

DENBIGH QUARRY STILE - FOOTFALL REPORT

BRIEF

- Fit a pedestrian counter to the stile on the public footpath west of Denbigh Quarry at SJ 0482 6699
- Collect data for at least 31 consecutive days after the adjacent gate had been padlocked by the owner to maximise use of the stile to cross between fields.
- Analyse and interpret data, reporting on the use of this path by the public.

METHOD

A secure metal box was fixed to the stile post as seen in the photo below. This contained a body heat sensor linked to a data logger which saves its results into flash memory. Each record is a 6-byte timestamp in the format dd/mm/yyyy HH:MM:SS so as to store every recorded event to the nearest second. This is the dataset called DENBIGHQ in the tables and charts discussed below.



The data logger has an internal software timer which was set to ignore repeated pulses from the sensor if they came less than 3 seconds apart as these would then be caused by the same person taking their time to cross the stile. It follows that every timestamp can only be recorded at least 3 seconds after the previous one.

We decided to treat these timestamps as the count of individual people although someone with a dog might well pause for longer than 3 seconds in the process of both negotiating the stile, and that would lead to over-counting. The stile is intended to stop cows moving between fields so there is no wire mesh or fencing underneath it. As small to medium size dogs can pass underneath the tread, dogs were not reckoned to be an issue in terms of causing over-counting by virtue of delaying the walker's crossing and causing extra spurious counts to be recorded.

RESULTS

We have analysed the number of timestamps and the clustering of the timestamps. The latter suggest groups of people at certain times and solo walkers at other times. We have treated a series of timestamps coming within a couple of minutes of each other as a group because the site is a sufficiently quiet place that the chances of independent groups meeting up exactly at the stile is quite low.

The events recorded per day (raw timestamps) are shown on the calendar below:

2019	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0	0	0	0	0	0	0	0	0	11	0	0
2	0	0	0	0	0	0	0	0	0	20	0	0
3	0	0	0	0	0	0	0	0	0	19	0	0
4	0	0	0	0	0	0	0	0	0	16	0	0
5	0	0	0	0	0	0	0	0	0	35	0	0
6	0	0	0	0	0	0	0	0	0	20	0	0
7	0	0	0	0	0	0	0	0	0	14	0	0
8	0	0	0	0	0	0	0	0	0	42	0	0
9	0	0	0	0	0	0	0	0	0	14	0	0
10	0	0	0	0	0	0	0	0	0	6	0	0
11	0	0	0	0	0	0	0	0	1	18	0	0
12	0	0	0	0	0	0	0	0	0	23	0	0
13	0	0	0	0	0	0	0	0	0	37	0	0
14	0	0	0	0	0	0	0	0	6	12	0	0
15	0	0	0	0	0	0	0	0	2	47	0	0
16	0	0	0	0	0	0	0	0	2	38	0	0
17	0	0	0	0	0	0	0	0	0	15	0	0
18	0	0	0	0	0	0	0	0	0	2	0	0
19	0	0	0	0	0	0	0	0	4	31	0	0
20	0	0	0	0	0	0	0	0	7	22	0	0
21	0	0	0	0	0	0	0	0	45	39	0	0
22	0	0	0	0	0	0	0	0	12	25	0	0
23	0	0	0	0	0	0	0	0	24	28	0	0
24	0	0	0	0	0	0	0	0	14	13	0	0
25	0	0	0	0	0	0	0	0	28	6	0	0
26	0	0	0	0	0	0	0	0	18	0	0	0
27	0	0	0	0	0	0	0	0	18	0	0	0
28	0	0	0	0	0	0	0	0	29	0	0	0
29	0		0	0	0	0	0	0	13	0	0	0
30	0		0	0	0	0	0	0	14	0	0	0
31	0		0		0		0	0		0		0

Any event total in black is original data. An event total in white (e.g. on 8th October) shows that editing has taken place, e.g. to remove counts associated with the data collection visit. A white rectangle indicates a diary note (e.g. on 16th September when the owner padlocked the wide gate to maximise usage of the stile).

