

CHAPTER 2- INVENTORY OF EXISTING FACILITIES

This chapter documents the existing facilities and infrastructure that support the Airport, management structure, and a description of the Airport setting for the purposes of providing a comprehensive foundation from which facility requirements and improvement recommendations will be made. An on-site inventory of Airport facilities was conducted on August 14, 2018 to supplement information previously obtained through a review of Airport drawings, previous reports, and interviews with airport management and the Client Group. See Figure 2-1 and Sheet 3 of the Airport Layout Plan (ALP) for a depiction of existing facilities.

2.1 GEOMETRY AND DESIGN STANDARDS

FAA AC 150/5300-13A provides standards and recommendations for the geometric layout and engineering design of airport facilities, including runways and runway associated environments such as Runway Safety Areas (RSAs), Obstacle Free Zones (OFZs), Object Free Areas (OFAs), clearways and, stopways, among other elements.

2.1.1 CURRENT DESIGN AIRCRAFT/DESIGN GROUP

Airports are designed according to their Approach and Departure Reference Codes (ARC and DRC), formerly referred to as the Airport Reference Code (ARC), which is determined by selecting a “design aircraft” for the airport. A design aircraft, as defined by FAA AC 150/5300-13A, is “an aircraft with characteristics that determine the application of airport design standards. This aircraft can be a specific aircraft model, or a composite of several aircraft using, expected to use, or intended to use the airport or part of the airport.” According to FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, the FAA uses a minimum of 500 annual operations as the basis for determining the most demanding aircraft. An operation is defined as one takeoff or one landing, so an aircraft that has landed and taken off from the same airport is considered to have made two operations at that airport. The dimensions and speed of the design aircraft are used to determine the Aircraft Approach Category (determined by approach speed and denoted by letters A through E) and Airplane Design Group (determined by tail height and wingspan and denoted by Roman numerals I through V).



Figure 2-2: Beechcraft Baron B-58

According to the 2003 Airport Master Plan, the most demanding aircraft known to use CQX was the Beech Baron B-58. With an approach speed of 95 knots, the Beech Baron B-58 falls under approach category B, and with a wingspan of 37.83 feet and a tail height of 9.75 feet, it falls under design group I. Therefore, CQX was determined to be a B-I (small airplane) facility, and all improvements implemented since that time were designed according to those standards.

Table 2-1: Aircraft Approach Category

Aircraft Approach Category	Approach Speed
A	Speed less than 91 knots
B	Speed 91 knots or more but less than 121 knots
C	Speed 121 knots or more but less than 141 knots
D	Speed 141 knots or more but less than 166 knots
E	Speed 166 knots or more

Source: AS 150/5300-13A

***Bold= CQX's Aircraft Approach Category**

Tale 2-2: Airplane Design Group

Airplane Design Group	Tail Height [ft. (m)]	Wingspan [ft. (m)]
I	< 20' (<6 m)	<49' (<15m)
II	20' - < 30' (6m- <9m)	49' - <79' (15m- <24m)
III	30' - < 45' (9m- <13.5m)	79' - <118' (24m- <36m)
IV	45' - <60' (13.5m- <18.5m)	118' - 171' (36m- <52m)
V	60' - <66' (18.5m- <20m)	171' - <214' (52m- <65m)
VI	66' - <80' (20m- <24.5m)	214' - <262' (65m- <80m)

Source: AS 150/5300-13A

***Bold= CQX's Airplane Design Group**

2.2 INVENTORY AND DESCRIPTION OF AIRSIDE FACILITIES

Airside facilities include all aircraft movement areas required for the movement, takeoff, and landing of aircraft. At CQX, these areas include the runway, taxiways, taxilanes, hangars, aprons, tie-downs, and navigational/visual/communication aids. These facilities are further described below.

2.2.1 RUNWAY

CQX has one runway, designated Runway 6-24, which is paved and is 3,001 feet in length by 100 feet in width. Runway 6-24 is marked as basic and is served by Medium Intensity Runway Lights (MIRLS) and a two-light PAPI on each runway end.



Figure 2-3: Runway 24 End

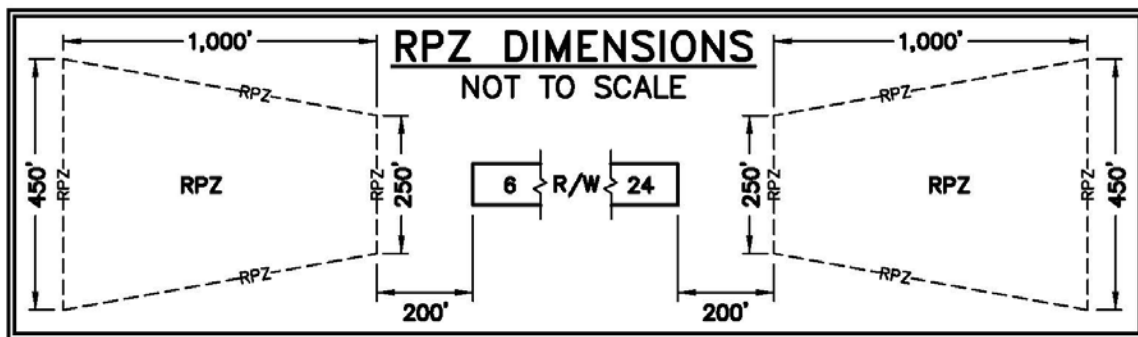
2.2.2 SAFETY AREAS

A runway safety area (RSA) is a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to an aircraft in the event of an undershoot, overshoot, or excursion from the runway. In accordance with FAA AC 150/5300-13A, the RSA for Runway 6-24 is 120 feet in width and extends 240 feet beyond each runway end.

2.2.3 RUNWAY PROTECTION ZONE

A runway protection zone (RPZ) is an area at ground level prior to the threshold or beyond the runway end designed to enhance the safety and protection of people and property on the ground in the event an aircraft undershoots or overshoots the runway end. When feasible, the Airport should make every effort to acquire property under the runway approach and departure surfaces, at a minimum, to the limits of the RPZ. The dimensions of the RPZ for Runway 6-24 are shown in Figure 2-4 below:

Figure 2-4: Runway Protection Zone Dimensions – Runway 6-24



2.2.4 RUNWAY OBJECT FREE AREA

The runway object free area (ROFA) is centered about the runway centerline. The ROFA clearing standard requires clearing the ROFA of above-ground objects protruding above the nearest point of the runway centerline, except where the object is fixed by function (such as runway lights). It is acceptable to place objects in the ROFA if they are necessary for air navigation or aircraft ground maneuvering purposes. It is also acceptable to taxi and hold aircraft in the ROFA. In accordance with AC 150/5300-13A, CQX’s ROFA is 250 feet in width and extends 240 feet beyond each runway end (see Figure 2-1).

2.2.5 INSTRUMENT APPROACH PROCEDURES

Table 2-3 presents a summary of the various instrument approach procedures available by runway at the Airport.

Table 2-3: Instrument Approach Procedures

Runway	Approach Category*	Minimums by Aircraft Category**			
		A	B	C	D
6-24	Circling GPS	600-1		680-1½	680-2
6-24	Circling NDB-A	600-1½		680-1½	680-2

**Terminal Instrument Procedures (TERPS), Aircraft Categories (ceiling in feet, visibility in nautical miles):*

Category A- Speed less than 91 knots; weight less than 30,001 pounds.

Category B- Speed 91 knots or more but less than 121 knots, weight 30,001 pounds or more but less than 60,001.

Category C- Speed 121 knots or more but less than 141 knots; weight 60,001 pounds or more but less than 150,001.

Category D- Speed 141 knots or more but less than 166 knots; weight 150,001 pounds or more.

