



Report to: General Committee

Report Date: June 24, 2013

SUBJECT: Award of Tender 155-T-13 Conversion of Existing HPS Cobra-Head Luminaires with LED Luminaires

PREPARED BY: Prathapan Kumar, Senior Manager, Ext. 2989
Patti Malone, Senior Buyer, Ext. 2239

RECOMMENDATION:

- 1) THAT the report entitled "Award of Tender 155-T-13 Conversion of Existing HPS Cobra-Head Luminaires with LED Luminaires" be received; and
- 2) THAT the contract for tender 155-T-13 to supply and install 12,276 LED luminaires be awarded to the lowest priced bidder, Fellmore Electrical Contractors Limited in the amount of \$4,604,060.78 inclusive of HST; and
- 3) THAT a contingency amount of \$460,406.08 inclusive of HST, be established to cover any additional expenditure in accordance with the Expenditure Control Policy; and
- 4) THAT the contract for tender 155-T-13 Provisional Items for the Factory Installed Part-Night and Constant Light Input (CLO) Dimmers, Factory Installed Wireless Addressable Dimming Control Modules, hosting the Monitoring Central Management System for Dimming Control Modules, and supply and installation of 500 units of House Shield be awarded to the lowest priced bidder, Fellmore Electrical Contractors Limited in the amount of \$1,568,373.84, inclusive of HST; and
- 5) THAT a contingency amount of \$156,837.38 inclusive of HST, be established to cover any additional expenditure in accordance with the Expenditure Control Policy; and
- 6) THAT the Staff be authorized to award the contract for part-time contract administration services to Laurilliam Lighting Technologies Inc. in the amount of \$39,584.64 inclusive of HST, in accordance with Part II (7) (I) (h) of the Purchasing By-law; and
- 7) THAT a contingency amount of \$4,000.00 inclusive of HST, be established to cover any additional expenditure in accordance with the Expenditure Control Policy; and
- 8) THAT Staff be authorized to retain a qualified consulting firm in accordance with the City's purchasing by-law to provide inspection services during LED conversion program for an upset limit of \$148,000.00 inclusive of HST; and
- 9) THAT the payback for the base LED conversion project be approved at 6.7 years and the provisional items be approved at 10.1 years and the combined project be approved at 7.3 years; and
- 10) THAT a By-Law be enacted to allow for the dimming of streetlights for 5 hours per night (midnight to 5.00 a.m.) at the locations where pedestrian activity permits; and
- 11) THAT the award be funded from the Project 058-6150-13346-005 Streetlights - LED Conversion of Cobra Head Fixtures; and

- 12) THAT a Public Communication Plan be developed in consultation with Corporate Communications & Community Engagement Department and Sustainability Office; and
- 13) THAT for all subdivision and site plans that do not have an approved streetlight plan that LED luminaires be required; and
- 14) THAT all City standards be adjusted accordingly; and further
- 15) THAT Staff be authorized and directed to do all things necessary to give effect to this resolution.

EXECUTIVE SUMMARY:

In Jan 2011, Council established the LED Streetlighting Task Force to evaluate LED retrofit options for the City's Streetlighting system. Staff retained Laurilliam Lighting Technologies Inc. to undertake the LED retrofit study. Phase 1 study was completed and presented to the LED Task Force on Nov 22, 2011. Phase 2 study was presented and endorsed by LED Streetlighting Task Force on Feb 7, 2013.

In July 2012, Request for Pre-Qualification (RFPQ) was released to the market to pre-qualify potential LED manufacturers. Three (3) LED manufacturers were pre-qualified along with specific qualified products.

In Feb 2013, RFPQ was released to the market to pre-qualify installation contractors. Eight (8) contractors were pre-qualified to participate in the supply & install tender.

At its meeting on March 19, 2013, Council authorized staff to proceed with the procurement tender for the supply and installation of LED luminaires to convert the existing HPS Cobra-head style luminaires.

In May 2013, Request for Tender (RFT) was released to the pre-qualified contractors to bid on supply and installation of tender using the pre-qualified LED products.

