

5.4 Twente airbase assessment

Photos : Film No. 7

ILS-General

"ILS acc. Annex 10"	ILS classification I/B/1. Mixed Military/Civil use.
Nominal glidepath angle	3°
TCH	16.5 m
Azimuth coverage	±35° possible but not required.

Localizer 06

General aspects

Mixed Military/Civilian use.

LLZ classification I/B/1 to be realised with medium and/or wide aperture localizer antenna system.

Helicopter activities

The airbase has momentarily a heli-pad located halfway RWY 06/24. It is foreseen that this heli-pad will be relocated in the near future. As helicopters will disturb the localizer signals care must be taken with respect to the helicopter operation. According to the way the local ATC handles the traffic pattern for the helicopters, this may benefit from the use of a wide aperture localizer antenna system. This benefit stems from the possibility to keep the helicopters out of the main localizer beam. As the beamwidth of the wide aperture array is smaller than the beamwidth of the medium aperture array, choosing the wide aperture array would in this specific case keep the heli pad outside the main beam for the current as well as for the future location. The medium aperture system would in both, current and future be sensitive to disturbances by helicopter

Frequency availability and pairing problem

According to the scheme laid out in the general part with respect to the frequency availability and pairing, it is proposed to use the ILS06 in combination with the TACAN/DME and only to apply for a frequency for ILS06 not paired with a DME.

For intercepting the localizer radar vectoring is also available.

Backup and missed approach are available by TACAN/DME.

Farfield monitor not necessary for CATI

Aspects discussed

Available distance

The available distance between the proposed localizer position and the threshold 24 is about 450 m. The concrete ends about 200 m before the localizer.

Ground characteristics flat no grading required

Major objects

no major objects are present or planned within the $\pm 7^\circ$ wide aperture
no major objects are present or planned within the $\pm 13^\circ$ medium aperture

Trees / Forests

No significant trees and bushes are present near the localizer.

Fences

The existing fences are considered to be of no importance for the performance of the localizer, in case the measures are taken as prescribed under Glideslope 24 for the fence near vv24..

Nearfield monitor

The nearfield monitor has no restriction, nominal siting at 100 m is recommended..

Offset Localizer

Only standard siting on the CL is considered.

Critical / sensitive area

Due to the relative clean site the normal critical / sensitive areas should be sufficient.

Results / Recommendation

Feasibility of LLZ 06

No major obstructions for the implementation of I/B/1 Localizer are identified.

Antenna-/system-type

2F wide-aperture Localizer to prevent interference by helicopter operations in favour of the also possible 2F medium aperture system.

Glideslope 06

General

Mixed Military/Civilian use.

GP classification I/B/1 to be realized with 0 reference or 2F M-array antenna system.

Glidepath angle

3°

Threshold crossing height

15m, preferred 16.5m to allow drift.

Current TCH realised today by PAR is 12.5m due counting of concrete before threshold.

According to Annex 10 TCH must be achieved above threshold 06. This means either a re-assessment of the PAR or if this is not possible an acceptance of a difference with respect to the Annex 10 in the achievement of the TCH.

PAPI position

Currently no PAPI is installed for the direction 06. If in the future a PAPI would be realised this should be sited for the same glidepath angle and TCH as the ILS glideslope.

Aspects discussed

Backset

It is recommended to calculate the backset of the glideslope system for a TCH of 16.5 m. As indicated this will be 300 to 320 m.

Lateral position

Two lateral positions for the glideslope antenna system are possible. First left from the runway 120 m out of CL06/24. Second to the right at a lateral offset of 100 m. In the first position interference to the glideslope will occur due to traffic within the critical sensitive area of the glideslope. This is less the case for the second possibility to the right. Traffic on RWY 29 will disturb the glideslope in case it passes in front of the glideslope. However it must be accepted that only a lateral distance of 100 m can be realised, where Annex 10 requires 120m. Therefore the second possibility is recommended for reasons above and that the terrain in front of the antenna is more suitable.

Assuming the preferred lateral position will implemented we have the following observations.

Ground characteristics

Almost flat, part of the reflection plane lies outside the airbase premises

Objects in front

No significant objects in front, traffic on the taxiway to secondary runway may cause interference, but less occurrences than for the alternative position.

Objects lateral

inside coverage $\pm 8^\circ$

Airbase fencing, not to be considered as of importance.

Inside pattern minimum $\pm 20^\circ$

Airbase fencing, not to be considered as of importance. Also in this area a fire truck stand is present. This stand is covered with steel pipes. There is a remote possibility that this object influences the glideslope performance. If this is the case the steel pipes should be replaced with dielectric materials such as PVC or wood.

Nearfield monitor

It is possible to implement with some restrictions a nearfield monitor. Not to violate the obstacle free zone of RWY29 siting of the glideslope should be as far back as possible. Tend to realise the 320 m backset with the higher THC to create sufficient space for the nearfield monitor.

