

Supplementary

Tables S1 (a). Rule of thumb' calculation to determine the number of part-time house team members, as required to achieve sufficient hours of conservation cleaning every day, and to prepare rooms for visitor access.

Basic Calculation of Cleaning Hours	Example	Indicative Roles *	Optimum Roles *
Historic spaces in daily care (or cleaning units)	e.g., 24		
Divide by		3	2
=		8 h/day	12 h/day
Multiply by [weekly days of access + 1]	e.g., 7		
=		56 h/week	84 h/week
Divide by weekly hours per p-t role	e.g., 20		
Number of part-time roles *		2.8	4.2

* Each role is employed 22.5 h/week (0.65 FTE), allowing an extra 0.5 h/day for a tea break, and servicing equipment.

Tables S1 (b). Weekly staffing rota for houses which open to visitors every day of the week and all year round. Staff only work 5 days per week; therefore, duty rosters ensure enough staff are on duty to achieve sufficient hours of cleaning every day.

House Open to Visitors	Mon	Tue	Wed	Thu	Fri	Sat	Sun
House head of dept.	-	On	On	On	On	On	-
House operations manager	On	On	On	On	-	-	On
Team leader	4	On	-	-	4	4	4
Team member 1	-	4	4	4	4	4	-
Team member 2	4	4	4	4	-	-	4
Team member 3	4	4	-	-	4	4	4
Seasonal or general cleaner	4	4	4	4	-	-	4
Total hours	12	16	12	12	12	12	12

Tables S1 (c). Weekly staffing rota for houses which close to visitors during the winter months, showing cleaning hours consolidated into 5-day working weeks.

House Closed to Visitors	Mon	Tue	Wed	Thu	Fri	Sat	Sun
House head of dept.	-	On	On	On	On	4	-
House operations manager	On	On	4	4	-	-	4
Team leader	4	4	-	-	4	4	4
Team member 1	4	4	4	4	4	-	-
Team member 2	4	4	4	4	4	-	-
Team member 3	4	4	4	4	4	-	-
Total hours	16	16	16	16	16	8	8

Tables S2. Recommended house staff structure, derived from an average of Quality and Quantity factors, converted to a percentage of the maximum score. Key to house staff roles: HHD: House head of dept.; HOM: House operations manager; TL: Team leader; ATL: Assistant team leader; TM: Team member.

Historic Property	Quality	Quantity	Average	%	House Team Structure		
					1	2	3
Mansion, late-18c, early 19c collections	4.23	3.51	3.87	77%	HHD	HOM	TL
<i>Cottage ornee</i> and collections, 18c	4.26	2.77	3.51	70%	HHD	HOM	TL
Farmhouse and collections, 17–19c	3.97	1.78	2.88	58%	TL	ATL	
Town house, 18c, 20c collections	3.41	2.12	2.76	55%	TL	ATL	
Terraced house and collections, early 20c	2.89	2.15	2.52	50%	TL	ATL	
Homestead, 17c, 18–19c alterations, mid-18c collections	2.28	2.25	2.26	45%	ATL	TM	

Tables S3. Determining minimum and optimum teams of part-time conservation roles, to achieve sufficient hands-on daily cleaning when the property is open to visitors, and also on one closed day (or equivalent additional hours on open days) to undertake weekly cleaning tasks.

Historic Property	Historic Spaces			Indicative Team for Robust Interiors			Sustainable Team for Fragile and Complex Interiors		
	Quality factor	Cleaning units	Days/week visitor access	Cleaning hours/day (@ 20 min/space)	Total hrs/week	Minimum team @ 22.5 hrs/week pp	Cleaning hours/day (@ 30 min/space)	Total hrs/week = target for CPI	Sustainable team @ 22.5 hrs/wk pp
Description									
Mansion, late 18c, early 19c collections	3.3	33	7.0	11.0	88	4.4	16.5	132	6.6
<i>Cottage ornée</i> and collections, 18c	3.7	18	7.0	6.0	48	2.4	9.0	72	3.6
Farmhouse and collections, 17–19c	3.3	8	6.0	2.7	19	0.9	4.0	28	1.4
Terraced house and collections, early 20c	2.3	9	5.0	3.0	18	0.9	4.5	27	1.4
Town house, 18c, with 20c collections	3.3	8	3.5	2.7	12	0.6	4.0	18	0.9
Homestead, 17c, mid-18c collections	2.0	19	3.0	6.3	25	1.3	9.5	10	0.5

Tables S4. Calculating hours and roles for deep cleaning, from November to March, or spread throughout the year, with and without visitor access (i.e., restricted, intermittent, or continuous) during the winter months.

