Counting the costs

BY LYNDA WILSON

Each issue, Lynda will provide us with an update on the trials and tribulations of the building process of her home.

With a 10-week overseas trip, the festive season and two issues of the magazine going to print, managing the building project as well has been a bit of a juggling act. So, what have we done so far?

Settlement on the land happened on the 14 August 2009. Although we had made some tentative plans before this, the real work only started after then.

Site assessment

The first job was to get a **site survey** done. This provided us with a detailed layout of the land, including boundaries, dimensions, levels, the location of services, and the location of adjoining buildings. This only took about 14 days to be finalised, due to the fact that I used the same company (Harper Somers O'Sullivan) who had done the original survey of the land for subdivision by the previous owner.

Council required that we apply for a **Flood Information Certification**, which was done mid September and we received the results within eight days. All this provided was confirmation that our property is located in a flood prone area (most of Newcastle is!) but stated that *'council do not have any flood level information for the local catchment but it appears from the aerial survey information available that there is a local depression which lies partly on this site. You may need to engage a civil engineer to provide an assessment of the local catchment flood levels.'* As a result, a requirement of building consent is that the minimum floor level for occupiable rooms is 3.6m Australian Height Data (AHD). The lowest point on the land under which the house will be built is 2.06m AHD, meaning that the house will need to be raised 1.54m above ground.

Our original plan had been to build a split level home, with the area to the street being more or less at street level (3.4m AHD) and the rear living area being slab on ground (roughly 2.5m AHD). Due to the porous nature of the local soils (even during the June 2007 floods no water was lying in the area) we could have pursued this option, but would have needed to commission a Flood Study to confirm this. This would have involved a preliminary report to investigate the surrounding area (at a cost of roughly $1500) and to gauge the likely outcome of council accepting the proposal. If this had seemed a possibility, a detailed study would need to be done, costing anything between $5000–$10,000, without any guarantee that council would accept the results. We decided to scrap the whole idea and build one level, as specified by council.

A **geotechnical assessment** was also commissioned (CSG Engineers), in order to identify the subsoil conditions and to classify the site in terms of *AS2870.1996 Residential Slabs and Footings*. This was not completed until mid October.

'Site classification is a method adopted in residential development for quantifying the anticipated ground surface movements that may occur on the site, principally due to soil reactivity. Sites are classified in terms of the potential for shrink/swell movement of the soil profiles due to changes in moisture content to be:

- *little or none (Class A)*
- *slight (Class S)*
- *moderate (Class M)*
- *high (Class H) or*
- *extreme (Class E).*

Sites may also be classified as problem sites (Class P) where subsoil conditions require site specific engineering design of foundation systems.'

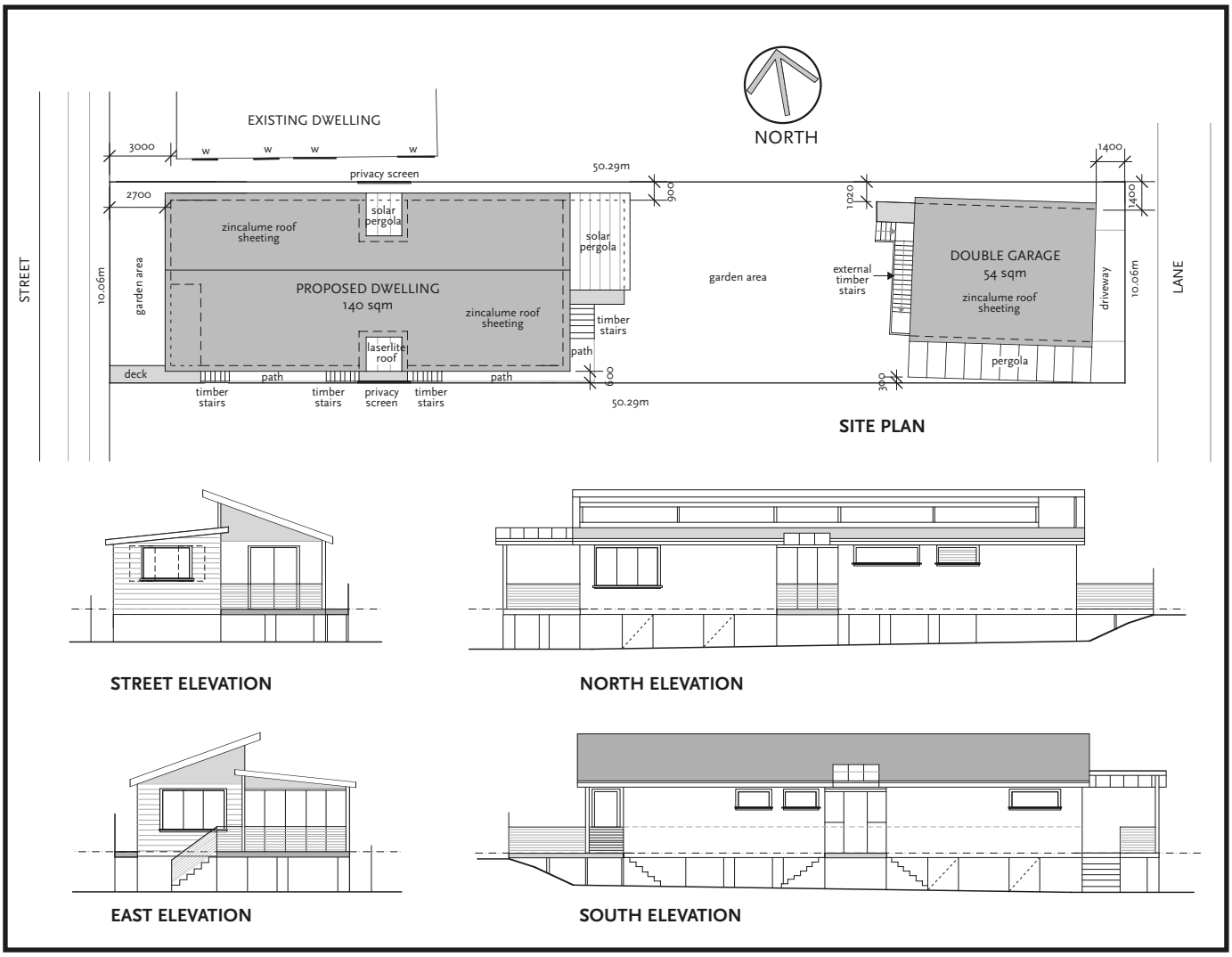
A visual assessment of the site and adjacent properties was made, plus the drilling and sampling of two 50mm diameter boreholes to a depth of 2m. This revealed poorly graded loose sand to a depth of 0.6m, beneath which is poorly graded medium dense tending to dense sand to the depth of the boreholes. No groundwater was encountered. Based on this, the site is classified as Class A (sand or rock site), having little to no movement.

