

**TO:** CITY MANAGER

**DATE:** 2002 06 18

**FROM:** DIRECTOR ENGINEERING

**FILE:** 40-05-02

**SUBJECT:** WILLARD/MEADOW DRAINAGE STUDY

**PURPOSE:** To inform Council of the results of the Drainage Study for the Willard/Meadow area and to seek Council approval in principle of the Drainage Improvement Plan.

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**RECOMMENDATION:**

1. **THAT** Council approve in principle the proposed Drainage Improvement Plan for the Willard/Meadow drainage area as outlined in this report and include the recommended improvements as part of the 2003-2007 five year capital plan discussion.
2. **THAT** staff be authorized to further refine the engineering practices for lot filling in the Willard/Meadow area in accordance with the recommendations of the geotechnical investigation.
3. **THAT** a copy of the report be provided to:
  - a) Willard/Meadow residents who previously corresponded with the City regarding drainage and filling concerns; and
  - b) Mr. Glenn Sergius, Chair  
Jerry Rogers Creek Streamkeepers  
6088 - 12<sup>th</sup> Avenue  
Burnaby, BC V3N 2J1

**R E P O R T**

**1.0 BACKGROUND**

The City completed a report on Big Bend drainage in 1986 which included the Willard/Meadow drainage area. Since 1986, changes have occurred in the drainage area including construction of the Meadow drainage pump station, on-site property filling and

drainage boundary modifications. As a result, the City retained Associated Engineering to update the drainage study for the Willard/Meadow area in order to address future drainage needs and the property filling issue. The Willard/Meadow study area is outlined in Figure 1.

The engineering study is now complete. This staff report summarizes the results and recommendations of the study and presents Council with a comprehensive improvement program to improve long term drainage in the Willard/Meadow area.

## 2.0 STUDY OBJECTIVES

The key objectives of the drainage study were:

- To examine the existing drainage conditions in the study area and to identify system constraints,
- To evaluate future drainage needs with respect to different on-site land filling scenarios,
- To recommend possible improvements to meet future drainage needs.

## 3.0 STUDY FINDINGS

The Willard/Meadow drainage area is located in an area with diversified land use including semi-rural residential (A2 Small Holdings), agricultural and industrial. The majority of the land in the area is low lying and in recent years, some lots have been filled by landowners to improve on-site drainage. The drainage system in the study area primarily consists of culverts and ditches which discharge to the Meadow pump station and flood box, and flow into the Fraser River.

Surface and subsurface drainage problems are evident in the study area during prolonged rainfall periods. The lower part of the drainage area is more susceptible to flooding due to tidal influence of the Fraser River. The objective of the drainage management plan for this area is to provide a reasonable level of flood protection for the ten year combined rainfall and tidal event. This would improve the existing drainage condition and provide flooding relief to existing and future development in the Willard/Meadow area.

Based on the engineering hydraulic analysis conducted by the consultant for the Willard/Meadow area, a cost effective solution involving upgrading of the existing culvert system is recommended. The recommended upgrades involve up-sizing of the existing culverts to improve conveyance capacity. The proposed improvements are shown on Figure 1 and included in Appendix A. The estimated cost of the recommended improvements is

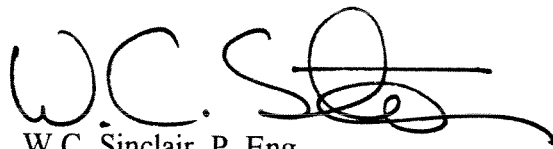
approximately \$1.5 M and the work can be incorporated within existing Capital Budget funding levels and implemented over a several year period.

As part of the drainage study, a geotechnical investigation was also carried out to evaluate the impact of site filling on the groundwater regime in the area. Based on the result of the technical evaluation, the study concluded that the gradient of the groundwater table is very flat and groundwater flows through the peat and silt surface layer are small in comparison to the overall drainage. The study further concluded that due to the characteristics of the subsurface soil conditions in this area, individual site filling has minimal impact to the groundwater flow and level in the area if adequate surface drainage control is provided along the perimeter of the fill site. Notwithstanding the above, the cumulative effect of individual lot filling and preloading could have an impact on the groundwater flow. In order to mitigate any potential impact that may arise as a result of site filling, the geotechnical investigation recommended that a higher level of engineering and construction control including better on-site surface drainage system, pre-construction groundwater survey and monitoring program during filling be implemented for future filling activities in the area.

