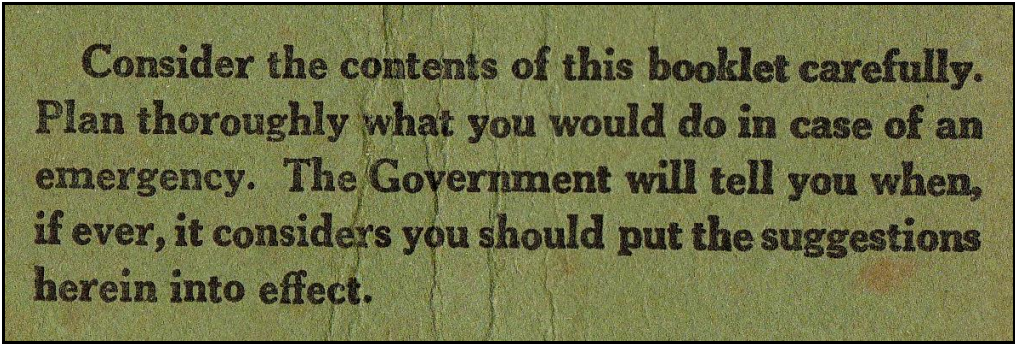


**Gimme Shelter:
Archaeology and the Social History of
Structural Defence in Adelaide
1941-1943**



Consider the contents of this booklet carefully. Plan thoroughly what you would do in case of an emergency. The Government will tell you when, if ever, it considers you should put the suggestions herein into effect.

Martin Wimmer

A thesis submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy

Department of Archaeology

School of Humanities

Flinders University, South Australia

2014

Cover Page: State Emergency Council for Civil Defence, Victoria 1941. *Air Raid
Precautions: Advice to Household.* H.E. Daw, Government Printer,
Melbourne.

.

Table of Contents

| | |
|---|-------|
| Table of Contents..... | i |
| List of Maps..... | xv |
| List of Tables..... | xvi |
| Abstract..... | xviii |
| Declaration of Candidate..... | xx |
| Acknowledgements..... | xxi |
| Acronyms and Abbreviations..... | xxiii |
| Linear Measurement Conversions..... | xxiv |
| Chapter One Think for a Moment..... | 1 |
| 1.1 Think for a moment..... | 2 |
| 1.2 Archaeology and social recency..... | 5 |
| 1.3 The nature of warfare..... | 8 |
| 1.4 Landscape as cultural flux..... | 13 |
| 1.5 Research questions and aims..... | 15 |
| 1.6 Constructing the argument..... | 17 |
| Chapter Two A Shifting Frontier..... | 20 |
| 2.1 A legacy of perceived international aggressors..... | 21 |
| 2.2 Edwardian future past: Flight and social destruction..... | 26 |
| 2.3 The UK genesis of ARP..... | 31 |
| 2.4 ARP in Australia: No longer “girt by sea”..... | 38 |
| 2.5 ARP in South Australia..... | 45 |
| 2.6 A fearful domestic familiarity..... | 50 |
| Chapter Three Understanding the Psychology and Landscape of Fear..... | 53 |
| 3.1 By-products of war..... | 54 |
| 3.2 Strategies for containing fear..... | 60 |

| | |
|--|-----|
| 3.3 Cultural landscape theory: Landscapes of fear and social stratification..... | 70 |
| 3.4 A dynamic frontier: Global warfare and local war fear | 76 |
| 3.5 The archaeology of context..... | 77 |
| Chapter Four Gimme Shelter in the Literature | 82 |
| 4.1 Sheltering outside the literature: Air raid shelters have no writes | 83 |
| 4.2 Sheltering in the literature: Air raid shelters in their own write | 85 |
| 4.3 A themed approach to heritage: The United Kingdom..... | 86 |
| 4.4 A themed approach to heritage: Australia | 89 |
| 4.5 Australian heritage listed air raid shelters..... | 91 |
| Chapter Five Methods: Detection and Recording | 96 |
| 5.1 Understanding public and domestic agency..... | 97 |
| 5.2 Investigating public agency | 98 |
| 5.2.1 Municipal agencies: Archival searches | 98 |
| 5.2.2 State and Federal agencies: Archival searches | 99 |
| 5.2.2.1 Private memorabilia..... | 101 |
| 5.2.3 Corporate archives: Archival searches..... | 102 |
| 5.2.4 Aerial photography: Archival searches | 103 |
| 5.3 Investigating domestic agency | 105 |
| 5.3.1 Oral testimony | 105 |
| 5.3.2 Local history associations | 112 |
| 5.3.3 Public appeal for information: Schools..... | 113 |
| 5.3.4 Public appeal for information: Radio interviews | 114 |
| 5.3.5 Public appeal for information: Print media | 115 |
| 5.3.6 Public appeal for information: Museum exhibition..... | 116 |
| 5.3.7 Public appeal for information: Conference presentations | 118 |
| 5.4 Determining wartime wealth and status of shelter builders..... | 118 |
| 5.5 Recording standing structures | 119 |
| 5.6 Geophysics..... | 121 |
| 5.7 Summary of unearthing tools | 124 |

