CHAPTER 3
GENERAL REQUIREMENTS

SECTION 301
GENERAL

301.1 General. Log structures shall comply with the general requirements of this chapter.

SECTION 302
MATERIALS

302.1 Materials. Materials used in the construction of log structures shall conform to the provisions of this Section. Materials used to conform to the applicable provisions of this standard shall be installed in accordance with the installation instructions provided for those materials.

302.2 Logs. Log styles shall include, but are not limited to, round, rectangular or other shapes (profiles) that are peeled, notched, coped, hewn, sawn, milled, or otherwise profiled into their final form for installation.

302.2.1 Stress grading. All logs shall be stress graded and identified by the grade mark or Certificate of Inspection issued by an accredited log grading agency.

302.2.1.1 Log grades and design values. Log grades and design values shall be developed in accordance with one of the following standards:

1. ASTM D3957
2. ASTM D3737
3. ASTM D245

302.2.1.2 Species. Logs shall be of species that are listed with clear wood strength values as published in ASTM D2555.

302.2.1.3 Grade marks. Grade marks or Certificates of Inspection shall include the following information:

1. Name or registered trade mark of the accredited grading agency.
2. Name or identification number of the manufacturer.
3. Species of logs.
4. Grade name or designation.
5. Moisture content at time of grading. If the moisture content is not included on the grade mark or certificate then the moisture content shall be assumed to be green for all design calculations where the moisture content is a factor.

302.2.1.4 Log profile. The average log profile shall be drawn and dimensioned.

302.2.2 Moisture content. Moisture content (*MC*) shall be evaluated in accordance with the requirements of this section.

302.2.2.1 Design moisture content. The design moisture content (MC_D) shall be determined in accordance with the requirements of Section 302.2.2.1.1 or 302.2.2.1.2.

302.2.2.1.1 Prescriptive specification. Logs shall be evaluated as green and shall have design moisture content (MC_D) equal to the average moisture content at fiber saturation (MC_{FSP}), in accordance with Table 304.2(1).

302.2.2.1.2 Certified specification. The design moisture content shall be equal to the moisture content determined and certified by methods prescribed by an accredited third-party grading agency.

302.2.2.2 Service moisture content. The service moisture content (MC_S) shall be determined in accordance with the requirements of Section 302.2.2.2.1 or 302.2.2.2.2.

302.2.2.2.1 Prescriptive specification by climate zone. Prescribed by geographic climate zone using Figure 304.2.2.3 and Table 304.2(4).

302.2.2.2.2 Calculation procedure. Calculated in accordance with ASTM D4933.

302.2.3 Design values and section properties. Elements of log structures shall have design values and section properties as prescribed in this section.

302.2.3.1 Sawn lumber and glued laminated timber. Design values, adjustment factors and section properties for visually-graded and mechanically-graded dimension lumber and glued laminated timber shall be as specified in the ANSI/AWC NDS.

302.2.3.2 Logs. Design values for softwood and hardwood logs shall be as specified in Tables 302.2(1) through 302.2(5) or as established by an accredited grading agency. Tabulated design values shall be multiplied by all applicable adjustment factors listed in Table 302.2(6) to determine allowable design values.

302.2.3.3 Specific gravity. The specific gravity (*G*) for wood species or species groups shall be obtained in accordance with one of the conditions listed in this section.

302.2.3.3.1 Prescriptive specification for wood in unseasoned condition. Specific gravity shall be obtained from ASTM D2555.

302.2.3.3.2 Prescriptive specification for wood in oven-dry condition. Specific gravity shall be taken from ANSI/AWC NDS.

