

Re: Swangard Stadium Drainage

The following is the report of the Parks and Recreation Administrator dated April 29, 1974 regarding the above.

This is an urgent matter and a decision should be made as quickly as possible if we are to have the field reconstructed for play this Fall.

The source of funds for this project is anticipated to be:

Parks & Recreation 1974 Capital Budget ...	\$50,000
Central Park Committee, 1973 Capital Budget	10,000
Community Recreation Facilities Fund	33,333 *
Surplus C.I.P. Parks Funds	<u>6,667</u>
	\$100,000

There is available in Surplus in C.I.P. Parks Funds \$33,945* should there be any problem with the application that we presently have before the Approval Committee of the Community Recreation Facilities Fund. We will upgrade our application from \$60,000 to \$100,000.

RECOMMENDATIONS:

THAT the recommendations of the Parks and Recreation Commission be adopted; and

THAT the application to the Community Recreation Facilities Fund be modified to read \$100,000; and

THAT a copy of this report item be forwarded to the Parks and Recreation Commission and the Central Park Committee.

* * * * *

April 29, 1974

TO: MUNICIPAL MANAGER

FROM: PARKS & RECREATION ADMINISTRATOR

RE: SWANGARD STADIUM DRAINAGE

On December 5, 1973 the Burnaby Parks and Recreation Commission, with the concurrence of the Central Park Committee, engaged Ripley, Klohn and Leonoff International Ltd., Consulting Geotechnical Engineers; and T.M. Lord and A. J. Green, Consulting Agronomists to define the nature and cause or causes of the Swangard Stadium drainage problem, to make recommendations as to the procedures to correct the drainage problem, and to provide an estimate of cost of the complete corrective works. Reports from these two Consultants were received by the Parks and Recreation Commission on January 23, 1974.

On February 5, 1974, the Central Park Committee authorized the Burnaby Parks and Recreation Commission to proceed with the work to correct the stadium drainage problem; and authorized an expenditure of up to \$10,000., for the installation of an irrigation system.

The staff of the Parks and Recreation Department drafted plans and specifications for the renovation project in accordance with the requirements laid down by Ripley, Klohn and Leonoff International Ltd., and Lord and Green, who were then engaged to review and refine these draft plans and specifications to their satisfaction. Thus, the final plans and specifications conformed fully to the drainage and agronomic requirements as set out by Ripley, Klohn and Leonoff and Lord and Green.

Tenders were called on March 23, 1974 and were opened on April 18, 1974. Seven landscape construction firms picked up tender documents. Two bids and one proposal were received. These were as follows:

Holland Landscapers	-	\$105,000.
Johnsen Landscaping Ltd.	-	93,200.

Cellsystem Design proposal		
to install a "cellsystem" field		\$ 81,710.

The tentative budget for the project was \$50,000. for field renovation plus \$10,000. for irrigation.

The bids were presented to the Parks and Recreation Commission on April 24, 1974. It was decided to have the Consultants evaluate the proposal of Cellsystem Design to determine the existence and extent of any variance from specifications; and to meet with Johnsen Landscaping Limited to determine if economies could be effected without major deviation from the specifications.

The Consultants have now met with Cellsystem Design and have submitted the evaluations of the Cellsystem. Cellsystem has replied, indicating conformity with the Consultant's requirements. The Consultants have also met with Johnsen Landscaping who have submitted a revised proposal of \$85,500.

The Parks and Recreation Commission met on April 29, with Mr. K. I., Morrison of Ripley, Klohn and Leonoff, to review the recent submissions. The following resolutions were made:

1. "That the Commission reject all tenders."
2. "That the cellsystem proposal in the amount of \$81,710. with modifications suggested by Mr. Morrison and the Commissioners be accepted, subject to the bonding requirements as laid out in the original specifications." The modifications referred to are as follows:
 - (a) Sand and gravel must conform to tolerances as set out by the Consultants.
 - (b) Depth of drain gravel around perforated pipes must be 6" as specified by the Consultants.
 - (c) Rototilling of rooting mix must be carried out as follows:
 - (1) Till the entire field in a north-south direction.
 - (2) Till the entire field in a east-west direction.
 - (3) Repeat (1) above.
 - (4) Repeat (2) above.
 - (5) Repeat (1) above.
 - (6) Repeat (2) above.

