

## TIMINGS FOR THE HARVEST AND CONSTRUCTION ELEMENTS OF BUILDING 851 –

### RAW DATA

#### Harvesting Timings

All timings given for harvesting are the mean times for English Heritage volunteers cutting with flint tools after a small amount of practice

##### Wall Stakes ( 40 stakes per wall).

Pine and hazel stakes between 70mm and 170mm diameter (at butt end).

40 X 2:47 (min:sec) = 111.333 minutes = **1.856 hours = 1:51:20 (hr:min:sec)**

##### Wall weaving material (10 rods per stake for 2m height = 400 rods per wall + 100 rods for spare)

Hazel rods between 30mm and 40mm diameter (at butt end).

500 x 1:29 (min:sec) = 741.667 minutes = **12.361 hours = 12:21:40 (hr:min:sec)**

##### Wall binding weavers (6 starting rods with one rod added per stake = 46 weavers).

Hazel rods between 10mm and 20mm diameter (at butt end).

46 x 1:07 (min:sec) = **51.366 minutes = 51:22 (min:sec)**

##### Rafters (27 rafters)

Hazel poles between 50mm and 70mm diameter (at butt end).

27 x 4:10 (min:sec) = 112.5 minutes = **1.875 hours = 1:52:30 (hr:min:sec)**

##### Purlins (7 rods per rafter for 2m length = 189 rod, estimate based on banding of purlins being 2/3 of the coverage of walls)

Hazel rods between 10mm and 30mm diameter (at butt end).

189 x 1:02 (min:sec) = 195.3 minutes = **3.255 hours = 3:15:18**

	<b>Harvesting of Materials (hrs)</b>
Wall Stakes	1.85
Weavers for Wall	12.35
Wall Binders	0.85
Rafters	1.86
Purlins	3.25
Timber for Furniture	2.7
<b>TOTAL</b>	<b>22.86</b>

## Construction Timings

These times were recorded during the prototype phase of the project and have been converted down to the time that it would take for one person to complete the task.

	<b>On Site Construction (hrs)</b>
Weaving Walls	100
Crushing Chalk	270.4
Daubing Walls	196.27
Constructing Roof Frame	256
Knotting Wheat Straw	75.2
Thatching Roof	48
Laying Floor	50.3
Furniture Construction	99
<b>TOTAL</b>	<b>1095.17</b>

### Walls

This has been estimated through photographs as:

08/03/13 – 14/03/13 = 5 working days @ 4 hours per day = 20 hours x 4 volunteers = **100 hours**

	<b>Construction of Walls (hrs)</b>
Weaving Walls	100
Crushing Chalk	270.4
Daubing Walls	196.27
<b>TOTAL</b>	<b>566.67</b>

### Daubing

#### *Chalk:*

We started with crushing chalk to a size no greater than 20mm and filling buckets.

The mean time of each 15 litre bucket = 33:48 (mins:sec)

Timing is for 1 square metre of wall, daubed on both sides, with a wall depth of 120mm.

Two volunteers mixing and two volunteers applying the daub, using 15 buckets of chalk it took 1hr 32min to apply. (bucket = 15 litres)

Time needed and number of buckets of crushed chalk required to daub walls = 32 sq mtr of wall x 15 buckets of crushed chalk = **480 buckets = 270:24:00 (hr:min:sec)**

15 litres = 15,000 cm<sup>3</sup> X 1.442g (density grams per cubic centimetre) = 21.6kg

21.6kg X 480 buckets = 10,368 kg = **10.368 tonnes**

Time needed to apply daub to walls = 6:08 (hrs:min) x 32 square metres of wall = **196:26 (hrs:min)**

*'Pig mud':*

Mud from the pig fields was delivered to the site which was then applied directly to the walls.

Timing is for 1 square metre of wall, daubed on both sides, with a wall depth of 140mm.

We had two volunteers mixing and two volunteers applying the daub, using 3 barrows of mud it took 15min to apply.

Time needed to apply daub to walls = 1 hour x 32 square metres of wall = 32 hours

	<b>Wall Daubing Methods Comparison (hrs)</b>
Chalk Daub	196.433
Pig Mud Daub	32

Roof

This has been estimated through photographs as:

15/03/13 – 09/04/13 = 16 days @ 4 hours per day = 64 hours x 4 volunteers = **256 hours**

Knottinq wheat straw (a handful of wheat straw knotted at the head end).

Mean timing for making 20 bundles of knotted thatch = 12:53 (min:sec)

Roof area = 48 square metres

The coverage of the knotted thatch is 150 bundles per square metre.

Number of bundles required for roof = 48 x 150 = **7200**

Time to make one square metre of knotted thatch = 1hr 34min

Total time for making 48 square metres of knotted thatch = 48 x 1:34 (hrs:mins) = **75.2 hours = 75:12:00 (hr:min:sec)**

Thatching with knotted wheat straw

With 2 volunteers, 1 square metre used 150 bundles of wheat straw and took 30min.

Time required to thatch roof = **48 hours**

	<b>Construction of Roof (hrs)</b>
Knottinq Wheat Straw	75.2
Constructing Roof Frame	256
Thatching Roof	48
<b>TOTAL</b>	<b>379.2</b>

Floor

We didn't take any measurement of the floor being laid but from the photographs that were taken the times seem to be:

26/4/13 15:25 - 4 hrs construction time

25/4/13 14:34 - 1.5 hrs construction time

Total estimated time for laying floor 5.5 hours x 3 volunteers = **16.5 hours**

Material for floor = 15 buckets of crushed chalk x 4 meters square = 60 buckets x 33:48 (min:sec)(time for crushing chalk) = **33.8 hrs = 33:48:00 (hrs:min:sec)**

Total time = **50.3 hrs = 50:18:00 (hrs:min:sec)**

Furniture

Felling tree for use in furniture = **2:42:00 (hrs:min:sec)**

Preparation of logs; Splitting, de-barking, cutting/shaping ends = 15 hours

Dressing logs; Dressing ends and split surface of quartered log = 18 hours

Joints; Cutting notches and mortices in logs = 15 hours

Installation; Preparing floor, cutting and fitting support rods, making cord, tying/fitting = 16 hours

Platforms; Collecting materials for and making 4 hazel & willow platforms = 35 hours

Total = **99 hours**

	<b>Construction of Furniture</b>
Preparation of Logs	15
Dressing logs	18
Cutting Joints	15
Making Platforms	35
Installation Into Buildings	16
<b>TOTAL</b>	<b>99</b>

**Total build time estimated to construct Building 851 = 1107.03 man hours**

**If we assume that working 8 hours per day the building would be constructed by one person in 138.38 days.**

<b>Number of Builders</b>	<b>Total Build Time (days)</b>
1	138.38
2	69.18
3	46.12
4	34.59
5	27.67
6	23.06
7	19.76
8	17.29
9	15.37
10	13.83