Gateways

Information from Gateway Geotechnical, LLC

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IN THIS ISSUE

IT'S YOUR TURN

Are you dealing with or have questions about a geotechnical issue? If so, send us an email.

Take advantage of this service. We'll get you the solution!

SPRING IS HERE!!!

Groundhog Day has come and gone. What was he looking at? Was it his shadow, or maybe the passing of construction equipment waking him from hibernation? Yes, some earthwork is underway. And along with that operation, compaction of fill still remains a mystery to many of us. Hopefully, we can answer some of those FAQs.

Q. What is soil compaction?

A. It's the process of making the soil denser by pushing the solids and water closer together, occupying previously void space. The result is a denser, more capable soil.

Q. How hard do I need to push (aka, what degree of compaction is required)?

A. It depends on what you're planning to build. Typically we see required compaction of 90 or 95 percent of the soil's maximum dry density (Proctor value) for support of spread footings.

Q. How many Proctor tests do I need?

A. Since different soils react to compactive effort in their own unique way, you really need a Proctor for each distinct type of soil that will be used as fill. The Proctor curve, which resembles an inverted parabola, relates moisture content on the x-axis and corresponding dry density on the y-axis.

Q. But is that a Modified or Standard Proctor? Does it matter?

A. Yes and yes. Both tests are used in the local area, with the Modified version providing roughly 4½ times the compactive energy of the Standard. A couple of things to remember – first, the Modified curve is typically lower in moisture content and higher in dry density than the Standard curve and, second, it's not a good idea to mix the two on any single project. Most important, it really doesn't make much difference which you use, as long as the required percent compaction and the planned performance of the compacted soil are compatible with each other.

Q. What's this relative density specification I sometimes see?

A. Relative density should be used as a compaction requirement for fairly clean granular soils – sands – that may not exhibit the typical Proctor curve. You can always tell who doesn't know their compaction (or maybe who doesn't read our *Geotechnical Reports*) when relative density requirements are used for cohesive soils – clays and silts. Or when relative density values similar in magnitude to Proctor numbers are called for. A relative density on the order of 70 percent is usually appropriate beneath spread footings, with an end-dumped and tamped 50 percent maybe good enough elsewhere.

In conclusion, if you have a compaction question we haven't answered, give us a call – we'll do our best to clear things up. Or better yet, come to our next presentation (see below).

* * *

Want to Know More About Compaction Testing?

If you've ever asked what level of compaction should I specify?
What issues affect getting compaction in the field?
How can I get better results without spending a ton of money?

Why am I not getting what I'm paying for?
What does the Contractor need to do to achieve compaction?
Does it really make a difference?
What should I look for in the report?

Later this summer we plan to present ---

EVERYTHING ENGINEERS, ARCHITECTS, AND DEVELOPERS SHOULD KNOW ABOUT COMPACTION

Stay tuned for the date/time/location in our next mailing.

AND PDHs TOO !!!!!!

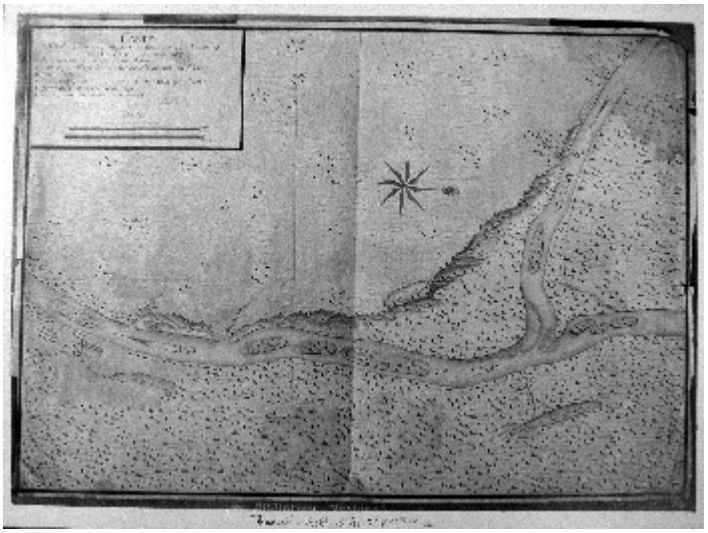
THE MAPPING OF EARLY ST. LOUIS BY DUFOSSAT – EXPLORER, ENGINEER

Following Choteau's and Laclede's founding of the St. Louis Settlement in 1763, up the Mississippi River from Fort de Chartres came Guy, or sometimes known as Guido, Dufossat. He was a French military engineer and later a Spanish army officer, credited with making the first colored maps of what was known to many as "Upper Louisiana." His maps included everything from historical geography to town planning, Indian settlements, agriculture, and architectural features. The area of his work, between the Missouri and Mississippi Rivers, was an expanse of land, hundreds of square miles in area, noted on his maps as an "immense prairie, where a multitude of farmers will be settled." The area he designated for farmers is now the Columbia River Bottom Conservation Area.

In 1767, he completed surveys and created three increasingly detailed versions of the earliest known maps of St. Louis. Sometimes the area was referenced as St. Louis and sometimes as Pain-Court (short of bread), and sometimes the Mississippi River was referred to as the St. Louis River, and then there was the "Missoury River." Throughout his work, his spelling was somewhat erratic, "but his draftsmanship was exquisite." Dufossat's maps included village buildings and randomly spaced trees, and even their shadows, perhaps an early version of today's graphical textures.

Dufossat is credited with being the first engineer to do river soundings at the mouth of the Missouri River, which thus "demonstrates the superiority of his maps over all earlier ones."

For more detail check out the source of the above abbreviated information, an article titled "The 1767 Dufossat Maps of St. Louis" by Carl J. Ekberg and Sharon Person in *The Magazine of the Missouri History Museum, Gateway, Volume 32, 2012*. This most-interesting article includes many of Dufossat's maps reproduced in color, as well as more extensive history of the settling and development of St. Louis.



In October 1767, Dufossat completed three general surveys and maps of the St. Louis region. This is likely the first version as it shows fewer structures and details that are included on later versions. It does include the artistic touch of shadows cast on the ground by the trees. Map by Guy Dufossat, 1767© Biblioteca Nacional de España.

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