This will ensure a reasonably homogeneous mixture of sand and peat.

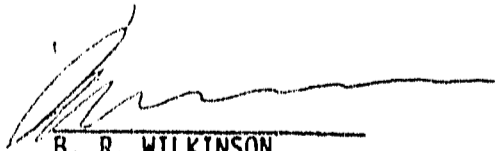
- (d) Following excavation, and prior to installation of the cells, the subgrade is to be thoroughly compacted to ensure against settlement.
3. "That a figure of \$12,000. be approved to cover initial design work and supervision and inspection by Ripley, Klohn and Leonoff and by T. M. Lord and A. J. Green." (Includes staff supervision).
4. "That the Manager and Administrator be authorized to negotiate with Cellsystem or others for the addition of pump and automatic sprinkling for a sum of approximately \$5,000. "
- "That the Commission approve a total project cost of \$95,000.
5. to \$100,000. including the \$10,000. from Central Park Committee."

The cellsystem is a "package" design providing a sand and peat rooting medium over a closely spaced drainage system; separated from the subgrade by a plastic membrane and so designed as to facilitate adjustment and control of the moisture level within the rooting medium. Compared with the Corporation's specification the cellsystem offers the following:

- (1) Reconstruction of the whole playing surface vs 2/3 of the playing surface as specified.
- (2) Drains spaced at 5' 6" centres vs 15' centres.
- (3) Sub-irrigation feature, plus sprinkler system vs sprinkler system.
- (4) Use of "imported" turf vs turf "borrowed" from Burnaby Lake Sports Complex.
- (5) 2 Year Guarantee.

RECOMMENDATION:

1. That Council be asked to approve the actions of the Parks and Recreation Commission.
2. That Council be asked to authorize the execution of an appropriate contract with Cellsystem Design for the reconstruction of the Swangard Stadium Sportsfield at a cost of \$81,710.
3. That Council be asked to authorize an extra expenditure of approximately \$5,000. for the addition of a pump and automatic sprinkling.
4. That Council be asked to approve an expenditure of \$12,000. to cover the cost of design work, supervision, inspection, and consultation by Ripley, Klohn and Leonoff, and by T.M. Lord and A. J. Green, and by Burnaby staff.
5. That Council be asked to approve a total project cost of \$95,000. to \$100,000., including the \$10,000. from Central Park Committee.



B. R. WILKINSON
PARKS AND RECREATION
ADMINISTRATOR.

\$ 50000 Original price

NAME	PRICE	ALTERNATE 1	ALTERNATE 2	ALTERNATE 3	ALTERNATE 4	ALTERNATE 5	ALTERNATE 6	BID BAND
ACK CENE LTD.								
INDUSTRIAL CONSTRUCTION CENTRE								
COLLAND LANDSCAPERS	\$ 105,000		\$ 18,000	\$ 13,000		\$ 10,800		
RO TURF LTD.								
ARLEY DEVELOPMENT LTD.								
TANDARD GENERAL CONSTRUCTION								
PRAGUES INC.								
JOHNSEN LANDSCAPING LTD.	93,200		15,000	14,440	13,000	13,000	\$ 3.90/lin. f..	
PACIFIC LAWN SPRINKLERS LTD.								
CHAMPION SERVICE CONSTRUCTION								
CELLSYSTEM DESIGN		\$ 81,710						

ITEM 30 (SUPPLEMENTARY)
 MANAGER'S REPORT NO. 33
 COUNCIL MEETING April 29/74

ITEM 30 (SUPPLEMENTARY)
MANAGER'S REPORT NO. 33
COUNCIL MEETING April 29/74

CELLSYSTEM[®]

design

3-1360 MAIN STREET
AREA 604-985-8708

NORTH VANCOUVER, B.C.
V7J 1C6 CANADA

QUOTATION NO: 1054

18th April, 1974

The Corporation of the District of Burnaby,
Municipal Hall,
4949 Canada Way,
Burnaby 2, B.C.

