

Flight Procedure Tracking Form		Action: AMENDMENT	Task Type: IAP	Date Open: 01/13/2014	Task #: 2014011328979801001	Request #: 20140113289798
Procedure: ILS OR LOC RWY 11 AMDT 25			Airport ID: KORH	Airport: WORCESTER RGNL		Reimbursable #: NO
City: WORCESTER	ST: MA	GPS #:	Estimated Chart Date: 12/07/2017		FICO #:	
Fac ID: RSR		Fac. Type: ILS			Specialist: JACOB MAXFIELD	
Procedure Review						
	Rec'd	Rel'd	Full Name	Comments		
Lead:	05/02/2017	08/10/2017	BEV L BORDY	QUALITY		
QA:	08/10/2017			4	9/8CTabaka	
Liaison:				CHECKED		
Procedure Comments:			Remark Type: INFORMATION			
<p>ENROUTE-NON</p> <p>FLT CHK: REQUEST EVALUATION FOR REMOVAL OF NOTE: AUTOPILOT COUPLED APPROACH NA BELOW 1360.</p> <p>PENDING DATA USED FOR KORH AIRPORT AND RUNWAYS</p> <p>PENDING DATA USED FOR PVD VOR/DME.</p> <p>CONTACT: PAT MULQUEEN 405-954-4073 OR BEV BORDY 405-954-8293.</p>						

LOC/DME I-RSR	APP CRS	Rwy Idg	7001
110.9	109°	TDZE	980
Chan 46		Apt Elev	1009

ILS or LOC RWY 11
WORCESTER RGNL (OR.H)

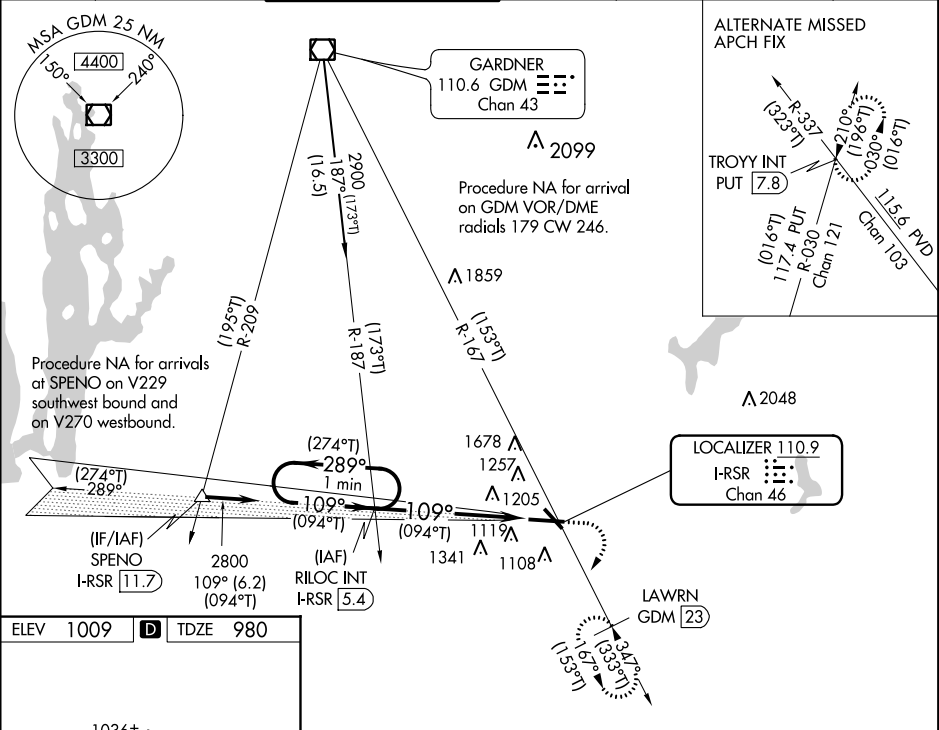
⚠ DME required. For inop ALS, increase S-LOC 11 Cats C and D visibility to 1 3/8 SM. When control tower closed: increase S-ILS 11 all Cats visibility to RVR 4000, and S-LOC 11 Cats A and B to RVR 4000 and Cats C and D to 1 1/4 SM. When control tower closed: Inop table does not apply to S-ILS 11 all Cats. When control tower closed: for inoperative ALS, increase S-LOC 11 Cats C and D visibility to 1 3/8 SM.

MALSR

A5

MISSED APPROACH: Climb to 1800 then climbing right turn to 3000 on heading 230° and GDM VOR/DME R-167 to LAWNRN/GDM 23 DME and hold, continue climb-in-hold to 3000.

ATIS	BRADLEY APP CON	WORCESTER TOWER★	GND CON	CLNC DEL	UNICOM
126.55	119.0 327.1	120.5 (CTAF) 0 263.0	123.85	128.65 119.0 (when tower closed)	122.95



ELEV 1009 **D** TDZE 980

TDZ/CL Rwy 11
REIL Rws 15, 29 and 33
HIRL Rwy 11-29 **0**
MIRL Rwy 15-33 **0**

FAF to MAP 5.5 NM

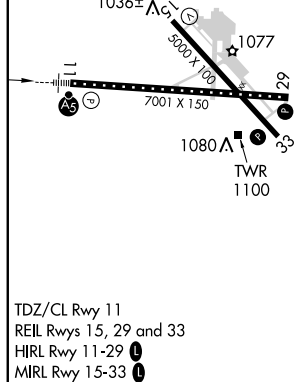
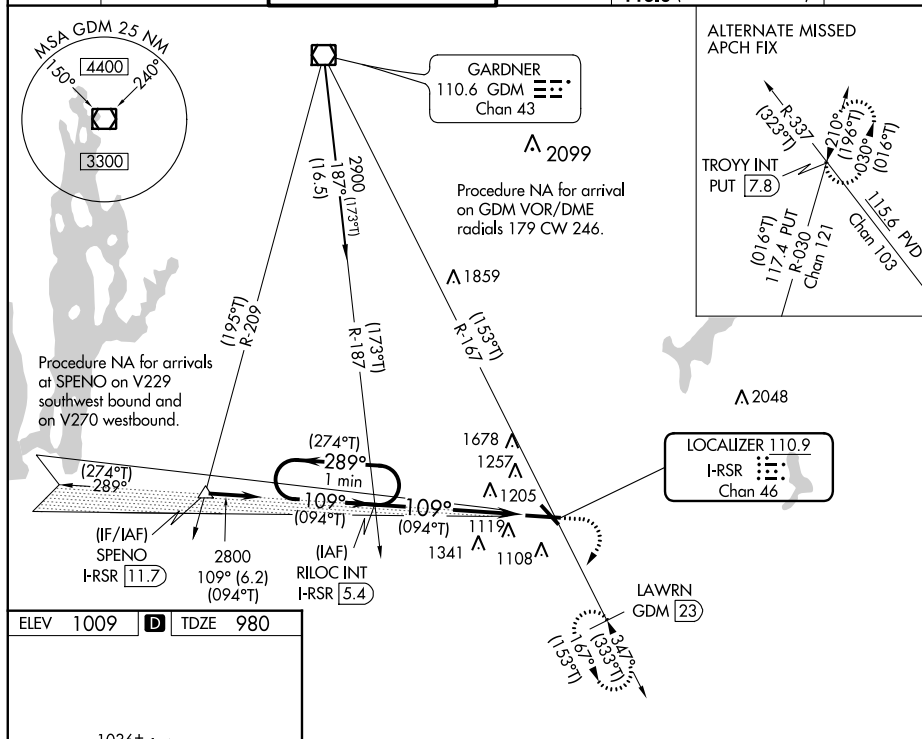
Knots	60	90	120	150	180
Min:Sec	5:30	3:40	2:45	2:12	1:50

<div>One Minute Holding Pattern</div> <div>RILOC INT I-RSR [5.4]</div> <div>2800 ← 289° (274°T) 109° (094°T) → 2800</div> <div>GS 3.00° TCH 55</div> <div>4 NM 1.5 NM</div>				
<div>1800 3000</div> <div>hdg 230°</div> <div>GDM R-167</div> <div>LAWNRN GDM [23]</div> <div>* I-RSR [1.4]</div> <div>* LOC only</div>				
CATEGORY	A	B	C	D
S-ILS 11	1180/18 200 (200-1/2)			
S-LOC 11	1500/24	520 (500-1/2)	1500/55	520 (500-1/4)
CIRCLING	1560-1 551 (600-1)	1720-1 711 (800-1)	2000-3	991 (1000-3)

ILS RWY 11 (CAT II & III)
WORCESTER RGNL (ORH)

MISSED APPROACH: Climb to 1800 then climbing right turn to 3000 on heading 230° and GDM VOR/DME R-167 to LAWRN/GDM 23 DME and hold, continue climb-in-hold to 3000.

ATIS 126.55	BRADLEY APP CON 119.0 327.1	WORCESTER TOWER★ 120.5 (CTAF) 0 263.0	GND CON 123.85	CLNC DEL 128.65 119.0 (when tower closed)	UNICOM 122.95
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One Minute Holding Pattern

RILOC INT
I-RSR 5.4

2800

(274°T)
289°

109°
(094°T)

2800

1080

IM

GS 3.00°
TCH 55

5.5 NM

1057'

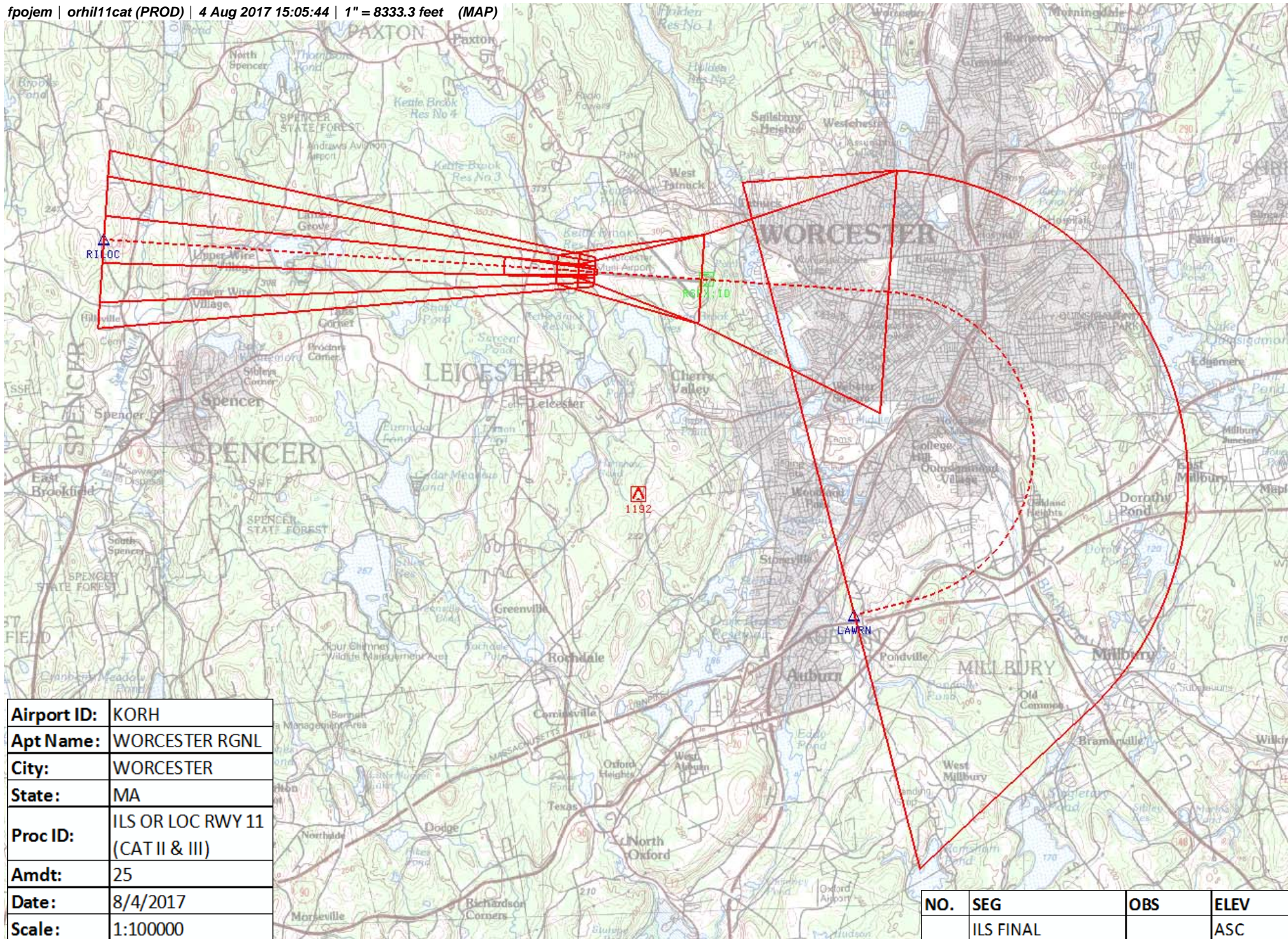
CATEGORY	A	B	C	D
S-ILS 10	CAT II RA 119/12 100 DA 1080			
S-ILS 10	CAT III RVR 06			

**CATEGORY II & III ILS - SPECIAL AIRCREW
& AIRCRAFT CERTIFICATION REQUIRED**

NM 1 2 3 4 5 6 7 8 9 10 11 12 13 14

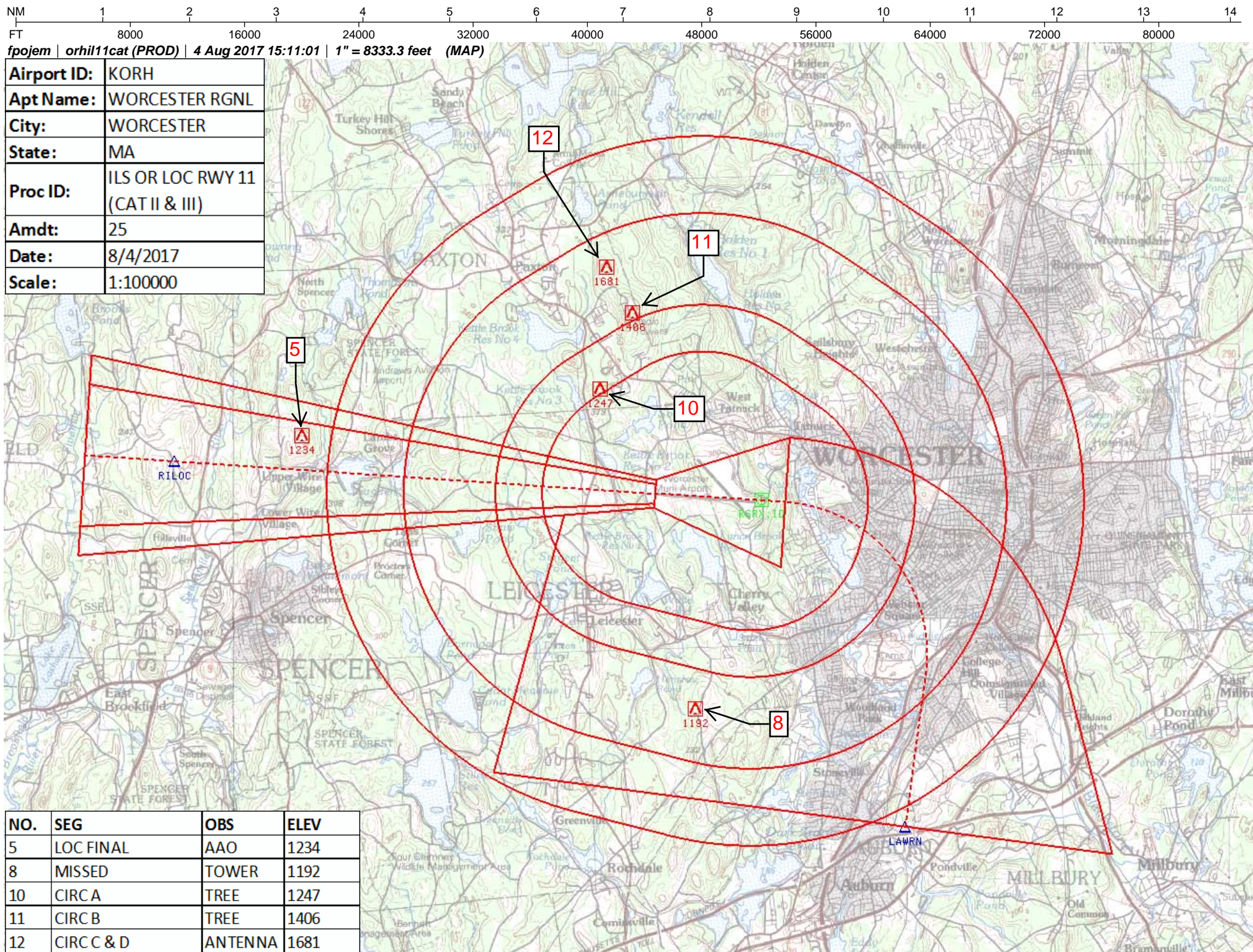
FT 8000 16000 24000 32000 40000 48000 56000 64000 72000 80000

fpojem | orhil11cat (PROD) | 4 Aug 2017 15:05:44 | 1" = 8333.3 feet (MAP)



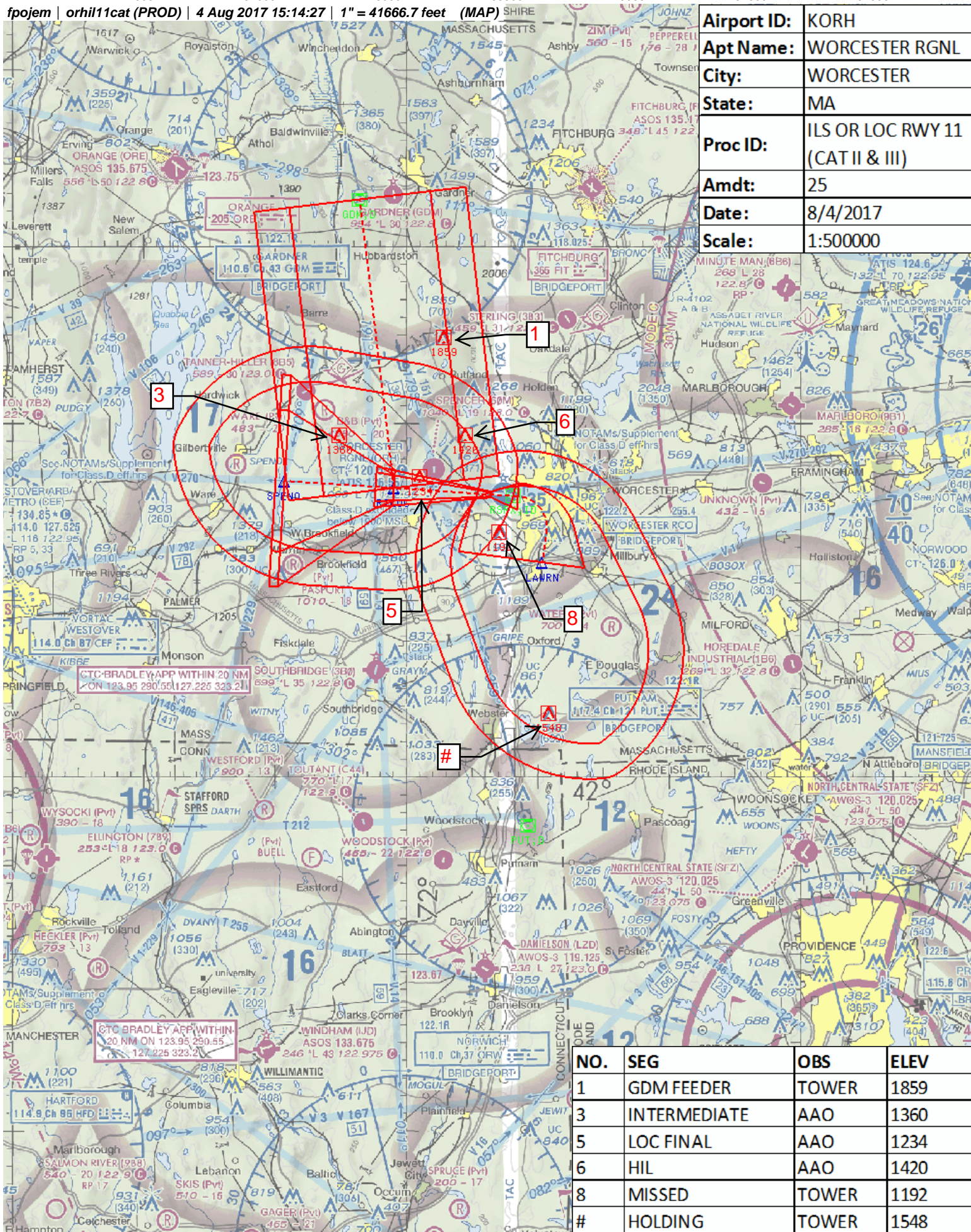
Airport ID:	KORH
Apt Name:	WORCESTER RGNL
City:	WORCESTER
State:	MA
Proc ID:	ILS OR LOC RWY 11 (CAT II & III)
Amdt:	25
Date:	8/4/2017
Scale:	1:100000

