PROJECT PLANNING REPORT

FOR

ELECTRICAL AND MECHANICAL INFRASTRUCTURE UPGRADES PHASE 4 : NEW CHILLER

AT

THE UNIVERSITY OF TORONTO AT SCARBOROUGH (UTSC)

3 JUNE 2005

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EXECUTIVE SUMMARY

- Deferred maintenance problems at UTSC in the next fifteen to twenty years have been estimated to have a total cost for repair and replacement of about $50 million. Electrical and Mechanical infrastructure upgrades are a significant component of this total deferred maintenance problem.

- Much of the electrical and mechanical infrastructure at UTSC is 40 years old and requires repairs to meet present demand, plus upgrades to accommodate growth on campus. Consequences of inaction could include catastrophic failure or inability to meet increased demands associated with capital construction to meet planned enrolment growth.

- Consultants' studies of the main electrical systems campus indicated serious deficiencies in the distribution systems, and the outdoor transformer station. There are 6 PCB transformers that will require replacement to meet legislated standards

- Consultants' studies of the mechanical systems indicate that the existing Central Steam Plant has had little preventative maintenance over the past 40 years, is inefficient, needs radical repairs and is inadequate to meet the needs of growth. The existing Chilled Water system, which supplies cooling to campus buildings, is in poor condition and inadequate to meet demands of growth. One chiller contains CFCs and has to be replaced to meet legislated requirements for protection of the ozone layer.

- It is proposed to upgrade the electrical and mechanical infrastructure over several phases, each phase corresponding to a budget year from 2003-04 onwards.

- Phase 1a Electrical met immediate needs for electrical distribution and heating, was approved by AFD in May 2003 for $451K, and is complete. Phase 1b Mechanical replaced the old aerator and condensate tank for $1.675 million. Phase 2a Electrical involved replacement of breakers and relays, replacement of the main outdoor switchgear that serves the campus and new electrical distribution runs and was approved by AFD in January 2004 for $1.660M. This work is complete. Phase 2b Mechanical added a new boiler to meet increased demands and further asbestos removal. The project was approved by AFD in January 2004 for $1.505M and is complete.

- Phase 3 Mechanical, undertaken in early 2005, provides for replacement of two existing cooling towers to add cooling capacity for existing buildings, required now that UTSC is trimestered. This phase of the infrastructure upgrade program was approved by Business Board in March 2005 for $2.515m and will be complete by August 2005.

- Phase 4 Mechanical, in 2005-06, provides for the removal and replacement of the existing 700 ton chiller with a new 1700 ton chiller. The estimated cost for this work is $2.919m. Sources of funding are Facilities Renewal Program $200,000; Operating Deferred Maintenance Account $2,719,000.

- Phase 5 Mechanical, planned for 2006-07, includes the replacement of the two existing boilers with four smaller boilers, and associated asbestos removal, to meet heating demands. The provisional total estimated cost is $3.050m. Funding sources have yet to be identified.

- Phase 6, 2007-08, replaces the six PCB transformers, as required by Provincial legislation. The provisional total estimated cost for this is $1.897m.

- Previous infrastructure reports identified a Phase 7 for the replacement of the CFC Chiller in 2009-10 at an estimated cost of $1.607m. The revisions to Phase 4 (increasing capacity of the chiller from 1000 to 1700 tons), makes Phase 7 unnecessary and reduces the overall cost of infrastructure upgrades by an estimated $1.607m.

II. TERMS OF REFERENCE AND COMMITTEE

1. Identify the requirements at UTSC for electrical and mechanical infrastructure upgrades in order to provide power, heating, cooling, and ventilation for existing and future buildings as approved by Governing Council and as identified in the 2001 Campus Master Plan.

2. Assess the current condition of key equipment such as high voltage transformers, electrical switchgear, boilers, chillers, pumps, piping, etc, that have been in place since the Scarborough College opened in the mid-1960s.

3. Identify the implications of legal requirements for replacing PCB transformers and CFC chillers for infrastructure at UTSC

4. Propose a phased programme for upgrades to electrical and mechanical infrastructure to meet the needs of capital expansion and replacement of worn-out components

5. Identify all resource implications, including estimate of total project cost for each of the phases.

6. Identify possible sources of funding

The committee that is responsible for investigating and making proposals for infrastructure upgrades at UTSC consists of:

Edward Relph, (Chair), Professor and Special Advisor, Campus Development, UTSC
Jim Derenzis, Director, Facilities Management, University of Toronto
Kim McLean, Assistant Principal and Chief Administrative Officer, UTSC
Michel Richard, Director, Projects Management, UTSC
Raafat Helmy, Assistant Director, Facilities Management, UTSC
Gail Milgrom, Office of Campus and Facilities Planning

