Building in the North (5th edition)

Elbert F. Rice Index by S. Jane Henderson, Indexplorations

A	dwellings (continued)	heat flow, 2, 30, 32, 60
aerobic decomposition, 89	temperate-zone vs. traditional,	heat gain, 61
air ducts, 19, 20	11–12	heating costs and priorities, 29, 47
air pollution, waste disposal and, 92	water service to, 75	heating systems, x, 42–47
air starvation syndrome, 45	see also buildings	heat loss, xi, 29, 38, 74
anaerobic decomposition, 84		heat pumps, 47
Anchorage, 2, 3, 27, 88	E	heat recovery ventilators (HRVs),
anoxia, 45	earthquakes, 18, 24	47
aquifers, 70	electric heating systems, 46–47	heat segregation, x, 16–17, 18
Arctic architecture, 27	electricity, 39, 47	heat sinks, 9
avalanche areas, 13	elevated buildings, xi, 15–18	heat suckers, 19
_	elevation, temperature and, 13	heat tape, x, xii, 75
В	emergency escape routes, x, 34	heat tracers, 74, 83
bacterial contamination, 97	Emmonak, 83	heat transfer, 58, 60
Barrow, 3, 40, 73, 90, 97	energy conservation, 37–38	helical anchors, 18, 23–24
basements, of igloos, 28	energy costs with various fuels, 39	high-density polyethylene pipe
biological sewage treatment, 88–91	entryways, 14, 28, 33	(HDPE), 76
Boeing Jetliners, entryways, 28	Eskimos, 37	honey buckets, 80, 81, 95
British Petroleum Company, 70, 73	P	hot water heating systems, 42, 44,
builders, speculative, 29–30	F. F. H. 1. 2. 12. 12.	45–46
building materials, 28	Fairbanks, 3, 12, 13	human waste. see sewage treatment
buildings, xi, 14–18, 57	fencing, 88–89	systems; waste disposal
see also dwellings	fiberglass insulation, 30, 32	systems
burnable trash, heat content of, 92	fibrous insulations, 30, 31, 32	humidity, 49–50, 51–52
C	Fick's Law, 50–51	humus toilets, 89
C	fire danger, ix–x	hybrid composting-graywater
capital investment costs, 29	fire logs, 40	treatment systems, 90–91
ceiling insulation, 31	floor insulation, 31–32	hydroelectric plants, 39
central heating, 43	floor temperatures, xi flush toilets, 67, 83–84	ī
chamber pots, 80		•
circulating water system, 75	foamed-in-place urethanes, 31	ice, as water source, 70, 72
coal, 41, 47	foamed plastic insulation, 31, 32 foam insulations, 30, 32	ice creep, 22
coal-burning furnaces, 42		ice-rich permafrost, 6, 15–16, 17–18
co-generation systems, 39 cold traps, 27	foil-backed insulation, 31, 57	ice wedges, 4–6, 8 icing (glaciering), 69
combustion toilets, 90	forced-air heating systems, 42, 44,	igloos, 27
community haul systems, 81–82, 86	Fort Yukon, 89	incineration of waste, 90, 92
composting toilets, 89	foundations, 15, 18–19, 20–25	insulations, 28–32, 47, 54, 57
conduit, heated, 75	freeze back, 9, 21	Inuvik, 21, 82, 97
convection heat transfer, 60	friction-fit batts of insulation, 31, 57	iron, in arctic water, 71, 76
Corbusier, 16	frost heave, 4	non, in arctic water, 71, 70
cost recovery systems, 94	frost-jacking, 22, 23	K
Crum-Kruzel tank, 86	furnaces, x, 42–47	Kivalina, 90
Cruin Muzer unix, 00	Tarraces, A, 12 17	Kotzebue, 97
D	G	Tiotzeoue, 57
dams on permafrost, 73	global warming, 20	L
Deering, 90	gravel pads, 24	lakes, 7, 68, 69
de-ionizers, 76	gravity-air heating systems, 42, 46	leaks in roofs, 54
demineralization of water, 71	gravity flow sewage systems, 83, 87	liquefied gas, 39
desalination, 70, 71	graywater, 76, 86, 90–91, 96	liquid wastes, disposal of, 96
Distant Early Warning (DEW) Line,	grease vapor, 50	low-emissivity (low-E) coating, 62
21, 73	groundwater, 68, 71, 87	3 \
doors, 32, 33, 35	gun-type oil burners, 41, 43–44	M
drain fields, 84, 85	, ,	Master heaters, 41, 50
driveways, 14, 19	Н	mechanical refrigeration, 19–20
dwellings	haul systems for waste disposal, 81–	meltwater, 69
elevated, xi, 15–18	82, 86	metal wastes, 92
orientation of, 13–14	heat distribution, 45–47	methane, 84
snow houses, 27–28	heat exchangers, 42, 45, 47	micro-flush toilets, 85
	=	•

