



ERA Architects Inc.
10 St. Mary Street, Suite 801
Toronto, Canada
M4Y 1P9

GM29.20

Attachment 2

September 26, 2017

Sent by EMAIL

Garry Ross & Ikwál Briaana
Facilities Management, City of Toronto
Email: garry.ross@toronto.ca
ikwal.briaana@toronto.ca

**RE: NATHAN PHILIPS SQUARE LEGACY STRUCTURE
 FEASIBILITY STUDY- PHASE 1**

Dear Garry & Ikwál,

The purpose of this letter is to outline the Phase 1 Feasibility Study findings for the installation of the “Truth and Reconciliation” Legacy Structure in Nathan Philips Square.

ERA Architects have received and reviewed the following background documents:

- Indian Residential School Survivors (IRSS) Legacy Structure Backgrounder, prepared by Toronto Council Fire Native Cultural Centre, dated May 12th 2017.
- Nathan Philips Square – replacement of the Existing Refrigeration Plant, Reflecting Pool Piping and Upgrades, prepared by Unit A Architecture Inc., dated May 25th, 2016.
- Structural Memo, prepared by Blackwell Bowick, dated May 26th, 2015
- Nathan Philips Square Heritage Impact Assessment, prepared by Blanche Lemco van Ginkel, dated January 26th, 2010
- Nathan Philips Square Design Competition Findings – Heritage Issues Report, prepared by Fournier, Gersovitz & Moss Architects, dated October 24th, 2005.
- Ontario Heritage Foundation Letter, dated June 28th, 2005

ERA was provided with a concept sketch and overall dimensions for the sculpture, which is to be primarily constructed out of limestone. It was also communicated that the sculpture is been estimated to weigh 12 tons. ERA was asked to consider the SW Quadrant of NPS as the location for the placement of the sculpture. ERA also contacted Chris Pommer (Plant Architect Inc.) for feedback on the proposed Legacy Structure in respect to the Nathan Philips Square Revitalization design scheme. During this discussion, the location of the large concrete planter to the east of the reflecting pool was suggested as an alternative placement option for the Legacy Structure.

Blackwell Bowick Structural Engineers have reviewed the existing structural drawings and have evaluated 2 placement strategies for the Legacy Structure within the SW Quadrant. The Structural Assessment is based on the limited technical information that was provided. In general, the Structural

Assessment concluded that the structural slab for the parking garage below the square has sufficient reserve capacity to support the sculpture. The depth of the existing fill and finishes (ie. the concrete pavers) varies throughout the NPS site. In certain locations, the existing fill will need to be replaced with lightweight structural fill that is designed to spread and transfer the load down to the slab, but ultimately there is a fair amount of flexibility with the placement of the sculpture. There are also a number of site services located below grade at the SW corner of the site, the approximate extent of these services has been indicated on the location plan.

Within the boundaries of the SW Quadrant that were indicated for consideration by the City Manager's office, there are 2 options:

Area 1 - Area of excess reserve capacity. Placement in this area does not require the addition of lightweight structural fill.

Area 2 - Placement in this area will require the addition of lightweight structural fill. Refer to Structural sketch SSK 1

The attached Structural Assessment Memo prepared by Blackwell Bowick, dated September 21st 2017, provides additional details regarding the placement options. An itemized Class D cost estimate for the structural support detail has also been provided by Blackwell Bowick (refer to costing notes on SSK1). Please be advised that this itemized costing does not include mobilization costs. We would suggest that the estimated value be scaled by a factor of 3 to account for this. The estimated total cost would be approximately \$33,633 +HST. The cost of the sculpture or its transportation and placement onsite is not included in this estimate.

We trust that this information is sufficient to satisfy your requirements for the Investigation (Phase 1) stage of this Feasibility Project. ERA is happy to meet with you and Garry Ross to discuss these findings and the requirements for Phase 2.

Sincerely,

A handwritten signature in blue ink, appearing to read 'E. Rowse', is positioned above the typed name.

Edwin Rowse, Principal
E.R.A. Architects Inc.

BAY STREET

TPA PARKING RAMP

OUT →

RABBIT STAIR

ICE RINK & REFLECTING POOL

THEATRE

CN BLDG.

