

Haener Block General Building Tips

By Robert Shepersky (Masonry Contractor of 38 years)

Intro for the Masonry Contractor:

Using Haener Block will change the way you think of reinforced masonry walls and concrete walls in general. Used properly you'll realize a dramatic time and cost savings.

The ratio of labor to skilled mason is the first change you'll notice. The mason does the layout and leveling for the first course. After that everyone present stacks the block into the wall. Checking alignment or inserting a leveling shim if necessary takes almost no time.

Second, you'll realize that taking time to stock a building in the traditional fashion results in moving blocks twice when once, into the wall, would have been enough. Forklift access will become more important than thinking about stocking.

Thanks to engineering, the system is stronger, easier to use and extremely fast. Because the block goes in so fast you will find your production limited only by how fast you can get blocks to the wall, insert rebar, electrical conduit, "j" boxes, get inspection and pump grout.

A word of caution to you speed demons. Don't give into temptation. Never build walls so fast you can't provide safe access to your crew. When you go up everyone wears gloves, hardhat, has a safe place to stand and uses cages and roll over protection on fork lifts and cranes. If you are lifting glued wall sections into place always use a net under the wall and spreader bar.

With Haener Block you can work safe and still build walls in a fraction of the time and cost. Once you and your crew get proficient using Haener Block, you'll never want to deal with the extra time, hassle and expense of using traditional block again. I guarantee it!

A good start:

A good start is everything. Remember, with a good first and second course layout anyone can stack these blocks into the wall. Most contractors don't bother to even stock a building. They take the block directly off the pallets and stack them into the wall. It is a thing of beauty to watch a wall go up in hours that used to take days. The more I use HB the more impatient I grow with other forms of construction including forming and pouring concrete.

Footings:

HB generally uses the same footing size for conventional block. As with any layout the vertical steel in the foundation fall in the hollow cells of the block. Lay out some block and measure from the end of the first end block to the center of the first cell and generally at 16" modules there after. After you have done it once you will know the steel layout without layout out blocks to see where the center of a cell falls.

Snapping a chalk line works fine on a flat smooth concrete slab or foundation for a dry lay. Using line blocks and a tight line for first course layout is generally recommended for horizontal and vertical alignment using mortar. The mortar covers the chalk line marks.

Remember these blocks go in dry and fast. You don't have mortar or the time to fix your mistakes later. Making any necessary small adjustments early will prevent them from growing into noticeable misalignment further up the wall. It is a blessing to stack HB into a well laid out wall at several times the conventional production rate. It is sad to watch all that fantastic production slowed down by poor layout and the corrections needed to realign and plumb the wall.

Wet Set:

One of the fastest and easiest ways to lay the first course is to "wet set" it in fresh concrete. When the foundation is poured a level line is set up by laying a block to the desired height at each end of a wall.

A level stake can also be used. Pull a tight level line between the two level and plumb end blocks and push the first course right into the soft concrete and level and plumb each one to the line. Lay a second course while the concrete is still wet but firm enough to hold the block in place. This is especially good for retaining walls. It keys the first block into the concrete and skips the mortar and trowel layout course work.

Less Equipment Required:

HB 8X8X16 and 12X8X16 make great forms. It's great to avoid all that layout and alignment of steel, forms, snap ties, she bolts, top ties and cat heads, inner tie rods, form oil and especially stripping and cleaning forms. Heavy duty scaffolding like conventional stocking may become a thing of the past for you also. If you are not going to take the time to stock a scaffold you may opt for a less expensive and time consuming type of scaffolding that fits your production style. Whatever scaffolding you use make sure it is safe and rated for your use.

Tips on laying the block:

There are two concepts to make SURE your workers understand and follow through with:

1. **Reversing every other course:**
Reversing each course does two important things:
 - a) it creates **unobstructed vertical columns** for unimpeded grout flow , insertion of vibrators, steel, electrical and plumbing; and
 - b) **evens out height irregularities** that might have occurred during manufacturing.

Also critical to be aware:

2. **Make sure that the closed end side of the block is not back to back with the closed end side of another block:**

This could cause grout not to fill properly in the space between, possibly allowing wind or

moisture through this space. This is not as important if you plan to use surface bonding

3. Check alignment with your eye by sighting down the wall and use a tight string line periodically. Use a framing square on the corners to make sure your not drifting out of square.
4. Keep your block supply close to the wall. The speed with which Haener Block goes into the wall surprises everyone. If the pallets of HB are not in your way they are probably not close enough to the wall.

Openings:

1. Check door and window frame sizes ahead of time. If you are using steel door jams you may want the butted type. The throat size of the steel door frames you are using will probably change.
2. Always make sure your headers are aligned and well shored to maintain position and alignment.
3. Make sure the windows you want to use fit the openings. HB cuts like any other block. Pick windows that minimize using your masonry saw. It saves a lot of time. HB is all about saving time and money.

Sills can be pressure treated wood, steel, sill blocks, sloped mortar after or before window installation depending on conditions and layout. To save time and insure a good fit you may want to standardize your own jam spreaders and head shoring kit to fit your selected window dimensions. Caulk and seal as necessary.

Bracing:

You will want to brace the end walls, openings and some wall sections where alignment is critical. It is easy to forget when your using a dry laid product it is still subject to grout pressure, people hitting the wall, dragging grout hoses across the walls, stacking material against the walls and mechanical impact of equipment and other material. It is rewarding to watch walls go up so quickly but you still have to take care of the wall until grouted. You will soon learn where and when you need extra bracing.

