

1. Work requester fills out this section.

Standing Work Permit

Requester: Don Lynch	Date: 11/2/2011	Ext.: 2253	Dept/Div/Group: PO/PHENIX
Other Contact person (if different from requester): Carter Biggs			Ext.: 7515
Work Control Coordinator: Don Lynch	Start Date: 11/2/2011		Est. End Date: 12/15/2011
Brief Description of Work: RPC3 Upgrades & Hodoscope Installation			
Building: RHIC tunnel N&S of IR	Room: RPC3 N & S enclosures	Equipment: n/a	Service Provider: PHENIX

. WCC, Requester/Designee, Service Provider, and ES&H (as necessary) fill out this section or attach analysis

ES&H ANALYSIS					
Radiation Concerns	<input type="checkbox"/> None	<input type="checkbox"/> Activation	<input type="checkbox"/> Airborne	<input type="checkbox"/> Contamination	<input checked="" type="checkbox"/> Radiation
Radiation Generating Devices:	<input type="checkbox"/> Radiography	<input type="checkbox"/> Moisture Density Gauges	<input type="checkbox"/> Soil Density Gauges	<input type="checkbox"/> X-ray Equipment	
<input type="checkbox"/> Special nuclear materials involved, notify Isotope Special Materials Group			<input type="checkbox"/> Fissionable materials involved, notify Laboratory Criticality Officer		
Safety Concerns	<input type="checkbox"/> None	<input type="checkbox"/> Ergonomics	<input type="checkbox"/> Transport of Haz/Rad Material		
<input type="checkbox"/> Adding/Removing Walls or Roofs	<input type="checkbox"/> Confined Space*	<input type="checkbox"/> Explosives	<input type="checkbox"/> Lead*	<input type="checkbox"/> Penetrating Fire Walls	
<input type="checkbox"/> Asbestos*	<input type="checkbox"/> Corrosive	<input type="checkbox"/> Flammable	<input type="checkbox"/> Magnetic Field*	<input type="checkbox"/> Pressurized Systems	
<input type="checkbox"/> Beryllium*	<input type="checkbox"/> Cryogenic	<input type="checkbox"/> Fumes/Mist/Dust*	<input checked="" type="checkbox"/> Material Handling	<input type="checkbox"/> Rigging/Critical Lift	
<input type="checkbox"/> Biohazard*	<input type="checkbox"/> Electrical	<input type="checkbox"/> Heat/Cold Stress	<input type="checkbox"/> Noise*	<input type="checkbox"/> Toxic Materials*	
<input type="checkbox"/> Chemicals*	<input checked="" type="checkbox"/> Elevated Work*	<input type="checkbox"/> Hydraulic	<input type="checkbox"/> Non-ionizing Radiation*	<input type="checkbox"/> Vacuum	
	<input type="checkbox"/> Excavation	<input type="checkbox"/> Lasers*	<input type="checkbox"/> Oxygen Deficiency*	<input type="checkbox"/> Other	
* Does this work require medical clearance or surveillance from the Occupational Medicine Clinic? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
Environmental Concerns	<input checked="" type="checkbox"/> None		<input type="checkbox"/> Work impacts Environmental Permit No.		
<input type="checkbox"/> Atmospheric Discharges (rad/non-rad)	<input type="checkbox"/> Land Use		<input type="checkbox"/> Soil Activation/contamination	<input type="checkbox"/> Waste-Mixed	
<input type="checkbox"/> Chemical or Rad Material Storage or Use	<input type="checkbox"/> Liquid Discharges		<input type="checkbox"/> Waste-Clean	<input type="checkbox"/> Waste-Radioactive	
<input type="checkbox"/> Cesspools (UIC)	<input type="checkbox"/> Oil/PCB Management		<input type="checkbox"/> Waste-Hazardous	<input type="checkbox"/> Waste-Regulated Medical	
<input type="checkbox"/> High water/power consumption	<input type="checkbox"/> Spill potential		<input type="checkbox"/> Waste-Industrial	<input type="checkbox"/> Underground Duct/Piping	
Waste disposition by: <input type="checkbox"/> Other					
Pollution Prevention (P2)/Waste Minimization Opportunity:	<input checked="" type="checkbox"/> None		<input type="checkbox"/> Yes		
FACILITY CONCERNS	<input checked="" type="checkbox"/> None				
<input type="checkbox"/> Access/Egress Limitations	<input type="checkbox"/> Electrical Noise	<input type="checkbox"/> Potential to Cause a False Alarm		<input type="checkbox"/> Vibrations	
	<input type="checkbox"/> Impacts Facility Use Agreement		<input type="checkbox"/> Temperature Change	<input type="checkbox"/> Other	
<input type="checkbox"/> Configuration Control	<input type="checkbox"/> Maintenance Work on Ventilation Systems		<input type="checkbox"/> Utility Interruptions		
WORK CONTROLS					
Work Practices					
<input type="checkbox"/> None	<input type="checkbox"/> Exhaust Ventilation	<input checked="" type="checkbox"/> Lockout/Tagout	<input type="checkbox"/> Spill Containment	<input type="checkbox"/> Security (see Instruction Sheet)	
