Si-W Forward Calorimeters

(Nosecone Calorimeter "NCC")

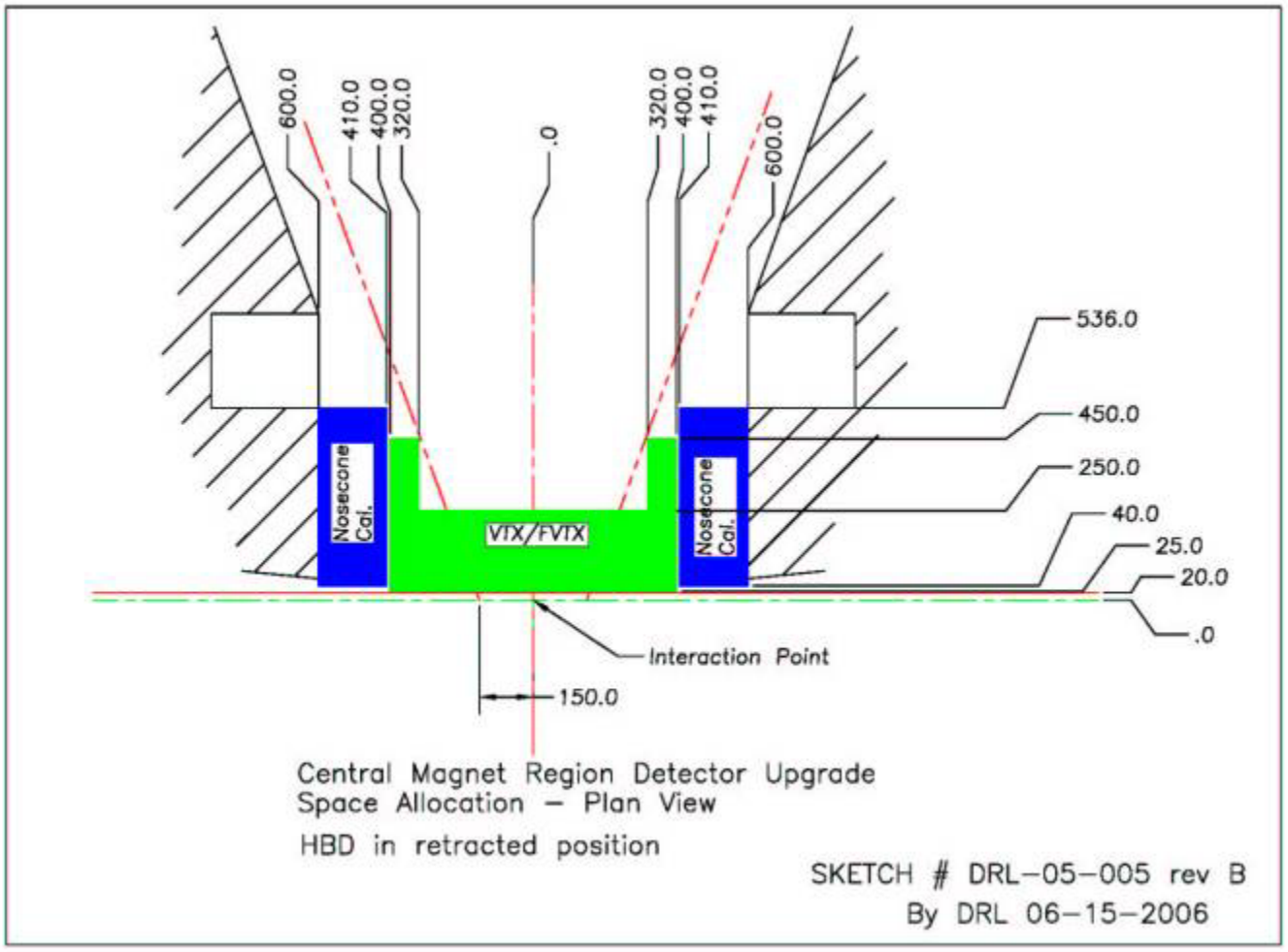
Mechanical System & Integration

Don Lynch

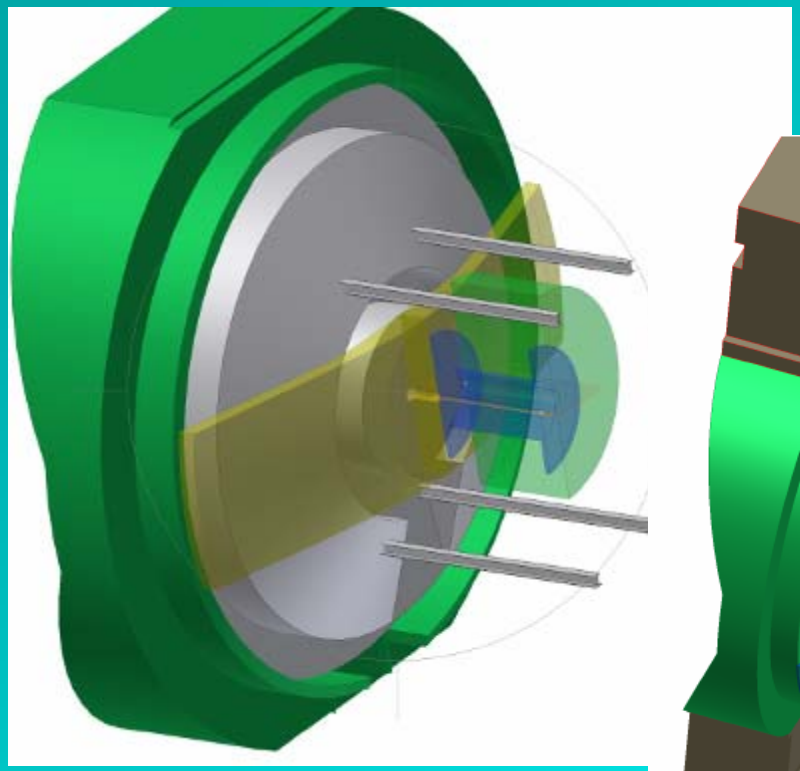
NCC Detector Mechanical Tasks

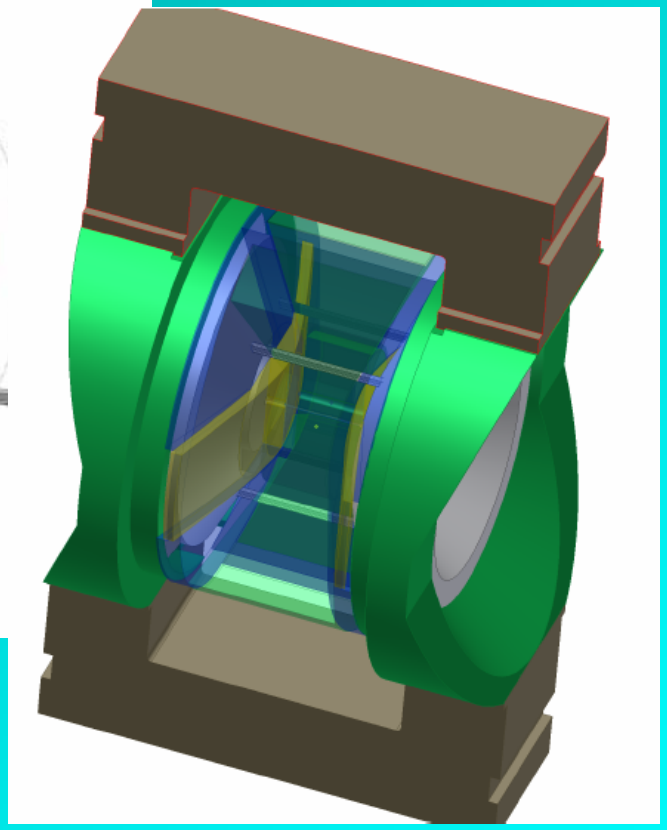
- Define space allocation - BNL
- Detector module mechanical design - BNL
- Internal structural support/assembly – BNL
- Detector Fabrication – BNL+JINR+….
- External mechanical/structural support - BNL
- Services (cables, cooling, etc.) - BNL
- Installation/alignment concept and logistical support - BNL

