

# PN148/9 TAPERED RETAINING WALLS

**READ THROUGH ALL THE INSTRUCTIONS BEFORE YOU START.**

To construct this kit you will need the following:

1. A Modellers knife.
2. A steel ruler.
3. Glue - UHU Clear Adhesive is our favourite.
4. Ultra Fine Tip Glue Applicator, *see right*.
5. A cutting surface - a sheet of card or a cutting mat.
6. Fine point tweezers to hold the smaller components.
7. Water colour paints and a very fine brush, for painting the edges and corners.

## GETTING STARTED

### 1 EXTRACTING COMPONENTS FROM SHEETS.

To stop the components from falling off the sheets, they are held secure with scorelines. These are cuts that only go about 75% of the way through the card.

To release them simply run the point of your knife along the scorelines and they will come seamlessly away.

These scorelines are indicated with blue arrows: →

WARNING, Cut with care using a knife that is not too sharp, this will reduce the risk of the blade running out of the score and cutting the kit components.

### 2 MAKE YOUR 'BUILDERS YARD'.

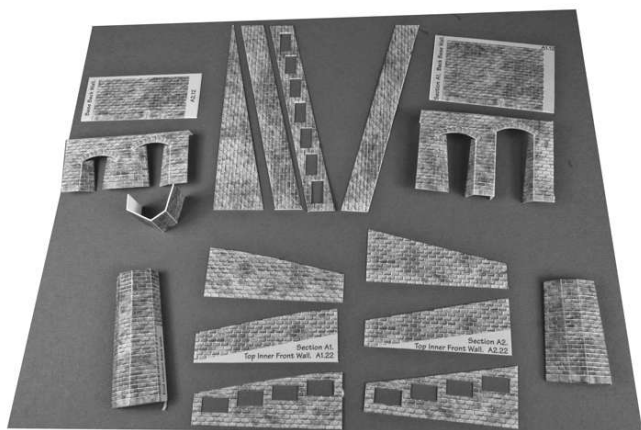
This is an area kept away from your working surface, where you store ALL components extracted from the base sheets until needed.

Use a piece of thick card or a tray to make your builders yard.

### CUT THE COMPONENTS OUT IN THE FOLLOWING ORDER:

Extract the components from the **LEFT HAND SIDE** of SHEET 'A' ONLY. Also leave the strip of tarmac in the centre.

The reason for this is that the other half of sheet 'A' has identical components, but they are mirror imaged for the opposite wall. Cutting them out now will make things very confusing. Leave plain grey card components on sheet until needed. *See descriptions right.*



Your **WORKING** area should have a clean flat surface, and should only contain the kit parts you are actually working on.

EVERYTHING ELSE SHOULD BE KEPT NEATLY ARRANGED IN THE BUILDERS YARD, UNTIL NEEDED.

PLEASE NOTE: Don't throw anything away. Keep all offcuts and waste card in a box until the kit is finished, just in case you can't find anything. The chances are that it will be there.

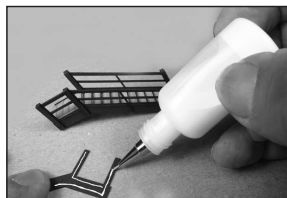
# INSTRUCTION SHEET 1

## CHECK LIST

This kit pack should contain the following:

- 1 x SHEET A - Main lower walls and piers.
- 2 x PLAIN GREY CARDS - Strengthening parts.
- 1 x Small Laser cut grey card with wall top strips.
- 2 x INSTRUCTION SHEETS.

**The METCALFE Ultra Fine Tip Glue Bottles** are essential for gluing the smaller components in this kit.



Tiny strips or spots of glue can be accurately laid down with precision.



Always replace the pin after use and store the bottles upside down to keep the glue moist.

**UHU Solvent Free All Purpose Adhesive Glue** Works superbly well in our fine glue applicators.

Dries quickly, but allows time for positioning of kit parts as described further on in the instructions.

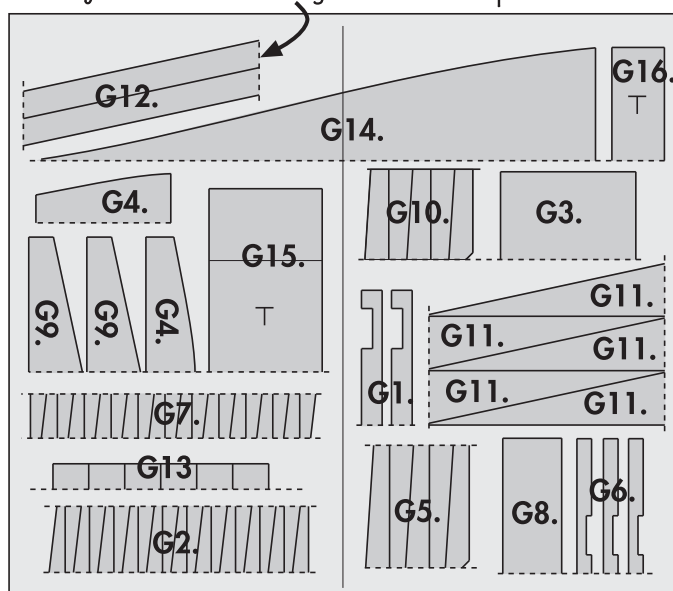
### Speed Bond by Deluxe Materials

This is an excellent PVA. based glue that dries quickly, but also allows time to get parts into position. Used in our fine glue applicator bottles a 112g bottle lasts for ages. [www.deluxematerials.com](http://www.deluxematerials.com)

### GREY CARD STRENGTHENERS

This sheet contains all the un-printed components that fit inside the walls to make them thicker and stronger. There are two of these sheets in this kit.