	Timing	Description	Est Cost	Funding Comments
Phase IA	2003-04	New electrical distribution switch Sub-total	$0.451m **$.451m**	Actual Sources $0.451 Centennial Lease $0.451m
Phase 1B	2003-04	De-aerator for heating Asbestos removal **The above work is complete.** Sub-total	$1.543m $0.132m **$1.675m**	$0.025 Mgmnt Bldg $0.233 Student Centre $0.047 Phase 4 Res $1.238 Centennial Lease $132K ARC savings $1.675m
Phase 2A	2004-05	Electrical distribution and outdoor Switchgear replacement Indoor Switchgear replacement **This work is complete.** Sub-total	 $1.256m $0.404m **$1.660m**	Actual Sources $0.200m Managmt Bldg $0.800m Student Centre $0.500m Arts Bldg $0.160 m FRP 03-04 $1.660m
Phase 2B	2004-05	New boiler for heat to Student Centre and Management Buildings Asbestos Removal **This work is complete.** Sub-total	 $1.470m $0.035m **$1.505m**	Actual Sources: $0.040m FRP 03-04 $0.916m UTSC 04-05- Operating $0.200m FRP 04-05 $0.349 Central Def Maint Base 04-05 $1.505m
Phase 3	2005-06	New Cooling Towers **This work will be completed by August 2005** Sub-total	$2.515m **$2.515m**	Actual Sources: $1.218m UTSC 04-05 Operating $0.500m UTSC 05-06 Operating $0.597 m UTSÇ deferred maintenance $0.200m FRP 05-06 $2.515m
Phase 4	2006-07	New 1700 Ton Chiller Sub-total	$2.919 **$2.919m**	Actual Sources: $1.205m Operating Deferred Maintenance 05-06 $1.514m Operating Deferred Maintenance 06-07 $0.200m FRP 06-07
Phase 5 Provisional	2007-08	Replace 2 existing boilers with 4 new boilers Asbestos Removal Sub-total	$2.800m $0.250m $3.050m	To be determined
Phase 6 Provisional	2008-09	Replace 6 PCB Transformer Sub-total s	$1.897m $1.897m	To be determined
		GRAND TOTAL (estimated)	**$15.672m**	

Table 1: Summary of Phases of Infrastructure Upgrades at UTSC

III. BACKGROUND INFORMATION

The Campus Master Plan for UTSC was approved in May, 2001. This plan detailed a vision of campus development over the coming years which included the construction of several new buildings to house the projected increases in student enrolment over that time frame. Some of these projects are currently under construction, while others are still in the planning stages. Although each building is/will be designed to suit its own unique electrical and mechanical requirements, the delivery of electrical feeder/distribution as well as heating, ventilation and air conditioning to these new facilities must be addressed.

An assessment of the existing status of the electrical infrastructure was initiated by the Electrical Consulting firm of MacViro Consultants, and later refined by another electrical consultant - Carinci, Burt Rodgers - in the fall of 2002. Their studies, in conjunction with testing of equipment undertaken by Smith and Long Inc., resulted in the identification of several potentially critical conditions that currently exist.

On the mechanical side, an assessment of the existing status of the mechanical infrastructure was undertaken by Rybka Smith and Ginsler Limited, Consulting Engineers. Their report of April 2003 identified major deficiencies in the existing heating/chilled water systems and recommends wholesale plant replacements in order to provide the University with dependable equipment that will both meet the requirements of growth and provide dependable service for the foreseeable future.

Building load requirements for existing and proposed buildings were derived from the consultants' studies. These are summarized in Appendix 6.

In response to these consultants' reports a multi-phase plan has been developed for infrastructure replacements and upgrades at UTSC. These phases have been included in reports submitted to AFD for approval of Phases 1 and 2. The phases correspond to the urgency of the work, and the first two and most urgent phases have been, or will shortly be completed. The remaining phases are required for the adequate functioning of the campus, and some of them are required to ensure adequate heating and cooling in the new buildings.

This report is specifically for Phase 4 Mechanical, which involves the replacement of the existing 700 ton York chiller with a new 1700 ton chiller to increase air conditioning capacity. This work has to be completed by about May 2006 to meet the increased requirements for cooling at UTSC in summer 2006.

