carpentry team. One hydraulic door on the sidewall and one on the endwall are both 50' wide by 20' tall with an additional overhead door on the end wall elevation.

Jim Freehill is very satisfied with the project site work craftsmanship and quality of the product installed by CBC. Jim was also very impressed that the product has true thermal resistance R-33 due to the elimination of studs for thermal bridging, with thru solid wood spline systems for structural support of the wall framing.

We have enclosed a copy of the heat loss calculations of standard post frame construction in comparison to the EPS Solid Core construction system.

Ron and Galen Schaeffer of CBC also utilized the following products for energy efficient and sustainable construction for Jim Freehill's machine shop:

- Hayfield Vinyl Windows
- · AJ Insulated Service Door
- · Tyvek House Wrap
- · EPS 29 gauge corrugated rolled steel siding and roofing with G-90 galvanized base

CBC project site preparation and the use of concrete pier-rebar systems with steel turnbuckles assured project site safety, wind resistance, including a thawing winter water conditions for project site success.

Thank you,

Dave Thomas
District Sales Manager
72 Burnette Drive
Antioch, IL. 60002

dthomas@epsbuildings.com

847-393-3106 Cell Phone

Energy Panel Structures, Inc.

www.epsbuildings.com

102 East Industrial Park • Graettinger, Iowa 51342 • Office: 712-859-3219 Ext. 1024 • Fax: 712859-3275



	:								
OD SO	DATE.	MUL	II-ZONE HE.	MULTI-ZONE HEAT LOSS DESIGN AN		LIOR NAME	SID PROJECT	Consolidate	Page 1
COMPANY: ADDRESS:			FLOOR AREA. WINDOW AREA:		800 SQ. FT. 45 SQ. FT.	COMPANY. ADDRESS:			,
CITY, ST:			% OF GLASS TO FLOOR AREA.		0.4%	CITY, ST.			
		ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5	ZONE 6		
DESCRIPTION	"U"-VALUE or R-VALUE						**	STINU	HEAT LOSS TOTALS
INSULATED WINDOW AREA (U-VALUE)	0.66	45						SQ. FT.	1,960 BTU/HR
INSULATED DOOR AREA (U-VALUE)	0.15	2,522						SQ. FT.	25,346 BTU/HR
INSULATED SKYLIGHTS (U-VALUE)	0.66							SQ. FT.	8TU/HR
EXTERIOR WALL HEIGHT>	*******	22.0						HEIGHT	
LENGTH OF UNHEATED EXTERIOR EDGE-		456						LN. FT.	
INSULATED WALL AREA (R-VALUE)	19.00	7,465						SQ. FT.	26,324 BTU/HR
ADDITIONAL INSULATED WALL AREA	33.00	720						SQ. FT.	1,462 BTU/HR
