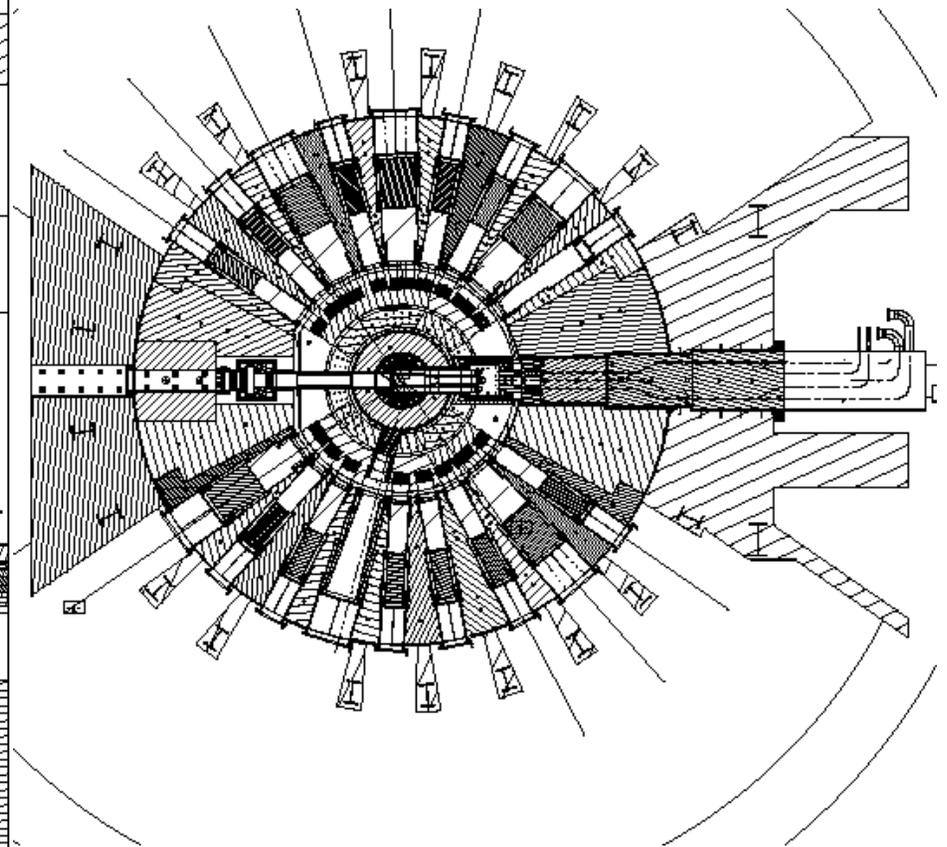
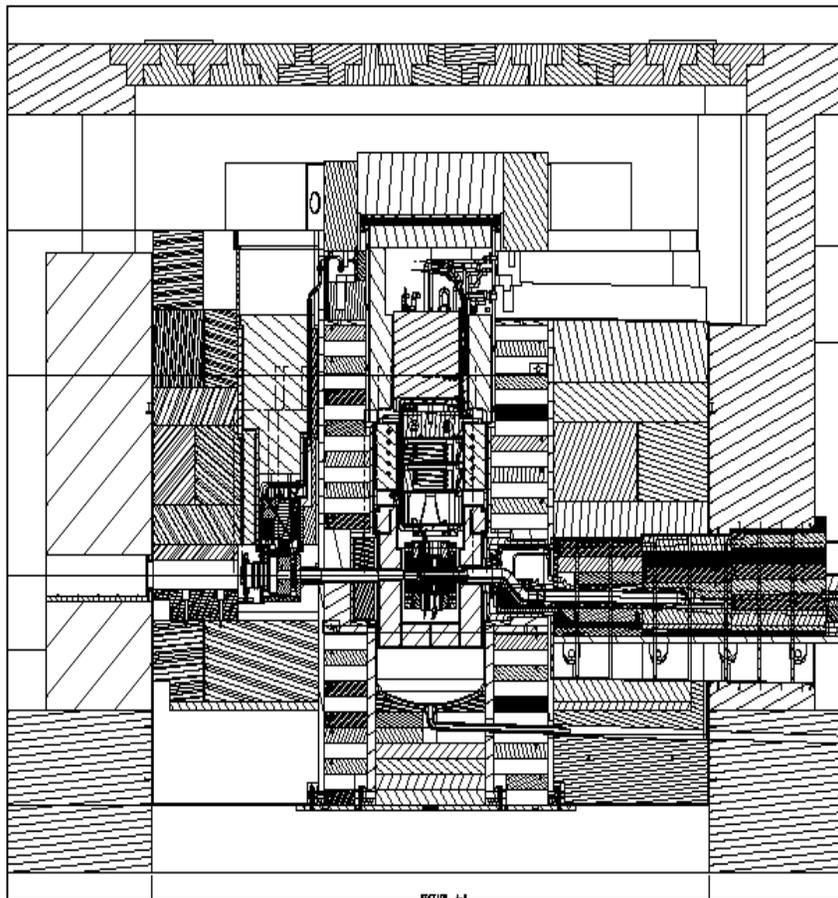


Target Systems' Installation

T. McManamy
Target Systems' Lead Engineer

Dec 13, 2001

Target Station Plan and Elevation Sections



Installation Method of Accomplishment



- **Specialized components and equipment will be CMFE**
- **The Base Award will be for installation of the following:**
 - Target Utilities (WBS 1.6.6)
 - Helium Refrigerator (Included in WBS 1.6.2)
 - Monolith Shielding and Support components below the proton beam elevation (Includes elements of WBS 1.6.4 and 1.6.5)
- **Remaining Installation Activities will be negotiated after CFC design packages are released**
 - Available design detail included in SOW to show total future scope of work and to obtain the mark-ups to be applied

Installation



- **The installation activities are organized into the following groups:**
 - Monolith (1.6.5 shielding, 1.6.4 Core Vessel and shielding and 1.6.3 reflector plugs)
 - Target Assemblies – 1.6.1 assemblies in hot cell
 - Moderator Systems – Cryogenic systems
 - Utilities – 1.6.6 Water and other utilities
 - Remote Handling Systems – Crane, windows, etc
 - Instrumentation and Controls
 - Beam Dumps

1.6 Target Installation Sequence



- **Preliminary Sequence for Monolith Installation**

- Liner (to be completed prior to start of GC activities)

- High-Density Concrete Collar

- Core Vessel Support Cylinder and Lower Shielding

Base Award

- Bottom Blocks

- Core Vessel and Shielding

- Shutter Housings and Supports and Shielding

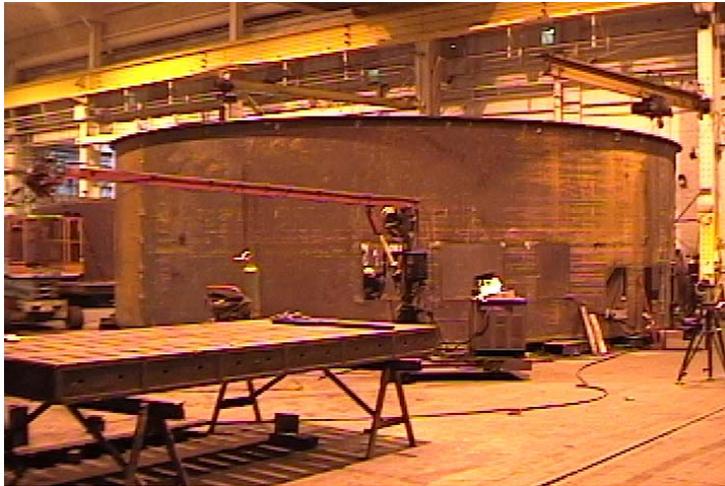
- Core Vessel Inserts

- Shutter Gates, Top Blocks, Drives

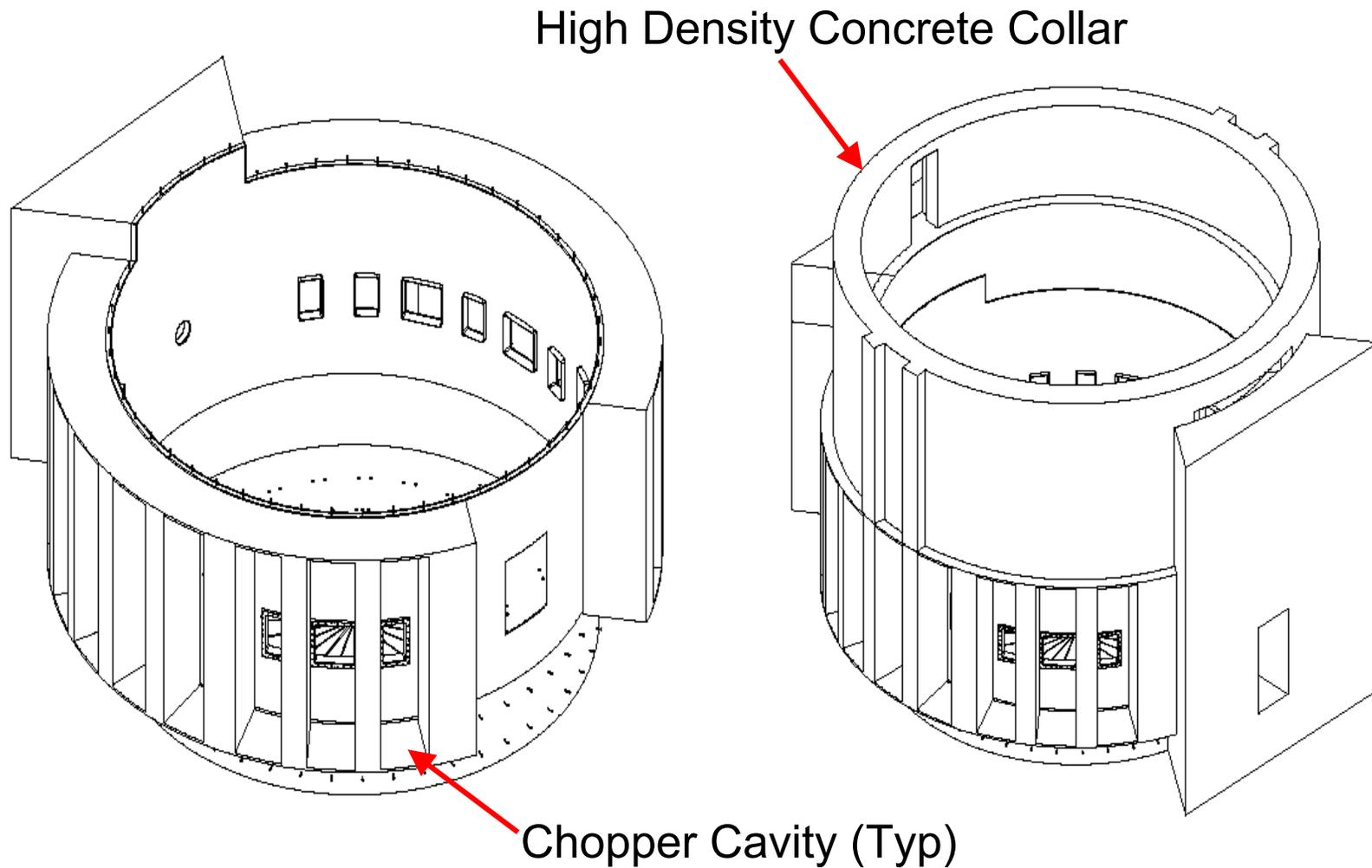
- Piping “Pan,” Utility Connections and Shielding

