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| **SCHEDULE A****FRAMEWORK AGREEMENT SPECIFICATION** |

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**Overview**

Smart Building Solutions using the internet of things (IoT) are intended to enable intelligent commercial type buildings. For the avoidance of doubt, this specification is not concerned with domestic properties. Solutions primarily involve the installation of a sensory network that is connected via wireless internet to cloud-based big data analytics enabling monitoring and control of energy usage, building occupancy and visibility of assets. The solution can be composed of several modular components which all work together to create a coherent platform for managing buildings to drive efficiencies across estates.

At a high-level, the solution must provide:

* A robust, infinitely scalable, internet enabled wireless sensor that can detect a range of environmental data, including light levels, temperature levels and motion
* The ability to provide a sensory network across multi-site, large scale commercial type estates
* Sensors that are fully and remotely configurable
* Sensors that are hardened and protected from hacking by botnet or other online threats
* The ability to link an unlimited number of sensors in a single network
* Secure, encrypted wireless networking
* Wireless transmission that has zero or minimal impact on currently installed WiFi networks
* Wireless transmission that is able to work reliably despite encountering interference
* Servers that are hardened and protected from hacking by botnet or other online threats
* Servers that maintains a strict separation between the wireless network and any existing networks
* Secure cloud based data analytics
* Data analytics software
* Energy control software
* User friendly, simple and clean single source access portal which presents information from all sensors
* Ability to integrate with existing systems
* Ability to integrate with existing hardware
* 100% uptime availability
* Minimal hardware and software maintenance requirements
* Minimal user maintenance – solutions that avoid battery changes will be preferred
* Sensory network resilience to individual component failure
* Fail-safe capability such that failure of an individual component or of wireless transmission does not prevent manual control

At a high-level, the supplier must provide:

* Enterprise level software licences to view, access, capture and route information
* Training and professional services for implementation and maintenance
* Software and hardware maintenance
* Appropriate hardware to facilitate transition to an intelligent building environment
* The manufacturing capability to supply an unlimited number of sensors
* A flexible hardware and software upgrade pipeline
* An optional payment model that funds turn-key installation and maintenance through savings generated with no balance sheet impact

The Smart Building Solution should be supplied by a single vendor that owns the intellectual property for each element of software, for the purposes of quick and efficient bespoke client tailoring.

**Modular Specification**

Bidders must offer a solution that encompasses all modular elements. These elements may be called off and established individually to enable authorities to adopt this technology with minimal impact to its services and available funding. However, all call-off contracts must have at their core the sensory network and lighting solution. Call-off contracts will include a road map of total or partial (including the core solution) adoption.

**Core Sensory Network and Lighting**

* A robust, infinitely scalable, internet enabled wireless sensor
* Provision of hardware as a service
* Provision of software as a service
* Simple, non-intrusive installation, including the ability to retrofit
* Ability to detect (as a minimum) light levels, temperature levels and motion
* Co-location of sensors with light fixtures
* Sensors that are fully and remotely configurable
* The ability to link an unlimited number of sensors in a single network
* Digital signal processing
* Secure wireless networking
* Low bandwidth wireless transmission
* Data analytics software
* Energy control software
* User friendly, simple and clean single source access portal which presents information from all sensors and applications
* Ability to modify lighting systems in real time, according to ambient conditions
* Ability to compensate for increased daylight intensity by reducing interior lighting levels (daylight harvesting)
* Ability to alter lighting according to area usage and traffic levels
* Ability to enable task tuning of lighting in response to user need
* Ability to control fluorescent or LED lighting
* Ability to deliver location-based services and in-context information via mobile apps to service users
* Ability to integrate with existing building management systems
* Ability to integrate with existing building hardware

**Heating and Cooling Control**

Core sensory network and lighting plus:

* Ability to provide real time information on ambient conditions, enabling fine control of heating and cooling systems
* Ability to enable targeted heating and cooling according to demand, area usage and traffic levels (depending on existing Building Management System)
* Ability to detect and enable reduction of hot and cold spots
* Ability to implement advanced reset strategies based on real-time building occupancy to maximise investment in Direct Digital Control (DDC) systems with Variable Air Volume (VAV) and Variable Frequency Drives (VFD) if installed

**Workspace Utilisation**

Core sensory network and lighting plus:

* Ability to provide real-time information on building usage and occupancy patterns
* Ability to visualise and measure workspace utilisation
* Ability to superimpose usage and occupancy patterns on to building plans
* Ability to provide customisable reports

**Location and Mapping**

Core sensory network and lighting plus:

* Ability to use the sensory network to track tagged assets
* Ability to analyse asset usage and non-usage in real time
* Ability to easily configure and customise boundaries and alerts
* Ability to interface with and augment existing asset tracking systems
* Ability to superimpose asset movement patterns on to building plans
* Ability to provide customisable reports

**Workplace Risk Reduction and Contact Tracing (Infection Prevention)**

Core sensory network and lighting plus:

* Ability to enable contact tracing to prevent further disease spread
* Ability to set up (and/or enforce) physical distance policies
* Ability to proactively reduce disease spreading risk in the workplace
* Ability to scale solutions to a greater real estate portfolio
* Ability to integrate with existing asset location systems
* Ability to prioritise privacy

**Standards**

The following technology / interface standards should be supported:

* IPv6
* Data transmission using IEEE 802.15.4 wireless communication protocol
* Encryption using AES 128 with wireless keys

**Accreditations and Certifications**

* Implementation must follow a defined project methodology – such as PRINCE2 or equivalent
* Systems must be CE marked
* The system must follow a Software Quality accreditation process – such as BS EN ISO 9001:20015 or the below equivalent criteria:
* Conform with OWASP safe coding practices
* Use of source code analysis tools
* Inclusion of automated vulnerability scanners
* The system must utilise an Information System Security management system – such as BS EN ISO 27001:2013, SOC2 or equivalent
* Suppliers must provide the results of a recent comprehensive remote security assessment and penetration test (Pen test), demonstrating their system resistance to attack
* Suppliers must provide a certificate of Co-existence Assurance for their sensory network
* Suppliers must self-certify that they own or have a licence to exploit the intellectual property for each element of software in your solution

**Cyber Essentials**

* Cyber Essentials is mandatory for Central Government Contracts which involve handling personal information and providing certain ICT products and services.
* The government is taking steps to further reduce the levels of cyber security risk in its supply chain through the Cyber Essentials scheme. The scheme defines a set of controls which, when properly implemented, will provide organisations with basic protection from the most prevalent forms of threat coming from the internet. There are 2 levels of certification: Cyber Essentials and Cyber Essentials Plus.
* Providers must be able to comply with the technical requirements prescribed by Cyber Essentials for Services under and in connection with this Procurement by the time the first call-off contract is awarded.
* Further details of Cyber Essentials may be found here:
* <https://www.cyberstreetwise.com/cyberessentials/>