

**FEDERAL AVIATION ADMINISTRATION
FLIGHT STANDARDS SERVICE
RNAV (GPS) STANDARD INSTRUMENT APPROACH PROCEDURE
TITLE 14 CFR PART 97.33**

Bearings, headings, courses, tracks and radials are magnetic. Elevations and altitudes are in feet, MSL, except HAT, HAA, TCH, and RA. Altitudes are minimum altitudes unless otherwise indicated.
Ceilings are in feet above airport elevation. Distances are in nautical miles unless otherwise indicated, except visibilities which are in statute miles or feet RVR.

<u>AIRPORT ID</u>	<u>PROCEDURE NAME</u>	<u>ORIGINAL/AMENDMENT</u>	<u>CITY</u>	<u>STATE</u>	
SFO	RNAV (GPS) Z RWY 28R	8	SAN FRANCISCO	CA	
<u>AIRPORT ELEVATION</u>	<u>TDZE</u>	<u>SUPERSEDED</u>	<u>DATED</u>	<u>MAG VAR</u>	<u>EPOCH YEAR</u>
13	13	RNAV (GPS) Z RWY 28R	09/13/2018	14E	2015
<u>FACILITY</u>	<u>COORDINATES OF FACILITIES</u>	<u>ACTUAL EFFECTIVE DATE</u>	<u>REQUIRED EFFECTIVE DATE</u>	<u>CANCEL/SUSPEND</u>	
RNAV			ROUTINE		

TERMINAL ROUTES

<u>FROM</u>	<u>FIX TYPE</u>	<u>TO</u>	<u>FIX TYPE</u>	<u>LEG TYPE</u>	<u>FO/FB</u>	<u>RNP</u>	<u>COURSE</u>	<u>DISTANCE</u>	<u>ALTITUDE</u>
ARCHI	IAF	ZILED		TF	FB	1.00	260.22	3.96	6000
ZILED		GIRRR		TF	FB	1.00	260.16	3.30	5000
GIRRR		DUMBA		TF	FB	1.00	260.10	3.30	4000
DUMBA	IAF	CEPIN		TF	FB	1.00	283.98	4.15	3000
EDDY	IAF	SIDBY		TF	FB	1.00	330.71	4.71	4000
SIDBY	IAF	CEPIN		TF	FB	1.00	331.28	5.28	3000
CEPIN	IF	AXMUL		TF	FB	1.00	283.94	4.55	1800
AXMUL	FAF	RW28R	MAP	TF	FO	0.30	283.88	5.44	
RW28R	MAP	213 MSL		CA			283.88		
213 MSL		VIKYU		DF	FO	1.00			3000

MISSED APPROACH

MAP:

LPV: DA
LNAV/VNAV: DA
LNAV: RW28R

MISSED APPROACH INSTRUCTIONS:

CLIMB TO 3000 DIRECT VIKYU AND HOLD. *MISSED APPROACH REQUIRES MINIMUM CLIMB OF 350 FEET PER NM TO 1900; IF UNABLE TO MEET CLIMB GRADIENT, SEE RNAV (GPS) RWY 28L.

ALTERNATE MISSED APPROACH INSTRUCTIONS:



PROFILE:

1.	PT	SIDE OF COURSE	OUTBOUND	FT WITHIN	MILES OF	(IAF)									
2.	PROFILE STARTS AT CEPIN														
3.	FAC:	283.88	FAF:	AXMUL	DIST FAF TO MAP:	5.44	DIST FAF TO THLD:	5.44							
4.	MIN ALT: CEPIN 3000, AXMUL 1800														
5.	DIST TO THLD FROM OM:		MM:		IM:		150 HAT:		200 HAT:	0.46	GS ANT:				
6.	MIN GP INCPT:	1800	GP ALT AT PFAF:	AXMUL 1800					OM:		MM:			IM:	
7.	GP ANGLE:	3.00	34:1:	IS CLEAR	20:1:	IS CLEAR	TCH:	54.8							
8.	MSA FROM: RW28R 5100														

PBN REQUIREMENTS NOTE:

RNP APCH - GPS.

NOTES:

CHART PROFILE NOTE: VGSI AND RNAV GLIDEPATH NOT COINCIDENT (VGSI ANGLE {ANGLE}/TCH {FEET}).
CHART NOTE: CIRCLING NA TO RWYS 10L, 10R, 19L, AND 19R.
CHART NOTE: CIRCLING RWY 1L, 1R NA AT NIGHT.
CHART NOTE: FOR UNCOMPENSATED BARO-VNAV SYSTEMS, LNAV/VNAV NA BELOW 4°C OR ABOVE 54°C.
CHART NOTE: FOR INOPERATIVE ALS, INCREASE LNAV/VNAV ALL CATS VISIBILITY TO 1 3/4 SM, INCREASE LNAV CAT C/D VISIBILITY TO 2 SM.
CHART SPEED ICON IN PLANVIEW AT EDDYY: MAX 240 KIAS.

