CENTRECOURT

April 29, 2025

The Honourable Rob Flack
Minister of Municipal Affairs and Housing
777 Bay Street, 17th Floor
Toronto, Ontario M7A 2J3

Dear Minister Flack,

Re: ERO 025-0347 Request for an Amendment to Minister's Zoning Order, Ontario Regulation 10/24, City of Toronto

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Congratulations on your recent appointment as Minister of Municipal Affairs and Housing and on your re-election as MPP for Elgin—Middlesex—London. We look forward to your leadership at a time when bold action is needed to address Ontario's housing challenges.

CentreCourt is Ontario's second most prolific high-rise residential developer, having completed over 10,000 homes across the Greater Toronto Area since 2010. We are writing to respectfully recommend an amendment to Ontario Regulation 10/24 – commonly known as the "Flight Path MZO." While we recognize the regulation's important intent, we believe it imposes unnecessary restrictions on the delivery of new housing development in one of Toronto's most transit-accessible areas. **Based on conservative estimates, more than 12,000 homes have been rendered unfeasible by the Flight Path MZO.**

Over the past several months, CentreCourt has collaborated with planners aviation experts, and legal counsel to develop a practical and responsible alternative to the Flight Path MZO and By-law 1432-2017. **Our proposed solution maintains the safety and operability of the critical hospital air corridor while enabling housing construction to move forward responsibly (refer to *Appendix A – Ensuring Safe Hospital Air Corridors in a Complex Urban Environment*).**

To protect the Flight Path while supporting new development, we propose establishing a controlled permit and enforcement zone that would include:

- **Mandatory financial security from builders to compel compliance** (e.g., $1 million letter of credit or surety bond) throughout the life of any project located under the Flight Path;
- **Real-time, automated monitoring systems** to detect & report any encroachments immediately and efficiently;

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- **Automatic penalties and work stoppages** for any violations of the Flight Path envelope.

This proposal has been shared through confidential briefings with political staff and officials across multiple provincial ministries over, as well as with municipal counterparts, and has consistently been well received. Technical experts and municipal reviewers have confirmed the approach is viable, enforceable, and consistent with public safety requirements. For your reference, we have included a technical report prepared by Arup Canada in Appendix B (*Toronto H1 Heliport Hospital Study*).

Regrettably, despite repeated efforts, our outreach to ORNGE Air Ambulance and affected hospital administrators has been unsuccessful. **Requests for meetings to discuss shared safety goals and technical feasibility have been inexplicably declined.** While we remain committed to a collaborative approach and are ready to engage immediately, it is increasingly clear that constructive dialogue is unlikely to occur without strong provincial leadership.

Accordingly, we respectfully request that the Minister consider sunsetting the existing MZO and to adopt our updated regulatory framework for the Flight Path. **This would maintain emergency medical air access – with no added risk to patients or pilots – while unlocking urgently needed housing supply in a designated growth area adjacent to multiple major transit lines, including the Ontario Line.** This balanced solution would better align with the Ontario government's stated goals of accelerating housing delivery and intensifying infrastructure investment.

We would welcome the opportunity to brief you directly on our proposal and to work with your office on a path forward.

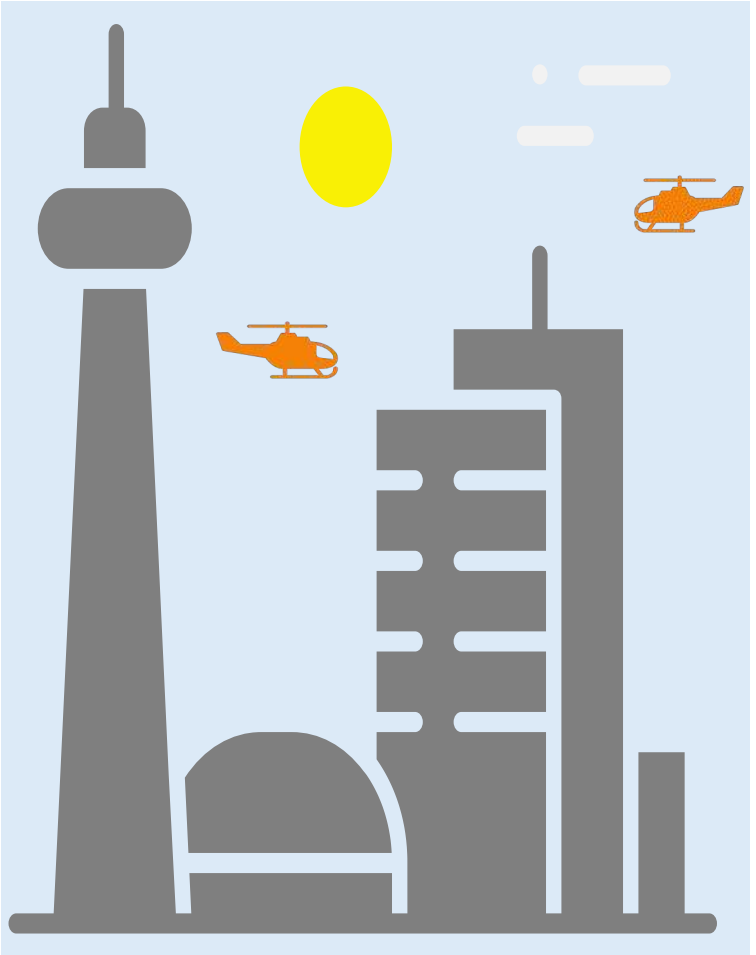
Yours truly,

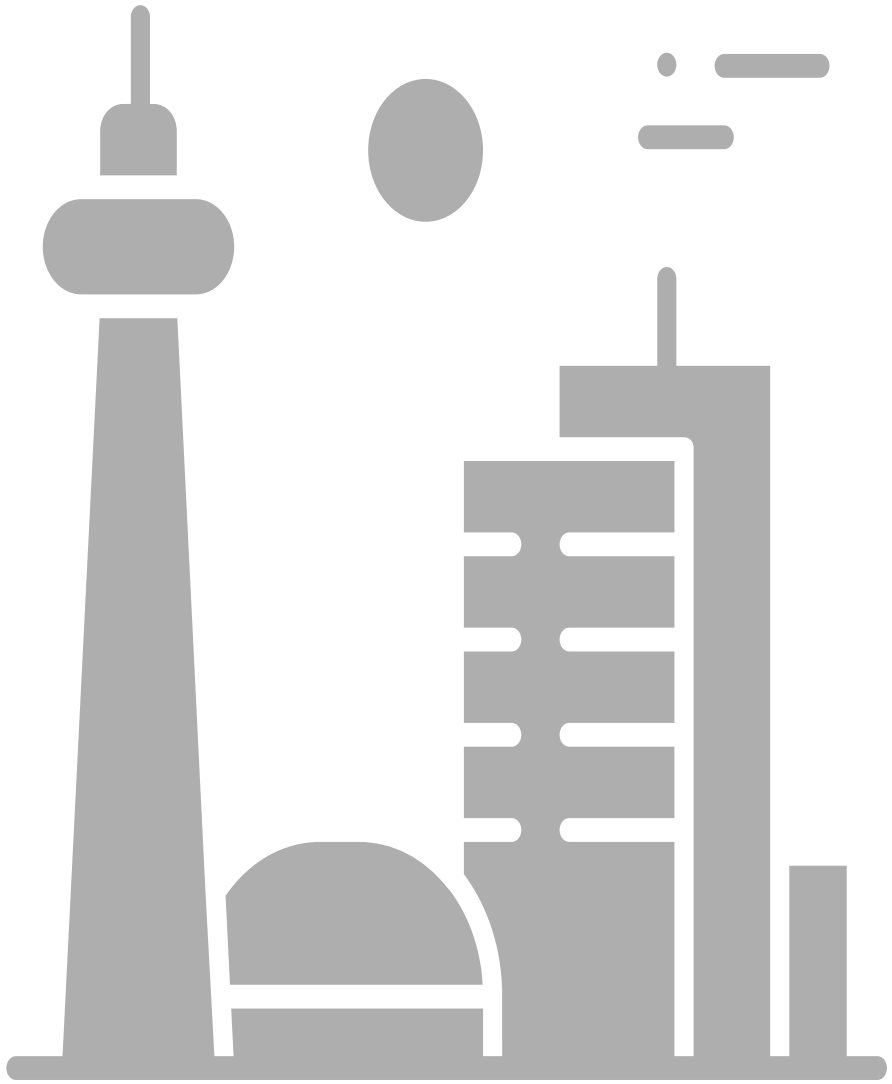
Mitch Gascoyne
Partner, SVP Development
CentreCourt

CC:
Sean Fraser, Assistant Deputy Minister, Municipal and Housing Operations Division, Ministry of Municipal Affairs and Housing, Province of Ontario

Ensuring Safe Hospital Air Corridors in a Complex Urban Environment

Establishing a durable solution for air ambulance safety in Toronto's core

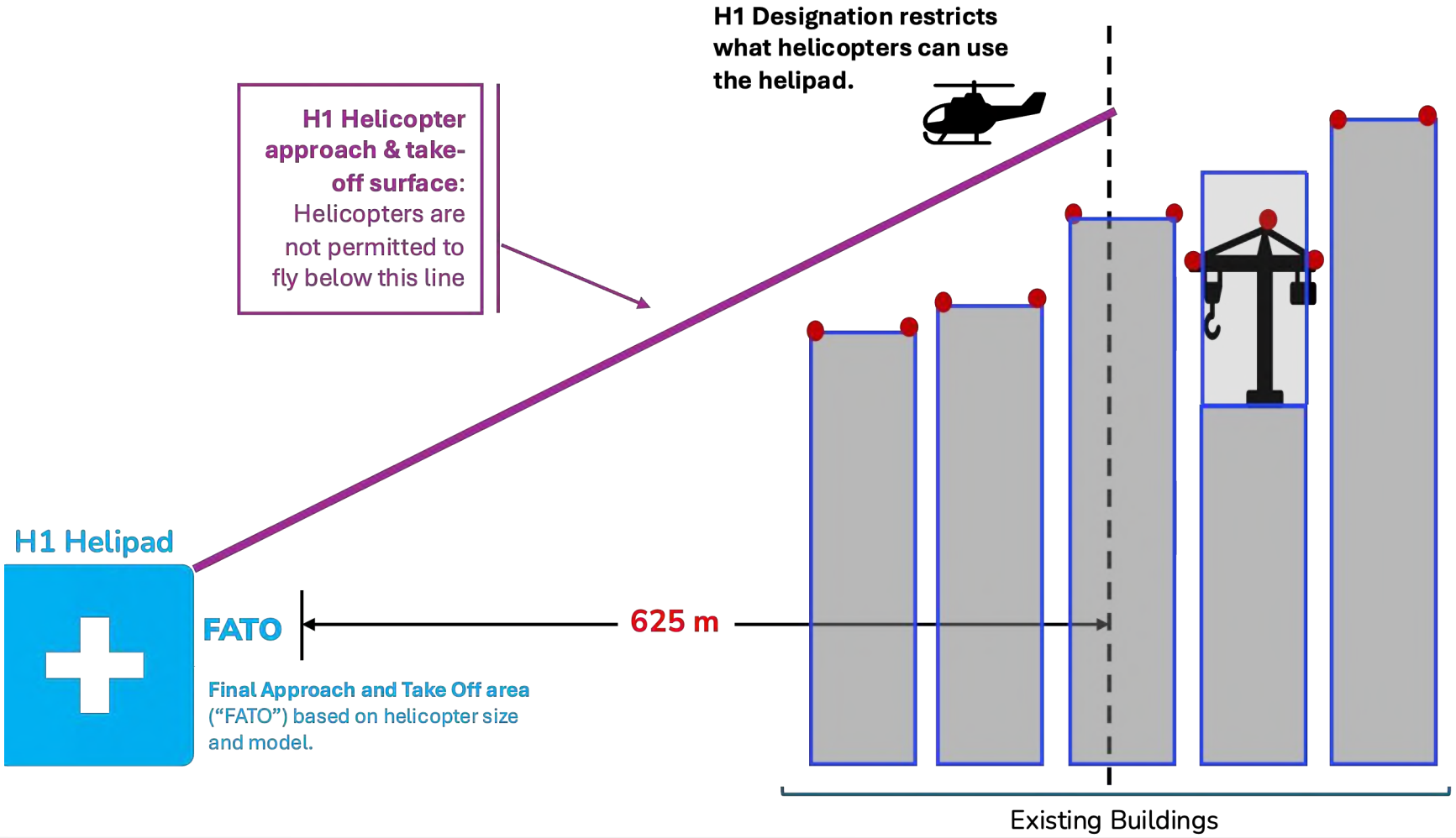




Toronto has become one of the fastest growing cities in North America, and much of this growth is occurring in the downtown core

- Growth has led to many challenges for residents and businesses, including constant construction of new homes and infrastructure to support them.
- New permanent and temporary structures appear on the skyline almost every day to keep up the pace.
- Even with all this activity Toronto's development sector is still not keeping up with housing demand.
- This rapidly changing urban environment has presented enormous challenges for residents, businesses, visitors, governments, and institutions.

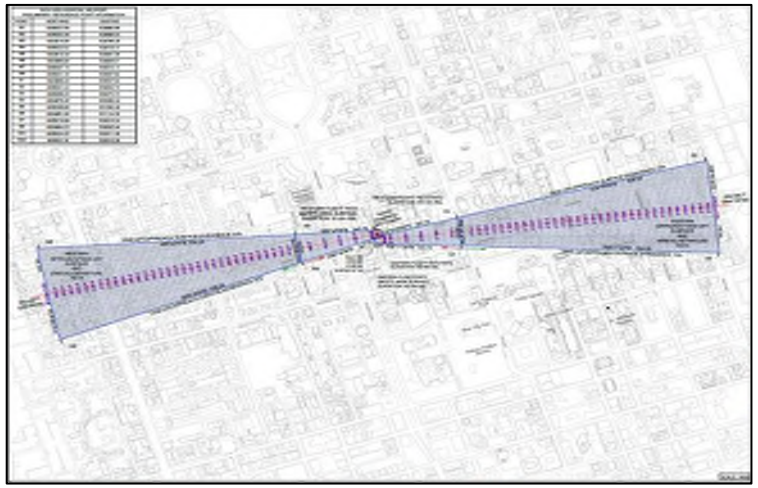
Air ambulance operations have grown more complex, resulting in an H1 designation for downtown hospital helipads

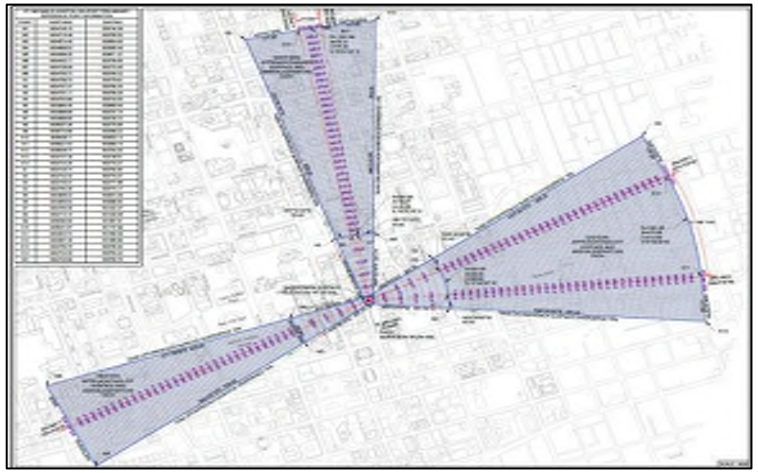


- In addition to its status as a major destination for population growth and infrastructure investment, Toronto is a critically important medical hub.
- Residents from all over Ontario rely on safe, rapid access too and from Toronto's world-leading hospitals.
- Toronto's hospital helipads are designated as "H1", the **most stringently regulated category** used for the most complex urban environments.

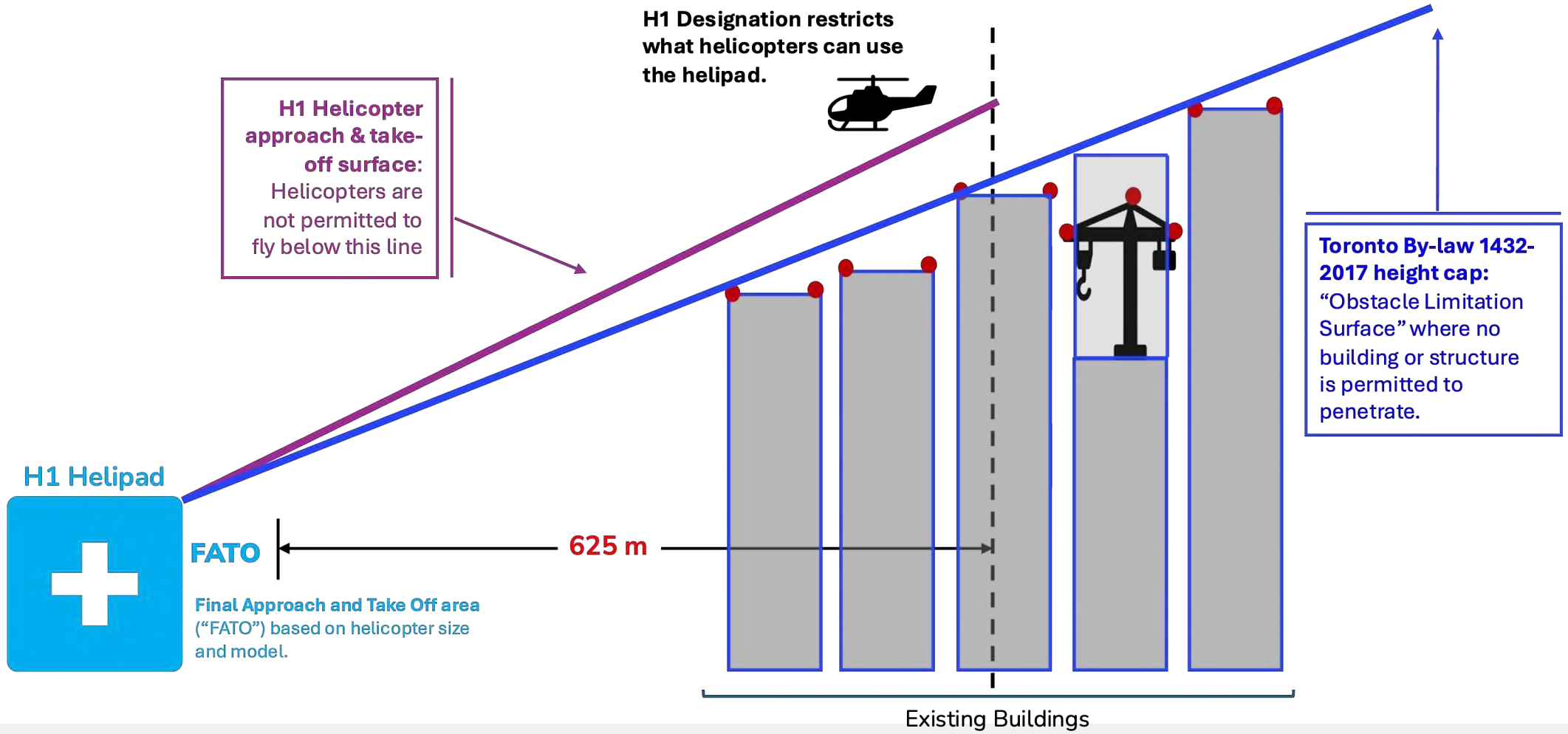
The City of Toronto enacted a by-law which capped heights near the hospital heliports.