| | |
|---|-----|
| Chapter Six Shelter Typology: An Archaeology of Sorts..... | 125 |
| 6.1 A context for shelter types | 126 |
| 6.2 A South Australian typology of air raid shelters..... | 129 |
| 6.3 Type I: trenches..... | 131 |
| 6.3.1 Background | 132 |
| 6.3.2 Factors affecting Type I construction..... | 133 |
| 6.3.3 Type I(a): Open trenches | 138 |
| 6.3.3.1 Pitfalls of Type I(a) shelters..... | 143 |
| 6.3.4 Type I(b): Covered trenches..... | 146 |
| 6.4 Type II: Dug-outs | 152 |
| 6.4.1 Background | 152 |
| 6.5 Type III: Sectional shelters..... | 155 |
| 6.5.1 Background | 155 |
| 6.6 Type IV: Pipe shelters..... | 161 |
| 6.6.1 Background | 161 |
| 6.7 Type V: Bunkers | 171 |
| 6.7.1 Background | 173 |
| 6.7.1.1 Factors affecting Type V shelter construction: Public spaces..... | 180 |
| 6.7.1.2 Factors affecting Type V shelter construction: Domestic spaces | 188 |
| 6.7.1.3 Factors affecting Type V shelter construction: Factories and businesses | 195 |
| 6.8 Type VI: Structurally modified rooms | 196 |
| 6.8.1 Background | 196 |
| 6.8.1.1 Factors affecting Type VI shelter construction: Domestic dwellings..... | 197 |
| 6.8.1.2 Factors affecting Type VI shelter construction: Factories and businesses | 201 |
| 6.9 Characterisation and archaeology | 202 |
| Chapter Seven Archaeological Results: The Pity of War Distilled..... | 203 |
| 7.1 The truth told: Gimme shelter..... | 204 |
| 7.2 Type I: Trenches..... | 204 |
| 7.2.1 Trenching the public spaces of Adelaide | 206 |

| | |
|--|-----|
| 7.2.1.1 Type 1(a): Open trenches | 206 |
| 7.2.1.2 Type I(b): Covered trenches..... | 219 |
| 7.2.2 Trenching the corporate spaces of Adelaide | 220 |
| 7.2.2.1 Type I(a): Open trenches | 220 |
| 7.2.2.2 Type I(b): Covered trenches..... | 222 |
| 7.2.3 Trenching the private spaces of Adelaide..... | 223 |
| 7.2.3.1 Type I(a): Open trenches | 224 |
| 7.2.3.2 Type I(b): Covered trenches..... | 226 |
| 7.2.4 Archaeological analysis of Type I domestic shelters..... | 229 |
| 7.2.4.1 Dimensions | 229 |
| 7.2.4.2 Roof..... | 231 |
| 7.2.4.3 Alignment..... | 232 |
| 7.2.4.4 Furnishings | 233 |
| 7.3 Type II: Dug-outs | 234 |
| 7.3.1 Public dug-outs | 234 |
| 7.3.2 Domestic dug-outs..... | 235 |
| 7.3.3 Archaeological analysis of Type II domestic shelters..... | 240 |
| 7.3.3.1 Dimensions | 240 |
| 7.3.3.2 Floor space and volume..... | 242 |
| 7.3.3.3 Roof..... | 243 |
| 7.3.3.4 Access..... | 244 |
| 7.3.3.5 Alignment..... | 245 |
| 7.3.3.6 Furnishings | 245 |
| 7.4 Type III: Sectional shelters..... | 246 |
| 7.4.1 Archaeological analysis of Type III domestic shelters..... | 248 |
| 7.4.2 Construction..... | 248 |
| 7.4.2.1 Dimensions | 250 |
| 7.4.2.2 Floor space | 253 |
| 7.4.2.3 Roof..... | 253 |
| 7.4.2.4 Entry configuration and access..... | 254 |
| 7.4.2.5 Alignment..... | 255 |
| 7.4.2.6 Furnishings | 255 |
| 7.5 Type IV: Reinforced concrete pipes | 257 |