moisture buildup, 51–53, 57	S	truck-haul system, 86
moisture in frozen soils, 21	sanitation system design, 86–88, 95	tundra, as ground cover, 18–19
mosquitos, 13	seawater ice, desalination of, 70	
muskeg water, 72	Selawik, 89	U
••	septic tanks, 84–85	U-factor (thermal conductance), 60
N N	sewage lagoons, 88–89	utilidors, 9, 72, 75, 82–83
Nansen, Fridtjof, 5	sewage treatment systems, 88–91,	**
native vegetation, 19	97, 98	V
natural gas, 40	see also waste disposal systems	vacuum sewer systems, 83
Noorvik, 83	sewers, 82–83	vapor barriers, 31–33, 54–57
	shutters, insulated, 35, 64–65	vapor pressure gradient, 50–52
O sil samps of North Clara 02	site selection, 12–13	vehicle parking, 14, 19
oil camps of North Slope, 93 oil heating, 40, 41	skirting, 17–18	ventilation, 28, 33, 44–45, 47, 55
oil wells, in permafrost, 8–9	skylights, 61 slab foundations, 19–20	viscosity, water temperature and, 72
oxygen solubility, 72	snow drifting, 13, 14, 18	W
oxygen solubility, 72	snow differing, 13, 14, 18 snow houses, 27–28	Wainwright, 70
P	snow in the Arctic, 35	walls, 31, 51–53
permafrost	soils, 3, 23	wans, 51, 51–55 waste collection, 81–82, 97
dams on, 73	space heaters, portable, 41	waste disposal systems, 79–80, 90,
ice-rich, building strategies with,	stack robbers, 42	92–96
15–16, 17–18	steam heating systems, 42, 45, 71	see also sewage treatment
ice wedges in, 4–6	steam thawing, 76	systems
locations of, 1–2	steel piling, 21	waste heat, 38, 39, 47
oil wells in, 8–9	Stefansson, Vihjalmur, 5, 11	water
preservation strategies, 19	storage areas, 14	availability of, 67
surface temperature and, 2–3	storm locks, 33–34	collection of, 72–73
permafrost terrain, diagram of, 68	stoves, 41–42	consumption per person, 68, 71
permeability of construction layers,	streams, as water sources, 69–71	conveyance of, 74
56	subpermafrost water, 68	disease incidence and
physical-chemical sewage	subsistence lifestyle, 93–94	availability of, 97–98
treatment, 91	sun, in arctic spring, 14	distribution of, 75–76
pile foundations, 15, 18, 20–24	surface-to-volume ratio, xi, 28	infiltration rate, 58
pingos, 7–8		sources of, 69–71, 72
piped sewage systems, 83	T	storage of, 73–74
pipes and pipelines, 8–9, 45, 74–76	temperature	water vapor
pit privies, 80	and anaerobic decomposition, 84	flow of, 32–33, 52
ponds, 6–7	average and bounding, 2	problems caused by, 49, 54-55,
post and pad foundations, 18, 24–25	elevation and, 13	57
power generation, and waste heat,	humidity and, 49–50	transport by diffusion, 50-51
38	and oxygen solubility, 72	wells, 72–73
power outages, x	typical ranges in Alaska, 3	wet burning, 89
public health in the Arctic, 95–97	water viscosity and, 72	wet garbage, 93
Putuligayak River runoff, 69	temperature gradient of the earth, 2	wind, heat flow, and relative
	thaw bulbs, 7, 18, 70	humidity, 63
R	thaw cylinders, 75	wind/earthquake braces, 24
radiant heaters, 47	thawing pipes, x, 75–76	wind in the tundra, 13
recycling metal wastes, 92	thaw wires, 75	window coverings, and heat flow,
redundancies, x	thermal comfort, 37–38	64
reflective insulation, 30	thermal isolation, x, 16–17, 18	windows
releveling, 24	thermal resistance of air space, 60	condensation on, 62–63
reservoirs, for water storage, 73	thermal syphons, 19, 20	costs and benefits of, 34–35, 59
residential water service, 75	thermostats, 43	multiple-pane, 53–54, 61
revolving doors, 33	thunder mugs, 80	placement of, 14
Rice, Eb, 21	toilets, 67, 80, 83–84, 85, 89–90	thermal conductance of, 59–60
roofs, leaks in, 54	see also honey buckets	wood, as fuel, 39–40
roof systems, 57	total energy systems, 38–39	V
	Trans-Alaskan Pipeline, 9	Y Vulcon stoves, 40, 41, 42
	Triodetic Foundation, 18, 25	Yukon stoves, 40, 41, 42