Reference:

SWANGARD STADIUM
SPORTS FIELD

Attention: Mr.K.F.Williams
Purchasing Agent

TO: CONSTRUCT a System designed Athletic
Field GUARANTEED to drain for a period
of TWO YEARS under a given Maintenance
Programme. TO INCLUDE:
Surface sprinkler irrigation and
Underground irrigation systems.
Excavation of existing soil and move to
site adjacent to Stadium.
Preparation of sub-grade.
Laying a System Field finished flat,
fertilized and turfed with a first-grade
"HYRIB" turf.

PRICE: 70 yds. x 120 yds. = 8,400 sq.yds.
210' x 360' = 75,600 sq.ft. \$81,710.00
=====

F.O.B. Job Site SWANGARD STADIUM.

TERMS OF PAYMENT: Progressive payments on
Labour and Materials on Site.

CONSTRUCTION COMPLETION DATE: 23rd July, 1974

WORK TO COMMENCE NO LATER THAN: 15th May, 1974

We thank you for the opportunity of submitting our Quotation
and look forward to your favourable reply.

Yours truly,
for CELLSYSTEM DESIGN

James Paterson Izatt
Design Consultant

LOS ANGELES
CALIFORNIA 91335

4800 ZOFINGEN
SWITZERLAND

LAHAINA
HAWAII 96761

RECREATIONAL TURF - INSTALLATION - DESIGN

ITEM 30 (SUPPLEMENTARY)
MANAGER'S REPORT NO. 33
COUNCIL MEETING April 29/74

APR 18 1974
PURCHASING AGENTS
OFFICE

Ron Davies & Associates Ltd.

RECREATION & ATHLETIC CONSULTANTS

2495 OTTAWA AVE.
WEST VANCOUVER, B.C.
V7V 2T2

AREA CODE 604
TEL. 922-0536
Bus: 985-8708

The Corporation of the District of Burnaby,
Municipal Hall,
4949 Canada Way,
Burnaby 2, B.C.

18th April, 1974

Attention: Mr. K.F. Williams
Purchasing Agent

Dear Sir,

Ref: SWANGARD STADIUM SPORTS FIELD
(Alternative Design Proposal)

Enclosed please find the plans, details and complete costs for the reconstruction of the Playing Field at Swangard Stadium.

This has been submitted for consideration as an alternative design-construct proposal.

The total cost of \$81,710.00 (Eighty-one thousand Seven hundred and ten dollars) includes all engineering, design and supervision of construction to satisfactory completion and also includes supervision of the Maintenance Programme to be carried out by Owner's work force (which work force includes all machinery, materials and labour) for a period of TWO YEARS.

The sum of \$81,710.00 (Eighty-one thousand Seven hundred and ten dollars) does NOT include the \$5,000 (Five thousand dollars) Cash Allowance for general contingencies.

We would appreciate the opportunity of discussing this proposal in greater detail at your earliest convenience.

Yours truly,
for RON DAVIES & ASSOCIATES LTD.

Ron Davies

Ron Davies
President

Encs:

FACILITY DESIGN • PROJECT MANAGEMENT • FEASIBILITY STUDIES

ITEM 30 (SUPPLEMENTARY)
MANAGER'S REPORT NO. 33
COUNCIL MEETING April 29/74

RS.

Earle J. Klohn
Cyril E. Leonoff
Donald M. Davison
Mark T. Olsen
Earl W. Speer
James Hunter

Principals



Ripley, Klohn & Leonoff International Ltd.

CONSULTING GEOTECHNICAL ENGINEERS
1847 WEST BROADWAY • VANCOUVER 9, BRITISH COLUMBIA • CANADA
TELEPHONE: (604) 731-5781 CABLE: "RIPSOIL VCR" TELEX: 04-507647

Dr. Yves G. Bajard
Keith Douglas
Ken R. Gillespie
C.M. (Bob) Maartman
K. Ian Morrison
Robert J. Rennie

Executive Engineers

Our File VA1855

April 24, 1974

The Corporation of the District
of Burnaby
Municipal Hall
4949 Canada Way,
Burnaby, B.C. V5G 1M2

Mr. M.J. Shelley, Manager

Review of Cell System Proposal for Field Re-construction
Swanguard Stadium, Central Park, Burnaby, B.C.

