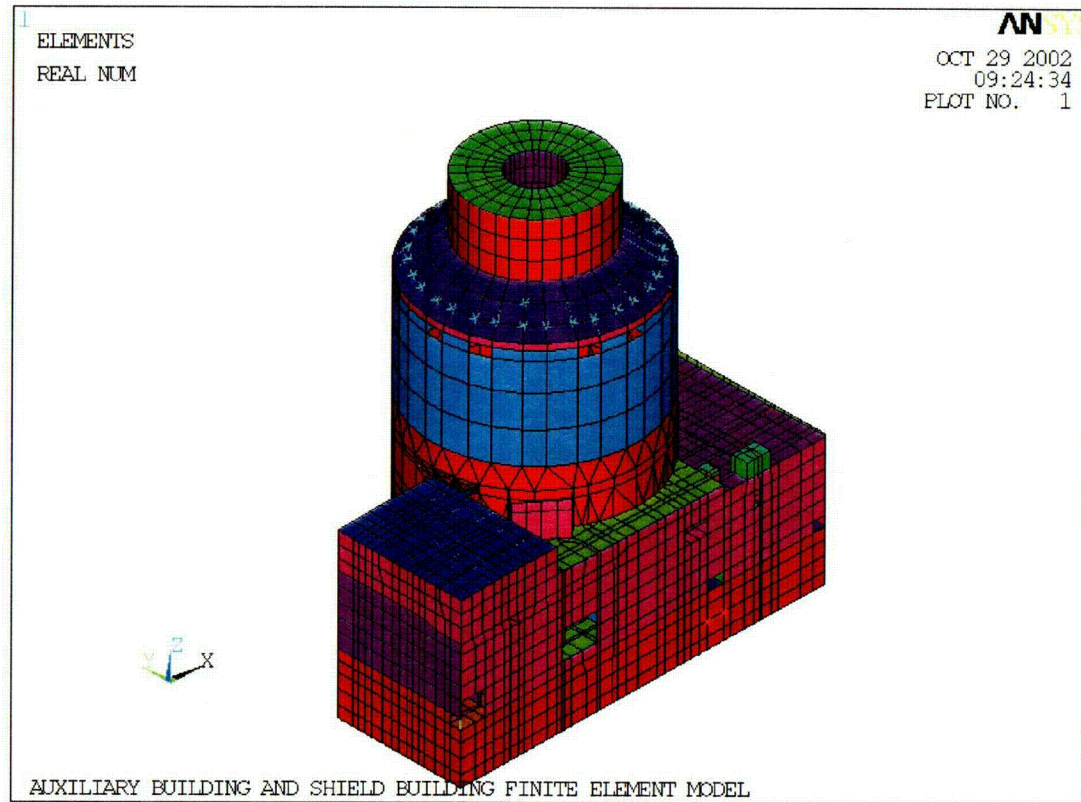


AP1000 Seismic and Structural Review

April 2 - 4, 2003



Richard Orr and Narendra Prasad

AP600 & AP1000 projects

412-374-5924 / 6317 - orrrs@westinghouse.com

AP1000 Seismic and Structural Review

- **Introduction**
- **AP1000 Structural Differences from AP600**
- **Summary of Seismic Analyses (November, 2002 meeting)**
- **Critical Section Overview and Documentation**
- **Draft revisions to DCD**
- **RAI Status**

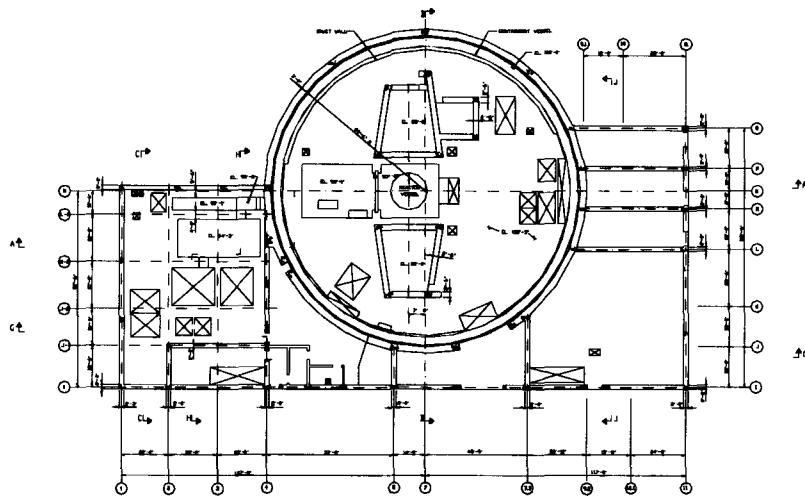
AP1000 vs AP600 Structures

- **Shield building raised by 25'6"**
- **PCS tank capacity increased to 800,000 gal.**
- **PCS air inlets reconfigured to 12' x 6.5'**
- **Containment vessel raised by 25'6"**
- **Polar crane raised and capacity increased**
- **RCS equipment increased in size**
- **Steam generator and pressurizer compartment walls raised**
- **Fuel pit floor elevations lowered by 18.5"**

AP1000 Structural Arrangement

Plan at Elevation 135'

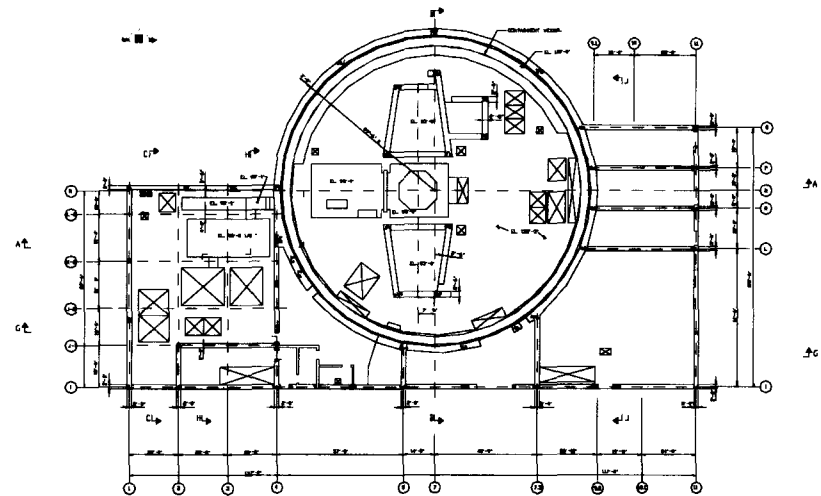
AP600



AP600

EL. 135'-3"