IV. ACADEMIC AND CAPITAL PLANS AND INFRASTRUCTURE NEEDS

Academic plans at UTSC call for a growth in combined undergraduate/graduate enrolment from about 5,700 fall and winter headcount in 2000-01 to about 7,600 fall and winter headcount in 2007-08, plus an increase in the summer semester headcount from 2400 in 2000-01 to about 4500 in 2007-08, for a total combined increase of about 68%. To accommodate this growth, the library has been expanded, a Student Centre, Management Building and new residence have been constructed, an Arts and Administration Building will be opened in August 2005, and a New Science Building is in design. About 32,000 gross sq metres will have been added to the 78,000 gross sq metres of buildings that existed on campus at the beginning of growth.

This programme of capital construction is mostly consistent with the directions laid out in the 2001 Campus Master Plan, although that plan indicated a total additional 50,000 gross sq metres of construction was required, including an additional residence, an expansion to the Science Wing, and an expansion to the Athletics Centre. A project committees has been struck for the additional residence and some possibilities for a new Athletics Building are being explored, but these have no firm source of funding and are not included on the University's capital plan.

The existing infrastructure was not designed for this scale of construction. Furthermore, at the beginning of the phased infrastructure improvement all parts of it were 35 to 40 years old and seriously degraded. They comprise a key component of a larger significant deferred maintenance issue at the UTSC campus that has been estimated to require a total expenditure of about $50 million over the next fifteen to twenty years, and includes roof repairs, concrete repairs, window replacements, floor replacements etc, as well as essential upgrades to electrical and mechanical systems. The initial phases of the infrastructure upgrade plan dealt with some critical aspects of deferred maintenance. The outdoor transformer and electrical distribution system have been replaced and improved. The central heating and cooling plant was designed for handling 60-70,000 gross sq metres of building, and is simply inadequate for the demands of the approximately 100,000 gross sq metres which UTSC will have by September 2005. The first improvements to the boilers were made in Phases 1B and 2B of the infrastructure upgrades; further improvements will be required in Phase 5. Additional cooling towers completed in summer 2005 will provide additional cooling capacity, which is important for the substantially increased enrolment in the summer semester. Remaining phases include new and expanded chillers, replacement of remaining boilers, and replacement of PCB transformers.

V. KEY FINDINGS OF CONSULTANTS' REPORTS

Key findings of the investigations by Carinci Burt Rogers for Electrical Infrastructure and Rybka Ginsler Smith for Mechanical Infrastructure were:

Electrical

- The electrical feeder/distribution system was seriously deficient. Under Phase 1 Electrical a new Vista switch was provided to feed both existing and new buildings on the east side of the campus. Flexibility was incorporated into the design in order to accommodate future growth beyond the time horizon of the Master Plan. Cost was $0.451m and this work is now complete.

- In addition, the outdoor transformer station was in a critical condition. Repair of parts was not possible as the existing equipment did not meet current Electrical Codes. The transformer was replaced under Phase 2a Electrical. This and some related distribution systems cost $1.256m and is now complete.

- The indoor high voltage switchgear units were over 38 years old, spare parts were very difficult to source and it was recommended that they be replaced. Under Phase 2a Electrical these were upgraded to new vacuum breakers, and the existing relays were changed from mechanical to electrical to ensure dependable future operation. The total cost for replacing switchgear and relays was $0.404m and is now complete.

- There are currently eight high voltage transformers on campus. Six of these utilize polychlorinated biphenyls (PCBs) for cooling purposes. PCBs are highly toxic and are thought to be carcinogenic. Various levels of government are moving towards legislation requiring their replacement. In Ontario it is expected that legislation will be enacted that will require these to be replaced by 2007, however this is not yet confirmed. The current estimated total project cost for this work is $1.897m (including escalation) and it is currently proposed that the replacement be carried out in 2008-09 as Phase 6 of the UTSC infrastructure upgrades.

Mechanical

- Boilers, steam and condensate piping, valves and other associated equipment have had little or no work performed over the past 40 years, and are deteriorating rapidly due to the age of the system.

- Prior to the building expansion program, heating demands were satisfied by one boiler with the other remaining on full standby. However, questions of reliability have arisen after several incidents of failure over the past two winters. Increased demands due to the completion of new buildings (ARC, Student Centre and Management buildings) exceed the present capacity of one boiler and will eliminate the ability of the steam system to provide uninterrupted supply. An increase in capacity is required in order to accommodate these increased heating needs and further increases for the Arts and Administration Building to be completed in Fall 2005, as well as the new Science Building that will come on stream by January 2008.

- The existing de-aerator was replaced at the end of 2003 under Phase 1 Mechanical. The old de-aerator had capacity limited to the production of one boiler. This meant that the full steam capability of the two boilers could not be fully utilized. As a result, usually only one boiler was actually working, with the other in standby mode. With both boilers operating on very cold days, the de-aerator had difficulty functioning.