TABLE 302.2(1)
LIST OF SPECIES COMBINATIONS

SPECIES OR SPECIES COMBINATION[b]	SPECIES PERMITTED TO BE INCLUDED IN COMBINATION[c]	SOURCE AGENCIES[a]	DESIGN VALUES PROVIDED IN TABLES
Appalachian Softwoods	Fir: Balsam Fir: Balsam—Canadian Hemlock: Eastern Hemlock: Eastern—Canadian Pine: Eastern White Pine: Eastern White—Canadian Pine: Jack Pine: Jack—Canadian Pine: Red Pine: Red—Canadian Southern Pine: Loblolly Southern Pine: Longleaf Southern Pine: Shortleaf Southern Pine: Slash Pine: Pitch Pine: Pond Pine: Sand Pine: Spruce Pine: Virginia Spruce: Black—Canadian Spruce: Red Spruce: Red—Canadian Spruce: White Spruce: White—Canadian Tamarack Tamarack—Canadian	TP	SRTB, Wall-Log
Ash		LHC	Wall-Log
Aspen	Aspen: Bigtooth Aspen: Largetooth—Canadian Aspen: Quaking Aspen: Trembling—Canadian	LHC	SRTB, Wall-Log
Bald Cypress		LHC, TP	SRTB, Wall-Log
Beech		TP	SRTB, Wall-Log
Cedar: Incense		LHC, TP	SRTB, Wall-Log
Cedar: Northern White	Cedar: Eastern (Northern) White—Canadian Cedar: Northern White	TP	SRTB, Wall-Log
Cedar, Red (Western, RC)	Cedar: Incense (IC) Cedar: Western Red (WRC) Cedar: Western Red—Canadian (WRC-N)	LHC	SRTB, Wall-Log
Cedar: Western Red (WRC)		LHC	SRTB, Wall-Log
Cedar: Western Red—Canadian (WRC-N)		LHC	SRTB, Wall-Log
Cedar: Western Red	Cedar: Western Red Cedar: Western Red—Canadian	TP	SRTB, Wall-Log
Cedar: White (WC)	Cedar: Atlantic White Cedar: Eastern White—Canadian Cedar: Northern White	LHC	SRTB, Wall-Log
Cedar: Yellow (Western, YC)	Cedar: Alaska Cedar: Cypress, Yellow—Canadian Cedar: Port Orford	LHC	SRTB, Wall-Log
Douglas Fir	Douglas Fir: Coast Douglas Fir: Interior North Douglas Fir: Interior West	TP	SRTB, Wall-Log
Douglas Fir: Coast		LHC	SRTB, Wall-Log
Douglas Fir: Interior North		LHC	SRTB, Wall-Log

(continued)

TABLE 302.2(1)—continued
LIST OF SPECIES COMBINATIONS

SPECIES OR SPECIES COMBINATION[b]	SPECIES PERMITTED TO BE INCLUDED IN COMBINATION[c]	SOURCE AGENCIES[a]	DESIGN VALUES PROVIDED IN TABLES
Douglas Fir: Inerior South		LHC	SRTB, Wall-Log
Douglas Fir—S	Douglas Fir: Interior South	TP	SRTB, Wall-Log
Douglas Fir: Interior West		LHC	SRTB, Wall-Log
Douglas Fir—N	Douglas Fir—Canadian	TP	SRTB, Wall-Log
Douglas Fir—Canadian		LHC	SRTB, Wall-Log
Douglas Fir-Larch	Douglas Fir: Interior West Douglas Fir—Canadian Douglas Fir: Coast Douglas Fir: Interior North Larch, Western Larch, Western—Canadian	TP	SRTB, Wall-Log
Douglas Fir-Larch (DFL)	Douglas Fir: Interior West Douglas Fir: Interior North Larch, Western	LHC	SRTB, Wall-Log
Douglas Fir-Larch—Canadian (DFL-C)	Douglas Fir—Canadian Larch, Western—Canadian	LHC	SRTB, Wall-Log
Eastern Spruce-Pine—Fir (ESPF)	Fir: Balsam Fir: Balsam—Canadian Pine: Jack Pine: Jack—Canadian Pine: Red (RP) Pine: Red—Canadian (RP-N) Spruce: Black Spruce: Black—Canadian Spruce: Red Spruce: Red—Canadian Spruce: White Spruce: White—Canadian	LHC	SRTB, Wall-Log
Eastern Softwoods	Fir: Balsam Fir: Balsam—Canadian Hemlock: Eastern Hemlock: Eastern—Canadian Pine: Eastern White (EWP) Pine: Eastern White—Canadian Pine: Jack Pine: Jack—Canadian Pine: Pitch Pine: Red (RP) Pine: Red—Canadian (RP-N) Spruce: Black Spruce: Black—Canadian Spruce: Red Spruce: Red—Canadian Spruce: White Spruce: White—Canadian Tamarack (TAM) Tamarack—Canadian	LHC, TP	SRTB, Wall-Log
Fir: Alpine		TP	SRTB, Wall-Log
Fir: White (WF)		LHC	Wall-Log
Hem—Fir (HF)	Fir: Amabilis—Canadian Fir: California Red Fir: Grand Fir: Noble Fir: Pacific Silver Fir: White (WF) Hemlock: Western Hemlock: Western—Canadian	LHC	SRTB, Wall-Log

