

# Forensic Fencing... The Dark Art of Re-Defining an Old DP (or the Problem with Using Just the Street to Fix the Street)

**Fred de Belin**

City of Ryde Council

[fdebelin@ryde.nsw.gov.au](mailto:fdebelin@ryde.nsw.gov.au)

## ABSTRACT

*Local councils own the land which contains our streets. In the City of Ryde many of the first streets were created well before 1921 and were not marked with anything other than pegs. After 1921 any survey which created a new street was required to place sound and solid reference marks in order to define the street boundary. Obviously, the surveying fraternity rejoiced, in the knowledge that survey reference marks would lead the way in the future definition of these streets. So much have the survey reference marks in Grand Avenue, West Ryde, influenced the current definition of Grand Avenue, that the street is now, with Land and Property Information (LPI) insistence, variable width, contains several dramatic bends and bears little resemblance to the Grand Avenue as created in 1905, which was 66 feet (20.115 m) wide and straight for its entire length of about 1,450 feet (442 m). This paper investigates whether the fencing occupations, by themselves, can deliver a fix of original DP 4516 (1905), which is in closer agreement than using any of the found reference marks.*

**KEYWORDS:** *Fencing, deduction, defining, fixing.*

## 1 INTRODUCTION

In the City of Ryde the original rural properties began to be subdivided for residential usage in the 1880s. By the early 1900s, subdivision had developed apace. New streets were created and the current subdivision patterns were established.

The Grand Avenue (now called Grand Avenue) (Figure 1), was surveyed and created by DP 4516 in 1905 as 66 feet wide (20.115 m) and straight for its entire length of about 1,450 feet (442 m). Since 1924, there has been a regular registration of plans (26 in total) with 12 by compilation and 14 by survey. These 14 plans of survey (see Appendix) have been made by 13 different surveyors! Grand Avenue has not been aligned.

The most recent plan of survey, DP 1210616 (2015), was a plan for the redefinition of a single lot, midway along Grand Avenue (Figure 2). This current fix of Grand Avenue shows various bends and 'variable width'. How does this occur? Are the reference marks moving? Are the different surveyors relying on different bits of evidence and information?

This paper firstly investigates what happened to the fix of Grand Avenue since 1949, when plans of survey re-commenced 45 years after the first subdivision plan. Secondly, it investigates how Grand Avenue could be re-fixed if all the reference marks were gone. Can current fencing occupations, by themselves, deliver a fix of Grand Avenue that is in closer

agreement to the original DP 4516 than the fix achieved by using the available survey reference marks?

