

4.0 GROUND MANEUVERING

4.1 General Information

4.2 Turning Radii

4.3 Clearance Radii

4.4 Visibility from Cockpit in Static Position

4.5 Runway and Taxiway Turn Paths

4.6 Runway Holding Bay

4.0 GROUND MANEUVERING

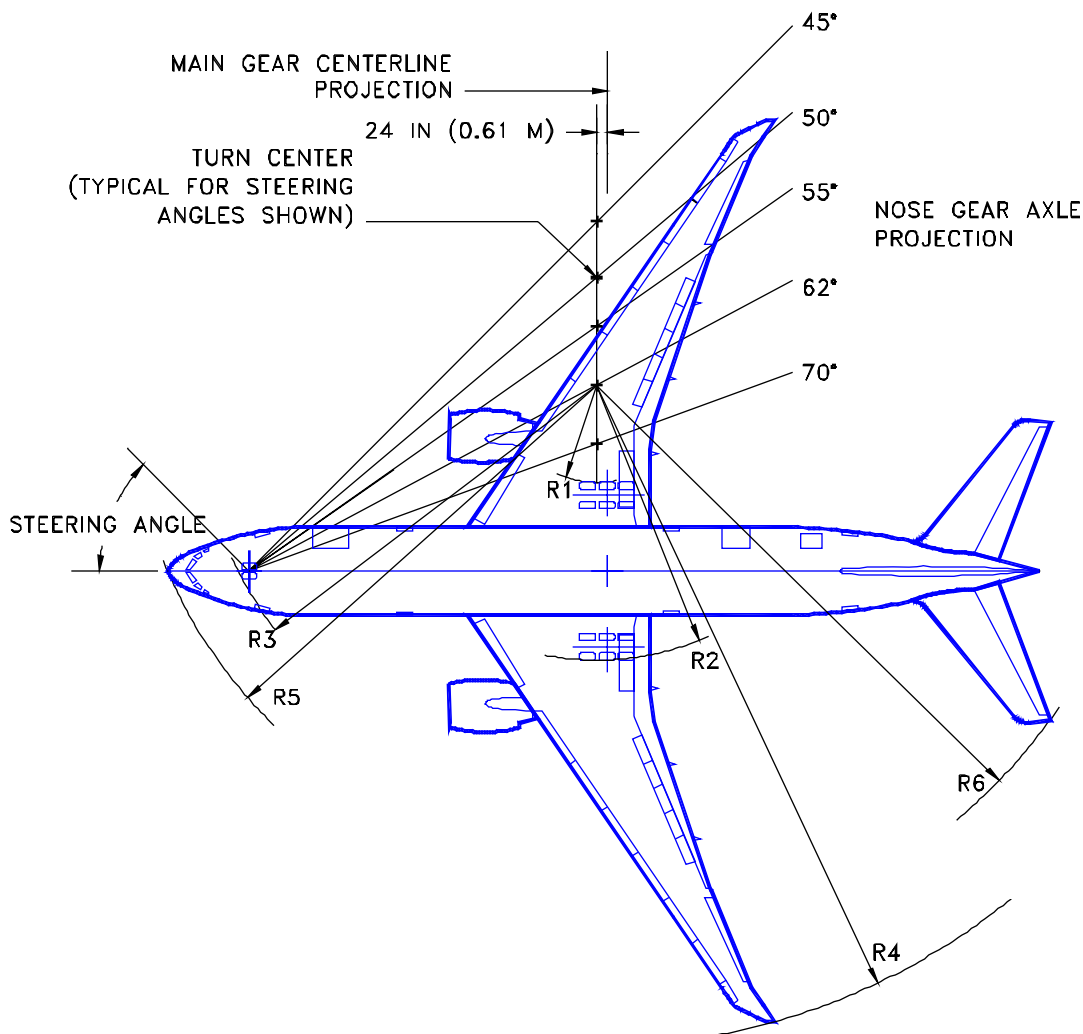
4.1 General Information

The 777 main landing gear consists of two main struts, each strut with six wheels. The steering system incorporates aft axle steering of the main landing gear in addition to the nose gear steering. The aft axle steering system is hydraulically actuated and programmed to provide steering ratios proportionate to the nose gear steering angles. During takeoff and landing, the aft axle steering system is centered, mechanically locked, and depressurized.

The turning radii and turning curves shown in this section are derived from airplane geometry. Other factors that could influence the geometry of the turn include:

1. Engine power settings
2. Center of gravity location
3. Airplane weight
4. Pavement surface conditions
5. Amount of differential braking
6. Ground speed