ADDITIONAL FLIGHT DATA:

HOLD E, RT, 283.67 INBOUND.
CHART FAS OBST: 320 TRANSMISSION_LINE (06-000774) 373511N/1221450W.
CHART VDP AT 2.12 NM TO RW28R.
WAAS CHANNEL # 48803
REFERENCE PATH ID: W28A
CHART MANDATORY 7000 AT ARCHI.
CHART MANDATORY 6000 AT EDDYY.
CHART CIRCLING ICON.
LTP HAE: -28.7 M

MINIMUMS:

TAKEOFF: SEE FAA FORM 8260-15A FOR THIS AIRPORT

ALTERNATE: NA ☐ STANDARD - CAT B 1100-2, CAT C 1700-3

CATEGORY:	A			B			C			D			E		
FINAL TYPE	DA/MDA	VIS	HAT/HAA	DA/MDA	VIS	HAT/HAA	DA/MDA	VIS	HAT/HAA	DA/MDA	VIS	HAT/HAA	DA/MDA	VIS	HAT/HAA
LPV DA*	213	1800	200	213	1800	200	213	1800	200	213	1800	200			
LNAV/VNAV DA	642	1 3/8	629	642	1 3/8	629	642	1 3/8	629	642	1 3/8	629			
LNAV MDA	760	2400	747	760	4000	747	760	1 3/4	747	760	1 3/4	747			
CIRCLING	760	1	747	1020	1 1/2	1007	1640	3	1627		NA				



CHANGES - REASONS

1. MINIMUMS CIRCLING CAT B CMDA/HAA CHANGED FROM 960/947 TO 1020/1007 - NEW CONTROLLING OBSTACLE
2. MINIMUMS CIRCLING CAT C CMDA/HAA CHANGED FROM 1560/1547 TO 1640/1627 - NEW CONTROLLING OBSTACLE
3. MINIMUMS CIRCLING CAT B VISIBILITY CHANGED FROM 1 1/4 SM TO 1 1/2 SM - IAW 8260.3 VISIBILITY TABLE 3-3-7 DUE TO CMDA/HAA INCREASE
4. MISSED APPROACH INSTRUCTIONS CHANGED FROM "CLIMB TO 3200 DIRECT VIKYU AND HOLD, CONTINUE CLIMB-IN-HOLD TO 3200" TO "CLIMB TO 3000 DIRECT VIKYU AND HOLD" - PER ATC REQUEST TO MAKE MISSED CONGRUENT WITH ILS OR LOC RWY 28R
5. MISSED APPROACH INSTRUCTIONS ADDED LPV MISSED CLIMB GRADIENT INSTRUCTION "**MISSED APPROACH REQUIRES MINIMUM CLIMB OF 350 FEET PER NM TO 1900; IF UNABLE TO MEET CLIMB GRADIENT, SEE RNAV (GPS) RWY 28L" - PER ATC REQUEST TO MAKE MISSED CONGRUENT WITH ILS/LOC RWY 28R, WAIVER ON FILE FOR ATC CLIMB GRADIENT IN MISSED APPROACH FOR LPV.
6. PBN REQUIREMENTS NOTE CHANGED FROM "RNP APCH" TO "RNP APCH - GPS" - PER 8260.19J 8-6-8
7. NOTES CHANGED CHART NOTE FROM "FOR UNCOMPENSATED BARO-VNAV SYSTEMS, LNAV/VNAV NA BELOW 3°C OR ABOVE 54°C" TO "FOR UNCOMPENSATED BARO-VNAV SYSTEMS, LNAV/VNAV NA BELOW 4°C OR ABOVE 54°C" - UPDATED TEMPERATURE STUDY
8. ADDITIONAL FLIGHT DATA REMOVED "**LNAV ONLY" - NO LONGER REQUIRED
9. ADDITIONAL FLIGHT DATA INFO CHANGED FROM "CHART VDP AT 2.12 NM TO RW28R*" TO "CHART VDP AT 2.12 NM TO RW28R" - "*" NO LONGER REQUIRED
10. PROFILE LINE 8 CHANGED FROM "RW28R 5000 TO 5100" - NEW CONTROLLING OBSTACLE
11. MINIMUMS ALTERNATE MINIMUMS CHANGED FROM "STANDARD - CAT B 1000-2, CAT C 1600-3" TO "STANDARD - CAT B 1100-2, CAT C 1700-3" - DUE TO INCREASED CAT B & C CIRCLING MINIMA
12. ADDITIONAL FLIGHT DATA CHANGED CHART FAS OBST FROM "320 T-L TWR 373511N/1221450W" TO "320 TRANSMISSION_LINE (06-000774) 373511N/1221450W" - NEW SURVEY.

