FINAL REPORT

AAIU Synoptic Report No: 2005-021
AAIU File No: 2005/0012
Published: 10/10/05

In accordance with the provisions of SI 205 of 1997, the Chief Inspector of Accidents, on 5 March 2005, appointed Jurgen Whyte as the Investigator-in-Charge to carry out a Field Investigation into this occurrence and prepare a Synoptic Report.

Aircraft Type and Registration:	**A/C No 1:** Cessna F 172M, EI-GSE **A/C No 2:** Cessna 172M, EI-STT (Parked)
No. and Type of Engines:	**A/C No 1:** 1 x Avco Lycoming O-320-E2D **A/C No 2:** 1 x Avco Lycoming O-320-E2D
Aircraft Serial Number:	**A/C No 1:** 1105 **A/C No 2:** 172-66228
Year of Manufacture:	**A/C No 1:** 1974 **A/C No 2:** 1975
Date and Time (UTC):	05 March 2005 @ 11.00 hrs approx
Location:	Weston Aerodrome (EIWT)
Type of Flight:	Private
Persons on Board:	**A/C No 1:** Crew - 1 Passengers - Nil **A/C No 2:** Crew – Nil Passengers – Nil
Injuries:	**A/C No 1:** Crew - Nil
Nature of Damage:	**A/C No 1:** Starboard wingtip damaged **A/C No 2:** Rudder damaged
Commander's Licence:	**A/C No 1**: Private Pilots Licence (PPL)
Commander's Details:	Male, aged 41 years
Commander's Flying Experience:	177 hours, of which 83 were on type
Information Source:	Aircraft Incident Report submitted by Pilot. AAIU Field Investigation

SYNOPSIS

While taxiing to park in a parking area that had been sanctioned for use by the aerodrome operator, but not licensed, the aircraft starboard wingtip struck the rudder of a stationary unattended aircraft. Damage to both aircraft was relatively minor and there were no injuries.

FINAL REPORT

1. FACTUAL INFORMATION

1.1 History of the Flight

The Pilot hired EI-GSE from a Weston based flight training school for the purpose of conducting local circuits and a navigational exercise (NAVEX). The aircraft was parked at an area referred to as the, "western taxiway extension". A general runway/taxiway map is presented as **Appendix A** to this report.

This temporary parking area had been established through procedures laid down by the aerodrome operator, due to the ground becoming soft at the official grass parking area, east of the apron. Personnel access to and from this temporary parking area was achieved through a "Green light" signalling procedure, which was coordinated through the control tower.

EI-GSE took-off at 09.51 hrs and completed a number of circuits, prior to departing on a NAVEX to Mullingar. The general weather conditions at the time were; wind 320º to 340º/12-14 kts, visibility 10 km+, Cloud FEW at 2,500 ft, SCT 4,200 ft, temperature 4ºC, dew point 0ºC, weather NOSIG (No significant change).

On return from an uneventful NAVEX, the Pilot of EI-GSE initially selected RWY 25 for a landing. However, due to the prevailing wind conditions, he elected to carry out a missed approach and repositioned for an approach and landing to RWY 07. EI-GSE was seen to touch-on within the first half of RWY 07 at 10.57 hrs, and run to the end of the runway. The aircraft then turned left off RWY 07 and taxied back along the northern taxiway towards the western extension of the taxiway, where the temporary parking area was located.

While manoeuvring EI-GSE along the taxiway, another aircraft (EI-GSM), which was parked on the left hand side of the temporary parking area (**See Appendix B**) called for taxi and advised the Aerodrome Flight Information Service (AFIS) that he had EI-GSE in sight. The AFIS requested EI-GSM to hold its position for the taxiing EI-GSE. EI-GSM acknowledged this request and held position.

On approaching the entrance to the temporary parking area, the Pilot of EI-GSE observed, ahead of his position, a number of parked aircraft on either side of the parking area. The aircraft on the left hand side were facing nose out to the centre of the taxiway, while the aircraft on the right hand side had their tails pointing back towards the centre of the taxiway. Amongst the line of aircraft parked along the left hand side, the Pilot reported seeing (in his 10 o'clock position) EI-GSM parked with its engine running. The Pilot informed the investigation that; *"Conscious of the presence of this aircraft with engine running, I manoeuvred EI-GSE right of the centre of the taxiway extension, in order to maintain additional separation from the started aircraft"*.

