

TO:	CHAIR AND MEMBERS COMMUNITY & PROTECTIVE SERVICES COMMITTEE MEETING ON TUESDAY, OCTOBER 20, 2015
FROM:	JOHN KOBARDA FIRE CHIEF LONDON FIRE DEPARTMENT
SUBJECT	REQUEST FOR PROPOSAL 15-39 SUPPLY & DELIVERY OF PROTECTIVE COATS & TROUSERS (BUNKER GEAR) FOR STRUCTURAL FIREFIGHTING

RECOMMENDATION

That, on the recommendation of the Fire Chief, and the concurrence of the Managing Director, Neighbourhood, Children & Fire Services, that the following action be taken:

- a) The proposal submission submitted by Innotex Inc., 275 Gouin, Richmond Quebec, JOB 2H0 for the Supply and Delivery of Protective Coats and Trousers for Structural Firefighting at their submitted rates with an estimated expenditure of \$503,880.00 year 1 and \$503,880.00 year 3, HST extra, **BE ACCEPTED**;
- b) That the funding for the project **BE APPROVED** as set out in the Source of Financing Report attached hereto as Appendix "A";
- c) That Civic Administration **BE AUTHORIZED** to undertake all the administrative acts which are necessary in connection with this contract; and
- d) That approval hereby **BE GIVEN** conditional upon the Corporation entering into a formal contract relating to the subject matter of this approval.

PREVIOUS REPORTS PERTINENT TO THIS MATTER
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None

BACKGROUND

Within its 10 year Capital Plan, the London Fire Department (LFD) includes the ongoing replacement of personal protective equipment (PPE), noting that the structural fire fighting bunker gear ensemble (here forward to as bunker gear) is an integral component thereof. Experientially, the London Fire Department has established that a seven (7) year life cycle replacement as an effective replacement schedule for bunker gear, albeit its research shows that other fire departments have moved to five (5) year replacement cycles. The City purchased and placed into service the majority of the existing bunker gear ensembles in 2009 and, as such, they are coming to the end of the LFD established frontline life cycle.

Purpose of Bunker Gear

Primarily, bunker gear is known for protecting Fire Fighters from burns, particularly from flashover fires. While the potential for flashovers exist at every fire, luckily, Fire Fighters are rarely involved in situations where they experience direct flame impingement on the outer shell. Further to providing protection from direct flame impingement, bunker gear also plays a critical role in insulating Fire Fighters from radiant heat found in all fire situations.

Flame and heat are but a few of the challenges faced by Fire Fighters entering buildings involved in fires. When they make entry into a building on fire they are also subjected to toxic byproducts of combustion, which represent inhalation and absorption challenges. While Self Contained Breathing Apparatus (SCBA) is designed and provided to minimize the inhalation risks in environments with unknown toxins, bunker gear also serves additional functions in that it is designed to reduce the risk of skin absorption from water that can be contaminated through its contact with airborne toxins, as well as reduce the risk of permeation of the smoke through the layers of the bunker gear to the skin. In sum, bunker gear is an integral and critical component of the personal protective equipment ensemble.

Third Party Requirements

The Corporation of the City of London (City), as well as all divisions within the City including the Fire Department, falls under several pieces of legislation, with the Occupational Health and Safety Act overarching all of those divisions. For the purposes of reviewing Fire Service specific safety matters, the Province of Ontario, through the Ministry of Labour, created a sector specific Advisory Committee known as the Section 21. Membership includes representatives from Labour (Ontario Professional Fire Fighters Associations and the Fire Fighters Association of Ontario) and Management (Ontario Association of Fire Chiefs), as well as the Ontario Fire Marshal's Office (OFM), the Association of Municipalities of Ontario (AMO), all of which work collaboratively on the development of Health and Safety Guidance Notes for the Ontario Fire Services, which outline recommended equipment and procedures to be used in the Fire Service to prevent injury or illness to Fire Department personnel.

Regarding Structural Fire Fighting bunker gear, the Advisory Committee created two (2) Guidance Notes: *Firefighters Guidance Note #4-1 Firefighters – Protective Equipment Regulation*, as well as *Firefighters Guidance Note #4-8 Care, Maintenance, Inspection and Replacement of Structural Firefighting Personal Protective Equipment*. Guidance Note #4-1 states that garments manufactured after March 1, 2007 must meet *National Fire Protection Association (NFPA) 1971 "Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*. Guidance Note #4-8 identifies that the bunker gear should be retired no later than 10 years from the date of the manufacture and references *NFPA 1851, 2014 edition, Standard on Selection Care and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*. Notwithstanding the references and information contained within the Section 21 Guidance Notes, as mentioned earlier, experientially the London Fire Department has scheduled a seven (7) year life cycle replacement of bunker gear within the Capital budget, noting that many fire departments use a five (5) year replacement schedule.

