is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for mechanical systems. The designer is required to check the applicable boxes by all acceptance tests that apply and listed all equipment that requires an acceptance test. If all equipment of a certain type requires a test, list the equipment description and the number of systems. The NA number designates the Section in the Appendix of the Nonresidential Reference Appendices Manual that describes the test. Since this form will be part of the plans, completion of this section will allow the responsible party to budget for the scope of work appropriately.

Building Departments:

Systems Acceptance: Before occupancy permit is granted for a newly constructed building or space, or a new space-conditioning system serving a building or space is operated for normal use, all control devices serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance.
Systems Acceptance: Before occupancy permit is granted. All newly installed HVAC equipment must be tested using the Acceptance Requirements.

The MECH-1C form is not considered a completed form and is not to be accepted by the building department unless the correct boxes are checked. The equipment requiring testing, person performing the test (Example: HVAC installer, TAB contractor, controls contractor, PE in charge of project) and what Acceptance test must be conducted. The following checked-off forms are required for **ALL** newly installed equipment. In addition a Certificate of Acceptance forms shall be submitted to the building department that certifies plans, specifications, installation, certificates, and operating and maintenance information meet the requirements of §10-103(b) and Title-24 Part 6. The building inspector must receive the properly filled out and signed forms before the building can receive final occupancy.

TEST DESCRIPTION		MECH-2A	MECH-3A	MECH-4A	MECH-5A	MECH-6A	MECH-7A	MECH-8A	MECH-9A	MECH-10A	MECH-11A
Equipment Requiring Testing or Verification	Qty.	Outdoor Ventilation For VAV & CAV	Constant Volume & Single-Zone Unitary	Air Distribution Ducts	Economizer Controls	Demand Control Ventilation DCV	Supply Fan VAV	Valve Leakage Test	Supply Water Temp. Reset	Hydronic System Variable Flow Control	Automatic Demand Shed Control
Heater - Hot Water	*5*	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐
Heating Only - No Cooling	*1*	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐
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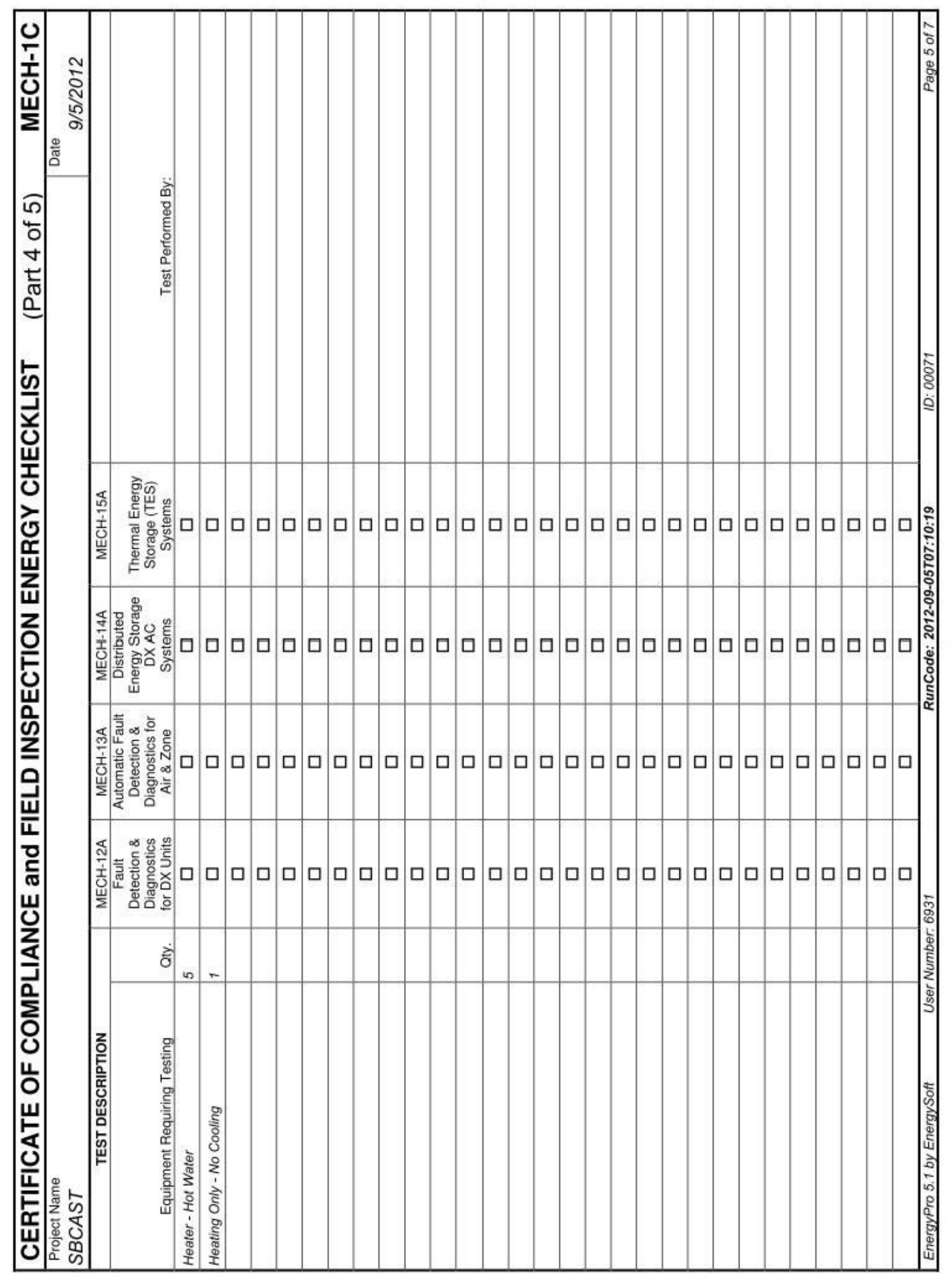

CERTIFICATE OF COMPLIANCE and FIELD INSPECTION ENERGY CHECKLIST (Part 4 of 5) MECH-1C

Project Name *SBCAST*

Date *9/5/2012*

TEST DESCRIPTION		MECH-12A	MECH-13A	MECH-14A	MECH-15A	
Equipment Requiring Testing	Qty.	Fault Detection & Diagnostics for DX Units	Automatic Fault Detection & Diagnostics for Air & Zone	Distributed Energy Storage DX AC Systems	Thermal Energy Storage (TES) Systems	Test Performed By:
Heater - Hot Water	*5*	☐	☐	☐	☐	
Heating Only - No Cooling	*1*	☐	☐	☐	☐	
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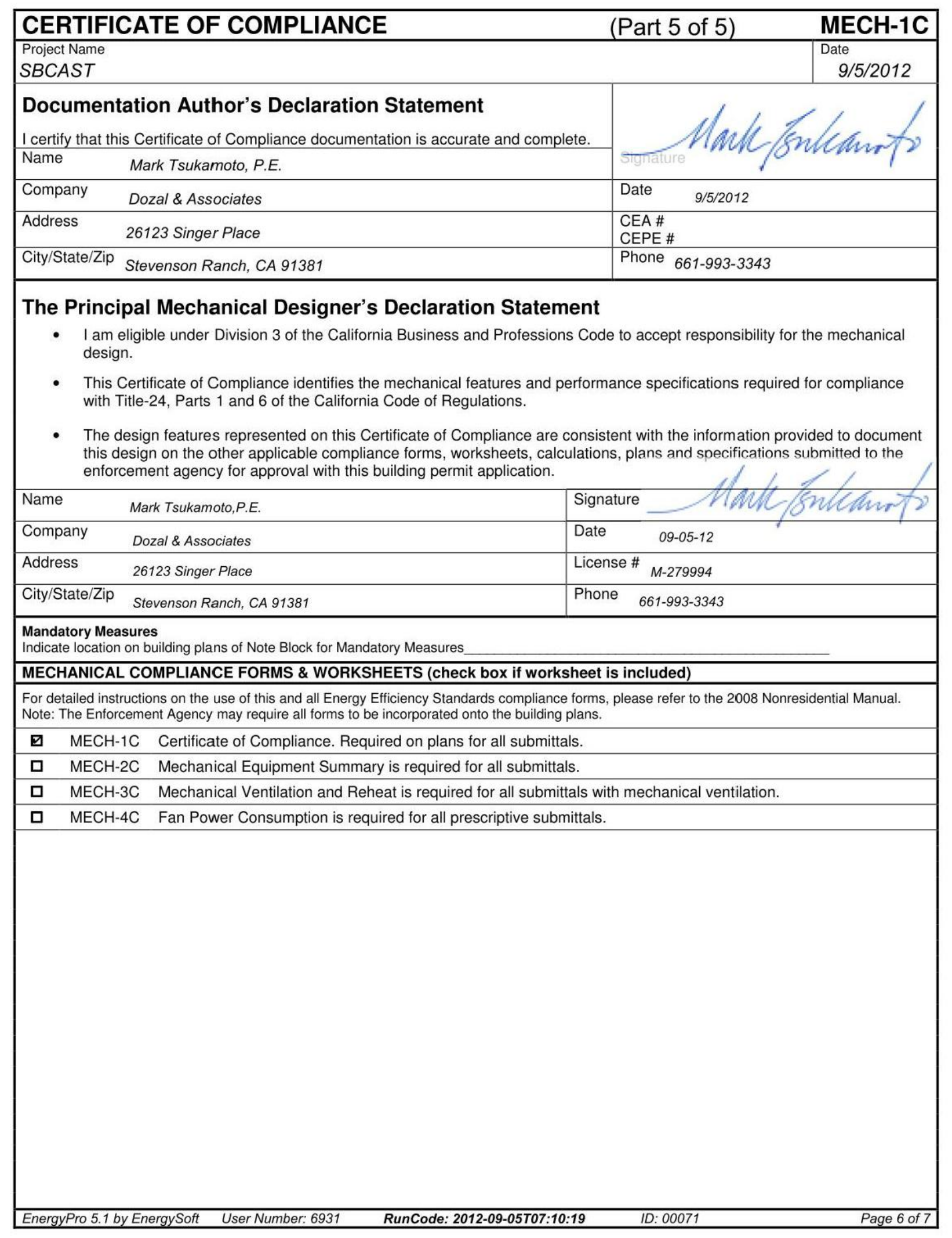