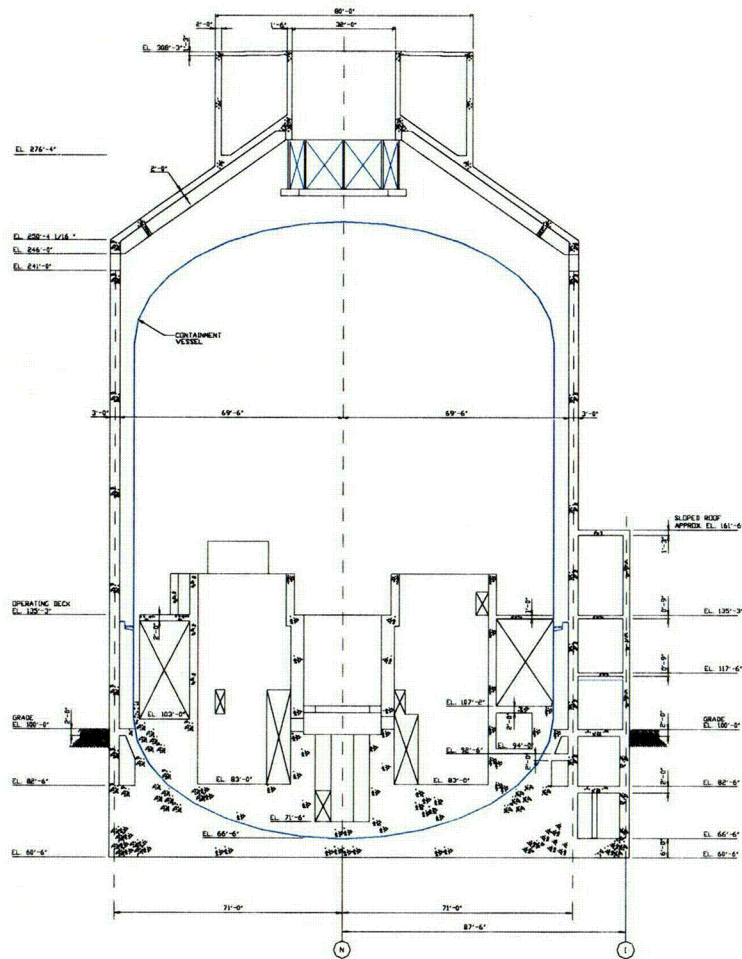
AP1000



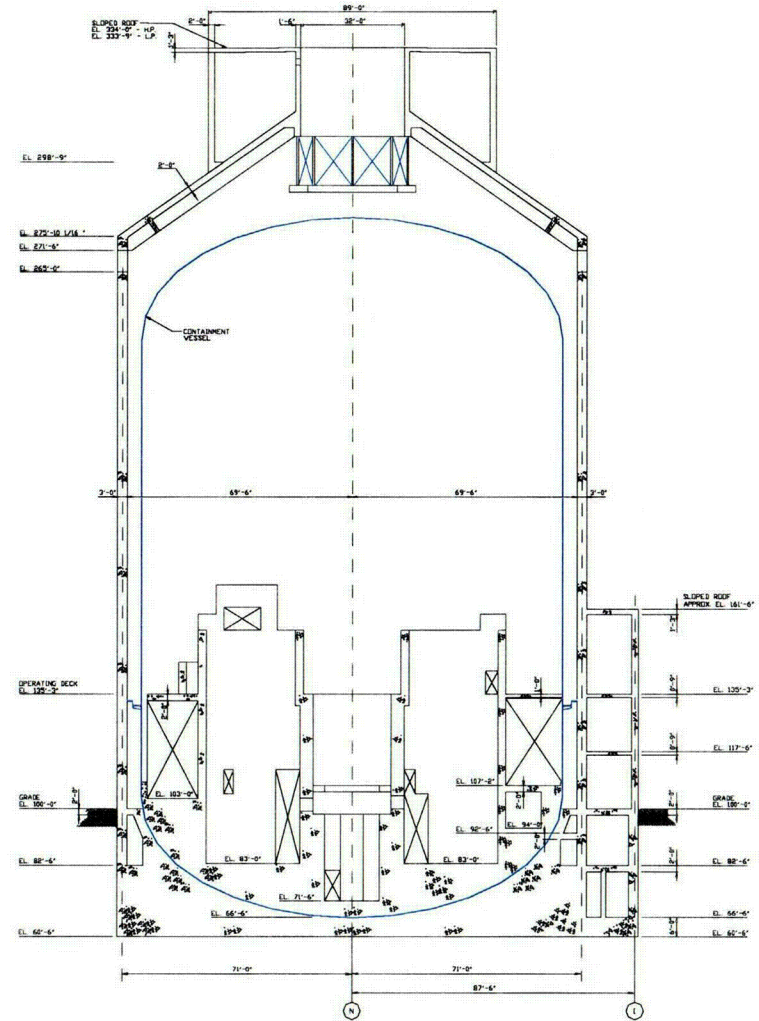
AP1000

AP1000 Structural Arrangement

Containment Section View



AP600



