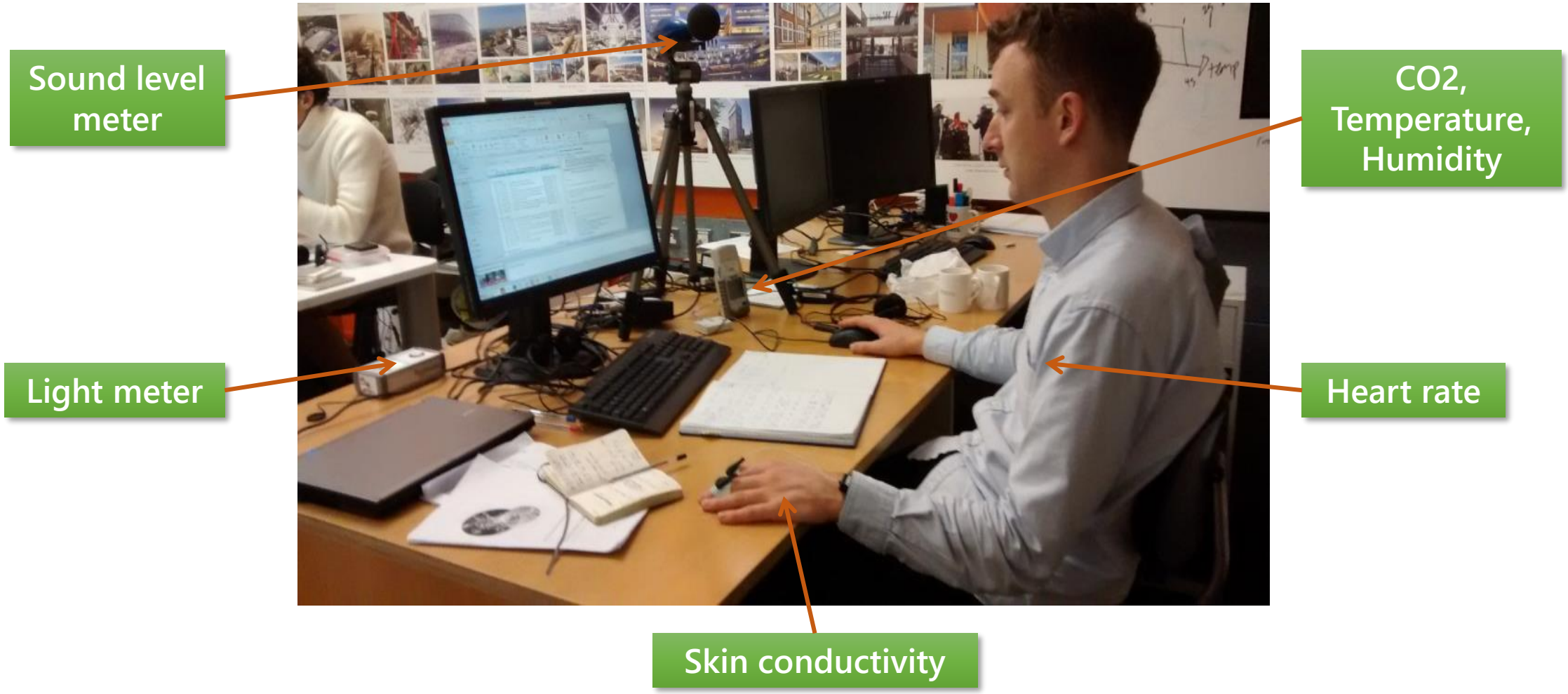
Integration of plants and buildings to support wellbeing