<input checked="" type="checkbox"/> Back-up Person/Watch	<input type="checkbox"/> HP Coverage	<input type="checkbox"/> Posting/Warning Signs	<input type="checkbox"/> Time Limitation	<input type="checkbox"/> Other	
<input type="checkbox"/> Barricades	<input type="checkbox"/> IH Survey	<input type="checkbox"/> Scaffolding-requires inspection	<input type="checkbox"/> Warning Alarm (i.e. "high level")		
Protective Equipment					
<input type="checkbox"/> None	<input type="checkbox"/> Ear Plugs	<input type="checkbox"/> Gloves	<input type="checkbox"/> Lab Coat	<input checked="" type="checkbox"/> Safety Glasses	
<input type="checkbox"/> Coveralls	<input type="checkbox"/> Ear Muffs	<input type="checkbox"/> Goggles	<input type="checkbox"/> Respirator	<input checked="" type="checkbox"/> Safety Harness	
<input type="checkbox"/> Disposable Clothing	<input type="checkbox"/> Face Shield	<input type="checkbox"/> Hard Hat	<input type="checkbox"/> Shoe Covers	<input checked="" type="checkbox"/> Safety Shoes	<input type="checkbox"/> Other
Permits Required (Permits must be valid when job is scheduled.)					
<input checked="" type="checkbox"/> None	<input type="checkbox"/> Cutting/Welding	<input type="checkbox"/> Impair Fire Protection Systems			
<input type="checkbox"/> Concrete/Masonry Penetration	<input type="checkbox"/> Digging/Core Drilling	<input type="checkbox"/> Rad Work Permit-RWP No			
<input type="checkbox"/> Confined Space Entry	<input type="checkbox"/> Electrical Working Hot	<input type="checkbox"/> Other			
Dosimetry/Monitoring					
<input checked="" type="checkbox"/> None	<input type="checkbox"/> Heat Stress Monitor	<input type="checkbox"/> Real Time Monitor	<input checked="" type="checkbox"/> TLD		
<input type="checkbox"/> Air Effluent	<input type="checkbox"/> Noise Survey/Dosimeter	<input type="checkbox"/> Self-reading Pencil Dosimeter	<input type="checkbox"/> Waste Characterization		
<input type="checkbox"/> Ground Water	<input type="checkbox"/> O ₂ /Combustible Gas	<input type="checkbox"/> Self-reading Digital Dosimeter	<input type="checkbox"/> Other		
<input type="checkbox"/> Liquid Effluent	<input type="checkbox"/> Passive Vapor Monitor	<input type="checkbox"/> Sorbent Tube/Filter Pump			
Training Requirements (List below specific training requirements)					
PHENIX Awareness, LockOut/TagOut affected, RHIC Access, task specific to be addressed at daily worker planned work sessions					
Based on analysis above, the Walkdown Team determines the risk, complexity, and coordination ratings below:			If using the permit when all hazard ratings are low, only the following need to sign: (Although allowed, there is no need to use back of form)		
ES&H Risk Level:	<input checked="" type="checkbox"/> Low	<input type="checkbox"/> Moderate	<input type="checkbox"/> High	WCC:	Date:
Complexity Level:	<input checked="" type="checkbox"/> Low	<input type="checkbox"/> Moderate	<input type="checkbox"/> High	Service Provider:	Date:
Work Coordination:	<input checked="" type="checkbox"/> Low	<input type="checkbox"/> Moderate	<input type="checkbox"/> High	Authorization to start	Date:
(Departmental Sup/WCC/Designee)					

3. Both work requester and service provider contribute to work plan (use attachments for detailed plans)

Work Plan (procedures, timing, equipment, and personnel availability need to be addressed): See Attached				
Special Working Conditions Required: No				
Operational Limits Imposed: No				
Post Work Testing Required: No				
Job Safety Analysis Required: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			Walkdown Required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Reviewed by: Primary Reviewer will determine the size of the review team and the other signatures required based on hazards and job complexity. Primary Reviewer signature means that the hazards and risks that could impact ES&H have been identified and will be controlled according to BNL requirements.				
Title	Name (print)	Signature	Life #	Date
Primary Reviewer				
ES&H Professional				
Other				
Other				
Work Control Coordinator	Don Lynch		20146	
Service Provider				
	Review Done: <input type="checkbox"/> in series <input type="checkbox"/> team			

4. Job site personnel fill out this section.

Note: Signature indicates personnel performing work have read and understand the hazards and permit requirements (including any attachments).			
Job Supervisor:		Contractor Supervisor:	
Workers:	Life#:	Workers :	Life#:
Workers are encouraged to provide feedback on ES&H concerns or on ideas for improved job work flow. Use feedback form or space below.			

