PROJECT PLANNING REPORT

FOR

ELECTRICAL AND MECHANICAL INFRASTRUCTURE UPGRADES PHASE 3 : COOLING TOWERS

AT

THE UNIVERSITY OF TORONTO AT SCARBOROUGH (UTSC)

5 November 2004

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EXECUTIVE SUMMARY

- Much of the electrical and mechanical infrastructure at UTSC is 38 years old and requires repairs to meet present demand, plus further upgrades to accommodate growth on campus. Consequences of inaction could include catastrophic failure or inability to meet the increased demands associated with new 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 38 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 after 2007 to meet legislated requirements.
- 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 now complete. Phase 1b Electrical involved installing a new de-aerator (and removal of asbestos) and was approved by AFD in January, 2004 for $1.675M and is now complete. Phase 2a Electrical involved replacement of breakers, relays, 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 now complete. Phase 2b Mechanical added a new boiler to meet increased demands and further asbestos removal. The total cost of this work was approved by AFD in January 2004 for $1.505M and will be completed by December 2004.
- Phase 3 Mechanical, to be undertaken in early 2005, provides for the replacement of two existing cooling towers to add cooling capacity for existing buildings, especially during the summer season now that UTSC is trimestered. The estimated cost of this work is $2.515m. Sources of funding are UTSC Operating $1.718 million, UTSC deferred Maintenance $0.597 million, UTSC FRP 2005-06 $0.200 million. No funds will be borrowed for this project.
- Phase 4 Mechanical, in 2006-07, provides for a new 1000 ton chiller. The provisional total estimated cost is $2.991m. Sources of funding have yet to be identified.
- Phase 5 Mechanical, planned for 2007-08, 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, 2008-09, replaces the six PCB transformers, as required by Provincial legislation. The provisional total estimated cost for this is $1.897m.
- Phase 7 provides for the replacement of the CFC Chiller in 2009-10, also as required by provincial legislation. The estimated cost will be $1.607m.

	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 **This 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 will be completed by December 2004** 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 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 Provisional	2006-07	New 1000 Ton Chiller Sub-total	$2.991 $2.991m	To be determined
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
Phase 7 Provisional	2009-10	Replace CFC Chiller Sub-total	$1.607m $1.607m	To be determined
		GRAND TOTAL (estimated)	**$17.351m**	

Table 1: Summary of Phases of Infrastructure Upgrades at UTSC

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, Development Manager, Capital Projects, University of Toronto
Kim McLean, Assistant Principal and Chief Administrative Officer, UTSC
Michel Richard, Director, Facilities Management, UTSC
Raafat Helmy, Assistant Director, Facilities Management, UTSC
Gail Milgrom, Office of Campus and Facilities Planning

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 3 Mechanical, which involves the construction of new cooling towers to provide additional air conditioning capacity. This work has to be completed by about June 2005 to provide necessary cooling for the summer trimester at UTSC.

IV. ACADEMIC AND CAPITAL PLANS AND INFRASTRUCTURE NEEDS

Academic plans at UTSC call for a growth in combined undergraduate/graduate enrolment from under 6,000 ftes in 2001-02 to about 10,000 ftes in 2007-08, an increase of about 66%. To accommodate this growth, the library has been expanded, a Student Centre, Management Building and new residence have been constructed, and an Arts and Administration Building is under construction. About 27,000 gross sq metres are being added to the existing 78,000 gross sq metres of buildings on campus.

This programme of capital construction is mostly consistent with the directions laid out in the 2001 Campus Master Plan, although that plan indicated an additional 20,000 gross sq metres of construction, including an additional residence, an expansion to the Science Wing, and an expansion to the Athletics Centre. Project committees have been struck for these extra buildings, and they are expected to report to Planning and Budget early in 2005.

The existing infrastructure was not designed for this scale of construction and is seriously degraded. 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 more than 100,000 gross sq metres which is what UTSC will have by September 2005. Furthermore the existing central boilers and related equipment are now at the end of their useful and efficient life and will soon have to be replaced.

V. KEY FINDINGS OF CONSULTANTS' REPORTS

Key findings of the investigations by Carinci Burt Rogers for Electrical Infrastructure and Rybka 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 $0.396m 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 38 years, and are deteriorating rapidly due to the age of the system.

- Prior to the building expansion program, heating demands were satisfied byone 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.

- 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 38 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 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. For purposes of this report, replacement has been slotted for 2009-2010 Phase 7 of the Infrastructure Upgrades.

- 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 3 MECHANICAL : COOLING TOWERS

A phased plan, running to 2009-10, 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 or will soon be completed, for a total expenditure of $5.291 million. 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 adjustments for escalation, required to deal with these infrastructure problems is $12.06.