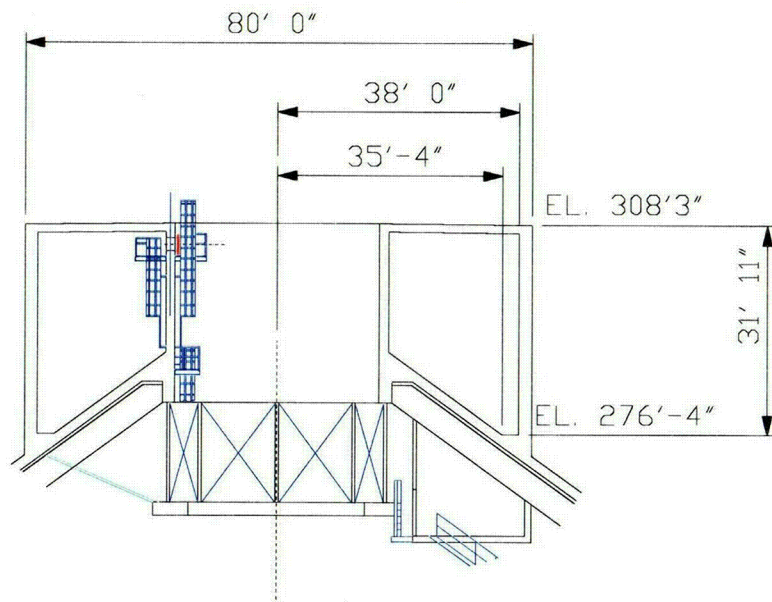
AP1000

CO2 —

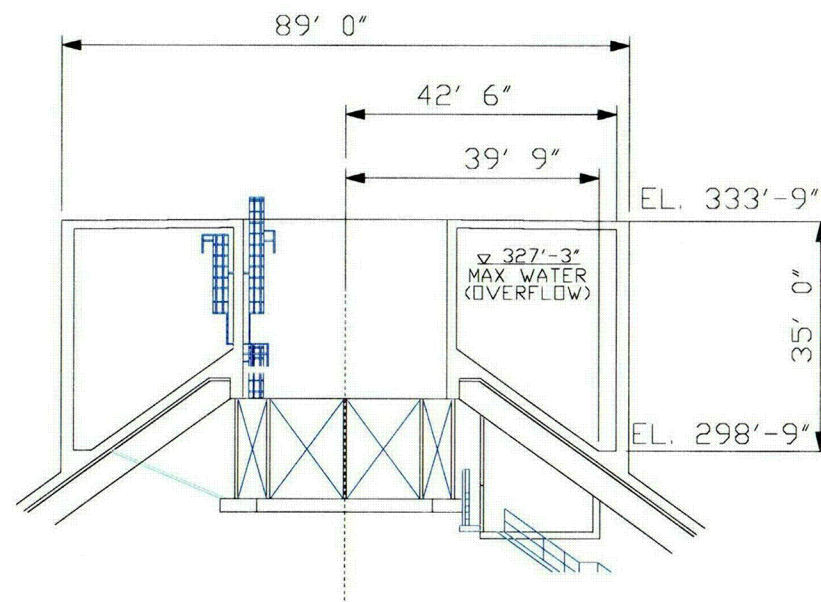


PCS Water Storage Tank

AP600



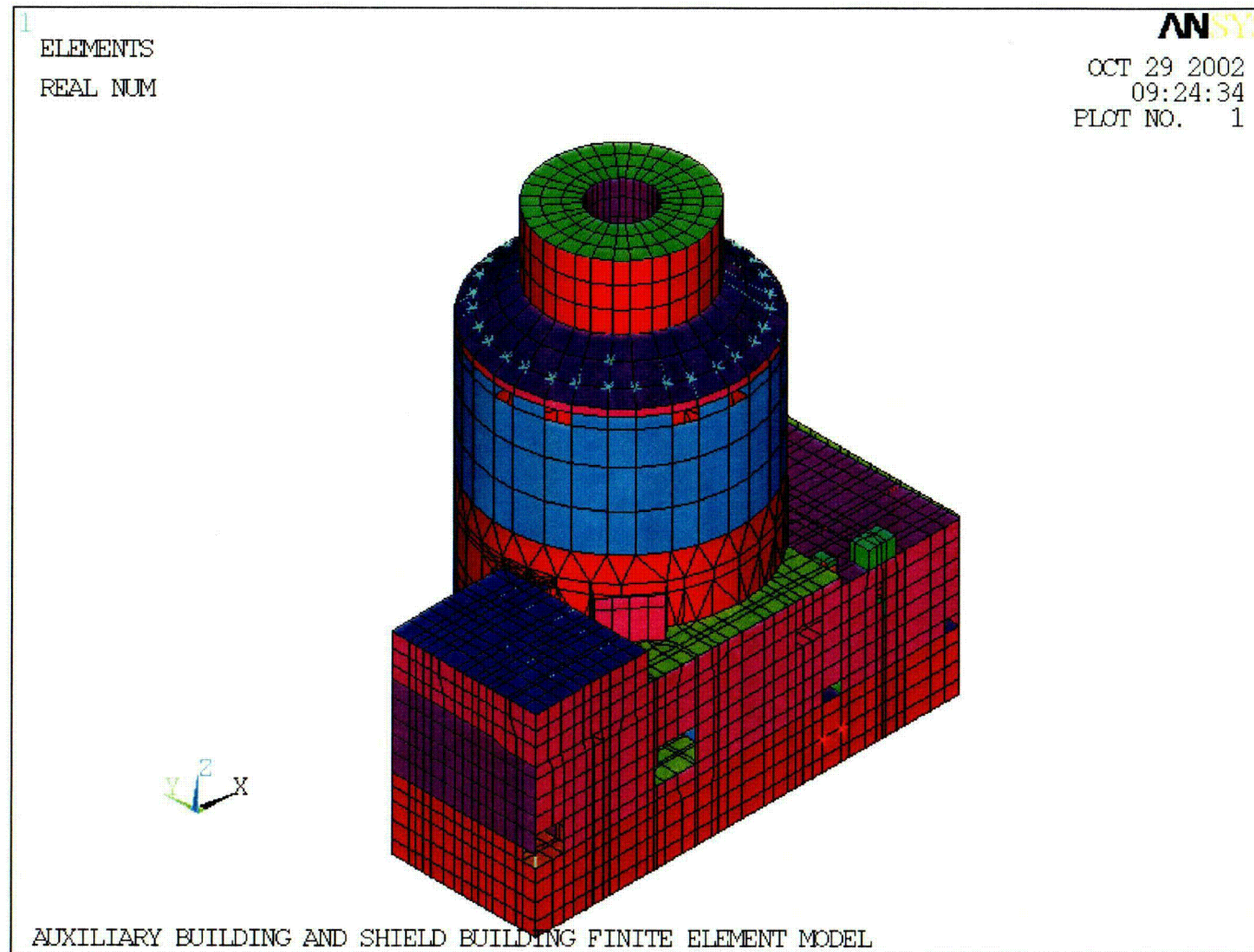
