

Schnieders, Adam [DNR]

From: Jeremy Goemaat [jeremy.goemaat@gmail.com]
Sent: Tuesday, July 15, 2014 12:58 AM
To: Schnieders, Adam [DNR]
Subject: Please keep the 4"top soil replacement standard!

Dear Mr. Adam Schnieders:

Please keep the 4"top soil replacement standard.

The frustration and expense home-owners go through is significant, not to mention the damage done to the environment - from poorly managed fertilizer and weed control measures, increased erosion from high-speed runoff, to sediments in our rivers and streams. Also serious economic damage is done through increase taxes for repairs and maintenance of storm water systems, loss of habitat impacting natural resource tourism and fishing revenues, and damage to properties from flooding, when topsoil/organic matter is removed and development sites are left with exposed compacted clay.

Again, please keep the 4" top soil replacement standard in General Permit #2.

Thank you for your time,

Thanks!

Jeremy T. Goemaat, President
LogicBox, Inc.
650 S Prairie View Dr., Ste 125 PMB#223
West Des Moines, IA 50266-6688
402.216.0783(desk)

Schnieders, Adam [DNR]

From: Rhonda Gearhart [gearhartrhonda@yahoo.com]
Sent: Tuesday, July 15, 2014 7:36 AM
To: Schnieders, Adam [DNR]
Subject: 4" topsoil requirement

A few years ago when the 4" topsoil requirement was implemented I believe this was a step in the right direction. Our state should do many more activities to make us a better steward of our land and this was a correct step to help reverse a major problem. Skimming off the topsoil to leave basically clay had become a problem and it needed improvement. I have talked with many homeowners in new subdivisions and they all complain about their yards and landscaping efforts because of the dominance of clay. They purchased their lots and homes not being informed of the "good" soil being stripped away and being left with the clay. Many probably would have agreed to pay a little more money for their lots to have better topsoil. I would think the big contractors for these subdivisions would not worry so much about their pocketbooks but be proactive for what is best for the homeowners and our state.

I hope this committee working on this issue can try to show some impartiality and do what is best for the Iowa homeowners and our state. Housing starts are a big part of any economy but the housing should be done proactively for what is best for their customers and our ecological future. Please continue the 4" topsoil requirement which was a step in the right direction and certainly should be continued.

Jeff Gearhart

Schnieders, Adam [DNR]

From: John Harrington [jwhjkh@gmail.com]
Sent: Wednesday, August 06, 2014 1:03 PM
To: Schnieders, Adam [DNR]
Subject: Topsoil

Hi Adam,

I heard about your 4" topsoil project. We live in Bettendorf and bought our new home in 1992. Prior to our ownership, topsoil was removed from about 2/3 of our 1 acre yard. The area with topsoil was seeded and grows well. The other area clay with sod and has had multitude problems such as fungus, dryness, weeds, bare spots and so forth.

Had I been given the choice of a house with a clay yard for \$200k or a house with a topsoil yard for \$205-\$210k, I would have chosen the latter.

Thanks for your help.

John

Schnieders, Adam [DNR]

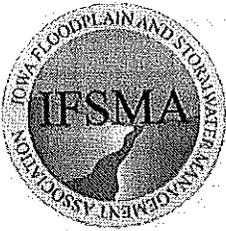
From: Adrian Holmes [AHolmes@Shoemaker-Haaland.Com]
Sent: Tuesday, July 15, 2014 8:42 AM
To: Schnieders, Adam [DNR]
Cc: Julie Tallman; Bradley J. Hansen; Eric Thompson; Leanne A. Harter; Luis T. Leon (lleon@tleon.com); Mark A Land; 'Sauer, Pat'
Subject: RE: letter to IDNR
Attachments: IFSMA_4in Topsoil Support Letter.pdf

Adam,

Please see the attached letter from the Iowa Floodplain and Stormwater Management Association in support of the 4" topsoil rule in Iowa's NPDES General Permit No. 2.

