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AIP Supplement for Singapore

**AIRAC AIP SUP****128/2023****Effective from 30 NOV 2023****PERM****Published on 21 SEP 2023**

SINGAPORE CHANGI AIRPORT – UPDATED INFORMATION AND DATA FOR RUNWAY 02C/20C AND NEW TAXIWAYS

1 INTRODUCTION

1.1 This AIP Supplement informs aircraft operators and pilots that Runway 02C/20C and new taxiways at Singapore Changi Airport will be open for flights effective from **30 November 2023, 2000UTC**.

1.2 In addition, effective from **30 November 2023, 2000UTC**:

- a. TWY T, between TWY P and TWY K, will be permanently closed.
- b. TWY J, between TWY T and TWY K1, will be permanently closed.

2 AERODROME INFORMATION AND DATA FOR RUNWAY 02C/20C AND NEW TAXIWAYS

2.1 The updated information and data for Runway 02C/20C will be incorporated into AIP Singapore Part 3 – AERODROMES (AD), Section AD 2 AERODROMES – WSSS.

2.2 Please refer to **Annex A** for details.

2.3 The following charts currently published in AIP Singapore will be updated with information on Runway 02C/20C, new taxiways and supporting aerodrome infrastructure.

Charts	Name	Refer to
Location of RWY 02R/20L in relation to RWY 02L/20R and RWY 02C/20C	AD-2-WSSS-ADC-1	Appendix 1
Aerodrome Chart - ICAO	AD-2-WSSS-ADC-2	Appendix 2
Aerodrome Advisory Chart	AD-2-WSSS-ADC-3	Appendix 3
Aerodrome Obstacle Chart - ICAO - TYPE A	AD-2-WSSS-AOC-2	Appendix 4
Aerodrome Obstacle Chart - ICAO - TYPE B	AD-2-WSSS-AOC-3	Appendix 5
Precision Approach Terrain Chart - ICAO - RWY 20C	AD-2-WSSS-PATC-2	Appendix 6

2.4 The following new chart related to Runway 02C/20C will be published in the AIP Singapore.

New Chart	Name	Refer to
Precision Approach Terrain Chart - ICAO - RWY 02C	AD-2-WSSS-PATC-5	Appendix 7

2.5 The following taxiways will be permanently closed:

- a. TWY T, between TWY P and TWY K.
- b. TWY J, between TWY T and TWY K1.

2.6 The closed areas are indicated in Appendix 2.

3 OBSERVING SYSTEMS AND OPERATING PROCEDURES AT SINGAPORE CHANGI AIRPORT

3.1 The following information will supersede information that is currently published in AIP Singapore, GEN 3.5, Table GEN 3.5.3, Row 3, Column 4, Item 'a'.

- a. Ultrasonic wind sensors at ends and middle of RWY 02L/20R (Runway 1), RWY 02C/20C (Runway 2) and RWY 02R/20L (Runway 3).
Surface wind report in METAR and SPECI is taken from the wind sensor at the southern end of RWY 02L (with the sensor at the northern end of RWY 02C/20C as backup).

3.2 Runway 02C/20C surface wind and RVR information.

- a. Surface wind is measured by three ultrasonic wind sensors located as follows:

	Distance from threshold	Distance from runway centreline
One set at	414 metres north of RWY 02C	130 metres
One set at	Middle of runway	130 metres
One set at	413 metres south of RWY 20C	128 metres

- b. RVR observations are made by means of three sets of transmissometers, located as follows:

	Distance from threshold	Distance from runway centreline
1 st Set	449 metres north of RWY 02C	120 metres
2 nd Set	Middle of runway	120 metres
3 rd Set	387 metres south of RWY 20C	120 metres

- c. RVR is reported in steps of 25 metres between 0 and 400 metres, 50 metres between 400 and 800 metres and 100 metres between 800 and 1500 metres.

4 CANCELLATION

4.1 This AIRAC AIP Supplement supersedes AIRAC AIP Supplement 103/2023 dated 27 July 2023.

4.2 Any change to the contents of this AIP Supplement will be notified through NOTAM.

4.3 This AIP Supplement will remain current until the information is incorporated into AIP Singapore.

Annex A**WSSS – SINGAPORE / SINGAPORE CHANGI INTERNATIONAL RUNWAY 02C/20C INFORMATION AND DATA**

Details in this Annex should be read in conjunction with AIP Singapore Part 3 – AERODROMES (AD), Section AD 2 AERODROMES – WSSS. Current information and data that remain relevant are not repeated in this Annex.

Additional or superseding aeronautical information and data can be found in the following sections:

WSSS AD 2.8 APRONS, TAXIWAYS AND CHECK LOCATIONS DATA		
2	Taxiway width, surface and strength	<p>Minimum width 23m for all taxiways</p> <p>TWY T1, T2, T4, T12, T13, T (between T11 and T13), U12, U13, U (between U12 and U13), D1, D2, D13, D14, D (between D1 and D2), D (between D13 and D14), C1, C2, C13, C14, C (between C1 and C2) and L (between C13 and C14) – Concrete surface; strength PCN 102/R/B/W/T.</p> <p>TWY T3, T5, T6, T7, T8, T9, T10, T11, U10, U11, U (between U9 and U12) and other TWYs C, D, L - Asphalt surface, strength PCN 82/F/B/X/T.</p> <p>Note: Open-air drains, demarcated by frangible poles, are installed within non-graded TWY strips at least 30m from the TWY centrelines.</p>