| | |
|--|-----|
| 7.5.1 Archaeological analysis of Type IV shelters | 263 |
| 7.5.1.1 Dimensions | 263 |
| 7.5.1.2 Furnishings | 263 |
| 7.6 Type V: Bunkers | 264 |
| 7.6.1 Public Type V shelters | 265 |
| 7.6.1.1 ARP Sub-Control Station Type V shelters..... | 265 |
| 7.6.1.2 Council Chamber Type V shelters | 273 |
| 7.6.1.3 Public venue Type V shelters | 275 |
| 7.6.1.4 Industrial Type V shelters | 278 |
| 7.6.1.5 School Type V shelters | 279 |
| 7.6.2 Type V shelters in domestic application | 280 |
| 7.6.2.1 Handyman-built Type V shelters..... | 280 |
| 7.6.2.2 Industry know-how built Type V shelters | 284 |
| 7.6.2.3 Catalogue-purchased Type V shelters | 293 |
| 7.6.2.4 Type V shelters of unknown construction agency..... | 299 |
| 7.6.3 The archaeological potential of Type V structures | 315 |
| 7.6.4 Archaeological analysis of domestic Type V shelters | 317 |
| 7.6.4.1 Dimensions | 317 |
| 7.6.4.2 Floor space and volume..... | 319 |
| 7.6.4.3 Roof..... | 320 |
| 7.6.4.4 Access..... | 320 |
| 7.6.4.5 Alignment..... | 321 |
| 7.6.4.6 Furnishings | 321 |
| 7.7 Type VI: Structurally modified rooms | 322 |
| 7.7.1 Public conversions | 323 |
| 7.7.1.1 ARP emergency services network Type VI shelters | 324 |
| 7.7.1.2 Public venues | 327 |
| 7.7.1.3 Work Places | 327 |
| 7.7.2 Domestic conversions..... | 329 |
| 7.7.3 Archaeological analysis of Type VI domestic shelters | 330 |
| 7.7.5 Construction..... | 331 |
| 7.7.5.1 Location of modified rooms..... | 331 |
| 7.8 The sum of all fears | 332 |

| | |
|--|-----|
| Chapter Eight Discussion: Life in Adelaide, South Australia 7 December 1941 – August 1943..... | 333 |
| 8.1 Five Hundred Holes in Adelaide, South Australia..... | 334 |
| 8.2 Spatial analysis of domestic shelters against the wartime landscape..... | 335 |
| 8.2.1 Type I spatial distribution | 341 |
| 8.2.2 Type II spatial distribution | 344 |
| 8.2.3 Type III spatial distribution | 346 |
| 8.2.4 Type V spatial distribution | 348 |
| 8.2.4.1 Type V shelter dimensions as markers of fear..... | 351 |
| 8.2.4.2 Faith in Type V shelters..... | 354 |
| 8.2.5 Type VI spatial distribution | 355 |
| 8.2.6 Summary..... | 357 |
| 8.3 Gender and the shelter builders..... | 362 |
| 8.3.1 Men: Type I | 362 |
| 8.3.2 Women: Type I..... | 363 |
| 8.3.2.1 Debunking bunker myths: Women as shelter builders | 364 |
| 8.3.3 Children: Type I..... | 365 |
| 8.3.4 Unattributable labour: Type I | 367 |
| 8.4 Military training: Type II construction..... | 368 |
| 8.5 Wealth and the distribution of shelters | 371 |
| 8.5.1 Wealth and Type III shelters | 373 |
| 8.5.2 Wealth and Type V shelters..... | 376 |
| 8.5.2.1 Peculiarities of local Type V shelters | 377 |
| 8.5.3 Wealth and Type VI shelters..... | 384 |
| 8.6 A condensed timeframe..... | 384 |
| 8.7 Particular views of the world in time and place..... | 385 |
| Chapter Nine The Psychology of Fabric..... | 387 |
| 9.1 A measure of success in defence | 388 |
| 9.2 The psychological health of the community..... | 388 |
| 9.3 Predicted mayhem..... | 389 |

| | |
|--|-----|
| 9.4 The psychology of fabric | 390 |
| 9.4.1 The cognitive reverse-engineering of fabric | 392 |
| 9.4.2 Fear and the anticipated direction of attack on Adelaide | 396 |
| 9.4.2.1 Attack vs. invasion | 396 |
| 9.5 Fear: The adhesive of community spirit | 400 |
| Chapter Ten Conclusions: A Vernacular Life | 402 |
| 10.1 Primary use surpassed | 403 |
| 10.2 Shelter transit: A heritage reality | 404 |
| 10.2.1 The fate of Type I shelters | 404 |
| 10.2.2 The fate of Type II shelters | 406 |
| 10.2.3 The fate of Type III shelters | 406 |
| 10.2.4 The fate of Type IV shelters | 407 |
| 10.2.5 The fate of Type V shelters | 415 |
| 10.2.6 The fate of Type VI shelters | 421 |
| 10.3 A heritage of real people and of Adelaide wartime society | 421 |
| 10.3.1 Why shelters matter | 422 |
| 10.4 A regional study with national application..... | 423 |
| 10.5 Application in heritage assessment..... | 426 |
| 10.6 Think again..... | 426 |
| References..... | 428 |
| Appendices | 449 |
| Appendix 1 – Ethics Approval Letter | 450 |
| Appendix 2 – Information Sheet for Oral History Participants..... | 451 |
| Appendix 3 – Consent Form for Interview | 452 |
| Appendix 4 – Shelter Database | 453 |
| Appendix 5 – Oral History Transcripts | 454 |
| Appendix 6 – Additional Shelter Data | 455 |
| Appendix 7 – Additional Sources | 456 |