- In August 2017 the Canadian Minister of Transport entered into an agreement with the City of Toronto empowering the City to regulate the use of lands in the vicinity of hospital airports.
- The resulting By-law 1432-2017 “To regulate the use of lands in the vicinity of St. Michael’s Hospital and the Hospital for Sick Children” put in place “Obstacle Limiting Surfaces” (height caps) for new objects around the helipads.
- Since the By-Law was enacted, many new buildings have been approved, and many have been constructed or are under construction.

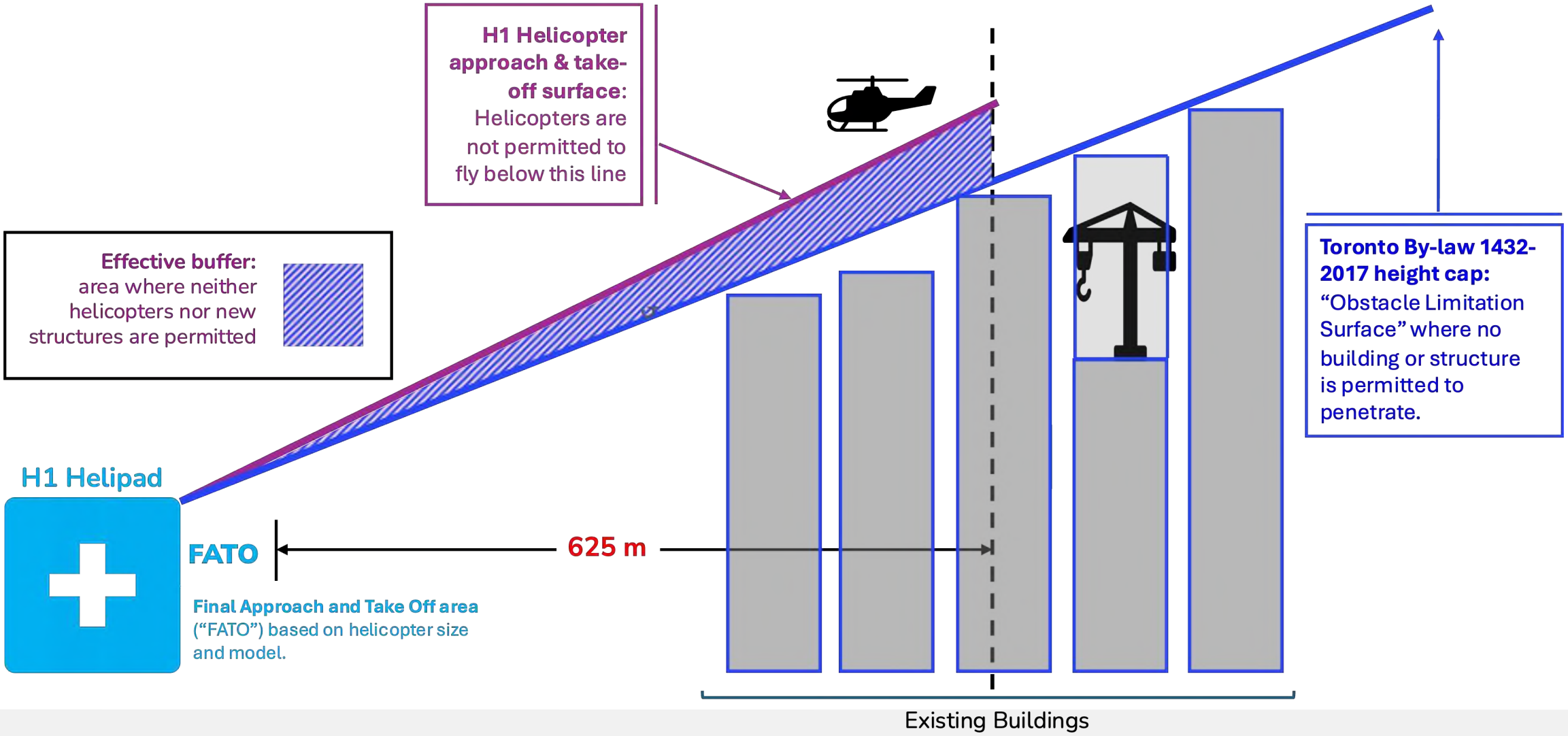




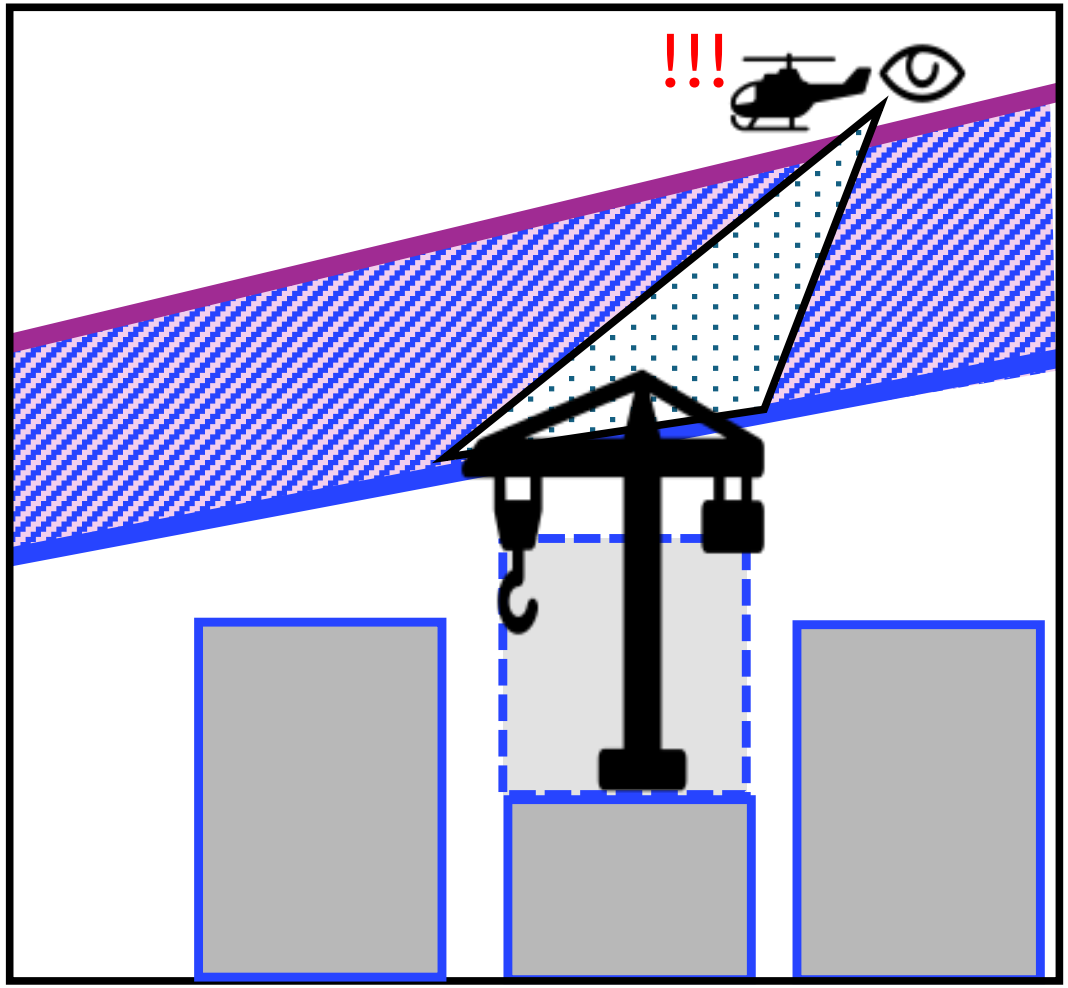
The City's by-law put a building and structure height cap below the limit or "surface" on which a helicopter can fly



This did not change the flight path but effectively created a buffer between where the helicopters can operate, and the tallest new objects permitted.



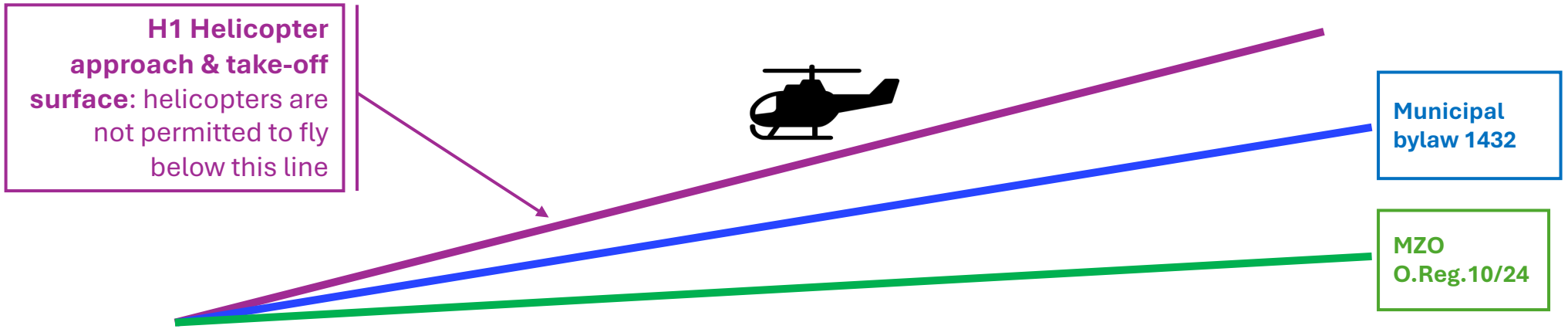
However, building activity during the housing crisis has at times made operating air ambulances challenging



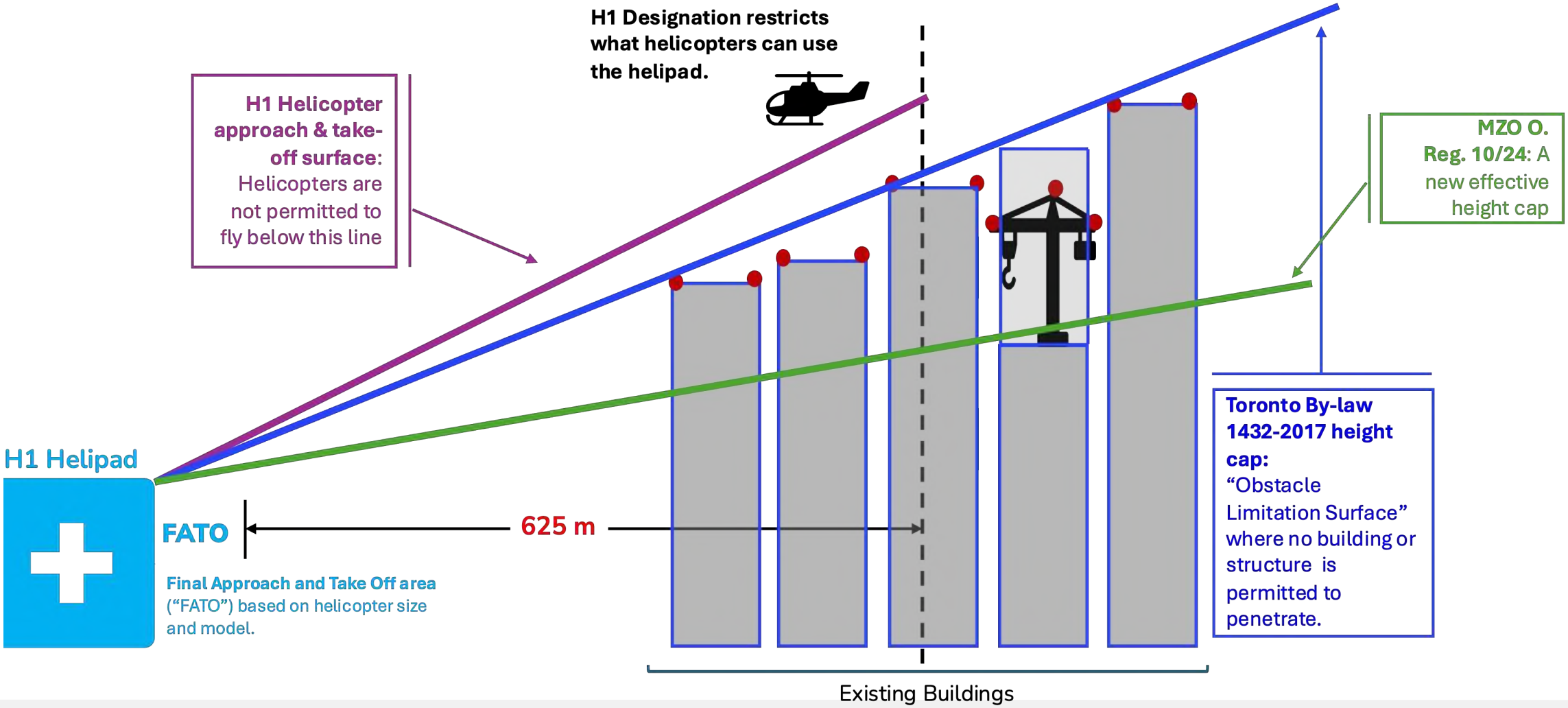
- Reported instances of temporary structures (construction cranes) puncturing this “obstacle limiting surface” (height cap) have led to aborted landings and serious delays in treatment for critically ill and injured patients.
- Helicopter pilots and other healthcare stakeholders have raised the alarm that failure to act on these encroachments will result in patients’ loss of fast and reliable access to these critical healthcare centres.

Ontario Government uses an MZO to protect the helicopter flight path

- On January 26, 2024, the Minister of Municipal Affairs and Housing issued a Minister's Zoning Order ("flight path MZO") significantly lowering the obstacle limitation surface or "height cap" identified in the by-law 1432.
- This MZO has a final provision that it is to be revoked (or expire) May 30, 2025. What comes after that date is still to be determined. In the meantime, development has been put on pause.
- The new MZO does not impact where helicopters are permitted to fly, they must remain on the "helicopter approach and take off surface" defined through federal regulations.

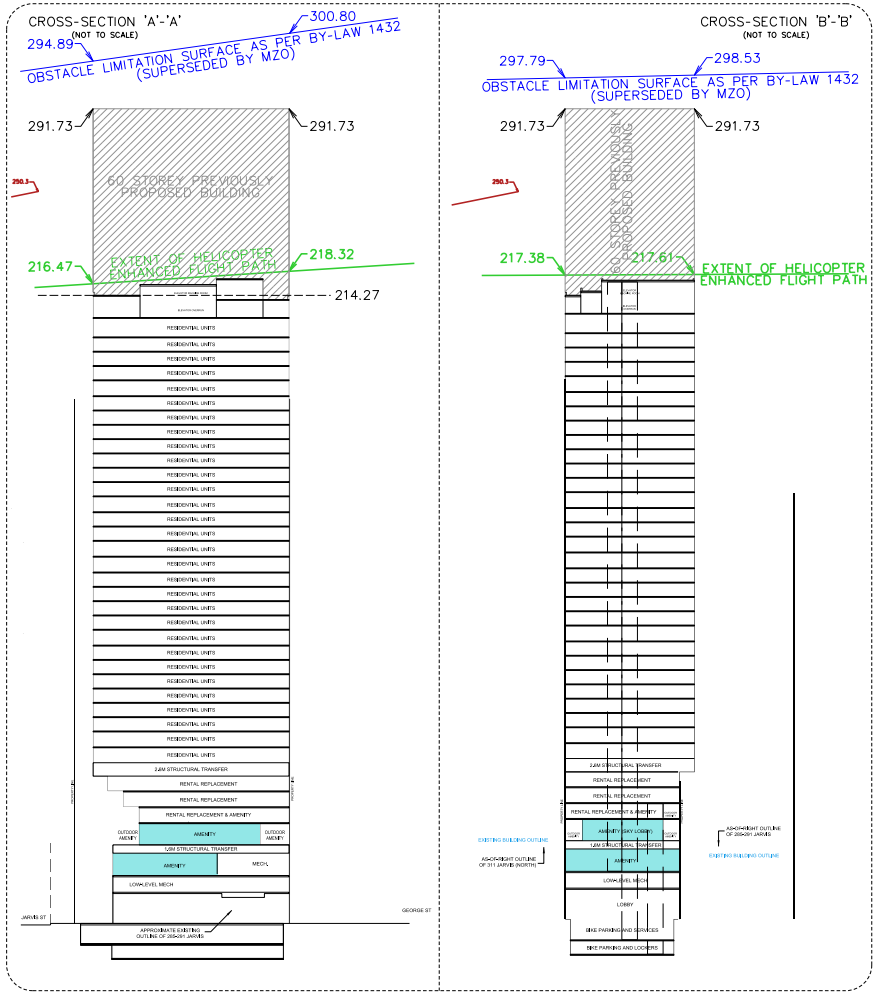


New MZO height cap is significantly lower than existing municipal and H1 safety provisions while permitting existing structures and those under construction

