

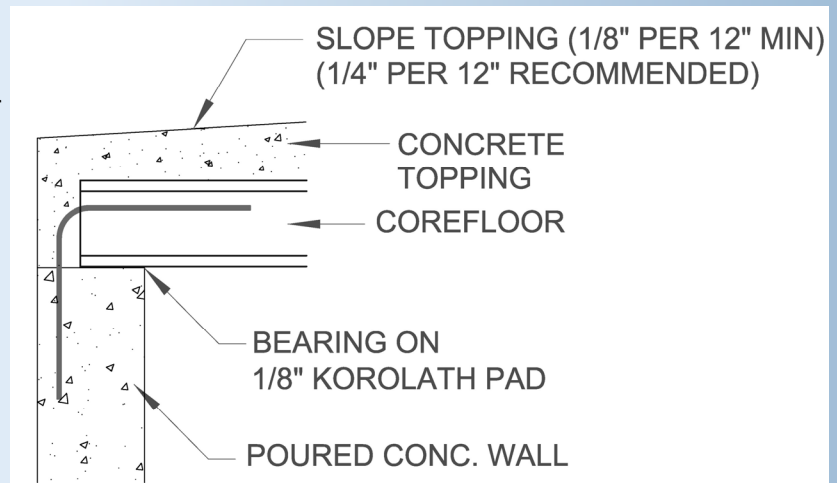
# RESIDENTIAL GARAGE FLOOR CONSIDERATIONS

Many architects like to use StresCore hollow core for a garage floor application. Typical design details specify vehicles park on the hollow core and the basement area underneath is allowed to be a finished space, thus adding extra square footage in the basement. Due to the longer spans allowed by hollow core, often these finished spaces can be basketball gyms, theater rooms, guest bedrooms, storage or other applications. There are several design aspects that should be considered by designers in order to have a successful project.

## Drainage and Waterproofing

One of the most important considerations when utilizing hollow core is making all of the considerations necessary for adequate drainage and waterproofing of the garage floor. These details are required so that the finished area underneath the hollow core has no leaks. Often, homeowners have hoses in the garage they utilize for washing vehicles or vehicles carry snow and rain into the garage and cause standing water. It is the designers responsibility to ensure a waterproof system for these applications. Through industry experience StresCore is providing the following considerations for designers:

**Slope the Topping:** One of the easiest ways to allow for water to drain off of the garage floor is to slope the topping. Gravity always works to move water from high spots to low spots. StresCore hollow core is a high strength product and the extra dead load of a sloped topping is often a non-issue due to its high load carrying capacities. Typically a slope of 1/8" to 1/4" per 12" is specified, with our recommendation of 1/4" per 12", where feasible. However, consideration should be given as to how much extra topping is being added due to the slope and the additional dead load. Sloping the walls instead of the topping is another consideration. This is often more difficult to construct and may result in other challenges in the design and is not recommended.

