

**Far Detector (ICARUS)****Technical Requirements****16-Mar-15****1.0 Detector Information**

1.1	Detector Size	(2) - 77'1 x 18'w x 19.7' h
1.2	Detector Weight	110,230 pounds each
1.3	Installation	Top Loaded in Detector Enclosure
1.4	Clear Space Above Detector	9 feet (2.74 meters)
1.5	Clear Space Around Detector	5 feet (1.54 meters)
1.6	Centered on Beamline	Horizontal
1.7	Environmental (Summer) - detector space	See Mechanical Criteria Sheet
	Environmental (Summer) - above grade high bay	See Mechanical Criteria Sheet
1.8	Environmental (Winter)	See Mechanical Criteria Sheet
	Ventilation	See Mechanical Criteria Sheet
1.9	Installation Method	
	Horizontal Transport Through North Wall	
	Interior Movement Options	
	Option 1 - Two (2) Overhead Bridge Cranes	
	Option 2 - Exterior Cranes Through Roof Hatches	
	Option 3 - Gantry System	

**2.0 Shielding Requirements**

2.1	Above	9 feet (2.74 meters)
2.2	Upstream	9 feet (2.74 meters)
2.3	Downstream	0 feet
2.4	East	9 feet (2.74 meters)
2.5	West	9 feet (2.74 meters)

**3.0 Material Handling Requirement**

3.1	Interior	24'x24' Adjacent to Loading Dock
3.2	Loading Dock	Sized for Standard Truck
3.3	Crane (Capacity)	10 ton minimum - heaviest load likely to be shield block which will increase capacity
3.4	Crane (Coverage)	Loading Dock and Detector Area
3.5	Overhead Door	16'w x 14't (4.87 meters x 4.26 meters)
3.6	Vertical Transport	Overhead Crane

**4.0 Electronics Rack**

4.1	Quantity	(6)-42 "u"
4.2	Rack Size	36" w x 48" l
4.3	Electrical Requirements	(3) - 208v/30amp circuits per rack
4.4	Data Connection	10 computers per rack
4.5	Location Requirement	Detector Enclosure Level
4.6	Cooling Requirements	
4.7	Environmental Conditions	"office" type conditions 78F +/- 5F, 55% RH (not controlled) no minimum RH

**5.0 Detector Racks**

5.1	Quantity	
5.2	Electrical Requirements	voltage/amps
5.3	Data Connection	
5.4	Location Requirement	On top of Detector
5.5	Cooling Requirements	

**6.0 Exterior Cyro Equipment**

6.1	LAr Tank Size	30,000 Liter 8'-2" diameter, 28'-6" long	provided by CERN
6.2	LN2 Tank Size	20,000 gallon 10' diameter, 51'-1" long	Tank 42 provided by Fermilab
6.3	Evaporator Size		
6.4	Piping		
6.5	Access	Adjacent to Road for filling	

**7.0 Interior Cyro Equipment**

7.1	Equipment Location	Detector Enclosure Level
7.2	Equipment Space Requirements	10'w x 36' w x 20' h
7.2	Electrical Requirement	voltage, amps, location
7.3	Ventilation Requirements	See mechanical requirements
7.4	Spill Containment Depth	2'-0"
7.5	Data Connection	Quantity, location
7.6	Generator Backed Requirement	No

**8.0 Grounding**

8.1	Ufer Style Ground	See SBN-doc-134 #4/0 bare copper cable with ground rods at perimeter #4/0 bare copper exothermically welded to both layers of wall rebar #4/0 bare copper cable extended and exothermically welded to internal structural steel K-13 rated shield transformer
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**9.0 Construction Tolerances**

9.1	Concrete	Normal Construction
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