

# Helistop Feasibility & Site Selection Report

## Shrub Oak International School

3151 Stoney Street  
Shrub Oak, NY 10547

April 4, 2017



*Developed & Provided By*



**HELIEXPERTS INTERNATIONAL LLC.**  
Formerly Raymond A. Syms & Associates



**Veteran Owned  
and Operated**

***An Aeronautical Consultancy***

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# The HeliExperts Team

HeliExperts International LLC was formed in January 2012 with the merging of Raymond A. Syms and Associates LLC and RJ Alexander Consulting LLC. Collectively, the HeliExperts team offers more than 75 years of highly specialized aviation, helicopter and heliport expertise and experience. Both founding members are active participants and contributors to the aviation and helicopter industries in multiple arenas of governmental rule making, regulatory policy authoring, aviation infrastructure design, technical research, education, training, safety initiatives and risk mitigation strategies. HeliExperts team members have donated thousands of hours to and actively collaborate with the Federal Aviation Administration, National Fire Protection Association, National Transportation and Safety Board, Transportation Safety Institute as well as numerous other Aviation, Safety and Trade Organization and Groups and Associations. Both members assisted the Transportation Safety Institute in Oklahoma City in the development of the current Heliport Evaluation Training Course used to train FAA Inspectors throughout the U.S. on heliport evaluation practices and procedures.



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Mr. Syms Possesses more than 45 years of military, general and commercial aviation experience as a pilot, instructor pilot, aviation manager, heliport developer, and aviation expert. Syms has qualified as an unchallenged aviation expert in federal, state and local courts in addition to official hearings and other regulatory proceedings. Additionally, Syms is the designer and primary author of the HAI Heliport/Vertiport Development Guide (a publication by the Helicopter Association International) and has spent more than 20 years serving on FAA and NFPA (National Fire Protection Association) committees that assist with authoring the FAA Heliport and Vertiport Design Advisory Circulars (the FAA's design recommendations for all heliports) and develop the NFPA Standards for Heliports (fire protection and safety standards for heliports). Syms is the current chair of the NFPA 418 Committee Standard for Heliports.

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Mr. Alexander possesses more than 30 years of military, general, and commercial aviation experience as a pilot, instructor pilot, safety manager, aviation regional manager, airframe and power-plant technician, heliport developer, educator, trainer, and aviation expert. Alexander has served as a board member and is a former President of both the National EMS Pilots Association (NEMSPA) and the Indiana State Association of Air Medical Services. Alexander has participated in numerous industry and government initiatives to include; NEMSPA National heliport safety survey, Model Air Medical State Guidelines Task Force, Heliport Risk and Liability Assessment Toolkit, FAA National Proposed Rule Making on HEMS and helicopter operations, and the NTSB hearings on Helicopter EMS operations and accident prevention. Mr. Alexander is a well-known and respected speaker lecturing throughout the United States and has published several well recognized industry articles on air medical, helicopter and heliport operations and safety.

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## **INTRODUCTION**

The following study was conducted at the request of the Shrub Oak International School to analyze the feasibility of establishing a private ground based helicopter landing site on the property located at 3151 Stoney Street, Shrub Oak, NY 10547. The study consisted of an on-site visit and evaluation, plus interviews with Corporate Management. During this process, we considered the following elements:

- Operational capabilities and limitations of the type and model of helicopter(s) that may potentially support this location currently and in the future.
- Required onsite operational space necessary to safely support the type, model and number of helicopter(s) that may potentially service this location currently and in the future.
- Airspace requirements necessary to support a safe and compliant Heliport/Helistop for flight operations into and out of this location for day and night VFR operations.
- Analysis of any overlying and surrounding special use airspace for any special operational considerations for flights conducted into and out of this geographic area.
- Regulatory and safety of flight requirements for state, federal, and local government aviation authorities as they would pertain to this location.
- Review of local zoning requirements and other applicable “By-Laws” provided by the client that may prohibit, restrict or otherwise significantly limit the proposed location.
- Review of on-site conditions to identify and suggest the most practical and cost-effective methods of construction.
- General assessment of the environmental impact on the surrounding community.
- Social, economic, and political analysis of the surrounding community as it would relate to the installation of a helicopter landing site at this facility.
- Determination of the time frame required to correctly evaluate the location, to process the various applications, and to obtain the necessary approvals and ultimately construct a helicopter landing site at this location.
- Analysis of the Climatical conditions that could potentially impact the proposed facility location.

## EXECUTIVE SUMMARY

### FINDINGS

HeliExperts feasibility and site selection study has concluded that the selected location, with management's approval and appropriate site decisions, can lead to a safe cost-effective private use ground based Helistop at this location. The required operational and safety plan and training that will be instituted at this location will meet all Federal, State and Local requirements as well as industry best practices.

### APPROVAL PROCESS & TIMELINE

The processing time and site visit from an official FAA representative varies from region to region, taking from three weeks to several months. Based on past experience, our close follow-up with the regional and local FAA offices has kept this time frame to an average of 3 to 6 months on most projects. That being said, we have also experienced delays in response from the Federal Government due to staffing issues of up to 12 months in some regions.

Upon receipt of a favorable airspace determination letter from the FAA the land owner shall, in accordance with New York General Business Law Section 249, request authorization to establish the private airport, heliport/helistop from the governing body of the city, village or town having jurisdiction. Upon receipt of the land owners request, the governing body of the city, village or town having jurisdiction must submit a request for a determination, before granting authorization, to the Commissioner of Transportation. Once the Commissioner of Transportation has received the request and all required documents, an inspection of the proposed helistop will be conducted with the proponent and the municipal representatives. Upon receipt of a favorable determination, the municipality may complete their actions notifying the State as to the final disposition of the helistop. At a minimum, this process can be expected to take 2 to 6 months.



# EVALUATION CRITERIA

The site identified and recommended in this study for a potential Helistop location was evaluated based on the consideration of the following criteria:

1. Safety (Ground & Air)
2. Aircraft Operational Requirements
3. Regulatory Approval Potential
4. Community Interface Considerations
5. Community Access to Emergency Air Medical Transport
6. Climatological Constraints
7. Security
8. Special Use Airspace Considerations

## 1. SAFETY (Ground & Air)

The issue of safety, not only from the standpoint of the occupants of the helicopters but also the individuals residing in the building as well as those on the ground and in the surrounding area are a primary consideration in identifying potential landing sites. While the probability of an accident occurring is very remote, it is critical to factor this possibility into every site location consideration and decision. Sound aviation practices require a very detailed and in-depth evaluation of not only the physical characteristics of the Helistop itself but also the surrounding area and supporting infrastructure. Thus, a major emphasis is placed on an intensive evaluation of the available helicopter maneuvering space in addition to the availability of the required clear unobstructed approach and departure paths.

## 2. HELICOPTER OPERATIONAL REQUIREMENTS

This category takes into consideration the unique flight characteristics and requirements of the type and model of helicopters that will be employed at this site. Specific physical dimensions of the helicopters are used to determine the required size of the Heliport/Helistop needed as well as the maneuvering space required for safe operations. Helicopter manufacture performance charts are used to determine the climb characteristics and worst-case operational performance conditions, i.e., high ambient temperatures, high density altitude and maximum loading of the helicopter that can be expected.

The “Design Helicopter” is a value that reflects the FAA recommendations for Heliports/Helistops. HeliExperts can provide a separate briefing document regarding this topic. Additional information on this topic can also be found in the Federal Aviation Regulation section of this report.

### **3. REGULATORY APPROVAL POTENTIAL**

There are three primary levels of government that will, in one manner or another, influence any final site selection. The federal government is responsible for a determination of the efficient use of airspace and any possible airspace conflicts with other air traffic in the vicinity. As a state, the New York State Department of Transportation (NYSDOT) Aviation Bureau directly oversees all applications for general aviation airports and heliports and helistops for which they provide a required certificate of registration. NYSDOT officials use the FAA Advisory Circular "Heliport Design" as their primary evaluation guideline for the design and location of heliport and helistop facilities. The Town of Yorktown and Westchester County concerns will primarily be focused on zoning, fire protection, building codes, environmental and community issues.

### **4. COMMUNITY INTERFACE CONSIDERATIONS**

Through the efforts of the Shrub Oak International School planning team the general misperceptions and misunderstanding that HeliExperts has commonly witnessed over the years regarding helicopter transport from the various entities within a community have chiefly been addressed. Concerns that have arisen regarding safety, noise, environmental impact, and property values, through active education and an appropriate proactive integration plan, have, for the most part, been properly identified and dealt with before they have become public issues.

### **5. COMMUNITY ACCESS TO EMERGENCY AIR MEDICAL TRANSPORT**

In many communities around the country, both urban and rural, air ambulance helicopters land under less than optimum conditions at off airport scene locations during all hours of the day and night. These locations are non-permanent transitory sites that are hastily set up by first responders only minutes prior to a helicopters arrival, often during the hours of darkness. These locations are greatly influenced by weather conditions and the changing seasons, often times making them a more hazardous environment for everyone involved. To improve safety and provide a rapid means for delivering lifesaving care during times of crises, many community leaders are working locally to identify areas that will support a permanent well established site for helicopter operations during all hours of the day and night that is always ready and always prepared.