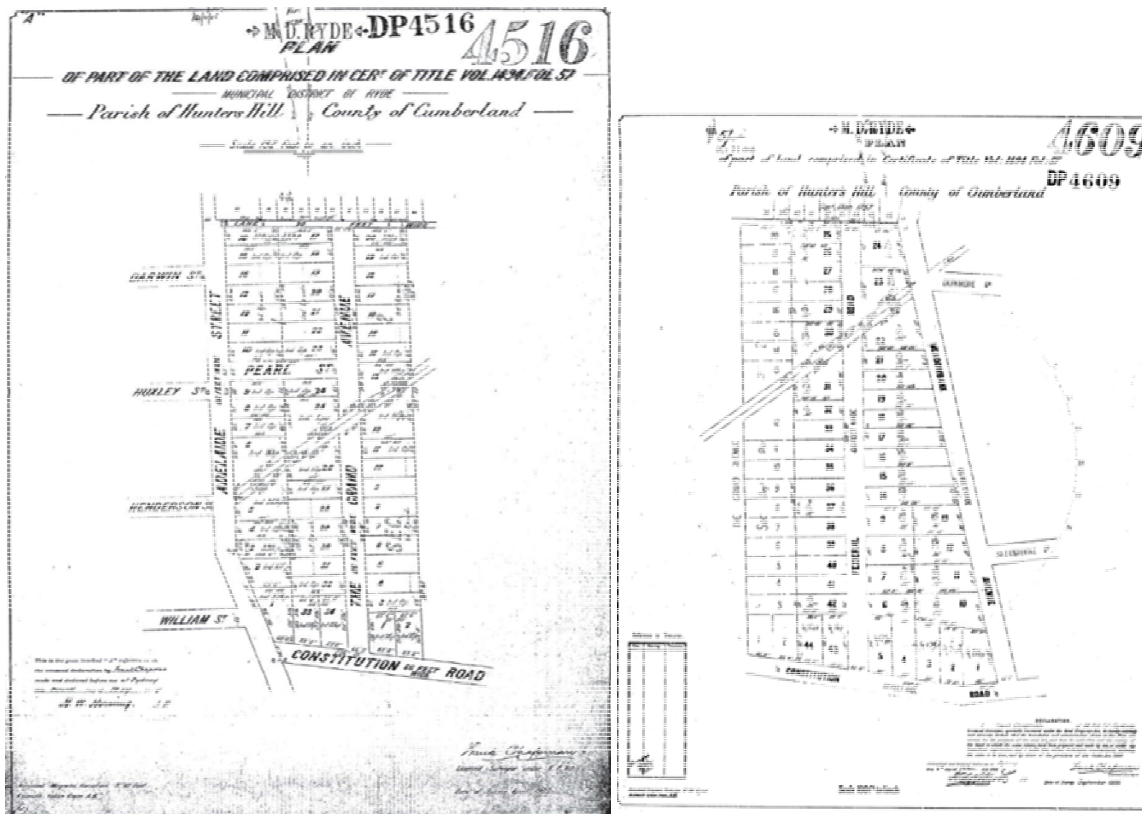


Figure 1: Two adjacent subdivisions done by the same surveyor in April and September 1905.

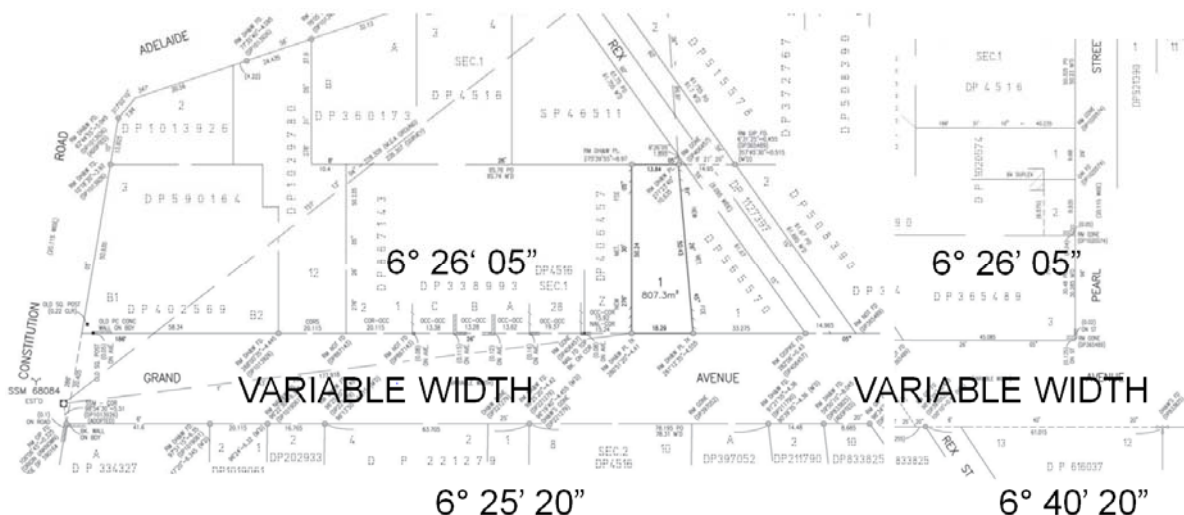


Figure 2: DP 1210616 (2015) showing the current fix of part of Grand Avenue.

## 2 HOW DID THE STREET REFERENCE MARKS FIX THE STREET?

In 1949, DP 365489 was the first re-subdivision survey plan in Grand Avenue and the first to place survey reference marks. Since that time 26 survey reference marks have been placed in Grand Avenue, of which 17 still exist. Some of these have been shown 'gone' on several plans. DP 365489 found and adopted two rock marks in the middle section of Grand Avenue

(Figure 3). These two rock marks are at original distance apart, and although not stated on the plan, the inference is that the rock marks were placed by the original 1905 survey.

In 1956, DP 397052 adopted one reference mark (GI Pipe placed by DP 365489 in 1949) together with occupations at the southern end of Grand Avenue. In 1957, the next surveyor adopted the same fix for Grand Avenue.

In 1959, DP 410618 adopted occupations at either end of Grand Avenue, showed one of the rock marks 'found' and re-referenced another mark (the GI Pipe placed by DP 365489 in 1949).

In 1962, 1963 and 1977, the surveyors adopted one reference mark (DH&W in face of kerb placed by DP 397052 in 1956) together with occupations at the southern end of Grand Avenue. The 1963 surveyor had also undertaken the 1956 survey.

In 1966 and 2013, the surveyors adopted a corner mark (DH&W on wall as placed by DP 410618 in 1959) together with an occupation at the northern end of Grand Avenue.

In 1993, DP 833825 adopted occupations at the southern end of Grand Avenue together with one reference mark (GI pipe placed by DP 211790 in 1962). It should be noted that this plan of survey also connected to the street fix of 1966 and showed two bends in Grand Avenue heading north.

In 1997, 1999 and 2000, the surveyors adopted occupations at the southern end of Grand Avenue together with one corner mark (DH&W placed by DP 221279 in 1963).

Finally, in 2015, DP 1210616 adopted a street fix from all the previous survey plans with the result that Grand Avenue is now shown, at Land and Property Information (LPI) insistence, as 'variable width' with bends!