AP1000



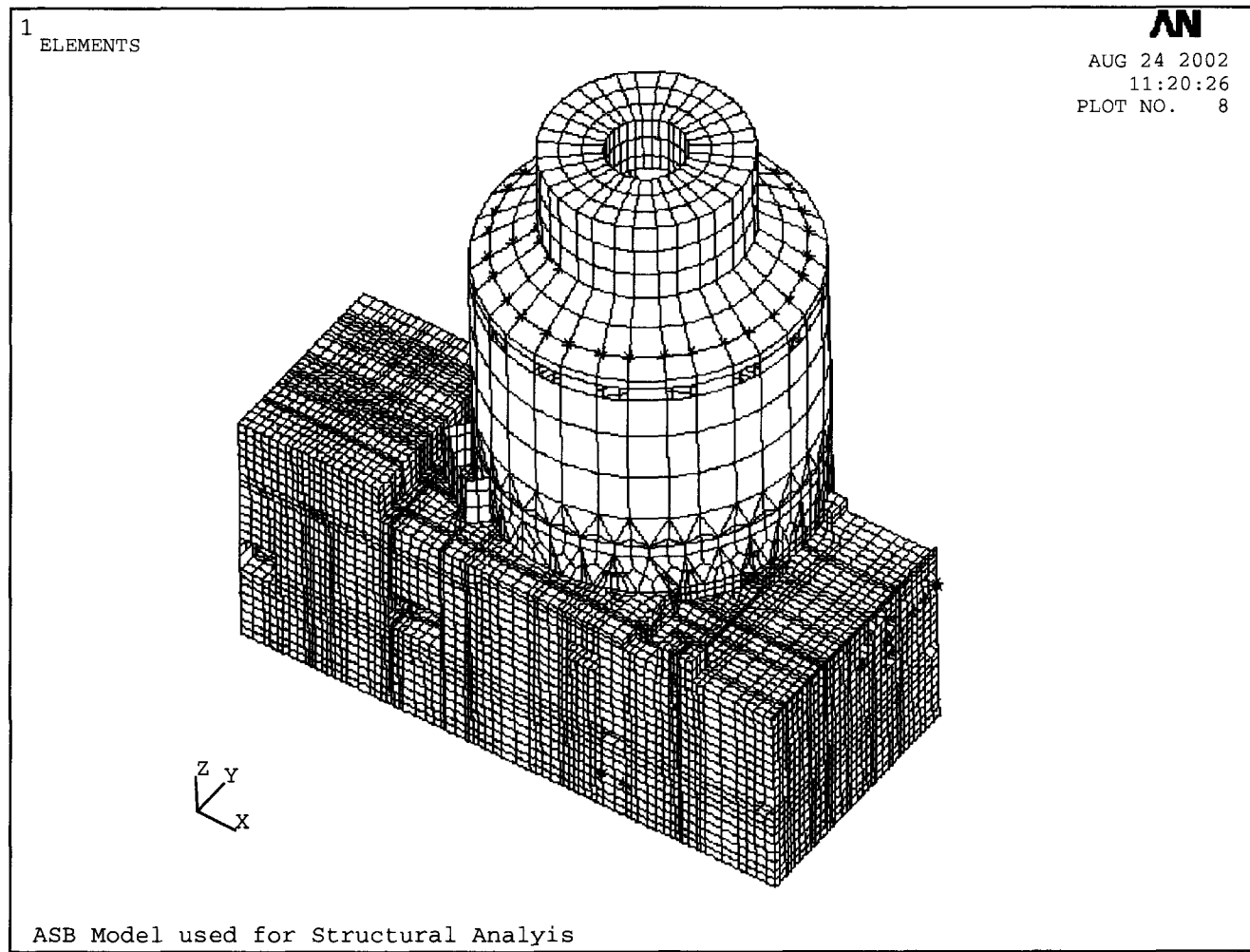
- **Passive Containment Cooling Water Storage Tank volume increased from 540,000 gallons to 800,000 gallons**