Appendices 1 - 5 contain details of the costs various phases and break down the project into individual components. The estimate for Phase 3 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 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 on page 4 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 2008-09 fiscal year has been targeted for this work.

Mechanical

Phase 3 2005-06 Mechanical involves the removal of the two existing cooling towers and their replacement with 3 new cooling towers. Because the new towers are slightly larger than the existing, they cannot be placed in the same location as the existing units, a location that is currently hidden from view. These new towers will have to be placed on the roof of the Humanities Wing, and given the Architectural significance of the original Andrews Buildings, a proposal was made in June of 2004 to the University's Design Review Committee for an enclosure to shield the towers from view while providing an appearance in line with the original buildings. The towers themselves will allow the existing cooling equipment to work at 100% capacity, something that is currently not possible with the assortment of equipment in house. 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, completion of commissioning in the ARC, and the introduction of trimestering at the University, an important consideration as the buildings are expected to be heavily used throughout the summer. Timing for this work would be early 2005 to allow for the towers to be operational by the summer of 2005. Total project cost for this work is estimated at $2.515m.

Phase 4 2006-07 Mechanical involves the addition of a new 1000 ton chiller to provide the additional cooling capacity required for the new Arts Building, the existing R-Wing as well as augmenting the systems providing cooling to existing buildings during the summer semester. Estimated total project cost is $2.991m.

Phase 5 2007-08 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 38 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.

Phase 7 2009-10 Mechanical involves the replacement of a very inefficient 700 ton chiller that uses CFCs. Current legislation calls for the complete replacement of chillers using CFC refrigerants by December 2005 if major works are undertaken on these units. Routine maintenance does not require complete replacement, hence the recommendation is to run this unit to failure. For this report, replacement has been slotted to 2009-2010 and is estimated at $1.607m.

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.

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 $17,351,000. Details of each component are described in more detail in Appendices 1 – 5.

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 3 Mechanical : Cooling Towers.

The estimated total project cost for the construction of the cooling towers, including all relevant fees, taxes and contingencies, is $2.515 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 3 Mechanical : Cooling Towers are :

1. UTSC Operating Funds 2004-05	$1,218,166
2. UTSC Operating Funds 2005-06	$ 500,000
3. Deferred Maintenance Funds 2005-06	$ 596,834
4. Facilities Renewal Program 2005-06	$ 200,000
	$2,515,000

All of these funds are orwill be in hand at the commencement of the project, and it is not necessary to borrow funds to finance this project.

VIII. SCHEDULE

General Recommendations for Schedule of Phases for Infrastructure Upgrades

In general the seven 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 and Mechanical was approved by AFD in May 2003 and both are now complete.

2. Phase 2 Electrical and Mechanical was approved by AFD in January 2004. The Electrical work is complete and the Mechanical work is in progress.

3. Phase 3 work provides for the removal of the two existing cooling towers and their replacement by three new cooling towers. The work must be completed by the summer of 2005 in order to provide increased cooling capacity to serve existing buildings given that the University has introduced trimestering.

4. Phase 4 upgrades and beyond should commence in the winter of 2006.

5. The proposals and schedules in this report should be reviewed on an on-going basis to reassess their validity and to capture any 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	Required for Student Centre and Management Bldgs
Phase 3	New Cooling Towers	May 2005	Required for Existing Bldgs
Phase 4	Add 1000 ton chiller, additional asbestos removal	April 2006	Life cycle replacement for Arts Building +

			R-Wing
Phase 5	Replace existing 2 boilers with 4 new boilers, additional asbestos removal	Sept 2007	Life cycle replacement for winter heat
Phase 6	PCB transformers replaced	Dec 2008	Legal requirement and deadline
Phase 7	Replace CFC Chiller	Dec 2009	Legal requirement and life cycle replacement

Table 2 : Detailed Recommendations for Phasing of Infrastructure Upgrades

Specific Schedule for Phase 3 Mechanical : Cooling Towers

The necessity to proceed as soon as possible with the work for Phase 3 Mechanical : Cooling Towers has been indicated above. It is essential that the work be completed by about June 2005 to provide necessary cooling for the buildings at the height of summer. The proposed schedule is as follows:

Submission for Governance Approval	November2004
Governance Approval	January 2004
Tender package complete	January 2005
Tender	February 2005
Detailed Design	February to April 2005
Construction	April to June 2005
Commissioning	June/July 2005

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 3 Mechanical : Cooling Towers be approved in principle.

2. THAT the project scope, consisting of the replacement of the existing cooling towers by new units and appropriately designed screens, at an estimated total project cost of $2.515 million, be approved.

