LIGHTING PROJECT SPECIFICATION DETAIL

1. Clarification

The **Scope of Work** is provided in Outline Form only. Bidders finding discrepancies, ambiguities, or omissions in the Outline Scope of Work, or having doubt as to the meaning or intent shall immediately advise the Owner, who may issue instruction or clarification, in the form of an Addendum to all Bidders.

2. BC Hydro Alliance Requirements

The Contractor and any Sub-contractor performing more than 10% of the work **must be** registered and approved with the BC Hydro Power Smart Alliance.

The Contractor and any Sub-contractor shall meet all BC Hydro Power Smart requirements. If there is a conflict between the BC Hydro Power Smart requirements and this document, the BC Hydro Power Smart requirements shall prevail.

3. Intent of Project

The project is being undertaken as lighting improvement and energy reduction initiatives to the service and common areas, while replacing the static white dome lighting with a dynamic Color Changing LED lighting system. The achievement of the planned energy savings is a key element of the project.

This project involves the removal of existing lighting fixtures, the installation of new lighting fixtures, addition of general lighting controls and the addition of Color Changing lighting controls.

Circuits to be de-energized (made safe and properly labeled) or re-used as required. All wiring/circuits are to be labeled at panels and junction boxes. All related breakers, relays and switches to be re-labeled to reflect lighting upgrade

4. Products to be Installed

Only those lighting products specified in **Appendix 3 – Product Specifications** will be accepted for this project. **No alternates will be considered.**

The **Color Changing LED Lighting System** will include the following equipment and accessories, including Commissioning by a representative of the manufacturer:
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64 only	Intellihue Blasts, Powercore	423-000011-00
64 only	40 Degree Lens	120-000185-09
64 only	Trim Rings	120-000185-00
64 only	Custom Mounting Brackets	
4 only	Data Enabler Pro	106-000004-00
1 only	Lighting System Manager	103-000042-03
1 only	Ethernet Control Keypad	103-000023-00
1 only	POE Injector	109-000029-00

The Contractor shall provide and the Consultant must approve the shop drawings for all products and fixtures before they are ordered by the Contractor. **The contractor is responsible to ensure that lighting fixtures are provided with the correct input voltages**.

5. Commissioning and Training

The Commissioning for this project will be provided by a representative of the manufacturer and will entail the following:

- Testing and confirmation of system operability
- configuration and addressing of all individual fixtures
- Simple static color and "white" scenes, along with one random color changing scene will be provided.
- Upon completion there will be a site walk through and explanation of system components and their respective operation for the buildings maintenance staff.
- One training session for appropriate staff members on resources available to maintain and update system. I.e. show authoring software etc.

6. Bid Requirements

Unit pricing for the specified fixtures and controls, which includes both materials and installation pricing for each fixture/ controls type is required from the Bidders.

7. Workmanship

All workmanship and materials shall be in accordance with well-established practice and standards accepted by the Industry and Trades for this class of facility and shall conform to all applicable Codes and Regulations.

The Owner shall have the right to reject any work that does not meet this standard.

The contractor must use Red Seal certified electricians who may be assisted by indentured apprentices to complete the work.

All bidders must have proven experience installing large LED color changing lighting and controls projects and **provide proof of that experience 5 days before the closing** in order to submit a qualified bid.

8. Mounting Hardware

The new LED Color Changing light fixture will require a custom mounting bracket which will be secured to the concrete ledge in designated positions around the base of the conservatory dome. The custom mounting bracket will support the weight of the LED fixture and position the fixture at a prescribed height to properly illuminate the dome window frames and windows.

Contractor to submit mounting bracket details for approval prior to installation. The bracket material and finish must be suitable for the extreme environment of the conservatory.

9. Wiring Methods

It is intended to re-use most of the existing conduit for the power and control wiring for the Color Changing LED system.

Where wiring is required, wiring methods and materials shall be consistent with wet/damp areas and approved for applicable environments. Suitable quality copper wire of minimum gauge #12 AWG shall be run in properly rated EMT with rain-tight couplings, connectors, junction boxes and gasketed covers unless otherwise approved by the Consultant.

Data cable where required for controls shall be CAT5e. All data cables must be tested for continuity and marked appropriately to identify as acceptable for installation.

Conduit must be neatly secured and must follow building lines. SOOW extreme environment cable may be used for short runs (less than 6 feet) and must be neatly secured, and must be pre-approved by the Consultant before installation. SOOW extreme environment cable may be used for low voltage wiring without conduit subject to consultant approval.

Where surplus wiring exists, it shall be identified and made safe to the satisfaction of the Consultant. At lighting panel locations, remove all accessible old existing redundant wiring from the lighting system.

10. Lighting Controls/Breaker Panels

Contractor shall re-use the existing Distribution circuit breaker panels and other related controls and shall complete all wiring changes necessary to meet the required circuit and lighting controls for the general and new Color Changing LED Lighting System. At lighting panel locations, remove all accessible old existing redundant wiring from the lighting system.

New Color Changing LED lighting system controls, switches and wiring must be properly labeled at junction boxes, panels and switch enclosures.

