

ITEM 12
MANAGER'S REPORT NO. 7
COUNCIL MEETING 90/01/29

RE: IMPACTS ON DRAINAGE OF AGRICULTURAL LANDS FROM THE CONSTRUCTION
OF RIVERWAY GOLF COURSE

MUNICIPAL MANAGER'S RECOMMENDATION:

1. THAT the recommendation of the Director Recreation & Cultural Services be adopted.

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1990 JANUARY 15

TO : MUNICIPAL MANAGER
FROM : DIRECTOR RECREATION & CULTURAL SERVICES
RE : **IMPACTS ON DRAINAGE OF AGRICULTURAL LANDS FROM THE CONSTRUCTION OF RIVERWAY GOLF COURSE**

PURPOSE: To provide Council with information regarding the above subject.

RECOMMENDATION:

1. THAT this report be received for information purposes.

REPORT

At its meeting of 1990 January 17, the Parks & Recreation Commission received the attached report on the above subject and approved the recommendation contained therein.



DENNIS GAUNT
DIRECTOR RECREATION &
CULTURAL SERVICES

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Attach.

cc: Director Engineering
Director Planning & Building Inspection

RE: IMPACTS ON DRAINAGE OF AGRICULTURAL LANDS FROM THE CONSTRUCTION OF RIVERWAY GOLF COURSE

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RECOMMENDATION:

1. THAT this report be referred to Council for information.

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REPORT

1.0 SUMMARY:

At the suggestion of Council, a study was initiated to determine the potential effects of the development of Riverway Golf Course on the surrounding agricultural lands. The consultant's research indicates that the golf course filling operations are not contributing to drainage problems experienced on the agricultural lands. Future golf course development plans were also assessed to have no negative impacts, and perhaps even a slight positive benefit. A few minor recommendations for improved storm flows were made by the consultant. Therefore golf course construction is proceeding as planned.

The consultant identified a number of factors outside of the golf course property that are contributing to drainage problems. These findings have been referred to the Engineering Department and the Planning and Building Inspection Department for assessment. These factors will be considered in a forthcoming report to Council recommending that a master drainage plan for the Big Bend Area west of Byrne Road be implemented.

The consultant's recommendations pertinent to the golf course filling operations are presented along with a staff response to each issue.

2.0 INTRODUCTION:

The purpose of this report is to advise on the findings of a soil and drainage consultant hired to assess the possible effects of the construction of Riverway Golf Course on the drainage of the neighbouring agricultural lands. This study was initiated at the direction of Council. On 18 September 1989, Council approved a Capital Reserve Bylaw to allow the continued development of the golf course and, at that time requested staff to ensure that the agricultural needs are addressed when dealing with drainage problems associated with this project.

This direction occurs as a result of concerns expressed by local farmers that agricultural lands have experienced increased flooding in recent years as a result of continued developments within the Big Bend Area.

3.0 STUDY OBJECTIVES:

In October, staff hired a consultant, Mr. Martin G. Driehuyzen, B.Sc., P.Ag., who is a specialist in drainage, erosion control and soil and water management. Mr. Driehuyzen, who is now retired, has had 18 years experience with the B.C. Ministry of Agriculture and Fisheries as a Provincial Drainage Specialist. Amongst his many tasks in this capacity, Mr. Driehuyzen has regularly carried out site investigations and the preparation of detailed recommendations for drainage improvements to assist agricultural capabilities.

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The specific objectives of the study were to:

1. Determine impacts, if any, from the construction of the Riverway Golf Course on the drainage of agricultural lands in the immediate vicinity and make recommendations for improvements with a view to safe-guarding, and where appropriate, enhancing drainage of agricultural lands.
2. Examine the golf course design and assess the potential impacts that may occur from its implementation and suggest modifications to the design where warranted.

4.0 FINDINGS, CONCLUSIONS AND RECOMMENDATIONS:

A copy of the consultant's report is on file in the Parks and Recreation Department. Copies have also been distributed to the Engineering Department and Planning and the Building Inspection Department. A summary of the consultant's findings applicable to the golf course is provided below.