5. Departmental Job Supervisor, Work Control Coordinator/Designee

Conditions are appropriate to start work: (Permit has been reviewed, work controls are in place and site is ready for job.)			
Name:	Signature:	Life#:	Date:

6. Departmental Job Supervisor, Work Requester/Designee determines if Post Job Review is required. Yes No

Post Job Review (Fill in names of reviewers)			
Name:	Signature:	Life#:	Date:
Name:	Signature:	Life#:	Date:

7. Worker provides feedback.

Worker Feedback (use attached sheets as necessary)	
a) WCM/WCC: Is any feedback required? <input type="checkbox"/> Yes <input type="checkbox"/> No	
b) Workers: Are there better methods or safer ways to perform this job in the future? <input type="checkbox"/> Yes <input type="checkbox"/> No	

8. Closeout: Work Control Coordinator (authorizing dept.) checks quality of completed permit and ensures the work site is left in an acceptable condition. (WCC can delegate clean up of work area to work supervisor)

Name:	Signature:	Life#:	Date:
Comments:			

RPC3 Upgrades & Hodoscope Installation

Introduction

During the 2011 Shutdown several improvements are planned for the RPC3 North and South detector subsystems. These include:

1. Additional background shielding both in the environment control area near the RPC3 detectors and around the suspected sources at Q02 upstream on both sides.
2. Improved flow balancing of the detector gases among the detector $\frac{1}{2}$ octants and the modules therein.
3. Improved HV distribution
4. Addition of hodoscopes, 1 each on the north and south, to measure the RPC3's efficiencies.

Work Plan

All persons performing the work described herein shall have appropriate training for all tasks involved, including but not limited to: PHENIX awareness training and Collider-Accelerator Access training. Additional training requirements for specific tasks shall be addressed during daily worker work planning.

This work is to be done by fully trained and experienced personnel (PHENIX mechanical and electrical technicians and RPC experts) during the 2011 maintenance shutdown.

1. Shielding- This work will be performed by CAD techs and the work planning will be documented separately by CAD engineers.
2. Flow balancing – This work is worker planned work that will requires no formal documentation. PHENIX gas system experts and RPC experts will coordinate efforts to insure personnel and equipment safety are maintained throughout.
3. Improved HV distribution– This work is worker planned work that requires no formal documentation. PHENIX gas system experts and RPC experts will coordinate efforts to insure personnel and equipment safety are maintained throughout.
4. Hodoscopes – Installation of the hodoscopes shall be in accordance with the attached illustrations. The actual sequence of installation shall be worker planned work.

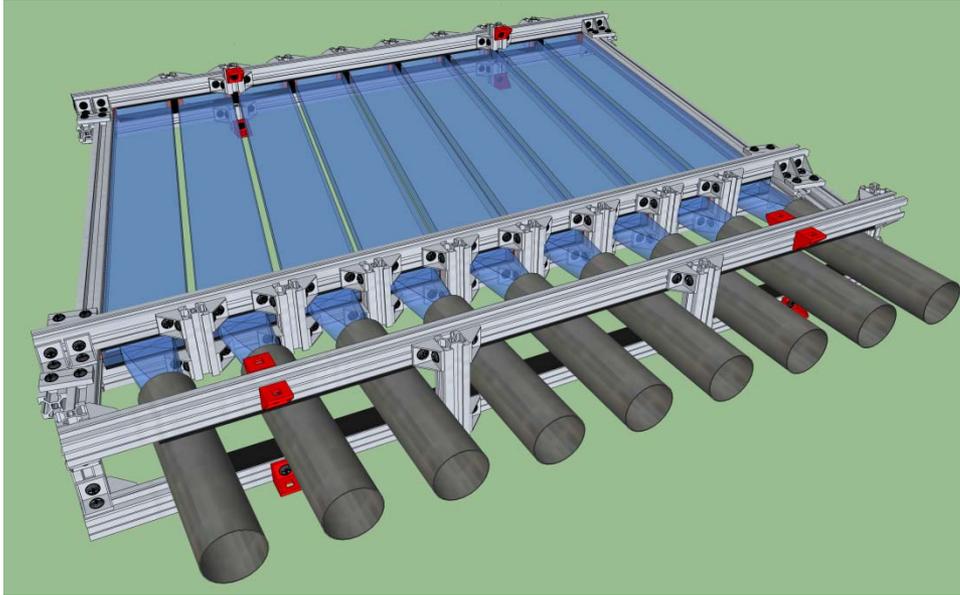
Should a situation arise where additional work planning becomes required, all of the work on the effected task shall be stopped until such time as PHENIX engineering completes an analysis of the task and determines an appropriate work plan to continue. Work shall re-commence only after PHENIX engineering and those performing the work agree on the plan.