- Shine Shield After Testing

Liner at Concord Steel



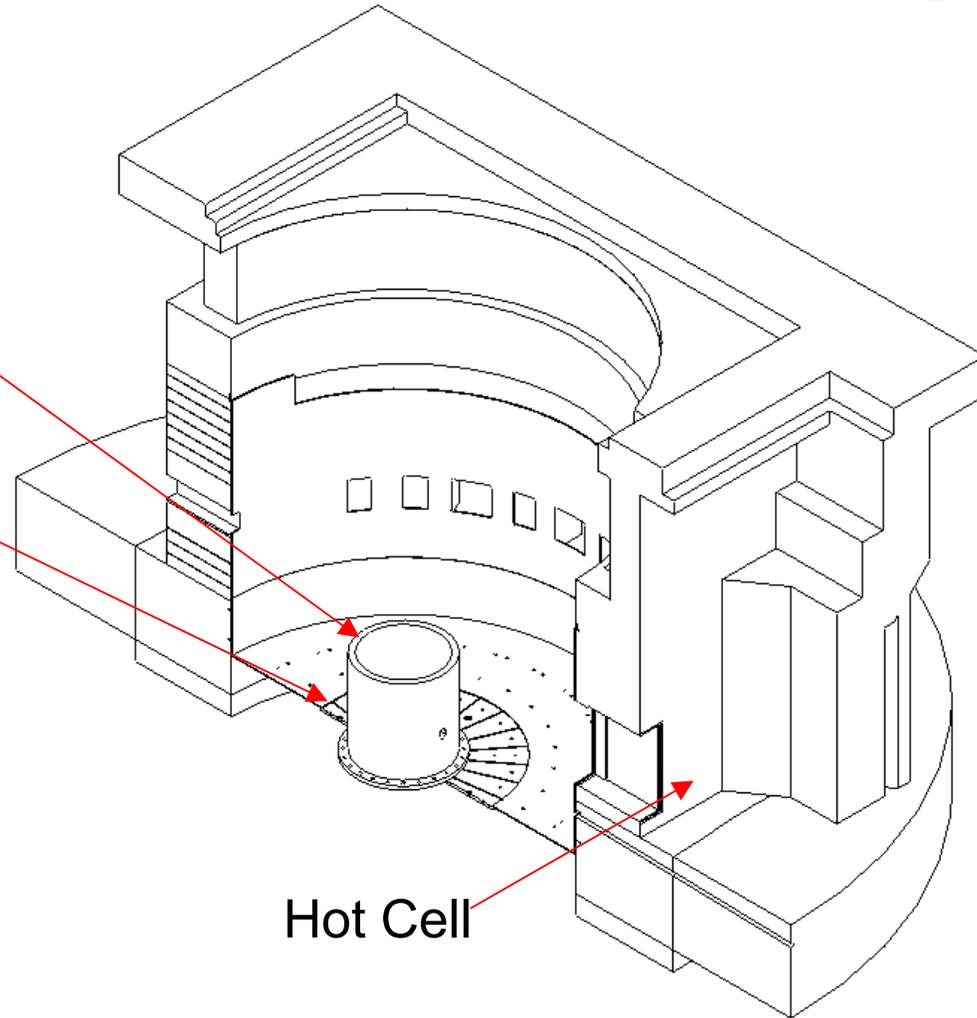
Chopper Steel and Concrete Collar



Start of Bulk Shielding Installation March 2003

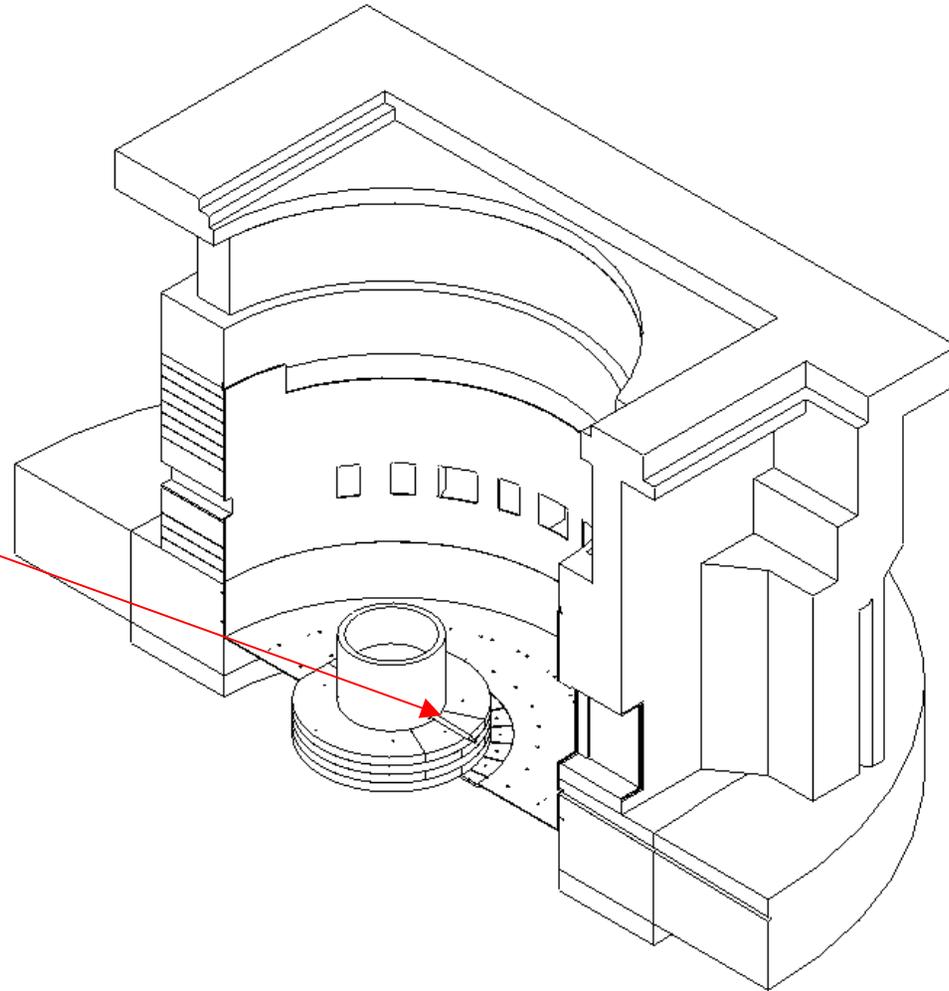


- **Support Cylinder for core vessel assembly.**
- **Lower shielding.**



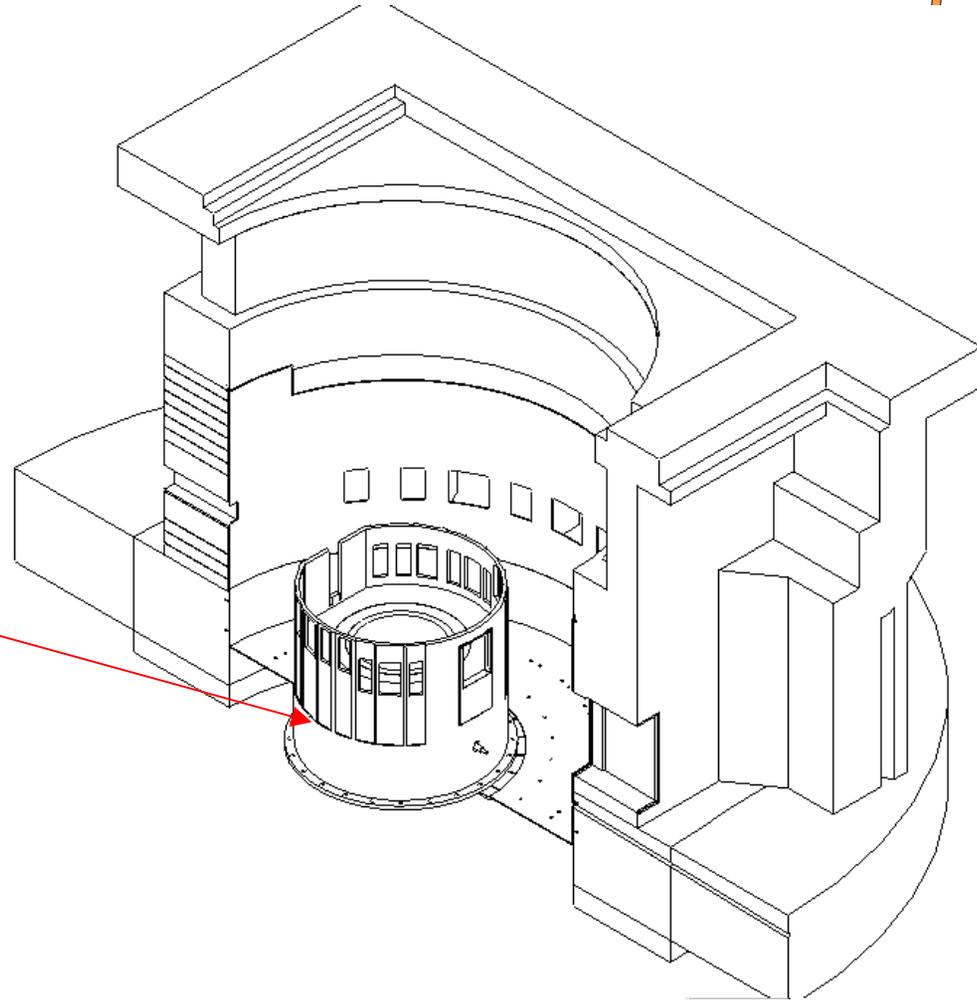
Core Vessel Shielding and Drain Line

- **Lower Shielding under core vessel.**
- **Part of core vessel drain line.**



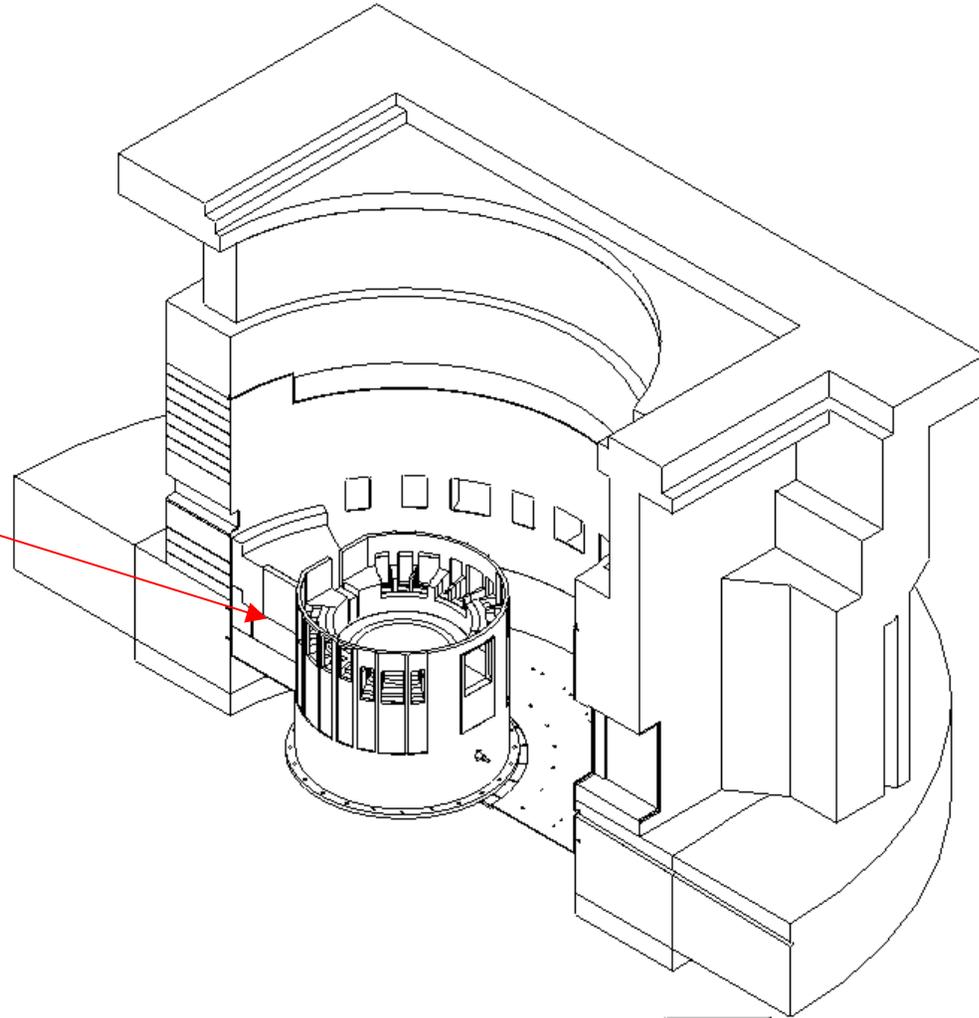
Lower Outer Support Cylinder

- Remaining lower shielding.
- Collection region shielding.
- Lower Outer support cylinder.

