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Construction Specifications Division 3 and Division 9

Most of you should know that Division 9 in a Construction Specification deals with flooring materials but not everyone has an understanding of the relationship this has with Division 3. Division 3 covers the concrete substrate on a construction project and Division 9 the finishes which include the flooring. The two are inextricably linked, particularly on a new construction project and knowledge of both should be understood. Hopefully the information here will aid you in future projects helping avoid problems and keep everyone out of trouble.

There are currently 16 divisions of construction as defined by the Construction Specification Institute. The standard is the most widely used standard for organizing specifications and other written information for commercial and institutional building projects in the U.S. and Canada. It provides a master list of divisions, and section numbers and titles within each division about a facility's construction requirements and associated activities. Standardizing the presentation of such information improves communication among all parties involved in construction projects.
https://en.wikipedia.org/wiki/Construction_Specifications_Institute
Following are the two divisions that involve flooring finishes and concrete substrates.

Division 3 essentially gives the general requirements for concrete on a project. Below is what encompasses the information included in Division 3 of a Construction Specification.

Division 3		Concrete
	03050	Basic Concrete Materials and Methods
	03100	Concrete Forms and Accessories
	03200	Concrete Reinforcement
	03300	Cast-In-Place Concrete
	03400	Precast Concrete
	03500	Cementitious Decks and Underlayment
	03600	Grouts
	03700	Mass Concrete
	03900	Concrete Restoration and Cleaning

We provided a list of items in Division 3 that would typically be relevant to the flooring installation. The flooring contractor/installer doesn't usually attend the pre-pour meeting for the slab but if it does happen some issues affecting the slab and flooring installation could be addressed ahead of time. ACI Guide 302.1R is a good reference guide for a lot of this information. This guide describes how to produce high-quality concrete slabs-on-ground and suspended floors for various classes of service. It emphasizes such aspects of construction as site preparation, concrete materials, concrete mixture proportions, concrete workmanship, joint construction, load transfer across joints, form stripping procedures, finishing methods, and curing. Flatness/levelness requirements and measurements are also outlined. A thorough preconstruction meeting is critical to facilitate communication among key participants and to clearly establish expectations and procedures that will be employed during construction to achieve the floor qualities required by the project specification which is why; if possible, the flooring contractor/installer should attend this meeting. It is also important that supervision and inspection are required for job operations, particularly those of finishing so the concrete and the flooring installation are not compromised.

- Floor flatness and levelness requirements. The time to get this right is during placement and finishing, and it will have a big impact on some projects if it is not right. Leveling a floor after the fact can be difficult and expensive.

- Type and placement of reinforcing. For slabs-on-grade, prefabricated, heavier gauge welded wire reinforcing is preferred over rolled fabric since it will be easier to keep in the right location. Supporting the reinforcing is important, but make sure the supports won't damage the vapor retarder.

- Selecting an appropriate mix design for the concrete can help lessen some problems down the road. Limiting water content, addition of water in the field, and fly ash; and specifying large aggregate with good gradation can all help.

- Selecting an appropriate admixture package to reduce the water content and limit shrinkage.

- Specify a vapor retarder complying with ASTM F1745 for slabs-on-grade. Detailing instructions for the vapor retarder are important to improve continuity and reliability.

- Select an appropriate curing method for the concrete. Curing is required, but it is best to limit the use of wet cure and curing compounds to promote drying and reduce the risk of bonding issues. Moisture retaining covers are a good option.

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- Consider finishing of concrete. Hard trowel is typical for floors, but may not be necessary or desirable depending on the types of finishes included in Division 9.

- Coordinate the placement of construction, isolation, contraction, expansion, and control joints with desired architectural finishes. Moving joints must be honored up through the flooring so their placement can be important for final aesthetics. Consider requiring a shop drawing of these joints in the concrete Specification.

- Requirements should be in place to protect the slab and keep it as dry as possible during construction and prior to the installation of flooring materials.