Carol Costello of Cullinan Studio

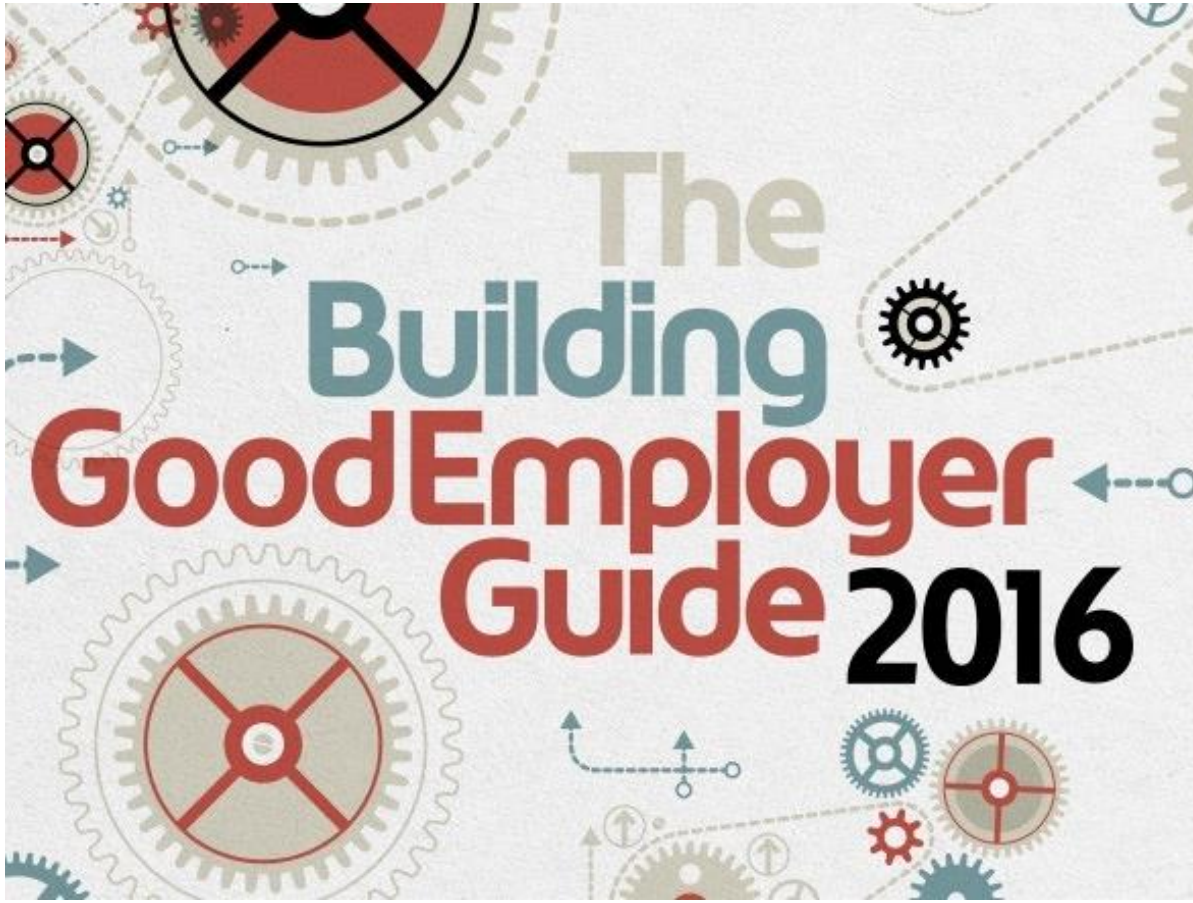
14 February 2018

Cullinan Studio’s canal side office

Cullinan Studio low energy retrofit of our canal side office



Our retrofitted studio scored highest of 6 ‘good’ workspaces in 2014 study by Trevor Keeling, Eng Doc student at Reading and Buro Happold because we have good daylight and personal control of our environment.

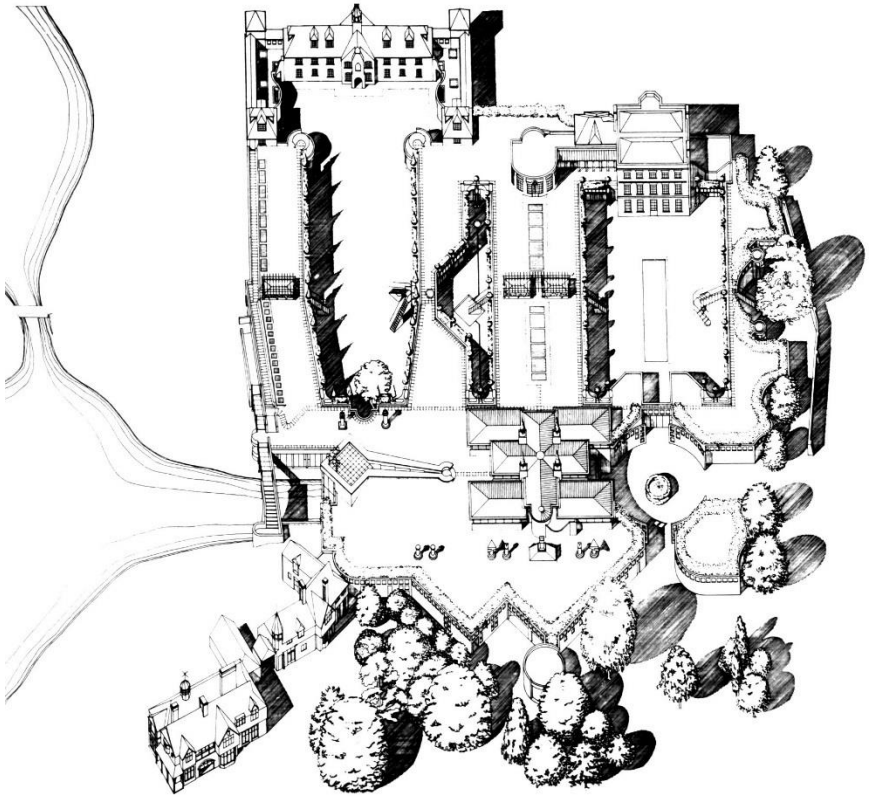


Cullinan Studio we run our company of cooperative principles

Integration of plants and buildings to support wellbeing

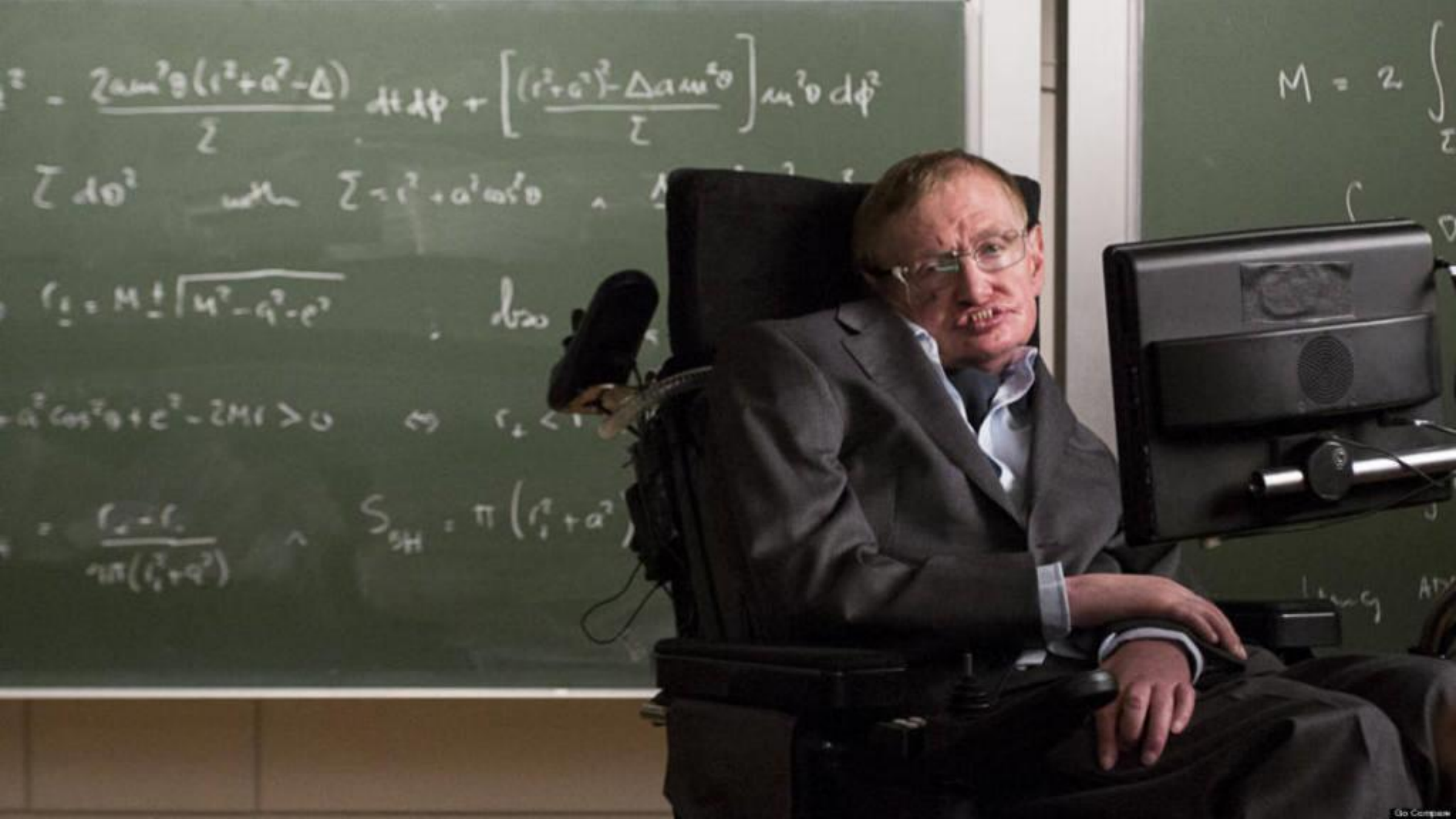
1. Softening the impact of buildings
2. Improving the air we breath
3. Making us feel better
4. Socialising us

