BUILDING ASSESSMENT
SCOTT COLLEGIATE
RISK ANALYSIS ON FOOTINGS, 1923 BUILDING

FEBRUARY, 2009

LIMITATIONS:
This report was prepared by GENIVAR for the account of The Regina Public School Board and FNI/P3 Architects. The material in it reflects our best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. GENIVAR accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

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February 18, 2009 File: 08-089-00-RE

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RE: SCOTT COLLEGIATE – STRUCTURAL RISK ANALYSIS ON FOOTINGS

We are pleased to submit our report for the 1923 portion of Scott Collegiate as it relates to the Structural Risk Analysis on the Footings. This report was prepared by GENIVAR whose representative visited the site together with Brian Wagner, P.Eng., and Tim Adelman, P.Eng., from GE Ground Engineering Limited.

Please do not hesitate to call us should you need any further clarification.

Yours truly,

GENIVAR

Huntley O'Connor, P.Eng.
Regina Branch Manager

Cc: Tim Adelman, P.Eng.
Brian Wagner, P.Eng.
James Youck

Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Genivar Consultants Limited Partnership
Number C0868
Permission to Consult held by:

Discipline	Sk. Reg. No.	Signature
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Report on the Structural Risk Analysis on Footings of Scott Collegiate

0.0 EXECUTIVE SUMMARY:

This report suggests three options for supporting the existing structure when it is attached to the proposed new structure.

The first option is to totally under-pin the existing building. This option offers not risks of future movements in the existing structure. It is also the most costly option.

The second option is to partially under-pin the existing building only in the vicinity where it is to be attached to the new building. Under this option the old building will need to have physical joints created, e.g. sawcuts, so as to separate the under-pined areas from those that are not. This option is more cost effective but does offer some risks in terms of areas not under-pined.

The third option is to do nothing with the old building thereby allowing it to remain supported on its present footings. This option has high risk of movement since the soil in the vicinity will be disturbed by the construction of the new adjacent building. Movements can then be anticipated in the old building. This option is not recommended.

1.0 OBJECTIVE:

The intent of this report is to review the structure of the existing 1923 portion of Scott Collegiate, Regina Saskatchewan, to provide our opinion on the existing footings as they relate to proposed modifications and additions to proposed adjacent new structures. These new structures including any adaptive reuse of the existing school will form part of the planned integrated facility.

2.0 METHODOLOGY:

- At the request of FNI/P3 Architects, a conceptual design called Centre for Entrepreneurship and Community Development dated 29 October 2008, was reviewed.
- Copies of drawings of the original school were reviewed. Visits were made to the Scott School site on November 17, 19 and again December 4th 2008.
- The inspections involved only visual review. No samples were removed from components and no finishes were removed. There was no drilling undertaken at this time and no destructive testing undertaken.
- This foundation report and floor level survey, see Appendix "B" forms the basis of this report.
- Part of the report for the interior structure of Scott Collegiate is included in this report only as it serves to explain this report.

3.0 OBSERVATIONS:

The existing structure is a two-story structure with a full basement below. The entrances are on the south (7th Ave) side at grade level. The basement floor is one-half level below grade and the main floor one-half level above grade. There are 4 building areas with a U shaped corridor. See drawing SK-1 (Appendix "A") for the areas. The structure is comprised of a basement level, main floor, second floor and roof. The east-west corridor shifts location from floor to floor.

Footings

The entire existing building is supported on footings. Footings are considered to be a shallow foundation system. (The alternate system could have been a deep foundation system comprising drilled or driven piles.)

With the use of footings, we have observed settlement of the structure since the footings have been placed in the underlying active zone of the soil stratigraphy. Any structures situated within this active zone of clay, will be susceptible to continual movements depending on the moisture regime. Typically when moisture gets into the soil, due to the nature of the expansive clays in the Regina area, the soil will expand thereby

lifting all structures placed and supported within that zone. Alternatively, when moisture is depleted from the soil, the soil will shrink thereby allowing supported structures to settle. Therefore with these shallow footings, hopefully placed below the frost level which is typically assumed to be the upper six (6) feet from grade, then we try to alleviate some of the problems associated with a changing soil regime.

