



Westinghouse
Electric Corporation

Energy Systems

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DCP/NRC1301
NSD-NRC-98-5620
Docket No.: 52-003

March 17, 1998

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: T. R. QUAY

SUBJECT: REVISION TO SECTION 3 OF CERTIFIED DESIGN MATERIAL

Dear Mr. Quay:

Following completion of the NRC staff review of critical sections in SSAR Section 3.8 and Appendix 3H, Certified Design Material Table 3.3-1, and the associated SSAR tables (Tables 3.8.4-7 and 3.8.5-3) have been revised to reflect changes resulting from the review.

The tables include the critical sections reviewed by the staff with changes as agreed upon by the staff and Westinghouse. Walls and sections that are not critical sections are generally not included in the tables. Walls and sections that are included for shielding requirements only, have a thickness requirement but not reinforcement requirements. Shear reinforcement for the basemat has been revised. Required reinforcement for the walls (columns) between the air vents and the shield building tension ring has been revised to reflect resolution of NRC comments. Reinforcement for auxiliary building walls has been revised to reflect design changes in response to NRC comments and design completion.

Attached are draft versions of CDM Table 3.3-1 and SSAR Tables 3.8.4-7 and 3.8.5-3. A draft of Table 3.8.4-7 with the struck-out material removed is also provided. These changes will be included in SSAR Revision 22.

Please contact Donald A. Lindgren at (412) 374-4856 if you have any questions.

Brian A. McIntyre, Manager
Advanced Plant Safety and Licensing

jml

Attachment

cc: J. M. Sebrosky, NRC (w/Attachment)
N. J. Liparulo, Westinghouse (w/o Attachment)

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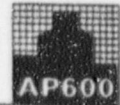


Table 3.3-1 (cont.)
Definition of Wall Locations and Thicknesses for NI Buildings, Annex and Radwaste Buildings⁽¹⁾

Wall or Section Description	Applicable Column Lines	Applicable Level or Elevation Level Range	Concrete Thickness ⁽²⁾⁽³⁾	Nominal Reinforcement Vertical ⁽⁴⁾ (in ² /ft)	Nominal Reinforcement Horizontal ⁽⁵⁾ (in ² /ft)	Applicable Radiation Shielding Wall (Yes/No)	Applicable Dimension ⁽⁶⁾
Auxiliary Building Basement							
Auxiliary Basement Area	Column line K to L and from Col. Line 11 wall to the intersection with the shield building	From level 0 to 1	6'-0"	Shear Reinforcement <i>0.26</i>	Bottom Reinforcement 2.7 (East-West Direction)	No	
Auxiliary Basement Area	Column line K to L and from Col. Line 11 wall to the intersection with the shield building	From level 0 to 1	6'-0"	NA	Top Reinforcement 2.7 (East-West Direction)	No	
Auxiliary Basement Area	Column line 1 to 2 and from Column Line K-2 to N wall	From level 0 to 1	6'-0"	Shear Reinforcement <i>0.74</i>	Bottom Reinforcement 4.5 (North-South Direction)	No	
Auxiliary Basement Area	Column line 1 to 2 and from Column Line K-2 to N wall	From level 0 to 1	6'-0"	NA	Top Reinforcement 3.12 (North-South Direction)	No	



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Table 3.3-1 (cont.)
Definition of Wall Locations and Thicknesses for NI Buildings, Annex and Radwaste Buildings⁽¹⁾

Wall or Section Description	Applicable Column Lines	Applicable Elevation Level or Elevation Level Range	Concrete Thickness ^(2,6)	Nominal Reinforcement Vertical (in ² /ft) ⁽³⁾	Nominal Reinforcement Horizontal (in ² /ft) ⁽³⁾	Applicable Radiation Shielding Wall (Yes/No)	Applicable Dimension ⁽⁴⁾
North Reactor Vessel Cavity Wall	E-W wall parallel with column line 7	From 2.3 to 3	4'-0"	-	-	Yes	-
East Reactor Vessel Cavity Wall	N-S wall parallel with column line N	From 2.3 to 3	4'-0"	-	-	Yes	-
South Reactor Vessel Cavity Wall	E-W wall parallel with column line 7	From 2.3 to 3	4'-0"	-	-	Yes	-
Shield Building							
Shield Building Cylinder between Containment and Auxiliary Building	From intersection of Col Ln Q wrapping around clockwise until intersection of column line 7.3	From 3 to 4	3'-0"	1.3	1.0	Yes	-
Shield Building Cylinder between Containment and Auxiliary Building	From intersection of Col Ln Q wrapping around clockwise until intersection of column line 7.3	From 4 to 6	3'-0"	1.7	1.7	Yes	-
Shield Building Cylinder between Containment and Auxiliary Building	From intersection of column line 7.3 wrapping around clockwise until intersection of Col Ln R-2	From 3 to 4	3'-0"	1.7	1.2	Yes	-
Shield Building Cylinder between Containment and Auxiliary Building	From intersection of column line 7.3 wrapping around clockwise until intersection of Col Ln K-2	From 4 to 5	3'-0"	1.7	1.2	Yes	-

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Wall Description	Applicable Column Lines	Applicable Elevation Level or Range	Concrete Thickness ^(a)	Nominal Reinforcement Vertical (in ² /ft) ^(b)	Nominal Reinforcement Horizontal (in ² /ft) ^(b)	Applicable Radiation Shielding Wall (Yes/No)	Applicable Dimension
Shield Building							
Shield Building Cylinder		From 3 to 11	3'-0"			Yes	-
Shield Building Cylinder		From 6 to 7	3'-0"	4.4	3.9 (Circumferential)	Yes	-
Shield Building Cylinder		From 7 to 8	3'-0"	3.9	3.4 (Circumferential)	Yes	-
Columns between air inlets		From 11 to 12	3'-0"	62.5 in ² (Total per column)	2.8 (Total for both faces and middle layer)	Yes	-
Tension Ring	Interface between conical roof and cylindrical portion of Shield building	From 12 to 12.1	3'-0"		75.3 in ² (Total circumferential in tension ring)	Yes	-
Conical Roof		From 12.1 to 13	1'-6" cast-in-place concrete over 6" precast concrete ribbed conical sections			Yes	-
PCS Tank External Cylindrical Wall	PCS external wall lower section	From 12.2 to 12.3	2'-0"	1.8	1.8 (Circumferential)	Yes	-
PCS Tank External Cylindrical Wall	PCS external wall upper section	From 13.1 to 13.2	2'-0"	0.8	1.0 (Circumferential)	Yes	-
PCS tank roof		Level 14	1'-3"			No	-