COORDINATED WITH:

A4A

☒

ALPA

☒

AOPA

☒

APA

☒

HAI

☐

NBAA

☒

OTHER: ZOA, NORCAL APP CON, SFO ATCT, AMGR

FLIGHT CHECKED BY

KEVIN Y CHENG

Digitally signed by

ERIC N SUSKI

Aug 15, 2024

OFFICE

FPO

DATE

08/13/2024

DEVELOPED BY

CHARLES HIRST

Digitally signed by

CHARLES HIRST

Jun 18, 2024

OFFICE

AJV-A431

DATE

05/07/2024

APPROVED BY

ERIC N SUSKI

Digitally signed by

ERIC N SUSKI

Aug 15, 2024

OFFICE

AJV-A431

DATE

TITLE

MANAGER



FAS DATA BLOCK INFORMATION

DATA FIELD	DATA
OPERATION TYPE	0
SBAS SERVICE PROVIDER IDENTIFIER	0
AIRPORT IDENTIFIER	KSFO
RUNWAY	RW28R
APPROACH PERFORMANCE DESIGNATOR	0
ROUTE INDICATOR	Z
REFERENCE PATH DATA SELECTOR	0
REFERENCE PATH IDENTIFIER (APPROACH ID)	W28A
LTP/FTP LATITUDE	373650.1050N
LTP/FTP LONGITUDE	1222129.0075W
LTP/FTP ELLIPSOIDAL HEIGHT	-00287
FPAP LATITUDE	373743.4590N
FPAP LONGITUDE	1222336.2105W
THRESHOLD CROSSING HEIGHT (TCH)	00054.8
TCH UNITS SELECTOR (METERS OR FEET USED)	F
GLIDEPATH ANGLE (GPA)	03.00
COURSE WIDTH AT THRESHOLD	106.75
LENGTH OFFSET	0000
HORIZONTAL ALERT LIMIT (HAL)	40.0
VERTICAL ALERT LIMIT (VAL)	35.0
CRC REMAINDER	FFA67AA8

ADDITIONAL PATH POINT RECORD INFORMATION

ICAO CODE	K2
LTP ORTHOMETRIC HEIGHT	+00039
FPAP ORTHOMETRIC HEIGHT	+00039



**FEDERAL AVIATION ADMINISTRATION
FLIGHT STANDARDS SERVICE
STANDARD INSTRUMENT APPROACH PROCEDURE DATA RECORD**

<u>AIRPORT ID</u>	<u>PROCEDURE NAME</u>	<u>AMDT NO.</u>	<u>CITY</u>	<u>STATE</u>	<u>AIRPORT ELEVATION</u>	<u>FACILITY</u>
SFO	RNAV (GPS) Z RWY 28R	8	SAN FRANCISCO	CA	13	RNAV

PART A: OBSTRUCTION DATA SEGMENTS

INITIAL

FROM ARCHI **TO** ZILED

RNP 1.00 **DISTANCE** 3.96 **PAT** **MAP** **HAT** **HMAS**

<u>OBSTRUCTION</u>	<u>COORDINATES</u>	<u>ELEV MSL</u>	<u>HORZ</u>	<u>VERT</u>	<u>AC</u>	<u>ROC</u>	<u>OCS</u>	<u>CG</u>	<u>CGTA</u>	<u>ADJUSTMENTS</u>	<u>MIN ALT</u>
TOWER (06-002266)	372956.77N/1215219.84W	3049	250	50	4D	1000				PR190 AT1761	6000
TERRAIN	373000.00N/1215230.00W	2539 (2500)								AS1500	4000

COMPUTATIONS

ALT **KIAS** **KTAS** **HAA** **VKTW** **TR** **BA** **DTA** **COURSE CHANGE** **DVEB** **VEB OCS** **RF CENTER FIX/DISTANCE**

SEGMENT REMARKS:

INITIAL: STEPDOWN

FROM ZILED **TO** GIRRR

RNP 1.00 **DISTANCE** 3.30 **PAT** **MAP** **HAT** **HMAS**

<u>OBSTRUCTION</u>	<u>COORDINATES</u>	<u>ELEV MSL</u>	<u>HORZ</u>	<u>VERT</u>	<u>AC</u>	<u>ROC</u>	<u>OCS</u>	<u>CG</u>	<u>CGTA</u>	<u>ADJUSTMENTS</u>	<u>MIN ALT</u>
AAO	373124.00N/1215627.00W	561	215	8	4B	1000				AT3439	5000
TERRAIN	372936.00N/1215948.00W	147 (100)								AS1500	1600

COMPUTATIONS

ALT **KIAS** **KTAS** **HAA** **VKTW** **TR** **BA** **DTA** **COURSE CHANGE** **DVEB** **VEB OCS** **RF CENTER FIX/DISTANCE**

SEGMENT REMARKS:



INITIAL: STEPDOWN

FROM

GIRRR

TO

DUMBA

<u>RNP</u>	<u>DISTANCE</u>	<u>PAT</u>	<u>MAP</u>		<u>HAT</u>		<u>HMAS</u>				
1.00	3.30										
<u>OBSTRUCTION</u>	<u>COORDINATES</u>	<u>ELEV MSL</u>	<u>HORZ</u>	<u>VERT</u>	<u>AC</u>	<u>ROC</u>	<u>OCS</u>	<u>CG</u>	<u>CGTA</u>	<u>ADJUSTMENTS</u>	<u>MIN ALT</u>
AAO	373218.00N/1220457.00W	483	215	8	4B	1000				AT2517	4000
TERRAIN	373218.00N/1220457.00W	282 (300)								AS1500	1800

COMPUTATIONS

ALT

KIAS

KTAS

HAA

VKTW

TR

BA

DTA

COURSE CHANGE

DVEB

VEB OCS

RF CENTER FIX/DISTANCE

SEGMENT REMARKS:

INITIAL

FROM

DUMBA

TO

CEPIN

<u>RNP</u>	<u>DISTANCE</u>	<u>PAT</u>	<u>MAP</u>		<u>HAT</u>		<u>HMAS</u>				
1.00	4.15										
<u>OBSTRUCTION</u>	<u>COORDINATES</u>	<u>ELEV MSL</u>	<u>HORZ</u>	<u>VERT</u>	<u>AC</u>	<u>ROC</u>	<u>OCS</u>	<u>CG</u>	<u>CGTA</u>	<u>ADJUSTMENTS</u>	<u>MIN ALT</u>
AAO	373218.00N/1220457.00W	483	215	8	4B	1000				AT1517	3000
TERRAIN	373221.00N/1220506.00W	177 (200)								AS1500	1700

COMPUTATIONS

ALT

KIAS

KTAS

HAA

VKTW

TR

BA

DTA

COURSE CHANGE

DVEB

VEB OCS

RF CENTER FIX/DISTANCE

SEGMENT REMARKS:

INITIAL

FROM

EDDYY

TO

SIDBY

<u>RNP</u>	<u>DISTANCE</u>	<u>PAT</u>	<u>MAP</u>			<u>HAT</u>	<u>HMAS</u>				
1.00	4.71										
<u>OBSTRUCTION</u>	<u>COORDINATES</u>	<u>ELEV MSL</u>	<u>HORZ</u>	<u>VERT</u>	<u>AC</u>	<u>ROC</u>	<u>OCS</u>	<u>CG</u>	<u>CGTA</u>	<u>ADJUSTMENTS</u>	<u>MIN ALT</u>
AAO	372103.00N/1220912.00W	1086	215	8	4B	1000				PR130 AT1784	4000
TERRAIN	372200.00N/1220930.00W	711 (700)								AS1500	2200

COMPUTATIONS

ALT

KIAS

KTAS

HAA

VKTW

TR

BA

DTA

COURSE CHANGE

DVEB

VEB OCS

RF CENTER FIX/DISTANCE

SEGMENT REMARKS:

INITIAL

FROM

SIDBY

TO

CEPIN

<u>RNP</u>	<u>DISTANCE</u>	<u>PAT</u>	<u>MAP</u>			<u>HAT</u>	<u>HMAS</u>				
1.00	5.28										
<u>OBSTRUCTION</u>	<u>COORDINATES</u>	<u>ELEV MSL</u>	<u>HORZ</u>	<u>VERT</u>	<u>AC</u>	<u>ROC</u>	<u>OCS</u>	<u>CG</u>	<u>CGTA</u>	<u>ADJUSTMENTS</u>	<u>MIN ALT</u>
TRANSMISSION LINE (06-000147)	373013.20N/1220724.00W	379	500	125	5E	1000				AT1621	3000
TERRAIN	372639.00N/1221109.00W	85 (100)								AS1500	1600

COMPUTATIONS

ALT

KIAS

KTAS

HAA

VKTW

TR

BA

DTA

COURSE CHANGE

DVEB

VEB OCS

RF CENTER FIX/DISTANCE

SEGMENT REMARKS:



INTERMEDIATE

FROM

CEPIN

TO

AXMUL

<u>RNP</u>	<u>DISTANCE</u>	<u>PAT</u>	<u>MAP</u>		<u>HAT</u>		<u>HMAS</u>				
1.00	4.55										
<u>OBSTRUCTION</u>	<u>COORDINATES</u>	<u>ELEV MSL</u>	<u>HORZ</u>	<u>VERT</u>	<u>AC</u>	<u>ROC</u>	<u>OCS</u>	<u>CG</u>	<u>CGTA</u>	<u>ADJUSTMENTS</u>	<u>MIN ALT</u>
TOWER (06-000075)	373249.58N/1221401.89W	560	20	50	1D	500				AT740	1800
TERRAIN	373048.00N/1221227.00W	36 (0)								AS1500	1500

COMPUTATIONS

ALT

KIAS

KTAS

HAA

VKTW

TR

BA

DTA

COURSE CHANGE

DVEB

VEB OCS

RF CENTER FIX/DISTANCE

SEGMENT REMARKS:

FINAL: LPV

FROM

AXMUL

TO

RW28R

<u>RNP</u>	<u>DISTANCE</u>	<u>PAT</u>	<u>MAP</u>		<u>HAT</u>		<u>HMAS</u>				
0.30	5.44		DA		200						
<u>OBSTRUCTION</u>	<u>COORDINATES</u>	<u>ELEV MSL</u>	<u>HORZ</u>	<u>VERT</u>	<u>AC</u>	<u>ROC</u>	<u>OCS</u>	<u>CG</u>	<u>CGTA</u>	<u>ADJUSTMENTS</u>	<u>MIN ALT</u>
							ASC				213

COMPUTATIONS

ALT

KIAS

KTAS

HAA

VKTW

TR

BA

DTA

COURSE CHANGE

DVEB

VEB OCS

RF CENTER FIX/DISTANCE

SEGMENT REMARKS:

FINAL: LNAV/VNAV

FROM

AXMUL

TO

RW28R

<u>RNP</u>	<u>DISTANCE</u>	<u>PAT</u>	<u>MAP</u>	<u>HAT</u>	<u>HMAS</u>
0.30	5.44		DA	629	

<u>OBSTRUCTION</u>	<u>COORDINATES</u>	<u>ELEV MSL</u>	<u>HORZ</u>	<u>VERT</u>	<u>AC</u>	<u>ROC</u>	<u>OCS</u>	<u>CG</u>	<u>CGTA</u>	<u>ADJUSTMENTS</u>	<u>MIN ALT</u>
							ASC			MA376 XP16	642

COMPUTATIONS

ALT

KIAS

KTAS

HAA

VKTW

TR

BA

DTA

COURSE CHANGE

DVEB

VEB OCS

RF CENTER FIX/DISTANCE

SEGMENT REMARKS:

RETAIN ACTIVE MINIMA

FINAL: LNAV

FROM

AXMUL

TO

RW28R

<u>RNP</u>	<u>DISTANCE</u>	<u>PAT</u>	<u>MAP</u>	<u>HAT</u>	<u>HMAS</u>
0.30	5.44		RW28R	747	

<u>OBSTRUCTION</u>	<u>COORDINATES</u>	<u>ELEV MSL</u>	<u>HORZ</u>	<u>VERT</u>	<u>AC</u>	<u>ROC</u>	<u>OCS</u>	<u>CG</u>	<u>CGTA</u>	<u>ADJUSTMENTS</u>	<u>MIN ALT</u>
TRANSMISSION_LINE (06-000774)	373510.80N/1221449.80W	320	500	50	5D	250				MA140 AC50	760

COMPUTATIONS

ALT

KIAS

KTAS

HAA

VKTW

TR

BA

DTA

COURSE CHANGE

DVEB

VEB OCS

RF CENTER FIX/DISTANCE

SEGMENT REMARKS:



MISSSED APPROACH: LPV

FROM

DA

TO

VIKYU

<div>RNP</div> <div>0.30*-1.00</div>	<div>DISTANCE</div>	<div>PAT</div>	<div>MAP</div>		<div>HAT</div>		<div>HMAS</div> <div>45</div>				
OBSTRUCTION	COORDINATES	ELEV MSL	HORZ	VERT	AC	ROC	OCS	CG	CGTA	ADJUSTMENTS	MIN ALT
							ASC	350	1900		
TOWER (06-000465)	374106.54N/1222604.58W	1545	20	3	1A	1000				SA-111	2500
TERRAIN	373733.00N/1222757.00W	931 (900)								AS1500	2400

COMPUTATIONS

ALT

KIAS

KTAS

HAA

VKTW

TR

BA

DTA

COURSE CHANGE

DVEB

VEB OCS

RF CENTER FIX/DISTANCE

SEGMENT REMARKS:

THE MINIMUM REQUIRED OBSTACLE CG IS 217 FT/NM TO 1160 FOR 920 FT MSL TREE 373748.00N/1222727.00W. ATC REQUESTED CLIMB GRADIENT OF 350FT TO 1900 TO PROVIDE OBSTACLE MITIGATION AND ALSO TO ELIMINATE CLIMB-IN-HOLD AT MISSED, WAIVER ON FILE FOR ATC CG.

MISSSED APPROACH: LNAV/VNAV

FROM

DA

TO

VIKYU

<div>RNP</div> <div>0.30-1.00</div>	<div>DISTANCE</div>	<div>PAT</div>	<div>MAP</div>		<div>HAT</div>		<div>HMAS</div> <div>481</div>				
OBSTRUCTION	COORDINATES	ELEV MSL	HORZ	VERT	AC	ROC	OCS	CG	CGTA	ADJUSTMENTS	MIN ALT
TOWER (06-000465)	374106.54N/1222604.58W	1545	20	3	1A		ASC				3000
TOWER (06-000465)	374106.54N/1222604.58W	1545	20	3	1A	1000				SA-111	2500
TERRAIN	373733.00N/1222757.00W	931 (900)								AS1500	2400

COMPUTATIONS

ALT

KIAS

KTAS

HAA

VKTW

TR

BA

DTA

COURSE CHANGE

DVEB

VEB OCS

RF CENTER FIX/DISTANCE

SEGMENT REMARKS:

MISSSED APPROACH: LNAV

FROM

RW28R

TO

VIKYU

<u>RNP</u> 0.30-1.00	<u>DISTANCE</u>	<u>PAT</u>	<u>MAP</u>				<u>HAT</u>	<u>HMAS</u> 660			
<u>OBSTRUCTION</u>	<u>COORDINATES</u>	<u>ELEV MSL</u>	<u>HORZ</u>	<u>VERT</u>	<u>AC</u>	<u>ROC</u>	<u>OCS</u>	<u>CG</u>	<u>CGTA</u>	<u>ADJUSTMENTS</u>	<u>MIN ALT</u>
TOWER (06-000465)	374106.54N/1222604.58W	1545	20	3	1A		ASC				3000
TOWER (06-000465)	374106.54N/1222604.58W	1545	20	3	1A	1000				SA-111	2500
TERRAIN	373733.00N/1222757.00W	931 (900)								AS1500	2400

COMPUTATIONS

ALT

KIAS

KTAS

HAA

VKTW

TR

BA

DTA

COURSE CHANGE

DVEB

VEB OCS

RF CENTER FIX/DISTANCE

SEGMENT REMARKS:

CIRCLING

☐ ALL CATS

☒ CAT A

☒ CAT B

☒ CAT C

☐ CAT D

☐ CAT E

☐ NOT AUTHORIZED

OBSTRUCTION	COORDINATES	RADIUS	HAA	ELEV MSL	HORZ	VERT	AC	ROC	OCS	ADJUSTMENTS	MIN ALT
CATEGORY A											
TREE	373548.00N/1222412.00W	1.30	747	412	250	10	4B	300		SI	760
CATEGORY B											
TREE	373533.00N/1222445.00W	1.81	1007	720	250	10	4B	300			1020
CATEGORY C											
TREE	373427.00N/1222521.00W	2.87	1627	1330	250	10	4B	300			1640

CIRCLING REMARKS:

MSA

CENTER

RW28R

RADIUS

25

SECTOR	OBSTRUCTION	COORDINATES	BEARING	DISTANCE	ELEV MSL	HORZ	VERT	AC	ROC	OCS	ADJUSTMENTS	MIN ALT
360-360	AAO	375254.00N/1215454.00W	039	26.5	4036	215	8	4B	1000			5100

MSA REMARKS:

<u>AIRPORT ID</u>	<u>PROCEDURE NAME</u>	<u>AMDT NO.</u>	<u>CITY</u>	<u>STATE</u>	<u>AIRPORT ELEVATION</u>	<u>FACILITY</u>
SFO	RNAV (GPS) Z RWY 28R	8	SAN FRANCISCO	CA	13	RNAV

NOTES/EXPLANATIONS FROM PROCEDURE SEGMENTS:

BACKUP ALTIMETER SOURCE NOT UTILIZED. KSFO HAS REDUNDANT REPORTING WEATHER SOURCES.

MAX TREE HEIGHT 165 FT, USE 150 FT SHIP MAST ON FINAL OUTSIDE OF 3NM, SHIP CHANNEL LOCATED OUTSIDE 3 NM FROM THE COAST.

BOAT HEIGHTS WITHIN 3NM ARE SMALL ENOUGH TO HAVE NO IMPACT ON PROCEDURE PER ATC/FPT.

WRITTEN COMMUNICATION FROM SFO TRACON CONFIRMS NO VECTORS TO INTERCEPT ANY FIXES GREATER THAN 30 DEGREES.

CAT D CIRCLING NA - CIRCLING MINIMUMS ABOVE FAF ALTITUDE

CIRCLING TO RUNWAYS 10L, 10R, 19L, AND 19R NA PER PREVIOUS COORDINATION WITH ATC/FPT.

PART B: SUPPLEMENTAL DATA

COMMUNICATIONS WITH

ZOA ARTCC, NORCAL APP CON, SFO TOWER

WX SERVICE	LOCATION	HRS OPERATION	ALTIMETER SOURCE	DISTANCE	SERVICE-A	ADJUSTMENTS
ASOS	SFO	24	SFO	0	Y	0
BACK-UP WX SERVICE	LOCATION	HRS OPERATION	ALTIMETER SOURCE	DISTANCE	SERVICE-A	ADJUSTMENTS

WX REMARKS:

PRIMARY NAVAID	MONITOR POINT	HRS OPERATION	CAT
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APPROACH AND RUNWAY LIGHTING SYSTEM	RUNWAY MARKINGS	RUNWAY VISUAL RANGE
RW01L - C/LINE, HIRL, REIL	NPI-G	APPROACH, MIDPOINT, ROLL OUT
RW19R - HIRL, C/LINE, PAPI-4L	NPI-G	APPROACH, MIDPOINT, ROLL OUT
RW01R - REIL, C/LINE, HIRL	PIR-G	APPROACH, MIDPOINT, ROLL OUT
RW10L - C/LINE, HIRL, REIL, PAPI-4L	PIR-G	APPROACH, MIDPOINT, ROLL OUT
RW10R - HIRL, C/LINE, PAPI-4L	PIR-G	APPROACH, MIDPOINT, ROLL OUT
RW19L - MALSF, TDZ, C/LINE, HIRL, PAPI-4L	PIR-G	APPROACH, MIDPOINT, ROLL OUT
RW28L - MALSR, HIRL, C/LINE, PAPI-4L	PIR-G	APPROACH, MIDPOINT, ROLL OUT
RW28R - ALSF-2, TDZ, C/LINE, HIRL, PAPI-4L	PIR-G	APPROACH, MIDPOINT, ROLL OUT

GLIDESLOPE ANGLE	ELEV RWY THRESHOLD	TCH	ELEV GS ANTENNA	DISTANCE FROM RWY	VGSI ANGLE	TCH
3.00	12.9	54.8			3.00	68.1

FINAL APPROACH COURSE AIMING

RUNWAY THRESHOLD	<div>X</div>	FT FROM THRESHOLD	DISPLACED THRESHOLD DISTANCE	300
ON CENTERLINE	<div>X</div>	FT FROM CENTERLINE		

CRITICAL TEMPERATURES

CRITICAL LOW	CRITICAL HIGH	ACT	APT ISA
+4C	+54C	+4C	+14.97C

CRITICAL TEMPERATURE REMARKS:

AVERAGE COLD TEMPERATURE DERIVED FROM 5-YEAR HISTORY (2019-2023).
CRITICAL LOW TEMPERATURE BASED ON ACT.
DESCENT RATE (FPM): STANDARD TEMP 955 HIGH TEMP 1260.

"VISUAL PORTION OF FINAL" PENETRATIONS

FINAL TYPE	CIRCLING
20:1	



<u>AIRPORT ID</u> SFO	<u>PROCEDURE NAME</u> RNAV (GPS) Z RWY 28R	<u>AMDT NO.</u> 8	<u>CITY</u> SAN FRANCISCO	<u>STATE</u> CA	<u>AIRPORT ELEVATION</u> 13	<u>FACILITY</u> RNAV
RWY 01R			588 TREE (06-098793) 373503.0500N/1222358.1400W (77.57)			
567 TREE (06-090859) 373504.4400N/1222357.0200W (64.89)			555 TREE (06-098966) 373506.0500N/1222354.7300W (64.39)			
568 TREE (06-101641) 373503.0700N/1222355.1800W (63.21)			571 TREE (06-105628) 373504.7200N/1222401.4300W (61.87)			
553 TREE (06-101731) 373507.4000N/1222359.2400W (59.97)			563 TREE (06-101794) 373506.0200N/1222403.2900W (56.19)			
554 TREE (06-090856) 373506.4000N/1222401.3000W (52.63)			551 BUILDING (06-033984) 373507.2800N/1222403.4000W (49.63)			
552 BUILDING (06-035176) 373504.1500N/1222358.6900W (45.46)			536 TREE (06-104700) 373509.4300N/1222403.1400W (44.73)			
532 TREE (06-098962) 373508.8500N/1222359.7400W (44.52)			539 TREE (06-137071) 373504.8400N/1222355.3500W (41.81)			
541 TREE (06-098732) 373503.3200N/1222354.1600W (39.25)			520 TREE (06-103327) 373510.4600N/1222400.0500W (39.14)			
542 TREE (06-090860) 373505.3600N/1222400.2900W (37.87)			526 TREE (06-096934) 373505.1100N/1222351.4000W (37.43)			
540 BUILDING (06-035145) 373507.5900N/1222404.9700W (37.07)			531 TREE (06-103354) 373507.7500N/1222401.0400W (36.16)			
535 BUILDING (06-035143) 373505.5900N/1222359.0000W (34.32)			511 TREE (06-107799) 373510.4800N/1222401.3500W (27.79)			
526 TREE (06-090385) 373503.6200N/1222353.2300W (27.33)			515 BUILDING (06-035125) 373507.7000N/1222357.5600W (26.46)			
521 TREE (06-107589) 373505.7800N/1222356.4400W (25.97)			503 TREE (06-133791) 373508.9000N/1222355.3000W (24.07)			
486 TREE (06-090191) 373513.4000N/1222357.9200W (22.29)			530 TREE (06-096924) 373502.0400N/1222354.5300W (21.82)			
512 TREE (06-102248) 373504.4100N/1222354.1100W (15.22)			508 TREE (06-103353) 373503.8800N/1222351.7200W (13.33)			
508 TREE (06-098799) 373508.3000N/1222402.3200W (13.22)			518 TREE (06-089996) 373501.4700N/1222352.3100W (11.44)			
493 TREE (06-098807) 373506.7800N/1222351.7100W (11.32)			472 TREE (06-133789) 373513.6200N/1222356.8400W (11.3)			
477 TREE (06-105851) 373508.0900N/1222346.8100W (10.38)			498 BUILDING (06-035126) 373505.8200N/1222353.1700W (9.29)			
508 BUILDING (06-035141) 373503.7200N/1222354.3600W (7.66)			487 TREE (06-090691) 373510.0600N/1222358.3500W (7.54)			
495 BUILDING (06-035124) 373506.9500N/1222355.2600W (7.42)			487 BUILDING (06-033969) 373510.6000N/1222359.7800W (7.27)			
496 POLE (06-035046) 373509.1200N/1222401.3700W (6.67)			477 TREE (06-105635) 373508.8000N/1222351.5600W (4.64)			
488 TREE (06-089981) 373509.0700N/1222358.1500W (4.48)			501 TREE (06-090382) 373502.8900N/1222350.4800W (4.23)			
468 TREE (06-107711) 373508.2900N/1222346.1100W (3.59)			484 TREE (06-137787) 373505.8500N/1222348.8900W (3.45)			
481 POLE (06-035042) 373508.1700N/1222353.8900W (1.45)			463 TREE (06-090187) 373508.4700N/1222345.2900W (0.93)			
			RWY 01L			
555 TREE (06-098966) 373506.0500N/1222354.7300W (48.59)			553 TREE (06-101731) 373507.4000N/1222359.2400W (44.16)			
536 TREE (06-104700) 373509.4300N/1222403.1400W (28.93)			532 TREE (06-098962) 373508.8500N/1222359.7400W (28.71)			
520 TREE (06-103327) 373510.4600N/1222400.0500W (23.34)			526 TREE (06-096934) 373505.1100N/1222351.4000W (21.63)			
491 TREE (06-107729) 373516.2700N/1222402.8400W (15.1)			511 TREE (06-107799) 373510.4800N/1222401.3500W (11.99)			
495 TREE (06-090517) 373515.4100N/1222404.5800W (11.98)			515 BUILDING (06-035125) 373507.7000N/1222357.5600W (10.66)			
503 TREE (06-133791) 373508.9000N/1222355.3000W (8.27)			486 TREE (06-090191) 373513.4000N/1222357.9200W (6.49)			
506 TREE (06-089982) 373512.0100N/1222405.2700W (6.48)			516 BUILDING (06-035131) 373509.9100N/1222405.9700W (5.77)			
506 TREE (06-102272) 373511.1600N/1222403.6800W (5.66)			485 TREE (06-090192) 373515.2100N/1222402.8300W (4.37)			
PENETRATIONS REMARKS:						