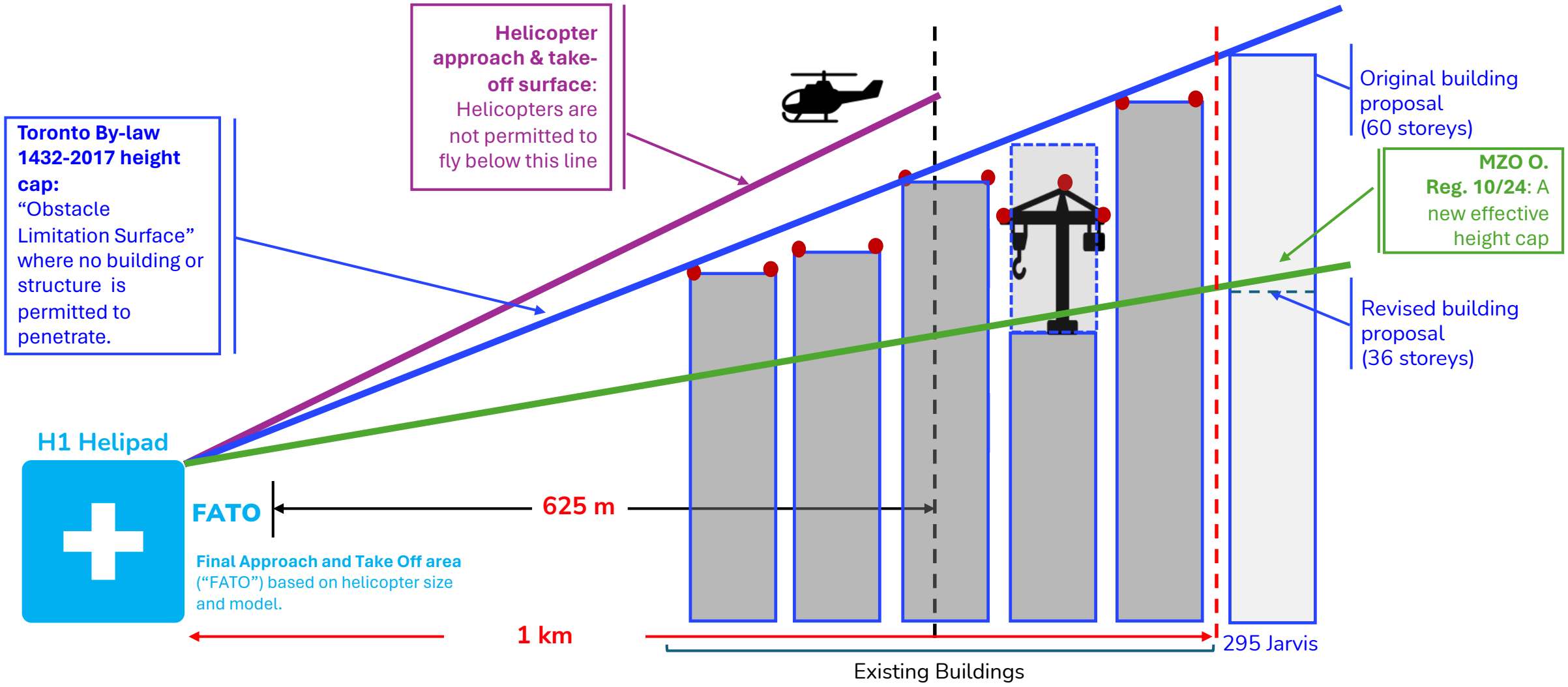


Sudden height-cap change has caused substantial losses in investment, community benefit potential, and housing

- Many developments compliant with the City's flight path protection requirements are now **blocked from reaching approved heights**.
- Several projects now face significant delays, even **requiring new applications**, while others will at minimum see substantial housing unit cuts.
- It is estimated that this decision will **impact thousands of potential new homes** in a prime area for transit and jobs.
- Builders are considering **legal action to recover their losses**.

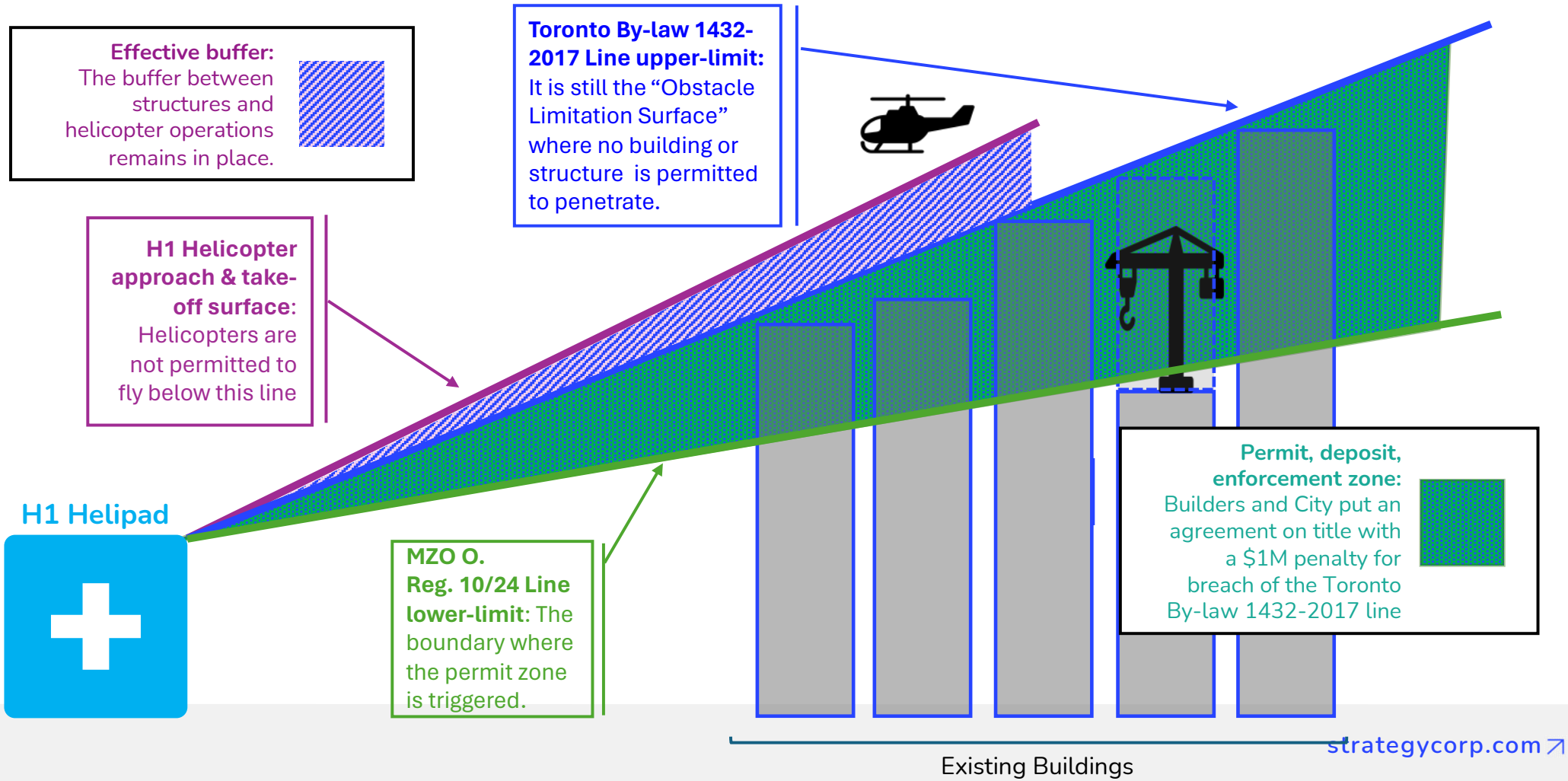


Our project at 295 Jarvis, over 1km away, is impacted by this change and will lose almost 50% of its new homes that would have been permitted under the City by-law



We propose a new solution to replace the expiring MZO, protecting the integrity of the hospital air corridors while enabling housing development to resume.

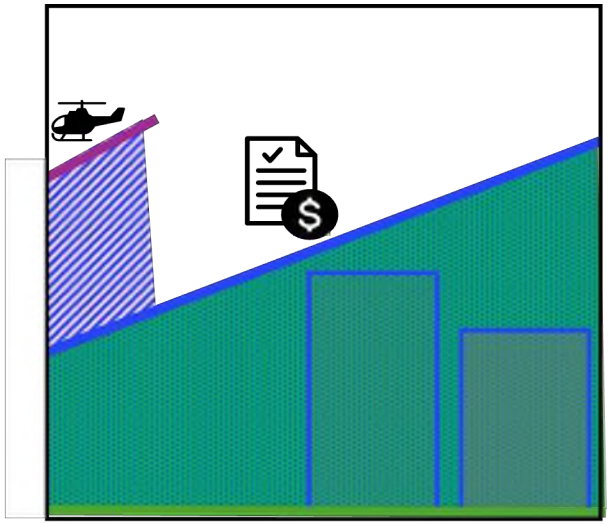
The By-law and MZO lines could establish the boundaries of a controlled permit, security, and enforcement zone. Builders would face increased scrutiny – and penalties – to operate here.



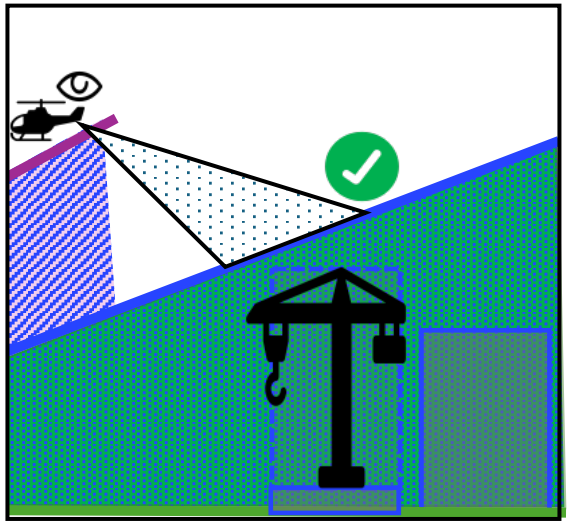
Builder would post large securities up front to operate in this space, with hefty penalties if they break the rules

The City would secure an agreement registered on title enabling them to swiftly enforce the terms of the permit, security, enforcement zone conditions. The agreement could contain provisions related to what will occur to the project in the event of a temporary or permanent structure penetrating the City established “Obstacle Limitation Surface” (height cap).

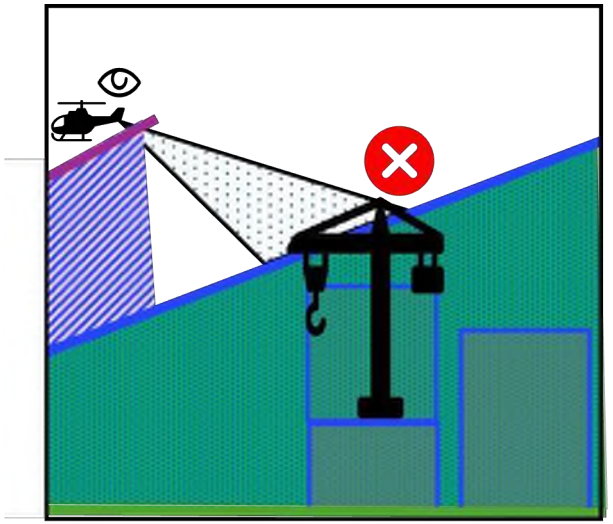
The agreement would require builders to put $1 million aside (e.g., surety bond or letter of credit) for the duration of the project, to be returned upon the crane coming down, end of construction, or occupancy.



When a project seeks its standard building permits it would be required to obtain an additional permit to operate in the permit, security, enforcement area. They would need to provide a $1M security to begin.



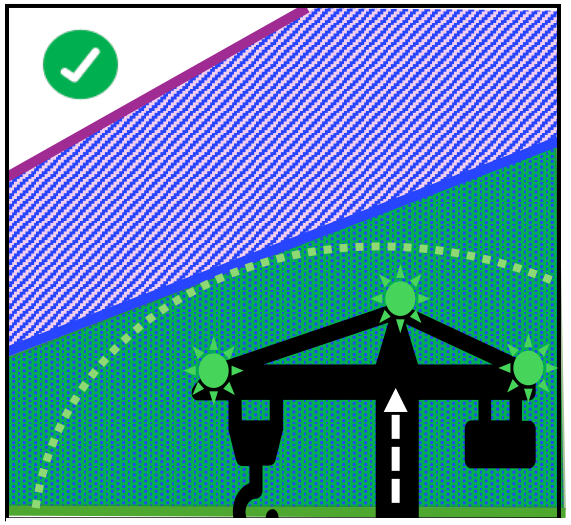
While the construction project is underway the activities will be monitored by bylaw enforcement and air ambulance pilots. Any concerns reported by air ambulance crews will be investigated immediately.



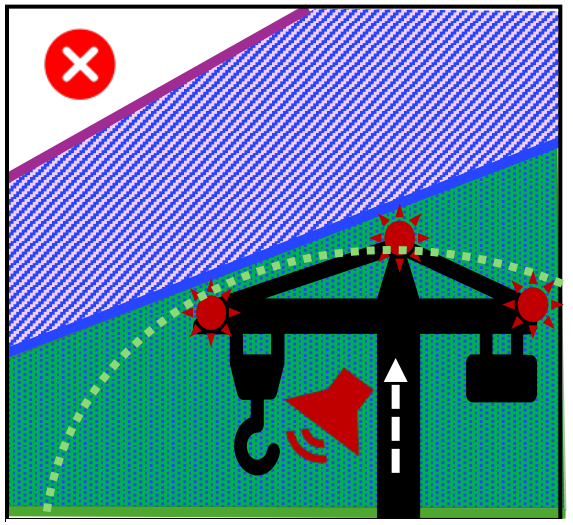
In the event a project encroaches or punctures the City line a stop work order is issued, the constructor loses their security, and construction can only resume when the offending structure is removed and a new $1M security paid.

Automated solutions can reliably prevent encroachments and alert authorities if one occurs

The "E-trak" system provides a solution for physically limiting the movement of equipment through geo-fencing technology. With coordinates provided by surveyors, the system ensures that the equipment remains within designated boundaries, preventing encroachment into restricted areas such as flight paths.



The E-trak system enhances safety by geo-fencing equipment movement, ensuring operations remain within designated areas.



Audible alarms provide warnings when approaching restricted zones, and the system automatically shuts down if boundaries are breached, maintaining on-site precision and safety.

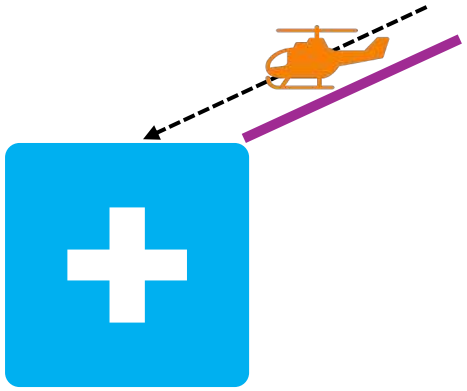
This solution to protect the integrity of the hospital air corridors is available to replace the MZO when it expires.

We already have many of the components of the solution in place.

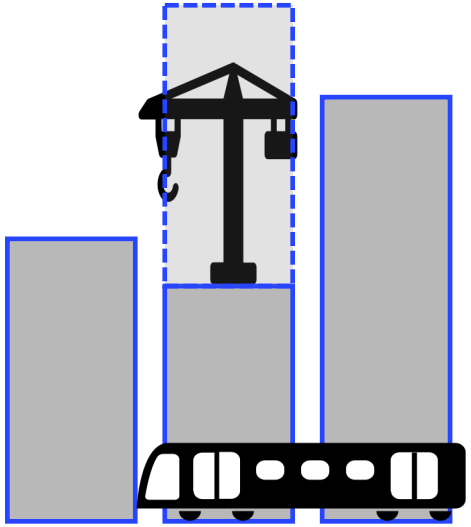
1. The vertical boundaries are provided by the MZO and City by-law. These lines still leave substantial buffer for the lowest point of the hospital flight paths.
2. The City and province have already established the area of the City that would be subject to the solution.
3. Letters of credit and surety bonds are routine and reliable means for the City to secure payment of the fine in the event of an infraction. As a penalty, $1 million dollars is a substantial amount of money that would provide a significant deterrent at every job site.
4. The City likely already has the ability under section 113 of the City of Toronto Act to do this, and if it does not, a minor amendment before May 30, 2025 would be all that is required.

We do not have to choose between building the housing we need and safe and efficient hospital air corridors.

With this solution, we can have:



Safe, reliable, long-term hospital access for ORNGE



Builders to resume construction of new homes near transit and employment

Reduced stakeholder conflict and enforceable remedy if there is an infraction

1-866-231-6535
strategycorp.com

APPENDIX

- Nav Can H1 Heliport Diagrams
- Larger scale maps of Toronto By-law 1432-2017
- Larger scale map of area impacted by MZO O.Reg 10/24
- Potential terms for Toronto to include in an agreement

