MITREPLAN PROJECT PLANNER

Retaining walls

- **An easy-to-follow guide to achieving a perfect result.**
- **Outlines all the tools you will need for the job.**
- **Includes a materials checklist.**

PLEASE NOTE:
Before starting this project or buying any materials, it is worth your time to read all steps thoroughly first to be sure you understand what is required.

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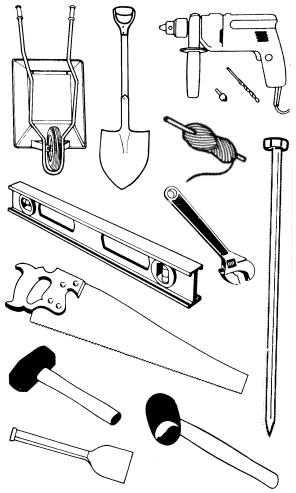
MIGHTY HELPFUL™ MITRE 10

MIGHTY TOOLS FOR YOUR MITREPLAN



Shovel
Crow bar
Wheel barrow
Power drill & drill bits
String line
Spirit level
Shifting spanner
Saw

BLOCK RETAINING WALL
Shovel
Crow bar
Wheel barrow
Spirit level
String line
Mash hammer
Cold chisel
Rubber mallet
Hire a mechanical plate compactor

✓ MIGHTY HELPFUL CHECKLIST

		ORDER
	Timber	
	Treated pine sleepers, posts spaced at 1800mm max. & rails to span 1800mm	
	Treated pine sleepers, posts spaced at 1800mm max. & rails to span 1800mm	
	Red gum sleepers, posts spaced at 2400mm max. & rails to span 2400mm	
	12mm diameter galvanized coach bolts, washers & nuts (length to suit combined width of post and rail)	
	Bags of concrete mix	
	Weed mat	
	Agricultural (ag.) drainage pipe	
	Screenings (“quarter minus”, trade term)	
	Back-fill material	
	25mm gal. clouts	
	Block retaining wall	
	Crushed rock base material	
	Retaining wall blocks	
	Agricultural (ag.) drainage pipe	
	Back-fill material	
	Hardware	
	12mm coach bolts as required	
	12mm drill bit	
	Other materials	

Verbal quotes are indicative only. Written quotes on materials are available upon request from your Mitre 10 store.

Retain your home garden – with help from Mitre 10.

Retaining walls are most useful on a sloping block as a means of terracing or levelling sections of land (Fig. 1), or used as a garden surround or edge as a feature (Fig. 2). A good variety of materials are available for your selection and the design possibilities are exciting.

And with some guidance from Mitre 10 the job is well within the means of the home handy-person. For our project we will look at timber and blockwork wall systems.

Fig. 1

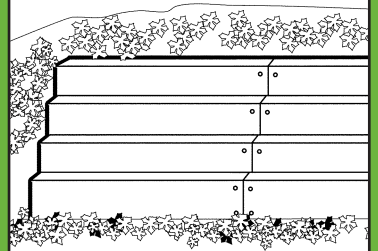
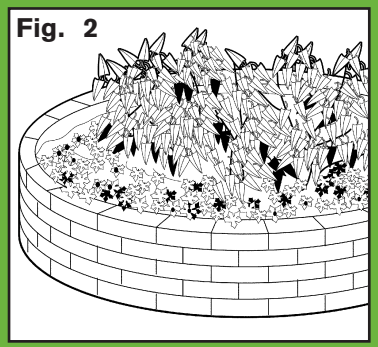


Fig. 2



Timber retaining wall – work sequence

1. Read MitrePlan
2. Set out wall
3. Excavate post holes
4. Fit rails
5. Lay agi pipe and drainage material
6. Backfill with selected material

Step 1: Set out the job

Your first job is to mark out the line of the wall, drive a stake into the ground at one end of the wall, then another stake at the other end. Run a string line stretched tight from one stake to the other. Carefully mark out the location of the posts with small stakes using the string line as a guide for straightness (Fig.3). Divide the total distance into equal sections. Remember, 1800mm max span for treated pine and 2400mm for redgum.

Step 2: Placing the posts

Remove the string line and dig the post holes; these should be to a depth of 600mm and 300mm square. Stand the two end posts in their holes and mark the required height at which you want the wall to finish - ideally the top will be in equal multiples of the width of the selected sleepers. Take the posts out of the holes and cut to length.