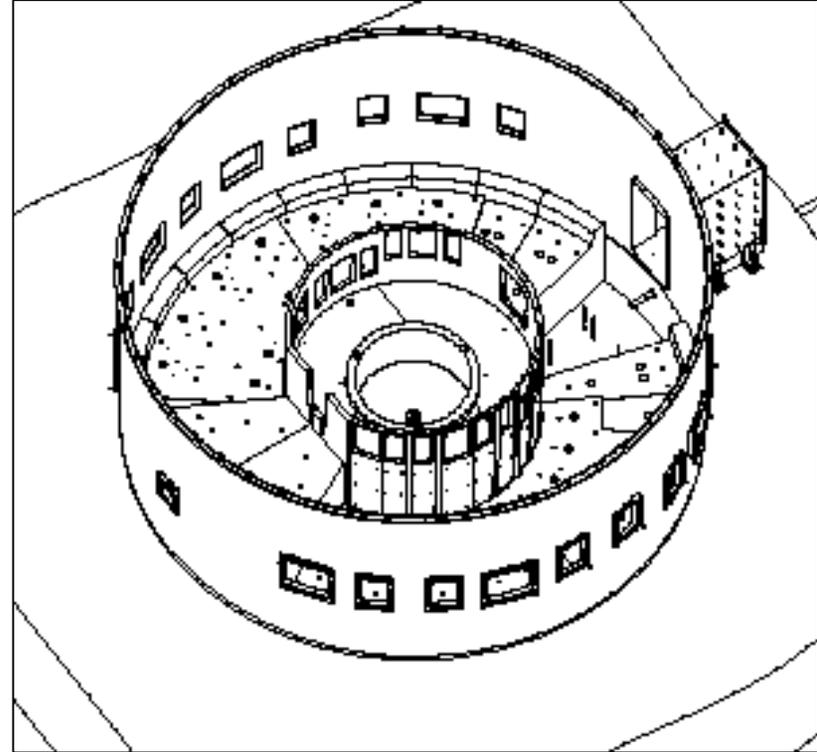
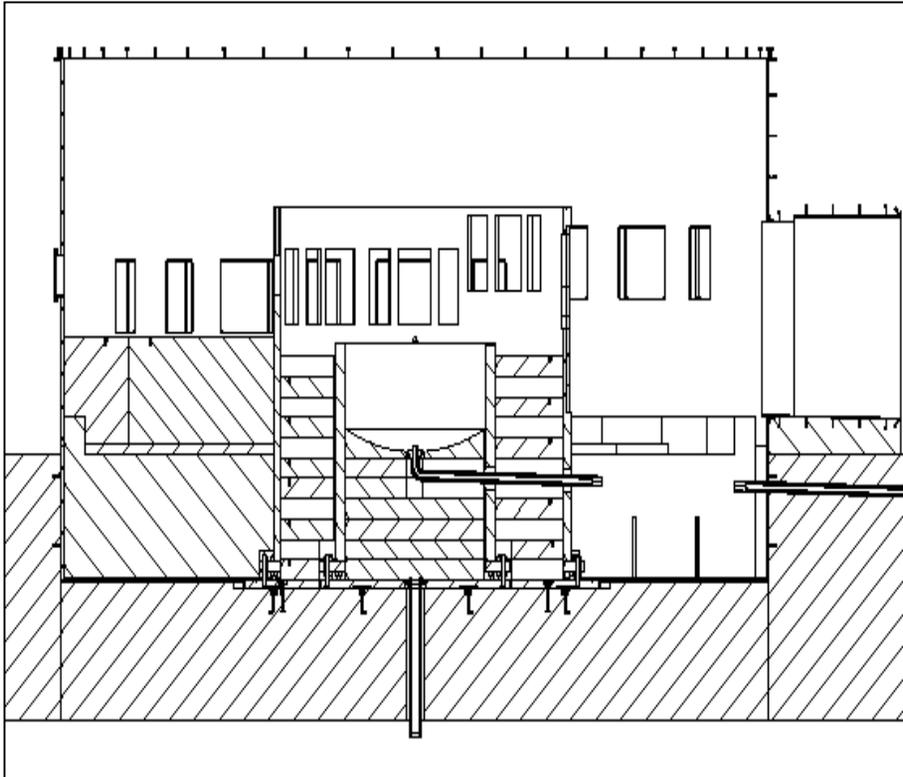


1.6.5 Shielding by Proton Beam Window

- Shielding and base for proton beam window cavity.

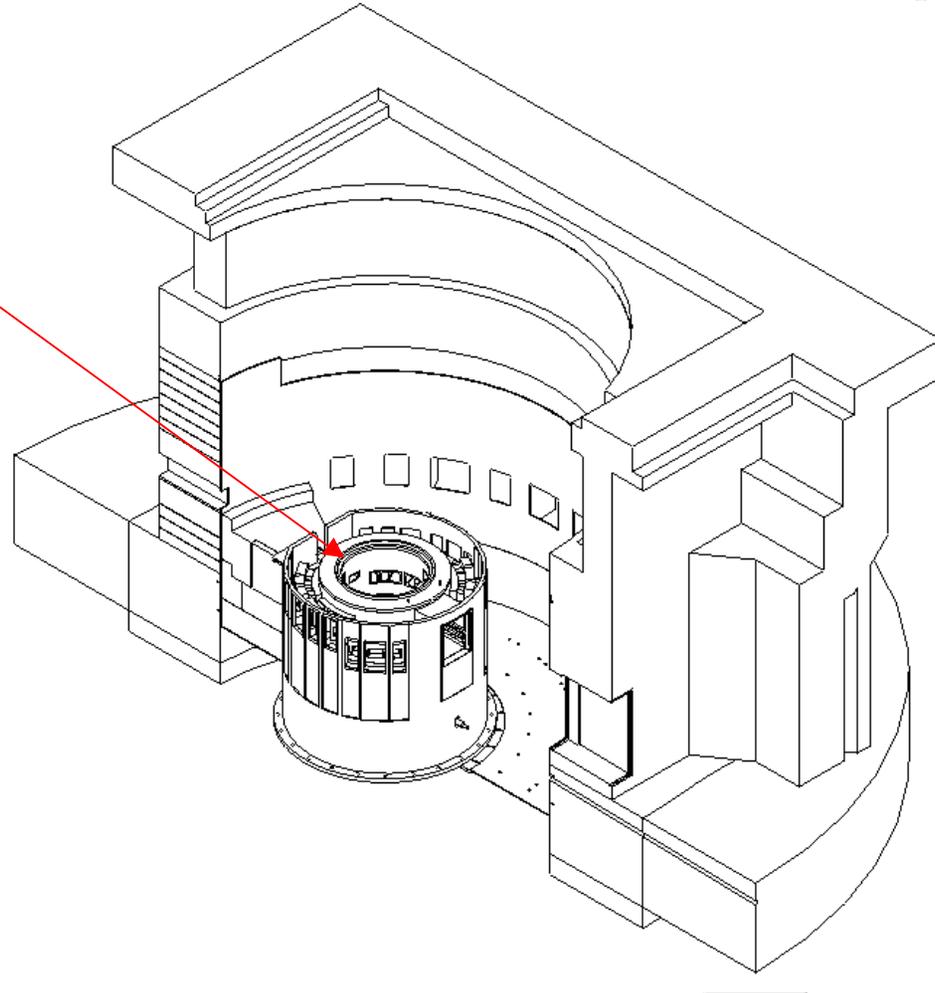


Base Award Portion of Monolith Installation

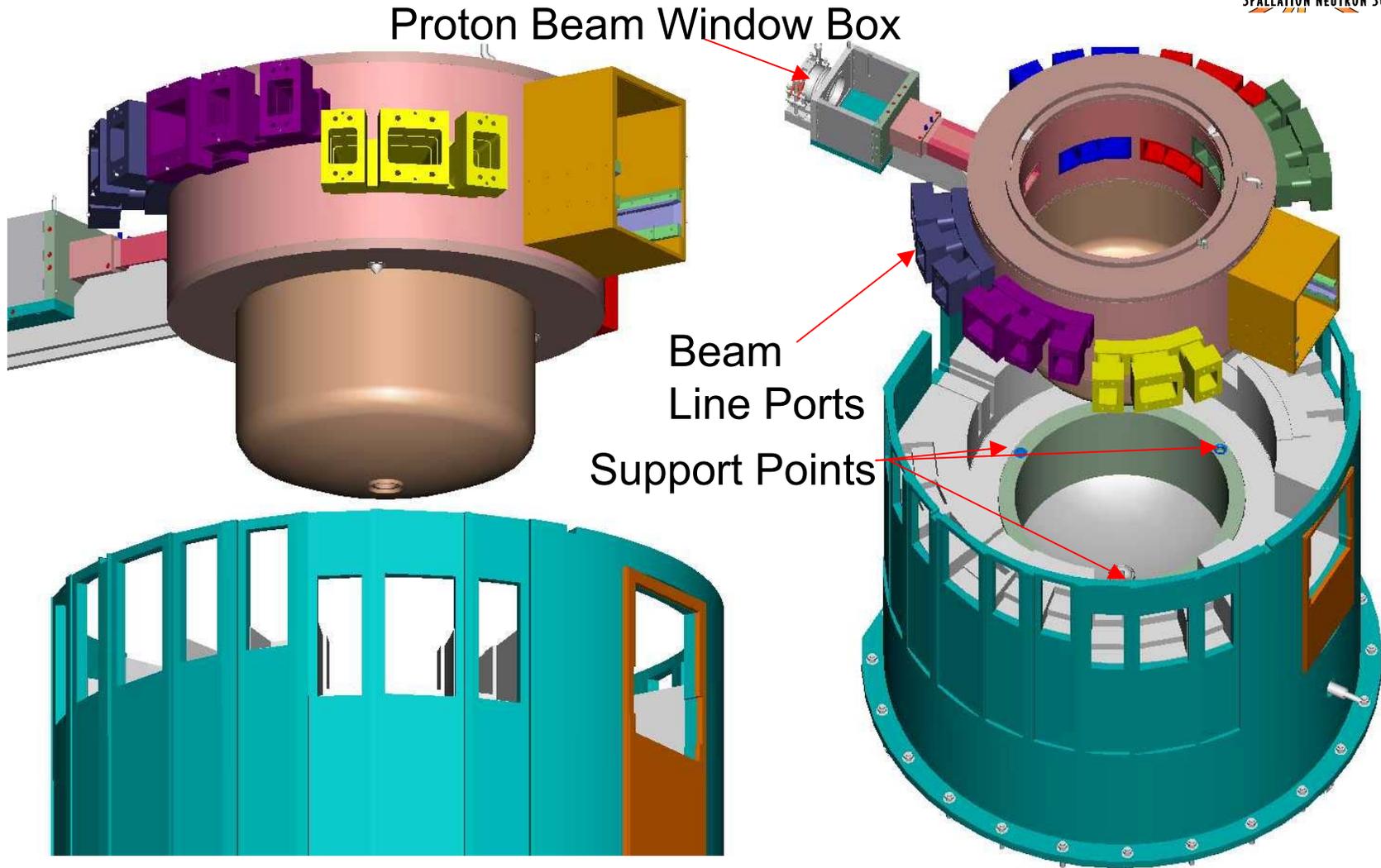


Core Vessel Middle Section

- 50 ton middle section of core vessel installed on support cylinder with temporary crane.
- Includes Proton Beam Window support shelf.
- Drain line connections.