1. Softening the impact of buildings



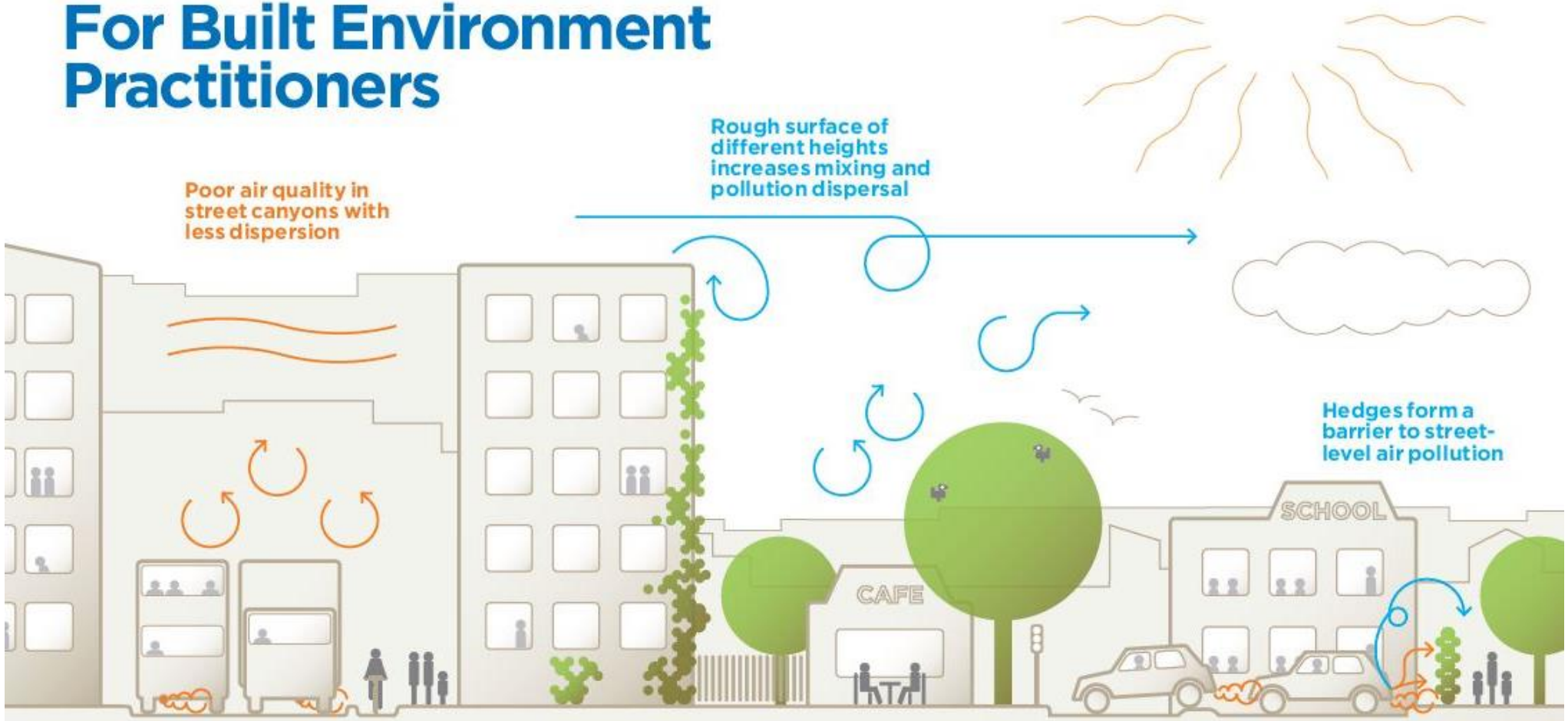
RMC Headquarters, Thorpe, Surrey

Cambridge University Centre of Mathematical Sciences



2. Improving the air we breath

For Built Environment Practitioners



Green infrastructure provides a comparatively large surface area for pollutant deposition