TOTAL GROSS FLOOR AREA	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	12,800						SQ. FT.	
INSULATED FLOOR AREA (R-VALUE)	19,00							SQ. FT.	8TU/HR
INSULATED SLAB AREA* (R-VALUE)	10.00	2,910						SQ. FT.	6,914 BTU/HR
INSULATED CEILING AREA (R-VALUE)	38.00	2,910						SQ. FT.	6,131 BTU/HR
ADDITONAL AIR VOLUME	>							CU.FT.	
TOTAL AIR VOLUME	>	281,600						CU.FT.	339,610 BTU/HR
AIR CHANGES PER HOUR	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	1.00	1.00	1.00	1.00	1.00	1.00	ACH	
TOTAL HEAT LOSS PER ZONE		399,833						BTU/HR	406,747 BTU/HR
*SLAB LOSS FIGURED BELOW			KITEC® RADI	KITEC® RADIANT DESIGN WORKSHE	NORKSHEET	© Copyright 199	© Copyright 1997-98 Bio-Radiant Energy, Inc. All Rights Reserved	ergy, Inc. All F	Rights Reserved
INPUT VALUES		ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5	ZONE 6	UNITS	
To-OUTDOOR DESIGN TEMPERATURE		-2	-2	2.	-21	-2	-2	-2 DEG, F	
Ta-ROOM TEMPERATURE		65	60	60	60	60	60	60 DEG, F	
Qr-RADIANT FLOOR LOAD AT DESIGN CONDITIONS	DITIONS	399,833						BTU/HR	
A-NET RADIANT SLAB SURFACE AREA		12,800						SQ. FT.	Ī
Ua-ENERGY TRANSFER FROM RADIANT SURFACE	URFACE	2	2	2	2	2	D 20 6104 2	BTU/HR/SC	BTU/HR/SQ. FT./DEG. F
TYPE OF FLOOR OF SORFACE COVERING		Dare Sign	pare stap	Oute Sign	Dare Stab	Sale Stab	Ddie Sid	75/GT/ 1.8	
US-ESTIMATED U-VALUE WITHIN SLAB		1.01	1.01	1.01	1.01	1,01		BTU/HR/SO	1.01 BTU/HR/SQ. FT/DEG. F
De-DEPTH OF TUBING IN SLAB OR THICKNESS OF FLOOR	ESS OF FLOOR	2.00	2 00	2.00	2.00	2.00	2.00	2.00 INCHES	
QHNTERIOR SLAB HEAT LOSS		2.00	2.00	2.00	2.00	2,00	2.00	BTU/HR/SQ. FT	Q. FT.
Ue-U-VALUE AT SLAB EDGE		0.10	0.10	0,10	0.10	0.10		BTU/HR/So	0.10 BTU/HR/SQ FT /DEG F
TYPE OF TRANSFER FLUID		25% Glycol	25% Glycol	25% Glycol	25% Glycol	25% Glycol	25% Glyco	FLUID	
DI-DENSITY OF HEAT TRANSFER FLUID		8.55	8.55	8.56	8.55	8.55		8.55 LBS/GAL	
CI-HEAT CAPACITY OF HEAT TRANSFER FLUID		0.93	0.93	0.93	0.93	0.93		0.93 BTU/LB/DEG. F	io.
Td-FLUID TEMPERATURE DROP		20	20	20	20	20	,	20 DEG. F	
Le-DESIRED LOOP LENGTH		250	250	250	250	250	2	250 FT.	
Sp-AVERAGE PIPE SPACING		12	12	12:	12	12	12	12 INCHES ON CENTER	N CENTER
INSTALLATION METHOD		Slab on Grade	Slab on Grade	Slab on Grade	Slab on Grade	Slab on Grade	Slab on Grade		
CALCULATED VALUES		ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5	ZONE 6		
1. Tr-DESIGN TEMPERATURE DIFFERENTIAL	IAL .	67	62	62	62			62 DEG. F	