Note: The dotted lines shown here represent the scores you need to cut along to release components.



### Key to Grey Components:

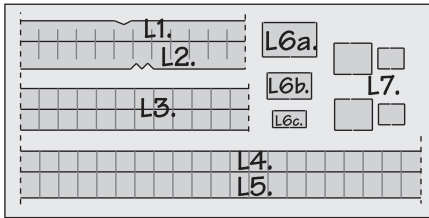
- G1. Wall A1. top spacers x 2.
- G2. Wall A1. inner spacers x 21
- G3. Wall A1. back card.
- G4. Top wall A1. spacers with curved top x 2.
- G5. Large column spacers x 5.
- G6. Wall A2. top spacers x 3.
- G7. Wall A2. inner spacers x 21.
- G8. Wall A2. back card.
- G9. Top Wall A2 spacers x 2.
- G10. Small column spacers x 5.
- G11. Wall A3. spacers x 5.
- G12. Top Wall A3. spacers x 2.
- G13. Wall End inner spacers x 6.
- G14. Inner ramp wall.
- G15. Ramp large spacer.
- G16. Ramp small spacer.

Only extract as needed.

## LASER CUT CARD COMPONENTS

There is another smaller plain grey card with finer laser cut wall top strips and capping stones. There are two identical sets for each wall.

Cut down the dotted lines to release the strips, smaller squares simply push out.

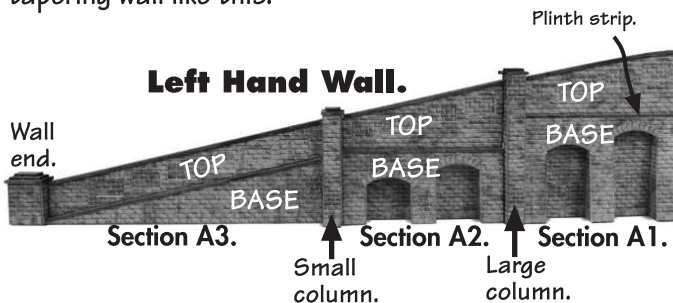


Key:  
L1. Small plinth  
L2. Large plinth  
L3. Short capping stone strips x 2.  
L4. Long capping stone strip.  
L5. Long plinth.  
L6. a.b. & c. capping stones for wall end.  
L7. Large and small capping stones for the columns x 2 sets

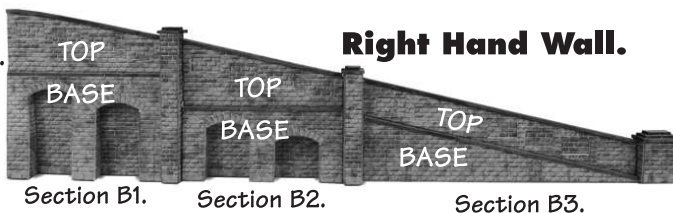
## BRIEF DESCRIPTION OF FINISHED KIT.

There are a lot of similar and identical components in this kit, so it's best if you take the time to understand what the finished thing is supposed to look like.

All the components from the left hand side of sheet 'A' and one of the grey card strengthener sheets, plus half the laser cut bits will give you a left handed tapering wall like this.

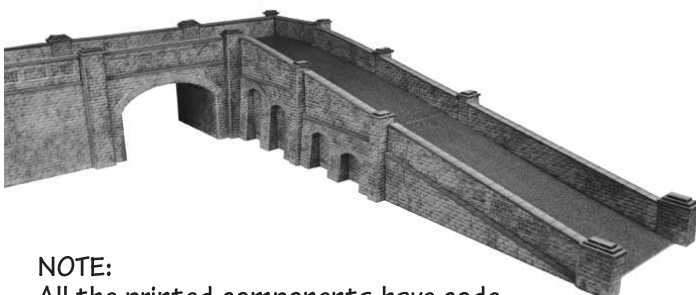


There are three sections to each completed wall. Each section is made up of a base unit, with a top wall sitting directly above with a plinth strip in between. Standing between the walls are two columns and at the end of the wall, an oblong 'Wall end' to finish it off.  
**All the wall components for the Left Hand Wall are marked with prefix letter 'A'.**



This wall is exactly the same as the left hand wall except all components are a mirror image, **All the wall components are marked with the prefix letter 'B'**

There is also a strip of tarmac and extra grey strengtheners to be used if you are making the two walls into a ramp for use with our PN14-6/7 Railway Bridge kit.



### NOTE:

All the printed components have code numbers next to them. We have largely ignored these on the instructions to avoid extra confusion.

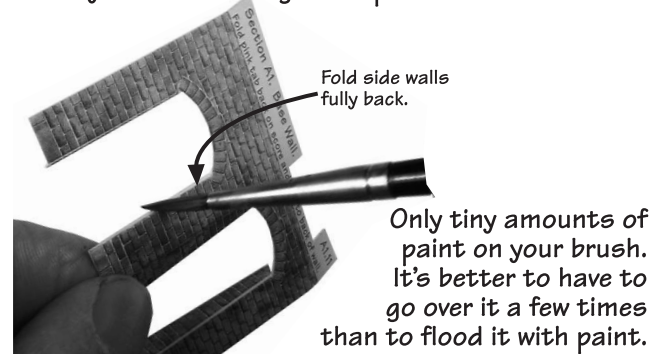
## Fig.1. PAINTING CORNERS & EDGES.