CM Region Space Allocation



CM Region 3D Space Allocation



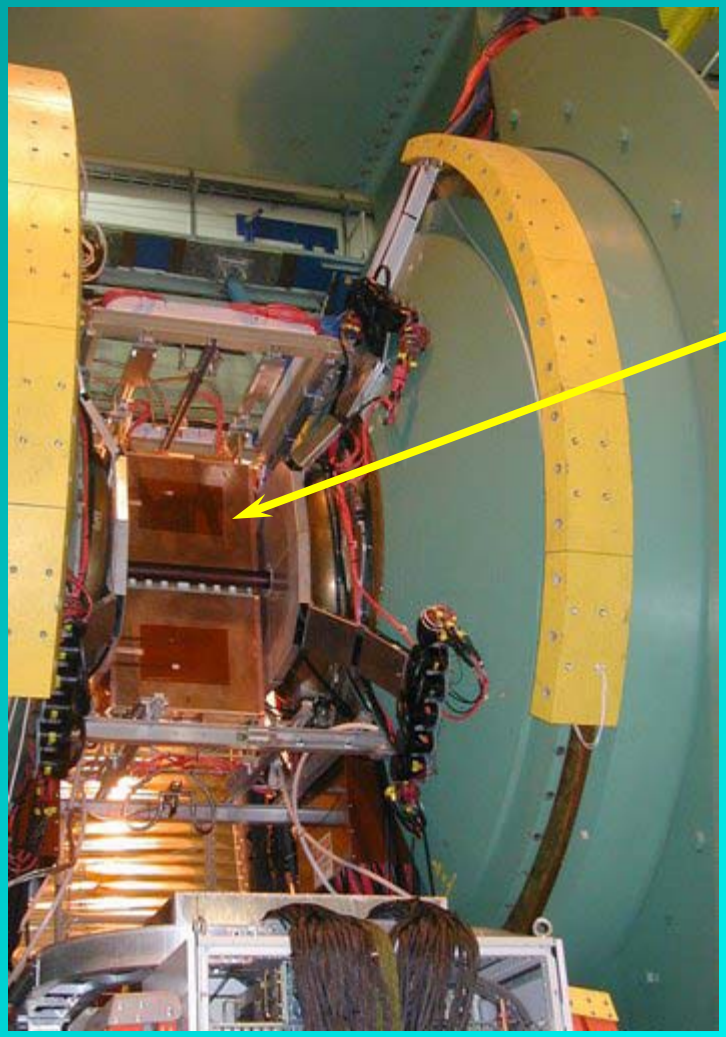


All space in between the CM poles to a radius of 2 meters from the nominal beam centerline has been (or will be) apportioned to the north and south NCC and east and west VTX/FVTX detectors, with allowances for common support infrastructure

Groups working on the VTX, FVTX and NCC have been coordinating space allocation on a regular basis.

Since the HBD in the outboard position has been abandoned, The space previously allocated to the HBD is now unoccupied space.