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Table 3.3-1 (cont.)
Definition of Wall Locations and Thicknesses for NI Buildings, Annex and Radwaste Buildings⁽¹⁾

Wall or Section Description	Applicable Column Lines	Applicable Elevation Level or Elevation Level Range	Concrete Thickness ⁽²⁾⁽³⁾	Nominal Reinforcement Vertical (in ² /ft) ⁽⁴⁾	Nominal Reinforcement Horizontal (in ² /ft) ⁽⁵⁾	Applicable Radiation Shielding Wall (Yes/No)	Applicable Dimension ⁽⁶⁾
Shield Building Cylinder between Containment and Auxiliary Building	From intersection of column line 7.3 wrapping around clockwise until intersection of column line K-2	From 5 to 6	3'-0"	2.0	1.2	Yes	
Shield Building Cylinder freestanding portion	From intersection of column line N wrapping around clockwise until intersection of column line Q	From 3 to 4	3'-0"	3.2	1.5	Yes	
Shield Building Cylinder freestanding portion	From intersection of column line N wrapping around clockwise until intersection of column line Q	From 4 to 5	3'-0"	2.8	1.9	Yes	
Shield Building Cylinder freestanding portion	From intersection of column line N wrapping around clockwise until intersection of column line Q	From 5 to 6	3'-0"	2.6	3.0	Yes	
Shield Building Cylinder freestanding portion	From intersection of column line N wrapping around clockwise until intersection of column line Q	From 6 to 160'-6"	3'-0"	4.1	3.9	Yes	
Shield Building Cylinder freestanding portion	From intersection of column line N wrapping around clockwise until intersection of column line Q	From 160'-6" to 7	3'-0"	4.0	3.7	Yes	



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Table 3.3-1 (cont.)
Definition of Wall Locations and Thicknesses for NI Buildings, Annex and Radwaste Buildings⁽¹⁾

Wall or Section Description	Applicable Column Lines	Applicable Elevation Level or Elevation Level Range	Concrete Thickness ⁽²⁾⁽³⁾	Nominal Reinforcement Vertical (in ² /ft) ⁽³⁾	Nominal Reinforcement Horizontal (in ² /ft) ⁽³⁾	Applicable Radiation Shielding Wall (Yes/No)	Applicable Dimension ⁽⁴⁾
Shield Building cylinder freestanding portion	From intersection of column line N wrapping around clockwise until intersection of column line Q	From 7 to 8	3'-0"	3.7	3.5	Yes	
Shield Building cylinder freestanding portion	From intersection of column line N wrapping around clockwise until intersection of column line Q	From 8 to 9	3'-0"	2.4	2.5	Yes	
Shield Building cylinder freestanding portion	From intersection of column line N wrapping around clockwise until intersection of column line Q	From 9 to 10	3'-0"	2.3	1.7	Yes	
Cylindrical Wall	Shield building wall	From 9 to 10	3'-0"	0.74	5.5 (Circumferential)	Yes	
Cylindrical Wall	Shield building wall	From 10 to 11	3'-0"	3.5	3.7 (Circumferential)	Yes	
Cylindrical Wall	Shield building wall	From 11 to 12	3'-0"	7.3	2.0 (Circumferential)	Yes	
Tension Ring	Interface between conical roof and cylindrical portion of shield building	From 12 to 12.1	3'-0"	3.2	6.0 (Circumferential)	No	
Conical Roof external to PCS tank	From tension ring up to interface with outer cylindrical section of PCS tank	12.1 to 12.2	1'-6" cast-in-place concrete over pre-cast concrete ribbed conical sections	1.6 (Radial)	1.5 (Circumferential)	No	



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Table 3.3-1 (cont.)
Definition of Wall Locations and Thicknesses for NI Buildings, Annex and Radwaste Buildings⁽¹⁾

Wall or Section Description	Applicable Column Lines	Applicable Level or Elevation Level Range	Concrete Thickness ⁽²⁾	Nominal Reinforcement Vertical (in ² /ft) ⁽³⁾	Nominal Reinforcement Horizontal (in ² /ft) ⁽³⁾	Applicable Radiation Shielding Wall (Yes/No)	Applicable Dimension ⁽⁴⁾
Conical Roof internal to PCS tank	From interface with outer cylindrical section of PCS tank to compression ring	12.2 to 12.3	1'-6" cast-in-place concrete over pre-cast concrete ribbed conical sections	2.1 (Radial)	1.5 (Circumferential)	No	
Compression Ring	Cylindrical ring shaped section with interfaces with conical roof section and vertical cylindrical section (inside of PCS tank)	From 281'-2" to 13	Cast-in-place concrete over pre-cast concrete ribbed conical sections	1.3	2.8 (Circumferential)	No	
Cylindrical Wall	PCS internal wall lower section	From 13 to 13.1	1'-6"	1.1	0.6 (Circumferential)	No	
Cylindrical Wall	PCS internal wall upper section	From 13.1 to 13.2	1'-6"	0.6	0.7 (Circumferential)	No	
Cylindrical Wall	PCS external wall upper section	From 296'-4" to 13.2	2'-0"	0.7	0.8 (Circumferential)	No	
Cylindrical Wall	PCS external wall mid-elevation section	From 286'-4" to 296'-4"	2'-0"	1.2	0.6 (Circumferential)	No	
Cylindrical Wall	PCS external wall lower section	From 276'-4" to 286'-4"	2'-0"	2.3	1.0 (Circumferential)	No	
Roof	PCS tank roof internal wall side	Inside cylindrical edge of PCS tank to 8'-0" radius at Level 14	2'-0"	0.8 (radial)	0.7 (Circumferential)	No	