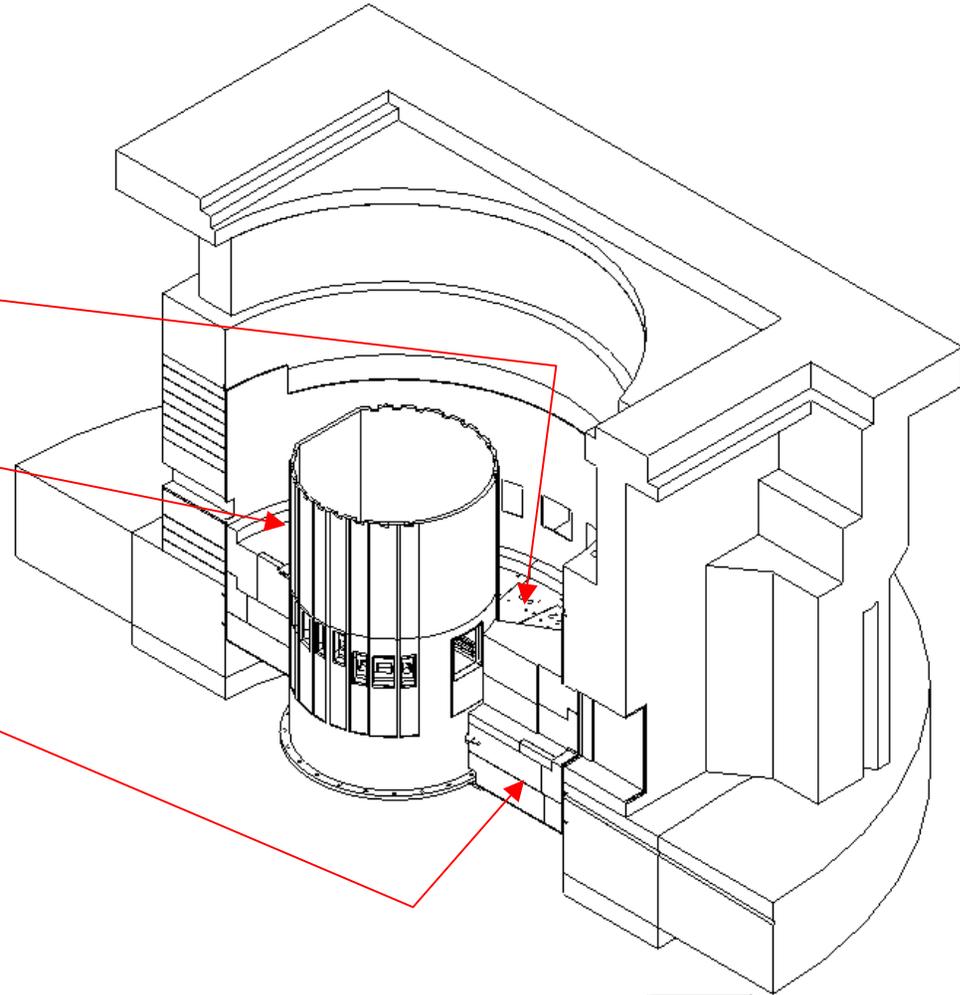


Core Vessel Middle Section Installation



Shielding Addition

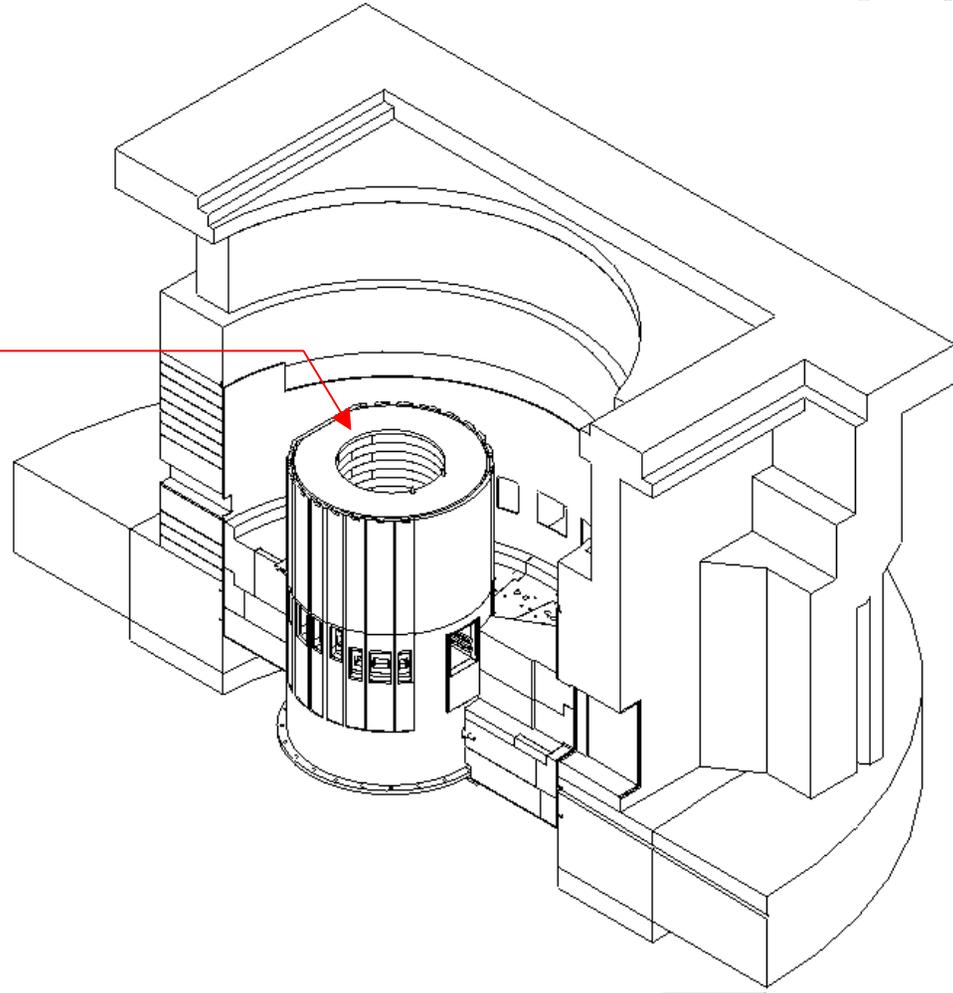
- **Bottom shield block array.**
- **Upper support cylinder.**
- **Foundation for liner to hot cell.**



Shielding Internal to Shutter Support Cylinder

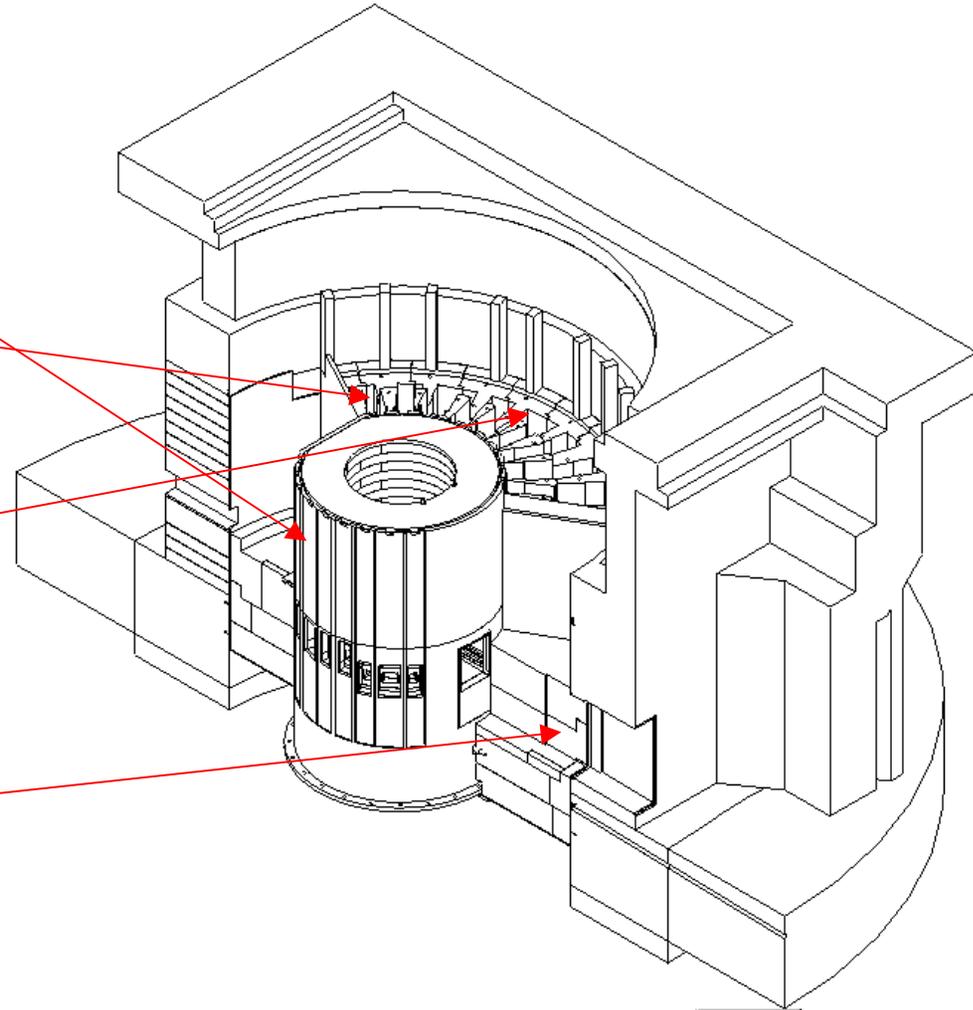


- **Shielding rings added above middle section of core vessel within support cylinder.**



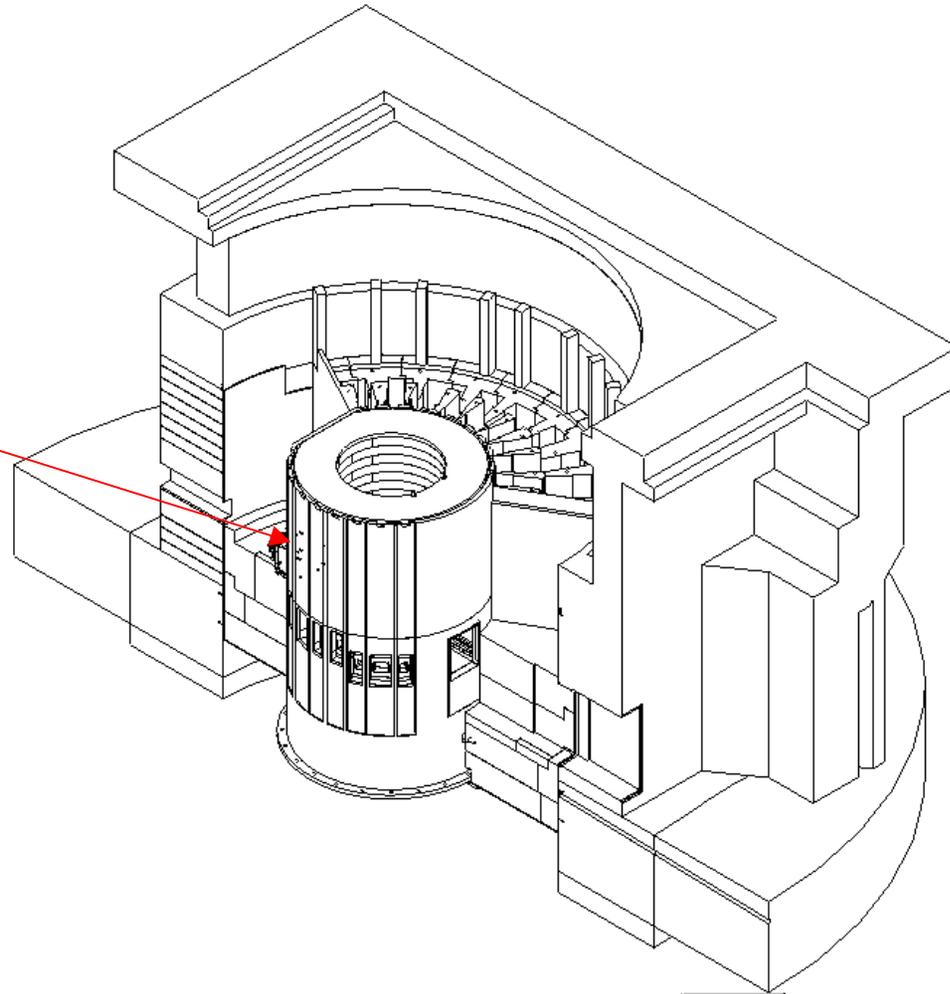
Shutter System Installation Start

- **Shutter inner guide rails.**
- **Shielding between shutter gates.**
- **Shutter outer support and guide rails.**
- **Liner between core vessel and hot cell.**



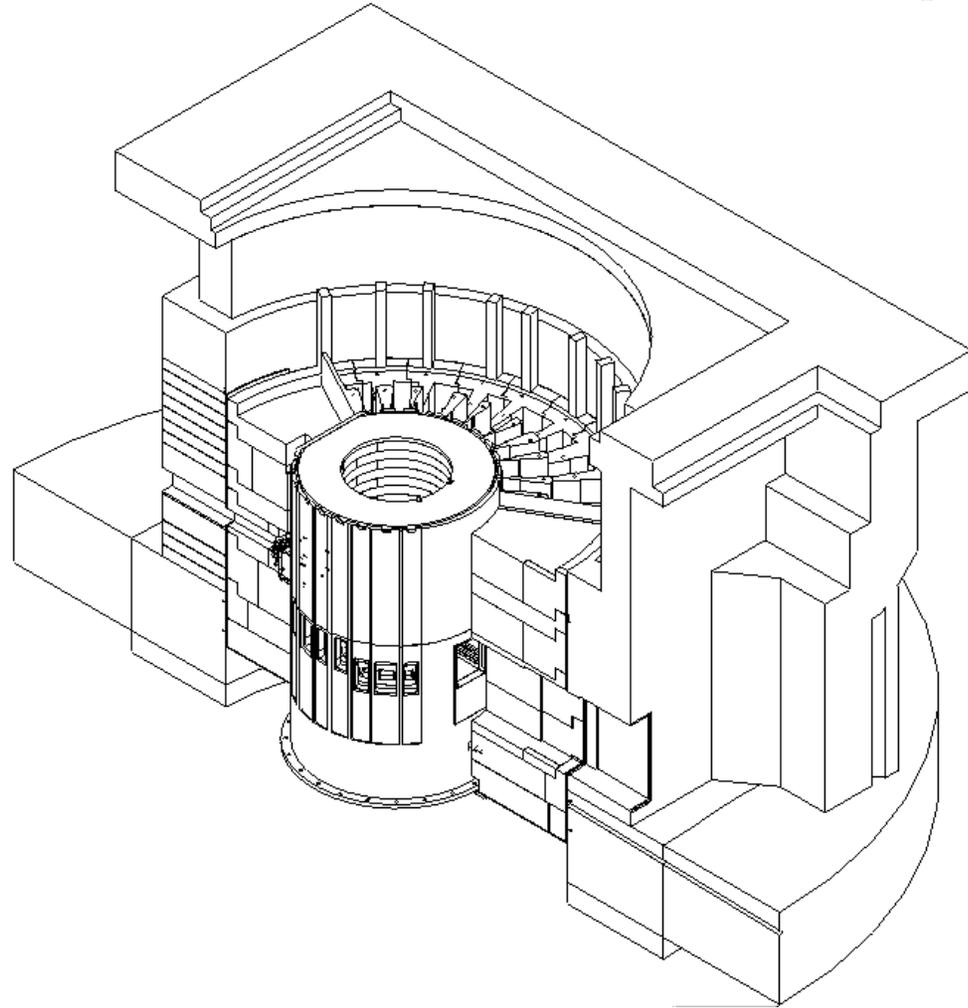
Proton Beam Window Components

- Lower Proton beam window assembly.