- The chilled water system providing cooling to the existing buildings has had little or no work performed over the past 40 years, and is also deteriorating due to the age of the system.

- Existing pumps are not compatible, resulting in an inability to operate both pumps in parallel. The current chilled water flow and condenser water flow system need to be reconfigured and the pumps resized.

- Fluid flow in existing piping is severely limited by scale build-up inside the pipes and requires wholesale replacement.

- The existing Trane 700 ton Chiller is not reliable and contains R-11 refrigerant (CFC). Current legislation requires complete replacement of the unit if major works are undertaken on these units. Routine maintenance does not require a complete replacement, hence the recommendation is to run this unit to failure. Replacement of this unit will coincide with the installation of a new, much larger chiller in order to re-use the same footprint in an already congested mechanical area.

- There is asbestos insulation on many of the pipes that will have to be replaced as the repairs and upgrades are carried out. This can be phased over several years as the other Mechanical projects are undertaken.

VI. PHASING PLAN FOR INFRASTRUCTURE UPGRADES, INCLUDING PHASE 4 MECHANICAL : NEW CHILLER

A phased plan, running to 2008-09, has been developed to resolve these electrical and mechanical infrastructure problems. The phasing is based on the urgency of replacement of worn-out parts, the demands for additional infrastructure, and the anticipated provision of funding. Phases 1 and 2 have been completed, for a total expenditure of $5.291 million. Phase 3 will be completed in summer 2005 at a cost of $2.515m. Total project costs for the remaining phases have been estimated through discussions with the electrical and mechanical consultants, and this gives a sense of the scale of the problem confronting UTSC. The remaining expenditure, including Phase 4 and adjustments for escalation, required to deal with these infrastructure problems is $7.806 million.

Appendices 1 - 3 contain details of the costs various phases and break down the project into individual components. The estimate for Phase 4 Mechanical, for which this report is being submitted, has been scrutinized and is current, but it must be stressed that these costs for future years are estimates only, and subject to revision. In addition, future phases may be readjusted as needs and conditions change. The costs and phasing shall be revisited with every phase of the infrastructure upgrades. An escalation factor of 5% per year has been allowed. The phasing is summarized in Table 1 of this report. Each phase of the work will be reviewed closer to the time of implementation in order to validate all aspects of scope, timing, cost and validity.

Electrical

There is no electrical upgrade work scheduled for 2005-06 or 2006-07. Phase 6 electrical work involves the replacement of the six existing PCB transformers. Provincial legislation requiring the replacement of these transformers by the end of 2007 has yet to be enacted, and thus the timing is not yet established. For purposes of this report, the 2007-08 fiscal year has been targeted for this work. Total project cost for this work is estimated at $1.897m.

Mechanical

There are currently two existing chillers providing cooling for the campus buildings connected to the Central Plant. One is a newer 1000 ton unit that operates efficiently and is used for the vast majority of the cooling needs of the campus. The other is an older 700 ton unit that has had a history of malfunctions and currently operates at 50% capacity or less. Phase 4 2005-06 Mechanical involves the removal of this smaller unit and its replacement with a new 1700 ton chiller. Because the new chiller is only slightly larger than the existing, it can occupy the same footprint as the existing unit, a positive aspect in an area of

congestion in the Mechanical Room. The new chiller will allow the existing cooling equipment to work at 100% capacity, something that is currently not possible with the assortment of equipment in house.

An additional outcome of this phase of work will be the elimination of the 'shoulder season' whereby the University's plant cannot respond to temperature spikes in spring and fall, causing a general feeling of discomfort for the occupants of the buildings and posing some serious difficulties for temperature sensitive science experiments. Provision was made for a 4th winterized cooling tower for this purpose in Phase 3 Mechanical: New Cooling Towers, which was completed in summer 2005. The actual construction of this winterized cooling tower is included as part of Phase 4 Mechanical: New Chiller.

This additional cooling capacity is required for several reasons, including increased cooling load in the Science Wing due to the addition of larger air handling units that were required as part of a capital project in 2004 to renovate science teaching laboratories, completion of the new Arts & Administration building in 2005, proposed air-conditioning of the R-Wing, the rapid growth in enrolment in the summer semester at the University, and the imminent construction of a new Science Building on campus. Timing for this work would be early 2006 to allow for the towers to be operational by the late spring of 2006. Total project cost for this work is estimated at $2.919m.

Phase 5 2006-07 Mechanical calls for the replacement of the existing 2 boilers with four smaller boilers to provide additional steam capacity and flexibility required for the campus. These existing boilers are now 40 years old and have reached the end of their life cycle. A substantial amount of asbestos removal is anticipated during this phase as the exiting boilers are insulated with this hazardous material. Total project cost for this work is estimated at $3.050m.