After a short distance maintaining this offset track, the pilot had a sensation that felt as if he had rolled over something, but he did not hear a bang or anything untoward. He continued, parked his aircraft and shutdown the engine with the intention of inspecting the aircraft. Immediately following engine shutdown, the Pilot was approached by another pilot, who informed him that he had struck an aircraft. Following a visual inspection it was determined that, the starboard wingtip of EI-GSE, struck the rudder of a parked and unattended aircraft (EI-STT), which was the first aircraft in line on the right hand side of the parking area. On securing EI-GSE, the Pilot met with the aerodrome manager and reported the event.

1.2 Damage

Damage to EI-GSE was limited to cracking and associated paint damage of the glass fibre conical camber starboard wingtip. The starboard navigation light assembly loosened from its mounting. EI-STT suffered ripple damage to the rudder skin panel and tearing of the rudder skin in the area of the rudder hinges.

1.3 Aerodrome Information

1.3.1 General

Weston is a visual flight rules (VFR) aerodrome, located 8 nm west of Dublin City. The aerodrome is licensed by the Irish Aviation Authority (IAA) for public use and has been categorized under the provisions laid down by the International Civil Aviation Organisation (ICAO) in Annex 14 - Aerodromes, with an Aerodrome Reference Code 1A[1].

1.3.2 Recent Aerodrome Construction Works

Over the past number of months, major aviation related construction works have taken place at Weston, including, among other things, the construction of a stopway/clearway to the western end of the existing RWY 25/07, a parallel taxiway with taxiway/runway connections to RWY 25/07, a large apron area to the north of the field, which is served by two taxiways leading to/from the taxiway/runway and a number of aviation buildings. The physical construction of these aviation facilities have been carried out in accordance with the Aerodrome Design provisions as laid down under ICAO Annex 14 – Aerodromes.1.3.3

1.3.3 Aerodrome On Site Investigation

On the arrival of the Investigator-in-Charge (IIC) at the incident site, it was found that EI-GSE had already been re-positioned to a maintenance hanger and that the damaged wingtip had been removed for replacement. This was done without the knowledge of the Pilot or without prior permission from the AAIU.

EI-STT was found in its original unattended parked position following impact.

A number of light aircraft were found parked on the left-hand side/edge of the western taxiway extension (noses pointing towards centre of taxiway) and directly across from these aircraft a number of aircraft were parked on the right-hand side/edge of the taxiway (tails pointing back to the centre of the taxiway).

No taxiway or apron markings were found on the taxiway. The taxiway measured 30 metres in width.

The taxiway and temporary parking area on the western taxiway extension remained in use during the course of the site inspection.

Further enquiries by the Investigation determined that these facilities had been in use for a period of time prior to this particular event and that the aerodrome operator had issued written procedures to users.

[1] The Code number (1) refers to a field length less than 800 metres and the Code letter (A) refers to a wing span up to but not including 15 metres

1.4 Aeronautical Information Publication

The Aeronautical Information Publication (AIP) Ireland forms part of the Integrated Aeronautical Information Package and is made up of three parts, General (GEN), Enroute (ENR) and Aerodromes (AD).

Under Part 3 – Aerodromes (AD), a wide variety of detailed information is provided on Aerodromes/Heliports. The Weston Aerodrome Chart (EIWT AD.2.24-1), which was in force at the time of this particular event, is presented as **Appendix C** to this report. The Chart shows, among other things, a single runway (RWY) 25/07, which measures 799 metres in length and 23.5 metres in width. In addition, the chart shows a taxiway to a parking apron and a number of helicopter parking stands. The recently constructed facilities are not portrayed on this chart.

1.5 ICAO Annex 14 Provisions

Annex 14 contains Standards and Recommended Practices (specifications) that prescribe the physical characteristics and obstacle limitation surfaces to be provided for at aerodromes, and certain facilities and technical services normally provided at an aerodrome (**See Appendix D**).