4. Work conclusion

At the conclusion of the tasks described herein, any temporary equipment, work aids and or tools brought into either tunnel shall for the sole purpose of performing such tasks, shall be removed. Any non-trivial changes to the work plan methodology described above and or any unexpected difficulties or other problems encountered during such tasks shall be documented on or attached to this work permit.

Hodoscope Design

Design by Daniel Jumper (UIUC)



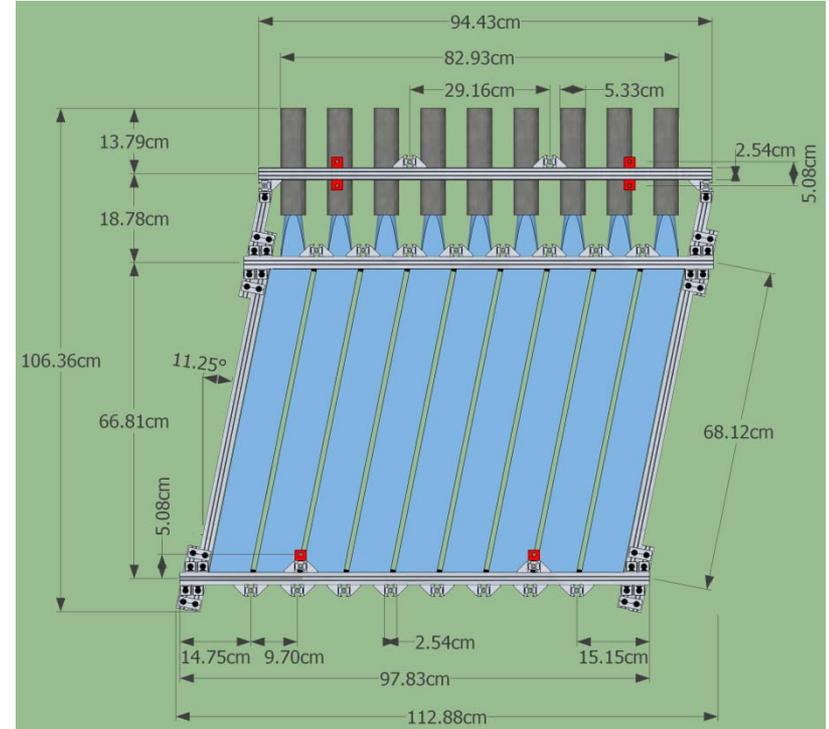
Hodoscope 3D View

9 Scintillators + 9 PMTs

Size : 96 x 107 x 11 cm

Weight : ~ 73 lb

NOTE: MOUNTING BRACKETS ARE SHOWN IN RED

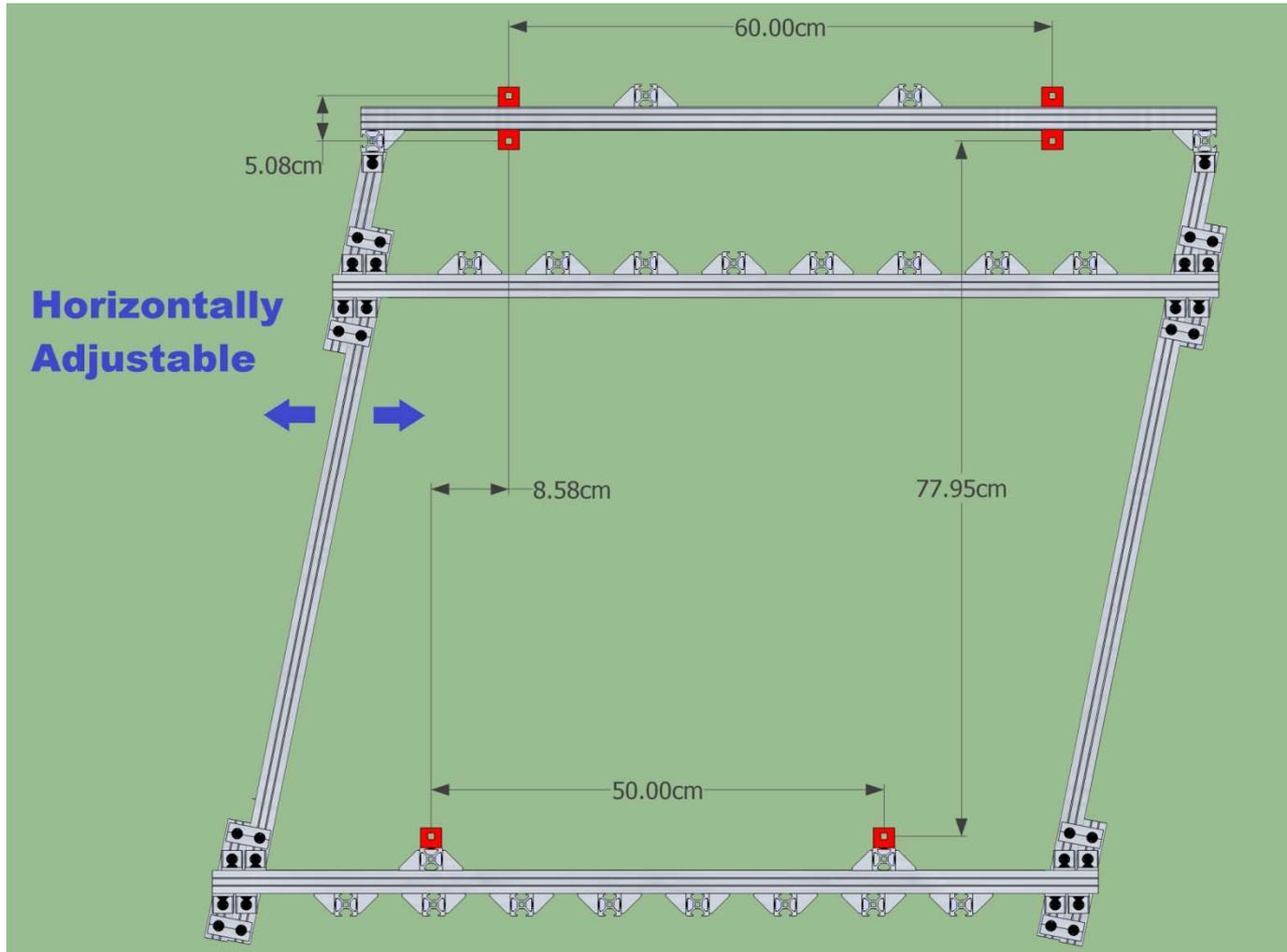


Front View



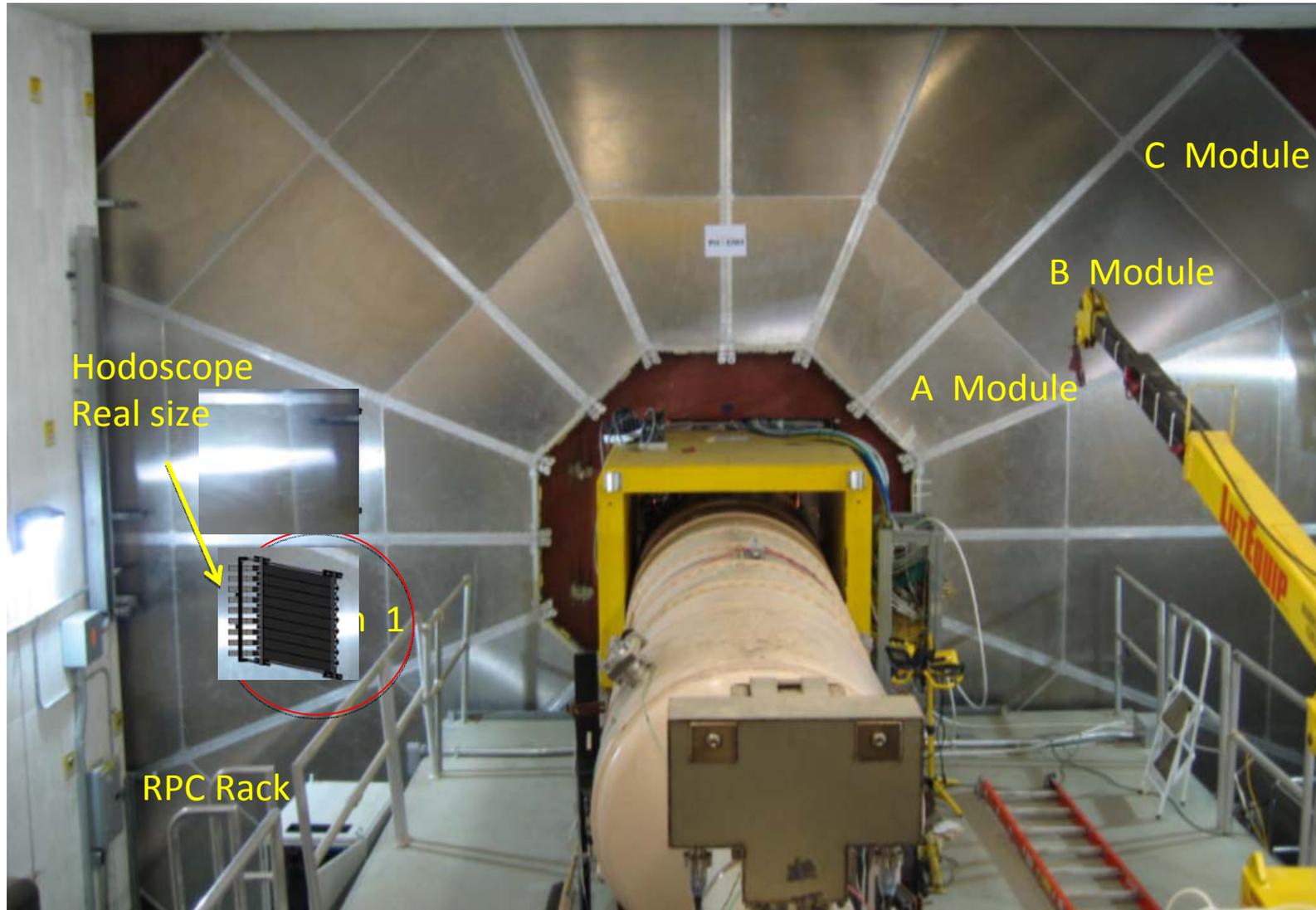
Side View

Mounting Points

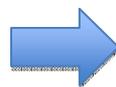


Mounting brackets are on frame profile rails that allow 1-D alignment.
Brackets use ¼" thick bolt or screw.

Location of Hodoscope

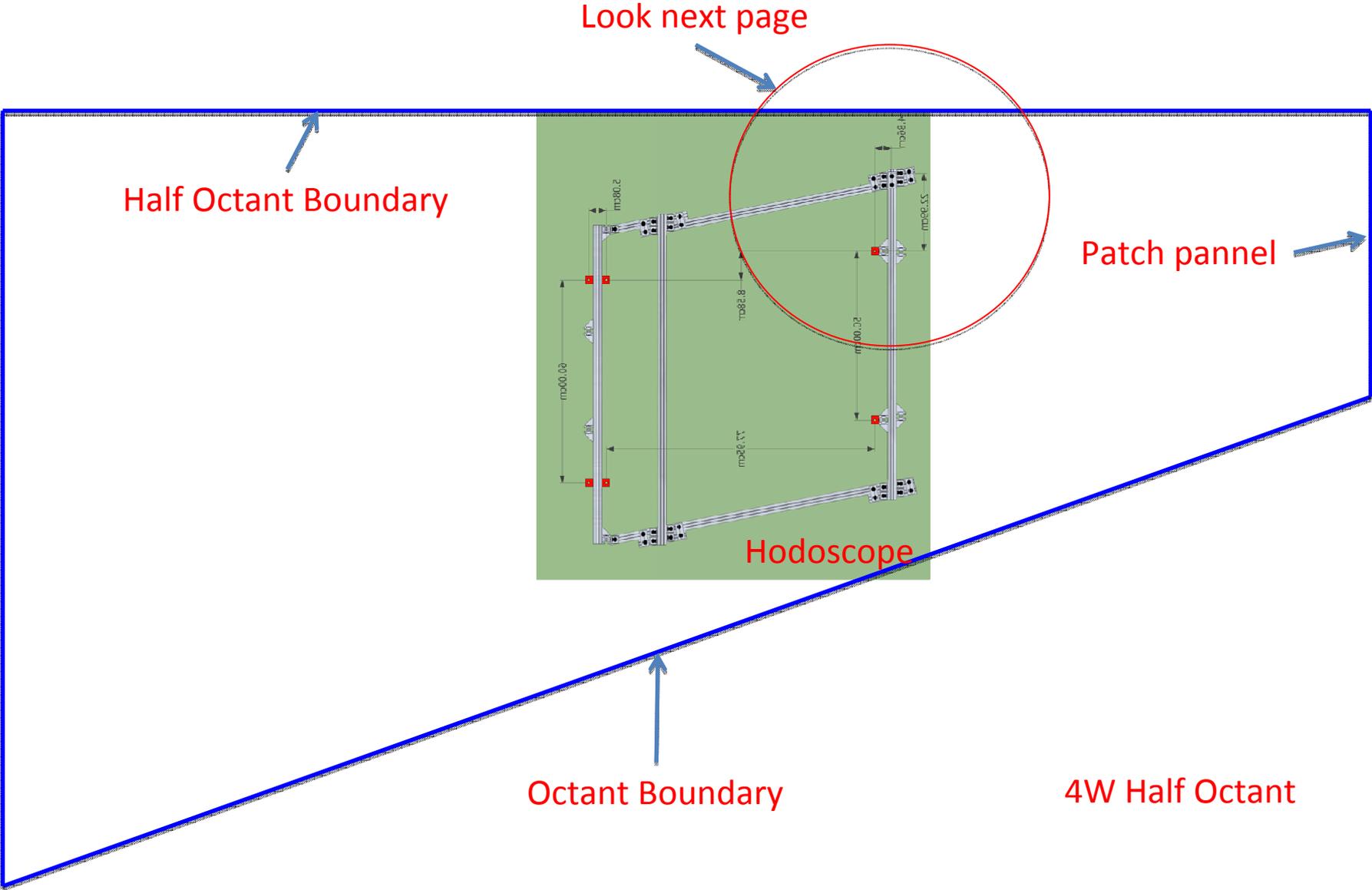


Close to RPC3 electronics rack
Less Beam background region



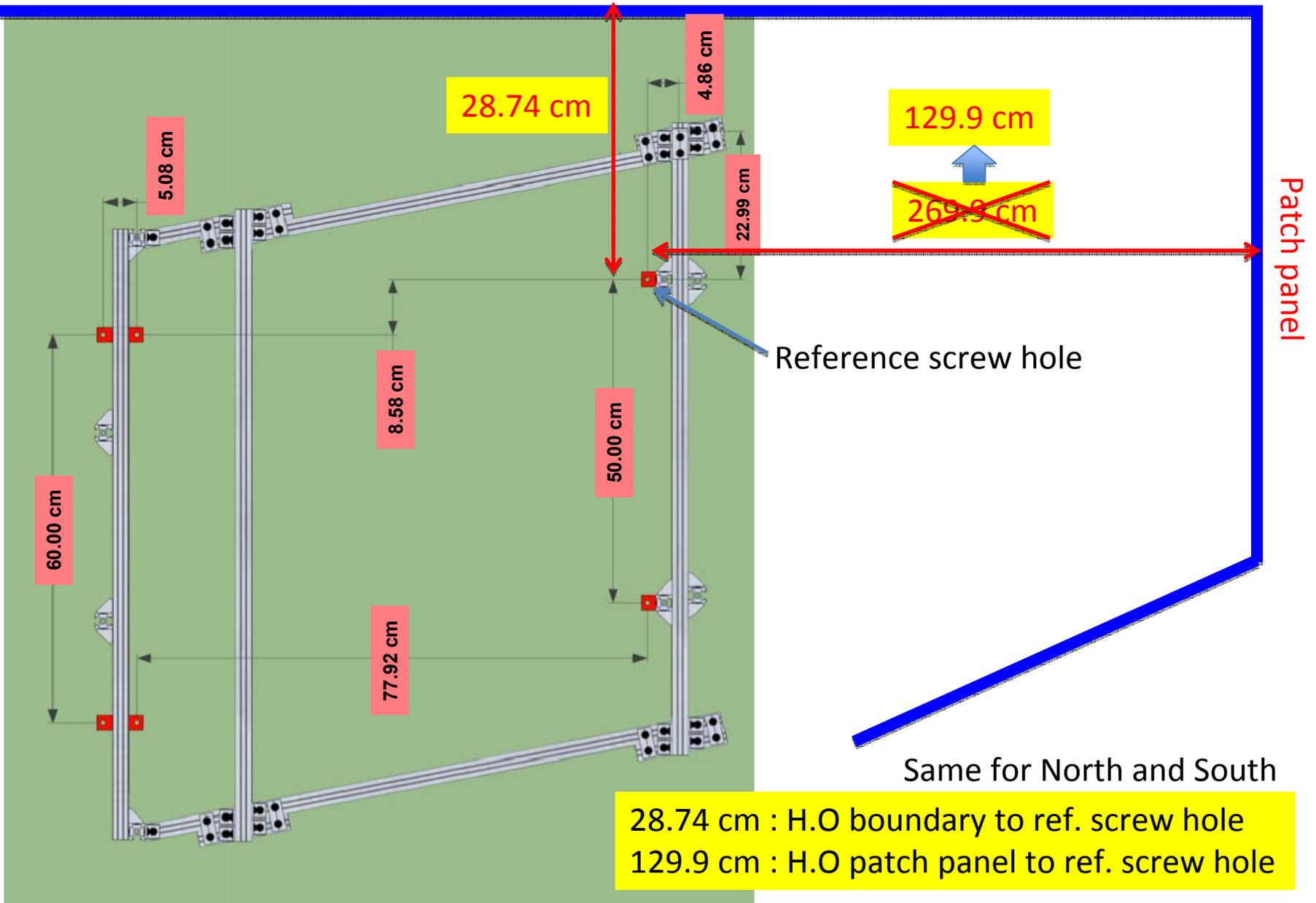
Location 1 or 2 would be good position.
Install at North and South tunnel.

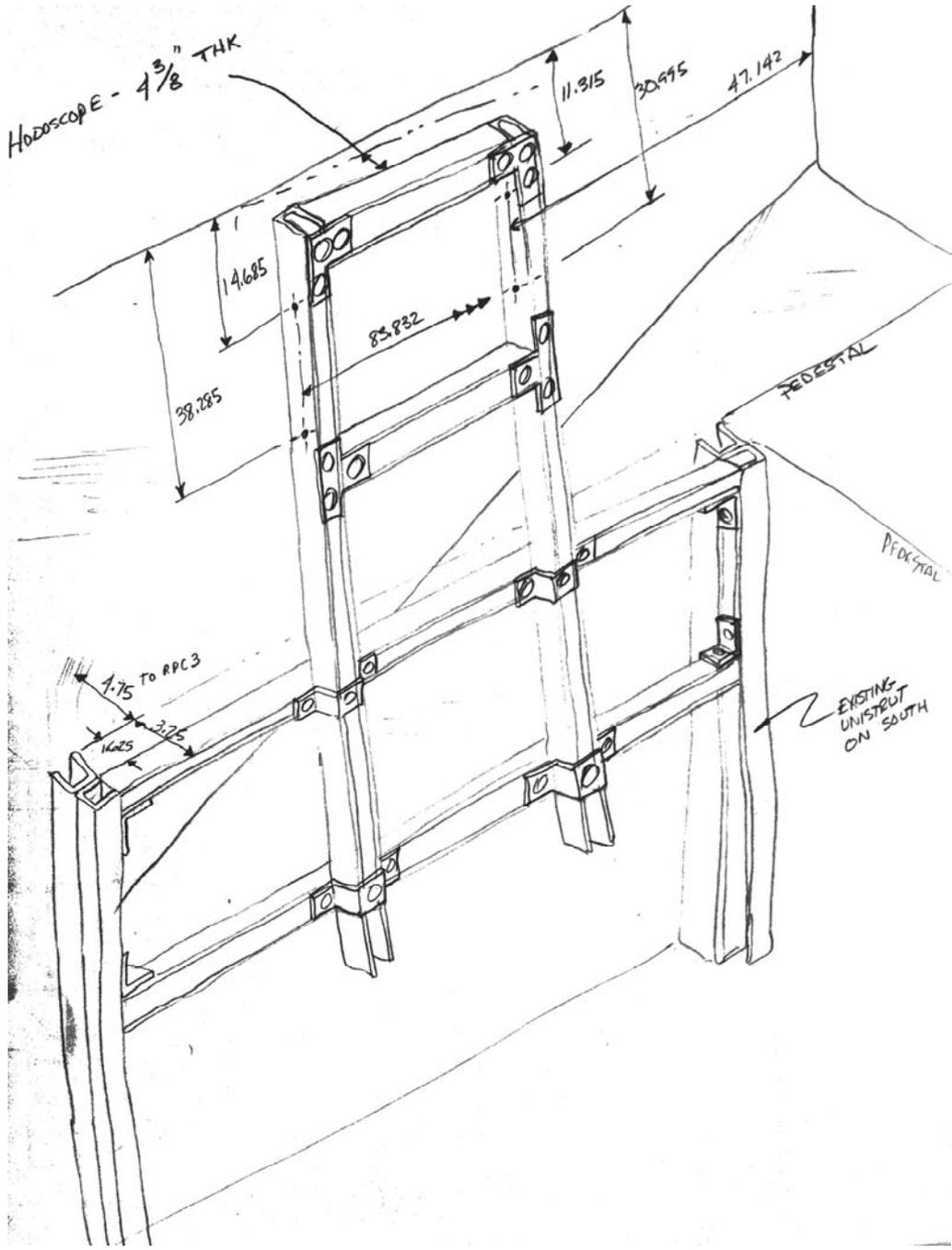
On the 4W half octant



Mounting point

Half octant boundary





Hodoscope Installation support construction scheme

(South side shown,
North side similar
except Unistrut on
wall and pedestal is
needs to be added)