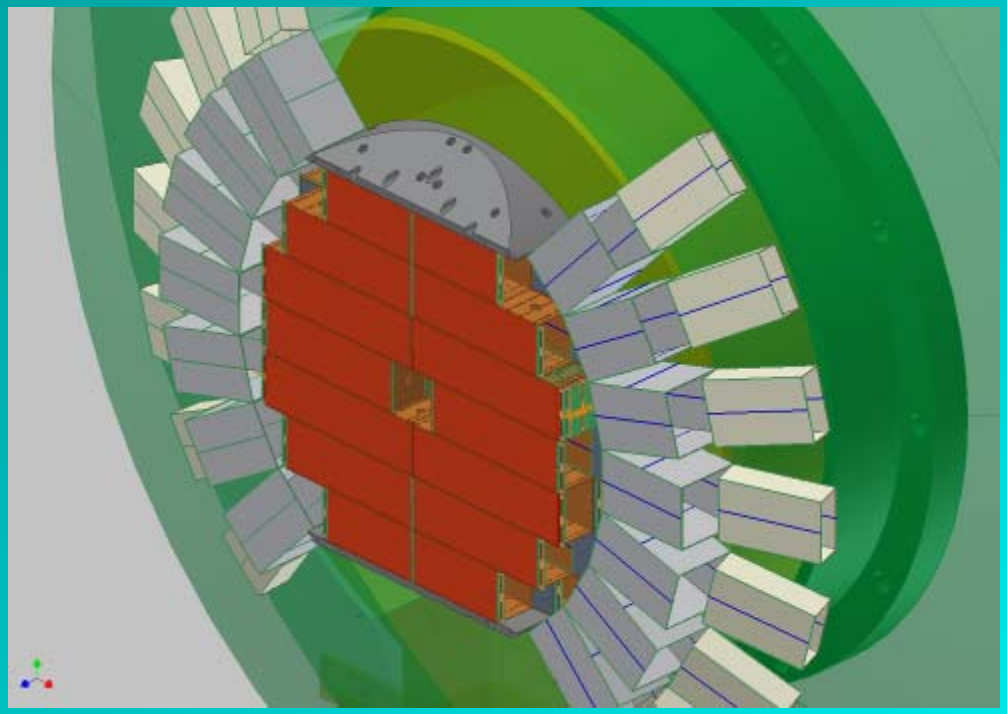
Current CM Region

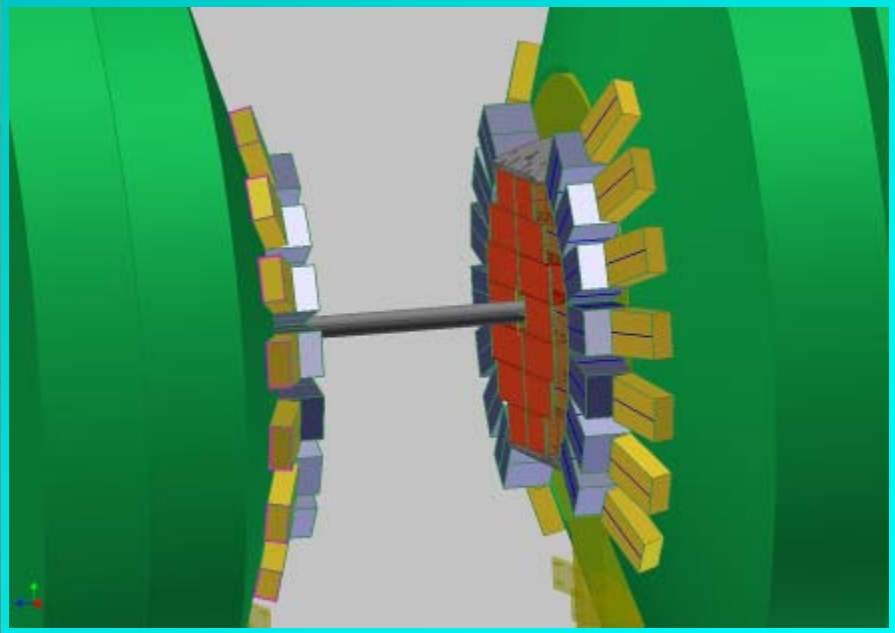


Currently the HBD and RXNP detectors are installed in this region. They will remain there until the NCC and/or the VTX is ready for installation.

Support infrastructure and cable management support for HBD may be reused by VTX/FVTX. NCC support structure will be integrated into the NCC design.