CERTIFICATE OF COMPLIANCE (Part 5 of 5) MECH-1C

Project Name *SBCAST*

Date *9/5/2012*

Documentation Author's Declaration Statement

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

Name *Mark Tsukamoto, P.E.*	Signature Mark Tsukamoto
Company *Dozal & Associates*	Date *9/5/2012*
Address *26123 Singer Place*	CEA # CEPE #
City/State/Zip *Stevenson Ranch, CA 91381*	Phone *661-993-3343*

The Principal Mechanical Designer's Declaration Statement

- I am eligible under Division 3 of the California Business and Professions Code to accept responsibility for the mechanical design.
- This Certificate of Compliance identifies the mechanical features and performance specifications required for compliance with Title-24, Parts 1 and 6 of the California Code of Regulations.
- The design features represented on this Certificate of Compliance are consistent with the information provided to document this design on the other applicable compliance forms, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.

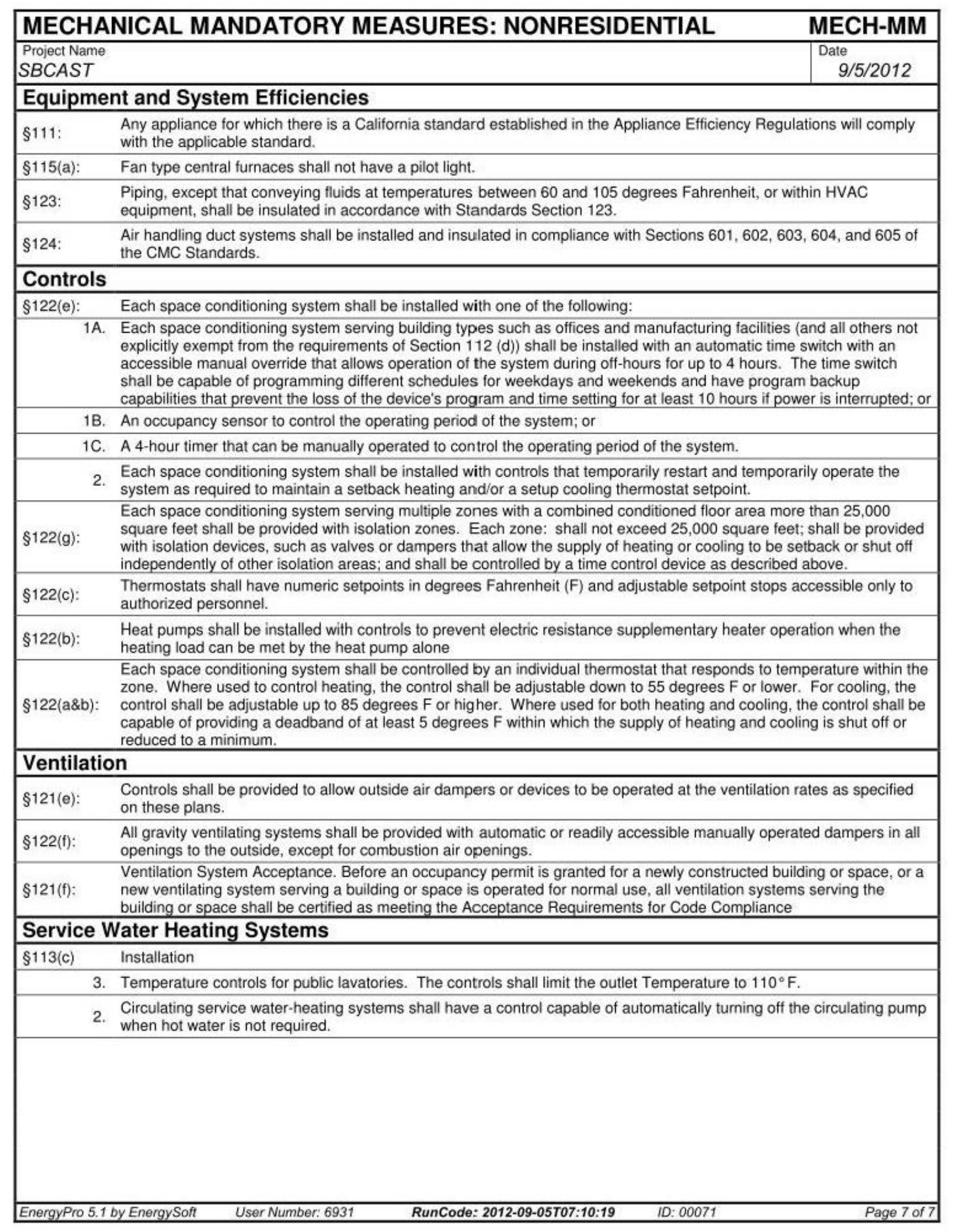
Name *Mark Tsukamoto,P.E.*	Signature Mark Tsukamoto
Company *Dozal & Associates*	Date *09-05-12*
Address *26123 Singer Place*	License # *M-279994*
City/State/Zip *Stevenson Ranch, CA 91381*	Phone *661-993-3343*

Mandatory Measures
Indicate location on building plans of Note Block for Mandatory Measures____

MECHANICAL COMPLIANCE FORMS & WORKSHEETS (check box if worksheet is included)

For detailed instructions on the use of this and all Energy Efficiency Standards compliance forms, please refer to the 2008 Nonresidential Manual.
Note: The Enforcement Agency may require all forms to be incorporated onto the building plans.

☒	MECH-1C	Certificate of Compliance. Required on plans for all submittals.
☐	MECH-2C	Mechanical Equipment Summary is required for all submittals.
☐	MECH-3C	Mechanical Ventilation and Reheat is required for all submittals with mechanical ventilation.
☐	MECH-4C	Fan Power Consumption is required for all prescriptive submittals.



MECHANICAL MANDATORY MEASURES: NONRESIDENTIAL MECH-MM

Project Name *SBCAST*

Date *9/5/2012*

Equipment and System Efficiencies

§111:	Any appliance for which there is a California standard established in the Appliance Efficiency Regulations will comply with the applicable standard.
§115(a):	Fan type central furnaces shall not have a pilot light.
§123:	Piping, except that conveying fluids at temperatures between 60 and 105 degrees Fahrenheit, or within HVAC equipment, shall be insulated in accordance with Standards Section 123.
§124:	Air handling duct systems shall be installed and insulated in compliance with Sections 601, 602, 603, 604, and 605 of the CMC Standards.

Controls

§122(e):	Each space conditioning system shall be installed with one of the following:
1A.	Each space conditioning system serving building types such as offices and manufacturing facilities (and all others not explicitly exempt from the requirements of Section 112 (d)) shall be installed with an automatic time switch with an accessible manual override that allows operation of the system during off-hours for up to 4 hours. The time switch shall be capable of programming different schedules for weekdays and weekends and have program backup capabilities that prevent the loss of the device's program and time setting for at least 10 hours if power is interrupted; or
1B.	An occupancy sensor to control the operating period of the system; or
1C.	A 4-hour timer that can be manually operated to control the operating period of the system.
2.	Each space conditioning system shall be installed with controls that temporarily restart and temporarily operate the system as required to maintain a setback heating and/or a setup cooling thermostat setpoint.
§122(g):	Each space conditioning system serving multiple zones with a combined conditioned floor area more than 25,000 square feet shall be provided with isolation zones. Each zone: shall not exceed 25,000 square feet; shall be provided with isolation devices, such as valves or dampers that allow the supply of heating or cooling to be setback or shut off independently of other isolation areas; and shall be controlled by a time control device as described above.
§122(c):	Thermostats shall have numeric setpoints in degrees Fahrenheit (F) and adjustable setpoint stops accessible only to authorized personnel.
§122(b):	Heat pumps shall be installed with controls to prevent electric resistance supplementary heater operation when the heating load can be met by the heat pump alone
§122(a&b):	Each space conditioning system shall be controlled by an individual thermostat that responds to temperature within the zone. Where used to control heating, the control shall be adjustable down to 55 degrees F or lower. For cooling, the control shall be adjustable up to 85 degrees F or higher. Where used for both heating and cooling, the control shall be capable of providing a deadband of at least 5 degrees F within which the supply of heating and cooling is shut off or reduced to a minimum.