WSSS AD 2.9 SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS	
2	<p>RWY and TWY markings and LGT</p> <p><u>RWY 02C/20C</u></p> <p>RWY LGT: refer to WSSS AD 2.14 and WSSS AD 2.15.</p> <p>TWY LGT: Blue lights on TWY curved edges. Blue TWY edge markers along selected straight TWY edge sections. Red stop bar lights at TWY INT are controllable on/off. Red stop bar lights at Pattern “A” RWY HLDG PSN entrances to RWY are controllable on/off and are supplemented with elevated RWY guard lights and RWY designation sign at the sides. Red stop bar lights at Pattern “B” RWY HLDG PSN before entry into the RWY ILS sensitive area are controllable on/off with Category I/II RWY HLDG PSN sign.</p> <p>Internally lighted mandatory or information TWY signboards.</p> <p>On the east and west of RWY 02C/20C, alternate green and yellow taxiway centreline lights along taxiways within ILS sensitive zone in the vicinity of the runway and green taxiway centreline lights with selective controls along taxi-routes to/from main RWY and aprons.</p> <p>On the east of RWY 02C/20C between Pattern “A” RWY HLDG PSN and Pattern “B” RWY HLDG PSN TWY, alternate green and yellow taxiway centreline lights along taxiways within ILS sensitive zone.</p> <p>Rapid Exit Taxiway Indicator LGT comprises a set of yellow unidirectional LGT positioned in a 3-2-1 sequence at 100m intervals prior to the point of tangency of the rapid exit taxiway centreline.</p> <p>MARKING AIDS: THR, touchdown zone, RWY centreline, RWY side stripe, RWY designations, aiming point markings, TWY centreline, taxi holding positions – all taxiways, apron markings.</p>

WSSS AD 2.10 AERODROME OBSTACLES**1. Obstacles in Approach/ TKOF Areas**

The information below supersedes the information **specific to RWY 02C/20C** published in the **AIP Singapore, Section WSSS AD 2.10, Item 1.**

IN APPROACH/ TKOF AREAS			
RWY/Area affected		Obstacles type, ELEV, Markings/LGT	Location of Obstacles
1		2	3
1)	RWY 20C APCH	Mast HGT ranging from 98ft AMSL and above	Shipping channel APRX 2650m from THR RWY 20C
2)	RWY 02C TKOF	Mast HGT ranging from 98ft AMSL and above	Shipping channel APRX 2590m from DER RWY 02C
3)	RWY 02C APCH RWY 20C TKOF	Trees HGT ranging up to 75ft AMSL	011909.0N 1035849.0E
4)	RWY 02C APCH RWY 20C TKOF	Approach lighting masts HGT ranging up to 35ft AMSL	Within APCH/TKOF
5)	RWY 02C APCH RWY 20C TKOF	ILS LLZ (South), 27ft AMSL, marked	011932.4N 1035901.3E
6)	RWY 02C APCH RWY 20C TKOF	LLZ Hut (South), 31ft AMSL, marked and LGTD	011934.1N 1035856.8E
7)	RWY 02C APCH RWY 20C TKOF	Mast, 61ft AMSL, marked and LGTD	011919.8N 1035902.3E
8)	RWY 20C APCH RWY 02C TKOF	Trees HGT ranging up to 92ft AMSL	012221.0N 1040022.2E
9)	RWY 20C APCH RWY 02C TKOF	Approach lighting masts HGT ranging up to 35ft AMSL	Within APCH/TKOF
10)	RWY 20C APCH RWY 02C TKOF	ILS LLZ (North), 27ft AMSL, marked	012154.8N 1040001.2E
11)	RWY 20C APCH RWY 02C TKOF	LLZ Hut (North), 31ft AMSL, marked and LGTD	012156.3N 1035957.6E
12)	RWY 20C APCH RWY 02C TKOF	Mast, 59ft AMSL, marked and LGTD	012200.7N 1040010.8E

2. Obstacles in Circling area and at Aerodrome

The information below supersedes the information published in the **AIP Singapore, Section WSSS AD 2.10, Item 2.**

IN CIRCLING AREA AND AT AERODROME		
	Obstacles type, ELEV, Markings/LGT	Location of Obstacles
1)	RWY 02L/20R and RWY 02R/20L Wind direction indicators, marked and LGTD	Located at each end of RWY adjacent to GP Hut
2)	RWY 02C Wind direction indicator, 38ft AMSL, marked and LGTD	011954.7N 1035915.2E
3)	RWY 20C Wind direction indicator, 38ft AMSL, marked and LGTD	012124.9N 1035953.4E
4)	RWY 02L Anemometer, 48ft AMSL, marked and LGTD	012110.5N 1035840.2E
5)	RWY 20R Anemometer, 44ft AMSL, marked and LGTD	012222.7N 1035910.9E
6)	RWY 02C Anemometer, 49ft AMSL, marked and LGTD	011954.3N 1035914.9E
7)	RWY 20C Anemometer, 49ft AMSL, marked and LGTD	012043.4N 1035935.7E
8)	RWY 20C Anemometer, 49ft AMSL, marked and LGTD	012129.4N 1035955.1E
9)	RWY 02R Anemometer, 47ft AMSL, marked and LGTD	012105.7N 1040048.5E
10)	RWY 20L Anemometer, 48ft AMSL, marked and LGTD	011931.7N 1040008.8E
11)	RWY 02L GP Antenna, 67ft AMSL, marked and LGTD	012108.5N 1035839.1E
12)	RWY 20R GP Antenna, 67ft AMSL, marked and LGTD	012225.5N 1035912.2E
13)	RWY 02C GP Antenna, 67ft AMSL, marked and LGTD	011952.2N 1035913.7E
14)	RWY 20C GP Antenna, 67ft AMSL, marked and LGTD	012131.7N 1035955.7E
15)	RWY 02R GP Antenna, 67ft AMSL, marked and LGTD	012108.9N 1040049.4E
16)	RWY 20L GP Antenna, 67ft AMSL, marked and LGTD	011929.1N 1040007.3E
17)	Antenna, HGT 82ft AMSL, marked and LGTD	012036N 1035819E
18)	Antenna, HGT 85ft AMSL, marked and LGTD	012039N 1035821E
19)	Antenna, HGT 78ft AMSL, marked and LGTD	012042N 1035823E

