7. SEWER GROUTING PROGRESS REPORT

Officer responsible Waste Manager	**Author** Neville Stewart, Senior Engineering Officer
Corporate Plan Output: Liquid Waste Capital Renewal and Replacement	

The purpose of this report is to recommend awarding a contract to City Care Ltd for an initial 12 month trial period for the chemical grouting of sewers to reduce overflows in wet weather, and ground water infilration in dry weather.

BACKGROUND

A report to the Committee in February 2000 outlined a strategy for sewer rehabilitation and control of infiltration by chemical injection (grouting) of pipe joints in the sewer mains and laterals. This process has been established as the most cost effective method suitable for sewers that are structurally sound but have leaking joints.

This Committee resolved:

"*That staff provide cost effective comparison between a Waste Management Unit developed and Canroad* (now City Care Ltd) *operated sewer grout rig operation and an operation provided by a private contractor."*

The consulting group Australian Water Technologies (AWT ex Sydney Water Board) has been carrying out flow monitoring in the reticulation system and developing a hydrodynamic model of the system in both wet and dry weather. The results of this work will be used to reduce wet weather overflows and to enable better targeting of sewer renewal and sewer rehabilitation measures.

The AWT work has shown that on average over a year 63% of flow in the sewer system is wastewater, 30% is from groundwater infiltration in dry weather and 7% is from storm events. An area in Papanui has been identified as the worst affected catchment for wet weather overload. It is proposed to commence grouting in this area. A successful grouting programme will significantly reduce the overflow frequency by reducing groundwater infiltration and also may allow capacity for some urban expansion without compromising the target overflow reduction. The lack of sewer capacity for urban expansion is inhibiting development in some locations. During the contract the opportunity will be taken to test methods of sealing the deteriorating rubber ring joints in the New Brighton area. The cost of the work has been allowed for in the current budget for sewer renewal. If sewer grouting proves successful in the Christchurch conditions then this technique of rehabilitation will be able to be used for many years as a tool to significantly reduce maintenance and pipe network renewal costs.

ECONOMICS

Chemical grouting has an expected life of 20 years when used in the appropriate manner. If the remaining life of a new sewer, before infiltration becomes excessive, is assumed at 80 years,(not its structural life which is 100+ years) then the cost of chemical grouting should not exceed 25% of the new pipe to be cost effective. That is for 150mm diameter sewers which when new cost upwards of $160/m, the grouting cost should not exceed $40/m, based on one quarter of the expected life of new pipe.

Grouting also has the added advantage of reducing the rate of deterioration of the pipe system by reducing future joint failures due to loss of pipe support material normally washed into the pipe with the groundwater infiltration. It is estimated that grouting could extend pipe life by an estimated 25%. The alternative of relaying new pipe instead of grouting for infiltration control is at least four times as expensive.

CITY CARE LIMITED PROPOSAL

The proposal is to establish a partnering contract between the Council and City Care Ltd for a period of 12 months with the objective of achieving good quality at the lowest reasonable cost. The key factors of the partnership are share of risk and ability of both parties to input into and learn from the operation. City Care Ltd has appointed a new position of Special Projects Manager who is experienced in chemical grouting. The company has an option with a USA manufacturer willing to lease equipment for a 12 month period and with a purchase option later. The manufacturer has offered training for City Care Ltd staff in USA and on-site training after delivery. The leasing arrangement for equipment allows that at the end of the 12 month period if either or both parties are dissatisfied, the operation can terminate at no cost penalty. This win/win arrangement suits the company and the Council, as performance of the contract can be closely monitored by both parties. The Council's interest is quality, cost, production rate and effectiveness of the process, while City Care has to maintain and refine the efficiency of the process to ensure continued contracts. Such a partnering contract will allow the effectiveness and suitability of injection grouting to be fully assessed in Christchurch conditions in a spirit of development and cooperation.

COST OF PROPOSAL

Extended negotiations with City Care have reached a conclusion that will provide the Council with a very cost competitive initial grouting program while allowing City Care to develop expertise and experience in a new technology. City Care Ltd's offer is to carry out a 12 month contract to grout main sewers and laterals for the provisional sum of $544,518 excluding GST. The payment basis is daywork scheduled rates for the grouting operation and acceptance testing and measure and agreed cost scheduled rates for cleaning, CCTV inspection and materials, all based on quantity of work actually done.

COST COMPARISON WITH CURRENT INDUSTRY PRICING.

Cost comparisons are set out below. The following factors are relevant:

- City Care Ltd's proposal is largely at hourly rate pricing therefore unit costs depend on the production rate. The contract performance expectation is 15km per year of mainline sewer grouting plus associated sewer laterals.
- The Australian contract practice is pricing on per metre length of mainline sewer with the contractor taking the risk on the number and severity of faults requiring repair. (typically 15%-20% of joints for Sydney).
- North Shore City Council has let contracts on the basis of scheduled rates for joint testing (every joint) plus a separate rate for grouting (per grouted joint).

The following table assumes 33% of our pipework systems joints will require grouting which corresponds to a conservative estimate of City Care Limited's production rate to achieve 15,000m/year.

Main Sewer Grouting

Company	per metre mainline rate
• City Care Ltd	$25
• ex North Shore City	$60
• Australia (Sydney)	$55 ($A35/m adjusted to 33% of joints grouted
• J B Pipelines quote to CCC	$75 ($55/m grouting $20/m testing separately)

Lateral Grouting

Company		
• City Care Ltd	$100 each (junction and 3m of lateral)	
• ex North Shore City	ex North Shore City; (lateral to boundary)	$95 (junction only) plus $220
• J B Pipelines quote to CCC	J B Pipelines quote to CCC; (lateral to boundary)	$600 (junction only) plus $600

Note: The quotation from J B Pipelines was for a small trial and large scale pricing is likely to mirror that of North Shore City above.

SUMMARY

The Council wishes to embark on sewer grouting to reduce groundwater infiltration and sewer overflows and to extend the economic life of the sewer network. Sewer grouting is part of an integrated sewer repair and rehabilitation operation which would extend present trenchless methods and reduce repair costs. A contract with City Care Ltd on the basis outlined will enable a degree of monitoring of sewer grouting quality, production performance and an ability for Waste Management Unit staff to obtain knowledge of other uses of the process that would be difficult to achieve under a competitively tendered contract. The price offered by City Care Ltd is less than half of recent industry pricing and it is not considered likely that lower rates could be obtained by competitive tendering. The training offered by the equipment manufacturer plus the experience of the staff specialist of City Care Limited should ensure a competent operation.

Recommendation: That the Council enter into an agreement with City Care Ltd to carry out sewer chemical grouting for a 12 month period in accordance with the prepared Specifications and Schedule for the Provisional Sum of $544,518 excluding GST. Actual payment will be based on quantity of work completed at agreed contract scheduled rates.

Chairman's Recommendation: That the above recommendation be adopted.