The soft sands in their existing condition were not suitable to support the loads anticipated from a building, and it is recommended that prior to footings and slab construction the area should be compacted. As the building will be on piers, this is not as much of an issue as it would have been for slab-on-ground construction.

Design

We started speaking to building designer Natalie Allan (Terra Prima Sustainable Designs) in mid August 2009. After an initial site meeting, we provided Natalie with as much information as we could – some sample floor layouts, our wish list and design criteria, photos of ideas we liked, cross references to websites and books. We had a further site meeting in early September with Natalie and Bruce Fletcher (CSG Engineers) to iron out a few of the potential structural issues.

I also spoke to our wonderfully environmentally aware electrician and solar designer, David Watson, about the optimal roof angles for the solar power and hot water panels we plan to install on the roof. As a result we decided that the power panels will be placed on the roof of the garage (built to the optimal angle of 33 degrees) and that the hot



water panels will be placed on a frame on the north facing house roof, in an area that will least impact the solar access through the clerestory windows.

Plan ideas flew back and forth, before Natalie presented us with four possible solutions in late September. Due to the constraints posed by the flood information and the desire to build a home that would still 'work' irrespective of what our neighbours to the north built in the future, one plan stood out as being 'almost' perfect. With a few small tweaks we had a starting point, which was then fleshed out to include room sizes, door and window sizes and placement, and a rough idea of materials to be used. See *TOB 156 p.73* for floor layout.

Thermal performance

This was then sent to Gavin Chambers (Building Sustainability Assessments) for a thermal performance assessment (BASIX star rating) of some of the possible material options, to help us decide on the final selection. In order to pass, the star rating must be 4 or above, with a heating load not exceeding 90 and a cooling load not exceeding 43.

Eight scenarios (Run 1 to 8, see Table over the page) were used to determine the most effective combination of materials.

The base (Run 1) was: R1.5 insulation to the weatherboard and reverse brick veneer walls, timber (bedroom area) and concrete (living area) floors with no insulation, R3.5 ceiling insulation plus a 50mm blanket under the roof, single glazed clear glass in timber frames. This returned an abysmal 2.5 stars (heating 130, cooling 43).

Each successive run (see table next page) changed the rating only slightly, if at all, until Run 6 finally returned 4 stars (heating 75, cooling 37). This was: R1.5 insulation to the weatherboard and reverse brick veneer walls, R2 subfloor insulation, R3.5 ceiling insulation plus a 50mm blanket under the roof, Low E single glazed clear glass in timber frames. Surprisingly, changing some of the windows (living area) to double glazing made very little difference to the heating and cooling loads (heating 70, cooling 38).

Costs

The final plans were submitted to council mid December 2009, and we have already spent around $12,000. So just where has all the money gone?