(continued)

TABLE 302.2(1)—continued
LIST OF SPECIES COMBINATIONS

SPECIES OR SPECIES COMBINATION[b]	SPECIES PERMITTED TO BE INCLUDED IN COMBINATION[c]	SOURCE AGENCIES[a]	DESIGN VALUES PROVIDED IN TABLES
Hem—Fir	Fir: California Red Fir: Grand Fir: Noble Fir: Pacific Silver Fir: White Hemlock: Western	TP	SRTB, Wall-Log
Hem—Fir North	Fir: Amabilis (Pacific Silver)—Canadian Hemlock: Western—Canadian	TP	SRTB, Wall-Log
Hemlock: Eastern		LHC	Wall-Log
Hemlock: Eastern—Canadian		LHC	Wall-Log
Hemlock: Eastern	Hemlock: Eastern Hemlock: Eastern—Canadian	TP	SRTB
Hemlock: Eastern—Tamarack	Hemlock: Eastern Hemlock: Eastern—Canadian Tamarack Tamarack—Canadian	TP	SRTB, Wall-Log
Hemlock: Western	Hemlock: Western Hemlock: Western—Canadian	TP	SRTB, Wall-Log
Larch: Western	Larch: Western Larch: Western—Canadian	TP	SRTB, Wall-Log
Larch: Western		LHC	SRTB, Wall-Log
Larch: Western—Canadian		LHC	SRTB, Wall-Log
Mixed Oak	Oak, Red: Black Oak, Red: Cherrybark Oak, Red: Laurel Oak, Red: Northern Red Oak, Red: Pin Oak, Red: Scarlet Oak, Red: Southern Red Oak, Red: Water Oak, Red: Willow Oak, White: Bur Oak, White: Chestnut Oak, White: Live Oak, White: Overcup Oak, White: Post Oak, White: Swamp Chestnut Oak, White: Swamp White Oak, White: White	TP	SRTB, Wall-Log
Mixed Southern Pine (MSP)	Pine: Loblolly (LBP) Pine: Longleaf (LLP) Pine: Slash (SHP) Pine: Shortleaf (SLP) Pine: Pond Pine: Sand Pine: Spruce Pine: Virginia	LHC	SRTB, Wall-Log

(continued)