The cell colouring represent the number of hours per day in which some activity was recorded where red=12+ hours, green=6+ hours and blue=1+ hours.

There is an obvious jump in walker activity but not immediately from the date when the gate was locked but from the Saturday following. This is the red cell in the calendar. This could be due to community concerns about the implications of the quarry project. An alternative explanation is that many walkers were opening the gate in preference to climbing over the stile prior to the gate being locked.

The Excel spreadsheet (Annex A) contains the raw data and clustering interpretation. The calendar below shows the number of groups per day that we have inferred. We have seen a pattern where some visitors cross the stile, walk to the woodland or

around the entire top field, then return to the stile, cross it and return to the town. In these cases they would be counted as two groups since their usages of the stile would more than a couple of minutes apart. In other cases people continue into the woodland, and beyond it for a longer walk, possibly returning to town by a different route, in which case they would be scored only as a single group in this study.

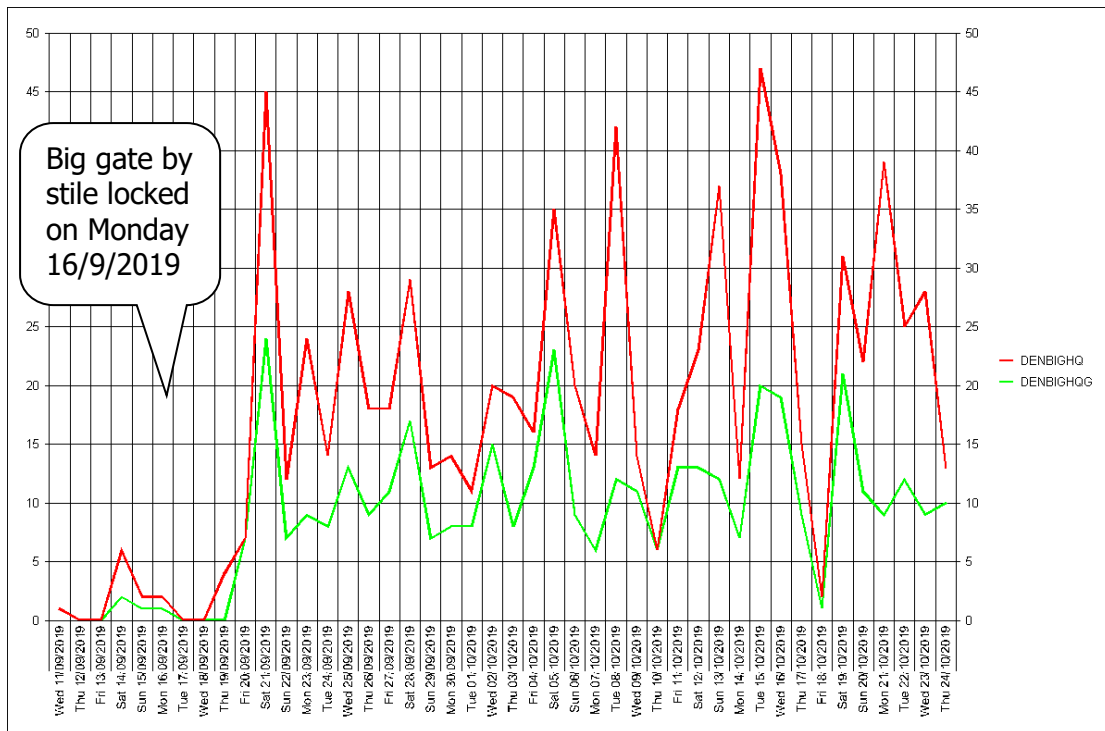
2019	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0	0	0	0	0	0	0	0	0	8	0	0
2	0	0	0	0	0	0	0	0	0	15	0	0
3	0	0	0	0	0	0	0	0	0	8	0	0
4	0	0	0	0	0	0	0	0	0	13	0	0
5	0	0	0	0	0	0	0	0	0	23	0	0
6	0	0	0	0	0	0	0	0	0	9	0	0
7	0	0	0	0	0	0	0	0	0	6	0	0
8	0	0	0	0	0	0	0	0	0	12	0	0
9	0	0	0	0	0	0	0	0	0	11	0	0
10	0	0	0	0	0	0	0	0	0	6	0	0
11	0	0	0	0	0	0	0	0	1	13	0	0
12	0	0	0	0	0	0	0	0	0	13	0	0
13	0	0	0	0	0	0	0	0	0	12	0	0
14	0	0	0	0	0	0	0	0	2	7	0	0
15	0	0	0	0	0	0	0	0	1	20	0	0
16	0	0	0	0	0	0	0	0	1	19	0	0
17	0	0	0	0	0	0	0	0	0	9	0	0
18	0	0	0	0	0	0	0	0	0	1	0	0
19	0	0	0	0	0	0	0	0	0	21	0	0
20	0	0	0	0	0	0	0	0	7	11	0	0
21	0	0	0	0	0	0	0	0	24	9	0	0
22	0	0	0	0	0	0	0	0	7	12	0	0
23	0	0	0	0	0	0	0	0	9	9	0	0
24	0	0	0	0	0	0	0	0	8	10	0	0
25	0	0	0	0	0	0	0	0	13	1	0	0
26	0	0	0	0	0	0	0	0	9	0	0	0
27	0	0	0	0	0	0	0	0	11	0	0	0
28	0	0	0	0	0	0	0	0	17	0	0	0
29	0		0	0	0	0	0	0	7	0	0	0
30	0		0	0	0	0	0	0	8	0	0	0
31	0		0		0		0	0		0		0