Grouting:

1. When grouting and preparing for another lift make sure you brush down the top of the wall with a stiff brush. The sand and gravel must be removed before starting another course for the next lift.
2. 2) You can grout using a wood funnel trough that slides along the top of the wall if you are lower than the concrete chute.

Finishing:

If you are using a HB product with a formed joint you can leave it or use a slicker to fill the small crack between block. It looks good either way. If your layout is uneven, use correction wedges in the joints that may need to be filled.

It is fast and easy to fill and brush the joints if necessary. In some climates where all exterior masonry walls are treated with waterproofing it may be necessary to fill and brush the joints prior to the waterproofing material application.

About the Author:

Mr. Shepersky is the principal consultant for Shepersky Construction and Forensic Services with 14 years experience in masonry and concrete construction and 26 years as a successful general contractor and consulting construction technologist.



The Haener Mortarless Interlocking Block



The Haener Mortarless Interlocking Block is a modular system which is dry stacked in running bond without mortar and then filled with grout to provide a finished wall.

The advantage of the Haener system is its simplicity, flexibility and attractiveness. There are only two blocks: the combination stretcher-corner-end block, and the half block. The half and combination blocks produce finished ends, pilasters and corners. The half block is also used to produce a lintel for door and window openings.

Although HAENER BLOCK may be made in all conventional sizes, the most commonly used size is an 8 x 8 x 16 combination block, and an 8 x 8 x 8 half block.

HAENER BLOCK differs from conventional block in that it is not necessary to use mortar between blocks or between courses. Interlocking nubs position each block in relationship to those around it and each block is manufactured to a constant height to maintain the level and plumb of the finished wall.

PREPARATION

Design your project with HAENER BLOCK in units of combination and half blocks. This reduces the cutting of individual block with a masonry saw.

Openings should be spaced a minimum of 24 inches apart to allow for a minimum width of one and a half block.

Plan your site to have the block placed where you will need it, but not where it will be in the way of scaffolding, bracing or backfilling.

Pour a level concrete footing to suit your project. If the footing is level and relatively smooth, block may be stacked directly on the concrete without mortar. If the footing is not level, it will be necessary to lay the first course of block on a full bed of mortar. Both are equally correct methods.

The tools you will need are few; a hammer, level, mason's line, chalk line, perhaps a trowel and, if block must be cut, a masonry saw.

ASSEMBLY

The first goal is to provide a plumb and level first and second course of block. An off-level start will only become more pronounced as additional courses are stacked.

After establishing square, snap a chalk line on the footing as a guide. Begin at a corner and stack two courses of block at once. This applies if you're working on the bare footing or with a bed of mortar. The second course helps to establish a comfortable spacing for both rows, one that will be easy to maintain for the full height of the wall. The height of two blocks is also easier to work with when you are trying to establish plumb.

No mortar is required between courses or between blocks. Where reinforcing is required, bars are placed horizontally along the grooves cast in the webs of each block, or vertically down the cores.

Note – Alternating the direction of the open end of the block on every course will form straight columns for vertical rebar and grout.

Proceed to place the first two rows for the complete project. This will allow you to check the placement of doors and to check that your walls are straight, square and level.

Continue one course at a time, using the appropriate half and combination blocks, until the walls are complete. Check for plumb and level often. Stretch a mason's line every second row to help maintain straight courses.

If a wall begins to lose plumb or level, it is not a problem unless it is allowed to go unchecked and is then grouted. Use a small shim or mortar mix to correct minor variations in level or plumb. To reposition a block within a stacked portion of the wall, use a straight piece of wood and a hammer to tap it into line.

COMPLETING THE WALLS

The strength of the finished wall is usually achieved by filling the cores with grout. Reinforcement will further increase the strength of grouted walls.

GROUTING - When using grout, it is important to assemble the wall in such a way that it becomes an enclosed form. This allows the grout to flow into every available space, but obviously not outside of the block. To achieve the best flow of grout, position the blocks in opposite direction to the blocks below in every other course.

Reinforcement must be placed before pouring grout. Ready-mix grout is recommended for larger projects. For walls at or below grade, the grout can normally be placed directly from the chute on the ready-mix truck.

For walls higher than five or six feet it is possible to build scaffolding and to pour from a wheelbarrow. A much easier and more

effective method to fill the block cores is to utilize a grout pump, filling the cores from a hose.

When using a conveyor, bucket or wheelbarrow it is helpful to construct a wooden trough about 24 inches long, which straddles the wall and directs the grout into the cores.

Some small projects may only require an amount of grout that would be practical to mix on site.

DEFINITIONS

CONTROL JOINT – a continuous joint in the structure to regulate the location and amount of cracking and separation resulting from movement.

EXPANSION JOINT – a separation between adjoining masonry, which is provided to allow small relative movement, such as that caused by temperature and moisture changes.

GROUT – a mixture of cementitious material (Portland cement) and aggregate, of liquid consistency suitable for pouring or pumping without segregation of the constituents; having only water, cement and concrete sand (fine grout); or water, cement, concrete sand and 3/8 inch pea gravel (coarse grout), with a slump of 8 to 10 inches.

SLUMP – a measure of the workability of a concrete mix.

PARGING – the process of applying a coat of mortar to masonry.