QUALITY
29
CHECKED

HELICOPTER 'VISUAL PORTION OF FINAL' PENETRATIONS

and/or

5280-FT "PROCEED VFR" SEGMENT LEVEL SURFACE AREA PENETRATIONS

PENETRATIONS REMARKS:

PART C: GENERAL REMARKS:

PRECIPITOUS TERRAIN EVALUATION COMPLETED.
ORDER 8260.3, CHAPTER 2, NEW CIRCLING CRITERIA APPLIED.

PART D: AIRSPACE

DOCKET #

ALL DISTANCES TO 1/100NM; ELEVATION TO NEAREST 100 FEET; COORDINATES TO 1/100 SECOND; DEG TO 1/100 DEGREE

DISTANCE FROM	THLD	TO 1000FT POINT	3.24
WIDTH OF	FINAL	SEGMENT AT 1000FT POINT	1.20
TRUE COURSE OF	FINAL	SEGMENT CONTAINING 1000FT POINT	297.88
HIGH TERRAIN IN	FINAL	SEGMENT CONTAINING 1000FT POINT	100
DISTANCE FROM	THLD	TO 1500FT POINT	5.04
WIDTH OF	FINAL	SEGMENT AT 1500FT POINT	1.76
TRUE COURSE OF	FINAL	SEGMENT CONTAINING 1500FT POINT	297.88
HIGH TERRAIN IN	FINAL	SEGMENT CONTAINING 1500FT POINT	100

THRESHOLD COORDINATES (IF STR-IN)	373650.11N/1222129.01W
ARP COORDINATES	373707.70N/1222231.50W
RUNWAY APCH END AND DIST FURTHEST FROM ARP	RUNWAY 10L DISTANCE 1.04 NM
FAF COORDINATES	373417.45N/1221525.91W
FIX NAME COORDINATES	

REMARKS

THLD DISPLACED 300FT, ACTUAL COORDINATES: 373648.72N/1222125.71W

PART E: PREPARED BY

NAME	OFFICE	DATE	TITLE
CHARLES HIRST	AJV-A431	05/07/2024	AERONAUTICAL INFORMATION SPECIALIST