Thank you,

Adrian Holmes, PE, CFM
Chairman
Iowa Floodplain and Stormwater Management Association
Direct: 319.383.7822
Office: 319.351.7150
Mobile: 319.594.5775
www.iowafloods.org



Iowa Floodplain and Stormwater Management Association
1860 Boyson Road
Hiawatha, Iowa 52233

July 15, 2014

Adam Schneiders
Iowa Department of Natural Resources
900 E. Grand Ave.
Henry A. Wallace State Office Building
Des Moines, IA 50319-0034

Dear Mr. Schneiders:

The Iowa Floodplain and Stormwater Management Association (IFSMA) Board of Directors is in favor of a topsoil requirement within Iowa's NPDES General Permit #2 (GP#2). It is our opinion that re-applying topsoil will provide benefits in water quality by accelerating the establishment of permanent vegetation and thereby minimizing sediment loads from erosion. It is also our opinion that preserving and re-applying topsoil will promote infiltration and absorption and thereby reduce volumes of run-off.

IFSMA's Board is comprised of civil engineers, planners, and city administrators. As a group, we have years of education and experience as floodplain managers and designers of stormwater management facilities. We understand that frequent small storm events (1 – 1.5 inches of rainfall) are the source of the majority of water that enters these facilities and ultimately, our rivers and tributaries. Residential lawns, typically sod on compacted soil, shed 30% to 40% of the stormwater that falls during a rain event.¹ If pre-development topsoil is stored on-site and re-applied on top of compacted soils, the re-applied topsoil will accelerate the establishment of a healthy layer of vegetation by virtue of site-specific organic material and nutrients, and the re-applied topsoil will retain more of its pre-development capacity for infiltrating and absorbing rainwater.

We have relied on stormwater management basins to retain and detain water, but their benefit to water quality is in question, and their storage volume is dependent on proper design and maintenance. Basins capture and slow down the release of water during storm events but they also can accumulate sediment from eroding land surfaces, which can result in diminished storage capacity. Without regular maintenance, debris can collect in these basins and clog intakes and outlets to the extent that basins can't function, which can result in localized flooding.

¹ Iowa Stormwater Management Manual Section 2C-4, Table 1, page 4



Iowa Floodplain and Stormwater Management Association
1860 Boyson Road
Hiawatha, Iowa 52233

Communities are utilizing pervious pavers and other engineered solutions that counter the impacts of rain on non-absorbent surfaces. We support the topsoil requirement because it utilizes an existing feature on the landscape that, when stored on-site and re-applied to disturbed areas:

- hastens the establishment of permanent vegetation, and
- has the potential to decrease runoff to rates to as low as 11% - 20%.²

IFSMA was formed with the support of the Iowa Legislature in response to floods of 1993 and 2008. Our support for a topsoil rule in Iowa's GP#2 is based on our opinion that this rule will advance State of Iowa objectives of minimizing flood damage and preserving water quality.

Respectfully,

Adrian Holmes, PE, CFM

Chairman

Iowa Floodplain and Stormwater Management Association

² Ibid

Schnieders, Adam [DNR]

From: matt McDermott [mcdermott_matt@hotmail.com]
Sent: Tuesday, July 15, 2014 9:13 AM
To: Schnieders, Adam [DNR]
Subject: General Permit #2

Hello Adam,

My name is Matt and I am involved with partners of duck creek watersheds in Scott county.

I recently was made aware that a meeting is scheduled to discuss removal of the 4" top soil requirement and replace it with federal language.

Please fight to keep the general permit #2 language of 4" topsoil requirement in place.

I believe Iowa waterways need improvements not setbacks. We all need to do our part to prevent run off, flooding and erosion control.

We can't continue to compromise the natural resources that we all share so that individuals can profit!!

Thank you for you

Sent from my iPhone

Schnieders, Adam [DNR]

From: Mary Sue Kislingbury [mskisingbury@gmail.com]
Sent: Tuesday, July 15, 2014 12:49 PM
To: Schnieders, Adam [DNR]
Subject: Against Proposed Change to Top Soil Requirements

Dear Mr. Schneiders,

When people buy new homes they expect that their lots will be "move-in ready." Removing these top soil requirements leaves home buyers vulnerable to the scruples of developers who are themselves vulnerable always to the bottom line. In my husband's and my situation we are dealing with damp foundation walls that are going to require amending the high clay content of our soil with good top soil. Please leave these requirements in place. There are many reasons to do so.

Thank you for your consideration.