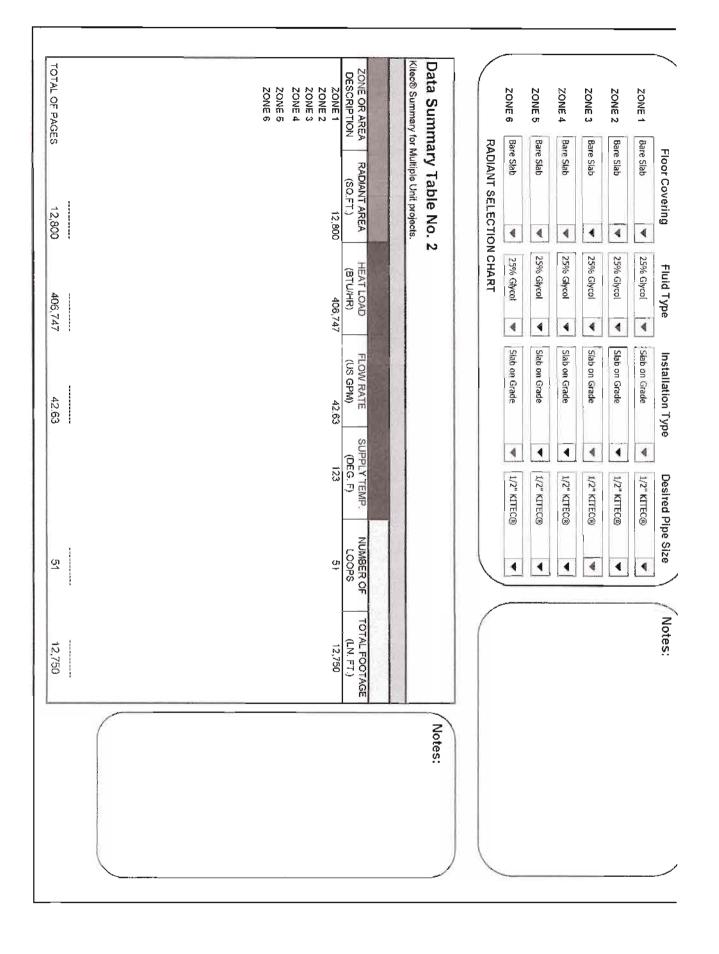
Estimates are for space healing only and do not include the effects of passive	heating only and do not in	nates are for space		scant a misrantaa n	ata and do not rang	w margan manther d	COL	NOTE Those consulted productions are heard as 20 year overseen data and do not represent a distance of performance	TE-These calculates
\$16.173.36						\$16 173 36		SON TONED BADIANT ELOOR	90%
\$18,599,36						\$18,599.36	™ HEAT	90% ZONED HYDRO-AIR IN HEAT	_
\$21,658,34						\$21,858.34	AIR	90% CENTRAL FORCED AIR	PROPANE 90%
							OOR	90% ZONED RADIANT FLOOR	90%
							™ HEAT	90% ZONED HYDRO-AIR™ HEAT	90%
							AIR	90% CENTRAL FORCED AIR	OIL 90%
\$15,225.04						\$15,225.04	OOR	100% ZONED RADIANT FLOOR	100%
\$17,608.80						\$17,508.80	™ HEAT	100% ZONED HYDRO-AIR™ HEAT	100%
\$20,676.69						\$20,576.69	AIR	100% CENTRAL FORCED AIR	ELECTRICITY 100%
\$6,856.18						\$6,856.18	OOR	90% ZONED RADIANT FLOOR	90%
\$7,884.60						\$7,884.60	™ HEAT	90% ZONED HYDRO-AIR™ HEAT	GAS 90%
\$9,266.14						\$9,266.14	AIR	90% CENTRAL FORCED AIR	NATURAL 90%
ZONE COST TOTAL	ZONE 6	ZONE 5	ZONE 4	ZONE 3	ZONE 2	ZONE 1		TYPE	FUEL/ EFFICIENCY
TAGE: 12,760 LN. FT.	TOTAL KITEC® FOOTAGE:	1,822	50 DEG. F		\$22.41		PER GAL.	\$2.05	PROPANE
	TOTAL NUMBER OF LOOPS:	2,987	55 DEG. F				PER GAL.		OIL
	AVERAGE SUPPLY TEMP:	4,458	60 DEG. F		\$23,44		PER KWH	\$0.08	ELECTRICITY
4	TOTAL FLOW RATE:	6,025	65 DEG. F		\$9.50		THERM	\$0.95	NATURAL GAS
4	REVISED HEAT LOSS:	Deg. Days	Base	ENCY	BASED ON 100% EFFICIENCY	BASEC	CNI	FUEL COST	ר טפר - יייציב
0FACE 12 800 SO ET	TOTAL BADIANT SHIBEACE	TOTAL		77)	T DED MILLION D	Social Para	2110		ELICI TVDC
Data Summary Table No. 1	Data Summ				nformation	Weather Data Information	Peoria I	ult iPEX, Inc.	tFor Larger Size Consult iPEX. Inc.