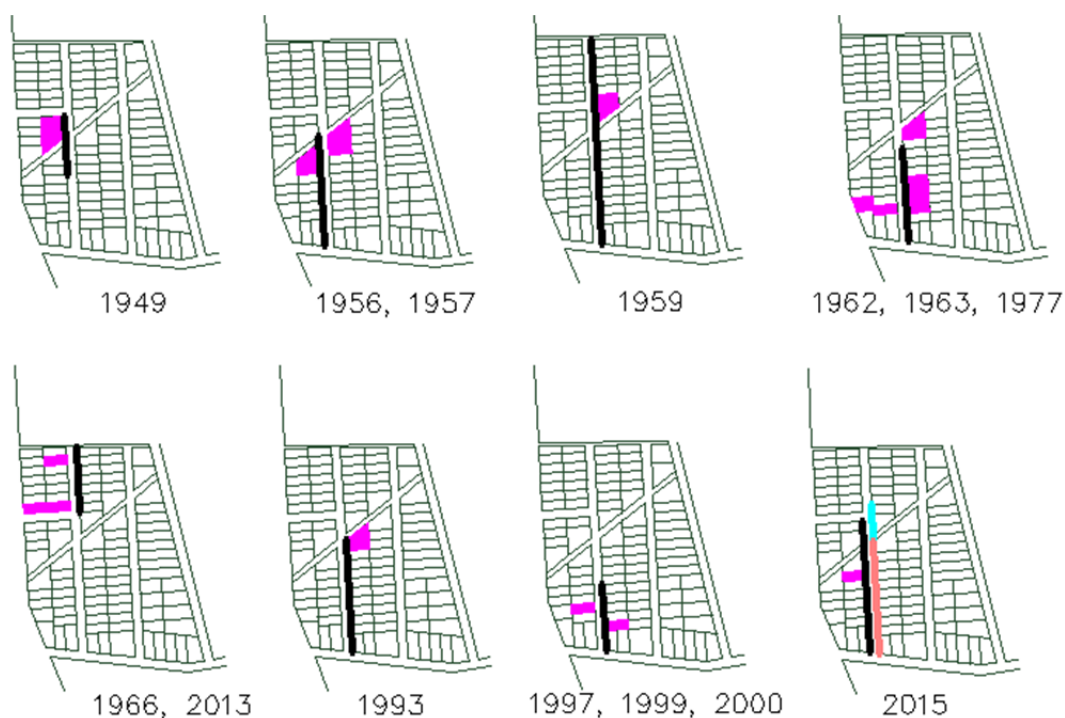


Figure 3: Survey azimuth lines for the fixing of Grand Avenue.

### 3 WHAT IS A REFERENCE MARK?

A reference mark is placed at the time of survey and provides a snapshot of the cadastral evidence at the time of survey, tempered by:

- The surveyor's experience.
- The field party's diligence.
- Availability of close-by reference marks.
- Cost of the LPI search.
- Expediency and time factor.

Who is going to pass up two beautiful reference marks, either side of the job (Figure 4), or investigate the definition on which they were placed, or determine whether they were even placed correctly? Registered plans from the LPI are gospel, right?

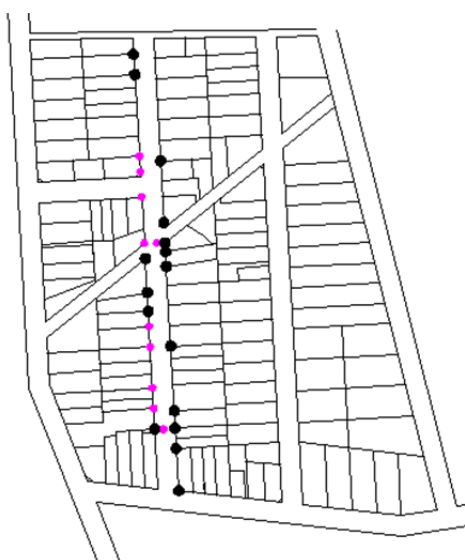


Figure 4: Survey reference marks in Grand Avenue, as placed (dots) and as found (black dots).

### 4 WHAT IS A FENCING OCCUPATION?

A fencing occupation separates and demarcates two adjoining properties or lots and forms a physical barrier. Adjoining land owners are generally adamant where their side boundary is. Land owners are fiercely protective of their side boundaries and insist that any new replacement fence is erected exactly in the same location as the previous, older fence. Any fencer with integrity will only replace a side fence in the same location, or rely on visible survey marks.

In the Grand Avenue example and other subdivisions from that era, it would be fair to say that, at the time of erection of the first fences, pegs would be marking the corners of the lots and therefore the side boundaries. Given the age of the original subdivision is 110 years, there is little likelihood that any of the first fences remain. Figure 5 does show a very old timber fence, but it is more probable that the current side fences are all into their second or third re-incarnation, given that the life of a paling fence is around 40 years.