Mix enough concrete mix for the two posts with water to a slightly runny consistency, stand the end posts in their holes and place the concrete in and around the posts to within 50mm of the ground level. Finally ensure the posts are plumb in both directions with your level.

With both end posts set in correct location, run a string line from one post to the other along the bottom of the post and another one at the top of the post (Fig. 4). This helps align the intermediate posts. Place posts in the hole, mark to the correct height using the string line as a guide then remove the post and cut the excess off. Progressively place posts in the hole with the concrete mix. Once all the posts are in allow the concrete to set for 48 hours.

Fig. 3

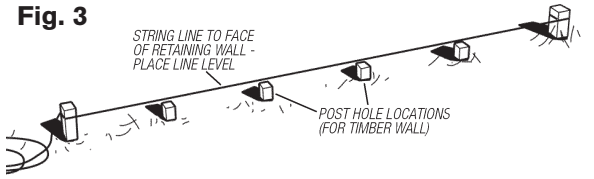


Fig. 4

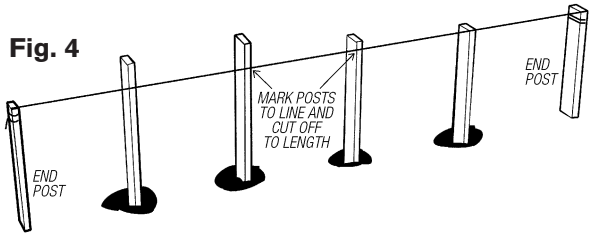


Fig. 5

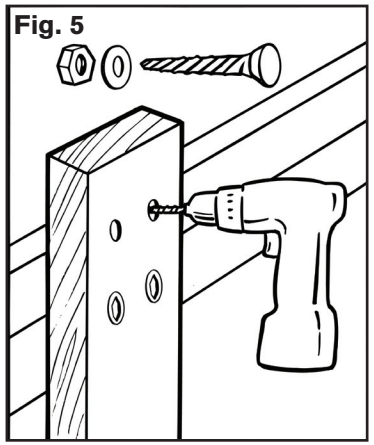
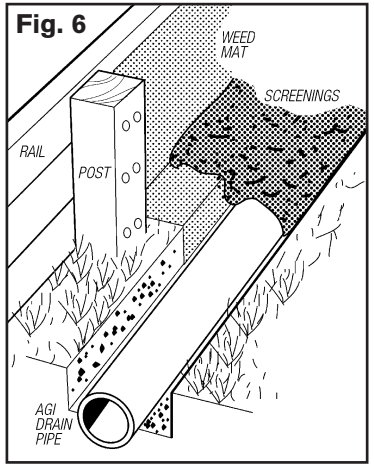


Fig. 6



Step 3: Placing the rails

Ensure the tops of the posts are cut off level and straight and measure down on each post to pin-point the top of the bottom rail. The wall rails sit behind the posts. Place the rail in position, mark and cut it to length so it joins halfway onto a post. Drill a 12mm diameter hole through both the rail and post, push the bolt into the hole with the head exposed on the outer surface, place the washer and nut on the bolt and tighten securely (Fig. 5).

Step 4: Drainage

First dig a trench against the corner of the bottom of the wall (Fig. 6) 50mm deep by 150mm wide. Lay weed mat down the back of the wall between the posts and turn it down into the trench, nail the top of the mat to the back of the wall with galvanized clouts. Lay a 40mm deep bed of “quarter minus” screenings on the weed mat in the trench. Not all Mitre 10 stores will stock screenings. Check with your local Mitre 10 store to see if they’re available to order. Now lay the polytube agricultural pipe along the base of the wall and embed it into the screenings. Lay the pipe with a slight fall to one end of the wall, and place an open end so that it can drain out. Cap the end with fine chicken wire to prevent rodent invasion. Spread screenings over the agricultural pipe to a cover of about 40mm above the top of the pipe. Now all that remains is to back-fill behind the wall with your selected filling, and plant grass or cultivate your garden to your new terraced extension.

Block retaining wall

Brick or block retaining walls and foundations have structural elements which really need to be designed by a structural engineer, however in this great age of do-it-yourself there is available interlocking block retaining wall systems which are installed without the need of cement or concrete. Remember, any wall over one metre in height will need to be designed by an engineer. Not all Mitre 10 stores will stock interlocking blocks. Check with your local Mitre 10 store to see if they’re available to order.