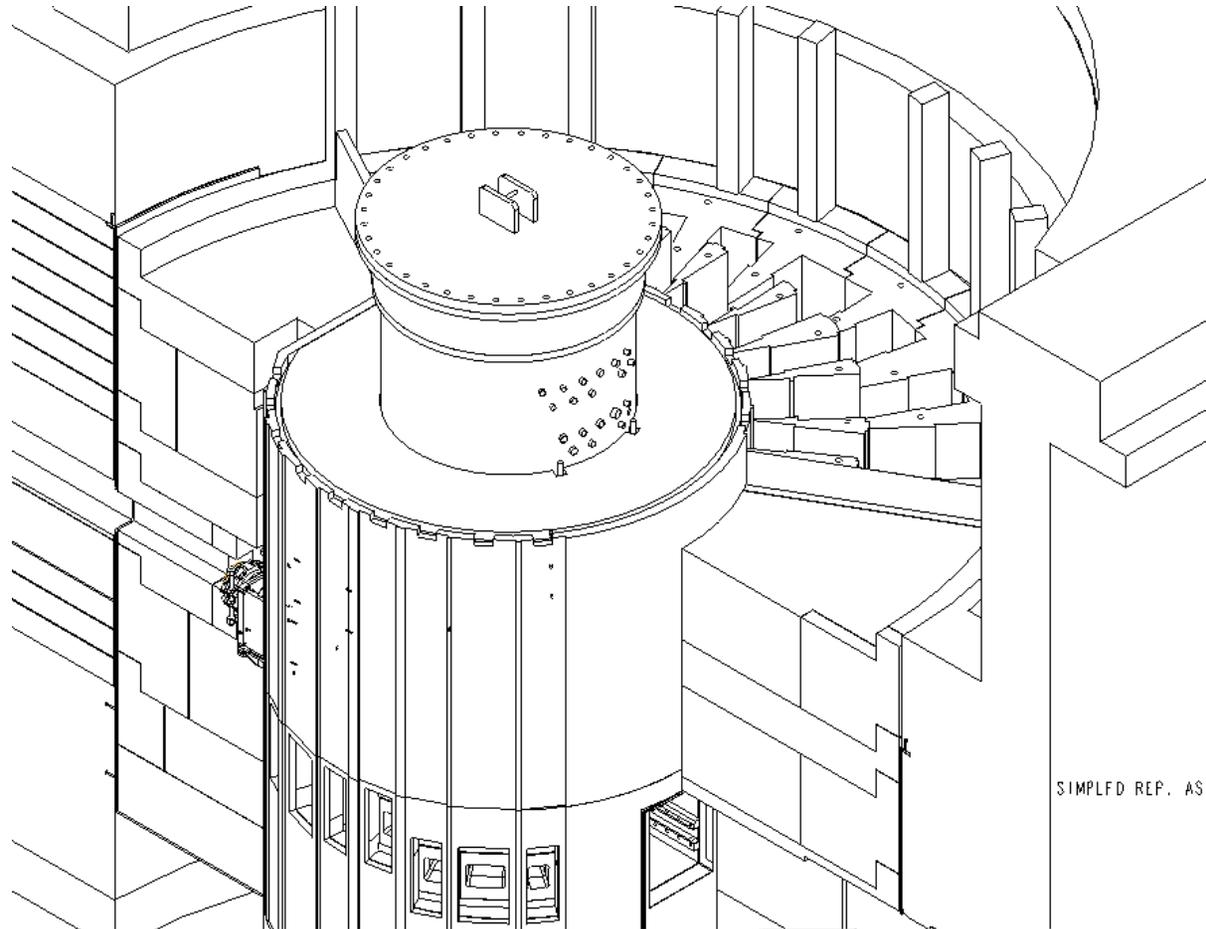
1.6.5 Bulk Shielding

- Remaining shielding up to shutter top block base elevation.



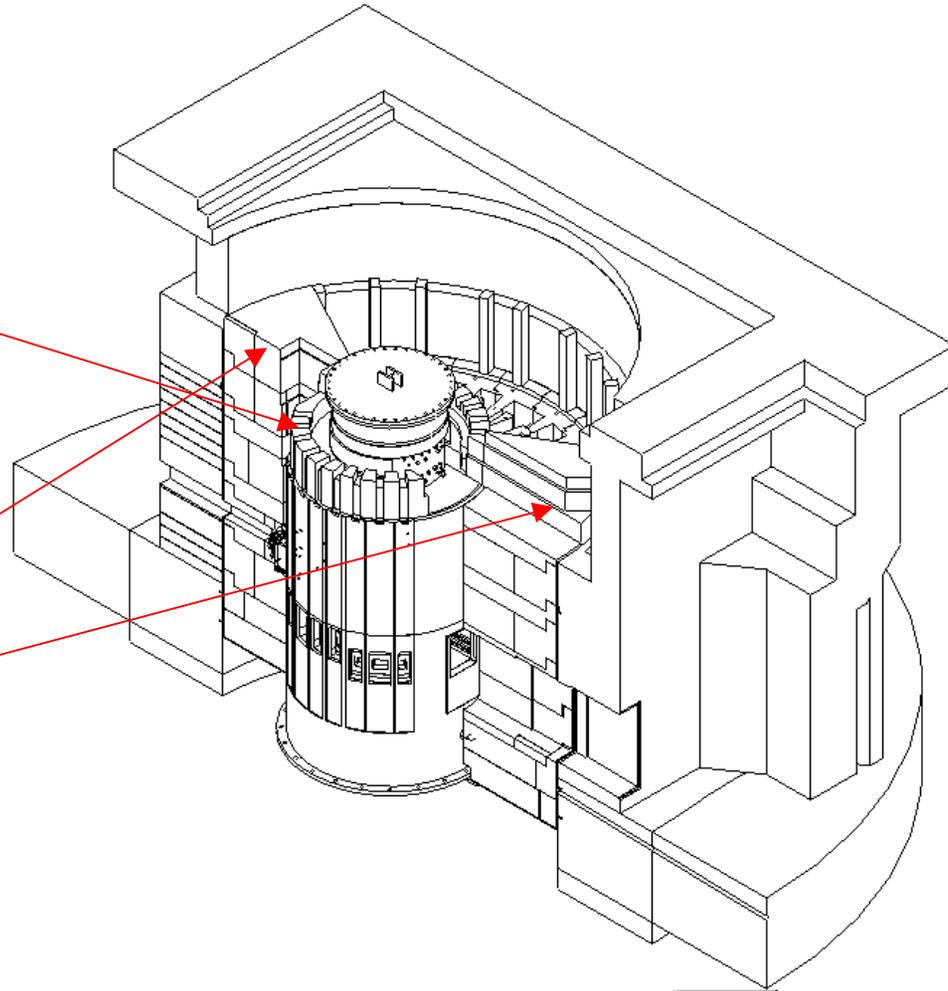
Core Vessel Chimney Installation

- Core vessel chimney installed within upper shielding and welded to middle core vessel section.



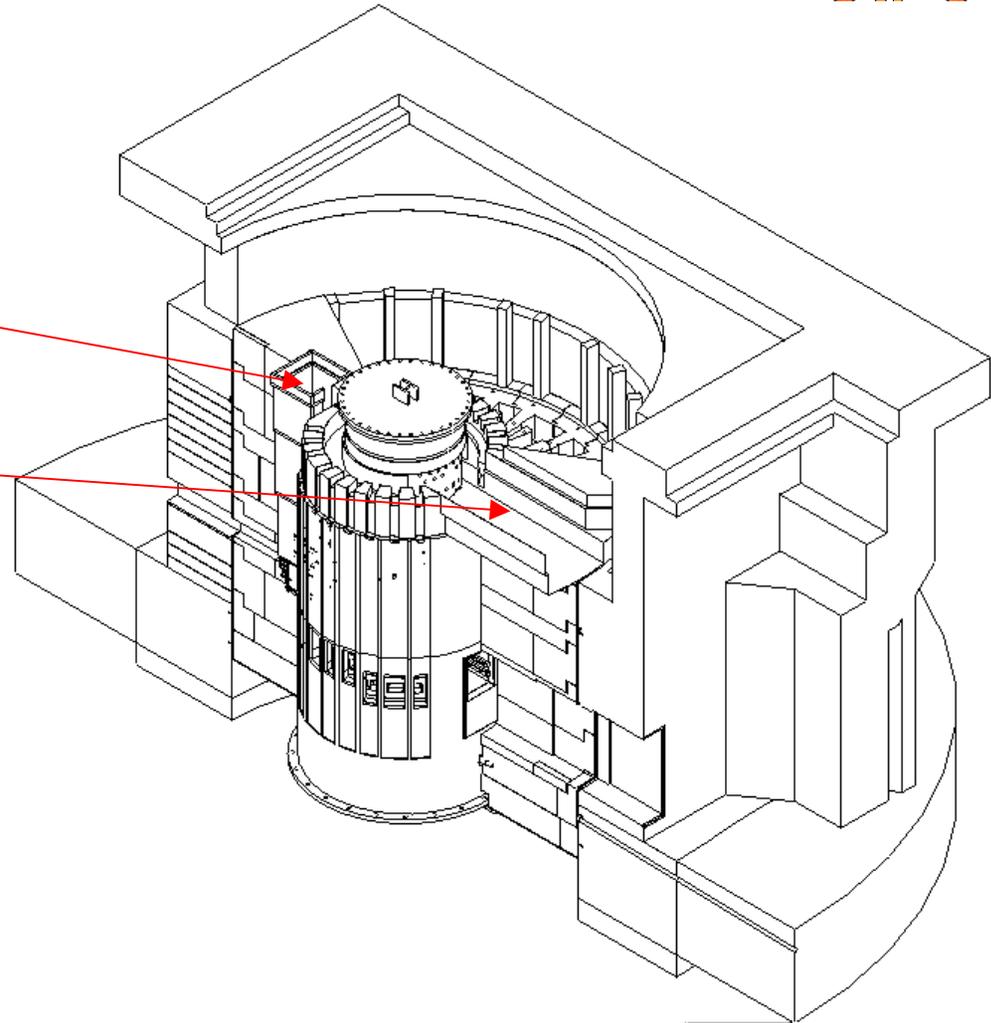
Shielding Installation

- Shielding around utility piping chase by top of core vessel.
- Final shielding above proton beam window and target cart liner regions.



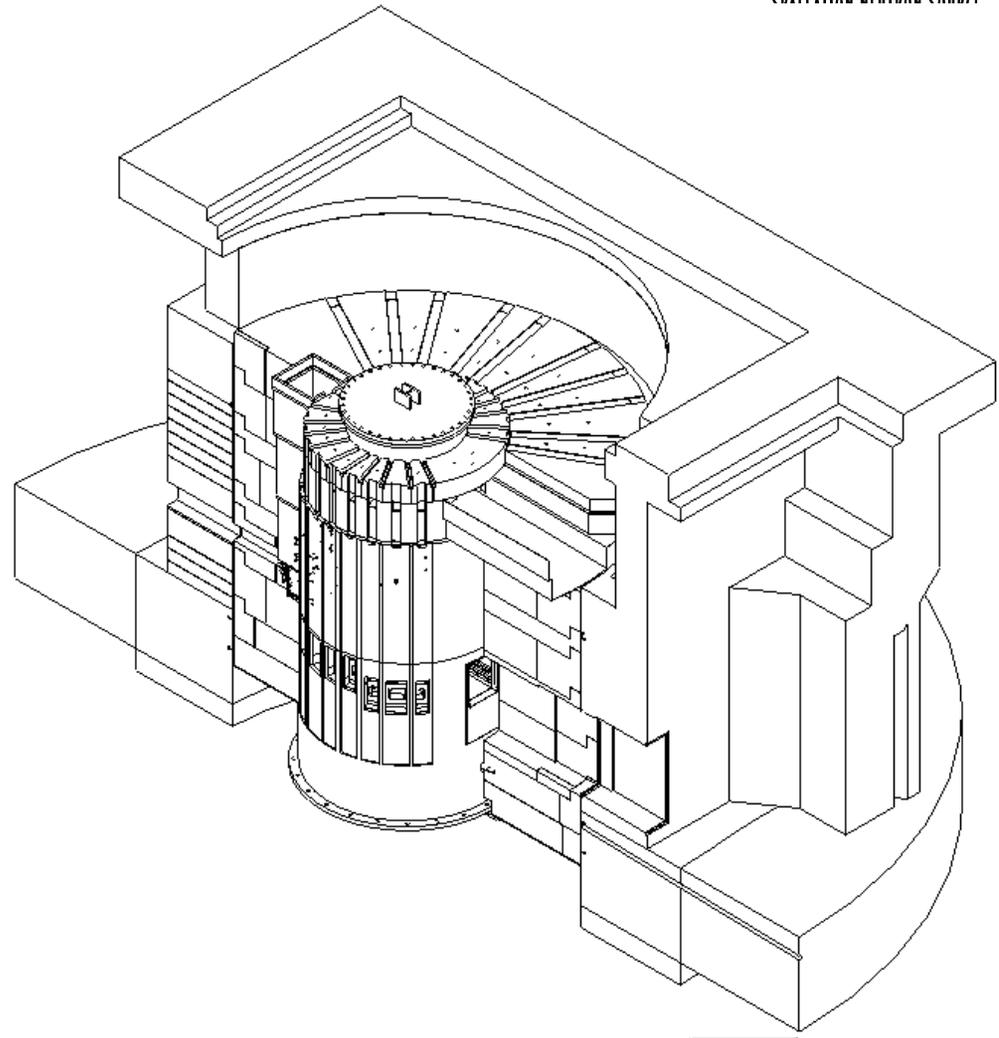
Piping Pan and Proton Beam Window Enclosure

- Proton beam window enclosure and support assembly.
- Utility piping pan field fabricated and installed.
- Piping manifolds (Part of Utilities).
- Reflector Plug installation.