SURFACE BONDING

SURFACE BONDING - This method is a practical and easy alternative to grouting. Both sides of the finished wall are covered with a minimum 1/8th inch of surface bonding cement or similar product. The finished wall must be free of soil, clay, sand, oil, paint or other foreign materials that will interfere with proper bonding.

For the purpose of structural integrity a single coat on both sides of the wall is troweled over the entire exposed surface area.

Surface bonding is not recommended for structural use where reinforcement is required, or in chimneys. These areas must be fully grouted.

It is advisable to provide control joints every 15 feet (5m) and expansion joints every 45 feet (15m) for structures using surface bonding cement.

For esthetic purposes, various types of architectural finishes are available.

NOTE: The information presented here, regarding the use and application of surface bonding cement, is based on our best knowledge of the product in general. It in no way implies a guarantee or warranty regarding any particular brand of surface bonding cement and does not constitute any responsibility for its use. Refer to the manufacturer's label for complete instructions.

***NOTE – ALWAYS CHECK WITH AND FOLLOW YOUR LOCAL BUILDING CODES AND/OR CONSULT WITH A PROFESSIONAL ENGINEER FOR ALL ASPECTS OF YOUR PROJECT.**



BASEMENT FOUNDATION WALLS
EXTERIOR AND INTERIOR BEARING
WALLS – TYPICAL *

Footing dimensions and depth below grade must be adjusted to suit area frost conditions and weight of the finished structure. Contact your local building inspector for code requirements in your area.

Flush joint units below grade are recommended in areas of ground frost. Raked joint units may be used but the exterior surface of the wall must be parged.

The final course should be positioned with the nubs down. Clean the top of the wall thoroughly after pouring and before the grout has set to provide a level surface on which to attach the sill plate.

Foundation walls must be grouted solid in one continuous pour. Wall bracing must be in place and the block in a dry state before grouting begins. Refer to your local building code regarding the bracing required to meet safety standards. In addition, support all walls securely to prevent shifting during the grouting process.

Grout must have a minimum compressive strength of 3000 PSI (20 MPa) to comply with most building codes. Contact your local building inspector for code requirements in your area.

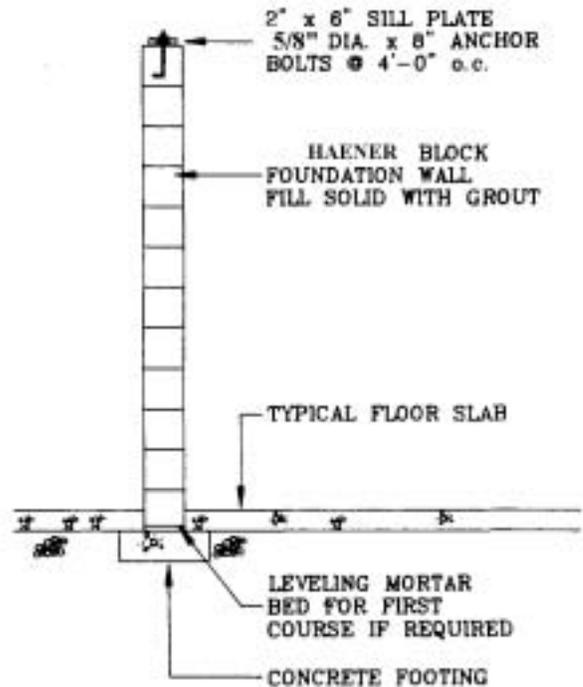
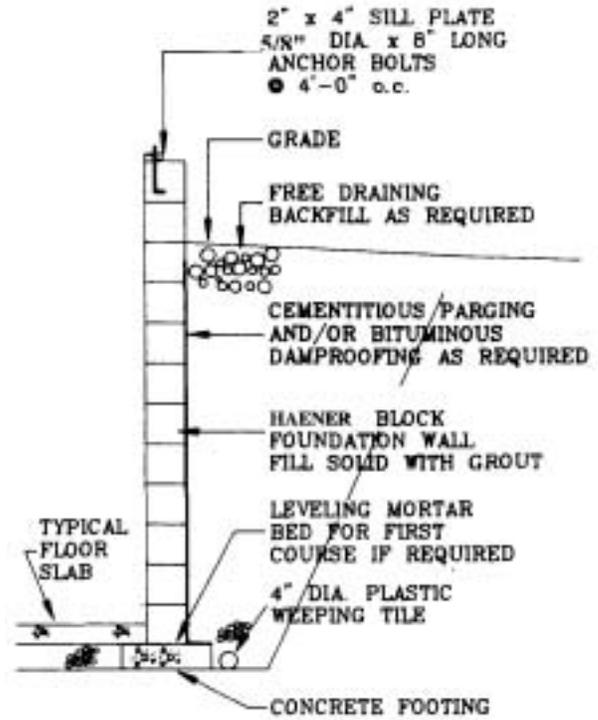
Position anchor bolts for the sill plate before the grout has set.

Allow grout to cure for three days before removing the bracing.

Under most building codes, unit masonry walls to be damp proofed or waterproofed must be parged with mortar and sealed with bitumin on all exterior surfaces below ground level. Contact your local building inspector for code requirements in your area.

Install joists and flooring before backfilling, to provide lateral support. Backfill with free draining granular material.