Ventilation

§121(e):	Controls shall be provided to allow outside air dampers or devices to be operated at the ventilation rates as specified on these plans.
§122(f):	All gravity ventilating systems shall be provided with automatic or readily accessible manually operated dampers in all openings to the outside, except for combustion air openings.
§121(f):	Ventilation System Acceptance. Before an occupancy permit is granted for a newly constructed building or space, or a new ventilating system serving a building or space is operated for normal use, all ventilation systems serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance

Service Water Heating Systems

§113(c)	Installation
3.	Temperature controls for public lavatories. The controls shall limit the outlet Temperature to 110° F.
2.	Circulating service water-heating systems shall have a control capable of automatically turning off the circulating pump when hot water is not required.

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TURE

315 Linden Street
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Tel 415 551 7630
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STAMP

MARK VINCENT TSUKAMOTO
NO. 27994
EXP. 08/30/14

CONSULTANTS

Dozal & Assoc.
26123 Singer Pl.
Stevenson Ranch, CA
91381
T.661.993.3343

PROJECT

SANTA BARBARA CENTER FOR ART, SCIENCE & TECHNOLOGY

513 GARDEN STREET
SANTA BARBARA, CA 93101

ISSUES / REVISIONS

•

SHEET TITLE

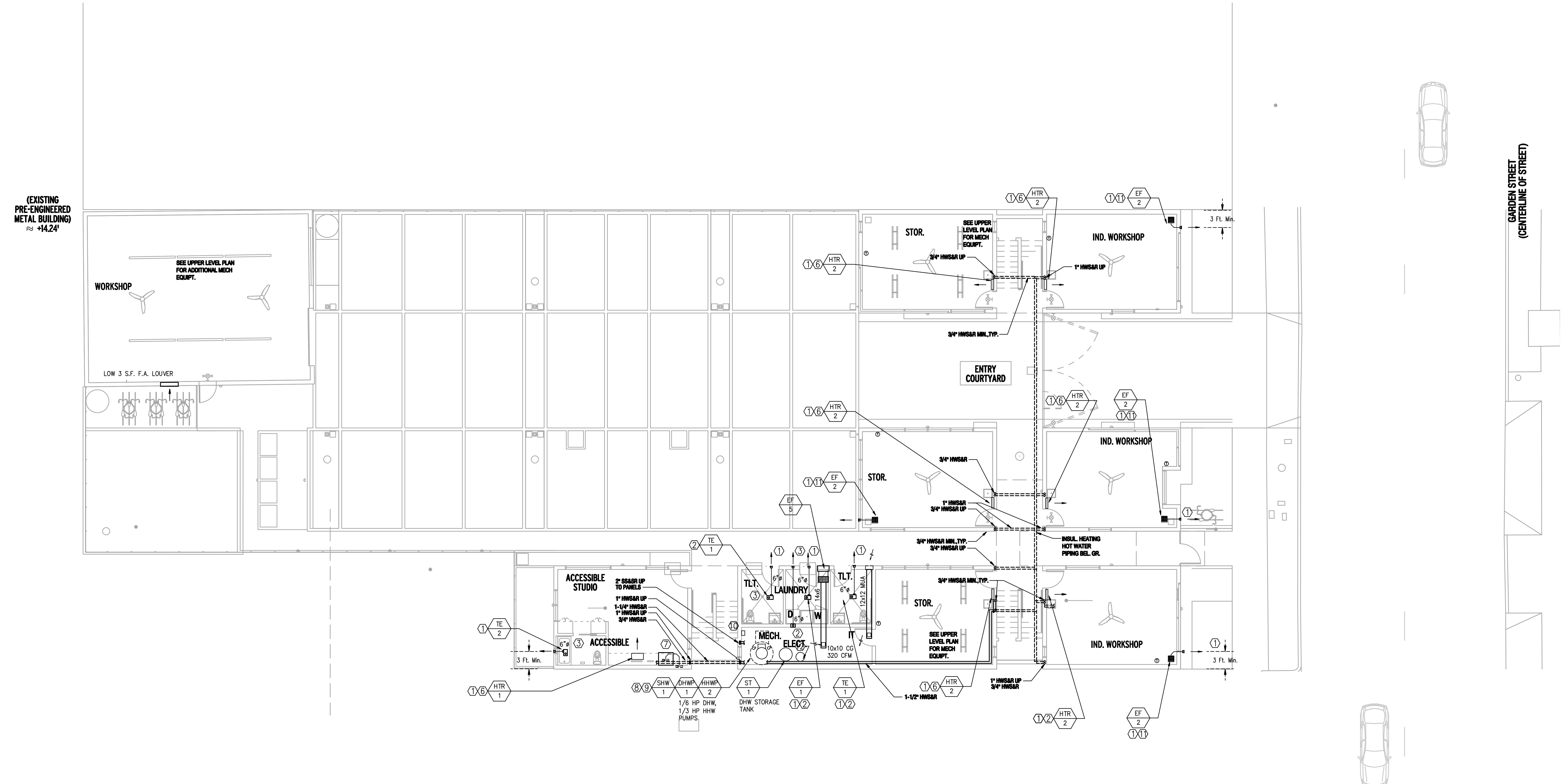
TITLE 24 DOCUMENTS NON-RESIDENTIAL PORTION

DATE	04/1/13
PHASE	ISSUE FOR BID SET
SCALE	NONE

FULL SIZE

SHEET

M1.2



MECHANICAL GENERAL NOTES

① CONTRACTOR SHALL INSTALL MECH. EQUIPT. FOR CONCEALED LOC'NS. W/ SERVICE ACCESS IN SUCH A MANNER AS TO ALLOW FOR 36" IN FRONT OF CONTROLLERS, COMPONENT ACCESS AND ELECTRICAL DISCONNECTS.

② ALL EXTERIOR COMPONENTS OR ANY COMPONENT EXPOSED TO THE EXTERIOR ENVIRON SHALL BE EPOXY–COATED, CORROSION–PROOF OR EQUAL. INSECT AND BIRDSCREENS SHALL BE STAINLESS STEEL.

③ EXPOSED DUCTS SHALL BE INSTALLED WITHOUT DENTS OR DEFECTS. USE COUPLINGS AT JOINTS SEALED WITH CLEAR SILICONE SEAL.

④ ALL DUCTWORK SHALL BE GALVANIZED SHEET METAL AND COMPLY WITH CURRENT CMC CH. 6.

⑤ CONTRACTOR SHALL VERIFY ALL WALL PARTITIONS TYPES/CEILING TYPES AND RATING IN ORDER TO PROVIDE COMBINATION SMOKE FIRE DAMPERS / FIRE STOPPING AT PENETRATIONS TO FIRE RATED AREAS (IN ACCORDANCE WITH MECHANICAL CODE).

⑥ THERMOSTATS SHALL BE INSTALLED 48" ABOVE FINISHED FLOOR. FINAL THERMOSTAT LOCATION(S) SHALL BE COORDINATED WITH FURNITURE LAYOUT AND APPROVED BY THE ARCHITECT.

⑦ FINAL GRILL TYPES AND LOCATIONS SHALL BE COORDINATED AND APPROVED BY ARCHITECT.

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⑨ ALL DUCT AND PIPE PENETRATIONS THROUGH FULL HEIGHT WALLS SHALL BE ACOUSTICALLY SEALED.

⑩ CONTRACTOR SHALL PROVIDE ACCESS PANELS FOR ALL EQUIPMENT LOCATED ABOVE HARD LID CEILINGS.

⑪ PROVIDE LINED DUCTWORK FOR THE FIRST 15 FEET TO AND FROM FANS.

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⑬ ALL THERMOSTATS INSTALLED ON EXTERIOR WALLS OR COLUMNS SHALL HAVE AN INSULATED BACKING INSTALLED BEHIND THE THERMOSTAT.

KEYED MECHANICAL NOTES:

1 CENTER MECHANICAL DEVICES WITH, OR IN BETWEEN ARCHITECTURAL FEATURES, SUCH AS DOORS, WINDOWS, WALLS, COLUMNS, ETC. WHEN POSSIBLE. SUBMIT OPENING LAYOUTS TO ARCHITECT FOR APPROVAL, PRIOR TO PENETRATION.

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3 4"ø RIGID SHEET METAL DRYER (W/ NO INTERIOR SCREWS) DUCT UP, TO FANTECH LINT TRAP #DBLT4 (DUCT IN JOIST SPACE TRANS. TO 4"ø THRU WALL TO SEIHO #SFZ–C4–N WITH DRYER BACKDRAFT DAMPER.[MAX. 14 FT. RUN INCL. 2 ELBOWS, OTHERWISE INCREASE TO 5 INCH ROUND DUCT]

4 SPARE

5 PROVIDE ALL SUSPENDED MOTORIZED EQUIPMENT WITH RESILIENT ISOLATION AND FLEXIBLE CONNECTIONS TO PREVENT VIBRATIONS. SUPPORT ALL MOTORIZED EQUIPMENT WITH ALL–THREAD RODS.

6 LOCATE HEATER PER ARCHITECT & ACCORDING TO MFR. INSTALL'N. INSTRUCTIONS. MAINTAIN 24 INCHES MIN. FROM ADJACENT WALLS AND STRUCTURE.

7 HIGH STATIC RESIDENTIAL HOOD BY OTHERS, 14x3–1/4 EXH. DUCT UP IN WALLS & OFFSET OVER AND THRU THE ROOF AT 3 FT. FROM BLDG. EDGE., TYP.