Dear Sir:

As requested the writer met with Mr. Ron Davies (representing the cell system contractor), Mr. Stockstad, Mr. Wilkinson and Mr. Baranszky of Burnaby Parks on April 19, 1974. The purpose of the meeting was to review the cell system proposal for re-construction of Swanguard Stadium play field. On April 20, 1974 the writer inspected Capilano Stadium turf, in company with Mr. Ron Davies and Mr. Alec Green.

Our comments on the cell system proposal for Swanguard Stadium, as we understand it, are presented below. Our comments are restricted to the drainage aspects of the system. Agronomic aspects of the cell system proposal are to be reviewed by T. Lord and A. Green. The irrigation aspects of the cell system proposal are to be reviewed by Burnaby Parks Department.

1. All comments below are referenced to our understanding cell system proposal. The only on paper details we have are presented on attached cell system dwg 191-01 rev. A, "Swanguard Stadium, Central Park, Burnaby, B.C. - Re-construction Playing Field (360 ft x 210 ft)".
2. The rate of water absorption of the cell system proposal for field re-construction (15" of coarse sand with perforated drains at 5½ ft

VANCOUVER

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Our File VA1855

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spacing) is theoretically higher than the rate for a field re-constructed according to the Burnaby specifications (which had new drains at 15 ft spacing). In our opinion a field re-constructed to the cell system proposal (with the modifications we suggest below) will drain satisfactorily and the rate of absorption of rainfall will exceed 3/4" per day, and may be of the order of 4" per day.

3. There is no specific specification for coarse sand fill and for the drain gravel around the perforated pipes, as shown on the cell system drawing 191-01 revision A.

We consider that:

- a) the coarse sand used in the cell system proposal should meet the requirements for the sand drainage layer material as indicated in the Burnaby specifications and in our report revised to March 20, 1974. The above mentioned specifications for the sand drainage layer are not a restrictive specification, but as simply a specification of normally available clean well draining sand materials.
- b) the drain gravel placed around the perforated pipes should meet all the gradation and permeability requirements indicated below, on the understanding the perforation holes in the pipes are 1/2 inch diameter.
 - i the percentage by weight of the drain gravel retained on 1/2 inch sieve shall not be less than 15%.
 - ii the 15% size of the drain rock shall not be greater than 5 times the 85% size of the coarse sand.
 - iii the 50% size of the drain rock shall not be greater than 25 times the 50% size of the coarse sand.
 - iv the 15% size of the drain rock shall not be greater than 20 times the 15% size of the coarse sand.
 - v the 15% size of the drain rock shall not be less than 4 times the 15% size of the coarse sand.
 - vi the drain rock shall have less than 3% passing #200 sieve.
 - vii the drainage rate for the drain rock zone when tested by the pail test described on figure 3 in our report should not be less than 15 seconds.

Our File VA1855

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All the above requirements are conventional requirements for filters designed to prevent movement of material from one zone to another. We recommend that regardless of the system used or the contractor chosen for the work, the filter material around perforated pipes meet the above requirements.

4. We recommend the cell system be constructed with the bottom of each cell dead level and with the perforated lateral pipes in each cell at the same elevation. The 4" diameter drain pipes leading from each pair of cells may be sloped for drainage. (The size of the drain pipes leading from the two cell units has been increased to 4 inches on revision A of the cell system drawing at our request).
5. We comment that the drainage rate in the area between ^djoining cells (for example between cell 1 and cell 5 on dwg 191-01 revision A) will be reduced as the underdrain coverage per unit of surface area is restricted in the area as there is a 10 ft separation shown between the ends of the subdrain laterals. In order to make the underdrainage more uniform, the underdrain lateral should extend to within about 2 ft of the separation line between the cells. This would mean a maximum separation between the ends of the perforated pipes of about 4 ft.
6. A dashed line indicating a perforated underdrain lateral is not apparent along the center line of the field. We assume the maximum spacing between perforated pipes will be maintained at a uniform 5½ ft spacing at all locations across the field, and this should be confirmed.
7. We would recommend that the quantity of drain gravel placed around the perforated pipes be increased to the minimum dimensions we have sketched in green on an attached print of cell system drawing 191-01 revision A. We recognize that the gravel they show is their normal practice, however, in our opinion only 2 inches of filter protection between the hole openings in the pipes and the overlying sand is inadequate and unsafe. We recommend a minimum 6 inch thickness of properly graded drain gravel separate the sand from the pipe perforations.
8. We understand that prior to starting excavation the cell system contractor