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Table 3.3-1 (cont.)
Definition of Wall Locations and Thicknesses for NI Buildings, Annex and Radwaste Buildings⁽¹⁾

Wall or Section Description	Applicable Column Lines	Applicable Level or Elevation Level Range	Concrete Thickness ⁽²⁾⁽³⁾	Nominal Reinforcement Vertical (in ² /ft) ⁽³⁾	Nominal Reinforcement Horizontal (in ² /ft) ⁽³⁾	Applicable Radiation Shielding Wall (Yes/No)	Applicable Dimension ⁽⁴⁾
Roof	PCS tank roof mid-span	Inside cylindrical edge of PCS tank + 8'-0" to 16'-0" radius at Level 14	2'-0"	0.7 (radial)	0.8 (Circumferential)	No	
Roof	PCS tank roof external wall side	Inside cylindrical edge of PCS tank + 16'-0" to outside edge at Level 14	2'-0"	0.8 (radial)	0.9 (Circumferential)	No	



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Table 3.3-1 (cont.)
Definition of Wall Locations and Thicknesses for NI Buildings, Annex and Radwaste Buildings⁽¹⁾

Wall or Section Description	Applicable Column Lines	Applicable Elevation Level or Elevation Level Range	Concrete Thickness ⁽²⁾⁽³⁾	Nominal Reinforcement Vertical (in ² /ft) ⁽⁴⁾	Nominal Reinforcement Horizontal (in ² /ft) ⁽⁵⁾	Applicable Radiation Shielding Wall (Yes/No)	Applicable Dimension ⁽⁶⁾
Auxiliary Building Walls/Floors							
Wall between J-2 and K-2	From 1 to 2	From 1 to 2	2'-0"	-	-	Yes	-
Column Line 2 wall	From 1 to K-2	From 1 to 2	2'-6"	-	-	Yes	-
Column Line L-2 wall	From 2 to 4	From 1 to 2	4'-0"	-	-	Yes	-
Column Line 2 wall	From K-2 to L-2	From 1 to 5	5'-0"	-	-	Yes	-
Column Line K-2	From 2 to 4	From 1 to 5	4'-9"	-	-	Yes	-
Column Line 3 wall	From J-1 to L-2	From 1 to 80'-6"	2'-6"	-	-	Yes	-
Column Line J-1 wall	From 2 to 4	From 1 to 5	2'-6"	-	-	Yes	-
Column Line J-2 wall	From 2 to 4	From 1 to 5	2'-6"	-	-	Yes	-
Column Line J-1 wall	From 4 to 5	From 1 to 3.1	2'-0"	-	-	Yes	-
Column Line 4 wall	From 1 to K-2	From 1 to 90'-6"	2'-6"	-	-	Yes	-
Column Line 5 wall	From 1 to J-1	From 1 to 6	2'-0"	-	-	Yes	-
Column Line 7.1 wall	From 1 to J-1	From 1 to 7	2'-0"	-	-	Yes	-
Column Line 7.2 wall	From 1 to J-1	From 1 to 98'-0"	2'-0"	-	-	Yes	-
Column Line 7.3 wall	From 1 to K	From 1 to 2	3'-0"	0.8 1.1	0.8 0.9	Yes	-
Column Line 7.3 wall	From 1 to K	From 2 to 3	3'-0"	1.4 1.6	0.8 1.3	Yes	-
Column Line 7.3 wall	From 1 to J-1	From 3 to 4	2'-0"	0.8 0.7	0.8 0.7	No	-
Column Line 7.3 wall	From J-1 to K	From 3 to 4	2'-0"	1.6 1.9	0.8 1.4	No	-



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Table 3.3-1 (cont.)
Definition of Wall Locations and Thicknesses for NI Buildings, Annex and Radwaste Buildings⁽¹⁾

Wall or Section Description	Applicable Column Lines	Applicable Elevation Level or Elevation Level Range	Concrete Thickness ⁽²⁾⁽³⁾	Nominal Reinforcement Vertical (in ² /ft) ⁽³⁾	Nominal Reinforcement Horizontal (in ² /ft) ⁽³⁾	Applicable Radiation Shielding Wall (Yes/No)	Applicable Dimension ⁽⁴⁾
Column Line 7.3 wall	From I to K	From 4 to 5	2'-0"	24 1.8	40 1.4	No	-
Column Line 7.3 wall	From I to K	From 5 to 6	2'-0"	24 3.0	22 2.5	No	-
Column Line J-1 wall	From I to 2	From 2 to 97'-0"	2'-0"	-	-	Yes	-
Column Line 2 wall	From I to K-2	From 2 to 5	2'-6"	-	-	Yes	-
Column Line 2 wall	From K-2 to L-2	From 2 to 97'-0"	5'-3"	-	-	Yes	-
Column Line 2 wall	From L-2 to N	From 2 to 97'-0"	2'-6"	-	-	Yes	-
Labyrinth Wall between Col Line 3 and 4 and J-1 to J-2	N/A	2 to 3	2'-0"	-	-	Yes	-
Column Line J-2 wall	From 4 to 5	From 2 to 3.1	2'-0"	-	-	Yes	-
Column Line 4 wall	From J-2 to K-2	From 2.1 to 5	2'-6"	-	-	Yes	-
Floor	From 1 to 2 and 1 to N	2	2'-0"	-	-	Yes	-
Floor	From 2 to 5 and J-1 to J-2	2	0'-9"	-	-	Yes	-
Pipe Chase	From 2 to 5 and J-1 to J-2	2.1	2'-0"	-	-	Yes	-
Floor	From 2 to 5 and J-2 to K-2	2.1	2'-0"	-	-	Yes	-
Floor	From 4 to 7.3 and 1 to J-1	2	2'-0"	-	-	Yes	-