Parkland has fewer emission sources and therefore cleaner air

Air pollution greater where traffic regularly idles

Breaking and accelerating increases vehicle emissions

Children closer to vehicle exhaust and higher pollutant concentration

Trees & Design Action Group

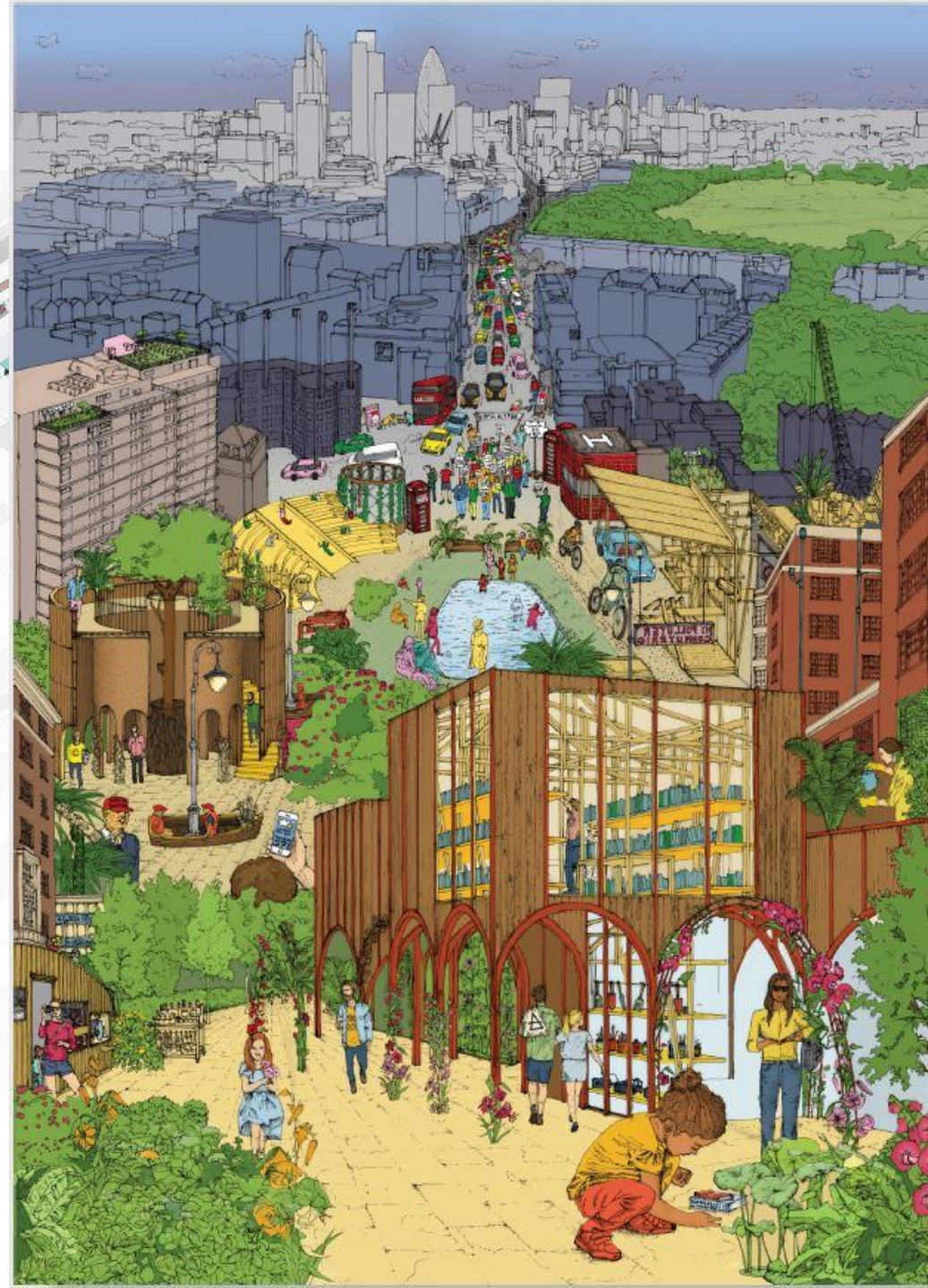
UNIVERSITY OF BIRMINGHAM | BIFOR

Lancaster Environment Centre | Lancaster University

THE RECLAIMED STREET : EDGWARE ROAD

Due to the densification of the city resulting increasingly in schools being located next to main roads and losing access to outdoor space with shrinking footprints, we want to utilise the notion of the future school using the city as a classroom. We propose to consolidate facilities both schools and local community along with increasing their permeability by locating a network of facilities between the two on the reclaimed civic street. Communal facilities for the people, used by the people.