*** Minimums given by either (ceiling in feet- visibility in miles) or ceiling height/Runway Visibility Range*

Source: U.S. Terminal Procedures- NE-1, 21 JUN 2018 to 19 JUL 2018

2.2.6 TAXIWAYS

The purpose of taxiways is to move aircraft to or from a runway. CQX has the following system of taxiways to provide access to aircraft movement areas:

Taxiway 'A'- is a full-length parallel taxiway serving Runway 6-24. Taxiway 'A' is paved, 25 feet wide, and approximately 2,932 feet long.

Taxiway 'B'- is a paved stub taxiway connecting the Main Apron with Taxiway 'A' and Runway 6-24 between midfield and the Runway 6 end. Taxiway 'B' is approximately 35 feet wide at its narrow point and approximately 150 feet long.

Taxiway 'C'- is a paved stub taxiway connecting Taxiway 'A' with Runway 6-24 midway between midfield and the Runway 24 end. Taxiway 'C' is approximately 35 feet wide at its narrow point and approximately 80 feet long.

Taxiway 'D'- is a paved taxiway located just south of Taxiway 'C' and is approximately 25 feet wide and 275 feet long.

Taxiway 'E'- is a paved taxiway running parallel to Taxiway 'A' and is approximately 25 feet wide and 1,040 feet long.



Figure 2-5: Taxiway 'A'



Figure 2-6: Taxiway 'B'



Figure 2-7: Taxiway 'D'

2.2.7 APRONS AND TIE-DOWN AREAS

The purpose of an apron is to provide aircraft with a place to park to load or unload passengers and cargo. CQX has one paved Main Apron, constructed in 2006, and one Terminal Apron, which together can accommodate 42 aircraft. Additionally, CQX has a turf tie-down area, located in the turf area between the Main Apron and Taxiway 'D', which can accommodate 26 aircraft.



Figure 2-8: Apron

2.2.8 HANGARS

Aircraft hangars are buildings designed to store aircraft, many with office, workshop, and lounge space. CQX has three rows of nested T-hangar buildings located northeast of the SRE storage building designated H1 T-Hangars (formerly "Green T-Hangars"), H2 T-Hangars (formerly "East and West T-Hangars"), and H3 T-Hangars, which together can accommodate 34 aircraft. There are also 2 box hangars ("Front Hangar" and "Rear Hangar") attached to the administration building, with a combined capacity for 5 aircraft. These hangars are served by taxilanes in varying conditions, which are outlined in Table 2-6, *Conditions of Existing Facilities*.



Figure 2-9: Nested T-Hangar Buildings

2.2.9 NAVIGATIONAL/VISUAL/COMMUNICATION AIDS

FAA AC 150/5340-30H provides guidance and specifications for the design and installation of airport visual aids. The use of this AC is mandatory for all projects relating to the design and installation of airport visual aids funded with federal grant monies through the Airport Improvement Program (AIP). Navigational aids assist pilots by providing navigational, visual, and communication guidance to locate the Airport in support of safe operations in the airport environment.



Figure 2-10: Runway Light

2.2.9.1 Runway Lights

Runway edge lights are used for safety purposes during night operations or low visibility conditions so that pilots can clearly identify the edges of runway pavement. Runway 6-24 is equipped with medium intensity runway lights (MIRLS), which were installed in 2009 as part of the Runway 6-24 reconstruction project. The MIRLS system is airport-owned and maintained and is in fair condition. Recently, the Airport replaced several frangible couplings due to weather corrosion.

2.2.9.2 Runway End Identifier Lights

Runway end identifier lights (REILS) provide pilots with rapid and positive identification of the end of the runway. The system consists of two synchronized, unidirectional flashing lights. The lights are positioned on each corner of the runway landing threshold, facing the approach area.¹ REILS at CQX were installed on both ends of Runway 6-24 in 2009 as part of the Runway 6-24 reconstruction project. The REILS are airport-owned and are in good condition.