***NOTE – ALWAYS CHECK WITH AND FOLLOW YOUR LOCAL BUILDING CODES AND/OR CONSULT WITH A PROFESSIONAL ENGINEER FOR ALL ASPECTS OF YOUR PROJECT.**



BASEMENT FOUNDATION WALLS
BRICKLEDGE FOUNDATION WALL*

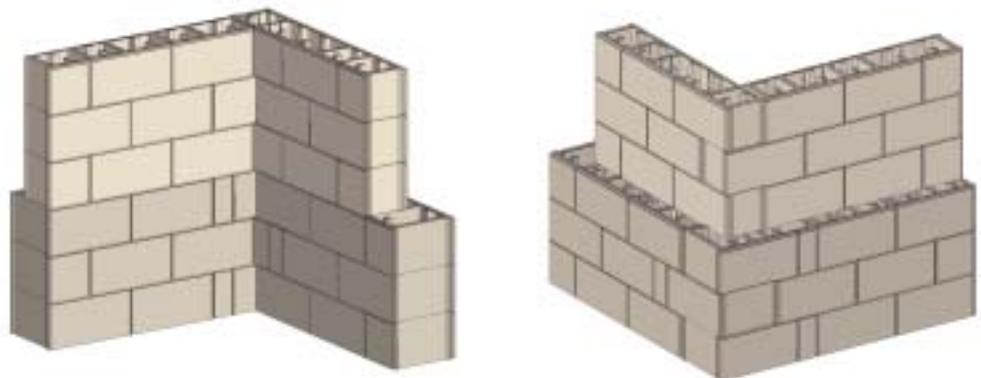
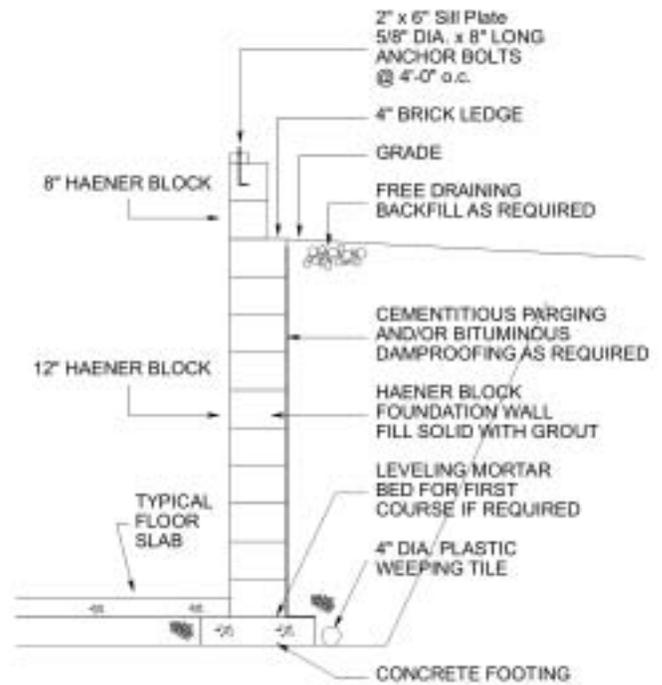
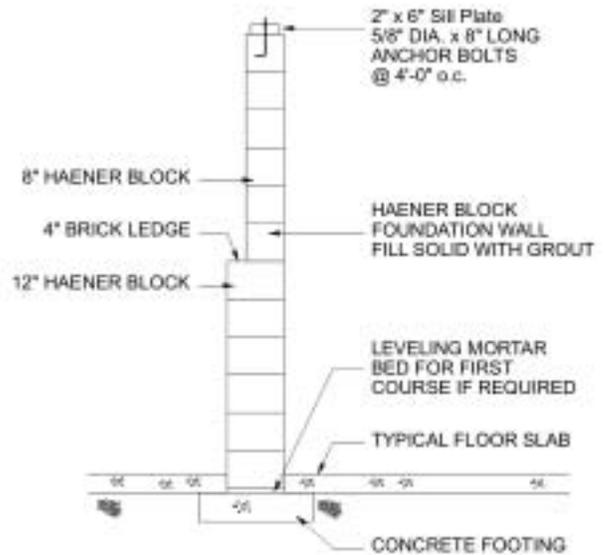
The following diagrams are of the Haener Block Mortarless Interlocking Brickledge System. This consists of a 12-inch Haener Block used as the foundation wall interlocking with the 8-inch Haener Block above grade thus allowing for a 4-inch Brickledge.

All guidelines given under "Basement Foundation Wall" should be followed for the Haener Brickledge System.

Following are additional guidelines (Tips) for the Haener Brickledge System:

1. Follow local codes for adding steel reinforcing bars where needed in the walls, footings and slabs.
2. To create the 4-inch Brickledge transition, remove the exposed interlocking lugs of the 12-inch Haener Block with a hammer.
3. Grouting from 12-inch Haener Block to the 8-inch Haener Block—
 - Σ • If the lower 12-in. wall has not been grouted you can place a 2x6 over the top of the brick ledge and hold it in place with by stacking blocks on top of it. CAUTION, if you grout too high above the ledge the hydrostatic pressure of the grout will push off the 2x6 and you will loose grout.
 - Σ • When Grouting is complete and set, remove the 2x6 lumber.
 - Σ • You now have a 4-inch flat surface for starting the Brick Facing on the exterior of the building.
4. Drainage – Perforated Pipe or Weep Tiles (not plastic) may be used – check local building codes

*NOTE – ALWAYS CHECK WITH AND FOLLOW YOUR LOCAL BUILDING CODES AND / OR CONSULT WITH A PROFESSIONAL ENGINEER FOR ALL ASPECTS OF YOUR PROJECT