Nav Can H1 Heliport Diagrams

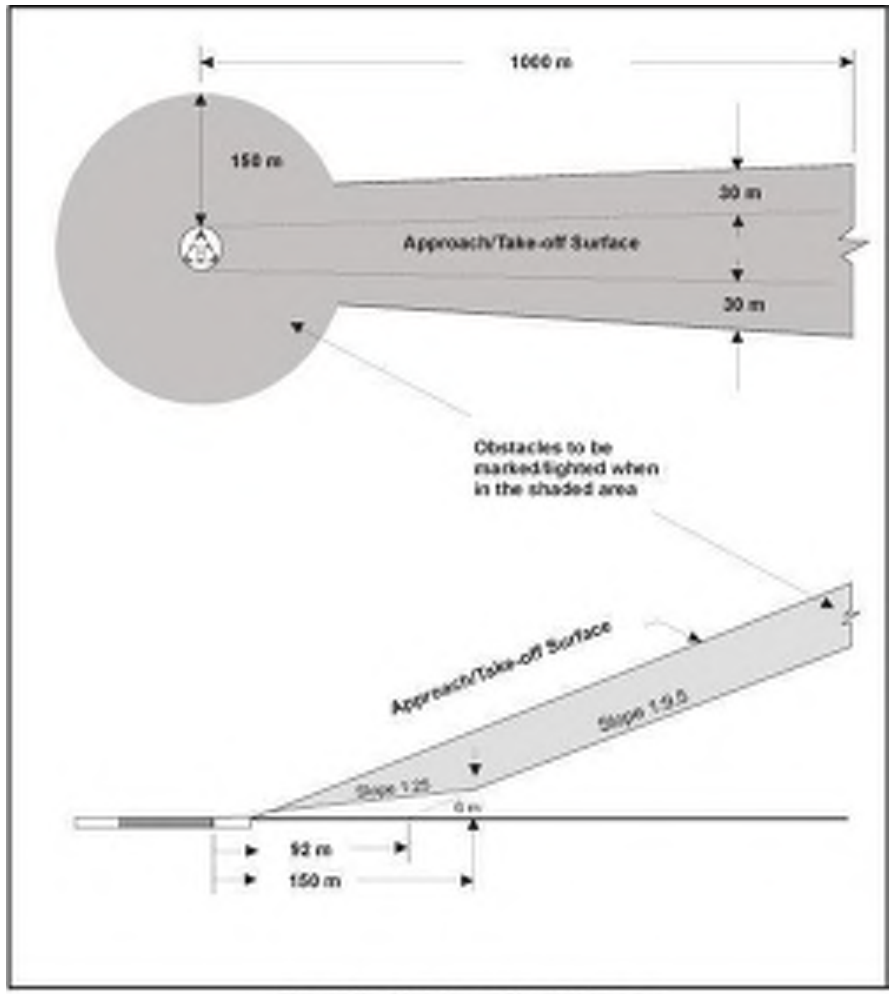


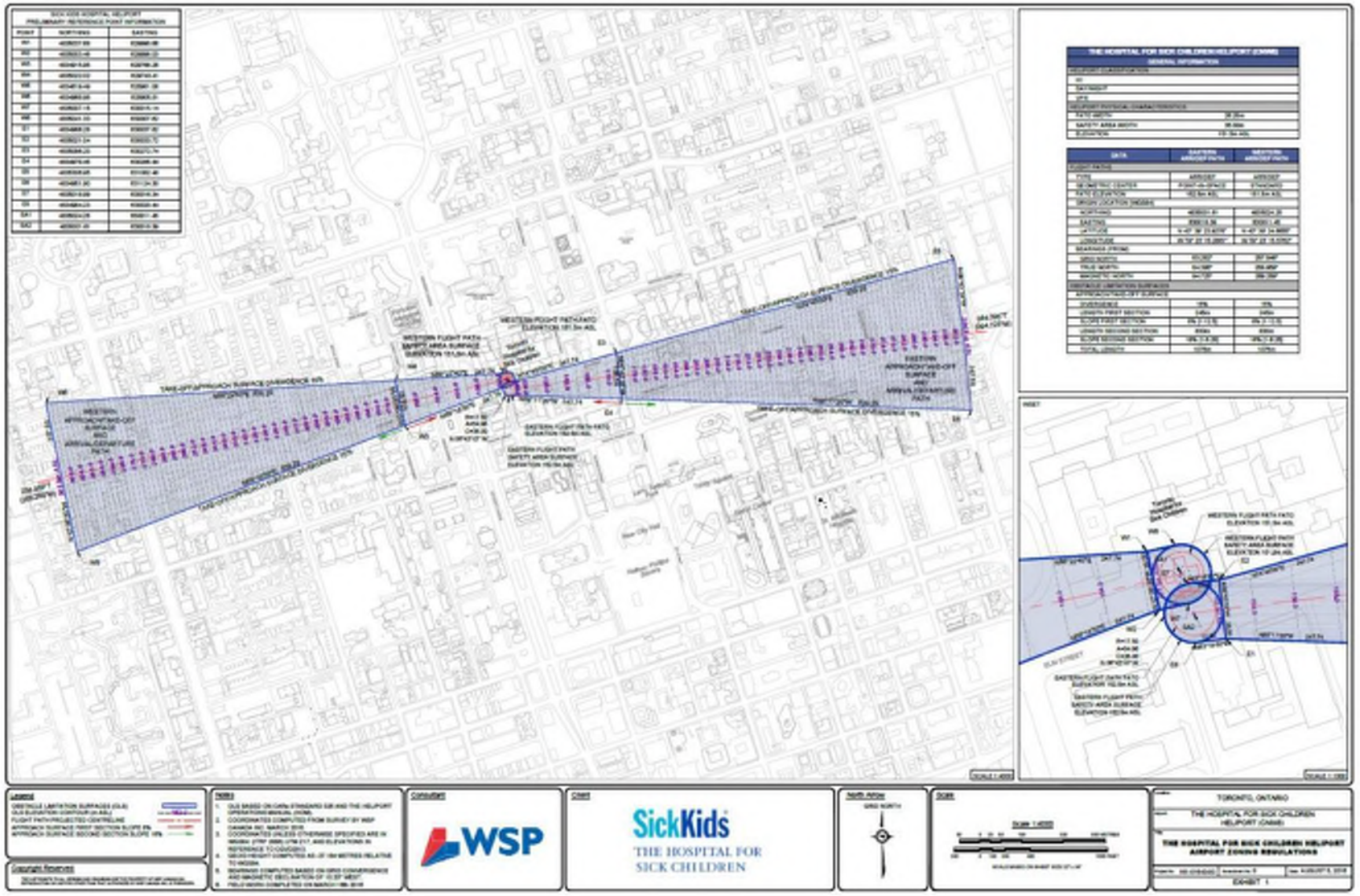
Figure 6-1. Obstacle marking/lighting area

Standard 325 - Heliports - Canadian Aviation Regulations (CARs)

Division X — Heliport Requirements - Visual Aids for Denoting Obstacles

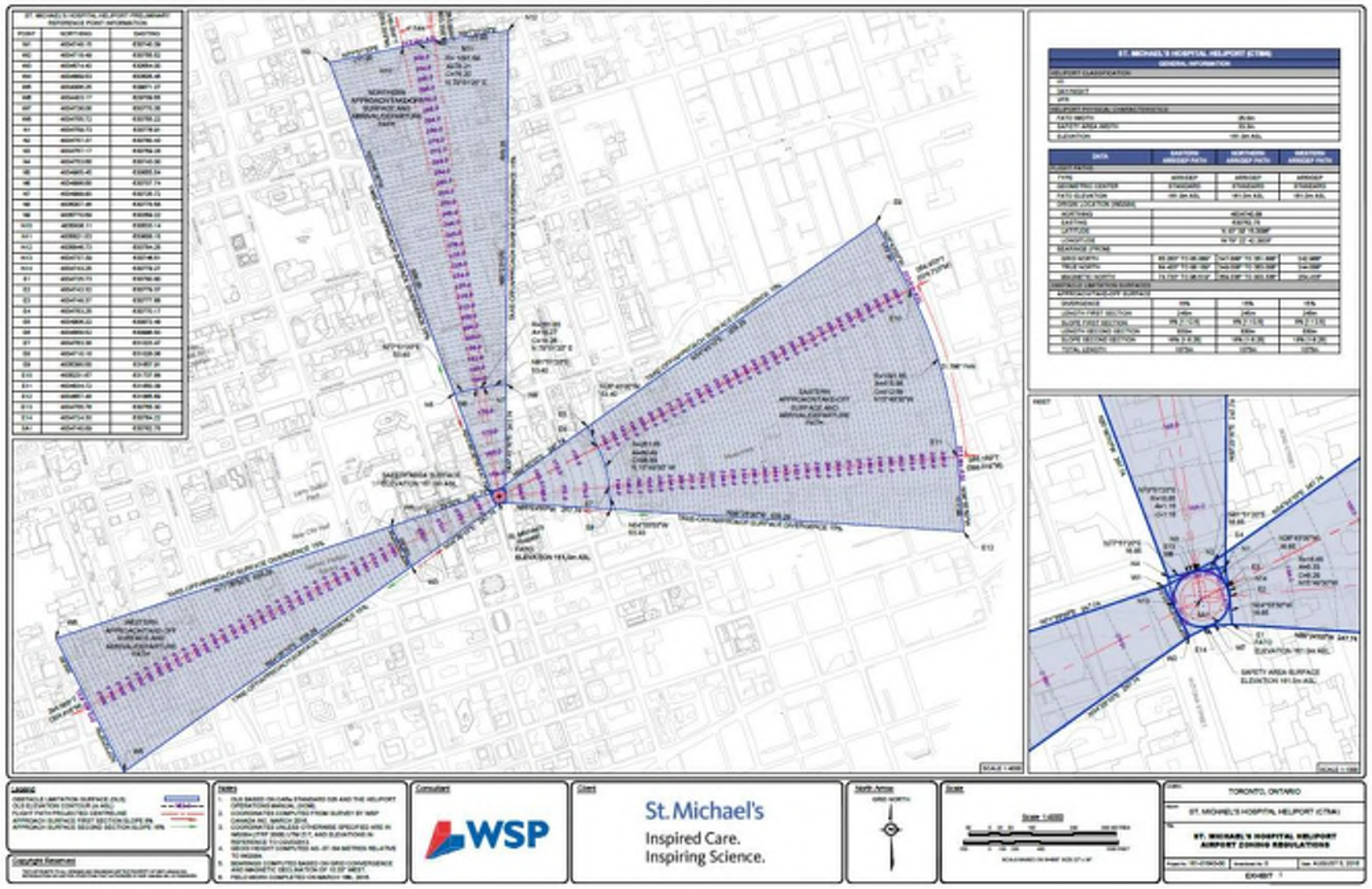
https://tc.canada.ca/en/corporate-services/acts-regulations/list-regulations/canadian-aviation-regulations-sor-96-433/standards/standard-325-heliports-canadian-aviation-regulations-cars

Larger scale maps of Toronto By-law 1432-2017 (SickKids)



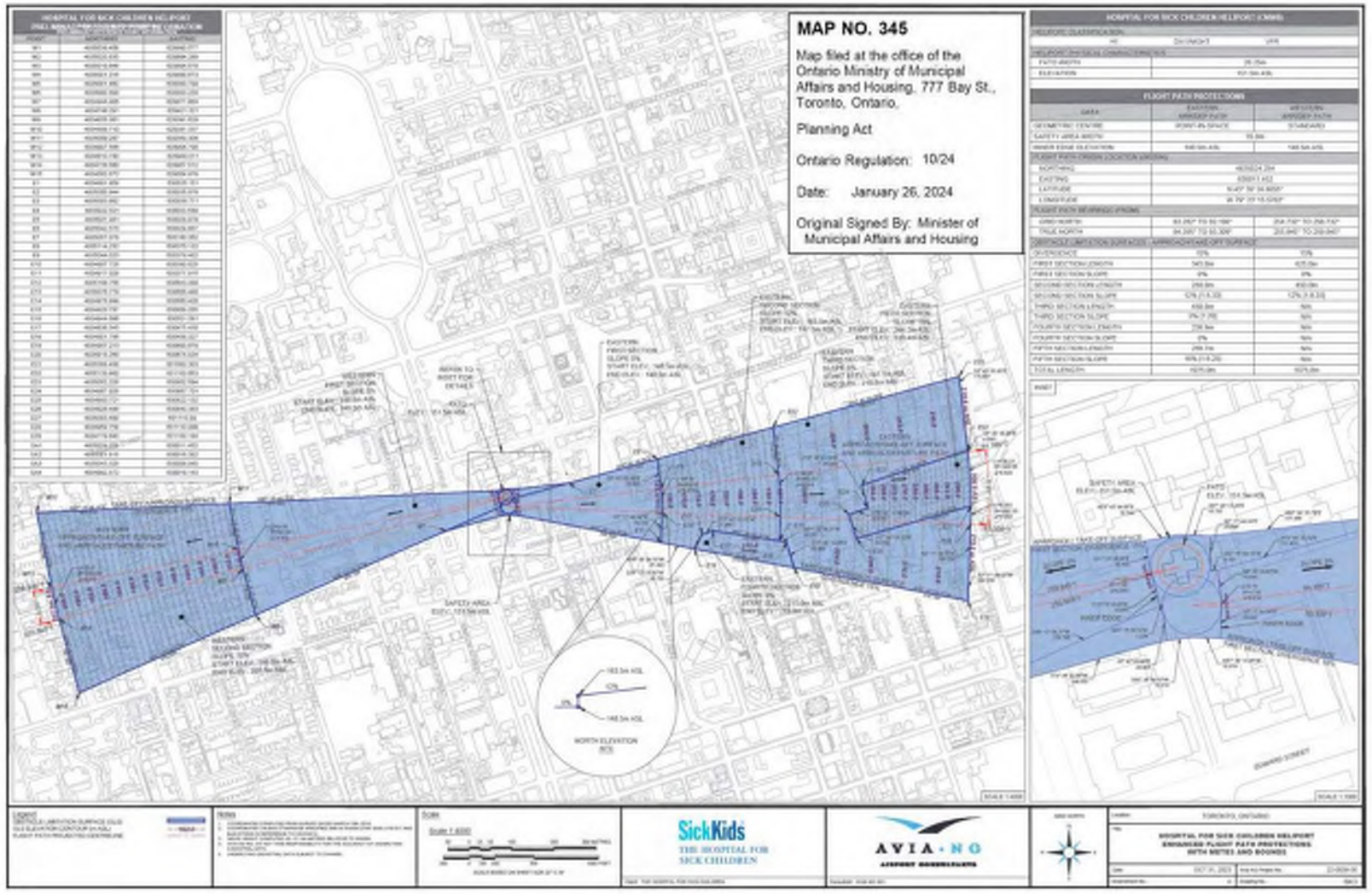
https://www.toronto.ca/legdocs/bylaws/2017/law1432.pdf

Larger scale maps of Toronto By-law 1432-2017 (St. Michaels)



https://www.toronto.ca/legdocs/bylaws/2017/law1432.pdf

Larger scale map of area impacted by MZO O.Reg 10/24



Environmental Registry Bulletin 019-8199
"Ontario Regulation 10/24 Zoning Order in the City of Toronto"
Map 345

Larger scale map of area impacted by MZO O.Reg 10/24

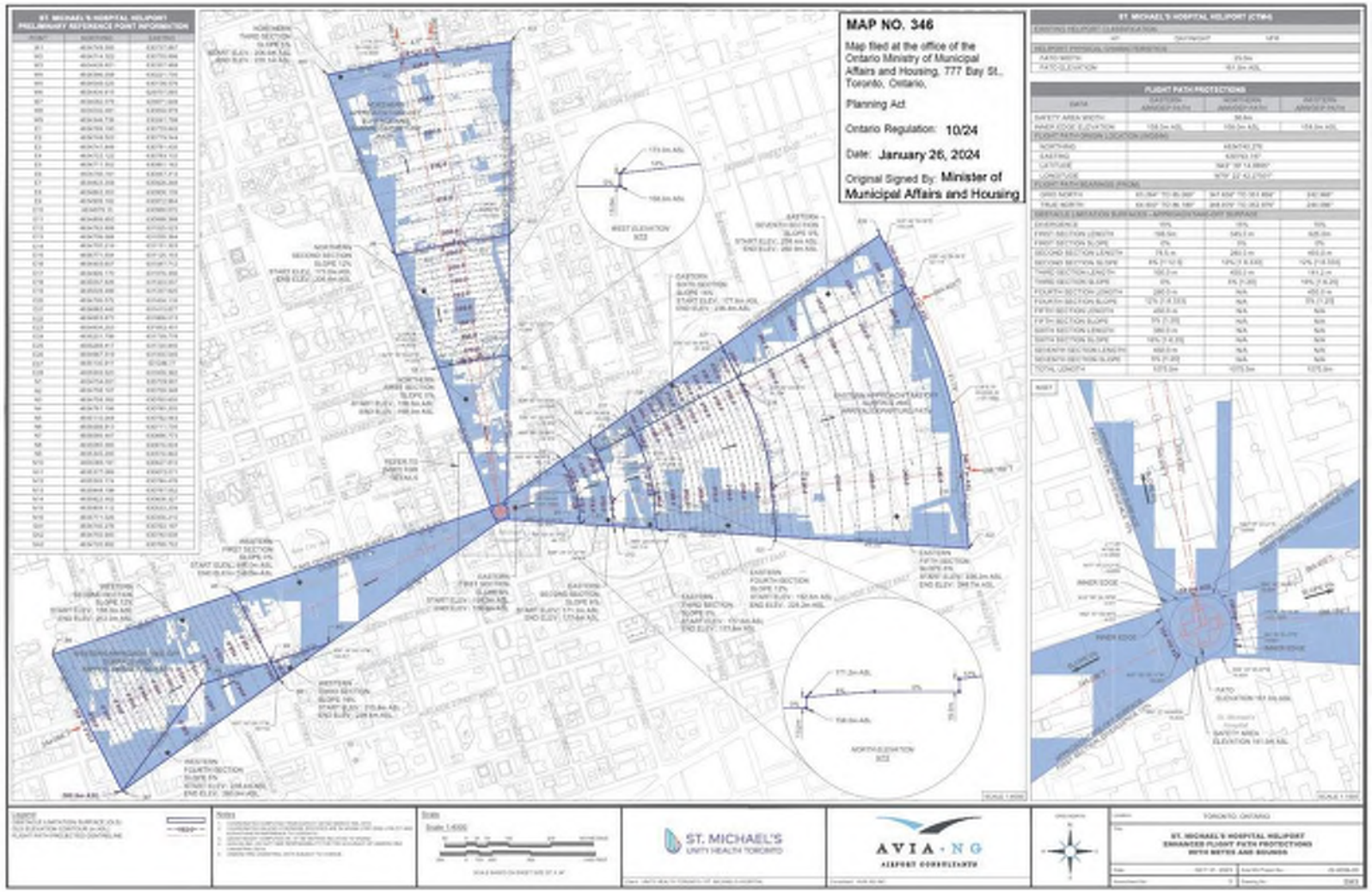


Image as received from:
Environmental Registry Bulletin 019-8199
“Ontario Regulation 10/24 Zoning Order in the City of Toronto”
Map 346

Potential terms for Toronto to include in an agreement

Registration on Title

- Agreement should be registered on the property title to ensure enforceability and quick access to funds.

Strict Liability

- The agreement should stipulate that any violation is a strict liability breach, leaving the builder with no defence once the violation occurs.

Respect Stop Work Order

- The agreement should include language that ensures the builder respects any stop work orders issued by the city.

Height Restriction Compliance

- Builder must acknowledge the city's right to require immediate removal of any part of the building violating height restrictions, at the builder's expense.

Insurance Requirements

- Additional insurance requirements and clause allowing the city to notify the builder's insurance company if the agreement is breached.

Penalties

- The offence would carry a "penalty" instead of "fine" to avoid implying a court process and emphasize immediate enforceability.

Surety Bonds

- Include carefully worded terms related to surety bonds to ensure the city can quickly call on the bond without delays.

Legal Authority

- Ensure the agreement aligns with the relevant legal provisions, such as section 113 of COTA, to support the city's jurisdiction.

ARUP

295 Jarvis LP

134 Peter Street, Suite 200,

Toronto, ON, M5V 2H2

Toronto H1 Heliport Hospital Study

Sick Kids Eastern Flight Path

| February 7, 2025

Job number 601501-49

Arup Canada Inc.
121 Bloor Street East, Suite 900
Toronto, ON M4W 3M5
Canada
arup.com

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Appendices

Introduction

On December 5, 2017, pursuant to an agreement entered into under section 5.81 of the Aeronautics Act (Canada), City Council enacted by-lay 1432-2017 (the “Bylaw (2017)”) to regulate the use of lands in the vicinity of St. Michael’s Hospital (SMH) and the Hospital for Sick Children (HSC). Each hospital has a helipad that provides vital critical and trauma care service to the City of Toronto and surrounding areas. As part of the Bylaw (2017), a Service Protection Corridor (or ”Flight Path”) was defined for each of the hospitals which placed limits on the height of development to ensure safe and effective operations for their respective helipads.