List of Figures

| | |
|---|-----|
| Figure 1-1: Less bang for your dollar! (realestate.com.au 2008)..... | 3 |
| Figure 1-2: The genesis and trajectory of a WWII civilian landscape of fear | 14 |
| Figure 2-1: ARP card issued with Allen's Butter Menthol Cough Drops (Author's collection)..... | 34 |
| Figure 2-2: Inside front cover of <i>Handbook of Advice for Civilians in War Time</i> (Blind Self-Aid Society of Australia, Melbourne n.d.) | 45 |
| Figure 3-1: Fear as a selling tool (<i>Australian Home Beautiful</i> 1943, 22(7): 44) .. | 64 |
| Figure 3-2: Double-decker bus blown into a private residence in London (Browne 1941: 35)..... | 66 |
| Figure 3-3: German anti-ship mine, Main Street, Robe (Wimmer 2006) | 77 |
| Figure 3-4: Psychology as an agency in creating and understanding the material remains of Adelaide's air raid shelters..... | 79 |
| Figure 5-1: Cut this out and keep it! (<i>News</i> , February 1941:2)..... | 100 |
| Figure 5-2: Unley Museum flyer of the air raid shelter exhibition | 117 |
| Figure 5-3: Martin Wimmer recording the Peterborough Type V shelter (Kylie Lower 2010)..... | 121 |
| Figure 5-4: Survey grids at Soutar Park, Goodwood, 24 September 2010 (Image URL: www.nearmap.com) | 123 |
| Figure 6-1: City of Adelaide disclaimer (CEF[1942]027a)..... | 144 |
| Figure 6-2: Relative risks from air raids under various shelter conditions (State Emergency Council for Civil Defence, Vic. 1941: 30) | 145 |
| Figure 6-3: Proposed modifications to open trench shelters (CEF[1942]021) .. | 147 |
| Figure 6-4: Plan of Mellor dug-out (Mellor 1942: 13)..... | 154 |
| Figure 6-5: Elevation of Mellor dug-out (Mellor 1942: 13)..... | 155 |

| | |
|---|-----|
| Figure 6-6: Anderson Shelter (arrowed): Chingford, East London 19-20 April 1941 (Warburton 1946: n.p.) | 157 |
| Figure 6-7: Anderson re-used as a wood shed (Anstey 2009: 1) | 160 |
| Figure 6-8: Corrugated iron shell encased with concrete and rubble (CCA n.d.c: 14)..... | 161 |
| Figure 6-9: Plywood pipe shelter, Bellevue Hill, NSW, December 1941 (<i>Sydney Morning Herald</i> , 31 December 1941: 9) | 168 |
| Figure 6-10: Installing a plywood pipe shelter in suburban Sydney, December 1941 (In Fallows 2005: 132)..... | 169 |
| Figure 6-11: Pipe shelter suitable for a typical suburban house (CCA n.d.a: 3) | 170 |
| Figure 6-12: Protection for the factory worker (CCA n.d.a: 2) | 171 |
| Figure 6-13: Advertisements for shelters (<i>Australian Home Beautiful</i> 1942b: 38 and 1942c: 39)..... | 172 |
| Figure 6-14: Section of a German WWI concrete bunker (<i>Architecture</i> 1918: 15) | 175 |
| Figure 6-15: Concrete shelter for 50 persons intended for use in Adelaide streets c1939 (Fargher 1940: 132)..... | 185 |
| Figure 6-16: Section view of bomb proof shelter with detonating slab above (CCA n.d.c: 16) | 186 |
| Figure 6-17: Plan view of bomb proof shelter showing traversed entrance (CCA n.d.c: 16)..... | 188 |
| Figure 6-18: Plan views of double shelters demonstrating alternative entrances. Emergency exits arrowed (Home Office 1939e: 9) | 190 |
| Figure 6-19: Know your enemy and improvise your own repairs (Bartlett n.d.: 52) | 193 |

| | |
|---|-----|
| Figure 6-20: The safest room in this house marked with an 'X' (Bartlett n.d.: 8) | 199 |
| Figure 7-1: Trenching Victoria Square, Adelaide c1942 (c/o Ray Hirst, NEWS LTD) | 209 |
| Figure 7-2: Depth of trenches in Victoria Square, Adelaide c1942 (c/o Ray Hirst, NEWS LTD) | 210 |
| Figure 7-3: Plan and elevation for a zigzag trench, Glenelg foreshore, April 1942 (Glenelg Air Raid Shelter Interpretive Centre) | 214 |
| Figure 7-4: Footprint of zigzag trench on lawns west of Pier Hotel, Glenelg foreshore, 10 January 1949 (MAPLAND 1949a) | 216 |
| Figure 7-5: Footprint of a zigzag trench system (arrowed) on the playing fields of Woodlands, Glenelg, 10 January 1949 (MAPLAND 1949a) | 218 |
| Figure 7-6: Griggs' undated perspective sketch of a Type I(a) shelter (S167/867/1) | 222 |
| Figure 7-7: Shared trench in Sefton Park depicted by heavy red line, section of original trench arrowed (Google Maps, accessed 15 September 2012) | 225 |
| Figure 7-8: Eric Neilson excavating a trench in Brighton, December 1941 (photo: R.E. Ragless [nee Holmes]) | 226 |
| Figure 7-9: Type I shelter construction (State Emergency Council for Civil Defence in Victoria 1941: sketch 8) | 227 |
| Figure 7-10: Type I trenches in Bartlett (n.d.: 12) and George Haskard's choice | 229 |
| Figure 7-11: Commercial Case Company's Type II shelter (News, 27 February 1942: 3) | 235 |
| Figure 7-12: Still taken from home movie of Doug Freeman's shelter c1941 (with kind permission of Margaret Cornwall & Pamela Pearce, 2008) | 237 |

