

HUMBER COLLEGE LRC (NORTH)

ARCHIVES

HUMBER COLLEGE STUDENTS

HAZARD TREE ASSESSMENT REPORT

For

HUMBER COLLEGE - QUAD CAMPUS

Prepared By

HUMBER COLLEGE STUDENTS

Enrolled In

ARBORICULTURE PROGRAMMES - 1995

Table of Contents

Hazard Tree Assessment Report Lakeshore Hospital Campus



Prepared for :

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May 1995

Table of Contents

	Page #
1.0 Introduction.....	1
2.0 Methodology.....	2
3.0 Individual Assessments and Recommendations...	3
4.0 General Recommendations.....	20
4.1 General Conclusions.....	22
5.0 Postscript.....	23
6.0 Appendix 'A' Glossary of Terms.....	24
7.0 Appendix 'B' Tree Location Map	

May 1998

1.0 Introduction

In early 1985 Jan Bruke, Co-ordinator of Architecture at the Royal College of Surgeons in London, England, contacted the Ministry of the Royal College of Surgeons to provide students with the opportunity to undertake the same type of work as they do at the Lakeside Hospital. This he thought provided an excellent opportunity for the students to undertake an assessment of their work in the "Quad" and prepare a report with suitable attention being given to the assessment, recommendations for maintenance and removal of existing work and guidelines for the preservation of it as far as possible to remain.

For years the hospital site and the large number of buildings were with the grounds were neglected. This was a serious problem especially for a site of this type of approach. There was little regard for the health and safety of the site.

1.0 INTRODUCTION

Credit should be given to the college and all governing bodies involved in the restoration being conducted on this hospital site. However, considering the condition of the building, it would be difficult to provide a full list of the construction damage that has been examined by these means. Presumably the costs of remedial maintenance, removal and replacement will be high. It is out of the question that would have been examined had the site been given professional consideration early in the planning phase. Finally many of the existing trees have extensive structural defects, increasing the hazard posed by their use by staff and students alike. Specific measures will be required if these trees are to be preserved.

It is hoped to say the future of all the "Quad" trees will be examined in a separate report, and successful preservation (where preservation is possible) will require a long term commitment by all involved. Students of the Architecture programme were glad to be a part of the project and the challenge it posed.

1.0 Introduction

In early 1995 Ian Bruce, Co-ordinator of Arboriculture at Humber College, finalized an agreement with the Ontario Ministry of the Secretariat which provided students with the opportunity to undertake the care and removal of trees at the Lakeshore Hospital site. This partnership provided much needed tree care while at the same time providing relevant arboricultural skills training.

In addition the students were asked to undertake an assessment of trees within the "Quad" and prepare a report with particular attention being given to hazard assessment, recommendations for maintenance and removal of existing trees and guidelines for the preservation of the trees identified to remain.

For years the hospital site and the large number of mature trees within the grounds were neglected. Tree care activities occurred sporadically on a crisis management bases, with little regard for tree health and structural integrity. This type of approach is typical of management of institutional landscapes and is perhaps largely a reflection of recessionary times.

Credit should be given to the college and all governing bodies involved for the restoration being conducted on this historical site, however, consulting a Certified Arborist in the planning phase would definitely have prevented much of the construction damage that has been sustained by these trees. Predictably the costs of remedial maintenance, ultimate removal and tree replacement will far out pace the costs that would have been incurred had the trees been given professional consideration early in the planning phase. Finally many of the mature trees have extensive structural defects, increasing the hazard potential on the site as use by staff and students increases. Specific measures will be required if these trees are to be preserved.

Needless to say the future of all the "Quad" trees will pose some major challenges, and successful preservation, (where preservation is possible), will require a long term commitment by all involved. Students of the Arboricultural programs were glad to be a part of this project and the challenges it posed.

2.0 Methodology

As the focus of the assessment was to concentrate on the tree's structure, a site plan of the area was obtained from the Physical Resources Department of Hunter College. Discussions were held in class as to the approach to be taken in carrying out the assessment. Trees were then distributed among the students.

Due to construction activities and parking issues, the assessment could not be initiated until three activities were 80% complete. This restriction allowed the students about two to three weeks to assess and formulate their findings before the end of the school year.

Using the site plan provided, the trees were tagged just above ground level on the south side using sequentially numbered metal tags, numbered from 401 through to 475. Recently planted small trees were not numbered or tagged, and in some cases the tree tags were removed.

2.0 METHODOLOGY

As an aid in the development of the assessment, a form was developed by the students. The form was evaluated and revised using one of the following methods: a) a pilot test of the form was conducted with a small group of students to establish a format for a given tree. The form was found to be inadequate on its own for a proper assessment, but very useful in focusing the students' attention to the education and task assigned. The students found that the knowledge gained in the completion of studies in tree biology, tree identification, morphology, pathology, and ecology, up to date arboriculture practices, arborology for assessing tree health and vigor, as well as written communication skills prepared them well to go beyond the limitations of the form and do a more relevant assessment.

On the next part, visual inspection was carried out from ground level. When doubts about individual tree structural integrity were encountered during the tree or removing the soil from around the root zone was required for construction purposes.

DBH - Trunk diameter at breast height (1.4m) from ground level was determined using a metric diameter tape measure. The actual height and girth of the trees were photographed.

The students received also inspection observations, and if an unnumbered tree was found, it was numbered. Final submissions and reports were prepared and submitted on the following dates.

2.0 Methodology

As the focus of the assessment was to concentrate on the trees within the boundaries of the ring road, a site plan of the area was obtained by Ian Bruce from the Physical Resources Department of Humber College. Discussions were held in class as to the approach to be taken in assessing the trees and individual trees were then distributed among the students.

Due to construction activities and barriers within the area, assessment could not be initiated until these activities were 95% complete. This restriction allowed the students about two to three weeks to assess and formulate their findings before the end of the school year.

Using the site plan provided, the trees were tagged just above ground level on the south side using sequentially numbered metal tags, numbering from 401 through to 475. Recently planted small trees were not numbered or inspected, and in some cases trees indicated on the plan had already been removed.

As an aid in the initial evaluation process a standard form, recommended and developed by the International Society of Arboriculture, was utilized. Each tree was evaluated separately using one form per tree. The form combines information about tree health and structural integrity with site factors to establish a hazard rating for a given tree. The form was found to be inadequate on its own for a proper full assessment, but very useful in focusing the students attention to the situation and task assigned. The students found that the knowledge gained in the combination of studies in tree biology, tree identification, morphology, pathology, entomology, up to date Arboriculture practices, technology for assessing tree health and integrity as well as written communication skills prepared them well, to go beyond the limitations of the form and do a more relevant assessment.

On the most part, visual inspection was carried out from ground level. Later, when doubts about individual trees structural integrity were questioned climbing the tree or removing the soil from around the root flare was required for confirmation purposes.

(DBH; Trunk diameter at breast height or 4.5 feet from ground level), was determined using a metric diameter tape measure. The actual height and age of the trees were approximated.

The students recorded site inspection observations, and then confirmed their assessment with Ian Bruce. Final submissions and recommendations are adjoined and presented on the following pages.

3.0 INDIVIDUAL ASSESSMENTS and

RECOMMENDATIONS

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Tree # 401: Ulmus americana (American Elm)

DBH. 56 cm.

The tree is in a general state of decline. Dieback is evident on the larger branches and there is deadwood throughout the crown. Uncharacteristic burls and epicormic shoots are present as well as bark injury high in the crown and at the largest crotch. Root severance and construction injury have occurred.

Recommendation: Remove Deadwood.

Tree # 402: Ulmus americana (American Elm)

DBH. 83 cm.

This tree appears healthy and in good form with a sound and well balanced crown and trunk. Construction damage has caused minor wounding and some root severance.

Recommendation: Standard pruning.

Tree # 403: Acer platanoides (Norway Maple)

DBH. 78 cm.

The tree is reasonably healthy and showing only slight minor symptoms of decline. Due to previous limb failure the crown is unbalanced and may be the reason for a seam which runs from the main crotch to the ground. Small deadwood throughout.

Recommendation: Remove deadwood/ Reduce and balance the crown.

Tree # 404: Acer saccharinum (Silver Maple)

DBH. 59.5 cm.

A healthy tree with a straight clean trunk. A previous injury has callused well. The crown, which has two co-dominant stems is unbalanced and unattractive.

Recommendation: Standard Pruning.

Tree # 405: Acer platanoides (Norway Maple)

DBH. 90 cm.

The tree has minor deadwood and a limited amount of dieback is evident, however, the tree poses an immediate risk of failure. It is in a serious state of decline. There is a large amount of decay and the crown is unbalanced due to previous failure of the co-dominant stem. Stress cracks along the main trunk symptomatic of internal decay. The roots are girdled on one side and have been cut on the other to make way for water mains and hydrants. There may not be enough anchorage to support the tree.

Recommendation: Immediate removal/ Replant.

Tree # 406: Ulmus americana (American Elm)

DBH. 40 cm.

The tree is in a state of decline as indicated by minor deadwood, tip dieback and numerous epicormic shoots. The crown is unbalanced and leaning over the roadway. These present stresses will be aggravated as construction activities put the trees health at further risk.

Recommendation: Standard pruning & reshape.

Tree # 407: Acer saccharinum (Silver Maple)

DBH. 39.5 cm.

At first glance the tree appears vigorous and healthy, but on closer inspection it is in a state of chronic decline. There are frost ribs on the trunk, an indication of internal decay, girdled roots and bark injury at ground level.. Every branch arises as watersprouts due to the previous severe topping. These are weakly attached! The tree is not an imminent hazard.

Recommendation: Remove/ Replant

Tree # 408: Ulmus americana (American Elm)

DBH. 53 cm.

Numerous watersprouts growing throughout the tree are symptomatic of chronic stress. The large scaffold branches are weakly attached where they join the main stem due to included bark, however there is no immediate threat of failure at these points.

Recommendation: Crown reduction/ Deadwooding/ Cable and bolting.

Tree # 409: Acer platanoides (Norway Maple)

DBH. 91 cm.

Apart from some advanced dieback in the lower crown the tree appears to be relatively healthy. The crown is large, full and well balanced. The two co-dominant stems may split apart as they are acute in angle and have included bark at point of attachment.

Recommendation: Standard pruning/ Deadwooding/ Cable and Bracing.

Tree # 410: Ulmus americana (American Elm)

DBH. 70 cm.

The tree, apart from minor deadwood, appears healthy, clean and well balanced in crown and trunk. Structurally, however, the main branches are weak in attachment, the roots appear to be girdled and there is evidence of decay within the 'Zone of Rapid Taper'. Combining the recent construction damage and soil disturbance the tree will show increasing signs of decline.

Recommendation: Standard pruning/ Cable and Bracing.

Tree # 411: Acer saccharinum (Silver Maple)

DBH. 67.5 cm.

Generally a healthy tree, but due to a previous loss of one main scaffold branch the crown is unbalanced and a cavity has resulted. The remaining wood appears to be sound. Construction damage has occurred within the root zone.

Recommendation: Standard pruning/ Map and assess the cavity.

Tree # 412: Acer platanoides (Norway Maple)

DBH. 52 cm.

The tree is attractive and relatively healthy. The minor deadwood throughout the crown may be a result of recent construction activity. There are several lignotuber concentrations on the lower trunk.

Recommendations: Standard pruning.

Tree # 413: Ulmus americana (American Elm)

DBH. 55.5 cm.

The tree is in an advanced state of decline as there is noticeable deadwood throughout the crown. Structurally sound.

Recommendation: Standard pruning.

Tree # 414: Acer platanoides (Norway Maple)

DBH. 45 cm.

The health of this tree is in question. The crown appears stunted, a significant seam runs from one main crotch to the next, along the main stem. Dead bark is evident at the base of the tree, the roots may be girdled and the root plate was observed to be heaving with loading. The tree is unsound.

Recommendation: Remove limb on the west side/ Ultimately remove/ replant.

Tree # 415: Acer saccharinum (Silver Maple)

DBH. 65.5 cm.

This tree is in the latter stages of decline, there has been extensive dieback leaving no main branches.

Recommendation: Remove/ Replant.

Tree # 416: Acer saccharinum (Silver Maple)

DBH. 55 cm.

The tree has a limited crown due to major scaffold dieback and previous removals. The bark is uncharacteristically burlled and there is decay in the main union of scaffold limbs.

Recommendation: Remove/ Replant.

Tree # 417: Acer saccharinum (Silver Maple)

DBH. 61 cm.

The tree appears healthy and has a full attractive crown. Structurally it is unsound as spiral frost seams on the trunk indicate extensive underlying decay.

Recommendation: Remove/ Replant.

Tree # 418: Ulmus americana (American Elm)

DBH. 76 cm.

This elm appears healthy and has a well balanced crown. The scaffolds are well distributed and the trunk seems to be clean and sound. There is some minor deadwood over the roadway and a large number of epicormic shoots are present near previous pruning cuts.

Recommendation: Standard pruning.

Tree # 419: Tilia cordata (European Linden)

DBH. 38 cm.

A healthy vigorous tree with excellent form. The crown is attractive and well balanced, however, there is some crowding of branches. Root and soil disturbances have occurred due to construction.

Recommendation: Standard pruning.

Tree # 420: Acer saccharinum (Silver Maple)

DBH. 78.5 cm.

At the present the tree is healthy. The narrowly attached co-dominant limbs will present problems in the future if not addressed, a pocket of decay exists at this union.

Recommendation: Standard pruning / Cable and Bracing.

Tree # 421: Acer saccharinum (Silver Maple)

DBH. 76 cm.

The tree is relatively healthy. The crown has previously been reduced, and there are signs of decay at those sites of old pruning wounds. These include squirrel nesting, a large wood decay fruiting structure, and cambial dieback.

Recommendation: Standard pruning.

Tree # 422: Acer platanoides (Norway Maple)

DBH. 61.5 cm.

This tree is in an intermediate stage of decline. The scaffolds are dying back and there are hangers and broken limbs throughout. The tree will die within three years.

Recommendation: Remove/ Replant.

Tree # 423: Ulmus americana (American Elm)

DBH. 56.5 cm.

Relatively healthy tree. There is the existence of included bark and narrow angled branch union where main trunk breaks into scaffold limbs.

Recommendation: Cable and bolt.

Tree # 424: Acer platanoides (Norway Maple)

DBH. 49 cm.

Tree appears relatively healthy. There are fungi mushrooms on the bark over the main branch/ trunk union indicative of underlying decay.

Recommendation: Regular maintenance/ Monitor advance of decay.

Tree # 425: Acer platanoides (Norway Maple)

DBH. 60 cm.

This tree has a healthy and attractive crown at present. Resent construction root severance and exposure will reduce the trees vigor in the near future.

Recommendation: Regular maintenance.

Tree # 426: Acer platanoides (Norway Maple)

DBH. 55 cm.

The tree is under stress and wood rot fungi is evident at ground level, indicating decay within the root crown.

Recommendation: Monitor advance of decay.

Tree # 427: Acer platanoides (Norway Maple)

DBH. 68 cm.

This tree is in a state of decline and has broken and dead limbs throughout the crown. There is a major bark wound in the main crotch and decay is advancing, wood rot decay fungi is evident.

Recommendation: Regular maintenance/ Monitor.

Tree # 428: Acer platanoides (Norway Maple)

DBH. 49.5 cm.

A structurally sound tree with a relatively healthy appearance. Construction disturbance has been minimal.

Recommendation: Regular maintenance.

Tree # 429: Acer platanoides (Norway Maple)

DBH. 48.5 cm.

The tree is leaning toward the parking lot, symptomatic of root rot. Previous major crown reduction has taken place in the past and there is small deadwood throughout.

Recommendation: Standard pruning/ Monitor changes in lean.

Tree # 430: Acer saccharinum (Silver Maple)

DBH. 68 cm.

The tree appears to be in good health, however several structural defects are present. There is a large cavity in the main stem and several in the scaffold branches. One of these scaffolds extends over the walkway. This tree is hazardous.

Recommendation: Immediate and extensive crown reduction/ Monitor cavity.

Tree # 431: Acer saccharinum (Silver Maple)

DBH. 93 cm.

Apart from some structural problems this tree appears to be in good health,. Due to the previous failure of one of the scaffold branches, decay has entered the main trunk and resulted in the weakening of the attachment of all scaffolds. On the west side of the tree construction activities have severed many roots and compacted the soil.

Recommendation: Deadwood/ Extensive crown reduction.

Tree # 432: Acer saccharinum (Silver Maple)

DBH. 65 cm.

Apart from severe compaction of the soil during construction this tree is in good health. A narrow branch union at the apex of the trunk with included bark exists, this may pose a problem in the future.

Recommendation: Standard prune/ Monitor main scaffold union.

Tree # 433: Aesculus hippocastanum (Horse Chestnut)

DBH. 69 cm.

There are several main branches that are either dead or dying in this tree. A large cavity in the trunk between two scaffolds exists, which may result in the scaffolds failing. Decline will be accelerated due to construction activity.

Recommendation: Standard prune/ Crown reduction/ Cable and bracing.

Tree # 434: Acer saccharinum (Silver Maple)

DBH. 66 cm.

This tree appears healthy, however, the crown is incomplete due to dieback and failure of major portions of the scaffolds. The main crotch is weak as it is narrowly attached and the bark included. Decay is present at points of previous failures, and a cavity is forming 1.5 meters above ground level.

Recommendation: Standard prune/ Major crown reduction/ Cable and bracing.

Tree # 435: Aesculus hippocastanum (Horse Chestnut)

DBH. 64 cm.

A full and attractive crown with minimal deadwood gives a healthy appearance to the tree. The trunk is relatively clean and free of external wounds, but there are unusual inrolling vertical seams which suggests an internal column of decay from ground level to three meters up.

Recommendation: Standard prune.

Tree # 436: Acer saccharinum (Silver Maple)

DBH. 71 cm.

The crown of this tree although appearing healthy has sustained major dieback. At the site of a previous limb removal three meters from ground level a cavity exists. A large hanger is present above the tunnel. The trunk appears sound and clean.

Recommendation: Standard prune/ Crown reduction.

Tree # 437: Ulmus americana (American Elm)

DBH. 91.5 cm.

This elm appears stunted and in a state of decline, but healthy enough to support twig and bud development. The crown is well balance, but unattractive due to excessive erratic growth. At the site of a previous limb removal, 2 m. from ground level, decay has entered the main trunk. Wounding, soil build up and sucker growth has occurred at the base of the tree, and resulted in infection by wetwood infection.

Recommendation: Standard prune/ Remove soil to original level.

Tree # 438: Ulmus americana (American Elm)

DBH. 57.5 cm.

A full and attractive crown gives a healthy appearance to the tree. Some larger lower limbs are dead and there is minor deadwood throughout. Being situated in a parking area several surface wounds have occurred. The main crotch is weak due to narrow angle of attachment with included bark. A surface wound exists at this junction and resulting decay may further weaken this area. This wound is also infected by wetwood bacteria.

Recommendation: Standard prune.

Tree # 439: Acer platanoides (Norway Maple)

DBH. 73.5 cm.

This tree appears to be in good health. There are, however, numerous epicormic shoots arising from previous pruning cuts. Seams with exposed wood are also evident on many of the scaffold limbs. Combining the limbs defects with windsail effects predisposes them to failure.

Recommendation: Deadwood/ Monitor deterioration of structural integrity.

Tree # 440: Acer platanoides (Norway Maple)

DBH. 80 cm.

This tree appears reasonably healthy, but has an incomplete crown due to storm damage or previous pruning. Spiral seams are evident on each of the three scaffolds and one prominent seam that runs from ground level to the main crotch is a major concern. A nesting hole and borer damage at the site of a previous limb failure, indicate extensive underlying decay.

Recommendation: Remove/ Replant.

Tree # 441: Acer platanoides (Norway Maple)

DBH. 81 cm.

This tree has a large healthy, but incomplete crown due to previous failures of a significant portion of scaffold limbs. There are stubs and deadwood throughout. The trunk appears sound apart from a surface wound extending from ground level to the main scaffold union, which has included bark on the opposite side.

Recommendation: Standard prune/ Box cable and bracing.

Tree # 442: Acer saccharinum (Silver Maple)

DBH. 84.5 cm.

A tree of excellent health with a large, full, complete and attractive crown. The trunk is straight sound and without noticeable defects. The scaffolds are well attached and sound with one exception. A limb 13 inches in diameter on the east side, over the building has a linear cavity on the top side.

Recommendation: Standard prune/ Two Cables to support weak limb.

Tree # 443: Acer saccharinum (Silver Maple)

DBH. 53.5 cm.

This tree is in the latter stages of decline. The crown has been skeletonized by previous limb removals and does not contribute to site aesthetics. The tree is not an imminent hazard.

Recommendation: Remove/ Replace

Tree # 444: Acer saccharinum (Silver Maple)

DBH. 72 cm.

This tree appears healthy, however, numerous hazards exists. The crown is unbalanced and unattractive with a linear form and erratic branching habit. There are hangers and deadwood throughout. Major, extensive cavities exist in the two main scaffold limbs and a major crack associated with included bark extends from the main scaffold union to the ground.

Recommendation: Crown reduction/ Replant for future removal.

Tree # 445: Acer saccharinum (Silver Maple)

DBH. 54 cm.

Despite the unbalanced and scraggly appearance of this tree, it is healthy. One notable cavity has developed 2m above the ground on the trunk. The remainder of the trunk is straight and clean.

Recommendation: Standard prune/ Dropcrotch most dominant scaffold.

Tree # 446: Acer saccharinum (Silver Maple)

DBH. 140 cm.

The trees' crown is complete, full and attractive, but decline is evident as bud set and twig development are erratic. The trunk and scaffold limbs are sound and clean.

Recommendation: Standard prune.

Tree # 447: Acer saccharinum (Silver Maple)

DBH. 151 cm.

This tree appears to be in the early stages of decline with hangers and deadwood throughout. The crown is incomplete due to previous removal of limbs on the west side. All the existing scaffolds originate from one point, 1.5m above the ground, and grow upright giving the crown a vase appearance.

Recommendation: Standard prune & reshape/ Box cable and brace.

Tree # 448: Catalpa speciosa (Northern Catalpa)

DBH. 42.5 cm.

There is minor deadwood throughout and a major cavity between the two co-dominant stems, However the tree is in relatively good condition.

Recommendation: Standard prune/ Cable and brace/ Cavity fill with foam.

Tree # 449: Ulmus americana (American Elm)

DBH. 57.5 cm.

The tree appears healthy despite its uncharacteristic growth habit. The tree is growing against the tunnel walk restricting its conductive capabilities. The crown is very thick with minor deadwood throughout. structural weaknesses such as included back and a partially opened seam. These do not pose an immediate hazard due to low target potential.

Recommendation: Standard prune/ Cable and brace.

Tree # 450: Acer saccharinum (Silver Maple)

DBH. 85 cm.

The tree appears healthy with a well balanced crown, however, a scaffold has been removed leaving a large wound that is subject to decay. There is a major seam developing due to included bark, but this does not pose an immediate hazard. A westerly scaffold has a topside cavity.

Recommendation: Standard prune/ Reduce end weight of scaffolds.

Tree # 451: Acer saccharinum (Silver Maple)

DBH. 83.5 cm.

A very healthy tree, however the crown is incomplete and has become weakened by decay at the face of a previous limb removal. There are several significant cavities on the trunk and limbs, and a frost rib on the trunk has formed due to torque twisting.

Recommendation: Drop crotch crown reduction.

Tree # 452: Acer saccharinum (Silver Maple)

DBH. 67 cm.

The tree is in good health. The crown, however, is incomplete due to a previous removal of a 40 cm. diameter co-dominant stem at two meters from ground level.

Recommendation: Standard prune.

Tree # 453: Acer saccharinum (Silver Maple)

DBH. 100 cm.

This tree with its full, well balanced crown is in excellent health. There is minor deadwood throughout, but the scaffolds are sound and well spaced. The trunk is large, straight and free of mechanical wounds.

Recommendation: Standard prune.

Tree # 454: Tilia cordata (European Linden)

DBH. 53.5 cm.

A very healthy and attractive tree with a full well balanced crown, strong scaffolds and straight clean trunk.

Recommendation: Standard prune.

Tree # 455: Acer saccharinum (Silver Maple)

DBH. 95 cm.

Judging from the poor state of bud development, this tree is in a state of decline. The crown is unbalanced due to previous removals of limbs and major structural deterioration is advancing at the site of previous wounds on the trunk. From the proximity of decay in relation to the main crotch, the tree should be considered hazardous.

Recommendation: Remove/ Replace

Tree # 456: Acer saccharinum (Silver Maple)

DBH. 105 cm.

Despite the full and well balanced crown the tree is in poor health due to structural defects. A large cavity has developed in the trunk and decay may continue ultimately resulting in failure. Further exploratory boring will be needed to determine the feasibility of cabling as an alternative to removal. This tree will become increasingly hazardous and prone to major limb failure over the sidewalk.

Recommendation: Constant monitoring.

Tree # 457: Acer saccharinum (Silver Maple)

DBH. 94 cm.

This tree is in the early stages of decline. It has sustained major dieback due to episodic injuries. The branches have developed significant cankers and have deadwood throughout. Bud development is erratic. Scaffolds are sound and well attached, however, some structural buckling was observed. The trunk has a moderate lean accompanied by a longitudinal crack with an extensive underlying cavity.

Recommendation: Standard prune and crown reduction.

Tree # 458: Acer saccharinum (Silver Maple)

DBH. 81.5 cm.

The tree appears to be healthy. The crown is well balanced over the trunk, but incomplete due to previous limb removals. Three main scaffolds, 5m above ground level, are attached at the same location and are quite weak due to the presence of included bark. All main limbs are accompanied by frost ribs. The main trunk has four openings, (one extensive) that are fluxing and are accompanied by underlying decay.

Recommendation: Standard prune and possible major crown reduction.

Tree # 459: Acer saccharinum (Silver Maple)

DBH. 103.5 cm.

Although the tree appears healthy it has sustained major dieback. The crown is incomplete from previous severe crown reduction. The scaffolds are well attached, but a number of them show signs of decay. The trunk is strong, straight and clean.

Recommendation: Major crown reduction and standard prune.

Tree # 460: Juglans nigra (Black Walnut)

DBH. 46.5 cm.

This attractive tree with a full, well balanced crown and straight, clean trunk is in relatively good health. There is deadwood throughout, which may indicate the early stages of decline.

Recommendation: Standard prune.

Tree # 461: Juglans nigra (Black Walnut)

DBH. 75.5 cm.

A healthy tree with a full but unbalanced crown due to crowding by adjacent tree. Branches are well spaced and strongly attached. The trunk is straight, clean and sound.

Recommendation: Standard prune & reshape.

Tree # 462: Juglans nigra (Black Walnut)

DBH. 72 cm.

This tree is healthy. It has a full but unbalanced crown with deadwood throughout due to crowding by adjacent tree. Branches are well spaced and strongly attached. The trunk is straight, clean and sound.

Recommendation: Standard prune.

Tree # 463: Juglans nigra (Black Walnut)

DBH. 78 cm.

An extremely healthy and attractive tree. It possesses a full, balanced crown with only minor deadwood throughout. The branches are well spaced and strongly attached. The trunk is straight clean and sound, apart from two bark injuries near ground level. This tree is a prime specimen on this site.

Recommendation: Standard prune.

Tree # 464: Acer platanoides (Norway Maple)

DBH. 88 cm.

Although unattractive the tree appears to be relatively healthy. It has gone through periods of stress, dieback and major limb removals. Two main scaffolds are cantilevered from the main trunk, 2m from ground level, and have the potential to create sheer forces at the trunk. The trunk is relatively straight, but its conductive capabilities have been impaired on the west side.

Recommendation: Sideplant for future removal.

Tree # 465: Ulmus americana (American Elm)

DBH. 86 cm.

Although the lower branches appear to be alive and minimal deadwood exists, a significant portion of the crown has previously died and been pruned out. The remaining crown is, therefore incomplete and unattractive. The tree is structurally weakened by a major pocket of decay from ground level up. There is also major decay in the trunk at breast height, measuring 52.5 cm. in diameter.

Recommendation: Sideplant for future removal.

Tree # 466: Ulmus americana (American Elm)

DBH. 59.5 cm.

Upon observation of bud and twig growth the tree appears to be relatively healthy. There has, however, been significant dieback or storm damage in the crown, which has corrected by major drop-crotch crown reduction pruning. The trunk appears sound, although there is much bark injury to the main limbs, exposing underlying wood to potential decay.