NO.	SEG	OBS	ELEV
	ILS FINAL		ASC



[illegible]

fpojem | orhil11cat (PROD) | 4 Aug 2017 15:14:27



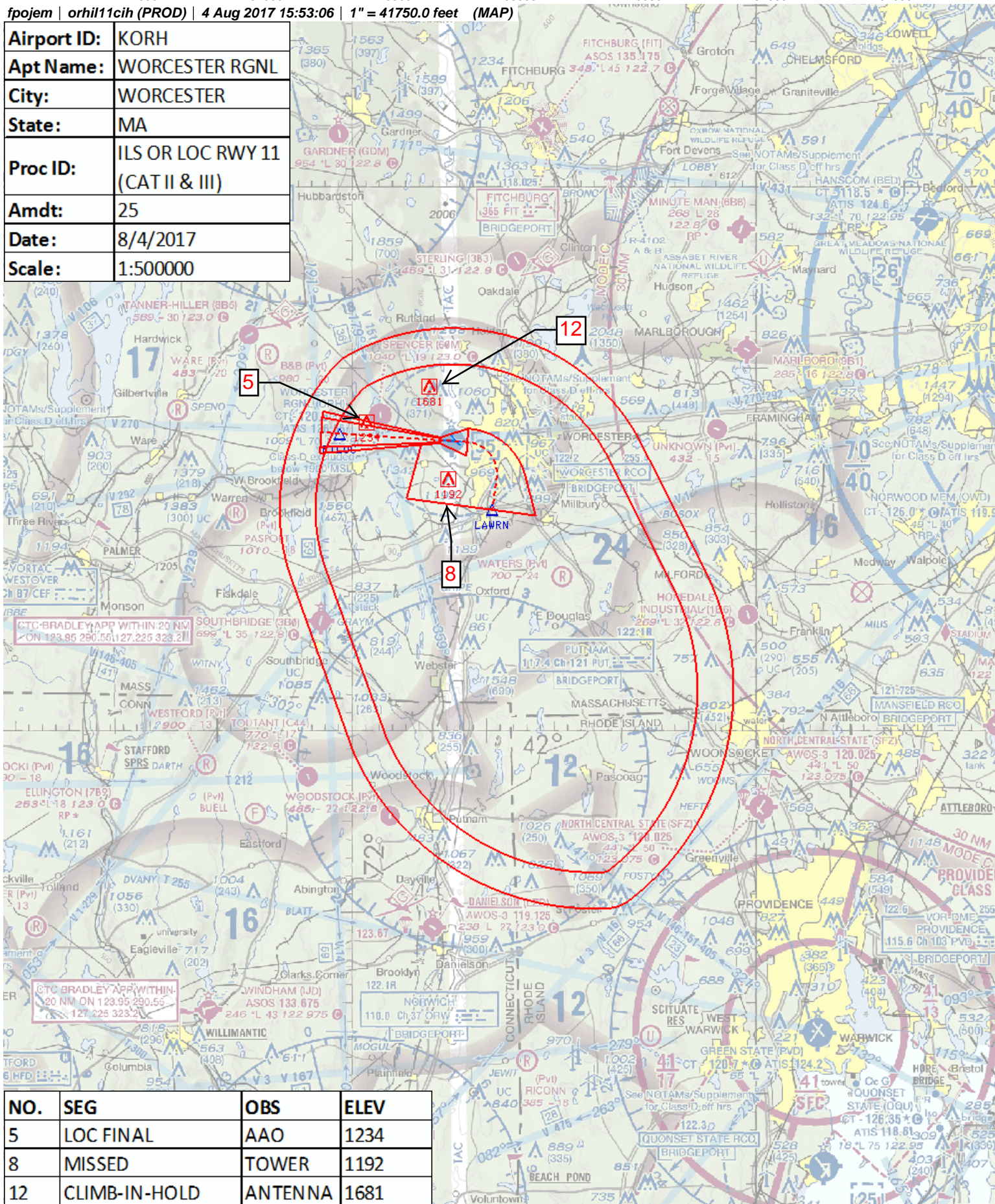
Airport ID:	KORH
Apt Name:	WORCESTER RGNL
City:	WORCESTER
State:	MA
Proc ID:	ILS OR LOC RWY 11 (CAT II & III)
Amdt:	25
Date:	8/4/2017
Scale:	1:500000

NO.	SEG	OBS	ELEV
1	GDM FEEDER	TOWER	1859
3	INTERMEDIATE	AAO	1360
5	LOC FINAL	AAO	1234
6	HIL	AAO	1420
8	MISSED	TOWER	1192
#	HOLDING	TOWER	1548

[illegible]

fpojem | orhil11cih (PROD) | 4 Aug 2017 15:53:06 | 1" = 41750.0 feet (MAP)

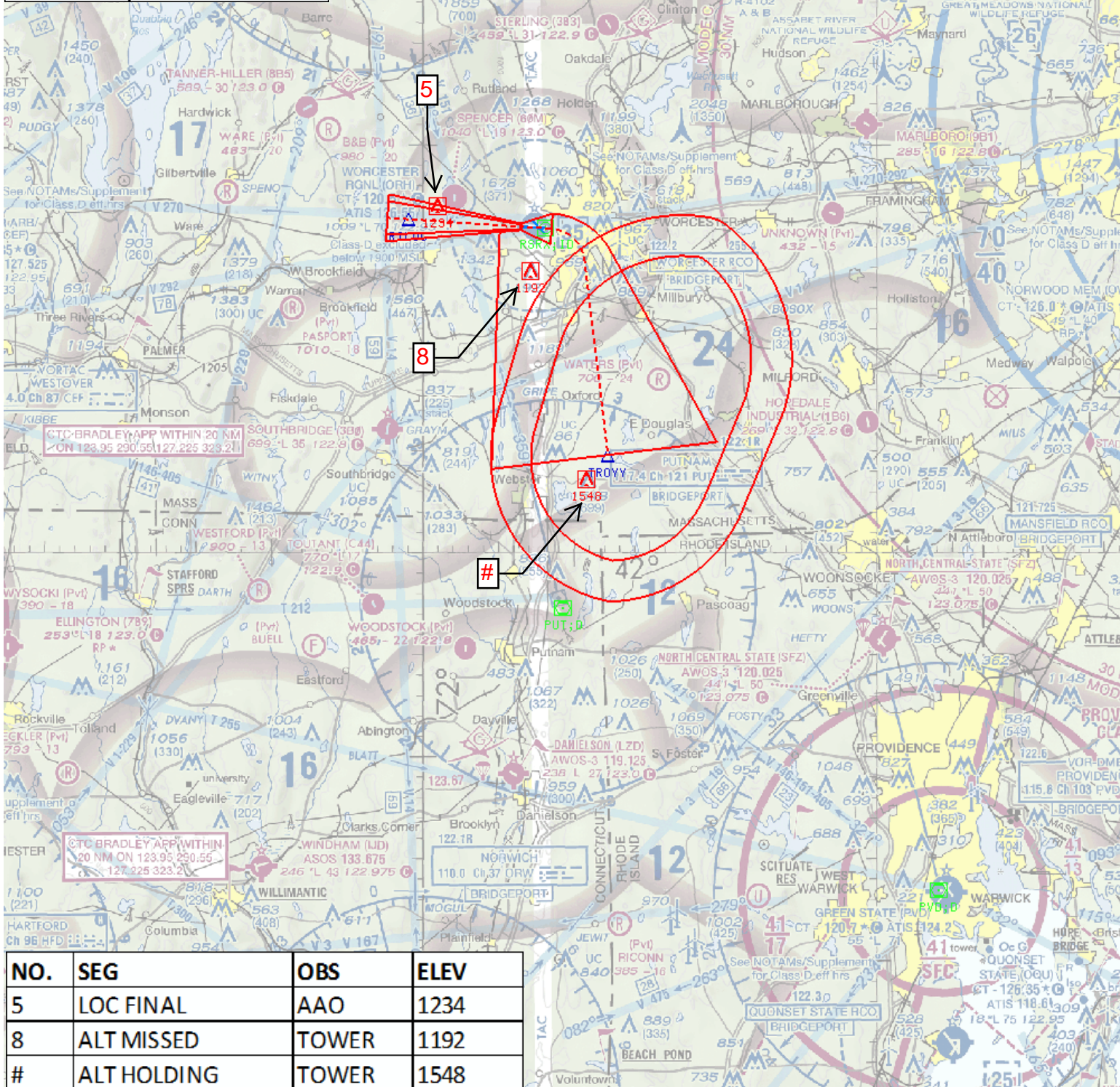
Airport ID:	KORH
Apt Name:	WORCESTER RGNL
City:	WORCESTER
State:	MA
Proc ID:	ILS OR LOC RWY 11 (CAT II & III)
Amdt:	25
Date:	8/4/2017
Scale:	1:500000



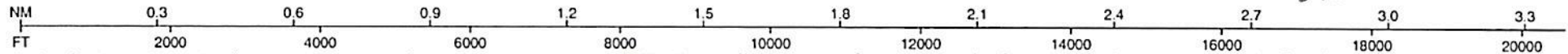
NO.	SEG	OBS	ELEV
5	LOC FINAL	AAO	1234
8	MISSED	TOWER	1192
12	CLIMB-IN-HOLD	ANTENNA	1681

NM 7 14 21 28 35 42 49
FT 42000 84000 126000 168000 210000 252000 294000
fpojem | orhil11alt (PROD) | 4 Aug 2017 15:36:51 | 1" = 41750.0 feet (MAP)

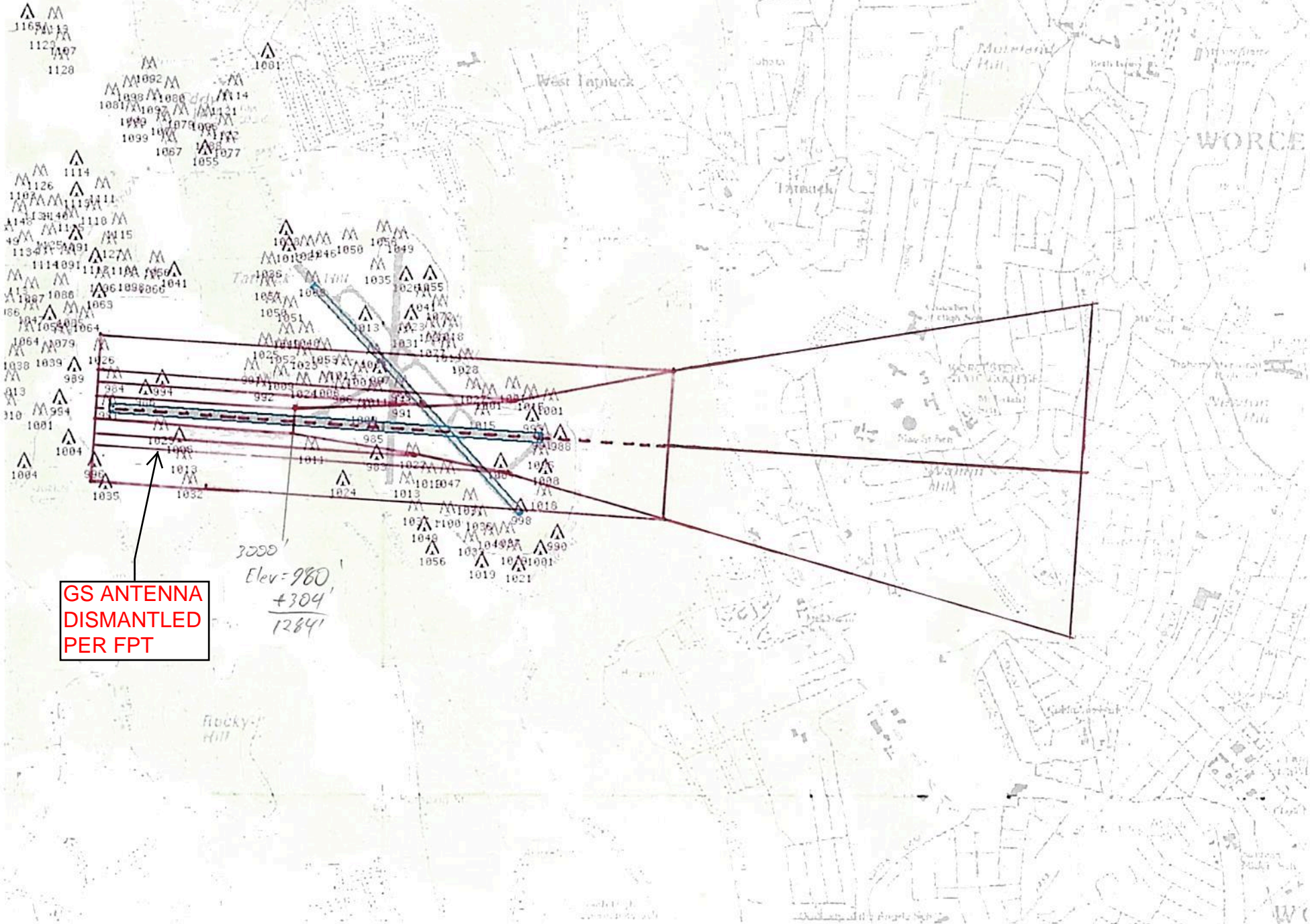
Airport ID:	KORH
Apt Name:	WORCESTER RGNL
City:	WORCESTER
State:	MA
Proc ID:	ILS OR LOC RWY 11 (CAT II & III)
Amdt:	25
Date:	8/4/2017
Scale:	1:500000



400 X 0.76 = 304'
0.75 = 304'

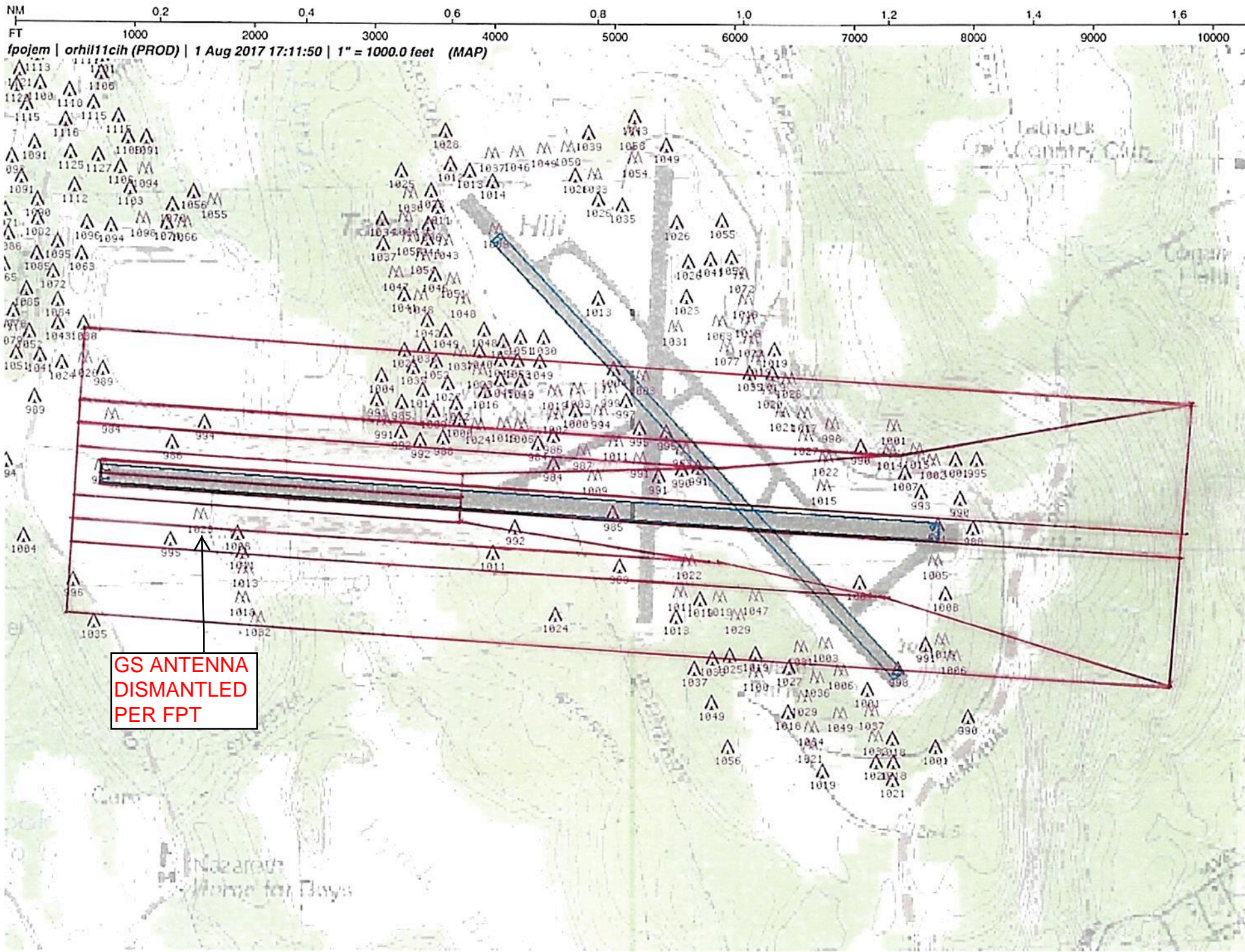


fpojem | orhi11cih (PROD) | 2 Aug 2017 10:44:41 | 1" = 2000.0 feet (MAP)



GS ANTENNA
DISMANTLED
PER FPT

3000'
Elev = 980'
+304'
1284'



NM 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6
FT 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

fpojem | orhil11cih (PROD) | 1 Aug 2017 17:11:50 | 1" = 1000.0 feet (MAP)

GS ANTENNA
DISMANTLED
PER FPT

FIPC BASIC FORM								
PROCEDURE: ILS OR LOC RWY 11 24			AIRPORT NAME: WORCESTER RGNL		AIRPORT ID: KORH	SPECIAL CONTROL NO: YP-07-040-17		
FAC ID: RSR		CITY: WORCESTER			ST: MA	ORIG CHART DATE: 08/17/2017		
DFL TYPE: PROC/A	THIRD PARTY: <input type="checkbox"/> YES	EST. TIME ON SITE: 0.5	REIMB. NUMBER:		PTS TASK ID: 2016040426419401001			
PREFLIGHT NOTES								
REVIEWER:					DATE:			
COMMENTS:					CHECK ONE: <input type="checkbox"/> FLT CK REQ <input type="checkbox"/> NFCR <input type="checkbox"/> REJECT			
							YES	NO
					CPV COMPLETE?		X	
PROCEDURE RESULTS								
INSPECTION DATE: 08/24/2017		CREW #: VN109	N #: N81	INSTRUMENT PROCEDURE STATUS: <input checked="" type="checkbox"/> SAT <input type="checkbox"/> SAT W/CHANGES <input type="checkbox"/> UNSAT		ARINC CODING: <input checked="" type="checkbox"/> SAT <input type="checkbox"/> SAT/GOLD <input type="checkbox"/> UNSAT		
FLIGHT INSPECTOR SIGNATURE: jorge a malcun @ 08/25/2017 07:03			PRINTED NAME: MALCUN, JORGE ALBERTO			NOTAM INITIATED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
FLIGHT INSPECTOR REMARKS: Completed sat as requested.								
IN-FLIGHT OBSTACLE REPORT								
OBSTRUCTION ID #:	COORDINATES OR LOCATION:		GNSS ALTITUDE (MSL):		BAROMETRIC ALTITUDE (MSL):		HEIGHT ABOVE GROUND LEVEL:	

1. FLIGHT PROCEDURE IDENTIFICATION:

Worcester, Massachusetts
Worcester Regional Airport (ORH)
ILS or LOC RWY 11

2. WAIVER REQUIRED AND APPLICABLE STANDARD:

A waiver is required to permit visibility minimum less than 1 SM/5000 RVR for the ILS or LOC RWY 11 approach without a full length parallel taxiway. This is an existing condition.