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Table 3.3-1 (cont.)
Definition of Wall Locations and Thicknesses for NI Buildings, Annex and Radwaste Buildings⁽¹⁾

Wall or Section Description	Applicable Column Lines	Applicable Elevation Level or Elevation Level Range	Concrete Thickness ⁽²⁾⁽³⁾	Nominal Reinforcement Vertical (in ² /ft) ⁽³⁾	Nominal Reinforcement Horizontal (in ² /ft) ⁽³⁾	Applicable Radiation Shielding Wall (Yes/No)	Applicable Dimension ⁽⁴⁾
Column Line I wall	From 1 to N	From 3 to 5	2'-3"	2.5 (outside) 2.2 (inside)	2.0 2.5 (outside) 1.6 2.0 (inside)	Yes	-
Column Line I wall	From 1 to N	From 5 to 7	2'-3"	3.7 2.5 (outside) 2.7 2.0 (inside)	2.7 1.4 (outside) 2.3 1.0 (inside)	Yes	-
Column Line N wall	From 1 to 2	From 3 to 5	3'-9"	-	-	Yes	-
Column Line N wall	From 2 to 4	From 3 to 5	5'-6"	-	-	Yes	-
N-S Shield Wall (low wall)	Between K-2 and L-2 extending from column line 1 north	From 3 to 3.1	3'-0"	-	-	Yes	-
N-S Shield Wall	Between K-2 and L-2 extending from column line 1 north	From 3 to 123'-0"	2'-9"	-	-	Yes	-
E-W Shield Wall	Between 1 and 2 extending from column line east	From 3 to 123'-0"	3'-0"	-	-	Yes	-
Column Line I wall	From 1 to 7.3	From 3 to 5	2'-0"	-	-	Yes	-
Column Line I wall	From 1 to Q	From 3 to 4	2'-0"	-	-	Yes	-
Column Line K wall	From 7.3 to 11	From 3 to 4	2'-0"	-	-	Yes	-
Column Line L wall	From Shield Building Wall to 11	From 3 to 4	2'-0"	-	-	Yes	-
Column Line L wall	From Shield Building Wall to 11	From 4 to 5	2'-0"	2.3	1.8	Yes	-

Column Line I wall	From 1 to N	From 3 to 3.2	2'-5" 3'-0"	4.1 2.5 (outside) 2.1 2.0 (inside)	1.1 1.5 (outside) 1.1 1.0 (inside)	No	-
Column Line I wall	From 1 to N	From 3 to 3.3	2'-5" 3'-0"	3.0 2.5 (outside) 2.6 2.0 (inside)	1.1 1.5 (outside) 1.1 1.0 (inside)	No	-

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Table 3.3-1 (cont.)
Definition of Wall Locations and Thicknesses for NI Buildings, Annex and Radwaste Buildings⁽¹⁾

Wall or Section Description	Applicable Column Lines	Applicable Elevation Level or Elevation Level Range	Concrete Thickness ⁽²⁾	Nominal Reinforcement Vertical (in ² /ft) ⁽³⁾	Nominal Reinforcement Horizontal (in ² /ft) ⁽³⁾	Applicable Radiation Shielding Wall (Yes/No)	Applicable Dimension ⁽⁴⁾
Column Line L wall	From Shield Building Wall to 11	From 5 to 6	2'-0"	1.8	1.8	No	-
Column Line M wall	From Shield Building Wall to 11	From 3 to 4	2'-0"	-	-	Yes	-
Column Line P wall	From Shield Building Wall to 11	From 3 to 4	2'-0"	-	-	Yes	-
Column Line Q wall	From Shield Building Wall to 11	From 3 to 6	2'-0"	-	-	Yes	-
Column Line 11 wall	From 1 to L	From 4 to 6	2'-0"	-	-	Yes	-
Column Line 11 wall	From L to M	From 4 to 5	4'-0"	-	-	Yes	-
Column Line 11 wall	From M to P	From 4 to 5	2'-0"	-	-	Yes	-
Column Line 11 wall	From P to Q	From 4 to 5	4'-0"	-	-	Yes	-
Column Line 11 wall	From L to Q	From 5 to 6	2'-0"	-	-	Yes	-
Floor	From 1 to 2 From 1 to N	3	3'-0"	-	-	Yes	-
Floor	From 2 to 4 From K-2 to L-2	94'-3"	4'-9"	-	-	Yes	-
Floor	From 1 to J-2 and 4 to intersecting vertical wall before column line 5	3.1	2'-0"	-	-	Yes	-
Floor	From 1 to shield bldg wall and from intersecting vertical wall before column line 5 to 5	3.1	0'-9"	-	-	Yes	-
Floor	From 5 to 7.3 and 1 to shield bldg wall	3	2'-0"	-	-	Yes	-



Table 3.8.4-7 (Sheet 1 of 36)

DEFINITION OF CRITICAL LOCATIONS AND THICKNESSES FOR SHIELD AND AUXILIARY BUILDINGS ⁽¹⁾							
Wall Description	Applicable Column Lines	Applicable Elevation Level or Elevation Level Range	Concrete Thickness ⁽²⁾	Reinforcement Required Vertical (in ² /ft) ⁽³⁾	Reinforcement Required Horizontal (in ² /ft) ⁽³⁾	Reinforcement Provided Vertical (in ² /ft) ⁽⁴⁾	Reinforcement Provided Horizontal (in ² /ft) ⁽⁴⁾
Shield Building							
Shield Building Cylinder between Containment and Auxiliary Building	Full circumference From intersection of column line Q wrapping around clockwise until intersection of column line 7.3	From 3 to 11-4	3'-0"	4.3	4.0	2.0	2.0
Shield Building Cylinder between Containment and Auxiliary Building	From intersection of column line Q wrapping around clockwise until intersection of column line 7.3	From 4 to 6	3'-0"	4.7	4.7	2.6	2.6
Shield Building Cylinder between Containment and Auxiliary Building	From intersection of column line 7.3 wrapping around clockwise until intersection of column line K-2	From 3 to 4	3'-0"	4.7	4.2	2.6	4.6

