

**THE CORPORATION OF THE TOWN OF RICHMOND HILL**

**BY-LAW NO. 100-09**

A By-law to Authorize the Designation of  
123 Hillsvie Drive  
David Dunlap Observatory Lands under the  
*Ontario Heritage Act*

**WHEREAS** Section 29 of the *Ontario Heritage Act, R.S.O. 1990, c.0.18, as amended,* authorizes the Council of a municipality to enact by-laws to designate real property to be of cultural heritage value or interest;

**AND WHEREAS** the Council of The Corporation of the Town of Richmond Hill has caused to be served on the owners of the lands and premises known as 123 Hillsvie Drive, Richmond Hill, and upon the Ontario Heritage Trust, notice of intention to so designate the aforesaid real property and has caused such notice of intention to be published in a newspaper having general circulation in the municipality;

**NOW THEREFORE THE COUNCIL OF THE CORPORATION OF THE TOWN OF RICHMOND HILL ENACTS AS FOLLOWS:**

1. That the real property located at 123 Hillsvie Drive, being Part of Lots 42 and 43, Concession 1, (former Township of Markham), more specifically described as Part 1, 65R-29959, Town of Richmond Hill, Regional Municipality of York is hereby designated under Part IV of the *Ontario Heritage Act, R.S.O 1990., Chapter 0.18, as amended,* as being of cultural heritage value or interest.
2. That the Clerk is hereby authorized to cause a copy of the By-law, together with a statement explaining the cultural heritage value or interest of the property and a description of the heritage attributes of the property to be served on the owner of the property and on the Trust, and publish a notice of the By-law in a newspaper having general circulation in the municipality.
3. That the Town Solicitor is hereby authorized to cause a copy of this By-law to be registered against the property in the Land Registry Office.
4. Schedules "A" and "B" attached to By-law No. 100-09 are declared to form a part of this By-law.

READ A FIRST AND SECOND TIME THIS 29TH DAY OF SEPTEMBER, 2009

READ A THIRD TIME AND PASSED THIS 29TH DAY OF SEPTEMBER, 2009.



Mayor

Dave Barrow  
Mayor



Clerk

SCHEDULE "A" TO BY-LAW NO. 100-09

REASONS FOR DESIGNATION  
DAVID DUNLAP OBSERVATORY LANDS  
123 Hillsvie Drive

*1. Description of Property*

The Property comprises Parts of Lots 42 and 43, Concession 1, former Township of Markham, more specifically described as Part 1, on Plan 65R-29959, with the municipal address of 123 Hillsvie Drive in the Town of Richmond Hill. The Property is known as the David Dunlap Memorial Observatory.

The heritage designation applies to a **cultural heritage landscape (chl)** on a portion of the Property extending from Hillsvie Drive in the north to the fence line at the boundary of Lot 41 to the south and from the CNR tracks in the west to a surveyed line located 150 metres to the east of the easternmost row of the University of Toronto's former experimental tree plantation as shown on Schedule "B" to the By-law. This area encompasses a wide range of important cultural resources. Principally these include: the Observatory Building (originally known as the Great Telescope Dome) and telescope; the Administration Building; *Elms Lea* (Observatory House); the Radio Shack; the natural topographic rise and earthwork enhancements in the area of the Observatory Building; the designed landscaping associated with the Administration Building; the vestigial landscape elements and plantings associated with *Elms Lea* and the University of Toronto's Department of Forestry's experimental tree plantation.