Before you start any construction, you need to paint over the white strips of card that show on every edge and corner. This is not a hard job and only takes a few moments, and is much easier than trying to paint the edges after the kit has been built.

A set of very simple child's water colour paints is all you need and a fine paint brush.

Mix your colour with lots and lots of water, apx. 1 part paint to 5 parts water, maybe more. **TEST ON WASTE CARD FIRST UNTIL YOU HAVE THE CORRECT SHADE AND COLOUR.**

Fold the edges of the card back fully and gently run the point of your brush along the exposed white card.



Before the paint dries, run your finger along the edge to rub the colour into the absorbent white card. Then wipe away any paint that has run onto the printed surface before it dries.



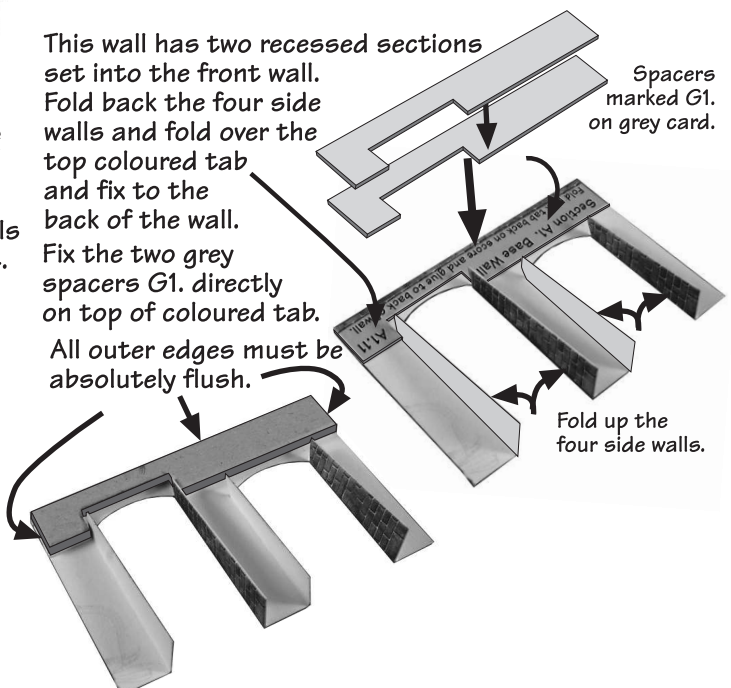
## Fig.2. SECTION A1. BASE WALL.

All instructions from here to Fig. 6. deal with making sections A1. (and B1. which is a mirror image of A1.).

This wall has two recessed sections set into the front wall. Fold back the four side walls and fold over the top coloured tab and fix to the back of the wall.

Fix the two grey spacers G1. directly on top of coloured tab.

All outer edges must be absolutely flush.



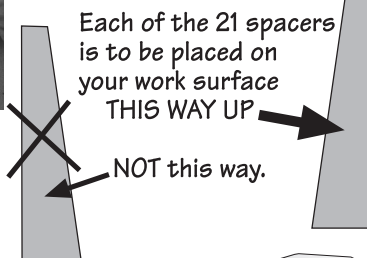


### Fig.3. FRONT WALL SPACERS.

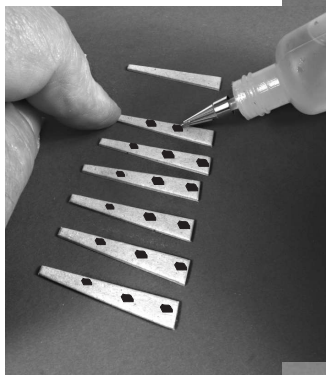
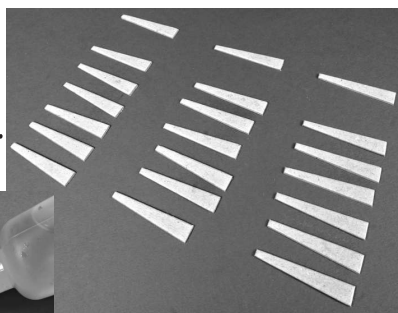
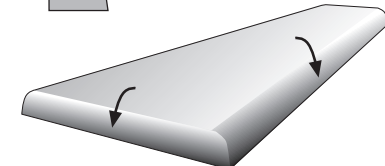


At the bottom of each grey card is a strip of 21 long spacers (marked G2.).

Now pay attention!



One easy way to tell if you have them the right way up, is to look at the edges of the card. The top edge is very slightly curved around the outer edges, caused by the blade as it pushes down through the card. Count them out into three rows of 7. Put the end one on each row further away.

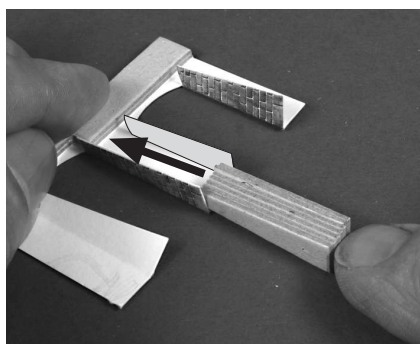
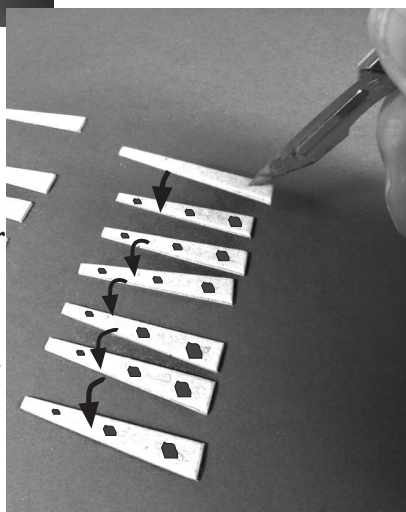


Place tiny spots of glue along the first 6 spacers (that's why the 7th is further away, so you don't glue it).