Notes:

1. The applicable column lines and elevation levels are identified and included in Figures 1.2-9, 3.7.2-12 (sheets 1 through 12), 3.7.2-19 (sheets 1 through 3) and on Table 1.2-1.
2. Concrete thicknesses less than or equal to 30" have a construction tolerance of + 1/2", -3/8".
3. These reinforcement values represent the minimum reinforcement required for structural requirements except for designed openings, penetrations, sumps or elevator pits. These reinforcement values apply for each face of the applicable wall unless specifically indicated on the table.
4. These reinforcement values represent the reinforcement provided for structural requirements except for designed openings, penetrations, sumps or elevator pits. These reinforcement values apply for each face of the applicable wall unless specifically indicated on the table.

Table 3.8.4-7 (Sheet 2 of 36)

DEFINITION OF CRITICAL LOCATIONS AND THICKNESSES FOR SHIELD AND AUXILIARY BUILDINGS ⁽¹⁾							
Wall Description	Applicable Column Lines	Applicable Elevation or Elevation Level Range	Concrete Thickness ⁽²⁾	Reinforcement Required Vertical (in ² /ft) ⁽³⁾	Reinforcement Required Horizontal (in ² /ft) ⁽³⁾	Reinforcement Provided Vertical (in ² /ft) ⁽⁴⁾	Reinforcement Provided Horizontal (in ² /ft) ⁽⁴⁾
Shield Building Cylinder between Containment and Auxiliary Building	From intersection of column line 7-3 wrapping around clockwise until intersection of column line K-2	From 4 to 5	3'-0"	4.7	4.2	2.6	4.6
Shield Building Cylinder between Containment and Auxiliary Building	From intersection of column line 7-3 wrapping around clockwise until intersection of column line K-2	From 5 to 6	3'-0"	2.0	4.2	2.6	4.6
Shield Building Cylinder freestanding portion	From intersection of column line N wrapping around clockwise until intersection of column line Q	From 3 to 4	3'-0"	3.2	4.5	3.25	2.6
Shield Building Cylinder freestanding portion	From intersection of column line N wrapping around clockwise until intersection of column line Q	From 4 to 5	3'-0"	2.8	4.9	3.4	2.6
Shield Building Cylinder freestanding portion	From intersection of column line N wrapping around clockwise until intersection of column line Q	From 5 to 6	3'-0"	2.6	3.0	3.4	3.4
Shield Building Cylinder freestanding portion	Full circumference	From 6 to 7 El. 160' 6" - 180' 6"	3'-0"	4.4 4.4	3.9 (Circumferential)	5.6 4.5	4.7 4.5



Table 3.8.4-7 (Sheet 3 of 36)

DEFINITION OF CRITICAL LOCATIONS AND THICKNESSES FOR SHIELD AND AUXILIARY BUILDINGS⁽¹⁾

Wall Description	Applicable Column Lines	Applicable Elevation Level or Elevation Level Range	Concrete Thickness (2)	Reinforcement Required Vertical (3) (in ² /ft)	Reinforcement Required Horizontal (3) (in ² /ft)	Reinforcement Provided Vertical (in ² /ft) (4)	Reinforcement Provided Horizontal (in ² /ft) (4)
Shield Building Cylinder freestanding portion	From intersection of column line N wrapping around clockwise until intersection of column line Q	From 18'-6" to 7	3'-0"	3.9	3.9	5.6	4.6
Shield Building Cylinder freestanding portion	Full circumference	From 7 to 8 El 180' 6" - 200'	3'-0"	3.9	3.4 (Circumferential)	4.2	3.5
Shield Building Cylinder freestanding portion	From intersection of column line N wrapping around clockwise until intersection of column line Q	From 8 to 9	3'-0"	2.4	2.5	2.6	2.6
Shield Building Cylinder freestanding portion	From intersection of column line N wrapping around clockwise until intersection of column line Q	From 9 to 10	3'-0"	2.3	4.7	2.6	2.4
Cylindrical Wall	Shield building wall	From 9 to 10	3'-0"	0.74	5.5 (Circumferential)	4.0	6.2 (Circumferential)
Cylindrical Wall	Shield building wall	From 10 to 11	3'-0"	3.5	3.7 (Circumferential)	4.4	4.4 (Circumferential)
Columns between air inlets Cylindrical Wall	N/A Shield building wall	From 11 to 12 El 241' - 246'	3'-0"	62.5 in ² /ft (Total per column)	2.8-2.9 (total for both faces and middle layers) (Circumferential)	74.9 in ² /ft (total per column)	3.6-2.4 (Total for both faces and middle layers) (Circumferential)

Table 3.8.4-7 (Sheet 4 of 6)