With our Edgware testbed, we look to provide a location for the currently temporary Marylebone library back to the heart of the community.



Research on Polluted Streets with LSA

COMMUNITY

Cleaning the air through planting

TREES, SHRUBS, FLOWERS, GRASS AND MOSS CLEAN THE AIR WE BREATHE BY ABSORBING HARMFUL POLLUTANTS, INCLUDING VEHICLE AND BUILDING POLLUTANTS. PLANTING PLAYS AN IMPORTANT ROLE IN KEEPING OUR AIR CLEAN, AND THROUGH OUR URBAN REALM SCHEMES WE WILL INTRODUCE AN EXTENSIVE AND VIBRANT PLANTING PROGRAMME.

We all want to take part in improving the air we breathe and we can do so through planting a variety of plant species that work to absorb pollutants. Below is a list of easy-to-grow and low-maintenance plants that are adept to cleaning our air, and which will be planted throughout the Marylebone LEN urban realm schemes.

Photo courtesy of The Portman Estate

WELL Building Standard v1: Core and Shell

Project:
Location:
Updated By:
Date:

Certification Matrix

AIR

Y	?	N			
Y			P	01	Air Quality Standards*
Y			P	02	Smoking Ban*
Y			P	03	Ventilation Effectiveness
Y			P	04	VOC Reduction
Y			P	05	Air Filtration*
Y			P	06	Microbe And Mold Control*
Y			P	07	Construction Pollution Management
Y			P	08	Healthy Entrance*
			n/a	09	Cleaning Protocol
Y			P	10	Pesticide Management
Y			P	11	Fundamental Material Safety
Y			P	12	Moisture Management
			n/a	13	Air Flush
Y			O	14	Air Infiltration Management
Y			O	15	Increased Ventilation
			n/a	16	Humidity Control
	?		O	17	Direct Source Ventilation*
			n/a	18	Air Quality Monitoring And Feedback
		N	O	19	Operable Windows*
Y			O	20	Outdoor Air Systems
			n/a	21	Displacement Ventilation
			n/a	22	Pest Control*
		N	O	23	Advanced Air Purification*
	?		O	24	Combustion Minimization*
			n/a	25	Toxic Material Reduction
			n/a	26	Enhanced Material Safety
			n/a	27	Antimicrobial Activity for Surfaces
			n/a	28	Cleanable Environment
			n/a	29	Cleaning Equipment
14	2	2	TOTAL		

WATER

Y	?	N			
Y			P	30	Fundamental Water Quality*
Y			P	31	Inorganic Contaminants*
Y			P	32	Organic Contaminants*
Y			P	33	Agricultural Contaminants*
Y			P	34	Public Water Additives*
			n/a	35	Periodic Water Quality Testing
	?		O	36	Water Treatment*
	?		O	37	Drinking Water Promotion*
5	2	0	TOTAL		

NOURISHMENT

Y	?	N			
			n/a	38	Fruits And Vegetables
Y			P	39	Processed Foods*
Y			P	40	Food Allergies*
			n/a	41	Hand Washing
			n/a	42	Food Contamination
Y			O	43	Artificial Ingredients*
Y			O	44	Nutritional Information*
	?		O	45	Food Advertising*
			n/a	46	Safe Food Preparation Materials
			n/a	47	Serving Sizes
			n/a	48	Special Diets
			n/a	49	Responsible Food Production
			n/a	50	Food Storage
		N	O	51	Food Production*
	?		O	52	Mindful Eating
4	2	1	TOTAL		

LIGHT

Y	?	N			
			n/a	53	Visual Lighting Design
			n/a	54	Circadian Lighting Design
Y			P	55	Electric Light Glare Control
Y			O	56	Solar Glare Control
			n/a	57	Low-Glare Workstation Design
			n/a	58	Color Quality
			n/a	59	Surface Design
			n/a	60	Automated Shading And Dimming Controls
		N	O	61	Right To Light
		N	O	62	Daylight Modeling
		N	O	63	Daylighting Fenestration
2	0	3	TOTAL		

