Development Services

From Concept to Construction

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APPEAL SUMMARY

Status: Hold for Additional Information - Reconsideration of ID 16156

Appeal ID: 16535	**Project Address:** 2946 NE Columbia Blvd
Hearing Date: 2/28/18	**Appellant Name:** Paul Hettervig
Case No.: M-002	**Appellant Phone:** 5036567400
Appeal Type: Mechanical	**Plans Examiner/Inspector:** Thomas Ng
Project Type: commercial	**Stories:** 1 **Occupancy:** H2 **Construction Type:** cinder block filled
Building/Business Name: Tarr LLC	**Fire Sprinklers:** Yes -
Appeal Involves: Reconsideration of appeal	**LUR or Permit Application No.:** 17-263360-MT
Plan Submitted Option: pdf [File 1] [File 2]	**Proposed use:** industrial manufacturing

APPEAL INFORMATION SHEET

Appeal item 1

Code Section	
Requires	Code Section being appealed: Energy Code Section 101.4.3 Regulation Requirement: Energy code section 101.4.3 Requires the thermal envelope of a non-conditioned space be brought up to current requirements when heating capacity is increased
Proposed Design	Proposed Design: Provide discharge air temperature control rather than space temperature control for hazardous occupancy ventilation make-up air system. Energy modeling shows that this method of control limits energy consumption by the ventilation system for the un-improved building envelope to the same energy consumption level as if building envelope was insulated. (Upgrading building insulation does not reduce energy consumption.)
Reason for alternative	Reason for Alternate: Project is a hazardous occupancy were flammable liquids in large containers are mixed and poured into smaller containers. Flammable liquids and rain water often accumulate on the floor creating additional hazards to the workers in the space. The present ventilation rate is 3.2 CFM/SF (3.2 times the minimum Code Requirement listed in OMSC 502.9.5.4) and is not sufficient to dry the floors during wet winter months. The initial appeal reviewer suggested we use radiant heaters in the space but we elected not to use them due to fears the hot surfaces of the radiant heaters might ignite the flammable vapors. The initial appeal reviewer suggested we heat the space and re-circulate the air with controls that limit the vapor concentrations to below 25% of the LFL limit but we elected not to do that because OMSC 510.4 prohibits the recirculation of air with flammable vapor contaminates. The most economical remaining method to remove excess moisture in the space is to increase the

ventilation air's moisture removal abilities. Heating the ventilation air increases the air's ability to absorb moisture. The proposed ventilation air heaters are sized for less than 60% of the space conditioning design load and have a limited temperature rise to gain the air drying effect needed to evaporate the liquids accumulating on the floor.
Commercial energy modeling software typically used for OEESC's Section 506 Whole Building Approach do not properly calculate energy consumption by air drying equipment (can only calculate to a space temperature control), therefore these tools cannot be used for this energy use comparison. We have made repeated attempts to discuss the proper calculation methods for this analysis with the initial appeal reviewer but have been unable to get a response. We believe that with air discharge temperature control, the building envelope properties do not factor into the energy model analysis.

APPEAL DECISION

Omission of current energy code requirements for building envelope insulation: Hold for additional information.
Appellant may contact Thomas Ng (503 823-7434) with questions.

Production Room Ventilation Upgrade
Tarr LLC

Energy Consumption by Make-up Air Unit Comparison - Existing Envelope vs Code Upgraded Envelope

Make-up Air Units are 100% outside air and controlled from discharge air temperature thermostat.
No room thermostat is provided and no room return air is ducted to the units. Unit firing rate is based solely on outside air temperature (room air temperature has no effect on unit firing rate).

Weather Data provided by Oregon State University Extension Service
Average hours at Portland Airport for Years 1948-1984

Temperature Range (F)		Annual Hours	MCWB (F)	MAU Leaving Air Temp.	Heating Rate BTUH Note 1	Energy Consumed in each temperature range (rate multiplied by hours in temperature range) BTU's Consumed w/ Existing Envelope	BTU's Consumed w/ Code Envelope
110	114	0					
105	109	0	73	105			
100	104	2	72	100			
95	99	6	69	95			
90	94	24	68	90			
85	89	65	67	85			
80	84	136	65	80			
75	79	231	63	75			
70	74	402	61	70			
65	69	594	58	70	94,500	56,133,000	56,133,000
60	64	1007	56	70	189,000	190,323,000	190,323,000
55	59	1266	53	70	283,500	358,911,000	358,911,000
50	54	1269	48	70	378,000	479,682,000	479,682,000
45	49	1357	44	70	472,500	641,182,500	641,182,500
40	44	1215	40	70	567,000	688,905,000	688,905,000
35	39	681	36	70	661,500	450,481,500	450,481,500
30	34	323	31	67	700,000	226,100,000	226,100,000
25	29	108	26	62	700,000	75,600,000	75,600,000
20	24	45	20	57	700,000	31,500,000	31,500,000
15	19	22	15	52	700,000	15,400,000	15,400,000
10	14	7	11	47	700,000	4,900,000	4,900,000
5	9	1	7	42	700,000	700,000	700,000
0	4	0	2				
-5	-1	0	-1				
Annual Hours		8761		Annual BTU's Consumed		3,219,818,000	3,219,818,000

Proposed energy consumption is the same as Code Upgraded Envelope case.

Notes

1 Heating Rate = 1.08 x 14000 CFM x Temperature Difference / Furnace Efficiency
The equipment maximum firing rate is 700,000 BTUH