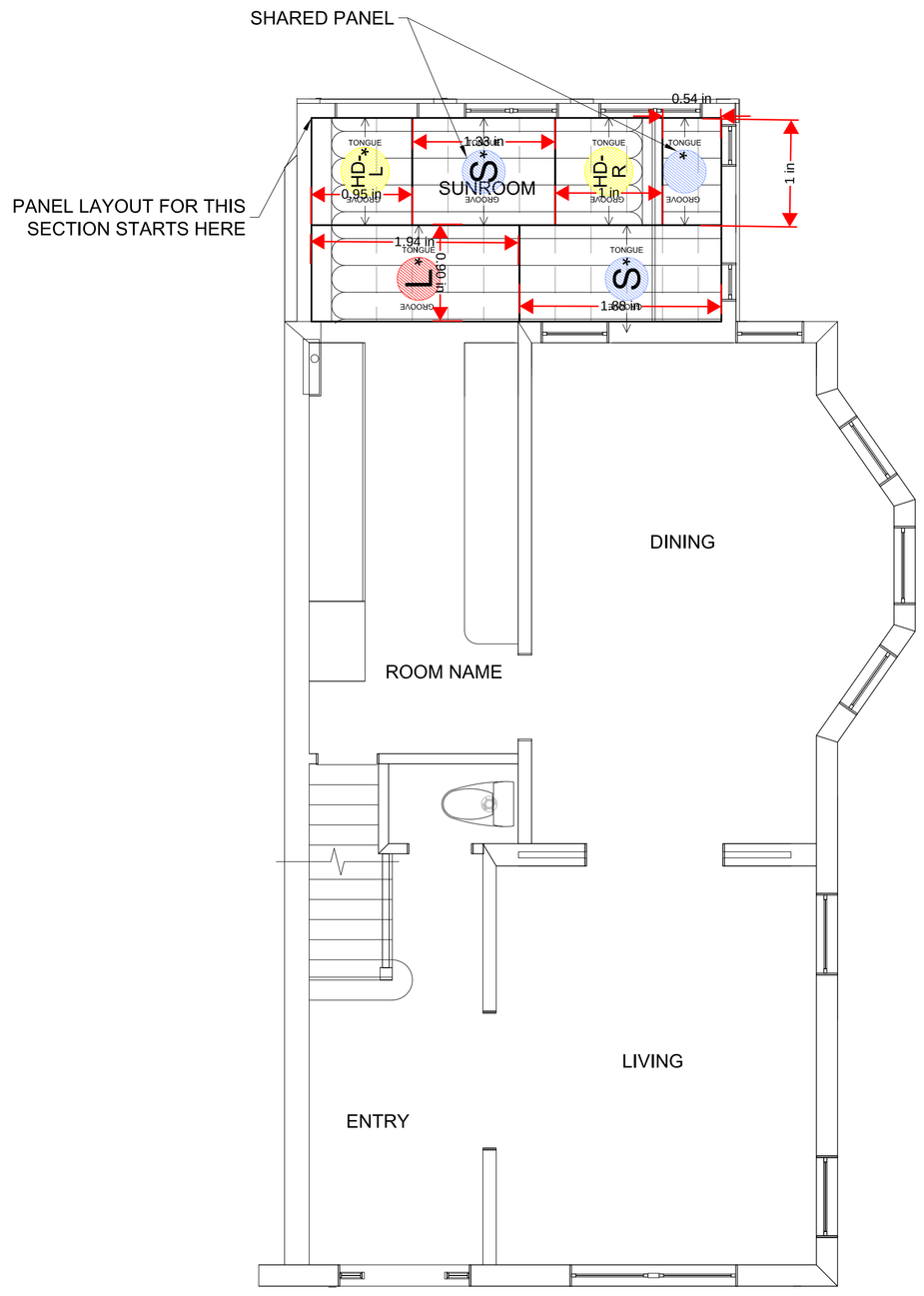
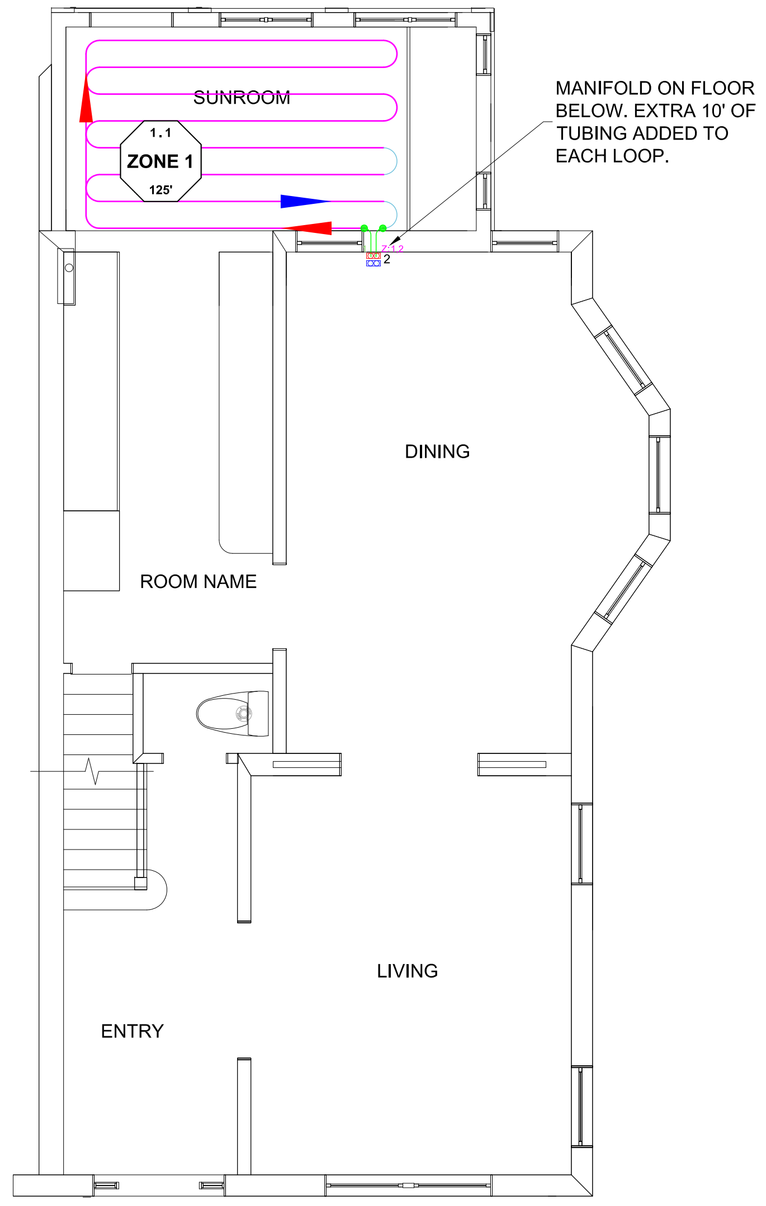


FIRST FLOOR PANEL LAYOUT

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



FIRST FLOOR TUBE LAYOUT

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

MANDATORY STRUCTURAL NOTES

1. TO ENSURE OPTIMAL PANEL INSTALLATION, FOLLOW PANEL LAYOUT PLANS, ALL WARMRBOARD INSTALLATION INSTRUCTIONS, AND APA GUIDELINES. FAILURE TO DO SO COULD CAUSE PANEL WASTE.

2. WARMBOARD PLANS ARE CONCEPTUAL AND DO NOT SUPERSEDE STRUCTURAL PLANS WHICH MAY BE PART OF THE ARCHITECTURAL PLAN SET. SHOULD THERE BE A CONFLICT BETWEEN WARMBOARD PLANS AND THE STRUCTURAL PLANS, CONSULT IMMEDIATELY WITH WARMBOARD CUSTOMER SERVICE BEFORE PROCEEDING.

3. INSTALLING CONTRACTOR IS RESPONSIBLE TO VERIFYING ALL MEASUREMENTS PRIOR TO THE INSTALLATION OF WARMBOARD PANELS.

QUESTIONS? FOR IMMEDIATE ASSISTANCE
CALL: 877-338-5493 (8AM - 5PM PT)

PANEL SCHEDULE

TYPE	QUANTITY	COMMENTS
S	2	(1)
L	1	(1)
R	0	(1)
D	1	(1) (2)
P	0	(3)

(1) ANY PANELS IN THE DRAWING THAT ARE MARKED WITH AN ASTERISK (*) INDICATE A PANEL THAT IS TO BE TRIMMED. A CAREFUL MEASUREMENT SHOULD BE MADE TO GUARANTEE A CORRECT INSTALLATION.