Figure 5: Old and disintegrating timber fence with palings retained and preserved by wire ties.

Why concentrate on side fencing occupations? Because street occupations seem to be more random. For a start, the Council is the adjacent owner of the street land but is rarely involved in the front fence location – relying instead on the private land owner doing the right thing.

When it comes to building a front fence, the land owner (or his fencer) simply joins between existing fences, lines up with existing fencing down the street by extrapolation, or guesses, taking such reliable guidance as the edge of a Council concrete footpath. On the other hand, side boundary occupations are almost always erected with the knowledge, consent and agreement between neighbours. Therefore, the side fence is retained in the same position and is more likely to be close to the originally marked boundary.

Which point best defines or represents the fenced line? Is it the centreline of a fence, the face of a fence, or some other feature of the fence structure? A fence obviously has a thickness, depending on whether it is made of timber (Figure 6a), brick and masonry (Figure 6b), metal tray (Figure 6c), or any other material.



Figure 6: (a) Timber fence with brick pier abutting, (b) brick piers abutting at a side boundary, and (c) old post retained as new front and side fences are erected.

Careful and close inspection of the terminal of a side fence, where it meets the street, can reveal much forensic detail, such as:

- New fencing ending at a very old post (Figure 6c).
- Evidence of a former post by such clues as paint silhouetting (Figure 7a).
- Fence rail slots in the back of brick piers.
- Edge of poured concrete (Figure 7b – note evidence of a previous brick pier, a previous fence post, a previous line of paling fence and the cut-off base of a metal post at ground level).



Figure 7: (a) Silhouette of removed timber post outlined on the brick pier by old paint, and (b) evidence of several previous fence structures.

## 5 HOW DOES THE FENCING OCCUPATION HELP FIX AN OLD DP?

Knock-downs and re-builds remove evidence of original house walls that were generally built parallel to, and at a set distance from, side boundaries. These days, with free access to lots being often very difficult or time consuming, few surveyors rely on these old buildings' walls. With buildings gone, can we look to the side fences as providing boundary evidence?

In the old DP 4516 from 1905, 54 lots were created. There are now 77 lots, as a result of subsequent subdivisions. However, throughout all this subdivision activity, 44 side boundaries have remained unchanged from that original DP (Figure 8a). When DP 4609 adjoined, it created lots in similar configuration to DP 4516, resulting in a further 14 complementary side boundaries that remain unchanged from 1905 (Figure 8b).

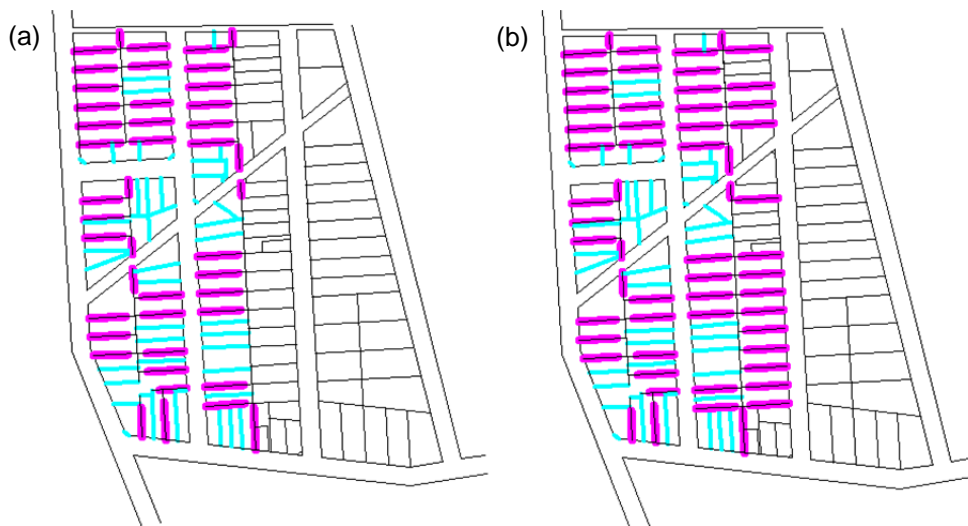


Figure 8: Side boundaries (shown in pink) that are unchanged from (a) DP 4516 and (b) DP 4609 (1905).

So there are 58 side fences that together could confirm the location of the original DP 4516. Notice, from the original subdivision pattern and the remaining side boundaries, that there are six boundary points (indicated by arrows in Figure 9) showing three key straight lines which traverse the whole of DP 4516. Also of note are the two boundary lines immediately south of the key east/west line, as they too extend the whole way across the DP.