*2. Statement of Cultural Value*

*(a) Summary*

The David Dunlap Observatory (DDO) is a place of high cultural value manifest at all currently recognized levels/categories associated with heritage significance. Its cultural heritage landscape is comprised of a 19<sup>th</sup> century farmstead overlain with the University of Toronto's remarkable astronomical research campus conceived as well as a memorial to the husband of the facility's donor and patron. The three major structures within this landscape each exhibit a particularly high quality of design and use of materials – *Elms Lea* as an 'architect' designed 19<sup>th</sup> century farmhouse; the Observatory Building (originally known as the Great Telescope Dome) manifesting 'leading edge' functional innovation as the envelope for the great telescope and the Administration Building profoundly combining the ceremonial and scientific in the Beaux-Arts form of the period. The building interiors each have outstanding features such as: the 74" telescope, largest in the Commonwealth when installed, within the Observatory Building, and its raison d'être; the first floor plan of the Administration Building with the main axis set to the cardinal points which intersect at the memorial at its core; and the main winder stair at *Elms Lea* which appears to be almost floating. The site has formidable historical associations ranging from the locally significant Alexander Marsh family, to the rise of astronomical research at the University of Toronto (and Canada generally) and culminating with important contributions to the world's understanding of astronomical phenomena.

*(b) The Cultural Heritage Landscape*

The David Dunlap Memorial Observatory Site is a complex cultural heritage landscape comprised of the overlay of a 20<sup>th</sup> century 'state of the art' astronomical observatory on a 19<sup>th</sup> century farmscape. There are two major layers/themes which are represented. The first is that associated with the farmstead of Alexander Marsh. Marsh, the grandson of area pioneer Robert Marsh, inherited Lot 42, Concession 1 Markham Township from his grandfather in 1852 and established a prosperous farm there (as well as on adjacent Lot 17 to the east) through the second half of the 19<sup>th</sup> century. His farmstead came to include

300 acres, three houses, and seven barns and/or stables. Originally occupying a frame house on the site which may have dated to the original patentee he had a new home for his family designed and built c.1864. This fine dichromatic brick house which came to be known as *Elms Lea* brought together eclectic influences in a picturesque composition. Sited on a rise deep within the property reached by a long lane from Yonge Street and screened by a stand of spruce, it later became the residence of C.A. Chant and subsequent directors of the DDO.

The second layer/theme grew out of the dream of C.A. Chant, often referred to as 'the father of Canadian astronomy', who recognized in a local high point of land, just east of the village of Richmond Hill, the potential site for a world class astronomical observatory. This dream was able to be realized through the support of Jessie Donalda Dunlap, whose husband had been dedicated to Chant's vision prior to his death. Since its establishment in 1933 the David Dunlap Memorial Observatory has been the site of much important astronomical research (including several 'ground breaking' discoveries), the cornerstone of astronomical education for generations of University of Toronto students and the site of pioneering efforts in Radio Astronomy spearheaded by the late Donald MacRae, also a DDO director.

The property, encompassing Lot 42 and the south half of Lot 43, was originally selected as the Observatory site for its topography - a pronounced rise relative to the surrounding area - lack of light pollution and relative accessibility to the University. Major earthwork further enhanced the natural knoll selected for the Observatory creating a podium like plateau. The circular observatory structure was designed and prefabricated in Great Britain to house the 74" telescope, largest in the British Empire at that time. The telescope, with its 5,000 pound mirror, is supported by the 'great pier', the concrete core of the building, constructed prior to the arrival and erection of the building shell in 1933. The large copper dome is built to rotate and there is a 15' wide section (shutters) which retracts for siting the telescope. The Administration Building, designed by Mathers and Haldenby, is a particularly fine example of Beaux-Arts classicism which also incorporates three copper observatory domes. The siting of the two structures, placed at right angles to each other and at cardinal points, (the Observatory at compass north) is indicative of the formal landscape which was originally planned for the site, the key axis being the approach to the Observatory from the south. The realization of this concept was only achieved, in modified form, with the landscape improvements of 1959 which featured an elliptical island within the new driveway, designed such that symbols within the paving, the bronze sundial and the pedestrian path through the island expressed cosmological laws. Also in the 1950's the Radio Astronomy program was established with the associated construction of a 'Radio Shack', (designed as a picturesque cottage), pyramidal horn antenna and 'zig zag' antenna directly east of the Administration Building.