Figure 2-11: REIL

2.2.9.3 Taxiway Lights

Taxiway edge lights are used to show the edges of taxiway pavement for safety purposes. The intersections of Taxiway 'A' and Runway 6-24 are lit; however, the majority of the taxiway/taxilane system at CQX remains unlit. The taxiway lights are airport owned and maintained and are in fair condition.



Figure 2-12: Taxiway Light

¹ https://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/techops/navservices/lsg/reil/

2.2.9.4 Precision Approach Path Indicator

A precision approach path indicator (PAPI) gives visual guidance for pilots to maintain the correct approach when landing at an airport. Originally installed in 1996, the Runway 6 and Runway 24 ends are each equipped with two-light PAPIs. The Runway 24 end PAPI was relocated as part of the Runway 6-24 reconstruction project and included the installation of new power cables, foundations, and other components as required to meet the specifications of the project. The PAPIs are airport owned and maintained and are in fair condition.



Figure 2-13: Runway 24 End PAPI

2.2.9.5 Windcone and Segmented Circle

A segmented circle provides traffic pattern information at airports with no control tower, and a windcone provides real-time wind conditions to aircraft approaching an airport. CQX has one lighted windcone with a segmented circle located at midfield, adjacent to the southeast edge of Runway 6-24. The windcone and segmented circle are airport owned and maintained and are in good condition.



Figure 2-14: Windcone

2.2.9.6 Automated Surface Observing Station

An automated surface observing station (ASOS) is a weather sensor capable of measuring barometric pressure, ambient temperature, dew point temperature, wind direction and speed, cloud height, visibility, and precipitation, among other conditions. The Airport's ASOS is located adjacent to the Main Apron and is accessible to pilots by radio on a frequency of 135.875 MHz or by telephone. The ASOS is owned and maintained by the National Weather Service.



Figure 2-15: ASOS

2.2.9.7 Non-Directional Beacon

A non-directional beacon (NDB) is a radio transmitting device that emits a low to medium identification signal whereby pilots can locate an airport. The NDB at CQX was installed in 1992 and is situated in the vacant area of land between the Runway 24 end and George Ryder Road. The NDB is maintained by MassDOT.

2.2.9.8 Rotating Beacon

A rotating beacon is a navigational aid used to indicate the location of the airport during low visibility conditions and nighttime operations. CQX has a 10-inch rotating beacon that was originally installed in 1995 and replaced in 2009 as a part of the Runway 6-24 reconstruction project. The rotating beacon is located on the roof of the front hangar building. The beacon emits two beams of light, one green and one white (or clear), 180 degrees apart, which is an indicator that the Airport is equipped with runway lights. In 2018, the beacon structure was replaced. According to discussions with the Airport Manager, the rotating beacon is in good condition.



Figure 2-16: Non-Directional Beacon



Figure 2-17: Rotating Beacon

2.3 INVENTORY OF PAVEMENT MARKINGS AND GUIDANCE SIGNS

2.3.1 PAVEMENT MARKINGS

Table 2-4 provides an inventory of the pavement markings at COX:

Table 2-4: Inventory of Pavement Markings

Runway

Runway centerline markings

Runway 6 designation marking

Runway 24 designation marking

Taxiway

Taxiway 'A' Runway 6 hold position marking

Taxiway 'A' Runway 24 hold position marking

Taxiway 'A' centerline

Taxiway 'B' Runway 6-24 hold position markings

Taxiway 'C' Runway 6-24 hold position markings

Windrose on Main Apron

Non-Movement Area Boundary on Main Apron

2.3.2 GUIDANCE SIGNS

Table 2-5 provides an inventory of the guidance signs at COX:

Table 2-5: Inventory of Guidance Signs

<i>Location</i>	<i>Description</i>
R/W 6 End	Runway 6 Hold Position Sign
R/W 6 End	Taxiway 'A' Location Sign
R/W 6 End	Noise Sensitive Area Sign
R/W 6-24	Runway 6-24 Hold Position Sign (2)
R/W 6-24	Taxiway 'B' Location Sign
R/W 6-24	Taxiway 'C' Location Sign
R/W 24 End	Runway 24 Hold Position Sign
R/W 24 End	Taxiway 'A' Location Sign
R/W 24 End	Noise Sensitive Area Sign