Historic Property	Historic Spaces	Some Winter Access + Deep Clean		Year-Round Access + Deep Clean		Indicative Roles		Optimum Roles	
		Cleaning units	Week Equivalents	Yearly factor: 1 year open + deep cleaning time	Hours/week	@ 22.5 hrs/wk pp	Hours/week – target for CPI	@ 22.5 hrs/wk pp	
Description									
Mansion, late 18c, early 19c collections	33		22.55	1.28	113	5.63	169	8.45	
<i>Cottage ornée</i> and collections, 18c	18		24.03	1.31	63	3.14	94	4.71	
Farmhouse and collections, 17–19c	8		19.25	1.22	23	1.14	34	1.70	

Terraced house and collns, early 20c	9	12.76	1.09	20	0.98	29	1.47
Town house, 18c, 20c collections	8	15.75	1.15	14	0.69	21	1.03
Homestead, 17c, mid-18c collns	19	13.20	1.10	7	0.35	10	0.52

Tables S5 (a). Conservation performance. Housekeeping targets and measures of success, used during annual or triennial reviews.

Band	Dimensions Score	Target to Achieve	Measure of Success	% Relevant Target Achieved
A	>65% +	100% optimum hours	Excellent	100%
B	45–64%	80% optimum hours	Good	80%
C	25–44%	60% optimum hours	Fair	60%
D	24% and below	100% minimum hours	Poor	40%
			Failing	<40%

Tables S5 (b). Conservation performance. Example scores and ratings for achievements against housekeeping targets.

House in Band	Target Cleaning Hours per Week	Achieved Cleaning Hours per Week	Calculation	Performance Score	Rating
A	120 h	45 h	(45/120)*100	37%	Poor
B	76 h	48 h	(48/76)*100	63%	Fair
C	60 h	50 h	(50/60)*100	83%	Good
D	22 h	22 h	(22/22)*100	100%	Excellent

Tables S6. Calculating preventive conservation and short-term cyclical maintenance budgets for collections and interiors, as each property’s contribution to an indicative national budget of GBP 3 m per year for 25 years.

Preventive Conservation	Interiors and Collections			Library	Historic Spaces	STC Conservation and Maintenance Need		
Property description	Significance	Fragility	Complexity	Significance	Cleaning units	Quality x spaces	% National total	% Share of GBP 3 m
Mansion, late 18c, early 19c collections	4	3	3	4	33	495	0.88	GBP 26,258
Cottage ornee and collections, 18c	4	4	4	3	18	270	0.48	GBP 14,323
Homestead, 17c, mid-18c collections	2	2	2	1	19	133	0.24	GBP 7055
Farmhouse and collections, 17–19c	4	3	3	4	8	112	0.20	GBP 5941
Town house, 18c, 20c collections	3	4	3	1	8	88	0.16	GBP 4668
Terraced house and collections, early 20c	3	2	2	2	9	81	0.14	GBP 4297

Tables S7. Six different houses: a more recent distribution of the national GBP 3 m conservation and maintenance ‘need’ budget in proportion to the quality (i.e., revised significance, fragility, and complexity) of collections and quantity of interior spaces open to visitors.

Historic Property	Spaces Quantity	Collections Quality	Library Quality	ity Quan-	National Q and Q	2019-20
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Description	Cleaning units	Significance	Fragility	Complexity	Significance		%	% GBP 3 m
Hall and collections, 16–17c	41	4.5	4	4	3	636	1.33	GBP 36,818
Hall, early 18c, 18–19c collections	22	3.5	3	3	2	311	0.65	GBP 17,989
House, 16c, 17–18c collections	21	2	2	3	2	189	0.4	GBP 10,950
Merchant's house, 15c, 17c colls.	14	2	3	3	2	140	0.29	GBP 8111
House, 14–15c, altered 16c and 18c	6	2	2	1	1	36	0.08	GBP 2086
Cottage and collections, 19c	8	2	1	1	-	32	0.07	GBP 1854