Pick up the 7th. unglued spacer with the point of your knife and place on top of the 6th. then the 5th. and so on until you have all seven together in a block.

Like this.

Before the glue has time to set, place the block into the centre section of the wall



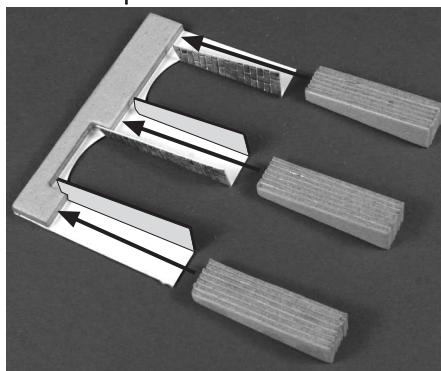
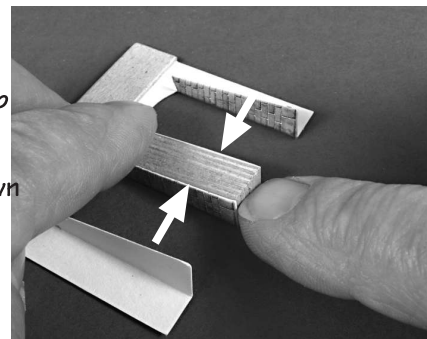
But DON'T GLUE. Just fold the sides around it and push it up to the top



Make sure you keep them this way up as they go in so it matches the sides of the recessed walls.

### Fig.3. Cont'd.

Whilst the glue's still wet mould the block to fit. Push up against the top, squeeze in the sides, and push down to form a nicely squared up spacer. Take out and repeat with the other two sets of spacers.



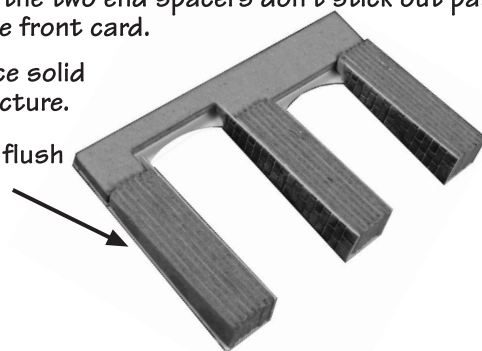
You now end up with three perfectly squared up sets of spacers like this.

Fix these spacers into the wall as shown.

Make sure all side walls are set at right angles nice and neat and that the two end spacers don't stick out past the ends of the front card.

A nice solid structure.

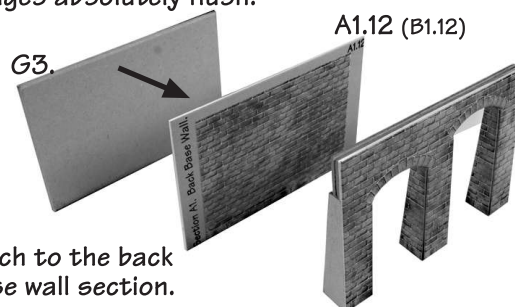
Edges flush



### Fig.4.

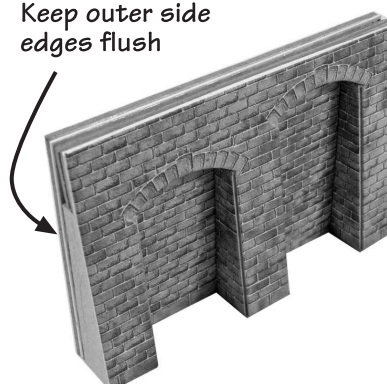
#### BACK WALLS.

Fix one plain grey back wall (G3.) behind the printed back base wall, A1.12 (B1.12 for right hand wall) keeping all four edges absolutely flush.



Then attach to the back of the base wall section.

Keep outer side edges flush



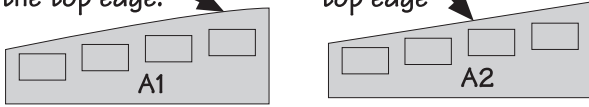
This is the completed base wall A1 (B1. for right handed version).

## Fig.5. TOP WALL SECTIONS.

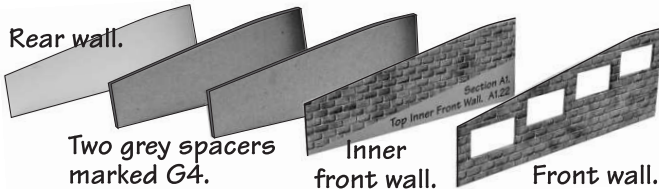
The top walls for both sections A1. and A2. go together in exactly the same way. **BUT** there is a very small difference between the wall tops for sections A1 and A2.

A1. has a very slight curve along the top edge.

A2 has a straight top edge



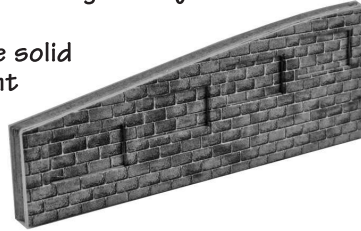
Each wall is made up of 5 layers of card printed front and back with grey card spacers in between. Be careful not to mix them up, match up before you glue.



Make sure all edges line up flush. Stand on flat surface whilst glue is still wet and push down from the top and inwards from both sides to align all layers of card.

So that you end up nice solid wall that stands upright on its own.

