APPENDIX A - DESIGN PRINCIPLE EVALUATION TEMPLATE ILS V RNAV

Design principle evaluation	**Option No: 1**
Option Name: Slightly steeper ILS	REJECT
Description of option: • This would see the ILS glideslope angle increased to at least one runway. It is not possible to immediately revert the glideslope back to a 3.0˚ approach angle. • Heathrow would be unavailable during LVPs without significant capital investment for additional ILS' and associated timescales for trialing steeper ILS approaches. Slightly steeper ILS approaches are an aspiration of Expansion, but they are not possible within the timescales of this ACP. This option assumes only a single ILS system per runway.	

Design principle: Must be safe	Not met	Partial	Met
Summary of qualitative assessment: • There is no evidence to suggest that a steeper than 3.0˚ ILS approach would not be safe. However, evidence will be required.			

Design principle: Must achieve the objective of reducing noise compared to a 3.0˚ approach	Not met	Partial	Met
Summary of qualitative assessment: • It is highly likely that steeper ILS approaches would reduce noise at ground level compared to 3.0˚ approaches.			

Design principle: Must not increase the numbers of go-arounds	Not met	Partial	Met
Summary of qualitative assessment: • There is no evidence to suggest that a steeper than 3.0˚ ILS approach would result in more go-arounds. However, evidence will be required.			

Design principle: Must not reduce Heathrow's capacity	Not met	Partial	Met
Summary of qualitative assessment: • Heathrow would currently be unavailable during LVPs if the glide slope was set to a steeper angle.			

Design principle: Must not change the lateral tracks of aircraft over the ground	Not met	Partial	Met
Summary of qualitative assessment: • There is no evidence to suggest that a steeper than 3.0˚ ILS approach would result in a change to tracks over the ground. However, evidence will be required.			

Design principle: Should not reduce the ability for arrivals to fly Continuous Descent Approach.	Not met	Partial	Met
Summary of qualitative assessment: • There is no evidence to suggest that a steeper than 3.0˚ ILS approach would result in a reduction in CDA performance. However, evidence will be required.			

Design principle: Should maximise the number of aircraft able to fly the slightly steeper approach	Not met	Partial	Met
Summary of qualitative assessment: • If the ILS glideslope was able to be safely increased in angle, it would result in all Heathrow arrivals being able to fly slightly steeper approaches			

Design principle: Should not adversely increase pilot or ATC workload	Not met	Partial	Met
Summary of qualitative assessment: • There is no evidence to suggest that a slightly steeper than 3.0˚ ILS approach would result in increased pilot or ATC workload, but evidence will be required.			

Design principle evaluation	**Option No: 2**
Option Name: Slightly steeper RNAV(GNSS) approaches	ACCEPT
Description of option: • This option would see Heathrow's RNAV approaches increased in angle. RNAV approaches are elective and used by less than 2% of Heathrow's arrivals and are not available during low visibility conditions. The ILS would remain at 3.0˚ for use by the majority of arrivals and by all arrivals during low visibility procedures. • Carried forward.	

Design principle: Must be safe	Not met	Partial	Met
Summary of qualitative assessment: • Heathrow's trials demonstrated that the RNAV Vertical Path angle can be safely increased (to 3.2˚).			

Design principle: Must achieve the objective of reducing noise compared to a 3.0˚ approach	Not met	Partial	Met
Summary of qualitative assessment: • Heathrow's trials demonstrated average noise reductions of 0.5dBA (SEL) for 3.2˚ RNAV approaches compared to 3.0˚ ILS approaches.			

Design principle: Must not increase the numbers of go-arounds	Not met	Partial	Met
Summary of qualitative assessment: • Heathrow's trials demonstrated that there were no increases in the number of go-arounds as a result of 3.2˚ RNAV approaches.			

Design principle: Must not reduce Heathrow's capacity	Not met	Partial	Met
Summary of qualitative assessment: • Heathrow's trials demonstrated that there was no reduction in capacity as a result of 3.2˚ RNAV approaches. However, ATC workload is a limiting factor on the number of RNAV approaches that can be flown at Heathrow which was a factor in the first trial.			

Design principle: Must not change the lateral tracks of aircraft over the ground	Not met	Partial	Met
Summary of qualitative assessment: • Heathrow's trials demonstrated that there was no change to the lateral tracks of aircraft over the ground as a result of 3.2˚ RNAV approaches.			

Design principle: Should not reduce the ability for arrivals to fly Continuous Descent Approach.	Not met	Partial	Met
Summary of qualitative assessment: • Heathrow's trials demonstrated that there was no reduction in CDA performance as a result of 3.2˚ RNAV approaches.			

Design principle: Should maximise the number of aircraft able to fly the slightly steeper approach	Not met	Partial	Met
Summary of qualitative assessment: • Nearly all Heathrow's aircraft are capable of performing RNAV approaches although ATC workload is a limiting factor on the number of RNAV approaches that can be flown at Heathrow which means that numbers in excess of 2% is unlikely. (This workload increase is not expected to be a factor for Slightly Steeper ILS approaches)			

Design principle: Should not adversely increase pilot or ATC workload	Not met	Partial	Met
Summary of qualitative assessment: • ATC workload is a limiting factor on the number of RNAV approaches that can be flown at Heathrow which means that numbers in excess of 2% is unlikely. This workload increase is not expected to be a factor for Slightly Steeper ILS approaches			