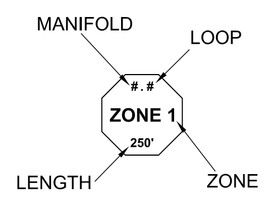
(2) DOUBLE PANELS WILL CONSIST OF A "HALF DOUBLE-LEFT" PANEL AND A "HALF DOUBLE-RIGHT" PANEL, ON THE PANEL LAYOUT, YOU MAY SEE A PANEL MARKED AS "HD-L" OR "HD-R." THIS MEANS THAT YOU CUT ONE OF THESE DOUBLE PANELS IN HALF AND USE THE APPROPRIATE SIDE AS MARKED FOR THE INSTALLATION.

(3) CONVENTIONAL TONGUE AND GROOVE PLYWOOD PANELS USED TO FILL IN EMPTY SPACES WHERE WARMBOARD MAY NOT BE APPROPRIATE.

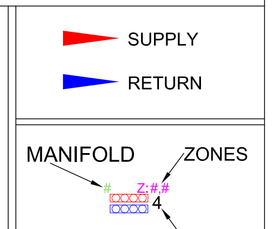
WARMBOARD LEGEND

- S — STRAIGHT PANEL
- L — LEFT TURN PANEL
- R — RIGHT TURN PANEL
- D — DOUBLE TURN PANEL
- HD-R — HALF DOUBLE PANEL-RIGHT TURN
- HD-L — HALF DOUBLE PANEL-LEFT TURN
- P — CONVENTIONAL PLYWOOD PANEL
- * — ASTERISK DENOTES A TRIMMED PANEL

JOIST
TUBING
CUSTOM GROOVE
BURIED TUBING
BURIED POINT



SUPPLY
RETURN



IMPORTANT NOTE: INSULATION BELOW WARMBOARD IS MANDATORY FOR PROPER PERFORMANCE.

MANDATORY TUBING NOTES

1. USE ONLY WARMBOARD APPROVED TUBING. SEE INSTALLATION MANUAL

2. USE AN APPROPRIATELY WEIGHTED ROLLER TO PRESS TUBING INTO CHANNELS.

3. MINOR FIELD MODIFICATION OF TUBING PLAN IS WELCOME AND TYPICAL. WHEN IN DOUBT CALL WARMBOARD CUSTOMER SERVICE.

QUESTIONS? FOR IMMEDIATE ASSISTANCE
CALL: 877-338-5493 (8AM - 5PM PT)

NOTE: TUBING IS REQUIRED TO BE INSTALLED AFTER WALLS ARE FRAMED

LOOP SCHEDULE

ZONE	MANIFOLD	LOOP	LENGTH
1	1	1	125'
	Total		125'-0"

REVISIONS:	BY:

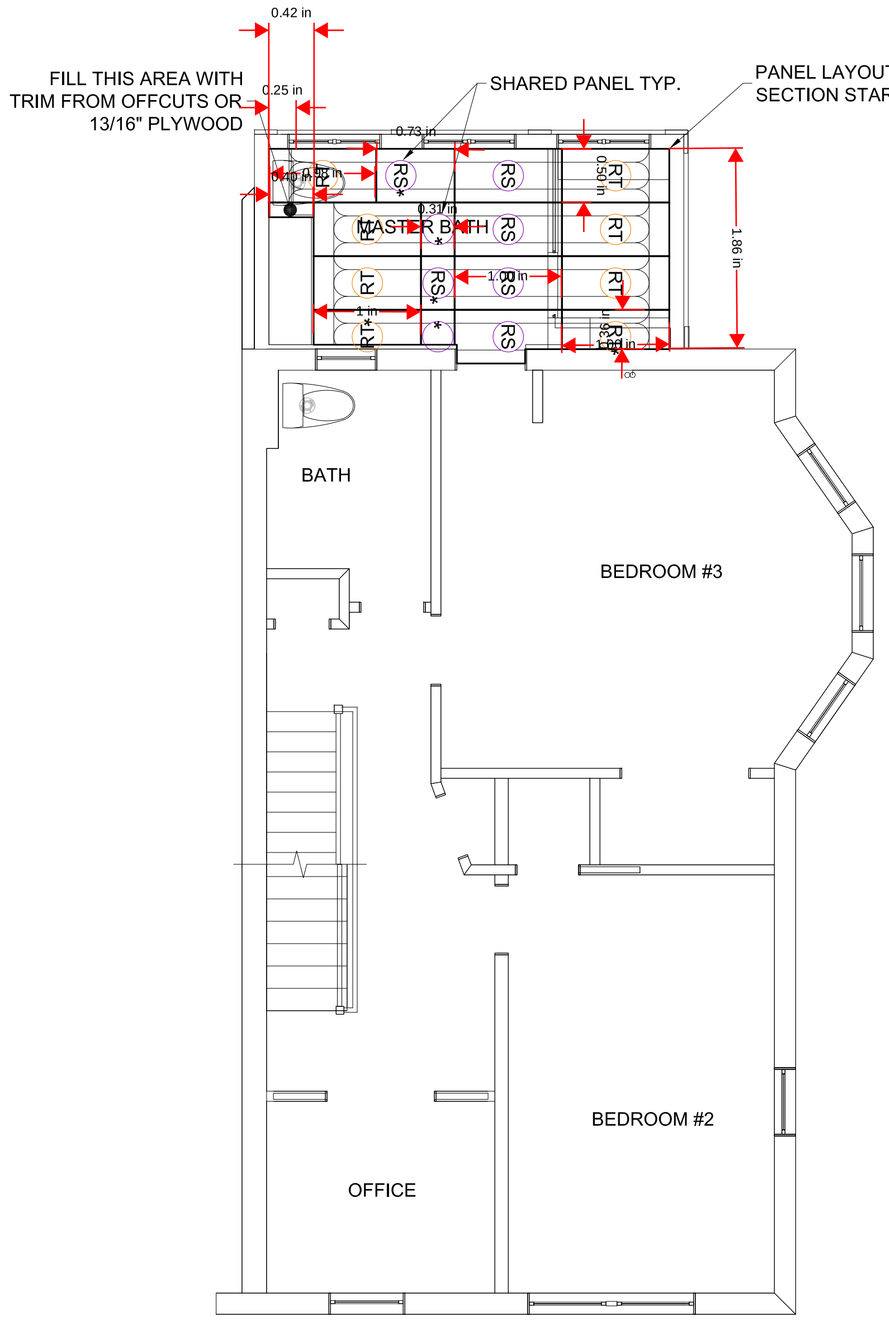
WARMBOARD, INC.
8035 SOQUEL DR. SUITE 41-A
APTOS, CA 95003
VOICE: (877)338-5493 FAX: (831)685-9278
WWW.WARMBOARD.COM EMAIL: PLANS@WARMBOARD.COM