Respectfully,

Mary Sue Kislingbury

Schnieders, Adam [DNR]

From: nelson morris [nbmorris63@gmail.com]
Sent: Tuesday, July 15, 2014 8:07 PM
To: Schnieders, Adam [DNR]
Subject: topsoil restoration

Sir, I understand that contractors want the four inch top soil replacement requirement cancelled. That would be a big mistake both because of the rain water runoff problem it would produce and because it's impossible to grow decent ground cover on clay! This should be considered to simply be a cost of doing business for builders. Thank you, Nelson Morris, 815 Pershing Blvd. Clinton, Iowa 52732

Schnieders, Adam [DNR]

From: Mdianekrejci@gmail.com
Sent: Friday, July 18, 2014 9:18 PM
To: Schnieders, Adam [DNR]
Subject: Topsoil restoration

I hope the 4 inch regulation on topsoil restoration is maintained.

Thank you.
M. Diane Krejci
Cedar Rapids, Iowa

Sent from my iPad

Schnieders, Adam [DNR]

From: Webmaster [DNR]
Sent: Sunday, July 20, 2014 12:35 PM
To: Schnieders, Adam [DNR]; Griffin, Joe [DNR]
Subject: Inquiry regarding topsoil for newly constructed homes.
Importance: High

We have had the following question come in via webmaster:

My husband and I bought a Jerry's home in 2005. We had never purchased a newly built home before. Since that time, we discovered that underneath a thin layer of sod with plastic netting we had no topsoil. I like gardening and I have put in several gardens by adding topsoil, but it feels like a hopeless job. After digging through the sod, tearing away the plastic netting and adding topsoil (over the past 9 years), I never seem to make any real progress with the clay. I had just put in another garden this summer and was planning on contacting both Jerry's homes and the DNR when my husband read an article in the paper requiring that builders leave topsoil. Is there any help for those of us who have no topsoil?

Can you please help with an answer/response?

Please note:

- We aim to answer all questions by COB on the same day.
- Answer can include contact information, such as an email or phone number.

Thank you so much in advance,

WEBMASTER sk



Iowa Department of Natural Resources
P 515.281.5918 | F 515.281.6794 | Webmaster@dnr.iowa.gov
502 E 9th Street | Des Moines, IA 50319

WWW.IOWADNR.GOV   

Leading Iowans in Caring for Our Natural Resources.

Katherine Guth
5375 Crow Creek Road
Bettendorf, IA 52722-5432
Kguth8110@msn.com
563-332-8110

Dear Governor Branstad,

Please do not let the DNR sell out to contractors regarding top soil retention. Of course contractors would rather make a few extra dollars selling it, but topsoil is one of Iowa's most valuable resources. It is crucial to watershed management and when it's gone, it's gone.

The small amount of up front expense to homeowners will be recouped many times over when they don't have to constantly try to amend clay to make it suitable for landscaping.

Homeownership is fraught with expenses: taxes, fees, maintenance, repairs. As hard hearted as it sounds, perhaps those who can't afford the modest up front cost of good land stewardship can't really afford to be homeowners.

Thank you.
With Warmest Regards,
Kathy Guth

Schnieders, Adam [DNR]

From: April Shindelar [April.Shindelar@intlfcstone.com]
Sent: Wednesday, August 20, 2014 12:35 PM
To: todd.dorman@sourcemedi.net; Schnieders, Adam [DNR]
Cc: ashindelar13@gmail.com
Subject: Topsoil/clay soil issues in new development

Hello,

I have been doing research and trying to find out if homeowners in new developments have any rights when it comes to the removal of top soil when buying a newly built home. I purchased a home from Classic Builders of Iowa back in April of this year in a new development called Woods of Copper Creek on the NE side of Des Moines. It has been brought to my attention, and I have seen it with my own eyes watching them continue to build new homes in the development, that top soil is removed, rolled up and taken away to be sold. Homeowner sod is then laid on top of hard, compacted, rock filled clay which has caused me, and other neighbors costly watering & fertilizing, in which the sod dries up almost as soon as the sprinkler is turned off or a good rainfall ends. In turn this obviously causes extremely high water bills. I even have to pre-soak spots in my yard because trying to put a metal/steel staked sprinkler head into the ground is like trying to penetrate through concrete and it has actually broke several of the sprinklers that I have bought so I am now going to have to buy more expensive ones that do not have to penetrate into the ground. I have an FHA loan which requires the builder to have the sod put in by closing day and they are required guarantee the sod to be free of termites, but do we have any rights as far as the high costs, we the consumer face, once purchasing a home with sod laid over this horrible clay and no top soil??? Any areas of sod that have a heavy rock mixture in the clay soil, turn brown and go dormant almost overnight over time, which I have also had happen. Why is this something that is not required to be disclosed to the consumer?