In judging the effect of the golf course on agricultural drainage, the following factors were used as a basis for evaluation:

- adequacy of current drainage facilities
- stream bed alteration
- flow volume alteration
- flood storage reduction
- golf course fill materials and adequacy of drainage plans

According to the consultant, development of Riverway Golf Course has had no significant effects upon the drainage of the neighbouring agricultural lands. In addition, evaluation of the proposed future development plans for the golf course indicated that no negative impacts would occur to the drainage as plans are implemented. Although a number of minor suggestions have been made to ensure that stream flow is unimpeded, particularly during storm events, these are not considered to be central to the larger issue.

Because of the nature of the research, the consultant explored drainage conditions on all land surrounding the golf course. As a result, a number of drainage problems were noted, the cause of which is unrelated to the development of the golf course. These conditions have been brought to the attention of the Engineering and Planning and Building Inspection Departments. These issues will be addressed in a forthcoming report to Council recommending that a master drainage plan for the Big Bend Area west of Byrne Road be implemented.

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Staff Response

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Assessment of the Riverway Golf (

Consultant's
Findings/Recommendations

1. Nelson Creek, Royal Oak Creek and a small drainage channel flowing south of Marine Way have been modified during filling operations. This work should be completed including removal of debris and stabilization of the fill slopes to prevent erosion and possible sloughing. The debris does not impede base flows but may affect drainage during storm events.

All debris will be removed and a clean up and maintenance program will be instituted on all creeks in the golf course. All water courses will be designed to the approval of the Director Engineering.

The Drainage System west of Byrne Creek is shown on Attachment #1.

2. Minor benefits could be achieved through stream maintenance to ensure flows are unimpeded.

A clean up and maintenance program will be instituted on all creeks in the golf course.

3. The golf course land in its unfilled state is situated almost entirely above the main Fraser River flood levels. For this reason, the development of the golf course has not reduced flood water storage from Fraser River flooding.

No action needed. Golf course filling operations can continue as planned.

4. The proposed use of ponds and artesian waters will contribute an additional flow of 0.014 cms. which is of such low proportion that it can be ignored for all practical purposes.

Planned development of the ponds and use of artesian water will proceed. Staff will continue to explore the option of incorporating fish rearing habitat within one of the new waterways. Any changes in the stream flow will be designed to the approval of the Director Engineering.

5. The fill material being placed in the golf course is high in silt and clay content which will decrease drainage and durability of the course. A drainage plan using subsurface drains is required. Wherever possible, porous mineral fill should be used.

Staff recognize the benefits of filling the property with free draining granular material. However, economically this is not feasible. Over two million cubic meters of fill is needed for the entire development. Currently, as fill is placed on the site, revenue is generated, whereas if sand were used it would have to be purchased at a cost of perhaps \$3.00-\$6.00 per cubic meter. Using sand fill is not the only acceptable approach to land development. The consulting geotechnical engineer and the golf course architect have developed an extensive grading and drainage program for impermeable material that will be effective in removing the water off site and maintaining a durable course.

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TABLE #1

Assessment of the Riverway Golf Course Site

Consultant's Findings/Recommendations

Staff Response

In addition, the tees and greens will be constructed using sand fill, drain rock and drain lines in order to ensure good drainage.

This is the most cost efficient method of development. Staff are confident that this approach will produce a well drained and durable course.

6. Water levels in the new ponds should be set at 1.2 m. below adjacent land level instead of the proposed 0.3 m., to ensure adequate drainage of the golf course.

Staff do not concur with this recommendation. Decreasing the water level would lower the flow which is a characteristic that provincial fisheries authorities want us to preserve in order to help develop viable fish habitat. The lower water level would also look unsightly.

To compensate for the possible effect of increased soil moisture, additional sub-surface drainage will be installed wherever warranted.

5.0 CONCLUSIONS:

The consultant's research has confirmed that any disturbance of the drainage of agricultural lands is not attributable to the development of the golf course. Therefore, peat removal and filling operations plus actual course development will proceed as planned.

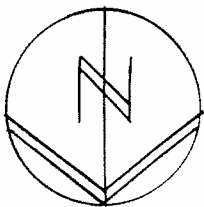
There are a number of factors outside of the course itself that have been identified as having impacts on the drainage of the agricultural lands. These issues have been referred to the applicable departments for their information.

The Planning and Building Inspection Department will be reporting to Council shortly on a proposal to prepare such a comprehensive drainage plan which would include an agricultural perspective.