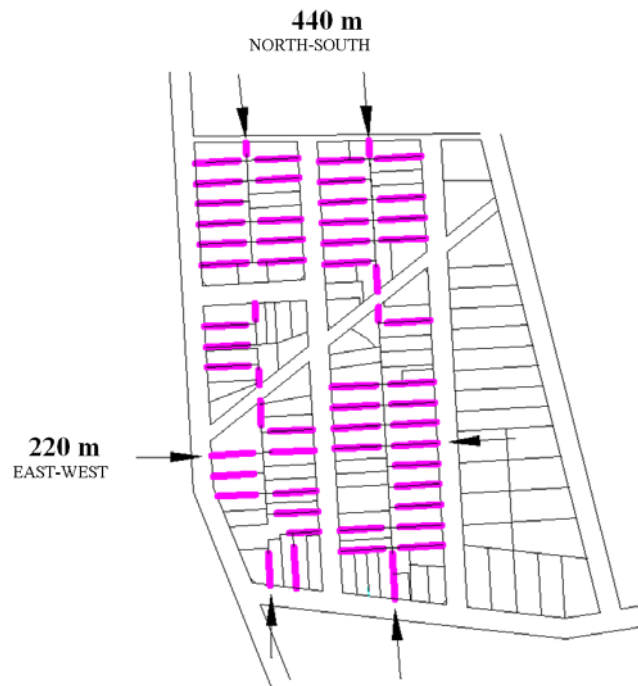


Figure 9: Shows six boundary points on three key lines.

The overall extent of DP 4516 is 440 m north/south and 220 m east/west. These are substantial distances, over which any large shift amounts to only a small effect in bearing. For example, a 60 mm shift over 200 m creates a swing of 1' of angle. A 120 mm shift over 400 m also creates a swing of 1' of angle.

A full field survey, controlled by closed traverse and connection to available SCIMS marks, was undertaken to locate the centrelines of the side fences at the key points together with the centrelines of the other 52 relevant side fencing occupations. It should be stressed that only the terminal of a centreline, where it met the street, was surveyed. There was no intention to survey the rear ends of the side fences. Even though all the survey reference marks were included in the field survey, none of them was used to help define a street or side boundary in this investigation using side fences.

A best fit was obtained in two iterations by overlaying the boundary pattern onto the surveyed side fence positions (Figure 10). Firstly, an orientation and east/west shift was achieved by using all of the occupations along the two key north/south lines, with validation by considering the angular effect on the key east/west lines. Secondly, a north/south shift was introduced after considering all the remaining side occupations.

Figure 10 also contains images of the actual fencing on each of the key lines. It would appear that none are original, although a couple of the brick piers seem to mirror the age of its relevant house, being built of the same matching material.

The final result (Figure 11a), after overlaying the boundary pattern onto the fencing occupation survey, culminated in 36 of the 58 side boundary lines (62%) being within 50 mm of fencing (Figure 11b), 9 of the side boundary lines being between 50 mm and 100 mm from fencing, and 12 of the side boundaries being further away than 100 mm (with 5 of those closer than 150 mm). An even distribution of very close fencing, over the whole area of DP 4516, confirms that a fix by side fencing is possible and has been achieved in this case.