Critical / sensitive areas

To limit the critical / sensitive area as much as possible to within the airbase and to minimize the influence of traffic on the service road an 2F M-array is proposed. We have doubts that a 0-Reference would fulfil the requirements.

Results/recommendations

GP06 installable regardless of type no

Antenna and system

A 2F M-array is proposed.

Localizer 24

General aspects

Mixed Military/Civil use. only

LLZ classification I/B/1 to be realized with medium and/or wide aperture localizer antenna system.

Helicopter activities

The discussion as for LLZ06 applies.

Frequency availability and pairing problem

According to the scheme laid out in the general part with respect to the frequency availability and pairing, it is proposed to use the ILS24 in combination with the TACAN/DME and only to apply for the same frequency as for ILS06 not paired with a DME.

For intercepting the localizer radar vectoring is available.

Backup and missed approach are available by TACAN/DME.

Farfield monitor not necessary for CATI

Aspects discussed

Available distance

The available distance between the proposed localizer position and the threshold 06 is about 260 m. The asphalt however ends just before the airport fence. The only possibility in this case for siting the localizer and the near field monitor is at the runway surface. Care should be taken that no aircraft make a back track to enjoy a greater take-off distance as the thrust of the aircraft commencing its take-off could damage the antenna system and the near field monitor antenna. It will also shorten the take-off distance if this part of the runway is included at this moment.

Ground characteristics

Flat no grading required

Major objects

no major objects present or planned within the $\pm 7^\circ$ wide aperture

no major objects present or planned within the $\pm 13^\circ$ medium aperture

The existing service road passes in front of the localizer. It is recommended to alter the route such that it passes behind the proposed localizer position

Trees / Forests

No significant vegetation is present.

Fences

The existing fences are considered to be of no importance for the performance of the localizer.

Nearfield monitor

Due to the siting of the nearfield monitor on the runway surface it must be protected against jetblast.

Offset Localizer

Only standard siting on the CL is considered.

Critical / sensitive area

Due to the relative clean site the normal critical / sensitive areas should be sufficient.

Results / Recommendation

LLZ24 is feasible.

No major obstructions for the implementation of I/B/1 Localizer are identified

Exceptions the localizer and the near field monitor have to be positioned at the runway surface. If this is unacceptable the airbase perimeter has to be extended.

Antenna-/system-type

2F wide-aperture localizer to prevent interference by helicopter operations is recommended..

Glideslope 24

General

Mixed Military/Civil use.

GP classification I/B/1 to be realised with 0 reference or 2F M-array antenna system.

Glidepath angle

3°

Threshold crossing height

15m, preferred 16.5m to allow drift.

Current TCH realised today by PAR is 12.5m due counting of concrete before threshold. According to Annex 10 TCH must be achieved above threshold 06. This means either a re-assessment of the PAR or if this is not possible an acceptance of a difference with respect to the Annex 10 in the achievement of the TCH.

PAPI position

Currently no PAPI is installed for the direction 24.

Aspects discussed

Backset

It is recommended to calculate the backset of the glideslope system for a TCH of 16.5 m. Indicative value is between 300 and 320 m.

Lateral position

No position are considered to be possible without major infrastructure efforts. The first lateral position is 100m right from CL 24/06. The second lateral position is 100 to 120 m left from CL 24/06. The first position suffers from the presence of a command bunker b13 including its antennas and access roads. All of these would have to be removed from the critical and sensitive area and be relocated outside these areas. The second location suffers from a service road, a taxi way and a fence inside its critical/sensitive area. To make the glideslope work in this location the service road and the fence have to be moved outside the critical/sensitive area and restrictions for the traffic at the taxiway have to be accepted.

It is recommended to choose a lateral position 120 m left from CL 24/06, to extend the airbase perimeter to 60 m besides the glideslope position parallel to the runway and reallocate the service road.

Ground characteristics

Almost flat, part of the reflection plane lies outside the airbase premises

Objects in front

Traffic on the taxiway to primary runway will cause interference, adequate holding positions must be implemented behind the glideslope system.

Objects lateral

inside coverage $\pm 8^\circ$

Airbase fencing, considered to be of influence on the performance.

Inside pattern minimum $\pm 20^\circ$

Trees and bushes of significant dimensions are present it is recommended that these are removed after the extension of the airbase perimeter to ensure the performance of the glideslope 24. After extension the airbase fencing, will not be of importance in case of the choice for an M-array type antenna system...

Nearfield monitor

It is possible to implement without restrictions a nearfield monitor when the service road in front of the glideslope is removed.

Critical / sensitive areas

As for the reasons mentioned above the M-type is recommended for GP24 the standard critical / sensitive areas for this type will apply.

Results

GP24 installable regardless of type	no
Antenna and system	Proposed 2F M-array