C03

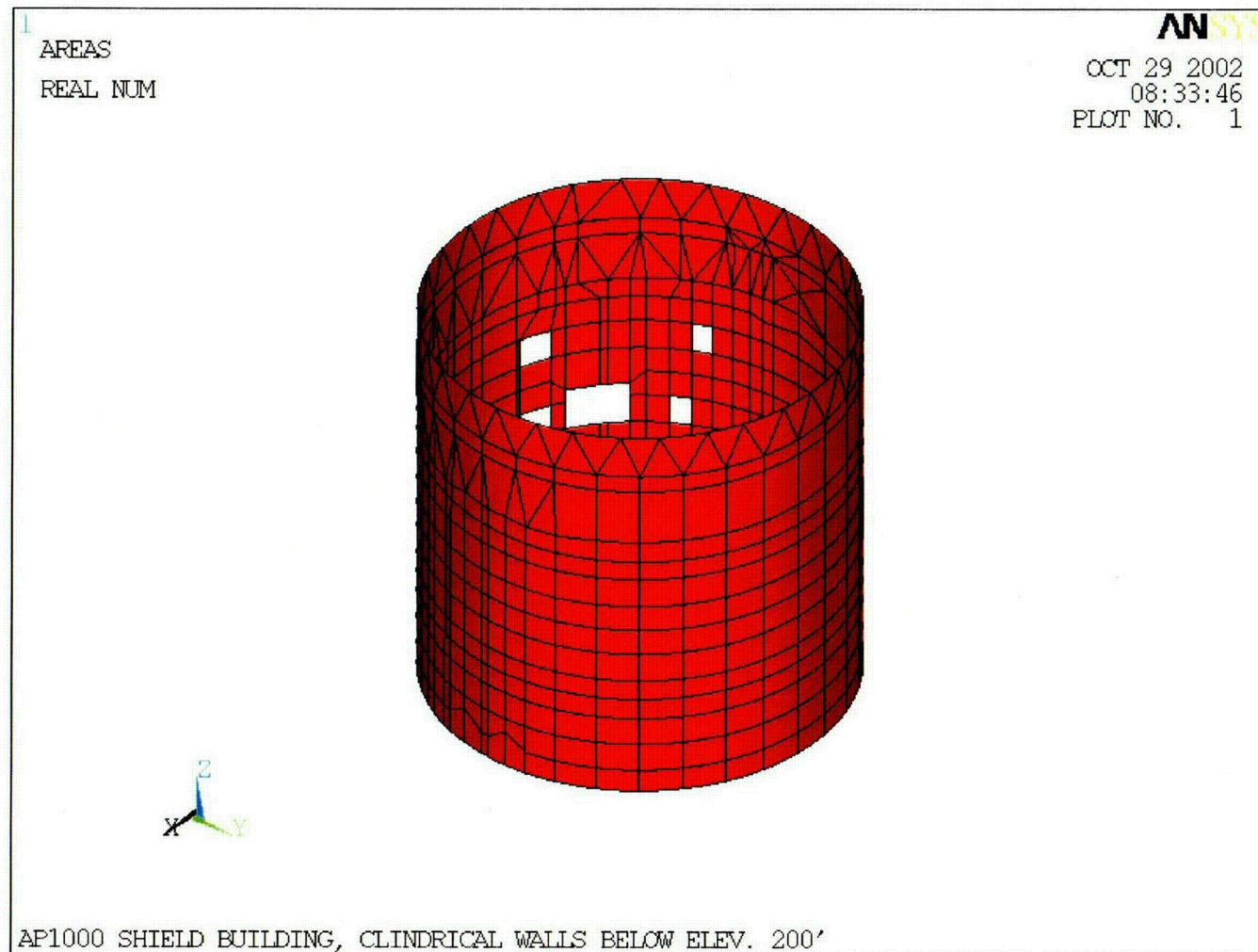
Isometric View of ASB Model used for Dynamic Analysis