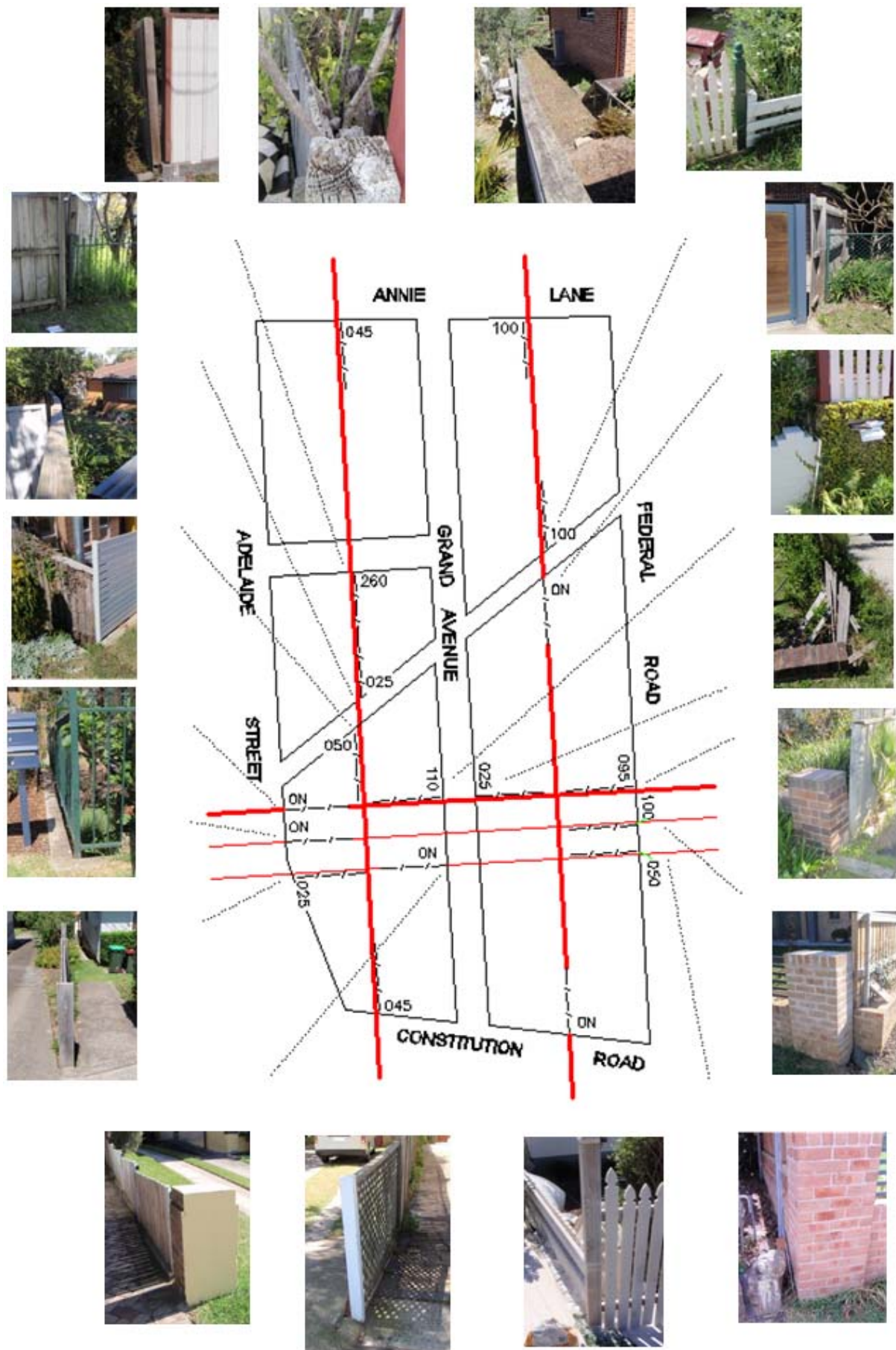


Figure 10: Relationship (in mm) of five key boundary lines in DP 4516 to fencing occupations.



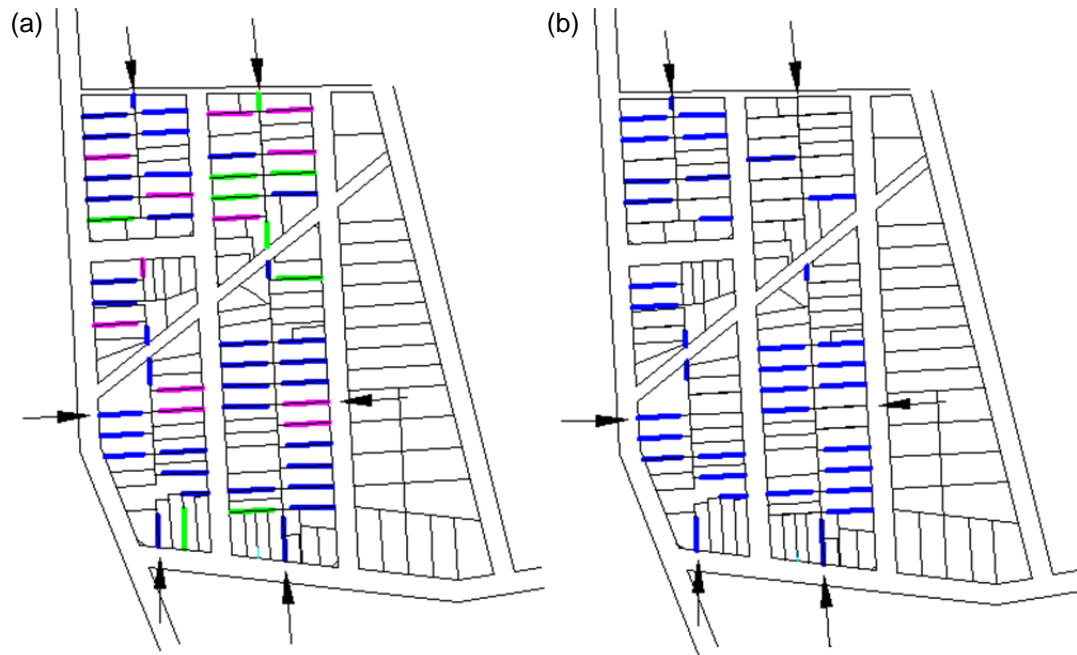


Figure 11: (a) Relationship of side boundaries in DP 4516 to fencing occupations (blue indicates <50 mm, green indicates 50-100 mm, red indicates >100 mm), and (b) distribution of side fencing that fits within 50 mm of side boundaries in DP 4516.

## 6 COMPARISONS

Confirmation that a reliable boundary fix of the old DP 4516 (1905) had been achieved was apparent when the occupations at bends and intersections in surrounding streets were compared (Figure 12).