PRELIMINARY FOR 777 FREIGHTER

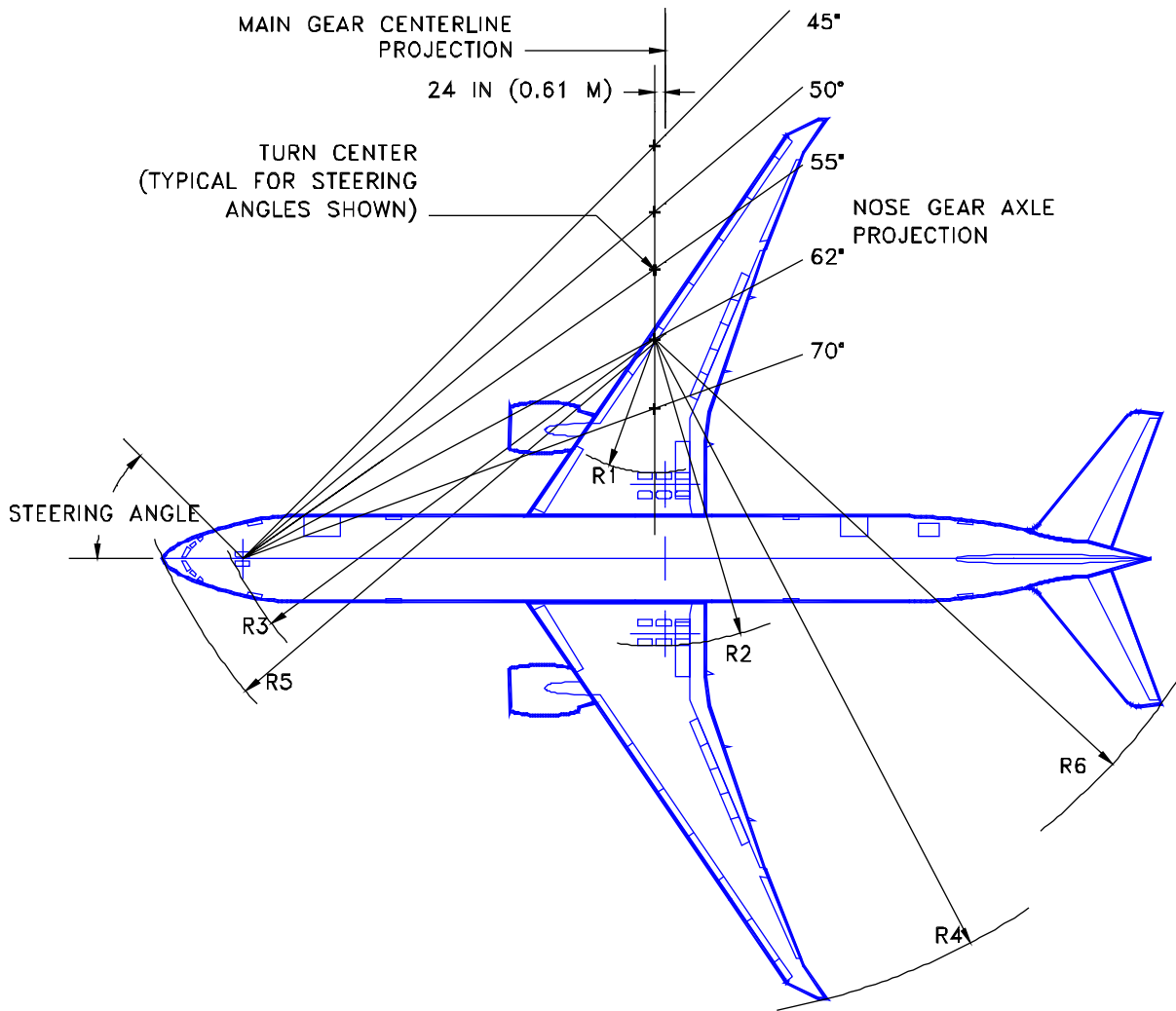


NOTES: DATA SHOWN FOR AIRPLANE WITH AFT AXLE STEERING
 ACTUAL OPERATING TURNING RADII MAY BE GREATER THAN SHOWN
 CONSULT WITH AIRLINE FOR SPECIFIC OPERATING PROCEDURE
 DIMENSIONS ROUNDED TO NEAREST 0.1 FOOT AND 0.1 METER

STEERING ANGLE	R1 INNER GEAR		R2 OUTER GEAR		R3 NOSE GEAR		R4 WING TIP		R5 NOSE		R6 TAIL	
	FT	M	FT	M	FT	M	FT	M	FT	M	FT	M
(DEG)												
30	122.4	37.3	164.8	50.2	168.8	51.5	253.0	77.1	177.4	54.1	207.4	63.2
35	97.2	29.6	139.6	42.6	147.7	45.0	228.1	69.5	157.7	48.1	186.1	56.7
40	77.6	23.7	120.0	36.6	132.3	40.3	208.8	63.6	143.6	43.8	170.3	51.9
45	61.7	18.8	104.1	31.7	120.7	36.8	193.3	58.9	133.2	40.6	158.0	48.2
50	48.4	14.8	90.8	27.7	111.8	34.1	180.2	54.9	125.3	38.2	148.3	45.2
55	36.8	11.2	79.2	24.1	104.8	31.9	169.0	51.5	119.3	36.4	140.4	42.8
60	26.7	8.1	69.1	21.1	99.5	30.3	159.1	48.5	114.7	35.0	133.9	40.8
65	17.5	5.3	59.9	18.3	95.3	29.0	150.2	45.8	111.1	33.9	128.3	39.1
70 (MAX)	9.0	2.7	51.4	15.7	92.1	28.1	142.0	43.3	108.5	33.1	123.7	37.7