Like this!

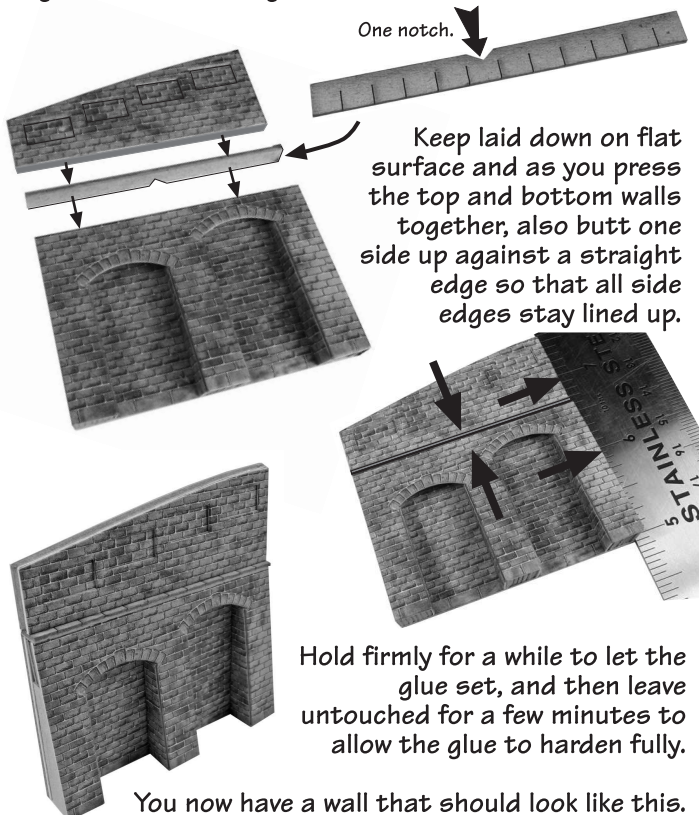


## Fig.6. ATTACH TOP WALL TO BASE.

Lay flat on work surface and glue the top wall down on to the base wall with a strip of laser cut plinth stones sandwiched in between.

### IMPORTANT:

Use the plinth strip with ONE notch cut into the back edge when assembling this A1/B1 wall section.

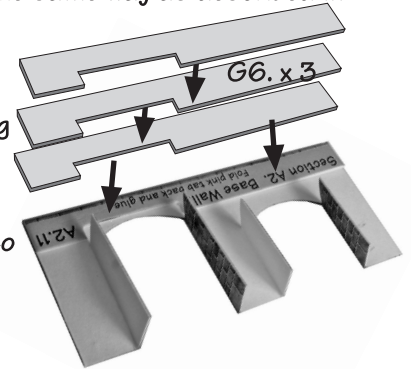


## Fig.7. WALL SECTION A2. (B2.).

This wall section builds up in exactly the same way as A1. (B1.) The base is shorter in height but it has the same 21 grey spacers (marked G7. on grey card) that fit together in the same way as described in Figs. 2 to 4.

The only difference is here, when assembling the front wall.

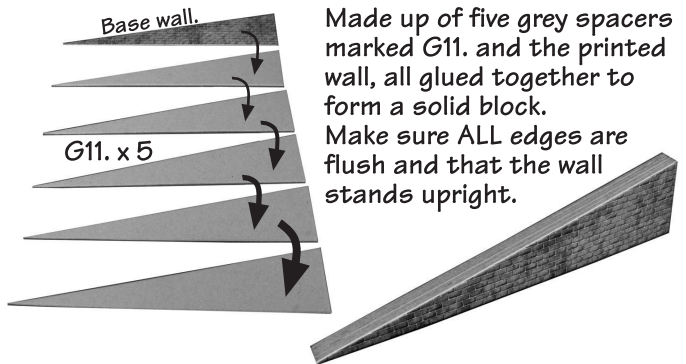
There are three grey spacers (G3.) attached directly onto the coloured tab with all outer edges flush.



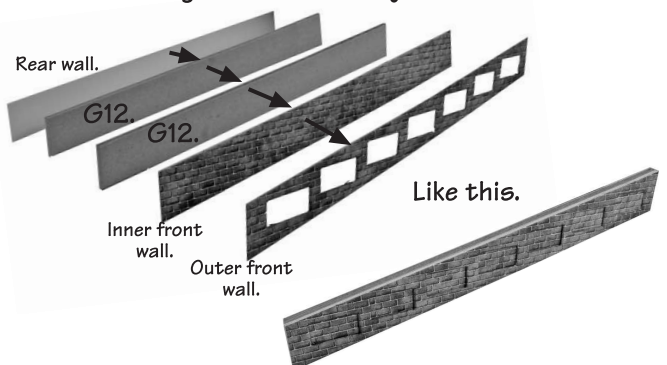
The rest of the base wall section is same as figs. 3 & 4. and the top wall as Fig. 5. & 6. (left).

## Fig.8. WALL SECTION A3. (B3.).

The base section for this wall is a simple tapered wall.

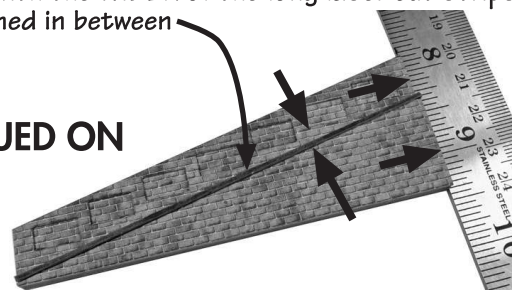


The top wall is similar to the other walls there are two printed front walls, two grey inner spacers G12. and rear printed wall, all glued together to form a very solid wall. Make sure all edges are absolutely flush.