The Obstacle Limitation Surfaces (OLS) established at this time were as per the Transport Canada Standard 325 regulations, section 325.29, Table 4-1 Dimensions and slopes of obstacle limitation surfaces – non-instrument FATOs. The HSC flight path map, defined in the Bylaw (2017) can be found in Appendix A.

On January 26, 2024, the Minister of Municipal Affairs and Housing issued a Ministerial Zoning Order (MZO), O. Reg. 10/24, reducing the heights of the protected air ambulance flight paths for St. Michael’s Hospital and the Hospital for Sick Children (SickKids). (see Appendix B)

The new vertical development limits have substantially decreased from those limits imposed in Bylaw (2017) and the Flight Path itself has increased in size (coverage/width). The OLS for the MZO (2024) does not explicitly follow the Standard 325 OLS parameters prescribed in Table 4-1 as did the Bylaw (2017) OLS. As a result of the MZO (2024), previously proposed and approved developments now penetrate the MZO (2024) OLS surfaces, thereby requiring a substantial reduction in build heights. The expiration of this MZO is May 30, 2025 and, at this time, it is unknown how this flight path will be further enforced and we believe that a permanent solution should reflect an OLS that takes into consideration our analysis and comments.

This study reviews the recent MZO Flight Path modifications for Hospital for Sick Children Heliport Enhanced Flight Path Protections With Metes and Bounds, Oct 31, 2024 (see Appendix B) and has been conducted with respect to understanding the methodology used to establish the Obstacle Limitation Surfaces (OLS) or, in more common terms, the Flight Path Protection area.

Flight path development

This review is based on Transport Canada documentation pertaining to H1 classified heliports as well as relevant material applicable to H2 and H3 heliports.

It is important to distinguish between these 3 heliport classifications as they are significantly different from each other and the H1 classification of the Sick Kids Hospital is a very important distinguishing factor in the development of this Flight Path. It is also important to note that the TC regulations applicable to Sick Kids take into account that this heliport is classified as “non-instrument” and with this designation, one of three heliport classifications (H1, H2 or H3) will apply.

Transport Canada’s definition of Non-Instrument FATO (or approach/departure): *intended for the operation of a helicopter under visual meteorological conditions (VMC).*

Visual Meteorological Conditions (VMC)

VMC for a helicopter is the following (CARS 602.114):

Minimum Visual Meteorological Conditions for VFR Flight in Controlled Airspace

602.114 No person shall operate an aircraft in VFR flight within controlled airspace unless

- (a) the aircraft is operated with visual reference to the surface;
- (b) flight visibility is not less than three miles;
- (c) the distance of the aircraft from cloud is not less than 500 feet vertically and one mile horizontally; and
- (d) where the aircraft is operated within a control zone,
  - (i) when reported, ground visibility is not less than three miles, and
  - (ii) except when taking off or landing, the distance of the aircraft from the surface is not less than 500 feet.

Heliport Classifications (H1, H2 & H3)

The following are the Transport Canada definitions for the three heliport classifications:

- H1
  - Located within an obstacle environment where
    - There is no emergency landing area within 625m from the FATO, and
    - The helicopters using the heliport can be operated at a weight, and in such a manner that, in case of an engine failure at any time during approach or take-off, the helicopters can either
      - Land and safely stop on the FATO or TLOF area, or

    - Safely continue the flight to an appropriate landing area with one engine inoperative and maintain at least 4.5m from all obstructions within flight path
- H2
    - Located within an obstacle environment where
        - The height of the obstacles are infringing the first section slope of the approach and take-off surface set out in Table 4-1, and
        - There are reachable emergency landing or rejected take-off areas within 625m of the FATO in relation to the altitude of the helicopter and its performance with one engine inoperative
- H3
    - Located within an obstacle environment where
        - The height of the obstacles do not penetrate any of the obstacle limitation surface (OLS) requirements set out in Table 4-1, and
        - There are reachable emergency landing or rejected take-off areas within 625m of the FATO in relation to the altitude of the helicopter and its performance during autorotation.

The importance of providing all 3 definitions is to clearly show that the H1 classification is the only option in such an obstacle rich environment. However, as will be discussed, the OLS for the lower classifications is an option that may satisfy the limits placed on future development.

H1 Helicopter Performance Requirements

The helicopter performance requirements for an H1 heliport are the following:

- Multi-engine
- In case of engine failure at any time during approach or take-off, the helicopter can either land and safely stop on the FATO or TLOF area, or safely continue the flight to an appropriate landing area.
- Capable of remaining at least 4.5m (15ft) above all obstacles within the approach/departure area in accordance with subsection 325.29(3) when operating in accordance with their flight manual with one engine inoperative.

The Orng AW139 helicopters are models that conform to these H1 high-performance requirements.

Please note that this review of the latest Sick Kids MZO OLS was not performed with a survey as is required with the establishment of an H1 heliport [329.29(3)(a)(ii)]. This study was conducted with a georeferenced Bing map used as the base file. We do not have building/structure/object elevation information. The intent of this study was not to develop the H1 flight path for Sick Kids. It is our understanding that the "Enhanced Flight Path" drawing (MZO 2024) was developed as per all applicable TC requirements.

Definitions

Approach/Departure Path Area (Flight Path)- a quadrilateral area on the surface of the earth lying directly below the approach/take-off surface.

ASL (Above Sea Level) – with reference to elevations.

Canada Flight Supplement (CFS) – a NAVCAN document published every 56 days containing information for all Certified and Registered Aerodromes within Canada.

Category A - with respect to normal and transport category rotorcraft, means multiengine rotorcraft designed with engine and system isolation features specified in Chapter 527 or 529 [of the CARs] and utilizing scheduled takeoff and landing operations under a critical engine failure concept which assures adequate designated surface area and adequate performance capability for continued safe flight in the event of engine failure.

Congested area [ICAO definition] - in relation to a city, town or settlement, any area which is substantially used for residential, commercial or recreational purposes.

Congested hostile environment [ICAO definition] - a hostile environment within a congested area. (see hostile environment)

D. [ICAO definition] - The largest overall dimension of the helicopter when rotor(s) are turning measured from the most forward position of the main rotor tip path plane to the most rearward position of the tail rotor tip path plane or helicopter structure.
Note. — "D" is sometimes referred to in the text using the terminology "D-value".

Emergency landing area - means an area where an unavoidable landing or ditching may take place with a reasonable expectancy of no injuries to persons or damage to property on the surface.

FATO - means a final approach and take-off area, which consists of a defined area over which the final phase of a helicopter approach manoeuvre to hover or land is completed and from which

the take-off manoeuvre is commenced.

Heliport elevation - the elevation of the highest point of each FATO.

Hostile environment [ICAO definition] - an environment in which:

a) a safe forced landing cannot be accomplished because the surface and surrounding environment are inadequate; or

b) the helicopter occupants cannot be adequately protected from the elements; or

c) search and rescue response/capability is not provided consistent with anticipated exposure; or

d) there is an unacceptable risk of endangering persons or property on the ground.

Landing decision point (LDP) - the point used in determining landing performance from which, an engine failure occurring at this point, the landing may be safely continued or a balked landing initiated.

Non-Instrument FATO – a FATO intended for the operation of helicopters under visual meteorological conditions (VMC).

Obstacle – an object that could have an adverse effect on the safe operation of aircraft in flight or on the ground.

Obstacle information – as detailed in ICAO Annex 15 – Aeronautical Information Services (AIS), NAV CANADA requires; the type of obstacle, obstacle position, represented by geographical coordinates in degrees, minutes, second and hundredths of seconds and obstacle elevation and height to the nearest foot or meter.

Obstacle Limitation Surface (OLS) – a surface that establishes the limit to which objects may project into the airspace associated with an aerodrome so that aircraft operations at the aerodrome may be conducted safely. OLS consist of the following:

- Approach Surface
- Take-Off Surface
- Transitional Surface

Operations in performance Class 1 [ICAO definition] - operations with performance such that, in the event of a critical engine failure, performance is available to enable the helicopter to safely continue the flight to an appropriate landing area, unless the failure occurs prior to reaching the take-off decision point (TDP) or after passing the landing decision point (LDP), in which cases the helicopter must be able to land within the rejected take-off or landing area.

Survey – examine and record the area and features of an area of land so as to construct a map, plan or description. This has generally been accepted to be a top-view, 2-dimensional map or plan with possible added descriptions.

Take-off decision point (TDP) - the point used in determining take-off performance from which, an engine failure occurring at this point, either a rejected take-off may be made or a take-off safely continued.

TLOF - means a touchdown and lift off area, which consists of a load-bearing area on which a helicopter may touch down or lift off.

$\mathbf{V_{TOSS}}$ – Take-off safety speed. The minimum speed at which climb shall be achieved with the critical engine inoperative, the remaining engines operating within approved operating limits.

The following abbreviations may be used in this document:

1. **(A)RFM**: (Aircraft) Rotorcraft Flight Manual.
2. **CAR(s)**: Canadian Aviation Regulations.
3. **FMS**: Flight Manual Supplement.
4. **HOM**: Heliport Operations Manual.
5. **ICAO**: International Civil Aviation Organization.
6. **APP/T-O**: Approach/ Take-Off
7. **OEI**: One Engine In-operative
8. **CFS**: Canada Flight Supplement
9. **TC**: Transport Canada
10. **NAVCAN**: Nav Canada

Analysis of MZO (Sick Kids) flight path - eastern app/dep pathway

The analysis of the MZO Flight Path initially raised several questions. Answers to these questions are required to more fully understand the methodology used in the flight path development.

1. Inner Edge of Safety Area

The Inner Edge is not coincident with the Safety Area.

a. Safety Area Width: 35m

b. Inner Edge length from APP/T-O c/l: 17.5m (35÷2)

- Drawing #SK3 appears to indicate an Inner Edge length of either 10 or 19m (unclear). Neither of which would be accurate. This dimension would be expected to be 17.5m

Figure 1 - Inner Edge

– Standard 325: section 325.29(1)(a)(i)(A) states that an inner edge of an approach surface (non-precision and precision) shall be perpendicular to the APP/T-O centreline and equal in length to the safety area.

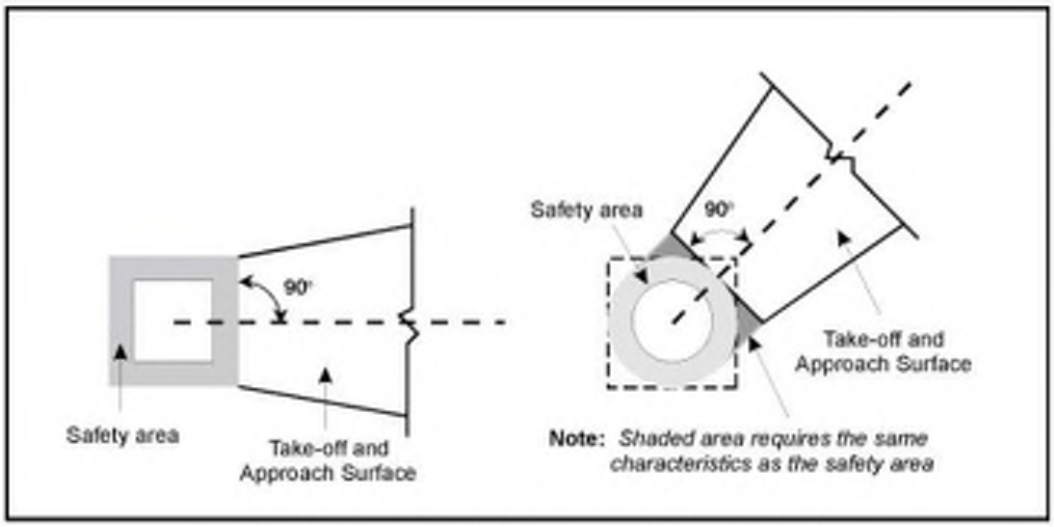


Figure 4-1. Obstacle limitation surfaces for a non-instrument FATO

Figure 2 – Safety Area

– Having 2 designated centrelines is unusual. These centrelines (or lines) would normally represent the outer range of a flight path. Designating each line as a "flight path projected centreline" is an unfamiliar term. It would imply that the helicopter would fly only one of the 2 "centrelines" without veering off-course beyond an acceptable range.

– A flight path centreline in a typical APP/T-O surface would dissect these 2 lines in the middle with the outer lines becoming the outer boundaries of flight within which it would be assumed that the H1 performance calculations were assessed, and the helicopter could remain 4.5m above all obstacles within this flight path cone in the event of an engine failure.

2. H1 Approach/Take-Off Path

Confirmation is required with respect to which buildings/structures/objects were used to establish H1 APP/T-O Surface and if 4.5m was used as a clearance throughout the approach and departure profile as per Canadian Performance Class 1 (H1) operations. (These obstacles would have been included in the required survey that must be completed by the heliport operator for any H1 heliport.)

The following drawing is a sketch using Google Earth to demonstrate the proposed MZO (2024) helicopter flight path with known obstacles highlighted. The 84 and 93 degrees True bearings were used as the approximate edges of the flight path. Within this flight path are shown critical obstacles (buildings) that would be used to calculate the helicopter performance gradients with OEI and maintaining 4.5m above any and all of these obstacles. We have indicated that as part of the due diligence aspect of the evaluation, the high buildings just outside the edges of the flight path would also be included in the helicopter performance evaluation given the proximity of these buildings to the proposed flight path.

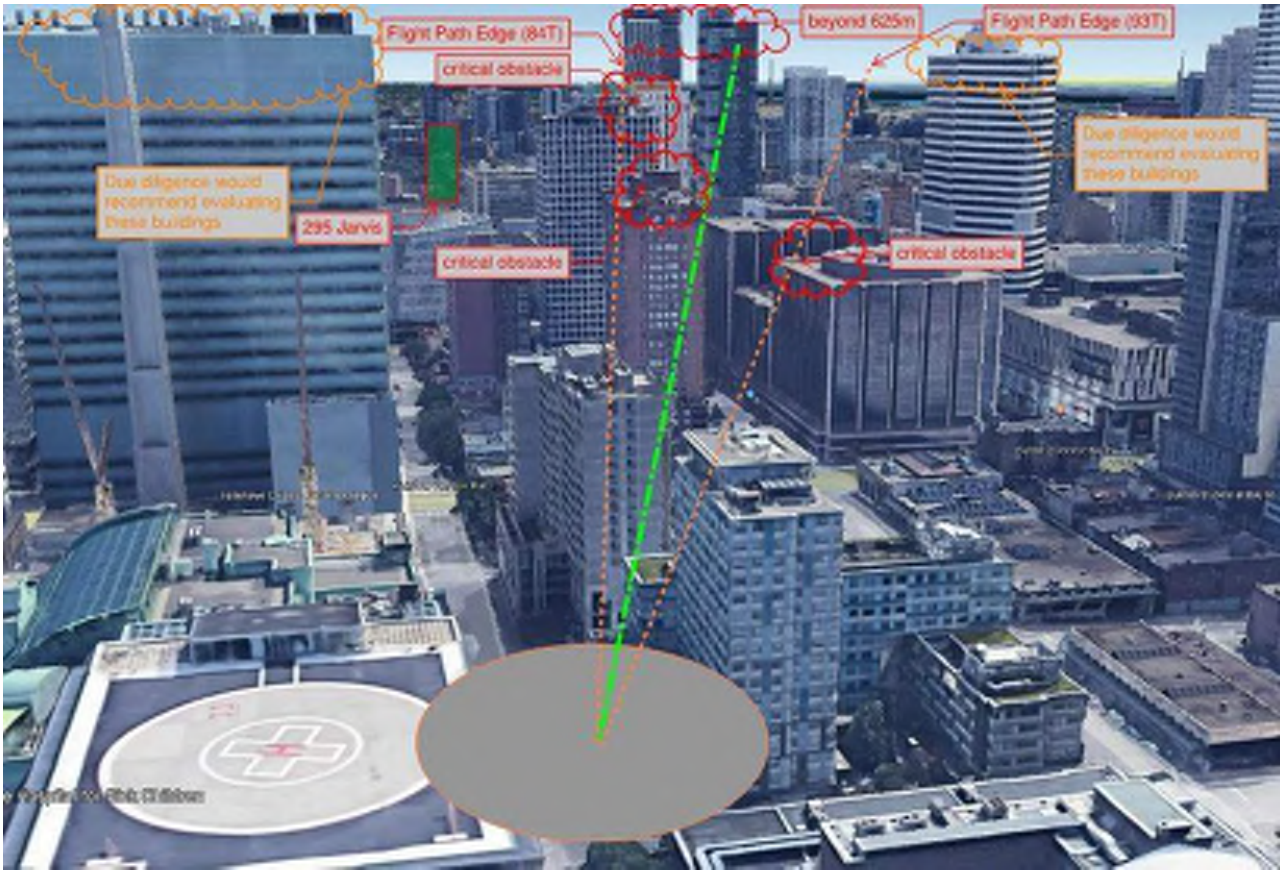


Figure 3 – MZO (2024) Critical Obstacles

The “True” Bearings provided in the MZO (2024) Flight Path would typically be published within the Canadian Flight Supplement (CFS) as Magnetic bearings within which the helicopter can approach and depart the helipad.

These bearings are provided as either a single bearing indicating that the helicopter should approach and depart flying this bearing from the helipad. Or, these bearings can be provided in pairs indicating a range within which the helicopter will approach/depart the helipad.

For instance, in the example below, the eastern side of the helipad indicates that the helicopter will arrive or depart the helipad while flying within the magnetic range of 105° to 125° from the helipad. These ranges do not indicate helicopter APP/T-O centrelines, they indicate a range within which the helicopter should fly knowing that this range was selected with aircraft flight safety in mind.

Therefore, it is unusual for these 2 bearings to be considered as indicating actual flight path centrelines. The area between these 2 bearings is the area that Transport Canada would evaluate for helicopter operations according to the helicopter type and operation during the certification of these helipads.