1.6 IAA Aerodrome Licensing Memorandum (ALM No. 003)

The IAA Aerodrome Licensing Memorandum is a supplement to the Aerodrome Licensing Manual (ALM No. 002) for lower category aerodromes and provides guidance to the general aviation sector in the State for the licensing of small aerodromes, safety standards at small unlicensed aerodromes and the issue of a temporary licence (**See Appendix E**).

1.7 Additional Information

1.7.1 The overall width of the taxiway at Weston measures 30 metres. The wingspan of a Cessna 172 is 10.92 metres and its length is 8.20 metres. These measurements would not be unlike other light aircraft that operate from Weston.

If EI-GSE had maintained a position along the centre part of the taxiway, the wingtip clearance between EI-GSE and the parked aircraft on either side of the taxiway, would have been approximately 1.3 metres.

1.7.2 The Aerodrome and Visual Ground Aids Order (SI 334 of 2000) specifies at 17 (2) that: *"Notwithstanding any air traffic control clearance, it shall remain the duty of the pilot-in-command of an aircraft to take all possible measures to ensure that his aircraft does not collide with any other aircraft or with any vehicle and to ensure as far as possible that injury to persons or damage to objects does not result from jet-efflux or propeller wake effects from that aircraft."*

1.7.3 In correspondence with the IAA the following was stated, *"The Authority routinely audits Weston Aerodrome in accordance with its regulatory remit, working procedures and processes, which are themselves subject to review by a variety of external agencies, including the Department of Transport, but it is neither a police service with permanent presence at any airport nor is it responsible for the operation of any aerodrome. Where it becomes aware through its audit process or otherwise of regulatory non-compliances at a particular aerodrome, it will take action to ensure that these are addressed by the licensee and if necessary enforce penalties.*

When the Authority became aware of the subject use of this pavement, the aerodrome management was summoned and instructed by the Authority to rectify matters, which it did immediately."

2. ANALYSIS

In his report, the pilot of EI-GSE acknowledged that when he became conscious of the presence of EI-GSM, which was parked and running in his 10 o'clock position, he manoeuvred to the right of the centre of the taxiway, in order to maintain additional separation.

EI-GSM was parked running and the pilot had confirmed to the AFIS that he would hold position. Therefore this particular aircraft should not have posed any separation threat to EI-GSE, once the centre of the taxiway was maintained. Had the centre of the taxiway been maintained, the wingtip clearance on either side of EI-GSE would have been approximately 1.3 metres. The concern for and possible fixation on EI-GSM by the pilot of EI-GSE, may have distracted his full attention from the starboard side of his aircraft, as the movement right of the centre of the taxiway was sufficient to reduce separation to such a point that the right wingtip struck the rudder of the parked aircraft EI-STT.

Ultimately, the pilot-in-command is responsible for the operation and safety of his aircraft from the moment the aircraft is ready to move for the purpose of taking-off, until the moment it finally comes to a rest at the end of the flight and the engine(s) used as primary propulsion unit(s) are shut down.

Not withstanding the responsibilities of the pilot-in-command, the aviation facilities provided at licensed aerodromes are required to comply with the provisions of Annex 14 and the licensing requirement laid down by the State (IAA).

It is clear that on the day in question the taxiway was in use and that a temporary parking area was established on the western taxiway extension. In addition, enquiries made by the Investigation determined that these facilities had been in use for a period of time prior to this particular event and that written procedures had been issued to users by the aerodrome operator.

The AIP for Weston Aerodrome did not include the new fixed aviation facilities that were present at Weston at the time of this event, as such facilities had not been sanctioned for use by the IAA, nor had they even been proposed for approval by the IAA.

The parking area did not comply with the minimum separation distances established in Annex 14 and AML No 003, as the aircraft stand taxi lane centre line clearance to the object was significantly less than 12 metres (ICAO) and 15 metres (IAA).

There were no taxiway markings present on the day of the event. Markings provide perspective information, alignment guidance and location to the pilot. Markings laid in compliance with ICAO Annex 14 provisions and the IAA licensing requirements for licensed aerodromes, should, if followed correctly, ensure adequate separation and will enhance safety.

3. CONCLUSIONS

(a) Findings

1. On the day of this particular event, and for a period of time prior to the event, fixed aviation facilities were being used at Weston Aerodrome that had not been sanctioned for use by the IAA.