Division 9 pertains to interior finishes and where we're concerned, flooring particularly where it defines conditions for substrate and preparation, the flooring material to be used, how it is to be installed, etc. Each construction project is different so the specifics of each application, installation and the types of materials will be unique to that project but fall under what defines that division. Below is what encompasses the information included in Division 9 of a Construction Specification.

Division 9		Finishes
	09050	Basic Finish Materials and Methods
	09100	Metal Support Assemblies
	09200	Plaster and Gypsum Board
	09300	Tile
	09400	Terrazzo
	09500	Ceilings
	09600	**Flooring**
	09700	Wall Finishes
	09800	Acoustical Treatment
	09900	Paints and Coatings

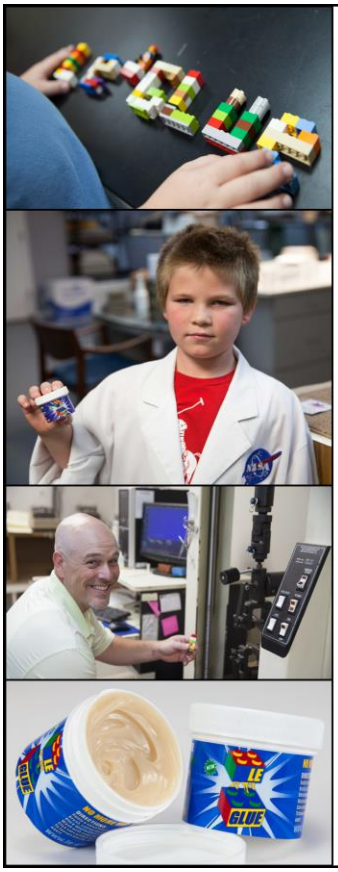
I'll share with you the information I wrote into a general specification for a million square foot building as an example. The spec itself is 12 pages long and contains everything from the type of flooring material desired, but not the specific flooring products, to maintenance. This spec was detailed and realistic without being burdensome, that is,

it had specifics that are rarely, if ever, covered in a spec to protect the client and also the providers of material and services. Covered in the spec were carpet tile, broadloom, vinyl and rubber flooring specifications – not the specific products themselves but the specifications they should meet such as size, face fiber, backing, etc. Also quality assurance from the manufacturer that the product submitted met the spec and was appropriate for the application so something didn't get sold into the space that wouldn't work nor would what was specified get substituted by someone trying to get a different product in. With a million square foot project the blood is in the water creating a feeding frenzy and all the sharks want to attack. To that we address the manufacturer's qualifications, their warranty and ask for product submittals. Regardless of the job size this information is just as important on every commercial flooring project.

Candidates who qualify for the project would then have their submitted products tested by us to insure they comply with the product specified and with their manufactured specification – just to make sure everything is what it is supposed to be. Once the final product selection is made and before it ships to the site, samples of that product are tested to make sure they comply with the spec. Not the architect, end user or manufacturer wants to find out later what they thought was; wasn't. Any adjustments to bring the product into spec at this point are fairly easy to make as flooring manufacturing specifications can vary for any number of normal reasons and they can typically be brought into line with minor adjustments.

Mock ups are an important part of the project specification whether new or renovation because they give a real indication of what a product will do on the floor under conditions it will be subjected to and a comparison can be made between the considered products to see which one actually works the best. Laboratory testing is very telling and necessary but there's no test like reality to determine what the product actually looks like when put in use. Better to know that up front than to find out later.

Also in the spec was the inspection of the material before it ships. We do this regularly on projects; watching the product being manufactured and



On a Personal Note:

I have a little buddy that created a really cool product and I wanted to share it with you.

Tripp Phillips is ten years old and was given a project at school and he decided to invent something. He loves playing with Lego® building blocks and any other bricks he could get his hands on. However, the pieces kept falling apart. He wanted a glue that was strong and would not ruin his blocks.