The following is an example of an H1 Helipad sketch within the CFS. It can be seen that the area between the 2 bearings is the Arrival/Departure zone within which the helicopter can operate. This sketch is contained in Appendix D of the AC305-001 document (Standards Associated with H1 Classified Heliports):

APPENDIX D — SUGGESTED NAVCANADA CFS DEPICTIONS

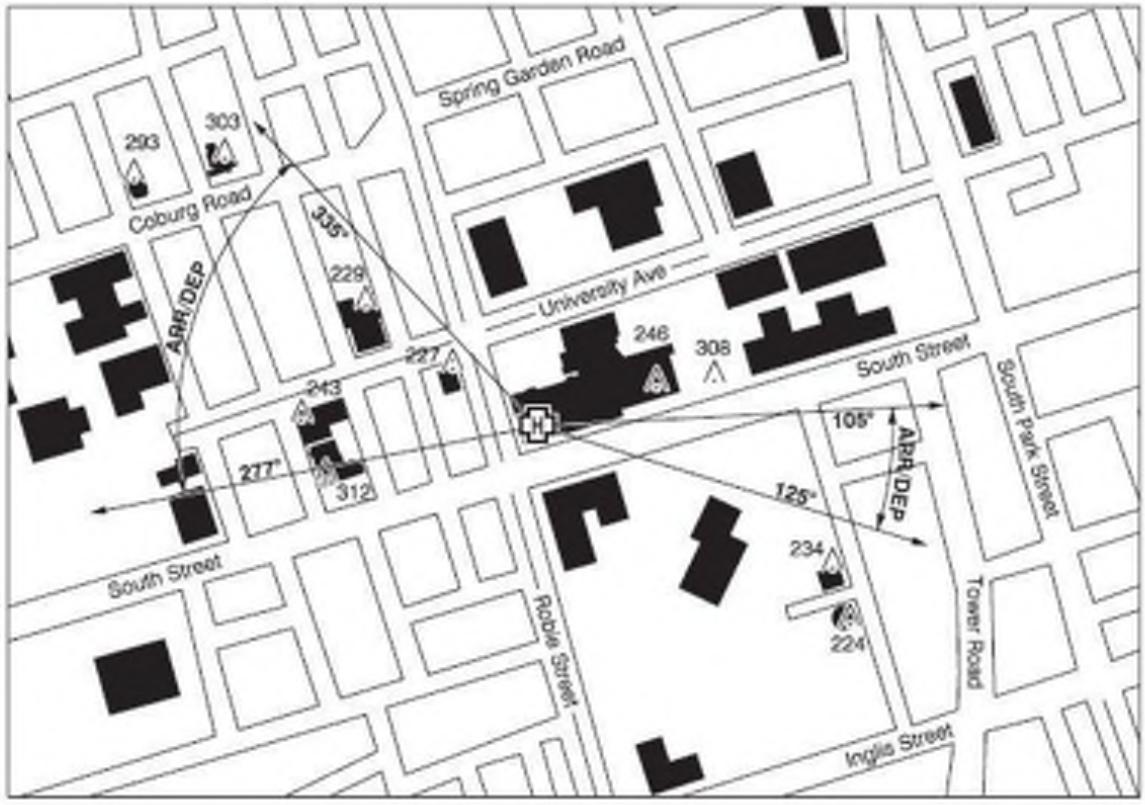


Figure 4 – CFS Arr/Dep Range (Magnetic)

For comparative purposes, the Sick Kids (CNW8) helipad sketch from the current CFS is provided below. The magnetic bearings shown represent the outer limits/range of the ARR/DEP surfaces on both the eastern and western sides.

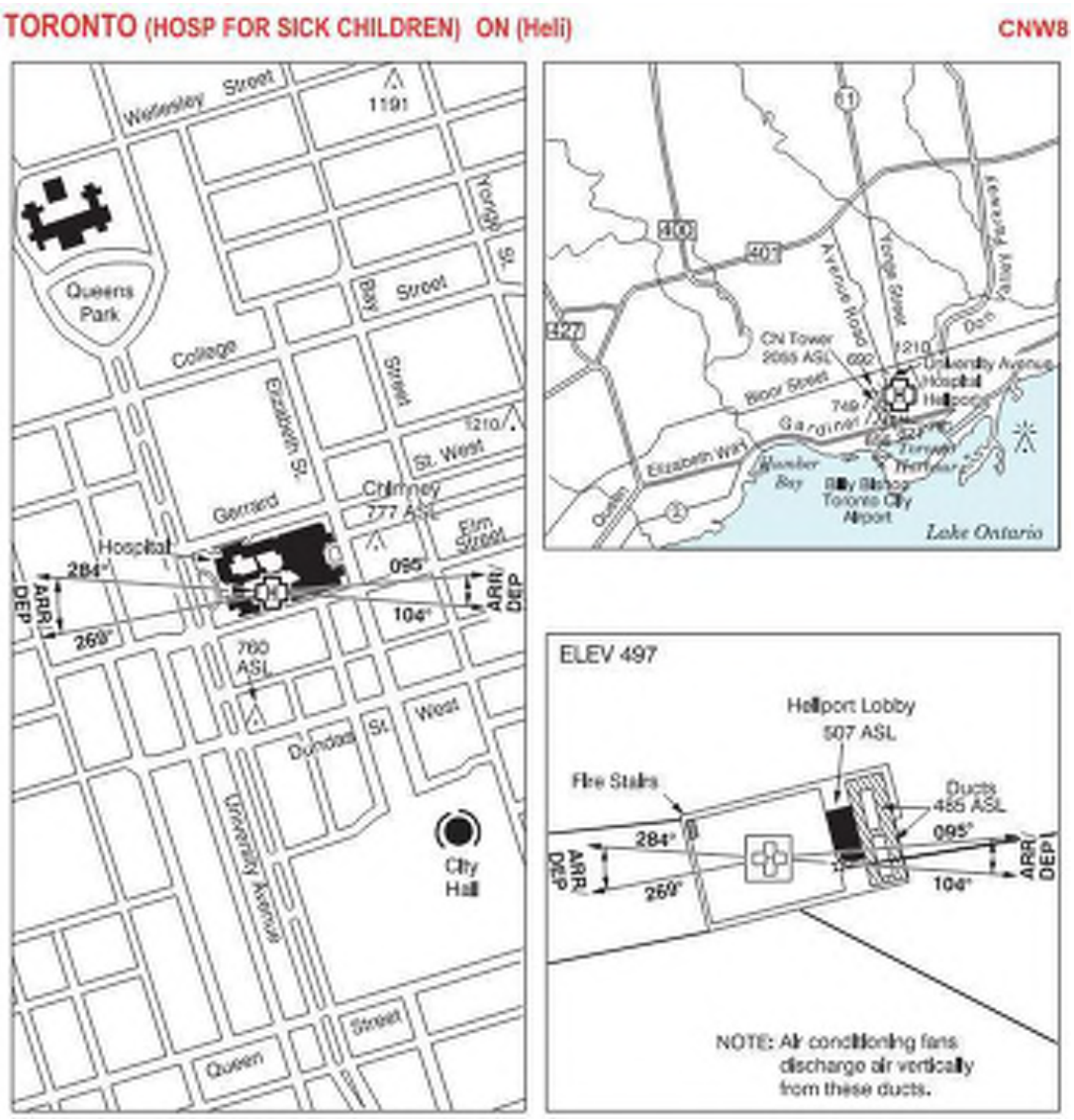


Figure 5 – Sick Kids CFS Publication

3. Prescribed H1 Approach/Take-Off (OLS) Slopes

The Eastern Third Section of the Sick kids MZO (2024) OLS is listed with a 5% slope. This is a very shallow slope when considering that much less powerful helicopters (H2/H3) are required to climb out at a 16% slope (see Standard 325, Table 4-1). The fact that much higher buildings are in closer proximity to the heliport leads to the following 2 inferences:

a. Higher buildings close to the heliport would result in the helicopter flying a much steeper trajectory on departure, therefore leaving one to wonder why the shallow departure surface at the greater distance from the heliport.

b. The middle of the third section is occupied by the Fifth section containing higher buildings and a higher app/dep slope of 16%. The Fifth section is within the 2 edges of the flight path (noted on MZO drawing as “Flight Path Projected Centreline”) and therefore is subject to the High Performance H1 evaluation criteria. Having the areas immediately surrounding the Fifth Section drop down to a 5% slope seems a bit counter intuitive. A 16% slope is generally considered to be optimal in terms of H1 helicopter performance levels and obstacle clearance requirements.

An understanding of the reasoning behind the use of this shallow slope is critical to the development of any potential alternatives that may provide less restrictive urban development parameters.

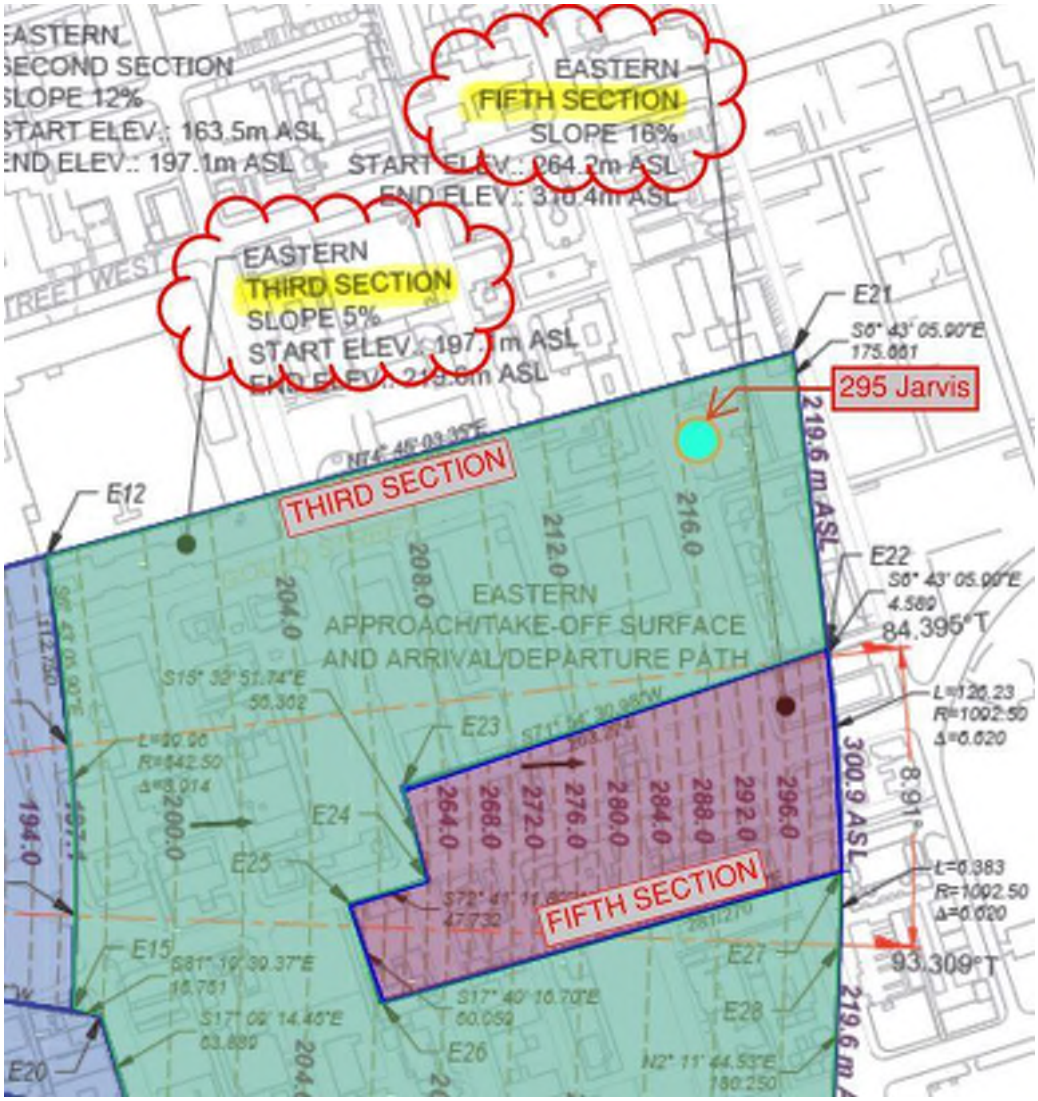


Figure 6 – MZO (2024) Sections

Proposed alternate flight paths - eastern app/dep pathway

There are special requirements for Non-Instrument FATOs with respect to H1 Heliports. Prescribing a specific APP/T-O slope for an H1 heliport, such as the slopes in the TC Table 4-1 would not be appropriate. H1 heliports can be surrounded by varying elevations of buildings or structures that would require a specific high performance helicopter type to not only clear these objects, but also clear them with one engine inoperative and maintaining at least 4.5m above all obstacles.

This is where the survey identifying all obstacle information of the proposed flight paths is essential. These surveys would be used by the helicopter operators to determine if their helicopter types can actually perform to the H1 performance level required to operate into and out of the heliport.

As per Transport Canada AC305-001, section 7, "…there is no specific OLS for H1 classified heliports, there are no additional diagrams required, and the heliport operator/designer need not publish slope information for H1 classified approach/departure pathways". The only app/dep slopes that are applicable for H1 operations are the slopes the helicopter operators determine will allow their helicopters to clear existing obstacles in the event of an engine failure and these slopes are not necessarily applicable to all multi-engine helicopters.

With respect to the required development of an H1 heliport, TC Standard 325.29(3) outlines the specific procedure for development:

- 325.29(3)(a) - Table 4-1 is not applicable
- 325.29(3)(a)(i) – Dep/App surface begins at edge of safety area and continues in a line connecting all the highest/critical obstacles in the proposed Dep/App path.
- 325.29(3)(a)(ii) – a survey of the Dep/App path must be conducted every 5 years
- 325.29(3)(a)(iii) – survey must be updated if new constructions penetrates OLS
- 325.29(3)(a)(iv) – App/Dep path area is a quadrilateral area on ground beneath the App/Dep surface, beginning at edge of safety area and extending out to the lessor of the point beyond where no obstacles that would adversely affect safety exists or **625m**
- 235.29(3)(a)(v) – the width of the App/Dep path area is the width of the safety area at the point of origin and increases at the rate of 0.15D where 'D' is the distance form the point of origin.

With this information, we can graphically summarize the minimum requirements for an H1 Obstacle Limitation Surface or Approach/ Take-Off surface (also referred to as the flight path). Important to note that the dimensions of this surface can vary considerably and depends on the size of the helicopter, the multi-engine helicopter's climb gradient with One Engine Inoperative (OEI), its approach speed and rate of descent on final approach and the controllability of the helicopter at these speeds.

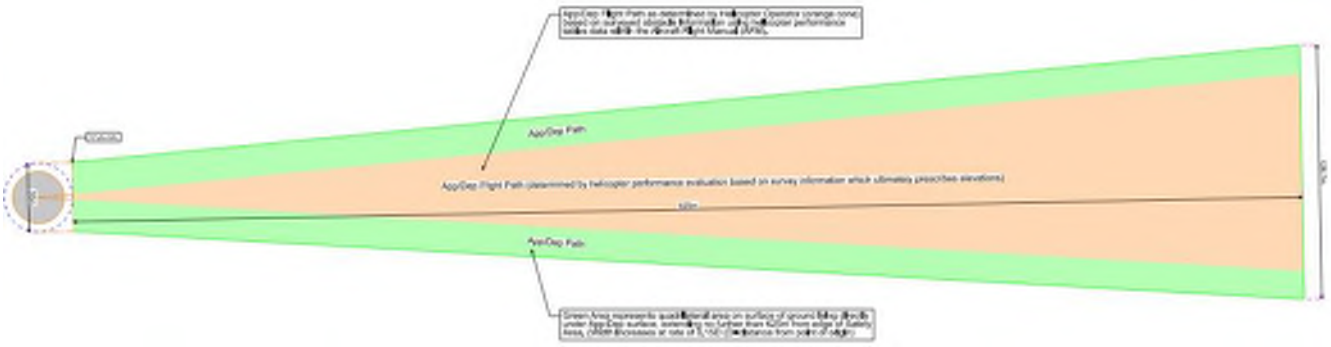


Figure 7 – H1 Quadrilateral Area (H1 Flight Path)

Nevertheless, it is understood that as per Canadian regulations [CAR 305.29(2)], there is no specific OLS for H1 heliports and the obstacle survey that is required for helicopter performance evaluations only extends out as far as 625m. The remaining 375m (out to 1000m) is required for the evaluation of markings and lighting of obstacles deemed necessary for the safety of the helicopter approach and departure procedures [CAR 325.37(1)].

Without specific regulatory detail and to control all future development near an H1 classified hospital helipad, it would be prudent and logical to adopt the existing published standards for Approach/Departure surfaces outside of the required H1 flight path. In other words, determine the quadrilateral area on the ground based on the required helicopter performance evaluation with respect to critical obstacles (SEE Appendix C). All areas outside of the quadrilateral area would be subject to the Table 4-1 APP/DEP slopes, widths and lengths. Within Table 4-1 of TC Standard 325, the second App/Dep section slope in Table 4-1 indicates a 16% slope which would also seem fitting here and optimal, as noted earlier, since the helicopter has already cleared high structures by 4.5m and should be well above this MZO 2024 5% surface as it flies further east, from the helipad.

Table 4-1 Dimensions and slopes of obstacle limitation surfaces - non-instrument FATOs

	NUMBER OF APPROACH/DEPARTURE PATHS AVAILABLE			
SURFACE and DIMENSIONS	Single		2 or more	
	FATO only	FATO + 65m obstacle free zone	FATO only	FATO + 85m obstacle free zone
(1)	(2)	(3)	(4)	(5)
APPROACH SURFACE and TAKE-OFF SURFACE:				
Length of inner edge	Width of safety area	Width of safety area	Width of safety area	Width of safety area
Location of inner edge	Safety area boundary	Safety area boundary	Safety area boundary	Safety area boundary
Divergence:				
Day use only	10 %	10 %	10 %	10 %
Night use	15 %	15 %	15 %	15 %
First Section :				
Length	245 m	245 m	245 m	245 m
Slope	6 % (1:16.6)	8 % (1:12.5)	8 % (1:12.5)	10 % (1:10)
Second Section:				
Length	830 m	830 m	830 m	830 m
Slope	16 % (1:6.25)	16 % (1:6.25)	16 % (1:6.25)	16 % (1:6.25)
Total Length from inner edge	1075 m	1075 m	1075 m	1075 m
TRANSITIONAL SURFACE:				
Slope	50 % (1:2)	50 % (1:2)	50 % (1:2)	50 % (1:2)
Height	45 m	45 m	45 m	45 m

Figure 8 – Transport Canada Table 4-1

Appendices E, F and G (Options 1,2 & 3) are diagrams intended to show, not only an alternative H1 flight path, but an H1 flight path that has been developed with adherence to Transport Canada Regulations. As was previously discussed, TC Standard 325.29(3) clearly outlines the development steps required to establish an H1 helicopter flight path (Appendix E – Option 1). Appendix E displays the H1 flight path (quadrilateral area) required. This is presented as Option 1 as it requires the least amount of area within which a TC certified H1 Helicopter flight path can be established.