### **6. CLIMATOLOGICAL CONSTRAINTS**

The concept and practice of all helicopter operations can be significantly influenced by some regions ever changing weather conditions which can prohibit safe flight operations under certain conditions. Site specific historical data analysis using empirical weather data is necessary to determine the suitability of any general location to insure it encompasses the safe operational requirements necessary to assure the highest percentage of usability possible for any given day.



## 7. SECURITY

A concern expressed by many individuals is the inadvertent entry of members of the public or non-authorized persons to a secure area where a helicopter may be operating. Adequate security measures must be in place to assure the safety of the helicopter, its crew and the public as a whole. Assuming that there will be occasions that may arise wherein the helicopter will remain unattended, even for short periods of time, the project has been evaluated as to the possibility of the helicopter being exposed to anything from the curious onlookers, to vandalism and even terrorism.

## 8. SPECIAL USE AIRSPACE CONSIDERATIONS

In many locations throughout the United States specific areas have been designated with airspace that has been classified as “Special Use”. These types of special use airspace often times pose limitations as to who may operate within their boundaries and when to the extent of requiring additional training, radio communications and written authorization up to and including refusal to entry. Types of special use airspace evaluated for the purposes of the establishment of a heliport or helistop are: Restricted Airspace, Prohibited Airspace, Military Operations Areas, Waring Areas, Alert Areas, Temporary Flight Restriction (TFR), National Security Areas, and Controlled Firing Areas.

# ANALYSIS DETERMINATIONS

## TOPICS

1. Site Selection & Operational Needs
2. Aviation Regulatory Considerations
3. Local Regulations & Zoning Requirements
4. Community Effects
5. Airspace Utilization
6. Climatological Considerations
7. Safety
8. Environmental Concerns
9. Special Use Airspace Considerations

## 1. SITE SELECTION & OPERATIONAL NEEDS

The Shrub Oak International School requested an independent, qualified and unbiased professional investigation for locating a “Private” Prior Permission Required (PPR) ground based helicopter landing site at its property located at: 3151 Stoney Street, Shrub Oak, New York 10547. The helistops primary purpose is to support the schools need for emergency medical care for its students with a secondary focus on availability to first responders for local emergencies where helicopter air medical transport may be deemed necessary. The first criterion used in this selection was the overall suitability of the property for helistop development coupled with the basic operational needs as determined from the interviews and inventory process.

The initial helistop needs assessment also included the following items:

1. The helistop site should anticipate night operations at some point in the future.
2. An on-site hanger facility, fueling system and or servicing area for the helicopter at this location is not anticipated.
3. A helicopter will not be based at this facility.
4. Any community relationship and interface issues are to be included with the site selection criteria.
5. The potential helicopter sound and noise effects on the community and the immediately adjacent buildings needs to be considered.
6. For the purposes of this study the “Design Helicopter” selected was the AgustaWestland AW-139. The AW-139 maximum gross weight potential is 14,991 pounds with a rotor diameter of 45.3’ and an overall length of 54.5’. The majority of potential helicopter types and models currently in use in the local air ambulance

arena, along with civilian, and corporate industries within the region will be capable of safely operating at this facility.

Community interface issues have the greatest potential for disruption or outright failure of any heliport/helistop regulatory approval process. This will be discussed in more detail later in the report.

## **2. AVIATION REGULATORY CONSIDERATIONS**

### **Federal Regulations**

The helistop that the Shrub Oak International School is considering to establish is not covered directly by the Federal Aviation Administration Regulations, which pertain predominantly to those installations designed for Public-Use, or publicly funded heliports and helistops. The design of the helistop can, however, take full advantage of all the safety and efficiency aspects identified in the FAA guidelines. The FAA guidelines are very detailed regarding the heliport/helistop area in addition to the clear airspace which a site must possess to be considered adequate for safe helicopter operations to take place. An initial investigation of the site reveals the proposed helistop location would have the ability to meet these parameters.

The FAA will, upon the mandatory notification by the proponent of their desire to establish a helistop on or in the general area of their property, initiate an airspace study of the surrounding vicinity of the proposed site. The FAA will ascertain whether the proposed helistop, at the suggested site, would have any detrimental effects upon the safe and efficient use of the surrounding navigable airspace. After a preliminary application of the appropriate FAA airspace criteria and existing area traffic, initial indications regarding the establishment of a helistop on the grounds of the Shrub Oak International School indicates a favorable FAA determination can be anticipated.

HeliExperts recommendation is for the helistop's Touchdown and Liffoff Area (TLOF) to be 46' x 46' and designed for a minimum helicopter gross weight of 15,000 lbs.

Upon the client's decision to proceed an FAA application can be filed rather quickly using the preliminary data from this report and other available information. The processing time and site visit from an official FAA representative varies from region to region, taking from three weeks to several months. Based on past experience, our close follow-up with the regional and local FAA offices has kept this time frame to an average of 3 to 4 months on those projects with short time constraints.

### **State Regulations**

There are two primary criteria standards dealing with the oversight of privately owned airports, heliports and helistops in the State of New York that must be adhered to for any application.

The first of these is covered in the:

**State of New York Official Compilation of Rules and Regulations, Title 17, Part 75  
“Approval of Privately Owned Airports.”**

*Official Compilation Of Codes, Rules And Regulations Of The State Of New York,  
Title 17 Department Of Transportation, Chapter III Airports, Part 75 Approval Of  
Privately Owned Airports*

These rules and regulations establish the accepted definitions and meanings for all terminology to be used in the application of aviation standards in the State of New York.

Specific aeronautical definitions which are pertinent to this project are found in Section 75.1. Standards prescribed by the Commissioner of Transportation for approval of privately owned airports are found in Section 75.2. Document required by Commissioner of Transportation for investigation of airport sites are found in Section 75.3.

The second of these is covered in the:

*New York General Business Law Section 249*

**New York General Business Law Section 249**

The following is an overview of the New York General Business Law Section 249 as it pertains to the establishment of airports, heliports and helistops on private property in the state of New York. A full copy of this document can be downloaded from the New York DOT website aviation division at <https://www.dot.ny.gov/modal/aviation>

The New York General Business Law Section 249 was implemented to reduce the potential conflicts of land use and assure coordination between developments in the field of public works that could seriously impair existing federal-state highway programs.

**Establishment of or Improvement to Privately-Owned Airports**

**Step 1: Land Owner**

- Request FAA Airspace review and approval.

This is done to:

- a) Examine the potential impact on nearby aviation facilities.
- b) Reserve airspace for the airport or heliport in question.

**Step 2: Land Owner**



- Request authorization to establish the private airport or heliport from the governing body of the city, village or town having jurisdiction.

**Step 3:** The governing body of the city, village or town having jurisdiction

- Must submit a request for a determination, before granting authorization, to the Commissioner of Transportation.

This request must include:

- a) Municipal Resolution requesting determination
- b) Favorable FAA airspace approval letter
- c) Topographical map showing site
- d) Site Plan
- e) Proponents Letter of Request to Municipality
- f) Municipal Statement of owner Consent

**Step 4:** The Commissioner of Transportation

Once the Commissioner of Transportation has received the request and all required documents, an inspection of the proposed airport will be conducted with the proponent and the municipal representative.

- The Commissioner will make a determination as to whether or not the establishment of such a privately-owned airport will comply with standards.

This includes:

- a) Ensuring that operations of such airport will not conflict with or affect the safety of public buildings or facilities, or operations on public highways or waterways or that,
  - b) The volume, character and direction of traffic at such airport will not constitute a menace to the safety of operations at other airports in the vicinity.
- Once a determination has been made the Commissioner of Transportation or his designee will send a letter to the municipality with his determination.

*Note: This determination should not be construed to mean State approval of the physical development of the site as the law does not give such authority to the State.*

**Step 5:** The governing body of the city, village or town having jurisdiction

- Upon receipt of a favorable determination, the municipality may complete their actions notifying the State as to the final disposition.

### **3. LOCAL REGULATIONS AND ZONING REQUIREMENTS**

#### ***Fire Code***

Over the years, the National Fire Protection Association (NFPA) has integrated numerous common sense safety criterion based on various lessons learned from historical data which have been shown to enhance overall heliport and helistop safety throughout the United States. This not only applies to the helicopter operators and their passengers but also to the general public at large. NFPA-418, Standard for Heliports, is mandatory for all new or upgraded heliports and helistops and the Shrub Oak International School helistop will adhere to and take full advantage of all pertinent code requirements pertaining to their helistop project as outlined in NFPA-418.

As of January 2011, NFPA-418 requires a heliport/helistop to meet all relevant portions of the FAA Heliport Design Advisory Circular (FAA A/C 150/5390-2C) for both new and modified heliports and helistops. The local Fire Marshall and code officials will use this information as their guide on the physical plant and operational issues dealing with the heliport/helistop application. The latest revision of NFPA-418, which was released in January 2016, requires that the Emergency Response Plan be approved by the AHJ for which the Shrub Oak International School intends to conform.

At an appropriate date in the future, a suitable safety training presentation to the local land-use and public safety officials will be scheduled. Given the unique issues present at almost all heliports and helistops and the broad range and variety of land-use regulatory responses that have been seen in the past at other sites, a collaborative well-orchestrated effort in creating a comprehensive and well thought out safety program between all stake holders involved will be essential for success.

By experience, the indication that the Shrub Oak International School helistop may be treated as an accessory use means it is essentially a permitted use helistop, and the levels of permits required is typically at the minimal level. It is however up to the local officials to determine what exact permits, public hearings or other procedures they will require. There should be no difficulty in the recommended ground level site currently being considered being fully accepted by the FAA.

### **4. COMMUNITY EFFECTS**

A very detailed and intensive inventory of the surrounding land uses and the overall nature of the area was taken. In addition, the potential impact the helistop may have on the surrounding community was also considered.



A properly designed helistop location in conjunction with adequately designed supporting approach/departure paths to the south, northeast and northwest, should not pose any community interface issues.

Proper helistop site selection, design, and operational policies will provide for an additional reduction in any actual or perceived negative effects upon the surrounding community. A special amount of attention was given to the possible effects caused by the location proposed.

In evaluating the impact a helistop at this location may have on the local community the areas which have been identified for potential future ball fields for children's activities were reviewed. If the helistop is designed appropriately and located at the site currently being recommended the area being considered for the ball fields should not be negatively impacted by helicopter operations nor should there be any need to suspend activities during helicopter operations.

## 5. AIRSPACE UTILIZATION

### *Inventory of Current Aviation Facilities in the Vicinity*

After a detailed search of the current FAA 5010 Airport Master Record Database, there were seven (7) aviation landing facilities found to be listed within 10 nautical miles of the proposed site at the Shrub Oak International School. The nearest of these sites is Westchester Resco heliport which is located 5.1 nautical miles to the west southwest of the proposed site. All seven sites have been identified as being heliport facilities. Due to the favorable location and distances from these other seven sites, this helistop will meet all FAA requirements for airspace and there is no perceived negative impact on current airspace that will be created by establishing a helistop at this location.

### *Heliport/Helistop Airspace Requirements*

To understand what defines the required airspace needed to safely support a heliport/helistop, Federal Regulations define three specific airspace categories for a heliport/helistop.

- **Primary Surface:** The area of the primary surface coincides in size and shape with the designated take-off and landing area. This surface is a horizontal plane at the elevation of the established heliport/helistop elevation.
- **Approach Surface:** The approach surface begins at each end of the heliport/helistop primary surface with the same width as the primary surface, and extends outward and upward for a horizontal distance of 4,000 feet where its width is 500 feet. The slope of the approach surface is 8 to 1 for civil heliports/helistops.

- **Transitional Surfaces:** These surfaces extend outward and upward from the lateral boundaries of the primary surface and from the approach surfaces at a slope of 2 to 1 for a distance of 250 feet measured horizontally from the centerline of the primary and approach surfaces.

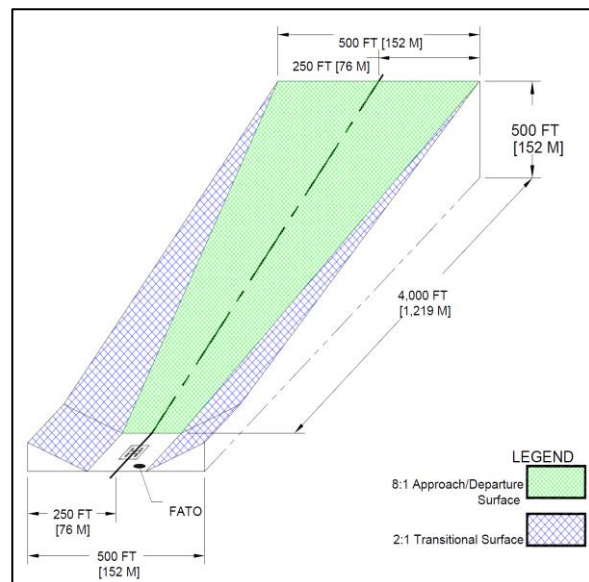
The FAA AC 150/5390-2C, Heliport Design Guide, further breaks down the “Primary Surface” into to three specific components for operational and obstruction evaluation purposes.

- **Touchdown and Liftoff (TLOF).** A load-bearing, generally paved area, normally centered in the FATO, on which the helicopter lands and/or takes off.
- **Final Approach and Takeoff (FATO).** A defined area over which the pilot completes the final phase of the approach to a hover or a landing and from which the pilot initiates takeoff. The FATO elevation is the lowest elevation of the edge of the TLOF.
- **Safety Area.** A defined area on a heliport surrounding the FATO intended to reduce the risk of damage to helicopters accidentally diverging from the FATO.

The Approach/Departure path is the flight track helicopters follow when landing at or departing from a heliport/helistop. The approach/departure paths may be straight or curved.

The two defined airspace surfaces of an approach/departure path that must be kept free of obstructions to meet FAA airspace criteria are identified in the FAA Heliport Advisory Circular, AC 150/5390 2C as the 8:1 Approach/Departure Surface and the 2:1 Transitional Surface.

The airspace surface identified as the Approach/Departure surface, is an unobstructed imaginary 8:1 (7.125°) plane starting at the edge of the FATO, at FATO height and FATO width which extends out to 4,000’ horizontally to an altitude 500’ above the horizontal FATO plane to a total width of 500’ wide.



**FAA AC 150/5390-2C Figure 2-7**  
VFR Heliport Approach/Departure and Transitional Surfaces.

The airspace surface identified as the transitional surface, is an unobstructed imaginary 2:1 (26.5°) plane surrounding the FATO which starts at the edge of the FATO at FATO height extending out to 250’ horizontal in a 360° arch from the center of the FATO which

includes that area which is parallel to the 8:1 approach/departure surface within 250' of either side of the approach/departure center line and extends along the entire length of the 4,000 feet of the approach/departure path.

## ***Airspace Rights & Ownership***

In the United States property rights of an owner go from the ground level up to infinity. The U.S. Government, with the FAA being the designated agency, oversees all airspace not occupied by a structure. The FAA sets criteria for obstructions within airspace for the general public.

The FAA requires notice for all structures greater than 200' above ground level as well as other lower structures close to public or military facilities. The FAA "DOES NOT" require notice for structures in the vicinity of private airports, heliports and helistops with the exception of those facilities having an instrument procedure associated with them.

FAA determination related to obstacles on private property is advisory only. Hence, compliance by the FAA is "NOT" required in the cases of private facilities.

If the obstacle is a radio tower or another transmitter platform an FCC license is required. The FCC requires that applicants follow the FAA guidelines and have a "No Objection" Determination from the FAA. If the structure is allowed by the local zoning and building code authorities, (to include variances) the FAA "CANNOT" and "WILL NOT" prevent construction.

Many local land-use authorities require an FAA determination to be sought and complied with for issuing zoning and building permits. It is therefore the local authority who is the enforcer in these instances and not the FAA, but only to the extent provided for by law and local land use zoning criteria.

## ***Airspace Protection***

To protect the airspace of a private use heliport/helistop the owner has two general courses of action at their disposal. The first being the adoption of local zoning rules by the local regulatory body that would restrict the height of any future building/object construction within the designated supporting airspace of the heliport/helistop in question. General guidance on drafting an ordinance that would limit building and object heights can be found in FAA Advisory Circular AC 150/5190-4, A Model Zoning Ordinance to Limit Height of Objects Around Airports.

The second option to protect private use airspace is the adoption of air rights and property or "Avigation Easements". An Avigation Easement is a conveyance of airspace over another property for use by the heliport/helistop. The owner of an easement-encumbered property (servient property) has restricted use of their property subject to the heliport/helistop sponsor's easement (dominant property) for overflight and other applicable restrictions on the use and development of the servient parcel.

Easement rights acquired typically include the right-of-flight of aircraft; the right to cause noise, dust, etc.; the right to remove all objects protruding into the airspace together with the right to prohibit future obstructions or interference in the airspace; and the right of ingress/egress on the land to exercise the rights acquired. The aviation easement on the property shall “run with the land” and any future owner’s use of the servient parcel is also restricted as described in the aviation easement.

It is the same basic legal agreement one would use for a driveway or other easement but in this case it deals with a three-dimensional corridor in the air and not on the ground.

The grantor of the easement in this case does not control the airspace, only the FAA is allowed to control airspace in the U.S. for the benefit of the general public. The easement is an agreement that the owner of the property will not erect any structure(s) within that desired airspace, hence waiving their right to the development of said airspace.

The use of air rights and property easements are viable options that can help to “Reserve” a heliports/helistop supporting airspace to prevent the encroachment of obstacles in the vicinity at a future date.

## 6. CLIMATOLOGICAL CONSIDERATIONS

Of primary importance in selecting an appropriate site for an aeronautical facility are the prevailing winds, cloud cover and horizontal visibility. The prevailing winds greatly influence the approach and departure routes to and from a facility. The general orientation of the touchdown area is, to some degree, related to the prevailing wind direction. The historic wind data for the general area indicates the suggested helistop site and plans are compatible with the prevailing winds.

Cloud cover and visibility can, of course, affect the operation significantly. The location and design of the helistop take advantage of these Climatological considerations and no problems are perceived in this area. If the weather conditions are such to pose a safety or comfort issue, flights will either be turned down prior to acceptance or canceled enroute by the pilot in command.

## 7. SAFETY

The proposed location possesses all of the components which meet or exceed the recognized safety standards of the FAA, State of New York, Town of Yorktown and the aviation industry in general. This includes the complete compliance with the NFPA-418 and adopted local building codes and standards.

The FAA completed a study in August of 1991 entitled “Analysis of Helicopter Accident Risk Exposure at Heliports, Airports and Unimproved Sites” FAA /RD 90/9. The results of this study statistically derived that there is a once in every 432-year probability exposure of a helicopter accident in a community where a heliport is located. Using NTSB

(National Transportation Safety Board) and FAA real-life historical heliport safety data on over 40 years of records for properly designed and operated private use heliports/helistops of the type considered here; those facilities have had a PERFECT safety record as it relates to physical risk to any members of the general public or anyone in the surrounding community.

## 8. ENVIRONMENTAL CONCERNS

### Exhaust Emissions, Dust and Lights

Today's modern aircraft, such as the helicopters that would operate at the proposed facility, are powered by gas turbine engines which produce very few pollutants. Much of this is due to the engine's high combustion temperatures and its ability to burn fuel very efficiently.

Due to the low amount of emissions from helicopter turboshaft engines, the most widely used, these engines are exempt from Engine Emission Certification requirements of the Federal Aviation Administration and Foreign Civil Aviation Authorities specified in the Federal Aviation Regulations (FARS) and the International Civil Aviation Organization (ICAO) Annex 16 Volume II.

In layman's terms, the exhaust of the helicopter is essentially invisible and due to the temperature difference with the surrounding air it rises and dissipates very rapidly. Another major factor is the natural dispersal of helicopter exhaust both by the helicopter's relative distance from members of the general public and the subsequent effect the rotor system has on the exhaust itself.

While there is minimal odor associated with the exhaust, it is detectable only while the helicopter is on the helistop and then only within a few feet of the helicopter. Under all proposed conditions, no member of the surrounding communities would be normally aware of any odors or effects from the exhaust emissions during the operation of the proposed helistop.

While helicopter exhaust is an issue that needs to be inventoried in regards to a building's HVAC system, there is methodology within conventional HVAC technology that has had success in mitigating the helicopter exhaust ingestion issue when necessary. This is an issue that all elevated or even ground based heliports/helistops in close proximity to buildings need to take into account.

The approach/departure paths for the helicopter at an average climb/approach speed of 70 mph has the helicopter spending less than 45 seconds in the climb out or approach phase of normal flight. A truck would need about two minutes for travel by roads to cover the same approximate distance providing there were no stops for traffic or traffic signals.

The helicopter does not discharge or leak any oil or fuel in the normal course of operation. The likelihood of any fuel spill is very remote. All of the fuel discharges on records of the



FAA and NFPA have been associated with fueling or maintenance operations, which will not occur at this location.

There are no lights associated with the helistop that will create a beam of light offsite. The windsock lights, obstruction lights and the helistop perimeter lights are designed to be glare-free and not produce any direct “beams” of light for illumination off the helistop. The helistop lights will be limited to the small period of time the helistop is actually in use.

## **Noise & Acoustic Considerations**

The sound level of the helicopter that would utilize the proposed facility is far below that of many accepted noise producers in the surrounding environment. Trains, jet airliners, ships, lawn equipment, leaf blowers, chain saws, tractors, irrigation pumps, vacuum cleaners, hair dryers, motor cycles, buses, trucks, and cars all regularly produce noise levels higher than that which the average person would perceive when they hear a helicopter.

The relative distance, nature and intensity of the noise generated, height above the ground, type and vintage of the aircraft, sound attenuation factors of the terrain between the source and the receptor are all factors in the way sound is perceived. Older, heavier military helicopters are very different from the more modern, light, efficient and much quieter civil helicopters utilized by the vast majority of air ambulance, corporate and executive helicopter transport community.

It must be kept in mind that the proposed helicopter activity represents an extremely transitory sound in nature. The entire sound event only last for approximately 45-60 seconds either on landing or takeoff. At any one point along the flight route, providing the observer is close enough to hear or notice it, the helicopter will typically only be heard for about 20 seconds or less. This compares very favorably with sounds already found in most metropolitan, urban and neighborhood settings. The sounds from a well-planned landing area that have appropriately factored in distances in its site selection can result in the sound level at sensitive receptors being typically equal to or less than the current sounds already in the community.

There are few active recreational or transportation activities in the modern world that are completely silent. Historically, the vast majority of heliports/helistops do not have any detrimental quality of life issues with the neighboring land-uses.

## **9. Special Use Airspace Considerations**

Based on current FAA navigational charts and publications the proposed location at the Shrub Oak International School does not reside within any FAA designated Prohibited, Restricted, Military Operations or Temporary Flight Restricted Area. Based on early findings and our assessment of the site location, a favorable airspace determination letter from the FAA is anticipated.





# RECOMMENDATIONS

## SUMMARY

The following is an Executive Summary pertaining to the feasibility and site selection study and design considerations conducted by HeliExperts International LLC for a proposed Private-Use, ground based, Prior Permission Required (PPR) helistop to be incorporated on the grounds of the Shrub Oak International School located at; 3151 Stoney Street, Shrub Oak, NY 10547.

## SITE SELECTION

At the request of the Shrub Oak International School, HeliExperts International LLC evaluated several locations located on the Shrub Oak International Schools property and has, in collaboration with executive member's input, identified the primary site for development. Standards used to evaluate the site included all applicable Federal, State and local regulatory and code standards as well as criteria for safety, functionality, longevity and proximity to adjacent properties.

## HELISTOP LOCATION

The proposed helistop site involves a ground based position situated on the Shrub Oak International School's property just south of the main building approximately 275'. The approximate location of the center of the heliport is estimated to be:

- Latitude: N – 41° 18' 31.03"
- Longitude: W – 073° 50' 12.23"

## HELISTOP DIMENSIONS

The size of the helistop and its supporting airspace i.e. TLOF, FATO and FATO Safety Area encompasses the following dimensions as outlined by the FAA in their Heliport Advisory Circular, AC 150/5390-2C:

- Touchdown and Liffoff Areas (TLOF): 46' Diameter
- Final Approach and Takeoff Area (FATO): 85' Diameter
- FATO Safety Areas (FSA): 115' Diameter

*\*Note: Nothing is allowed to penetrate the horizontal plane that constitutes the TLOF/FATO horizontal surface area except the perimeter lighting, which can only extend to a maximum height of 2" above the horizontal TLOF/FATO plane.*



## HELISTOP AIRSPACE

The proposed site location is capable of supporting three fully compliant standard approach/departure flight paths. One to the south, one to the northeast and one to the northwest. All three will meet the requirements set forth by the FAA for private-use heliport/helistop facilities. Having three approach/departure paths in this manner will help assure accommodating utilization capabilities during varying wind conditions.

The predominant winds, based on historical data obtained from the National Oceanic and Atmospheric Administration (NOAA) that was taken between 2002 and 2011 at the Westchester County Airport show specific concentrated wind directions from the Northwest. This will favor an approach path from the south and a departure path to the northwest during these conditions.

The prospective ground based helistop located on the Shrub Oak International School property presents an excellent location which will allow for excellent access to emergency vehicles and first responders as well as the main building and other surrounding local sites.



## CONCLUSION

HeliExperts feasibility and site selection study has concluded that the selected location, with management's approval and appropriate site decisions, can lead to a safe cost-effective private use ground based helistop at this location. The required operational and safety plan and training that will be instituted at this location will meet all Federal, State and Local requirements as well as industry best practices.

Key elements for this to be accomplished include the following:

- A properly designed site and helistop to support the prescribed dimensions and weight of the design helicopter.
- A helistop who's TLOF is slightly elevated above the surrounding area so as to allow for clear airspace within the vicinity of the helistop to the extent feasible.
- Adherence to all pertinent design, training and operational standards and criteria as outlined in the International Building Code, International Fire Code, and National Fire Protection Association standard for heliports. This includes all applicable Federal Aviation Administration regulations and guidance as well as identified industry best practices recommendations.

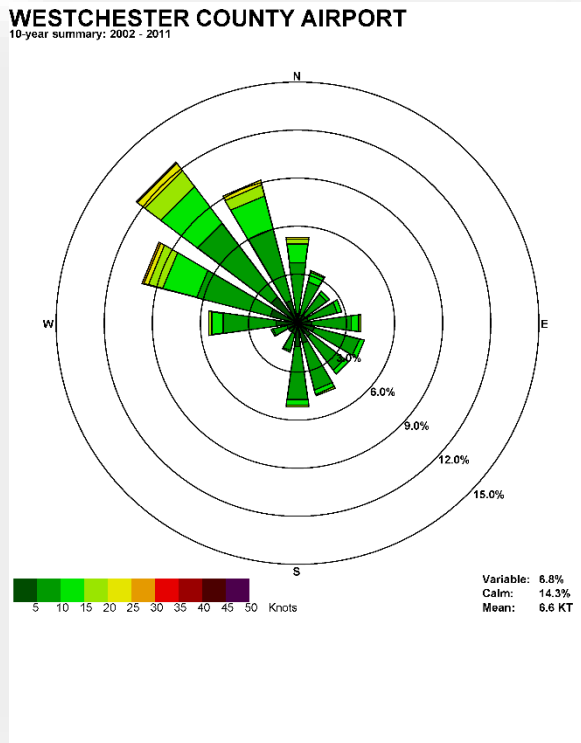
Respectfully Submitted By

Raymond A. Syms  
HeliExperts International LLC  
Aeronautical Consultant

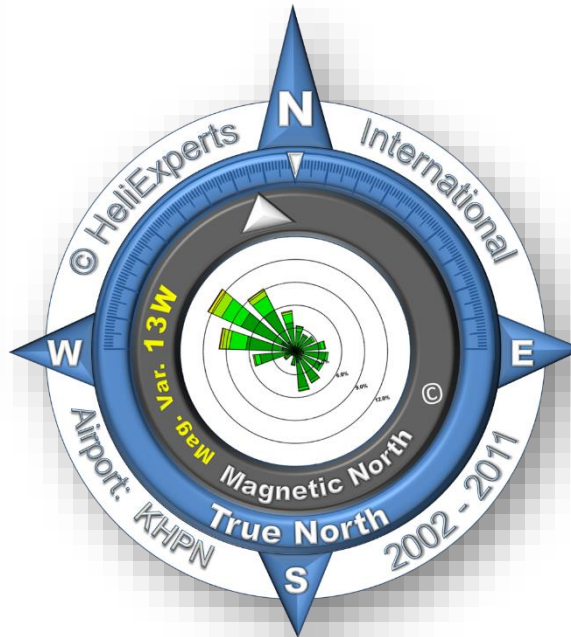
Rex J. Alexander  
HeliExperts International LLC  
Aeronautical Consultant

# Shrub Oak International School Feasibility & Site Selection Report: 4/4/2017

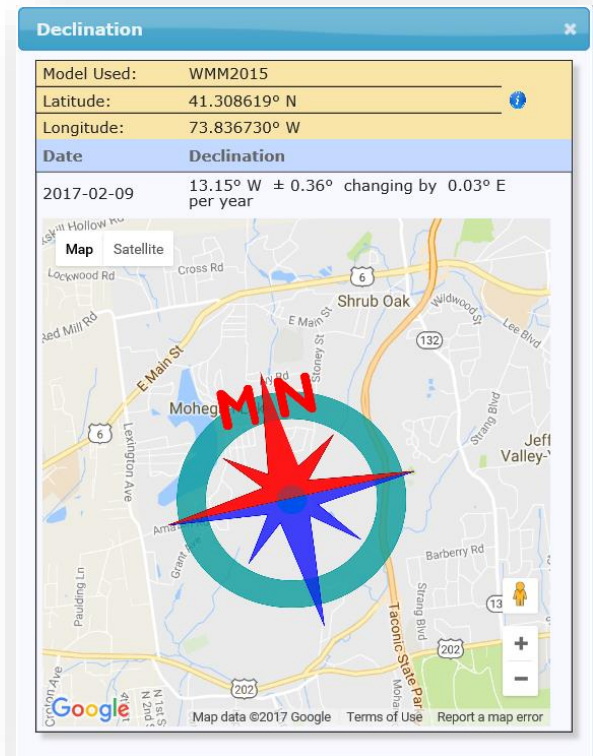
## Exhibit-A: Local Wind Patterns at Westchester Airport (2002-2011) & Local Magnetic Declination



Local wind speed and direction variability  
10-year summary from NOAA



HeliExperts site specific Wind & Compass  
Rose for both Magnetic and True North



Site magnetic declination as of 8/27/2016

## Shrub Oak International School Feasibility & Site Selection Report: 4/4/2017

### Exhibit-B: Inventory of Local Airports and Heliports Within 10NM

There are 7 Heliports (Public, Private and Military) on record and listed in the FAA 5010 Airport Master Record database located within a 10-nautical mile radius of the Shrub Oak international School proposed heliport site located at:

Address: Shrub Oak International School  
3151 Stoney Street  
Shrub Oak, NY 10547

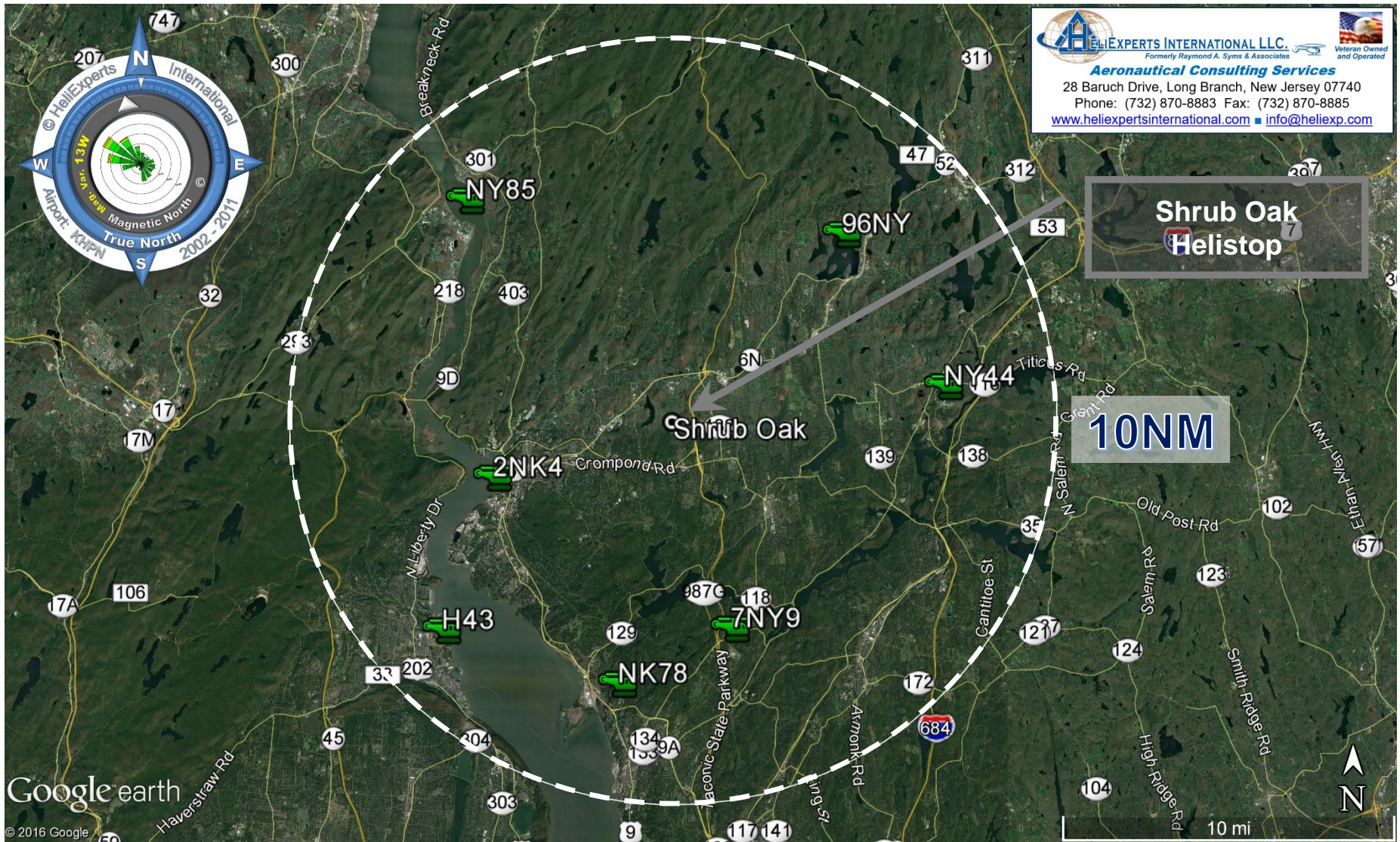
Coordinates: Latitude: N – 41° 18' 31.03"  
Longitude: W – 073° 50' 12.23"

ID	CITY	AIRPORT NAME	WHERE
2NK4	PEEKSKILL, NY	WESTCHESTER RESCO HELIPORT	5.1 nm WSW
7NY9	YORKTOWN, NY	YORKTOWN HELIPAD HELIPORT	6.1 nm SSE
96NY	CARMEL, NY	MASSARO HELIPORT	6.2 nm NE
NY44	SOMERS, NY	SOMERS HELIPORT	7.1 nm E
NY85	WEST POINT, NY	UNITED STATES MILITARY ACADEMY HELIPORT	7.5 nm NW
NK78	OSSINING, NY	GE MANAGEMENT DEVELOPMENT INSTITUTE HELIPORT	7.5 nm S
H43	HAVERSTRAW, NY	HAVERSTRAW HELIPORT	8.5 nm SW



# Shrub Oak International School Feasibility & Site Selection Report: 4/4/2017

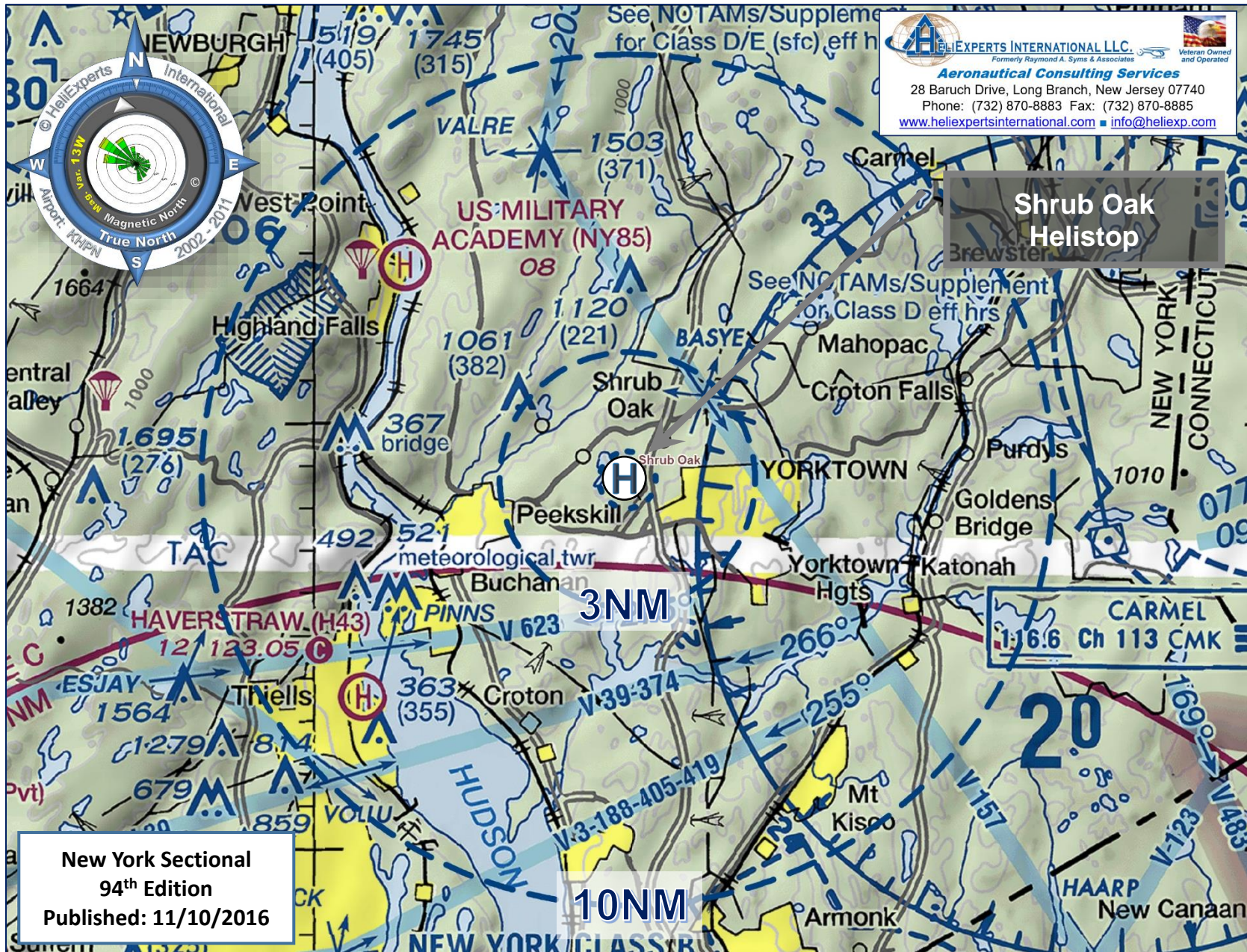
## Exhibit-C: Inventory of Local Airport & Heliports within 10NM





# Shrub Oak International School Feasibility & Site Selection Report: 4/4/2017

## Exhibit-D: Local Airspace Overlay (New York Sectional)





# Shrub Oak International School Feasibility & Site Selection Report: 4/4/2017

## Exhibit-E: Supporting Airspace for VFR Approach/Departure Paths



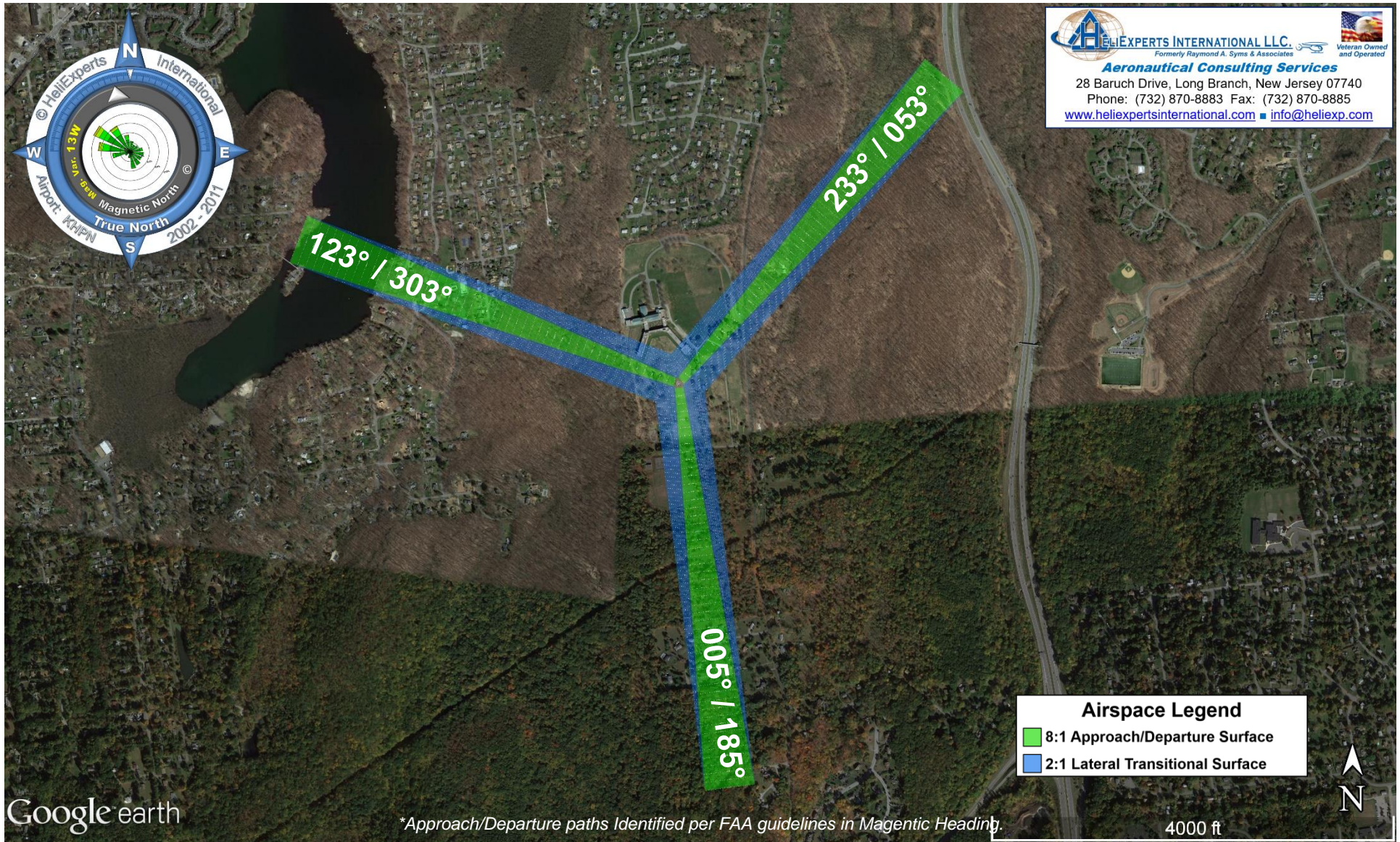
Supporting Airspace for Suitable App/Dep Paths

4000' Radius



# Shrub Oak International School Feasibility & Site Selection Report: 4/4/2017

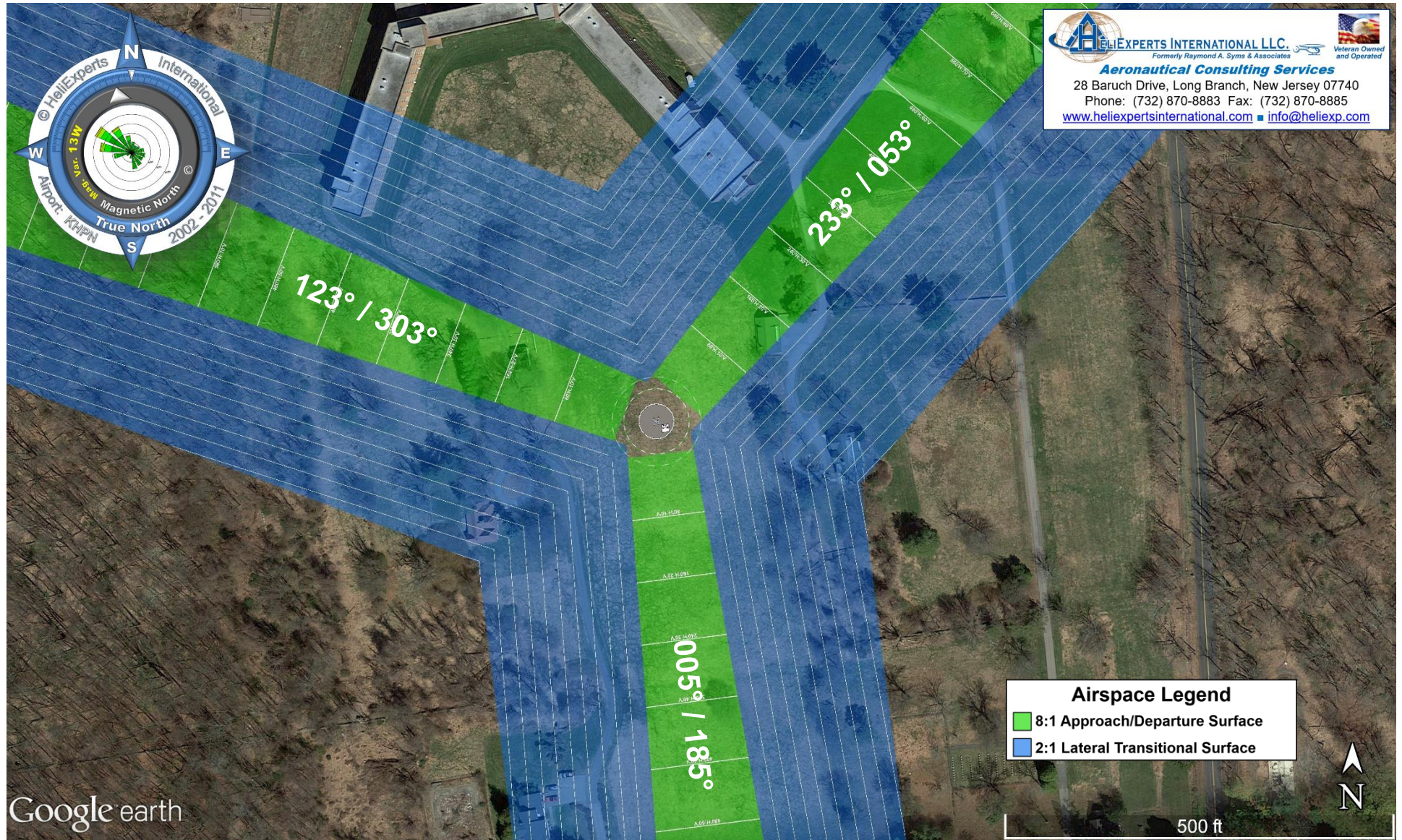
## Exhibit-F: Proposed Approach/Departure Paths Airspace Overlay (High Altitude View)





# Shrub Oak International School Feasibility & Site Selection Report: 4/4/2017

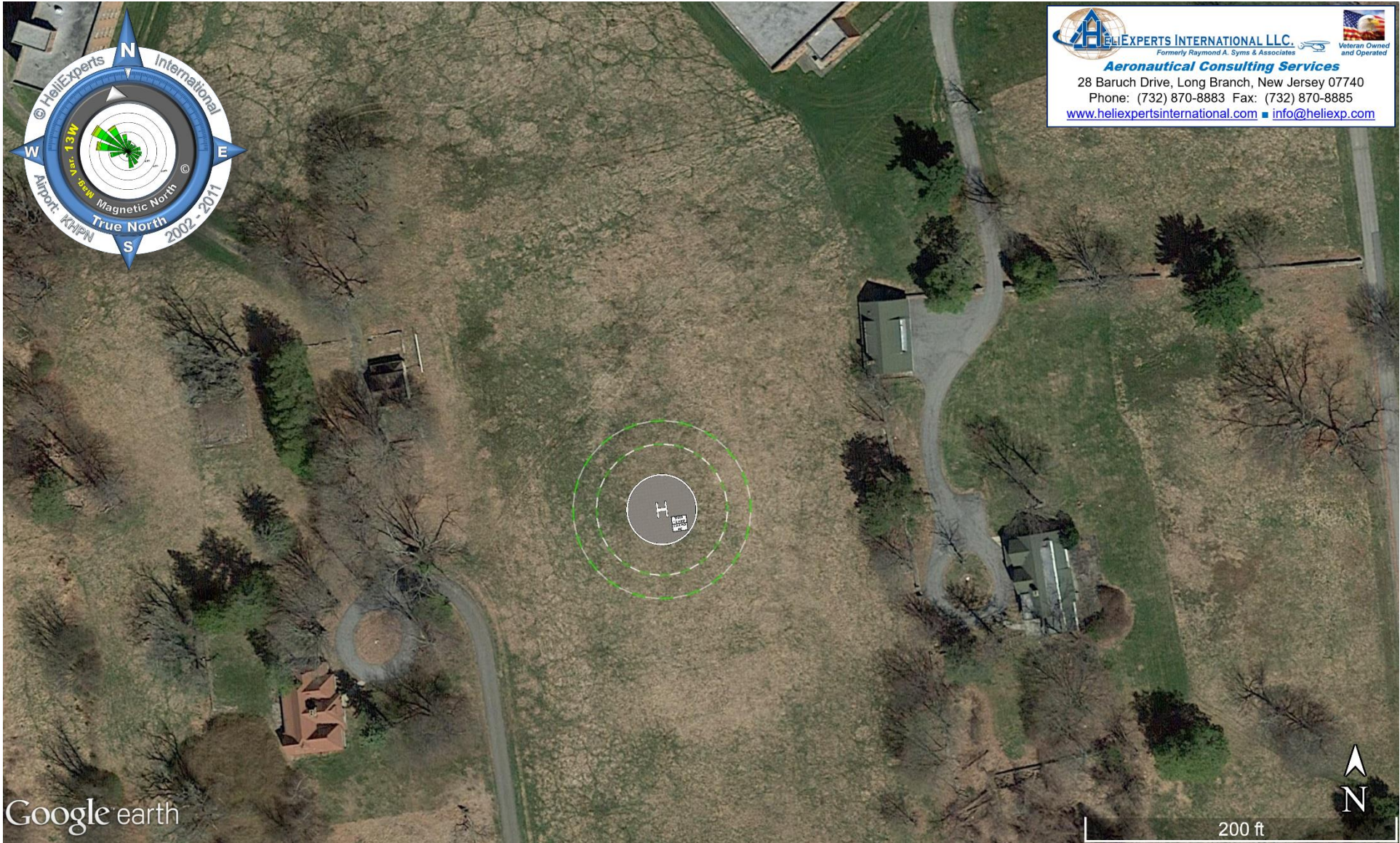
## Exhibit-G: Proposed Approach/Departure Paths Airspace Overlay (Low Altitude View)





# Shrub Oak International School Feasibility & Site Selection Report: 4/4/2017

## Exhibit-H: Proposed Helistop Site Orientation and Dimensional Integration





# Shrub Oak International School Feasibility & Site Selection Report: 4/4/2017

## Exhibit-I: Proposed Helistop Layout

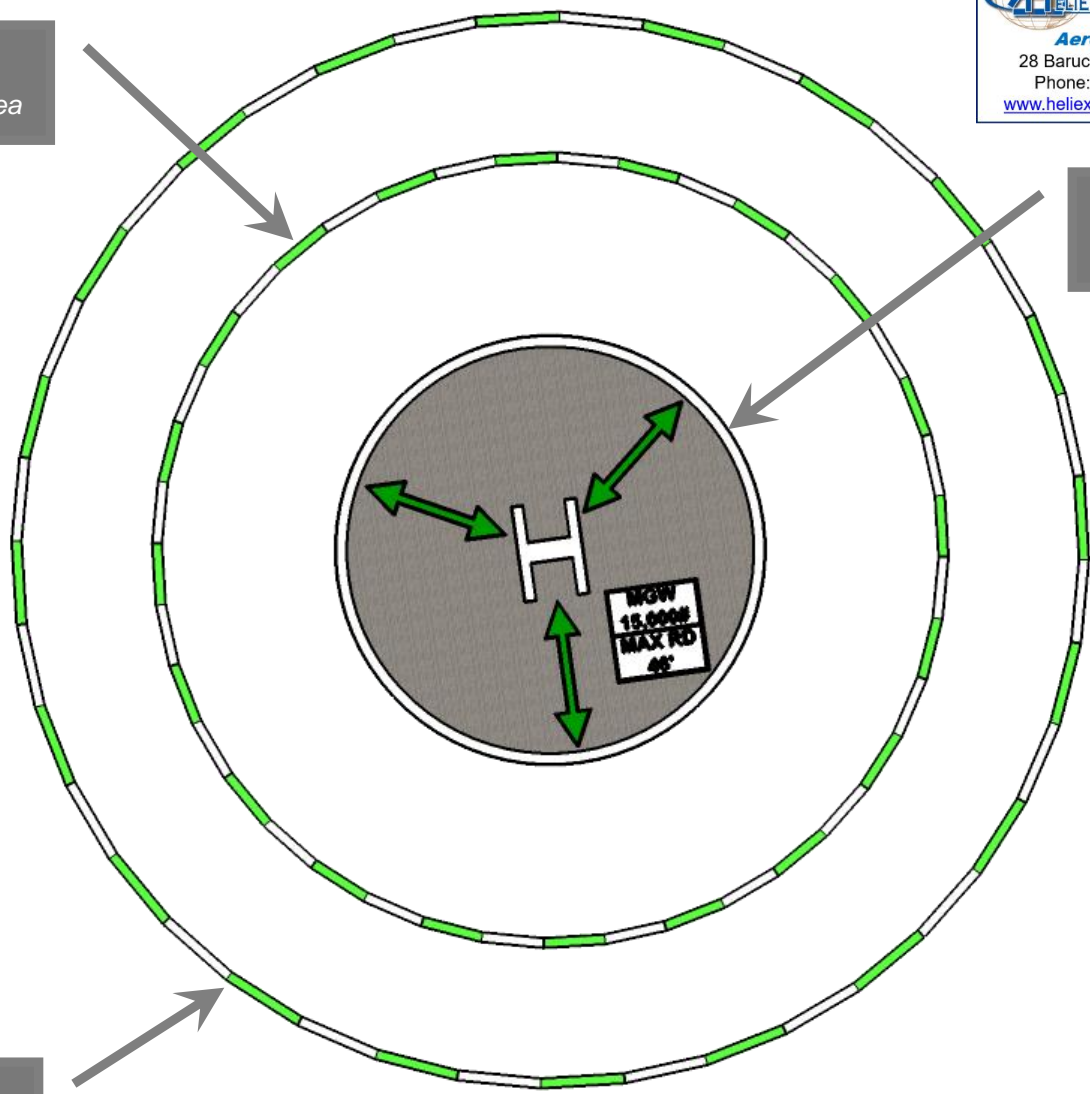


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**85' FATO**  
Final Approach & Takeoff Area

**46' TLOF**  
Touchdown & Liftoff Area



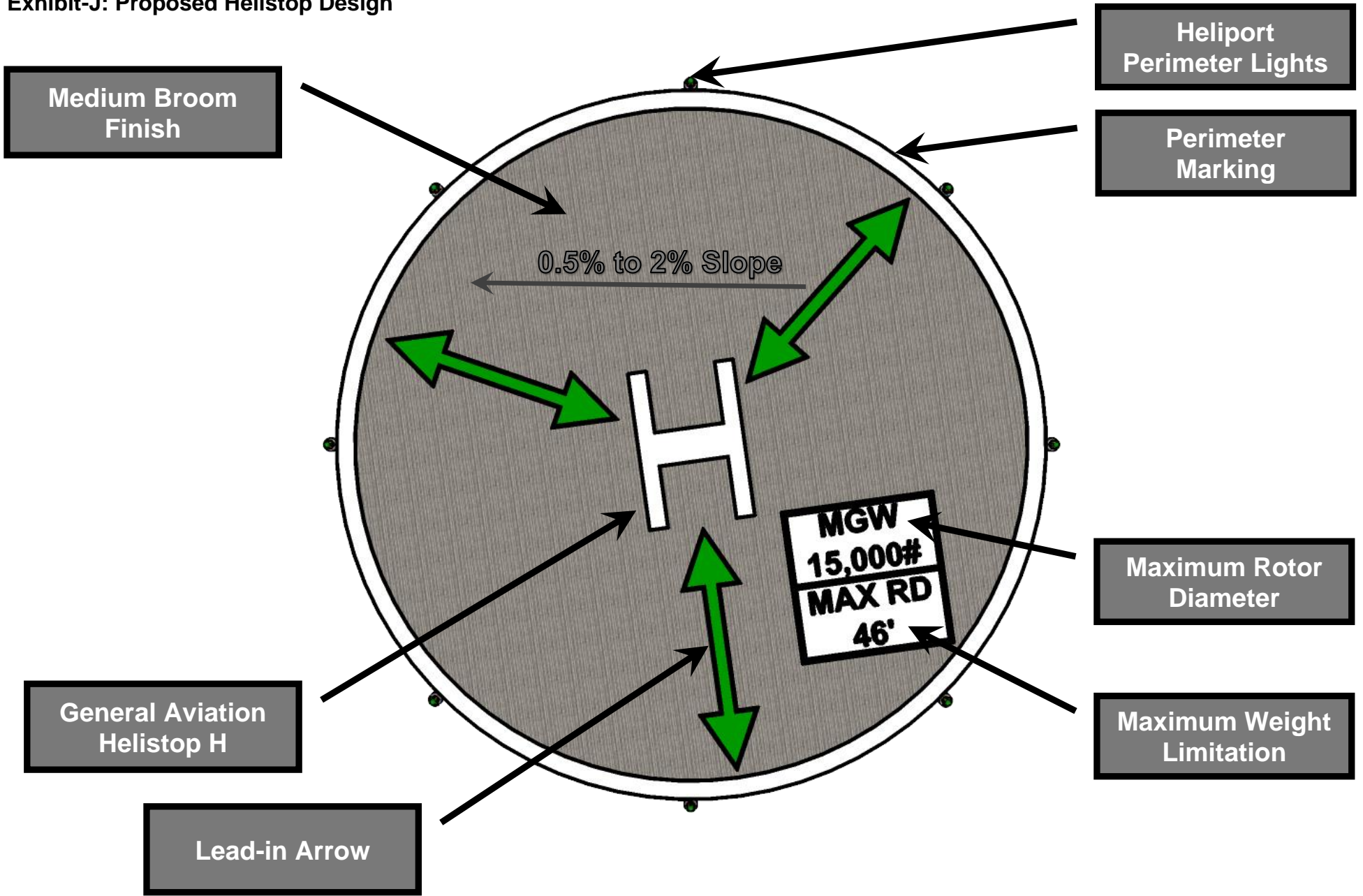
**115' Safety Areas**

*\*Green & White FATO and Safety Area lines for reference only*



Shrub Oak International School Feasibility & Site Selection Report: 4/4/2017

Exhibit-J: Proposed Helistop Design



## Exhibit-K: REFERENCES

Following are pertinent Regulations, Codes, Advisory Circulars, Guidelines, References and White Papers that should be consulted when designing, creating and maintaining a safe and efficient heliport or helistop. While this list is comprehensive, it should by no means be considered a complete list of all applicable codes, regulations and best practices.

- 14 CFR Part 77
  - 14 CFR Part 91
  - 14 CFR Part 135
  
  - 14 CFR Part 157
  
  - AIM
  - FAA FSIMS 8900.1
  - FAA AC 70/7460-1
  - FAA AC 150/5220-16
  
  - FAA AC 150/5190-4
  - FAA AC 150/5390-2C
  - FAA AC 150/5345-12
  - FAA AC 150/5345-27
  - FAA AC 150/5345-39
  
  - FAA AC 150/5345-46
  - IBC
  - IFC
  - NFPA 10
  - NFPA 72
  - NFPA 99
  - NFPA 418
  - ISO 31000:2009
  
  - OSHA 1910.95
  - OSHA 1910.132
  - IS-BAO Standards
  - IBAC Standards
  - CAMTS Standards
  - NEMSPA Heliport Safety Guide
  - AMSAC Recommended Practices
  - Air Medical Journal / AMJ
- Safe, Efficient Use and Preservation of the Navigable Airspace.  
General Operating and Flight Rules.  
Operating Requirements: Commuter and on demand operations and rules governing persons on board such aircraft.  
Notice of Construction, Alteration, Activation, and Deactivation of Airports.  
Aeronautical Information Manual  
Vol 8, Ch 3, Sec 3, Evaluation and Surveillance of Heliports  
Obstruction Marking and Lighting  
Automated Weather Observing Systems (AWOS) for Non-Federal Applications.  
A model Zoning Ordinance to Limit Height of Objects Around Airports  
FAA Advisory Circulars on Heliports Design  
Specifications for Airport and Heliport Beacons  
Specifications for Wind Cone Assemblies  
FAA Specification L-853, Runway and Taxiway Retroreflective Markers.  
FAA Specification for Runway and Taxiway Light Fixtures.  
International Building Code  
International Fire Code  
Standard for Portable Fire Extinguishers  
National Fire Alarm and Signaling Code  
Standard for Health Care Facilities  
Standard for Heliports  
International Organization for Standards Risk Management Principles and Guidelines  
Occupational Noise Exposure  
Personal Protective Equipment, General Requirements  
International Standard for Business Aircraft Operations  
International Business Aviation Council  
Commission on Accreditation of Medical Transport Systems  
National EMS Pilots Association  
Air Medical Safety Advisory Council  
AMJ Articles
- "Delay in ED Arrival Resulting from a Remote Helipad at a Trauma Center"/ By; Brooke Lerner, October-December 2000 issue.
  - "Hospital Helipads and the Emergency Medical Treatment and Active Labor Act" / By Steven S Andrews, MD, May-June 2005 issue.
  - "For Emergency Medical Service Helicopter Plots, All Wind Is Local" By Bruce R. Robinson & David Johnson, September-October 2009.