DEFINITION OF CRITICAL LOCATIONS AND THICKNESSES FOR SHIELD AND AUXILIARY BUILDINGS ⁽¹⁾							
Wall Description	Applicable Column Lines	Applicable Elevation Level or Elevation Level Range	Concrete Thickness ⁽²⁾	Reinforcement Required Vertical (in ² /ft) ⁽³⁾	Reinforcement Required Horizontal (in ² /ft) ⁽³⁾	Reinforcement Provided Vertical (in ² /ft) ⁽⁴⁾	Reinforcement Provided Horizontal (in ² /ft) ⁽⁴⁾
Tension Ring	Interface between conical roof and cylindrical portion of shield building	From 12 to 12.1 EL. 246' - 250'	3'-0"	3.2	75.3 in ² 6.0 (Total in tension ring) (Circumferential)	3.5	85.5 in ² 6.8 (Total in tension ring) (Circumferential)
Conical Roof external to PCS tank	From tension ring up to interface with outer cylindrical section of PCS tank	12.1 to 12.3 42.2	1'-6" cast-in-place concrete over 6" pre-cast concrete ribbed conical sections	4.6 (Radial)	4.5 (Circumferential)	4.7 (Radial)	4.6 (Circumferential)
Conical Roof internal to PCS tank	From interface with outer cylindrical section of PCS tank to compression ring	42.2 to 42.3	1'-6" cast-in-place concrete over pre-cast concrete-ribbed conical sections	2.1 (Radial)	4.5 (Circumferential)	2.3 (Radial)	2.0 (Circumferential)
Compression Ring	Cylindrical ring-shaped section with interfaces with conical roof section and vertical cylindrical section	From 284' 2" to 43	Cast-in-place concrete over pre-cast concrete ribbed conical sections	4.3	2.8 (Circumferential)	4.6	3.4 (Circumferential)
Cylindrical Wall	PCS internal wall lower section	From 13 to 13.1	1'-6"	4.4	0.6 (Circumferential)	4.4	0.6 (Circumferential)
Cylindrical Wall	PCS internal wall upper section	From 13.1 to 13.2	1'-6"	0.6	0.7 (Circumferential)	0.8	0.8 (Circumferential)
PCS Tank External Cylindrical Wall	PCS external wall upper section	13.1 to 13.2 From 296'4" to 308' 43.2	2'-0"	0.8 0.7	1.0 0.8 (Circumferential)	1.3 0.8	1.2 4.0 (Circumferential)

Table 3.8.4-7 (Sheet 5 of 6)

DEFINITION OF CRITICAL LOCATIONS AND THICKNESSES FOR SHIELD AND AUXILIARY BUILDINGS⁽¹⁾

Wall Description	Applicable Column Lines	Applicable Elevation Level or Elevation Level Range	Concrete Thickness ⁽²⁾	Reinforcement Required Vertical (in ² /ft) ⁽³⁾	Reinforcement Required Horizontal (in ² /ft) ⁽³⁾	Reinforcement Provided Vertical (in ² /ft) ⁽⁴⁾	Reinforcement Provided Horizontal (in ² /ft) ⁽⁴⁾
Cylindrical Wall	PCS external wall mid-elevation section	From 286'-4" to 296'-4"	2'-0"	4-2	0-6 (Circumferential)	4-3	0-8 (Circumferential)
PCS Tank External Cylindrical Wall	PCS external wall lower section	12.3 to 13.1 From 276'-4" to 280' 286'-4"	2'-0"	1.8-2.3	1.8-4.0 (Circumferential)	2.5	2.0-2 (Circumferential)
PCS Tank Roof	N/A PCS tank roof internal wall side	Inside cylindrical edge of PCS tank to 8'-0" radius at Level 14	1'-3"				
Roof	PCS tank roof mid-span	Inside cylindrical edge of PCS tank to 8'-0" to 16'-0" radius at Level 14	4'-3"				
Roof	PCS tank roof external wall side	Inside cylindrical edge of PCS tank to 16'-0" to outside edge at Level 14	4'-3"				
Auxiliary Building							
Column Line 7.3 wall	From 1 to K	From 1 to 2 El. 66'-6" - 82'-6"	3'-0"	1.108	0.908	1.64-0	1.0
Column Line 7.3 wall	From 1 to K	From 2 to 3 El. 82'-6" - 100'	3'-0"	1.61-4	1.308	2.04-6	1.64-0

Table 3.8.4-7 (Sheet 6 of 6)

DEFINITION OF CRITICAL LOCATIONS AND THICKNESSES FOR SHIELD AND AUXILIARY BUILDINGS ⁽¹⁾								
Wall Description	Applicable Colour Lines	Applicable Elevation Level or Elevation Level Range	Concrete Thickness ⁽²⁾	Reinforcement Required Vertical (in ² /ft) ⁽³⁾	Reinforcement Required Horizontal (in ² /ft) ⁽³⁾	Reinforcement Provided Vertical (in ² /ft) ⁽⁴⁾	Reinforcement Provided Horizontal (in ² /ft) ⁽⁴⁾	
Column Line 7.3 wall	From 1 to J K	From 3 to 4 (4) + El 100' - 117' 6"	2'-0"	0.7 0.5	0.7 0.5	1.0	1.0	
Column Line 7.3 wall	From J 4 to K	From 3 to 4 (4) + El 100' - 117' 6"	2'-0"	1.9 4.6	1.39 0.8	2.0 2.2	1.6 4.0	
Column Line 7.3 wall	From 1 to K	From 4 to 5 El 117' 6" - 135' 3"	2'-0"	1.8 4.4	1.4 4.0	2.0 4.6	1.6 4.0	
Column Line 7.3 wall	From 1 to K	From 5 to 6 El 135' 3" - 160'	2'-0"	3.0 2.3	2.5 2.2	3.1 2.3	2.6 2.3	
Column Line 1 wall	From 1 to N	From 1 to 2 El 66' 6" - 82' 6"	3'-0"	4.1 (outside face) 2.1 (inside face)	1.1 (outside face) 1.1 (inside face)	4.1 (outside face) 2.7 (inside face)	1.3 (outside face) 1.3 (inside face)	
Column Line 1 wall	From 1 to N	From 2 to 3 El 82' 6" - 100'	3'-0"	3.0 (outside face) 2.6 (inside face)	1.1 (outside face) 1.1 (inside face)	3.1 (outside face) 2.7 (inside face)	1.3 (outside face) 1.3 (inside face)	
Column Line 1 wall	From 1 to N	From 3 to 5 El 100' - 135' 3"	2'-3"	2.5 (outside face) 2.2 (inside face)	2.0 4.3 (outside face) 1.6 0.4 (inside face)	3.1 2.5 (outside face) 3.1 2.5 (inside face)	2.1 4.3 (outside face) 1.7 0.9 (inside face)	
Column Line 1 wall	From 1 to N	From 5 to 7 El 135' 3" - 180'	2'-3"	3.7 2.3 (outside face) 2.7 2.0 (inside face)	2.7 4.4 (outside face) 2.3 4.0 (inside face)	3.7 2.5 (outside face) 3.1 2.0 (inside face)	3.1 4.4 (outside face) 2.3 4.0 (inside face)	
Column Line L wall	From Shield Building Wall to 11	From 4 to 5 El 117' 8" - 135' 3"	2'-0"	4.7 2.3	3.5 4.8	5.1 2.6	3.7 2.0	
Column Line L wall	From Shield Building Wall to 11	From 5 to 6 El 135' 3" - roof	2'-0"	2.2 4.5	1.8 4.5	2.6 4.6	2.0 4.6	

