PART 1: GENERAL

1.1 SECTION INCLUDES

.1 Design, labor, products, equipment and services necessary for window treatment operating system work in accordance with the Contract Documents based on Somfy Digital Network and intelligent motors and components.

1.2 RELATED SECTIONS

.1 Glazing systems: Division 08.

.2 Window treatment: Section 12 20 00.

.3 Electrical wiring: Division 26.

1.3 SYSTEM DESCRIPTION

.1 Window treatment operating system for this project is based on the Somfy Digital Network (SDN) by Somfy Systems Inc.
The SDN system architecture consists entirely of interconnected intelligent devices without the need for a central controller increasing system reliability by reducing the potential of a single point of failure.
The SDN exchanges digital messages on a twisted pair bus line using the differential signaling method defined by the RS-485 standard. SDN Differential signaling, low data speed communication and high impedance devices results in a single bus segment that can be up to 4000' with 255 devices and free wiring topology with no termination resistors. Noise and interference is minimized by using capacitance controlled, unshielded twisted pair cable.
System scalability is virtually unlimited. Very large networks can be built using RS485 or IP, and then operated as a stand-alone system or integrated into a building management system.

1.4 SUBMITTALS

LEED Submittals

.1 SS c8.0　　Sustainable Sites - eliminate light trespass from the building and site, the maximum candela value of all interior lighting shall fall within the building (not out through windows).

EA c1.0　　Optimize Energy Performance - achieve increasing levels of energy performance above the prerequisite standard to reduce environmental impacts associated with excessive energy use.

IE c6.1　　Controllability of Systems - provide a high level of thermal and lighting system control by individual occupants or specific groups in multi-occupant spaces to promote the productivity, comfort and well-being of building occupants.

IE c7.1　　Thermal Comfort - provide a thermally comfortable environment that supports the productivity, health and well-being of building occupants.

IE c8.1　　Daylight and Views - provide for the building occupants a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.

.2 Product data:
    .1 Submit copies of manufacturer's Product data in accordance with Section 01 33 00 indicating:
        .1 System performance criteria, controls, characteristics, limitations, and trouble-shooting protocol.
        .2 Product transportation, storage, handling and installation requirements.

.3 Shop drawings:
    .1 Submit shop drawings in accordance with Section 01 33 00 indicating:
        .1 Elevations, sections, details, materials, operating components, dimensions, gauges, finishes and relationship to operating components and adjacent construction.
        .2 Complete electrical wiring diagrams including electrical schematics and sequence of operation.
        .3 Complete engineering design data confirming that Products meet design criteria specified.

.4 Closeout submittals:
    .1 Submit following for incorporation into Operations and Maintenance Manuals in accordance with Section 01 78 00:
        .1 Identification: Manufacturing name, type, year, serial number, number of units, capacity, and identification of related systems.
        .2 Functional description detailing operation and control of components.
        .3 Operating instructions and precautions.
        .4 Safety precautions.
        .5 Component parts availability including names and addresses of spare part suppliers.

1.5 QUALITY ASSURANCE

.1 Manufacturer Qualifications:
    .1 Minimum of 20 years experience manufacturing tubular motors for natural light control
    .2 Motor manufacturer must be Lloyds Registered ISO 9001 certified
    .3 Motor manufacturer must test 100% of motors before leaving factory
    .4 Manufacture products for automation of natural light control devices for both internal and external applications.
    .5 Manufacturer shall offer motors with wide torque ranges from 1Nm (8.8in/lbs) to 50Nm (440 in/lbs) to handle most natural light control lifting requirements
    .6 Manufacturer shall make motors available to a multitude of shade manufacturers allowing various design choices and options for a motorized natural light control solution
    .7 Manufacture motors with various power options to include line voltage, low voltage, battery and solar powered motors at a minimum.

.2 Quality Control
    .1 Motors shall have a life expectancy of 10 years or more
    .2 Motor warranty must have a minimum 5 year 100% motor replacement warranty.
    .3 Motors must be tested and approved by the major global safety testing laboratories UL, CUL,TUV,ETL,CE,VDE
    .4 Motor manufacturer must test 100% of motors before leaving factory.
    .5 Manufacturer must have minimum of 20 years experience testing tubular motors for natural light control in both internal and external applications

.3   Mock-up:

      .1   Construct one mock-up of complete window treatment operating system in location acceptable to Consultant.

      .2   Arrange for Consultant's review and acceptance of mock-up prior to proceeding with Work.

      .3   Mock-up may remain as part of Work if accepted by Consultant. Remove and dispose of mock ups which do not form part of Work.

      .4   Upon acceptance, mock-up shall serve as a minimum standard of quality for the balance of the work of this Section.

1.6   WARRANTY

.1   Standard Warranty:

      .1   Minimum of 5 years 100% Repair or replacement of defective equipment which does not conform to the warranty

PART 2: PRODUCTS

2.1   ROLLER WINDOW SHADES

****SPEC NOTE: EDIT FOLLOWING TO SUIT PROJECT.*****

.2 Shade Fabric shall:

      .1   Insert Fabric purpose (solar screen, privacy, blackout).

      .2   Have [...] value transmittance, [...] value reflectance.

      .3   Have correct color/finish to meet the reflectance value.

2.2   INTELLIGENT MOTORS (Pick AC Line Voltage Motor or DC Motor or Both, Line voltage intelligent motors provide simplified installation and wiring, stronger torque motors with greater lifting capacity)

.1   AC LINE VOLTAGE SONESSE DIGITAL MOTOR (SDM): Tubular, asynchronous motor, built-in reversible capacitor, brushless 110V AC (60 Hz) single phase motor, thermally protected, permanently lubricated gearbox, maintenance free, minimum of 4Nm torque lifting capacity. Motors must have embedded microprocessor based controller and on board serial communications port.

.1   DC LOW VOLTAGE SONESSE DIGITAL MOTOR (SDM): tubular, thermally protected, permanently lubricated gearbox, maintenance free, minimum of 2Nm torque lifting capacity, must fit in a minimum tube diameter of 31mm. Motors must have embedded microprocessor based controller and on board serial communications port.

.2   Built-in, digital encoder delivers precise alignment with a +/- 2mm accuracy, programmable configuration via PC. Systems using a "time function" for positioning are not acceptable.

.3   Motor lifting capacity should be 2Nm torque or greater for low voltage motors and 4 Nm torque or greater for line voltage motors without the need for any external mechanical components (springs)

.4   Each unit has 16 pre-set stopping points that are electronically precision set and locked into non-volatile memory.

.5   Each unit can be positioned at full-up, full-down or any position between 0-100% in ½ percent increments.

.6   Each drive unit has a whisper quiet sound output of 44dBA (this can vary based on installation environment and shade mfr hardware).

.7   Each unit comes equipped with 2 m of power cord and optional disconnect plug.

.8   Each unit comes with 2 m of modular control cable to connect to the Somfy Digital Network.

.9   Each unit UL recognized and meets CSA standards.

.10 Each unit's electrical components are tested to withstand a 15 Kvolt electrostatic discharge without damage or loss of memory.
.11 Intelligent motors should be available in both AC line voltage and DC low voltage power options.
.12 Motor must have individual addresses factory assigned and can be individually configurable over the network, without needing to physically access the SDM.
.13 Motor shall have an on-board communication port for bi-directional communication with the applicable system software.
.14 Motor shall be field interchangeable (can come out of the tube and be replaced in opposite end of tube) to easily adapt to wire locations.
.15 Each unit shall have the internal space to accept 16 user assignable group addresses that are electronically stored and locked into non-volatile memory.

2.3   **SYSTEM REQUIREMENTS**

.1   Somfy Digital Network (SDN):
    .1   Manages the shades on a RS485 network.
    .2   Manages unique addresses for each intelligent motor.
    .3   Configurable and managed from any desktop in the network via the Somfy System icon. Password protected for managers, maintenance personnel. Manual override for authorized personnel and areas.
    .4   Manages manual signals (switch, transmitter, desktop) and automatic sun threshold signals in the network.
    .5   Interfaces via RS485 communication.
    .6   Network repeaters as required based on network size.
    .7   No dedicated PC required.
    .8   Upper and lower limits are pre-set by shade manufacturer and adjustable on site via hand-held device, no need to access the roller assembly. No external, mechanical limit wheels or buttons are involved.
    .9   Each motor can be a member of up to 16 groups and the system can support up to 65000 groups.
    .10   Each motor is capable of automatically aligning itself to a referenced shade position upon receiving a command from the SDN control software.
    .11   Motor assignment and grouping must be compatible with 3rd party BMS systems Individual, Group and Zone Control: programmed via the System User Interface and setup programming software.
    .12   System does not require special wire or connectors. The SDN utilizes readily available category 5 UTP cable, Ethernet patch cables, RJ45 connectors and splitters to carry data communications and bus power. Bus connected control devices such as keypads, sensors and receivers are powered directly form the busline utilizing a 24vdc class 2 power supply.
    .13   Radio Frequency communication between natural light control devices should operate in the FCC unlicensed ISM (Industrial, Scientific, Medical) frequency band to enhance reliable wireless communication.
    .14   Digital Network Protocol shall allow the operation of both AC Line Voltage Motors and DC Low Voltage Motors on a single common intelligent shade network without requiring gateway devices.

****SPEC. NOTE: EDIT FOLLOWING TO SUIT PROJECT.

.2   Local Control:
    .1   Unlimited Virtual desktop switches available as part of the system.
    .2   SDN Keypads (wired): single gang, Decora style, 3-6 buttons, fully programmable.
    .3   Control keypads must include digital control, IR control and dry contact closures in

.4   Somfy RTS Wireless Switches available for wireless communication to motors.

.5   Manual override can be done at any time and will deactivate that point(s) from the automated system.

.3   Sun Control – Predictive Solar Scheduling:

.1   Sun Threshold control according to initial set points

.2   The system shall control the shades based on the following user-defined parameters, some examples are:

1.   Allowable distance of sunlight penetration into the space.
2.   Portion of window that could be un-shaded at all times.
3.   Shade position if light level drops below set-point threshold.
4.   Shade position at sunset and sunrise via scheduling
5.   Shade position in the sky based on astronomic timeclock
6.   Position of building relative to other buildings

.4   IP (Internet Protocol) & Computer Based Configuration Software:

.1   The system shall have a user interface that allows the user to manually configure the Somfy Intelligent motors and the Sun Control system including:

.1   Manual override of any shade or shade zone.
.2   Configuration of scheduled events.
.3   Configuration of all sun control operations.
.4   Configuration of all sensor control and parameters.
.5   Management of user access and privileges.

2.4   FABRICATION

.1   Verify dimensions of existing Work before commencing fabrications and report discrepancies to Consultant.

.2   Fabricate Work in accordance with Contract Drawings and reviewed shop drawings. Fabricate, fit and assemble Work in shop where possible. Where shop fabrication is not possible, make trial assembly in shop.

2.5   EXECUTION

.1   EXAMINATION

.1   Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

.2   INSTALLATION/APPLICATION/ERECTION

.1   Install window treatment operating system in accordance with reviewed shop drawings and manufacturer's written instructions.

END OF SECTION