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Save Time and Money - Don't Forget the Fence

Railings and fences above segmental retaining walls have been a problem since they hit the market over 25 years ago. The simple fact that you have a product designed to create a grade change will require the need for a fence or railing for safety reasons. However, the problem comes when proper fence/rail integration with retaining walls is overlooked during the design and construction phases.



By installing a railing above the wall you can create an additional overturning action in the top courses when somebody or something is pushing on the railing. This could move, bulge or even worse, topple the top portion of the wall. The key is to consider this additional loading during the design phase of the wall project to ensure the railing has an adequate amount of resistance. All too often we see an Allan Block retaining wall design with a fence/railing above it that is labeled, "Designed by Others". Usually what happens next is the railing is over-

looked and not discussed again until the wall is completed. For anybody that has been associated with projects like this, they know that installing a railing after the wall is constructed is more work and more expensive.



In the following pages we will explore some of the options to ensure proper fence/railing integration with an Allan Block wall.

At the bare minimum, we encourage engineers and contractors alike to communicate the rail/fence requirements at preconstruction meetings and to solve this problem before the wall construction is complete.



Photo credit: Nitterhouse Mas. Prdr LLC.



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Railing issues getting resolved with Sleeve-It™

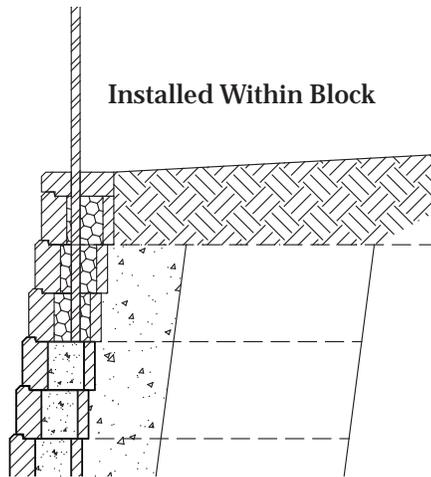
A recent analysis shows that Allan Block producers are seeing an uptick in Sleeve-It specifications and that the product is becoming as commonplace as geogrid and drainpipe in a retaining wall design. The Sleeve-It product safely integrates railings/fences atop Allan Block walls and is the only pre-engineered solution that has been tested to meet building code requirements.



Design Options Are Available For

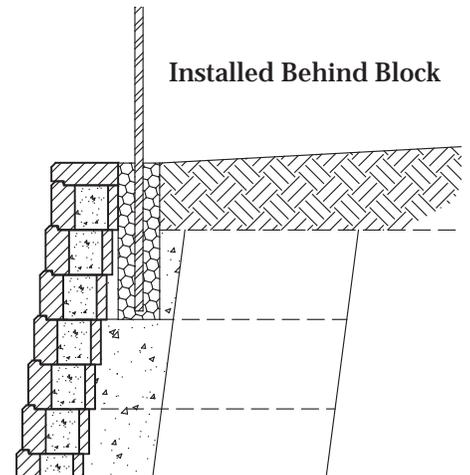
Typical Fence / Railing Details:

Whenever a fence or railing is placed above a retaining wall there is a potential for localized overturning at the post location. These overturning forces must be considered in the design of the retaining wall. Consult a local professional engineer for final design and construction details. The following represent variations in fence or railing installation. See allanblock.com and printed literature to view more detailed views of these typical details.



Installing a fence or railing within the block itself is by far the most challenging application. For this type of installation the cores around each post, or even the entire top few courses of block, must be grouted solid to add enough stability to the top of the wall. Using geogrid within the top three courses of block will also become necessary to resist the overturning fences created by the posts. This application should not be used for fences where large wooden posts are used.

Installing the fence or railing directly behind the block is the most common application and allows the designer much more flexibility in their designs. Unlike installing a post within the block cores, the designer can utilize more of the wall facing and more layers of grid to resist the overturning forces because the post can be embedded deeper.



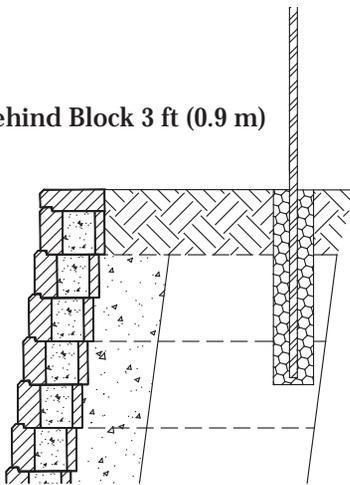
Important Considerations:

- According to Section 1013 of the International Building Code and Section R312 of the International Residential Code, if your retaining wall has an exposed height of greater than 30 inches (0.8 m), a guard may be required at the top of the wall.
- According to Section 11 of the AASHTO LRFD Bridge Design Specification, "Flexible post and beam barriers, when used, shall be placed a minimum distance of 3.0 ft. (0.9 m) from the wall face..."
- If a guard (whether it is a fence or railing) is placed above the wall, a local engineer should be involved to design the retaining wall and post placement above the wall.
- For ease of installation of the fence or railing, the concrete post footing should be considered while building the retaining wall. Concrete forms should be located and the geogrid should be cut around the forms. If the fence footings are installed after the retaining wall is built, it is recommended that each of the fence post holes are hand dug so that the geogrid may be trimmed as necessary.