Multiple Component Installation

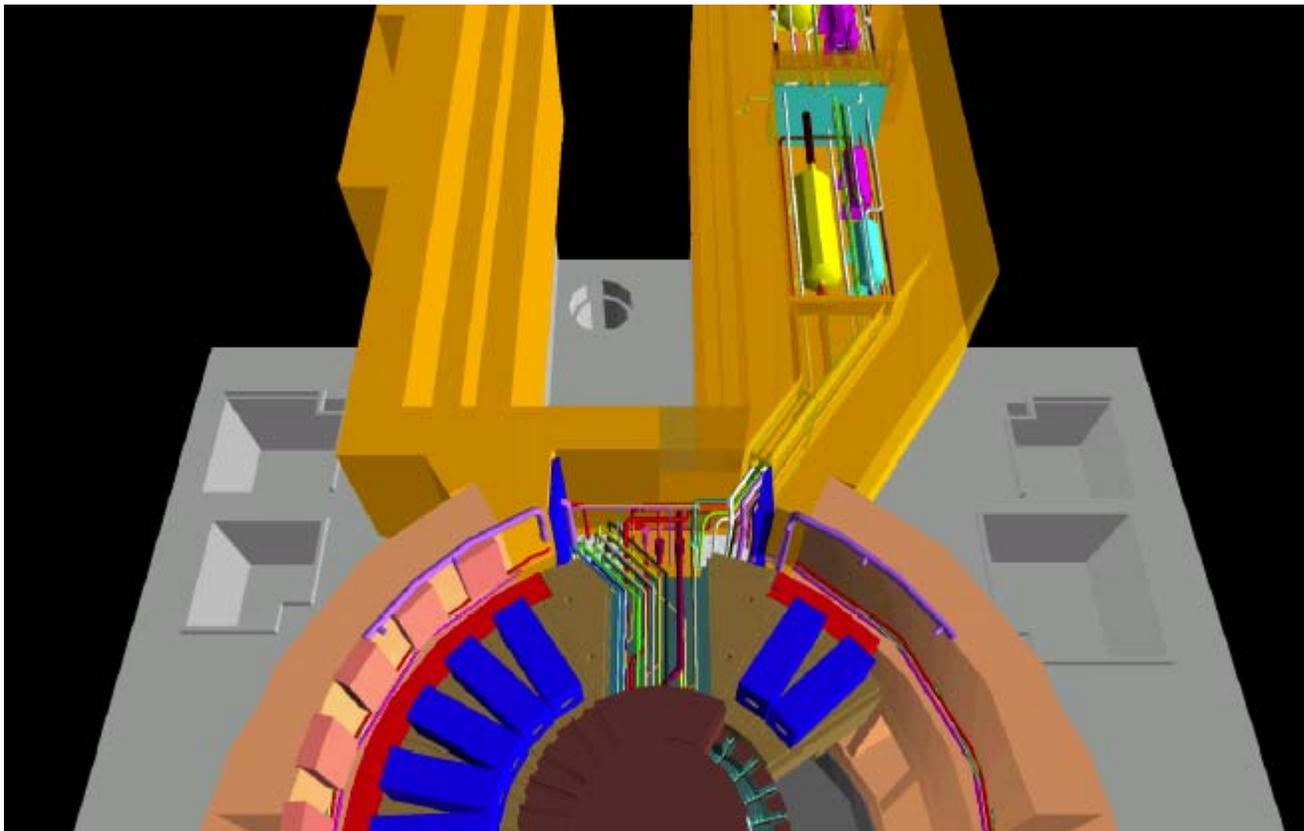
- Core vessel inserts using remote handling tooling by SNS technicians.
- Shutter gates.
- Shutter top blocks.
- Piping connections to delay tanks and manifolds.
- Proton Beam window assembly with RM tooling and utility connections.
- Shielding above piping.



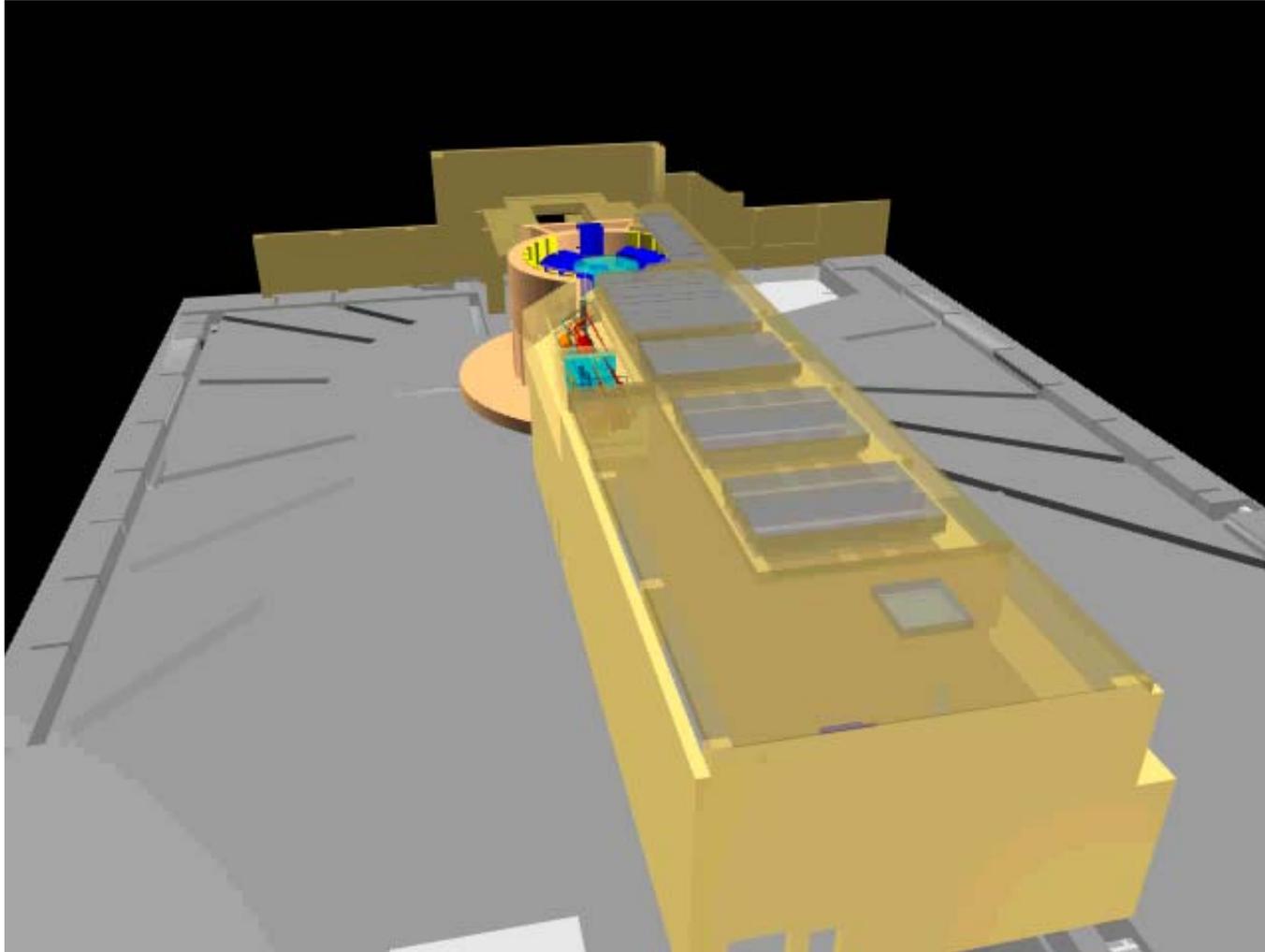
1.6.6 Utility Systems Components in Stack Region