IN →

SCULPTURE COURT

PLAYGROUND

TPA PARKING RAMP

TPA PARKING RAMP

PEACE GARDEN

POOL

Area 2

Area 1

Underground Services

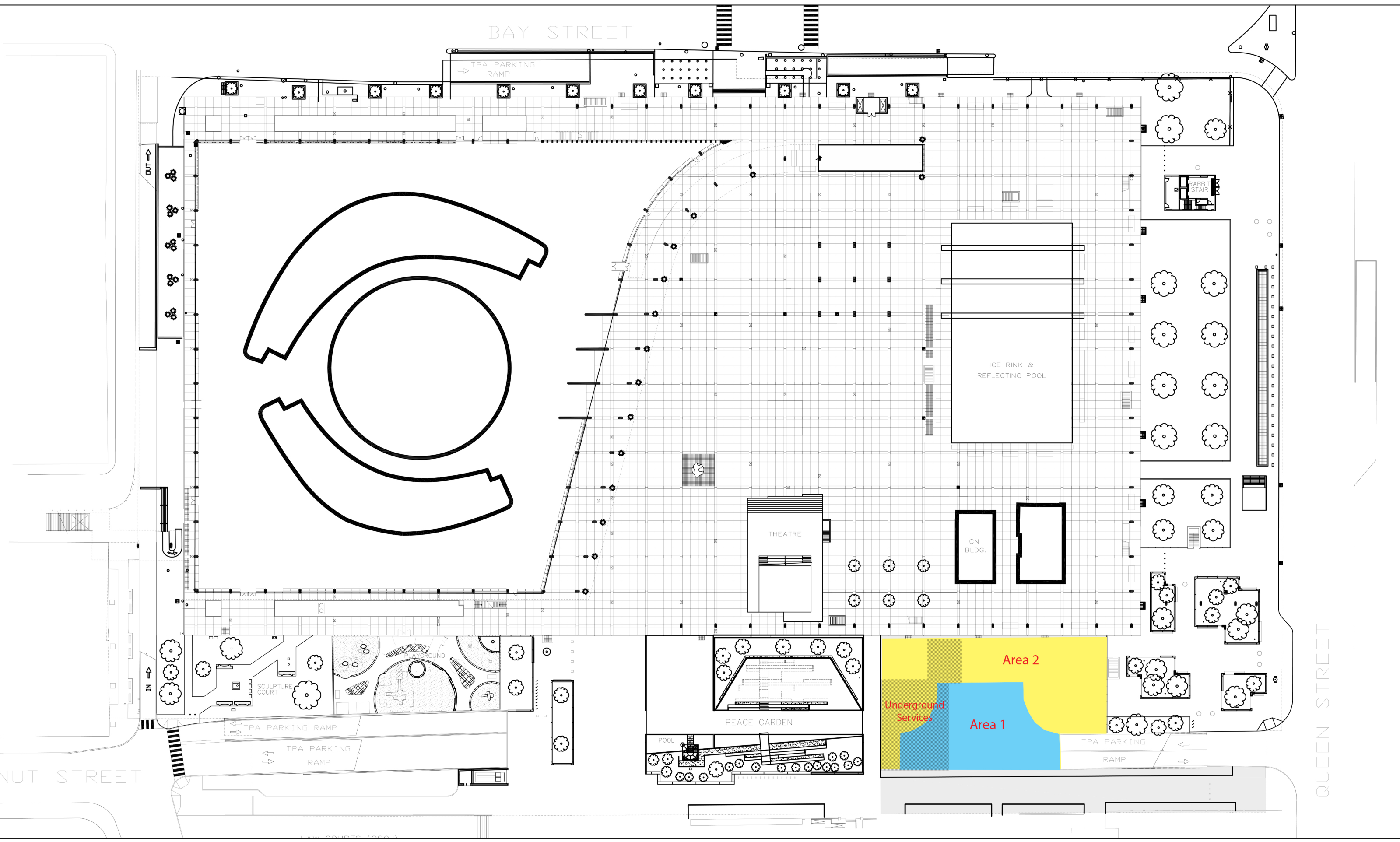
TPA PARKING RAMP

RAMP

QUEEN STREET

NUT STREET

LAW COURTS (OPP)



MEMORANDUM

TO: Jessie Grebenc (jessieG@eraarch.ca)
COPY TO: Chris Pommer (pommer@branchplant.com)
FROM: Kenny Cryer
DATE: 21 September 2017
PROJECT: Indian Residential School Survivor Legacy Sculpture at NPS
PROJECT NO: 170653

RE: Structural Feasibility Assessment of Legacy Sculpture at NPS Southwest Quadrant

Dear Ms Grebenc:

We understand the city proposes to erect a substantial sculpture at Nathan Phillips Square (100 Queen Street West, Toronto) in the area of the square known as Southwest Quadrant (SWQ). As per your request we are providing our assessment of the structural feasibility of the proposed sculpture location, facilitated by our extensive experience as engineer of record for various renovations undertaken at the square.

