



LIME MODIFICATION SAVES STORE OPENING

Kansas City, MO

NEW MENARDS STORE NEEDS PARKING LOT FOR OPENING

During the wet summer of 2016, Kansas City experienced a substantial amount of rainfall which led to challenging conditions on the construction of this new Menards store. With the buildings already in place, continuous heavy rainfall and excess water from roof downspouts caused even more problems to the future parking lot. The soil in this 8 acre asphalt lot was completely saturated with ruts up to 3'. After several weeks of trying to dry naturally and mechanically with no success, it was time to find an effective solution. Kat Excavation contacted Mt. Carmel to develop a plan to improve the subgrade conditions quickly so that the base stone and pavement could be placed and the project could get back on schedule to meet the targeted opening date.



Evaluation of the Conditions



Mt. Carmel Stabilization Group utilized a Wirtgen WR 2400 for work on this project. With 25 similar Wirtgen mixers in its fleet, Mt. Carmel can tailor production to meet any project demand.

This Menards parking lot subgrade was extremely wet and the fat clay soils were therefore very weak and any equipment on the site was causing deep rutting. Lime modification is a common process in the family of soil stabilization to solve these problems. With lime modification, subgrade problems such as high moisture, pumping and rutting are improved immediately, creating a solid working platform for pavement construction to continue. Mt. Carmel Stabilization project management personnel visited the site and met with the earthwork contractor, KAT Excavation to develop a plan for the site.

Lime Modification Selected

After visiting the site and meeting with all involved including the general contractor, earthwork contractor and geotechnical consultant, Mt. Carmel Stabilization Group recommended a 6% application rate of Lime Kiln Dust (LKD) and a **SINGLE LIFT TREATMENT DEPTH OF 16"** in the majority of the lot. This treatment depth is common and effective when dealing with poor subgrade conditions to a depth of over 3'. Other areas would be done with a 6% application rate of LKD to a treatment depth of 9". The project team approved the recommendation quickly and work started days later.

Within days, Mt. Carmel Stabilization Group mobilized and began work on the project. LKD was delivered in bulk pneumatic tankers and transferred into their state of the art, custom built spreader trucks for consistent and accurate application on the subgrade. Immediately after spreading, the LKD and soil were mixed in a **single pass to a depth of 16"** with a Wirtgen WR 2400 Stabilizer. LKD is a very thirsty chemical that requires a lot of moisture to hydrate. Typically water will be added before or during mixing but in this case the moisture present in the subgrade soil was adequate to hydrate the LKD and reach the soil's optimum moisture content. Following mixing, the soil/LKD mixture is compacted with a sheepsfoot roller, graded with a motor grader and sealed with a smooth drum roller. This process continued across the site until the entire paved areas were complete. Specially built equipment and 70 years of experience helped Mt. Carmel Stabilization Group minimize fugitive dust during the process of lime modification to the appreciation of the several trades on site at the same time.



The lime modified subgrade has been completed in this area. What was rutting up to 3' deep is now stable and stiff.

After weeks with no progress, the lime modification of this 8 acre Menards parking lot subgrade was complete and ***ready for pavement in just 5 working days...***

The poor, wet, weak and unstable subgrade was completely transformed into a solid working platform for pavement construction. The entire site passed proof roll and after a short curing period, the base layer was placed.

Cost Savings vs. Undercutting

Lime Modification is a common and effective alternative to costly undercutting when poor soil conditions are encountered. Depending on the area to be treated, lime modification can be ***50% OF THE COSTS OF UNDERCUTTING***, or less.