4.2.1 TURNING RADII - NO SLIP ANGLE

MODEL 777-200LR, 777F



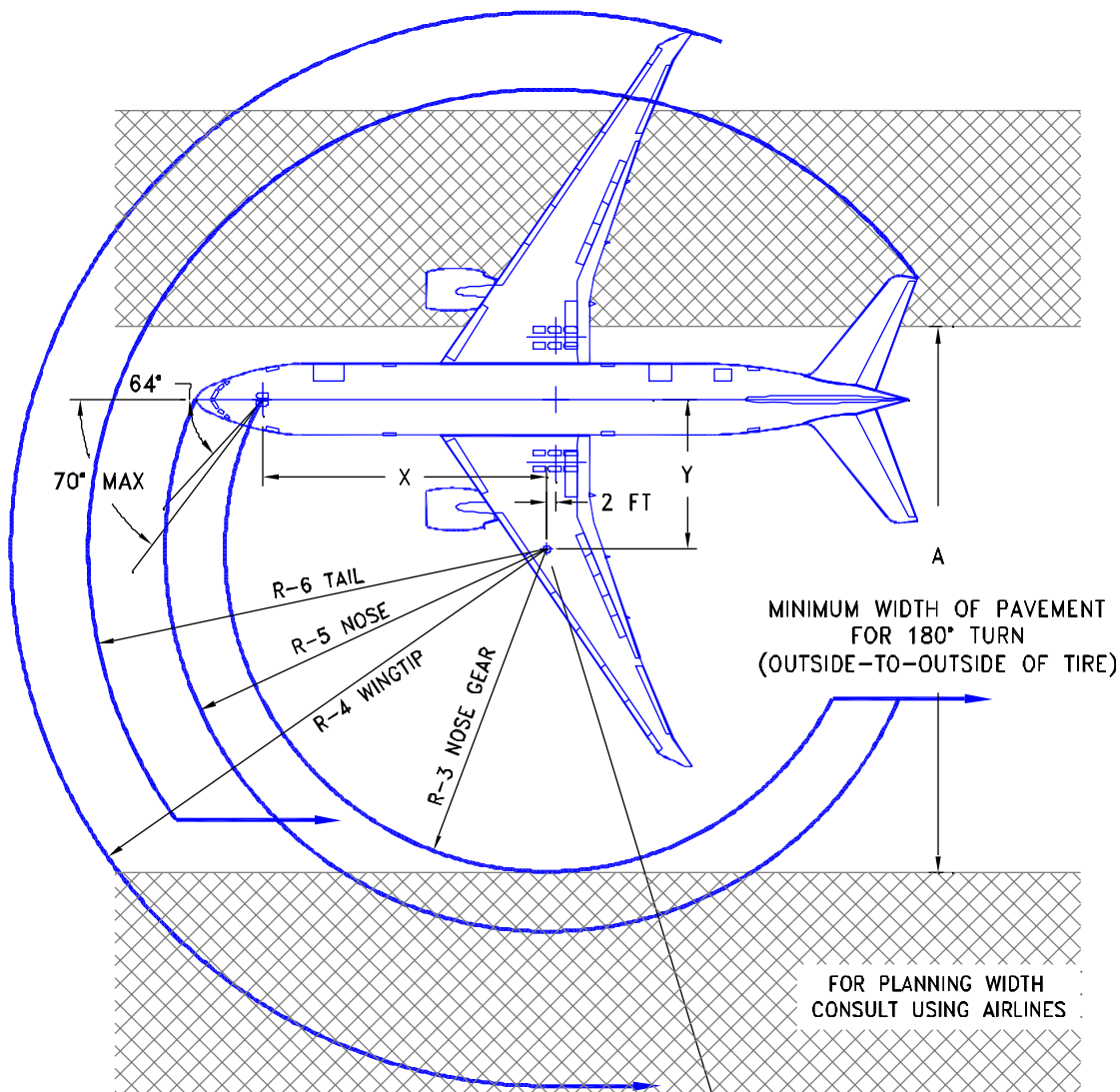
NOTES: DATA SHOWN FOR AIRPLANE WITH AFT AXLE STEERING
 ACTUAL OPERATING TURNING RADII MAY BE GREATER THAN SHOWN
 CONSULT WITH AIRLINE FOR SPECIFIC OPERATING PROCEDURE
 DIMENSIONS ROUNDED TO NEAREST 0.1 FOOT AND 0.1 METER

STEERING ANGLE (DEG)	R1 INNER GEAR		R2 OUTER GEAR		R3 NOSE GEAR		R4 WING TIP		R5 NOSE		R6 TAIL	
	FT	M	FT	M	FT	M	FT	M	FT	M	FT	M
30	152.7	46.5	195.1	59.5	203.8	62.1	283.3	86.4	212.3	64.7	241.5	73.6
35	122.2	37.2	164.6	50.2	178.2	54.3	252.8	77.1	188.1	57.3	215.6	65.7
40	98.5	30.0	140.9	42.9	159.5	48.6	229.4	69.9	170.7	52.0	196.4	59.9
45	79.2	24.1	121.6	37.1	145.4	44.3	210.4	64.1	157.8	48.1	181.5	55.3
50	63.0	19.2	106.5	32.4	134.6	41.0	194.6	59.3	148.0	45.1	169.4	51.6
55	49.1	15.0	91.5	27.9	126.2	38.5	180.9	55.1	140.5	42.8	160.3	48.9
60	36.8	11.2	79.2	24.1	119.7	36.5	168.9	51.5	134.8	41.1	152.5	46.5
65	25.6	7.8	68.0	20.7	114.6	34.9	158.1	48.2	130.4	39.7	145.9	44.5
70 (MAX)	15.3	4.7	57.7	17.6	110.7	33.7	148.2	45.2	124.6	38.0	140.4	42.8

4.2.2 TURNING RADII - NO SLIP ANGLE

MODEL 777-300ER

PRELIMINARY FOR 777 FREIGHTER



MINIMUM WIDTH OF PAVEMENT
FOR 180° TURN
(OUTSIDE-TO-OUTSIDE OF TIRE)

FOR PLANNING WIDTH
CONSULT USING AIRLINES

NOTES:

1. 6° TIRE SLIP ANGLE APPROXIMATE FOR 64° TURN ANGLE.
2. CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE.

THEORETICAL CENTER OF TURN FOR MINIMUM TURNING RADIUS. SLOW CONTINUOUS TURN. NO DIFFERENTIAL THRUST. NO DIFFERENTIAL BRAKING.

AIRPLANE MODEL	EFFECTIVE TURNING ANGLE (DEG)	X		Y		A		R3		R4		R5		R6	
		FT	M	FT	M	FT	M	FT	M	FT	M	FT	M	FT	M
777-200LR 777-FREIGHTER	64	82.9	25.3	40.4	12.3	157.4	48.0	96.0	29.3	151.9	46.3	111.8	34.1	129.4	39.4
777-300ER	64	100.4	30.6	49.0	14.9	185.5	56.5	115.5	35.2	160.2	48.8	131.2	40.0	147.1	44.8

NOTE: DIMENSIONS ARE ROUNDED TO THE NEAREST 0.1 FOOT AND 0.1 METER.

