

# PreTDR – Requirement Table

April, 2026

# Project reference used:

DETECTOR SYSTEM REQUIREMENTS

In: <https://eic.jlab.org/Detector/>

As on Wed, Apr 08, 2026 (as marked in the site)



# Requirement table, modified

$\eta$	Nomenclature		Tracking and Solenoid				Electromagnetic Calorimetry			Hadron PID: $\pi/K/p$		Hadronic Calorimetry			
			Resolution $\sigma_{p,P}$ [GeV/c]	max $X/X_0$	min $p_T$	transverse pointing $dca(xy), p_T$ [GeV/c]	Resolution $\sigma_{E,E}$ [GeV]	PID	$E_{min}$	Momentum range	Separation	Resolution $\sigma_{E,E}$ [GeV]	$E_{min}$		
< -4.6	$\downarrow p/A$	Far Backward Detectors	low- $Q^2$ tagger	< 5%											
-4.6 to -4.0		Not Accessible													
-4.0 to -3.5		Reduced Performance													
-3.5 to -3.0		Central Detector	Backward Detector		$0.1\% * p$ $\oplus 2\%$			$30 \mu m/p_T$ $\oplus 40 \mu m$	$< (2 - 3)\%/\sqrt{E}$ $\oplus (1 - 2)\%$	$\pi$ supp. up to $10^4$	100 MeV	1 - 7 GeV/c			
-3.0 to -2.5					$0.05\% * p$ $\oplus 1\%$			$30 \mu m/p_T$ $\oplus 20 \mu m$		$\pi$ supp. up to $10^3 - 10^2$				$100\%/\sqrt{E}$ $\oplus 10\%$	
-2.5 to -2.0			Barrel						$< 10\%/\sqrt{E}$ $\oplus (2 - 3)\%$		100 MeV	0.2 - 6 GeV/c			
-2.0 to -1.5										$\pi$ supp. up to $10^2$				$100\%/\sqrt{E}$ $\oplus 10\%$	
-1.5 to -1.0				Forward Detector											
-1.0 to -0.5						$0.10\% * p$ $\oplus 2\%$			$30 \mu m/p_T$ $\oplus 40 \mu m$	$< (10 - 12)\%/\sqrt{E}$ $\oplus (2 - 3)\%$	$3\sigma e/\pi$ up to 15 GeV/c	100 MeV	0.2 - 50 GeV/c		$50\%/\sqrt{E}$ $\oplus 10\%$
-0.5 to 0.0		Reduced Performance													
0.0 to 0.5		Not Accessible													
0.5 to 1.0		Far Forward Detectors	B0 Spectrometer						$< 20\%/\sqrt{E}$ $\oplus 3\%$		100 MeV				
1.0 to 1.5			Off Momentum Spectrometer												
1.5 to 2.0			Roman Pots												
2.0 to 2.5	Zero Degree Neutral Detection							$< 20\%/\sqrt{E}$ $\oplus 5\%$		100 MeV		$< 50\%/\sqrt{E}$ $\oplus 5\%$			
2.5 to 3.0	Not Accessible														
3.0 to 3.5	Not Accessible														
3.5 to 4.0	Not Accessible														
4.0 to 4.6	Not Accessible														
> 4.6	$\uparrow e$														

hpDIRC upper limit at 6 GeV/c is not quoted in the Project Table ?

There is a gap between 0.2-2.3 by TOF and 3-50 by dRICH → approximated as 0.2-50

# Requirement table, Version 3.1 – OPEN QUESTIONS

-4 < η < 4 in Project Table G-DET.5

η	Nomenclature		Tracking				Electrons and Photons			π/K/p		HCAL		
			Resolution σ <sub>p</sub> /p [GeV/c]	max X/X <sub>0</sub>	min p <sub>T</sub>	transverse pointing dca(xy), p <sub>T</sub> [GeV/c]	Resolution σ <sub>E</sub> /E [GeV]	PID	E <sub>min</sub>	Momentum range	Separation	Resolution σ <sub>E</sub> /E [GeV]	E <sub>min</sub>	
< -4.6	↓ p/A	Far Backward Detectors	low-Q <sup>2</sup> tagger	< 5%				10%/√E ⊕3%						
-4.6 to -4.0		Not Accessible												
-4.0 to -3.5		Reduced Performance												
-3.5 to -3.0		Central Detector	Backward Detector		0.1% * p ⊕2%			30 μm/p <sub>T</sub> ⊕40 μm	< (2 - 3)%/√E ⊕(1 - 2)%	π supp. up to 10 <sup>4</sup>	20 MeV	< 10 GeV/c		
-3.0 to -2.5					0.05% * p ⊕1%									100%/√E ⊕10%
-2.5 to -2.0			Barrel						< 10%/√E ⊕(2 - 3)%	π supp. up to 10 <sup>3</sup> - 10 <sup>2</sup>	100 MeV	< 6 GeV/c		
-2.0 to -1.5						< 5%	100 MeV/c (pions) 130 MeV/c (kaons)	20 μm/p <sub>T</sub> ⊕5 μm		π supp. up to 10 <sup>2</sup>			> 3σ	100%/√E ⊕10%
-1.5 to -1.0		Forward Detector												
-1.0 to -0.5							30 μm/p <sub>T</sub> ⊕20 μm		3σ e/π up to 15 GeV/c	100 MeV	< 50 GeV/c		50%/√E ⊕10%	
-0.5 to 0.0		Reduced Performance												
0.0 to 0.5	Not Accessible													
0.5 to 1.0	Far Forward Detectors	B0 Spectrometer		< 7% p <sub>T</sub> > 1 GeV				< 20%/√E ⊕3%		100 MeV				
1.0 to 1.5		Off Momentum Spectrometer		< 10% p <sub>T</sub> > 1 GeV										
1.5 to 2.0		Roman Pots		< 5% p <sub>T</sub> > 0.5 GeV										
2.0 to 2.5		Zero Degree Neutral Detection						< 20%/√E ⊕5%		100 MeV		< 50%/√E ⊕5%		
2.5 to 3.0														
3.0 to 3.5														
3.5 to 4.0														
4.0 to 4.6														
> 4.6	↑ e													

σ<sub>p</sub>/p < 5% (?)  
P-DET-TRAK-BAR.1

0.05% \* p  
⊕0.5%

At variance with P-DET.9:  
CD e-pi separation eff. > 90% , purity > 80%

Different upper limits in the project table: 7-10-50  
P-DET.10;  
6 GeV/c for DIRC not found