Fit the top and base walls together as you did with the other walls with the WIDER of the long laser cut strips L5. sandwiched in between

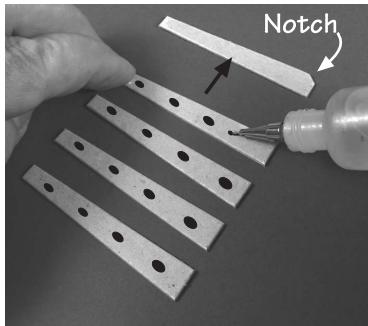
CONTINUED ON SHEET 2





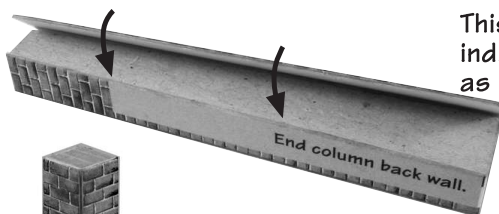
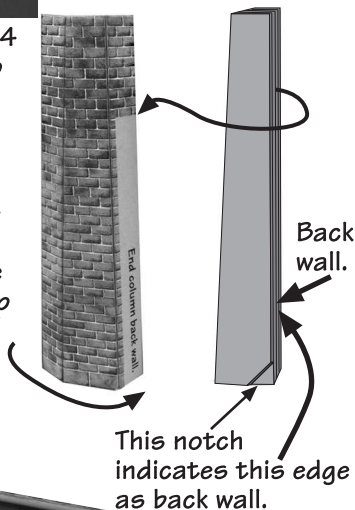
## Fig.9. THE COLUMNS & WALL ENDS.

There are two columns on each wall, one large and one small. Each column has four sides that fold around a central support made from five grey card spacers. The large column uses the spacers marked G5. and the small columns use G10. All go together the same way.



Starting with the large column, cut out the five spacers (G5.) and place all facing the same way up as described in Fig.3. Place in a row with the one with the notch cut in the bottom corner further away.

Place spots of glue on the 4 spacers, then pick them up to form solid block in just the same way as with the small spacers in Fig.3. Before the glue sets, place the spacer block inside the column with the indicated back wall fitting behind the column back wall, then wrap around and glue shut.

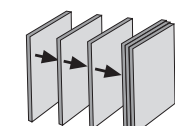


Whilst the glue is still wet make sure tops and bottoms of spacers are all lined up inside the column and then make sure all edges are squared up with all four corners at perfect right angles.

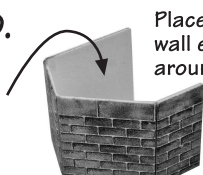
Hold firm until glue sets. You should end up with a column like this.

Repeat with the small column in just the same way.

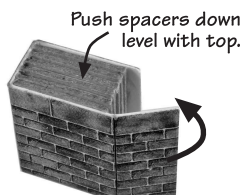
### WALL END.



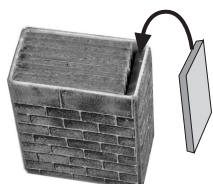
Glue the six spacers G13 together to form a solid block.



Place them inside the wall end and wrap it around.



Push spacers down level with top.



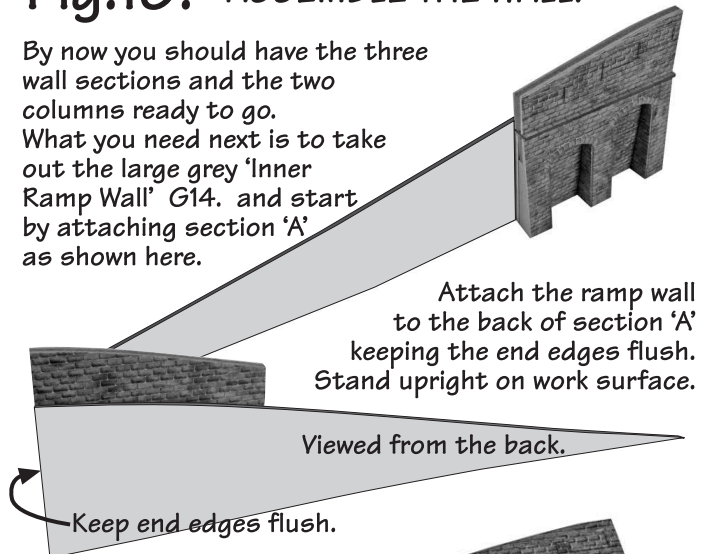
Cut a tiny piece of waste grey card and fit into this space so that it completely fills the inside of the wall.

Wrap up tight and mould to form squared corners. Hold tight until the glue sets.

## Fig.10. ASSEMBLE THE WALL.

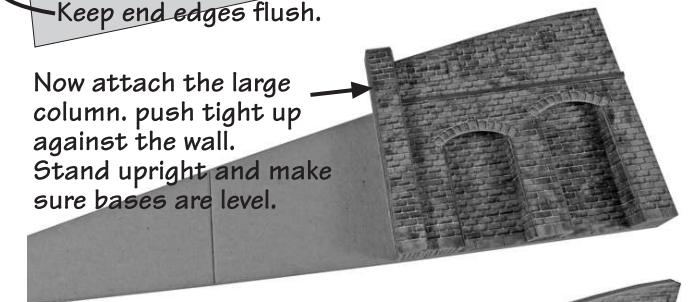
By now you should have the three wall sections and the two columns ready to go.