BTU/HR	ВТ						AT OUTPUT>	ENTER ACTUAL SUPPLIED AUXILIARY HEAT OUTPUT>	VITER ACTUAL SUP
SQ. FT.	SC						CE AREA	OPTIONALLY INCREASE RADIANT SURFACE AREA	PTIONALLY INCRE
LN. FT.	- N						)180 DEG. F)	HYDRONIC BASEBOARD (580 BTU/FT, @180 DEG. F)	YDRONIC BASEBO
BTU/HR	87						DESIGN	REQUIRED AUXILIARY HEAT OUTPUT AT DESIGN	EQUIRED AUXILIAN
LN FT.	CA					12,750	NANT PIPING	ESTIMATED TOTAL FEET OF KITEC® RADIANT PIPING	STIMATED TOTAL F
LOOPS	5				l	57		COPS	TOTAL NUMBER OF LOOPS
ZE	SIZE					1/2" KITEC®		PE SIZE†	SELECTED KITEC® PIPE SIZE+
5	PSI					2,86	® PIPING	14, Pd.PRESSURE DROP ACROSS KITEC® PIPING	, Pd-PRESSURE D
GPM	GF.					42.63		13. V-HEAT TRANSFER FLUID FLOW RATE	3. V-HEAT TRANSFE
BTU/HR/SQ. FT.	ВТ					31.78		LOAD PER SQ. FT.	12. QuI-TOTAL HEAT LOAD PER SQ. FT.
BTUHR	ВТ					406,747	NDITIONS	11. Qt-TOTAL HEAT LOAD AT DESIGN CONDITIONS	, Qt-TOTAL HEAT L
BTU/HR	ВТ					6,914	NO.	10. Q9-TOTAL SLAB HEAT LOSS TO GROUND	), Qg-TOTAL SLAB I
BTU/HR	ВТ					3,830	8	9, Qe-EDGE SLAB HEAT LOSS TO GROUND	), Qe-EDGE SLAB H
BTU/HR	ВТ					3,084	OUND	8. QI-INTERIOR SLAB HEAT LOSS TO GROUND	), QI-INTERIOR SLA
DEG.F	æ					84	LAB EDGE	7. Te-TEMPERATURE DIFFERENCE AT SLAB EDGE	7. Te-TEMPERATUR
DEG. F	- DE					123	FER FLUID	TI-SUPPLY TEMPERATURE OF TRANSFER FLUID	6. TI-SUPPLY TEMP
DEG. F	De					113	JSFER FLUID	TI-AVERAGE TEMPERATURE OF TRANSFER FLUID	5. TI-AVERAGE TEN
DEG. F	DE DE				•	82	ANT SURFACE	4. Ts-SURFACE TEMPERATURE OF RADIANT SURFACE	1. Ts-SURFACE TEN
DEG. F	-					81	OR COVERING	3. To SURFACE TEMPERATURE OF FLOOR COVERING	). To-SURFACE TEN
BTU/HR/SQ. FT.	ВТ					31.24	NT SURFACE	2. OU-HEAT LOAD PER SO, FT. OF RADIANT SURFACE	Qu-HEAT LOAD P