2.4 INVENTORY AND DESCRIPTION OF LANDSIDE FACILITIES

Landside facilities include all areas of the airport not required for the movement of aircraft and provide for the movement of passengers, freight, and ground transportation vehicles. At CQX, these areas include the airport administration building, other miscellaneous buildings, automobile parking, fuel facilities, and other major utilities. These facilities are further described below:

2.4.1 ADMINISTRATION BUILDING

An airport administration building provides a “front door” to the Airport, giving management a space to conduct business and airport users a place to converge or rest between flights. The Airport’s current administration building was constructed in the 1930s and includes office space for the Airport Manager, fixed base operator (FBO), and other miscellaneous purposes (restrooms, flight planning space, a classroom, and storage space). The administration building is attached to the Front and Rear Hangars. Also included in the administration building is Hangar B Eatery, a restaurant serving breakfast and lunch, which can seat up to 30 patrons indoors and 14-18 patrons on an outdoor deck. According to discussions with airport management, the facility is aging and needs repair or replacement.



Figure 2-18: Administration Building

2.4.2 AUTOMOBILE PARKING

Parking for automobiles is available in delineated spaces along George Ryder Road, north of the Main Apron. This parking area can accommodate 35 vehicles and provides direct access to the Airport’s administration building and restaurant. The Airport has additional parking in a gravel lot to the east of the rear hangar with access from George Ryder Road across from the Town of Chatham’s administrative offices. This lot can accommodate approximately 40 cars.



Figure 2-19: Parking on George Ryder Road

2.4.3 FUEL FACILITIES

In 2008, the Airport replaced its two (2) aging 10,000-gallon underground fuel storage tanks and fueling pumps, originally installed in 1985, with one (1) 10,000-gallon (double-walled, fire-resistant) above-ground 100-LL storage tank, new dispensing facility with protective shed, fueling apron, taxilane, and new electrical distribution system to meet regulatory requirements. The Airport also has a Jet-A fuel truck with a capacity of 3,000 gallons. According to airport management, the 100-LL fuel facility is in good condition, but the need for a fixed jet fuel tank is present.



Figure 2-20: Fuel Facility

2.4.4 MAJOR UTILITIES

2.4.4.1 Water

Water at CQX is provided by the Town of Chatham Sewer and Water Department. The Airport is served by a 10-inch water main located on the southerly side of George Ryder Road.

2.4.4.2 Electric

Electricity at CQX is provided by Eversource via overhead wires that enter the airport on the street side of the Front Hangar and terminate in the electrical vault adjacent to the Airport Manager's office.

2.4.4.3 Gas

Natural gas at CQX is provided by National Grid. The gas main is located on the northerly side of George Ryder Road and enters the airport at the rear of the Front Hangar.

2.4.4.4 Heating for the SRE Building

Propane heating for the SRE building at CQX is provided by Eastern Propane.

2.5 INVENTORY AND DESCRIPTION OF MISCELLANEOUS FACILITIES AND SUPPORT EQUIPMENT

In addition to the airside and landside facilities listed above, the Airport has miscellaneous support facilities and equipment, as described in the following sections, to aid in safe, efficient, and compliant airport operations. Support facilities and equipment at CQX include snow removal equipment (with corresponding snow removal plan), snow removal equipment storage building, and security fencing.

2.5.1 SNOW REMOVAL EQUIPMENT

The Airport currently owns two (2) pieces of snow removal equipment (SRE):

- One (1) 2000 Ford F-250 pickup truck with 8-foot Fisher plow, and
- One (1) 2017 Caterpillar Front End Loader with rotary plow (blower), ramp plow (snow pusher), and rotary broom (sweeper).