The completion of this Phase should ensure that the overall heating and cooling system at UTSC is sufficient to meet projected demands generated by the capital construction projects that are in construction, in design or planned. Construction beyond what is currently planned may require additional infrastructure upgrades.

Previous infrastructure reports identified a Phase 7 for the replacement of the 700 ton CFC chiller. This was scheduled in 2009-10 at an estimated cost of $1.607m. The revisions to Phase 4 described in this report make Phase 7 unnecessary. Phase 4 now involves increasing capacity of the replacement chiller from 1000 to 1700 tons. Because of improvements in technology and costing this can in fact be done with a slight reduction in the previously estimated cost for Phase 4 for a 1000 ton unit, which was $2.991m. Improvements in technology also permit this greater capacity unit to fit in the space occupied by the 700 ton unit in the mechanical room rather than taking up additional space.

The proposal for Phase 4 Mechanical : New Chiller, outlined in this report, therefore reduces the overall cost of infrastructure upgrades at UTSC both by the previously estimated cost of $1.607m for Phase 7 and by the savings of $72,000 for Phase 4. It creates extra space in the mechanical room, provides cooling during the shoulder season throughout the campus, and provides the necessary cooling capacity for the recent and approved capital projects on campus.

VII. RESOURCE IMPLICATIONS

A. Total Project Cost : all phases

The total project cost for all phases of electrical and mechanical work as identified, including all taxes, contingencies, permits, professional fees, and escalations consistent with the proposed sequence of implementation of the work, is estimated to be $15,672,000. Details of future components are described in more detail in Appendices 1 – 3.

The estimates were priced separately at current rates and reflect current market conditions. There is a construction contingency of 10% of total construction cost.

B. Operating Costs

Implementation of the above work is not expected to increase the maintenance, operating or utilities costs on campus. In fact it should reduce costs now being incurred for repairs, service calls, etc. Each new building coming on stream will have its own effects on operating costs, and these will be identified in respective project reports, but the proposed infrastructure improvements will reduce rather than increase overall operating and utility costs.

C. Total Project Cost Phase 4 Mechanical : New Chiller

The estimated total project cost for the construction of the chiller, including all relevant fees, taxes and contingencies, is $2.919 million. Details are shown in Appendix 1.
There are no anticipated secondary effects.

VIII. SOURCES OF FUNDING

Diverse sources of funding were identified for Phases 1 and 2 of the infrastructure upgrades. These include cross charges to capital projects to ensure that they pay a full contribution for the additional burden they impose on heating and cooling, FRP funds, the central base deferred maintenance fund, and UTSC operating funds. These phases of the Infrastructure Upgrades are already or will soon be completed.

Sources of funding for Phase 4 Mechanical : New Chiller are :

Account	**2005-06**	**2006-07**	
FRP		200,000	200,000
Operating Deferred Maintenance	1,204,809	1,514,191	2,719,000
TOTAL			**2,919,000**

All of these funds are or will be in hand by the completion of the project and the costs of financing have been built into this project.

VIII. SCHEDULE

General Recommendations for Schedule of Phases for Infrastructure Upgrades

In general the six phases of the infrastructure upgrades at UTSC are based on financial years because of the importance of relating them to suitable sources of funding. In more detail the work may have to be completed in concert with construction schedules and legal deadlines for replacing equipment using banned chemicals. Table 2 provides a detailed schedule for carrying out the upgrades

1. Phase 1 Electrical/Mechanical was approved by AFD in May 2003 and is complete.

2. Phase 2 Electrical/Mechanical was approved by AFD in January 2004. These are now complete.

3. Phase 3 work replaces two existing cooling towers with three new cooling towers. The work is currently underway and will be completed by the summer of 2005 to provide increased cooling capacity required by trimestering.

4. Phase 4 – New Chiller provides for the removal of the existing and inefficient 700 ton chiller and its replacement with a new 1700 ton chiller to meet current and future cooling requirements. This work should commence in the winter of 2006 so as to complete by spring 2006.

5. Phase 5 upgrades have to be completed by fall 2007 in order to allow the opening of the New Science Building as scheduled for January 2008.

6. Phase 6 replacement of PCB transformers will be scheduled to correspond with legislative requirements.

7. The proposals and schedules in this report should be reviewed on an on-going basis to reassess their validity and to note changes in terms of scope, timing and budget.