Recommendation: Standard pruning/ Monitor/ Sideplant for future removal.

Tree # 467: Ulmus americana (American Elm)

DBH. 70.5 cm.

The tree appears healthy with a good crown and minimal deadwood. Some lower branches are broken. There appears to have been previous drop-crotch pruning and at these pruning points epicormic shoots and advancing decay have been observed.

Recommendation: Reprune previous sites.

Tree # 468: Acer platanoides (Norway Maple)

DBH. 86 cm.

This tree is in an advanced state of decline as indicated by inconsistent bud and poor twig development. The crown has poor form due to previous dieback and major pruning of one scaffold. The four remaining scaffolds appear sound, although weakly attached due to the presence of a large pocket of decay and most notably significant bark and wood injury from ground level to the main crotch. In addition to girdling roots underground excavation has come unacceptably close to the trunk, (within 2 meters), on two sides of the tree.

Recommendation: Standard prune/ Sideplant for future removal.

Tree # 469: Ulmus americana (American Elm)

DBH. 88 cm.

This tree show signs of being in an advanced state of decline. The crown has deadwood throughout and has undergone significant tip and branch dieback. The large, straight trunk has many frost seams along with bark surface wounds. 2,5 meters above the ground on the west side of the trunk a large 30 cm. deep cavity exists. Root damage and decay are also present.

Recommendation: Standard prune/ Increment bore test/ Monitor.

Tree # 470: Acer platanoides (Norway Maple)

DBH. 63 cm.

This tree is in decline as evidenced by numerous structural and crown defects. Crown dieback and storm damage has resulted in the removal of several important limbs. The bark at the remaining branch attachments is uncharacteristically rough indicative of chronic stress. The two co-dominant limbs are accompanied by included bark, a frost rib and wetwood. Multiple wounds are present at ground level and the lack of a root flare indicates girdling root.

Recommendation: Sideplant for future removal.

Tree # 471: Acer platanoides (Norway Maple)

DBH. 69 cm.

A relatively healthy tree, but showing signs of having gone through episodic stress as evidenced by the numerous water sprout growths and previous limb removals. The crown is full and well balanced but weakened with decay at the scaffolds point of attachment.

Recommendation: Standard prune/ Sideplant for future removal.

Tree # 472: Acer platanoides (Norway Maple)

DBH. 78.5 cm.

What remains of the crown appears to be healthy. There is evidence of previous episodic stress. Limb removals and storm damage have severely limited the crown and one of the remaining scaffolds is weak due to major decay, poor caliper to height ratio, and weak attachment to the main trunk.

Recommendation: Sideplant for future removal.

*Tree # 473:

*Tree # 474:

Tree # 475: Acer platanoides (Silver Maple)

DBH. 75 cm.

This tree is relatively healthy, structurally sound, although with small deadwood throughout, and several large stubs and wounds due to previous storm damage.

Recommendation: Standard prune.

*NB - Trees # 473 - 474 were imminent hazards at the time of assessment and were removed by the students after consultation with Mr. John Hooiveld.

4.0 General Recommendations and Conclusions

4.0 General Recommendations

1.) College administration must first be convinced that not only are unhealthy weak trees a potential hazard, but more important an attractive well - planned and maintained landscape will become one of the factors that draw clients to Humber. This relationship between attractive landscape and tree cover, and favourable environment for increasing clientele, positive client experience, and client satisfaction has been quantified in municipalities around North America, and has been identified on other university and college campuses. The physical condition of Humber's North Campus, particularly the landscape, is a good example of a growing detractor. An attractive landscape and healthy tree cover will have positive affects on general public perceptions of Humber as a permanent and desirable corporate citizen, and on client perceptions and experiences on campus.

2.) College administration must then commit solid, consistent, long - term support to the following;

a.) conservation of valuable existing trees,

b.) enhancement of existing tree cover by mass planting of new trees of more diverse and desirable species which are selected for tolerance to known insect, disease and environmental limitations.

c.) proper landscape planning of the entire campus site, with specific priority being given to: i.) the existing trees; ii.) limited availability of capital and operational funds; iii.) plans for future infrastructure development, and iv.) the combination of landscape planting for both short - term and for permanent long - term affects.

d.) students involvement in the year round maintenance and development of existing and proposed landscaping at all campuses.

3.) Arboriculture students should continue to provide the labour and expertise required to ensure regular monitoring, preventive maintenance, removal, and planting of trees on the campuses, with capital and operating funds limited to the purchase of materials and supplies, (ie. trees, soil, tree care supplies), and rental of tree care equipment when necessary, (ie. stump grinder, brush chipper, aerial tower, tree spade).

4.) Existing trees at the Gordon Centre require the following maintenance:

- a.) annual inspection of each tree individually to assess state of health and structural integrity.
- b.) pruning as recommended in the foregoing report, or as deemed necessary annually, with first priority being given to crown reductions and deadwood removal for safety reasons, and secondly standard pruning for health.
- c.) installation of cables and bolts where deemed necessary for structural support.
- d.) removal of hazardous trees.
- e.) treatment of other wounds and defects as deemed appropriate.

4.1 General Conclusions

As the individual assessments repeatedly states or imply, trees on the "Quad" portion of the Lakeshore Hospital site could generally be characterized as mature to over - mature, and in a state of advancing structural decline due to a combination of old age, periodic wind storm damage, maintenance neglect, and recent construction activity associated with Humber College occupancy.

This situation has been aggravated by two facts;

a.) The mature tree population within the "Quad" is, in urban forestry terms, an undesirable monoculture composed of 20% American Elm, 27% Norway Maple, and 38% Silver Maple. The danger of course is that should a species - specific disease attack one of these, the entire population of that species could be killed. The American Elm are very susceptible to decline due to any construction activities which impact the roots, and predisposes them to infection by Dutch Elm Disease. Silver Maple is a relatively short - lived, fast growing, weak - wooded species and is susceptible to storm damage as age increases over 25 to 30 years. Norway Maple is very susceptible to the adverse affects of the urban environment, particularly drought, and excessive heat and cold, and for these reasons becomes predisposed to wood fibre degeneration and resultant failure of large limbs that appear outwardly sound.

b.) Recent construction and renovation related to Humber's occupancy of the "Quad" has been completed with little or no demonstrated regard for the welfare of the trees. Consequently most of the trees around buildings C, D, and E will soon show signs of significant decline in vitality, or structural integrity, or both, within the next five years.

As the trees decline, and / or are weakened by the progression of existing structural defects, the chances of unexpected failure will increase. This fact, coupled with additional college pedestrian and vehicular traffic, will create unpredictable and dangerous hazard potential, and associated liability.

Finally unless, large - scale tree planting is done in the next year or two, this campus will, within 10 to 15 years, be largely void of larger overstorey species, as the exiting trees die, or must be removed for liability reasons. If such a scenario would evolve, earlier expectations for a Robert A. Gordon Learning Centre crowned with majestic shade trees would be reduced to a landscape spotted sporadically with scruffy smaller trees, similar to those at the north campus.

5.0 Postscript

Although most of the information in this report was compiled by students in an ornithology program due to their 1985 Ornithology field trip, the volunteer undertaking of one graduate Dan Overland. The report was prepared in Dan's company available upon request. On several occasions I have met with John Hooveld, James Lynn, and John Flynn to discuss those issues that required their attention. John was very cooperative and a great deal of time was spent in the field. On several occasions hazardous work was done by students over the course of the winter semester. On several occasions during that semester and winter during a snowstorm, several students were injured. Extensive first aid was given and the injuries were clearly minor.

Of particular concern is the possibility of a bird strike. Excessive distance is maintained between the ground and trees during the winter and early spring months. This compacted soil was left exposed only in the summer. This will result in soil compaction and deterioration of the soil. Keeping the water pipes below the ground level will help to prevent this. Road salt between rows of trees on the north and east side of the installation of water lines. This installation is a 10-foot wide trench and peripheral openings to the trunk and branches. It is noted that the use of peripheral openings to the trunk and branches is a common practice. This effect on the soil is the primary concern in this report. It is noted that trees will become gradually unstable due to several years of soil compaction.

3. In the summer of 1985, the soil compaction was observed. Several samples of the soil were taken and most serious impact of soil compaction was observed when the existing ground was exposed to the soil. Excavation related to the installation of most water lines in the area of the road, and therefore the stability of many of these trees has been reduced. Excavation related to the installation of the road on the north side of the "Quads" were observed to have helped stabilize the trees. Excavation related to the installation of the road on the north side of the "Quads" were observed to have helped stabilize the trees. Excavation related to the installation of the road on the north side of the "Quads" were observed to have helped stabilize the trees.

Excavation related to the installation of the road on the north side of the "Quads" were observed to have helped stabilize the trees.

5.0 Postscript

Although most of the information in this report was compiled by individual students in arboriculture programs prior to May 1995, the final report has been the volunteer undertaking of one graduate Dan Overend. The report was prepared in Dan's scarcely available spare time, and reviewed by me.

On several occasions I have met with, John Hooiveld, Jamie Bilyk, and Janis Flynn to discuss those issues that required priority attention. John was very co-operative and as a result, several large trees considered to be imminently hazardous were removed, and much pruning was done by students over the course of the winter semester. On several occasions during that semester, and notably during a meeting on Monday, May 29, 1995, our concerns with regard to extensive root injury were clearly articulated.

Of particular concern are the following:

- 1.) Excessive disturbance of saturated soil around and close to trees during the winter and early spring resulted in root severance, and suffocation due to heavy compaction. This compacted soil was left exposed until late summer, and this will result in root mortality and contribute to accelerated tree dieback.
- 2.) During the winter of 1995 extensive excavation was completed, along the road and between rows of trees on the north and east side of the "Quad", for the installation of water lines. This excavation resulted in much root severance, and peripheral damage to tree trunks and branches. Apart from the obvious negative affect on tree health, my primary concern is that a number of these large trees will become structurally unstable due to severance of anchor roots.
- 3.) In the summer of 1995, the row of trees next to the sidewalk on the north side of the "Quad" received additional and most serious impact of construction thus far when the existing sidewalk was expanded to provide access for fire trucks. Excavation related to this installation did in most cases encroach on the "zone of rapid taper", and therefore the stability of many of these trees has further been reduced. In mid - September a number of the trees on the north side of the "Quad" were observed to have declined suddenly. Extensive early colouration, defoliation, and tip dieback were observed, and in two cases tree canopies were totally wilted.

Ian W. Bruce, NPD, ASCA.

6.0 Appendix 'A'

Glossary of Terms

Co-dominant - Trunks / stems or scaffold branches / limbs that are equal in size and importance.

Crown - Parts of the tree above the trunk, including the leaves, branches and scaffolds.

Crown Reduction Pruning - Any pruning method which reduces the size of the crown and includes, side under, top and through pruning.

Decline - The natural reduction in a trees health after it reaches maturity.

Dieback - Death of shoots and branches usually from tip to base.

Dropcrotch Pruning - The most desirable method for crown reduction pruning in which longest limbs are shortened to lateral branches at the desired location.

Epicormic Shoots - Shoots that arise from adventitious or latent buds.

Episodic Stress - Acute stress imposed by a sudden single and usually abiotic causal factor.

General / Standard Pruning - The elimination by pruning of dead or dying twigs and branches, hangers, stubs, interfering branches and branches of acute angled attachment.

Girdling Root - A root which encircles and constricts the stem or roots causing the death of the phloem and or cambium tissues.

Hanger - Both partially attached, (but clearly broken), and unattached, lodged branches in the crown.

