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City of Hiawatha

Engineering Department

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To: Mayor and City Council **Date:** October 5, 2017

From: John C Bender PE, City Engineer

Re: Topsoil Standards for New Developments

Description: Review of Existing Unified Development Code

Report:

There has been considerable discussion in the last year regarding the preservation and redistribution of topsoil on new developments throughout the metro area. Discussion started at the DNR level several years ago about including restrictions on providing the return of topsoil to the sites to at least a depth of 4 inches. Today developers are not routinely respreading topsoil onto home lots. The biggest objections to any new rule were shared development costs associated with continuous soil movement, added erosion control measures, additional costs for landscaping, governmental regulations and associated costs, and added professional costs associated with civil engineering and geotechnical engineering. It was predicted that new regulations for topsoil management and other associated development costs like interest, could equated to over $5,000 increased cost per lot.

The advantages of a new rule to re-spread top soil before lawns are established was listed to reduce the cost of post construction soil quality restoration to homeowners. Homeowners wished more soil was left on their site to improve the ability of their lots to absorb and retain moisture and nutrients. Soil restoration costs of $800 - $1,700 per home we identified and practices that are currently being paid for by homeowners to improve existing sites where poor soils result in nonfunctional lawns.

Cities have looked at the topsoil issues and agreed that rules should encourage enhanced methods of storm water management, provide for infiltration of the water quality volume, reduce runoff and provide for better growing conditions for lawns. Both Cedar Rapids and Marion have revised storm water ordinances to imposed topsoil restoration requirements. Hiawatha has not addressed any changes to date.

After review of the existing Hiawatha Code of Ordinances Chapter 167, Filling and Grading, it has been determined Section 167.10 paragraph 5 (attached) actually calls out the finishing grading requirement to be completed according to Section 02900 of the Metro Standards (attached). This section under paragraph 3.03, calls out the

replacement of 4"-6" of new topsoil. However in summary, this requirement has only been enforced under existing City capital improvement projects.

We have attached several photos of some of the recently developed lots in Hiawatha. Topsoil has been replaced on most commercial developments; however residential lots have had varying results based upon the builder's standard practice. If we do start enforcing Chapter 167 on residential lots, this would be a change to our standard practice to date.

Our current plan we would proposed to Council is to transition to the Statewide Urban Design and Specifications (SUDAS) along with the City of Cedar Rapids by July 2018. We would then phase out the Metro Standards, including section 02900 we have been using since the early 2000's. The most logical approach at this time is to review site plans submitted and encourage the replacement of topsoil, but wait for any additional enforcement of topsoil rules until next year when SUDAS has been adopted. There is currently a section on topsoil in these specifications that would become the guideline for any enforcement at that time.

Any questions on this proposal, please let me know.

December 2016

Topsoil/Different tests reveal different results

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when the City Council meets at noon Tuesday. No one spoke during a Nov. 15 public hearing before the first vote, which saw the ordinance unanimously approved.

TEST RESULTS

City officials say — and third-party tests show — lawns around town have a high concentration of clay subsurface and are densely compacted. They say it blocks stormwater absorption leading to runoff, which contributes to flash flooding and water pollution, and hampers lawn quality because grass and plants can't take root.

Cedar Rapids hired Des Moines-based Team Services to test soil at 26 randomly selected sites developed by nine different builders. The tests revealed lawns had an average 69 percent clay content and 97 percent were compacted.

Cory Denham, manager at Team Services, said they provided data based on the tests and locations the city ordered, without any qualitative analysis.

"All we did was provide the results," Denham said.

Dostal conducted his own tests, which he said contrasts the findings.

He bought a penetrometer, a stainless steel probe with a gauge by the handle that reveals the compaction level based on the pressure used to push the probe into the ground. The results showed no compaction at several spots in lots last week, and he said his additional tests show the compaction issue is overstated, he said.

Dostal also conducted a side-by-side comparison of two lawns — both started in May. One used standard practice and another following the city-proposed plan. Using methods allowed under the proposed new rule, Dostal spread a black dirt and compost mix to 4 inches deep, and planted grass seed over top. For the standard lawn, he spread black dirt and laid sod over-

Cliff Jette/The Gazette

Randy Dostal of Thomas Dostal Developers demonstrates a soil compaction tester/dial penetrometer last week in Cedar Rapids.

top. He maintained both through the summer.