CONTROL AND EXPANSION JOINTS
ALTERNATIVE COURSES FOR TYPICAL CONTROL JOINTS*

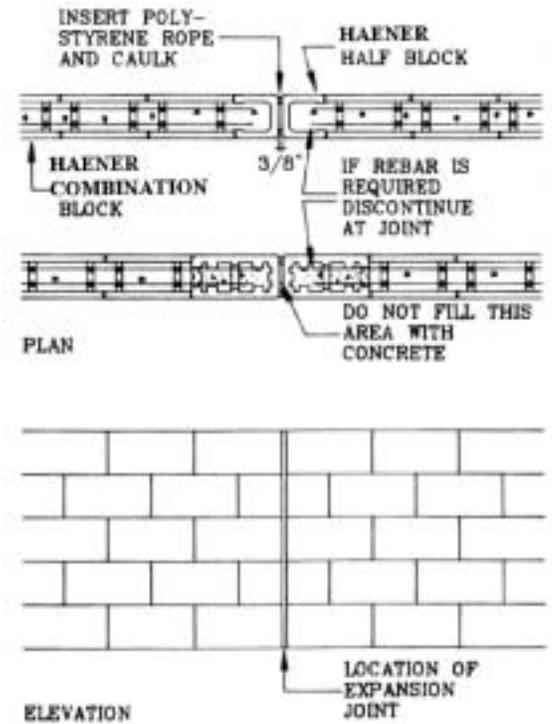
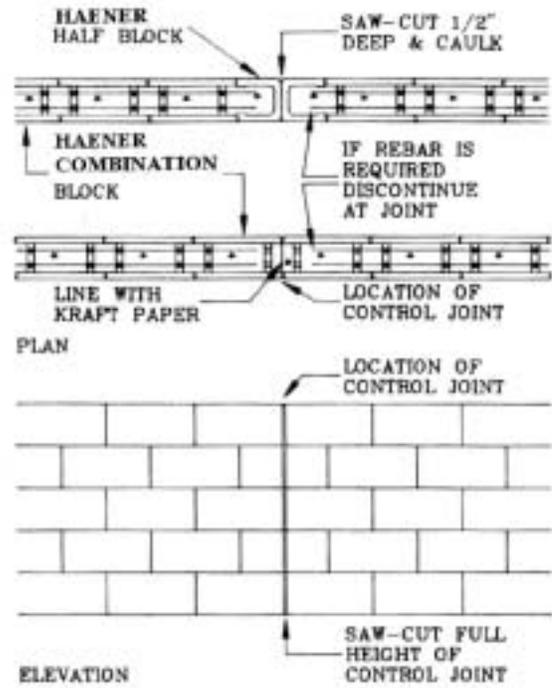
CONTROL JOINTS are used to relieve horizontal tensile stresses by reducing restraint and permitting movement to take place. Vertical separations are built into the wall at locations where stress concentrations may occur. Typical locations for control joints include: changes in wall height, at construction joints in a foundation, roof or floor; where openings occur; where wall and column or pilaster meet.

RECOMMENDED SPACING OF CONTROL JOINTS IN A MOISTURE CONTROLLED, FULLY GROUTED NON-REINFORCED WALL, WITHOUT OPENINGS	
EXPRESSED AS LENGTH TO HEIGHT RATIO	1:1.33
PANEL LENGTH NOT TO EXCEED	26 FEET

ALTERNATIVE COURSES FOR TYPICAL EXPANSION JOINTS

EXPANSION JOINTS are separations, which allow small relative longitudinal movement, such as those caused by temperature and moisture changes.

*NOTE – ALWAYS CHECK WITH AND FOLLOW YOUR LOCAL BUILDING CODES AND/OR CONSULT WITH A PROFESSIONAL ENGINEER FOR ALL ASPECTS OF YOUR PROJECT.



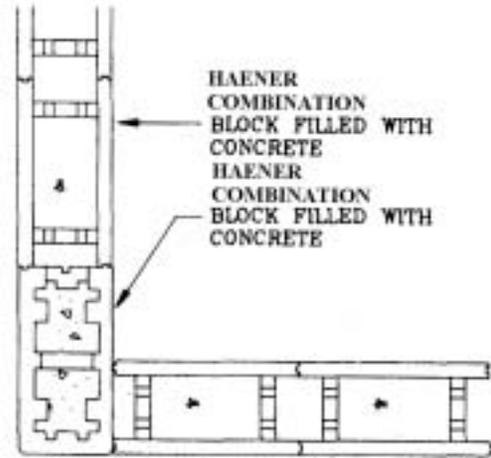
CORNER AND INTERSECTIONS

CORNER – TYPICAL*

A 90 degree turn is made using a combination block, butt joined at right angles. Check with a carpenter's square.

The combination block for the alternate course will be positioned in the opposite direction.

Use a plumb line or spirit level to check vertical alignment.