warmboard®

GALLAS PROJECT
JOB# 44997
DC

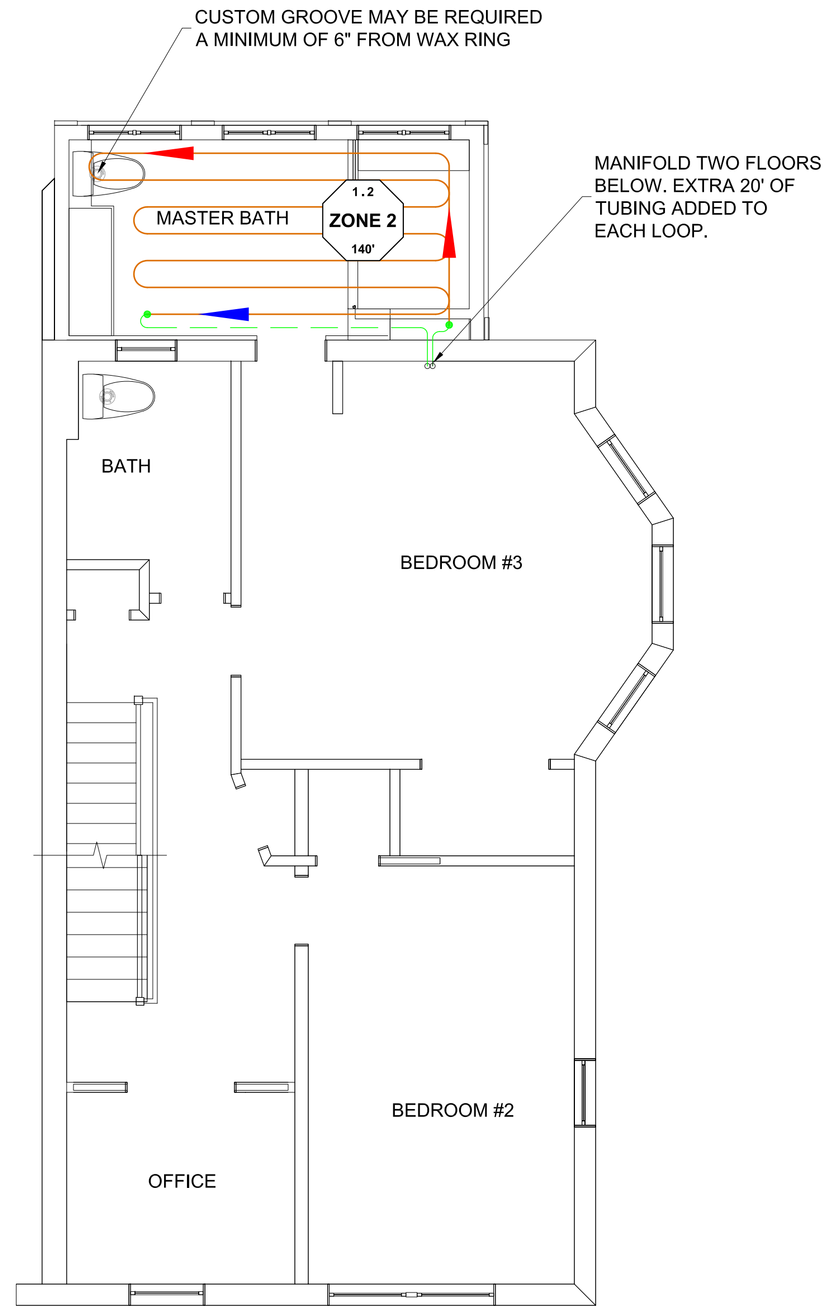
PANEL-TUBE LAYOUT

DATE: 03/22/2016
SCALE: 1/4" = 1'
DRAWN: R. Seitchick
REVIEWED: TW
SHEET: 1 OF 4



SECOND FLOOR PANEL LAYOUT

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



SECOND FLOOR TUBE LAYOUT

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

MANDATORY STRUCTURAL NOTES

1. TO ENSURE OPTIMAL PANEL INSTALLATION, FOLLOW PANEL LAYOUT PLANS, ALL WARMRBOARD INSTALLATION INSTRUCTIONS, AND APA GUIDELINES. FAILURE TO DO SO COULD CAUSE PANEL WASTE.

2. WARMBOARD PLANS ARE CONCEPTUAL AND DO NOT SUPERSEDE STRUCTURAL PLANS WHICH MAY BE PART OF THE ARCHITECTURAL PLAN SET. SHOULD THERE BE A CONFLICT BETWEEN WARMBOARD PLANS AND THE STRUCTURAL PLANS, CONSULT IMMEDIATELY WITH WARMBOARD CUSTOMER SERVICE BEFORE PROCEEDING.

3. INSTALLING CONTRACTOR IS RESPONSIBLE TO VERIFYING ALL MEASUREMENTS PRIOR TO THE INSTALLATION OF WARMBOARD PANELS.

QUESTIONS? FOR IMMEDIATE ASSISTANCE
CALL: 877-338-5493 (8AM - 5PM PT)

IMPORTANT:

RETAIN ALL OFF CUTS TO FILL IN SECTIONS AS NEEDED.

PANEL SCHEDULE

TYPE	QUANTITY	COMMENTS
RS	6	(1)
RT	8	(1)
RP	0	(2)

(1) ANY PANELS IN THE DRAWING THAT ARE MARKED WITH AN ASTERISK (*) INDICATE A PANEL THAT IS TO BE TRIMMED. A CAREFUL MEASUREMENT SHOULD BE MADE TO GUARANTEE A CORRECT INSTALLATION.

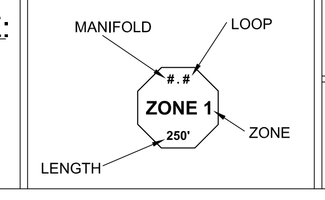
(2) OSB PLYWOOD PANELS USED TO FILL IN EMPTY SPACES WHERE WB-REMODEL PANEL MAY NOT BE APPROPRIATE.

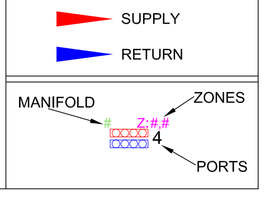
WARMBOARD LEGEND

- RS REMODEL STRAIGHT PANEL
- RT REMODEL TURN PANEL
- RP REMODEL OSB PLAIN PANEL
- * DENOTES TRIMMED PANEL.

- TUBING
- CUSTOM GROOVE
- BURIED TUBING
- BURIED POINT

IMPORTANT NOTE:
INSULATING JOIST CAVITIES BELOW EXISTING SUBFLOOR IS REQUIRED.





MANDATORY TUBING NOTES

1. USE ONLY WARMBOARD APPROVED TUBING. SEE INSTALLATION MANUAL

2. USE AN APPROPRIATELY WEIGHTED ROLLER TO PRESS TUBING INTO CHANNELS.

3. MINOR FIELD MODIFICATION OF TUBING PLAN IS WELCOME AND TYPICAL. WHEN IN DOUBT CALL WARMBOARD CUSTOMER SERVICE.

QUESTIONS? FOR IMMEDIATE ASSISTANCE
CALL: 877-338-5493 (8AM - 5PM PT)

LOOP SCHEDULE

ZONE	MANIFOLD	LOOP	LENGTH
2	1	2	140'
	Total		140'-0"

REVISIONS:	BY:

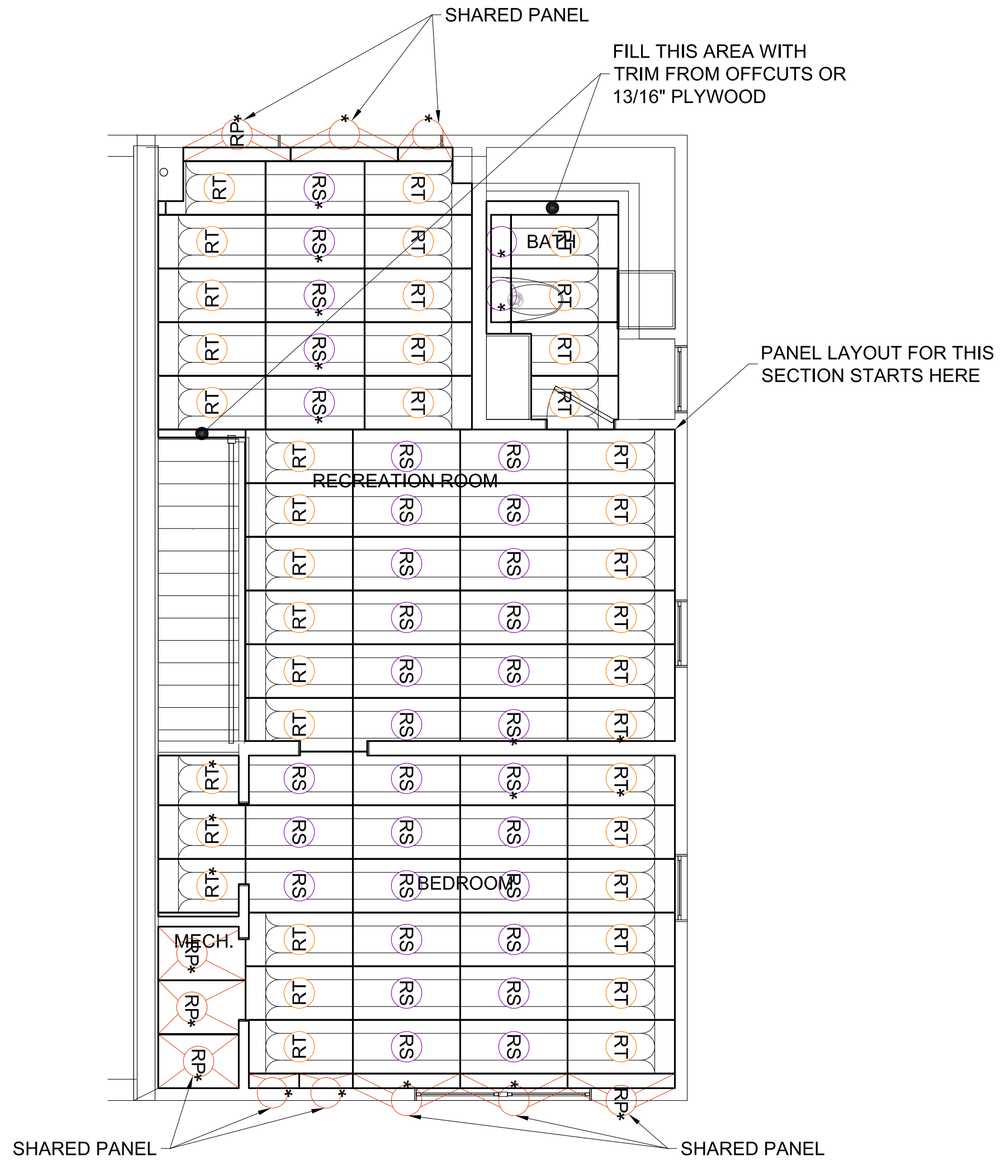
WARMBOARD, INC.
8035 SOQUEL DR. SUITE 41-A
APTOS, CA 95003
VOICE: (877)338-5493 FAX: (831)685-9278
WWW.WARMBOARD.COM EMAIL: PLANS@WARMBOARD.COM