TABLE 302.2(1)—continued
LIST OF SPECIES COMBINATIONS

SPECIES OR SPECIES COMBINATION[b]	SPECIES PERMITTED TO BE INCLUDED IN COMBINATION[c]	SOURCE AGENCIES[a]	DESIGN VALUES PROVIDED IN TABLES
Mixed Southern Pine	Pine: Loblolly Pine: Longleaf Pine: Slash Pine: Shortleaf Pine: Pond Pine: Virgina	TP	SRTB, Wall-Log
Oak, Red	Oak, Black Oak, Cherrybark Oak, Northern Red Oak, Southern Red Oak, Laurel Oak, Pin Oak, Scarlet Oak, Water Oak, Willow	LHC, TP	SRTB, Wall-Log
Oak, White	Oak, Chestnut Oak, Live Oak, Post Oak, Swamp Chestnut Oak, White Oak, Bur Oak, Overcup Oak, Swamp white	LHC, TP	SRTB, Wall-Log
Pine: Eastern White (EWP)		LHC	SRTB, Wall-Log
Pine: Eastern White	Pine: Eastern White Pine: Eastern White—Canadian	TP	SRTB, Wall-Log
Pine: Idaho White	Pine: Western White Pine: Western White—Canadian	TP	SRTB, Wall-Log
Pine: Loblolly (LBP)		LHC	SRTB, Wall-Log
Pine: Lodgepole (LPP)		LHC	SRTB, Wall-Log
Pine: Lodgepole	Pine: Lodgepole Pine: Lodgepole—Canadian	TP	SRTB, Wall-Log
Pine: Longleaf (LLP)		LHC	SRTB, Wall-Log
Pine: Northern	Pine: Jack Pine: Jack—Canadian Pine: Red Pine: Red—Canadian Pine: Pitch	TP	SRTB, Wall-Log
Pine: Ponderosa (PP)		LHC	SRTB, Wall-Log
Pine: Ponderosa	Pine: Ponderosa Pine: Ponderosa—Canadian	TP	SRTB, Wall-Log
Pine: Ponderosa—Lodgepole	Pine: Ponderosa Pine: Ponderosa—Canadian Pine: Lodgepole Pine: Lodgepole—Canadian	TP	SRTB, Wall-Log

(continued)

TABLE 302.2(1)—continued
LIST OF SPECIES COMBINATIONS

SPECIES OR SPECIES COMBINATION[b]	SPECIES PERMITTED TO BE INCLUDED IN COMBINATION[c]	SOURCE AGENCIES[a]	DESIGN VALUES PROVIDED IN TABLES
Pine: Ponderosa—Sugar	Pine: Ponderosa Pine: Ponderosa—Canadian Pine: Sugar	TP	SRTB, Wall-Log
Pine: Red (RP)		LHC	SRTB, Wall-Log
Pine: Red—Canadian (RP-N)		LHC	SRTB, Wall-Log
Pine: Shortleaf (SLP)		LHC	SRTB
Pine: Slash (SHP)		LHC	SRTB
Pine: Sugar		LHC, TP	SRTB, Wall-Log
Pine: Western White (WWP)		LHC	SRTB, Wall-Log
Redwood	Redwood: Old Growth Redwood: Second Growth	TP	SRTB, Wall-Log
Southern Pine	Pine: Loblolly (LBP) Pine: Longleaf (LLP) Pine: Slash (SHP) Pine: Shortleaf (SLP)	LHC, TP	SRTB, Wall-Log
Spruce: Eastern	Spruce: Black Spruce: Black—Canadian Spruce: Red Spruce: Red—Canadian Spruce: White Spruce: White—Canadian	LHC, TP	SRTB, Wall-Log
Spruce: Engelmann		LHC	SRTB, Wall-Log
Spruce: Engelmann	Spruce: Engelmann Spruce: Engelmann—Canadian	TP	SRTB, Wall-Log
Spruce: Engelmann—Fir: Alpine	Spruce: Engelmann Spruce: Engelmann—Canadian Alpine Fir	TP	SRTB, Wall-Log
Spruce: Engelmann—Pine: Lodgepole	Spruce: Engelmann Spruce: Engelmann—Canadian Pine: Lodgepole Pine: Lodgepole—Canadian	TP	SRTB, Wall-Log
Spruce: Engelmann—Fir: Alpine—Pine: Lodgepole	Spruce: Engelmann Spruce: Engelmann—Canadian Alpine Fir Pine: Lodgepole Pine: Lodgepole—Canadian	TP	SRTB, Wall-Log
Spruce-Pine—Fir	Fir: Alpine—Canadian Fir: Balsam Fir: Balsam—Canadian Pine: Jack Pine: Jack—Canadian Pine: Lodgepole Pine: Lodgepole—Canadian Pine: Red Pine: Red—Canadian Spruce: Black Spruce: Black—Canadian Spruce: Engelmann Spruce: Engelmann—Canadian Spruce: Red Spruce: Red—Canadian Spruce: Sitka Spruce: Sitka—Canadian Spruce: White Spruce: White—Canadian	TP	SRTB, Wall-Log