FAA Order 8260.3C Paragraph 3-3-2, "Establishing Straight-in Visibility Minimums" Sub paragraph (d), "Runway Requirements" and Table 3-3-6. This criteria state that 1 SM/5000 RVR is the minimum visibility for approaches to runways without a full length parallel taxiway

3. REASON FOR WAIVER (JUSTIFICATION FOR NONSTANDARD TREATMENT):

The waiver is necessary to continue operations using the current CAT I visibility minima of ½ SM /1800 RVR for ILS or LOC RWY 11 approach. In addition, infrastructure upgrades are ongoing to support amending this procedure to allow CAT II/III operations. The tentative publication date of the revised procedure is December 7, 2017.

Worcester Regional Airports is situated on a plateau overlying a major aquifer. In addition there are several public water reservoirs surrounding the airport. These factors and other unique siting conditions would require an expenditure of in excess of 45 million dollars to construct a full length parallel taxiway serving runway 11/29.

On June 16, 2015, Massport, operator of the Worcester Regional Airport, was granted a Modification of Standards (MOS) from the requirement of AC 150/5300-13A, Change 1, Table 3-4, footnote 11, "a full length parallel taxiway is required for a precision approach with visibility minimums less than 1 statute mile, for runway 11/29 (attached).

4. EQUIVALENT LEVEL OF SAFETY PROVIDED:

When CAT II/III operations are in progress airfield operations will be restricted to only a single aircraft operation (approach or departure).

When CAT I operations are in progress and the visibility is below 1 SM, the Worcester Air Traffic Control Tower will provide positive separation between IFR operations, including taxiing aircraft. When the tower is active, departures will be held on Taxiway Delta or the new partial parallel taxiway to Runway 11. When the tower is closed, no aircraft can enter the runway corridor without a departure or approach clearance from the approach control center. ORH has a Remote Communications Outlet (RCO) air to ground transmitter to assure continuous radio communications with approach control during all phases of an aircraft's flight and airfield movements. In addition, CTAF is used by pilots to report positions and intentions to each other. CTAF is monitored 24/7 by airport operations staff to detect any unusual or unauthorized activity on the airfield. ARFF services are also available to provide assistance if required. More specific information is contained in the attached Letter of Agreement (LOA) between Yankee TRACON (Y90) and the ORH FAA Control Tower.

During periods when the visibility is above 1,200 RVR, Massport agrees that ORH Management shall implement the following procedures to enhance the overall safety and mitigate risks in the absence of a full parallel taxiway;

A. During all operating conditions:

1. As required by the ORH Airport Certification Manual (ACM), conduct at least two (2) daily airfield inspections that include:
 - a. Inspecting all runway/taxiway intersections for Surface Painted Holding Position Signs (SPHIS) and enhanced taxiway centerline markings and ensure that correct color coding's are used; no peeling, blistering, chipping, or fading have occurred; hold position markings are visible and unobscured; and are reflective during the night.
 - b. Inspect all airfield signs to ensure the signs are readable, correct color coding are use and the panels are not missing.
 - c. Inspecting all runway guard lights to ensure that, no vegetation or foreign material do not interfere with illumination, correct color coding's are used and properly aligned.
 - d. As required by the ACM, all deficiencies shall be immediately noted and rectified and recorded in the Inspection Check List. If not able to correct immediately, a NOTAM shall be issued, as appropriate.
2. Minimize vehicular access to the AMA.
3. Ensure radio and telephone communications are functional between ARFF and ORH FCT.

4. Maintain 24/7 operations and ARFF coverage. If ARFF becomes unavailable, per the ACM appropriate NOTMAs shall be issued.
 5. When the Tower is closed, all vehicles shall announce position and intentions on the CTAF.
 6. To ensure personnel are properly trained on airfield operating procedures. Airport management will require initial and annual recurrent driver training for personnel with access to the AOA. If the driver training lapses, their security badge will not allow access to the AOA.
- B. In addition to the above procedures, Airport Management shall implement the following procedures in support of CAT I Operations:
1. In addition to two (2) daily inspections required by the ORH ACM, conduct an additional airfield inspection during CAT I conditions.
 2. In addition to on (1) daily runway light inspection required by the ORH ACM, inspect all runway lights and lighted signs during CAT I conditions to ensure that outages do not exceed the maximum allowable outages per the ACM. If maximum allowable outages are exceeded, appropriate NOTAM shall be issued.
 3. Provide "Follow Me" services to any pilot requesting that service.
 4. When the Tower is closed, require all vehicles operating on runway 11/29 to notify Bradley Approach of their presence, and report when they have vacated the runway.
 5. If any vehicle or equipment is in close proximity to Runway 11/29 for an extended period of time, the ORH Airport Management shall close the runway for the duration of that activity.
 6. Limit AMA access to only those personnel deemed essential.
- C. When visibility approaches SMGCS conditions (1200 RVR), all provisions of the LOA between ORH FCT and ORH Management will take effect (attached).
- D. In support of this waiver, the following infrastructure improvement are in progress;
1. Construct a 1,000 foot taxiway on the approach end of runway 11.
 2. Complete the following upgrades to support CAT II/III operations;
 3. Installation of an ALSF-2 Approach Light System
 4. Localizer and glideslope antenna upgrades
 5. Installation of an inner marker beacon
 6. Installation of a Far Field Monitor
 7. Mid-Field Runway Visual Range (RVR) monitor
 8. Airfield Lighting Control and Monitoring System (ALCMS) and emergency backup power
 9. Installation of in-pavement guard lights
 10. Runway Light Intensity Monitoring System, additional Surface Movement Guidance and Control (SMGCS) routes, and
 11. Taxiway Centerline Lights, enhanced markings and signage as well as use of guard lights for low visibility SMGCS operations
 12. Install surface markings and install lighted direction signs at Hotspot 1 to clearly distinguish taxiway Delta from taxiway Foxtrot.
 13. Install in-pavement runway guard lights at the hold short lines for taxiway Delta, Foxtrot, and Bravo.
 14. Install signage adjacent to taxiway Delta, Foxtrot, and Bravo hold-short lines advising pilots that, "If tower is closed and weather conditions below 800-2, do not proceed beyond this hold-line until receiving a departure release from ATC".
 15. In addition to the items, above, other geographic position markings, lighted directional signs, intersection hold - lines, in pavement guard lights and other aids, as recommended by the SMGCS Working Group will be installed.
 16. Compliance with the safety provisions within the LOA between Yankee Tracon and Worcester ATCT (attached) requiring coordination between the two facilities, mileage distance requirements during coordination, detailed aircraft positions, and airport surface movement restrictions.

5. ALTERNATIVE ACTIONS DEEMED NOT FEASIBLE:

- A. Three taxiway configurations were investigated. They are as follows, construct;
1. A full parallel taxiway serving runway 11/29,
 2. A partial taxiway from the end of runway 11 to taxiway Delta, and
 3. A 1,000 foot taxiway serving runway 11

The first two alternatives were eliminated due to the estimated costs and construction times which exceeded 45 million dollars and seven years.

6. COORDINATION WITH USER ORGANIZATIONS (SPECIFY):

Coordination with FAA Airports, Flight Standards, and Air Traffic Divisions has been accomplished.

7. SUBMITTED BY: DATE:

3/6/2017

OFFICE IDENTIFICATION

Massachusetts Port Authority

TITLE

Airport Director

SIGNATURE



8. AFS ACTIONS:

☐ APPROVED ☐ DISAPPROVED ☐ NOT REQUIRED

COMMENTS:

DATE ROUTING SYMBOL SIGNATURE

From: [Reddinger, Shawn \(FAA\)](#)
To: [Maxfield, Jacob \(FAA\)](#)
Subject: FW: ORH waiver question (ILS CAT I vs CAT II/III)
Date: Friday, August 04, 2017 1:16:24 PM

FYI

Shawn Reddinger
New England Region Flight Procedures
Eastern Operations Support Group
Flight Procedures Team; AJV-E24
College Park, GA
404-305-5948



From: Bordy, John (FAA)
Sent: Thursday, July 20, 2017 11:04 AM
To: Reddinger, Shawn (FAA)
Cc: Gianetta, William (FAA); Nichols, Thomas J (FAA); Prasse, Phil (FAA); Wacker, Daniel (FAA); Patterson, Lawrence (FAA)
Subject: RE: ORH waiver question (ILS CAT I vs CAT II/III)

Hi Shawn,

In general, a visibility waiver request that only describes CAT I operations should not be applied to a subsequently developed CAT II/III.

Regarding ORH specifically, I don't see an approved waiver yet, but I do see one was submitted and it looks like approval is pending completion of a successful flight inspection. The waiver that was submitted does address CAT II/III operations on the Form 8260-1, so once approved it would suffice for all minimums associated with the ILS RWY 11.

Thanks,

John Bordy
TERPS Standards Development Specialist
Flight Procedure Standards Branch, AFS-420
Phone: 405.954.0980

From: Reddinger, Shawn (FAA)
Sent: Thursday, July 20, 2017 9:33 AM

To: Bordy, John (FAA) <John.Bordy@faa.gov>; Nichols, Thomas J (FAA) <Thomas.J.Nichols@faa.gov>; Prasse, Phil (FAA) <Phil.Prasse@faa.gov>
Cc: Gianetta, William (FAA) <william.gianetta@faa.gov>
Subject: ORH waiver question (ILS CAT I vs CAT II/III)

Good Morning Gents, quick question if any of you can answer (or direct me elsewhere if needed)

If there is an approved waiver for approach mins below 1SM without a full parallel taxiway on the ILS (CAT 1) will that “carryover” to the development of CAT II/III mins

Or will a separate waiver be required?

Shawn Reddinger
New England Region Flight Procedures
Eastern Operations Support Group
Flight Procedures Team; AJV-E24
College Park, GA
404-305-5948





Federal Aviation Administration

Memorandum

Date: March 6, 2017

To: Wade Terrell, Manager, Flight Technologies and Procedures Division, AFS-460

From: David A. Swanson, NextGen Branch, AEA-220

Prepared by: William Gianetta, NextGen Branch, AEA-220

Subject: Waiver to FAA Order 8260.3C, United States Standards for Terminal Instrument Procedures (TERPS), Chapter 3, Section 3-3, Paragraph 3-3-2, "Establishing Straight-in Visibility Minimums" Sub paragraph (d), "Runway Requirements" and Table 3-3-6, minimum visibility for approaches to runways without a full length parallel taxiway - Worcester Regional Airport, (KORH) runway 11/29.

The Massachusetts Port Authority (Massport), operator of the Worcester Regional Airport, (KORH) requests a waiver of the minimum straight in visibility requirements, without a full length parallel taxiway, as specified in TERPS Order 8260.3C, Chapter 3, Section 3-3, Paragraph 3-3-2, subparagraph (d), and Table 3-3-6, in order to proceed with amending the current CAT I, ILS runway 11 to CAT II/III minimums. A Modification of Standards, authorizing a precision approach with visibility minimums of less than one statute mile, without a full length parallel taxiway, was approved on June 16, 2015.

In support of this waiver, Massport is investing over twenty million dollars in infrastructure improvements to include the construction of a 1,000 FT parallel taxiway serving the approach end of runway 11.

The construction of this taxiway along with adding additional runway signage, marking and lighting, installation of in- pavement and elevated guard lights at all runway/taxiway intersections, and limiting aircraft movement during periods of reduced visibility, are strong mitigations, ensuring a high level of confidence with the proposed operations.

Air traffic services at KORH are conducted by a Federal Contracted Tower (FCT). Massport is negotiating with the contractor to extend the hours of operations, providing ATC services during the hours when air carrier operations are ongoing.

The Eastern Region Flight Standards Division supports this waiver request. If you have any questions or require additional information, please contact David A. Swanson, Manager, Eastern Region NextGen Branch at (718) 238-7210.

Attachment:

Waiver Request

LOA between Yankee TRACON (Y90) & ORH Air Traffic Control Tower

Modification of Standard

Airport Diagram

LETTER OF AGREEMENT

EFFECTIVE: January 26, 2014

SUBJECT: Inter-facility Coordination and Control Procedures

1. PURPOSE: To establish coordination and control procedures between Yankee TRACON (Y90) and Worcester FCT (ORH).

2. SCOPE: These procedures apply for air traffic operations at the Worcester Regional Airport when the control tower is operating. Y90 has control jurisdiction over all aircraft operating IFR to and from ORH. Y90 delegates control authority to ORH for SVFR flights at and below 2,500 MSL in the Worcester Airport Class D surface area.

3. CANCELLATION: Yankee TRACON/Worcester Tower Letter of Agreement, dated January 24, 2013 is canceled.

4. PROCEDURES:

a. Y90 must:

(1) forward position information to Worcester Tower at least ten (10) miles from the airport. If not possible, ensure the inbound does not penetrate the Worcester Class D surface area, until the coordination is complete. When the landing runway touchdown RVR is 2400 feet or less, provide position information no earlier than fifteen (15) flying miles from the airport.

(2) ensure transfer of communications prior to the final approach fix for instrument approaches and prior to entering the Class D surface area for visual and contact approaches.

b. ORH must:

(1) obtain release for IFR aircraft from the Y90 Worcester Sector. Assign 3,000 feet to all departing IFR aircraft. Specify departing runway at time of request.

(2) consider receipt of an FDIO arrival strip as forwarded advance arrival information.

(3) consider receipt of an FDIO departure strip as constituting an approved clearance; obtain clearance from Eradley TRACON during FDIO outages.

(4) clear TEC aircraft (operating 10,000 and below) in accordance with the routes depicted in the Preferential Route Section of the IDS. Amend the FDIO strips as necessary, and advise the TRACON radar controller of revision number at time of release.

(5) suspend aircraft and vehicle movements from the time position information is forwarded until landing, during times when CAT II/III operations are being conducted.

(6) issue the routing between the plus signs, when pluses appear on the strip.

(7) force (RF) flight data to the Y90 STARS when there are two flight plans for the same aircraft. This must be accomplished after removing the unused flight plan.

(8) enter information into the FDIO for aircraft that request VFR flight following that will exit Y90 airspace.

(9) forward current weather, ATIS code, tower visibility changes, and runway/s in use to Y90 via the IDS. Verbally advise the Worcester controller of current ATIS code.

(10) suspend SVFR operations prior to an arriving IFR aircraft entering the Class D surface area.

(11) inform Y90 Worcester Sector immediately of an aircraft executing a missed approach.

(12) forward IFR cancellations or landing times to Y90.

(13) obtain CFR times and adhere to same.

(14) request clearances from Y90 when silent clearances have been cancelled.

(15) coordinate with Y90 when starting and ending Air Traffic Control services. Include information concerning NAVAIDS, runway closures, airport and approach lighting, weather, NOTAMS, field conditions, frequency transfer, any pending traffic, and any other pertinent information affecting Air Traffic operations. In the IDS, ensure that the ORH Status Information Area (SIA) page is accurate and up to date with the above items.

(16) forward reportable delays to Y90 at the end of each day. NOTE: Reportable delays are those delays that are 15 minutes or greater.

(17) inform aircraft requesting practice instrument approaches to Worcester Airport to contact Y90 on 119.0/327.1 MHz.

5. OPPOSITE DIRECTION SAME RUNWAY OPERATIONS. Opposite Direction Same Runway operations between aircraft receiving IFR separation services may be conducted at Worcester using the following procedures and under the following conditions:

a. Coordination:

(1) Local Control initiates for an opposite direction departure, and Y90 Worcester Radar initiates for an opposite direction arrival. Coordination, by the controllers involved, with the OS/CIC in each facility must also be accomplished.

(2) All coordination must be on a recorded line and must state "opposite direction."

(3) All coordination must include call-sign, aircraft type and arrival or departure runway.

b. Cutoff Points. The following minimum cut off points have been established as measured from the ILS DME, when conducting opposite direction same runway operations.

(1) A departure and an arrival:

(a) Between 2 turbojets: 10 miles.

(b) Between all other types or combinations of aircraft/helicopters: 8 miles.

(2) The application of the above cut off points ensures required longitudinal or lateral separation exists before any other type of separation is applied when a departing aircraft becomes airborne and issued a turn to avoid conflict; or when the first aircraft has crossed the runway threshold for opposite direction arrivals.

c. General:

(1) Traffic advisories must be exchanged to both the arriving and departing aircraft.

EXAMPLE-

OPPOSITE DIRECTION TRAFFIC (DISTANCE) MILE FINAL, (type aircraft).

OPPOSITE DIRECTION TRAFFIC DEPARTING RUNWAY (number), (type aircraft).

(2) Worcester Tower is responsible to apply the cutoff points noted above between departing and arriving; or arriving aircraft.

(3) Opposite direction same runway operations with opposing traffic inside the applicable cutoff point is prohibited unless an emergency situation exists.

6. GENERAL:

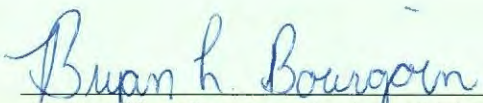
a. The hours of operation for Worcester Tower are daily from 6:30 a.m. to 9:00 p.m. lcl.