FITNESS

Y	?	N			
Y			P	64	Interior Fitness Circulation*
			n/a	65	Activity Incentive Programs
			n/a	66	Structured Fitness Opportunities
Y			O	67	Exterior Active Design*
		N	O	68	Physical Activity Spaces
Y			O	69	Active Transportation Support*
		N	O	70	Fitness Equipment*
			n/a	71	Active Furnishings
3	0	2	TOTAL		

COMFORT

Y	?	N			
Y			P	72	Accessible Design
			n/a	73	Ergonomics: Visual And Physical
Y			P	74	Exterior Noise Intrusion*
	?		O	75	Internally Generated Noise*
Y			P	76	Thermal Comfort*
			n/a	77	Olfactory Comfort
			n/a	78	Reverberation Time
			n/a	79	Sound Masking
			n/a	80	Sound Reducing Surfaces
			n/a	81	Sound Barriers
			n/a	82	Individual Thermal Control
		N	O	83	Radiant Thermal Comfort
3	1	1	TOTAL		

MIND

Y	?	N			
Y			P	84	Health And Wellness Awareness*
Y			P	85	Integrative Design
			n/a	86	Post-Occupancy Surveys
Y			P	87	Beauty And Design I*
Y			O	88	Biophilia I - Qualitative*
			n/a	89	Adaptable Spaces
			n/a	90	Healthy Sleep Policy
			n/a	91	Business Travel
			n/a	92	Building Health Policy
			n/a	93	Workplace Family Support
			n/a	94	Self-Monitoring
			n/a	95	Stress And Addiction Treatment
			n/a	96	Altruism
	?		O	97	Material Transparency*
			n/a	98	Organizational Transparency
Y			O	99	Beauty And Design II*
Y			O	100	Biophilia II - Quantitative*
Y			O	101	Innovation Feature I
	?		O	102	Innovation Feature II
	?		O	103	Innovation Feature III
	?		O	104	Innovation Feature IV
	?		O	105	Innovation Feature V
7	5	0	TOTAL		

SUMMARY

Y	?	N	
26	0	0	Preconditions (26 possible)
12	12	9	Optimizations (28 possible + 5 Innovations)

	Requirements	Results
Preconditions	Must meet all preconditions.	**All preconditions satisfied.**
Optimizations	0 needed for Silver, 12 for gold,23 for platinum	**Current status: Gold**

* Pending onsite post-occupancy Performance Verification testing.

Copyright © 2017 International Well Building Institute pbc and Delos Living LLC. All Rights Reserved