In the early 1960's a new approach road from Hillview Drive was established, its curvilinear form intended to ensure that the Observatory not be affected by the headlights of approaching cars. The new road was named Donalda Drive, the middle name of the site's great patron. In this period too the University of Toronto Forestry Department undertook a series of experimental plantings featuring both native and exotic species. Planted in rows formed of (approximately) square individual plots their general alignment again followed the north-south orientation seemingly so essential to all aspects of the lay-out of the property.

At its opening in May 1935, attended by Prime Minister Mackenzie King, the David Dunlap Memorial Observatory was proclaimed "a gift to science all over the world" and the Royal Train carrying King George VI and Queen Elizabeth (the Queen Mother), stopped in acknowledgment of the importance of the site during their visit of 1939.

Achievements directly associated with the Observatory such as Helen Hogg's work on variable stars in globular clusters and C.T. Bolton's investigation of Cygnus X-1 as a black hole as well as the determination of the absolute flux density of Cas A at 320 MHz through radio astronomy have indeed significantly contributed to our understanding of the universe.

Important internationally for the research it has produced it is also a local landmark to the suburban community which grew up around it and has been the site of many birthday celebrations and weddings.

### (3) *Description of Heritage Attributes*

**The following are the heritage attributes which express the physical/design value of the Property. The importance and complexity of a number of these elements, particularly the three main buildings (each worthy of Section 29 Designation in their own right) has dictated a form whereby they are included at the 'macro' level as attributes of the general site but then the features which define the heritage character of each of these main elements is also further broken down, forming, in essence, a subset of heritage attributes:**

- (a) the siting of the Observatory Building and the Administration Building at the highest local elevation, enhanced and modified to a 'podium' form by significant earthworks for the placement of the buildings.
- (b) the laying out of the site to follow the cardinal points with the Observatory Building as due north and the Administration Building due east. This directional emphasis remained an essential design determinant for site layout right through the 1960's<sup>1</sup> and extended throughout most major elements of the site - including the interior plan of the Administration Building (see below), the siting of the Radio Shack, the location of the elliptical traffic island with north-south pedestrian walkway through its center and sun dial at its southern end, the placement of the flag pole, the orientation of the rows of the University's Department of Forestry experimental tree plantation.
- (c) *Elms Lea* c.1864, the picturesque dichromatic brick farmhouse originally designed for Alexander Marsh. While subject to several renovations and minor additions associated with its use within the DDO complex, the original exterior appearance is largely intact and the interior plan remains legible. It is an eclectic expression combining elements of Classical, Gothic Revival and Italianate derivation in a well integrated composition.

Key heritage attributes of the exterior include:

- the three bay symmetrical façade;
- the 'T' plan with original kitchen 'tail';
- the side gabled roof with relatively steeply pitched centre gable;
- the bracketed eave at the façade, eave returns and verges with distinctive pendant bracket;
- the dichromatic brickwork with buff brick accent detailing which include: quoins; stringcourses; arches; decorative 'reflecting' of brackets in brickwork and cross pattern with margins at gables. The Flemish bond coursing pattern at the façade and the complex cambered ('flat') arches in red brick.
- The treatment of openings including: the quarter round windows with quarter fanlights at the gables; the 6/6 small pane wood sash; the French doors flanking the center bay of the façade; the prominence given to the openings of the center bay including the main entrance with transom (with distinctive lancet light divisions) and sidelights and the semi-circularly arched opening containing French doors at the balcony which 'breaks' the eaves at the centre gable.
- the rear 2 storey gable roofed 'tail' with dichromatic brickwork and voussoired cambered ('flat') arches at the window openings.

Key heritage attributes of the interior include:

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<sup>1</sup> The north-south axial emphasis continued into the 1980's reflected in the Town designed Observatory Park and Elvis Stojko Arena on what has become known as the 'Panhandle' (described as Parts 2 and 3 on Plan 65R-29959). The "Panhandle" does not form part of the Property and is not included here for designation.

- the centre hall plan;
- the grand winder stair and balustrade at main hall. The curved rail and soffit of the main stair create a spiraling, floating effect within the space.
- the plaster paterae featuring acanthus leaves in main hall and north reception room;
- the high wood bases throughout;
- the moulded door and window architraves;
- the remaining 4 panel doors;
- the original wood fireplace surrounds at the north reception room and 'tail' with c.1933 fireboxes and hearths;
- the tile floor, tiled dado and moulded tile dado cap at 'master bathroom';
- the king post truss roof structure of the main roof.