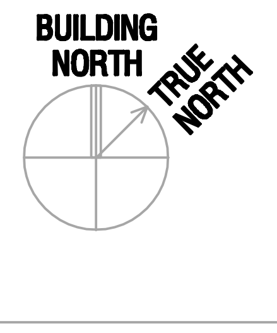
8 PROVIDE CONCENTRIC CAT. IV VENT TO ROOF WITH CODE–APPROVED ROOF VENT. PROVIDE FIRE–WRAP AS REQUIRED.

9 PROVIDE COMPLETE INSTALLATION OF HTC VERSAHYDRO MODEL PHE–199–119–S, COMBINATION SOLAR WATER HEATER, DUAL PUMPS & STORAGE TANK ACCORDING TO CODE, MFR. RQMTS., AND FIELD CONDITIONS. SEE DETAIL, SHT. M3.0. SUBMIT COMPLETE COORDINATION SHOP DRAWINGS AND P&I.D. PROCESS & INSTRUMENTATION DRAWINGS FOR APPROVAL PRIOR TO ORDERING AND INSTALLATION.

10 COORDINATE INSTALLATION ACCESS .

11 8"ø EXH. DUCT IN JOIST SPACE TO SEIHO MODEL SFX8–N W/ STAINLESS STEEL INSECT SCREEN.

12 DUE TO THE AREA'S HARD WATER, PROVIDE A WATER TREATMENT SYSTEM TO INHIBIT SCALE, CORROSION, ON AN EXCHANGE BASIS FOR CLOSED LOOP MAKEUP WATER.



MACY ARCHITECTURE
315 Linden Street
San Francisco, CA 94102
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STAMP
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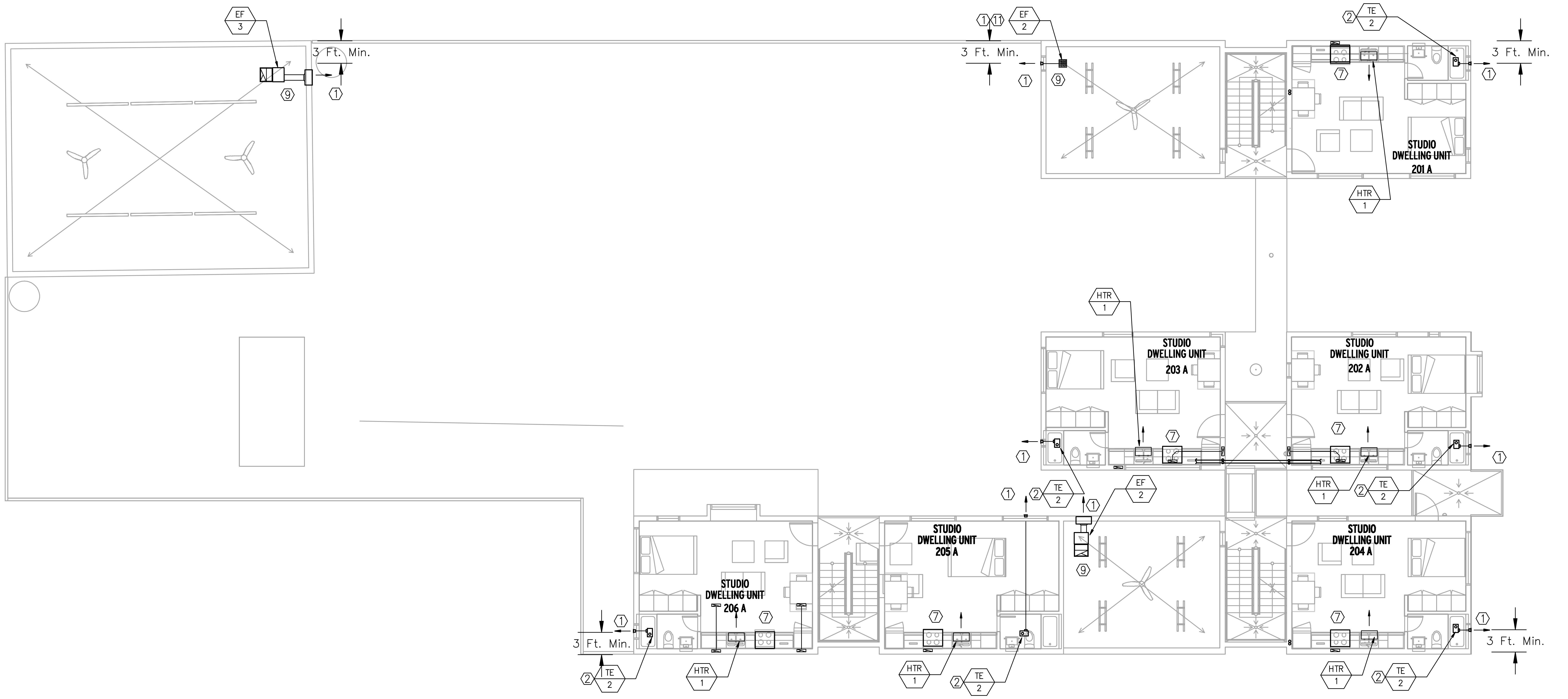
PROJECT
SANTA BARBARA CENTER FOR ART, SCIENCE & TECHNOLOGY
513 GARDEN STREET
SANTA BARBARA, CA 93101

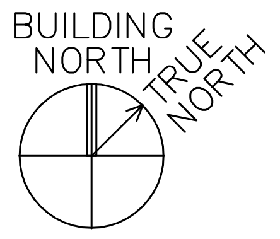
ISSUES / REVISIONS
•

SHEET TITLE
FIRST FLOOR MECHANICAL PLAN

DATE	04/01/13
PHASE	ISSUE FOR BID SET
SCALE	1/8" = 1'-0" FULL SIZE

SHEET
M2.1





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TURE

315 Linden Street
San Francisco, CA 94102
Tel 415 551 7630
Fax 415 551 7601
www.macyarchitecture.com

STAMP

MARK VINCENT TSUKAMOTO
NO. 27994
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CONSULTANTS

Dozal & Assoc.
26123 Singer Pl.
Stevenson Ranch, CA
91381
T.661.993.3343

PROJECT

SANTA BARBARA CENTER FOR ART, SCIENCE & TECHNOLOGY

513 GARDEN STREET
SANTA BARBARA, CA 93101

ISSUES / REVISIONS

•

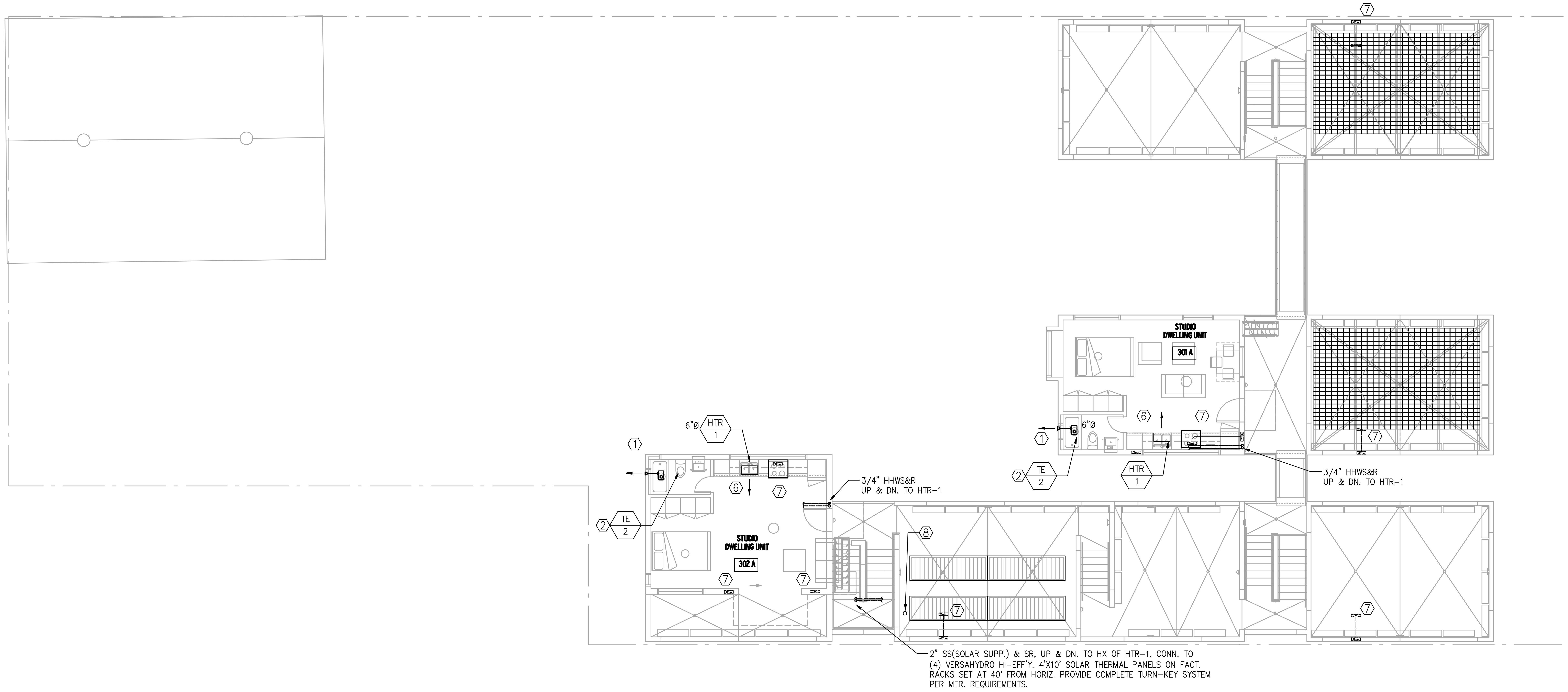
SHEET TITLE

SECOND FLOOR MECHANICAL PLAN

DATE 04/01/13
PHASE ISSUE FOR BID SET
SCALE FULL SIZE

SHEET

M2.2



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⟨3⟩ 4"Ø RIGID SHEET METAL DRYER (W/ NO INTERIOR SCREWS) DUCT UP, TO FANTECH LINT TRAP #DBLT4 (DUCT IN JOIST SPACE TRANS. TO 4"Ø THRU WALL TO SEIHO #SFZ-C4-N WITH DRYER BACKDRAFT DAMPER.[MAX. 14 FT. RUN INCL. 2 ELBOWS, OTHERWISE INCREASE TO 5 INCH ROUND DUCT]

