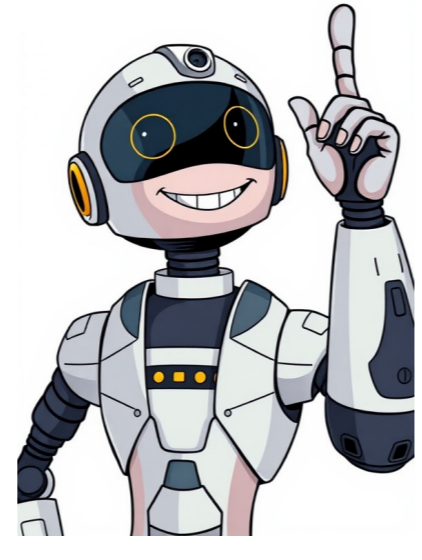


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inspectors that do include a section number with every citation. They take pride in that. Seems like wasted energy in most cases but to each his own. I did say everyone in her audience had (or does) what she said. She's a prosecuting attorney. What she was saying was, if a problem reaches the formal charge and court stage, if we haven't cited the section of code we allege was violated - the judge will throw the case out of court. Yes, I have been an inspector Fifteen+ years. 'Nuff to meet your qualification standards? Well then welcome to the ranks. Which discipline did you inspect? My license is Building Official. I inspect everything but I try to bring in help for electrical more complicated than residential. A contractor recently asked how tall an equipment bollard must be in the garage. Typically we see them approx 36" tall, but they want to see how short they can make them to get more for their buck out of their steel. We use the UPC for our plumbing code (I know this is in the mechanical board, but it is a mechanical question) and it states that bollards are regulated by NFPA 54 (Fuel Gas Code). I do not have a copy, so was wondering if anyone knows the installation criteria for these bollards? Thanks in advance! Re: Equipment Bollard in a Residential Garage I could be mistaken but I believe NFPA 54 addresses it as sufficient clearance shall be maintained to permit cleaning, service etc. with no dimensional criteria. Edit: Strike cleaning & service was winging without an available racket and forgot garage in OP. Thanks Haz & Mueller Re: Equipment Bollard in a Residential Garage People should be able to see it from their car seat. If it too short they will be running into it. Re: Equipment Bollard in a Residential Garage The old tennis ball on a string from the ceiling works for my wife Re: Equipment Bollard in a Residential Garage The IFC requires bollards for impact protection to be 48 inches in height. Re: Equipment Bollard in a Residential Garage NFPA 54 06 9.1.10- Installation in residential garages. 9.1.10.2- Such appliances shall be located or protected so they are not subject to physical damage by a moving vehicle. 06 IRC commentary M1307.3.1 Protection from impact. Appliances located in a garage or carport shall be protected from impact by automobiles. Mechanical appliances installed in garages and carports must be protected from vehicular impact. Although the code does not specify methods of protection, the most apparent method would be to locate the appliance where it could not reasonably be struck by a vehicle. A practical method of protection would be to place a formidable and permanent barrier between the motor vehicles and the appliance. This barrier could include such items as an effectively located vehicle wheel stop that is anchored in place, an elevated platform higher than the vehicle's bumpers or one or more concrete-filled steel pipes. Final approval of the method of protection is left to the local building official. This is what I like to see 06 IFC SECTION 312 VEHICLE IMPACT PROTECTION 312.1 General. Vehicle impact protection required by this code shall be provided by posts that comply with Section 312.2 or by other approved physical barriers that comply with Section 312.3. 312.2 Posts. Guard posts shall comply with all of the following requirements: 1. Constructed of steel not less than 4 inches (102 mm) in diameter and concrete filled. 2. Spaced not more than 4 feet (1219 mm) between posts on center. 3. Set not less than 3 feet (914 mm) deep in a concrete footing of not less than a 15-inch (381 mm) diameter. 4. Set with the top of the posts not less than 3 feet (914 mm) above ground. 5. Located not less than 3 feet (914 mm) from the protected object. 312.3 Other barriers. Physical barriers shall be a minimum of 36 inches (914 mm) in height and shall resist a force of 12,000 pounds (53 375 N) applied 36 inches (914 mm) above the adjacent ground surface. Re: Equipment Bollard in a Residential Garage I would like to see that too, but will it happen? I think the only thing that I can legally enforce would be NFPA 54.9.1.10.2, since it is quoted in the UPC, but if it doesn't tell me anything as to size etc., then I'll just let them do it as they have been (3" x 36" steel post bolted to the garage floor). Hmmm...new board is working just fine! Incidentally, I emailed them to remove my info from their site at ICC. They said they would, but were sorry to see it happen. I'm not. Re: Equipment Bollard in a Residential Garage People should be able to see it from their car seat. If it too short they will be running into it. For the sake of argument. I own two cars. A Hummv and a Porsche. From which car seat and at what distance? Re: Equipment Bollard in a Residential Garage I would like to see that too, but will it happen? I think the only thing that I can legally enforce would be NFPA 54.9.1.10.2, since it is quoted in the UPC, but if it doesn't tell me anything as to size etc., then I'll just let them do it as they have been (3" x 36" steel post bolted to the garage floor).Hmmm...new board is working just fine! Incidentally, I emailed them to remove my info from their site at ICC. They said they would, but were sorry to see it happen. I'm not. I use R104.11 Alternate materials, design and methods of construction to reference IFC 312. Specifically this sentence: Compliance with the specific performance-based provisions of the International Codes in lieu of specific requirements of this code shall also be permitted as an alternate. Anything else is woodoo subject to your approval. I sure wouldn't look to the plumbing code for guidance. Re: Equipment Bollard in a Residential Garage Glennan, the language in the NFPA section you are looking for is exactly the same as the UPC. Note there is no provision in the UPC for protection of electric water heaters. Funny? Dee Re: Equipment Bollard in a Residential Garage Oregon has a good requirement. It was vote down in the code hearings last cycle. Re: Equipment Bollard in a Residential Garage We have a minimum 36 inch high 2" schedule 40 iron pipe embedded in the garage slab. We also have two alternates that are wheel stops and pipes bolted to the floor for retrofits. 