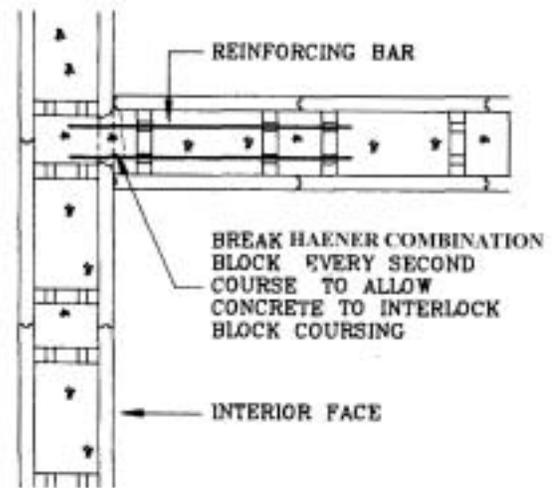


T-INTERSECTION – TYPICAL*

This intersection joins three blocks together to form a 'T'.

Use a hammer to break away the end projections on the interior side of the two block centering on the intersection (head joint). This will form a true 90 degree angle.

Alternate courses use a half block to end flush with the exterior wall.



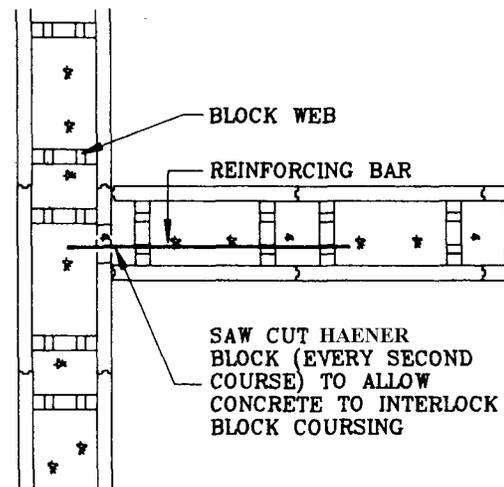
L-INTERSECTION – TYPICAL*

This intersection joins two blocks together to form an 'L'.

Use a masonry saw to cut through the side of the block without breaking or cutting through the web. This will form a grouted bond on every second course.

Butt join the intersecting wall to form a true 90 degree angle.

Alternate courses use a half block to end flush with the exterior wall.



**NOTE – ALWAYS CHECK WITH AND FOLLOW YOUR LOCAL BUILDING CODES AND/OR CONSULT WITH A PROFESSIONAL ENGINEER FOR ALL ASPECTS OF YOUR PROJECT.*

DOOR AND WINDOW JAMBS
WINDOW FRAME – TYPICAL*

NOTE – All materials contacting concrete must be pressure treated or of natural decay resistant materials.

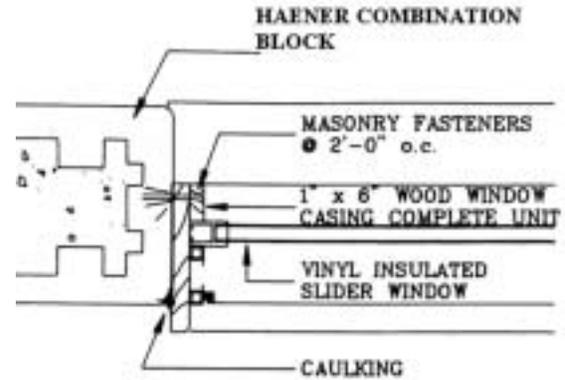
Openings should be designed in full or half block units (8 or 16 inches), to eliminate cutting of block.

Half and combination blocks have one end flush to provide a smooth end wall surface.

All openings must be plumb and square to validate the window or door manufacturers warranty. Check with plumb line or spirit level as you go.

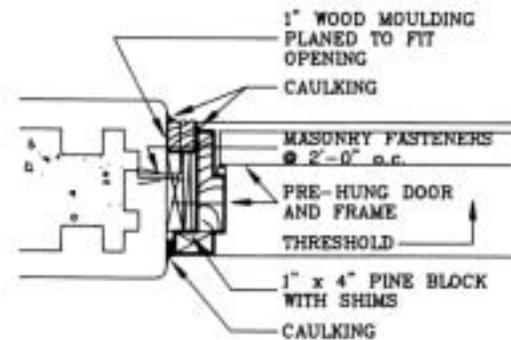
Install window according to manufacturer’s directions.

Caulk wherever heads, jambs or sills meet the block.



DOOR FRAME – TYPICAL*

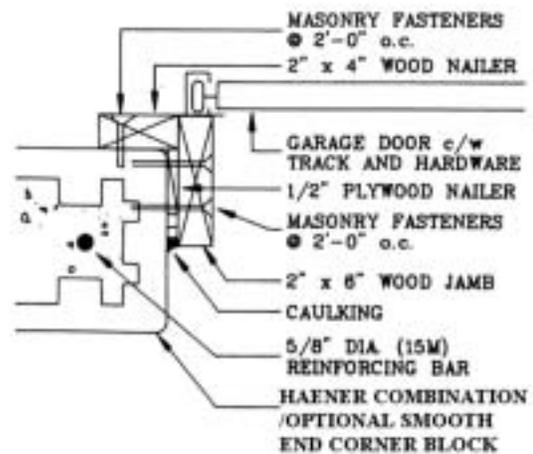
Follow directions as above for window frame and install according to manufacturer’s directions.



GARAGE DOOR FRAME – TYPICAL*

Follow directions as above for window frame and install according to manufacturer’s directions.

*NOTE – ALWAYS CHECK WITH AND FOLLOW YOUR LOCAL BUILDING CODES AND/OR CONSULT WITH A PROFESSIONAL ENGINEER FOR ALL ASPECTS OF YOUR PROJECT.