Beyond these prescribed TC Steps, there really isn't any further Transport Canada regulations pertaining to continued protection of the H1 flight path beyond the 625m from the helipad's safety area.

The only other TC protection of the H1 flight path would be that of the lighting and marking of objects. However, this is just an evaluation exercise 375m beyond the end of the H1 flight path (at 625m). The lighting and marking evaluation is reactive, it does not impact upon any part of the H1 flight path development process.

The blue areas outside of the green H1 quadrilateral area (as shown in Appendix F and Appendix G), are a recommendation that can be used to control development outside of the H1 flight path. These blue areas would be designed according to Transport Canada Standard 325, section 325.29, Table 4-1.

Appendix F, presented as Option 2, covers less area than Appendix G (Option 3) because it is more aligned with Table 4-1 with a 15% divergence used as the outer lateral boundaries. Appendix G (Option 3), on the other hand, occupies the largest area as it is based on the total area prescribed by MZO (2024).

Both options 2 and 3 are demonstrating a single 16% sloping surface extending laterally from Section 5 in the MZO (2024) diagram. Having a single sloping OLS surface on each side of Section 5 would be considered a safer procedure rather than having vastly different elevations (section 5 vs section 3) within a flight path.

As shown in both options 2 and 3, consideration should be given to eliminating the abrupt elevation change from the end of the H1 quadrilateral area to the beginning of the proposed Section 5 surface. If helicopter performance allows, a 42% sloping surface can join these 2 areas thereby keeping a smooth, uniform flight path surface as all OLS surfaces should be.

Any recommendations put forward in this report will have an association with a Transport Canada standard, regulation or guideline, namely:

- CARs Standard 325 – Heliports
- AC 305-001 – Standards Associated with H1 Classified Heliports

The intent of the recommendations is to show that by following the existing, prescribed Transport Canada standards, the Hospital H1 helipad will be compliant with TC. Additionally, beyond the Transport Canada regulated H1 flight path (green quadrilateral area), this recommendation also calls for further flight path protection in the form of the OLS surfaces as per TC Table 4-1.

The benefit is two-fold, (1) The H1 Helipad is protected by Transport Canada prescribed surfaces and, (2) The impact on urban development is significantly reduced (compared to the MZO (2024) impact).

Summary

- The MZO (2024) flight path protection area appears to be over-reaching with respect to the required flight path parameters set out by Transport Canada.

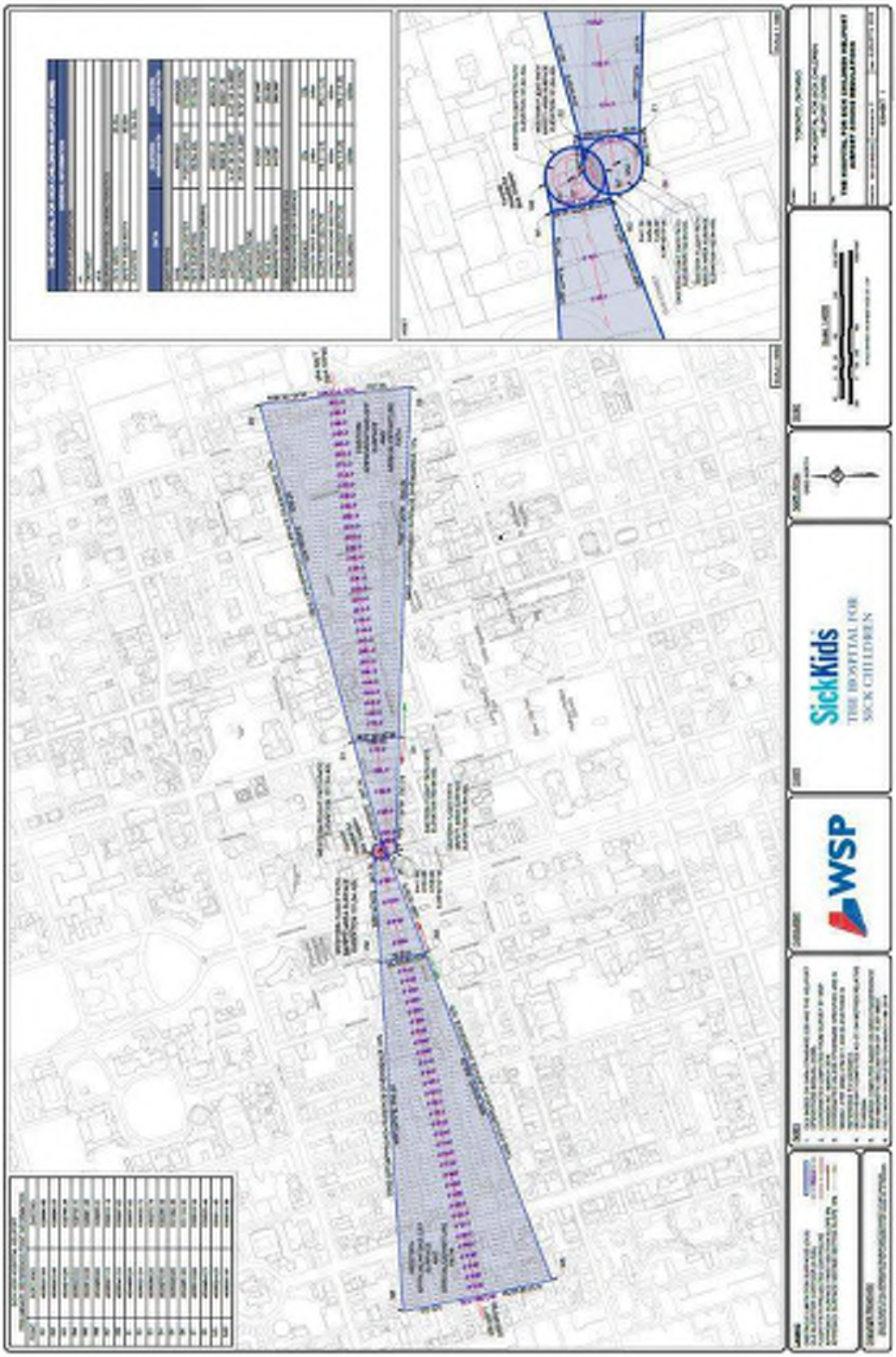
- The expanded horizontal protection area and the limited vertical allowances of MZO (2024) unfairly impact development opportunities surrounding the heliport.

- The alternate flight path put forward in this report is intended to encourage further dialogue in an effort to develop an H1 Flight Path that is reasonable enough to satisfy both the heliport operator and the development community of Toronto.

Appendix A

Bylaw (2017) HSC Flight Path

Schedule 1
The Hospital for Sick Children Air Ambulance Service Protection Corridor Map



Appendix B

MZO (2024)

HOSPITAL FOR SICK CHILDREN HELIPORT PRELIMINARY REFERENCE POINT INFORMATION (NAD83 (CSRS) UTM ZONE 17)		
POINT	NORTHING	EASTING
W1	4835039.468	629990.577
W2	4835020.835	629994.269
W3	4835019.645	629994.570
W4	4835001.318	629999.573
W5	4835001.460	630000.769
W6	4834980.698	630003.234
W7	4834944.905	629971.664
W8	4834749.291	629421.321
W9	4834655.061	629391.629
W10	4834896.710	629381.337
W11	4835009.267	629359.306
W12	4834997.556	629904.790
W13	4834810.780	629943.511
W14	4834736.560	629957.512
W15	4834582.672	629904.979
E1	4834991.958	630035.151
E2	4835000.944	630035.979
E3	4835003.662	630035.771
E4	4835022.531	630033.549
E5	4835021.981	630028.878
E6	4835042.570	630029.667
E7	4835057.078	630180.352
E8	4835114.232	630370.132
E9	4835044.023	630378.402
E10	4834997.726	630380.625
E11	4834917.029	630377.915
E12	4835188.755	630643.269
E13	4835376.779	630656.460
E14	4834976.069	630660.420
E15	4834920.767	630658.265
E16	4834944.688	630501.581
E17	4834936.545	630475.430
E18	4834901.796	630458.327
E19	4834857.213	630693.679
E20	4834918.260	630874.934
E21	4835308.438	631082.303
E22	4835133.962	631102.653
E23	4835052.228	630852.594
E24	4834997.926	630667.701
E25	4834883.721	630622.132
E26	4834926.496	630640.363
E27	4835003.489	631113.89
E28	4834959.758	631110.069
E29	4834779.643	631103.184
SA1	4835024.254	630011.452
SA2	4835001.615	630010.392
SA3	4835043.328	630009.946
SA4	4834982.572	630019.143

MAP NO. 345

Map filed at the office of the Ontario Ministry of Municipal Affairs and Housing, 777 Bay St., Toronto, Ontario,

Planning Act

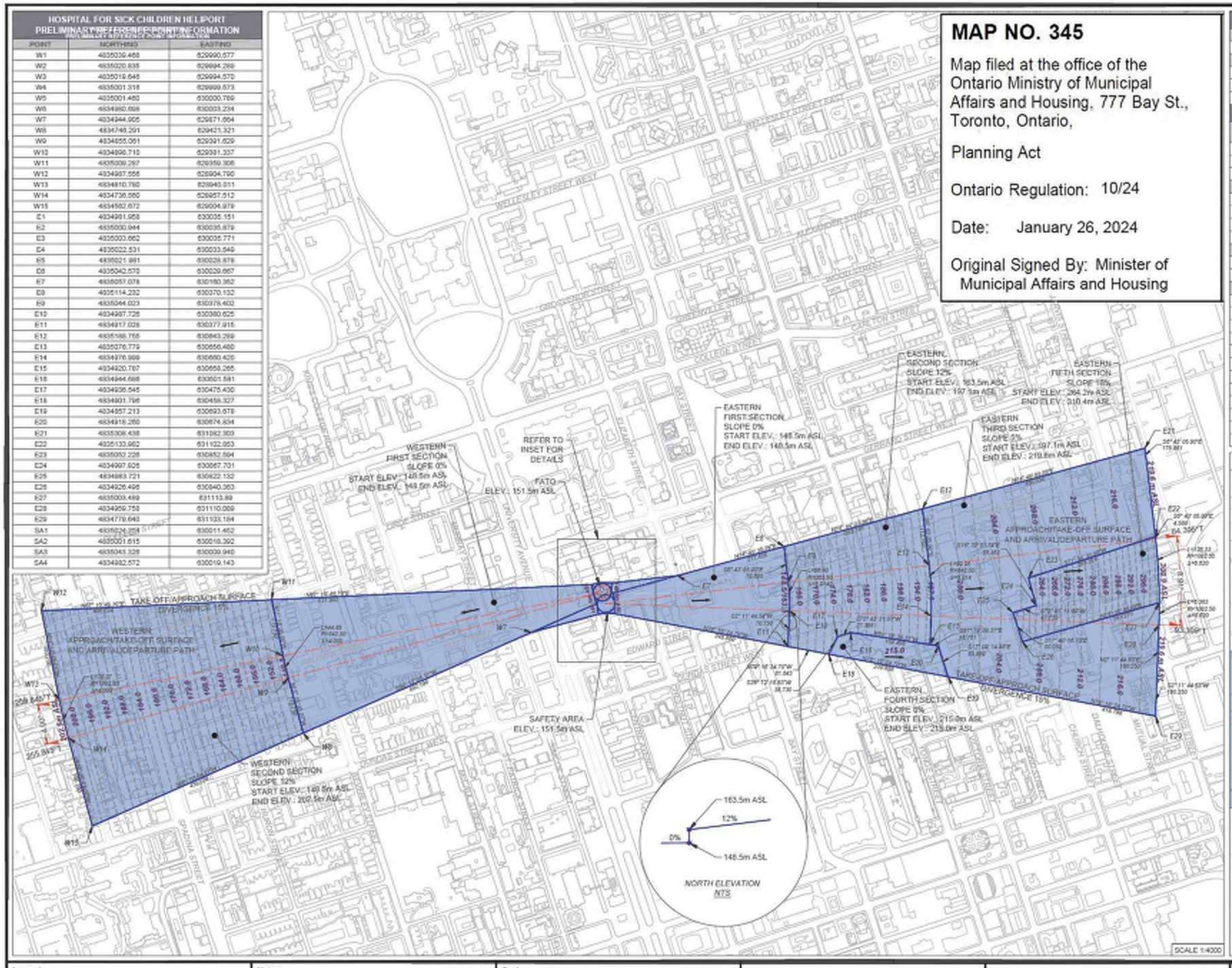
Ontario Regulation: 10/24

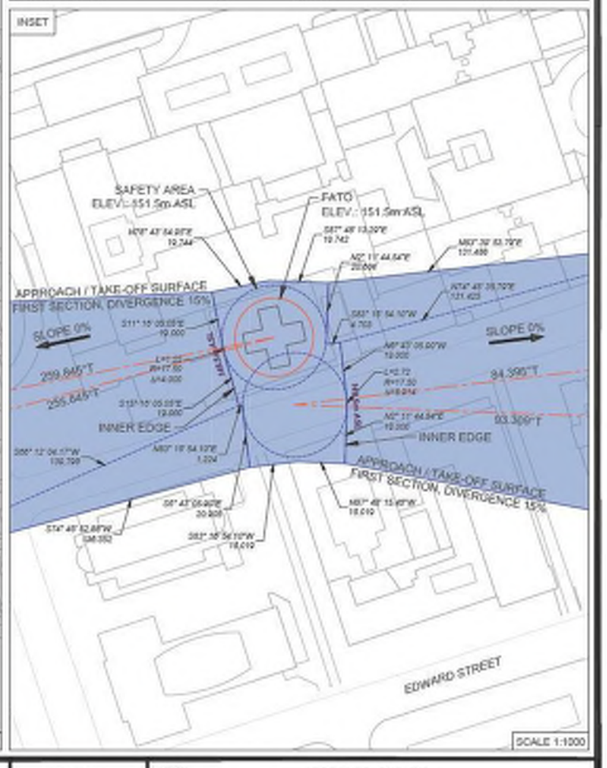
Date: January 26, 2024

Original Signed By: Minister of Municipal Affairs and Housing

HOSPITAL FOR SICK CHILDREN HELIPORT (CNW8)		
HELIPORT CLASSIFICATION		
H1	DAY/NIGHT	VFR
HELIPORT PHYSICAL CHARACTERISTICS		
FATO WIDTH	26.25m	
ELEVATION	151.5m ASL	

FLIGHT PATH PROTECTIONS		
DATA	EASTERN ARR/DEP PATH	WESTERN ARR/DEP PATH
GEOMETRIC CENTRE	POINT-IN-SPACE	STANDARD
SAFETY AREA WIDTH	35.0m	
INNER EDGE ELEVATION	148.5m ASL	148.5m ASL
FLIGHT PATH ORIGIN LOCATION (WGS84)		
NORTHING	4835024.254	
EASTING	630011.452	
LATITUDE	N 43° 39' 24.6655"	
LONGITUDE	W 79° 23' 15.5762"	
FLIGHT PATH BEARINGS (FROM)		
GRID NORTH	83.282° TO 92.196°	264.732° TO 258.732°
TRUE NORTH	84.395° TO 93.309°	265.845° TO 259.845°
OBSTACLE LIMITATION SURFACES - APPROACH/TAKE-OFF SURFACE		
DIVERGENCE	15%	15%
FIRST SECTION LENGTH	345.0m	625.0m
FIRST SECTION SLOPE	0%	0%
SECOND SECTION LENGTH	280.0m	450.0m
SECOND SECTION SLOPE	12% [1:8.33]	12% [1:8.33]
THIRD SECTION LENGTH	450.0m	N/A
THIRD SECTION SLOPE	5% [1:20]	N/A
FOURTH SECTION LENGTH	236.9m	N/A
FOURTH SECTION SLOPE	0%	N/A
FIFTH SECTION LENGTH	280.7m	N/A
FIFTH SECTION SLOPE	16% [1:6.25]	N/A
TOTAL LENGTH	1075.0m	1075.0m





Legend
OBSTACLE LIMITATION SURFACE (OLS)
OLS ELEVATION CONTOUR (m ASL) —162.0—
FLIGHT PATH PROJECTED CENTRELINE

Notes
1. COORDINATES COMPUTED FROM SURVEY DATED MARCH 16th, 2016.
2. COORDINATES UNLESS OTHERWISE SPECIFIED ARE IN WGS84 ITRF 2008 / UTM Z17 AND ELEVATIONS IN REFERENCE TO CGVD2013.
3. GEOID HEIGHT COMPUTED AS -27.164 METRES RELATIVE TO WGS84.
4. AVIA NG INC. DO NOT TAKE RESPONSIBILITY FOR THE ACCURACY OF UNDERLYING CADASTRAL DATA.
5. UNDERLYING CADASTRAL DATA SUBJECT TO CHANGE.

Scale
Scale 1:4000
50 0 25 50 100 200 300 METRES
200 0 100 200 600 1000 FEET
SCALE BASED ON SHEET SIZE 22" X 34"

SickKids THE HOSPITAL FOR SICK CHILDREN
Client: THE HOSPITAL FOR SICK CHILDREN

AVIA · NG AIRPORT CONSULTANTS
Consultant: AVIA NG INC.