warmboard®

GALLAS PROJECT
JOB# 44997
DC

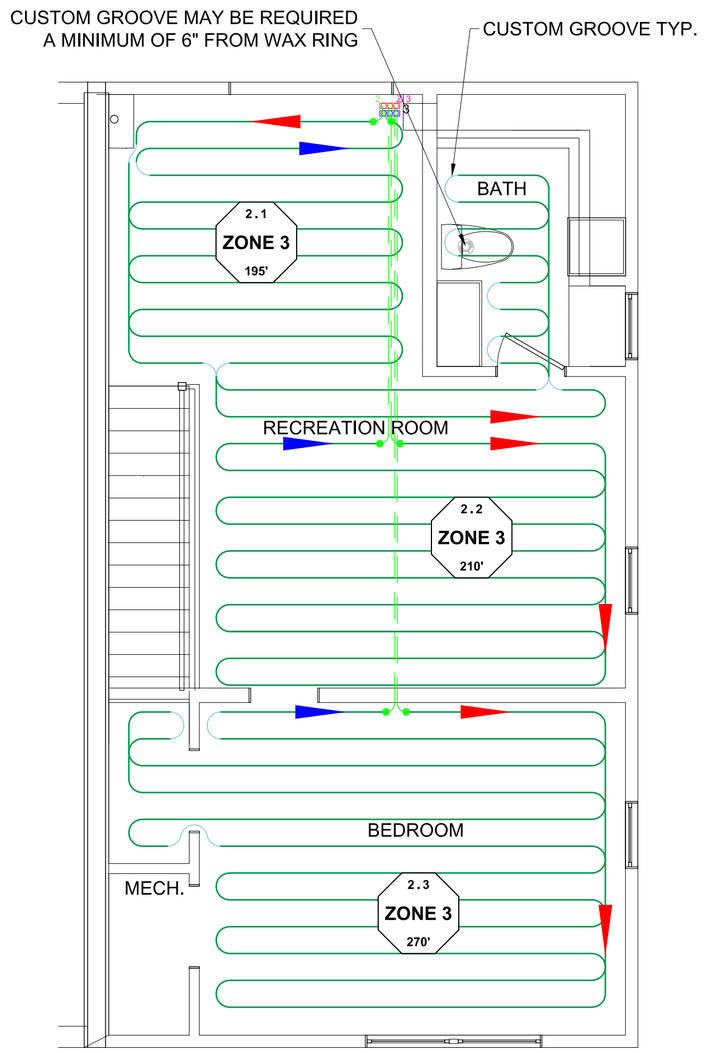
PANEL-TUBE LAYOUT

DATE: 03/22/2016
SCALE: 1/4" = 1'
DRAWN: R. Seitchick
REVIEWED: TW
SHEET: 2 OF 4



THIRD FLOOR PANEL LAYOUT

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



THIRD FLOOR TUBE LAYOUT

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

MANDATORY STRUCTURAL NOTES

1. TO ENSURE OPTIMAL PANEL INSTALLATION, FOLLOW PANEL LAYOUT PLANS, ALL WARMRBOARD INSTALLATION INSTRUCTIONS, AND APA GUIDELINES. FAILURE TO DO SO COULD CAUSE PANEL WASTE.

2. WARMBOARD PLANS ARE CONCEPTUAL AND DO NOT SUPERSEDE STRUCTURAL PLANS WHICH MAY BE PART OF THE ARCHITECTURAL PLAN SET. SHOULD THERE BE A CONFLICT BETWEEN WARMBOARD PLANS AND THE STRUCTURAL PLANS, CONSULT IMMEDIATELY WITH WARMBOARD CUSTOMER SERVICE BEFORE PROCEEDING.

3. INSTALLING CONTRACTOR IS RESPONSIBLE TO VERIFYING ALL MEASUREMENTS PRIOR TO THE INSTALLATION OF WARMBOARD PANELS.

QUESTIONS? FOR IMMEDIATE ASSISTANCE
CALL: 877-338-5493 (8AM - 5PM PT)

IMPORTANT:

RETAIN ALL OFF CUTS TO FILL IN SECTIONS AS NEEDED.

PANEL SCHEDULE

TYPE	QUANTITY	COMMENTS
RS	32	(1)
RT	38	(1)
RP	5	(2)

(1) ANY PANELS IN THE DRAWING THAT ARE MARKED WITH AN ASTERISK (*) INDICATE A PANEL THAT IS TO BE TRIMMED. A CAREFUL MEASUREMENT SHOULD BE MADE TO GUARANTEE A CORRECT INSTALLATION.

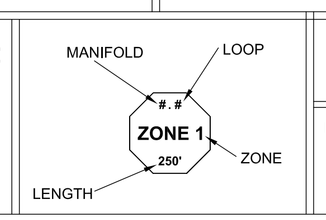
(2) OSB PLYWOOD PANELS USED TO FILL IN EMPTY SPACES WHERE WB-REMODEL PANEL MAY NOT BE APPROPRIATE.

WARMBOARD LEGEND

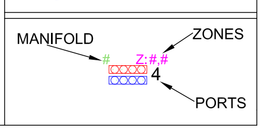
- RS REMODEL STRAIGHT PANEL
- RT REMODEL TURN PANEL
- RP REMODEL OSB PLAIN PANEL
- ✱ DENOTES TRIMMED PANEL.

- TUBING
- CUSTOM GROOVE
- BURIED TUBING
- BURIED POINT

IMPORTANT NOTE:
INSULATING JOIST CAVITIES BELOW EXISTING SUBFLOOR IS REQUIRED.



- SUPPLY
- RETURN



MANDATORY TUBING NOTES

1. USE ONLY WARMBOARD APPROVED TUBING. SEE INSTALLATION MANUAL

2. USE AN APPROPRIATELY WEIGHTED ROLLER TO PRESS TUBING INTO CHANNELS.

3. MINOR FIELD MODIFICATION OF TUBING PLAN IS WELCOME AND TYPICAL. WHEN IN DOUBT CALL WARMBOARD CUSTOMER SERVICE.

QUESTIONS? FOR IMMEDIATE ASSISTANCE
CALL: 877-338-5493 (8AM - 5PM PT)

ESTIMATED CUSTOM ROUTES

TURNS	16
TOTAL LINEAR LENGTH OF STRAIGHT ROUTES	0'

LOOP SCHEDULE

ZONE	MANIFOLD	LOOP	LENGTH
3	2	1	195'
3	2	2	210'
3	2	3	270'
	Total		675'-0"

REVISIONS:	BY:

WARMBOARD, INC.
8035 SOQUEL DR. SUITE 41-A
APTOS, CA 95003
VOICE: (877)338-5493 FAX: (831)685-9278
WWW.WARMBOARD.COM EMAIL: PLANS@WARMBOARD.COM

warmboard

GALLAS PROJECT
JOB# 44997
DC

PANEL-TUBE LAYOUT

DATE: 03/22/2016
SCALE: 1/4" = 1'
DRAWN: R. Seitchick
REVIEWED: TW
SHEET:
3 OF 4

THIS WARMBOARD DESIGN CONSIST OF: SPECIFYING PANELS, TUBING, AND MANIFOLDS ONLY.