Block retaining wall – work sequence

1. Read MitrePlan
2. Set out wall
3. Excavate foundation
4. Lay foundation material
5. Lay first row of blocks
6. Lay ag. pipe and drainage material, fill cores of first row of blocks
7. Lay subsequent courses of blocks
8. Back fill behind retaining wall

Fig. 7a

Fig. 7b

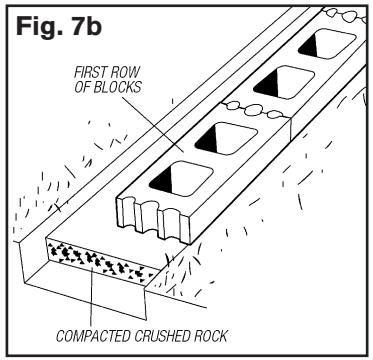
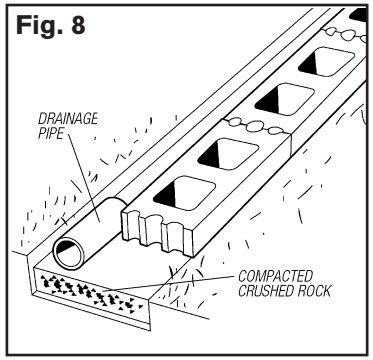


Fig. 8



Step 1: Set out the job

Your first job is to mark out the line of the wall, drive a stake into the ground at one end of the wall, then another stake at the other end. Run a string line stretched tight from one stake to the other. This line represents the face of wall line (Fig. 3).

Step 2: Solid foundations

Excavate a trench 400mm wide by 200mm minimum deep for the length of the wall required. The front edge of the trench will become a restraint for the base course of blockwork so the trench base needs to be level and straight. Now place the crushed rock into the trench to 120mm deep, scrape it to a straight level line and then using a mechanical compactor vibrate the crushed rock down to consolidate it (Fig. 7a), adding and scraping as necessary to obtain a good even and level surface.

Step 3: Block wall

Stretch the string line again from stake to stake, adjusted level and to the top of the first row of blocks.

Lay the first row of blocks onto the foundation, checking each block for level both side to side and front to back (Fig. 7b), making necessary minor adjustments by tapping with a rubber mallet or placing small amounts of coarse sand under the block. Maintaining straight and level work on all rows is important as irregularities become larger as work progresses higher.

Step 4: Drainage

Place agricultural pipe at the bottom rear of the wall with fall to the selected drainage point. Fill around the pipe up to the top of the first course of blocks with screenings, and fill the hollow cores of the first row of blocks (Fig. 8).

Step 5: Finish the wall

Now proceed to lay the rest of the blockwork. Naturally the blocks are laid in brick pattern (staggered end joints), so where straight vertical ends are desired last blocks will need cutting, or some suppliers will have blocks to facilitate this. Remember to regularly check and adjust the blockwork to be level and straight as work proceeds.

Finally back-fill behind the wall with your selected material, and grade the top level of the fill material so that it provides adequate surface drainage.

To build a brick retaining wall refer to MitrePlan#23 – “Do your own bricklaying.” Remember, check with your local authorities to see if a building permit is required for this project.

Irregular shaped walls

Free flowing walls such as curved walls, circular walls or even short stepped walls will be laid more with the use of a level and straight edge than string lines. One constant with work of this nature is to consistently work to obtain a level and plumb job.

Retaining walls

MIGHTY HELPFUL HINTS TO MAKE THE JOB EASIER

- Study the area where the wall is to be constructed, take note of the fall of the land.
- Ask yourself, will the top of the wall be level or will it follow partly the natural slope of the land? What about steps or access up to the terraced section?
- Check for any underground services such as telephone, gas, water, electricity running under the proposed wall.
- How high will the wall be? If it is over 1 metre high then consult a structural engineer to design the wall.
- Is the wall going to withstand extra loading such as a car park, or have a building of any sort on top? If so consult a structural engineer to design the wall.
- Is the wall to be constructed on solid ground and capable of withstanding long term settlement of the withheld soil?
- **Remember, a building permit may be required. Check with your council first about local regulations.**

Your local MITRE 10 Store is: