MILLARD TOWERS LTD.

KEEPING THE WORLD ON COURSE SINCE 1951!

10 YEAR WARRANTY + OVER 60 YEARS EXPERIENCE

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Established in 1951, Millard Towers Limited (Canada) has been supplying the world with frangible aviation masts for over 60 years. The design was invented by a pilot, Mr. John Millard, who recognized the need for a safe approach light system without compromising integral performance. Millard's design would later be used as the ICAO standard for frangible design and testing.

Today, Millard engineers frangible masts for airside applications where accidental impact is a risk. The masts are favoured for their reliable safety, simple construction and uncompromised durability in all climatic conditions, particularly regions with high wind, ice, UV and saltwater exposure.

Applications:

- Approach Lights
- AWOS / Anemometers
- Windsocks
- ILS Glide Path
- ILS Localizers
- Near-Field Monitors
- Far-Field Monitors
- DME Antennas
- RVR Sensors
- Communication Antennas
- MLAT Systems
- Floodlights
- Surveillance Cameras
- Hazard Beacons
- Custom

Millard developed the world's first frangible mast in 1951, over 50 years prior to the release of ICAO Doc 9157. In fact, images of Millard masts being tested are included in the ICAO document as examples of proper frangible design and testing.

Millard builds all of its frangible masts in compliance to ICAO Doc 9157 AN/901 Part 6, Frangibility. Masts' frangibility has been confirmed by 3rd party full-scale impact testing. In addition to the testing, every project is custom engineered to ensure that only masts of minimum mass are used based on the equipment to be mounted and site-specific wind and ice conditions.

For the over 60 years Millard masts have been used at airports, over 40 accidents have occurred involving direct impact between the aircraft and the mast(s). In each impact, Millard masts failed as engineered by safely giving way without risk of secondary impact. What is even more impressive is the range of aircraft and applications involved in the accidents – from private pleasure crafts to commercial airliners and from approach lamps to ILS localizers.

Millard Aluminum masts offer unique advantages that make it the economical choice for all airfield operations:

SAFE

The only mast to achieve frangibility by yielding causing no risk of secondary impact and no requirement for breakaway cabling. Also, mast is made from Aluminum (non-ferrous material) and therefore, non-sparking.

DURABLE

Rugged Aluminum construction is maintenance free and built to withstand extreme temperature, saltwater and UV exposure. Typical lifespan is 30 years.

STRONG

Stringent wind and ice loading and deflection criteria are calculated for each project to ensure masts are engineered to perform as required.

SIMPLE

The lightweight modular design goes together simply minimizing in-field assembly. Sections weigh between 3kg and 12kg per meter.

SERIVCEABLE

Tilt base and center hinge designs provide enhanced serviceability without compromising frangibility or user safety. Tilting features are renowned for their simple construction and ease of use.

GREEN

Aluminum masts are 100% recyclable and ideal for airports looking to increase their environmental compliance. For every Millard mast that is recycled, two to three (2-3) fibreglass (GRP) masts end up in landfills.

Located at the end of runways where accidental impact is most likely to occur, Millard masts are yielding, but rigidly support approach lights to ICAO deflection criteria. Service-ability features are simple and do not compromise safety or durability. A tilt base feature allows for installation without a crane, while a center hinge design provides a mechanical, safe and easy alternative to bucket truck lamp mainte-nance.

Millard offers two designs – single lamp and lightbar - to ensure that masts are of minimum mass as ICAO specified. Triangular sections are used for single steady-burning, flasher and ODAL lamps. Square sections are used for crossbar positions where multiple lamps must be fitted on a single lightbar up to 6 metres in length. The modular design is well-suited for all approach configurations – Barrette Centreline, Calvert, ALSF, MALSR, SSALR, Simple, etc. All masts provide in-field lamp height adjustment of ±400mm.

Standard systems up to 14m. Solutions provided up to 60m. Custom wind and ice loading is available.

The strong Aluminum structure is resistant to corrosion and is well-suited to providing decades of reliable performance in even the most demanding conditions, particularly environments with extreme UV and saltwater exposure. The unique lattice structure provides support for mounting various equipment and junction boxes without the need for special hardware or added bracing. Masts can also come equipped with optional tilt base or center hinge to provide installation and servicing that requires nothing more than basic hand tools. The center hinge design is a favourite for accessing equipment on a frequent basis.

Standard systems of 2.25m, 3m, 6m and 10m are available for both standard (170km/h) and heavy (250km/h) wind loads. Custom designs and mounting brackets are available.

Millard's frangible windsock system is a safe alternative to traditional pole designs. Lattice masts offer strong, long-lasting performance and optional tilt base or center hinge provides simple, safe servicing. Millard is able to supply the complete system including 120V, 220V, 240V and 6.6A electrical configurations. Fabric windsocks are triple-stitched polyurethane nylon and come in variety of colours and configurations. A patented swivel system utilizes high-grade bearings and brushes ensuring a lifetime of reliable performance.

Masts are available in standard heights of 3m and 6m with other heights available upon request. LED and solar options are also available.

Millard offers a complete line of ILS masts engineered to meet the stringent deflection criteria of critical ILS equipment. Masts are engineered to site-specific conditions ensuring masts provide rigid, reliable performance in even the most demanding environments regardless of UV and saltwater exposure. Masts comply with ICAO Doc 9157 AN/01, Chapter 6: Frangibility and has been confirmed through 3rd party full- scale impact testing.

GLIDE PATH

Masts are built as either double or triple mast structures and come equipped with a ladder for servicing. The rigid Aluminum structure provides minimal deflection while strongly supporting antennas, cabling and other accessories. Sections come pre- fabricated requiring little in-field assembly.

Masts are available in 0.75m increments up to 18m. Mounting brackets are also available.

LOCALIZER

Millard masts offer rigid support for localizer systems ensuring stringent deflection criteria is met. The lightweight modular design is quick and simple to install. Also, antennas can be easily integrated onto masts.

Masts are available to required height. Mounting brackets are also available.

NEAR-FIELD MONITOR

Millard's Near-Field Monitor design is lightweight, yet rigid. Millard's Near-Field Monitor Adaptor allows the antenna to be fitted to the mast and adjusted up to 6m quickly and easily. Available tilt base provides simple installation and optional center hinge offers safe mechanical lowering of the mast.

Masts are available to required height. Near- Field Monitor Adaptor included. Tilt base and center hinge options available.

FAR-FIELD MONITOR

Like the Near-Field Monitor, the Far-Field Monitor is lightweight, but rigid providing reliable performance in all weather. Tilt base and center hinge options allow for simple installation and servicing. An adjustable adaptor allows the antenna to be quickly adjusted in- field up to 800mm.

Masts are available to required height. Far-Field Monitor Adaptor included. Tilt base and center hinge options available.

DME ANTENNA

As with all of Millard's ILS masts, the DME mast provides rigid performance and complies with frangibility standards. An optional tilt base allows the antenna to be installed from the convenience of the ground and afterwards, the lightweight mast can be easily raised into place. A DME antenna mounting plate is included for seamless integration with the mast.

Masts are available to required height. DME Antenna Mounting Plate included. Tilt base option available.

The modular design of Millard masts makes it an ideal solution for any application. Millard engineers ensure that the design meets customer specific criteria and location wind and ice loads. The rigid lattice structure provides a universal mounting surface for any equipment and uses standard hardware widely available. Millard also offers design and fabrication of custom mounts and system interfaces.

Other Applications include:

- Communication Antennas
- MLAT Systems
- Floodlights
- Surveillance Cameras
- Hazard Beacons
- WiFi

MILLARD REFERENCE LIST

Millard has installations at over 300 airports in over 40 countries. Around since 1951, Millard has replaced many original sites over 40 years later – a testament to the quality Millard has become renowned for.

Afghanistan – Various Military Sites
Angola – Luanda
Argentina – Iguazu Falls
Bermuda – Hamilton
Canada – Calgary
Canada – CFB Alert
Canada – Edmonton
Canada – Halifax
Canada – Montreal
Canada – Ottawa
Canada – St. John's
Canada – Toronto
Canada – Vancouver
Canada – Military Bases
Canada – Mine, Oil & Resource Sites
Cayman Islands – Grand Cayman
Chile – Antofagasta
Chile – Valdivia
China – Jiuhua
China – Lincang
China – Nanshan
Curacao – Willemstad
Hong Kong – Chep Lap Kok
Indonesia – Babullah
Indonesia – Juwata
Indonesia – Kalimarau
Israel – Tel Aviv
Italy – Cagliari
Italy – Forli
Italy – Pisa
Italy – Torino
Italy – Various Military Sites
Kazakhstan – Taldykorgan
Kazakhstan – Taraz
Malaysia – Kuala Lumpur
Maldives – Male
New Zealand – Ohakea Air Force Base
Nigeria – Gombe
Peru – Cuzco
Poland – Lublin
St. Vincent & the Grenadines – Kingstown
Sierra Leone – Freetown
Taiwan – Taipei
United Kingdom – Birmingham
United Kingdom – RAF Barkston Heath
Uruguay – Santa Bernardina
U.S.A. – Akron-Canton
U.S.A. – Eglin AFB
U.S.A. – Fort Bliss
U.S.A. – Various USAF Sites
U.S.A. – Wilmington
Vietnam – Cam Ranh
Vietnam – Can Tho
Vietnam – Da Nang
Vietnam – Phu Quoc
Vietnam – Tan Son Nhat