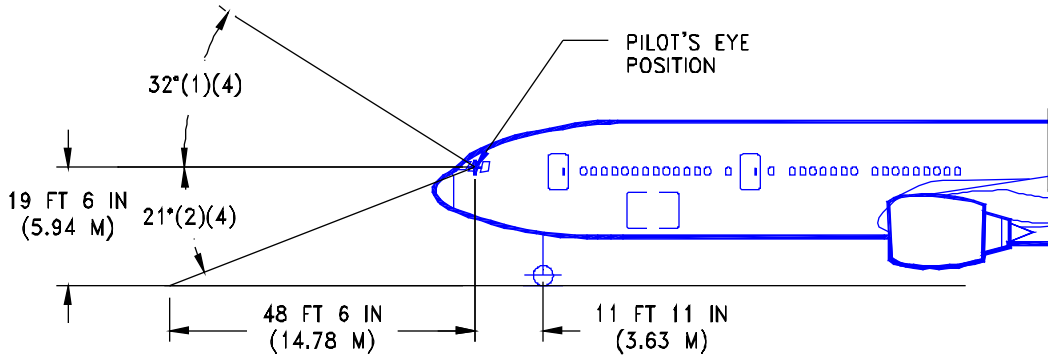
4.3 CLEARANCE RADII

MODEL 777-200LR, -300ER, 777F

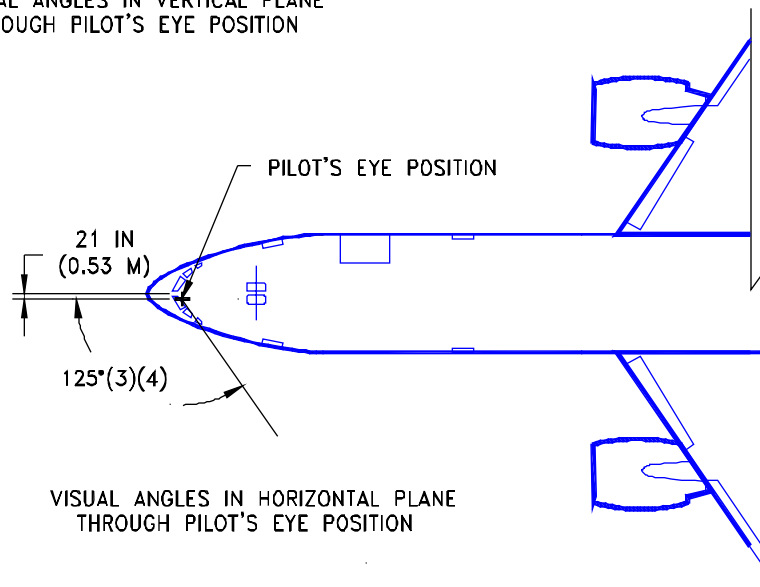
PRELIMINARY FOR 777 FREIGHTER

NOT TO SCALE

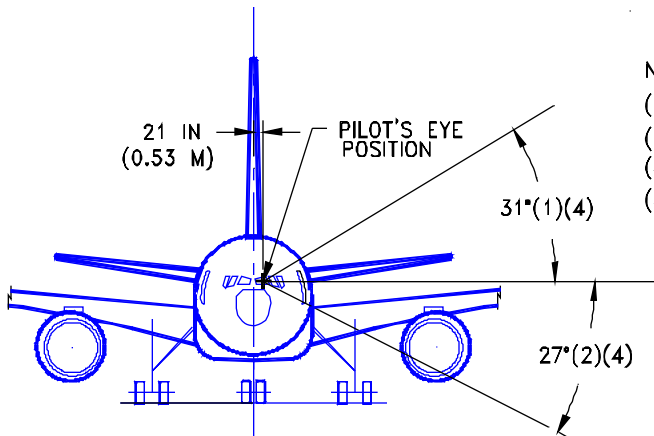
NOT TO BE USED FOR
LANDING APPROACH
VISIBILITY



VISUAL ANGLES IN VERTICAL PLANE
THROUGH PILOT'S EYE POSITION



VISUAL ANGLES IN HORIZONTAL PLANE
THROUGH PILOT'S EYE POSITION



VISUAL ANGLES IN A PLANE
PERPENDICULAR TO LONGITUDINAL AXIS
THROUGH PILOT'S EYE POSITION

NOTES:

- (1) UPWARD THROUGH MAIN WINDOW
- (2) DOWNWARD THROUGH MAIN WINDOW
- (3) VISION THROUGH SIDE WINDOW
- (4) HEAD ROTATED ABOUT POINT
3.3 IN (0.08 M) AFT OF PILOT'S
REFERENCE EYE POSITION.