The southwest quadrant is generally described as the gravel-surfaced area bounded to the north by the Peace Garden (grid 25), to the south by the Moose Stair (approximately grid 30), and extending from the Elevated Walk (grid T) westward to the west property line. The SWQ principally overlies the Queen Street entry ramp to the underground parking garage (Toronto Parking Authority Car Park #32) constructed in 1957; the entry ramp was reconstructed in 1980.

Structural drawings of the underground parking garage indicate that generally the working load of the garage roof under the SWQ is 20.6 kPa (430 psf), except the roof of the re-built Queen Street entry ramp was designed to support a live load of 4.8 kPa (100 psf) and a soil overburden load of 26.8 kPa (560 psf). The design load of the garage roof is generally sufficient for a live load of 4.8 kPa (100 psf) and an average of 0.75m (2'-6") of heavily compacted overburden (assuming bulk density of 21kN/m³).

The stated live load capacity is suitable for pedestrian traffic (i.e. assembly occupancy) or light vehicle traffic (vehicles under 4000 kg gross weight). Concentrated loads of up to 54 kN (12kips) are acceptable if distributed over a base footprint of approximately 3.2 m² (34 ft²).

Concentrated loads should be spaced about 3.6m (12'-0") apart. Due to the configuration of the reconstructed entry ramp roof slab the soil overburden is significantly less than the re-design load allowance. In our opinion there is an additional load capacity of 14.3 kPa (300 psf) directly above the entry ramp roof.

September 21, 2017

Areas of the SWQ that lie west of the underground parking garage are generally situated on terra firma with no loading restriction.

We understand the following with respect to the proposed sculpture:

Weight of the sculpture: 12 tonnes (12,000 kg);
Plan dimension of sculpture: 16' x 16' (4.8m x 4.8m);
Height of sculpture: 4'-0" (1.2m);

The artist's concept sketch of the sculpture is attached as Appendix A.

Based on our understanding of the garage structure it is our opinion the sculpture can be supported by the garage roof without the need for extensive structural alterations. There are three primary structural considerations for the SWQ underground garage structure in respect of supporting the sculpture:

1. The depth of soil overburden, which varies from as much as 2'-6" over the stage 1 structure, to as little as 1'-0" over the entry ramp;
2. The concentration of sculpture weight.
3. The expansion joint between the garage and the rebuilt entry ramp, and the joint between the two construction stages of garage (Stage 1 garage lying south of grid 25, and Stage 2 garage lying generally north of grid 25);

The primary structural consideration will be the removal and replacement of the existing soil overburden with light-weight fill within the footprint of the proposed sculpture, particularly for the section SWQ not overlying the rebuilt entry ramp. In our opinion light-weight fill would be either a bulk polystyrene foam fill capped by a relatively thin (i.e. 15cm) concrete slab to distribute the sculpture weight, or a concrete slab over voids as achieved with Cupolex leave-in concrete forms as manufactured by Pontarolo Engineering.

The bulk of the sculpture weight, which appears to be concentrated in an area approximately 8'x8' (2.4m x 2.4m), will need to be distributed to the garage roof over a larger area of at least 12'x12' (3.6m x 3.6m) or larger.

With respect to the expansion joints located within the SWQ it is our opinion that locating the sculpture such that it does not transit the joints will result in a more cost effective installation by avoiding more complex waterproofing and expansion joint detailing.

Sketch SSK-1 is attached illustrating approximately the above conditions and considerations.

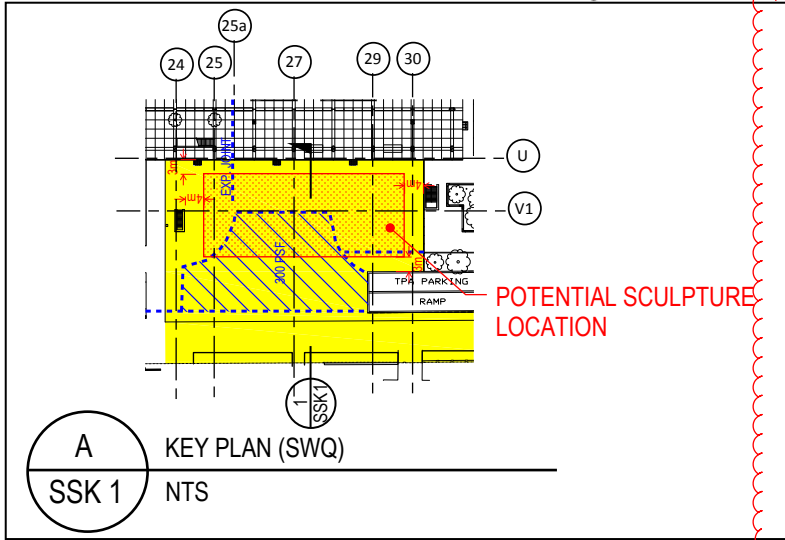
We trust the above to meet your needs at present.