Figure 12: Additional occupations and fencing (within 50 mm) at street corners and bends.

In Adelaide Street and Annie Lane, occupations stand within 50 mm of the street boundaries. Of particular note is that the 'face of very old brick shop' is only 10 mm off line. This face of the shop has been adopted by surveyors for decades as defining the boundary of Adelaide Street! The resultant bearing for Grand Avenue, after investigating the relevant side fencing occupations, is 6°27'55". This compares to 6°26'05" in DP 1210616 (2015).

A comparison between the street fix by side fencing and the street fix by reference mark is shown in Figure 13. The differences show where the reference mark street fix is in relation to the re-defined old DP boundary.

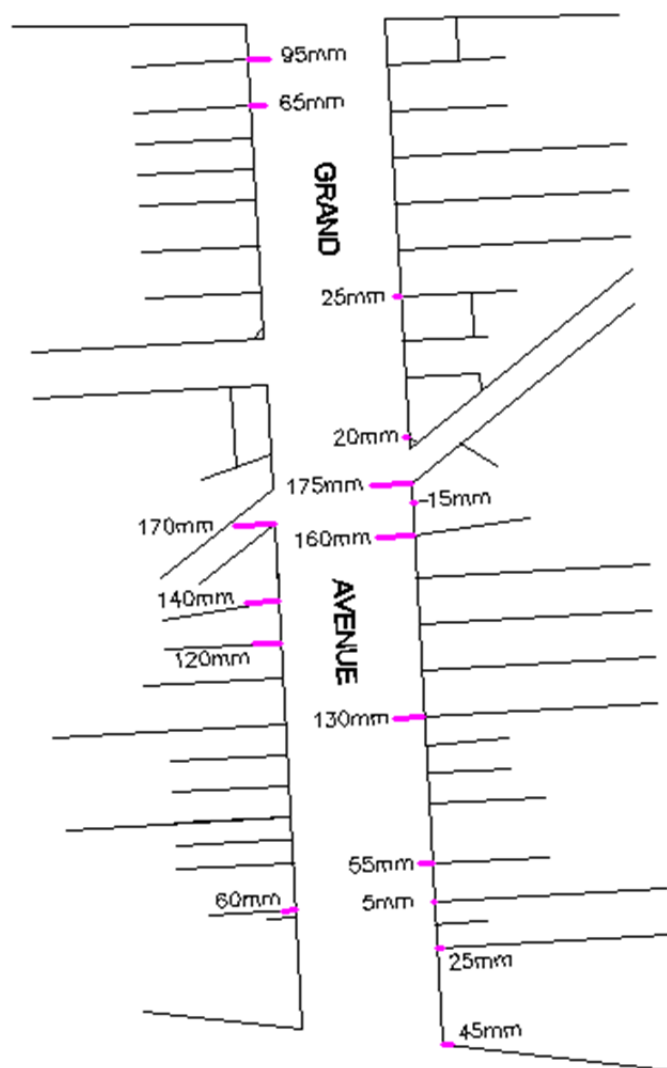


Figure 13: Street boundary fix by reference marks (pink) compared to street boundary using only side fencing.

## 7 PRE-CONCLUSION

Ryde Council's efforts to preserve survey reference marks in recent years may be contributing to future anomalies in street definition. If a reference mark is available it can influence the street boundary. If a reference mark is gone, then definition reverts to other means such as evidence by fencing or other long-standing occupations. The registered surveyor is then compelled to look further back (behind the current DP) and perhaps even look at the old original subdivision DP. It should be remembered that survey plans after 1885 are accurate. If

the surveys created a street as one straight line, then most likely the street was marked as one straight line. With a loss of reference marks, surveyors tend to try to emulate the original intention of an old DP. But in long streets such as Grand Avenue it is rare (see Figure 3) for surveyors to make that effort and survey a street from end to end. The surveyor in DP 410618 (1959) did survey it end to end, and his plan is in closest agreement to the investigation.

## **8 CONCLUDING REMARKS**

This investigation was successful in that the solution obtained in re-defining an old DP did not upset the surrounding cadastre. Was its success due to the high percentage (70%) of original side boundaries within the old DP being still existent? If just the side boundary points along the key lines were used (25% of the original side boundaries), the final result would not change. Of course, the result may have differed if the rear of all the side fences were analysed as well. However, the object of the exercise was to attain a solution using only the side fence occupations at their junction with the street, i.e. where they are readily accessible. One of the problems of an old DP is its sheer size. In this example the survey needed to cover an area 440 m by 220 m.

Analysis of the current street fix of Grand Avenue, using the available survey reference marks, shows that if surveys over the years had been carried out from end to end of Grand Avenue, then they would show a result closer to that of this investigation.