Piping & Equip. Top of Shield Stack/Tank Cavities/Drain Tank Pits

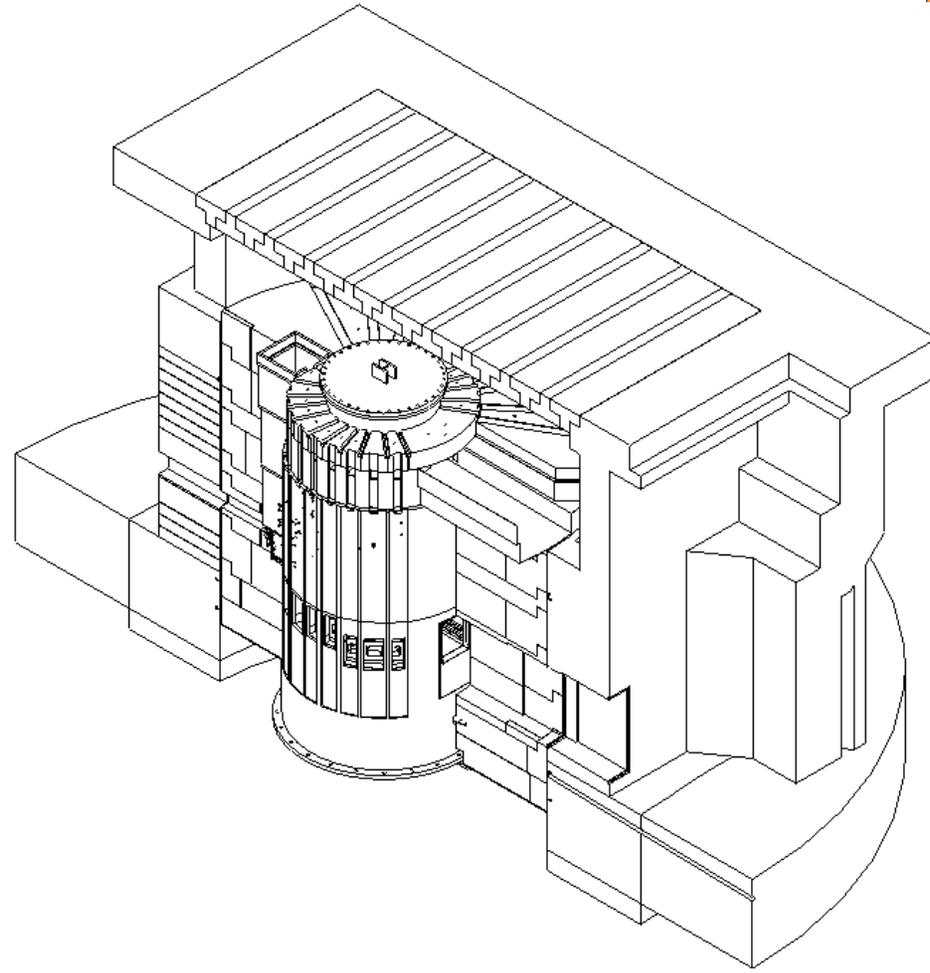


Utility Piping in High Bay and Monolith Region



Monolith Completion

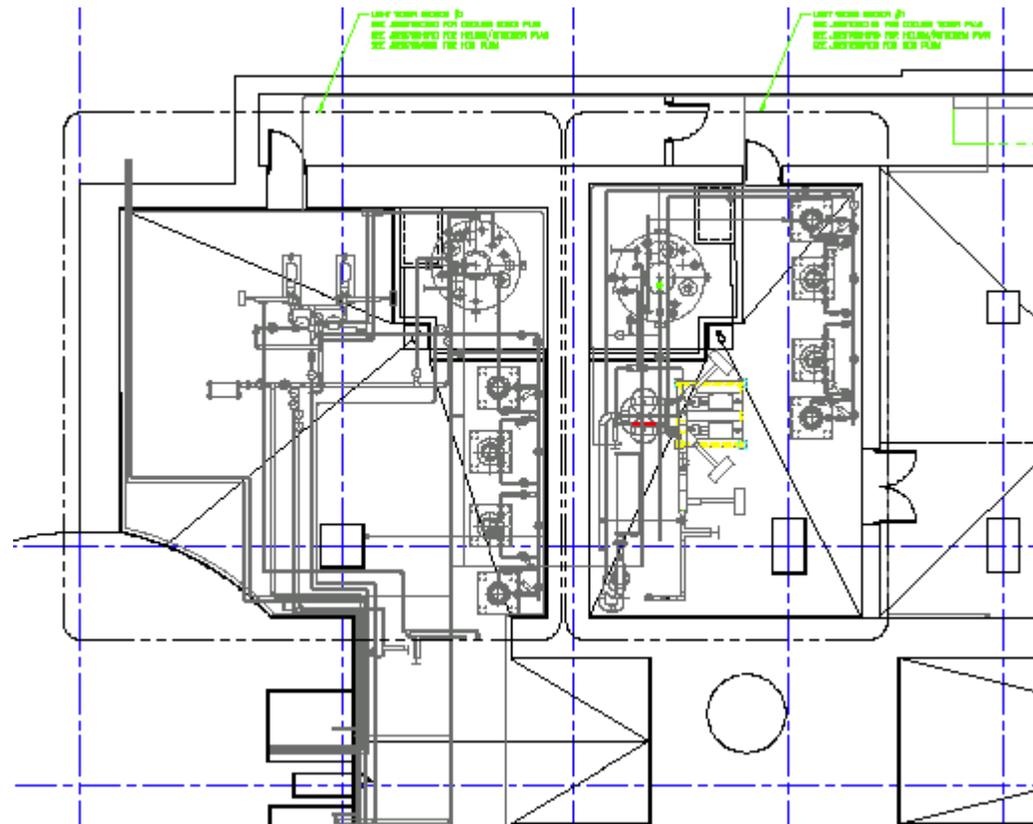
- **Shutter Drives.**
- **Utility cabinets for core vessel and shutter inserts.**
- **Cryogenic transfer line.**
- **Subsystem testing.**
- **Shine shielding.**



1.6.6 Utility Systems



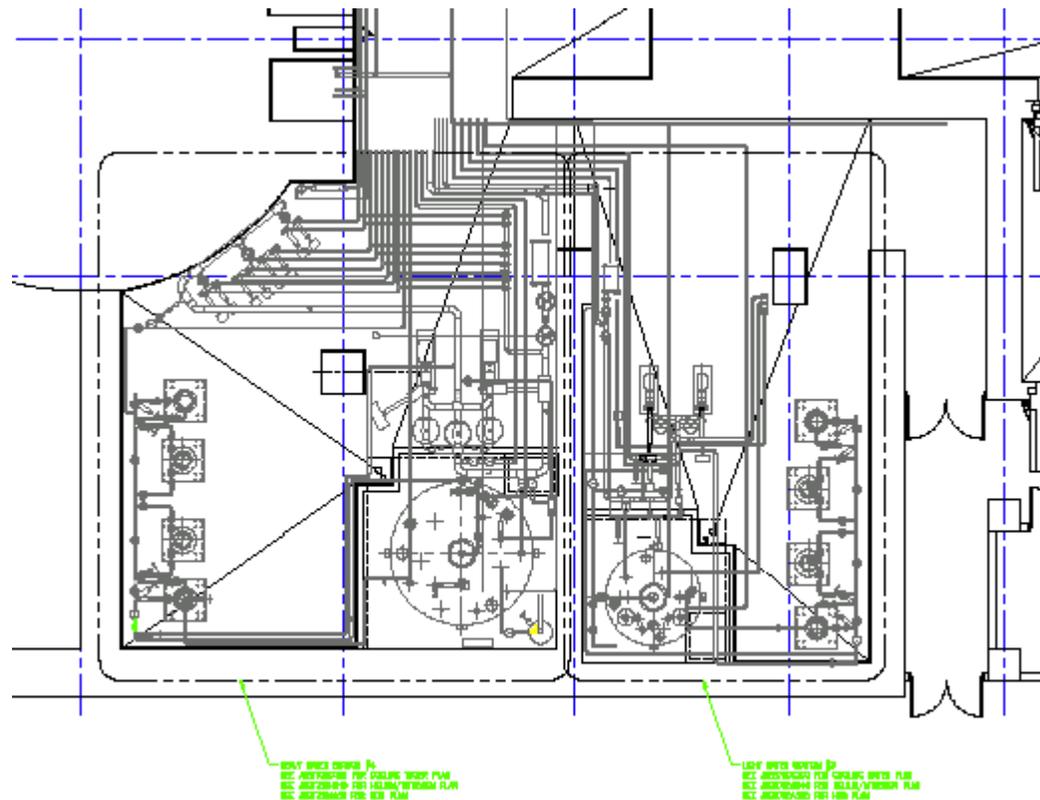
Light Water #2 and #1 Basement Vault Layouts