During a visit to the site last week, the dirt-compost mix side had patchy grass including a spot with puddling, while the control side had thick full grass. Dostal added the compost-dirt mix lawn cost $7,485 compared to the $2,400 per lot he spends normally to grade and sod.

Joe Horaney, a spokesman for the Cedar Rapids Linn County Solid Waste Agency, said the recommended way to add compost for the goal of growing grass is to first plant the grass seed directly into topsoil and then add a quarter- to half-inch layer of compost after the seed has been planted.

"The grass seed will root stronger with topsoil," he said. "After the grass establishes and begins to grow, add 2 inches of compost directly on the grass and till it in to build up absorption levels."

AGREEING TO DISAGREE

The proposed Cedar Rapids topsoil ordinance provides nine methods to preserve, stockpile and restore topsoil to an average depth of 4 inches. Cedar Rapids officials have said they expect neighboring communities to adopt similar plans so there is a level playing field.

Dostal and Retz said they favor an approach of planting grass with longer roots to reduce compaction, installing neighborhood detention basins to control stormwater, and biannual aeration of lawns to help with both aesthetics and stormwater control.

The argument by Dostal and Retz hasn't gained traction with the city or peers.

Cara Matteson, the city's stormwater coordinator, said the goal of the topsoil rule is to address issues on a micro-level.

"We wanted to not just look on a big scale, but on the home lot, so people could have healthy lawns," Matteson said. "We wanted to look at this site by site."

The city worked with a builders' council for more than a year to find a middle ground. City leaders insisted an ordinance was happening but dialed back a requirement of 8 inches of topsoil, reworded the rule for topsoil depth from "minimum" to "average," added flexibility in approved methods, and exempted developments through preliminary platting by Jan. 1 when the rule takes effect, if approved, based on feedback from developers.

"There was plenty of agreeing to disagree from day one, and at the end of the day, too, but what was settled upon was something the development community, as well as the city, could live with and move forward with," said Dustin Kern, a key voice among developers in creating the plan. "It appeared something was going to happen regardless of what we said, but if they were going to do it without taking us into consideration, something would have been approved in spring 2016."

COST OF THE ORDINANCE

Kern called the plan a step in the right direction, particularly for greener grass, but remains unconvinced it is going to combat flash flooding. He contends the new rules might slow development on land where topsoil is lacking because it will significantly add to the costs.

Retz takes it a step further, suggesting it is going to make homes unaffordable and discourage development.

"The number of new developments in Cedar Rapids will decline and the number of permits will decline," Retz said.

Kyle Skogman of Skogman Homes said many builders would, if given the choice, prefer not to have the extra regulations. But he also agrees with the city assessment that issues were present that needed to be addressed. He called the final version a "good plan."

"I think a number of us agreed there were compaction issues, but in fairness to Drew and Randy, we didn't get enough information on these 20 to 30 samples the city took," Skogman said.

Scott Olson, a member of the Cedar Rapids City Council and a commercial developer, guided the topsoil policy through his infrastructure committee — a subcommittee of the City Council. He said he's heard from Dostal and Retz, who consistently have objected throughout the process.

Olson said he was not swayed by Dostal's findings, noting he is not a "qualified tester."

"These are the two outliers," he said. "They didn't want to do anything."

Olson said he anticipates the rule is going to move forward, and he is "pretty confident the direction we reached is going to work."

● Comments: (319) 339-3177; brian.morelli@thegazette.com

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comply with any of the regulations set forth in this chapter, or any requirement of law, statute or regulation.

6. The following activities are exempt from the requirements of this chapter:

A. Corp production activities.

B. Cemetery graves.

C. Emergencies posing an immediate danger to life or property, or substantial flood or fire hazards.

D. Total fill quantity of less than 25 cubic yards in a 12-month time period.

E. Disturbed area of less than ¼ acre.

F. Public improvements work within public right-of-way and easements.

167.10 FILLING REQUIREMENTS.

1. Clearing and grubbing shall be performed according to Part 3 of Section 01400 of the *Standard Specifications*, except as provided in this chapter.

2. Fill material shall be placed according to the Grading, Erosion and Sediment Control Plan as accepted by the City.

3. Interim filling during construction shall be placed in a safe manner. Soil stabilization, inspection and maintenance of erosion control, and soil stabilization where work has been suspended shall be according to the *Design Standards Manual*.