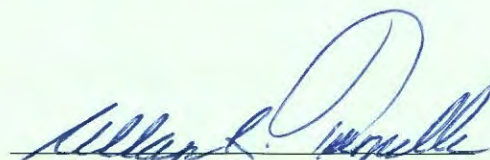
b. CAT II/III ILS approaches are authorized only during times when the Tower is operating.

c. In the event of an FDIO, or IDS breakdown (outage), and when otherwise required, for example: maintenance shutdown, transfer of flight data, control, or weather; information must be effected on the 11 Line.

d. Each facility must advise the other concerning outages of their respective equipment.

e. When appropriate, consult the facility contingency plans for additional guidance.


Air Traffic Manager, Yankee TRACON


Air Traffic Manager, Worcester FCT

**FAA NEW ENGLAND REGION
MODIFICATION OF AIRPORT DESIGN STANDARDS
2013-1**

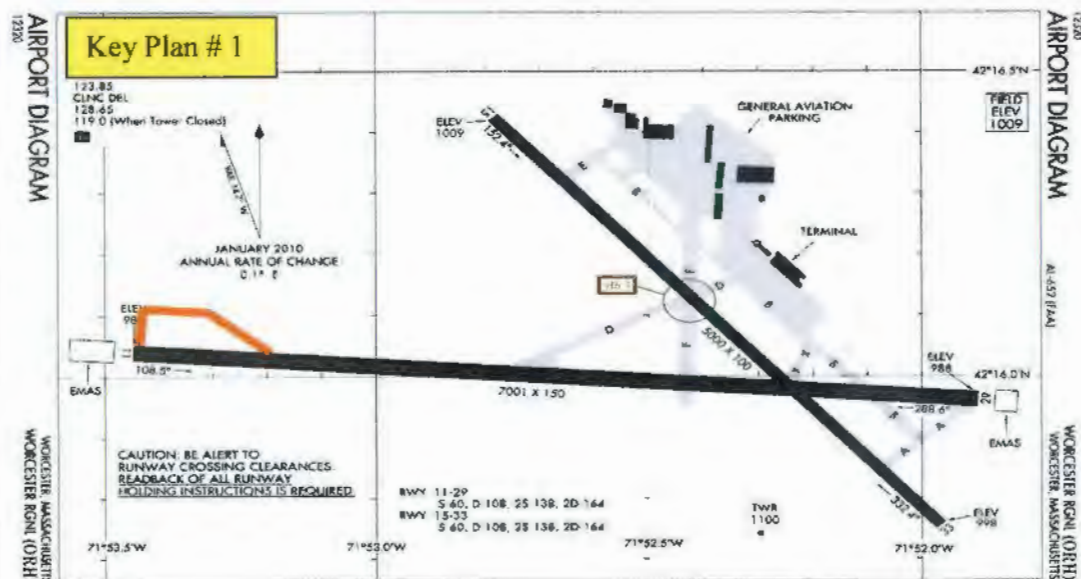
BACKGROUND

BACKGROUND		
1. AIRPORT: Worcester Regional Airport	2. LOCATION (CITY, STATE): Worcester, Massachusetts	3. LOC ID: KORH/ORH
4. EFFECTED RUNWAY/TAXIWAY: Runway 11	5. APPROACH (EACH RUNWAY): <u>11, 29</u> PIR NPI VISUAL	6. AIRPORT REF. CODE (ARC): C-III
7. DESIGN AIRCRAFT (EACH RUNWAY/TAXIWAY): Group III Boeing 737-300, -500, -700 and -800; Airbus A320-200		

MODIFICATION OF STANDARDS

8. TITLE OF STANDARD(S) BEING MODIFIED (CITE REFERENCE DOCUMENT):
FAA Advisory Circular (AC) 150/5300-13A, Change 1, <i>Airport Design</i>
9. STANDARD/REQUIREMENT:
AC 150/5300-13A, Change 1, Table 3-4, footnote 11, states that a full-length parallel taxiway is required for a precision approach with visibility minimums less than 1 statute mile.
Approval required for existing and proposed CAT I, CAT II and III operations.
10. DESCRIPTION OF PROPOSED MODIFICATION:

Massport proposes to provide 100% funding to upgrade the existing FAA CAT I ILS equipment for Runway 11 to CAT II/III ILS equipment standards, including the approach light system. Massport proposes to use an operational restriction limiting use of CAT II/III operations to a single aircraft within the movement area depicted on the Surface Movement Guidance and Control System (SMGCS), Low Visibility Taxi Routes chart (***Refer to Attachment # 7: Current ORH FCT-ORH SMGCS LOA 12-6-13***). This restriction provides an acceptable level of safety in the absence of a full length parallel taxiway. Massport will also construct a “Jug Handle” taxiway (partial parallel taxiway up to 1,000 ft. in length) at the Runway 11 threshold (***Refer to Key Plan # 1, below, and Attachment # 1: Figure 1 – 1,000’ Partial Parallel Taxiway Concepts at Runway 11 End***). This enables the reduction of runway occupancy time including the duration of the back taxi operation, provides a location for an aircraft to hold clear of the runway protected operating areas, and facilitates departing aircraft to taxi to position at the Runway 11 threshold.



Specific upgrades include:

- Approach Light System with Sequence Flashers (ALSF-2)
- Localizer and glideslope antennae upgrades
- Inner Marker Beacon
- Far Field Monitor
- Mid-Field Runway Visual Range (RVR) monitor
- Airfield Lighting Control and Monitoring System (ALCMS) and emergency backup power
- Installation of in-pavement runway guard lights
- Runway Light Intensity Monitoring System, additional Surface Movement Guidance and Control (SMGCS) routes, and
- Taxiway centerline lights, enhanced markings and signage as well as the use of guard lights for low visibility SMGCS operations

Under this proposal Massport anticipates spending approximately \$10 million for upgrading navigational equipment and approximately \$11 million to construct a 1,000 ft. parallel taxiway at the Runway 11 threshold end.

11. EXPLAIN WHY STANDARD(S) CANNOT BE MET:

There are significant obstacles to constructing a standard full length parallel taxiway. A parallel taxiway from Runway 11 to Taxiway D requires substantial fill of precipitous terrain, including impacts to wetlands with hydrological connection to a public water reservoir that is a component of the municipal water supply system. This will incur extraordinary costs and an estimated seven year delay in implementing the CAT II/III approaches (*Refer to Key Plan # 2 and Attachment #2: Figure 2 - Partial Parallel Taxiway Concept from Runway 11 End to Taxiway D*). Likewise, construction of parallel taxiway from the Runway 29 end to the north of the runway to avoid a runway crossing would require substantially more fill and time and would eliminate the only available site for the Runway 29 glideslope antenna (*Refer to Key Plan # 3*).

Given ORH's frequency of low visibility conditions, it is not viable for airlines to operate during those low visibility periods without the ability to land. (*Refer to Attachment # 4: Technical Memorandum - Weather Analysis Update, April 10, 2013*). This is consistent with the history of air service at Worcester.

12. DISCUSS ALL VIABLE ALTERNATIVES:

Alternatives to the Proposed Modification of Airport Design Standards include: (1) no action; (2) parallel taxiway from Runway 11 to Taxiway D; and (3) full parallel taxiways from Runway 11 end to the Runway 29 end.

1. No Action:

This alternative is not acceptable to Massport. It acquired this airport with a commitment to facilitate the redevelopment of scheduled service for this region. JetBlue started limited scheduled service in November 2013 with the expectation that a CAT II/III ILS will be installed in the near future to enhance safety and reliability of operations. Since initiation of that service, more than 50% of JetBlue's cancelled or diverted flights have been due to CAT II/III weather.

2. Parallel taxiway from Runway 11 to Taxiway D. (*Refer to Key Plan # 2, below, and Attachment # 2: Figure 2 Partial Parallel Taxiway Concept from Runway 11 End to Taxiway D*).

This section of taxiway would provide a full parallel route for departing aircraft to travel from the terminal and GA hangar areas to the end of Runway 11. This alternative would permit departing aircraft to taxi to the threshold hold position while aircraft were conducting CAT II or III approaches. However, this alternative would not eliminate the crossing of the CAT II/III runway by an arriving aircraft that cannot exit the runway at Taxiway B and restriction to single aircraft operation would still be required in low visibility conditions.

This option increases the project cost to approximately \$45 million. It would delay reduction of approach minima by seven years due to environmental processing and placement of substantial fill.

3. Full parallel taxiway from Runway 11 end to Runway 29 end: (*Refer to Key Plan # 3, below*)

This alternative would have extraordinary costs over and above the \$45 million for Alternative 2. This concept would require constructing a parallel taxiway segment to the north of Runway 29 resulting in the elimination of the existing Runway 29 ILS as there is no other place to relocate the ILS. The loss of the Runway 29 ILS would be counter to Massport's and the FAA's interest of enhancing safety and efficiency, although the impact could be reduced as airlines and GA aircraft implement RNP and GPS navigation. Further, construction of the full parallel taxiway would incur an additional delay in the implementation of CAT II/III ILS due to extensive environmental permitting, added design effort and increased construction time, and the need to relocate existing landside facilities.

13. STATE WHY MODIFICATION WOULD PROVIDE AN ACCEPTABLE LEVEL OF SAFETY:

This case is unique in that low visibility approaches are normally installed at hub airports where a limitation of single aircraft operation would not be tolerable. In this situation, the need is related to the high prevalence of low visibility conditions that undermine schedule integrity, and not delay reduction associated with high volumes of operations. Forecast analysis indicates that the operational restrictions proposed in this MOS (Refer to Box 10) limiting use of CAT II/III operations to single aircraft within SMGCS operational area can be used for at least the next fifteen years of anticipated growth in scheduled services and GA operations (*Refer to Attachment # 5: Aviation Activity Forecast Commercial and GA Operations for 15 – Year Planning Horizon*). If operations exceed ten flights per hour, Massport will reevaluate this Modification of Standards and pursue construction of additional phases of improvement if needed and concurred by FAA.

EQUIVALENT LEVEL OF SAFETY

An equivalent level of safety is achieved during;

1. Category II/III approaches and instrument departures by restricting the airfield to only a single aircraft operation (approach or departure) and compliance with the SMGCS plan when below 1200' RVR (visibility standard for SMGCS). This method is currently used to support RVR departures down to 600' RVR.
2. Category I approaches and departures below one mile visibility require IFR clearances and ORH FCT applies positive separation between IFR operations, including taxiing aircraft. When the tower is active, departures will be held on Taxiway Delta or the new partial parallel taxiway to Runway 11. When the tower is closed, no aircraft can enter the runway corridor without a departure or approach clearance from the approach control center. Taxi clearances are not used by approach control. ORH has a Remote Communications Outlet (RCO) air to ground transmitters to assure continuous radio communications with approach control during all phases of an aircraft's flight and airfield movements. In addition, the CTAF is used by pilots to report positions and intentions to each other. CTAF is monitored 24/7 by operations staff to detect any unusual or unauthorized activity on the airfield. ARFF services are also available to provide assistance if required.

More specific information is contained in the following descriptions and attached Letters of Agreement.

(1) The LOA between Y90 and ORH FCT dated February 16, 2015 (Y90-ORH FCT LOA) that established coordination and control procedures down to CAT II/III Operations (Refer to Attachment #6: Y90-ORH FCT LOA_February 16, 2015). The key provisions of this LOA are summarized here:

As required in this LOA, Y90 communicates the aircraft position information to ORH FCT at least ten (10) miles from the airport. If not possible, Y90 must ensure the inbound does not penetrate the ORH CLASS D surface area, until the coordination is complete. When the landing runway touchdown RVR is 2,400 feet or less, Y90 is required to communicate the aircraft position no earlier than 15 flying miles from the airport. Further, when the CAT II/III operations are being conducted, i.e., below 1,200 RVR, the Y90-ORH FCT LOA requires that ORH FCT suspend vehicle and aircraft movements from the time position information for arriving aircraft is forwarded by Y90 until the completion of landing operations. In doing so, it satisfies the MOS requirement of single aircraft operations during CAT II/III conditions that will be implemented upon completion of the ORH CAT II/III and Jug Handle Taxiway Construction Project. CAT II/III ILS approaches are authorized only during times when the ORH FCT is operating.

By addressing the procedures above, this LOA also establishes coordination and control procedures for 1 mile and lower operations.

(2) The LOA between ORH FCT and Airport Management dated December 6, 2013 (Current ORH FCT-ORH SMGCS LOA or the "Current LOA") that established operational procedures and SMGCS Plan for RVR 1200 - 600 feet for departures (Refer to Attachment #7: Current ORH FCT-ORH SMGCS LOA_12-6-13). The key provisions of this LOA are summarized here:

The Current LOA triggers the SMGCS Plan at 1200 RVR and is consistent with FAA Order 8000.94. This LOA will be replaced by the Proposed LOA between ORH and ORH FCT (attached and to be effective upon completion of the CAT II/III ILS and Jug Handle Taxiway Construction Project: *Refer to Attachment #8_Proposed ORH FCT – ORH SMGCS LOA or the "Proposed LOA"* and revised SMGCS plan (not attached – to be revised in due course) that addresses CAT II/III operations for both departures and arrivals including the low visibility taxi routes for both arrivals and departures with the proposed jug handle taxiway. The Proposed LOA also requires that SMGCS operations are conducted only during the times when ORH FCT is open. The single aircraft operation restriction is covered by the Y90 – ORH FCT LOA and it is the responsibility of ORH FCT to ensure single aircraft operations.

(3) Airport Operations during Visibility above 1,200RVR

In addition, during periods when visibility is above 1,200 RVR, Massport agrees that ORH Management shall implement the following procedures to enhance the overall safety and mitigate risks in the absence of a full parallel taxiway:

A. During all operating conditions:

1. As required by the ORH Airport Certification Manual (ACM), conduct at least two (2) daily airfield inspections that include:
 - i. Inspecting all runway/taxiway intersection for Surface Painted Holding Position Signs (SPHPS) and enhanced taxiway centerline markings and ensure that correct color codings are used; no peeling, blistering, chipping, or fading have occurred; hold position markings are visible and unobscured; and are reflective during the night.
 - ii. Inspecting all airfield signs to ensure that the signs are readable, correct color codings are used and the panels are not missing.
 - iii. Inspecting all runway guard lights to ensure that no vegetation or foreign material deposits interfere with illumination, correct color codings are used and are properly aligned.
 - iv. As required by the ACM, all deficiencies shall be immediately noted and rectified and recorded in the Inspection Check List. If not able to correct immediately, a NOTAM shall be issued, as appropriate.
2. Minimize vehicular access to the AMA.
3. Ensure radio and telephone communications are functional between ARFF and ORH FCT.
4. Maintain 24/7 operations and ARFF coverage. If ARFF becomes unavailable, per the ACM appropriate NOTAMs shall be issued.
5. When the Tower is closed, all vehicles shall announce position and intention on CTAF.
6. To ensure personnel are properly trained on airfield operating procedures, Airport management will require initial and annual recurrent driver training for personnel with access to AOA. If the driver training lapses, their security badge will not allow access to the AOA.

B. In addition to above procedures, Airport Management shall implement following procedures in support of CAT I Operations:

1. In addition to two (2) daily inspections required by the ORH ACM, conduct an additional airfield inspection during CAT I conditions.
2. In addition to one (1) daily runway lights inspection required by the ORH ACM, inspect all runway lights and lighted signs during CAT I Conditions to ensure that outages do not exceed the maximum allowable outages per the ACM. If maximum allowable outages are exceeded, appropriate NOTAM shall be issued.
3. Provide "Follow Me" services to any pilot requesting that service
4. When the Tower is closed, require all vehicles operating on runway 11/29 to notify Bradley Approach of their presence, and report when they have vacated the runway
5. If any vehicle or equipment is in close proximity to Runway 11/29 for an extended period of time, the ORH Airport Management shall close the RW for the duration of that activity.
6. Limit AMA access to only those personnel deemed essential.

C. When visibility approaches SMGCS condition (1200 RVR), all provisions of the LOA between ORH FCT and ORH Management will Take effect.

CRITERIA FOR FURTHER MOS REVIEW

This MOS will be reviewed during:

1. Any future Airport Master Plan Update
2. At the request of any organization within FAA that has experienced difficulties with its utilization
3. When scheduled and unscheduled IFR operations exceed 10 operations per hour

**FAA NEW ENGLAND REGION
MODIFICATION OF AIRPORT DESIGN STANDARDS
2013-I**

14. SIGNATURE OF ORIGINATOR: Flavio Leo	15. PRINTED NAME OF ORIGINATOR Worcester Regional Airport	16. DATE
17. ORIGINATOR'S ORGANIZATION Massachusetts Port Authority	18. TELEPHONE (617)-568-3528	19. E-MAIL

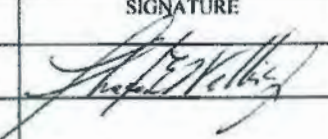
20. DATE OF LATEST FAA SIGNED ALP:
June 22, 2010

BELOW IS TO BE COMPLETED BY FAA

21. ADO RECOMMENDATION: Concur – See ANE review & comments on following page.	22. SIGNATURE:	23. DATE:
--	----------------	-----------

24. FAA DIVISIONAL REVIEW (AT, AF, FS, etc.):

This review involves the approval required for existing and proposed CAT I, CAT II and CAT III operations below one mile. The review was conducted by a regional HIT Team and airspace study 2015-ANE-146-NRA

ROUTING SYMBOL	SIGNATURE	DATE	CONCUR	NON-CONCUR
<i>AST-22</i>		<i>6/11/2015</i>	✓	

COMMENTS:

CONDITIONS OF APPROVAL

In addition to the terms proposed by Massport in their application for a Modification of Standards the following measures are added to mitigate the need for Runway 11 departures to taxi on the runway between Taxiway D and the proposed "jug handle" Taxiway G:

1. Enhance the ability of pilots to provide accurate position reports in lower visibility conditions by installing the following items:
2. Painting of surface markings and installation of lighted direction signs at Hotspot 1 to clearly distinguish taxiway D from taxiway F.
3. Installation of in-pavement runway guard lights at the hold short lines for taxiway D, F and B.
4. Install signage adjacent to taxiway D, F and B hold-short lines advising pilots that "If tower is closed and weather is below 800-2, do not proceed beyond this hold line until receiving a departure release from ATC." (Specific language and sign location(s) to be approved by FAA's Part 139 inspector).
5. In addition to the items above, other geographic position markers, lighted directional signs, intersection hold lines, in pavement guard lights and other aids, as recommended by the SMGCS team may be installed after approval through amendments to Worcester's Part 139 Certification Manual. Further revisions may be developed through the annual SMGCS review.
6. Compliance with the safety provisions within the LOA between Yankee Tracon and Worcester ATCT (Attachment #6, **Y90-ORH FCT LOA_2-16-2015**) requiring coordination between the two facilities, mileage distance requirements during coordination, detailed aircraft positions, and airport surface movement restrictions.