⟨4⟩ SPARE

⟨5⟩ PROVIDE ALL SUSPENDED MOTORIZED EQUIPMENT WITH RESILIENT ISOLATION AND FLEXIBLE CONNECTIONS TO PREVENT VIBRATIONS. SUPPORT ALL MOTORIZED EQUIPMENT WITH ALL-THREAD RODS.

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ISSUES / REVISIONS

•

SHEET TITLE

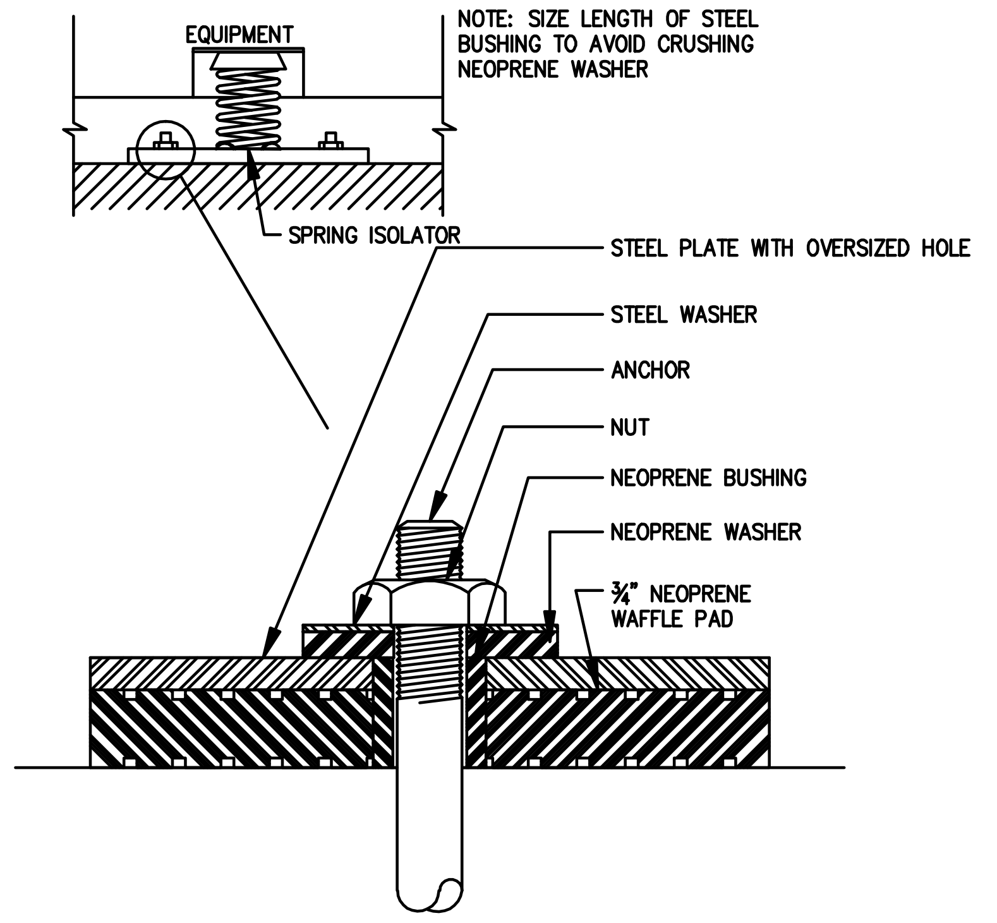
THIRD FLOOR
MECHANICAL PLAN

DATE	04/01/13
PHASE	ISSUE FOR BID SET
SCALE	1/8" = 1'-0"