| | |
|---|-----|
| Figure 7-13: Doug and Margaret Freeman with dug-out (visible at right), August 1944 (with kind permission of Margaret Cornwall 2008) | 238 |
| Figure 7-14: Andersons for sale in Adelaide (<i>News</i> , 12 June 1942: 5) | 246 |
| Figure 7-15: The Bruce family in their Anderson (<i>Mail</i> , 7 June 1941: 2) | 247 |
| Figure 7-16: Instructions for assembly of Anderson shelters (Australian War Memorial RC02049) | 251 |
| Figure 7-17: Inside the Hazelwood Park Type III shelter facing the rear escape hatch (Wimmer 2010)..... | 252 |
| Figure 7-18: Plan view of Trowse Type III shelter..... | 256 |
| Figure 7-19: Reinforced concrete pipes, North Terrace (image c/o Ray Hirst, NEWS Ltd, Adelaide) | 259 |
| Figure 7-20: Fully accessorised: 48 in. x 8 ft pipes installed on North Terrace with sand filled bitumen drums being used in lieu of sandbags (<i>Hume Pipe News</i> 1942: 5)..... | 260 |
| Figure 7-21: 36 in. x 8 ft pipes at Unley School awaiting installation of blast walls (<i>Hume Pipe News</i> 1942: 4) | 262 |
| Figure 7-22: A Pneumatic Core Concrete Shelter installed above ground at Norwood (Concreters [S.A.] Ltd. n.d.)..... | 262 |
| Figure 7-23: City of Adelaide pipe shelter user's guide (CEF[1942]027b)..... | 264 |
| Figure 7-24: Construction of Norwood Sub-Control Station (SA Water photo archive) | 266 |
| Figure 7-25: January 1942 plan of proposed Type V Sub-Control Stations (GRG 53/21/00000 Unit Id 705, 3115/41) | 268 |
| Figure 7-26: Section drawing of ARP Sub-Control Station showing portions above and below ground (GRG 53/21/00000 Unit Id 705, 3115/41) | 269 |
| Figure 7-27: Aerial view of Thebarton ARP Sub-Control Station 2010 (URL image www.nearmap.com)..... | 270 |

| | |
|--|-----|
| Figure 7-28: Rear of Thebarton Sub-Control Station showing roof overhang (Wimmer 2006) | 270 |
| Figure 7-29: Unley ARP Sub-Control Station c1965 (with permission of David Vincent)..... | 271 |
| Figure 7-30: Aerial view of Unley ARP Sub-Control Station, 1949 (MAPLAND 1949b)..... | 272 |
| Figure 7-31: Prospect ARP Sub-Control Station showing blast wall across both exits (Wimmer 2007) | 273 |
| Figure 7-32: Oxford Terrace Type V shelter c1970s (Unley Museum photographic archive #89:117)..... | 274 |
| Figure 7-33: Griggs shelter plan for Ramsgate Hotel, January 1942 (S167/856/1) | 276 |
| Figure 7-34: Norwood Oval entrances to former air raid shelters (Wimmer 2010) | 277 |
| Figure 7-35: Remains of Type V shelter on Kangaroo Island (Black 2012) | 278 |
| Figure 7-36: Chapman Type V shelter, Peterborough (John Mannion 2007) ... | 281 |
| Figure 7-37: Detail of air vent, Chapman Type V shelter (Wimmer 2010) | 282 |
| Figure 7-38: Plan of Chapman Type V shelter..... | 283 |
| Figure 7-39: Emergency light, Jackson Type V shelter (Wimmer 2012) | 286 |
| Figure 7-40: Jackson Type V shelter exit (Wimmer 2012) | 287 |
| Figure 7-41: Plan of Jackson Type V shelter | 288 |
| Figure 7-42: The Lamberton Type V shelter (Wimmer 2013)..... | 290 |
| Figure 7-43: Plan of Lamberton Type V shelter | 291 |
| Figure 7-44: Morrell bungalow, Woodville, location of air raid shelter as hatched area (drawn by Bob Morrell 21 August 2007) | 293 |
| Figure 7-45: External wall thickening evident below range pole in Griff Type V shelter (Wimmer 2008)..... | 296 |