PURPOSE:

The purpose of this report is to obtain the Council approval to award the construction tender 155-T-13 Conversion of Existing HPS Cobra-Head Luminaires with LED Luminaires.

BACKGROUND:

The City of Markham presently manages the municipal streetlight system on City and Regional roadways. The system is comprised of approximately 25,447 high pressure sodium (HPS) luminaires which vary in terms of wattage and style. 13,018 are cobra-heads (51%) and 12,429 (49%) are of decorative fixtures.

Streetlighting in the City currently incorporates a HPS light source. This light source emits a yellowish light that has a very poor colour rendering index (i.e. under this light, colours and objects are not easily distinguishable). The existing HPS luminaires produce significant glare

and 'up' light which is a major contribution to sky glow as identified by the International Dark-Sky Association (IDA).

The LED retrofit will have the following benefits:

- Increased vehicular and pedestrian safety through better visibility, object recognition and colour performance;
- 54% percent reduction in energy costs of \$630,358;
- 57% percent reduction in maintenance costs of \$164,598, due to the longevity of LED luminaires (approx. 20 years), elimination of the five year group relamping program;
- Reduction in the City's streetlighting carbon footprint;
- LED luminaires meet the requirements of the International Dark-Sky Association (IDA) as dark-sky friendly, thus eliminating up-light that produces obtrusive sky glow from streetlights;

Bid Information:

Advertised	N/A
Bids closed on	June 18, 2013
Number picking up bid documents	8
Number responding to bid	7

Detailed Pricing Information:

Rank based on LED Luminaires Price	Company	LED Luminaires Price	Provisional Items	Total
1.	Fellmore Electrical Contractors Ltd	\$4,604,060.78	\$1,568,373.84	\$6,172,434.62
2.	Stacey Electric Company Ltd	\$5,218,767.71	\$2,308,037.59	\$7,526,805.29
3.	Black & McDonald Limited	\$5,220,975.37	\$1,716,116.87	\$6,937,092.24
4.	Beacon Utility Contractors Limited	\$5,478,399.72	\$3,479,145.91	\$8,957,545.62
5.	Guild Electric Limited	\$5,626,653.33	\$2,839,954.71	\$8,466,608.04
6.	AGI Traffic Technology	\$5,890,746.99	\$2,705,977.87	\$8,596,724.86
7.	Enersource Hydro Mississauga Services Inc.	\$6,115,788.29	\$2,314,449.79	\$8,430,238.08

Note: Prices are inclusive of HST impact and have been verified for accuracy and compliance with the tender terms and conditions.

OPTIONS/ DISCUSSION:

The following Procurement Process was followed:

- Pre-qualified LED manufacturers and replacement fixtures through the Request for Pre-qualification (RFPQ) process
- Pre-qualified installation contractors through the RFPQ process

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- (c) Issued a Request for Tender (RFT) to the pre-qualified contractors for supply and installation utilizing the pre-qualified LED manufacturers products as well as the provisional items

(a) LED Products RFPQ:

In July 2012, RFPQ was released to the market to pre-qualify potential LED manufacturers. Seven proponents submitted their proposals including: Philips Lumec, Cree Canada, LED Roadway Lighting, Acuity Brands, Cooper Lighting, Osram/Sylvania and GE (Tymat). Only four proponents met the City's acceptance criteria - Philips Lumec, LED Roadway Lighting, Cooper Lighting and GE (Tymat). As part of the selection process samples were obtained from the above four pre-selected manufacturers and were installed at various locations to verify their field performance. Based on the field testing, the following three LED manufacturers have been pre-qualified along with specific qualified products:

- Philips Lumec
- LED Roadway Lighting (LRL)
- GE (Tymat)

(b) Installation Contractors RFPQ:

In Feb 2013, RFPQ was released to the market to pre-qualify contractors who will supply the LED products from the identified LED manufacturers noted above, remove the existing HPS Cobra-Head Style Luminaires and install the LED luminaires. The following eight (8) contractors were pre-qualified to participate in the supply & install tender:

- Fellmore Electrical Contractors Ltd
- Langley Utilities Contracting Ltd
- Guild Electric Limited
- Beacon Utility Contractors Limited
- Stacey Electric Company Ltd
- Black & McDonald Limited
- AGI Traffic Technology
- Enersource Hydro Mississauga Services Inc.

(c) Supply & Install LED Conversion RFT:

In May 2013, supply and installation RFT was released to the pre-qualified contractors. The bid included the following provisional items as per Council recommendations dated March 18, 2013:

- Provision of factory installed Part-Night and Constant Light Output (CLO) Dimmers for 3,744 dimmable streetlights
- Provision of factory installed, wireless addressable Dimming/Monitoring/Metering Control System for all 12,276 streetlights
- Provision to host the Monitoring Central Management System
- Installation of House Shield

Part-Night Dimming, CLO Dimming and Monitoring and Metering – Provisional Items

Dimming is applicable only when pedestrian activity is reduced during the night. Streets designed as having low pedestrian activity already have low light levels and cannot be further reduced. Of the 12,276 cobra head luminaires, only 4,091 (increased from 3,744) higher wattage cobra heads are installed where pedestrian activity is medium and might be dimmed. Dimming is usually programmed for 5 hours per night (midnight to 5:00 a.m.). A By-law will be enacted prior to implementation of the dimming. The energy savings for part-night dimming for 4,091 luminaires and CLO dimming for 12,276 luminaires will be \$103,800 per year.

The streetlight monitoring system (SMS) allows for constant monitoring of the status and energy consumption of the streetlighting system. It will also eliminate current costs to patrol by Operations staff (estimated at \$30,000), additional cost claimed by the maintenance contractor due to wrong location information/repeated visits (estimated at \$32,600). The 2014 operating budget will be adjusted accordingly to reflect these operational savings. Streetlight system could be managed effectively and efficiently as the outages will be monitored in real-time and alerts are sent immediately. This will enhance the service provided to the residents. The SMS can be programmed to provide a controlled constant light output over the life of the luminaire thereby providing additional energy savings.

In total this will generate \$166,400 in energy savings per year which translates into a payback of 10.1 years. Therefore, Staff recommend proceeding with the provisional items.

House Shield – Provisional Item

House shield will be installed to limit the light trespass to the adjoining residential homes where required.

Conversion of Cobra-Head style HPS Luminaires:

As part of this contract, all Cobra-Head style HPS luminaires will be replaced with LED luminaires except along Steeles Avenue East (north side) - Yonge Street to Markham Road and HWY #7 (from Yonge Street to Kennedy Road).

Steeles Avenue East: It is not recommended to convert to LED as south side is lit with HPS luminaires and owned by City of Toronto. Two different light sources will confuse the drivers. City of Toronto is not planning for LED conversion in the near future.

HWY #7: As part of transit improvement, vivaNext will be installing new poles and HPS fixtures. These fixtures will not be replaced at this time.

Coordination with PowerStream:

The retrofit of the City's streetlighting system will also have a significant impact on the existing Streetlighting Services Agreement with PowerStream. In Feb 2013, staff met with PowerStream and discussed the procedure involved in calculating the energy consumption for the LED luminaires. Asset Management, Finance and Sustainability staff will prepare the required documentation for submission to PowerStream to justify the City's request for energy fee review due to changes in technology and resulting reduction in energy.

Public Communication Plan:

A public communication plan will be developed as part of the LED conversion program prior to implementation in consultation with Corporate Communications & Community Engagement department and Sustainability Office.

FINANCIAL CONSIDERATIONS AND TEMPLATE:

The following table summarizes the financial considerations for this report.