Phase	Scope of Work	Deadline for Implementation	Comment
Phase 1	New De-aerator	Fall 2003	Complete
	Replace Switchgear	Fall 2003	Complete
Phase 2A	Replace outdoor transformer Electrical feeder/distribution Main indoor switchgear replacement	Sept 2004	Complete
Phase 2B	New Boiler and peripherals	October 2004	Complete
Phase 3	New Cooling Towers	August 2005	Required for Existing Bldgs
Phase 4	Add 1700 ton chiller, more asbestos removal	May 2006	Life cycle replacement for Arts Building + R-Wing. Required replacement of CFC chiller
Phase 5	Replace existing 2 boilers with 4 new boilers, more asbestos removal	Sept 2007	Life cycle replacement for winter heat
Phase 6	PCB transformers replaced	Sept 2008	Legal requirement and deadline

Table 2 : Detailed Recommendations for Phasing of Infrastructure Upgrades

Specific Schedule for Phase 4 Mechanical : New Chiller

The necessity to proceed as soon as possible with the work for Phase 4 Mechanical : New Chiller has been indicated above. It is essential that the work be completed by about May 2006 to provide necessary cooling for the buildings at the height of summer. The proposed schedule is as follows:

Submission for Governance Approval	September 2005
Governance Approval	October 2005
Detailed Design	October to November 2005
Tender package complete	November 2005
Tender	December 2005
Construction	January to April 2006
Commissioning	May 2006

IX RECOMMENDATIONS

THAT the Planning and Budget Committee recommend to the Academic Board

1. THAT the Project Planning Report for Electrical and Mechanical Infrastructure Upgrades at the University of Toronto at Scarborough, Phase 4 Mechanical : New Chiller be approved in principle.

2. THAT the project scope, consisting of the replacement of the existing 700 ton chiller by a 1700 ton chiller, at an estimated total project cost of $2.919 million, be approved.

APPENDIX 1

PROJECT COST ESTIMATE — PROJECT: Mechanical UpGrade Phase IV - New Chiller (2005/06)

PROJECT MGR: Jim Derenzis — U OF T PROJECT NO:

NO	ITEM	REMARKS	BASE COST	GST(2.31%)	COST
CONSTRUCTION					
835730	Main contract	as per RSG estimate of cost	$2,100,000	$48,510	$2,148,510
835752	Other contract		$0	$0	$0
835757	Construction Contingency	at 10%	$210,000	$4,851	$214,851
835754	Secondary effects	na	$0	$0	$0
835765	Demolition		$10,000	$231	$10,231
835768	Site preparation	na	$0	$0	$0
835762	Hazardous materials removal		$50,000	$1,155	$51,155
	Total Construction				$2,424,747
LANDSCAPING					
835755	Landscaping	na	$0	$0	$0
	Total Landscaping				$0
PERMITS, INSURANCE					
835400	Permits		$21,000	$0	$21,000
836700	Insurance		$6,300	$146	$6,446
	Total Permits, Insurance				$27,446
PROFESSIONAL FEES					
835200	Consultants: -Architects, Engineers	10% of construction cost	$210,000	$4,851	$214,851
835201	Consultants - disbursements	5% of fees	$10,500	$243	$10,743
835204	Construction management fees		$0	$0	$0
835206	Other consultants	Asbestos, acoustics, surveyor	$21,000	$485	$21,485
835210	Legal fees		$0	$0	$0
835720	Design fees-In House		$0	$0	$0
835721	External Project Manager		$0	$0	$0
835725	Management fees-Capital Projects		$90,388	$0	$90,388
	Total Professional fees				$337,466
SERVICES TO SITE					
835700	Site services & infrastructure	inc	$0	$0	$0
	Total Site Services				$0
COMPUTER WIRING AND TELEPHONES					
821110	Computer infrastructure		$0	$0	$0
835010	Telephone		$0	$0	$0
	Total Computer Wiring & Telephones				$0
MOVING AND STAGING					
837100	Moving	na	$4,000	$92	$4,092
837101	Staging	minor allow	$2,000	$46	$2,046
	Total Moving and Staging				$6,139
FURNISHINGS AND EQUIPMENT					
820010	Furnishings	na	$0	$0	$0
821010	Equipment	na	$0	$0	$0
821610	Scientific Equipment	na	$0	$0	$0
821510	AV for classrooms	na	$0	$0	$0
	Total Furnishings and Equipment				$0
OTHER					
890670	U of T Trades	allow	$10,000	$0	$10,000
835070	Courier, misc.		$6,000	$0	$6,000
820011	Signage-Interior	na	$0	$0	$0
821325	Security & Access systems	na	$0	$0	$0
835756	Signage-Exterior	na	$0	$0	$0
835764	Client Construction expenses	na	$10,000	$0	$10,000
835900	Advertising	allow	$0	$0	$0
836430	Donor recognition	na	$0	$0	$0
835766	Ceremonies	na	$0	$0	$0
	Total Other				$26,000
		SUB TOTAL			$2,821,797
PROJECT CONTINGENCY					
835758	Project Contingency	na	$50,000	$0	$50,000
	Total Project Contingency				$50,000
FINANCE COSTS					
835300	Finance Costs	7% @6 months	$47,250	$0	$47,250
	Total Finance Costs				$47,250
		TOTAL PROJECT COST:			$2,919,047

Prepared by: Jim Derenzis — Recommended by: — Approved by:
Date: 26 April 2005 — Date: — Date:

APPENDIX 2

PROJECT COST ESTIMATE — PROJECT: Infrastructure UpGrade Phase V - Replace Existing Boilers - 2006/2007

PROJECT MGR: Jim Derenzis — U OF T PROJECT NO:

NO	ITEM	REMARKS	BASE COST	GST(2.31%)	COST
CONSTRUCTION					
835730	Main contract	includes escalation @5% for 3 years	$2,083,725	$48,134	$2,131,859
835752	Other contract		$0	$0	$0
835757	Construction Contingency	at 10%	$208,373	$4,813	$213,186
835754	Secondary effects		$0	$0	$0
835765	Demolition		$0	$0	$0
835768	Site preparation		$0	$0	$0
835762	Hazardous materials removal	asbestos	$250,000	$5,775	$255,775
	Total Construction				$2,600,820
LANDSCAPING					
835755	Landscaping		$0	$0	$0
	Total Landscaping				$0
PERMITS, INSURANCE					
835400	Permits		$20,837	$479	$21,317
836700	Insurance		$2,084	$48	$2,132
	Total Permits, Insurance				$23,448
PROFESSIONAL FEES					
835200	Consultants: -Architects, Engineers	10% of construction cost	$208,373	$4,813	$213,186
835201	Consultants - disbursements	5% of fees	$10,419	$241	$10,659
835204	Construction management fees		$0	$0	$0
835206	Other consultants	0.5% of construction cost	$10,419	$241	$10,659
835210	Legal fees		$0	$0	$0
835720	Design fees-In House		$0	$0	$0
835721	External Project Manager		$0	$0	$0
835725	Management fees-Capital Projects		$89,278	$0	$89,278
	Total Professional fees				$323,783
SERVICES TO SITE					
835700	Site services & infrastructure	inc	$0	$0	$0
	Total Site Services				$0
COMPUTER WIRING AND TELEPHONES					
821110	Computer infrastructure		$0	$0	$0
835010	Telephone		$0	$0	$0
	Total Computer Wiring & Telephones				$0
MOVING AND STAGING					
837100	Moving	na	$0	$0	$0
837101	Staging	minor allow	$5,000	$116	$5,116
	Total Moving and Staging				$5,116
FURNISHINGS AND EQUIPMENT					
820010	Furnishings	na	$0	$0	$0
821010	Equipment	na	$0	$0	$0
821610	Scientific Equipment	na	$0	$0	$0
821510	AV for classrooms	na	$0	$0	$0
	Total Furnishings and Equipment				$0
OTHER					
890670	U of T Trades	allow	$5,000	$0	$5,000
835070	Courier, misc.		$2,000	$46	$2,046
820011	Signage-Interior	na	$0	$0	$0
821325	Security & Access systems	na	$0	$0	$0
835756	Signage-Exterior	na	$0	$0	$0
835764	Client Construction expenses	na	$5,000	$116	$5,116
835900	Advertising	allow	$0	$0	$0
836430	Donor recognition		$0	$0	$0
835766	Ceremonies	Ground breaking, Top off, Grand opening	$5,000	$116	$5,116
	Total Other				$17,277
		SUB TOTAL			$2,970,444
PROJECT CONTINGENCY					
835758	Project Contingency	na	$0	$0	$0
	Total Project Contingency				$0
FINANCE COSTS					
835300	Finance Costs	7% @ 6 months	$80,000	$0	$80,000
	Total Finance Costs				$80,000
		TOTAL PROJECT COST:			$3,050,444

Prepared by: Jim Derenzis — Recommended by: — Approved by:
Date: 24 Sept 2004 — Date: — Date:

APPENDIX 3

PROJECT COST ESTIMATE

PROJECT: Infrastructure UpGrade Phase VI - Replace PCB Transformers (2007/08)

PROJECT MGR: Jim Derenzis

U OF T PROJECT NO:

NO	ITEM	REMARKS	BASE COST	GST(2.31%)	COST
CONSTRUCTION					
835730	Main contract	as per Carinci estimate of cost	$1,285,000	$29,684	$1,314,684
835752	Other contract		$0	$0	$0
835757	Construction Contingency	at 10%	$128,500	$2,968	$131,468
835754	Secondary effects	na	$0	$0	$0
835765	Demolition		$50,000	$1,155	$51,155
835768	Site preparation	na	$0	$0	$0
835762	Hazardous materials removal		$10,000	$231	$10,231
	Total Construction				$1,507,538
LANDSCAPING					
835755	Landscaping	na	$0	$0	$0
	Total Landscaping				$0
PERMITS, INSURANCE					
835400	Permits		$12,850	$0	$12,850
836700	Insurance		$3,855	$89	$3,944
	Total Permits, Insurance				$16,794
PROFESSIONAL FEES					
835200	Consultants: -Architects, Engineers	10% of construction cost	$147,350	$3,404	$150,754
835201	Consultants - disbursements	5% of fees	$7,368	$170	$7,538
835204	Construction management fees		$0	$0	$0
835206	Other consultants	Asbestos, acoustics, surveyor	$14,735	$340	$15,075
835210	Legal fees		$0	$0	$0
835720	Design fees-In House		$0	$0	$0
835721	External Project Manager		$0	$0	$0
835725	Management fees-Capital Projects		$55,938	$0	$55,938
	Total Professional fees				$229,304
SERVICES TO SITE					
835700	Site services & infrastructure	inc	$0	$0	$0
	Total Site Services				$0
COMPUTER WIRING AND TELEPHONES					
821110	Computer infrastructure		$0	$0	$0
835010	Telephone		$0	$0	$0
	Total Computer Wiring & Telephones				$0
MOVING AND STAGING					
837100	Moving	na	$4,000	$92	$4,092
837101	Staging	minor allow	$20,000	$462	$20,462
	Total Moving and Staging				$24,554
FURNISHINGS AND EQUIPMENT					
820010	Furnishings	na	$0	$0	$0
821010	Equipment	na	$0	$0	$0
821610	Scientific Equipment	na	$0	$0	$0
821510	AV for classrooms	na	$0	$0	$0
	Total Furnishings and Equipment				$0
OTHER					
890670	U of T Trades	allow	$10,000	$0	$10,000
835070	Courier, misc.	incl parking	$7,500	$0	$7,500
820011	Signage-Interior	na	$0	$0	$0
821325	Security & Access systems	na	$10,000	$231	$10,231
835756	Signage-Exterior	na	$0	$0	$0
835764	Client Construction expenses	na	$10,000	$0	$10,000
835900	Advertising	allow	$0	$0	$0
836430	Donor recognition	na	$0	$0	$0
835766	Ceremonies	na	$0	$0	$0
	Total Other				$37,731
		SUB TOTAL			$1,815,922
PROJECT CONTINGENCY					
835758	Project Contingency	na	$50,000	$0	$50,000
	Total Project Contingency				$50,000
FINANCE COSTS					
835300	Finance Costs	7% @6 months	$31,500	$0	$31,500
	Total Finance Costs				$31,500
		TOTAL PROJECT COST:			$1,897,422

Prepared by: Jim Derenzis
Date: 26 April 2005

Recommended by:
Date:

Approved by:
Date:

APPENDIX 4
EXISTING AND FUTURE BUILDINGS – ELECTRICAL/MECHANICAL LOADS

Building	Gross Sq. Metres	Timing	Electrical Load (kW)	Heating Load (KLB/HR)	Cooling Load (TONS)
Existing					
H-Wing	9217	Existing			
S-Wing	29772	Existing			
Bladen	10596	Existing			
R-Wing (Gymnasium)	8050	Existing			
ARC	8232	Existing			
Residence Phase IV	8300	Existing			
Management	5067	Existing			
Student Centre	4713	Existing			
ARC	8232	Existing			
Sub-Total #1	83647		4538	59.414	2013
Under Construction/Design					
Classroom/Arts	5200	2005	420	6.880	315
Sub-Total #2	5200		420	6.880	315
Planned					
Science Building	5000		500	6.332	280
Sub-Total #3	5000		500	6.332	280
Future					
H-Wing Extension	4600		415	4.051	150
Athletics Expansion	2190		310	3.140	80
Gymnasium (Existing)			N/A	N/A	250
Residence Phase V	8300		780	N/A	N/A
Sub-Total #4	15090		1505	7.191	480
I. GRAND TOTAL	108937		6963	79.817	3088