#### 4.0 CONCLUSIONS AND RECOMMENDATIONS

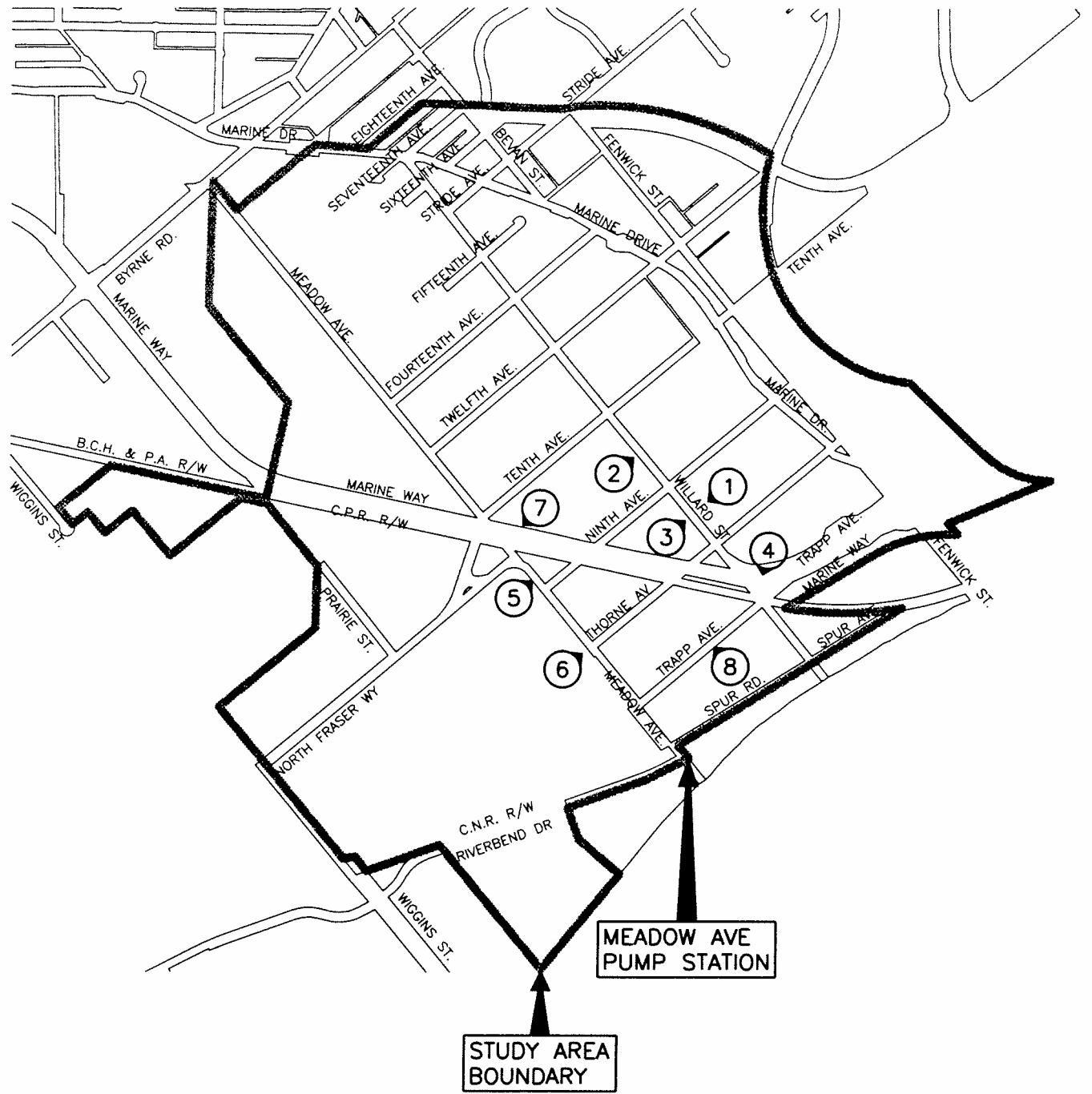
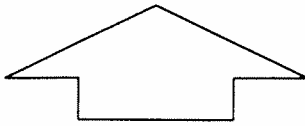
The drainage study recently completed for the Willard/Meadow area has identified a number of opportunities to improve drainage conveyance and to provide better management of future site filling in the study area. The study recommended a program of culvert improvements to enhance flow capacity at an estimated cost of approximately \$1.5 M. To improve the long term drainage in the Willard/Meadow area, it is recommended that Council approve in principle of the proposed drainage improvement plan as shown in Figure 1 and the specific improvements be included in the 2003-2007 five year capital plan discussion and prioritization.

Subject to Council concurrence of this report, staff would refine the existing property filling guidelines to reflect the recommended engineering and construction practices as outlined in the geotechnical investigation and process future filling applications accordingly.

  
W.C. Sinclair, P. Eng.  
DIRECTOR ENGINEERING

LSC:dh  
Attach.

cc: Director Planning and Building  
Director Finance



(X) SEE APPENDIX A FOR WORK DESCRIPTION

NO.	DATE	REVISION



## WILLARD/MEADOW DRAINAGE AREA IMPROVEMENT PLAN

DRAWN BY: HLOUIE	SCALE: N.T.S.	A 580
APPR'V'D BY:	DATE: 2002-06-17	

**PROPOSED DRAINAGE IMPROVEMENTS WILLARD/MEADOW AREA**

1. Upgrade culverts on north side of Willard Street between 9<sup>th</sup> Avenue and Thorn Street.
2. Upgrade culverts on south side of Willard Street between 10<sup>th</sup> Avenue and 9<sup>th</sup> Avenue.
3. Upgrade culverts on south side of Willard Street between 9<sup>th</sup> Avenue and Thorn Street.
4. Upgrade culvert under Marine way at Willard Street.
5. Upgrade culvert at Meadow Avenue, north of 9<sup>th</sup> Avenue.
6. Upgrade culvert under ABC Recycling driveway.
7. Install flap-gate on culvert upstream of the railway culverts near Marshland Avenue (now North Fraser Way).
8. Construct a new storm sewer on Trapp Avenue between Willard Street and Meadow Avenue.