DOOR AND WINDOW LINTELS

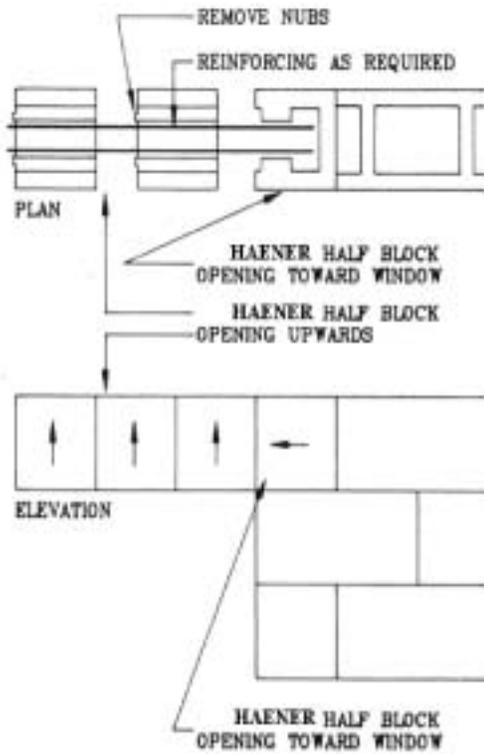
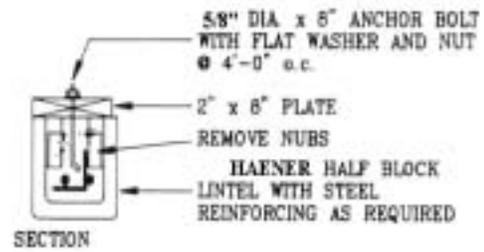
NOTE – All materials contacting concrete must be pressure treated or of natural decay resistant materials

REINFORCED LINTEL – TYPICAL*

Construct temporary wood frames for each opening. Do not obstruct access to cores at base of windows. Each support must be level to 1/8 inch tolerance for the width of the span.

Place half block over the temporary frames with the closed ends down. The interlocking nubs on each block must be knocked off with a hammer.

Half blocks on either side of the opening are placed with the closed end away from the opening to allow grout to reach the courses below. Place the steel reinforcing inside the half block as shown on the drawings. Positioning is important. (See photos next page).



LINTEL SCHEDULE (normal residential roof loads)			
SPAN IN FEET	REINFORCING BAR WITH MINIMUM YIELD STRENGTH 58,000 PSI (400 MPA)		SPAN IN CM
4	#4	10M	122
6	#5	15M	183
8	#6	20M	244
10	#8	25M	305
12	2 X #6	2 X 20M	366

This information is presented as a general rule of thumb only. Accurate roof loads must be determined by a building designer and approved by the building inspector in your area.

*NOTE – ALWAYS CHECK WITH AND FOLLOW YOUR LOCAL BUILDING CODES AND/OR CONSULT WITH A PROFESSIONAL ENGINEER FOR ALL ASPECTS OF YOUR PROJECT.

EXTERIOR WALL - UNINSULATED

NOTE – All materials contacting concrete must be pressure treated or of natural decay resistant materials

Footing dimensions and depth below grade must be adjusted to suit area frost conditions and weight of the finished structure. Contact your local building inspector for code requirements in your area.

Flush joint units below grade are recommended in areas of ground frost. Raked joint units may be used but the exterior surface of the wall must be parged.

If the walls are to be poured in two lifts, (total wall heights of 12 feet or more) grout to within two inches of the last row stacked. This will provide an interlock or key between lifts and prevent a continuous joint through the wall.

Appropriate wall bracing must be in place and block must be in a dry state before grouting begins.

To comply with most building codes, grout for basements must have a minimum compressive strength of 3000 PSI (20 MPa), and for walls above grade, 2000 PSI (15 MPa). Contact your local building inspector for code requirements in your area.

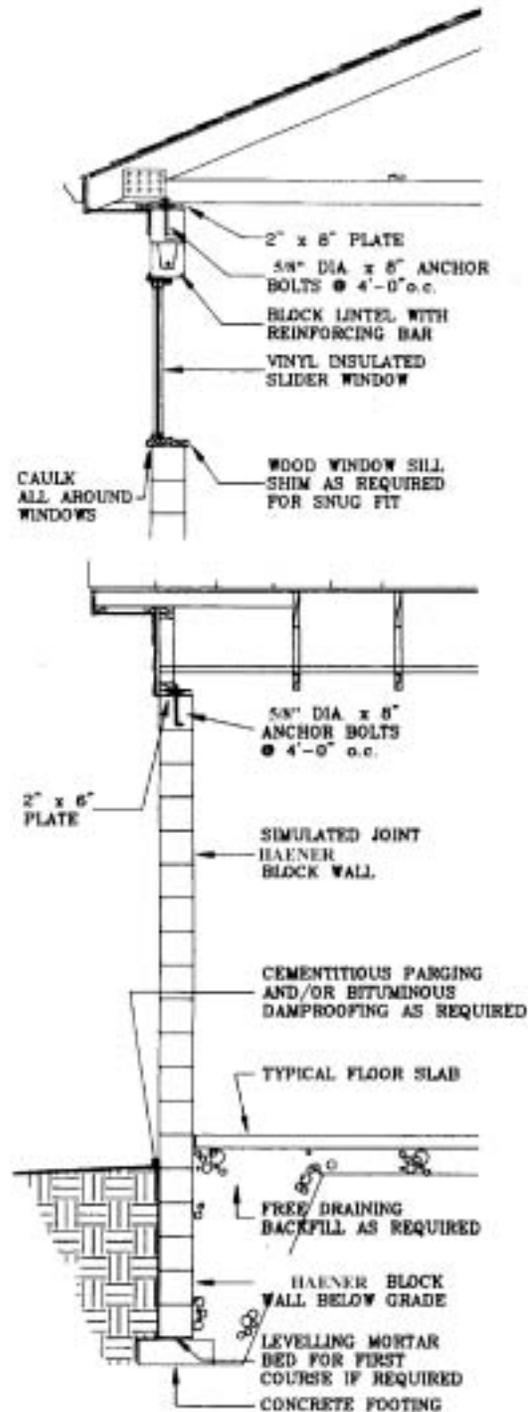
For the final course, knock off the interlocking nubs. Clean the top of the wall thoroughly after pouring and before the grout has set to provide a level surface on which to attach the header or sill plate.