Sincerely,
Blackwell

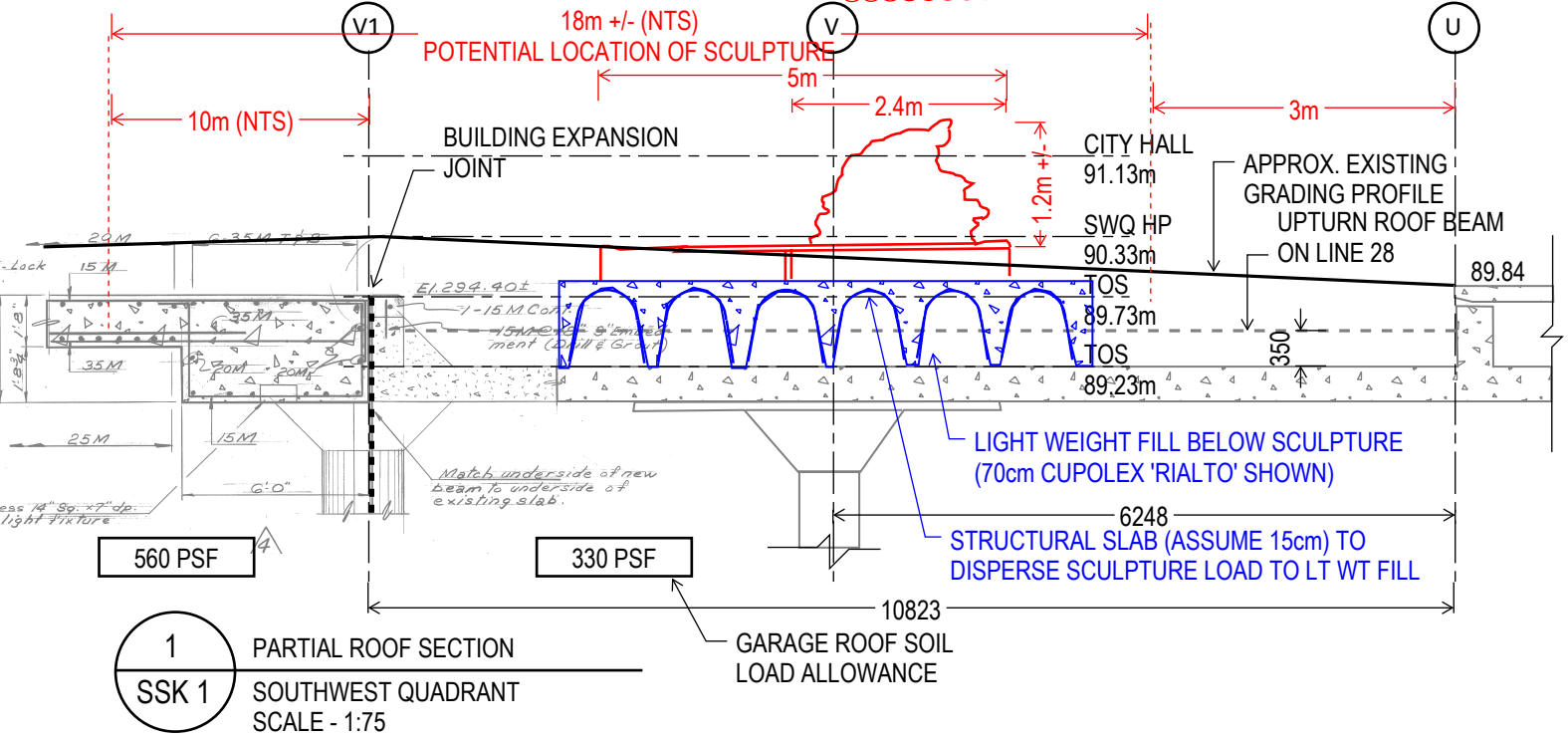


Blackwell	Seat	Title IRSS LEGACY SCULPTURE, NATHAN PHILLIPS SQUARE STRUCTURAL FEASIBILITY ASSESSMENT SWQ CROSS SECTION AT LINE 27	Project #	Date
			170653	13-SEP-2017
	Designer		Scale	
	KMC	1:75	Checked by	Sheet #
	CB		CB	SSK 1