2. The Aerodrome Operator issued written procedures to users of these fixed aviation facilities.

3. A parking area had been established on the western extension of the taxiway, which did not provide the minimum separation distances as specified by ICAO and ALM No 003.

4. No markings were present on the taxiway at the time of this event.

5. The Pilot of EI-GSE consciously manoeuvred his aircraft right of the centre of the taxiway, in order to provide further separation from a parked running aircraft, which, in the opinion of the Investigation, did not constitute an immediate separation threat.

6. Following the conscious offset manoeuvre to the right by the pilot, separation reduced to such a degree that the wingtip of EI-GSE struck the rudder of a parked aircraft (EI-STT).

7. The Pilot of EI-GSE did not provide adequate separation while manoeuvring on the ground.

(b) Cause

Failure to ensure adequate aircraft separation while manoeuvring on the ground.

(c) Contributory Factors

1. Operation of fixed aviation facilities, which had not been sanctioned for use by the IAA.

2. Use of a parking area, which did not comply with, laid down minimum separation distances.

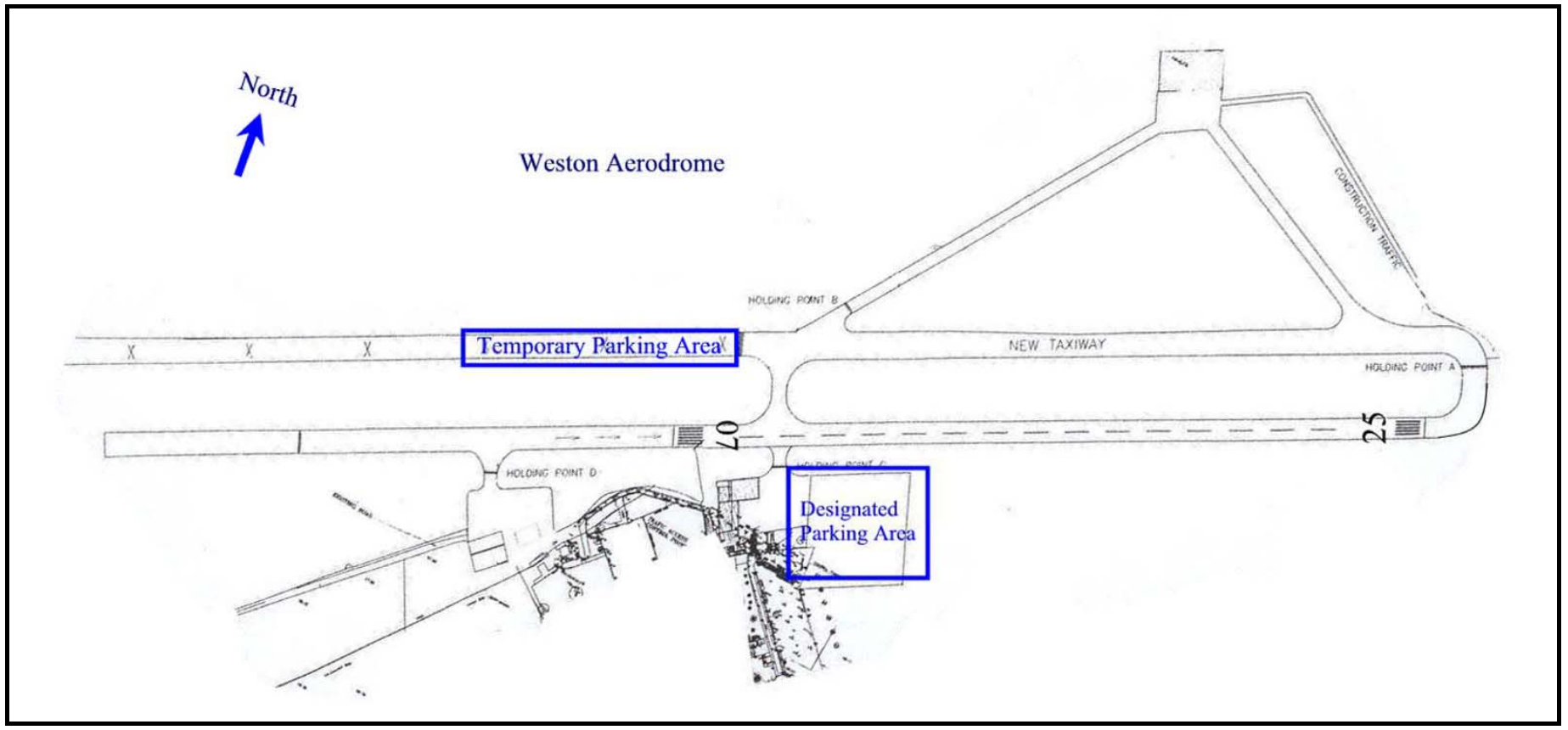
3. Lack of taxiway markings in the manoeuvring area.