1.6.6 Utility Systems

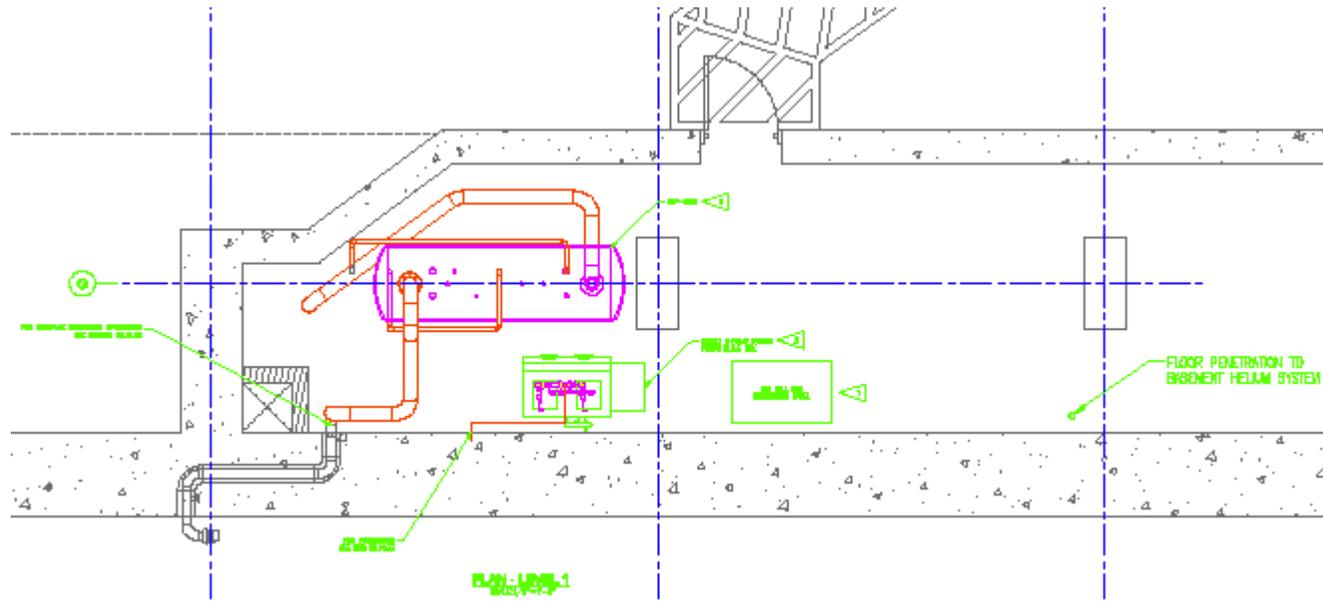


Heavy Water #4 and Light Water #3 Basement Vault Layouts



1.6.6 Utility Systems

Target Utility Equipment in Service Gallery



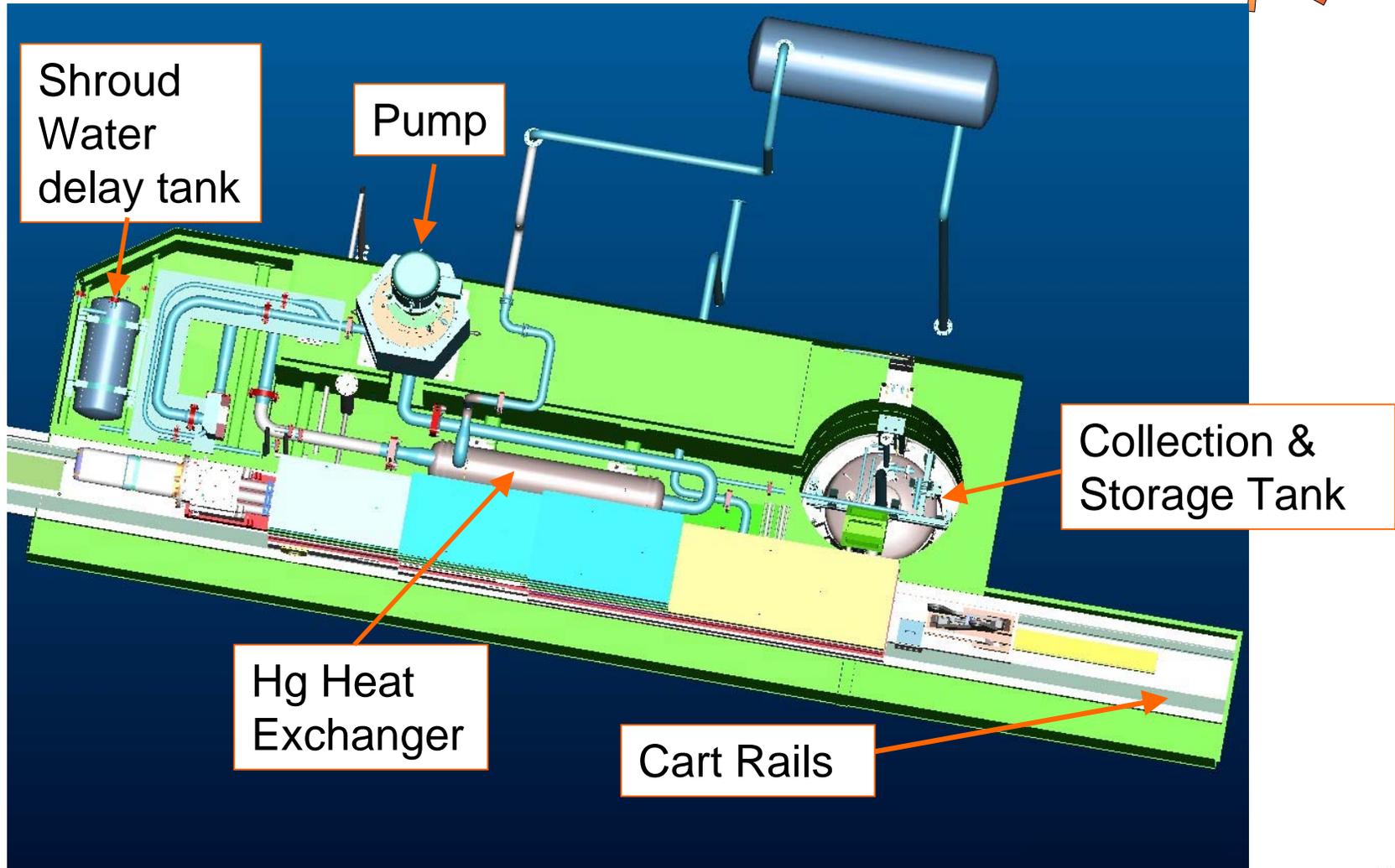
Hot Cell

Hot Cell Installation – Sequence Planning



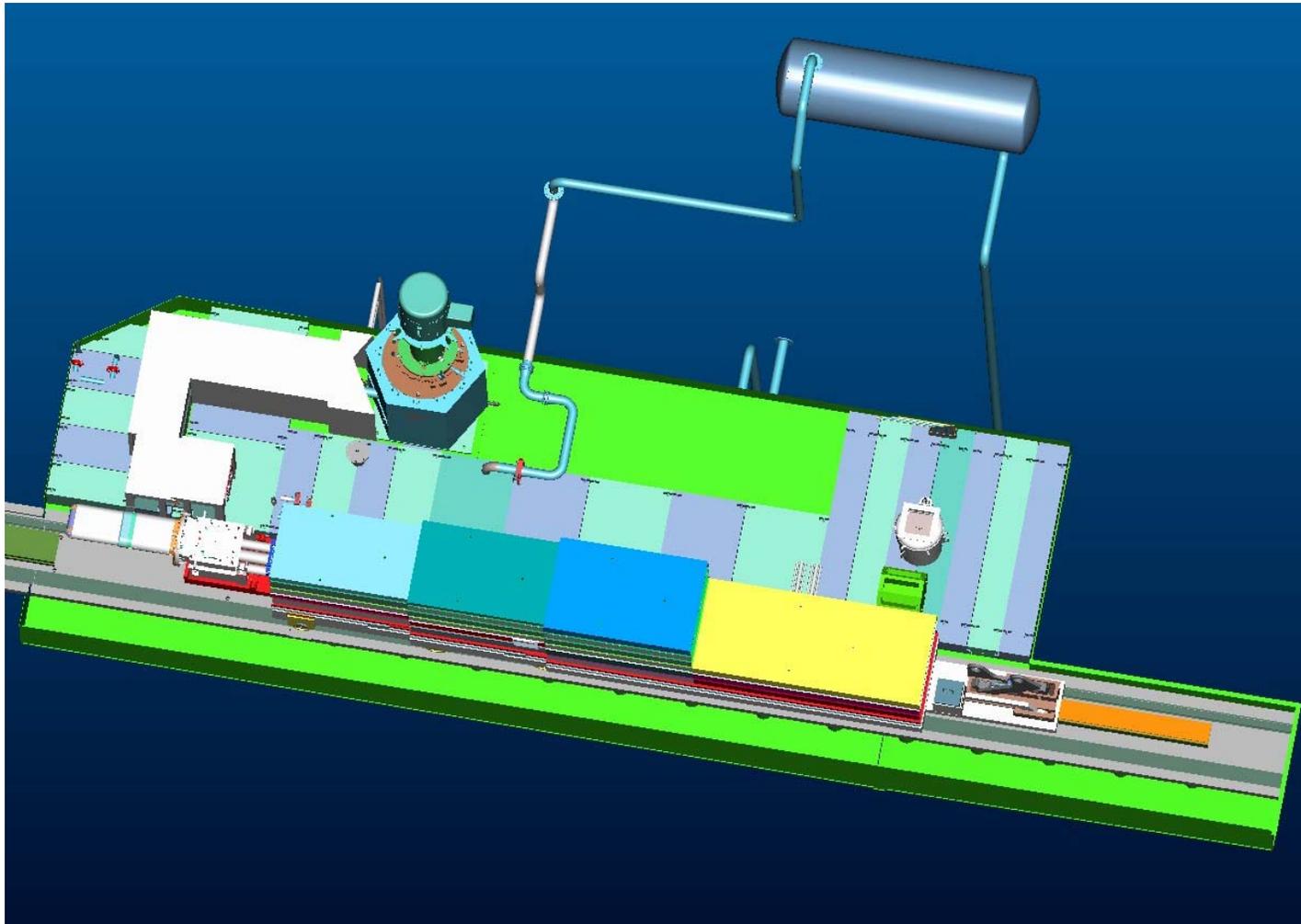
- **Process Loop**
 - 7.5 Ton Crane
 - Collection/Storage Tank
 - Heat Exchanger
 - Mercury Process Piping and Pump
 - Utility Piping
 - Process Shielding
- **Target Plug (start when liner from core vessel to cell is complete)**
 - Target Rails and Rail Shielding
 - Target Carriage and Drive
 - Telemanipulator
 - Target Module (by others)

WBS 1.6.1.2 Process Bay Equipment



2000-0xxxx/v1b

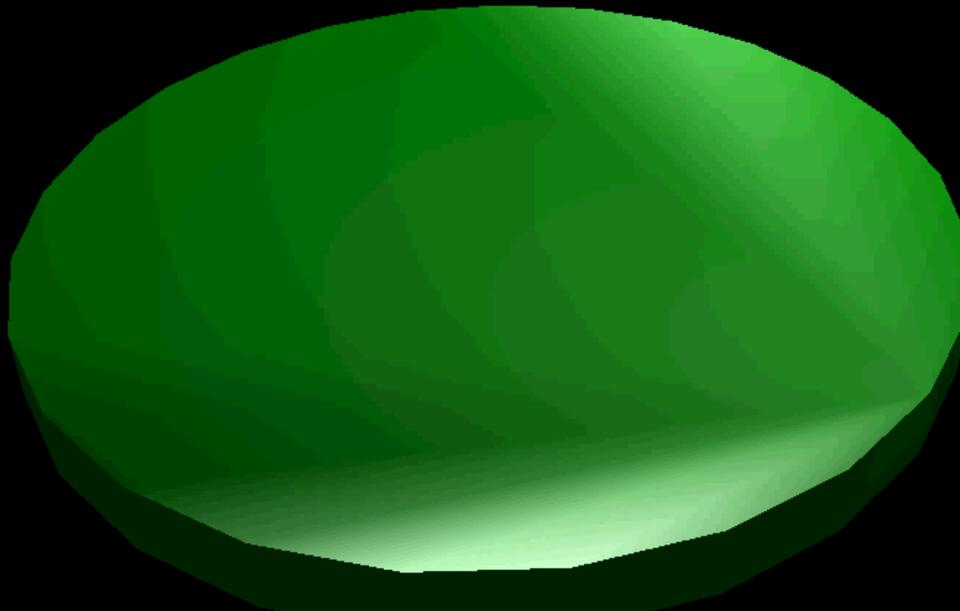
Hot Cell With Process Shielding Installed



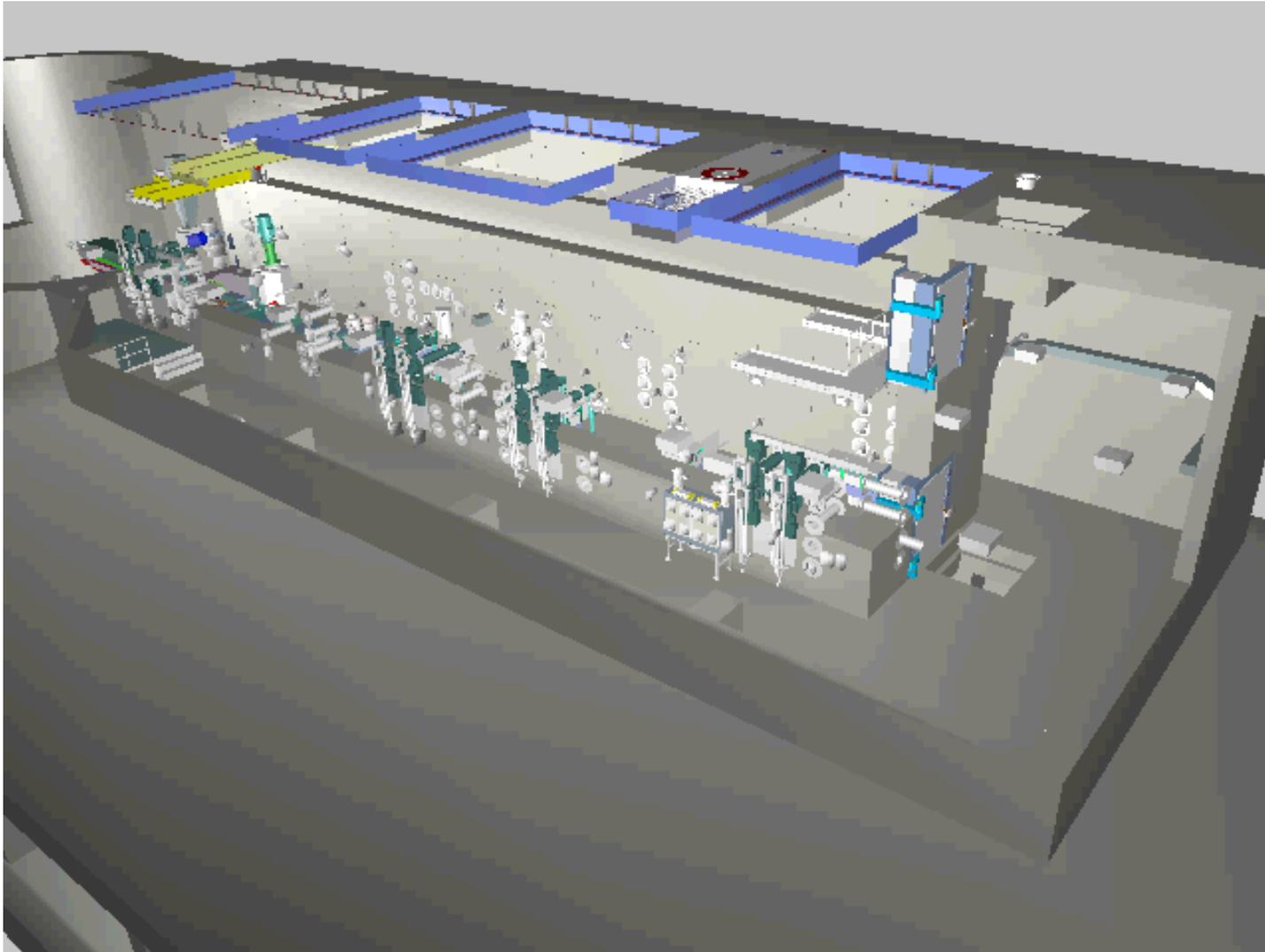
Monolith Assembly Sequence



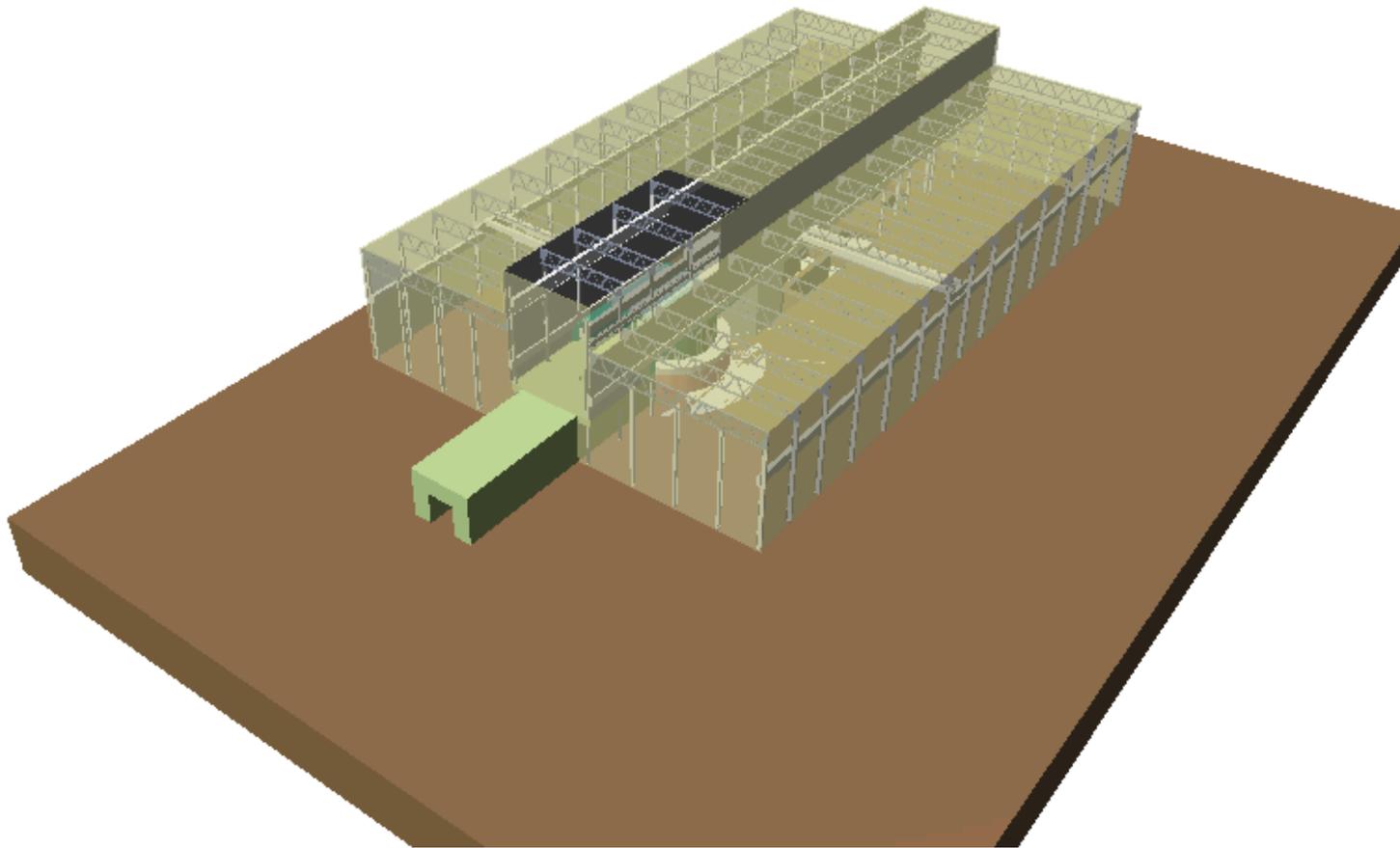
01/01/2002



Hot Cell Animation



Helium Refrigeration System Installation



Summary



- **Preliminary sequences developed for installation**
- **Statement of Work and Installation packages for Base Award Installation developed**
- **Installation packages for remaining systems will be released and negotiated after January 2002**