**FAA NEW ENGLAND REGION
MODIFICATION OF AIRPORT DESIGN STANDARDS
2013-1**

14. SIGNATURE OF ORIGINATOR: Flavio Leo	15. PRINTED NAME OF ORIGINATOR Worcester Regional Airport	16. DATE
17. ORIGINATOR'S ORGANIZATION: Massachusetts Port Authority	18. TELEPHONE (617)-568-3528	19. E-MAIL

20. DATE OF LATEST FAA SIGNED ALP:
June 22, 2010

BELOW IS TO BE COMPLETED BY FAA

21. ADO RECOMMENDATION: Concur – See ANE review & comments on following page.	22. SIGNATURE:	23. DATE:
--	----------------	-----------

24. FAA DIVISIONAL REVIEW (AT, AF, FS, etc.):

This review involves the approval required for existing and proposed CAT I, CAT II and CAT III operations below one mile. The review was conducted by a regional HIT Team and airspace study 2015-ANE-146-NRA

ROUTING SYMBOL	SIGNATURE	DATE	CONCUR	NON-CONCUR
AFS-408	pat.zelechowski@faa.gov <small>Digitally signed by pat.zelechowski@faa.gov DN: cn=pat.zelechowski@faa.gov Date: 2015.06.15 07:32:57 -0400</small>		X	

COMMENTS:

CONDITIONS OF APPROVAL

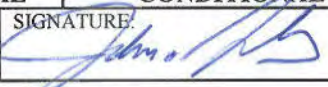
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2. Painting of surface markings and installation of lighted direction signs at Hotspot 1 to clearly distinguish taxiway D from taxiway F.
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4. Install signage adjacent to taxiway D, F and B hold-short lines advising pilots that "If tower is closed and weather is below 800-2, do not proceed beyond this hold line until receiving a departure release from ATC." (Specific language and sign location(s) to be approved by FAA's Part 139 inspector).
5. In addition to the items above, other geographic position markers, lighted directional signs, intersection hold lines, in pavement guard lights and other aids, as recommended by the SMGCS team may be installed after approval through amendments to Worcester's Part 139 Certification Manual. Further revisions may be developed through the annual SMGCS review.
6. Compliance with the safety provisions within the LOA between Yankee Tracon and Worcester ATCT (Attachment #6, Y90-ORH FCT LOA_2-16-2015) requiring coordination between the two facilities, mileage distance requirements during coordination, detailed aircraft positions, and airport surface movement restrictions.

New England Region Airport Division's Recommendation

Given these findings, the New England Airport Division **recommends approval** of the modification of standards for Category I/II/III approaches. We note this modification is subject to the requirements for periodic review described in a prior section of this application.

25. AIRPORTS' DIVISION FINAL ACTION:

<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
UNCONDITIONAL APPROVAL	CONDITIONAL APPROVAL	DISAPPROVAL
DATE: 6/16/15	SIGNATURE: 	TITLE: MANAGER, AAS-100
CONDITIONS OF APPROVAL: PER TERMS PROPOSED BY MASSPORT AND CONDITIONS OF APPROVAL SHOWN ON PAGE 7 OF 8, ALSO, APPROVAL IS CONTINGENT ON A SATISFACTORY SAFETY RISK MANAGEMENT (SRM) RESULT.		

**Attachment # 1: Figure 1 – 1000' Partial Parallel Taxiway Concepts at Runway 11 End
CAT III ILS & TAXIWAY IMPROVEMENTS PROJECT, WORCESTER REGIONAL AIRPORT**

July 10, 2013

Preferred Option



Attachment # 2: Figure 2 – Partial Parallel Taxiway Concept from Runway 11 End to T/W Delta
CAT III ILS & TAXIWAY IMPROVEMENTS PROJECT, WORCESTER REGIONAL AIRPORT July 10, 2013



Attachment # 3: Figure 3 – Use of Taxiways A and B at Runway 29 End as Partial Parallel Taxiway
CAT III ILS & TAXIWAY IMPROVEMENTS PROJECT, WORCESTER REGIONAL AIRPORT
July 10, 2013



Memorandum

(Continued)

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1.1 Background

Massport tasked Jacobs to analyze weather data for several airports Worcester Regional Airport (ORH), Boston-Logan International Airport (BOS), Theodore Francis Green State Airport (PVD), Bradley International (BDL) and Manchester-Boston Regional (MHT) for the periods Jan. 1996 – Dec. 2000 and Jan. 2001 – Dec. 2012. The goal of the analysis was to determine the percentage of time each airport experienced weather ceiling or visibility conditions under the FAA's ILS Minimums for Category I, II and III weather conditions. The 2003 study applied filters to the visibility observations to group them into the decimal equivalent ranges for the different categories. The ceiling and visibility minimums taken from the 2003 study were defined as:

1. **Category I or better** – Ceiling \geq 200 feet
and/or Visibility \geq 3/8 or 0.38 mi;
2. **Category II** - Ceiling = 100 feet
and/or Visibility \geq 0.25, but \leq 0.38 mi;
3. **Category III** - Ceiling $<$ 100 feet
and/or Visibility $<$ 0.25 mi.

These ranges were back-checked against the FAA's Aeronautical Information Manual (AIM), Chapter 1, Section 1-1-9.i. "ILS Minimums", which defines visibility in terms of Runway Visibility Range (RVR). The AIM defines the ILS Minimums as follows:

- a. **Category I** – Decision Height (Ceiling) = 200 feet; and RVR with touchdown zone and centerline lights (as with ORH RW11) = 1,800 feet (or 0.34 mi)
- b. **Category II** - Decision Height (Ceiling) = 100 feet; and RVR = 1,200 feet (or 0.22 mi)
- c. **Category III.c.** - No Decision Height (Ceiling) and No RVR limitation (I.E.: Ceiling = Zero; and RVR = Zero)

The RVR values for the FAA's equivalent values were found to be slightly lower than the 2003 study's visibility values (I.E.: 0.34 vs. 0.38 mi for CAT I; and 0.22 vs. 0.25mi for CAT II). These minimal differences were assumed not to create any significant aberration in the findings of the weather analyses, especially since the weather observations recorded by NOAA use tenths of a mile for their reporting categories, which would have required use of a rounding factor in establishing the data filters.

This Update Analysis used the FAA RVR decimal equivalents rounded to the next closest tenth-of-a-mile reporting category (I.E.: 0.34 was rounded down to 0.3 mi for CAT I; and 0.22 was rounded down to 0.2 mi for CAT II) as data filters. These may have differed minimally from those used to filter the visibility categories in the 2003 study, which were unreported, but again, the results showed a high correlation between the data sets.

Memorandum

(Continued)

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1.2 Methodology

The weather data for this Weather Analysis Update was obtained from the National Climatic Data Center (NCDC) website at:

<http://cdo.ncdc.noaa.gov/pls/plclimprod/poemain.accessrouter?datasetabbv=DS3505>

The data from the NCDC website was provided for download as space separated text files for the requested periods with weather observations at hourly intervals. Due to the large file size (184,655 observations for ORH x 2 for ceiling/visibility + 722,677 x 2 for BOS, PVD, BDL and MHT), the data had to be broken into four year periods and then imported into MS Excel spreadsheet software. The date field (provided as mmddyyhr) then needed to be separated into fields for month, day, year and hour to enable querying for specific time periods. Once correctly formatted, the data for each of the four year periods for each of the five study airports was then imported to MS Access as the database software is capable of sorting and querying large dataset, whereas MS Excel is limited.

Once imported into MS Access, queries were set up to display only those weather observations that met the criteria for each weather category as noted above. The total number of observations for each requested time period and weather category were noted and totaled. The total for each category was then divided by the sum of the number of observations for each of the weather categories (CAT I, II, and III) to yield the percentages for each category. An example of this process, using the 1996 thru 2000 observations for Providence, is illustrated below:

CAT I -	55,067 observations at PVD (1996-2000)
CAT II -	502 observations
CAT III -	<u>268 observations</u>
	55,838 total observations at PVD (Jan. 1, 1996 – Dec. 31, 2000)

CAT I percentage of operations = 55,067 divided by 55,838, or 98.62 % for 1996 – 2000 (see Table 1.2, below). This process was then repeated for the CAT II and CAT III observations to derive the percentage for each condition. The calculations were then repeated for each subsequent data period (2001-2012) and for each airport.

A step by step account of the process is included in Appendix A.

1.3 Weather Analysis Update: Conclusions

This Weather Analysis Update confirmed that Worcester Regional Airport experiences CAT II/III weather conditions, on an average annual basis, six to seven times more frequently than Boston, Providence or Bradley International, and up to 9 times more often than Manchester-Boston Regional Airport.

The tables in Section 1.4, below and on the following pages, summarize the weather observations by percentages of time for the ceiling and visibility observations noted under CAT I, CAT II, and CAT III conditions. Table 1.0 provides a comparative analysis of the average percent of time for each airport under each weather category. The Table has been formatted to facilitate comparison with Table 5 on page 3-3 in the 2003 Feasibility Study. Note that the 2003 Feasibility Study did not include the extra weather data for BDL or MHT, as in this Update. The subsequent Tables 1.1

Memorandum

(Continued)

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through 1.5 provide summaries of the weather data percentages for each of the five individual airports.

This Weather Analysis Update confirms the conclusion reached in Chapter 3.1.2 of the 2003 Feasibility Study that, "ORH has a higher percentage of usable hours for CAT II and CAT III instrument approaches and could potentially attract carriers to use ORH once the CAT II/III equipment is provided."

1.4 Weather Summary Tables

TABLE 1.0			
USABLE HOURS PERCENT OF TIME			
AIRPORT	CATEGORY		
	CAT I*	CAT II**	CAT III***
	Berger / '96-'00 / '01-'12	Berger / '96-'00 / '01-'12	Berger / '96-'00 / '01-'12
ORH	92.11% / 91.73% / 91.90%	5.45% / 5.25% / 6.33%	2.43% / 3.01% / 1.77%
PVD	98.75% / 98.62% / 98.68%	1.01% / 0.90% / 1.07%	0.24% / 0.48% / 0.25%
BOS	98.73% / 98.86% / 98.73%	0.92% / 0.75% / 1.06%	0.35% / 0.39% / 0.20%
BDL	NA / 98.74% / 98.75%	NA / 0.87% / 0.84%	NA / 0.38% / 0.40%
MHT	NA / 99.52% / 99.12%	NA / 0.21% / 0.02%	NA / 0.26% / 0.85%
Data source: NCDC Weather Station Sites WBAN ID's 14739, 94746, 14765. Percentage calculations performed by Jacobs for years '96-'12			
*CAT I =	ceiling \geq 200' and/or visibility \geq 0.3mi/ 1,800FT RVR		
**CAT II =	ceiling \geq 100' and \leq 200' and/or visibility \geq 0.2mi but \leq 0.3sm/ 1,200FT RVR		
***CAT III=	ceiling $<$ 100' and visibility $<$ 0.3mi/ less than 1,200FT RVR		

TABLE 1.1			
WORCESTER	Data Period		
	Base data (Berger)	Jan. 1, 1996- Dec. 31, 2000	Jan. 1, 2001 - Dec. 31, 2012
		52,136 observations reported	132,519 observations reported
CAT I	92.11%	91.73%	91.90%
CAT II	5.54%	5.25%	6.33%
CAT III	2.43%	3.01%	1.77%
	99.99%	100.00%	100.00%

Memorandum

(Continued)

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TABLE 1.2			
PROVIDENCE	Data Period		
	Base data (Berger)	Jan. 1, 1996- Dec. 31, 2000	Jan. 1, 2001 - Dec. 31, 2012
		55,838 observations reported	142,273 observations reported
CAT I	98.75%	98.62%	98.68%
CAT II	1.01%	0.90%	1.07%
CAT III	0.24%	0.48%	0.25%
	100.00%	100.00%	100.00%

TABLE 1.3			
BOSTON-LOGAN	Data Period		
	Base data (Berger)	Jan. 1, 1996- Dec. 31, 2000	Jan. 1, 2001 - Dec. 31, 2012
		53,727 observations reported	144,855 observations reported
CAT I	98.73%	98.86%	98.73%
CAT II	0.92%	0.75%	1.06%
CAT III	0.35%	0.39%	0.20%
	100.00%	99.99%	100.00%

TABLE 1.4		
BRADLEY INTL.	Jan. 1, 1996- Dec. 31, 2000	Jan. 1, 2001 - Dec. 31, 2012
	54,829 observations reported	138,835 observations reported
CAT I	98.74%	98.75%
CAT II	0.87%	0.84%
CAT III	0.38%	0.40%
	99.99%	99.99%

TABLE 1.5		
MANCHESTER	Jan. 1, 1996- Dec. 31, 2000	Jan. 1, 2001 - Dec. 31, 2012
	23,027 observations reported	110,293 observations reported
CAT I	99.52%	99.12%
CAT II	0.26%	0.85%
CAT III	0.21%	0.02%
	99.99%	99.99%

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(Continued)

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APPENDIX A

Weather Analysis Process Steps

Memorandum

(Continued)

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Weather Analysis Process Steps

1. Navigate to:
<http://cdo.ncdc.noaa.gov/pls/plclimprod/poemain.accessrouter?datasetabbv=DS3505>
Agree to WMO resolution 40 and continue with simplified options.
2. Select country "U.S." then continue to next screen to select state from drop-down menu.
Click continue
3. Select Weather Station/ Airport. Note the period of record for each Airport, since the files are sometimes split into two or more stations.
4. Choose data range and click continue. Enter email address. Data will be sent via a download link, normally within a few hours. Download files will be delimited/ASCII, so that they will import into a spreadsheet application.
5. Download ceiling and visibility observations from NCDC data files
6. Import .txt file to MS Excel
7. Format date field to be compatible in MS Access for querying
8. Import to MS Access
9. Set up query for weather category
10. Note number of observations for each query (i.e. Cat I – 55,067 observations for PVD for period Jan. 1 1996 – Dec. 31, 2000)
11. Sum queried observations (i.e. 55, 838 observations for PVD)
12. Divide observations of each query by sum of queried observations to obtain percentages (i.e. $55,067 / 55,838 = 98.62\%$ CAT I for PVD)
13. Calculate similar percentages for remaining observations (using CAT II/III minima for ceiling and visibility) for each month and year from 1996 through 2012, inputting each hourly observation at ORH, PVD, BOS, BDL and MHT. (See attached 29-page ORH weather data file for the single month of December 2012, in Appendix A, as example of NCDC file.) Each month's hourly observations for each year at each Airport were analyzed in this Weather Update. The results for each airport are shown on Tables 1.1 through 1.5, in the Section 1.4, below.

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APPENDIX B

Example Weather Data File

**4 Excerpt Pages from
29-Page File
Month of December, 2012
Hourly Observations Data File
Worcester Regional Airport**

**NOTE: 29 to 30 pages of hourly data for each month
12 months x 17 years x 5 airports = 908,332 observations
Ceiling + Visibility = 2 x 908,332 = 1,816,664 data points**

(Continued)

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Worcester Hourly Data
December 2012

[illegible]

<http://www.lrncdc.noaa.gov/pub/orders/72510994746-2012-12-2567706198055dat.html>

CHINESE

94746	201212170708	0509	***	2	CRS	1.0	***	104	***	28	***	30.00	979.1	***	0.007	***		
725100	94746	201212170710	0509	***	2	CRS	0.8	***	61.0	***	28	26	29.99	978.8	***	0.007	***	
725100	94746	201212170752	0409	21	2	***	1.0	***	61.0	***	28	27	29.99	978.8	***	0.007	***	
725100	94746	201212170754	0409	21	2	CRS	1.0	***	61.0	***	28	23	1016.9	99978.8	***	0.007	***	
725100	94746	201212170817	0409	21	2	CRS	1.0	***	61.0	***	28	26	29.99	978.8	***	0.01	***	
725100	94746	201212170817	0409	21	2	CRS	1.0	***	61.0	***	28	27	1016.9	99978.8	***	0.02	0.03	
725100	94746	201212170856	0509	***	2	CRS	1.0	***	61.0	***	28	26	29.99	977.2	***	0.01	***	
725100	94746	201212170940	0409	***	2	CRS	0.8	***	61.0	***	28	26	1015.3	99977.2	***	0.01	***	
725100	94746	201212170954	0409	21	2	CRS	1.0	***	61.0	***	28	27	29.99	977.2	***	0.01	***	
725100	94746	201212171009	0509	11	18	2	CRS	1.0	***	61.0	***	28	27	29.99	977.5	***	0.03	***
725100	94746	201212171043	0409	13	20	2	CRS	1.0	***	61.0	***	28	26	29.99	977.5	***	0.04	***
725100	94746	201212171054	0409	13	***	2	CRS	1.0	***	61.0	***	28	27	1015.8	99977.5	***	0.05	***
725100	94746	201212171103	0309	11	20	2	CRS	1.0	***	61.0	***	28	26	29.99	977.8	***	0.007	***
725100	94746	201212171114	0309	***	2	CRS	1.0	***	61.0	***	28	27	29.99	977.8	***	0.02	***	
725100	94746	201212171154	0509	11	21	2	CRS	1.0	***	61.0	***	29	27	1015.6	99977.5	***	0.08	0.16
725100	94746	201212171252	0409	10	18	2	CRS	1.0	***	61.0	***	29	27	29.99	977.2	***	0.03	***
725100	94746	201212171252	0409	10	***	2	***	1.0	***	61.0	***	28	27	29.99	977.2	***	0.03	***
725100	94746	201212171254	0509	11	***	2	CRS	1.0	***	61.0	***	29	27	1015.2	99977.2	***	0.03	***
725100	94746	201212171303	0409	13	20	2	CRS	1.0	***	61.0	***	29	27	29.99	977.2	***	0.007	***
725100	94746	201212171339	0409	***	2	CRS	1.0	***	61.0	***	29	27	29.99	977.5	***	0.007	***	
725100	94746	201212171354	0409	***	2	CRS	1.0	***	61.0	***	29	27	29.99	977.5	***	0.007	***	
725100	94746	201212171354	0409	***	2	CRS	1.0	***	61.0	***	29	28	29.99	977.2	***	0.007	***	
725100	94746	201212171411	0309	***	2	CRS	1.0	***	61.0	***	29	28	1015.3	99977.2	***	0.01	***	
725100	94746	201212171454	0309	11	***	2	CRS	1.0	***	61.0	***	30	28	1015.4	99977.5	***	0.007	0.05
725100	94746	201212171554	0409	11	***	2	CRS	1.0	***	61.0	***	30	29	1014.6	99977.5	***	0.00	***
725100	94746	201212171654	0409	***	2	CRS	1.0	***	61.0	***	30	29	1014.3	99977.2	***	0.00	***	
725100	94746	201212171754	0309	***	2	CRS	1.0	***	61.0	***	30	29	1014.9	99977.5	***	0.00	0.05	
725100	94746	201212171812	0409	***	2	CRS	1.0	***	61.0	***	30	29	1014.9	99977.5	***	0.00	***	
725100	94746	201212171854	0409	10	***	2	CRS	1.0	***	61.0	***	31	30	1013.3	99977.5	***	0.00	***
725100	94746	201212171949	0409	***	2	CRS	1.0	***	61.0	***	32	30	29.99	977.5	***	0.00	***	
725100	94746	201212171954	0409	***	2	CRS	1.0	***	61.0	***	32	31	1013.3	99977.5	***	0.00	***	
725100	94746	201212172054	0409	***	2	CRS	1.0	***	61.0	***	32	31	1012.4	99977.5	***	0.00	***	
725100	94746	201212172154	0409	***	2	CRS	1.0	***	61.0	***	32	31	1011.9	99977.5	***	0.00	***	
725100	94746	201212172154	0409	***	2	CRS	1.0	***	61.0	***	32	31	29.99	977.5	***	0.00	***	
725100	94746	201212172246	0309	10	***	2	CRS	1.0	***	61.0	***	32	31	29.99	977.5	***	0.00	***
725100	94746	201212172254	0209	10	***	2	CRS	1.0	***	61.0	***	32	31	1012.5	99977.5	***	0.00	***
725100	94746	201212172318	0209	10	***	2	CRS	1.0	***	61.0	***	32	31	29.99	977.5	***	0.00	***
725100	94746	201212172352	0309	***	2	CRS	1.0	***	61.0	***	32	30	29.99	977.5	***	0.00	***	
725100	94746	201212172354	0309	***	2	CRS	1.0	***	61.0	***	31	31	1012.4	99977.5	***	0.00	0.007	
725100	94746	201212180054	0309	10	***	2	CRS	1.0	***	61.0	***	33	31	1011.7	99977.5	***	0.01	***
725100	94746	201212180154	0409	11	***	2	CRS	1.0	***	61.0	***	33	31	29.99	977.2	***	0.007	***
725100	94746	201212180154	0409	11	***	2	CRS	1.0	***	61.0	***	33	32	1011.0	99977.2	***	0.01	***
725100	94746	201212180233	0309	11	20	2	CRS	1.0	***	61.0	***	31	31	29.99	977.5	***	0.00	***