The raw data at the timestamp level shows some regular patterns. The most common is that someone or some group uses the stile, then 5-10 minutes later it happens again. That corresponds to the type of visitor who walks across or around the top field and then goes straight back to town.

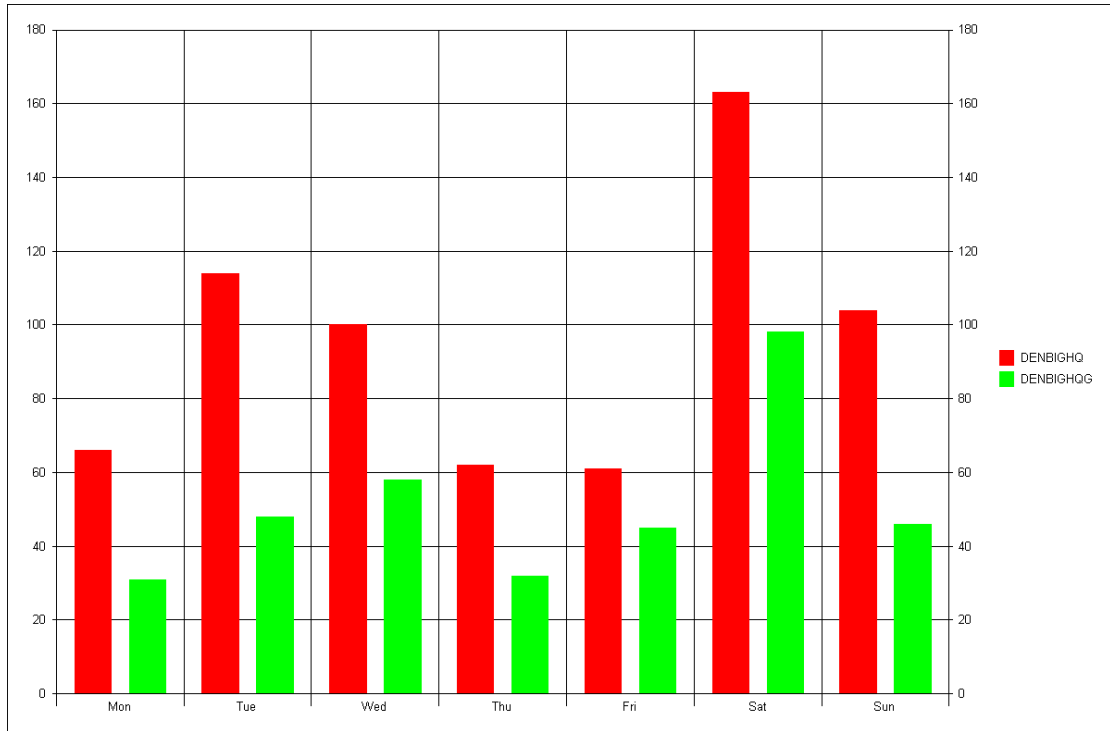
The group numbers in the calendar above do not include the visits made by professional visitors (i.e. our own staff and the ecologists). There have been other visits for non-recreational reasons, including the landowner's, but as we do not know their dates and times we have not removed them from the group counts.