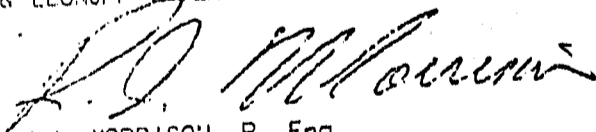
File VA1855

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- would expose all existing field subdrain laterals in the work area and would carefully cap these so that the main underdrain pipe down the center of the field will be protected also, the drainage continuity of all existing subdrain pipes beneath the field that are beyond the work area will be maintained and protected by the contractor at his cost.
9. We recommend that if the cell system is used the specification requirements for final grade be maintained. Also, a sand field will almost always undergo relatively large and uneven settlements when first saturated after being loosely spread and placed. We recommend that prior to laying the turf the area should be fully saturated and rolled or lightly compacted, to remove most of the initial settlements.
 10. If our suggestions and recommendations listed under 3 to 9 above can be accepted by the cell system people we consider their revised proposal would meet the drainage requirements for the field, and will be equivalent to the specified design as far as drainage capacity is concerned.
 11. We restate that we have not considered the cell system proposal with respect to the agronomic aspects of the turf quality and the proposed field mixing of 2 inches of peat into the top 4 inches of sand. The agronomic evaluations are the responsibility of T. Lord and A. Green.
 12. We understand the cell system contractors proposing a sub-irrigation system, and that his surface irrigation proposal does not include installation of a booster pump for high capacity surface coverage, as called for in the Burnaby specification. The evaluation of irrigation requirements, sub-irrigation and/or surface irrigation, is the responsibility of Burnaby Parks Department.

Yours very truly,

RIPLEY, KLOHN & LEONOFF INTERNATIONAL LTD.


K.I. MORRISON, P. Eng.
Executive Engineer

KIM:rj

cc: Mr. B. R. Wilkinson
Mr. P. L. Stockstad
Mr. T. M. Lord
Mr. A. J. Green
Mr. E. J. Klohn

Ripley, Klohn & Leonoff International Ltd.

ITEM 30 (SUPPLEMENTARY)
MANAGER'S REPORT NO. 33
COUNCIL MEETING April 29/74

PS

3746 Wotling Street
Burnaby 1, B. C.

April 23rd., 1974

The Corporation of the District
of Burnaby
4949 Canada Way
Burnaby 2, B. C.
V5G 1M2

Mr. H. J. Shelley, Manager,

Report on the CELLSYSTEM playing fields
with reference to the Swangard Stadium
sports field,
by T. M. Lord and A. J. Green, P. Ag.

Dear Mr. Shelley:

We have been requested to submit a report regarding the agronomic aspects of a CELLSYSTEM playing field as it would affect the Swangard Stadium site.

On April 20th we examined a CELLSYSTEM playing field in operation at Capilano Stadium in the company of Mr. Ron Davies of CELLSYSTEM Irrigation and Drainage Ltd. and Mr. Ian Morrison, Executive Engineer, Ripley, Klohn and Leonoff International Ltd.

The CELLSYSTEM field in operation at Capilano Stadium was examined and found to have excellent drainage and a very satisfactory playing surface. According to Mr. Davies the field was constructed a year ago and has been receiving heavy use. The turf, which is composed of Merion Bluegrass (35%), Creeping Red Fescue (35%), Red Fescue (20%) and Highland Bent (10%) is well rooted and has been successfully resisting wear. There are some slightly uneven areas in the field. The rooting mix for the field has been prepared by

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rotovating 2 inches of peat into the top 4 inches of sand.