Basement, Main Floor, Second Floor, Roof Structure
For a description on these areas refer to the report on the interior structure previously submitted.

4.0 CONCLUSIONS:

Footings

We have reviewed the level survey provided on the building and have observed that the levels around the structure are varying and not consistent. This could have predicted based on the fact that the building is founded on footings. Had the building been placed on piles, we could similarly have predicted virtually no movement of the structure.

With the planning anticipated and based on the drawings for the new Shared Facility concept, we would expect the adjacent exiting structure to be impacted by the new structure. In order to prevent further damage to the existing structure and to secure the connections between the old and new structures, we would recommend that the existing footings be under-pinned with piles to prevent further movement of the existing structure. Generally, this type of under-pinning would be carried out under the entire building so as to prevent cracks from forming in stiff elements such as walls and beams at the edge of the under-pinning work should this be discontinuous. However, it is possible to under-pin footings just in the areas where the new structure abuts the old structure provided that cracks can be anticipated and vertical joints provided in the old structure and filled with a soft flexible material, such as mastic, at appropriate locations. We would anticipate these joints beyond corners of the structure and through the entire structure including basement walls and super-structure walls. This is the approach we would anticipate and recommend be considered for this project.

Note that the total under-pining of the entire building would offer no risks of future movements since the (old) building would be totally stabilized. The partial under-pining offers some stability but also some risks of future movement in areas not under-pinned. The third option to do nothing is highly risky and not recommended.

All new structures would be placed on a deep (piling) system.

The condition of the basement walls, based on our visual observations, indicate that these walls are in relatively good condition given the age of the structure. There is evidence of efflorescence in the walls but we did not observe any deterioration of the concrete based on this. It does however indicate the presence of sulphates in the soil together with moisture which would cause these salts to be conducted from the exterior wall surfaces and be deposited on the interior wall surfaces.

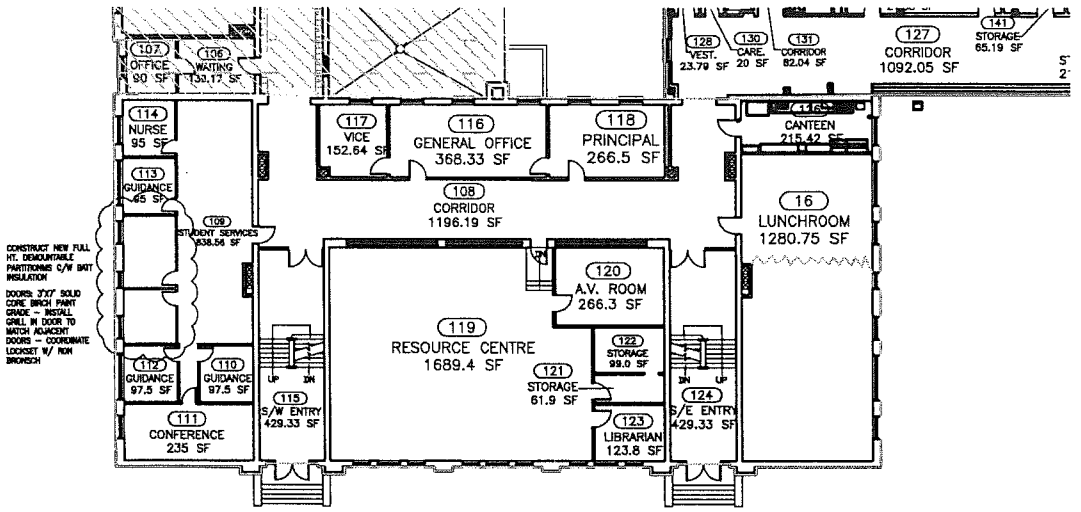
The condition of the footings cannot be observed since they are buried in the soil. However, based on the sulphates in the walls above, we would anticipate that sulphates exist in the footings and the footing concrete may have been compromised by the presence of this salt. This possibility can only be guessed at but should be anticipated at the time of under-pinning. If in fact the footings

have been deteriorated, then they would have to be locally removed and replaced with good concrete prior to the under-pinning piles being placed. This would be observed and designed at that time. Alternatively, tests would have to be made at this time by digging below the wall to expose the footings and taking appropriate core samples of the concrete for testing in the lab. This work could be done at any time prior to commencing design or at the time a soil investigation is being undertaken.