If there is anything that can be done or anyway for this to be brought to attention or protested in anyway, I am happy to do so and I am sure I can get neighbors on board as they are also frustrated with the issue they weren't aware of until starting their lawn care after purchase of their homes.

Thanks,

April Shindelar
Business Solutions Specialist

INTL[®] FCStone[®]

2829 Westown Pkwy, Ste. 100 / West Des Moines, IA 50266 USA

Direct Office: (515) 223-3779

Email: april.shindelar@intlfcstone.com

Web: www.fcstone.com

Schnieders, Adam [DNR]

From: Serio, Melissa [DOT]
Sent: Wednesday, August 27, 2014 12:44 PM
To: Schnieders, Adam [DNR]
Cc: Griffin, Joe [DNR]
Subject: Iowa DOT comments on topsoil preservation and GP2
Attachments: 20140827123115797.pdf

Adam,

Please see attached letter for Iowa DOT comments on topsoil preservation and NPDES General Permit No. 2.

We appreciate the opportunity to provide comments and thank you for taking them into consideration.

Melissa A. Serio, P.E.
Earthwork Field Engineer
Office of Construction & Materials
Iowa Department of Transportation
800 Lincoln Way
Ames, IA 50010
(515) 239-1280



www.iowadot.gov

Office of Construction and Materials/Project Delivery Bureau
800 Lincoln Way, Ames, Iowa 50010
Phone: 515-239-1280 | Email: Melissa.Serio@dot.iowa.gov

August 27, 2014

Mr. Adam Schnieders
Iowa Department of Natural Resources
Wallace State Office Building
502 E. 9th St.
Des Moines, IA 50319-0034

RE: Topsoil Preservation Requirements in Storm Water Construction General Permit No. 2

Dear Mr. Schnieders:

The Iowa Department of Transportation (IDOT) respectfully submits the following comment related to topsoil preservation requirements in the current NPDES General Permit No. 2 (GP2):

The IDOT performs geotechnical soil borings on many projects, but it is our understanding that information provided from these borings would not meet the definition of a soil survey. As such, the DOT has taken a conservative approach and established an absolute minimum of 4-inches of topsoil replacement on disturbed areas. If not enough topsoil is available to meet the absolute minimum standard after stripping and salvaging, the remaining balance of topsoil is purchased and provided from an off-site location. Also, if sufficient topsoil can be generated from the project, it's the IDOT's preferred practice to cover all disturbed areas of the final template, other than pavement and shoulders with 8-inches of topsoil. This topsoil is obtained from stripping 12-inches of material.

The IDOT also provides the following comments in response to the Executive Order 80 topsoil preservation stakeholder group proposal (as submitted for discussion at the July 15, 2014 Environmental Protection Commission (EPC) meeting):

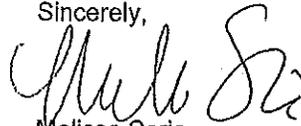
1. The IDOT supports including definition for infeasible.
2. The following statement in the proposal should not be included if the intent is to address only the topsoil preservation requirement in the permit:

The permittee(s) shall control stormwater volume and velocity to minimize soil erosion in order to minimize pollutant discharges and shall control stormwater discharges, including both peak flowrates and total stormwater volume, to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points.

3. The IDOT is concerned whether the proposed language requires an affidavit. Since this item is likely only relevant to MS4 communities, we recommend including it in MS4 permits or city ordinances and not in GP2.
4. The IDOT has concerns with the general language of "preserve topsoil" as there are instances on IDOT projects where topsoil is not stripped in fill areas because there is enough topsoil stripped from cut areas to spread a final thickness of 8-inches over disturbed areas. The IDOT would support one of the suggestions made at the July 15, 2014 EPC meeting by some members of the stakeholder group to include a range or add the term "average" to better accommodate challenges associated with uniform topsoil spreading.

Additionally, based on stakeholder meeting minutes and discussion at the July 15, 2014 EPC meeting, discussion appears to have revolved around residential construction, with no mention of linear projects. We echo comments made by MidAmerican Energy Company and would welcome the opportunity to participate in a stakeholder group that more fully represents GP2 permit holders in Iowa.