Our conclusions are that the stile is used every day in daylight hours to a modest extent with three clear preferred times of day as seen in the charts and tables below: the early morning, mid morning to mid afternoon, and after work or evening. There is no overnight use between 9pm and 7am, which is to be expected for such a path.

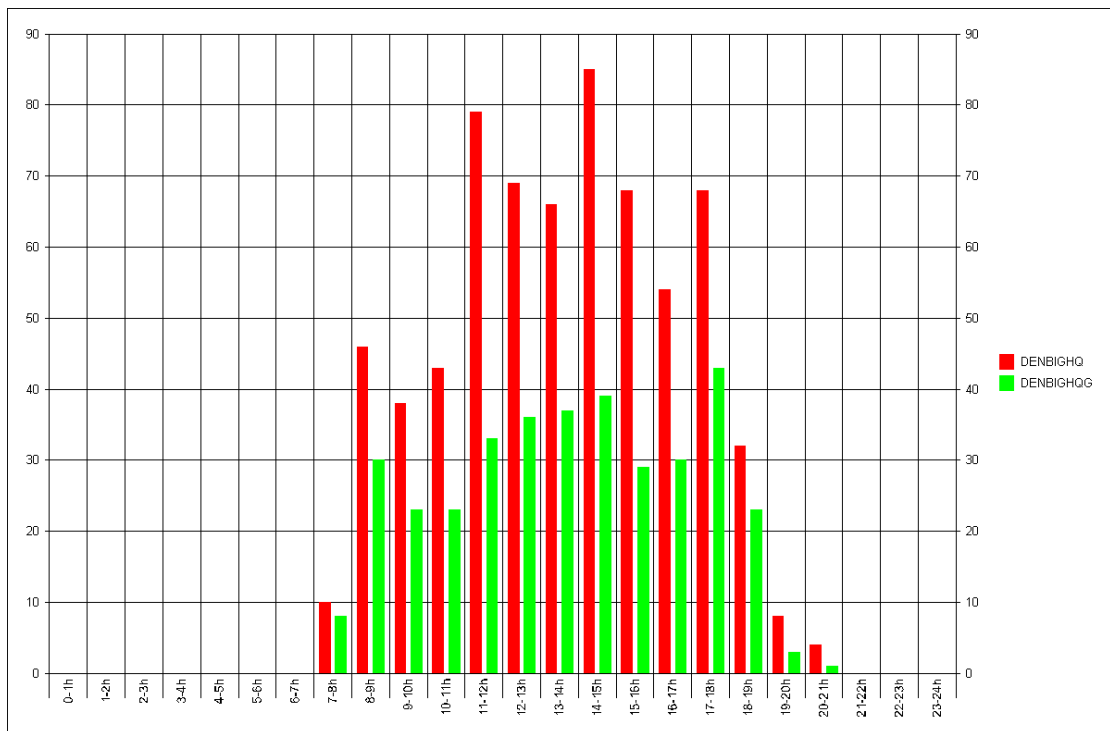
The busiest weekday is clearly Saturday although we cannot read too much into the day-of-week pattern with such a short run of days in the study to go so far as to suggest the path has tourist potential as distinct from local community value. Put into perspective, in local studies we have measured Denbigh High Street footfall for the September/October period in other years at 2,000 daily while the castle had about 60 visitors and the town walls 10 people daily. The walls need a loaned key.