GRID NORTH

Location: TORONTO, ONTARIO

Title: HOSPITAL FOR SICK CHILDREN HELIPORT ENHANCED FLIGHT PATH PROTECTIONS WITH METES AND BOUNDS

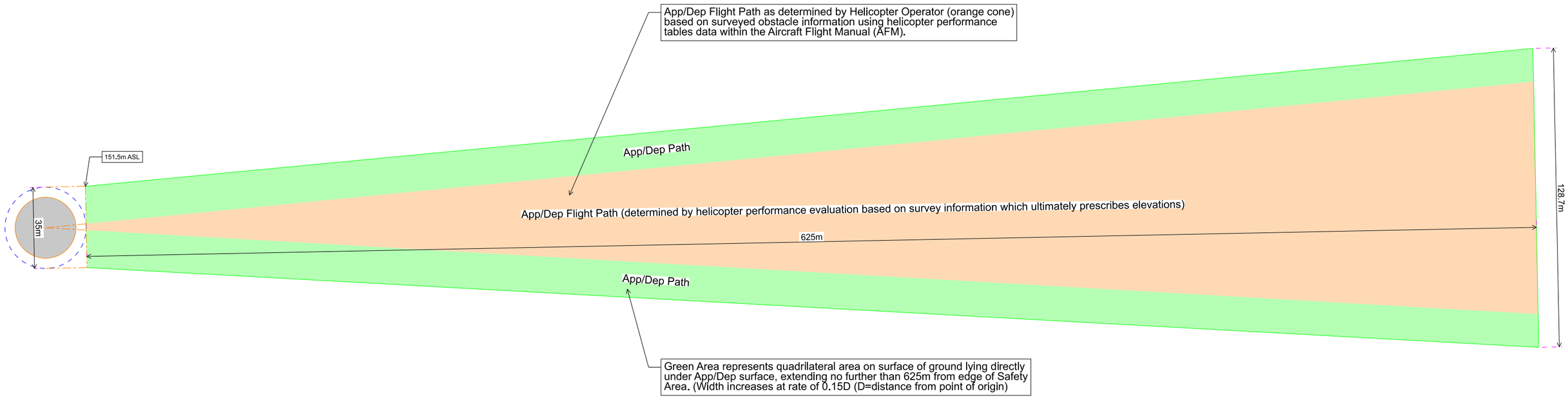
Date:	OCT 31, 2023	Avia NG Project No.:	22-0039-00
Amendment No.:	0	Drawing No.:	SK3

Appendix C

Flight Path Quadrilateral Area

Scale @ ANSI B: $SCALESHORT$

ANSI B (11x17" / 279x432mm)



File: $FILE$
Date: $DATE$ Time: $TIME$ Plot Driver: $PLTDRVS$

$MODELNAME$

Appendix D

Comparison Between Bylaw (2017) and MZO(2024) Flight Paths

Scale @ ISO A1: $SCALESHORT$

A1 (33.11x23.39" / 841x594mm)

295 Jarvis

Enhanced Flight Path (H1 - MZO 2024)

Original OLS per CARs Standard 325 (Bylaw - 2017)

App/Dep Surface (16% slope, 15% divergence out to end of Second Section-830m [Total: 1075m])

App/Dep Surface (8% slope, 15% divergence out to end of First Section-245m)

App/Dep Surface (16% slope, 15% divergence out to end of Second Section-830m [Total: 1075m])

Post 340° True (Flight Path)

Post 160° True (Flight Path)

Heliport Safety Area
35m diameter
151.5m ASL

File: $FILEL$
Date: $DATE$ Time: $TIME$ Plot Driver: $PLTDRVS$

$MODELNAME$

Appendix E

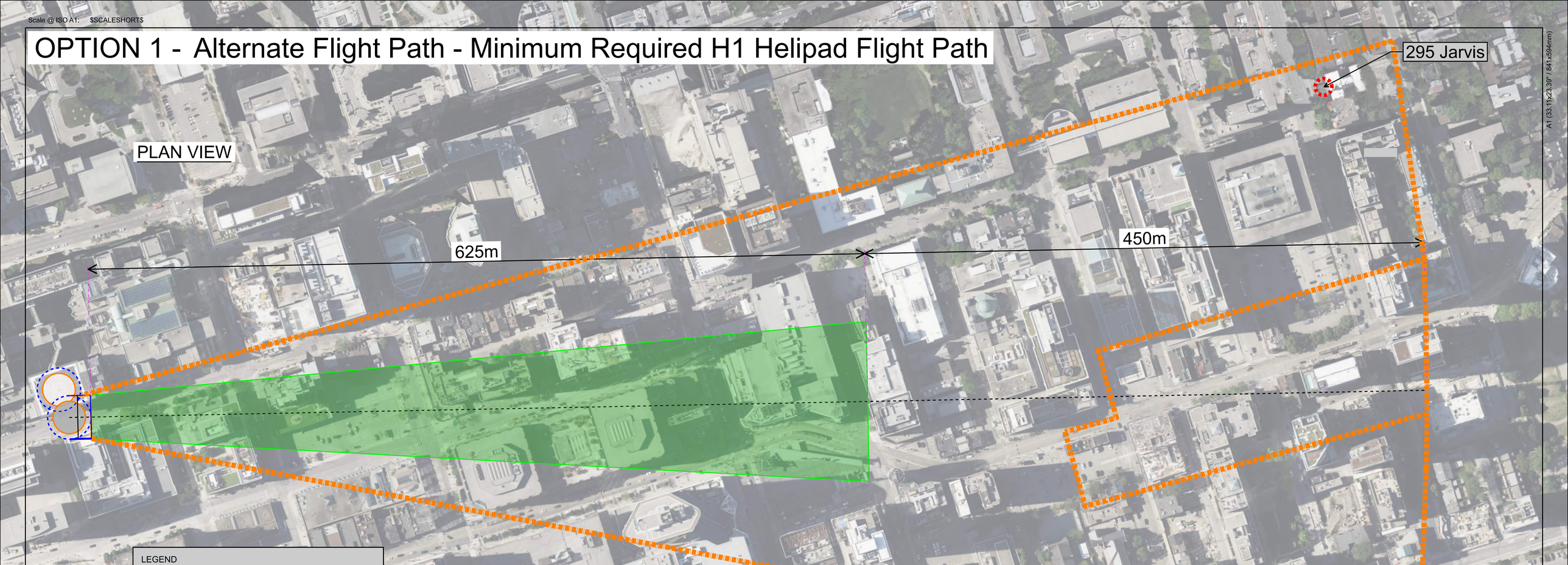
Option 1 – Alternate Flight Path (Minimum H1 Requirement)

Scale @ ISO A1: $SCALESHORTS

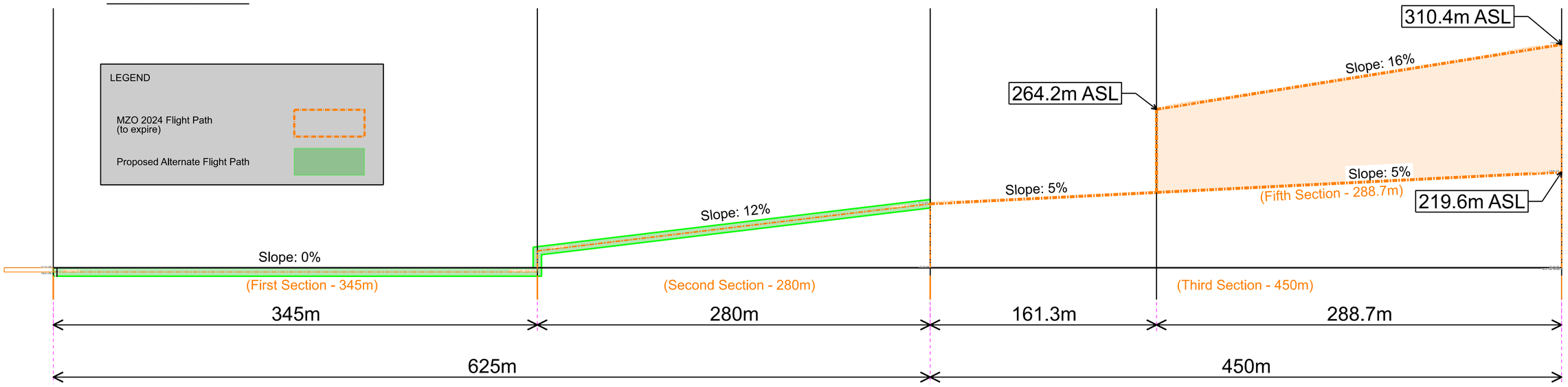
OPTION 1 - Alternate Flight Path - Minimum Required H1 Helipad Flight Path

A1 (33.11x23.39" / 841x594mm)

PLAN VIEW



SECTION VIEW



File: $FILEL$
Date: $DATE$ Time: $TIME$ Plot Driver: $PLTDRVS$

$MODELNAMES$

Appendix F

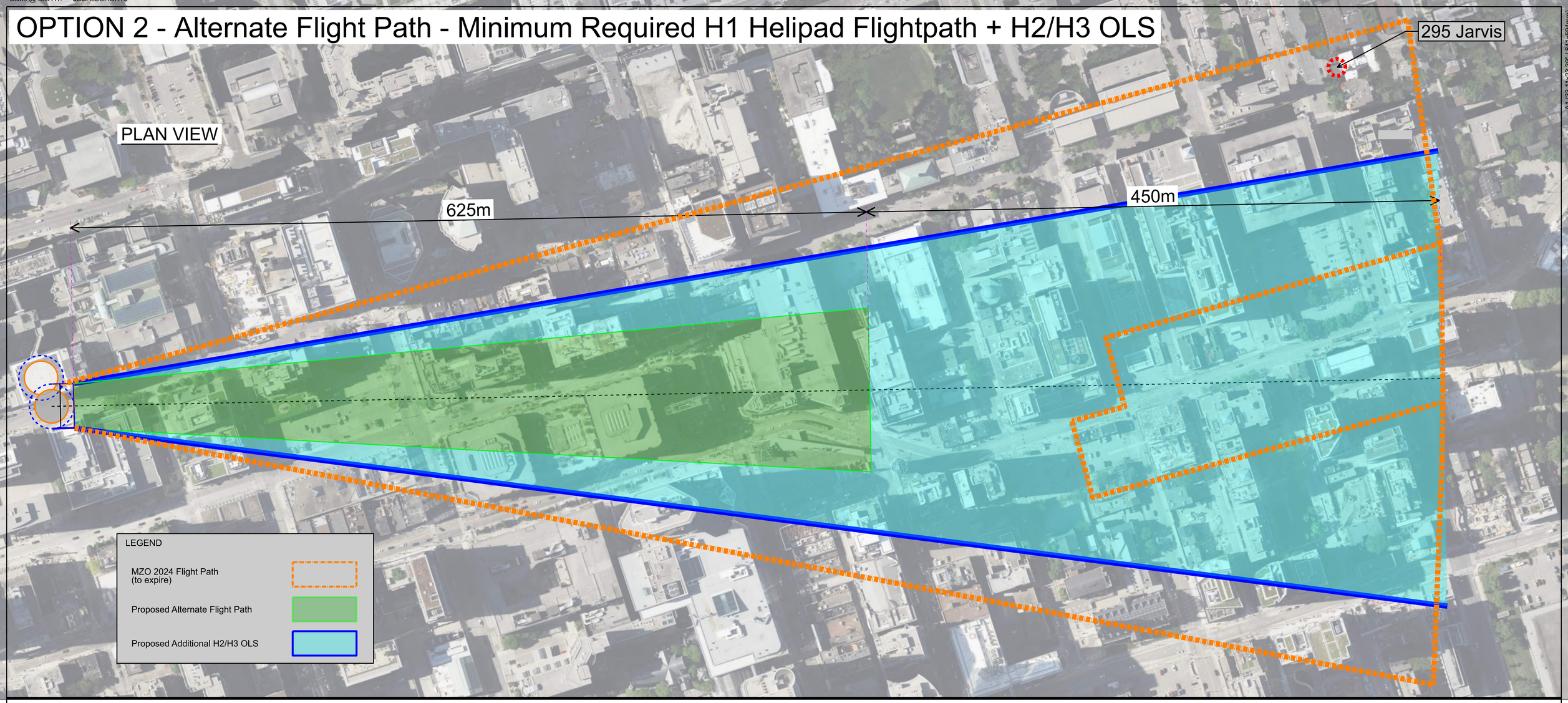
Option 2 – Alternate Flight Path (Minimum H1 Requirement with H2/H3 OLS)

Scale @ ISO A1: $SCALESHORTS

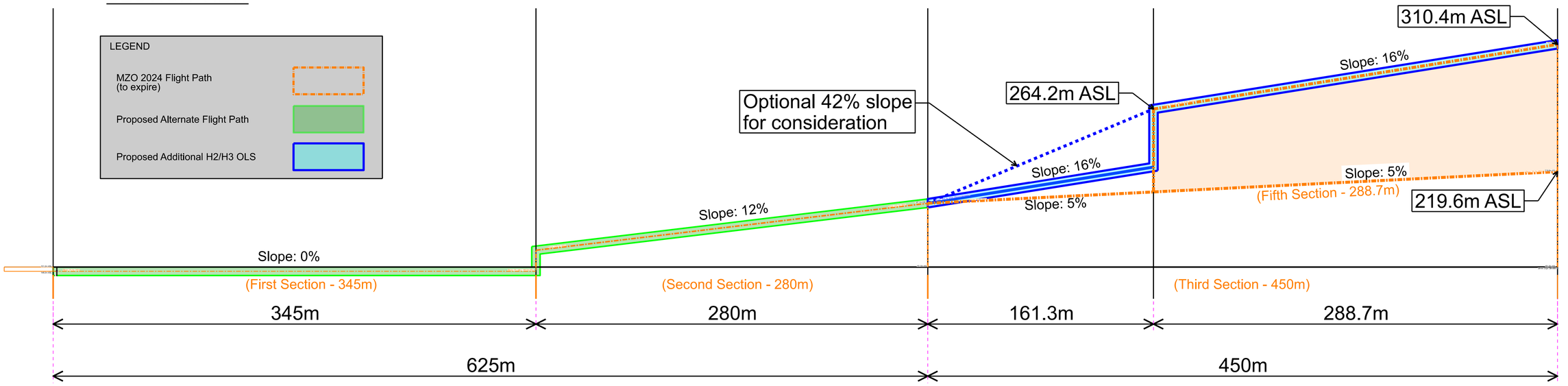
OPTION 2 - Alternate Flight Path - Minimum Required H1 Helipad Flightpath + H2/H3 OLS

A1 (33.11"x23.39" / 841x594mm)

PLAN VIEW



SECTION VIEW



File: $FILEL$
Date: $DATE$ Time: $TIME$ Plot Driver: $PLTDRVS$

$MODELNAME$

Appendix G

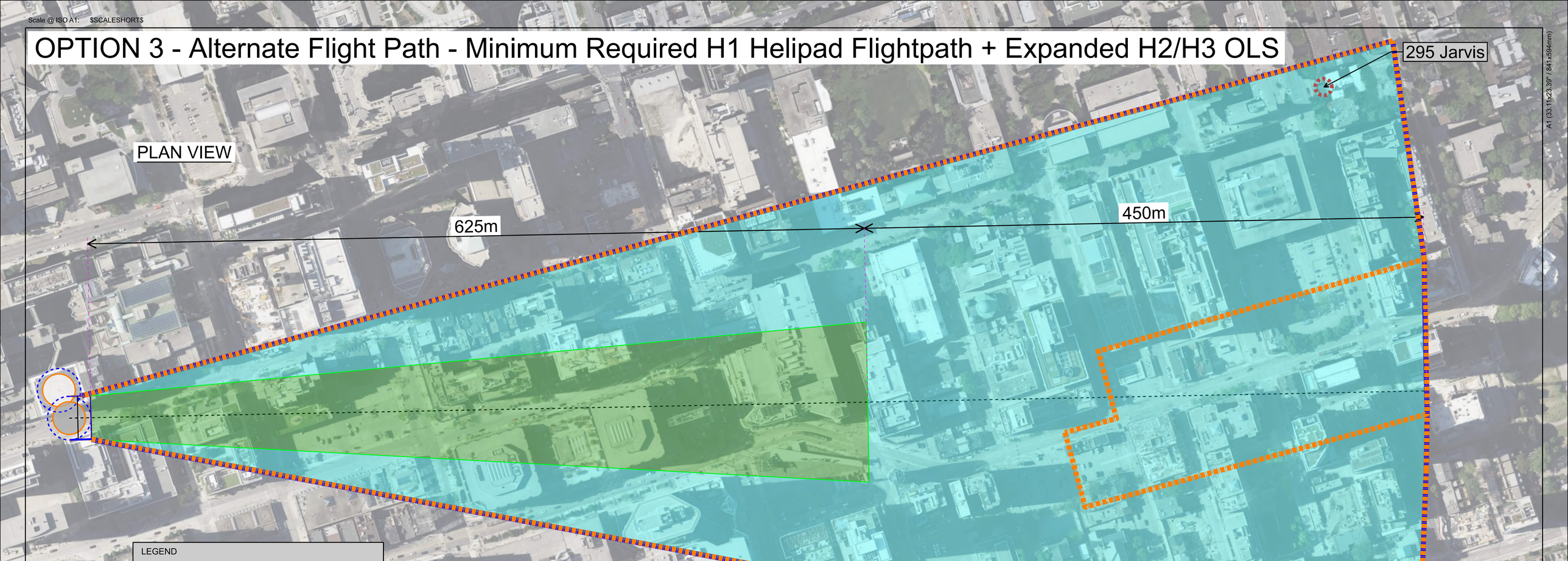
Option 3 – Alternate Flight Path (Minimum H1 Requirement with Expanded MZO (2024) H2/H3 OLS)

Scale @ ISO A1: $SCALESHORT$

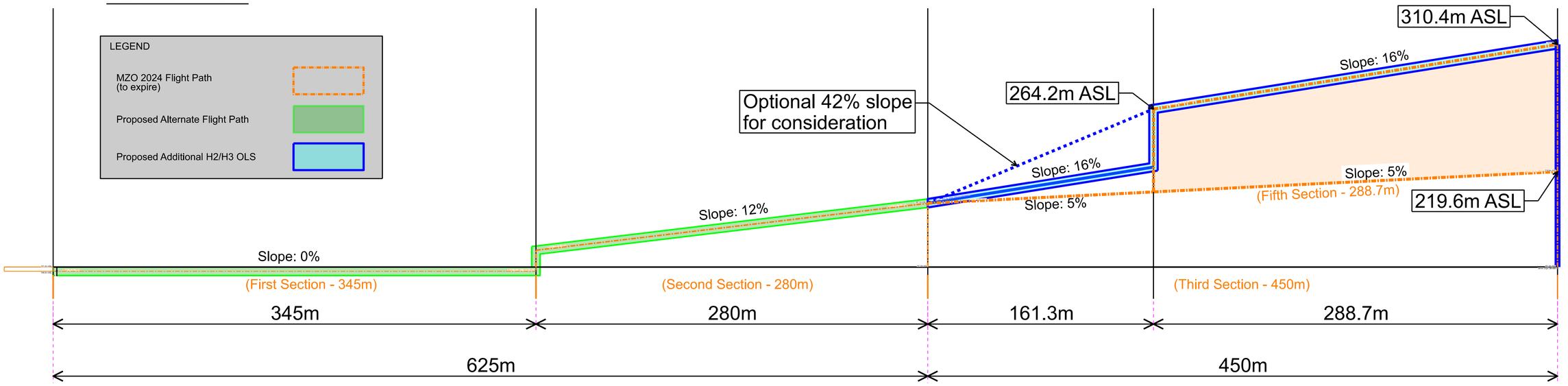
OPTION 3 - Alternate Flight Path - Minimum Required H1 Helipad Flightpath + Expanded H2/H3 OLS

A1 (33.11x23.39" / 841x594mm)

PLAN VIEW



SECTION VIEW



File: $FILEL$
Date: $DATE$ Time: $TIME$ Plot Driver: $PLTDRVS$

$MODELNAME$