Sincerely,



Melissa Serio
Earthwork Engineer

MS:ms

Schnieders, Adam [DNR]

From: Dechant, David M. [David.Dechant@hdrinc.com]
Sent: Monday, August 04, 2014 8:47 AM
To: Schnieders, Adam [DNR]
Subject: Developers Replacing Topsoil Issue
Attachments: Soil Restoration TM 07-30-14 with Appendices.pdf; Spring Lake Soil Restoration Spec - SECTION 02923.docx

Adam,

See attached information on Soil Restoration from the Omaha CSO program. Contrary to Iowa residential developer interests, people are starting to pay attention to and restoring soil quality post construction for any number of benefits in doing so.

Regards,
Dave D

From: Aurit, Scott A.
Sent: Friday, August 01, 2014 2:41 PM
To: WPG-Wet Weather Regulatory; WPG-Wet Weather Regulatory-2; WPG-Stormwater
Cc: Driscoll, Christine M.; Wittmann, Michaella
Subject: Omaha CSO Specification for Surface Restoration/Soil Amendment

A new spec for Omaha CSO on Soil Conditioning. We are using this most specifically for areas with green infrastructure or areas that were over compacted during construction by equipment. There is a TM that accompanies the specification as to purpose. This was driven by using the Envision system for restoring disturbed soils, especially in the Midwest with high clay content.

Scott A. Aurit, P.E.
D [402.926.7082] M [402.575.1617]

hdrinc.com/follow-us

SECTION 02923

SOIL PREPARATION - DEEP CULTIVATION

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Remove soil compaction and condition soil by shattering soil, providing soil amendments and pulverizing the upper layer of soil.

PART 2 - PRODUCTS

2.1 MATERIALS

- B. Organic Compost
 - 1. Oma-Gro as produced by the City of Omaha's compost facility located at 15705 Harlan Lewis Road, Bellevue, Nebraska 68123, Phone: (402)444-6655 or approved equivalent.
 - 2. Contractor shall verify product availability and shall be responsible for procuring material if not available from the City of Omaha's compost facility.

2.2 EQUIPMENT

- A. Deep soil shattering shall be accomplished using a subsoiler capable of shattering the soil to a minimum 6-inch depth. The subsoiler shall have a minimum of three high-life wing shanks set at a maximum horizontal spacing of 30 inches. Two of the shanks shall be set in line with the power unit's wheels/tracks to remove any soil compaction related to the soil shatter operations. An agricultural disk, chisel plow or bulldozer with ripper shall not be used for deep soil shattering.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare areas shown to receive deep cultivation by removing topsoil according to Standard Specification 801.
- B. Complete grading operations within areas to receive deep cultivation in accordance with the Drawings.

3.2 DEEP CULTIVATION

- A. Perform deep soil shattering with spacing on implement shanks set so that subsoil between shanks is fully shattered at the 6-inch depth. Soil shattering operations shall not be performed if soils are frozen, wet, or muddy.

- B. Upon completion of subsoil operations, spread topsoil evenly on designated areas to a depth, which after settlement and compaction, shall be three (3) inches, unless otherwise directed by Construction Manager. Thoroughly till entire area to a depth of no less than 8 inches to fully break up soil clods and till topsoil into upper 8 inches of soil. Do not undertake operation if organic material or subgrade is frozen.
- C. After topsoil placement and tillage, amend all areas to receive deep cultivation by placing a minimum two-inch depth of organic matter to full extent of the area. Thoroughly till entire area to a depth of no less than eight inches to fully break up soil clods and provide uniform planting bed of pulverized soil ready to receive seed. Do not undertake operation if organic material or subgrade is frozen.
- D. If compaction occurs within deep cultivated areas after tilling operations are complete, the Contractor shall loosen soils within the compacted areas utilizing a rotary device capable of reaching a depth of eight inches below the surface.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

- A. Construction Manager shall measure deep cultivated soil preparation for payment by the number of square yards cultivated, furnished, installed, and accepted.
- B. Payment will be made as defined in Specification 1065 unless otherwise indicated in the Contract Documents.

4.2 BID ITEM COVERED WITHIN SPECIFICATION

<u>Description</u>	<u>Unit</u>
Soil Preparation – Deep Cultivation	Square Yard

END OF SECTION

TECHNICAL MEMORANDUM

Implementation of Soil Restoration as a Soil Preparation Process for Omaha CSO! Projects

TO: CSO! Projects Teams
Program Management Team (PMT)

FROM: Mike McMeekin and Lauren Goecke, Lamp Rynearson &
Associates, Inc.