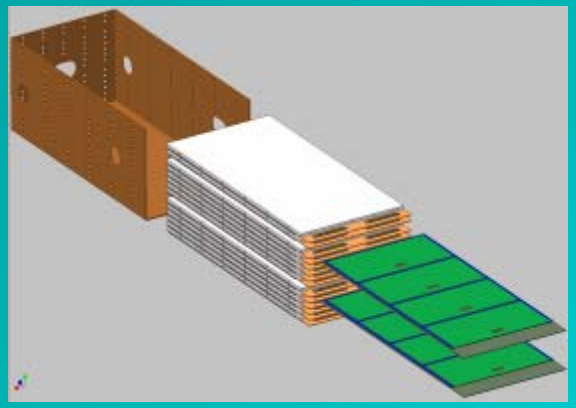
Mechanical Design Concept



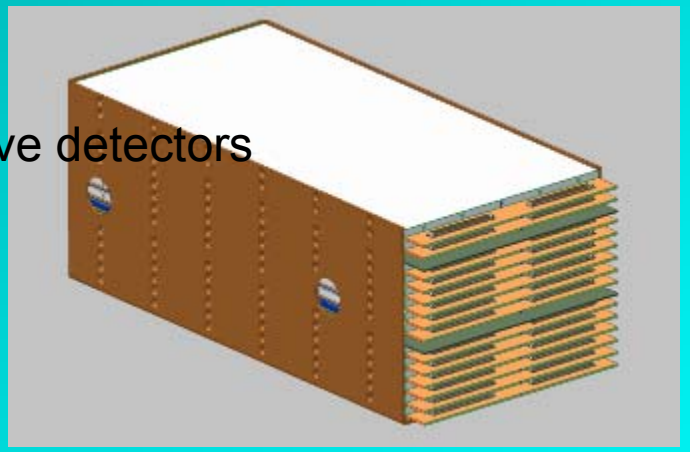


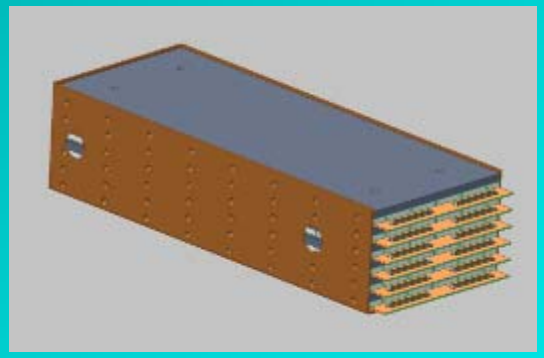
Typical NCC Module Design

EM Section



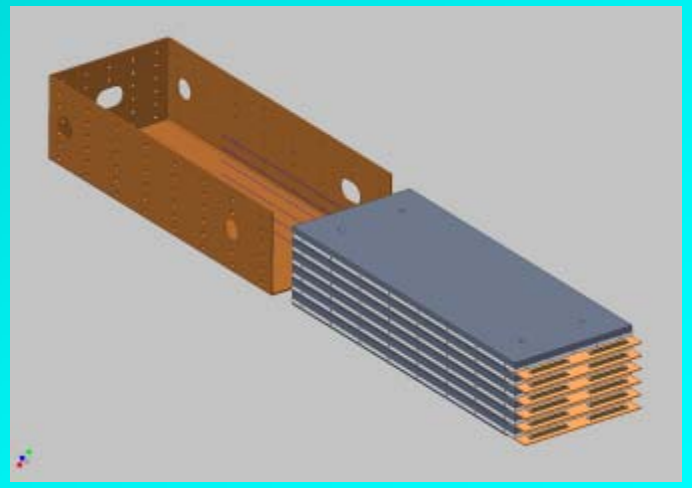