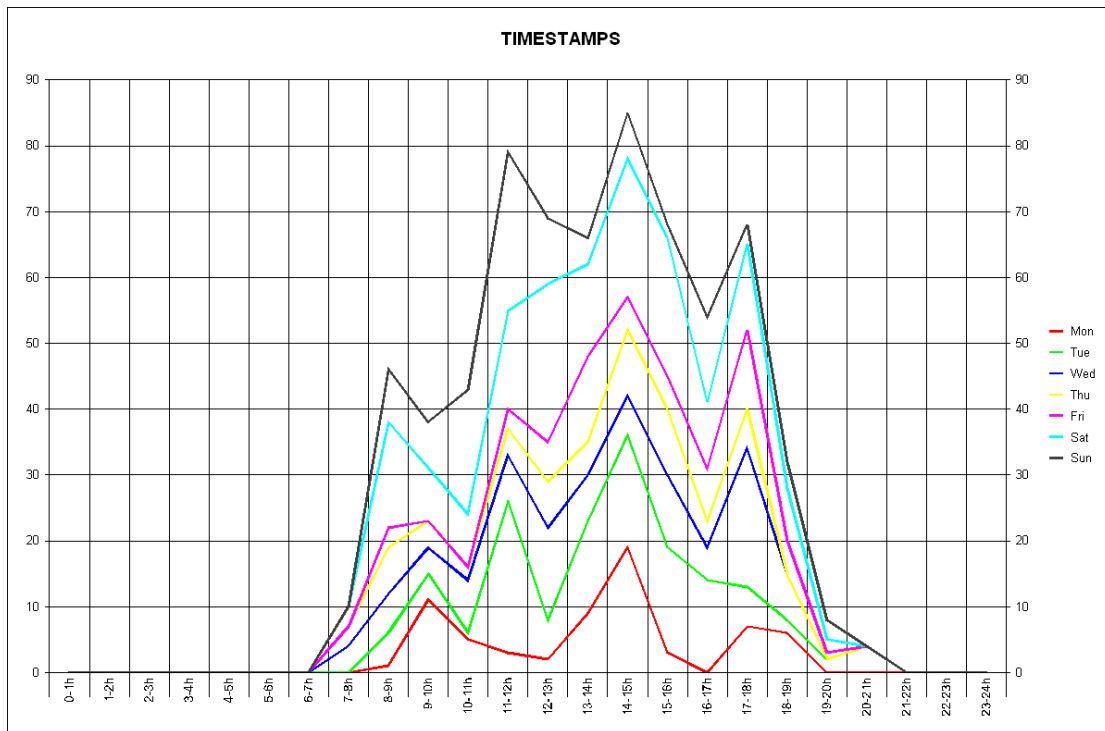
Full weeks from Monday 16th September to Sunday 20th October