What you need next is to take out the large grey 'Inner Ramp Wall' G14. and start by attaching section 'A' as shown here.

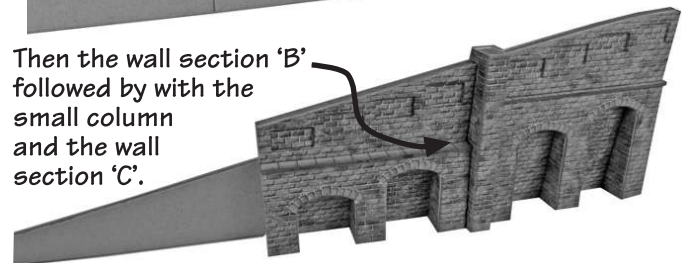


Attach the ramp wall to the back of section 'A' keeping the end edges flush. Stand upright on work surface.

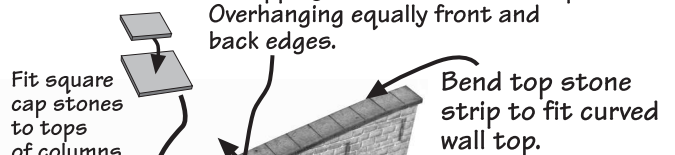
Now attach the large column. push tight up against the wall. Stand upright and make sure bases are level.



Then the wall section 'B' followed by with the small column and the wall section 'C'.



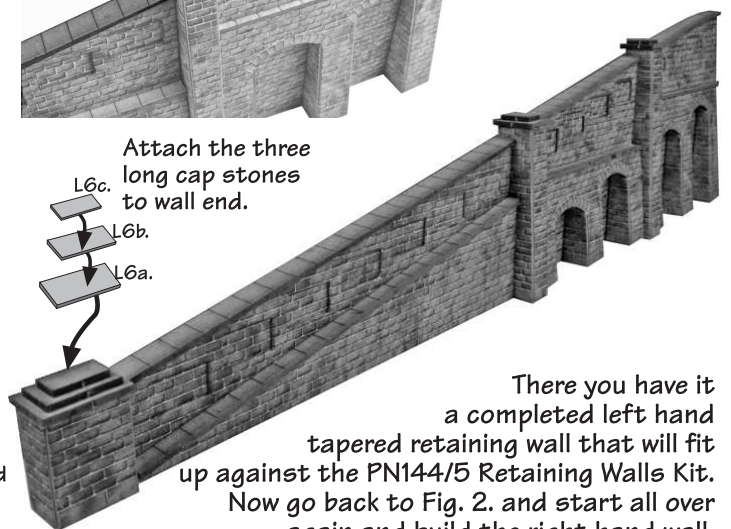
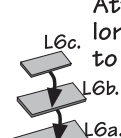
To finish off, attach the laser cut strips of capping stones to the wall tops. Overhanging equally front and back edges.



Fit square cap stones to tops of columns.

Bend top stone strip to fit curved wall top.

Attach the three long cap stones to wall end.



There you have it a completed left hand tapered retaining wall that will fit up against the PN144/5 Retaining Walls Kit. Now go back to Fig. 2. and start all over again and build the right hand wall.

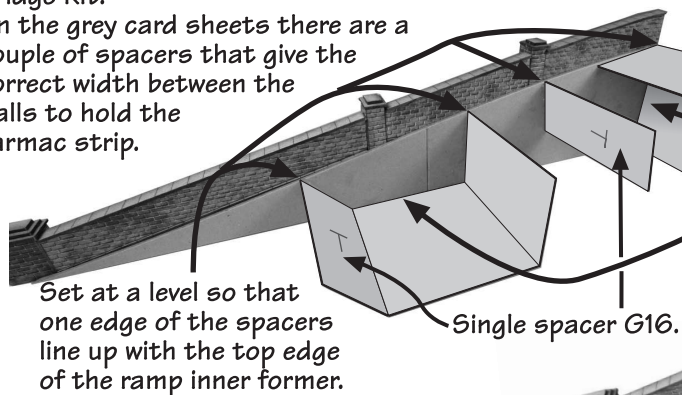
## Fig.10. BUILDING A RAMP.

Once you have built both walls, you can use them to flank either side of a ramp for use with our PN146/7 Bridge Kit.

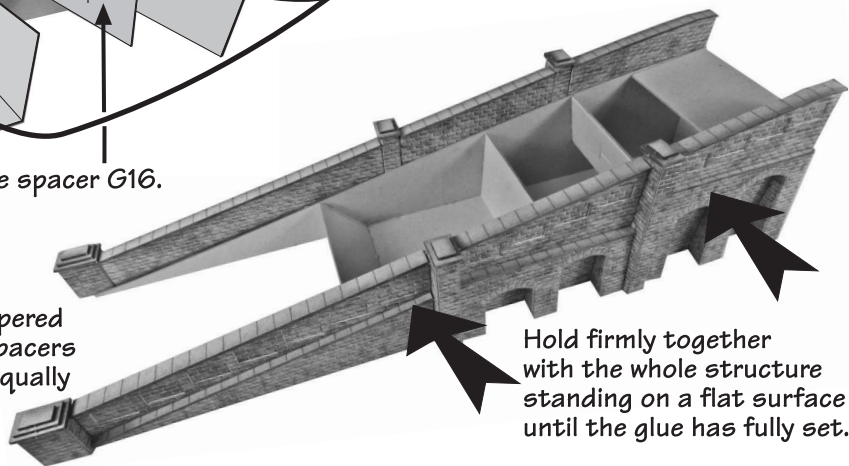
On the grey card sheets there are a couple of spacers that give the correct width between the walls to hold the tarmac strip.