| | |
|---|-----|
| Figure 7-46: Plan of Griff Type V shelter | 298 |
| Figure 7-47: Pierce Type V shelter showing concrete bench and built in shelves (Wimmer 2009) | 300 |
| Figure 7-48: Detail of shelf in eastern wall, Pierce Type V shelter (Wimmer 2009) | 302 |
| Figure 7-49: Plan of Pierce Type V shelter | 304 |
| Figure 7-50: Garden exit and steps, Willis Type V shelter (Martin Wimmer and Louise Holt 2010) | 306 |
| Figure 7-51: Detail of southern wall, Willis Type V shelter (Louise Holt 2010) . | 307 |
| Figure 7-52: Fire place in Willis Type V shelter (Wimmer 2010) | 308 |
| Figure 7-53: Globe roofing terne, Willis Type V shelter (Wimmer 2010) | 310 |
| Figure 7-54: Plan of Willis Type V shelter | 311 |
| Figure 7-55: Rear of Harley home. Fenced Type V shelter location arrowed (Wimmer 2013) | 312 |
| Figure 7-56: Plan of Harley Type V shelter | 314 |
| Figure 7-57: Detail of roof vault showing two courses of bricks, Harley Type V shelter (Wimmer 2013) | 315 |
| Figure 7-58: Remains of the Fleming shelter (Mitcham Heritage Centre 1988) | 317 |
| Figure 7-59: December 1941 Plan of ARP Central Control Headquarters in Adelaide CBD (GRG 53/21/00000 Unit Id 705, 3115/41) | 325 |
| Figure 7-60: December 1941 Plan of ARP Sub-Control Centre in Adelaide CBD (GRG 53/21/00000 Unit Id 705, 3115/41) | 326 |
| Figure 7-61: Norwood Oval grandstand showing proposed modifications, March 1942 (S98/6/1) | 328 |
| Figure 8-1: Proximity of Willis's residence to Pope Products Ltd (MAPLAND 1949c) | 349 |

| | |
|---|-----|
| Figure 8-2: Members of the 2/1st Light Anti-Aircraft Regiment digging trenches at St George's Anglican Church, Magill (with permission of Sue Teagle) | 363 |
| Figure 8-3: Children constructing a Type I(b) shelter in an Adelaide backyard (Australian War Memorial n.d.: 4)..... | 367 |
| Figure 8-4: Three breather pipes (arrowed) above the Williamson shelter, Prospect (Prospect Local History Group 2009)..... | 383 |
| Figure 9-1: Psychology as an agency in creating and understanding material remains | 391 |
| Figure 10-1: Excavated playground pipe, Mitcham Primary School September 2009 (Wimmer 2009)..... | 410 |
| Figure 10-2: Glover Playground, South Terrace, Adelaide (Wimmer 2007) | 412 |
| Figure 10-3: A concrete pipe rainwater tank, Kilburn, SA (Wimmer 2012) | 415 |
| Figure 10-4: The Harley Type V sunken garden (Wimmer 2013)..... | 417 |
| Figure 10-5: Proposed re-use of Prospect ARP Sub-Control Station as model car club (Riddle1965:2) | 418 |
| Figure 10-6: Murals on entrances of Thebarton Sub-Control Station (Wimmer 2010)..... | 419 |
| Figure 10-7: Plant room, Oxford Terrace Type V shelter (Wimmer 2010)..... | 420 |

List of Maps

| | |
|--|-----|
| Map 1-1: Location of Adelaide in relation to areas of Japanese attacks (URL: http://www.awm.gov.au/encyclopedia/air_raids/) | 13 |
| Map 2-1: The positioning of the eight Sub-Control Areas of Adelaide (GRG 9/28/28)..... | 47 |
| Map 6-1: Profile of Adelaide soils (Stokes 2013) | 136 |
| Map 7-1: Proposed trench system for the East Parklands, Adelaide (Fargher 1940: 132)..... | 207 |
| Map 7-2: Sketch map by Malcolm Haskard, 21 June 2010, depicting location of family trench (highlighted area in original) | 233 |
| Map 8-1: Wartime map of Adelaide showing the spatial relationship of its various elements including the ARP Sub-Control Areas and the number of domestic shelters recorded in each (http://mapco.net/adelwar/adelwar.htm) | 338 |
| Map 8-2: Spread of domestic shelter types across Adelaide. | 340 |
| Map 8-3: Type I shelter distribution across Adelaide | 343 |
| Map 8-4: Type II shelter distribution across Adelaide | 345 |
| Map 8-5: Type III shelter distribution across Adelaide | 347 |
| Map 8-6: Type V shelter distribution across Adelaide | 350 |
| Map 8-7: Type VI shelter distribution across Adelaide | 356 |
| Map 8-8: Chinnery's plan of ARP Patrol Area #1573 (author's collection) | 361 |
| Map 9-1: Adelaide in WWII showing civilian's anticipated directions of attack (Fuller 1940: front cover) | 398 |
| Map 10-1: War and post-war location of pipes at Mitcham Primary School. With permission of Mitcham School 150 History Committee (Cornwall 1997: 128). ... | 411 |