Position anchor bolts before the grout has set.

Allow grout to cure for three days before removing bracing.

Refer to other design detail sheets for general construction information.

*NOTE – ALWAYS CHECK WITH AND FOLLOW YOUR LOCAL BUILDING CODES AND/OR CONSULT WITH A PROFESSIONAL ENGINEER FOR ALL ASPECTS OF YOUR PROJECT.

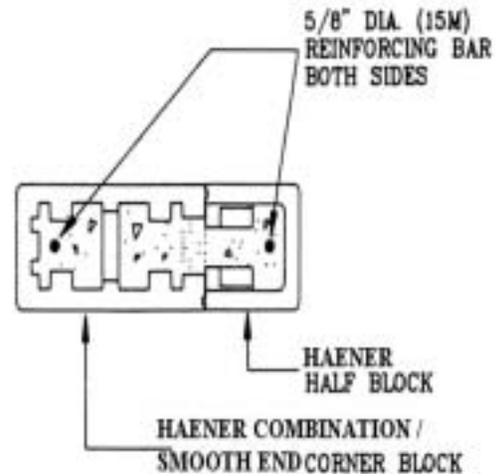


PIERS AND PILASTERS
NARROW WALL BETWEEN MASONRY OPENINGS*

Where a narrow wall occurs between masonry openings, it should be designed as a minimum 1 1/2 block (24 inches) to allow proper interlocking.

Use a hammer to remove the knock-out from the corner block. This will allow the grout to easily fill the entire column.

Insert reinforcing after wall is stacked, before grouting.

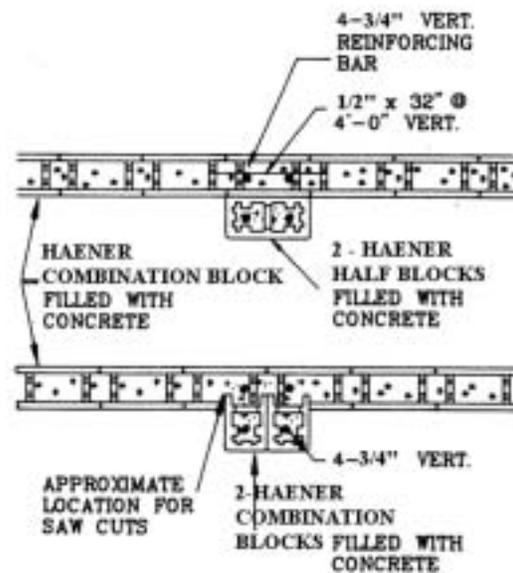


INTEGRATED PILASTER WITHIN A WALL *

To maintain a running bond pattern on the exterior surface of a wall while providing an integrated pilaster, use this method.

Footings must be increased in width to accommodate the increased width of the wall wherever pilasters occur.

To begin the first course of the pilaster, place a corner block parallel to a stretcher on the interior side of the wall. For the alternate row, it is necessary to cut the two stretchers forming the running bond. Remove 1/4 of each stretcher with a right angled cut through the end web and another through the mid point of the inside face shell.



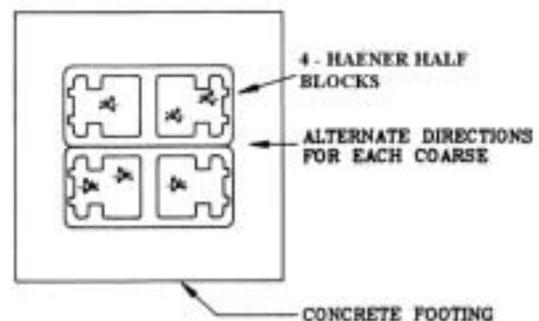
Cut the knock-out webbed end from two corner blocks (1/4 of the block) and position into the gap created in the stretchers.

Repeat the procedure alternating each course for the height of the wall.

Brace the full height of the finished pilaster on both sides, before grouting.

FREESTANDING PIER*

Two corner blocks per course are used to form a pier. Alternate courses are laid at right angles. Insert reinforcement as required when pier is completely stacked, before grouting. Check for level and plumb before grouting. A 24 inch and 32 inch pier and pilaster can also be constructed with the Haener Two-Block system. (See the Two-Block Info-Booklet on the CD-ROM).



*NOTE – ALWAYS CHECK WITH AND FOLLOW YOUR LOCAL BUILDING CODES AND/OR CONSULT WITH A PROFESSIONAL ENGINEER FOR ALL ASPECTS OF YOUR PROJECT.