We later examined the CELLSYSTEM playing field at Ambleside Park, West Vancouver. We found the playing field well drained with a smooth playing surface.

If CELLSYSTEM is going to construct the Swangard sports field, the following points should be considered:

A. The rooting mix should be as homogeneous as possible to the depth of the water table induced by subsurface irrigation in order to facilitate the movement of subsurface water up into the grass rooting zone. We consider the pre-mixing of the materials for the rooting mix before putting it on the field is preferable to rotovating them in place. Rotovating is only effective to shallow depths and even then the mixing of materials may not be uniform. It also tends to "fluff" the mixture with air and this condition can cause uneven settling if it is not corrected by careful rolling.

B. Subsurface irrigation cannot be relied upon to provide adequate moisture for the establishment of the turf during the first growing season. The sprinkler irrigation system must be able to give even coverage of the field. There should be an ample supply of water available to take care of any long, hot, dry periods during the summer months.

C. To seed or to sod. We believe that a high quality turf and optimum drainage conditions can best be obtained by seeding the rooting mix on the field with a suitable grass seed mixture. This procedure would mean that the sports field would not be ready for use until the spring of 1975; however, the more immediate use of the field by sodding should be carefully considered as against the long term benefits of a superior turf and good drainage characteristics obtained by seeding.

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D. CELLSYSTEM proposes to sod the Swangard sports field with turf from Instant Lawns Ltd. located in Delta Municipality. We visited Instant Lawns Ltd. and examined the turf and soil. The turf that would be used at the Swangard site is two years old and is composed of Penlawn Fescue (60%), Merion Bluegrass (20%) and Nugget Bluegrass (20%). It is dense, well knit and judged to be of good quality.

We are concerned that this turf has been grown on a silty clay loam soil. When such turf is laid on a sandy rooting mix, water movement and drainage are impeded. It could be made suitable for the Swangard sports field by using sod sliced as thinly as possible and by introducing mechanical slicing regularly into the maintenance program once the turf has become established. We do not believe that spiking would sufficiently aerate this sod. Since aeration is not practical during the first growing season, some surface impidence to drainage is foreseen.

Before making a commitment to use this turf from Instant Lawns Ltd., CELLSYSTEM should explore the possibility of obtaining from some other source, a high quality turf that has been grown on a permeable medium such as sand.

E. The turf at the Burnaby Sports Complex has been grown on a sandy rooting mix and it would be compatible with the mix to be used on the Swangard sports field. However, the grass species present in this turf are not the best suited for playing field conditions.

Yours very truly,

cc Mr. F. L. Stockstad
Mr. B. Wilkinson
Mr. T. I. Morrison

T. H. Lord

Alan J. Green
A. J. Green, P. Ag.

ITEM 30 (SUPPLEMENTARY)
MANAGER'S REPORT NO. 33
COUNCIL MEETING April 29/74

CELLSYSTEM[®]

design

3-1360 MAIN STREET
AREA 604-985-8708

NORTH VANCOUVER, B.C.
CANADA

The Corporation of the District of Burnaby,
Municipal Hall,
4949 Canada Way,
BURNABY 2, B.C.

29th April, 1974

Attention: Mr. B. Wilkinson
Administrator.

Dear Sir,

Re: Swangard Stadium Sports Field - Reconstruction
(Alternative Design Proposal)

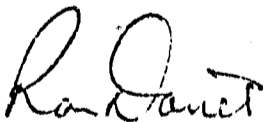
Further to our meeting on Thursday, 25th April, 1973,
at which time we received copies of the reports from
Mr. Ian Morrison of Ripley Kohn & Leonoff and Mr. Alex
Green of Lord & Green, together with notes from Burnaby
Parks & Recreation Department.

The enclosed notes have been made further to our
discussions and to confirm the points raised in the
reports.

We also enclose Drawing No. 191-02 showing details of
surface irrigation and sub-irrigation, together with
copies of Maintenance and Fertilization Programmes.

If you require any further details or information
please feel free to call us.