WARMBOARD SHOP DRAWINGS DO NOT INCLUDE THE FOLLOWING:

ROOM BY ROOM HEAT LOSS CALCULATIONS, PROPER DESIGN OF FLOW RATES, REQUIRED WATER TEMPERATURES, SIZING OF CIRCULATION PUMPS, SIZING OF DISTRIBUTION LINES, SIZING OF OTHER COMPONENTS NECESSARY FOR PROPER HYDRONIC SYSTEM OPERATION, SPECIFICATION OF HEAT SOURCE, OR COMPLETE ELECTRONIC CONTROL STRATEGY. SUCH DESIGNS SERVICES RELATED TO THESE COMPONENTS OF A HYDRONIC SYSTEM ARE TYPICALLY PERFORMED BY THOSE RESPONSIBLE FOR SUPPLYING AND/OR INSTALLING THESE COMPONENTS.

WARMBOARD INC. HIGHLY RECOMMENDS CONSULTING WITH A QUALIFIED RADIANT DESIGNER, MECHANICAL ENGINEER OR MECHANICAL CONTRACTOR FOR COMPLETE INTEGRATED SYSTEM DESIGN THAT MEETS OR EXCEEDS RPA GUIDELINES. DESIGN PROFESSIONALS SHALL RELY ON WARMBOARD TUBING LAYOUTS AND OUTPUT TABLES FOR THEIR DESIGN CALCULATIONS.

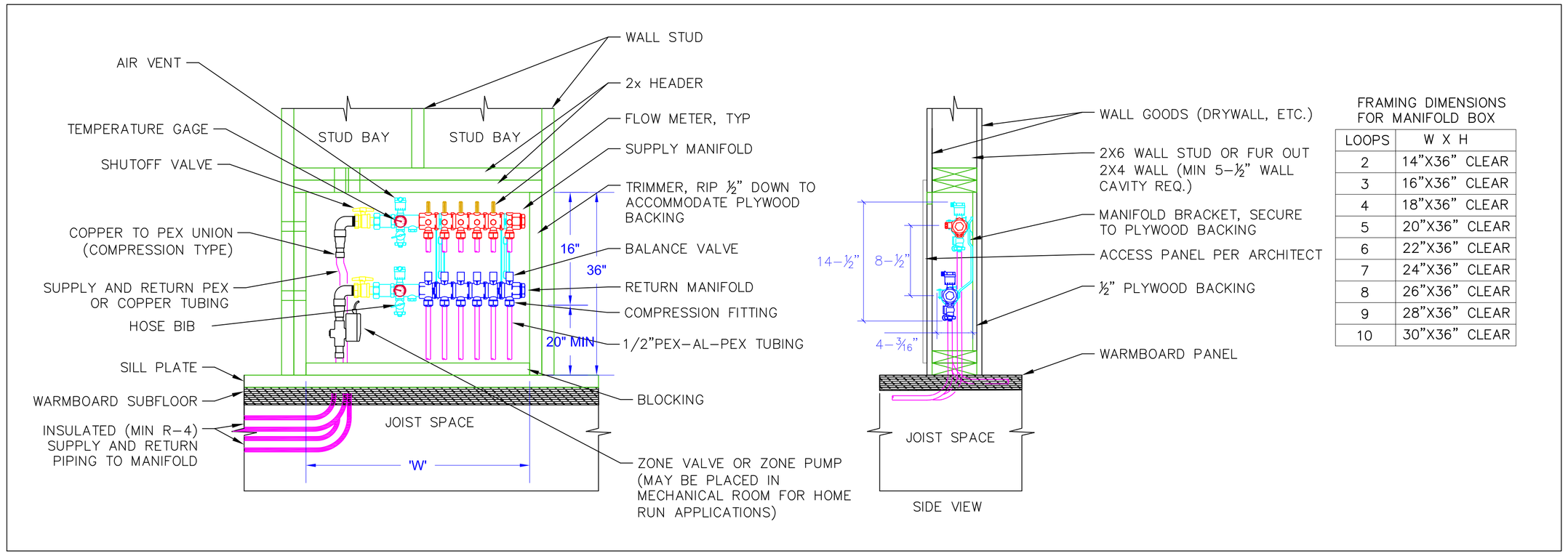
WHEN IN DOUBT, ASK!

Please review all installation instructions. If there are any questions or need for technical assistance call: 1 877 338-5493

MANIFOLD & TUBING MATERIALS LIST		
QTY	DESCRIPTION	NOTES
1	1000' X 1/2" AL PEX ROLL	(1.1,1.2,2.1,2.2,2.3)940'
	500' X 1/2" AL PEX ROLL	
	300' X 1/2" AL PEX ROLL	
	SINGLE SUPPLY & RETURN	
1	2 PORT SUPPLY & RETURN MANIFOLD KIT	MULTI ZONE
1	3 PORT SUPPLY & RETURN MANIFOLD KIT	SINGLE ZONE
	4 PORT SUPPLY & RETURN MANIFOLD KIT	
	5 PORT SUPPLY & RETURN MANIFOLD KIT	
	6 PORT SUPPLY & RETURN MANIFOLD KIT	
	7 PORT SUPPLY & RETURN MANIFOLD KIT	
	8 PORT SUPPLY & RETURN MANIFOLD KIT	
	9 PORT SUPPLY & RETURN MANIFOLD KIT	
	10 PORT SUPPLY & RETURN MANIFOLD KIT	
10	1/2" COMPRESSION FITTINGS	
2	24 VOLT ACTUATORS	

1 SINGLE ZONE MANIFOLD INSTALLATION-NO ACTUATORS REQUIRED

SCALE: NONE

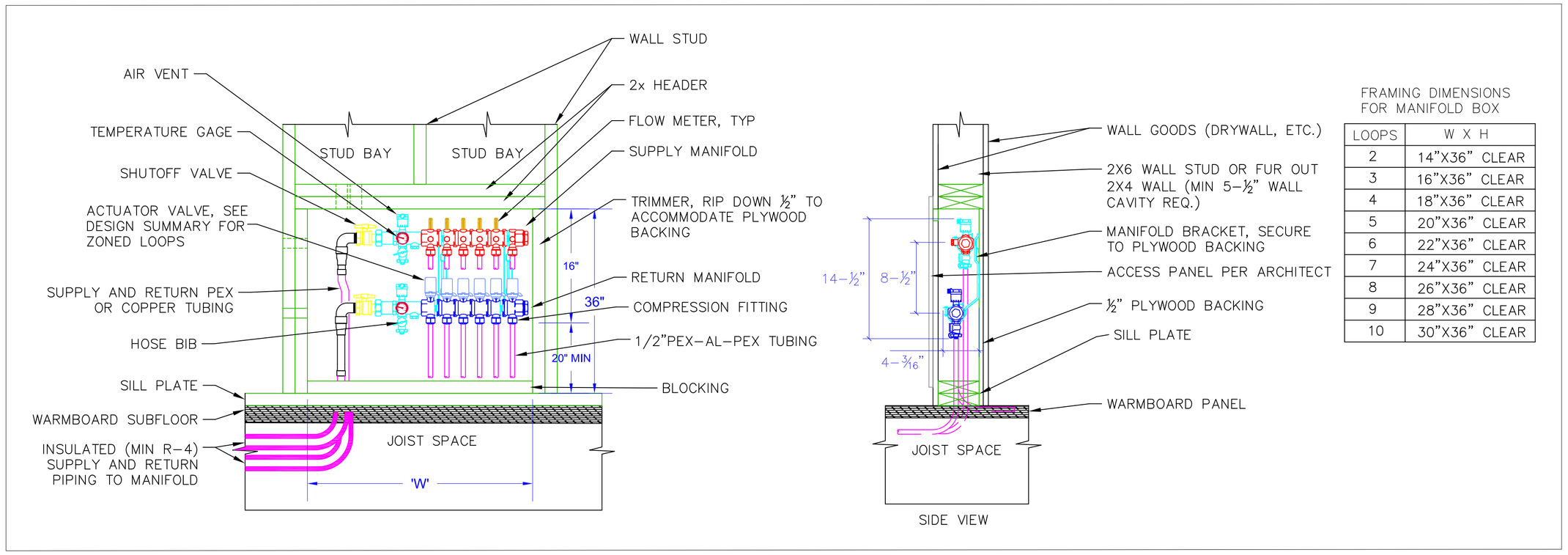


FRAMING DIMENSIONS FOR MANIFOLD BOX

LOOPS	W X H
2	14"X36" CLEAR
3	16"X36" CLEAR
4	18"X36" CLEAR
5	20"X36" CLEAR
6	22"X36" CLEAR
7	24"X36" CLEAR
8	26"X36" CLEAR
9	28"X36" CLEAR
10	30"X36" CLEAR