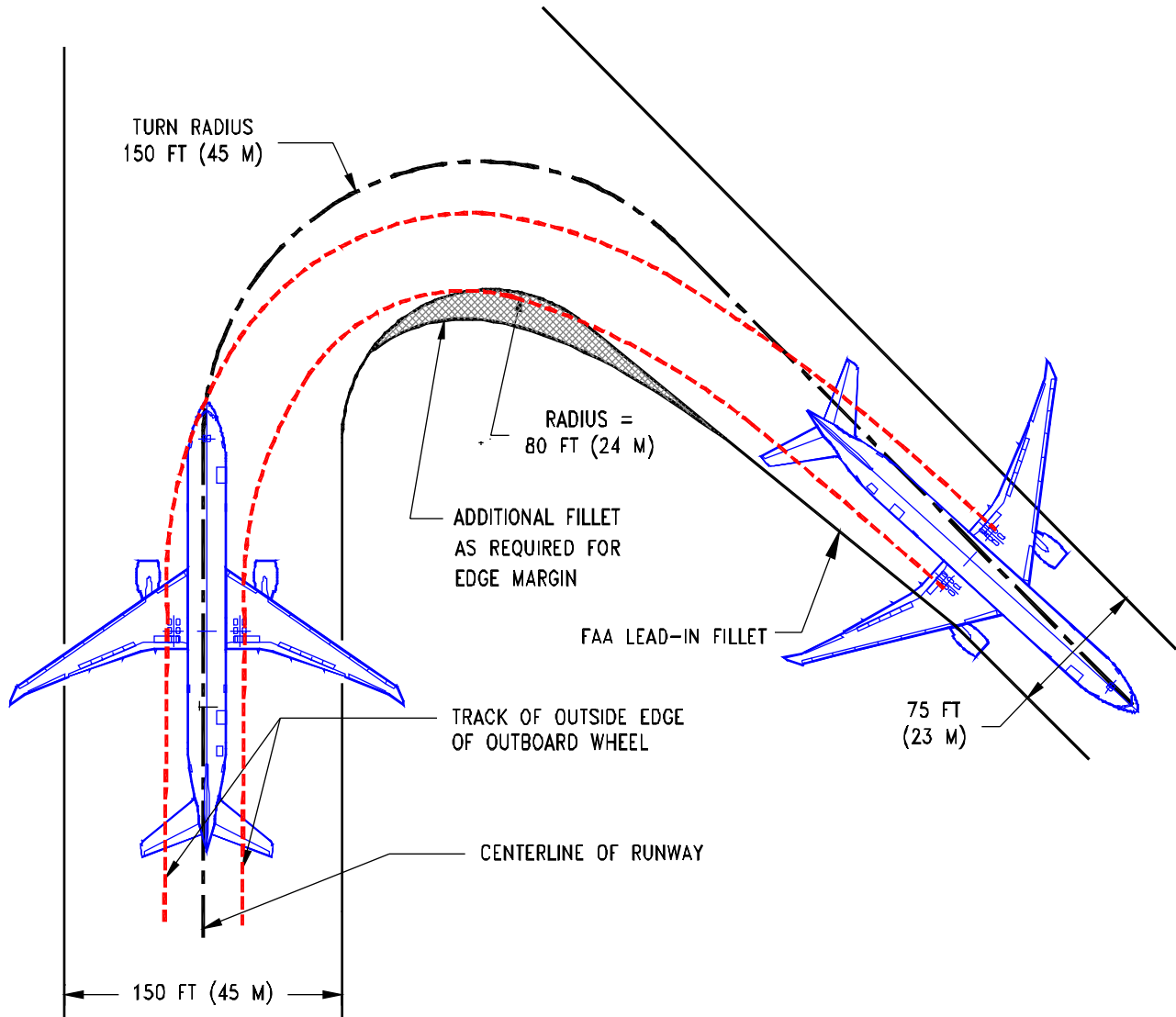
4.4 VISIBILITY FROM COCKPIT IN STATIC POSITION

MODEL 777-200LR, -300ER, 777F

PRELIMINARY FOR 777 FREIGHTER

NOTES:

- BEFORE DETERMINING THE SIZE OF THE INTERSECTION FILLET, CHECK WITH THE AIRLINES REGARDING THE OPERATING PROCEDURES THAT THEY USE AND THE AIRCRAFT TYPES THEY ARE EXPECTED TO USE AT THE AIRPORT
- 777-300ER DATA SHOWN. 777-200LR DATA WOULD BE LESS STRINGENT.

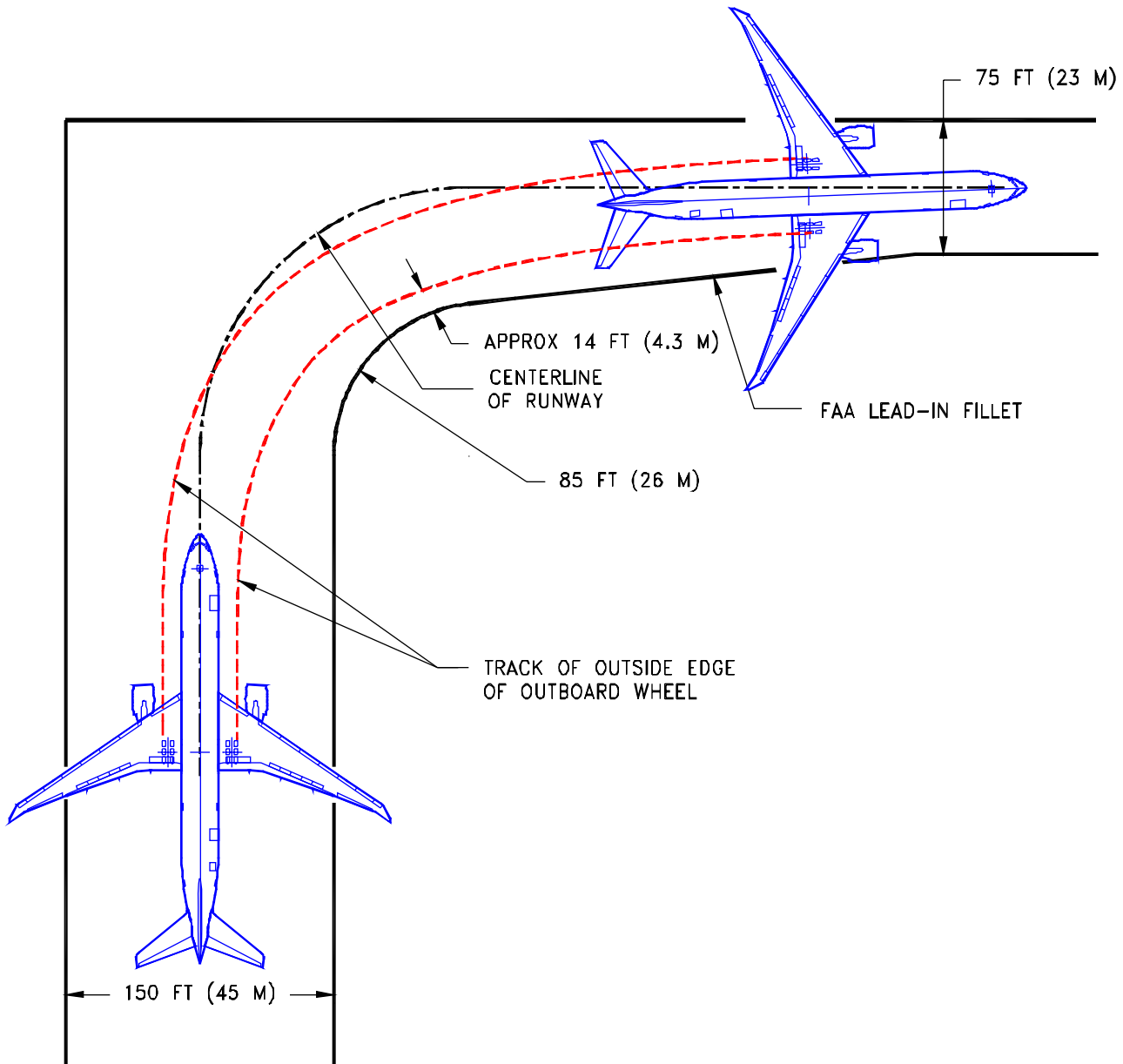


4.5.1 RUNWAY AND TAXIWAY TURNPATHS - RUNWAY-TO-TAXIWAY, MORE THAN 90 DEGREES MODEL 777-200LR, -300ER, 777F

PRELIMINARY FOR 777 FREIGHTER

NOTES:

- BEFORE DETERMINING THE SIZE OF THE INTERSECTION FILLET, CHECK WITH THE AIRLINES REGARDING THE OPERATING PROCEDURES THAT THEY USE AND THE AIRCRAFT TYPES THEY ARE EXPECTED TO USE AT THE AIRPORT
- 777-300ER DATA SHOWN. CALCULATED EDGE MARGIN FOR THE 777-200LR WOULD BE APPROXIMATELY 20 FT (6.1 M) INSTEAD OF 14 FT (4.3 M) AS SHOWN.