Yours truly,
for CELLSYSTEM DESIGN



Ron Davies
Design Consultant
Encs:

LOS ANGELES
CALIFORNIA 91335

4800 ZOFINGEN
SWITZERLAND

LAHAINA
HAWAII 96761

RECREATIONAL TURF - INSTALLATION - DESIGN

ITEM 30 (SUPPLEMENTARY)
MANAGER'S REPORT NO. 33
COUNCIL MEETING April 29/74

CELL SYSTEM[®]

design

3-1360 MAIN STREET
AREA 604-985-8708

NORTH VANCOUVER, B.C.
V7J 1C6 CANADA

Swangard Stadium Sports Field - Reconstruction

Reference Ripley Klohn & Leonoff Report :

- ITEM 3 - Specification for Coarse Sand fill and drain gravel around perforated pipes :
- a) Sand will be concrete reject sand or clean Fraser River pump sand.
 - b) Drain gravel placed around will depend upon type of sand used and will meet the specification called for.
- ITEM 4 - Each cell will be constructed level with sufficient slope of drain pipes of each pair of cells for drainage. This will be 4" dia.
- ITEM 5 - Drainage laterals between separation of each cell will be extended to within 2 ft. of the separation to give a maximum of 4 ft. between ends of drain laterals.
- ITEM 6 - Confirm that all drain laterals will be maintained at 5'6" spacings throughout the field. Separation of cells along centre line of the playing field will in fact place the drain laterals at that point closer than 5'6" spacing.
- ITEM 7 - Quantity of drain gravel around perforated pipes was not dimensioned on drawing. This has varied on projects constructed to date being dependent upon the specification of sand fill material used. This has generally averaged about 4". We will agree to increase this to 6" if the pump sand is used.
- ITEM 8 - The existing drains in the centre of the field will be exposed and capped to protect the main underdrain pipe and to preserve the continuity of the existing drainage system outside the work area.
- ITEM 9 - Final grade specification will be met and the field worked to ensure that all initial settlement has occurred before turf is laid.

LOS ANGELES
CALIFORNIA 91335

4800 ZOFINGEN
SWITZERLAND

LAHAINA
HAWAII 96761

RECREATIONAL TURF - INSTALLATION - DESIGN

Swangard Stadium Sports Field - Reconstruction

Reference Lord & Green Report :

ITEM A - Extreme care will be taken to ensure that a satisfactory mixing of the rooting mix material will take place. This will be done by rototilling in place, the rototilling will be done in both directions across the work area at a minimum of six times until the required mix has been achieved, followed by rolling to lightly compact the surface to prevent any uneven settlement.

ITEM B - During the critical period of establishing the new turf, both the surface irrigation and sub-irrigation system will be utilized. The soil water will be raised to the desired level by controls in the special irrigation units installed in the field and to ensure ample water the surface sprinklers will give complete and even coverage of the whole field.

ITEM C - Turf to be used for Swangard Stadium Sports Field was selected from Instant Lawns Ltd. for its superior quality which has been grown on Ladner silty loam soil.

To ensure successful establishment of this turf a programme of Maintenance and Fertilization will take place both before the turf is lifted and when the turf has been placed on the stadium field. This will be carried out after careful selection of the section of turf at the farm. The lifting of the sod to ensure that the amount of soil is minimal will be cut at a maximum of 3/4" thick. The programme of top dressing with sand and aeration by mechanical slicing will be carried out to eliminate any possibility that water movement will be impeded.

ITEM 30 (SUPPLEMENTARY)
MANAGER'S REPORT NO. 33
COUNCIL MEETING April 29/74

Swangard Stadium Sports Field - Reconstruction

Reference Burnaby Parks & Recreation Department Notes :

- ITEM 1 - Details of the surface irrigation system are shown on Drawing No.191-02 and is designed to give complete and even coverage of the whole field.
- ITEM 2 - The source of sod, the programme of Maintenance to ensure compatability and successful establishment has been described in answer to Mr.Alex Green's report.
- ITEM 3 - Maintenance Programme together with Fertilization Programme, mowing height etc. are enclosed.

APRIL 1974