IN CIRCLING AREA AND AT AERODROME		
	Obstacles type, ELEV, Markings/LGT	Location of Obstacles
20)	Antenna, HGT 82ft AMSL, marked and LGTD	012053N 1035827E
21)	Antenna, HGT 78ft AMSL, marked and LGTD	012049N 1035826E
22)	FOD detection mast, HGT 38ft AMSL, marked and LGTD	011952.5N 1035913.9E
23)	FOD detection mast, HGT 37ft AMSL, marked and LGTD	011959.1N 1035917.2E
24)	FOD detection mast, HGT 37ft AMSL, marked and LGTD	012005.0N 1035919.6E
25)	FOD detection mast, HGT 37ft AMSL, marked and LGTD	012016.9N 1035924.7E
26)	FOD detection mast, HGT 37ft AMSL, marked and LGTD	012028.7N 1035929.7E
27)	FOD detection mast, HGT 37ft AMSL, marked and LGTD	012033.8N 1035931.8E
28)	FOD detection mast, HGT 38ft AMSL, marked and LGTD	012045.5N 1035936.8E
29)	FOD detection mast, HGT 37ft AMSL, marked and LGTD	012056.5N 1035941.5E
30)	FOD detection mast, HGT 37ft AMSL, marked and LGTD	012108.7N 1035946.6E
31)	FOD detection mast, HGT 37ft AMSL, marked and LGTD	012114.0N 1035948.8E
32)	FOD detection mast, HGT 37ft AMSL, marked and LGTD	012124.0N 1035953.1E
33)	FOD detection mast, HGT 37ft AMSL, marked and LGTD	012129.0N 1035954.9E
34)	FOD detection mast, HGT 45ft AMSL, marked and LGTD	011929.5N 1040007.5E
35)	FOD detection mast, HGT 45ft AMSL, marked and LGTD	011934.4N 1040009.8E
36)	FOD detection mast, HGT 45ft AMSL, marked and LGTD	011943.2N 1040013.6E
37)	FOD detection mast, HGT 45ft AMSL, marked and LGTD	011954.2N 1040018.2E
38)	FOD detection mast, HGT 45ft AMSL, marked and LGTD	012003.3N 1040022.0E
39)	FOD detection mast, HGT 45ft AMSL, marked and LGTD	012004.5N 1040022.5E
40)	FOD detection mast, HGT 45ft AMSL, marked and LGTD	012027.2N 1040031.8E
41)	FOD detection mast, HGT 45ft AMSL, marked and LGTD	012027.8N 1040032.0E
42)	FOD detection mast, HGT 45ft AMSL, marked and LGTD	012052.8N 1040042.9E
43)	FOD detection mast, HGT 45ft AMSL, marked and LGTD	012054.9N 1040043.8E
44)	FOD detection mast, HGT 45ft AMSL, marked and LGTD	012103.4N 1040047.4E
45)	FOD detection mast, HGT 45ft AMSL, marked and LGTD	012108.4N 1040049.3E
46)	<p>Liquefied Natural Gas storage tanks, plants, gas stacks and flares within Malaysia's Pengerang Integrated Complex (PIC) extending up to HGT 1,500ft AMSL.</p> <p>Refer to AIP Malaysia for information on "Pengerang Integrated Complex Safety Area". Aircraft may overfly the area at 2,000ft and above.</p>	<p>Within area bounded by</p> <p>012245N 1040705E</p> <p>012245N 1040831E</p> <p>012306N 1040954E</p> <p>012301N 1041056E</p> <p>012232N 1041058E</p> <p>012114N 1041057E</p> <p>012038N 1040939E</p> <p>012031N 1040813E</p> <p>012136N 1040704E</p> <p>012245N 1040705E</p>
Remarks: Obstacles are shown on the AOC, IAC and VAC.		

WSSS AD 2.12 RUNWAY PHYSICAL CHARACTERISTICS

Designations RWY NR	TRUE BRG	Dimensions of RWY	Strength (PCN) and surface of RWY and SWY	THR coordinates and RWY end coordinates (THR Geoid Undulation)	THR elevation and highest elevation of TDZ of precision APCH RWY
1	2	3	4	5	6
02C	023.01 °	4000m x 60m	82F/B/X/T Grooved Asphalt Surface	THR coordinates: 011943.51N 1035905.86E RWY end coordinates: 012143.37N 1035956.46E (10.27m)	4.80m 4.80m
20C	203.01 °	4000m x 60m	82F/B/X/T Grooved Asphalt Surface	THR coordinates: 012143.37N 1035956.46E RWY end coordinates: 011943.51N 1035905.86E (10.30m)	4.80m 4.80m

Slope of RWY-SWY Transverse / Longitudinal	SWY Dimensions (m)	CWY Dimensions (m)	STRIP Dimensions (m)	Dimensions of RESA (m)	Locations and description of ARST system	OFZ
7	8	9	10	11	12	13
RWY 02C 1.25% / 0.00% SWY 1.25% / 0.00%	60 x 60	60 x 150	4240 x 280	240 x 150	Not Applicable	Yes
RWY 20C 1.25% / 0.00% SWY 1.25% / 0.00%	60 x 60	60 x 150	4240 x 280	240 x 150	Not Applicable	Yes

Remarks
The information below supersedes the information published in the AIP Singapore, Section WSSS AD 2.12, Item 14.
14
1) Open-air drains, demarcated by frangible poles, within the runway strip of RWY 02R/20L.
2) Not in use military hookwire system embedded in runway pavement at 490m from RWY 02R and RWY 20L thresholds.
3) Frangible End Around Taxiway (EAT) visual screens located at the approach/take-off end of RWY 02C and RWY 20C do not penetrate the obstacle limitation surfaces of RWY 02C/20C. The EAT visual screens are marked in diagonal red-white stripes and installed with additional red obstacle lights. The EAT visual screens are intended to help pilots operating on RWY 02C/20C to differentiate between an aircraft crossing the runway or taxiing on end-around taxiways TWY K and TWY L.
4) Scheduled Closure of RWY 02L/20R
a. BTN 1700-2100UTC on every SUN and WED of the month (preventive maintenance work). In the event of emergency, RWY will be re-opened within 30 minutes.
b. A 5-minute inspection conducted within the periods BTN 0100-0359UTC 0500-0759UTC 0800-1059UTC daily.
5) Scheduled Closure of RWY 02C/20C
a. BTN 1700-2100UTC on every MON of the month (preventive maintenance work). In the event of emergency, RWY will be re-opened within 30 minutes.
b. A 5-minute inspection conducted within the periods BTN 0100-0359UTC 0500-0759UTC 0800-1059UTC daily.
6) Scheduled Closure of RWY 02R/20L
a. BTN 1700-2100UTC on every TUES and FRI of the month (preventive maintenance work). In the event of emergency, RWY will be re-opened within 30 minutes.
b. A 5-minute inspection conducted within the periods BTN 0100-0359UTC 0500-0759UTC 0800-1059UTC daily.
7) Additional Inspection and Maintenance Closures
a. On days when there is a scheduled 4-hour runway closure BTN 1700-2100UTC
i) 10-minute inspection conducted within the period BTN 1500-1610UTC on the other operational runway(s);
ii) 15-minute inspection conducted within the period BTN 2300-2359UTC on the other operational runway(s);
iii) 5-minute inspection conducted within period BTN 2300-2359UTC on the re-opened runway.
b. On days when there is no scheduled 4-hour runway closure BTN 1700-2100UTC
I) RWY 02L/20R;
i. 5-minute inspection conducted BTN 2300-2305UTC
ii. 30-minute maintenance will be conducted BTN 1830-1900UTC
II) RWY 02C/20C;
i. 5-minute inspection conducted BTN 2315-2320UTC
ii. 60-minute maintenance will be conducted BTN 2000-2100UTC
III) RWY 02R/20L
i. 5-minute inspection conducted BTN 2330-2335UTC
ii. 30-minute maintenance will be conducted BTN 2100-2130UTC