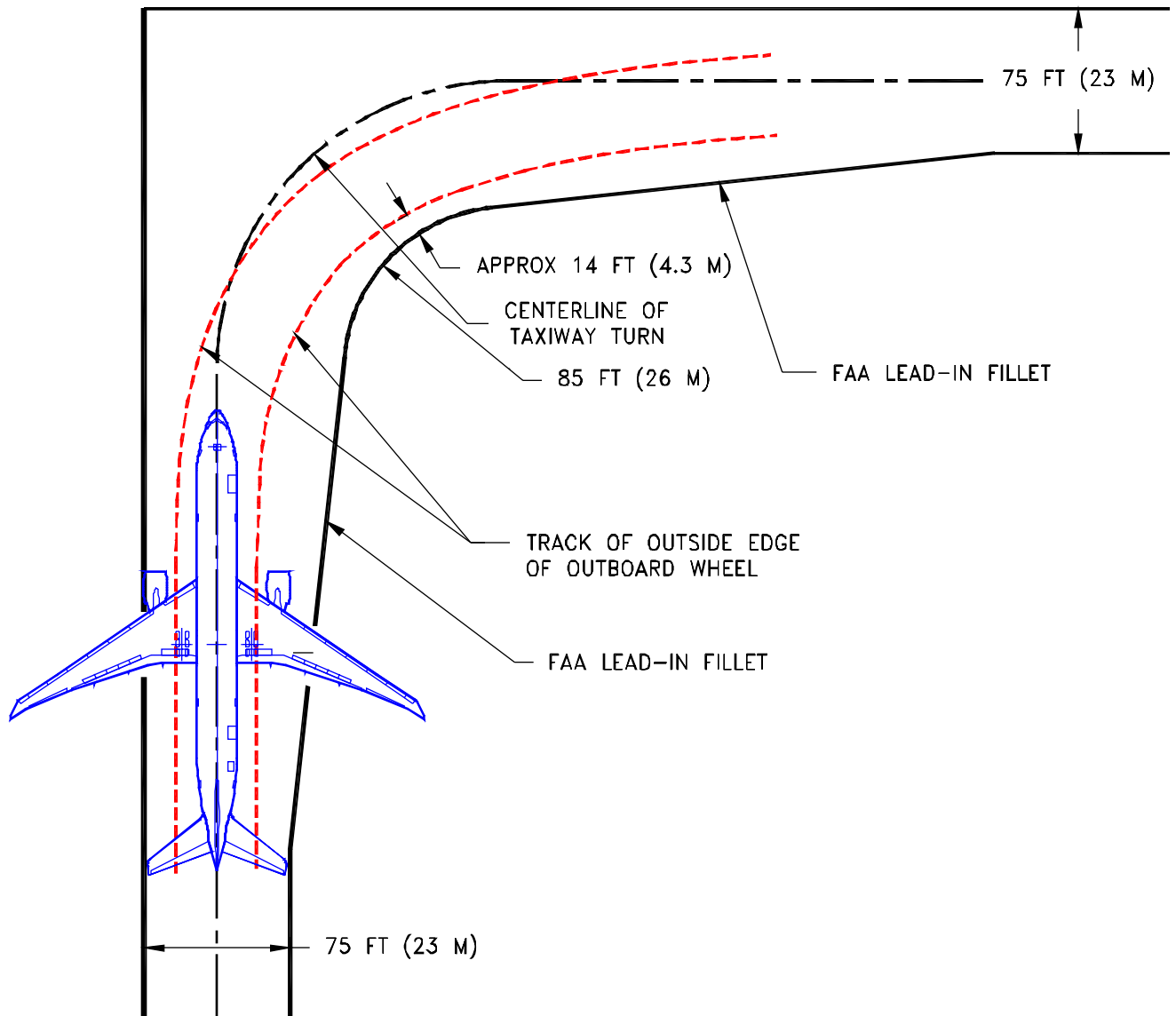


4.5.2 RUNWAY AND TAXIWAY TURNPATHS - RUNWAY-TO-TAXIWAY, 90 DEGREES MODEL 777-200LR, -300ER, 777F

PRELIMINARY FOR 777 FREIGHTER

NOTES:

- BEFORE DETERMINING THE SIZE OF THE INTERSECTION FILLET, CHECK WITH THE AIRLINES REGARDING THE OPERATING PROCEDURES THAT THEY USE AND THE AIRCRAFT TYPES THEY ARE EXPECTED TO USE AT THE AIRPORT
- 777-300ER DATA SHOWN. CALCULATED EDGE MARGIN FOR THE 777-200LR WOULD BE APPROXIMATELY 22 FT (6.7 M) INSTEAD OF 14 FT (4.3 M) AS SHOWN.



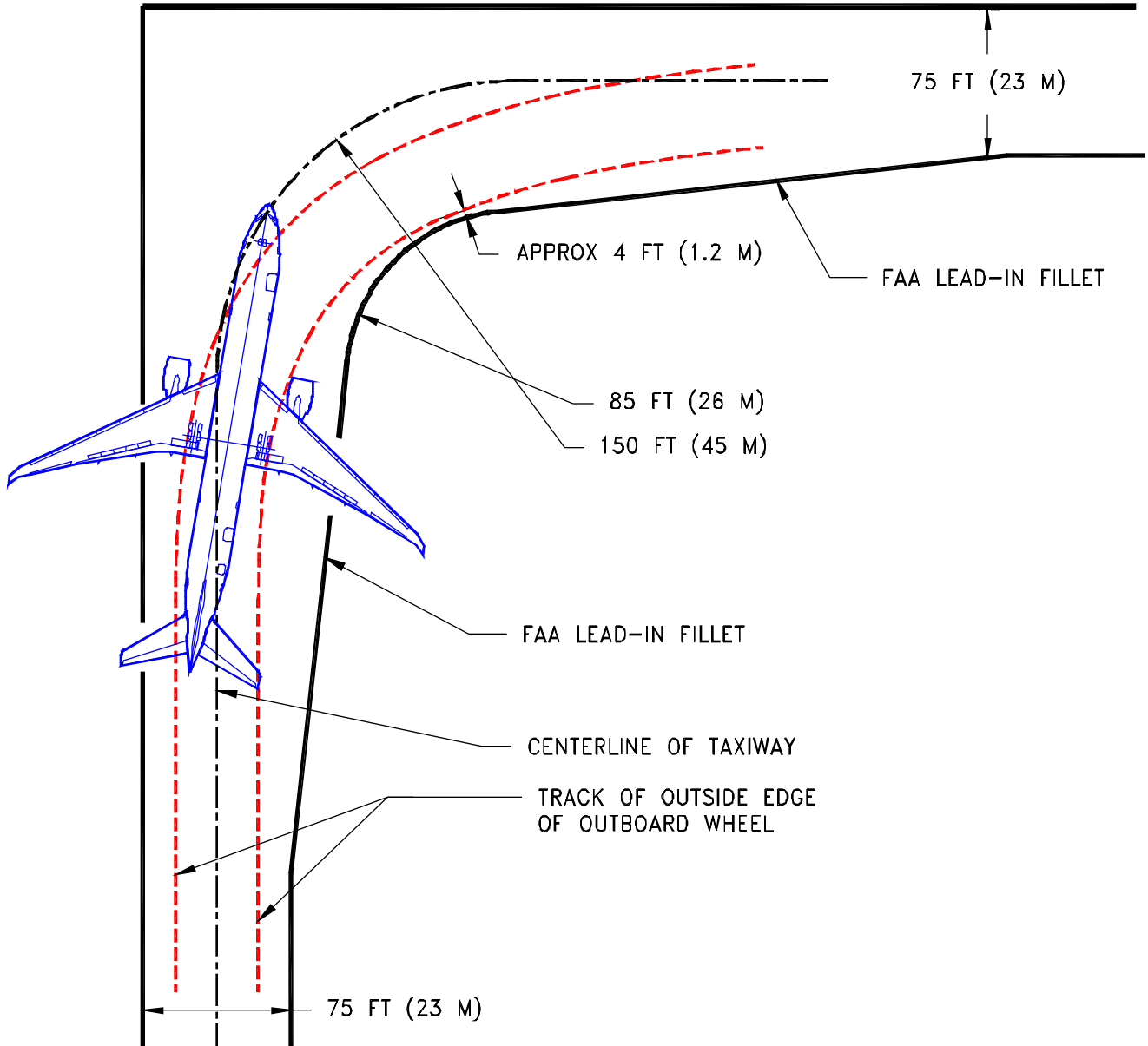
4.5.3 RUNWAY AND TAXIWAY TURNPATHS - TAXIWAY-TO-TAXIWAY, 90 DEGREES, NOSE GEAR TRACKS CENTERLINE

MODEL 777-200LR, -300ER, 777F

PRELIMINARY FOR 777 FREIGHTER

NOTES:

- BEFORE DETERMINING THE SIZE OF THE INTERSECTION FILLET, CHECK WITH THE AIRLINES REGARDING THE OPERATING PROCEDURES THAT THEY USE AND THE AIRCRAFT TYPES THEY ARE EXPECTED TO USE AT THE AIRPORT
- 777-300ER DATA SHOWN. CALCULATED EDGE MARGIN FOR THE 777-200LR WOULD BE APPROXIMATELY 17 FT (5.2 M) INSTEAD OF 4 FT (1.2 M) AS SHOWN.



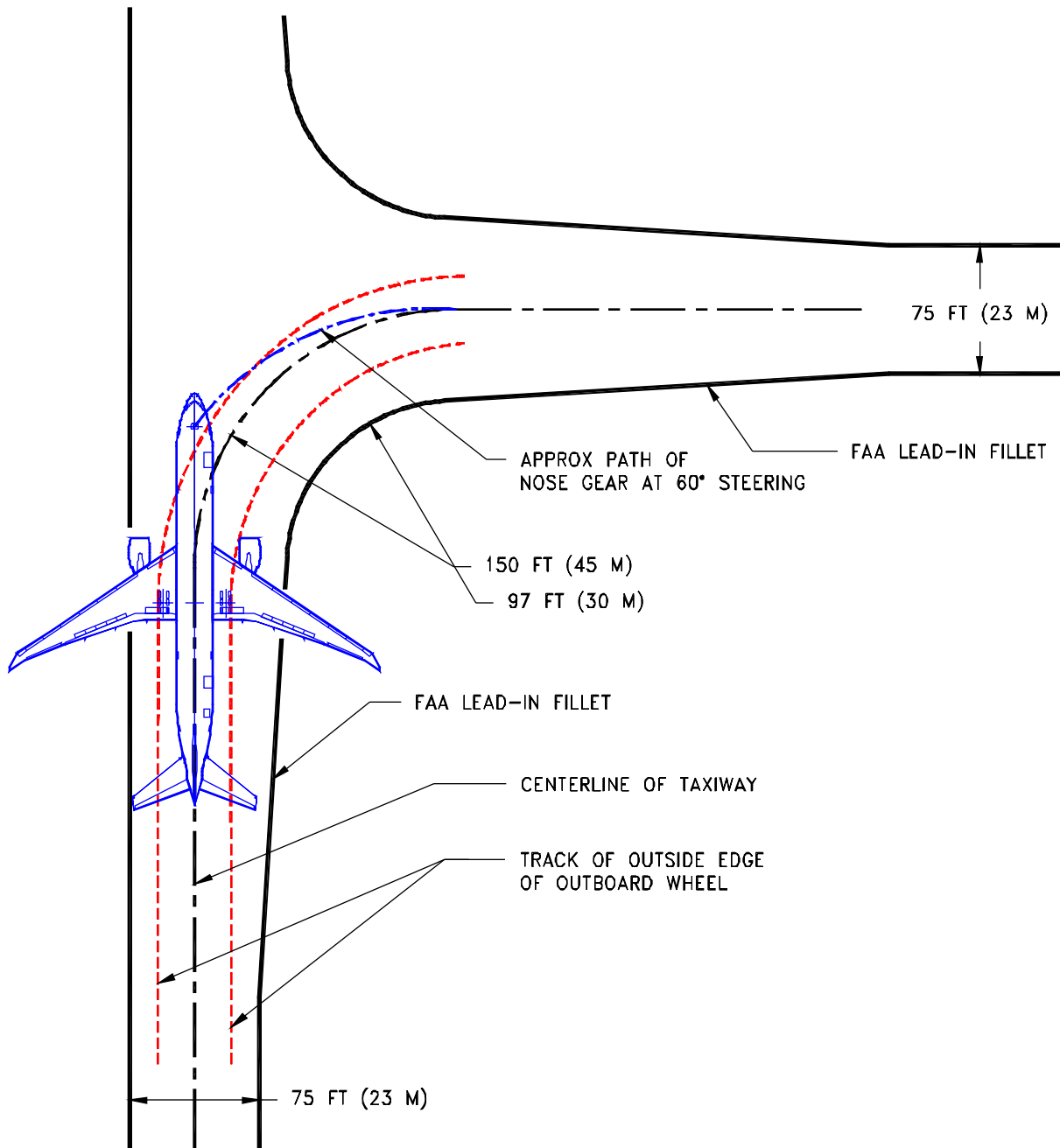
4.5.4 RUNWAY AND TAXIWAY TURNPATHS - TAXIWAY-TO-TAXIWAY, 90 DEGREES, COCKPIT TRACKS CENTERLINE

MODEL 777-200LR, -300ER, 777F

PRELIMINARY FOR 777 FREIGHTER

NOTES:

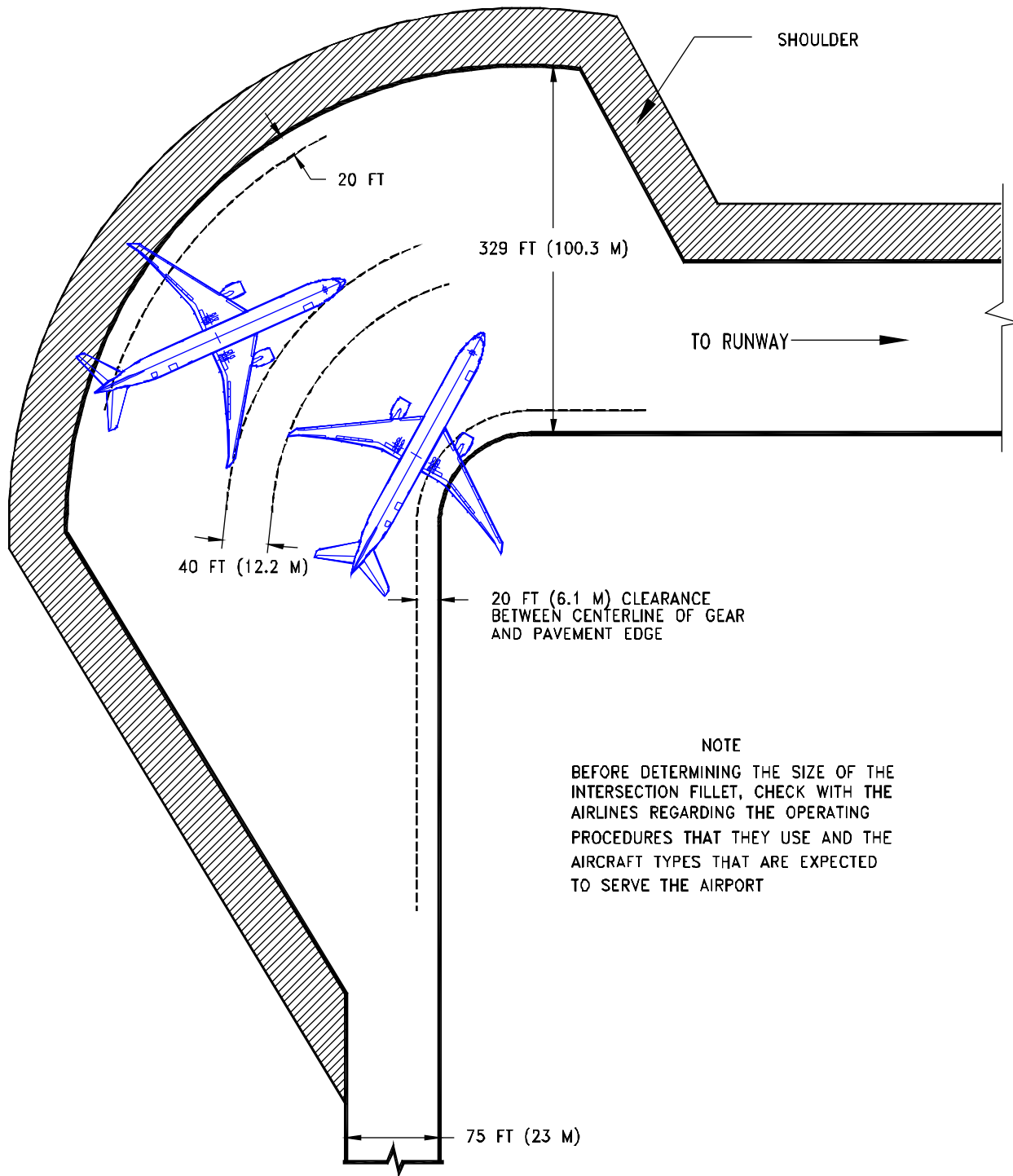
- BEFORE DETERMINING THE SIZE OF THE INTERSECTION FILLET, CHECK WITH THE AIRLINES REGARDING THE OPERATING PROCEDURES THAT THEY USE AND THE AIRCRAFT TYPES THEY ARE EXPECTED TO USE AT THE AIRPORT
- 777-300ER DATA SHOWN. 777-200LR DATA WOULD BE LESS STRINGENT



4.5.5 RUNWAY AND TAXIWAY TURNPATHS - TAXIWAY-TO-TAXIWAY, 90 DEGREES, JUDGMENTAL OVERSTEERING

MODEL 777-200LR, -300ER, 777F

PRELIMINARY FOR 777 FREIGHTER



4.6 RUNWAY HOLDING BAY MODEL 777-200LR, -300ER, 777F