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94746	261212300554	310	10	***23	0VC	1	2.0	**	**	**	71	10	**	**	27	24	397.4	29.42	950.1	29	27	0.01	0.36	*****	**
725100	94746	261212300559	20	13	***27	0VC	1	1.8	**	**	71	10	**	**	27	24	*****	29.42	960.1	***	0.007	*****	***	**	
725100	94746	261212300620	110	15	22	21	0VC	1	2.0	**	**	71	10	**	**	26	23	*****	29.43	960.3	***	0.007	*****	***	
725100	94746	261212300624	300	15	***30	0VC	1	3.0	**	**	71	10	**	**	25	22	*****	29.44	960.7	***	0.01	*****	***		
725100	94746	261212300654	310	17	28	28	0VC	1	3.0	**	**	71	10	**	**	25	22	998.1	29.44	960.7	***	0.01	*****	**	
725100	94746	261212300701	110	21	28	36	0VC	1	3.0	**	**	71	10	**	**	25	22	*****	29.44	960.7	***	0.007	*****	**	
725100	94746	261212300754	310	17	***39	8K3	1	10.0	**	**	71	10	**	**	26	22	998.3	29.44	960.7	***	0.007	*****	***		
725100	94746	261212300951	290	17	***9	8K3	1	10.0	**	**	71	10	**	**	27	21	*****	29.45	963.0	***	0.007	*****	***		
725100	94746	261212300954	300	16	***9	8K3	1	10.0	**	**	71	10	**	**	26	22	998.5	29.45	963.0	***	0.007	*****	0.01		
725100	94746	2612123009924	290	18	25	722	SC7	1	10.0	**	**	71	10	**	**	25	22	*****	29.45	963.0	***	0.007	*****	**	
725100	94746	2612123009954	300	18	29	722	CL8	1	10.0	**	**	71	10	**	**	25	21	999.0	29.46	961.4	***	0.007	*****	**	
725100	94746	261212301026	300	28	40	722	SC7	1	2.5	**	**	41	40	**	25	20	*****	29.48	963.0	***	0.007	*****	**		
725100	94746	261212301038	310	23	34	722	SC7	1	4.0	**	**	27	27	**	24	19	*****	29.49	962.4	***	0.007	*****	**		
725100	94746	261212301054	300	23	30	722	SC7	1	7.0	**	**	41	40	**	24	19	1000.8	29.51	963.0	***	0.007	*****	**		
725100	94746	261212301154	300	26	36	120	8K3	1	5.0	40	**	41	40	**	23	16	1002.2	29.55	964.3	27	22	0.007	0.58		
725100	94746	2612123011554	290	26	34	722	SC7	1	2.5	40	**	41	40	**	23	15	1002.8	29.57	965.0	***	0.007	*****	**		
725100	94746	261212301306	300	29	37	90	8K3	1	1.5	38	**	27	27	**	22	15	*****	29.58	965.3	***	0.007	*****	**		
725100	94746	261212301313	300	24	36	90	8K3	1	10.0	**	**	27	27	**	22	15	*****	29.59	965.6	***	0.007	*****	**		
725100	94746	261212301354	310	24	33	100	8K3	1	10.0	**	**	41	40	**	22	15	1004.1	29.61	966.3	***	0.007	*****	0.007		
725100	94746	261212301454	300	26	36	722	CL8	1	4.0	40	**	41	40	**	22	15	1005.3	29.65	967.6	***	0.007	*****	**		
725100	94746	261212301554	290	26	36	722	CL8	1	4.0	40	**	41	40	**	23	15	1005.3	29.64	967.3	***	0.007	*****	**		
725100	94746	261212301735	290	38	722	SC7	1	10.0	**	**	71	10	**	**	24	14	*****	29.65	967.6	***	0.007	*****	**		
725100	94746	261212301754	290	21	37	722	CL8	1	10.0	**	**	71	10	**	24	14	1005.5	29.65	967.6	24	22	0.007	0.007		
725100	94746	261212301820	290	25	40	722	CL8	1	2.5	38	**	27	27	**	24	13	*****	29.66	967.9	***	0.007	*****	**		
725100	94746	261212301838	290	26	37	722	CL8	1	10.0	**	**	71	10	**	25	13	*****	29.66	967.9	***	0.007	*****	**		
725100	94746	261212301910	290	25	40	722	CL8	1	10.0	**	**	71	10	**	25	12	1005.8	29.66	967.9	***	0.007	*****	**		
725100	94746	261212301954	290	31	41	722	CL8	1	2.5	38	**	27	27	**	25	12	*****	29.67	968.3	***	0.007	*****	**		
725100	94746	261212301954	290	31	41	722	CL8	1	2.5	38	**	27	27	**	25	12	*****	29.67	968.3	***	0.007	*****	**		
725100	94746	261212301954	300	15	29	722	CL8	1	10.0	**	**	71	10	**	25	11	1007.1	29.70	969.3	***	0.06	*****	**		
725100	94746	261212302054	300	22	36	722	CL8	1	7.0	**	**	71	10	**	24	10	1008.3	29.72	970.3	***	0.007	*****	0.007		
725100	94746	261212302054	290	22	33	722	CL8	1	10.0	**	**	71	10	**	23	10	1009.3	29.77	971.6	***	0.08	*****	**		
725100	94746	261212302154	290	22	29	722	CL8	1	10.0	**	**	71	10	**	22	9	1011.2	29.81	972.9	***	0.00	*****	**		
725100	94746	261212302254	290	21	29	722	CL8	1	10.0	**	**	71	10	**	21	6	1013.4	29.85	974.2	25	21	0.00	0.007		
725100	94746	261212302354	290	21	33	722	CL8	1	10.0	**	**	71	10	**	20	8	1015.8	29.88	975.2	***	0.00	*****	**		
725100	94746	261212310054	290	20	29	722	CL8	1	10.0	**	**	71	10	**	20	7	1014.3	29.90	975.8	***	0.00	*****	**		
725100	94746	261212310154	290	32	32	722	CL8	1	10.0	**	**	71	10	**	19	6	1014.6	29.92	976.5	***	0.00	*****	**		
725100	94746	261212310254	290	14	***22	22	CL8	1	10.0	**	**	71	10	**	18	6	1015.5	29.94	977.2	***	0.00	*****	**		
725100	94746	261212310354	300	16	22	722	CL8	1	10.0	**	**	71	10	**	17	6	1015.5	29.94	977.2	***	0.00	*****	**		
725100	94746	261212310454	300	10	***22	22	CL8	1	10.0	**	**	71	10	**	17	6	1015.5	29.93	976.8	***	0.00	*****	**		
725100	94746	261212310459	300	13	***22	22	CL8	1	10.0	**	**	71	10	**	17	6	1015.5	29.92	976.5	21	18	0.00	0.02		
725100	94746	261212310554	300	13	***22	22	CL8	1	10.0	**	**	71	10	**	17	6	1015.5	29.92	976.5	21	18	0.00	0.02		
725100	94746	261212310654	280	3	***22	22	CL8	1	10.0	**	**	71	10	**	17	6	1015.5	29.91	976.6	***	0.00	*****	**		

Attachment # 5: Aviation Activity Forecast - Commercial and GA Operations for 15-Year Planning Horizon CAT III ILS Upgrade at Worcester Regional Airport

Year 15: Potential Schedule Projection for Commercial Services - High Growth Scenario

'Leisure' Markets: 8 depts/day MCO,FLL,RSW,PBI

'Business' Markets: 8 depts/day NYC,WAS,CHI

Commercial Arrivals

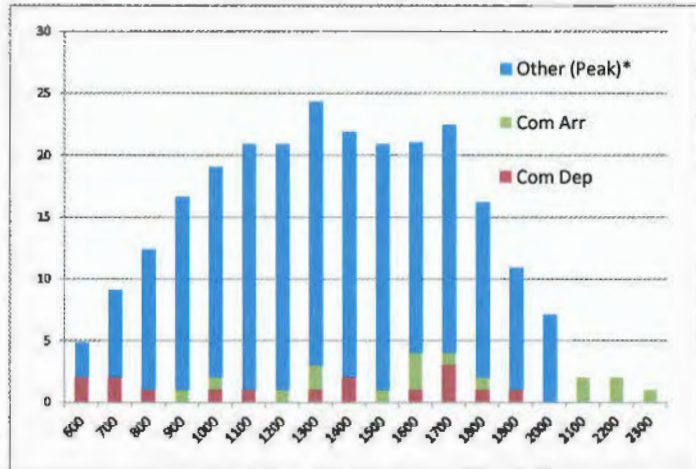
Seats	A/C Type	Origin	Dep Time	ORH Arr Time
75	TP/RJ	NYC	800	915
150	NB	MCO	800	1045
150	NB	FLL	915	1215
150	NB	PBI	1015	1315
75	TP/RJ	WAS	1200	1345
150	NB	MCO	1230	1515
150	NB	FLL	1315	1615
75	TP/RJ	CHI	1330	1630
75	TP/RJ	NYC	1530	1645
150	NB	RSW	1415	1715
75	TP/RJ	WAS	1700	1845
150	NB	MCO	1815	2100
75	TP/RJ	CHI	1815	2115
150	NB	FLL	1915	2215
75	TP/RJ	NYC	2130	2245
75	TP/RJ	WAS	2145	2330
Total Commercial Arrivals/day			16	

Commercial Departures

ORH					
turns	Dep Time	Arr Time	Destin.	A/C Type	Seats
	1000	1115	NYC	TP/RJ	75
	1130	1445	MCO	NB	150
	1300	1630	FLL	NB	150
	1400	1715	RSW	NB	150
	1430	1615	WAS	TP/RJ	75
	1600	1930	FLL	NB	150
	1700	2215	MCO	NB	150
	1715	1815	CHI	TP/RJ	75
	1730	1845	NYC	TP/RJ	75
	1800	1130	PBI	NB	150
	1930	2115	WAS	TP/RJ	75
	815	1145	FLL	NB	150
	745	845	CHI	TP/RJ	75
	715	1030	MCO	NB	150
	615	730	NYC	TP/RJ	75
	600	745	WAS	TP/RJ	75
Total Commercial Arrivals/day					16

Projected Peak Hourly Demand (VFR + IFR)

Hr	Com Dep	Com Arr	Other (Peak)*	Total
600	2		3	5
700	2		7	9
800	1		11	12
900		1	16	17
1000	1	1	17	19
1100	1		20	21
1200		1	20	21
1300	1	2	21	24
1400	2		20	22
1500		1	20	21
1600	1	3	17	21
1700	3	1	18	22
1800	1	1	14	16
1900	1		10	11
2000			7	7
2100		2		2
2200		2		2
2300		1		1
Total	16	16	221	253
Projected Annualized*	63,479			
Annual 2012	44,606			



*ORH General Aviation Activity - Moderate Growth Forecast for 2030 (Source - Massport):

ORH General Aviation Activity - 2012 Actual Operations (Source Tower):

2012-2030 Growth Factor:

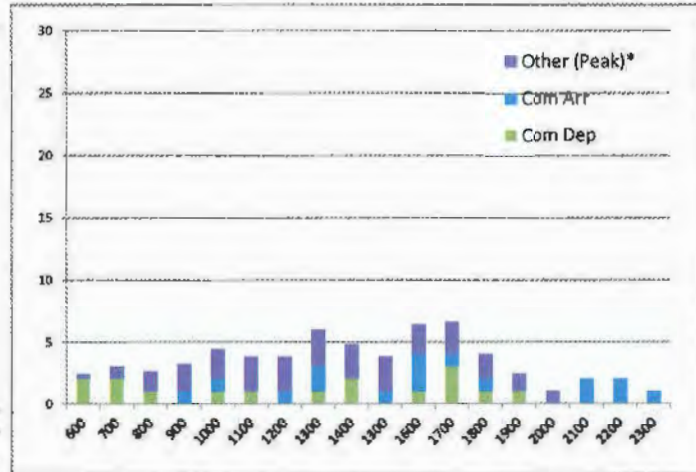
63,276 all but commercial

44,606

1.42

Projected Peak Hourly Demand (IFR Only)

Hr	Com Dep	Com Arr	Other (Peak)*	Total
600	2		0	2
700	2		1	3
800	1		2	3
900		1	2	3
1000	1	1	2	4
1100	1		3	4
1200		1	3	4
1300	1	2	3	6
1400	2		3	5
1500		1	3	4
1600	1	3	2	6
1700	3	1	3	7
1800	1	1	2	4
1900	1		1	2
2000			1	1
2100		2	0	2
2200		2	0	2
2300		1	0	1
Total	16	16	31	63
Projected Annualized (IFR)*	17,856			
Annual 2012	44,606			



Note: Current IFR traffic is 13% of overall noncommercial traffic. Future 20%.

ATTACHMENT # 6

Yankee Terminal Radar Approach Control (Y90) and Worcester FAA Contract Tower (ORH)

LETTER OF AGREEMENT

EFFECTIVE: February 16, 2015

SUBJECT: Control Procedures and Coordination Responsibilities

1. PURPOSE: To provide control procedures and coordination responsibilities for use in the conduct of air traffic control in the ORH Class D airspace.

2. CANCELLATION: This letter cancels Bradley Tower/Worcester Tower Letter of Agreement, dated January 26, 2014.

3. SCOPE: These procedures apply for air traffic operations in the ORH Class D airspace. The hours of operation for ORH are 6:30 a.m. to 9:00 p.m. local time. Y90 has control jurisdiction over all aircraft operating IFR to and from the Worcester Regional Airport.

4. PROCEDURES:

a. Arrivals:

(1) Y90 must:

- a) forward position information to ORH at least ten (10) miles from the airport. If not possible, ensure the inbound does not penetrate the ORH Class D surface area, until the coordination is complete. When the landing runway touchdown RVR is 2400 feet or less, provide position information no earlier than fifteen (15) flying miles from the airport.
- b) ensure transfer of communications prior to the final approach fix for instrument approaches and prior to entering the Class D airspace for visual and contact approaches.

(2) ORH must:

- a) advise aircraft requesting practice instrument approaches to Worcester Regional Airport to contact Y90 on 119.0/327.1 MHz.
- b) consider receipt of an FDIO arrival strip as forwarded advance arrival information.
- c) suspend aircraft and vehicle movements from the time position information is forwarded until landing, during times when CAT II/III operations are being conducted.
- d) inform Y90 immediately of an aircraft executing a missed approach.
- e) forward IFR cancellations or landing times to Y90.

b. Departures:

(1) Y90 must:

a) maintain the Terminal Enroute Control (TEC) routes contained in the IDS.

(2) ORH must:

a) consider receipt of an FDIO departure strip as constituting an approved clearance and obtain clearances from Y90 during FDIO outages.

b) request clearances from Y90 when silent clearances have been cancelled.

c) clear TEC aircraft (operating 10,000 and below) in accordance with the routes depicted in the Preferential Route section of the IDS. In the event a destination is not specified, coordinate with Y90 Flight Data. Amend the FDIO strips as necessary and advise Y90 of revision number at time of release.

d) issue the routing between the plus signs, when pluses appear on the strip.

e) obtain Call for Release (CFR) times and adhere to same.

f) force (RF) flight data to the Bradley STARS when there are multiple flight plans for the same aircraft. This must be accomplished after removing the unused flight plans.

g) obtain release for IFR aircraft from Y90 Worcester Radar and specify the departure runway at the time of request. Assign 3,000 feet to all departing aircraft.

h) enter information into the FDIO for aircraft that request VFR flight following that will exit Y90 airspace.

i) provide visual separation between an arrival and a departure provided other IFR separation is assured before, and after, the application of visual separation. If Y90 uses the phrase *"RELEASED REFERENCE (identification)"*, it means specifically: *"VISUAL SEPARATION APPROVED BETWEEN (identification) AND (identification), and for departing aircraft, (departing/succeeding aircraft) RELEASED YOUR DISCRETION."*
ORH will advise Y90 when the tower is unable to provide visual separation.

5. OPPOSITE DIRECTION SAME RUNWAY OPERATIONS. Opposite Direction Same Runway operations between aircraft receiving IFR separation services may be conducted at Worcester Regional Airport. When ODO is approved and utilized, the following is required:

a. Procedures:

(1) Local Control initiates and verbally requests for opposite direction departures with Worcester Radar. Worcester Radar initiates and verbally requests for opposite direction arrivals with Local Control.

(2) All coordination must be on a recorded line, must state "OPPOSITE DIRECTION". Initial coordination must include call-sign, aircraft type and arrival or departure runway.

(3) Traffic advisories must be exchanged to both aircraft.

EXAMPLE-

OPPOSITE DIRECTION TRAFFIC (DISTANCE) MILE FINAL, (type aircraft).

OPPOSITE DIRECTION TRAFFIC (position), (type aircraft).

OPPOSITE DIRECTION TRAFFIC DEPARTING RUNWAY (number), (type aircraft).

(4) OS/CIC in each facility must be informed of the opposite direction operation.

(5) Visual separation is *NOT* authorized.

(6) Opposite direction same runway operations with opposing traffic inside the applicable cutoff point is prohibited unless an emergency situation exists.

b. Cut-off Points. The following minimum cut-off points have been established as measured from the ILS DME, when conducting opposite direction same runway operations in all runway configurations.

(1) A departure and an arrival: All Aircraft: *10 miles*

(2) An arrival and an arrival: All Aircraft: *10 miles* when the first arrival crosses the runway threshold.

(3) The application of the above cut-off points ensures required longitudinal or lateral separation exists before any other type of separation is applied when a departing aircraft becomes airborne and turns to avoid conflict; or when the first aircraft has crossed the runway threshold for opposite direction arrivals.

(4) Y90 Worcester Radar is responsible for ensuring compliance with the applicable cut-off points between a departure and an arrival.

(5) Y90 Worcester Radar is responsible for ensuring compliance with the applicable cut-off points between an arrival and an arrival.

6. SPECIAL VFR (SVFR) OPERATIONS: Y90 delegates control authority to ORH for SVFR flights at and below 2,500 MSL in the ORH Class D surface area. Suspend SVFR operations prior to an arriving IFR aircraft entering the Class D airspace.

7. GENERAL:

a. CAT II/III ILS approaches are authorized only during times when the Tower is operating.

b. Forward current weather, ATIS code, tower visibility changes, and runway/s in use to Y90 via the IDS. Verbally advise Y90 Worcester Radar of the current ATIS code.


c. In the event of an STARS, FDIO, RADAR or IDS outage, and when otherwise required, information must be effected on the 11 Line.

d. Either facility that experiences equipment malfunctions that affect the operation must advise the other facility. When appropriate, consult the facility contingency plans for additional guidance.