WSSS AD 2.13 DECLARED DISTANCES						
RWY Designator	Intersection Departures	TORA (m)	TODA (m)	ASDA (m)	LDA (m)	Remarks
1	2	3	4	5	6	7
20C	Not Applicable	4000	4060	4060	4000	NIL
	T3	3808	3868	3868	Not Applicable	
	T4	3421	3481	3481	Not Applicable	
	T5	2721	2781	2781	Not Applicable	
	D3	3842	3902	3902	Not Applicable	
	D4	3502	3562	3562	Not Applicable	
	D5	3027	3087	3087	Not Applicable	
	D6	2552	2612	2612	Not Applicable	
02C	Not Applicable	4000	4060	4060	4000	NIL
	T11	3842	3902	3902	Not Applicable	
	T10	3329	3389	3389	Not Applicable	
	T9	3197	3257	3257	Not Applicable	
	T8	2551	2611	2611	Not Applicable	
	D12	3842	3902	3902	Not Applicable	
	D11	3480	3540	3540	Not Applicable	
	D10	2877	2937	2937	Not Applicable	
	D9	2402	2462	2462	Not Applicable	

WSSS AD 2.14 APPROACH AND RUNWAY LIGHTING								
RWY	APCH LGT Type, LEN, Intensity	THR LGT colour WBAR	PAPI (MEHT)	TDZ LGT LEN	RWY Centreline LGT, LEN, spacing, colour, INTST	RWY Edge LGT, LEN, spacing, colour, INTST	RWY End LGT colour	SWY LGT colour
1	2	3	4	5	6	7	8	9
02C	CAT II High Intensity Approach Lighting (900m) consisting of extended centreline and Red row barrettes, 2 crossbars, 2 approach beacons and sequenced flashing lights.	Green supplemented by green wing-bar and 2 THR ident lights.	PAPI 003° located either side of RWY, 418m from THR. 2 White LGT and 2 Red LGT (19.8m), 3 White LGT and 1 Red LGT (23.7m), 4 White LGT (26.2m). ACFT with eye-to-wheel height greater than 8m are advised to fly with 2 White and 2 Red LGT visible so as to achieve sufficient wheel clearance.	White. 900m (From THR) TDZ. Every 60m from THR.	Inset High Intensity centreline lights as follows: From THR to 900m from RWY end: White, 300m to 900m from RWY end: ALTN Red/ White, 300m to RWY end: Red.	Bi-directional White/Amber edge lights as follows: From THR to 600m from RWY end: White, 600m to RWY end: Amber.	Red	Red

WSSS AD 2.14 APPROACH AND RUNWAY LIGHTING								
RWY	APCH LGT Type, LEN, Intensity	THR LGT colour WBAR	PAPI (MEHT)	TDZ LGT LEN	RWY Centreline LGT, LEN, spacing, colour, INTST	RWY Edge LGT, LEN, spacing, colour, INTST	RWY End LGT colour	SWY LGT colour
1	2	3	4	5	6	7	8	9
20C	CAT II High Intensity Approach Lighting (720m) consisting of extended centreline and Red row barrettes, 2 crossbars, 2 approach beacons and sequenced flashing lights.	Green supplemented by green wing-bar and 2 THR ident lights.	PAPI 003° located either side of RWY, 418m from THR. 2 White LGT and 2 Red LGT (19.8m), 3 White LGT and 1 Red LGT (23.7m), 4 White LGT (26.2m). ACFT with eye-to-wheel height greater than 8m are advised to fly with 2 White and 2 Red LGT visible so as to achieve sufficient wheel clearance.	White. 900m (from THR) TDZ. Every 60m from THR.	Inset High Intensity centreline lights as follows: From THR to 900m from RWY end: White, 300m to 900m from RWY end: ALTN Red/ White, 300m to RWY end: Red.	Bi-directional White/Amber edge lights as follows: From THR to 600m from RWY end: White, 600m to RWY end: Amber.	Red	Red

WSSS AD 2.15 OTHER LIGHTING, SECONDARY POWER SUPPLY		
2	Anemometer location and LGT	RWY 02C/20C: Three ultrasonic wind sensors at the ends and middle of the runway. Windsocks at the ends of the runway. Transmissometers at both ends and in the middle of the runway.

WSSS AD 2.18 ATS COMMUNICATION FACILITIES				
Service Designation	Call Sign	Frequency (P-Pri, S- Sec)	Hours of operation	Remarks
TWR	Singapore Tower	118.6 MHz	H24	for TKOF/LDG for ACFT operating on RWY 02L/20R for vehicular movements on RWY 02L/20R
		118.25 MHz		for ACFT operating on RWY 02C/20C for vehicular movements on RWY 02C/20C for ground movement of ACFT (including ACFT on tow) north and south of RWY 02C/20C
		131.4 MHz		for ACFT operating on RWY 02R/20L for vehicular movements on RWY 02R/20L
	Singapore Ground	124.3 MHz	1600-0000 0000-1600	for push-back / taxiing of all ACFT for ground movement of ACFT (including ACFT on tow) west of Terminal 3
		121.725 MHz	0000-1700 2100-0000	for push-back / taxiing of all ACFT for ground movement of ACFT (including ACFT on tow) east of Terminal 2
		121.85 MHz	0000-1800 2300-0000	for push-back / taxiing of all ACFT for ground movement of ACFT (including ACFT on tow) north of Terminal 1
		121.00 MHz	H24	for ground emergency
		122.55 MHz		for push-back / taxiing of all ACFT for ground movement of ACFT (including ACFT on tow) east of Terminal 4
		125.65 MHz		for push-back / taxiing of all ACFT for ground movement of ACFT (including ACFT on tow) west of Terminal 4
		127.275 MHz		for taxiing of all ACFT for ground movement of ACFT (including ACFT on tow) west of RWY 02R/20L and east of TWY K1
	Singapore Delivery	121.65 MHz	H24	for Pre-flight check/ATC clearance
		119.6 MHz	0030-0230 1200-1300	for issuance of ATC clearance