99% of the time we see the schedule 40 pipe embedded in the concrete. Re: Equipment Bollard in a Residential Garage Yes Dee... In the 2009 IRC M1307.3.1 states that "appliances shall not be installed in a location subject to vehicle damage, except where protected by approved barriers". While the wording is slightly different than the '03, being that it is a sub section to M1307.3 that deals with an ignition source, it could be construed that electric water heaters would actually require vehicle barriers. If you look at the definition of an "ignition source" in the IRC, this would include an electric water heater, or any other appliance that has "switching devices". Re: Equipment Bollard in a Residential Garage Yeah, but chapter 28 water heaters of the IRC is silent on protection from impact. M1301.1 states the provisions of this chapter shall govern the intallation of mechanical systems not specifically covered in other chapters applicable to mechanical systems. I am of the opinion that the code only addresses fuel fired appliances directly whether this is the intent or not. Re: Equipment Bollard in a Residential Garage Dee, That is correct (that 1301.1 covers those systems not specifically covered in other chapters). That's why you could draw the inference that I mentioned, because it is not specifically covered in the water heater chapter. Besides, I was only saying that it could be construed from the section that vehicle barriers could be required. Do you think that electric water heaters are a source of ignition per 1307.3? If you do, then 1307.3.1 would just the same apply to electric water heaters. Remember, if it applies to one it applies to the other, since one is a subsection to the other. In other words, the "appliances" in 1307.3 would be the same as "appliances" in 1307.3.1. Would this line of reasoning apply just the same in P2801.6? It mentions there that water heaters having an ignition source (i.e. electric switching devices, per the definition) shall be elevated above the garage floor. If this is the case, then M1307.3 and 3.1 would apply just as I have inferred. To be truthful, I hardly ever see electric water heaters in garages, and I don't really remember what I have required for them. I'm sure you have seen cases where contractors have installed barriers there, required or not. In that case, the subject wouldn't even come up. Here's something to consider...(food for thought). How much of these sections apply in Washington State, since we have adopted the UPC? Re: Equipment Bollard in a Residential Garage I think water heaters are specifically mentioned in chapter 28. And we do not enforce the P chapters in the IRC in the 'Quah but as far as the IRC is concerned I think it helps my point, dont you? Would not your condensate pump for your a/c unit then be an ignition source and need to be elevated and bollard added? How about washer and dryer? Refrigerator? Recepticles? How about those little infrared switches for your garage doors? Hmm? It is all so confusing how can we regulate anything? : Re: Equipment Bollard in a Residential Garage Dee, What I was saying that was not specifically mentioned is not water heaters, but the bollard requirement. You are correct that there is way too much by way of restrictions. You mean you don't require a 3 ft tall bollard for a condensate pump? Man, where have you been? How about a bollard for the garage wall where there is an outlet or a light switch in it that can be a source of ignition? You are correct in that one can read almost anything into the code that one wants. I've heard some doozies. That's what Dan tried to keep us from getting into during training in 'Qualmie. What does the code "really" say, he would say? Common sense goes along way. I've heard that you have jumped leaps and bounds in your career there. Keep it up. Good discussion. Hope to see you in some training. Maybe next spring. Glenn Re: Equipment Bollard in a Residential Garage I think, based on the vehicles rktect 1 drives, he makes too much money to be involved with the likes of the rest of us... If it's a gas appliance, it needs to be elevated above the floor anyway. (IRC M1307.3 - 18"). other than that, the IRC is silent. Having mechanical equipment in the garage is not a good idea since it's subjected to outside temperature (unless it's a conditioned garage).. it has to work harder. Then there's the CO issue... how to prevent the car exhaust from getting into the house. Re: Equipment Bollard in a Residential Garage The requirement itself is asinine, and a tennis ball is as good as most bollards installed in 1+2 Family. Neither will stop a car. A wheel stop anchored to the floor is the most cost effective physical barrier. But it's such a non-safety issue, that it should not be in the 1+2 Family codes to begin with. 