(d) the Observatory Building (originally known as the Great Telescope Dome), 61' in diameter, designed and built to house the 74" telescope, 2<sup>nd</sup> largest in the world at that time and prototype for the use of pyrex mirrors of that scale, with rotating copper dome incorporating retractable shutters for astronomical viewing. The building expresses the Machine Age aesthetic of the period, the building being an 'envelope' for the instrument and its function. The DDO 74" reflecting telescope, still the largest optical telescope in the country, is one of Canada's most significant scientific artifacts (as well as continuing to be a viable instrument for astronomical observation). A 'leading edge' technical achievement at the global level upon its fabrication, much innovative design went into its housing and support allowing for its rotation and the cleaning and re-aluminizing of its 5000 lb. primary mirror. Most of the apparatus and associated electrical system for these operations remains original (with some replacement parts) and these partake of the high level of significance of the telescope itself.

Key heritage attributes of the exterior include:

- the circular form broken only by the entrance vestibule facing due south;
- the hemispherical dome clad in flat seam copper panels;
- the galvanized metal cladding of the walls and the 'rhythm' created by the regular spacing of pilasters and louvered shutters;
- the symmetry of the façade;
- the beveled base into which the pilasters terminate;
- the network of steel stairs and 'catwalks';
- the double leaved metal clad paneled entrance doors with moulded surround and transom with tripartite geometric pattern.
- the retractable shutters.

Within this structure form, material and function are virtually indivisible. Thus all aspects of the interior are included, highlighted by, but not restricted to:

- the semi-circular corridor formed around the service core at the first floor with galvanized metal wall cladding;
- the multi-pane steel sash (louvered shutters on exterior);
- the telescope;
- the concrete support pier (formed independently from the building itself);
- the telescope tube;
- the interior stair and 'catwalk' system;
- the apparatus associated with the rotation of the telescope;
- the apparatus associated with the rotation of the dome and opening of the shutters including the cable pulley system;
- the carriage/elevator and all associated components such as the vacuum chamber, floor hatch and pulley system associated with the mirror cleaning/re-aluminizing process
- the electrical system with much original wiring.

- (e) the Administration Building, a prototypical example of Beaux-Arts classicism rendered masterfully in stone and incorporating three copper 'observatory domes'. The Administration Building is a major architectural achievement. Mathers and Haldenby successfully combined an eloquent memorial to the patron's husband, David Dunlap, with a functional administrative and research facility supporting the astronomical Observatory. Literally at its core the building integrates the sacred and scientific bringing the cardinal point orientation of the site into the interior where, directly in line with the main entrance, at the termination of the building's eastern axis, accessed across the compass rose inlaid into the floor, through a monumental, temple-like double height space and then through a pilastered arch, resides the memorial to David Dunlap. The memorial, incised and gold-leafed into a panel at the marble wall, is at the centre of the cross hall. At the cross halls the ceremonial space is further defined by fluted pilasters. Throughout this area both wall and floor finishes are marble and the ceilings arched. Around this sacred core and the highly articulated Library a functional lay-out of offices, laboratories and support services was arranged.

Key heritage attributes of the exterior include:

- the classical Beaux-Arts symmetrical form and footprint;
- the 5 bay main block with projecting central pavilion and angled side pavilions;
- the focal treatment of the center bay incorporating semi-circular main entrance portico with Corinthian columns and Tuscan pilasters and approached via stone steps, Palladian window (with moulded architrave and keystone), balcony with wrought iron railing, stepped (up) and splayed section of stone parapet incorporating stone balustrade and urns surmounted by the largest dome placed in symmetrical relationship with the smaller domes of the side pavilions.
- the wall treatment combining sandstone and limestone and contrasting the texture of the rock faced general coursing with cut stone accents (including quoins, stringcourses, parapet copings, window and door surrounds) and carved elements (including panels with swag and floral patera at the stone parapets, freestanding urns surmounting the central dome parapet, balusters at the central dome parapet, Corinthian columns at the front portico including circular dentillated entablature with fluted frieze and a floral patera above each of the column capitals;
- the main entrance treatment consisting of a wide door of 6 fielded panels (with original hardware), with both wood and stone surrounds. The wood surround includes fluted pilasters and architrave featuring 'the lamp of knowledge' in relief as its central motif and floral emblem at its raised corners. The stone surround is in the form of a moulded architrave.
- The window treatment typically incorporating a stone apron panel with bas relief floral patera at 2<sup>nd</sup> storey. The multi-pane window sash typically 12/8 at 2<sup>nd</sup> storey, and 12/12 at ground storey. Oculus windows with broached stone voussoirs at side pavilions and centre bay of rear elevation.
- The domes clad in flat seam copper panels;
- The symmetrical 9 bay rear elevation;
- The side entrances each featuring a door with six fielded panels (with original hardware), stone sill and moulded architrave, with semi-circular fanlight above, approached via stone steps and landing with curved wrought iron rail with newel set into 'return' of first step.

Key heritage attributes of the interior include:

- the symmetrical Beaux-Arts footprint and floor plan;
- the true cardinal point orientation of the halls and straight-line relationship between the main entrance and the memorial wall;
- the open two storey volume of the main hall and mezzanine with groin vaulted ceiling featuring the marble stair with swan necked bronze rail, tapered newels

- and alternating baluster types accented with floral motifs at every second baluster;
- the relationship of the main stair landing to the Palladian window with fluted marble colonnade surround;
  - the chamfered marble cladding and flooring of the hall;
  - the compass rose of coloured marble inlaid in the marble floor;
  - the 'lantern' type light fixture suspended from the apex of the cross vault;
  - the patterned cast bronze vent covers;
  - the Greek key pattern in marble carried around the Hall at 2<sup>nd</sup> storey floor level;
  - the unifying use of decoration in marble, wood and bronze including the patera (spiral disc) and the stylized floral patera carried from the exterior;
  - the pilastered entry to the memorial space at the center of the cross hall from the north, south and west;
  - the fine jointed marble wall cladding and marble flooring of the dedication area;
  - the marble memorial bench;
  - the incised and gold-leafed dedication panel with red marble border;
  - the terrazzo flooring and brick wall finish at the remaining sections of the cross hall;
  - the barrel vaulted ceiling of the cross hall;
  - the original entrances to the rooms off the cross hall with transoms above the door openings;
  - the bronze framed panels along the walls of the cross hall designed to display images of astronomical phenomena illuminated with back-lighting;
  - the acorn light fixtures in the cross halls and Lecture Room;
  - all the finishes and features of the Library including: the plastered cornice, frieze with dentillation and fluting accented by a raised floral motif, pilastered fireplace surround with dentillated mantel and black marble at the firebox face and hearth, the paneled walls, built-in book shelves and display cabinet, the doors composed of three major panels with the top and bottom panels decorated with a patera (spiral disc motif) and architraves with gold leafed urn motif accenting the corners, the two original suspended bronze chandeliers;
  - the original raised dais, slate chalkboard in the Lecture Room;
  - the typical door type of six 'frosted' lights above two panels, simple wood entablature (from office side), patera centered on the lower panel and original bronze hardware;
  - the parquet flooring of the offices and Library;
  - the colonnade treatment which defines the mezzanine area with plaster wall finish between;
  - the doors with two large panels, each with patera at the bathroom entry
  - marble stalls and terrazzo floors at the bathrooms;
  - the 'Donor's Room', originally the office/reception space of Jessie Dunlap, finished with a marble fireplace with moulded and dentillated wood surround, moulded chair rail, base, plaster cornice and parquet floors;
  - the original built-in wood cabinets at the technical and shop areas;
  - the observatory domes including: their pulley rotation and shutter retraction systems; the 24" c.1960 telescope in the centre dome and most particularly the 19" telescope built by C.A. Chant's astronomical colleague at University of Toronto, R.K Young in 1929.