8. OPENING/CLOSING PROCEDURES.

a. Opening: ORH must verbally advise Y90 when starting service and include the runway/approach in use, pending traffic, and any other pertinent information affecting Air Traffic operations. Ensure that the ORH Status Information Area (SIA) page in the IDS is accurate and up to date.

b. Closing: ORH must verbally advise Y90 when completing service and include the status of any inbound IFR traffic or IFR clearances issued, field conditions, ILS location, outages, and any other pertinent information affecting Air Traffic operations.


Air Traffic Manager, Yankee TRACON


Air Traffic Manager, Worcester FCT

Worcester FCT/ Worcester Regional Airport

LETTER OF AGREEMENT

EFFECTIVE: December 6, 2013

**SUBJECT: WORCESTER REGIONAL AIRPORT SURFACE MOVEMENT
GUIDANCE AND CONTROL SYSTEM (SMGCS) PLAN**

- 1. PURPOSE:** This agreement prescribes the procedures to be utilized by Worcester FAA Contract Tower (ORH FCT) and the Worcester Regional Airport during low visibility conditions when the Surface Movement Guidance and Control System (SMGCS) Plan for Worcester Regional Airport is in effect.
- 2. CANCELLATION:** Worcester FAA Contract Tower/Worcester Regional Airport, Letter of Agreement, Worcester Airport Surface Movement Guidance Control System (SMGCS) Plan, dated June 11, 2012, is cancelled.
- 3. SCOPE:** This agreement supplements the formal published Surface Movement Guidance and Control System Plan (SMGCS) for Worcester Regional Airport.

4. PROCEDURES/RESPONSIBILITIES:

A. The Worcester FAA Contract Tower (ORH FCT) shall:

- (1) Notify Massport to initiate the implementation of the SMGCS Plan when the RVR and visibility trends indicate that Runway Visual Range (RVR) values may go below 1200 feet.
- (2) Ensure all appropriate airfield lighting to conduct SMGCS operations is on.
- (3) Conduct a communications check with the Worcester Regional Airport Airport Rescue and Fire Fighting (ARFF) department.
- (4) When appropriate, broadcast on the ATIS: "SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM PROCEDURES ARE IN EFFECT."
- (5) Advise Airport Management of the need for "Follow Me" services.
- (6) In the event of an emergency and/or declared emergency, ORH FCT may provide progressive instructions to ARFF vehicle operators.

(7) Route participating aircraft via taxi routes depicted on the Low Visibility Taxi Route Chart, unless directed otherwise by ATC. (see Low Visibility Taxi Chart)

(8) Notify Airport Management when SMGCS conditions are no longer in effect.

B. Airport Management shall:

(1) Ensure all parties involved are thoroughly familiar with the SMGCS Plan for the Worcester Regional Airport.

(2) Monitor all airfield activities and notify ARFF and affected tenants that the SMGCS Plan is in effect.

(3) Minimize vehicular access to the SMGCS operating areas when SMGCS operations are in effect.

(4) Inspect and evaluate airfield lighting as required by the SMGCS Plan.

(5) Advise control tower personnel when the airfield lighting inspection and the notification of all user and tenant notifications have been completed.

(6) Ensure radio and telephone communications are functional between all organizations involved in SMGCS operations.

(7) Provide "Follow Me" services to those who have requested it.

(8) Advise all users and tenants of SMGCS Operating Conditions termination.

5. GENERAL:

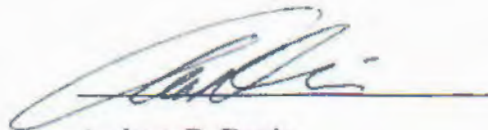
A. SMGCS operations are not permitted during periods when the ORH FCT is closed.

B. SMGCS operations are limited to departing aircraft utilizing Runway 11 or Runway 29.

C. SMGCS operations are not permitted with an RVR below 600 feet.



Allan R. Turmelle
Air Traffic Manager, Worcester FCT
Midwest ATC Service, Inc.



Andrew B. Davis
Airport Director
Worcester Regional Airport

KORH/ORH
WORCESTER REGL

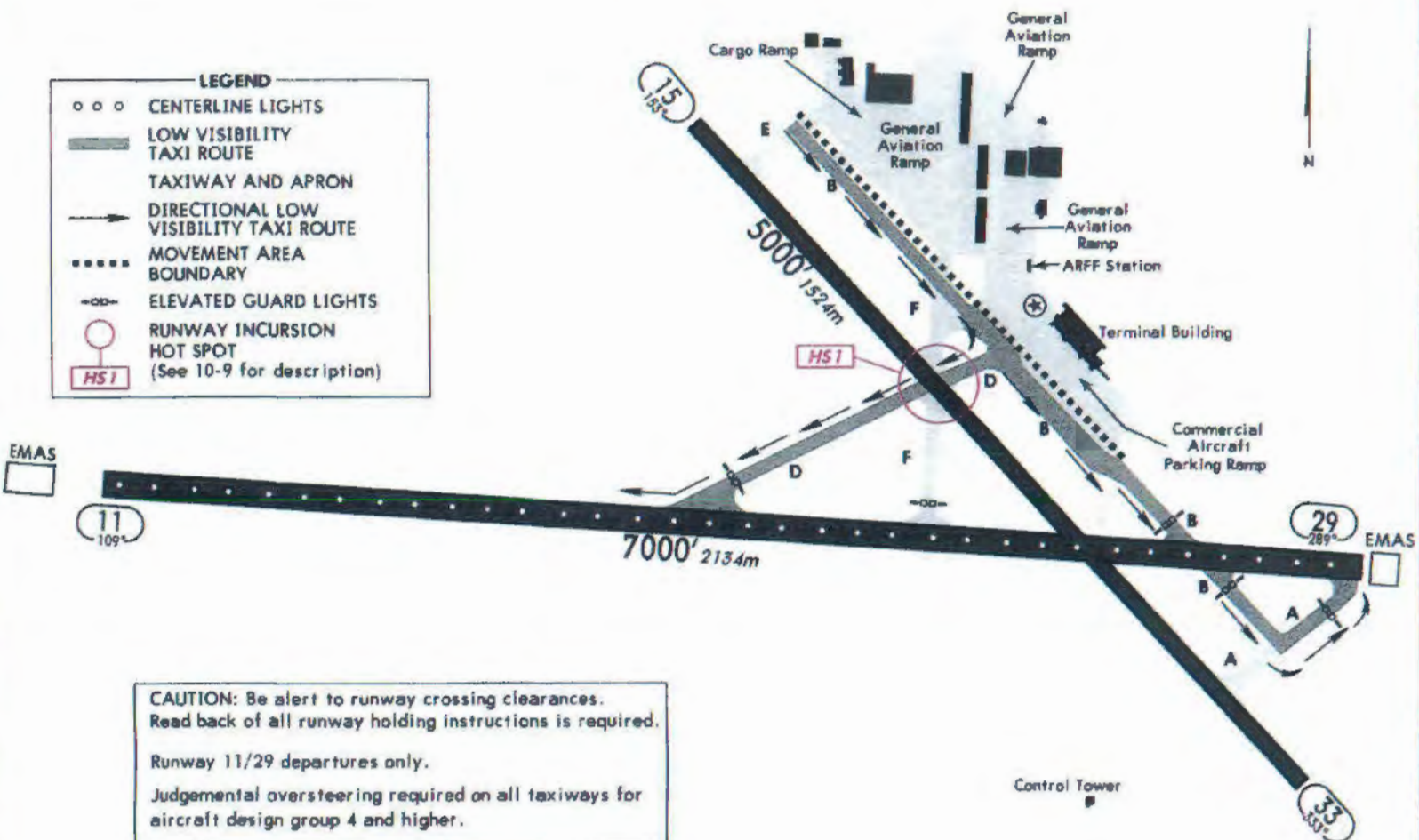
25 NOV 11
10-9B

SMGCS

LESS THAN RVR 1200 TO 600

WORCESTER, MASS
LOW VISIBILITY TAXI ROUTES

ATIS (ASOS when Twr Inop) 126.55	*WORCESTER Clearance 128.65 119.0 when Twr Inop.	*Ground 123.85
VOT 108.2 *Tower	UNICOM 122.95	BRADLEY Departure (R) 119.0
CTAF 120.5		



CHANGES: New chart.

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Worcester FCT/ Worcester Regional Airport

LETTER OF AGREEMENT

EFFECTIVE: TBD

**SUBJECT: WORCESTER REGIONAL AIRPORT SURFACE MOVEMENT
GUIDANCE AND CONTROL SYSTEM (SMGCS) PLAN**

- 1. PURPOSE:** This agreement prescribes the procedures to be utilized by Worcester FAA Contract Tower (ORH FCT) and the Worcester Regional Airport during low visibility conditions when the Surface Movement Guidance and Control System (SMGCS) Plan for Worcester Regional Airport is in effect.
- 2. CANCELLATION:** Worcester FAA Contract Tower/Worcester Regional Airport, Letter of Agreement, Worcester Airport Surface Movement Guidance Control System (SMGCS) Plan, dated December 6, 2013, is cancelled.
- 3. EFFECTIVE:** Becomes effective upon publication of Worcester Regional Airport Runway 11 CAT II/III ILS procedures by FAA ATO.
- 4. SCOPE:** This agreement is part of the formal published Surface Movement Guidance and Control System Plan (SMGCS) for Worcester Regional Airport (to be attached when this LOA becomes effective).
- 5. PROCEDURES/RESPONSIBILITIES:**
 - A. The Worcester FAA Contract Tower (ORH FCT) shall:**
 - (1) Notify Massport to initiate the implementation of the SMGCS Plan when the RVR and visibility trends indicate that Runway Visual Range (RVR) values may go below 1200 feet.
 - (2) Ensure all appropriate airfield lighting to conduct SMGCS operations is on.
 - (3) Conduct a communications check with the Worcester Regional Airport Airport Rescue and Fire Fighting (ARFF) department.
 - (4) When appropriate, broadcast on the ATIS: "SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM PROCEDURES ARE IN EFFECT."
 - (5) Advise Airport Management of the need for "Follow Me" services.

- (6) In the event of an emergency and/or declared emergency, ORH FCT may provide progressive instructions to ARFF vehicle operators.
- (7) Route participating aircraft via taxi routes depicted on the Low Visibility Taxi Route Chart, unless directed otherwise by ATC. (see Low Visibility Taxi Chart)
- (8) Notify Airport Management when SMGCS conditions are no longer in effect.

B. Airport Management shall:

- (1) Ensure all parties involved are thoroughly familiar with the SMGCS Plan for the Worcester Regional Airport.
- (2) Monitor all airfield activities and notify ARFF and affected tenants that the SMGCS Plan is in effect.
- (3) Minimize vehicular access to the SMGCS operating areas when SMGCS operations are in effect.
- (4) Inspect and evaluate airfield lighting as required by the SMGCS Plan.
- (5) Advise control tower personnel when the airfield lighting inspection and the notification of all user and tenant notifications have been completed.
- (6) Ensure radio and telephone communications are functional between all organizations involved in SMGCS operations.
- (7) Provide "Follow Me" services to those who have requested it.
- (8) Advise all users and tenants of SMGCS Operating Conditions termination.

6. GENERAL:

- A. SMGCS operations are not permitted during periods when the ORH FCT is closed.
- B. SMGCS operations are limited to departing or arriving aircraft utilizing Runway 11 or Runway 29.
- C. SMGCS operations are not permitted with an RVR below 600 feet.

Allan R. Turnelle
Air Traffic Manager, Worcester FCT
Midwest ATC Service, Inc.

Andrew B. Davis
Airport Director
Worcester Regional Airport

4. Install signage adjacent to taxiway D, F and B hold-short lines advising pilots that "If tower is closed and weather is below 800-2, do not proceed beyond this hold line until receiving a departure release from ATC." (Specific language and sign location(s) to be approved by FAA's Part 139 inspector).
5. In addition to the items above, other geographic position markers, lighted directional signs, intersection hold lines, in pavement guard lights and other aids, as recommended by the SMGCS team may be installed after approval through amendments to Worcester's Part 139 Certification Manual. Further revisions may be developed through the annual SMGCS review.
6. Compliance with the safety provisions within the LOA between Yankee Tracon and Worcester ATCT (Attachment #6, Y90-ORH FCT LOA_2-16-2015) requiring coordination between the two facilities, mileage distance requirements during coordination, detailed aircraft positions, and airport surface movement restrictions.

This determination is independent of the design and approval of upgrades to the components of the existing ILS and approach lights system serving Runway 11.

This determination does not constitute FAA approval or disapproval of the physical development involved in the proposal. It is a determination with respect to the safe and efficient use of navigable airspace by aircraft and with respect to the safety of persons and property on the ground.

In making this determination, the FAA has considered matters such as the effects the proposal would have on existing or planned traffic patterns of neighboring airports, the effects it would have on the existing airspace structure and projected programs of the FAA, the effects it would have on the safety of persons and property on the ground, and the effects that existing or proposed manmade objects (on file with the FAA), and known natural objects within the affected area would have on the airport proposal.

If you have any questions concerning this determination contact Ralph Nicosia-Rusin (781) 238-7612 ralph.nicosia-rusin@faa.gov.

Ralph Nicosia-Rusin
DivUser

DIRECTIVES CLEARANCE RECORD				Kind of Document MOS		Identification Number				
Title ORH MOS APPLICATION				Return Document to Point of Contact (POC)						
				Name Lauren S King		Routing/ FAX ANE-600		Telephone 781-238-7604		
Budget Impact <input type="checkbox"/> None <input type="checkbox"/> Yes (Explain in brief summary below)										
Summary. What does it do? (Instruction and additional space available on reverse side)										
Please provide concurrence below and email response to Ralph Nicosia-Rusin and a courtesy copy to Lauren S King										
ORIGINATING OFFICE CLEARANCE										
Routing Symbol	Initials	Routing Symbol	Date MM/DD/YY	Name of Approving Official(s) Original or Electronic Signature(s) Accepted		Date MM/DD/YY	Directive Management (POC) For This Document		Coordination Start Date	
ANE-610	RNR		4/7/15	Ralph Nicosia-Rusin, Airports Division			** Deadline Date ** 4/14/15			
CLEARANCE ROUTING										
Routing Symbol	Internal Clearance			Name of Approving Official(s) Original or Electronic Signature(s) Accepted	Date MM/DD/YY	Concur with....				Non-Concur
	Initials	Routing Symbol	Date MM/DD/YY			No Response	No Comment	Comments Attached	Comments Attached	
Y90						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
AEA220						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
AFS410						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PVD						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
A90						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
ANE-2	PG ANE-2		4/6/15	TODD P. FRIEDENBERG Lieut. D. Friedenber		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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		FINAL ADMINISTRATIVE CLEARANCE					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		FINAL APPROVAL. (Authorizing Release)				Date Approved				

DIRECTIVES CLEARANCE RECORD				Kind of Document MOS		Identification Number		
Title ORH MOS APPLICATION				Return Document to Point of Contact (POC)				
				Name Lauren S King		Routing/ FAX ANE-600		Telephone 781-238-7604
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ORIGINATING OFFICE CLEARANCE								
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ANE-610	RNR		4/7/15	Ralph Nicosia-Rusin, Airports Division				
					** Deadline Date ** 4/14/15			
Routing Symbol	Internal Clearance			CLEARANCE ROUTING		Concur with....		Non-Concur
	Initials	Routing Symbol	Date MM/DD/YY	Name of Approving Official(s) Original or Electronic Signature(s) Accepted	Date MM/DD/YY	No Response	No Comment	Comments Attached
Y90				david.a.swan		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AEA220	below	AEA-220:RW		son@faa.gov <small>Digitally signed by david.a.swanson@faa.gov DN: cn=david.a.swanson@faa.gov Date: 2015.04.08 13:34:22 -04'00'</small> David A. Swanson, Acting Mgr, AEA-220		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AFS410						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PVD						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A90						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ANE-2						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	FINAL ADMINISTRATIVE CLEARANCE					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	FINAL APPROVAL. (Authorizing Release)				Date Approved			

King, Lauren S (FAA)

From: Beasley, Cully (FAA)
Sent: Thursday, April 16, 2015 12:11 PM
To: King, Lauren S (FAA); Swanson, David A (FAA); Wolf, Romana (FAA); Gianetta, William (FAA); Hope, Chris (FAA); Welch, Bryant (FAA)
Cc: Nicosia-Rusin, Ralph (FAA); Goldsher, Allan (FAA); Rakoff, Bryon (FAA); Friedenber, Todd D (FAA)
Subject: RE: ORH MoS / 04-08-2015 revision

New England District Concurs

H. Cully Beasley
Assistant District Manager, New England Terminal Operations
Federal Aviation Administration
(603) 594-5503 (Office)
(603) 213-1956 Cellular)

From: King, Lauren S (FAA)
Sent: Wednesday, April 08, 2015 8:59 AM
To: Swanson, David A (FAA); Wolf, Romana (FAA); Gianetta, William (FAA); Hope, Chris (FAA); Welch, Bryant (FAA); Beasley, Cully (FAA)
Cc: Nicosia-Rusin, Ralph (FAA); Goldsher, Allan (FAA); Rakoff, Bryon (FAA); Friedenber, Todd D (FAA)
Subject: ORH MoS / 04-08-2015 revision

Good Morning,

Please find the attached modified MoS and its associated sign off Clearance Record. Flight Standards has modified the MoS document in order to provide more specific detail to their recommended conditions. They also consolidated the regional comments for clarity. In addition, a few edits of the Massport text was modified to update references to Advisory Circular 150-5300-13A, Change 1, and some minor edits to clarify that the scope of this Modification included all approaches conducted with visibility below one mile. Airport Division has determined these revisions consistent with the HIT team discussions that served as the basis for inter-divisional agreement with the terms of this Modification of Standards, and appreciates the efforts of Flight Standards to enhance the clarity and accuracy of this document. We therefore are asking the other divisions for their concurrence with this latest revision. Please review and provide your concurrence no later than **COB April 14, 2015**. In doing so, please copy myself when you send your signed Clearance Record to Ralph Nicosia-Rusin.

Thank you,

Lauren King
Management & Program Assistant
Airports Division
FAA, New England Region
781-238-7604

King, Lauren S (FAA)

From: Johnson, Coby (FAA)
Sent: Friday, April 17, 2015 2:02 PM
To: King, Lauren S (FAA)
Cc: Welch, Bryant (FAA); Hope, Chris (FAA)
Subject: RE: ORH MoS / 04-08-2015 revision

Lauren,

AFS-410 concurs with the subject MOS.

Best,

Coby

From: Welch, Bryant (FAA)
Sent: Friday, April 17, 2015 11:40 AM
To: Johnson, Coby (FAA)
Subject: FW: ORH MoS / 04-08-2015 revision

We got this a few days ago. It's the final MOS for Worcester, MA for their proposed CAT II/III ops. Basically says it's too expensive to build a parallel taxiway and they don't need it anyway because they don't have the traffic. So CAT II/III will be one-in / one-out, and CAT I will be as they are doing it now, using ATCT / approach control / CTAF to control ops and keep the runway clear. Eastern AWOs have signed off on the plan.