4. Finish grading shall be according to Part 2 and Part 3 of Section 02900 of the *Standard Specifications*.

5. Finish slopes shall not exceed a 3:1 ratio on any slope facing and terminating within 15 feet of a property line.

6. Unacceptable Fill Materials.

A. Fill materials shall not include hazardous waste, synthetic material, metal, and organic material other than natural topsoil incidental to excavation except as noted below. Concrete, brick, tile, and other manufactured inert material shall not be greater than 18 inches in its greatest dimension. Asphalt paving material shall not be used for bank stabilization or where the final location will be below the known water table.

B. Trees may be buried within the site they originate from, provided they are not buried within structural footprints or in earthwork providing structural support, such as for building foundations and roadways. Trees shall not be placed in the trench backfill for sewers, culverts, and other underground utilities. Trees shall not be imported onsite from offsite for use as fill.

167.11 GRADING, EROSION AND SEDIMENT CONTROL PLAN REQUIRED.

1. No person shall engage in land-disturbing activities within the City unless a Grading, Erosion and Sediment Control Plan has been approved by the Erosion Control Officer and permit issued.

2. All erosion control measures must be in place before any additional work is started.

Prairie Grass/Wild Flower Seeding Dates		
Type of Seeding	Introduced Species (Grasses & Legumes)	Native Species (Includes Prairie Restoration Mixtures)
Spring	March 1 – May 15	April 1 – June 1
Late Summer	August 1 – September 15	Not Permitted
Dormant	November 15 – Freeze-up	November 15 – Freeze-up
Frost	February 1 – March 15	February 1 – March 15

D. Install stabilizing crop seed type specified in contract documents between June 1 and August 15.

E. Fall seeding will include only the grass seed, not legumes.

F. Legumes, including crown vetch, shall be seeded only during the spring season prior to May 15.

G. For Work that is substantially complete, except for Seeding, by August 1, seeding shall be completed by September 10.

H. At the option and at the full responsibility of the Contractor, seeding operations may be conducted under unseasonable conditions. The final results shall be as specified and guaranteed without additional compensation should the seeded areas require reseeding.

3.03 - Finish Grading

A. Grading Tolerances: Prior to the seeding subcontractor beginning seeding operations, the Contractor shall grade areas adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces free from irregular surface change, and as in conformance with the grading plan as follows:

1. Lawn or unpaved areas near buildings, parking areas and sidewalks: ±0.10'.
2. Lawn or unpaved areas away from buildings, parking areas and sidewalks: ±0.25'.

B. Subgrade: When construction Work is finished, after rough grading has settled and been approved, but prior to finished grading, harrow or otherwise loosen subgrade to depth of 4-6 inches, to reduce compaction. Remove sticks, stones and foreign material one inch or greater in size from the subgrade.

C. Topsoil.

1. The topsoil shall be hauled to the location of application only after all grading and trenching activities in the area have been completed.
2. Topsoil shall be spread over areas to be seeded and planted, and any other areas scheduled to receive additional topsoil. The depth of topsoil shall be 4 to 6 inches after natural settlement, and shall conform smoothly to the lines, grades and elevations shown.
3. After spreading topsoil, rake up large stiff clods, hard lumps, roots, litter, other foreign matter and stones larger than ¾ inch in greatest dimension. Remove from the premises or dispose where directed, in a satisfactory manner. Fine grade and rake topsoiled areas to a smooth, uniform surface. Compact with an approved roller weighing approximately 500 pounds. Regrade and reroll until satisfactory grades as shown are obtained with the required depths of topsoil. Do not finish grade during unsuitable weather.
4. The seeding or sodding operation shall follow the finish grading activities as closely as is practical in order to minimize the potential for soil erosion.
5. The Contractor shall remove excess topsoil from the Site. Unless specified elsewhere in the Contract Documents, excess topsoil belongs to the Contractor.

3.04 - Seedbed Preparation

A. Limit preparation of seedbed to areas which will be seeded immediately upon completion.

B. Remove all weeds and weed debris where weed growth has developed, in the opinion of the Engineer. **In addition, fine rake topsoil to a minimum depth of three (3) inches to remove all rocks and soil clumps. The process for these activities shall be approved by the Engineer. No additional compensation shall be allowed for this work.**

C. The Contractor shall shape and fine grade to remove washes or gullies, water pockets, and irregularities to provide a smooth, firm, and even surface true to grade and cross-section.

Rolling Prairie

Dell Ridge

Dell Ridge

Mission
Electric, Inc.
Commercial Site

Commercial Site