Position sensitive detectors





HAD PART 102 mm

EM PART 83.0mm



Hadronic Section

PHENIX

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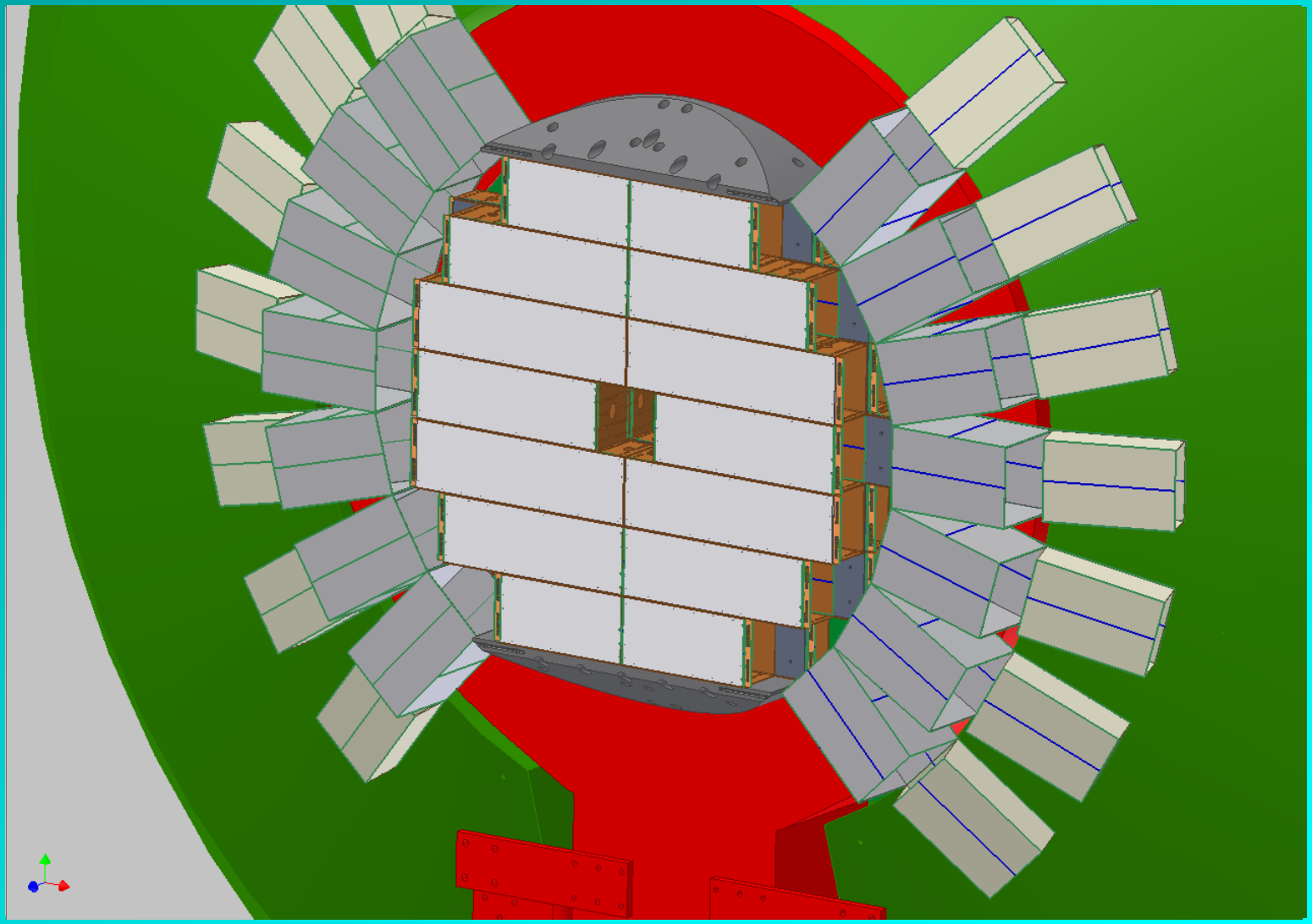
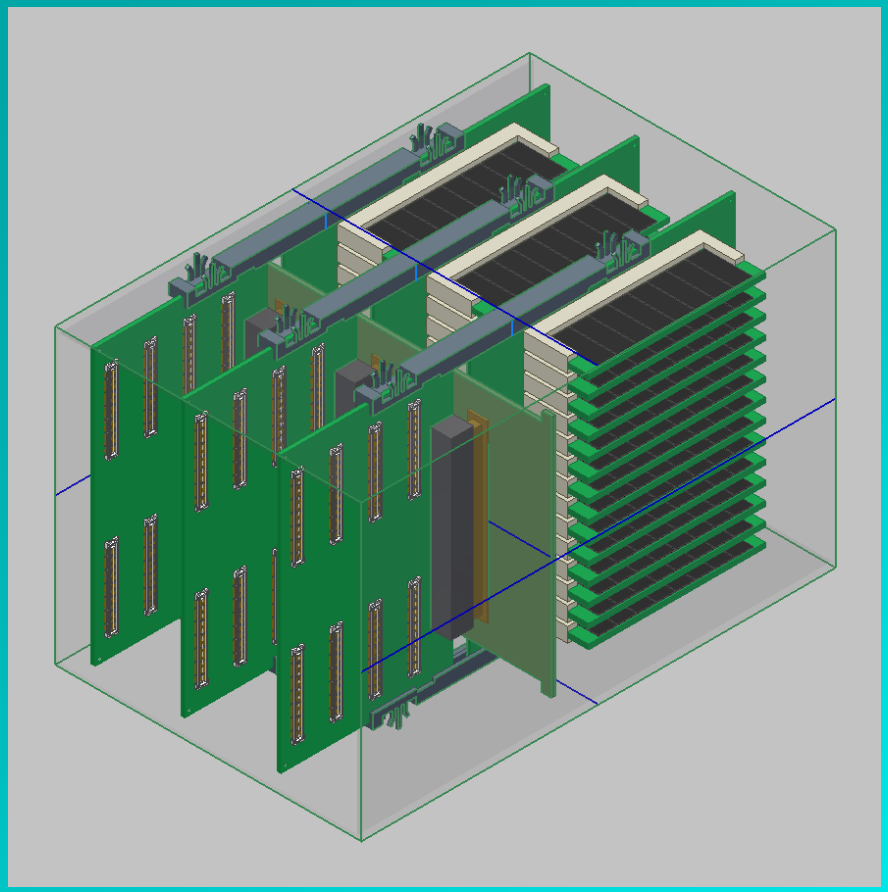
Mechanical Assembly Concept



Thermal Considerations



Preamp module, 1 per brick each generate ~ 150 watts or ~ 2 kW per NCC

There will be space to provide cooling

Each NCC would need ~ 1.5 gpm water or ~ 600 cfm air to cool the expected load

(based on 5 °C cooling medium temperature rise

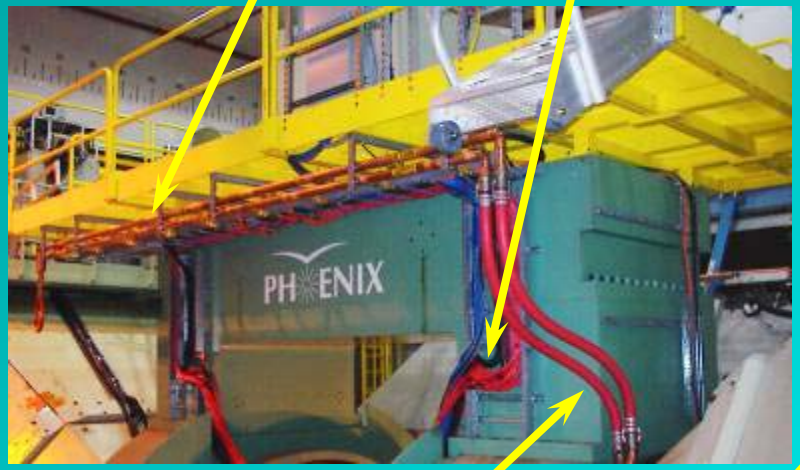
Tungsten Quotation

Quotation from:
ATI Firth Sterling,
Allegheny Technologies:

QTY	Description	Unit Price	Part Subtotal
60	-033 Tungsten plate 17.559”x4.933”x0.358” th	$1,219.38	$73,162.80
24	-034 Tungsten plate 12.667”x4.933”x0.358” th	$1,005.10	$24,122.40
56	-035 Tungsten plate”x4.933”x0.157” th	$826.50	$46,284.00
116	-036 Tungsten plate 17.559”x4.933”x0.157” th	$1,156.67	$134,173.72
84	-037	$925.03	$77,702.52
48	-038 Tungsten plate 12.667”x4.933”x0.157” th	$1,020.74	$48,995.52
		Total	$404,440.96

Bridge Utilities

Bridge water manifolds and cable trays



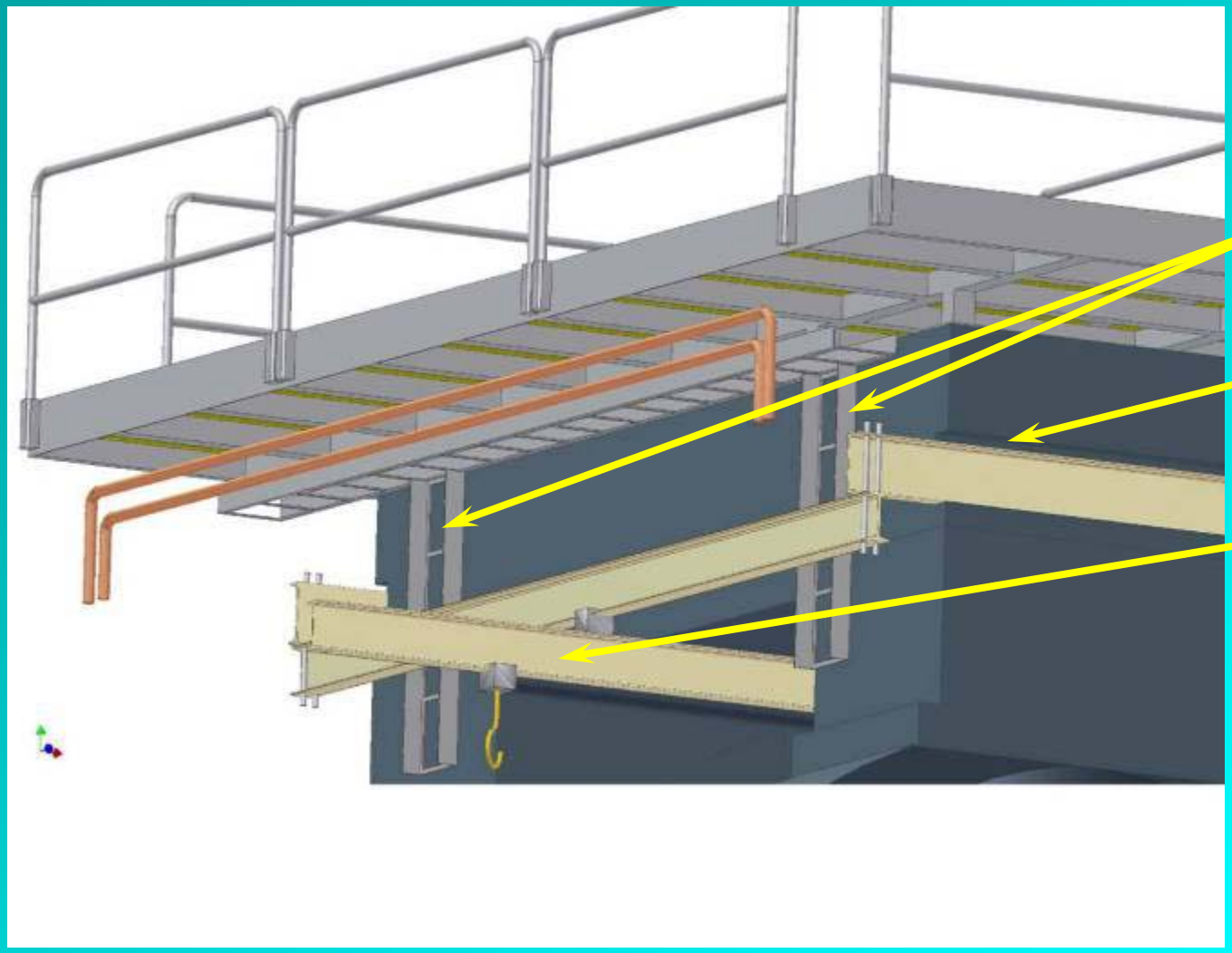
Bridge water supply & return flexible connections

Bridge elect. distribution and disconnect

HBD & RXNP Racks. NCC and VTX/FVTX racks will be in these or other racks at ~ these locations

Bridge and utilities efforts will serve all central region detector upgrades

CM Region Crane and Cable Routing Concept



Cable Trays to route NCC cables from Bridge to Detector

Crane Supports use existing flux return notches

CM Crane north-south & east-west motions; extended travel east to existing crane coverage

Gorbel visit in 11/06; waiting for quote

NCC Mechanical Efforts Current Status

- **General efforts for CM region**
  - Space allocation concept in place
  - CM platform extensions done
  - Crane design underway- waiting for quote – Install summer 2007
  - Bridge utilities installed
  - Cable routing in place for HBD/RXNP
- **NCC Specific efforts**
  - Space allocation defined NCC remains ~ within envelope
  - Detector design well established.
  - Structural support concept specified; Prototype brick design complete begin fabricating 3/07
  - Installation plan & fixturing need to be finalized
  - Preamp cooling to be designed
  - Cable management to be defined