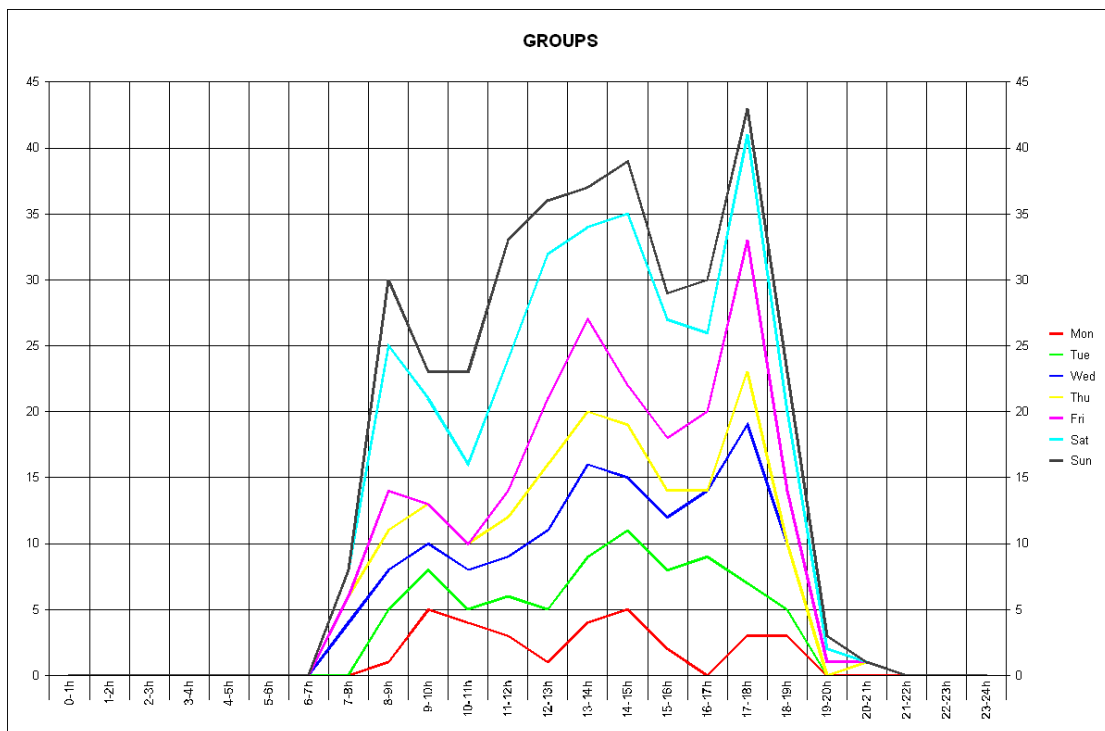
Monday 16th September to Sunday 20th October by weekday



Monday 16th September to Sunday 20th October by hour of day



Monday 16th September to Sunday 20th October 2019 by hour of day vs weekday
Timestamps - series stacked



Monday 16th September to Sunday 20th October 2019 by hour of day vs weekday
Groups - series stacked

Viewed as raw timestamps, there appear to be four preferred visiting times of
early morning, late morning, mid-afternoon, evening

The late morning and early afternoon peaks merge when viewed as groups

	DENBIGHQ	DENBIGHQG
	WALKERS	GROUPS
Mon 16/09/2019	2	1
Tue 17/09/2019	0	0
Wed 18/09/2019	0	0
Thu 19/09/2019	4	0
Fri 20/09/2019	7	7
Sat 21/09/2019	45	24
Sun 22/09/2019	12	7
Mon 23/09/2019	24	9
Tue 24/09/2019	14	8
Wed 25/09/2019	28	13
Thu 26/09/2019	18	9
Fri 27/09/2019	18	11
Sat 28/09/2019	29	17
Sun 29/09/2019	13	7
Mon 30/09/2019	14	8
Tue 01/10/2019	11	8
Wed 02/10/2019	20	15
Thu 03/10/2019	19	8
Fri 04/10/2019	16	13
Sat 05/10/2019	35	23
Sun 06/10/2019	20	9
Mon 07/10/2019	14	6
Tue 08/10/2019	42	12
Wed 09/10/2019	14	11
Thu 10/10/2019	6	6
Fri 11/10/2019	18	13
Sat 12/10/2019	23	13
Sun 13/10/2019	37	12
Mon 14/10/2019	12	7
Tue 15/10/2019	47	20
Wed 16/10/2019	38	19
Thu 17/10/2019	15	9
Fri 18/10/2019	2	1
Sat 19/10/2019	31	21
Sun 20/10/2019	22	11
Mon 21/10/2019	39	9
Tue 22/10/2019	25	12
Wed 23/10/2019	28	9
Thu 24/10/2019	13	10
TOTAL	769	397
NUM OF DAYS	39	
AVERAGE/DAY	20	10
PER MONTH	601	310
PER YEAR	7197	3716
AVG GROUP SIZE		1.9

	DENBIGHQ	DENBIGHQG
2019W38	70	39
2019W39	144	74
2019W40	135	84
2019W41	154	73
2019W42	167	88
TOTAL	670	358
WEEKS	5	5
AVERAGE	134	72

Totals for 5 weeks from Monday 16th September to Sunday 20th October 2019								
TIMESTAMPS	Mon	Tue	Wed	Thu	Fri	Sat	Sun	TOTAL
0-1h	0	0	0	0	0	0	0	0
1-2h	0	0	0	0	0	0	0	0
2-3h	0	0	0	0	0	0	0	0
3-4h	0	0	0	0	0	0	0	0
4-5h	0	0	0	0	0	0	0	0
5-6h	0	0	0	0	0	0	0	0
6-7h	0	0	0	0	0	0	0	0
7-8h	0	0	4	3	0	3	0	10
8-9h	1	5	6	7	3	16	8	46
9-10h	11	4	4	4	0	8	7	38
10-11h	5	1	8	2	0	8	19	43
11-12h	3	23	7	4	3	15	24	79
12-13h	2	6	14	7	6	24	10	69
13-14h	9	14	7	5	13	14	4	66
14-15h	19	17	6	10	5	21	7	85
15-16h	3	16	11	10	5	21	2	68
16-17h	0	14	5	4	8	10	13	54
17-18h	7	6	21	6	12	13	3	68
18-19h	6	2	7	0	5	8	4	32
19-20h	0	2	0	0	1	2	3	8
20-21h	0	4	0	0	0	0	0	4
21-22h	0	0	0	0	0	0	0	0
22-23h	0	0	0	0	0	0	0	0
23-24h	0	0	0	0	0	0	0	0
TOTAL	66	114	100	62	61	163	104	670
GROUPS	Mon	Tue	Wed	Thu	Fri	Sat	Sun	TOTAL
0-1h	0	0	0	0	0	0	0	0
1-2h	0	0	0	0	0	0	0	0
2-3h	0	0	0	0	0	0	0	0
3-4h	0	0	0	0	0	0	0	0
4-5h	0	0	0	0	0	0	0	0
5-6h	0	0	0	0	0	0	0	0
6-7h	0	0	0	0	0	0	0	0
7-8h	0	0	4	2	0	2	0	8
8-9h	1	4	3	3	3	11	5	30
9-10h	5	3	2	3	0	8	2	23
10-11h	4	1	3	2	0	6	7	23
11-12h	3	3	3	3	2	10	9	33
12-13h	1	4	6	5	5	11	4	36
13-14h	4	5	7	4	7	7	3	37
14-15h	5	6	4	4	3	13	4	39
15-16h	2	6	4	2	4	9	2	29
16-17h	0	9	5	0	6	6	4	30
17-18h	3	4	12	4	10	8	2	43
18-19h	3	2	5	0	4	6	3	23
19-20h	0	0	0	0	1	1	1	3
20-21h	0	1	0	0	0	0	0	1
21-22h	0	0	0	0	0	0	0	0
22-23h	0	0	0	0	0	0	0	0
23-24h	0	0	0	0	0	0	0	0
TOTAL	31	48	58	32	45	98	46	358

Report prepared on 14/11/2019 by Stuart France
 Linetop Ltd, 16 Roseheyworth Business Park, Abertillery NP13 1SP
 Email service@linetop.co.uk
 Tel 01495 321569