He and his dad teamed up to create Le-Glue. Kids love it! Tripp won the International Torrence Legacy Creative Award with his new invention.

Lee Phillips is a good friend of mine and I found this idea fascinating and it proves that the entrepreneurial spirit is alive in our kids.

Click the photo to follow Tripp's Kickstarter campaign.

taking samples to test, which the manufacturer does also. Putting checks and balances in place insures everything is what it's supposed to be. Manufacturers' have no issues with this because the process helps all parties involved comply with the specs and avoid problems.

Next we go to the flooring contractor/labor portion of the spec that is, Flooring Contractor and Installer Qualifications. Here it's stated that the flooring contractor must be capable of a project this size, have the wherewithal to comply with the specs and be a viable business and meet specifications relative to that. The same goes for the installers. The spec can say who specifically is qualified. After all, this is a specification which deals with specifics of products, labor, conditions, and so forth. It is perfectly appropriate for the specification to say exactly what the writer and end user wants it to say to protect the end users interests. You wouldn't want a pilot of a small propeller plane to be piloting a passenger jet – he can fly but not with the big boys.

The spec would also call for meetings with all relevant parties in attendance so that all aspects of the project can be discussed including the flooring guys at the pre-pour meeting – as mentioned earlier relative to Division 3. The meetings may be regular weekly sessions or conducted as needed. There is nothing more important than for all the parties communicating to prevent any problems from occurring and to decide on the strategy and logistics of the installation. The communications should virtually eliminate any chance of a flooring installation failure. As in any relationship, communicating is of the utmost importance to prevent problems. Meetings should also be conducted with the flooring product suppliers as well and they should be included in the process; everyone has to be onboard. The meetings should also deal with the sequencing of the installation and materials, scheduling of the work and what goes where and how and staging the work.

Delivery, handling and storage must also be in the spec so the strategy for receiving the flooring products and getting them to the job site have to be known and provisions made.

It is important the area receiving the flooring is free of all other trades and materials so the installation can be undertaken and completed according to the manufacturers and industry's standards.

Substrate conditions must also be a part of the spec and this portion of the spec will very much coincide with Division 3. Here information on the concrete, additives, curing agents and finishing are important if the building is new. If not then the current conditions of the concrete, moisture testing, bond testing and finishing and flatness have to be included. All of this has to do with floor prep as well. Using agents in or on concrete that prevent flooring materials from staying down is becoming a very big problem so again we see the correlation between Division 3 and Division 9.

Installation methods for each flooring material have to be included and defined and determining the installation warranty. This is why qualified, experienced and seasoned flooring contractors and installers should be on the job so an installation can actually be given from a firm with crews that have a history of excellence and service and can provide an installation warranty.

The installed flooring material should be protected during further construction and move in to prevent the flooring from being damaged. Any leftover materials of significant size should be left for any future repair or changes in the space as overage. Old materials removed should be recycled as well as left over new material scrap – this is an aspect of the spec that is very important today and to make sure no flooring goes to a landfill that shouldn't.

Division 9 of any specification will be specific to that particular project. Though many aspects of division 9 will be the same, or should be, such as floor prep, environmental conditions, substrate testing, protection and clear space to work in. There will be information that would define a particular project and specific to that project such as when the work is to be done, if the operation getting flooring is a 24/7 business, like a

hospital or call center or any unique aspects of the facility receiving flooring.

I want to thank Emily R. Hopps, P.E. Senior Project Manager with Simpson Gumpertz & Heger - http://www.sgh.com/ for her contribution to the Division 3 information. Emily leads SGH's flooring group and has wide experience in the design, failure investigation, and repair of a variety of flooring finishes particularly relative to moisture issues.

SIMPSON GUMPERTZ & HEGER

Engineering of Structures and Building Enclosures

If you have questions about a project, need consulting or spec writing help, have a problem that needs to be resolved or tests conducted on materials or floors, we do that and can help you.