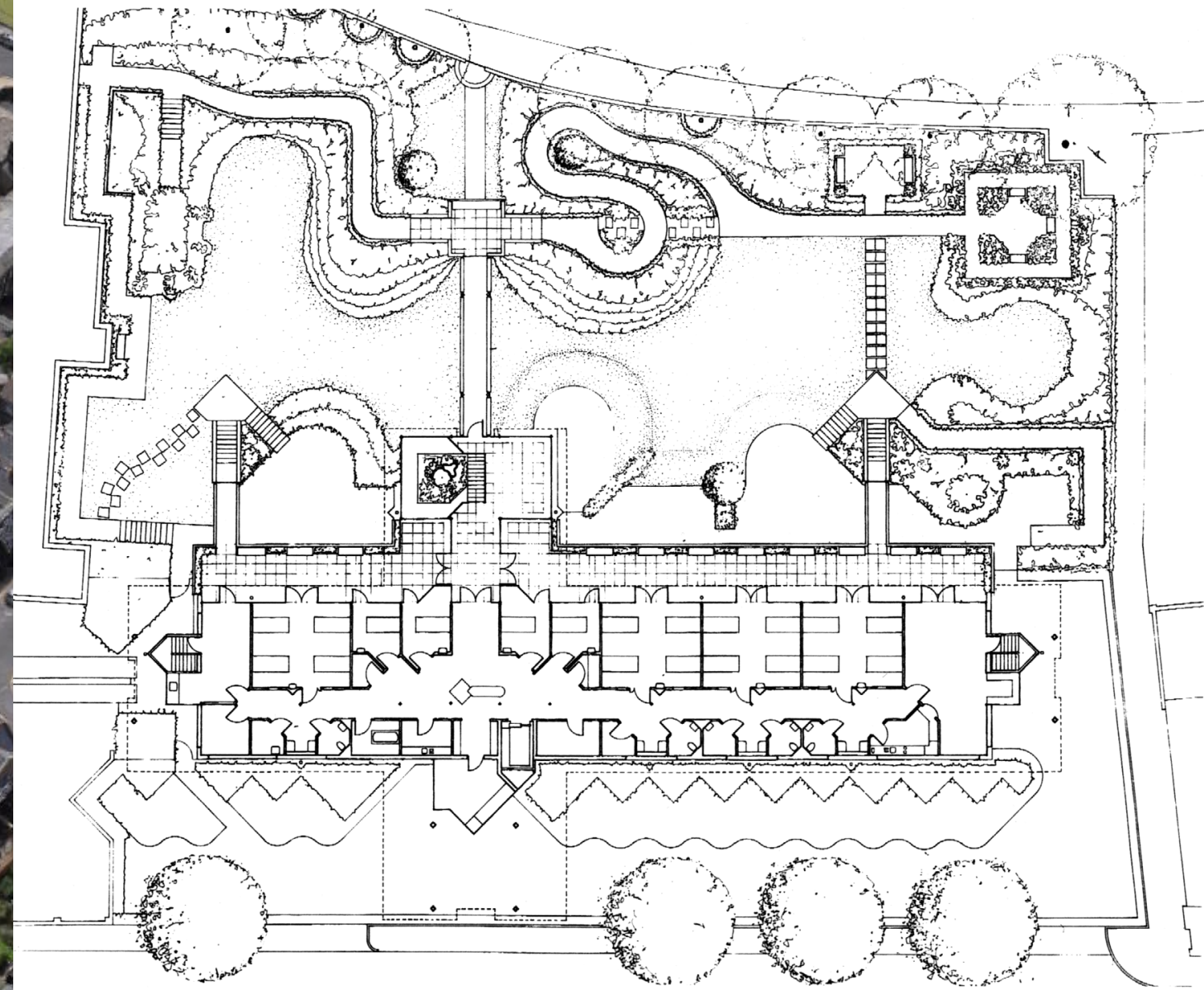
Workplace project for central London

Workplace project for central London

Singapore Management University

3. Making us feel better

Lambeth Community Care Centre Garden



Fire exit

We can persuade our clients through research to support evidence based design.

Cullinan Studio Partner, Lucy Brittain, research at Newcastle University into Therapeutic Environments

Further studies by Ulrich and others show that restorative effects can be manifested in a very short time. “Laboratory and clinical investigations have found that viewing nature settings can produce significant restoration within less than five minutes as indicated by positive changes, for instance, in blood pressure, heart activity, muscle tension, and brain electrical activity.[40] Ulrich notes, “views of vegetation or garden-like features elevate levels of positive feelings (pleasantness, calm), and reduce negatively toned emotions such as fear, anger and sadness.”

HERE'S AN EXAMPLE
IT'S CALLED A MAGGIES
IT'S AT THE FREEMAN
HOSPITAL IN NEWCASTLE
TO WHICH IT IS CONNECTED
BY AN AVENUE OF APPLE TREES.
THE DOOR LEADS TO A WEL-
COMING FRONT HALL AND A TWO
STOREY LIBRARY WITH LOG FIRE.
DOWN ONE ARM IS A COOKING AND —

EATING MEETING
ROOM, DOWN THE
OTHER AN EXERCISE
ROOM. COUNSELLING
ROOMS ARE EN ROUTE.
THE NORTHERN FLANKS
ARE SUNK INTO THE GROUND
FOR SUPER INSULATION, THE
SOUTH FACING MAIN ROOMS
OPEN ONTO A SUNKEN COURT + BARBEQUE.

IN QUITE LONG
GRASS ON THE BANKS
ARE SNOWDROPS IN
FEBRUARY, CROCUSES
IN MARCH, DAFFODILS
IN APRIL MAY JUNE.
THERE IS A REVOLVING GLASS
SUMMER HOUSE SECRETED IN
TREES DOWN BY THE BOUNDARY.
ON THE ROOF ARE A GRASS
BOWLING GREEN AND SOME EXERCISE
STUFF FOR THE ONES THAT LIKE IT.
THE LIBRARY IS CROWNED BY A SOUTH
SLOPING ARRAY OF PHOTOVOLTAIC CELLS
MAKING ELECTRICITY.

Maggie’s Cancer Care, Newcastle

maggies

4. Socialising us

John Hope Gateway, Royal Botanic Gardens Edinburgh

Rosendale School and Learning Garden – RHS Campaign for School Gardening

Car Park Community Allotment, Rosendale Road

TRUE