Original Budget and Account #	\$7,632,000.00	058-6150-13346-005 Streetlights – LED Conversion of Cobra-Head Fixtures
Budget Available for this Project	\$7,632,000.00	
Less: Supply & Install LED Luminaires	\$4,604,060.78	
Provisional Items including: Provisional Items for the Factory Installed Part-Night and Constant Light Input (CLO) Dimmers, Factory Installed Wireless Addressable Dimming Control Modules, hosting the Monitoring Central Management System for Dimming Control Modules, and supply and installation of 500 units of House Shield		
Less: Total of Provisional Items	\$1,568,373.84	
Total Contract Cost:	\$6,172,434.62	} Awarded to Fellmore Electrical Contractors Limited
Less: Construction Contingency (10%) *	\$617,243.46	
Less: Contract Administration Services	\$39,584.64	} Awarded to Laurilliam Lighting Technologies Inc.
Less: Contract Administration Services Contingency (+10%)	\$4,000.00	
Less: Contract Inspection Services (estimated)	\$148,000.00	
Budget Remaining	\$650,737.27	**

Note: Figures above include HST impact.

* Contingency will cover the supply and installation of additional 220 fixtures added to the inventory after the tender and any unforeseen costs encountered during construction.

**Due to favourable pricing there is no need to fund the Budget Remaining \$650,737.27 from the Life Cycle Replacement and Capital Reserve Fund.

Project #13346, "Streetlights - LED Conversion of Cobra-Head Fixtures" was approved in the amount of \$7,632,000 as part of the 2013 capital budget. The scope of this project is to convert the 12,276 Cobra-head HPS streetlights to LED technology. The actual tender is approximately

22% lower on the LED luminaires and 58% lower on installation cost compared to the initially estimated prices.

The original scope did not include the provisional items for part-night and constant light out dimming (CLO) and monitoring options and the conversion to LED for decorative fixtures. Staff also recommends awarding the provisional items which have a 10.1 year payback to the lowest bidder.

Replacement of Cobra-head fixtures

With the conversion of the Cobra-head to LED technology, it is estimated that annual energy consumption cost and maintenance cost will be reduced as indicated below once the project is complete. The simple payback on the initial capital costs for this project, based on the savings is also shown below. Simple payback represents the initial capital cost divided by the annual cost savings.

Savings	without Part-Time/ CLO Dimming and Monitoring	With Part-Time/ CLO Dimming and Monitoring
Savings on Energy	\$630,358 (54.2%)	\$734,158 (77%)
Savings on Maintenance	\$164,598 (57.0%)	\$227,198 (57%)
Simple Payback Period	6.7 years	7.3 years

The simple payback period for conversion to LED luminaires has reduced from the initial estimate of 8.3 years to 6.7 years due to favourable pricing. Further, the payback period for Part-Time/CLO dimming and Monitoring has reduced from 24.3 years to 10.1 years and therefore Staff recommend inclusion of this option. The overall payback period will then be 7.3 years.

The total energy savings will be approximately \$734,158 (77%) and total maintenance cost savings will be approximately \$227,198 (57%).

Ontario Power Authority's – SaveOnEnergy Program

The City has already applied for an incentive amounting to \$310,764 under Ontario Power Authority's SaveOnEnergy Retrofit program. If the City is successful in getting the grant, the payback period will be further reduced.

HUMAN RESOURCES CONSIDERATIONS:

Not applicable.

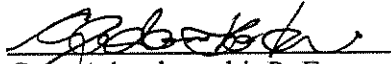
ALIGNMENT WITH STRATEGIC CONSIDERATIONS:

Pursuing the use of energy efficient LED technology in streetlighting is in line with the City's Sustainability initiatives and moves closer to the Greenprint's Energy and Climate objective of zero energy and emissions by 2050.

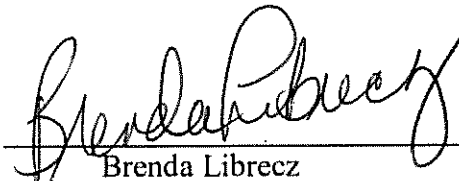
BUSINESS UNITS CONSULTED AND AFFECTED:

The Finance and Sustainability departments have been consulted, provided input and reviewed this report.

RECOMMENDED BY:



Gary Adamkowski, P. Eng.
Director, Asset Management



Brenda Librecz
Commissioner, Community & Fire Services

ATTACHMENTS:

None.