Figure 2-21: Front End Loader

2.5.2 SRE STORAGE BUILDING

The Airport's SRE storage building was constructed in 2015 in efforts to extend the useful life of existing and future AIP-funded SRE. The approximately 2,800 SF facility is in excellent condition and consists of two bays, a maintenance area, break room, bathroom, and storage area.



Figure 2-22: SRE Storage Building

2.5.3 SNOW REMOVAL PLAN

The Airport has a "Snowplowing Procedures" plan, which defines the conditions where plowing is required and identifies the following priority areas:

1. Runway and parallel taxiway – completed within 6 hours of snowfall stop or less.
2. Runway/taxiway to ramp area access, partial ramp, and fuel pumps – within 6 hours.
3. Main sidewalks (with snowblower) and vehicle access gate – within 12 hours.
4. Access to T-hangars/taxiway from back hangar to Ts – within 12 hours.

5. T-Hangars (including using snowblower to get as close to all doors as possible) – within 24 hours.
6. Full ramp, perpendicular taxiway and NW runway connector stub – within 36 hours.

2.5.4 PERIMETER FENCING

Perimeter fencing provides safety and security for the Airport by preventing wildlife incursions, intruders, and inadvertent access by the general public. The Airport is supported by approximately 8,443 LF of 8-foot high, chain-link fencing around the perimeter of the airfield.



Figure 2-23: Perimeter Fence

Table 2-6: Conditions of Existing Facilities

Facility	Date of Construction or Last Rehabilitation	Condition ²	Useful Life ³	Eligible for Replacement
Runway 6-24	2009	Satisfactory	20 years	2029
Taxiway 'A'	1988	Fair	20 years	2008
Taxiway 'B'	1988	Satisfactory	20 years	2008
Taxiway 'C'	1988	Good	20 years	2008
Taxiway 'D'	1998	Fair	20 years	2018
Taxiway 'E'	1998	Fair	20 years	2018
H1 Pavement	1984	Serious	20 Years	2004
H2 Pavement	1999	Fair	20 Years	2019
H3 Pavement	2006	Good	20 Years	2026
Main Apron	2006	Good	20 years	2026
Terminal Apron	unknown	Very Poor	20 years	unknown
Front Hangar ⁴	1936	Poor	40 years	1986
Rear Hangar ⁵	1960s	Fair	40 years	2000s

Source: Airport Records.

² Pavement conditions obtained from MassDOT/AD Pavement Management System 2018 conditions projections.

³ Useful life determinations as identified by FAA Order 5100.38D, The AIP Handbook.

⁴ Front Hangar power washed, sealed, and repainted in 2018.

⁵ Rear hangar foundation repairs and exterior wall replacement in 2018.

Table 2-6: Conditions of Existing Facilities (Continued)

<i>Facility</i>	<i>Date of Construction or Last Rehabilitation</i>	<i>Condition</i>	<i>Useful Life</i>	<i>Eligible for Replacement</i>
H1 T-Hangars ⁶	1984	Good	40 years	2024
H2 T-Hangars	1999	Good	40 years	2039
H3 T-Hangars	2006	Good	40 years	2046
MIRLS	2009	Fair	20 years	2029
REILS	2009	Good	20 years	2029
Taxiway Lights	2009	Fair	20 years	2029
PAPI	2009	Fair	20 years	2029
Windcone and Segmented Circle	1995	Good	15 years	2010
ASOS	1999	Good	N/A	N/A
Non-Directional Beacon	1992	Operational	15 years	2007
Rotating Beacon	2009	Good	15 Years	2024
Administration Building	1930s	Poor	40 years	1970s
Fuel Facility	2008	Good	20 years	2028
Pickup Truck with Plow	2000	Fair	10 years	2010
Front End Loader with Attachments	2017	New	10 years	2027
SRE Storage Building	2015	Good	40 years	2055
Perimeter Fence	1999/2006	Fair	20 years	2019/2026

Source: Airport Records.

⁶ H1 T-Hangars last rehabilitated in 2018, including replacement of hangar doors with new aluminum doors and the gable ends were reskinned. In approximately 2013, the roof was replaced.