WSSS AD 2.18 ATS COMMUNICATION FACILITIES				
Service Designation	Call Sign	Frequency (P-Pri, S- Sec)	Hours of operation	Remarks
TWR	Changi Tower / Changi Apron	121.9 MHz	H24	<p>Requests for engine runs on aprons and taxiways, excluding runways, would be regulated by Changi Apron. All towing request to contact Changi Apron, followed by instruction to contact respective Singapore Ground frequency for towing clearance.</p> <p>Request for vehicular movements on taxiways, excluding runways, would be regulated by Changi Tower.</p> <p>For ACFT on tow and vehicular movements on the runway when the runway is closed for maintenance.</p> <p>All personnel operating the radio station on board an ACFT that is on the ground in Changi Airport should possess the Aircraft Radio Operator Approval (AROA) or other equivalent certification.</p>
	Changi East Tower	119.675 MHz		<p>Request for vehicular movements on taxiways, excluding runway, west of RWY 02R/20L and east of TWY K1 will be regulated by Changi East Tower.</p> <p>For ACFT on tow and vehicular movements on RWY 02R/20L when the runway is closed for maintenance.</p> <p>All personnel operating the radio station on board an ACFT that is on the ground in Changi Airport should possess the Aircraft Radio Operator Approval (AROA) or other equivalent certification.</p>

WSSS AD 2.19 RADIO NAVIGATION AND LANDING AIDS					
Type of aid and Variation	IDENT	Frequency	OPR Hour	Position of Transmitting Antenna Coordinates	DME Transmitting Antenna Elevation / Remarks
1	2	3	4	5	6 & 7
RWY 20C ILS LLZ	ICC	109.7MHz	H24	011932.40N 1035901.32E	Located 368m (1207ft) from THR RWY 02C, along RWY centreline. Course width 2.80°. EM: A0/A2.
RWY 20C ILS GP	-	333.2MHz	H24	012131.73N 1035955.71E	Located 338m (1109ft) from THR RWY 20C on left side of RWY, 120m (394ft) from RWY centreline. GP angle 3°. HGT of ILS Reference Datum: 16.2m (53ft). EM: A0/A2.
RWY 20C ILS DME	ICC	CH34X	H24	012131.73N 1035955.71E	DME co-located with GP. EM: P9.
RWY 20C ILS MM	-	75MHz	H24	012212.24N 1040008.87E	Located 964m (3162ft) from THR RWY 20C along extended centreline of RWY. No back beam.
RWY 02C ILS LLZ	ICE	108.3MHz	H24	012154.47N 1040001.18E	Located 368m (1207ft) from THR RWY 20C, along RWY centreline. Course width 2.80°. EM: A0/A2.
RWY 02C ILS GP	-	334.1MHz	H24	011952.18N 1035913.68E	Located 338m (1109ft) from THR RWY 02C on right side of RWY, 120m (394ft) from RWY centreline. GP angle 3°. HGT of ILS Reference Datum: 16.5m (54ft). EM: A0/A2.
RWY 02C ILS DME	ICE	CH20X	H24	011952.18N 1035913.68E	DME co-located with GP. EM: P9.

WSSS AD 2.19 RADIO NAVIGATION AND LANDING AIDS

Type of aid and Variation	IDENT	Frequency	OPR Hour	Position of Transmitting Antenna Coordinates	DME Transmitting Antenna Elevation / Remarks
RWY 02C ILS MM	-	75MHz	H24	011914.72N 1035853.19E	Located 966m (3169ft) from THR RWY 02C along extended centreline of RWY. No back beam.

WSSS AD 2.22 FLIGHT AND GROUND PROCEDURES**1. Arrivals – Minimum Runway Occupancy Time**

- a. To enhance planning, pilots can make reference to the Landing Exit Distance (LED), information below which is measured from threshold to tangent point where the exit taxiway centreline starts to curve away from the runway centreline:

RWY	Exit Taxiway (LED in metres)	Remarks
20C	<u>T7*</u> (1924), <u>T8*</u> (2375) <u>D8*</u> (1750), <u>D9*</u> (2225), D10* (2700)	Note 1: Recommended exit taxiways are bold and underlined.
02C	<u>T6*</u> (2040), <u>T5*</u> (2545), T4* (3245) <u>D7*</u> (1900), <u>D6*</u> (2375), D5* (2850)	Note 2: * Indicates Rapid Exit Taxiway (RET) and maximum design ground speed for the exit taxiway is 50kts.

2. Take-Off and Landing

- a. Departing aircraft will normally be directed by ATC to use the full length of the runway for take-off. On obtaining an ATC clearance the aircraft shall enter the runway via designated taxiways:

RWY 02C – TWY T12, T13, D13, D14

RWY 20C – TWY T1, T2, D1, D2

3. Taxiing

- a. TWY K (north of RWY 02C/20C) and TWY L (south of RWY 02C/20C) are End-Around Taxiways to facilitate aircraft movement between the east and west of RWY 02C/20C. Aircraft taxiing on these taxiways will be regulated by ATC to avoid conflict with aircraft operating on RWY 02C/20C.

Charts

Location of RWY 02R/20L in relation to RWY 02L/20R and RWY 02C/20C	Appendix 1
Aerodrome Chart - ICAO	Appendix 2
Aerodrome Advisory Chart	Appendix 3
Aerodrome Obstacle Chart - ICAO - Type A	Appendix 4
Aerodrome Obstacle Chart - ICAO - Type B	Appendix 5
Precision Approach Terrain Chart - ICAO - RWY 20C	Appendix 6
Precision Approach Terrain Chart - ICAO - RWY 02C	Appendix 7

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A map of the Changi Control Zone. The map shows a coastal area with several islands and a large body of water. A dashed line runs diagonally across the map. In the bottom left corner, there is a box containing the text "CHANGI CONTROL ZONE". In the center of the map, there are three parallel black bars. The leftmost bar is labeled "02" at both ends. The middle bar is labeled "02" at both ends. The rightmost bar is labeled "20" at both ends. A north arrow is located in the top left corner of the map.

