# Principles and Practices of Light Construction



Ronald C. Smith, Ted L. Honkala, and Malcolm W. Sharp.

# **CONTENTS**

	1
TOOLS 1	
Hand Tools 1 Construction Equipment 43 Review Questions 48	
	2
SCAFFOLDS 49	
Types of Scaffolds 50 Safe Use of Scaffolds 61 Review Questions 62	
	3
THE BUILDING SITE 63	
Site Investigation 63 Soil Investigation 64 Available Services 66 Zoning Restrictions 68 Site Layout 69 Leveling Instruments 72 Leveling Operations 73 Review Questions 77	

# 4

# THE FOUNDATION 79

Foundation Types 80
Foundation Excavation 80
Excavating Procedures 82
Concrete Full Basement Construction 83
Concrete Block Foundation Walls 102
Concrete Surface Foundation 110
Slab-on-Ground Foundation 112
Pier Foundation 117
Preserved Wood Foundation 119
Concrete Placing 127
Basement Floor 131
Concrete Steps 133
Sidewalks and Driveways 135

# 5

# THE FLOOR FRAME 14

Review Questions 138

Component Parts 141
Posts and Beams 141
Bearing Walls 145
Foundation Wall—Floor Frame Connection 146
Joists 146
Subfloor 162
Review Questions 163

# 6

# THE WALL FRAME 165

Component Parts, Platform Frame 165
Platform Frame Wall Construction 168
Cutting the Frame 172
Assembling the Frame 174
Wall Sheathing 178
Erecting the Frame 184
Partitions 186
Light Steel Wall Framing 190
Masonry Wall Systems 193
Review Ouestions 197

### THE CEILING AND ROOF FRAME 199

Ceiling Joist Sizes 200 Cutting Ceiling Joists 200

Assembling the Ceiling Frame 203

Roof Shapes 206

Rafter Terms 208

How to Use the Rafter Table 215

Roof Frame Assembly 225

Gable Frame 225

Rafter Bracing 226

Dormer Framing 228 Trussed Roof Systems 231

Alternate Roof Systems 240

Flat Roof with Regular Joists 242

Flat Roof with Laminated Beams 244

Glue-Laminated Arches 246 Review Ouestions 248

8

## STAIR BUILDING 249

Terms Used in Stair Building 250

Stair Dimensions 252

Types of Stairs 253

How to Build an Open Stringer Stair 256 How to Build a Semihoused Stringer Stair 264

How to Lay Out and Cut a Housed Stringer 264

Assembling a Housed Stringer Stair 267

Assembling the Handrail 268

Review Ouestions 271

### **EXTERIOR FINISHING** 273

Cornice Work 273

Roof Coverings 278

Windows 298

Exterior Doors 305

Wall Sheathing Paper 308

Types of Exterior Wall Finish 309

Stone Construction 326

Review Questions 328

# 10

# **INTERIOR FINISHING** 329

Insulation 330
Interior Wall and Ceiling Finishes 332
Flooring 340
Inside Door Frames 348
Interior Trim 358
Cabinetwork 360
Review Questions 366

# 11

# **ENERGY-EFFICIENT HOUSING 367**

Foundations 368
Floor Frame 374
Wall Frame 375
Ceilings and Roofs 381
Passive Solar Gain 384
Building Evaluation 386
Review Questions 387

# GLOSSARY 389

**INDEX** 411