

Contents

ACKNOWLEDGMENTS.....	i
INTRODUCTION.....	1
1 TIMBER SPECIFICATION AND EXPLANATION	2
Timber specification for hardwood	2
Timber specification for domestic pine.....	3
Structural adequacy	3
Understanding the hardwood specification	3
The importance of using a suitable species	3
Exclusion of blackbutt.....	5
Structural Grade One.....	6
Not starting with an F grade	6
Knot size limited to 1/7 th of the face	8
Only slight tight gum allowed.....	9
Underside may comply with Structural Grade Two.....	10
Timber to be treated to H3 with ACQ or Copper Azole	10
Over ordering by ten percent.....	11
Use of unseasoned timber	11
Use of laminated timber	12
Independent confirmation of grade	13
Health advantages of hardwood handrail	13
Correct use of LOSP treated pine handrail.....	14
Checking primer adhesion.....	14
End sealing of rails	15
2 BEST PRACTICE IN DESIGN	18
Code compliance.....	18
Machining capacity	18
Profile stability	19
Width to thickness ratio.....	19
Keeping the profile in balance	20
Tooling costs	20
Structural adequacy	21

Detailing for durability	22
Introduction	22
Detailing to shed moisture.....	22
Keping your handrail from sagging.....	23
Fit between posts when appropriate	25
Fixing from underneath	25
Introduce a gap at the ends	25
End sealing	25
fastening vertically aligned rails.....	26
Edge treatment.....	26
Kerb design.....	27
Finishing	27
Maintenance	28
3 STANDARDS	29
The elephant in the room	29
When do you need a railing?	31
Railing geometry	33
Railing height with horses	37
Railing engineering	38
Kerbs.....	38
4 FIXINGS	39
Fastener type.....	39
Nailplates and brackets.....	40
Attaching a top horizontal rail to the post	42
5 POSTS	44
Introduction	44
Post timber specification	44
Notes on the specification	45
Free of heart.....	45
Slight gum vein.....	47
Laminated posts.....	48
Attaching the post to the girder.....	49
Accommodating shrinkage	49

Timber handrail post considerations	50
Engaging with the ground	50
Embedding timber posts in the ground	50
Timber posts in supports	52
Steel to handrail post considerations	53
Other matters	54
Frangible handrails	54
Post tops	54
Metal posts	55
Posts using timber for aesthetic reasons.....	55
Timber top rails with steel posts	55
Paint finishes to posts.....	56
6 WIRE ROPES	58
Top rails.....	58
Wire size and spacing.....	59
Vandal resistance.....	59
Timber posts	59
Terminating in timber.....	60
Importance of having the design correct	60
Suggested timber termination.....	62
Minor change of direction in timber and steel	62
Steel posts.....	63
Detailing for steel - a need for caution	63
Major change of direction with steel posts.....	63
7 CASE HISTORIES	64
Which is better, timber or steel?.....	64
Mangrove Walk, Queens Wharf, Brisbane	69
Cairns Marina	71
An interesting handrail from the UK.....	73
Refurbishing handrails on two NSW road bridges.....	75

8 CHECK LIST	78
SOURCE OF IMAGES	81
REFERENCES	83
ABOUT THE AUTHOR	84