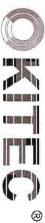
the Architect. IPEX, Inc. assumes no responsibility for the accuracy of these measurements. All calculations are based upon these figures. Local fuel cost are estimated as closely as possible from local sources. It is the NOTE-These calculated annual cost estimates are based on 20 year average weather data and do not represent a guarantee of performance. Estimates are for space heating only and do not include the effects of passive These annual cost comparisons are for space healing only, and do not include the cost of Domestic Hot Water, lighting and other energy uses responsibility of the owner to obtain a quote for the cost of these fuets from the various suppliers. Your actual cost will vary from these figures, based on lifestyle, meter charges, connection fees and other additional charges solar or other Internal gains as these factors are impossible to predict or control. These estimates should be used for comparative purposes only. All area measurements and "U"-Values are supplied by the Builder and/or © Copyright 1997-98 Bio-Radiant Energy, Inc. All Rights Reserved



SIP PROJECT Page 2

ARTA   ZONE 1   ZONE 2   ZONE 3   ZONE 4   ZONE 5   ZONE 6	Worksheet No. 1					Notes:	1
1,960   25,346   25,346   26,324   26,324   26,324   26,324   26,324   26,324   26,324   26,324   26,324   26,324   27,4822   26,324   27,4822   27,4828	AREA	ZONE 1 ZONE 2		ZONE 4			
TRATE  26.324  1,462  1						-	
25,346  26,324  1,462  26,324  1,462  Commercial  Comm	WINDOW	1,960			A CONTRACTOR OF THE PERSON NAMED IN CONT		
26.324  1,462  1	DOOR	25,346					
26.324  1,462  1,462  6,914  5,131  5,131  Couble Glazed	SKYLIGHT						
6,914 5,131    System Upgrade   Compressed Air   Cool Distribution   Cool Distrib	NALL 1	26,324					
Canadan   Floor   Fleeting   SparPool Heating   Canadan   Canada	WALL 2	1,462					
CANADA   Peorie   Campersed   Compensed   Campersed	FLOOR						
TE 339,610  Your project contains one or more of the following ellowing ell	LA8	6,914					
ADDA  Area    Compressed Air   Cool Distribution	EILING	5,131					
Area  Double Ghazed  Parea  Double Ghazed  Double Ghazed  Double Ghazed  Pea  Insulation  Pea  Double Ghazed  Pea  Double Ghazed  Pouble Gha	IR INFILTRATE	339,610					
Area   Double Glazed   Tinsulation   Page   Double Glazed   Page   Pag	,	406 747		**			
Double Glazed   ▼			)				
Insulated Core	Window Area		J	rour project contair		llowing elements:	
Double Glazed	Door Area	Insulated Core		Commercial	New Construction	☐ Natural Gas	
Calgary   Peoria   Poor   Cool   Co	Skylight Area	Double Glazed	4	Residential	Retrofit/Remodel	☐ Electricity	
Enter Other>    Comparison   Cold   Hydro-Air Heat   Hydro-Air Cool   Hydro-Air Cool   Hydro-Air Cool   Hydro-Air Cool   Hydro-Baseboard   Spa/Pool Heating   Spa/Pool Heating   Spa/Pool Heating   Sterilize Soil   Outdoor Controls   Heat Distribution   Peoria   Cool Distribution   Compressed Air   Cool Distribution   Cool D	Wall Area No. 1	6" Insulation	4	☐ Industrial	☐ System ∪pgrade	☐ Fuel Oil	
Bomestic Cold ☐ Hydro-Air Cool ☐ Hydro-Baseboard ☐ Ground Loop ☐ Hydro-Baseboard ☐ Spa/Pool Heating ☐ Sports Field ☐ Sauna/Jacuzzi ☐ Sterilize Soil ☐ Outdoor Controls ☐ Eave Melting ☐ Heat Distribution ☐ ☐ Compressed Air ☐ Cool Distribution ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	Wall Area No. 2	Enter Other>	4	☐ Damestic Hot	☐ Hydro-Air Heal	☐ Wood Heat	
Ground Loop ☐ Hydro-Baseboard ☐ ☐ Root Bed Heat ☐ Spa/Pool Meating ☐ ☐ Spare Field ☐ Spare Distribution ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐		6" Inculation	•	Domestic Cold	Hydro-Air Cool	Coal Heat	
Ea 12" Fiberglass   □ Sports Field □ Sauna/Jacuzzi □ Sterilize Soil □ Outdoor Controls □ Eave Melting □ Heat Distribution □ □ Compressed Air □ Cool Distribution □ □ Cool Distribution □ □ Cool Distribution □ Cool Distrib	Floor Loss Area	o mamanan		Ground Loop	☐ Hydro-Baseboard	Solar Heat	
Sports Field	Slab Loss Area	2" Insulation	_	Root Bed Heat	Spa/Pool Heating	☐ Ice Storage	
☐ Sterilize Soil ☐ Outdoor Controls ☐ ☐ Eave Melting ☐ Heat Distribution ☐ ☐ Compressed Air ☐ Cool Distribution ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	Ceiling Loss Are	-	1	Sports Field	Sauna/Jacuzzi	☐ Heat Storage	
Peoria Compressed Air Cool Distribution	O CANADA		4	Sterilize Soil		Waste Heat	
	<b>®</b> 11 ≤ A	Peoria	•	Compressed Air	Cool Distribution	☐ Chiller	