List of Tables

| | |
|---|-----|
| Table 3-1: 1945 survey of 4,222 American soldiers and the relationship between proximity to combat dangers and anxiety (Abridged from Janis 1971: 25)..... | 59 |
| Table 4-1: Number of civilian air raid shelters listed on heritage databases in Australia States..... | 93 |
| Table 4-2: Distribution of shelter listings across various heritage databases in Australia..... | 93 |
| Table 6-1: Monthly rainfall in Adelaide, October 1941 – May 1942, recorded at Weather Station #023000 on West Terrace, 5000..... | 136 |
| Table 6-2: Comparative guidelines for open trenches (April 1941 - January 1942). | 139 |
| Table 6-3: Comparative general guidelines for covered trenches (September 1938 – July 1942)..... | 149 |
| Table 6-4: Comparative guidelines from the various Codes for covered trenches (1939 - 1942) | 152 |
| Table 6-5: Basic weekly wage rates declared by various States during WWII (abridged from Carver 1944: 478) | 159 |
| Table 6-6: South Australian shelter Types and their characteristics..... | 202 |
| Table 7-1: Number of Type I shelters in Adelaide and country SA (shown in red). Numbers followed by 'p' are proposed shelters that may not have been built... | 205 |
| Table 7-2: Type 1(a) shelters in Glenelg (Glenelg Air Raid Shelter Interpretive Centre)..... | 217 |
| Table 7-3: Type II shelter recorded dimensions..... | 240 |
| Table 7-4: Type II shelter roof construction | 244 |
| Table 7-5: Recorded entrances of Type II shelters | 244 |
| Table 7-6: Number of Type IV locations (country pipes in red) | 258 |

| | |
|---|-----|
| Table 7-7: Dimensions of main refuge in recorded Type V shelters..... | 318 |
| Table 7-8: Area and volume of main refuge in recorded Type V shelters..... | 319 |
| Table 8-1: Total number of each type of shelter recorded (country SA in red) .. | 334 |
| Table 8-2: Frequency of domestic shelter types in Adelaide's Sub-Control Areas | 336 |
| Table 8-3: Distribution of Type I shelters across Adelaide Sub-Control Areas .. | 341 |
| Table 8-4: Distribution of Type II shelters across Adelaide Sub-Control Areas . | 344 |
| Table 8-5: Distribution of Type III shelters across Adelaide Sub-Control Areas | 346 |
| Table 8-6: Distribution of Type V shelters across Adelaide Sub-Control Areas. | 348 |
| Table 8-7: Sub-Control Area and average length and width of Domestic Type V shelters | 352 |
| Table 8-8: Sub-Control Area and average floor space and volume of Domestic Type V shelters | 353 |
| Table 8-9: Distribution of Type VI shelters across Adelaide Sub-Control Areas | 355 |
| Table 8-10: Division of labour in Adelaide shelter sample | 365 |
| Table 8-11: Number of individuals with WWI war service living in Sub-Control Areas on 30 June 1933 (abridged from Wilson 1936: 365-367)..... | 369 |
| Table 8-12: Division of labour in Type II construction | 370 |
| Table 8-13: Income of males and females across Adelaide Sub-Control Areas on 30 June 1933 (abridged from Wilson 1936: 421-426)..... | 373 |
| Table 8-14: Overhead protection of archaeologically recorded domestic Type V shelters vs. the Code..... | 379 |
| Table 8-15: Archaeologically recorded lateral dimensions of domestic Type V shelters vs. the Code..... | 381 |
| Table 9-1: Comparison of shelter Types, direction of attack vs. industrial zone | 399 |
| Table 10-1: Dimensions of extant schoolyard and playground pipes | 410 |

Abstract

The underlying premise of this research is that civilian air raid shelters reflect aspects of our past society that other forms of material culture do not. This thesis concerns itself with the archaeological interpretation of the civilian structural response to an anticipated Japanese aerial bombardment of Adelaide in South Australia during World War II.

Analysis incorporates archival research, archaeological fieldwork, the testimony of eyewitnesses and contemporary early twentieth century psychological research into the effects of aerial bombardment, in order to help understand 547 Adelaide metropolitan and 39 South Australian country air raid shelters. It provides a typology for the range of responses recorded, identifies the social contingencies attributable to each type, and tests the depth of social data stored in these structures. This thesis also introduces the notion of the 'psychology of fabric' as an additional cultural attribute of material remains that were purposely developed and positioned in the landscape to elicit a behavioural change in a fearful community awaiting a catastrophe.

Across Adelaide, air raid shelters were built by people from diverse backgrounds and with varied economic means. The largest, most expensive and best fortified, however, were not owned by the wealthiest people in society, but instead by those with ties to the food and construction industries. Those employed in the building/construction industries tended to over-engineer the structural components of their shelters, greatly enhancing their personal protection. Men with previous military experience favoured a particular type of shelter, and whilst some single women dug trenches for themselves, they took little part in

constructing other shelter types beyond making the initial decision to install one. Analysis showed that 89.3% of domestic shelters that could be properly characterised had overhead protection and that the local Code for Shelter Construction was, for the main, observed. This, to some extent, vindicates government policy which encouraged people to make their way home during an air raid under the assumption that they could procure better protection for themselves than could be provided for them in the public arena.