There are two plain grey cards with a scoreline G15, and two plain pieces G16, both marked with a T.

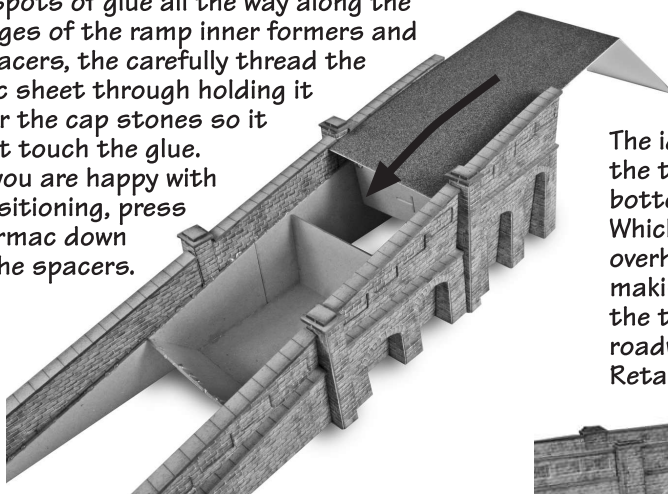
Fold the larger spacers to form an angled shape and fit one edge against the ramp inner former



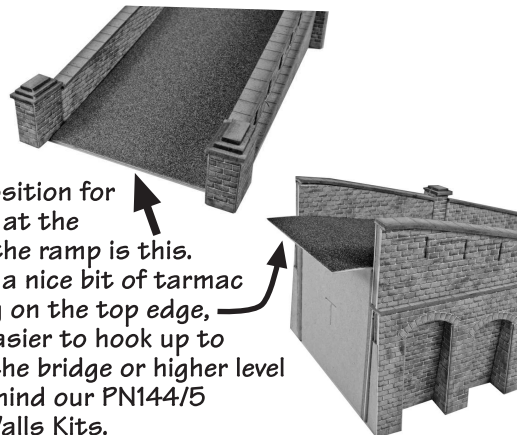
Once in place attach the other tapered wall to the opposite side of the spacers making sure they are all lined up equally on both sides.



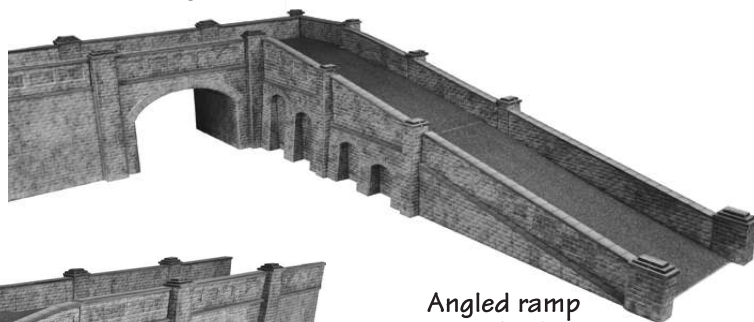
Place spots of glue all the way along the top edges of the ramp inner formers and the spacers, the carefully thread the tarmac sheet through holding it up near the cap stones so it doesn't touch the glue. When you are happy with the positioning, press the tarmac down onto the spacers.



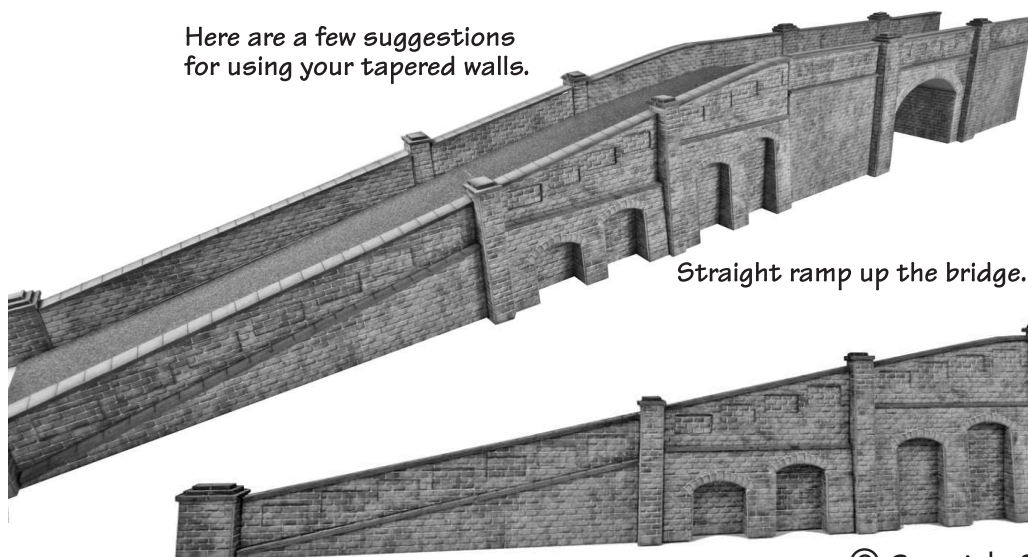
The ideal position for the tarmac at the bottom of the ramp is this. Which leave a nice bit of tarmac overhanging on the top edge, making it easier to hook up to the top of the bridge or higher level roadway behind our PN144/5 Retaining Walls Kits.



Remember that the inner ramp former has a curved shape along the top edge so you will need to make sure the tarmac is pressed down firmly whilst the glue sets.



Here are a few suggestions for using your tapered walls.



Angled ramp up to bridge.

Used with retaining wall.