Through its reference to *NFPA 1851 – 2014 Edition Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*, Guidance Note #4-8 addresses the care of bunker gear. In addition to the content of the standard, Annex A Explanatory Material is included for informational purposes and contains explanatory material related to the section. Section 7.1.1 of the standard states: "Organizations shall provide a means for having ensemble elements cleaned and decontaminated." A further explanation of this requirement can be found in Appendix A which directly quotes Annex A from *NFPA 1851 – 2014 Edition*.

Fire Service Evolution

Noting the Section 21 Committee's references to NFPA standards, it is important to note that the NFPA, through standards changes that occur once every five (5) years, has continued to provide that Fire Service suppliers make product improvements for the purposes of protecting the safety of Fire Fighters, with one very important area being PPE, particularly as the Fire Service becomes increasingly aware of hazards related to fire fighting.

Since 1991, at least in the case of the London Fire Department, personal protective equipment and standards related thereto have significantly changed, as have the guidelines related to its use, care and maintenance to ensure that the Fire Fighter is appropriately protected. Guidance Note #4-8 relates specifically to the care, maintenance, inspection and replacement of structural firefighting personal protective equipment, noting that the Guidance Note states, "All PPE should be kept clean as soiled or dirty elements may expose firefighters to hazardous chemicals and reduce the effectiveness of the protection it is intended to provide". Furthermore, the Guidance Note states that PPE that has been contaminated must be cleaned and clothes washed ensuring that the contaminated gear is stored in closed containers while being transported back to the fire station. Finally, the Guidance Note states that the fire department should develop a program for care, maintenance, inspection and replacement of all PPE elements including "requirements for cleaning and decontamination, advanced cleaning, routine inspection, advanced inspection, repairs, storage, records and retirement of bunker gear from emergency service operations after no longer than a 10-year life cycle (reference:NFPA1851)."

Routes of Entry and Effects

Discussed earlier, inhalation and absorption of toxins are significant issues for Fire Fighters. Contributing to the challenge are materials used to manufacture consumer goods. Increasingly, furniture and other products are being made of synthetic compounds, foam, and plastics and treated with chemical products and flame retardants. Once those compounds burn, they create unknown chemical compounds. Today, fires are more toxic than in the past because of society's move from natural materials to cheaper synthetic compounds to create goods.

Exposure to toxins created as a byproduct of combustion has been recognized as a significant issue, as evidenced by the presumptive legislation that the Ontario Government introduced in 2007. Prior to 2007, each case submitted to Workplace Safety and Insurance Board (otherwise referred to "WSIB") was assessed on a case by case basis. The presumptive legislation passed

in 2007 recognized that certain types of cancer (brain cancer, bladder cancer, kidney cancer, urethra cancer, esophageal cancer, colorectal cancers, non-Hodgkin's lymphoma and leukemia) were more prevalent amongst the Fire Fighter and Fire Prevention Inspector population than the general public. In 2014, the Ontario Government proclaimed the expansion of the current regulation to include six (6) additional cancers also presumed to be work related for Fire Fighters and Fire Prevention Inspectors. Unlike the previous presumptive legislation, the new cancers are to be phased in as follows: multiple myeloma, breast cancer, testicular cancer (phased in 2014), prostate (phased in 2015), lung cancer (phased in 2016) and skin cancer (phased in 2017). The legislation provides that if a Fire Fighter or Fire Prevention Inspector contracts one of these cancers and also falls within the prescribed duration of employment, the WSIB will deem it to be a workplace occupational disease unless the employer can rebut the presumption and show that there was a non-occupational reason that the employee had contracted the disease. Fire Fighters and Fire Prevention Inspectors not meeting the inclusion criteria will have their claims decided on their individual merits.

By reducing the risk of exposure to its Fire Fighters and Fire Prevention Inspectors, the Corporation can not only minimize the health risks but hopefully avoid the financial costs associated with these occupational diseases.

London Fire Department Continuous Improvement

Toward the goal of improving Fire Fighter safety, the Joint Health & Safety Committee, including extensive input from London Professional Fire Fighters Association (LPFFA) members, and the Department have developed detailed guidelines related to the care and cleaning of its PPE and in particular post incident decontamination. At all events where Fire Fighters are exposed or suspected to be exposed to toxins, gross decontamination of PPE is performed at the scene using a hose line. Contaminated gear then is removed at the scene, bagged for transport and no contaminated gear is permitted to be worn in the cab, or transported therein, unless properly bagged. Prior to learning more about the effects of the by-products of combustion, Fire Fighters routinely wore their bunker gear back from an event without knowing it could create a potential for cross contamination within the fire vehicle. Additionally, Fire Fighters could be exposed to the off gassing from the contaminated gear, as well as absorption hazards if toxins within water breached the seals and moisture barriers.