The phenomenon of shelter building was a short-lived event, and largely occurred in Adelaide over an eighteen month period beginning on December 7, 1941. This thesis, therefore, is also an archaeology of social recency. It deals with a very concise time period during a significant world event. As such, it precisely maps social trends and patterning in the cultural landscape of an Australian wartime community. It is an archaeology of real and identifiable people who are largely unrepresented in official documentation, but who made decisions about their own protection and invested considerable time, energy and physical resources in doing the best they possibly could for themselves, their families and their neighbours.

The dividend of this investment lies in their material legacy to us—a unique cultural landscape, the interpretation of which, seventy years on, allows us to finally document a very real moment in their lives.

Declaration of Candidate

I certify that this work does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

Martin Wimmer

31 January 2014

Acknowledgements

For every section of this thesis I owe a debt of thanks to someone. This debt is owed variously for time, specialist advice, editing or contributing to the data base which supports this research.

To Dr Heather Burke of the Department of Archaeology, Flinders University, for directing this study and, who at times, must have thought it would be easier trying to teach three women how to use a two-man stirrup pump. Cheryl Ahrens, Clinical Psychologist, for regular (and free) counselling sessions and the ongoing monitoring of my mental health, expert advice on the psychological research into fear and memory, proof reading and fussy editing – any grammatical errors that remain are entirely my own fault and, without exception, *metri causa*. My daughter, Anna Wimmer, who managed to finish eight years of primary school in the time it took me to finish a PhD (and yes Darling, you too will someday do one despite what you say now), to her for being in the next room whenever I needed to step away from it for a while. Thanks also to all my friends and family who waited so long for my return...!

To Dr Alice Gorman, also of the Department of Archaeology, Flinders University, for her occasional utterances of brilliance. My colleagues Kylie Lower and Louise Holt for assisting with field work. Dr Julie Collins, Collection Manager, Louis Laybourne Smith School of Architecture and Design Museum, UNISA, for “keeping me in mind” whenever anything relevant to my study crossed her desk. Russell Pilbeam, Senior GIS Officer, Australian Cultural Heritage Management, for his advice and expertise in map making.

Mention must be made also of the various independent researchers and research facilities (with their largely volunteer staff) that are hidden away across the community. Included in their numbers is David Vincent for sharing his collection of military aviation related ephemera. Denis Gojak, Historical Archaeologist. Dr Peter Bell, Industrial Historian. John Mallion, country South Australian historian. Ray Hirst, Editorial Artist, NEWS Ltd, for access to his organisation's photo archive. The Mitcham Heritage Research Centre (Maggie Ragless, Margaret and Charles Cornwall), the Port Adelaide Historical Society (Laurie Shields), the Prospect Local History Group (Dr David Kilner) and the Prospect Library Heritage Collection (Lianne Gould), the Holdfast Bay History Centre/Glenelg Air Raid Shelter (Jim and Bev Huckstepp), the Australian Society of Magicians/ Thebarton Air Raid Shelter (Bernard Larkin), the Unley Museum (Ron Praise), MAPLAND and the Adelaide City Archives.

Finally, thank you to all those who managed to get through World War II without being bombed and who wanted desperately to tell me exactly how they did it!

Acronyms and Abbreviations

| | |
|----------|--|
| ARP | Air Raid Precautions |
| CBD | Central Business District |
| CCA | Cement and Concrete Association (UK) |
| CT | Certificate of Title |
| FFCF | Fighting Forces Comforts Fund |
| GPR | Ground Penetrating Radar |
| ICRC | International Committee of the Red Cross |
| LTO | Land Titles Office |
| NSW | New South Wales |
| NT | Northern Territory |
| QLD | Queensland |
| RAF | Royal Air Force |
| RC Pipes | Reinforced Concrete Pipes |
| SA | South Australia |
| TLP | Thematic Listing Program (UK) |
| UK | United Kingdom |
| USSBS | United States Strategic Bombing Survey |
| VIC | Victoria |
| WA | Western Australia |
| WWI | World War I |
| WWII | World War II |

Linear Measurement Conversions

All physical dimensions of air raid shelters were archaeologically recorded using the metric system. These were also converted to values in the imperial system and appear in brackets after the metric measurement so that they could be more effectively compared to contemporary building advice and materials. Imperial linear measurements sourced from historical documents, such as, the Codes for shelter construction, were not converted to metric values, nor were those relating to air raid shelters which were recorded from testimonial sources.

Imperial to Metric Conversion

| | | |
|-----------------------|---|-------------------|
| One inch | = | 2.54 centimetres |
| 12 inches (one foot) | = | 0.3048 metre |
| Three feet (one yard) | = | 0.9144 metre |
| 1760 yards (one mile) | = | 1.6093 kilometres |

Metric to Imperial Conversion

| | | |
|----------------|---|-----------------------------|
| One centimetre | = | 0.3937 inch |
| One metre | = | 39.37 inches or 3.2808 feet |
| One kilometre | = | 0.621 mile |