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Exposition of the Methodology Adopted in Calculating the Timing of Ṣalāh for Southampton Medina Mosque

Introduction: This document aims to elucidate and clarify the methodology by which ṣalāh (prayer) timings are calculated, and subsequently printed and implemented at Southampton Medina Mosque; it will be centred on explaining necessary details, relevant partially or fully, to the calculation of timings for the five ṣalāhs which are a daily obligation upon Muslims.

Allāh The Most Exalted has made incumbent upon all sane Muslim adults the establishment of ṣalāh, five times a day. This divinely commanded injunction mandates that each ṣalāh must be prayed within its prescribed time of the day; the significance, essentiality and indispensability of the connection between a ṣalāh and its corresponding ordained time is stipulated in many Qur`ānic verses and Prophetic narrations. Such as, Allāh the Most Glorious has stated in the Qur`ān: “Indeed prayers are a time-bound obligatory duty upon the Muslims” (4:103). This āyah perspicuously affirms the undeniable and unquestionable connection between ṣalāh and its prescribed time. It should therefore be well understood that entrance of the correct time is a precondition for the 5 daily ṣalāhs.

Before discussing the core of the matter at hand, below is a list of some crucial and relevant terminology which will assist in complete comprehension of this document. Please do familiarise yourself with these terms, so as to avoid chances of becoming confused when the respective terminology is used.

Important Terminology

‘Arḍul-balad (Latitude): The northern or southern angular distance from the equator. The latitude is from 0 to 90 degrees.

Inḥiṭāṭ-ush-Shams (The Depression of the Sun): The measurement of the sun’s centre below the horizon, it ranges from 0 to 90 degrees e.g. 0 degrees is when the centre of the sun is aligned with the Horizon and 90 degrees is when the sun’s centre is at the nadir.

Niṣfun-Nahār ḥaqeeqī (Actual Midday): The time that is equally between sunrise and sunset

Niṣfun-Nahār shar’ī (Shar’ī Midday): The time that is equally between, the start time of fajr and sunset

Niṣful-Layl ḥaqeeqī (Actual Midnight): Half the time between sunset and sunrise added to the time of sunset

Aṣ-Ṣubḥ Al-Kāzib (False Dawn): This is that light which appears like the tail of a wolf a bit above the eastern horizon which is described as zodiacal light.

Aṣ-Ṣubḥ Aṣ-Ṣādiq (Eastern Astronomical Twilight): This occurs a long time after aṣ-ṣubḥ al-kāzib (Zodiacal light). It is the light spreading across the horizon towards the north and south when the Sun is 18 degrees below the horizon (in the East).

Ash-Shafaq Al-Aḥmar (Red Twilight): The red light that remains along the western horizon after sunset, until the sun’s angle of depression reaches 12 degrees below the horizon.

Ash-Shafaq Al-Abyaḍ (White Twilight): The white light that remains along the western horizon after sunset, until the sun’s angle of depression reaches 18 degrees below the horizon.

Fajr (Dawn Prayer): This is the first of five ṣalāhs which Muslims are required to establish every day. Just as the name suggests, the time for fajr ṣalāh begins with the break of dawn (*aṣ-ṣubḥ aṣ-ṣādiq*). It ends exactly at sunrise; one must ensure that he/she has prayed fajr before the sun begins to rise.

It is important to know that there are two types of dawns. The first is known as *aṣ-ṣubḥ al-kāẓib* (false dawn), and is not connected to any ṣalāh time, nor any other religious matter so to say. Its light is in reality zodiacal light, and is not light that appears naturally due to the sun's close proximity to the horizon, hence the name false dawn. Furthermore, such light can only be observed in the short days of the year e.g. during winter nights, therefore it should not under any circumstance be mistaken for *aṣ-ṣubḥ aṣ-ṣādiq*, which is the actual dawn.

In order to observe the precise time of occurrence of *aṣ-ṣubḥ aṣ-ṣādiq*, it is necessary for *ash-shafaq al-abyaḍ* to disappear, or in other words, for the sun to depress more than 18 degrees below the horizon. If this does not occur, then it is not possible to distinguish between the white light of *ash-shafaq al-abyaḍ*, and the white light of *aṣ-ṣubḥ aṣ-ṣādiq*; a white light remains continuous along the horizon throughout such a night, thus making it impossible according to the above definition of *aṣ-ṣubḥ aṣ-ṣādiq*, to determine the start time of fajr. This phenomenon only occurs in those places with *latitude* equal to, or a greater than, 48°30' [forty-eight degrees and 30 minutes]. The *latitude* of the UK is roughly between 50-60 degrees, and more pertinently, the *latitude* of Southampton medina Mosque is 50°91'. Consequently at Medina Mosque, from 25th/26th of May to 17th July, *the depression of the sun* is less than 18 degrees: the light on the horizon does not disappear.

For those days when the light on the horizon remains continuous throughout the entire night, fajr starts after *niṣful-layl ḥaqeeqī* (*actual midnight*) has passed. Therefore on such days, it is compulsory to pray 'ishā', and finish saḥoor (for those intending to fast), before *niṣful-layl ḥaqeeqī*.

As an example to illustrate, suppose on a night when *the depression of the sun* is less than 18 degrees, the sun sets at 2140 and rises at 0440; the total period of time for which the sun is below the horizon is 7 hrs. Halving this time yields 3hrs 30mins. Adding this to the time of sunset gives 2140 + 0330 = 0110. This is the time of *niṣful-layl ḥaqeeqī* for that night.