In an effort to eliminate the hazard of absorption and/or inhalation, a number of years ago the LFD required that all bunker gear suspected to be contaminated be properly cleaned using commercial type washers prior to going back into service. In doing so, another set of bunker gear must be provided while the primary set of gear is being cleaned. Currently, the Department has approximately 70 sets of loaner bunker gear centrally stored at Central Fire Station (Station 1) at Colborne St. and Horton St., E., which came from an accumulation of bunker gear returned by retiring Fire Fighters. The decontamination/loaner process enables Fire Fighters to decontaminate their issued bunker gear, as well as gain access to clean bunker gear. While the latter is a better alternative to wearing soiled gear, the process of providing spare gear poses two (2) problems. The first issue is that in order to obtain loaner bunker gear, the fire crew is required to be out of service and be unavailable for calls, as they travel to Station 1. Because the fire crew is unavailable for alarms during this period of time, response times to emergency events within that vehicle's primary response area could be delayed as another fire crew would have to respond to an event from a fire station which is farther away. Additionally, the loaner bunker gear must also then be returned to Station 1 once the primary bunker gear is cleaned. This again takes time to monitor and coordinate the return. The second issue relates to the sizing of the loaner bunker gear. The primary set of bunker gear that is provided to the Fire Fighters, although not custom tailored per se, is sized by the supplier to each individual to maximize protection. When the Fire Fighter obtains a set of loaner bunker gear, the bunker gear selected is "best fit". Fit cannot be guaranteed and, therefore, may not provide the best protection or the same protection as their issued bunker gear.

Recommendation and Plan

In consideration of the information above and looking to maximize Fire Fighter protection, the consensus of the Joint Health & Safety Committee is that a second set of "sized" bunker gear be provided to each Fire Fighter. In this way, the Fire Fighter would have with them a backup set of bunker gear that truly fits them whenever their primary gear is being decontaminated. The Department identified within the issued RFP that, pending Council approval, it may seek to purchase within the contract period a second set of gear. Noting that NFPA 1851, revision 2014, section 10, stipulates that bunker gear should be retired no later than 10 years from the date of manufacture, the oldest manufacture date of the existing bunker gear is 2009. The LFD proposes to issue new bunker gear to all Fire Fighters in the first year of the contract thereby enabling the current set of bunker gear to become the backup set. While the current bunker gear is almost seven (7) years old, it is anticipated that it would not see as much use while it is a backup set and thereby would last for the full 10 years. In order to spread out the purchase, the second set of bunker gear would then be purchased in the third year of the contract (2018), which would be within the 10 year period. The bunker gear purchased in year 1 of the contract would then become the backup set.

Given that the majority of the existing bunker gear was purchased in 2009, if the Department does not adopt a process that includes a backup set of gear for each frontline staff there will still be a need to purchase a number of sets of bunker gear as loaners in Year 3 of the contract. In order to determine the number of sets required, the Department, through its supplier, would need to estimate the range of sizes base on the sizing for year 1 purchase. Taking this approach, the LFD would still face the issues noted above - that being taking crews out of their response zones to retrieve spare gear and, more importantly, supplying bunker gear that does not necessary fit the Fire Fighter as well as the properly "sized" set.

Procurement Process

A Request for Proposal (RFP) was issued in July 2015 to purchase protective coats and trousers for structural firefighting, to which the City received six (6) compliant proposal submissions.

An evaluation team comprised of London Fire Department (LFD) Fire Fighters from Station 5 – B Platoon and Fire Administration, including assistance from Purchasing and Supply, undertook the following three (3) stage evaluation process: Evaluation of the specific requirements; Product Demonstration and Presentation; and Field Testing. During each stage of the evaluation Proponents were required to achieve a minimum score in order to move onto the next stage. The field test, which included comprehensive, hands on testing simulating "real life" activities, was conducted by the Station 5 crew and overseen by the Deputy Fire Chief – Operations and a member from Purchasing and Supply. Upon completion of all three (3) stages, the Team's results showed that Innotex Inc. scored the highest, as well as provided the best financial offer to the City.

The contract is for a three (3) year period, with an option to renew the contract for four (4), one (1) year periods at the sole discretion of the City.

Financial Impact

Funding for this expenditure is provided in the following approved Capital Budgets:

PP1123-14 - \$475,000.00
PP1123-15 - \$550,000.00

SUMMARY

The London Fire Department has included in its 10 year Capital Plan the replacement of Fire Fighter equipment, including bunker gear. It has become increasingly apparent that the exposure to toxic materials when fighting fires has increased over the past few decades.

Through research, it has also become clear that the effect on Fire Fighters in terms of contracting cancers has increased, which has been recognized by the Provincial Government through its introduction of presumptive legislation that recognizes specific types of cancer that if contracted are deemed to be occupational workplace diseases for Fire Fighters. The proposal herein noted further builds upon the measures to protect Fire Fighters and to minimize the cost of these devastating diseases to the City.