(continued)

TABLE 302.2(1)—continued
LIST OF SPECIES COMBINATIONS

SPECIES OR SPECIES COMBINATION[b]	SPECIES PERMITTED TO BE INCLUDED IN COMBINATION[c]	SOURCE AGENCIES[a]	DESIGN VALUES PROVIDED IN TABLES
Tamarack (TAM)		LHC	SRTB, Wall-Log
Tamarack	Tamarack Tamarack—Canadian	TP	SRTB, Wall-Log
Western Spruce-Pine—Fir (WSPF)	Fir: Alpine—Canadian Pine: Lodgepole (LPP) Pine: Lodgepole—Canadian (LPP-N) Spruce: Engelmann Spruce: Engelmann—Canadian Spruce: Sitka Spruce: Sitka—Canadian	LHC	SRTB, Wall-Log
Western Softwoods (WS)	Fir: Subalpine Hemlock: Mountain Pine: Lodgepole (LPP) Pine: Lodgepole—Canadian (LPP-N) Pine: Monterey Pine: Ponderosa (PP) Pine: Ponderosa—Canadian Pine: Sugar (SUP) Pine: Western White (WWP) Pine: Western White—Canadian Spruce: Engelmann Spruce: Engelmann—Canadian Spruce: Sitka Spruce: Sitka—Canadian	LHC	SRTB, Wall-Log
Western Woods	Douglas Fir: Coast Douglas Fir: Interior North Douglas Fir: Interior South Douglas Fir: Interior West Douglas Fir—Canadian Fir: Amabilis (Pacific Silver)—Canadian Fir: California Red Fir: Grand Fir: Noble Fir: Pacific Silver Fir: Subalpine Fir: White Hemlock: Mountain Hemlock: Western Hemlock: Western—Canadian Larch: Western Larch: Western—Canadian Pine: Lodgepole Pine: Lodgepole—Canadian Pine: Monterey Pine: Ponderosa Pine: Ponderosa—Canadian Pine: Sugar Pine: Western White Pine: Western White—Canadian Spruce: Engelmann Spruce: Engelmann—Canadian Spruce: Sitka Spruce: Sitka—Canadian	TP	SRTB, Wall-Log

(continued)

TABLE 302.2(1)—continued
LIST OF SPECIES COMBINATIONS

SPECIES OR SPECIES COMBINATION[b]	SPECIES PERMITTED TO BE INCLUDED IN COMBINATION[c]	SOURCE AGENCIES[a]	DESIGN VALUES PROVIDED IN TABLES
White Woods	Fir: Amabilis (Pacific Silver)—Canadian Fir: California Red Fir: Grand Fir: Noble Fir: Pacific Silver Fir: White Hemlock: Mountain Hemlock: Western Hemlock: Western—Canadian Pine: Eastern White Pine: Eastern White—Canadian Pine: Jack Pine: Jack—Canadian Pine: Lodgepole Pine: Lodgepole—Canadian Pine: Monterey Pine: Ponderosa Pine: Ponderosa—Canadian Pine: Red Pine: Red—Canadian Pine: Sugar Pine: Western White Pine: Western White—Canadian Spruce: Engelmann Spruce: Engelmann—Canadian Spruce: Sitka Spruce: Sitka—Canadian	TP	SRTB, Wall-Log

a. Source agencies:
   1. LHC: Log Home Council, National Association of Home Builders
   2. TP: Timber Products Inspection, Inc.

b. Species combinations listed represent typical combinations utilized by TP or LHC member clients. Other species combinations published by accredited grading agencies are permissible. The grading agencies listed here do not preclude the use of other accredited grading agencies.

c. Identified species and their subsequent design values were obtained from clear wood test data as shown within ASTM D2555.