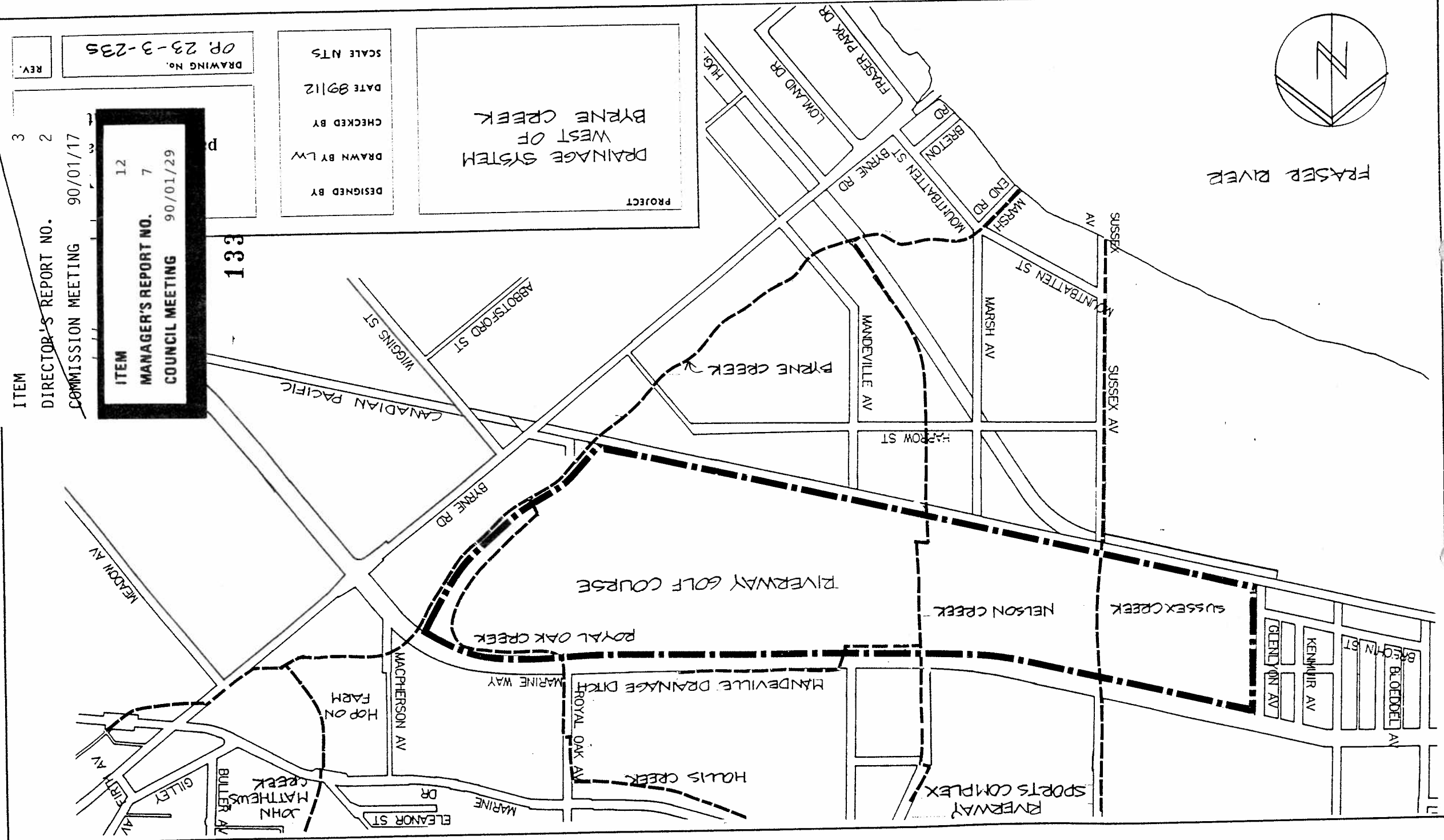
JK/mdw

Attach. (1)

c.c. Director Engineering
Director Planning and Building Inspection.



FRASER RIVER



PROJECT

DRAINAGE SYSTEM
WEST OF
BYRNE CREEK

DESIGNED BY

DRAWN BY LW

CHECKED BY

DATE 89/12

SCALE NTS

DRAWING No. OR 23-3-235

REV.

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ITEM 3
DIRECTOR'S REPORT NO. 2
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ALL INFORMATION IS