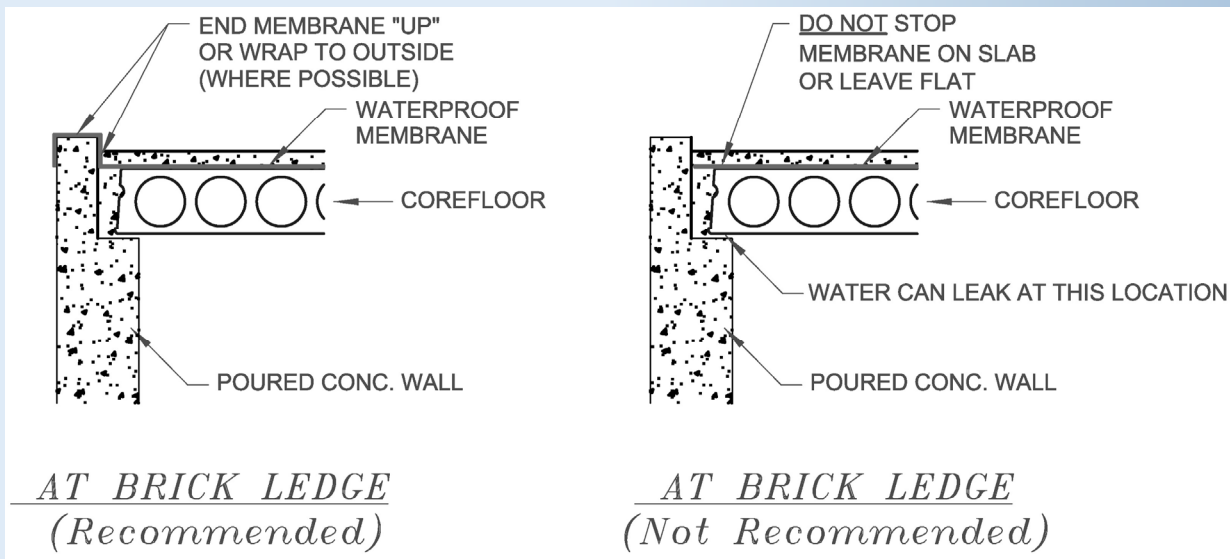
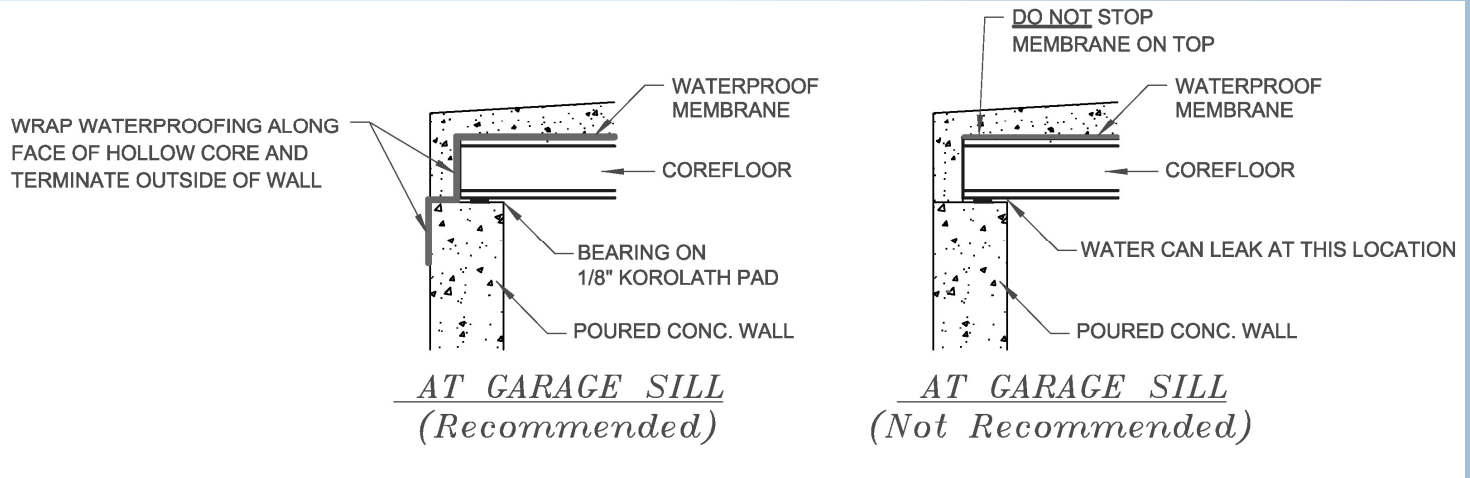


## Other Topping Considerations:

- **Limit Control Joints:** Sawcut control joints are required in the topping in order to reduce the concrete from randomly cracking from expansion and contraction. Every joint that is placed is an invitation for water to leak onto the hollow core. Consideration should be given to using wire mesh, reinforcing steel or fiber mesh in the topping and reduce the number of control joints. At a minimum, control joints should be caulked or sealed in order to limit the water that infiltrates the joint. However, caulk often breaks down over time and will require periodic maintenance by the homeowner.
- **Topping thickness:** If no waterproof membrane is used and the topping is cast directly on the hollow core, a minimum of 2" of concrete is recommended. If a waterproof membrane is used and the topping is not bonded to the hollow core, we recommend a 3" minimum concrete topping.
- **Epoxy Coat the Garage Floor:** We believe epoxy coating the garage floor provides some level of waterproofing and will provide an added benefit in the long term performance of the garage floor. However, our opinion is that epoxy coating should not be the primary treatment for waterproofing and should be considered as a secondary treatment. All concrete invariably cracks and water can still penetrate control joints or other random cracks in the topping.
- **Adding Drains:** Standard drains or trench drains can be added to the topping and piping can run through the hollow core. However, concrete can crack adjacent to the drain and/or water can pool around the drain and both provide avenues for water to leak onto the hollow core and subsequently leak to the basement underside. We recommend minimizing or eliminating the number of drains and using alternate drainage methods such as sloping the topping.

**Waterproof Membrane:** If a finished room is under the garage floor, we recommend utilizing a waterproof membrane. A local professional industrial roofer or waterproofer can ensure the correct membrane is being specified for your project. If the area underneath the garage is unfinished and the owner does not envision the garage floor to be exposed to water, the cost of a waterproof membrane may not be justified.