Visit allanblock.com for more information.

Building Retaining Walls With Fences Above

Behind Block 3 ft (0.9 m)



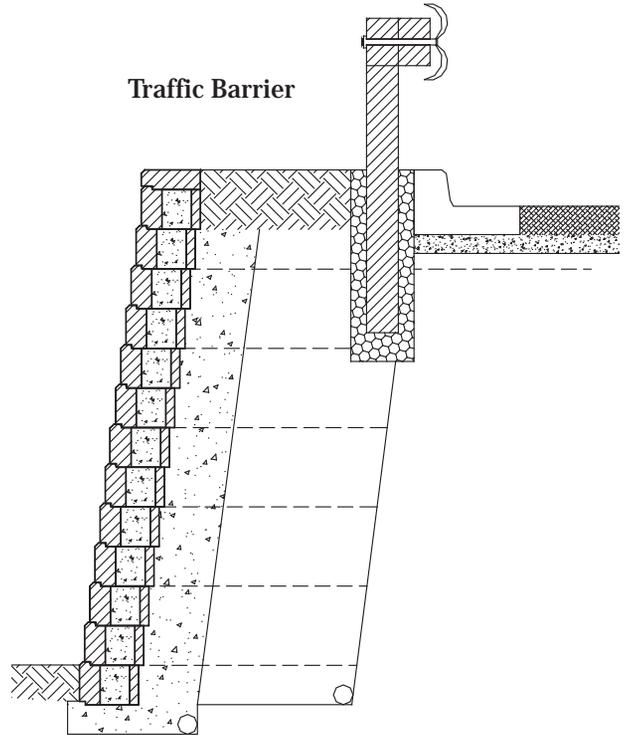
Placing the fence or railing a minimum of 3 feet (0.9 m) behind the wall is the best overall. This application provides minimal overturning forces to the back of the wall. The design can utilize the lateral resistance from the soil mass between the wall and post. As with all fence applications behind the wall, the installer must be aware of the geogrid location and avoid the use of a power auger where there is a potential to snag the geogrid and pull it out of the soil.

When a traffic barrier is required on the project, it is often located at least 3 feet (0.9 m) behind the wall. This specialty application must be designed by an engineer to account for the impact loading the barrier would encounter if struck by a vehicle.

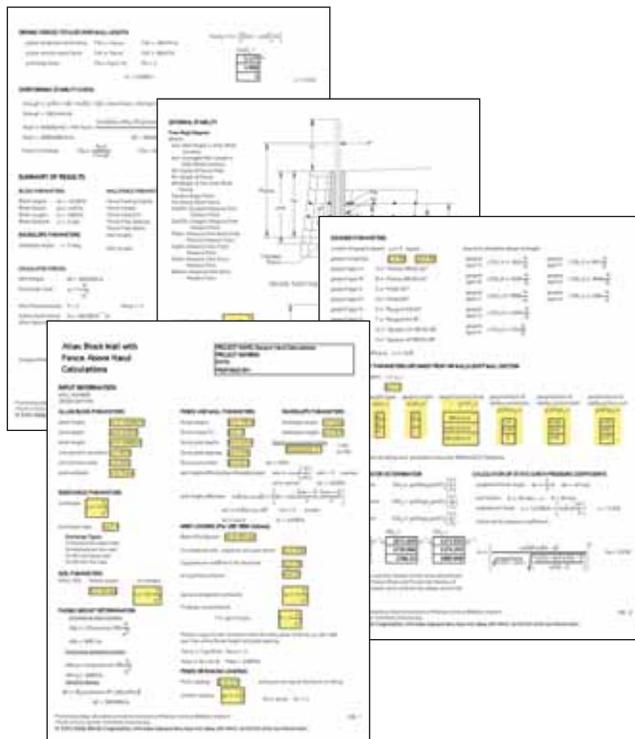
Rigid traffic barriers can also be designed that would allow the barrier to be placed near, or even on top of, the retaining wall.

These details are for illustration and discussion purposes only. Contact the Allan Block Engineering Department for additional details.

Traffic Barrier



Mathcad Fence Calculation Template



Please contact the Allan Block Engineering Department to receive a copy of the Mathcad design template to assist with your fence overturning calculations. Once your section has been designed in AB Walls 10, all you need to do is input some of the key variables into the file to simplify your design and review process.

Visit allanblock.com for typical fence details in .PDF and .DWG format. The .DWG files can easily be modified to meet your sites specific design requirements.

Visit allanblock.com for more information.

Allan Block Technical Newsletter - 3rd Qtr 2010

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Visit allanblock.com for more information.

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