The LFD has put into place processes that stipulates when and how to decontaminate the PPE in order to minimize the risk of exposure to the Fire Fighters. The LFD proposal seeks to create a primary set of bunker gear in year 1 of the contract, which then enables the Department to use the Fire Fighters existing bunker gear as a backup set while the primary gear is being cleaned. In Year 3, the LFD would then issue a second set of gear which will become the primary set of gear and the set of bunker gear issued in year 1 would then become the backup set. The funding for these actions can be accommodated within the existing approved Capital Budget.

Acknowledgements

This report was prepared by Terri Sue Wyatt, Procurement Officer, and Gwen Francis, Manager II, Finance and Planning, Fire Services.

SUBMITTED BY:	RECOMMENDED BY:
DAVID LAZENBY DEPUTY FIRE CHIEF	JOHN KOBARDA FIRE CHIEF
REVIEWED AND CONCURRED BY:	REVIEWED AND CONCURRED BY:
LYNNE LIVINGSTONE MANAGING DIRECTOR, NEIGHBOURHOOD, CHILDREN & FIRE SERVICES	ANNA LISA BARBON DIRECTOR, FINANCIAL SERVICES

APPENDIX A

NFPA 1851 – Standard on Selection, Care and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting (2014 Edition)

ANNEX A Explanatory Material

“A.7.1.1 The importance of maintaining the cleanliness of ensembles and ensemble elements should not be underestimated. Studies have shown that soiled or contaminated ensembles and ensemble elements are a hazard to fire fighters because soils and contaminants can be flammable, toxic, or carcinogenic. Additionally, soiled or contaminated ensembles and ensemble elements can have reduced protective performance. Clean ensembles and ensemble elements offer the emergency responder better protection and can add to the life of the ensemble and ensemble elements. Ensembles and ensemble elements should be cleaned whenever they become soiled.

In everyday use, personal protective equipment (PPE) becomes dirty by absorbing sweat from the wearer and soils, soot, and so forth, from the outside environment. Cleaning of ensembles and ensemble elements removes those substances. Ensembles and ensemble elements can also become contaminated with other substances, principally hazardous materials, particulates, and body fluids. The removal of these substances is most often referred to as *decontamination*. In structural and proximity fire fighting, both general cleaning and decontamination of ensembles and ensemble elements might be necessary.

Health risks of soiled or contaminated ensembles and ensemble elements.

Soiled or contaminated ensembles and ensemble elements can expose fire fighters to toxins and carcinogens that enter the body through ingestion, inhalation, or absorption. Repeated small exposures to some contaminants can accumulate over time and cause health problems. Although great emphasis is placed on safety to avoid injury or inhalation hazards to personnel working on the fire ground, many of the toxins that lead to health risks are being carried away from the fire scene on personal protective equipment used by the fire fighter.

Toxins that a fire fighter will come into contact with can be trapped in the fibers of soiled ensembles and ensemble elements or absorbed into the materials themselves. Contact with the soiled ensembles and ensemble elements increases the risk of the toxic contaminants being introduced into the body.

Ensembles and ensemble elements contaminated with body fluids present a potential risk of a communicable disease being transmitted to the person coming into contact with the contaminated ensembles or ensemble elements.

Reduced performance hazards of contaminated ensembles and ensemble elements.

When ensembles or ensemble elements become laden with particles and chemicals, other problems are faced in addition to being exposed to toxins, such as the following:

- (1) Soiled ensembles and ensemble elements typically reflect less radiant heat. After materials are saturated with hydrocarbons, they will tend to absorb rather than reflect the radiant heat from the surrounding fire.
- (2) Ensembles and ensemble elements heavily contaminated with hydrocarbons are more likely to conduct electricity, increasing the danger when entering a building or vehicle where wiring can still be live.
- (3) Ensembles and ensemble elements impregnated with oil, grease, and hydrocarbon deposits from soot and smoke can ignite and cause severe burns and injuries, even if the materials are normally flame-resistant.

Even though the number of specialized hazardous materials response teams is growing, individual fire fighters can still encounter various chemicals in their normal fire fighting activities. Exposures to oils, gasoline, and lubricants can occur around fire station vehicles. During responses, exposures to liquids ranging from pesticides to acids to chemical solvents can occur, knowingly or unknowingly. These contaminants, in addition to being hazardous, can also degrade ensembles and ensemble elements as follows:

- (1) Clothing fabrics can become weakened and tear more easily.
- (2) Thread or seam sealing tape can become loose.
- (3) Flame-retarding or water-repelling treatments can be removed.
- (4) Visibility markings can lose reflective properties or markings, becoming less visible.
- (5) Helmet shells, helmet face shields, or goggles can pit or craze.
- (6) Ensemble and ensemble elements hardware can become corroded