					•					
		MUL	TI-ZONE HE	MULTI-ZONE HEAT LOSS DESIGN A	SIGN ANAL	NALYSIS			Page 1	
DESIGNER:	DATE:		HBN3	ENERGY CODE INFORMATION	IATION	JOB NAME:	POST FRAME PROJECT	OJECT	Consolidated Building Center	ing Center
COMPANY:			FLOOR AREA: WINDOW AREA:		800 SQ. FT. 45 SQ. FT.	45 SQ. FT. COMPANY:				
CITY, ST:			% OF GLASS TO			CITY, ST				
		ZONE 1	ZONE 2	ZONE 3	ZONE 4		SONE 6			
DESCRIPTION	R-VALUE or							UNITS	HEAT LOSS TOTALS	
INSULATED WINDOW AREA (U-VALUE)	0.65	45						SQ FT.	1,960 BTU/HR	.UMR
INSULATED DOOR AREA (U-VALUE)	0,16	2,522						SQ. FT.	25,346 BT	BTU/HR
INSULATED SKYLIGHTS (U-VALUE)	0 66							SQ. FT.	Bĭ	BTU/HR
EXTERIOR WALL HEIGHT	`	22.0						HEIGHT		
LENGTH OF UNHEATED EXTERIOR EDGE	>	456						LN. FT.		
INSULATED WALL AREA (R-VALUE)	19.00	7,465						SQ. FT.	26,324 BTU/HR	JHR.
ADDITIONAL INSULATED WALL AREA	19.00	720						SQ. FT.	2,539 BTU/HR	J.HR.
TOTAL GROSS FLOOR AREA	·····>	12,800						SQ. FT.		
INSULATED FLOOR AREA (R-VALUE)	19.00							SQ. FT.	ВТ	BTU/HR
INSULATED SLAB AREA* (R-VALUE)	1.00	2,910						SQ. FT.	48,404 BT	BTU/HR
INSULATED CEILING AREA (R-VALUE)	30.00	2,910						SQ. FT.	6,499 BTU/HR	J.HR.
ADDITONAL AIR VOLUME	····>							CU. FT.		
TOTAL AIR VOLUME	>	281,600						인판	611,297 BTU/HR	CHR
AIR CHANGES PER HOUR>	>	1.80	1.80	1.80	1.30	1.80	1.30	ACH		
TOTAL HEAT LOSS PER ZONE	>	673,965						BTU/HR	720,369 BTU/HR	NHZ.
*SLAB LOSS FIGURED BELOW			KITEC® RAD	RADIANT DESIGN WORKSH	WORKSHEET	© Copyright 19	© Copyright 1997-98 Bio-Radiant Energy, Inc. All Rights Reserved	ergy, Inc Alf	Rights Reserved	
INPUT VALUES	:	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5	ZONE 6	UNITS		
TO-OUTDOOR DESIGN TEMPERATURE		-2	-2		-2		-2	DEG. F		
Ta-ROOM TEMPERATURE		65	60	60	60	60	60			
Or-RADIANT FLOOR LOAD AT DESIGN CONDITIONS	SNOITI	673,965						BTU/HR		
A-NET RADIANT SLAB SURFACE AREA		12,800						SO FT		
Ua-ENERGY TRANSFER FROM RADIANT SURFACE	RFACE	2	2	2	2	Page Slat 2	T	BTU/HR/S	BTU/HR/SQ, FT./DEG, F	
THE OF FLOOR OF SOREBING		Dal a Stab	20.00	Sque Sign	30.00	00160	Dai to Oto	BT MERIO		
Us-ESTIMATED U-VALUE WITHIN SLAB		1.01	1.01	1.01	1.01	1,01		BTU/HR/S	1.01 BTU/HR/SQ FT/DEG. F	
De-DEPTH OF TUBING IN SLAB OR THICKNESS OF FLOOR	SS OF FLOOR	2.00	2.00	2 00	2.00	2.00		2.00 INCHES		
QHNTERIOR SLAB HEAT LOSS		2.00	2.00	2.00	2 00	2.00	2.00	BTU/HR/SQ FT.	Q FT.	
Ue-U-VALUE AT SLAB EDGE		1.00	1.00		1.00			BTU/HR/S	1.00 BTU/HR/SQ, FT./DEG, F	
TYPE OF TRANSFER FLUID		26% Glycol	25% Glycol	25% Glyc	26% Glyc	25% Glyc	25% Glyco	FLUID		
DI-DENSITY OF HEAT TRANSFER FLUID		8.55	8.55					8.65 LBS/GAL.		
CF-HEAT CAPACITY OF HEAT TRANSFER FLUID	JID I	0.93	0.93	0.93	0.93	0.93		0.93 BTU/LB/DEG. F	G. F	
Td-FLUID TEMPERATURE DROP		20	20	20	20	20		20 DEG. F		
Le-DESIRED LOOP LENGTH		250	250	250	250	250	2	250 FT.		
Sp-AVERAGE PIPE SPACING		12	12	12	12	12		12 INCHES ON CENTER	NOENTER	
INSTALLATION METHOD		Stab on Grade	Slab on Grade	Slab on Grade	Slab on Grade	Slab on Grade	Stab on Grade			
CALCULATED VALUES		ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5	ZONE 6			
1. Tr-DESIGN TEMPERATURE DIFFERENTIAL		67	62			62		62 DEG. F		
								L		_