Isometric View of ASB Model used for Structural Analysis

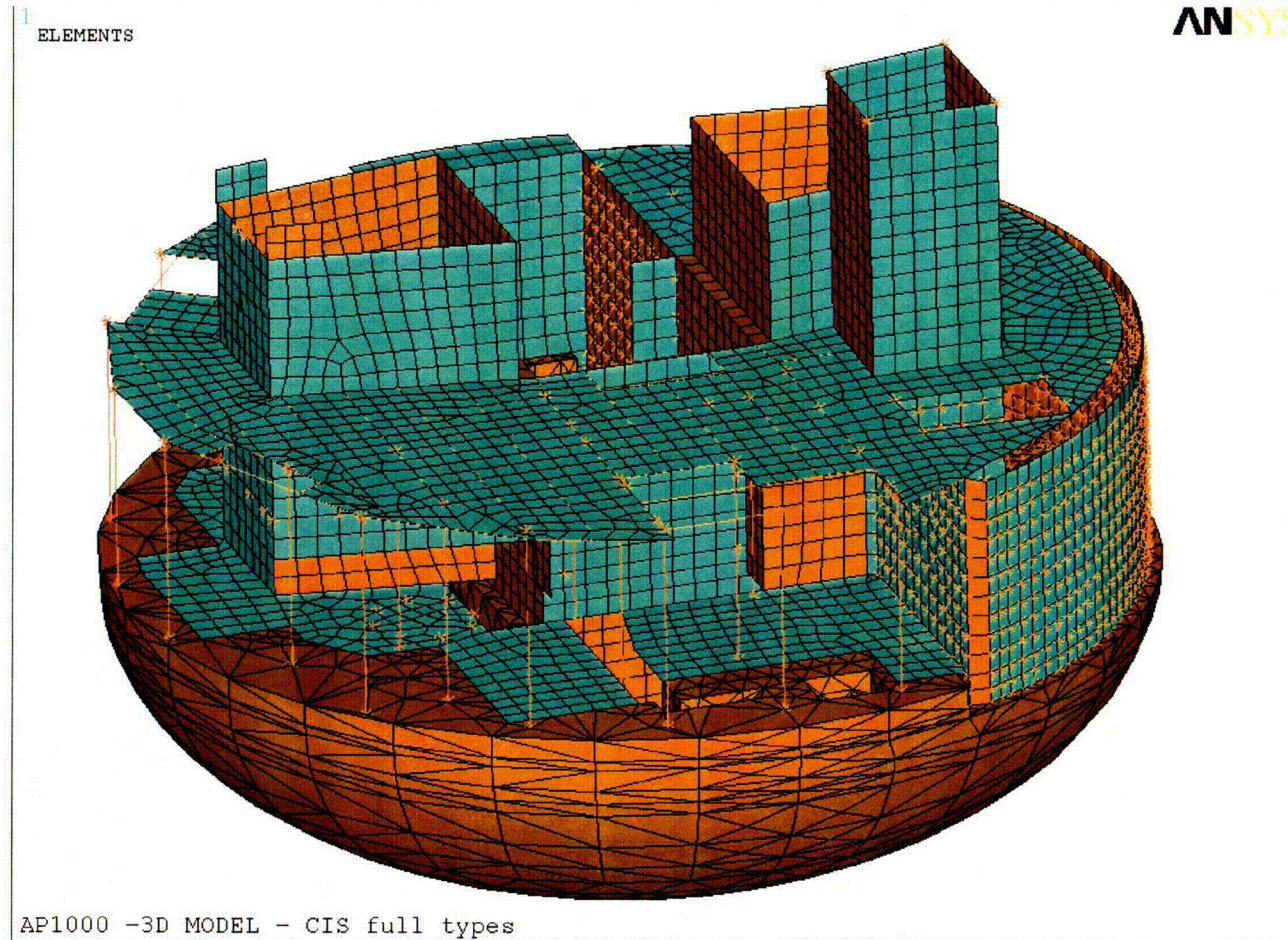


Shield Building cylindrical Wall



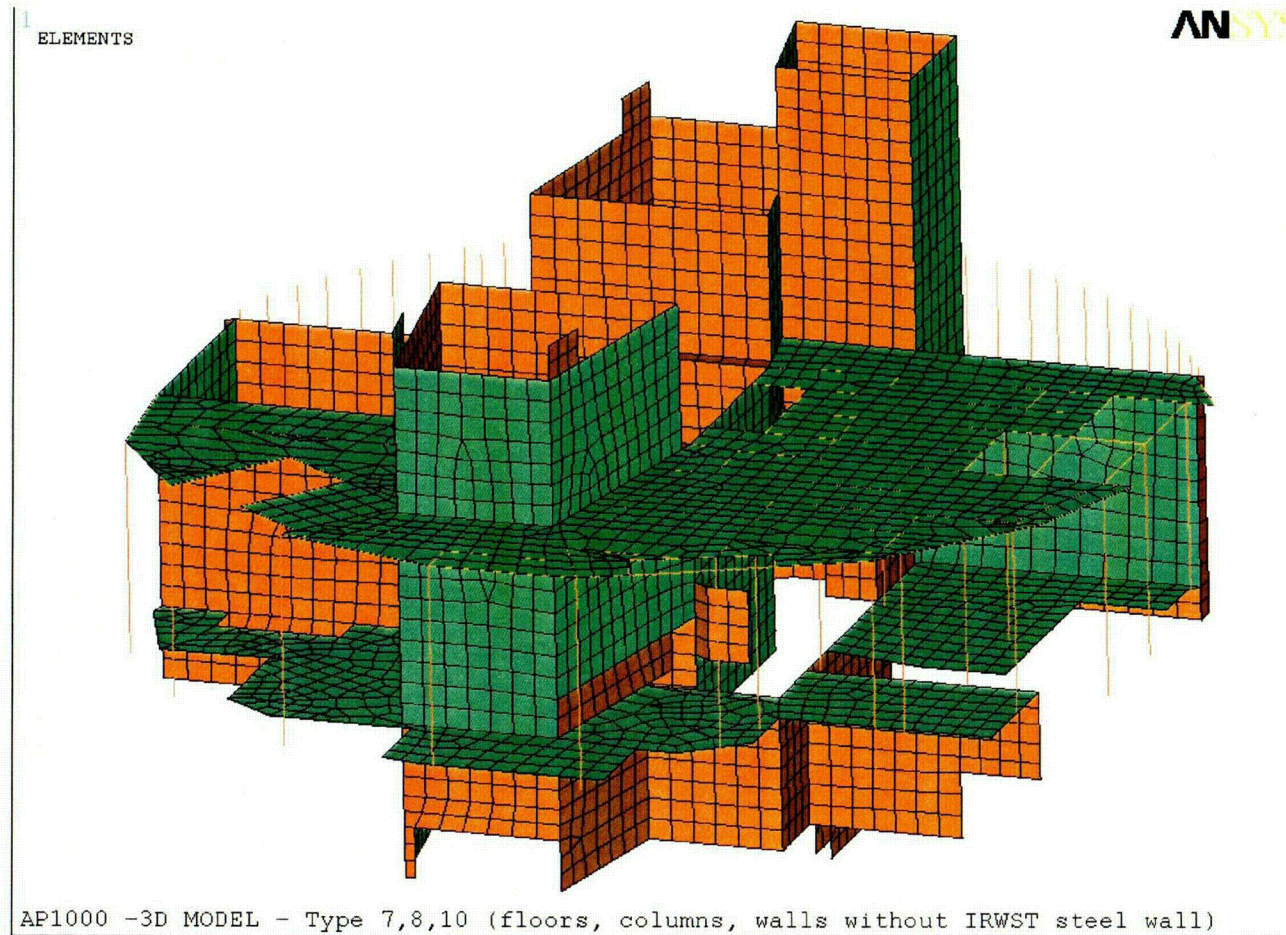
C05

CIS Finite Element Model



Model Without the NI Basemat Looking from North