4. SAFETY RECOMMENDATIONS

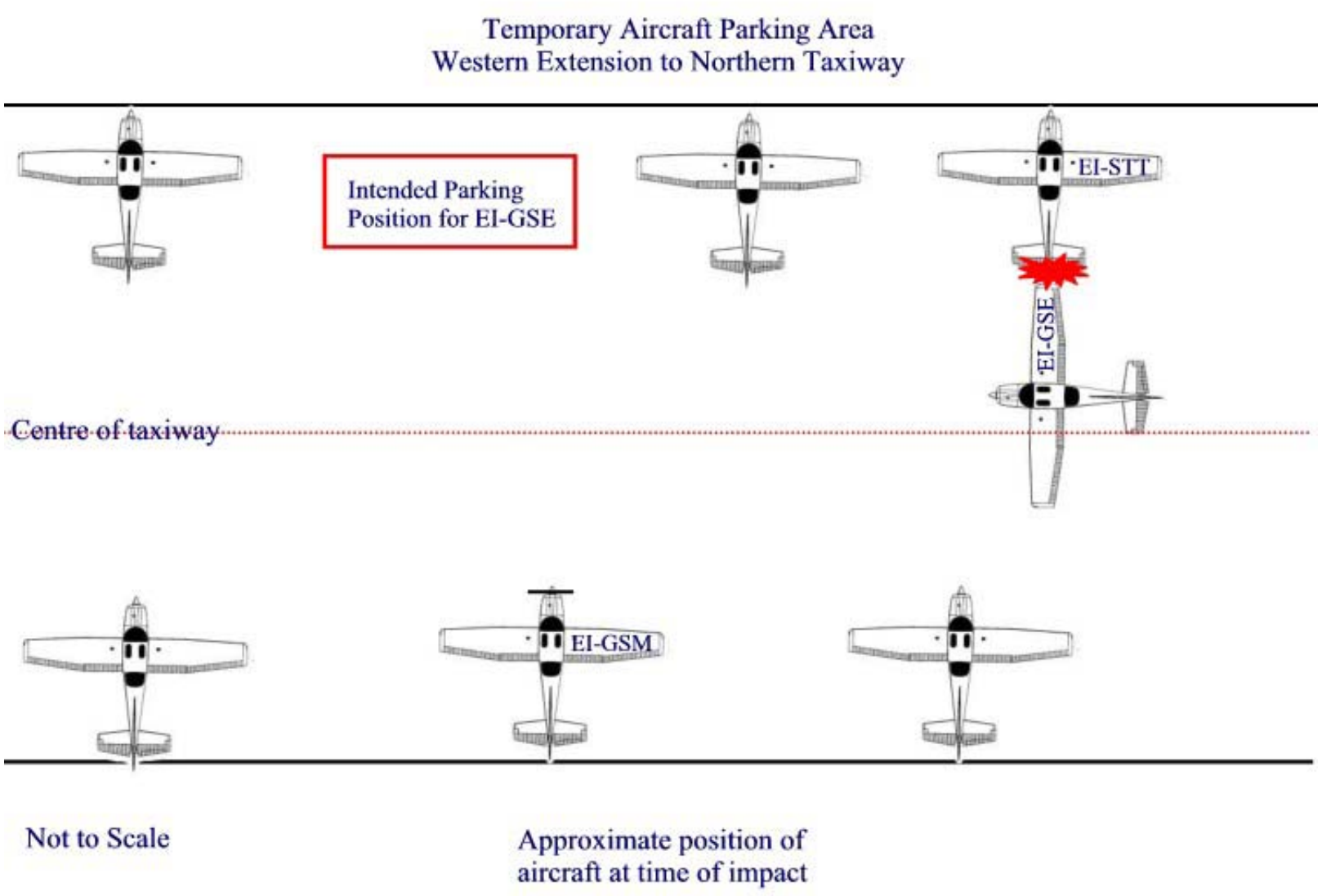
It is recommended that:

The Aerodrome Licensee puts appropriate structures and procedures in place to ensure, that the operation of fixed aviation facilities, shall be limited to those facilities that are sanctioned and licensed for use at the aerodrome by the IAA. **(SR 20 of 2005)**

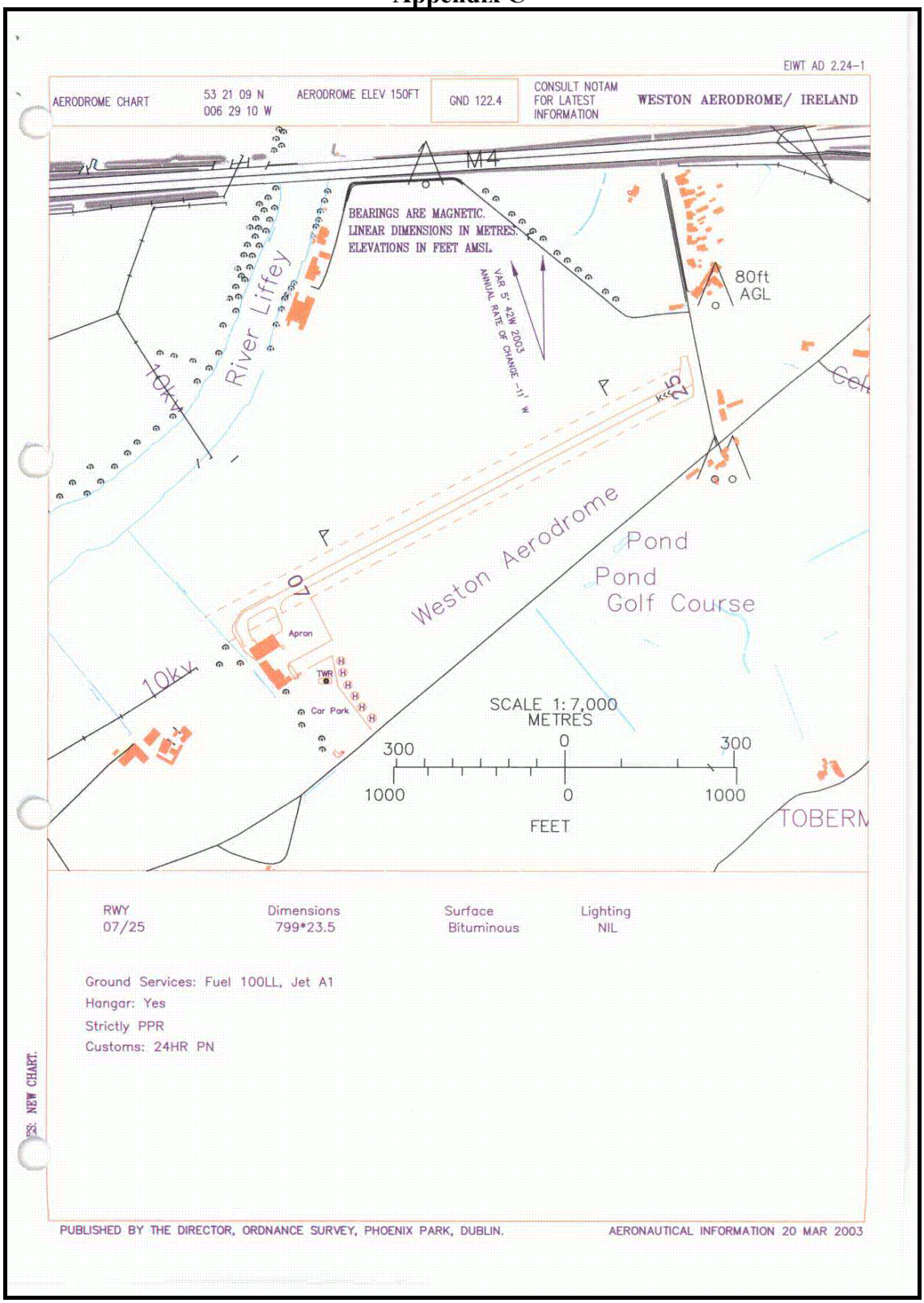
Appendix A


North
Weston Aerodrome
CONSTRUCTION TRAFFIC
HOLDING POINT B
Temporary Parking Area
NEW TAXIWAY
HOLDING POINT A
07
25
HOLDING POINT D
Designated
Parking Area