- (f) the elliptical island within the driveway with paving designed to represent Kepler's 2<sup>nd</sup> Law of Planetary Motion and walkway/axis through the center from sun dial to Observatory Building. The island, along with the curved hedge, flagpole and plantings around the Administration Building represent a 1950's attempt to realize something of the grand scheme originally envisaged for the site and continued the compass and cosmological orientation established from the outset.

**The following are the cultural attributes which express the associative/historical values of the Property:**

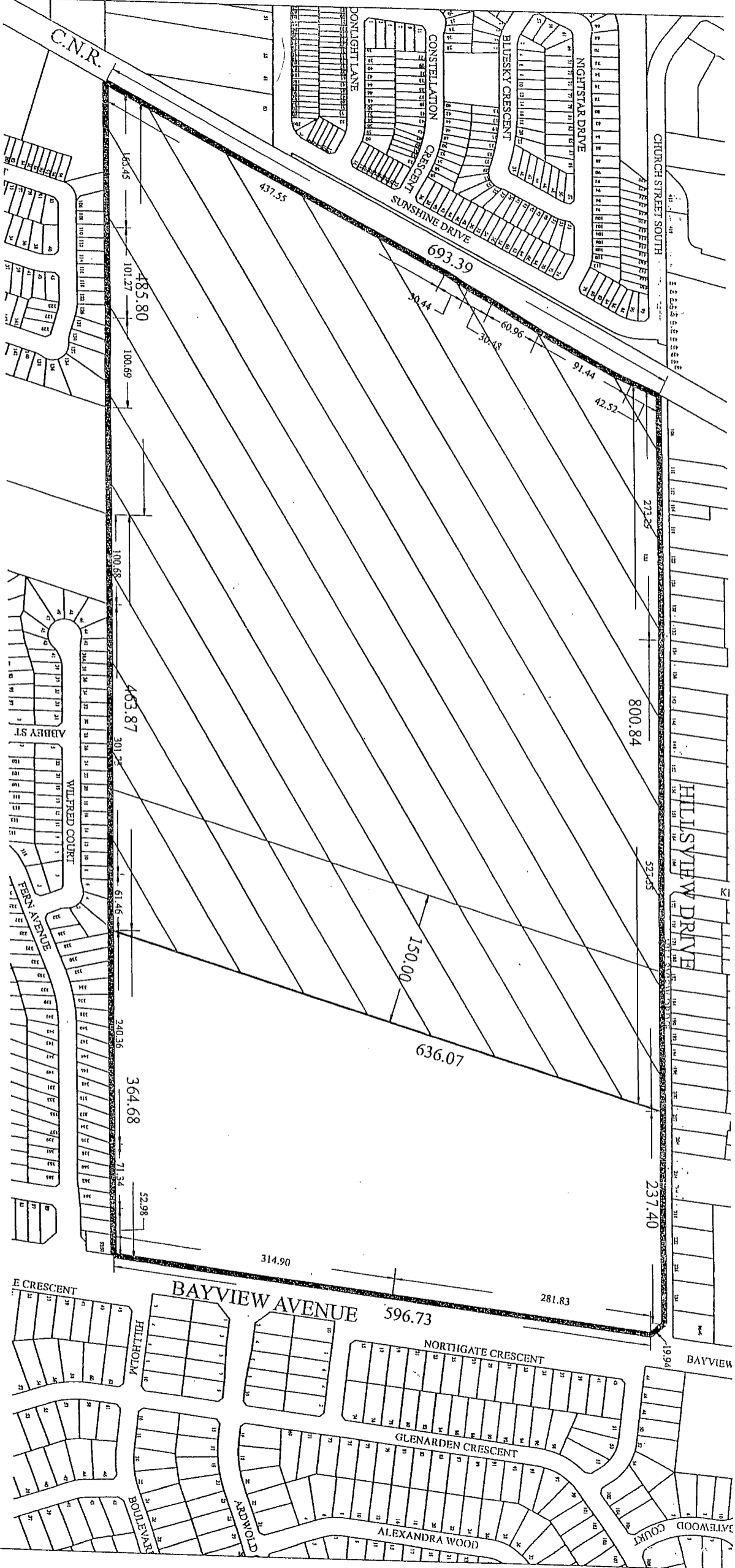
- (a) landscape features such as the former lane to Yonge Street, the line of mature spruce which screen *Elms Lea*, the vestigial orchard to the south of the house, the row of hickories between the house yard and the field, the line of maples to the north of the lane and the old field pattern, which, along with *Elms Lea* itself, represent the 19<sup>th</sup> century Marsh farmstead era of the property;
- (b) *Elms Lea* c.1864, the Alexander Marsh family residence throughout the latter half of the 19<sup>th</sup> century, which, with the transformation of the site into the DDO in 1935, became Observatory House, the home of C.A. Chant, 'the father of Canadian Astronomy' and the visionary behind the creation of the DDO;
- (c) the Observatory Building (originally known as the Great Telescope Dome) from which major discoveries of international importance were made including Helen Hogg's work on variable stars in globular clusters and C.T. Bolton's investigation of Cygnus X-1 as a black hole. The Observatory Building and especially the telescope also represents an important period in the development of astronomy in Canada and particularly at the University of Toronto – a period in which astronomy grew from its infancy as a faculty to where major world class discoveries were being made, the best known of which being the confirmation of 'black holes' by C.T. Bolton;
- (d) the Radio Shack from which the determination of the absolute flux density of Cas A at 320 MHz was made;
- (e) the original components which comprised the DDO at its initiation/dedication in 1935 – the Observatory Building (originally known as the Great Telescope Dome), Administration Building and Observatory House (*Elms Lea*). This event was considered of national importance (attended by the Prime Minister), and indeed throughout the British Empire;
- (f) the complex overall land pattern within the identified area. Comprised of the original survey grid field pattern overlain with the formal geometry of the Beaux Arts observatory core and the curvilinear road network containing all fields, lawns and plantings;
- (g) Donalda Drive, the curvilinear 'new' approach road named to commemorate the Observatory's patron Jessie Donalda Dunlap; and
- (h) the experimental tree plantation planted by University of Toronto's Dept. of Forestry as representing one of the founding objectives of the facility, i.e., its use by other academic disciplines.