FULL SIZE

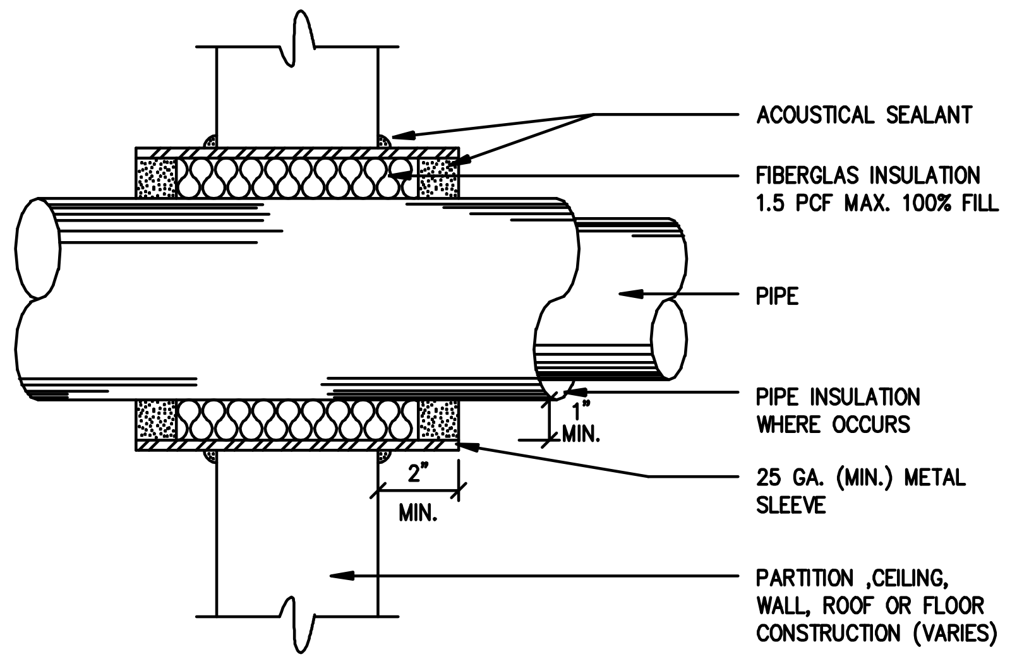
SHEET

M2.3



TYPICAL SPRING MOUNT RESTRAINT BOLT

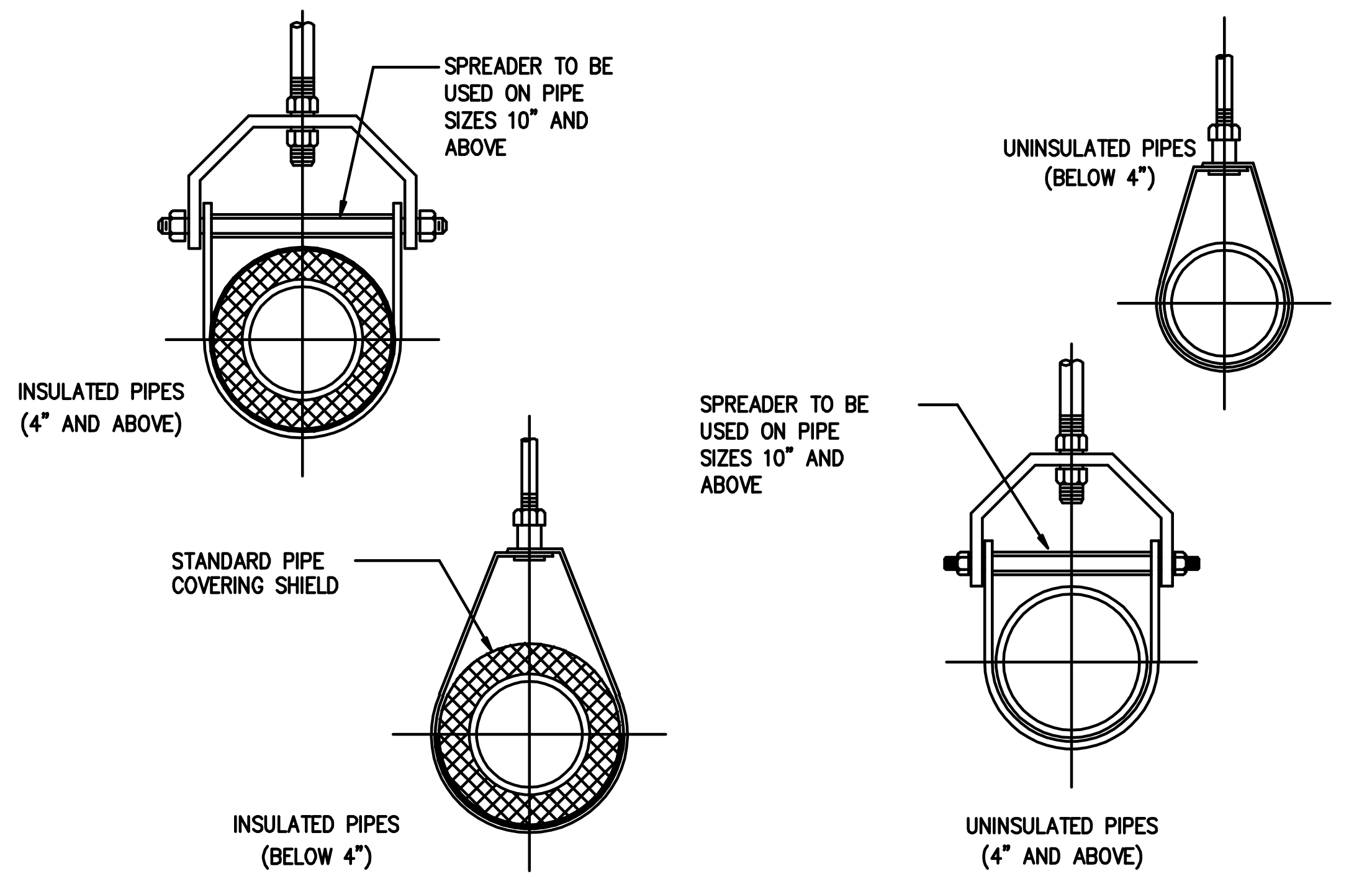
16



NOTES:
1. PROVIDE PITCH POCKET CONSTRUCTION, ADDITIONAL FLASHING, OR WEATHER CAP AS REQUIRED FOR WATER PROOF CONSTRUCTION. DO NOT MECHANICALLY TIE PIPE TO STRUCTURE IN ANY WAY.
2. SPACE BETWEEN PIPE AND SLEEVE SHALL BE FREE OF ANY FOREIGN MATERIALS.
3. PIPE SHALL NOT CONTACT STRUCTURE AT ANY TIME. WEDGES SHALL NOT BE USED TO MAINTAIN PIPE POSITION
4. PIPE MUST BE APPROXIMATELY CENTERED IN OPENING. PROVIDE ADDITIONAL CLEARANCE FOR POSITIONAL CHANGE OF PIPE DUE TO LOADING OF PIPE OR OPERATION OF SYSTEM.

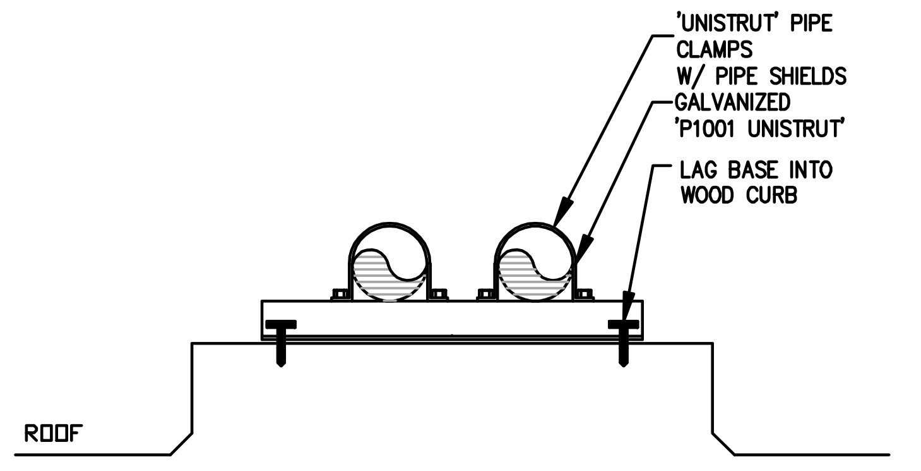
ISOLATED PIPE PENETRATION DETAIL

11



TYPICAL PIPE HANGER DETAIL

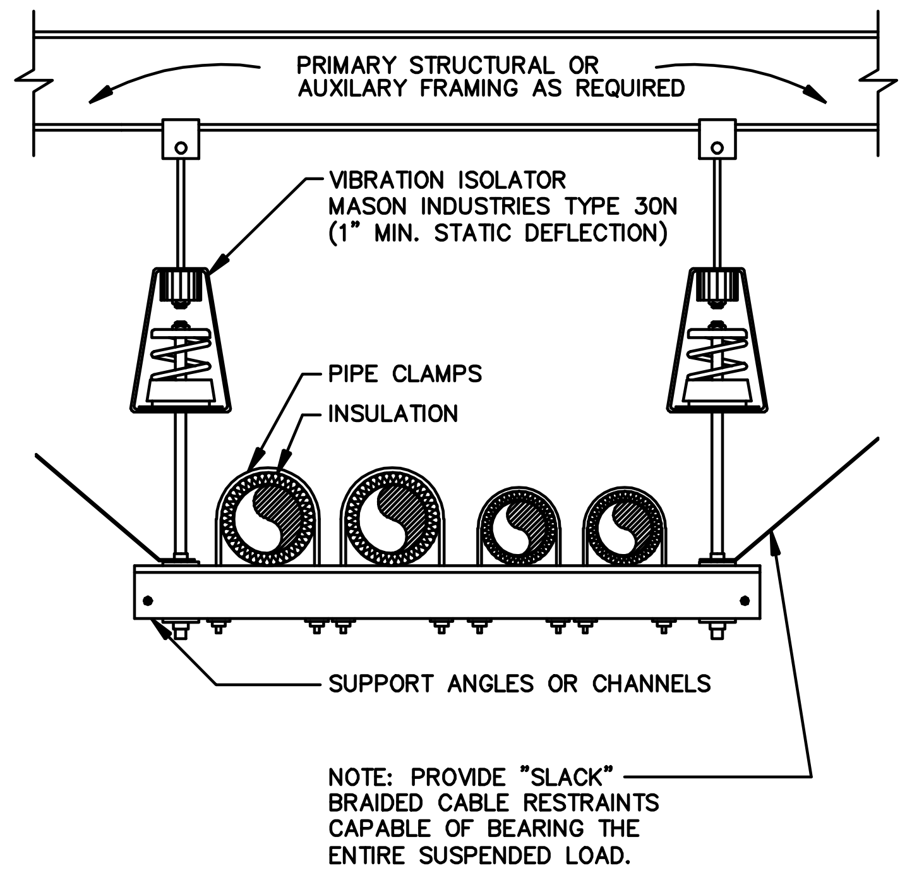
6



NOTES:
1. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR ALL ROOF CONSTRUCTION AND FLASHING DETAILS.
2. COORDINATE ALL ROOF AND/OR FLOOR PENETRATIONS WITH STRUCTURAL ENGINEER, AND WITH APPROVED ROOFING CONTRACTOR.