CHANGI CONTROL ZONE

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AERODROME CHART - ICAO

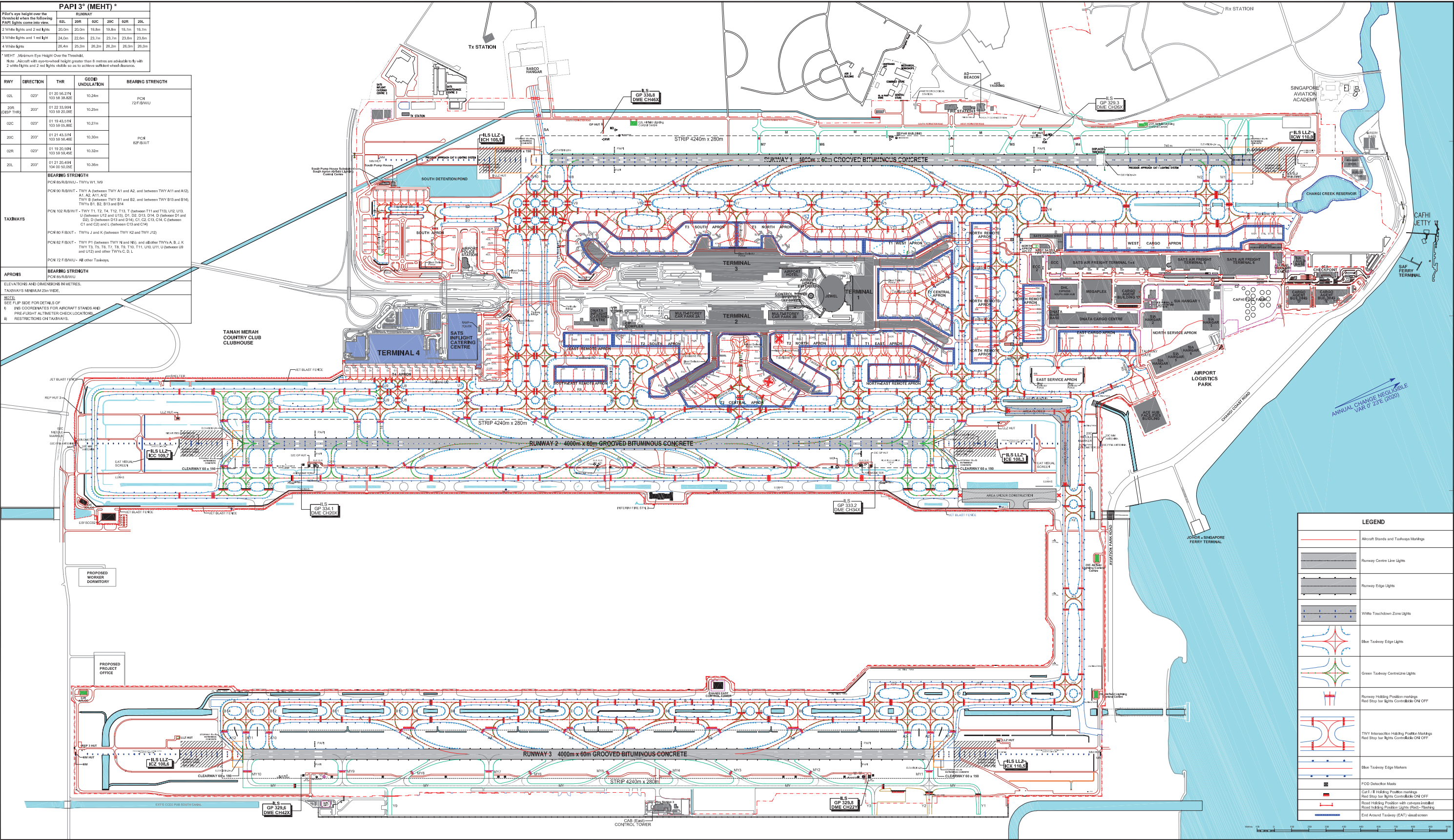
01 21° 33'N
103° 59' 22"E

AERODROME ELEVATION 6.66m

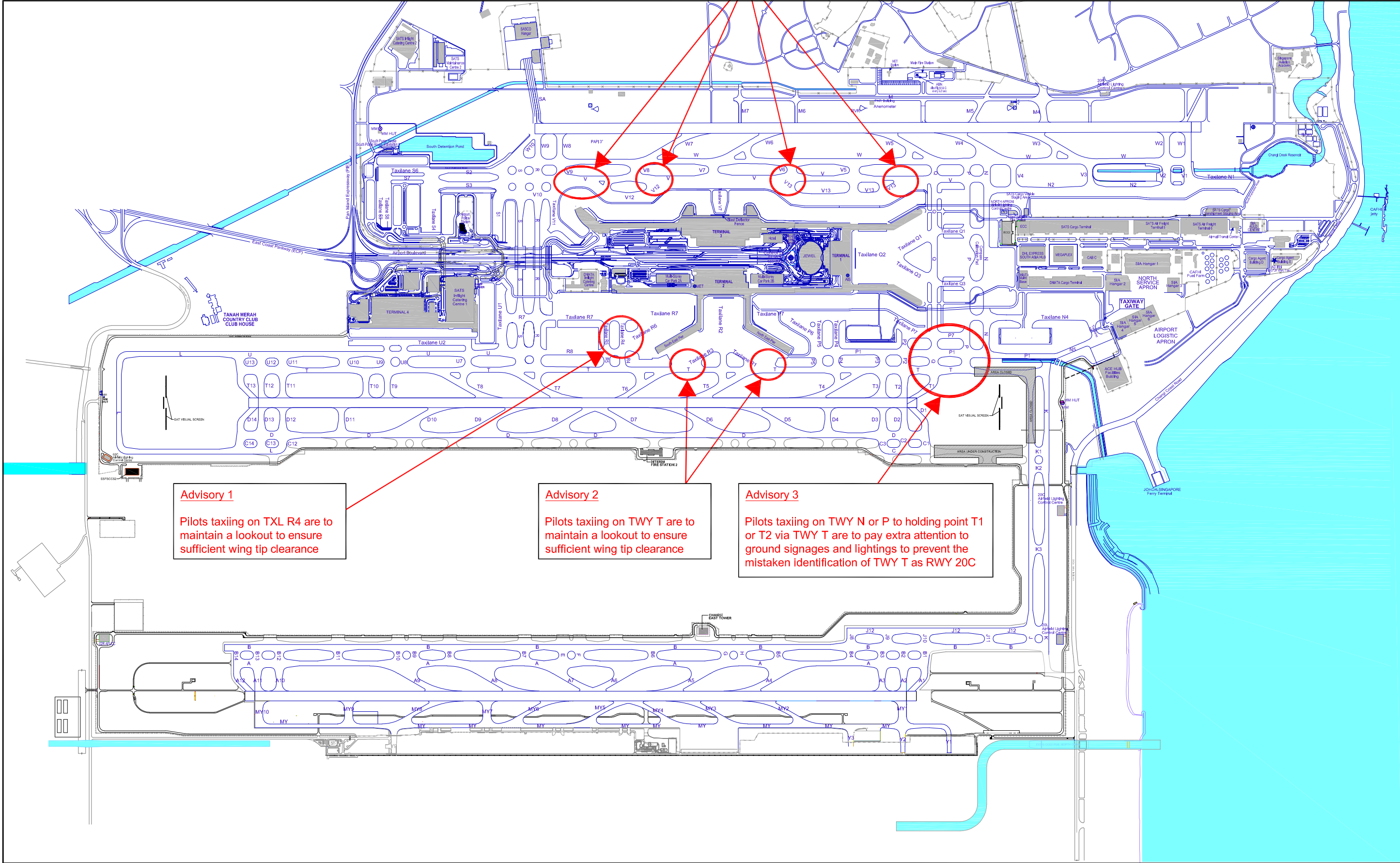
TWR 118.6 / 118.25 / 131.4
GND 124.3 / 121.85 / 121.725 / 127.275
DELIVERY 121.65 / 119.6

RAMP TWR 122.55 (GMC 4 EAST)
GND 125.65 (GMC 4 WEST)

SINGAPORE/SINGAPORE CHANGI



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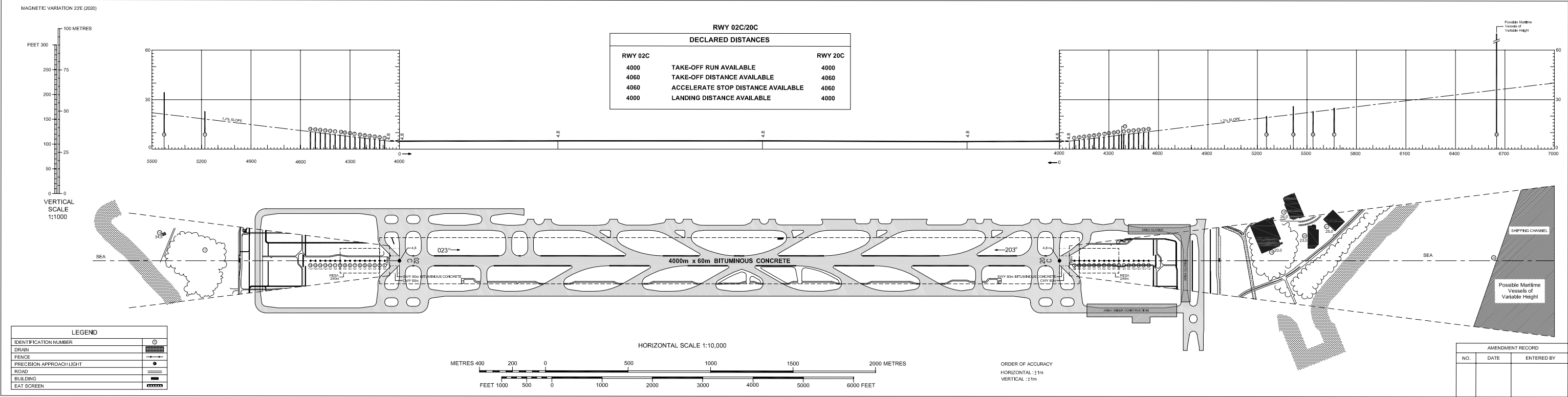


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DIMENSIONS AND ELEVATIONS IN METRES

AERODROME OBSTACLE CHART - ICAO
TYPE A (OPERATING LIMITATIONS)

SINGAPORE/Singapore Changi



PUBLICATION DATE: 21 SEP 2023
EFFECTIVE DATE: 30 NOV 2023

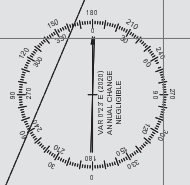
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AERODROME OBSTACLE CHART - ICAO TYPE B

SINGAPORE / Singapore Changi



Obstacles which generate this surface are specified in Annex 14, Chapter 4 are shown with elevations. Other obstacles which may generate this surface are possible ships and or rigs. These maritime vessels may not have obstruction lights.