e effects of passive	estimates are for space heating only and do not include the effects of passive	ates are for space	_	NOTE. These calculated annual cost estimates are based on 20 year average weather data and do not represent a quarantee of performance	ar average weather data	e ara hasad on 20 ve	ed annual cost estimate	These calculat	NOTE:
\$28,643.82					\$28,643.82	LOOR	90% ZONED RADIANT FLOOR	909	_
\$32,940.39					\$32,940.39	₹™ HEAT	% ZONED HYDRO-AIR™ HEAT	90%	
\$38,712.20					\$38,712.20	AIR	90% CENTRAL FORCED AIR		PROPANE
						LOOR	8 ZONED RADIANT FLOOR	90%	
						₹™ HEAT	90% ZONED HYDRO-AIR™ HEAT	909	
						AIR	90% CENTRAL FORCED AIR	900	읃
\$26,964.30	,				\$26,964.30	LOOR	100% ZONED RADIANT FLOOR	1000	
\$31,008,94					\$31,008.94	R™ HEAT	100% ZONED HYDRO-AIR™ HEAT	100,	
\$36,442.33					\$36,442.33	AIR	100% CENTRAL FORCED AIR	_	ELECTRICITY
\$12,142.63					\$12,142.63	LOOR	90% ZONED RADIANT FLOOR	900	
\$13,964.02					\$13,964.02	R™ HEAT	90% ZONED HYDRO-AIR™ HEAT		GAS
\$16,410.79					\$16,410.79	DAIR	90% CENTRAL FORCED AIR		NATURAL
ZONE COST TOTAL	ZONE 6 Z	ZONE 5	ZONE 4	ZONE 2 ZONE 3	ZONE 1		JAPE	FUEL/ EFFICIENCY	FUEL/ E
12,760 LN.FT.	TOTAL KITEC® FOOTAGE:	1,822	50 DEG. F	\$22.41		PER GAL.	\$2.05	NE	PROPANE
51 LOOPS	TOTAL NUMBER OF LOOPS:	2,987	55 DEG. F			PER GAL.			
156 DEG. F	AVERAGE SUPPLY TEMP:	4,458	60 DEG. F	\$23.44		PER KWH	\$0.08	RICITY	ELECTRICITY
76.50 GPM	TOTAL FLOW RATE.	6,025	65 DEG. F	\$9,50		THERM	\$0.95	NATURAL GAS	NATUR
720,369 BTU/HR	REVISED HEAT LOSS:	Deg. Days	Base	BASED ON 100% EFFICIENCY	BASEDO	2	FUEL COST	בטפר - זאם	
able No. 1	Data Summary Table No. 1	TOTAL	7	ormation	Weather Data Information	oria	sult IPEX, Inc.	†For Larger Size Consult IPEX, Inc	†For La
						1			
	BTU/HR					EAT OUTPUT>	ENTER ACTUAL SUPPLIED AUXILIARY HEAT OUTPUT>	R ACTUAL SU	ENTER
	SQ. FT			-	5,397	ACE AREA	OPTIONALLY INCREASE RADIANT SURFACE AREA	NALLY INCRI	OPTION
	LN, FT.				279	@180 DEG. F)	HYDRONIC BASEBOARD (580 BTU/FT. @180 DEG. F)	ONIC BASEB	HYDRO
	BTU/HR				161,920	T DESIGN	REQUIRED AUXILIARY HEAT OUTPUT AT DESIGN	RED AUXILIA	REQUI
	LN. FT.				12,750	DIANT PIPING	ESTIMATED TOTAL FEET OF KITEO® RADIANT PIPING	ATED TOTAL	ESTIMA
	LOOPS				51		LOOPS	TOTAL NUMBER OF LOOPS	TOTAL
	SIZE				Check Length		PIPE SIZE†	SELECTED KITEC® PIPE SIZET	SELEC
	PSI				8.38	S® PIPING	14. Pd-PRESSURE DROP ACROSS KITEC® PIPING	PRESSURE (	14. Pd-
	GPM				76.50	Œ ]	13. V-HEAT TRANSFER FLUID FLOW RATE	HEAT TRANSF	13. V-H
Q. FT.	BTU/HR/SQ. FT.				56.28		12. QUI-TOTAL HEAT LOAD PER SQ. FT,	I-TOTAL HEA	12, Qut
	BTU/HR				720,369	DNDITIONS	11. Qt-TOTAL HEAT LOAD AT DESIGN CONDITIONS	TOTAL HEAT	11. Qt-
	8TU/HR				46,404	DIND	10. Qg-TOTAL SLAB HEAT LOSS TO GROUND	TOTAL SLAB	10, ag-
	8TU/HR				43,320	JND	9. Qe-EDGE SLAB HEAT LOSS TO GROUND	EDGE SLAB	9. Qe-
	BTU/HR				3,084	ROUND	8. QI-INTERIOR SLAB HEAT LOSS TO GROUND	INTERIOR SL	8. QI-I
	DEG. F				95	SLAB EDGE	<ol><li>Te-TEMPERATURE DIFFERENCE AT SLAB EDGE</li></ol>	TEMPERATU	7. Te-
	DEG. F				155	SFER FLUID	TI-SUPPLY TEMPERATURE OF TRANSFER FLUID	MEL ANDONS	6. Ti-8
	DEG. F				145	NSFER FLUID	THAVERAGE TEMPERATURE OF TRANSFER FLUID	AVERAGE TE	7-11 G
	DEG. F				93	DIANT SURFACE	4 Ts-SURFACE TEMPERATURE OF RADIANT SURFACE	SURFACE TE	4 Ts-
	DEG F				91	OOR COVERING	3. To-SURFACE TEMPERATURE OF FLOOR COVERING	SURFACE TE	3, Tc-
Q. FT.	BTU/HR/SQ. FT.				62.65	ANT SURFACE	2. Qu-HEAT LOAD PER SQ FT. OF RADIANT SURFACE	-HEAT LOAD	2. Qu-