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Adding a protection protection requirement will allow more plans to be rejected over trivial requirements. And return the fun to plan review. Re: Equipment Bollard in a Residential Garage Don't be silly, I think the simple solution is a mechanical equipment vehicle proximity sensor which activates an on board kill switch and brake activation servo via satellite... This would alleviate the need for this confusing wheel stop or bollard issue. Re: Equipment Bollard in a Residential Garage Well, THAT or.... ummmmm... maybe... People should learn to PAY ATTENTION TO vehicle barriers could be required. Do you think that electric water heaters are a source of ignition per 1307.3? If you do, then 1307.3.1 would just the same apply to electric water heaters. Remember, if it applies to one it applies to the other, since one is a subsection to the other. In other words, the "appliances" in 1307.3 would be the same as "appliances" in 1307.3.1. 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IBC goes directly to ASCE7 which is 6k at 18" minimum, but acting in any horizontal direction, and specifically precludes busses and "trucks" (meaning actual trucks like SU-30, not that humvee). Those values are for traffic collision, and are mainly to guide traffic back onto a road. The 6k is in line with testing of guardrail systems, which shows around 5.9k for a light duty vehicle at ±20° at a low speed threshold collision. I would presume an "approved barrier" per the IRC would be something like a traffic railing rather than an intended impact mechanism, like a loading dock. In that case, I would anticipate an official would accept my design per IBC, which is ASCE7. Conversely, something like a vehicle barrier on a loading dock is designed for a 100k impact force as semi-trailers intentionally ram it downhill. The semi could go through the bollards and right on through the rest of the house. I design industrial barriers for anything between 6k and 10k, at the client's request. I design push walls for front loaders for anything between 30k and 130k. A front loader could also go right through a house. None of those higher loads would make sense to me from a design perspective for the IRC's intent. I'd say use 6k @ 18" or a little higher if you want. "Very" lengthy thread driven by a contractor seeking to save pennies. Vehicles include trucks and jacked up SUV's. this is not a one size suits all issue. As usual it depends on what you are protecting, vehicles or objects? And from what action of the vehicle? Anything I'd call a truck (AASHTO SU commercial vehicle) is going to push with multiple kips of force if you take your foot off the clutch. 6k is a "soft stop" barrier of someone intentionally letting their 5k passenger truck/ car bump at about 5mph, or being in neutral around 10 mph. The barriers in IRC are to keep the stupid off of something, not collision design. When designing residence, I provide collision resistance at any columns/etc of 30k, which is monolithick concrete extending down with vertical bars, horizontals at 19" above floor and lateral restraint. See And from what action of the vehicle? Anything I'd call a truck (AASHTO SU commercial vehicle) is going to push with multiple kips of force if you take your foot off the clutch. 6k is a "soft stop" barrier of someone intentionally letting their 5k passenger truck/ car bump at about 5mph, or being in neutral around 10 mph. The barirers in IRC are to keep the stupid off of something, not collision design. When designing residence, I provide collision resistance at any columns/etc of 30k, which is monolithick concrete extending down with vertical bars, horizontals at 19" above floor and lateral restraint. See excellent practice, thank you. It would have never occurred to me that a residential bollard would be engineered. Right you are...I am just an inspector. "not just", as such, though you are expected to have knowledge of many things, you deal with moving targets every day. Yours is a necessary/critical (often unappreciated) element of the construction process. Keep the faith, love your shades. Thanks for your responses everyone. I tried responding end of last week, but the forum must have been down as I could not access the site at all. Where does it state that? Separation is only required when the separated occupancies method is used. Section 406.6.1 (enclosed garages) refers to Sections 504 and 506 (and 507 if applicable). Sections 504 and 506 both reference Section 508 regarding mixed occupancies. Sections 406.5.3 and 406.5.4 (open garages) reference Section 508.1 directly. If using the nonseparated occupancies method for the entire building you definitely do not need to provide the fire barrier separation. If you are using separated occupancies and separating the Group B occupancy from the parking garage, you must classify the garage as a Group S-2. Section 406.5.4 (open garages) states specifically that, and Section 311.3 provides a general provision requiring that. Thus, separation is required if you are separating all occupancy groups, and you may be required to separate them if doing a combination of nonseparated and separated occupancies. Apologies for missing a key piece of information from my original post. I was assuming the use of the separated occupancies method. I understand that 311.3 lists parking garages (open or enclosed) as S-2. Further, 311.2 states that S-1 occupancies are for storage uses that "are not