Table 3.8.5-3

DEFINITION OF CRITICAL LOCATIONS AND THICKNESSES FOR NUCLEAR ISLAND BASEMAT ⁽¹⁾							
Wall or Section Description	Applicable Column Lines	Applicable Elevation Level or Elevation Level Range	Concrete Thickness ⁽²⁾	Nominal Reinforcement Required Vertical (in ² /ft) ⁽³⁾	Nominal Reinforcement Required Horizontal (in ² /ft) ⁽³⁾	Reinforcement Provided Vertical (in ² /ft) ⁽⁴⁾	Reinforcement Provided Horizontal (in ² /ft) ⁽⁴⁾
Auxiliary Building Basemat							
Auxiliary Basemat Area	Column line K to L and from Column line 11 wall to the intersection with the shield building	From level 0 to 1	6'-0"	Shear Reinforcement 0.26	Bottom Reinforcement 2.7 (East-West Direction) Top Reinforcement 2.7 (East-West Direction)	Shear Reinforcement 0.31	Bottom Reinforcement 2.7 (East-West Direction) Top Reinforcement 2.7 (East-West Direction)
Auxiliary Basemat Area	Column line 1 to 2 and from Column line K-2 to N wall	From level 0 to 1	6'-0"	Shear Reinforcement 0.74	Bottom Reinforcement at column line 2 4.5 (North-South Direction) Top Reinforcement at mid-span 3.12 (North-South Direction)	Shear Reinforcement 0.78	Bottom Reinforcement 4.5 (North-South Direction) Top Reinforcement 3.12 (North-South Direction)

Notes:

1. The applicable column lines and elevation levels are identified and included in Figures 1.2-9, 3.7.2-12 (sheets 1 through 12), 3.7.2-19 (sheets 1 through 3) and on Table 1.2-1.
2. These thicknesses have a construction tolerance of +1 inch, -3/4 inch.
3. These concrete reinforcement values represent the minimum reinforcement required for structural requirements except for designed openings, penetrations, sumps or elevator pits.
4. These concrete reinforcement values represent the provided reinforcement for structural requirements except for designed openings, penetrations, sumps or elevator pits.

Table 3.8.5-3

DEFINITION OF CRITICAL LOCATIONS AND THICKNESSES FOR NUCLEAR ISLAND BASEMAT ⁽¹⁾							
Wall or Section Description	Applicable Column Lines	Applicable Elevation Level or Elevation Level Range	Concrete Thickness ⁽²⁾	Nominal Reinforcement Required Vertical (in ² /ft) (3)	Nominal Reinforcement Required Horizontal (in ² /ft) (3)	Reinforcement Provided Vertical (in ² /ft) ⁽⁴⁾	Reinforcement Provided Horizontal (in ² /ft) ⁽⁴⁾
Auxiliary Building Basement							
Auxiliary Basement Area	Column line K to L and from Col. Line 11 wall to the intersection with the shield building	From level 0 to 1	6'-0"	Shear Reinforcement 0.260-0.40	Bottom Reinforcement 2.7 (East-West Direction) Top Reinforcement 2.7 (East-West Direction)	Shear Reinforcement 0.31 0-45	Bottom Reinforcement 2.7 (East-West Direction) Top Reinforcement 2.7 (East-West Direction)
Auxiliary Basement Area	Column line 1 to 2 and from Column line K-2 to N wall	From level 0 to 1	6'-0"	Shear Reinforcement 0.74-0.37	Bottom Reinforcement at column line 2 4.5 (North-South Direction) Top Reinforcement at mid-span 3.12 (North-South Direction)	Shear Reinforcement 0.78 0-6	Bottom Reinforcement 4.5 (North-South Direction) Top Reinforcement 3.12 (North-South Direction)

Notes:

1. The applicable column lines and elevation levels are identified and included in Figures 1.2-9, 3.7.2-12 (sheets 1 through 12), 3.7.2-19 (sheets 1 through 3) and on Table 1.2-1.
2. These thicknesses have a construction tolerance of +1 inch, -3/4 inch.
3. These concrete reinforcement values represent the minimum reinforcement required for structural requirements except for designed openings, penetrations, sumps or elevator pits.
4. These concrete reinforcement values represent the provided reinforcement for structural requirements except for designed openings, penetrations, sumps or elevator pits.