APPENDIX 1:

PROJECT: Infrastructure UpGrade Phase 3 – Mechanical : New Cooling Towers

PROJECT COST ESTIMATE

PROJECT MGR: Jim Derenzis

NO	ITEM	REMARKS	BASE COST	GST(2.31%)	COST
CONSTRUCTION					
835730	Main contract	as per RSG estimate of cost	$1,900,000	$43,890	$1,943,890
835752	Other contract		$0	$0	$0
835757	Construction Contingency	at 10%	$190,000	$4,389	$194,389
835754	Secondary effects	na	$0	$0	$0
835765	Demolition	inc	$0	$0	$0
835768	Site preparation	na	$0	$0	$0
835762	Hazardous materials removal		$0	$0	$0
	Total Construction				$2,138,279
LANDSCAPING					
835755	Landscaping	na	$0	$0	$0
	Total Landscaping				$0
PERMITS, INSURANCE					
835400	Permits		$19,000	$0	$19,000
836700	Insurance		$5,700	$132	$5,832
	Total Permits, Insurance				$24,832
PROFESSIONAL FEES					
835200	Consultants: -Architects, Engineers	10% of construction cost	$190,000	$4,389	$194,389
835201	Consultants - disbursements	5% of fees	$9,500	$219	$9,719
835204	Construction management fees		$0	$0	$0
835206	Other consultants	Asbestos, acoutics, surveyor	$19,000	$439	$19,439
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		$81,557	$0	$81,557
	Total Professional fees				$305,104
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	$5,000	$116	$5,116
837101	Staging	minor allow	$5,000	$116	$5,116
	Total Moving and Staging				$10,231
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	$4,000	$0	$4,000
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		$5,000	$116	$5,116
	Total Other				$16,277
		SUB TOTAL			$2,494,723
PROJECT CONTINGENCY					
835758	Project Contingency	na	$0	$0	$0
	Total Project Contingency				$0
FINANCE COSTS					
835300	Finance Costs	7% @ 6 months	$20,000	$0	$20,000
	Total Finance Costs				$20,000
		TOTAL PROJECT COST:			$2,514,723

Prepared by: Jim Derenzis
Date: 15 Oct 2004

Recommended by:
Date:

Approved by:
Date:

APPENDIX 2:

PROVISIONAL PROJECT COST ESTIMATE

PROJECT: Infrastructure UpGrade Phase 4 – Mechanical : New 1000 Ton Chiller - 2005/2006

PROJECT MGR: Jim Derenzis

NO	ITEM	REMARKS	BASE COST	GST(2.31%)	COST
CONSTRUCTION					
835730	Main contract	includes escalation @5% for 2 years	$2,205,000	$50,936	$2,255,936
835752	Other contract		$0	$0	$0
835757	Construction Contingency	at 10%	$220,500	$5,094	$225,594
835754	Secondary effects		$0	$0	$0
835765	Demolition		$0	$0	$0
835768	Site preparation		$0	$0	$0
835762	Hazardous materials removal	asbestos	$40,000	$924	$40,924
	Total Construction				$2,522,453
LANDSCAPING					
835755	Landscaping		$0	$0	$0
	Total Landscaping				$0
PERMITS, INSURANCE					
835400	Permits		$22,050	$507	$22,557
836700	Insurance		$2,205	$51	$2,256
	Total Permits, Insurance				$24,813
PROFESSIONAL FEES					
835200	Consultants: -Architects, Engineers	10% of construction cost	$220,500	$5,094	$225,594
835201	Consultants - disbursements	5% of fees	$11,025	$255	$11,280
835204	Construction management fees		$0	$0	$0
835206	Other consultants	0.5% of construction cost	$11,025	$255	$11,280
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		$94,405	$0	$94,405
	Total Professional fees				$342,558
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	$4,000	$92	$4,092
	Total Moving and Staging				$4,092
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			$2,911,193
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:			**$2,991,193**

Prepared by: Jim Derenzis
Date: 24 Sept 2004

Recommended by:
Date:

Approved by:
Date:

APPENDIX 3

PROVISIONAL PROJECT COST ESTIMATE

PROJECT: Infrastructure UpGrade Phase 5 – Mechanical : Replace Existing Boilers - 2006/2007

PROJECT MGR: Jim Derenzis :

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 &				$0

	Telephones				
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
Date: 24 Sept 2004

Recommended by:
Date:

Approved by:
Date:

APPENDIX 4

PROVISIONAL PROJECT COST ESTIMATE

PROJECT: Infrastructure UpGrade Phase 6 – Electrical PCB Transformer Replacement - 2008/2009

PROJECT MGR: Jim Derenzis

NO	ITEM	REMARKS	BASE COST	GST(2.31%)	COST
CONSTRUCTION					
835730	Main contract	includes escalation @5% for 4 years	$1,440,375	$33,273	$1,473,648
835752	Other contract		$0	$0	$0
835757	Construction Contingency	at 10%	$144,037	$3,327	$147,365
835754	Secondary effects		$0	$0	$0
835765	Demolition		$0	$0	$0
835768	Site preparation		$0	$0	$0
835762	Hazardous materials removal		$0	$0	$0
	Total Construction				$1,621,012
LANDSCAPING					
835755	Landscaping		$0	$0	$0
	Total Landscaping				$0
PERMITS, INSURANCE					
835400	Permits		$14,404	$331	$14,735
836700	Insurance		$1,440	$33	$1,474
	Total Permits, Insurance				$16,209
PROFESSIONAL FEES					
835200	Consultants: -Architects, Engineers	10% of construction cost	$144,037	$3,327	$147,365
835201	Consultants - disbursements	5% of fees	$7,202	$166	$7,368
835204	Construction management fees		$0	$0	$0
835206	Other consultants	0.5% of construction cost	$7,202	$166	$7,368
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		$61,792	$0	$61,792
	Total Professional fees				$223,894
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 &				$0

	Telephones				
MOVING AND STAGING					
837100	Moving	na	$0	$0	$0
837101	Staging	minor allow	$4,000	$92	$4,092
	Total Moving and Staging				$4,092
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	$3,000	$0	$3,000
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	$2,000	$46	$2,046
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				$12,208
		SUB TOTAL			$1,877,415
PROJECT CONTINGENCY					
835758	Project Contingency	na	$0	$0	$0
	Total Project Contingency				$0
FINANCE COSTS					
835300	Finance Costs	7% @ 6 months	$20,000	$0	$20,000
	Total Finance Costs				$20,000
		TOTAL PROJECT COST:			$1,897,415

Prepared by: Jim Derenzis
Date: 24 Sept 2004

Recommended by:
Date:

Approved by:
Date:

APPENDIX 5

PROVISIONAL PROJECT COST ESTIMATE

PROJECT: Infrastructure UpGrade Phase 7 – Mechanical : Replace CFC Chiller 2009/2010

PROJECT MGR: Jim Derenzis

NO	ITEM	REMARKS	BASE COST	GST(2.31%)	COST
CONSTRUCTION					
835730	Main contract	includes escalation @5% for 5 years	$1,148,653	$25,534	$1,175,187
835752	Other contract		$0	$0	$0
835757	Construction Contingency	at 10%	$114,865	$2,653	$117,519
835754	Secondary effects		$0	$0	$0
835765	Demolition		$0	$0	$0
835768	Site preparation		$0	$0	$0
835762	Hazardous materials removal		$20,000	$0	$20,000
	Total Construction				$1,313,168
LANDSCAPING					
835755	Landscaping		$0	$0	$0
	Total Landscaping				$0
PERMITS, INSURANCE					
835400	Permits		$11,487	$264	$11,751
836700	Insurance		$1,149	26	$1,175
	Total Permits, Insurance				$12,926
PROFESSIONAL FEES					
835200	Consultants: -Architects, Engineers	10% of construction cost	$114,865	$2,653	$117,519
835201	Consultants - disbursements	5% of fees	$5,743	$133	$5,876
835204	Construction management fees		$0	$0	$0
835206	Other consultants	0.5% of construction cost	$5,743	$133	$5,876
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		$49,482	$0	$49,482
	Total Professional fees				$178,752
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	allow	$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			$1,527,239
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:			$1,607,239

Prepared by: Jim Derenzis
Date: 24 Sept 2004

Recommended by:
Date:

Approved by:
Date:

APPENDIX 6
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			
Sub-Total #1	57635		2968	44.000	1700
Under Construction/Design					
ARC	8232	2003	390	7.177	313
Residence Phase IV	8300	2003	360	N/A	N/A
Management	5067	2004	460	3.752	N/A
Student Centre	4713	2004	360	4.485	N/A
Sub-Total #2	26312		1570	15.414	313
Planned					
Classroom/Arts	7900	2005	420	6.880	315
Residence Phase V	8300	2006	360	N /A	N/A
Sub-Total #3	16200		780	6.880	315
Future					
H-Wing Extension	4600		415	4.051	150
Science Building	9000		880	6.332	280
Athletics Expansion	2190		310	3.140	80
Gymnasium (Existing)			N/A	N/A	250
Sub-Total #4	15790		1605	13.523	625
I. GRAND TOTAL	115937		6923	79.817	2953