Appendix B


Temporary Aircraft Parking Area
Western Extension to Northern Taxiway
Intended Parking
Position for EI-GSE
EI-STT
EI-GSE
Centre of taxiway
EI-GSM
Not to Scale
Approximate position of
aircraft at time of impact

Appendix C


EIWT AD 2.24-1
AERODROME CHART
53 21 09 N
006 29 10 W
AERODROME ELEV 150FT
GND 122.4
CONSULT NOTAM FOR LATEST INFORMATION
WESTON AERODROME/ IRELAND
M4
BEARINGS ARE MAGNETIC.
LINEAR DIMENSIONS IN METRES.
ELEVATIONS IN FEET AMSL.
VAR 5° 42W 2003
ANNUAL RATE OF CHANGE -11' W
80ft AGL
River Liffey
10kV
07
25
Weston Aerodrome
Pond
Pond
Golf Course
Apron
TWR
Car Park
10kV
SCALE 1:7,000
METRES
300
0
300
1000
0
1000
FEET
TOBERM
RWY
07/25
Dimensions
799*23.5
Surface
Bituminous
Lighting
NIL
Ground Services: Fuel 100LL, Jet A1
Hangar: Yes
Strictly PPR
Customs: 24HR PN
ISS: NEW CHART.
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AERONAUTICAL INFORMATION 20 MAR 2003

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Appendix D

ICAO Annex 14 Provisions

Relevant Extracts

3.13 Aprons

Clearance Distances on Aircraft Stands

3.13.6 **Recommendation[2]. -** *An aircraft stand should provide the following minimum clearances* (Code Letter A shown only) *between the aircraft using the stand and any adjacent building, aircraft on another stand and other objects.*

Code Letter	Clearance
A	3 metres

3.9 Taxiways

Taxiway Minimum Separation Distances

3.9.7 **Recommendation. -** *The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should not be less than the appropriate dimension specified in Table 3-1, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.* For a Code letter A Aerodrome, Table 3-1 specifies under Column (11) that the minimum separation distance for a Taxiway, other than aircraft stand taxi lane, centre line to object should be 16.25 metres. Under Column (12) Aircraft stand taxi lane centreline to object should be 12 metres.

5.2 Markings

Taxiway Centre Line Markings

5.2.8.2 **Recommendation. -** *Taxiway centre line marking should be provided on a paved taxiway, de-icing/anti-icing facility and apron where the code number is 1 or 2 in such a way as to provide continuous guidance between the runway centre line and the aircraft stands.*

[2] **Recommended Practice**: Any specification for physical characteristics, configuration, material, performance, personnel or procedure, the uniform application of which is recognized as desirable in the interest of safety, regularity, and to which Contracting States will endeavour to conform in accordance with the Convention.

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Appendix E

IAA Aerodrome Licensing Memorandum (ALM No. 003)

Relevant extracts

5.3 Taxiways

5.3.3. Taxiway Minimum Separation Distances between Taxiway and Apron taxiway to object equals 16.25 metres.

5.4 Taxiway Strips

5.4.1. A taxiway strip should extend symmetrically on each side of the taxiway centreline throughout the length of the taxiway to at least a distance from the centre line of 16.25 metres.

5.4.2. The Taxiway strip should provide an area clear of objects that may endanger taxiing aeroplanes.

Aprons

5.5.5. Aircraft will usually taxi and park under their own power. In order to do this safely the taxi and parking areas should allow for at least 15 metres separation between aircraft extremities and between aircraft extremities and vehicles, fences, etc.

Taxiway Markings

7.5.4. Taxiway centre line marking should be provided on a paved taxiway in such a way as to provide continuous guidance between the runway centre line and aircraft stands.