Contractor shall evaluate the location and condition of the existing Distribution circuit breaker panels and make recommendations to the Consultant.

11. Labeling and Certification

All new fixtures shall be CSA or ULC approved and shall bear the approval label. The Contractor shall be responsible to label all retrofit fixtures to satisfy Province of BC Electrical Safety Branch requirements.

12. Specified Work

The work to be performed is as outlined in the attached **Appendix 3 - Outline Scope of Work** document and shall fully comply with BC Hydro Power Smart requirements. The Contractor shall provide all labour, materials and equipment required to complete the work and maintain the work site in a clean and tidy manner. All shipping and packing material shall be removed from each job site at the end of each working day.

13. Ballast Sorting and Inspection Requirements

It is a BC Hydro Power Smart requirement that all **HID fixtures** (integral ballasts) and **T8 ballasts** be temporarily stored on site and photographed by the Consultant. Fixtures (including ballasts) may be released for disposal and recycling following BC Hydro approval of photographs. All wire leads shall be cut off close to the ballast so the fixture cannot be reused. It is required that the contractor provide written documentation that the removed units will be/were sent to recycling. Although none are known to be present, all magnetic ballasts containing PCBs shall be identified and segregated from non-PCB ballasts. PCB ballast disposal is excluded from the contract and is the Owner's responsibility. Advise the consultant if PCB containing ballasts are encountered or suspected and arrangements will be made with the owner for them to supply their PCB waste storage container for use by this contractor.

The balance of the lighting and electrical equipment removed in the course of the work shall be disposed of or delivered to the Owner, at the Owner's direction. The Owner anticipates that the quantity of items to be retained will be minimal.

14. Changes to Scope of Work

The Owner reserves the right to amend the Outline Specification of Work prior to the start of the work by the Contractor and to use the Unit Prices specified in the bid documents to amend the contract price at any time. Where Unit Prices are not available for changes, changes to the contract price shall be based on the labour rates and material markup specified in the bid documents.

No additional work shall be undertaken without the written approval of the Owner. The Owner shall not make payment for any additional work that has not been approved.

15. Hours of Work

All construction shall be coordinated with the Owner prior to the start of work. At all times, the work must be completed in a manner that respects the normal operation of the facility. It is expected that the work will be completed both within and outside normal working hours as necessary. Access may be provided for any work that may be completed prior to the proposed shutdown periods provided that it does not interfere with normal operation of the facility.

The contractor shall submit a work plan and ensure it includes sufficient information on the phasing of work areas to minimize disruption to facility operations and details relating to the on-site safety plan during construction. The work plan must be coordinated with the facilities site liaisons.

16. Recycling of Lamps, Non-PCB Ballasts and Metals

As of October 1st, 2012, all lamps, non-PCB ballasts and unwanted fixtures shall be returned to a BC Light Recycle collection site to be recycled. For more information and depot locations, visit the website below.

http://www.productcare.org/lights

Metal recycling is encouraged where practical.

17. Workplace Safety Practices

The location of the Color Changing light fixtures is on a ledge at the base of the conservatory dome and above the conservatory floor. The contractor must ensure that all electricians receive a safety orientation from the conservatory staff safety person before working on the site and must be outfitted with the appropriate safety harness to work above the conservatory floor.

The Contractor shall provide the Owner with written electrical lock-out procedures to be followed by all Contractor personnel during the course of the project as well as details relating to the on-site safety plan during construction.

It is a City of Vancouver and Vancouver Parks Board requirement that when a Contractor is working in isolation outside the following hours: Monday-Friday 6:30 am to 3:30 pm; the Contractor must provide Occupational First Aid coverage.

18. Substantial Completion

The Contractor shall advise the Owner when the work has been substantially complete and shall review all completed work with the Owner and his Consultant for the purposes of final inspection and commissioning. Any deficiencies identified shall be promptly corrected to the satisfaction of the Owner and his Consultant.

19. Warranty and Installation Documentation

The Contractor shall provide, in writing, a 1-year warranty of all products and workmanship. Replacement labour and materials shall be the responsibility of the Contractor.

The Contractor shall also provide the Owner with **3** hard copy 3-ring binder and an electronic pdf copy Maintenance Manual containing all manufacturer warranties, product specifications and maintenance documentation for each type of product used in the project, excluding wire, conduit and fittings. Manufacturer warranties for LED fixtures shall be for a minimum of 5 years.

20. Record Drawings and As-Built Scope of Work

The Contractor shall keep a set of Scope of Work spreadsheets and one set of white prints on the project and enter all changes.

The Contractor shall return one set of Scope of Work spreadsheets and one set of white print drawings with all marked changes showing the "as built" work to the Consultant at the completion of the project.

21. Specifications

Refer to Appendix 3- Product Specifications

22. Scope of Work

Refer to Appendix 3- Outline Scope of Work

23. *Drawings* (PDF Format, Appended)

Drawing Number	**Description**
System Wiring Diagram	ColorBlast 12, Power Core – Typical Wiring Diagram