2 MULTI ZONE MANIFOLD INSTALLATION- ACTUATORS REQUIRED

SCALE: NONE



FRAMING DIMENSIONS FOR MANIFOLD BOX

LOOPS	W X H
2	14"X36" CLEAR
3	16"X36" CLEAR
4	18"X36" CLEAR
5	20"X36" CLEAR
6	22"X36" CLEAR
7	24"X36" CLEAR
8	26"X36" CLEAR
9	28"X36" CLEAR
10	30"X36" CLEAR

REVISIONS:	BY:

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8035 SOQUEL DR. SUITE 41-A
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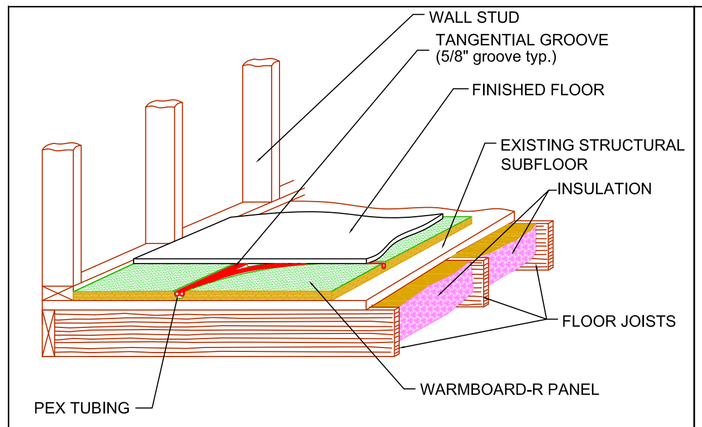
warmboard®

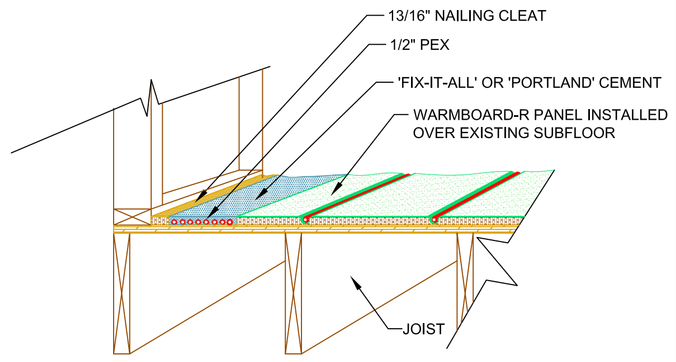
GALLAS PROJECT
JOB# 44997
DC

TUBING & MANIFOLD LAYOUT

DATE: 03/22/2016
SCALE: NTS = 1'
DRAWN: R. Seitchick
REVIEWED: TW
SHEET: 4 OF 4

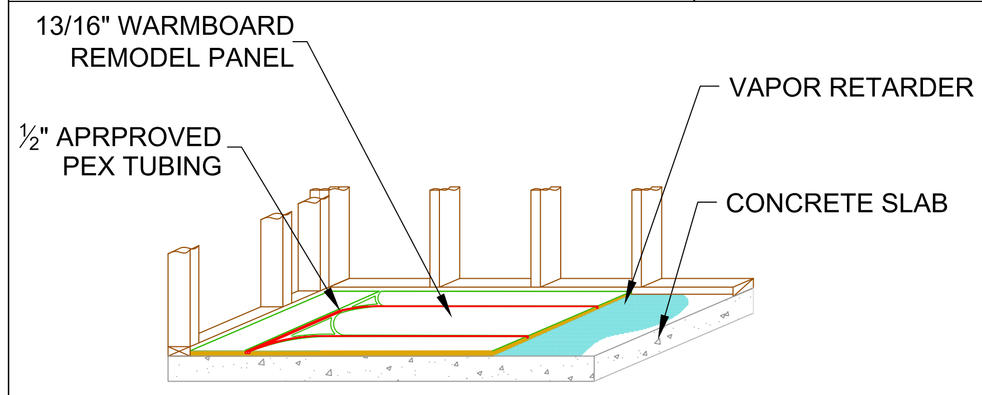


1 - WARMBOARD-R OVER EXISTING STRUCTURAL SUBFLOOR

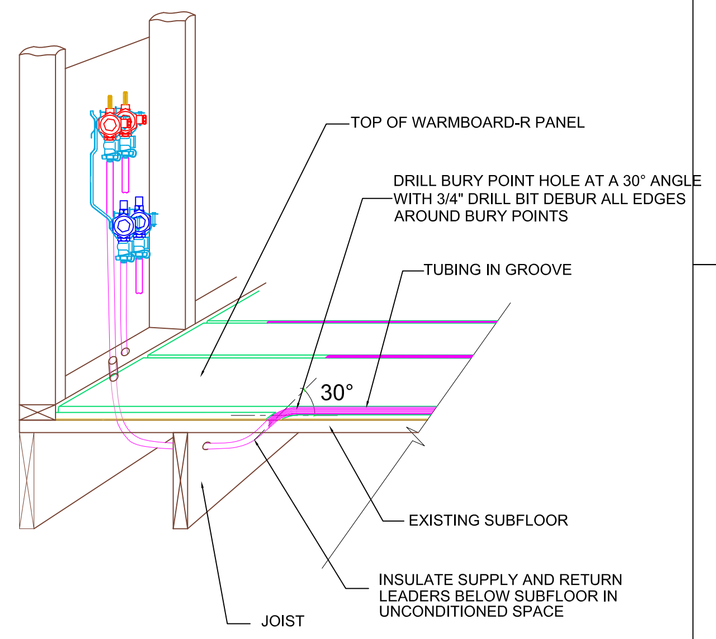


3 - PANEL CUT BACK DETAIL

NO SCALE



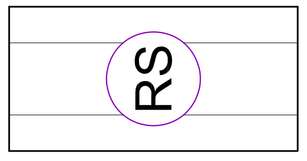
2- WARMBOARD REMODEL PANEL OVER SLAB



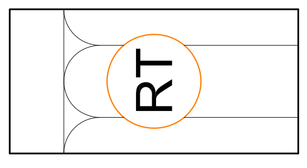
BURY POINT DETAIL

SCALE: NONE

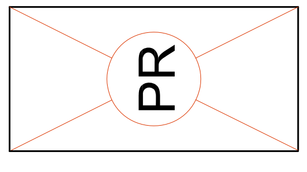
RS STRAIGHT PANEL



RT TURN PANEL



RP OSB PANEL



B.1- WARMBOARD-REMODEL PANEL

WARMBOARD REMODEL PANEL SPECIFICATIONS

A. GENERAL INFORMATION

1. Warmboard Radiant Remodel panel is manufactured in the USA, and supplied by:
   Warmboard Inc.
   8035 Soquel Drive, Ste 41A
   Aptos CA 95003
   877-338-5493
2. Warmboard Remodel panels shall be 2'x4' OSB with a thickness of 13/16".

   WB-R Panels shall be consisting of straights and turns patterns, such channels on 12" centers to interface with 1/2" PEX tubing.

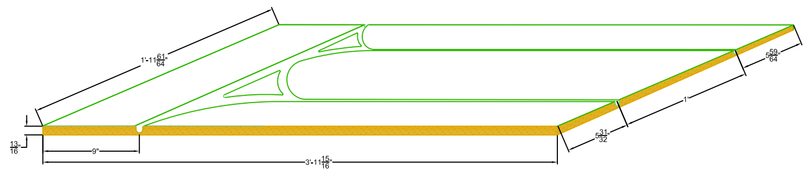
   The entire top skin (2'x4') of OSB panel shall have a highly conductive continuous sheet of 1060 series aluminum alloy, bonded to the entire surface.

   The continuous sheet of aluminum shall completely contour in all channels depths: both turns and straight runs.

   Warmboard-Remodel Panels shall be (2'x4') in one of the two tubing channel pattern options. - Straight and Turns - (See Detail BB).
3. All panels installed will meet or exceed all specifications documented on Warmboard engineered AutoCAD drawings and Warmboard Remodel Installation manual.
4. Panel assembly shall be one of the following:

   Warmboard Remodel panel installed over existing structural plywood, decking or OSB.subfloor. (See Detail 1)

   Warmboard Remodel panel installed over concrete slab (See Detail 2)



B - WARMBOARD REMODEL PANEL DETAIL

SCALE: NONE

WARMBOARD-R INSTALLATION NOTES - MANDATORY:

The contractor(s) responsible for the installation of the Warmboard-R panels, as well as any hydronic tubing supplied by other, shall review these plans for accuracy and completeness. These contractors will also be responsible to verify all measurements prior to any Warmboard-R installations. Any discrepancy between these plans an the existing framing of the project for which they apply shall be brought to the immediate attention of Warmboard, Inc.

WHEN IN DOUBT, ASK!

Please review all installation instructions. If there are any questions or need for technical assistance call: 1 877-338-5493

TO ORDER PRODUCT PLEASE CALL: 1-877-338-5493

A. GENERAL INFORMATION

1. WARMBOARD-R IS ONE COMPONENT OF A HYDRONIC SYSTEM. THIS CONCEPTUAL PLAN COVERS ONLY PANEL AND TUBING LAYOUTS AND DOES NOT CONSTITUTE A COMPLETE INSTALLATION GUIDE FOR A HYDRONIC SYSTEM. Installation of a hydronic system employing Warmboard-R panels requires a combination of carpentry and plumbing skills. The general contractor shall be responsible for the skills, training, and experience of the installers. Warmboard, Inc. refers to Architectural Floor Plan information supplied by the customer. Deviations should be brought to the immediate attention of Warmboard, Inc. The hydronic contractor shall follow the tubing layout plan and tubing installation instructions supplied. They shall also be responsible for providing an accurate heat loss analysis and the installation of the hydronic system as a whole in accordance with Radiant Panel Association (RPA) guidelines. Design floor and supply water temperatures for a given floor covering will follow RPA guidelines and the Warmboard, Inc. recommended water temperatures chart.
2. It is the installer's responsibility to assure the system functions properly, safely, and meets all local, state, and regional codes.
3. The installer is to supply and install all materials shown on this plan; as well as all other materials needed to complete this hydronic system and any incidental work not shown or specified, which can be reasonably inferred as belonging to the work necessary to provide the complete system.
4. Warmboard, Inc. makes no guarantee for any material to be installed in this hydronic system other than the Warmboard-R panels.

B. WARMBOARD-R INSTALLATION

1. WARMBOARD-R shall verify the compatibility of their layout with the attached floor plan.
2. All supply and return tubing below subfloor in unconditioned space shall be insulated with pipe insulation.
3. Custom grooves shall be routed as indicated on the plans using supplied router templates, a properly sized router equipped with a template guide, and the supplied 5/8" core box router bit. All router use shall conform to supplied instructions, and all safety instructions provided by manufacturer of the router you plan to use.
4. When applicable, installation contractor shall coordinate with the plumbing contractor so as to have all plumbing stubbed out 12" above sub-floor prior to installation.
5. Alignment pins shall be used for proper alignment of panels.
6. Any excess adhesive that may interfere with tubing installation shall be removed.
7. All burrs left by custom routing and on angle holes shall be removed.
8. Refer to manufacturer's installation manual for additional guidelines for this product.

C. TUBING INSTALLATION

1. Holes for routing below sub-floor shall be drilled using an 3/4" bit at the correct location and in the appropriate direction, so that the end of the tube can be passed from the groove to under the floor
   area in the right direction, leading to the appropriate manifold location or the boiler panel.
2. All grooves shall be inspected and cleaned of any debris prior to tubing installation.
3. Tubing for radiant floor heating shall be ½" PEX approved by Warmboard, In. (See approved tubing list).
   The installation of nails plates are required to hold down tubing in channels, remove plates before finish floors are installed. Caution, do not install silicone or other types of adhesives in tubing channel
4. Tubing shall be and remain pressurized immediately following installation into the panel diaphragm for the duration of all construction.
5. Installer is responsible for protecting tubing from freezing during construction. Should climatic conditions occur, this would require adding antifreeze and corrosion inhibiting fluids upon completion of work.
6. Installer to record length of every pipe and photograph completed installation.
7. Special note for carpeted areas: 'Fix-It-All' or 'Portland Cement' shall shall fill any unused groove areas. This provides support for the pad & carpet.

REVISIONS:	BY:

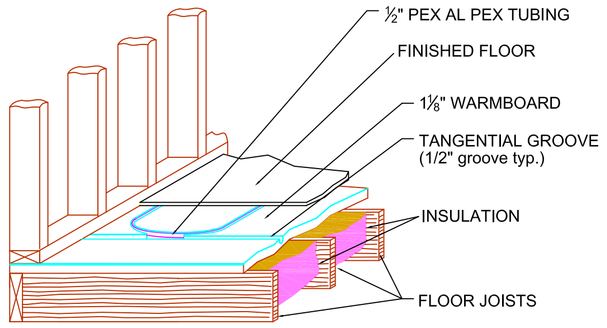
WARMBOARD, INC.
8035 SOQUEL DR. SUITE 41-A
APTOS, CA 95003
VOICE: (877)338-5493 FAX: (831)685-9278
WWW.WARMBOARD.COM EMAIL: PLANS@WARMBOARD.COM

warmboard

"SIMPLY SMARTER" RADIANT HEAT"

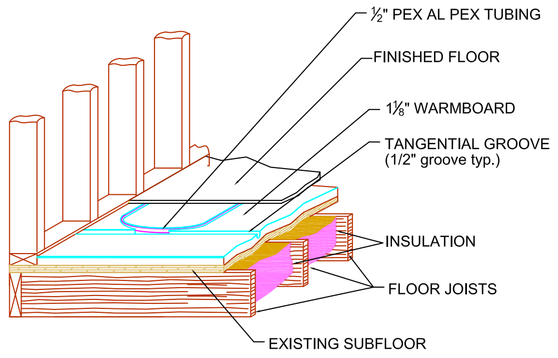
SPECIFICATION & INSTALLATION INSTRUCTIONS

DATE:	
SCALE:	NTS
DRAWN:	YOU
REVIEWED:	J. M.
SHEET:	WB-R SPEC



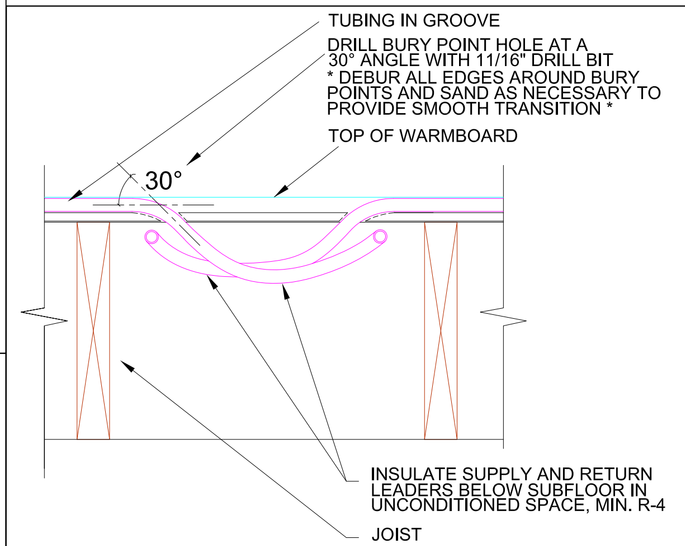
WARMBOARD OVER JOIST/TJI

Scale: N/S



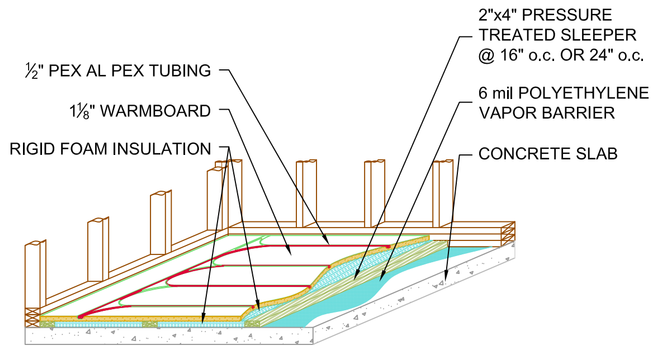
WARMBOARD EXISTING SUBFLOOR

Scale: N/S



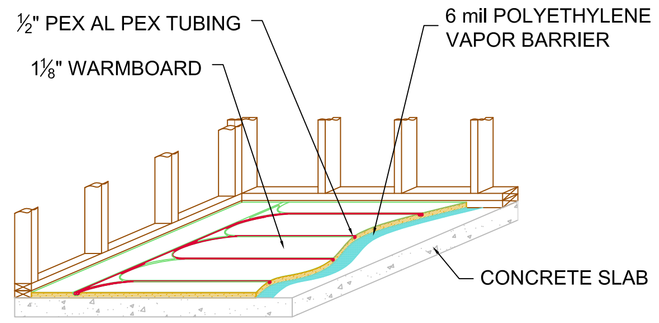
BURY POINT DETAIL

SCALE: NONE



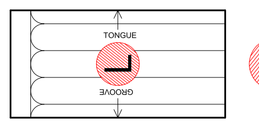
WARMBOARD CONCRETE w-SLEEPERS

Scale: N/S

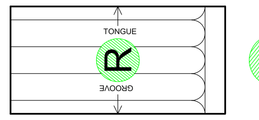


WARMBOARD CONCRETE SLAB

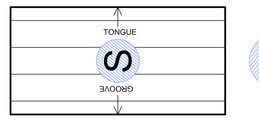
Scale: N/S



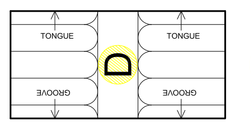
L LEFT TURN PANEL



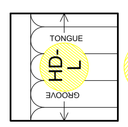
R RIGHT TURN PANEL



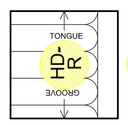
S STRAIGHT PANEL



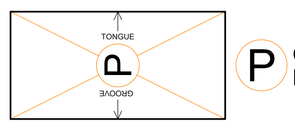
D DOUBLE TURN PANEL



HD-L *HALF DOUBLE PANEL-LEFT TURN
(Cut a Double panel in half to get this piece)



HD-R *HALF DOUBLE PANEL-RIGHT TURN
(Cut a Double panel in half to get this piece)



P CONVENTIONAL
PLYWOOD PANEL

HP HALF CONVENTIONAL
PLYWOOD PANEL

A.1- WARMBOARD PANEL DETAIL

SCALE: NONE

WARMBOARD SPECIFICATIONS

A. GENERAL INFORMATION

1. Warmboard Radiant Subfloor is manufactured in the USA, and supplied by:
   Warmboard Inc.
   8035 Soquel Drive, Ste 41A
   Aptos CA 95003
   877-338-5493

2. Warmboard panels shall be 4'x8' plywood, tongue and groove, with a thickness of 1-1/8".

   Panels shall have 5/8" depth channels, consisting of straights and turns patterns, such channels on 12" centers to interface with 1/2" PEX aluminum PEX tubing. 4 Limber slots per panel, 2 limber slots cut on the bottom of the 4' end. Limber slots located 12" from the outside. Each slot is 5"x3/8"x 3/8"

   The entire top skin (4'x8') of plywood shall have a highly conductive continuous sheet of 1100 series aluminum alloy, bonded to the entire surface.

   The continuous sheet of aluminum shall completely contour in all channels depths: both turns and straight runs.

   Panels shall be (4'x8') in one of the four tubing channel pattern options. - Straight, Double, Turns (turns at one end), Left or Right - (See Detail A.1).

3. All panels installed will meet or exceed all specifications documented on Warmboard engineered AutoCAD drawings and Warmboard Installation manual.

   Supplied panels will meet or exceed APA certification and report #T2002Q-37

   Supplied panels will meet or exceed ICC Evaluation ESR# 1421and CSA0325 (Canadian Standards Association).

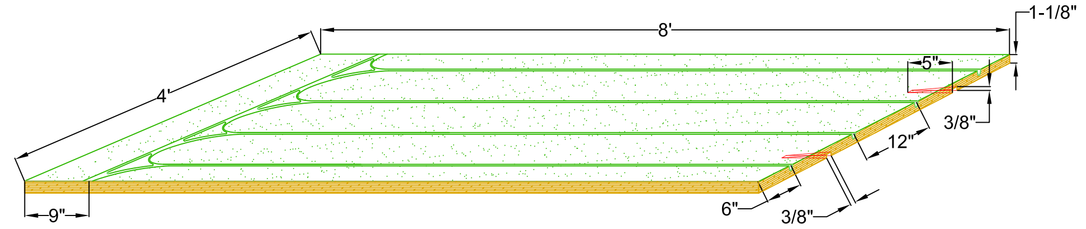
4. Panel assembly shall be one of the following:

   Warmboard structural subfloor installed over existing Joist or TJI. (See Detail B)

   Warmboard structural subfloor installed over existing concrete slab (See Detail C)

   Warmboard structural subfloor installed over existing concrete slab with sleepers (See Detail D)

   Warmboard Structural subfloor installed over existing structural plywood, decking or OSB. (See Detail E)



A- WARMBOARD PANEL DETAIL

SCALE: NONE

WARMBOARD INSTALLATION NOTES - MANDATORY:

The contractor(s) responsible for the installation of the Warmboard panels, as well as any hydronic tubing supplied by other, shall review these plans for accuracy and completeness. These contractors will also be responsible to verify all measurements prior to any Warmboard installations. Any discrepancy between these plans an the framing of the project for which they apply shall be brought to the immediate attention of Warmboard, Inc.

WHEN IN DOUBT, ASK!

Please review all installation instructions. If there are any questions or need for technical assistance call: 1 877-338-5493

TO ORDER PRODUCT PLEASE CALL: 1-877-338-5493

A. GENERAL INFORMATION

1. WARMBOARD IS ONE COMPONENT OF A HYDRONIC SYSTEM. THIS CONCEPTUAL PLAN COVERS ONLY PANEL AND TUBING LAYOUTS AND DOES NOT CONSTITUTE A COMPLETE INSTALLATION GUIDE FOR A HYDRONIC SYSTEM. Installation of a hydronic system employing Warmboard-R panels requires a combination of carpentry and plumbing skills. The general contractor shall be responsible for the skills, training, and experience of the installers. Warmboard refers to floor framing information supplied by the customer. Deviations should be brought to the immediate attention of Warmboard, Inc. The hydronic contractor shall follow the tubing layout plan and tubing installation instructions supplied. They shall also be responsible for providing an accurate heat loss analysis and the installation of the hydronic system as a whole in accordance with Radiant Panel Association (RPA) guidelines. Design floor and supply water temperatures for a given floor covering will follow RPA guidelines and the Warmboard recommended water temperatures chart.

2. It is the installer's responsibility to assure the system functions properly, safely, and meets all local, state, and regional codes.

3. The installer is to supply and install all materials shown on this plan; as well as all other materials needed to complete this hydronic system and any incidental work not shown or specified, which can be reasonably inferred as belonging to the work necessary to provide the complete system.

4. Warmboard makes no guarantee for any material to be installed in this hydronic system other than the Warmboard panels.

B. WARMBOARD INSTALLATION

1. WARMBOARD shall verify the compatibility of their layout with the attached floor framing plan. Special attention shall be given to the compatibility of Warmboard panels and joist layout.

2. All supply and return tubing below subfloor in unconditioned space shall be insulated with R-4.0 pipe insulation.

3. Custom grooves shall be routed as indicated on the plans using supplied router templates, a properly sized router equipped with a template guide, and the supplied 5/8" core box router bit. All router use
   shall conform to supplied instructions, and all safety instructions provided by manufacturer of the router you plan to use.

4. When applicable, installation contractor shall coordinate with the plumbing contractor so as to have all plumbing stubbed out 12" above sub-floor prior to installation.

5. Alignment pins shall be used for proper alignment of panels.

6. Any excess adhesive that may interfere with tubing installation shall be removed.

7. All burrs left by custom routing and on angle holes shall be removed.

8. Refer to manufacturer's installation manual for additional guidelines for this product.

C. TUBING INSTALLATION

1. Holes for routing below sub-floor shall be drilled using an 1⅛" bit at the correct location and in the appropriate direction, so that the end of the tube can be passed from the groove to under the floor
   area in the right direction, leading to the appropriate manifold location or the boiler panel.

2. All grooves shall be inspected and cleaned of any debris prior to tubing installation.

3. Tubing for radiant floor heating shall be ½" PEX approved by Warmboard, In. (See approved tubing list).

4. Tubing shall be and remain pressurized immediately following installation into the panel diaphragm for the duration of all construction. Caution, do not install silicone or other types of adhesives in tubing channel

5. Installer is responsible for protecting tubing from freezing during construction. Should climatic conditions occur, this would require adding antifreeze and corrosion inhibiting fluids upon completion of work.

6. Installer to record length of every pipe and photograph completed installation.

7. Special note for carpeted areas: Short pieces of PEX tubing (typically offcuts) shall be pressed into any unused groove areas. This provides support for the pad & carpet.

REVISIONS:	BY:

WARMBOARD, INC.
8035 SOQUEL DR. SUITE 41-A
APTOS, CA 95003
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WWW.WARMBOARD.COM EMAIL: PLANS@WARMBOARD.COM

warmboard®

"SIMPLY SMARTER" RADIANT HEAT"

SPECIFICATION & INSTALLATION INSTRUCTIONS

DATE:	
SCALE:	NTS
DRAWN:	J.McDONALD
REVIEWED:	J. M.
SHEET:	WB SPEC