LIMITATIONS:

- This report relied heavily on the use of the original drawings provided by the Regina Public School Board. Many of the components are concealed and therefore alteration or deviation from the plans cannot be confirmed without partial dismantling. The as-built condition may differ significantly from what is shown on the drawings.
- Drawings and design of the era relied on the expertise of the contractor to interpret needs and best practice. Much of the contractor's other interpretations and practices are not currently visible.
- Property of materials such as concrete strength and steel yield are not specified on the drawings nor were samples taken for testing.
- Foundation and exterior wall condition and their capacity to perform in the proposed configuration are considered in this report based on our general knowledge of the type of construction and the anticipated results based on experience with this type of soil.
- This report is provided for the use of the Regina Public School Board and FNI/P3 Architects solely for their use in determining the feasibility of adaptive reuse of the 1923 portion of Scott Collegiate as part of the North Central Shared Facility.
- This report represents a view of the building condition as of December 2008.

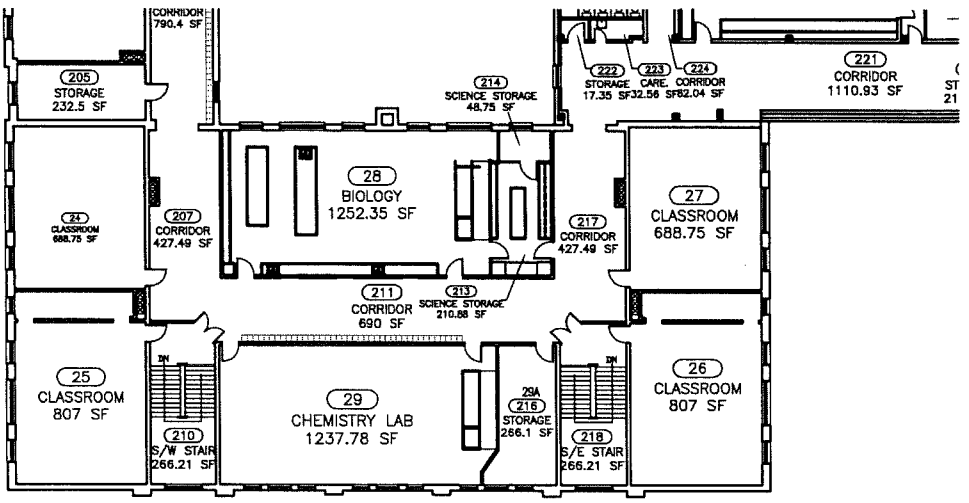
Appendix "A"



Main Floor Plan

MAIN BUILDING AREA– 40,740.2 sq.ft. (3,784.9 sq.m.)
MAIN BUILDING PERIMETER– 1,676'–4" (511.1 m.)
MAIN FLOOR USEABLE AREA– 27,879.1 sq.ft. (2,590.0 sq.m.)
MAIN FLOOR USEABLE PERIMETER– 6,379'–7" (1,945 m.)
COMMUNITY CENTRE USEABLE AREA– 3,338.3 sq.ft. (310.1 sq.m.)
COMMUNITY CENTRE USEABLE PERIMETER– 988'–0" (301.2 sq.m.)

TOTAL USEABLE AREA – 31,217.47 sq.ft. (2,900.2 sq.m.)



Second Floor Plan

MAIN BUILDING AREA– 40,740.2 sq.ft. (3,784.9 sq.m.)
MAIN BUILDING PERIMETER– 1,676'–4" (511.1 m.)
SECOND FLOOR USEABLE AREA– 18,393.6 sq.ft. (1,708.8 sq.m.)
SECOND FLOOR USEABLE PERIMETER– 3,492'–4" (1,064.7 m.)

TOTAL USEABLE AREA– 18,393.6 sq.ft. (1,708.8 sq.m.)

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TITLE	SCOTT COLLEGIATE 3250 7th Ave. Regina, Sk.
DATE 12/22/2008	FILE RE–08–089–01–RE
DRAWN AMM	DWG No. SK–1

Appendix "B"