Streets shown 'variable width' could be a clue for LPI that the street fix is meandering away from the original intention. Is it correctable? There are ramifications for future surveyors setting out side boundaries when using a changing street boundary fix, especially when side boundaries are related to the street by an angular relationship.

Finally, there is a predilection for surveyors to adopt street occupations at bends and intersections, so should Council, as the adjoining land owner, be more involved when private land owners intend to construct a front fence, especially at bends and street intersections?

## **ACKNOWLEDGEMENTS**

The author wishes to acknowledge the most valuable contribution made by Dennis Liu and Albert Li (future registered surveyors) for undertaking the field survey work that gathered all the information used in the boundary investigation.

## APPENDIX

TIMELINE FOR A GRAND STREET FIX									
DATE	PLAN	TYPE	STREET	LOTS	SUBDIVISION OF	REFERENCE MARKS			
						PLACED	FOUND		
1903	DP 926032	SURVEY	ADELAIDE AND MONS EXIST		SYDNEY WATER			0	
1905	DP 4516	SURVEY	ANNIE, PEARL, GRAND, REX	54	FIRST SUBDIVISION			0	
1924	DP 310086	COMP	THE GRAND	3	LOTS 19-20 OF SECTION 1 IN DP 4516			0	
1926	DP 315090	COMP	CONSTITUTION	2	LOT 34 OF SECTION 1 IN DP 4516			0	
1928	DP 185439	COMP	CONSTITUTION	2	LOT 33 OF SECTION 1 IN DP 4516			0	
1936	DP 334327	COMP	CONSTITUTION	3	LOTS 1 & 2 OF SECTION 2 IN DP 4516			0	
1938	DP 338993	COMP	THE GRAND	3	LOTS 29 & 30 OF SECTION 1 IN DP 4516			0	
1949	DP 365489	SURVEY	THE GRAND	4	LOTS 24-25 OF SECTION 1 IN DP 4516			2	1
1956	DP 397052	SURVEY	GRAND	3	LOTS 11-12 OF SECTION 1 IN DP 4516			2	0
1957	DP 406457	SURVEY	THE GRAND	3	LOTS 26-27 OF SECTION 1 IN DP 4516			2	1
1957	DP 402569	COMP	THE GRAND	2	LOT B IN B389497			0	
1959	DP 410618	SURVEY	THE GRAND	4	LOTS 13-14 OF SECTION 1 IN DP 4516			2	2
1961	DP 20933	COMP	GRAND	2	LOTS 4-5 OF SECTION 1 IN DP 4516			0	
1962	DP 211790	SURVEY	GRAND	2	LOTS B-C IN DP 397052			2	2
1963	DP 221279	SURVEY	GRAND	4	LOTS 6-7 OF SECTION 2 IN DP 4516 AND LOT 1 IN DP 202933			2	2
1966	DP 521390	SURVEY	PEARL	3	LOTS 10 & 23 OF SECTION 1 IN DP 4516			2	0
1973	DP 565570	COMP	THE GRAND	2	LOTS X-Y IN DP 406457			0	
1977	DP 590164	SURVEY	GRAND	3	LOT 32 OF SEC 1DP 4516, LOT 11-DP 531772, LOT A-DP 185439			2	1
1979	DP 616037	COMP	GRAND	2	LOTS 2-3 IN DP 410618			0	
1992	DP 1182367	COMP	GRAND	2	LOT 20 OF SECTION 2 IN DP 4516			0	
1993	DP 833825	SURVEY	REX	2	LOT 1 IN DP 211790			1	1
1997	DP 867143	SURVEY	GRAND	2	LOT 31 OF SECTION 1 IN DP 4516			2	0
1999	DP 1019061	SURVEY	GRAND	2	LOT 3 OF SECTION 2 IN DP 4516			2	2
2000	DP 1013926	SURVEY	ADELAIDE	2	LOT 1 IN DP 590164, LOT 12 IN DP 531772			1	1
2001	DP 1029780	COMP	GRAND	1	CONSOLIDATION OF LOT 1-DP 1013926 & LOT 2-DP 590164			0	
2008	DP 1127397	COMP	REX	1	LOT 3 IN DP 926032			0	
2013	DP 1180371	SURVEY	GRAND	1	REDEFINITION OF LOT 18 OF SECTION 1 IN DP 4516			2	2
2015	DP 1210616	SURVEY	GRAND	1	REDEFINITION OF LOT 3 IN DP 565570			2	2
112 YEARS		28 PLANS		54 ORIGINAL LOTS				26	17
		16 SURVEYS		77 LOTS NOW				PLACED	STILL
		12 COMPS		[23 STILL ORIGINAL PLUS				IN	EXIST
				14 COMP FROM DP 4516]				GRAND	

Note: The names of the surveyors responsible for each DP have been omitted from this table on purpose. Suffice to say that the 26 plans since 1924 have been prepared by 24 different surveyors (the 14 plans of survey prepared by 13 different surveyors).