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CLASS D COST ESTIMATE:	QTY	\$/UNIT	TOTAL \$
1.1) EXCAVATION,	32m3	6/m3	\$192
1.2) 6" GRAN BASE COURSE,			
1.2.1) PREPARE BASE:	36m2	\$1.60/m2	\$58
1.2.2) PLACE BASE COURSE:	5.4m3	\$70/m3	\$378
1.3) WATERPROOFING:	36m2	\$60/m2	\$2160
1.4) CONCRETE:			
1.4.1) REINF'G BARS (2-15M @ 700c/c):	224kg	\$2.30/kg	\$515
1.4.2) WELDED WIRE MESH:	25 m2	\$6/m2	\$150
1.4.3) FORM PERIM. WALLS (0.85m TALL):	17m2	\$117/m2	\$1989
1.4.4) PLACE CONCRETE (SOG):	8m3	\$35/m3	\$280
1.4.5) SUPPLY CONCRETE:	8m3	\$350/m3	\$2800
1.4.6) CONCRETE FINISHING:	25m2	\$6/m2	\$150
1.4.7) CUPOLEX '70' VOID FORMS:	1 LS	\$300	\$300
1.5) EXPANSION JOINT:	5m	\$30/m	\$150
1.6) BACKFILL			
1.6.1) IMPORTED GRANULAR:	17m3	\$100/m3	\$1700
1.6.2) HAULING:	17m3	\$19/m3	\$323
1.6.2) FINAL GRADING (BY HAND):	11m2	\$6/m2	\$66
TOTAL:			\$11211



- STRUCTURAL FEASIBILITY NOTES:**
- 1) PROPOSED SCULPTURE WEIGHT: 12 T (26.4 kips)
 - 2) PROPOSED SCULPTURE FOOTPRINT: 8'x8' (OVERALL 16'x16')
 - 3) GARAGE ROOF WEST OF LINE V1 AND SOUTH OF LINE 25 HAS 300 PSF RESERVE CAPACITY.
 - 4) GARAGE ROOF EAST OF LINE V1 HAS NO RESERVE CAPACITY GIVEN THE QUANTITY OF SOIL FILL IN THIS ZONE.
 - 5) DUE TO ROOF CAPACITY LIMITATIONS BETWEEN LINES V1 AND U THE SOIL FILL WILL NEED TO BE REPLACED WITH LIGHT-WEIGHT FILL (BULK POLYSTYRENE, CUPOLEX VOID FORMS, OR SIM) AT THE FINAL LOCATION OF THE SCULPTURE.
 - 6) STRUCTURALLY IT WILL BE MORE COST EFFECTIVE TO LOCATE THE SCULPTURE SUCH THAT IT DOES NOT TRAVERSE THE BUILDING EXPANSION JOINT ON LINE V1 AND LINE 25a
 - 7) EAST OF LINE V1: THE SCULPTURE WEIGHT WILL NEED TO BE DISPERSED TO AN AREA OF APPROX. 12'x12'
 - 8) WEST OF LINE V1: THE SCULPTURE CAN BEAR DIRECTLY ON THE GARAGE ROOF SLAB WITHIN THE PROPOSED SCULPTURE FOOTPRINT.
 - 9) DATUMS AND DIMENSIONS NOTED ARE APPROX AND NEED TO BE FIELD VERIFIED.

APPENDIX A



Indian Residential School Survivors (IRSS) Legacy Structure Backgrounder



Restoration of Identity

In its final report, The Truth and Reconciliation Commission of Canada called for provincial governments, in collaboration with Survivors and their organizations to establish a highly-visible, publicly accessible structure in each capital city to commemorate the victims and survivors of Canada's residential schools.

Objective

To establish, through the engagement and interaction with residential school survivors and intergenerational members, an Indian Residential Schools Survivors (IRSS)

Legacy "Restoration of Identity" structure prominently displayed in Toronto to commemorate the victims and survivors of residential schools.