Table 3.8.4-7 (Sheet 1 of 3)

DEFINITION OF CRITICAL LOCATIONS AND THICKNESSES FOR SHIELD AND AUXILIARY BUILDINGS ⁽¹⁾							
Wall Description	Applicable Column Lines	Applicable Elevation Level or Range	Concrete Thickness ⁽²⁾	Reinforcement Required Vertical (in ² /ft) ⁽³⁾	Reinforcement Required Horizontal (in ² /ft) ⁽³⁾	Reinforcement Provided Vertical (in ² /ft) ⁽⁴⁾	Reinforcement Provided Horizontal (in ² /ft) ⁽⁴⁾
Shield Building							
Shield Building Cylinder	Full circumference	From 3 to 11	3'-0"				
Shield Building Cylinder	Full circumference	From 6 to 7 EL. 160' 6" - 180' 8"	3'-0"	4.4	3.9 (Circumferential)	5.6	4.7
Shield Building Cylinder	Full circumference	From 7 to 8 EL. 180' 8" - 200"	3'-0"	3.9	3.4 (Circumferential)	4.2	3.5
Columns between air inlets	N/A	From 11 to 12 EL. 241' - 246'	3'-0"	62.5 in ² (total per column)	2.8 (Total for both faces and middle layers)	74.9 in ² (total per column)	3.6 (Total for both faces and middle layers)
Tension Ring	Interface between conical roof and cylindrical portion of shield building	From 12 to 12.1 EL. 246' - 250'	3'-0"		75.3 in ² (Total in tension ring) (Circumferential)		85.5 in ² (Total in tension ring) (Circumferential)
Conical Roof		12.1 to 12.3	1'-6" cast-in-place concrete over 6" pre-cast concrete ribbed conical sections				

Notes:

1. The applicable column lines and elevation levels are identified and included in Figures 1.2-9, 3.7.2-12 (sheets 1 through 12), 3.7.2-19 (sheets 1 through 3) and on Table 1.2-1.
2. Concrete thicknesses less than or equal to 30" have a construction tolerance of $\pm 1/2"$, $\pm 3/8"$.
3. These reinforcement values represent the minimum reinforcement required for structural requirements except for designed openings, penetrations, sumps or elevator pits. These reinforcement values apply for each face of the applicable wall unless specifically indicated on the table.
4. These reinforcement values represent the reinforcement provided for structural requirements except for designed openings, penetrations, sumps or elevator pits. These reinforcement values apply for each face of the applicable wall unless specifically indicated on the table.



Table 3.8.4-7 (Sheet 2 of 3)

DEFINITION OF CRITICAL LOCATIONS AND THICKNESSES FOR SHIELD AND AUXILIARY BUILDINGS ⁽¹⁾								
Wall Description	Applicable Column Lines	Applicable Elevation Level or Elevation Level Range	Concrete Thickness ⁽²⁾	Reinforcement Required Vertical (in ² /ft) ⁽³⁾	Reinforcement Required Horizontal (in ² /ft) ⁽³⁾	Reinforcement Provided Vertical (in ² /ft) ⁽⁴⁾	Reinforcement Provided Horizontal (in ² /ft) ⁽⁴⁾	
PCS Tank External Cylindrical Wall	Upper section	13.1 to 13.2 From 296' to 308'	2'-0"	0.8	1.0 (Circumferential)	1.3	1.2 (Circumferential)	
PCS Tank External Cylindrical Wall	Lower section	12.3 to 13.1 From 276' to 280'	2'-0"	1.8	1.8 (Circumferential)	2.5	2.0 (Circumferential)	
PCS Tank Roof	N/A	Level 14	1'-3"					
Auxiliary Building								
Column Line 7.3 wall	From 1 to K	From 1 to 2 El. 66' 8" - 82' 8"	3'-0"	1.1	0.9	1.6	1.0	
Column Line 7.3 wall	From 1 to K	From 2 to 3 El. 82' 6" - 100'	3'-0"	1.6	1.3	2.0	1.6	
Column Line 7.3 wall	From 1 to J	From 3 to 4 El. 100' - 117' 6"	2'-0"	0.7	0.7	1.0	1.0	
Column Line 7.3 wall	From J to K	From 3 to 4 El. 100' - 117' 6"	2'-0"	1.9	1.39	2.0	1.6	
Column Line 7.3 wall	From 1 to K	From 4 to 5 El. 117' 6" - 135' 3"	2'-0"	1.8	1.4	2.0	1.6	
Column Line 7.3 wall	From 1 to K	From 5 to 6 El. 135' 3" - 160'	2'-0"	3.0	2.5	3.1	2.6	

Table 3.8.4-7 (Sheet 3 of 3)

DEFINITION OF CRITICAL LOCATIONS AND THICKNESSES FOR SHIELD AND AUXILIARY BUILDINGS ⁽¹⁾							
Wall Description	Applicable Column Lines	Applicable Elevation Level or Elevation Level Range	Concrete Thickness ⁽²⁾	Reinforcement Required Vertical (in ² /ft) (3)	Reinforcement Required Horizontal (in ² /ft) (3)	Reinforcement Provided Vertical (in ² /ft) (4)	Reinforcement Provided Horizontal (in ² /ft) (4)
Column Line 1 wall	From 1 to N	From 1 to 2 El 66' 6" - 82' 6"	3'-0"	4.1 (outside face) 2.1 (inside face)	1.1 (outside face) 1.1 (inside face)	4.1 (outside face) 2.7 (inside face)	1.3 (outside face) 1.3 (inside face)
Column Line 1 wall	From 1 to N	From 2 to 3 El 82' 6" - 100'	3'-0"	3.0 (outside face) 2.6 (inside face)	1.1 (outside face) 1.1 (inside face)	3.1 (outside face) 2.7 (inside face)	1.3 (outside face) 1.3 (inside face)
Column Line 1 wall	From 1 to N	From 3 to 5 El 100' - 135' 3"	2'-3"	2.5 (outside face) 2.2 (inside face)	2.0 (outside face) 1.6 (inside face)	3.1 (outside face) 3.1 (inside face)	2.1 (outside face) 1.7 (inside face)
Column Line 1 wall	From 1 to N	From 5 to 7 El 135' 3" - 180'	2'-3"	3.7 (outside face) 2.7 (inside face)	2.7 (outside face) 2.3 (inside face)	3.7 (outside face) 3.1 (inside face)	3.1 (outside face) 2.3 (inside face)
Column Line L wall	From Shield Building Wall to 11	From 4 to 5 El 117' 6" - 135' 3"	2'-0"	4.7	3.5	5.1	3.7
Column Line L wall	From Shield Building Wall to 11	From 5 to 6 El 135' 3" - 153'	2'-0"	2.2	1.8	2.6	2.0