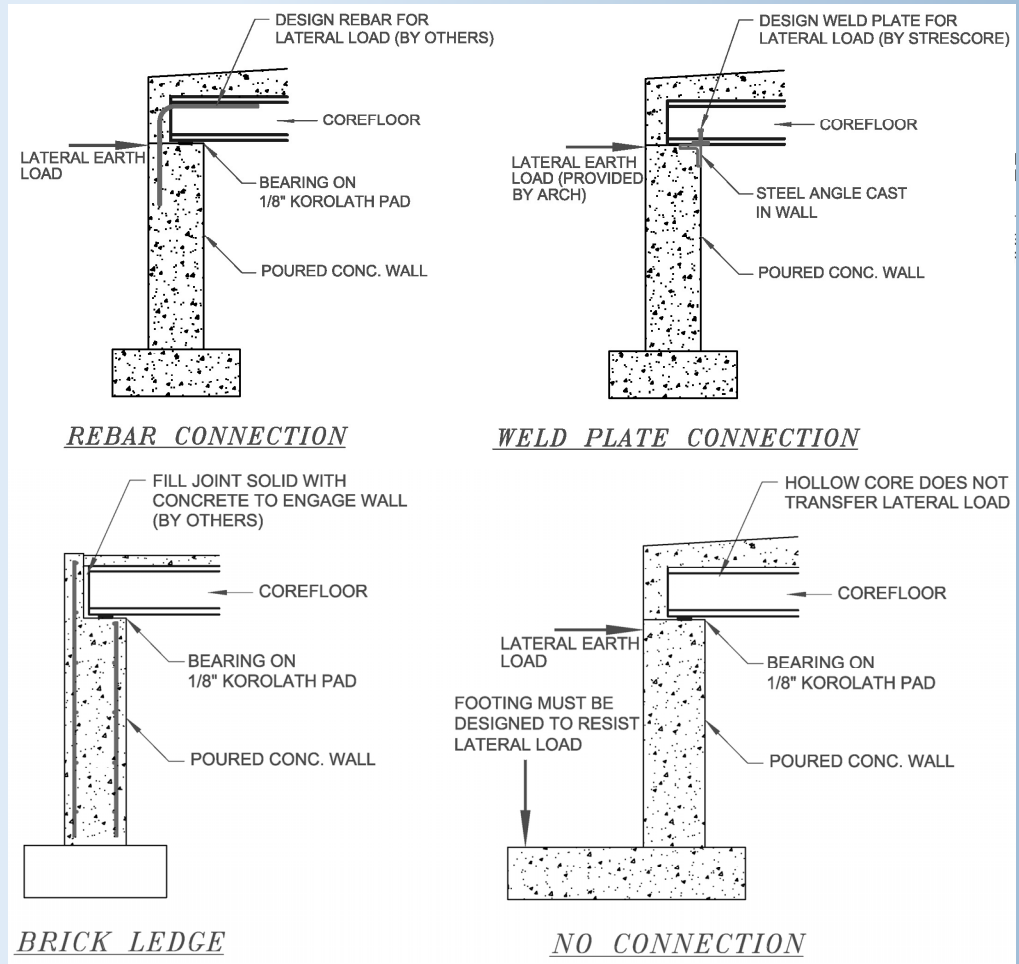
Based on our experience, an important focal point of the waterproof membrane is how the membrane is terminated at the garage floor perimeter. Typically these are the areas where water can get into the basement area. We recommend working closely with your waterproofer on perimeter details and follow their specifications. Some focal points of those discussions should be as follows:



# Basement Wall Considerations

One of the benefits of using hollow core is that it serves as a load carrying diaphragm and can transfer lateral loads from the basement walls. Often, the designers utilize the hollow core to resist the loads from basement walls and the hollow core serves as an important design component of the retaining wall. The hollow core allows for the basement wall footings to be much smaller, since the hollow core resists the loads. Some important design considerations are as follows:

**Connection Design:** In order for the basement wall loads to be transferred through the hollow core designers should carefully consider the connection details. For tall basement walls, as seen typically in gym or theatre room applications, the loads can be significant. Larger reinforcing steel or multiple weld plates per panel may be required. If a rebar connection is present, the architect specifies the reinforcing steel size and spacing. If an embedded weld plate is to be cast into the hollow core, StresCore will design the embedded plate if loads are provided by the architect. If no rigid connection is specified between the precast and the walls, the hollow core will not resist the lateral earth loads. In this situation, the architect must consider how the loads are resisted in the design.



**Backfilling:** Another area that requires special attention is the timing of the backfill in relation to the placement of the hollow core. As is often the case, the hollow core is specified to resist the lateral earth forces from the basement walls. DO NOT BACKFILL until the hollow core is in place and all connections have been made. If backfilling takes place prior to the hollow core in place, the walls may be damaged or deflect under the lateral loads that the walls and footings were not designed to accommodate without the presence of hollow core.