DATE: July 30, 2014

Introduction

In January 2012, the Institute for Sustainable Infrastructure (ISI) started its Envision™ rating system as a new way for projects to be evaluated and recognized for their consideration and implementation of more sustainable practices that benefit the community, environment, infrastructure, and economy. Section NW3.3 of the Envision™ supporting document, included in Appendix A, covers the category of restoring disturbed soils to conditions prior to construction or prior to development of the area. Envision™ was adopted by the CSO program to assist in the development of sustainability strategies for CSO projects. The City of Omaha's Regional Stormwater Design Manual specifically outlines a recommended minimum procedure in Chapter 8.6.9 on Soil Conditioning, included in Appendix B. The CSO Spring Lake Park Project Team went so far as to develop a detailed specification, included in Appendix C, on Deep Cultivation to be used on certain areas of the project.

Purpose

The purpose of this technical memorandum (TM) is to recommend program-wide guidelines for implementing soil restoration on Omaha CSO! projects.

What is Soil Restoration?

Soil restoration, preservation, conditioning, and deep cultivation are different ways to refer to the post-construction management of soil quality and characteristics. Even the slightest disturbance of a vegetated area can compromise the ability of soil to retain its nutrients, allow vegetation to grow, and absorb rainfall. The minimum requirement of the Envision™ rating system for soil restoration is that projects should restore the quality of the soil to what it was before construction. This minimum requirement was adopted by the PMT during the PMT review of expectations for Envision. Beyond the rating system, regulating authorities are starting to set more specific guidelines for projects to conduct soil restoration at the end of construction activities.

City of Omaha Regional Stormwater Design Manual - 8.6.9 Soil Conditioning

The City of Omaha advises to conduct "soil conditioning" on applicable projects to help minimize runoff from the entire project area. The soil conditioning allows the soil to absorb

greater portions of runoff, which reduces the need to provide water quality treatment downstream. This is because the soil conditioning returns the soil to a state that allows quicker establishment of vegetation and improved ability to sustain a resilient root system for the vegetation.

The areas that have the highest potential for soil conditioning have characteristics including flat slopes, separation from tree canopies, and a ground surface that is more than 1.5 feet above the water table. The conditioning should not be conducted in damp or frozen conditions, existing vegetation should be removed prior, and a minimum depth of six inches should be tilled and have compost incorporated. The size of the area can also have a significant impact on the construction techniques used for soil conditioning, with larger areas allowing the use of larger equipment.

Spring Lake Park Section 02923 – Soil Preparation – Deep Cultivation

The project team for Spring Lake Park developed a specification referred to as "Soil Preparation - Deep Cultivation." In this specification deep cultivation involves "shattering" a minimum depth of 16 inches of soil adding two inches of compost that is tilled into the top eight inches, and re-tilling the top eight inches should the area need to be compacted. Section 8.6.9 of the City of Omaha Stormwater Design Manual recommends tilling three inches of compost into the top six inches of soil, without the requirement for the 16 inch deep cultivation. The deep cultivation requires specialized equipment that may not be readily available on typical CSO projects and may significantly increase the cost of the Soil Preparation - Deep Cultivation. The Spring Lake Park plans designate 2,149 square yards in low slope open areas on the north side of the park to receive the soil preparation. The project has not been bid yet but the estimated price per square yard for deep cultivation was \$1.50.

How Will the Implementation of Soil Restoration Affect CSO Projects?

Ecologically

1. Soil restoration keeps soil in developed areas and areas impacted by construction from becoming too compacted and replenishes the natural nutrients in the soil. This will provide the CSO projects with a good base for vegetation to be established better and quicker. This would also help the projects reach 70% vegetation cover, which is required by the NPDES permit to close out the project.
2. The established vegetation will slow the movement of runoff and the less compacted soil will allow the runoff to infiltrate quicker. This will minimize the effects of erosion and help improve downstream water quality.
3. Well established vegetation and less erosion will also extend the longevity of the soil.

Economically

1. Depending on the specification used for soil conditioning, the contractor may need additional equipment and material that will increase the initial cost of the project.
2. The potential for quicker establishment of vegetation could provide monetary benefits through reduced maintenance costs.

3. The absorptive ability of conditioned soil can help reduce rilling and sediment transport during smaller, more frequent rain events. This can reduce the amount of re-grading and re-seeding required.
4. The possible acceleration of vegetative growth can lead to a shorter NPDES permit period, which can save money on the performance of compliance inspections.