CIS Finite Element Model

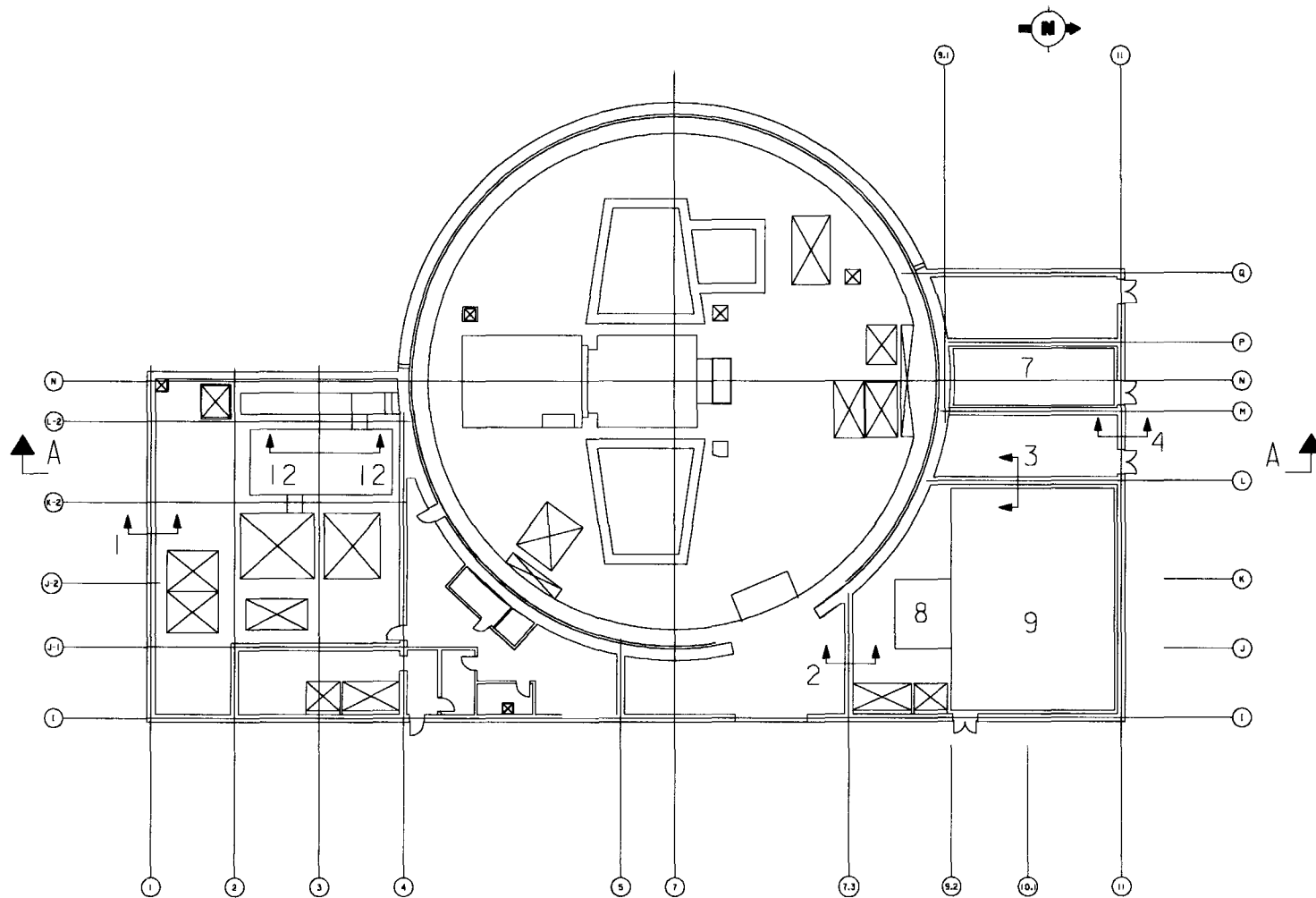


Walls, Floors and Columns. View from East

APP-1000-S2C-034

C07

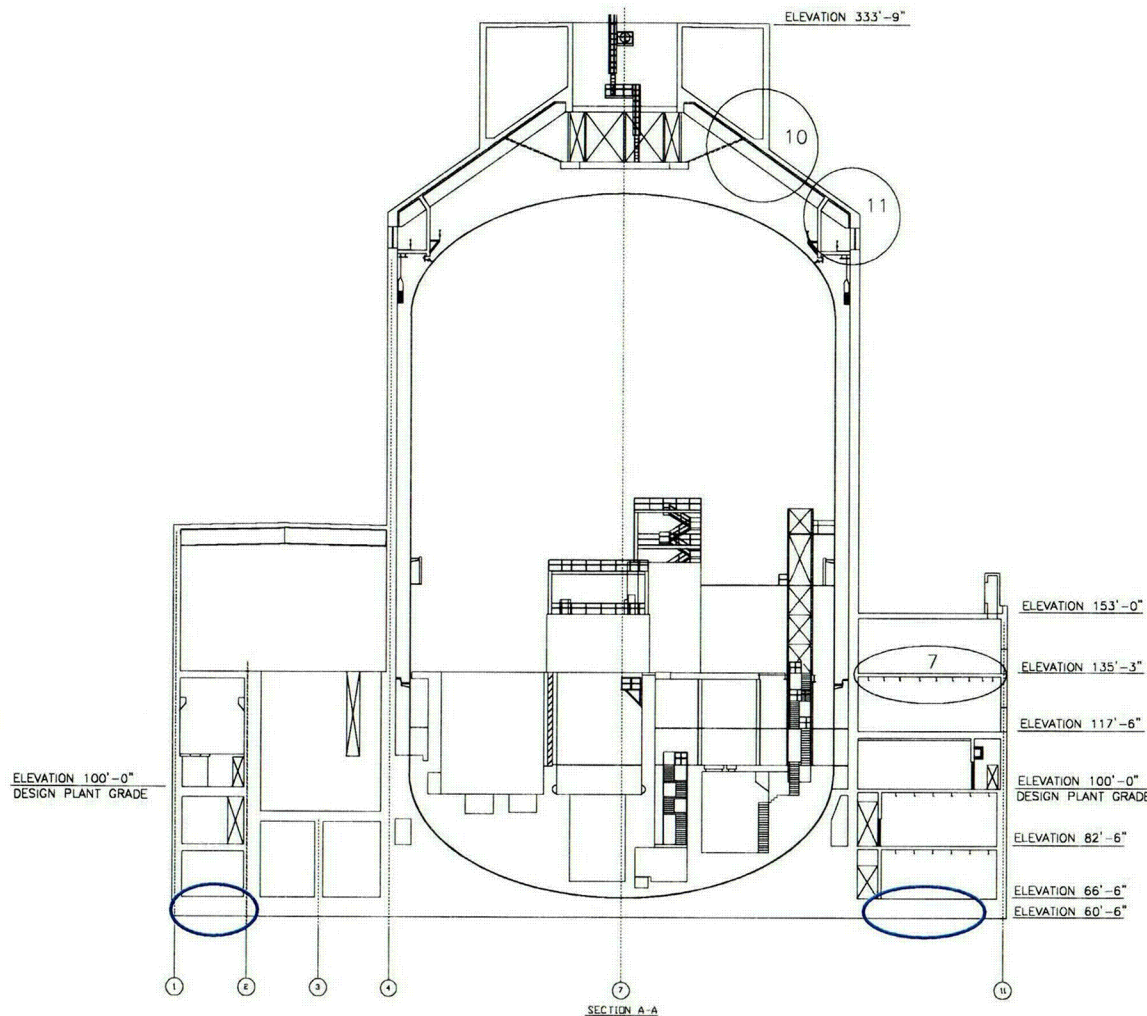
Nuclear Island Critical Sections Plan at El. 135 -3