**The following are the cultural attributes/relationships which express the contextual values of the Property:**

- (a) as a result of its early insertion into the then rural landscape, its unique function and associated architecture, as well as its international reputation, the site is a landmark;
- (b) the traditional views to the west (toward Yonge Street) from *Elms Lea* and the Administration Building and the views to the Observatory Building and the Administration Building from the west (though now partially obscured by mature trees) reflecting the visual prominence of the structures sited at (the Observatory Building, the Administration Building) or near (*Elms Lea*) the top of the knoll ;
- (c) the views from the south to the Observatory Building, particularly along the direct north/south axis which was carried into the Town's design of Observatory Park on

the leased 'Panhandle' lands, reflecting its visual prominence having been sited at the top of the knoll;

- (d) the form of the Town designed Observatory Park, sub-division and adjacent buildings to the south reflecting the influence of the Observatory and its site design principles (the lands originally having been surveyed to provide an approach to the Observatory from the south);
- (e) the traditional relationship of the Observatory to the CNR line; and
- (f) the traditional relationship of the Observatory to Hillsvie Drive, formerly the 'narrow lane' which divided Lot 43 into north and south halves.



Note: All dimensions are in metres

# SCHEDULE "B"



TO BY-LAW NO. 100-09

This is Schedule "B" to By-Law  
No. 100-09 passed by the Council  
of The Corporation of the

Town of Richmond Hill on the  
29<sup>th</sup> Day of September, 2009.

*[Signature]*  
Dave Barrow  
Mayor

*[Signature]*  
Clerk

- Legend:
-  Cultural Heritage Landscape
  -  Observatory Lands

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JLH/L