Truth and Reconciliation

Between 2007 and 2015, the Government of Canada provided support for the TRC as they spent six years travelling to all parts of Canada hearing from more than 6,500 witnesses to create a historical record of the residential school system.

The TRC's Final Report is a testament to the courage of each and every survivor and family member who shared their story. Some [150,000 Indigenous children](#) were removed and separated from their families and communities to attend residential schools. The last federally-run school closed in the late 1996. Incorporated under the *Indian Act* by the federal government, Residential Schools were created for assimilation of Indigenous youth through education and religious institutions. Children as young as 4 years were removed from their home community far from parental influence and were separated from their siblings as schools were segregated according to gender. They were forbidden to speak their languages and ability to practice their culture. Children were institutionalized to integrate them into Canadian society, disrupting their growth, lives and communities and causing long-term impacts. Many children experienced excessive punishment; physical, mental, emotional and sexual abuse.

In June 2015, the TRC held its Closing Event in Ottawa and presented the Executive Summary of the findings contained in its Final Report, including 94 "Calls to Action" to further reconciliation between Canadians and Indigenous peoples. For more information please visit the [TRC website](#).

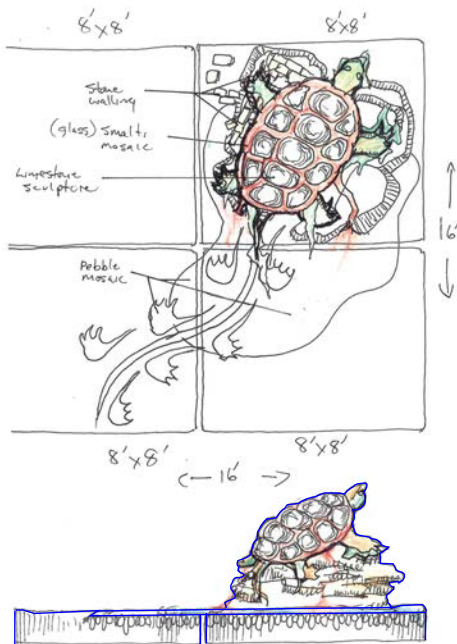
Call for Legacy Structure

The IRSS Legacy recognizes these dark facts of the residential school system and commits towards Truth and Reconciliation through the creation of the “Restoration of Identity” structure in the City of Toronto. This commitment responds directly to [Call to Action: 82](#) “We call upon provincial and territorial governments, in collaboration with Survivors and their organizations, and other parties to the Settlement Agreement, to commission and install a publicly accessible, highly visible, Residential Schools Monument in each capital city to honour Survivors and all the children who were lost to their families and communities.”

Toronto Council Fire Native Cultural Centre (TCFNCC)

Committed in honouring its relationship with the Indigenous community of Ontario, the province reached out to Council Fire to lead the project designated for Toronto. We are an autonomous, vibrant cultural agency that involves and serves the Indigenous community of Toronto with confidence for and commitment to their well-being. Our mandate is to provide counselling, material assistance and other direct services to First Nations people as well and to encourage and enhance spiritual growth. We have been delivering cultural and social services to the Indigenous community of Toronto since 1976. The Centre is an active member of the [Ontario Federation of Indigenous Friendship Centres](#) (OFIFC) and the [Toronto Aboriginal Support Services Council](#) (TASSC).

Meaning of the Turtle



Ojibway artist Solomon King from the Cape Crocker community is currently working on the TRC legacy structure. The Restoration of Identity structure for Toronto, Ontario will be the Turtle, symbolic of Mother Earth and important to all First Nations from the west coast to the east coast. Solomon will recreate the Turtle climbing over a boulder containing the name of 13 residential schools in Ontario representing the resiliency, recovery and overcoming by residential school survivors.

The Turtle will cover an area of 16 feet by 16 feet and 4 feet high. It will be 12 feet long and 6 feet wide, making it a large structure. The sections on the top of the Turtle shell will represent the 13 new moons and will have the names of the 12 First Nations to this region as well as the Inuit. Along the outer shell will be 28 sections that represent our clans. The TRC legacy structure will be unveiled to the public in Fall 2018 with smaller versions placed around Toronto in areas of significance.

Links:

<https://www.aadnc-aandc.gc.ca/eng/1100100015576/1100100015577>

http://www.trc.ca/websites/trcinstitution/File/2015/Findings/Calls_to_Action_English2.pdf

<http://www.trc.ca/websites/trcinstitution/index.php?p=3>

<http://www.ofifc.org/about-us/general-information/ofifc-overview>

<http://www.tassc.ca>