Nuclear Island Critical Sections

Section A-A



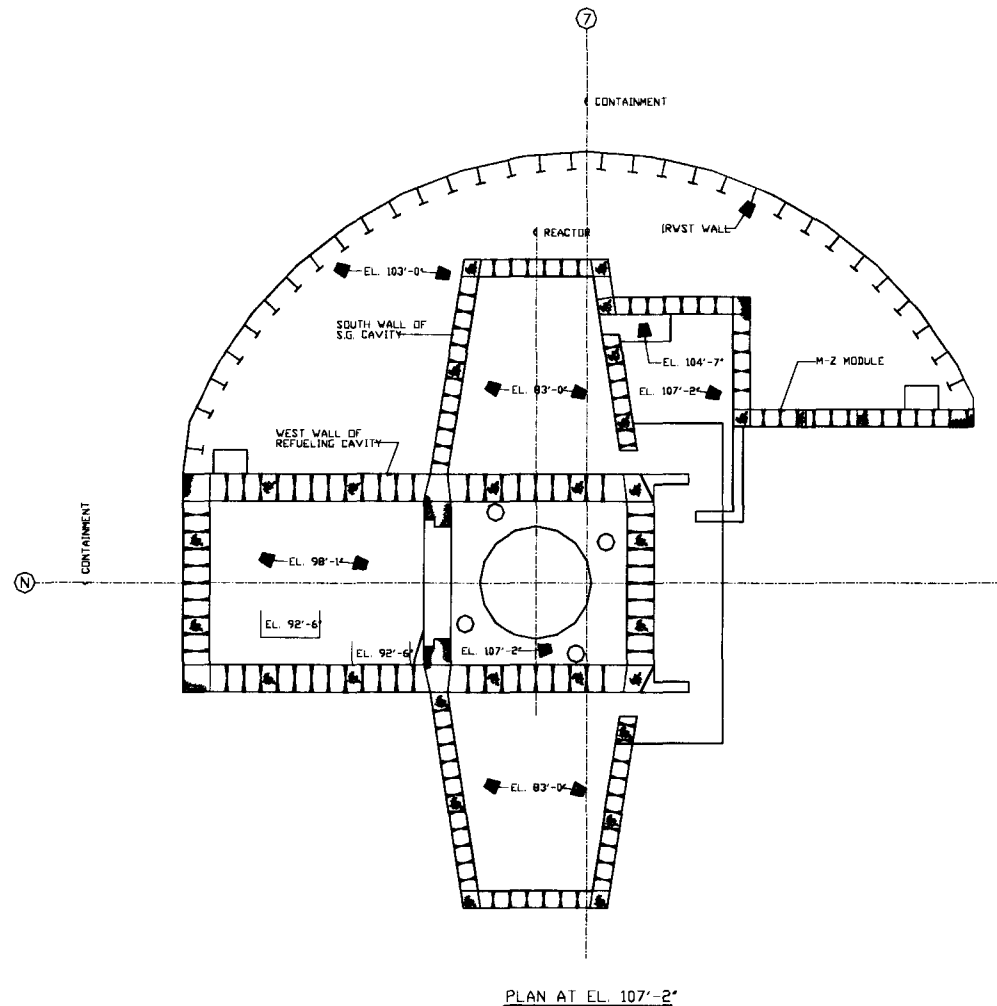
C08

AP1000 Critical Section Documentation

Auxiliary and Shield Buildings

Critical Sections	Design Calculation	Analysis Results
3-D Finite Element ASB Static Analyses		APP-1200-S2C-001, Rev.0
Wall 1	APP-1200-CCC-106, Rev 0	APP-1200-S2C-106, Rev 0
Wall 7.3	APP-1200-CCC-102, Rev 0	APP-1200-S2C-102, Rev 0
Wall 11	APP-1200-CCC-101, Rev 0	APP-1200-S2C-101, Rev 0
Wall L	APP-1200-CCC-110, Rev 0	APP-1200-S2C-110, Rev 0
Wall L-2 (Fuel pit divider wall)	APP-1200-CCC-118, Rev 0	APP-1200-S2C-118, Rev 0
Shield building cylinder (including connection to FHB roof)	APP-1200-CCC-119, Rev 0	APP-1200-S2C-119, Rev 0
Floor slab on metal decking at 135' – 3"	APP-1250-CCC-001, Rev 0	APP-1250-S2C-001, Rev 0
Floor slab (tagging room ceiling) at 135' – 3"	APP-1251-CCC-002, Rev 0	APP-1250-S2C-002, Rev 0
Finned floor in MCR at elevation 135' – 3"	APP-1252-CCC-001, Rev 0	APP-1250-S2C-001, Rev 0
Shield building roof	APP-1277-S3C-006, Rev 2	
NI base mat	APP-1010-CCC-001, Rev 0	APP-1010-S2C-001, Rev 0

Containment Internal Structures



AP1000 Critical Section Documentation

Containment Internal Structures

Finite Element Shell Model of CIS	APP-1000-S2C-034, Rev 1
Static Analysis - Seismic Equivalent Accelerations	APP-1100-S2C-002, Rev 1
Static Analysis - Pressures	APP-1100-S2C-003, Rev 1
Temperature distribution through wall	APP-1100-S2C-004, Rev 0
Static Analysis - Thermal Analyses.	APP-1100-S2C-005, Rev 1
Static Analysis - Load Combinations.	APP-1100-S2C-006, Rev 1
Required Steel Area Calculations of Main IRWST Concrete Filled Module Walls.	APP-1100-S2C-007, Rev 0
IRWST Steel Wall and Main Operating Floor Columns Verifications.	APP-1100-S2C-008, Rev 0
IRWST Seismic Sloshing and Wall Flexibility	APP-1100-S2C-009, Rev 0
Containment Internal Structures Summary Report	APP-1100-S3R-001, Prel.