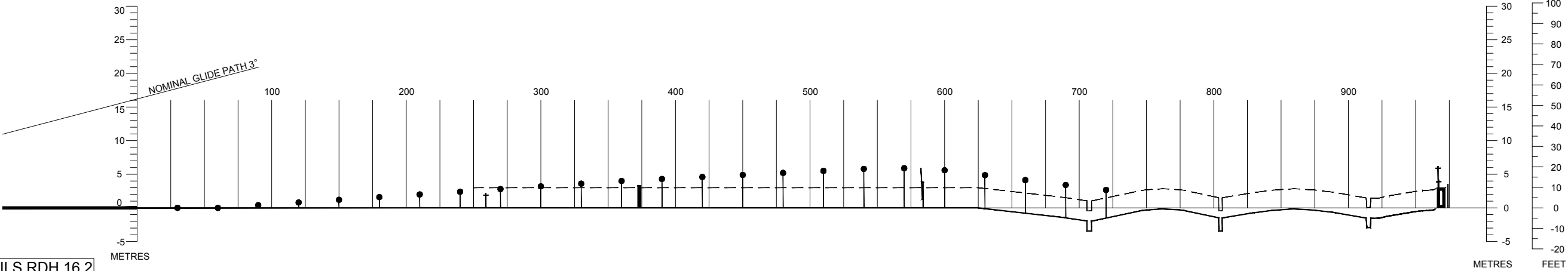
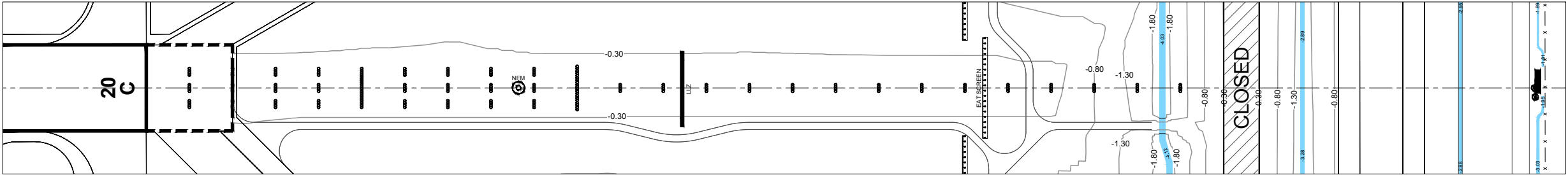
PUBLICATION DATE: 21 SEP 2023
EFFECTIVE DATE: 30 NOV 2023

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DISTANCES AND HEIGHTS IN METRES

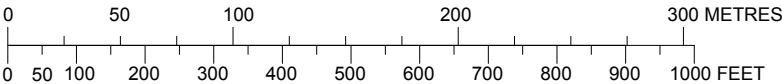
PRECISION APPROACH TERRAIN CHART - ICAO

SINGAPORE/Singapore Changi
RWY 20C



ILS RDH 16.2

SCALE 1: 2500



HORIZONTAL SCALE 1 : 2500
VERTICAL SCALE 1 : 500
CONTOUR AND HEIGHTS ARE RELATED
TO ELEVATION OF RWY THR

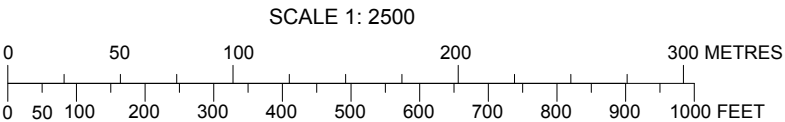
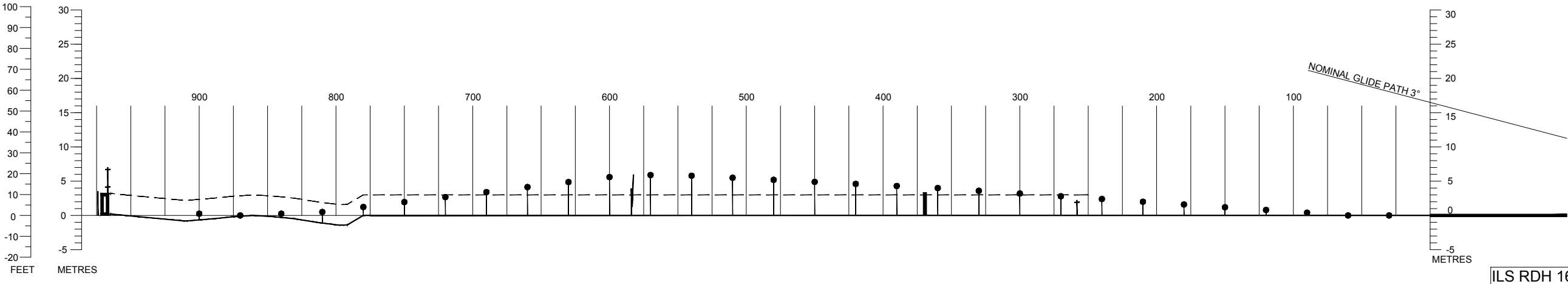
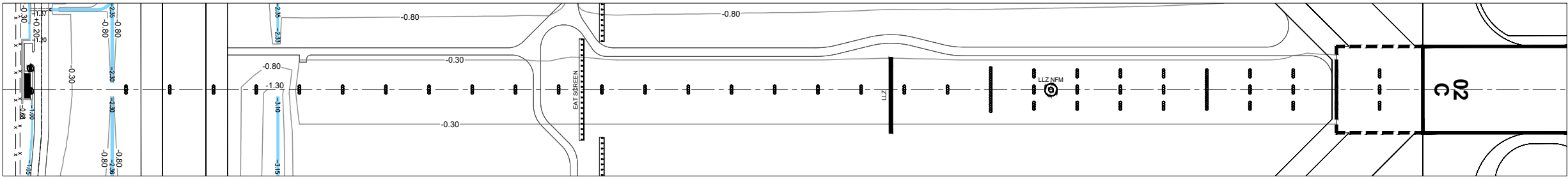
LEGEND		
LOCALISER		LLZ
ANTENNA		⊙↑
DRAIN		—X—X—
FENCE		—X—X—
CONTOUR		~1.30~
PRECISION APPROACH LIGHT		⊙↑
ROAD		—X—X—
EAT SCREEN		—X—X—
BUILDING		—X—X—
CENTRE-LINE PROFILE		—X—X—
DEVIATION AT LEAST +/- 3M FROM CENTRE-LINE PROFILE		—X—X—
AMENDMENT RECORD		
NO.	DATE	ENTERED BY

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DISTANCES AND HEIGHTS IN METRES

PRECISION APPROACH TERRAIN CHART - ICAO

SINGAPORE/Singapore Changi
RWY 02C



HORIZONTAL SCALE 1 : 2500
VERTICAL SCALE 1 : 500
CONTOUR AND HEIGHTS ARE RELATED
TO ELEVATION OF RWY THR

LEGEND		
LOCALISER		LLZ
ANTENNA		⊙↑
DRAIN		—x—x—
FENCE		—x—x—
CONTOUR		~1.30~
PRECISION APPROACH LIGHT		⊙↑
ROAD		==
EAT SCREEN		⊙↑
BUILDING		■
CENTRE-LINE PROFILE		—
DEVIATION AT LEAST +/- 3M FROM CENTRE-LINE PROFILE		—
AMENDMENT RECORD		
NO.	DATE	ENTERED BY

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