- $990 site survey
- $180 flood certification
- $900 geotechnical assessment
- $4200 design
- $1200 structural engineering
- $4000 council fees

We are hoping to complete our build (house and garage) on a budget of $225,000 maximum. If we were doing

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Thermal Performance Assessment

Climate zone: 15. *Conditioned floor area:* 127m². *Glazing area:* 60.2m². *Glazing %:* 47.4

Run	Run description	Heating load	Cooling load	Stars
	BASIX Caps (maximum loads)	*90*	*43*	
1	• R1.5 to weatherboard walls • R1.5 to reverse–brick veneer wall • Timber & concrete floor (open) with no insulation • R3.5 ceiling + 50mm blanket under roof • All glass single clear in timber frames, openings as 30% or as drawn	130	43	2.5
2	• Run 1 with Low E in timber frames (U:3.92* & SHGC: 0.42)** – except bath, laundry & ensuite (SC† in timb)	123	35	3.0
3	• Run 1 with double glazing in timber (U:3.58 & SHGC: 0.62) to dining/lounge/kitchen (except W10 & clerestory (possible louvres?)	123	40	2.5
4	• Run 2 with double timber (U: 3.58* & SHGC: 0.62)** to dining/lounge/kitchen (except W10 & clerestory (possible louvres?). All rest Low E except wet areas	117	36	3.0
5	• Run 1 with R2 to subfloor	84	47	3.5
6	• Run 2 (Low E) with R2 to subfloor	75	37	4.0
7	• Run 1 with all timber floor	132	52	2.5
8	• Run 1 with 75 AAC (autoclaved aerated concrete) floor instead of RC (reinforced concrete)	122	53	2.5

**U = thermal conduction, **SHGC = solar heat gain, †SC = single clear*

more of the physical work ourselves, I would expect this figure to be a lot lower, but I will basically be managing the project and using contractors to do the building work. In our case, we are time poor and financially it makes more sense for us to work and pay a professional to do the jobs in a fraction of the time that we would. Nevertheless, choosing our own design and using me to manage the project will allow us to build our home exactly as we want. A similar sized 'project home' would probably be built cheaper, but if we asked a project builder to incorporate the features and materials we want, it would become a 'custom' build and the price would likely double.

During the day to day running of *The Owner Builder*, I often hear the question ***'How can I calculate what percentage I might expect to save (if any) compared with using a project builder?'***

There is no easy answer! It depends on a lot of factors. Mainly you will be saving on the labour component and markup that a builder would apply.

How much you save on labour depends on how much you take on yourself. Even if you don't do it all, you can make significant savings by being the general 'dogs body' – cleaning up, carting bricks, digging trenches etc. If you can't do it yourself, perhaps you have a friend or family member who would be prepared to act as a labourer – it makes sense not to pay a qualified tradesman an hourly rate to do menial tasks. Also remember that some trades will simply NOT do the menial tasks e.g. a bricklayer expects to have a labourer working alongside to mix and provide the mortar, and cart bricks around.

It will also depend on your timescales. If you have the time to spare, then the fact that it takes you twice as long to do the tiling may not be a big issue. However, if time is pressing then it may be worth paying a professional tiler to do the job.

Materials is an uncertain area. Tradesmen can often get good discounts as they have an account, but places like Bunnings do offer a trade discount card to owner builders, and many independent hardware stores will do the same. Gains can also be made by spending your time to shop around – tradesmen will generally buy everything at one location and can therefore miss out on bargains. However, you must factor your own time and travel costs into these savings – it may not be worth the effort to only save $20, but would be to get a full bathroom suite at half price.

Acting as project manager should save you a fair bit, as most builders will put a significant markup onto the project for this. However, acting as project manager means that you have to be on the ball – especially if the timescales are tight. There is no point having a plasterer hanging around for a day or two waiting for the electrician to finish, because you forgot to let him know that you were running late. Also, tradesmen are pretty fully booked up and if you have to cancel them for a certain date, you may have to go to the back of the queue for a new timeslot. Another reason why it is good to be prepared to tackle most tasks yourself if needed.

At the end of the day, you should be able to make a decent saving on anything but the most bog standard 'project style' house. A builder will increase his quote significantly for anything that is 'different' to the norm, as the risk factor increases for him.

More importantly, you will be getting exactly what you want. ■

- **Harper Somers O'Sullivan** Surveyors. *02 4961 6500, www.rpshso.com.au*
- **CSG Engineers** Geotechnical assessments. *Speers Point NSW, 02 4958 3308.*
- **Terra Prima Sustainable Designs** Drafting your design or helping to create it. *02 4967 3641, 0409 126 353*
- **Building Sustainability Assessments** Thermal performance assessor. *02 4962 3439, www.buildingsustainability.net.au*