Thanks,
Bryant

From: King, Lauren S (FAA)
Sent: Wednesday, April 08, 2015 8:59 AM
To: Swanson, David A (FAA); Wolf, Romana (FAA); Gianetta, William (FAA); Hope, Chris (FAA); Welch, Bryant (FAA); Beasley, Cully (FAA)
Cc: Nicosia-Rusin, Ralph (FAA); Goldsher, Allan (FAA); Rakoff, Bryon (FAA); Friedenber, Todd D (FAA)
Subject: ORH MoS / 04-08-2015 revision

Good Morning,

Please find the attached modified MoS and its associated sign off Clearance Record. Flight Standards has modified the MoS document in order to provide more specific detail to their recommended conditions. They also consolidated the regional comments for clarity. In addition, a few edits of the Massport text was modified to update references to Advisory Circular 150-5300-13A, Change 1, and some minor edits to clarify that the scope of this Modification included all approaches conducted with visibility below one mile. Airport Division has determined these revisions consistent with the HIT team discussions that served as the basis for inter-divisional agreement with the terms of this Modification of Standards, and appreciates the efforts of Flight Standards to enhance the clarity and accuracy of this document. We therefore are asking the other divisions for their concurrence with this latest revision. Please review and provide your concurrence no later than COB April 14, 2015. In doing so, please copy myself when you send your signed Clearance Record to Ralph Nicosia-Rusin.

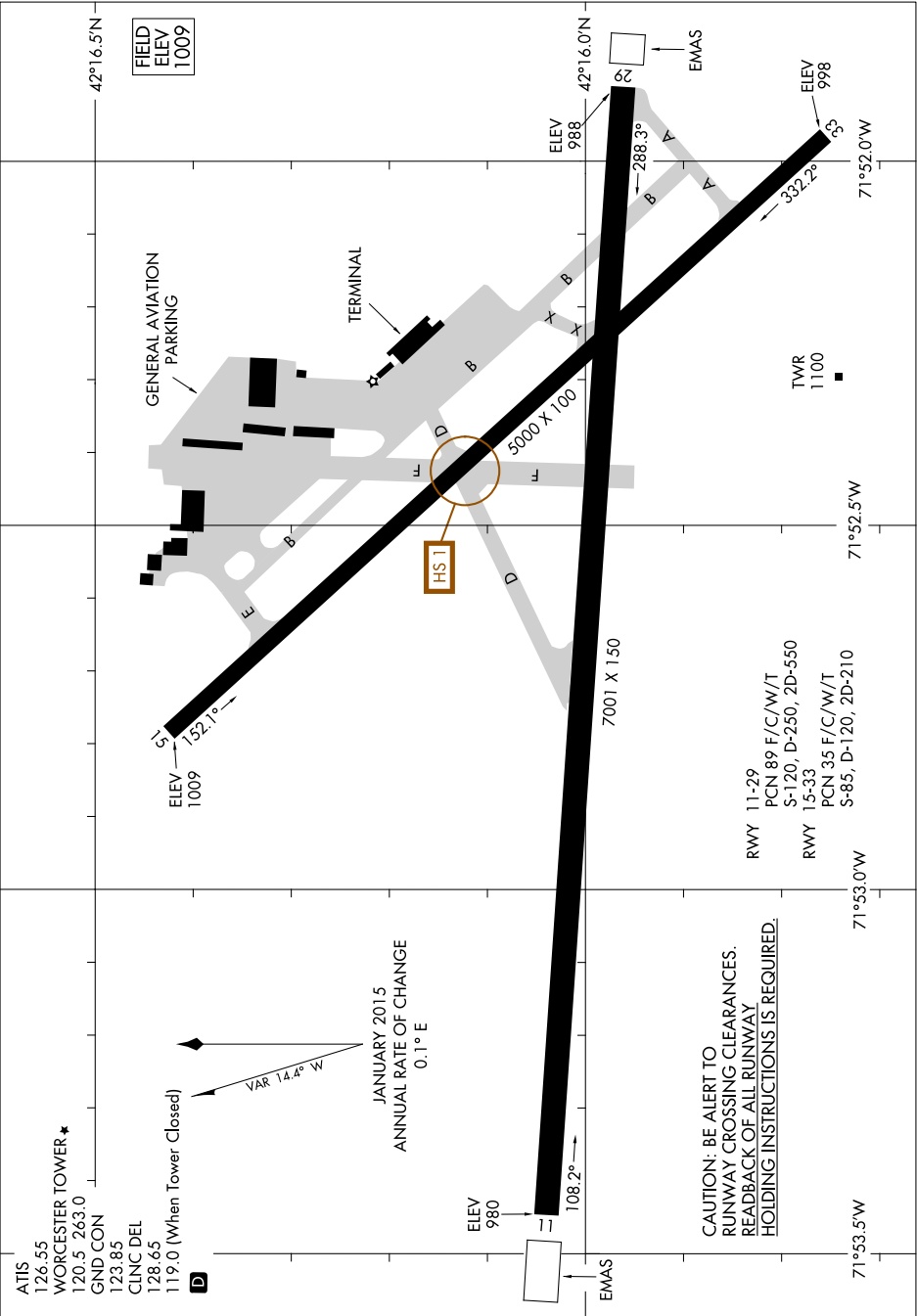
Thank you,

AIRPORT DIAGRAM

AL-652 (FAA)

WORCESTER RGNL (ORH)
WORCESTER, MASSACHUSETTS

NE-1, 02 MAR 2017 to 30 MAR 2017



NE-1, 02 MAR 2017 to 30 MAR 2017

AIRPORT DIAGRAM

WORCESTER, MASSACHUSETTS
WORCESTER RGNL (ORH)

From: [Gianetta, William \(FAA\)](#)
To: [Reddinger, Shawn \(FAA\)](#)
Subject: FW: KORH - WORCESTER REGIONAL, MA: Waiver Data Missing!
Date: Thursday, April 06, 2017 10:10:56 AM
Attachments: [image003.png](#)

Shawn,

Please see email below.

I believe we have confirmation from AFS-410 and AAS-100 that a second waiver addressing the HATh < 250 FT in ORH is not necessary.

Best,

Bill Gianetta
All Weather Operations
Eastern Region NextGen Branch AEA-220
Office (207) 780-3263 x 119
Email: william.gianetta@faa.gov

From: Criswell, Christopher (FAA)
Sent: Thursday, April 06, 2017 9:16 AM
To: Bordy, John (FAA); Kodsí, Khalil (FAA)
Cc: Gianetta, William (FAA); Terrell, Wade Ek (FAA); Nichols, Thomas J (FAA); Wacker, Daniel (FAA); Legarreta, George (FAA); Meyers, Michael A (FAA)
Subject: RE: KORH - WORCESTER REGIONAL, MA: Waiver Data Missing!

John,

As indicated in your email below footnote #3 states *"The HATh/HAA indicated is for planning purposes; actual obtainable HATh/HAA is determined by **TERPS** and may be higher due to obstacles or other requirements."*

Based on the additional information within footnote 3# (*HATh **less than 250 ft** must comply with requirements in < 3/4 statute mile column regardless of published visibility*), the existing MOS for the parallel taxiway and the TERPS vis waiver I agree with your interpretation that a HAT waiver is not required.

Let me know if you need anything else from ARP.

Chris

Christopher Criswell
Office of Airport Safety and Standards
Federal Aviation Administration
202-267-4634

From: Bordy, John (FAA)
Sent: Wednesday, April 05, 2017 11:48 AM
To: Kodsí, Khalil (FAA); Criswell, Christopher (FAA)
Cc: Gianetta, William (FAA); Terrell, Wade Ek (FAA); Nichols, Thomas J (FAA); Wacker, Daniel (FAA)
Subject: FW: KORH - WORCESTER REGIONAL, MA: Waiver Data Missing!

Khalil/Chris,

RWY 11 at Worcester has an approved MoS to enable visibility of less than 1 SM due to lack of a parallel taxiway. This MoS is to support the current CAT I ILS, as well as a planned CAT II ILS scheduled for December 2017.

A TERPS visibility waiver will be processed shortly for this same issue since we have an identical requirement within order 8260.3C.

There is an opinion (see below) that an additional waiver is needed to enable HAT less than 250 feet based on information within table 3-4 of the AC 150/5300-13A. While I agree a TERPS waiver is needed to enable visibility less than 1 SM on RWY 11, I don't share the opinion that a waiver is needed for a HAT less than 250 feet on this same runway. Footnote 3 of table 3-4 firstly states the HAT is determined by TERPS. The footnote then concludes by simply stating the $\frac{3}{4}$ SM column applies if HAT is less than 250 feet, regardless of visibility. If an MoS and a TERPS waiver is obtained for the parallel taxiway requirement, then in my opinion that's sufficient to enable a HAT less than 250 feet and visibility less than $\frac{3}{4}$ SM (provided all other $< \frac{3}{4}$ SM columnar requirements are met).

Do you agree with my interpretation of table 3-4?

Thanks,

John Bordy
TERPS Standards Development Specialist
Flight Procedure Standards Branch, AFS-420
Phone: 405.954.0980

From: Gianetta, William (FAA)
Sent: Wednesday, April 05, 2017 10:03 AM
To: Bordy, John (FAA)
Subject: FW: KORH - WORCESTER REGIONAL, MA: Waiver Data Missing!

John,

Here you!

Bill Gianetta
All Weather Operations
Eastern Region NextGen Branch AEA-220
Office (207) 780-3263 x 119
Email: william.gianetta@faa.gov

From: Reddinger, Shawn (FAA)
Sent: Wednesday, April 05, 2017 9:55 AM
To: Gianetta, William (FAA)
Subject: FW: KORH - WORCESTER REGIONAL, MA: Waiver Data Missing!

Greetings Bill!

Small problem that just popped up... I sent all the waiver/MoS data and documents to the development team in OKC and let them know 460 was in possession of those docs,

The development team however has a concern that the waiver does not specify that in addition to the visibility, that a HAT less than 250 is also required

Gimme a call when you get a chance, small detail and hopefully a small addition to the waiver will fix this concern

Shawn Reddinger

New England Region Flight Procedures

Eastern Operations Support Group
Flight Procedures Team; AJV-E24
College Park, GA
404-305-5948



From: Ciarlone, Mark (FAA)
Sent: Tuesday, April 04, 2017 10:48 AM
To: Reddinger, Shawn (FAA)
Cc: Lanier, Donald H (FAA); Salpino, Ronald (FAA); Chaney, Andrea J (FAA); Pavelko, Cheryl A (FAA)
Subject: RE: KORH - WORCESTER REGIONAL, MA: Waiver Data Missing!

Good Morning Shawn,

I sent this to the wrong person yesterday methinks: I am working a new project for KORH, and I need some waiver letters to address it's non-full length parallel runway (see below).

Thanks!

Kind Regards,

Mark "Mario" Ciarlone

Aeronautical Information Specialist
6500 S. MacArthur Blvd, Room 110
Oklahoma City, OK 73169
(405)954-4709 (office)
(405)990-5569 (cell)
[Visit Aeronautical Information Services Here](#)

From: Ciarlone, Mark (FAA)
Sent: Monday, April 03, 2017 11:30 AM
To: Pavelko, Cheryl A (FAA)
Cc: Lanier, Donald H (FAA); Salpino, Ronald (FAA); Chaney, Andrea J (FAA)
Subject: KORH - WORCESTER REGIONAL, MA: Waiver Data Missing!
Importance: High

Good Morning Cheryl,

I have been researching Project ID 2016040426419401, and find I am missing some important waiver letters:

- 1. Need a 8260-1 waiving visibility to below $\frac{3}{4}$ SM.**
- 2. Need a 8260-1 waiving the HATh <250ft.**

The PTS project and its associated "checked-in" attachments include information about folks concurring with alternate suggestions of how to deal with a non-full length parallel taxiway (the "MOS"), but I have no approved waiver letters, **which will be required prior to me continuing with this project (or, at least a good forecast approval date).**

The current **ILS OR LOC RWY 11** approach, **AMDT 23C**, has *not only* visibility below non-full length taxiway requirements (less than $\frac{3}{4}$ SM), *but the HATh is also below 250, which ALSO requires a waiver letter!*

Considering the fact that this approach is active, and there are no waiver letters on file in the Active Procedure Files folder, this is pretty important.

Below is the AC 150/5300-13A Table 3-4 with applicable waiver required portions highlighted:

Table 3-4. Standards for Instrument Approach Procedures

Visibility Minimums ¹	< 3/4 statute mile	3/4 to < 1 statute mile	≥ 1 statute mile straight-in	Circling ²
HATh ³	< 250 ft	≥ 250 ft	≥ 250 ft	≥ 350 ft
TERPS GQS ⁴	Clear	Clear	Clear	Not applicable
PA final approach surfaces ⁵	Clear	Not Required	Not Required	Not applicable
POFZ (PA & APV only)	Required	Not Required	Not Required	Not applicable
TERPS Chapter 3, Section 3	34:1 clear	20:1 clear	20:1 clear ⁶	20:1 clear ⁶
ALP ⁷	Required	Required	Required	Recommended
Minimum Runway Length	4,200 ft (paved)	3,200 ft ^{8,9}	3,200 ft ^{8,9}	3,200 ft ^{8,9}
Runway Markings (See AC 150/5340-1)	Precision	Non-precision ⁹	Non-precision ⁹	Visual (Basic) ⁹
Holding Position Signs & Markings (See AC 150/5340-1, AC 150/5340-18)	Precision	Non-precision ⁹	Non-precision ⁹	Visual (Basic) ⁹
Runway Edge Lights ¹⁰	HIRL / MIRL	HIRL / MIRL	MIRL / LIRL	MIRL / LIRL (Required only for night minimums)
Parallel Taxiway ¹¹	Required	Required	Recommended	Recommended
Approach Lights ¹²	MALSR, SSALR, or ALSF	Recommended ¹³	Recommended ¹³	Not Required
Applicable Runway Design Standards, e.g. OFZ	< 3/4-statute mile approach visibility minimums	≥ 3/4-statute mile approach visibility minimums	≥ 3/4-statute mile approach visibility minimums	Not Required
Threshold Siting Criteria To Be Met (Reference paragraph 303)	Table 3-2, row 7	Table 3-2, row 6	Table 3-2, rows 1-5	Table 3-2, rows 1-4
Survey Required ¹⁴	VGS	VGS (PA & APV) NVGS	NVGS ¹⁵	NVGS ¹⁶

Notes:

1. Visibility minimums are subject to the application of Order 8260.3 ("TERPS"), and associated orders or this table, whichever is higher. To qualify for each visibility (or circling), all requirements within the same column must be met or exceeded.
2. All runways authorized for circling must meet threshold siting (reference paragraph 303), OFZ (reference paragraph 308), and TERPS Chapter 3, Section 3 criteria.
3. Height Above Airport (HAA) for circling. The HATh/HAA indicated is for planning purposes; actual obtainable HATh/HAA is determined by TERPS and may be higher due to obstacles or other requirements. **HATh less than 250 ft must comply with requirements in < 3/4 statute mile column regardless of published visibility.**
4. GQS is applicable to PA and APV only. See Table 3-2, row 8.
5. Applicable to PA only, as defined by paragraph 102. If not clear, HATh must be increased to 250 ft or greater (as required by TERPS).
6. If not clear, obstacles must be lighted (see AC 70/7460-1) or procedure/circling runway restricted to day only. In certain circumstance, a VGSI may be used in lieu of obstruction lighting as defined in TERPS.
7. An ALP is only required for obligated airports in the NPIAS; it is recommended for all others.
8. Runways less than 3,200 ft are protected by Part 77 to a lesser extent. However, runways as short as 2,400 ft could support an instrument approach provided the lowest HATh is based on clearing any 200-ft (61 m) obstacle within the final approach segment.
9. Unpaved runways require case-by-case evaluation by the RAPT.
10. Runway edge lighting is required for night approach minimums. High intensity lights are required for RVR-based minimums.
11. **A full-length parallel taxiway must lead to the threshold.**
12. To achieve lower visibility minimums based on credit for lighting, a full approach light system (ALSF-1, ALSF-2, SSALR, or MALSR) is required for visibility < 3/4 statute mile. Intermediate (MALSF, MAL, SSALF, SSALS, SALS/SALSF) or Basic (ODALS) systems will result in higher visibility minimums. An ALSF-1 or ALSF-2 is required for CAT II/III ILS.
13. ODALS, MAL, SSALS, and SALS are acceptable.
14. See AC 150/5300-18 for Vertically Guided Survey (VGS) and non-Vertically Guided Survey (NVGS) requirements.
15. For PA and APV only, the NVGS must be supplemented with the first 10,200 ft of the Vertically Guided Approach Surface.
16. Absence of the indicated survey does not preclude authorization to establish circling to a runway but may result in increased HATh and visibility.

Thanks Very Much for your time!

Kind Regards,

Mark "Mario" Ciarlone

Aeronautical Information Specialist
6500 S. MacArthur Blvd, Room 110

RAPT Consensus Form

WORCESTER RGNL (ORH), Worcester, MA

Project Request:

ILS or LOC RWY 11 Amdt 25

Project Request Approved: ☐

Disapproved: ☐ (see comments)

Status/Issues:

MassPort funded improvements project: Add Cat II/III to the ILS approach.
Modification to Standards (MoS) for lack of full parallel taxiway approved and on file.

Priority Assigned:

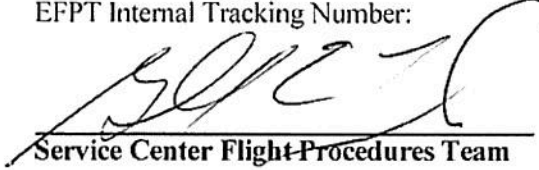
2

Project Tracking Number:

2014011328979801

EFPT Internal Tracking Number:

16-417


Service Center Flight Procedures Team


Service Center Air Traffic Operations
Support

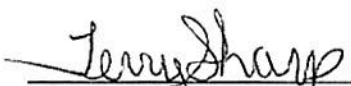
Digitally signed by william.gianetta@faa.gov

DN: cn=william.gianetta@faa.gov

Date: 2016.09.28 08:06:55 -04'00'

Flight Standards Division
NextGen Branch


Airports Division


Service Center Planning and
Requirements Group

10/27/16

Date

RAPT Consensus Form

WORCESTER RGNL (ORH), Worcester, MA

Project Request:

Project Request Approved: ☐

Disapproved: ☐ (see comments)

ILS or LOC RWY 11 Amdt 24

RNAV (GPS) RWY 11 Amdt 2

Status/Issues:

MassPort funded improvements project: Amend the ILS or LOC RWY 11 IAP due to
Glide Slope Antenna move, new TCH 55'
Amend the RNAV (GPS) RWY 11 concurrently

Priority Assigned:

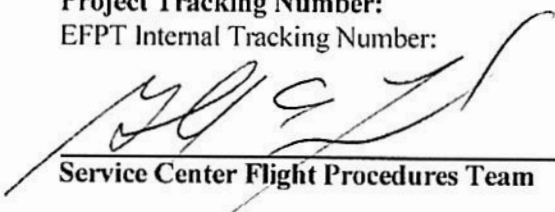
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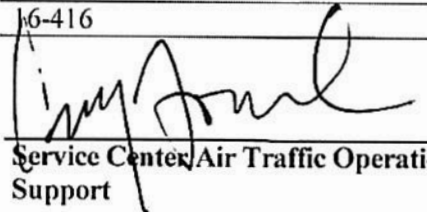
Project Tracking Number:

2016040426419401

EFPT Internal Tracking Number:

16-416


Service Center Flight Procedures Team


Service Center Air Traffic Operations
Support

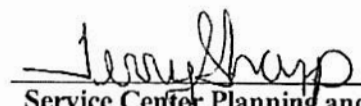
Digitally signed by william.gianetta@faa.gov

DN: cn=william.gianetta@faa.gov

Date: 2016.09.28 08:05:30 -04'00'

Flight Standards Division
NextGen Branch


Airports Division


Service Center Planning and
Requirements Group

10/27/16

Date