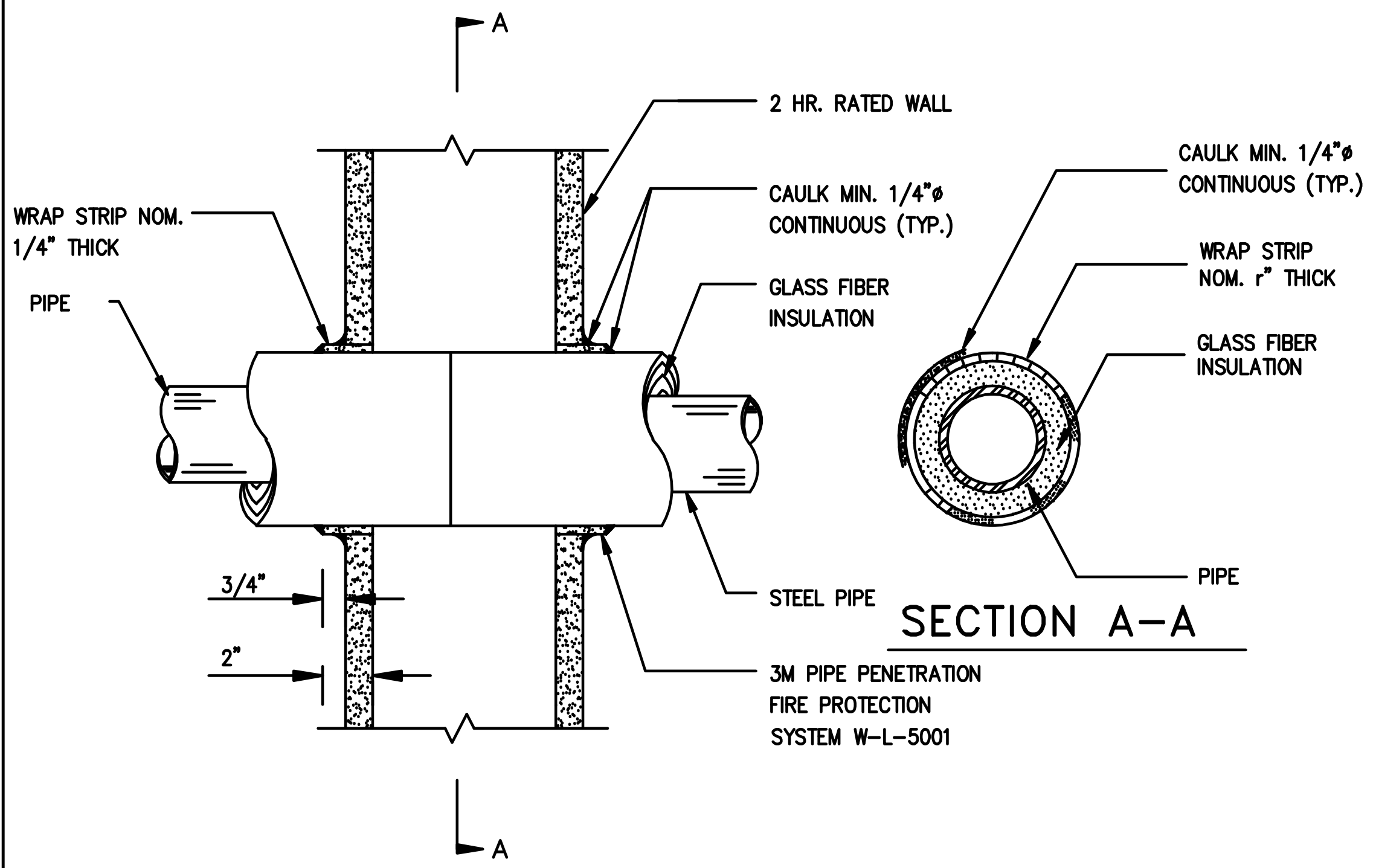
ROOF TOP PIPE SUPPORT DETAIL

1



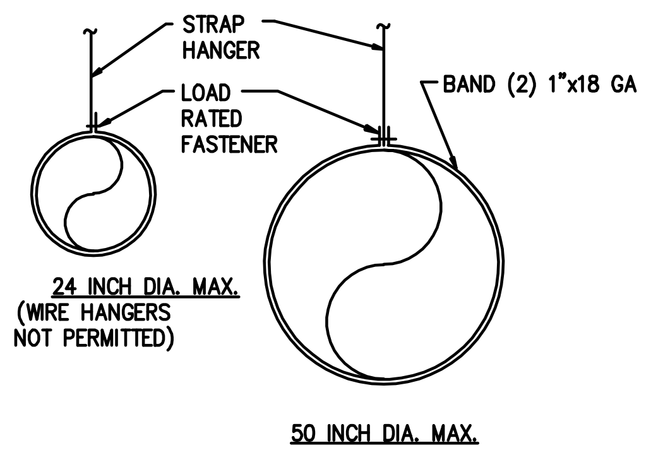
TRAPEZE PIPING OR EQUIPMENT SUPPORT

17



FIRE RATED WALL PIPE PENETRATION

12

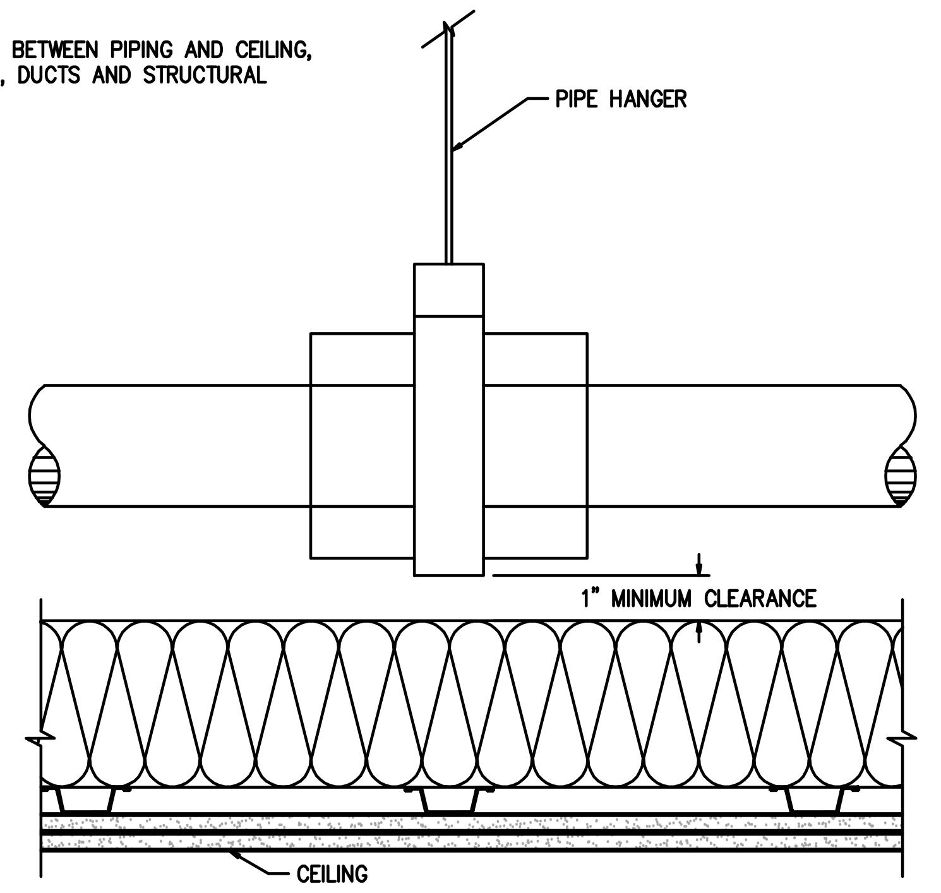


NOTES:
1. FOR HANGER SIZE AND SPACING, SEE SMACNA HVAC DUCT CONSTRUCTION STANDARS TABLE 4.2.
2. FOR UPPER ATTACHMENT TO BUILDING SEE SMACNA HVAC DUCT CONSTRUCTION STANDARDS FIG. 4–1 AND FIG. 4–2, WITH SPECIFIC BUILDING STRUCTURAL ENGINEER APPROVAL.
3. FOR BRACING AND OTHER SEISMIC REQUIREMENTS SEE GUIDELINES FOR SEISMIC RESTRAINTS OF MECHANICAL SYSTEMS AND PLUMBING PIPING SYSTEMS PUBLISHED BY SMACNA AND PPIC. ALSO REFER TO NATIONAL UNIFORM SEISMIC INSTALLATION GUIDELINES (NUSIG) 1991 AS APPROVED BY OFFICE OF THE CALIFORNIA STATE ARCHITECT 9/25/92.

TYPICAL HORIZONTAL ROUND DUCT SUPPORTS

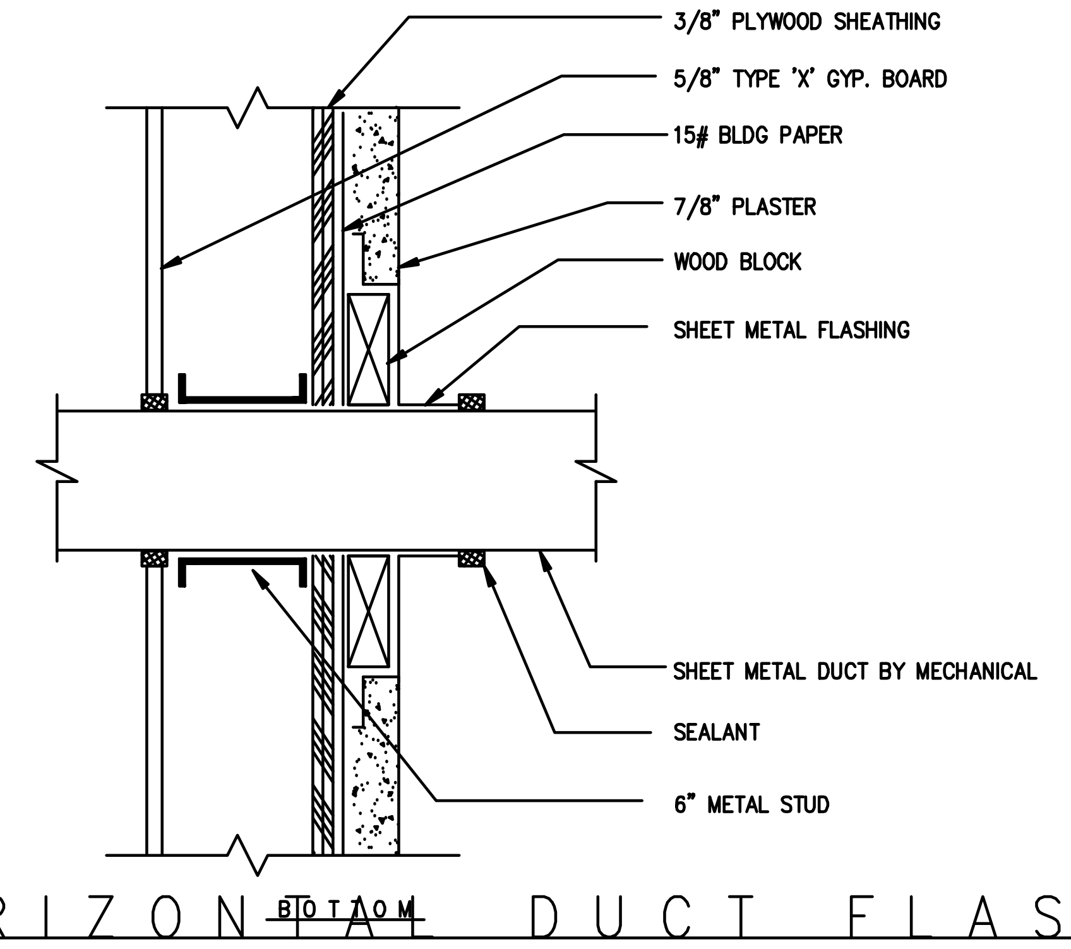
7

NOTE: PROVIDE 1" CLEAR BETWEEN PIPING AND CEILING, CEILING SUPPORTS, DUCTS AND STRUCTURAL FRAMING.



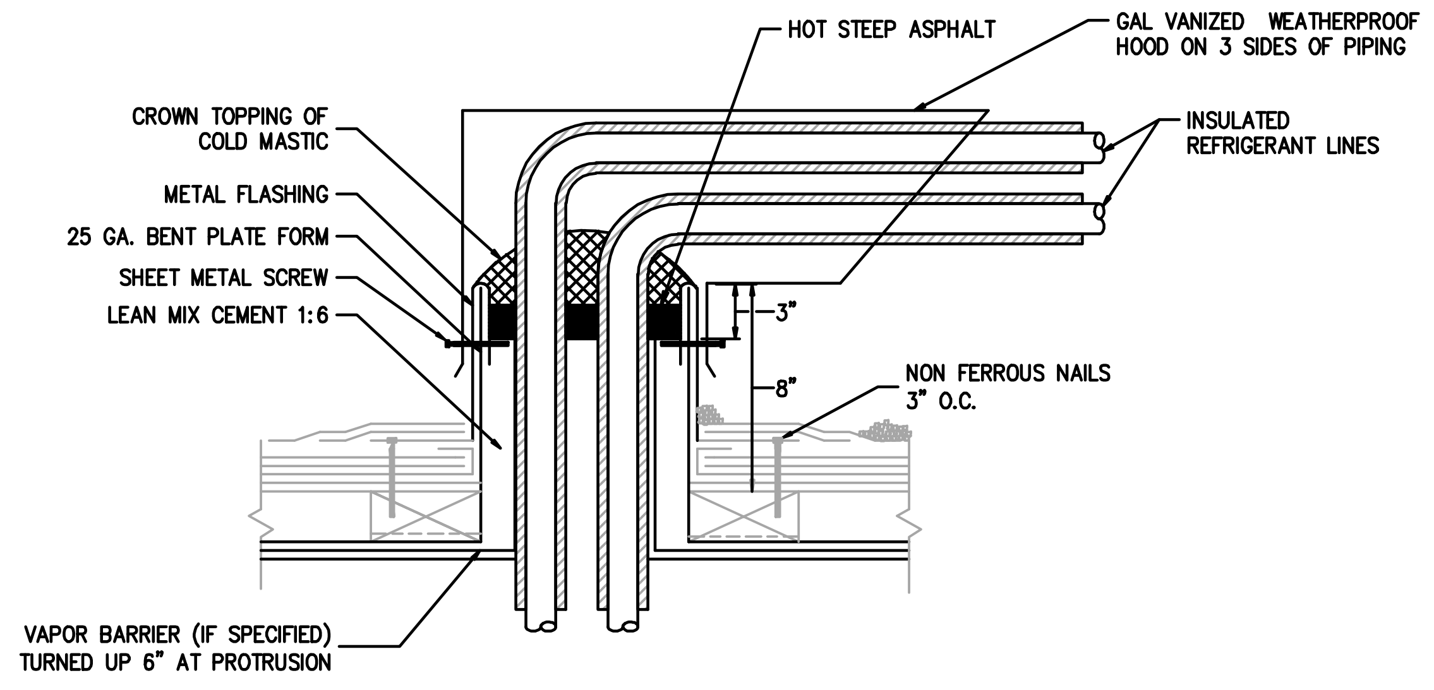
HORIZONTAL PIPE RUN

2



HORIZONTAL DUCT FLASHING THROUGH EXTERNAL WALL

8



NOTES:
1. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR ALL ROOF CONSTRUCTION AND FLASHING DETAILS.
2. COORDINATE ALL ROOF AND/OR FLOOR PENETRATIONS WITH STRUCTURAL ENGINEER, AND WITH APPROVED ROOFING CONTRACTOR.

REFRIGERANT LINE ROOF PENETRATION DETAIL

13

G. SOLAR PIPING WITH CENTRAL HEATING

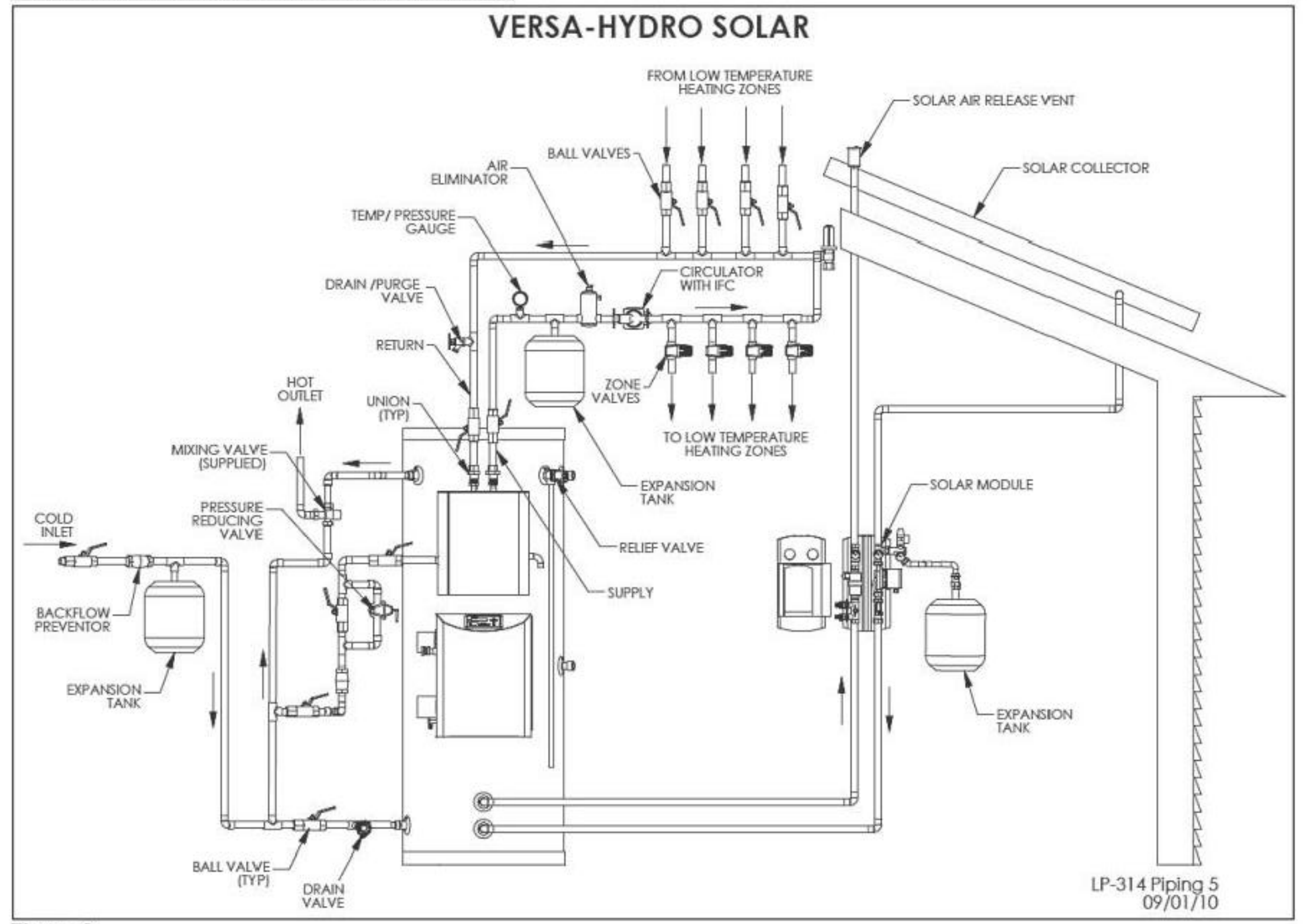


Figure 8

FIGURE NOTES:
1. Minimum pipe size should match connection size on appliance. If you require greater flow, upsize pipe accordingly.
2. A thermal expansion tank suitable for potable water must be sized and installed within the piping system between the check valve and cold water inlet of the appliance.
3. Gas line must be rated to the maximum capacity of the unit. Unit must have 10 feet of pipe after gas regulator.
4. All circulators shall have an integral flow check.
5. An ASSE 1017 mixing valve is required per SRCC OG-300.
6. Provide piping and connections to interface with domestic hot water storage tank and pumps.
7. Provide standby pumps for all domestic and heating hot water systems, in case of pump failure, with full bypass.

MACY ARCHITECTURE

315 Linden Street
San Francisco, CA 94102
Tel 415 551 7630
Fax 415 551 7601
www.macyarchitecture.com

STAMP

MARK VINCENT TSUKAMOTO
NO. 27894
EXP. 06/30/14

CONSULTANTS

Dozal & Assoc.
26123 Singer Pl.
Stevenson Ranch, CA
91381
T.661.993.3343

PROJECT

SANTA BARBARA CENTER FOR ART, SCIENCE & TECHNOLOGY

513 GARDEN STREET
SANTA BARBARA, CA 93101

ISSUES / REVISIONS

-

SHEET TITLE

MECHANICAL DETAILS

DATE 04/1/13
PHASE ISSUE FOR BID SET
SCALE NONE
FULL SIZE

SHEET

M3.0