Zuhr (Afternoon Prayer): The time in which zuhr ṣalāh is valid begins immediately after *niṣfun-nahār ḥaqeeqī* and lasts until the start of 'aṣr – the third ṣalāh of the day.

'Aṣr (Late Afternoon Prayer): There are two valid opinions in Islam regarding the start time of 'aṣr ṣalāh. The 1st opinion states that 'aṣr begins once the sun has declined (after midday) to such an extent that the shadow of an arbitrary object is the same size as the object itself, plus the size of its shadow at *niṣfun-nahār ḥaqeeqī*. The 2nd opinion is similar; according to it, the time for 'aṣr begins once the sun has declined so much after midday that the shadow of any object is double the size of the object plus the size of the object's shadow at *niṣfun-nahār ḥaqeeqī*: this is the start time of 'Aṣr according to Imām Abū Hanīfah.

As an example, consider a stick of length 10cm that has a shadow of 5cm at *niṣfun-nahār ḥaqeeqī* on a given day. Because the length of the stick is 10cm, this means that the start time of 'aṣr on that day, according to the first opinion, will be once the stick's shadow has reached a length of 15cm: 10cm (size of object) + 5cm (size of shadow at *niṣfun-nahār ḥaqeeqī*) = 15cm (start time).

Now consider the same stick on the same day as above, with a 5cm shadow at *niṣfun-nahār ḥaqeeqī*. According to the second opinion, on that day, 'aṣr will start once the shadow of the stick is 25cm long: 20cm (double the size of object) + 5cm (size of shadow at *niṣfun-nahār ḥaqeeqī*) = 25cm (start time)

The prescribed time for 'aṣr ṣalāh ends precisely at sunset, simultaneously, the time for the next ṣalāh begins.

Maghrib (Sunset Prayer): The fourth prayer mandatory upon Muslims to pray. It starts once the sun has set (i.e. disappeared below the horizon), and lasts until it is the time of the next prayer ('ishā').

'Ishā` (Night Prayer): Its time begins straight after maghrib, and lasts until the start of fajr. So the end time of the 'ishā` prayer does not need any explanation as it is exactly the same time as the start time of fajr. As for its start time, then there are 2 major valid opinions regarding this, just as is the case for 'aṣr.

The first opinion states that 'ishā` starts when *ash-shafaq al-abyaḍ* disappears, or after *the depression of the sun* has reached 18 degrees below the horizon. This opinion is clearly impossible to follow for the whole year. The reason being that on some days of spring and summer, either *ash-shafaq al-abyaḍ* disappears for a very brief moment before *aṣ-ṣubḥ aṣ-ṣādiq* occurs and the time of fajr begins, or *ash-shafaq al-abyaḍ* remains continuous throughout the night and joins with *aṣ-ṣubḥ aṣ-ṣādiq* without disappearing at all. This difficulty '*ḥaraj*' in acting upon this opinion occurs in Southampton roughly between 21 April and 31 August. As a result, between these dates, those following this opinion are compelled to follow the second opinion, which is detailed below.

The second opinion states that 'ishā` starts when *ash-shafaq al-aḥmar* disappears, or after *the depression of the sun* has reached 12 degrees below the horizon. This opinion is also impractical to follow for the whole year. This is because there are places in the UK, for which there are days in the summer, in which *ash-shafaq al-aḥmar* disappears for a brief moment before *aṣ-ṣubḥ aṣ-ṣādiq*, or *ash-shafaq al-aḥmar* remains continuous throughout the night, even until the occurrence of *aṣ-ṣubḥ aṣ-ṣādiq*. This difficulty '*ḥaraj*' in acting upon this opinion occurs in Southampton, roughly between 25 May and 17 July. Due to this difficulty, the time remains constant for every single day, between the above two dates. Post 17th July, once it becomes natural again to start praying 'ishā` with the disappearance of *ash-shafaq al-aḥmar*, the 'ishā` start time begins to change again.

Interesting Fact: For those places with latitudes more than or equal to 84°30' (in the vicinity of the north and south poles), there are certain days in which the sun very briefly rises/sets, or does not set/rise at all. The jurists of Islām have differed over the ruling in such places. Some stated that when the sun doesn't set/rise at all, it is not compulsory to pray the ṣalāhs for which the sign of their start time is hidden, and others said to make those prayers up as qaḍa. Others insisted on taking the ṣalāh time to be the same as the last days when the sun set/rose, or taking it to be the same as the closest city where the times can be calculated as normal. The last edict is the more veracious, prominent and famous one.

The Prohibited Times for Prayer: There are 3 times during the day in which all types of ṣalāh are prohibited.

- 1) During sunrise – This is the period of time from the start of sunrise. 20 minutes should be allowed after the sunrise time to ensure the entire sun has risen above the horizon.
- 2) During sunset – This is the period of time which starts towards the beginning of sunset, when ones gaze can fix itself on the sun without any strain. Just like during sunrise, 20 minutes need to be allowed before sunset to ensure safety from entrance into this time period. It should be noted, that even though one can pray 'aṣr until the start time of maghrib, to delay it to such an extent without any valid reason is strictly prohibited.
- 3) The time between *niṣfun-nahār shar'ī* and *niṣfun-nahār ḥaqeeqī* – The length of this period of time for a given day, is equivalent to half the duration of fajr on that given day. For example, assume on a given day, fajr starts and ends at 0300 and 0500 respectively. The duration of fajr is 2 hours in this case. Therefore, the length of the prohibited time will be 1 hour before Ṣuḥr on this day.