classified as Group S-2". Perhaps my question to you all is more of a theoretical one. My generic, baseline understanding (right or wrong), is that the code dictates minimum requirements and does not prevent one from going above and beyond what would be minimally required. Maybe this is overly simplistic - but theoretically speaking, if I had a "container" designed to store an object posing a high fire risk, it stands to reason that I could use that same "container" to store an object posing a lower fire risk. Applying that concept to storage occupancies, S-1 is a higher hazard use than S-2 and is more restrictive from a life-safety design standpoint. From a life-safety standpoint, what risks of S-1 would prevent storing a (lower hazard) motor vehicle so long as the Special Detailed Requirements in Chapter 4 for Motor-Vehicle-Related-Occupancies (along with other specific provisions of the code for S-1) are met? Section 903.2.9 cited in mtlogcabin's response (below) seems to open the door to at least the notion that motor vehicles (albeit commercial vehicles in this case) could be stored in an S-1 occupancy even though not specifically included or even implied in section 311.2. How big is the building? You may need to create different fire areas or sprinkle the building. It does not matter if it is an S-1 or S-2 the CWV of the RV will be over 10,000 lbs and that may trigger sprinklers unless your fire area is less than 5,000 sq ft. An S-1 would require a 3-hour wall and S-2 a 2-hour wall. [F] COMMERCIAL MOTOR VEHICLE. A motor vehicle used to transport passengers or property where the motor vehicle meets one of the following: 1. Has a gross vehicle weight rating of 10,000 pounds (4540 kg) or more. 2. Is designed to transport 16 or more passengers, including the driver. [F] 903.2.9 Group S-1. An automatic sprinkler system shall be provided throughout all buildings containing a Group S-1 occupancy where one of the following conditions exists: 4. A Group S-1 fire area used for the storage of commercial motor vehicles where the fire area exceeds 5,000 square feet (464 m2). [F] 903.2.10 Group S-2 enclosed parking garages. An automatic sprinkler system shall be provided throughout buildings used for storage of commercial motor vehicles where the fire area exceeds 5,000 square feet (464 m2). View attachment 10036 Thank you. I had not yet reached this section of the code when I posted originally. The building in question is approximately 8,800 square feet. The whole building will be sprinkled because there is a single dwelling (R-3) unit attached to the building. 406.3.1 Classification. Private garages and carports shall be classified as Group U occupancies. Each private garage shall be not greater than 1,000 square feet (93 m2) in area. Multiple private garages are permitted in a building where each private garage is separated from the other private garages by 1-hour fire barriers in accordance with Section 707, or 1-hour horizontal assemblies in accordance with Section 711, or both. Further - 406.4 reads (in part) "Parking garages, other than private garages, shall be classified as public parking garages..." Again - Thank you all for your thoughtful responses. Section R309.2 says garages less than 3 from a dwelling on the same lot require protection. So if I have a 3 foot total distance from dwelling to garage, there's no gypsum board protection required and I can have windows in either the garage or dwelling or both with no protection? Is that correct? My code brain is trying to do the imaginary property line thing or look at connecting the two buildings, but if I'm reading this correct the garage can be as close as 3 feet and nothing is required. My client requested building an addition as close to an existing garage as possible. Before checking the code, I thought I might need 6' (3' each structure) with protection, 10' without any protection. I'm just totally surprised and decided to have you guys verify my code review. R309.2.....Garages located less than 3 feet (914 mm) from a dwelling unit on the same lot shall be protected with not less than 1/2-inch (12.7 mm) gypsum board applied to the interior side of exterior walls that are within this area. Re: Garage distance separation from dwelling - Section R309 Section R309.2 says garages less than 3 from a dwelling on the same lot require protection. So if I have a 3 foot total distance from dwelling to garage, there's no gypsum board protection required and I can have windows in either the garage or dwelling or both with no protection? Is that correct?My code brain is trying to do the imaginary property line thing or look at connecting the two buildings, but if I'm reading this correct the garage can be as close as 3 feet and nothing is required. My client requested building an addition as close to an existing garage as possible. Before checking the code, I thought I might need 6' (3' each structure) with protection, 10' without any protection. I'm just totally surprised and decided to have you guys verify my code review. R309.2.....Garages located less than 3 feet (914 mm) from a dwelling unit on the same lot shall be protected with not less than 1/2-inch (12.7 mm) gypsum board applied to the interior side of exterior walls that are within this area. Make it 3'-6" from the other building and be more safe that it is not going to be less then that distance. This would include the roof overhang projection should not be within 3'. It does not say 3-ft. or less. Which is

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