These annual cost comparisons are for space heating only, and do not include the cost of Domestic Hot Waler, lighting and other energy uses. solar or other internal gains as these factors are impossible to predict or control. These estimates should be used for comparative purposes only! All area measurements and "U-Values are supplied by the Builder and/or the Architect. IPEX, Inc. assumes no responsibility for the accuracy of these measurements. All calculations are based upon these figures. Local fuel cost are estimated as closely as possible from local sources. It is the NOTE-These calculated annual cost estimates are based on 20 year average weather data and do not represent a guarantee of performance. Estimates are for space heating only and do not include the effects of passive responsibility of the owner to obtain a quote for the cost of these fuels from the various suppliers. Your actual cost will vary from these figures, based on lifestyle, meter charges, connection fees and other additional charges © Copyright 1997-98 Bio-Radiant Energy, Inc. All Rights Reserved



POST FRAME PROJECT Page 2

TOTAL	AIR INFILTRATE	CEILING	SLAB	FLOOR	WALL 2	WALL 1	SKYLIGHT	DOOR	WINDOW	AREA	Worksheet No. 1 Provides total Heat Loss for each area in BTU/HR.
720,369	611,297	6,499	46,404		2,539	26,324		25,346	1,960	ZONE 1	). 1 s for each area in BT
										ZONE 2	U/HR.
										ZONE 3	
										ZONE 4	
										ZONE 6	
									Constitution of the Consti	SONE 6	
											Notes:

Cool Distribution	Compressed Air	1	Peorla	● U.S.A.
☐ Heat Distribution	☐ Eave Melting	1	Calgary	O CANADA
☐ Sauna/Jacuzzi ☐ Outdoor Controls	☐ Sports Field ☐ Sterilize Soil	4	10" Fiberglass	Ceiling Loss Area
☐ Spa/Pool Heating	Root Bed Heat	4	No Insulation	Slab Loss Area
☐ Hydro-Baseboard	Ground Loop	1	6" Insulation	Floor Loss Area
☐ Hydro-Air Heat	□ Domestic Hot	4	6" Insulation	Wall Area No. 2
☐ Multi-Zone	Radiant Floor	4	6" Insulation	Wall Area No. 1
☐ Retrofit/Remodel	☐ Residential☐ Industrial☐	4	Double Glazed	Skylight Area
New Construction	Commercial	4	Insulated Core	Door Area
is one of more of a	rour project contains one of more of the	•	Double Glazed	Window Area

Your
project
contain
is one or
or more
of the
our project contains one or more of the following element
elements:

rcial Itial	☐ New Construction ☐ Retrofit/Remodel	□ Natural Gas □ Electricity
<u>m</u>	∭ System ∪pgrade	☐ Fuel Oil
Floor	☐ Multi-Zone	Propane
c Hot	☐ Hydro-Air Heat	₩ood Heat
c Cold	☐ Hydro-Air Cool	Coal Heat
Loop	☐ Hydro-Baseboard	Solar Heat
d Heat	☐ Spa/Pool Heating	☐ lce Storage
ield	Sauna/Jacuzzi	☐ Heat Storage
Soil	Outdoor Controls	Waste Heat     Waste Heat
elting	☐ Heat Distribution	☐ Heat Pump
ssed Air	Cool Distribution	Chiller