Included Bark - The pattern of development at branch junctions where bark is turned inward rather than pushed out.

Root Flare - The swelling or flare of the trunk where it joins the root and enters the ground.

Scaffolds - Primary structural branch or branches of the crown.

Seam - Callus ridge formed by included bark at branch junctions, also formed when two edges of callus wood meet at the centre of a wound.

Southwest Injury - A high temperature wound on the south to southwest side of the trunk caused by fast warming by the sun in the winter followed by a quick freeze.

Torque Twisting - Twisting of the trunk or stem caused by wind loading on the crown, particularly an asymmetric crown.

Wind Loading - The loading force exerted on the tree by the wind.

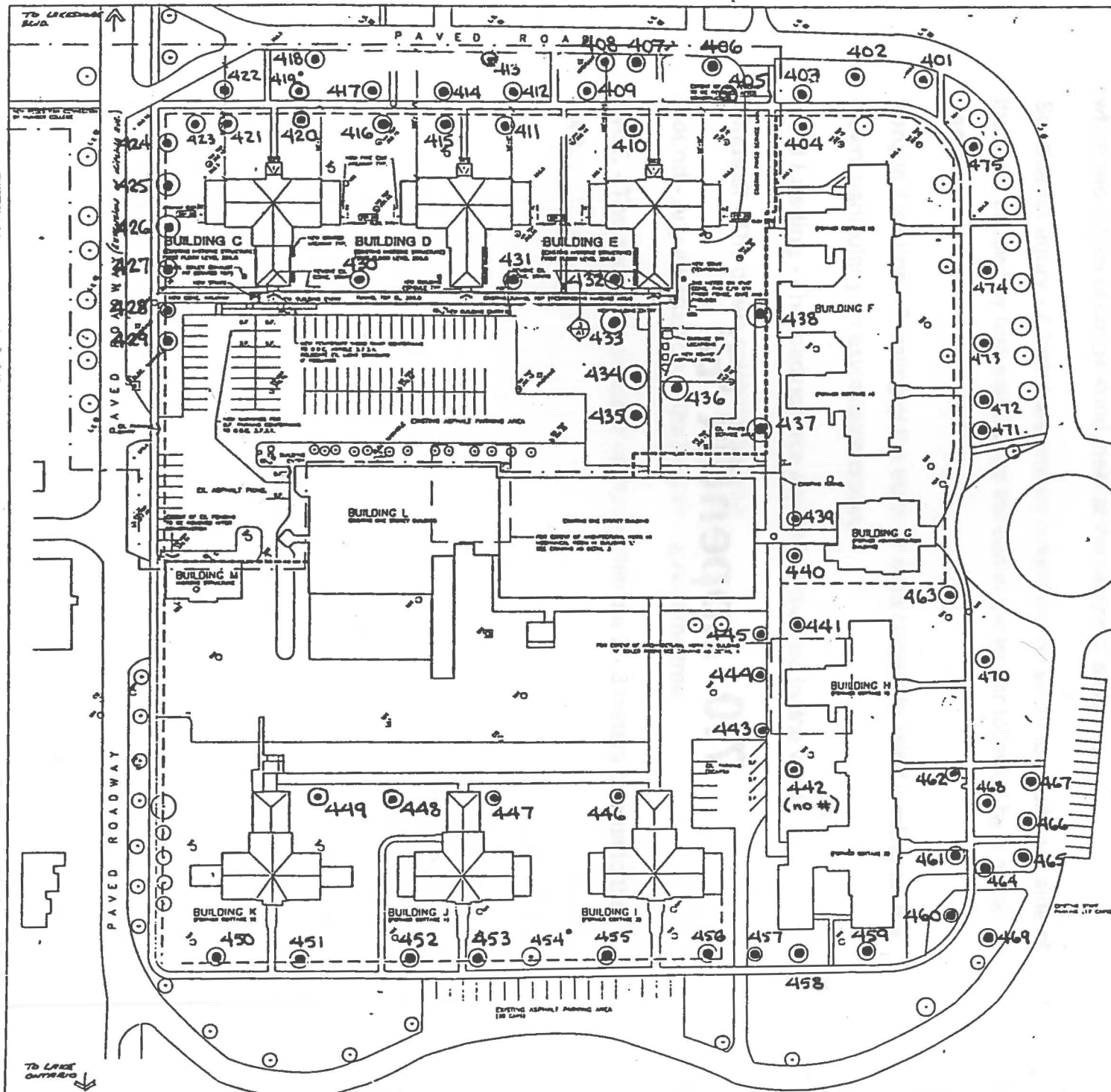
Windsail - The crown catching the wind.

Wound - Any interruption of the bark throughout the tree.

Z.R.T. - The zone of rapid taper of roots within the 2 - 3 meters closest to the trunk.



7.0 Appendix 'B'



SITE PLAN PHASE 1

Project No.	4181
Client	HUMBER COLLEGE
Scale	1:1000
Date	1984

A1R1

9 4 0 4

3	17/84	ISSUED WITH ADDENDUM #1
2	17/84	ISSUED FOR TENDER
1	15/84	ISSUED FOR BUILDING PERMIT

NO.	DATE	DESCRIPTION
REVISION/ISSUED		

TAYLOR/HAZELL ARCHITECTS LTD.
 95 GERRARD STREET, 2ND FLOOR
 TORONTO, ONTARIO, CANADA M5E 1B5
 Telephone: (416) 593-3800
 Facsimile: (416) 593-3800

C. E. WELSH CONSULTING INC.

CROSSEY ENGINEERING LTD.

This drawing shall not be used for construction purposes without the written consent of the architect and engineer.

This drawing shall not be used for construction purposes without the written consent of the architect and engineer.

**HUMBER COLLEGE
 LAKESHORE CAMPUS
 BUILDINGS C, D AND E**

HAZARD TREE