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CITY OF **VANCOUVER**

ADMINISTRATIVE REPORT

Report Date: August 21, 2007
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Meeting Date: September 18, 2007

TO: Vancouver City Council

FROM: General Manager of Engineering Services

SUBJECT: Fleet Addition - Cured In Place Pipe Equipment

RECOMMENDATION

A. THAT, Council approve the allocation of $120,000 from the Truck and Equipment Plant Account to fund the capital cost of the Cured in Place Pipe (CIPP) Equipment.

B. THAT, the $26,000 required to repay the Truck and Equipment Plant Account for annual capital costs and operating costs be provided from the existing Sewer Operations Branch Operating Budget (CC 36030/700000).

COUNCIL POLICY

Council approves expenditures from Reserves, including the Truck and Equipment Plant Account.

Council approves all increases in service levels, including the addition of vehicles and equipment to the fleet.

Council approves budget transfers over $50,000.

PURPOSE

This report seeks approval for the purchase of CIPP (Cured in Place Pipe) equipment for the Sewer Operations Branch.

BACKGROUND

The City of Vancouver Sewer Operations Branch relays, repairs and installs several hundred sanitary and storm services, mains and catch basin leads annually. Typically, Sewer Operations use open trench methods and whenever possible employ trenchless technologies to perform the necessary work. Currently, the trenchless program uses pipe bursting technology and has more recently included CIPP technology. Pipe bursting is a method of repairing and rehabilitating buried pipelines by using an expanding device to shatter the existing pipeline, and drawing in a new line behind it. Trenchless techniques do not require excavating to expose sewer lines and can therefore be more efficient and cost effective.

DISCUSSION

Over the past two years, Sewer Operations have used CIPP technology successfully through outside contractors. CIPP technology allows the trenchless installation of a liner impregnated with resin inside an existing pipe. Once the resin cures, it effectively acts as a stand alone pipe within a pipe.

The CIPP equipment includes a trailer with a launching unit which is composed of a generator, a conditioner, a vacuum pump and a compressor along with various fittings and operating controls. Resins and liners are consumable materials that the CIPP equipment uses to repair and rehabilitate deteriorated or damaged sewer lines.

CIPP has several distinct advantages that make it the optimum choice for repair and rehabilitation type work. CIPP is generally faster and less costly than excavating the existing pipe to replace it with a new pipe. For example, a pipe may be under a mature boulevard tree, a concrete or newly paved street, a water table, utilities, or some other impediment that makes excavation difficult or impossible. CIPP may also be more advantageous than pipe bursting because the existing sewer pipe may be very shallow, the ground conditions may be too hard, or the existing sewer pipe may be at a severe grade differential that does not permit bursting.

Two common tasks that would greatly benefit from the use of CIPP technology are replacements and repairs to catch basin leads and service lines. Catch basin leads are sewer lines that connect main sewer lines to catch basins. They are good candidates for CIPP technology because the lines often run under busy streets or intersections that make excavation undesirable. Sanitary and storm service lines are sewer lines that connect main sewer lines to property lines. They are also good candidates for CIPP technology if it is determined that pipe bursting is undesirable or unsuccessful.

The current methods of repairing damaged and defective service lines include outsourcing to CIPP contractors and open cut methods. Outside CIPP contractors schedule work based upon the priorities of all their customers, whereas City crews conform to City priorities. Open cut methods require many operations such as excavating, shoring trenches, replacing the line section, filling and finishing the excavation. Therefore open cut methods are usually more costly and labour intensive than trenchless methods and can cause substantial disruption to the public.

All of the CIPP work to date has been completed by contractors under the supervision of Sewer Operations or a consultant. Although satisfactory service and product has been received, economic analysis shows that this work can be performed by City crews more efficiently and cost effectively.

FINANCIAL IMPLICATIONS

Based upon historical work load, it is anticipated that 40 catch basin leads will require repairs annually. Table 1 shows that annual savings between $70,000 and $130,000 can be realized for catch basin leads by using City operated CIPP technology in lieu of other methods. The historical split between open cut methods and contractor CIPP in recent years has been 3 to 1, and thus the expected annual savings with City operated CIPP technology are $115,000.

Table 1. Annual Catch Basin Leads Savings

Method	Cost per Repair	Annual Cost	Annual Savings with COV CIPP
COV Open Methods	$4,790	$190,000	$130,000
Contractor CIPP	$3,185	$130,000	$70,000
COV CIPP	$1,455	$60,000	-

The Sewer Line Preventative Maintenance Program allows sewer crews to clear and clean pipes that have a history of root infiltration and other damage. This preventative maintenance program has grown from 600 to approximately 3,000 lines over the last four years. The large increase is due to aging infrastructure with more intrusions and a more proactive inspection methodology. CIPP technology will allow the rehabilitation of more lines and as a result, repair and maintenance costs will be reduced as well as the potential for flooding. Since 2005, 41 properties have been identified as candidates for CIPP service re-lining, and it is anticipated that 20 CIPP service re-linings will be required per year. Open cut methods or pipe bursting would not be practical for these particular cases of service re-lining, and are therefore omitted from the table below. Table 2 shows that annual savings of $30,000 can be realized for annual service re-lining by using City operated CIPP technology instead of a CIPP contractor.

Table 2. Annual Service Re-lining Savings

Method	Cost per Repair	Annual Cost	Annual Savings with COV CIPP
Contractor CIPP	$3,300	$65,000	$30,000
COV CIPP	$1,700	$35,000	-

Taking the different CIPP applications into account, it is estimated that the total annual net savings of City operated CIPP technology would be $145,000 over current methods. The realized savings will be reinvested back into the Sewers Operating Budget to help replace the increasing number of deteriorated services that have been identified as part of the Sewer Line Maintenance Program. There is currently a backlog of 300 deteriorated lines that have not been repaired due to budgetary constraints, and it is expected that an additional 24 lines may be replaced per year with the identified savings.

There will be a one time charge of approximately $120,000 to the Truck and Equipment Plant Account, which will be used to purchase the necessary equipment from one of the numerous CIPP suppliers. Sewer Operations Branch will repay this amount over the 10 year life of the equipment through internal rental rate charges of approximately $15,000 for capital and $11,000 for maintenance, for a total annual cost of $26,000. Funding is to be provided from the existing Sewer Operations Branch Operating Budget. Consumable materials such as resins and liners are expected to cost between $30,000 and $40,000 annually and will also be funded from the existing Sewer Operating budget.

ENVIRONMENTAL IMPLICATIONS

CIPP equipment uses less fuel and less fill material than conventional open cut methods. As well, use of CIPP eliminates truck traffic associated with open trench construction. CIPP uses consumable materials such as epoxies, polyesters, vinyl esters, felts, glass fibre composites and carbon fibre composites. Although there are many choices for the consumable materials on the market, the City of Vancouver would only purchase the non-toxic consumable materials.

CONCLUSION

This report recommends the purchase of CIPP equipment at a cost of $120,000 with funds to be provided by the Truck and Equipment Plant Account. Savings of $145,000 can be achieved annually with the purchase and use of City-operated CIPP technology over current methods. The savings can then be reinvested into back into the Sewers Operating Budget (CC 36030/700000) to help maintain the deteriorated services that have been identified as part of the Sewer Line Maintenance Program.

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