Recommendations

1. The Project Team should be provided guidance on soil conditioning in order to help identify areas where the practice should be applied.
2. The Project Team should focus on evaluating critical areas for soil conditioning such as construction staging areas, construction access routes, parks, boulevard medians, bio-retention cells, open space, etc.
3. A revised version of the Spring Lake Park specification should be utilized as the program standard. One of the recommended changes to the specification is that the depth of cultivation be decreased to 6 inches, according to the City of Omaha Stormwater Design Manual. This would help lower costs by allowing more readily available construction equipment to be used.

Appendix A

Institute for Sustainable Infrastructure Envision™ Guidance Manual Section NW3.3 Restore Disturbed Soils

NW3.3 RESTORE DISTURBED SOILS

INTENT:

Restore soils disturbed during construction and previous development to bring back ecological and hydrological functions.

LEVELS OF ACHIEVEMENT

IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE
			<p>(8) Construction restoration. Restore 100% of soils disturbed during construction in the site's vegetated area. Soils must be reused for functions comparable to their original function (i.e., topsoil is used as topsoil, subsoil as subsoil, or subsoil is amended to become functional topsoil). (A)</p>	<p>(10) Previous development restoration. Restore 100% of soils disturbed as a result of previous development. Soils must be reused for functions comparable to their original function (i.e., topsoil is used as topsoil, subsoil as subsoil, or subsoil is amended to become functional topsoil). (B)</p>

DESCRIPTION

Restoring soils disturbed during construction in areas that will be re-vegetated (all areas surrounding the constructed works) improves the soil's ability to support healthy plants, biological communities, water storage, and water infiltration. Previously developed sites may also benefit from soil restoration.

ADVANCING TO HIGHER ACHIEVEMENT LEVELS

Benchmark. Soil restoration only to the extent required by regulations and construction permits.

Performance Improvement. Restoration of soils disturbed during the construction of the project, extended to restoration of soils disturbed during previous development.

EVALUATION CRITERIA AND DOCUMENTATION

A. Have 100% of soils disturbed during construction been restored and reused properly?

1. Documentation of soil restoration activities, areas of disturbance, and areas restored.
2. Calculations showing that 100% of disturbed soils have been restored.
3. Documentation of soil reuse.

B. Have 100% of soils disturbed by previous development, been restored and reused properly?

1. Documentation of soil restoration activities, areas of disturbance, and areas restored.
2. Calculations showing that 100% of disturbed soils have been restored.
3. Documentation of soil reuse.

SOURCES

- Adapted from The Sustainable Sites Initiative: Guidelines and Performance Benchmarks 2009, Prerequisite 7.2: Restore soils disturbed during construction, Credit 7.3: Restore soils disturbed by previous development.

RELATED CREDITS

- NW1.1 Preserve Prime Habitat
- NW1.5 Preserve Floodplain Functions
- NW1.6 Avoid Unsuitable Development on Steep Slopes
- NW3.1 Preserve Species Biodiversity

Appendix B

**City of Omaha
Regional Stormwater Design Manual
Section 8.6.9 Soil Conditioning**

Advantages	Disadvantages
Reduces runoff peaks and volumes for small storm events and the initial rainfall of larger events.	Compost must meet specifications or performance may be diminished
Simple design, construction, and maintenance	If compaction occurs on soil conditioned area performance will be diminished
Encourages healthy plant growth	Cannot be used to control runoff from off-site areas.
Increases biological diversity and activity in the soil complex	

- Step 1 – Ensure site conditions are dry prior to beginning the soil conditioning process to
- Step 2 – Remove existing vegetation, including turf, and till the ground to a minimum depth
- Step 3 – Place a 3-
- Step 4 – Fine grade the site with minimum equipment passes (no more than two (2) passes)
- Step 5 – Firm soil using one pass of a 50-
- Step 6 – Establish vegetative cover immediately after finish grading and take steps to prevent
must be understood (i.e. – there may be a short period of plant stress due to nutrient cycling
- Step 7 – A management plan is required in the PCSMP for all areas that have undergone soil

Appendix C

**Spring Lake Park Project
Official Specification
Section 02923 – Soil Preparation –
Deep Cultivation**

SECTION 02923

SOIL PREPARATION - DEEP CULTIVATION

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Remove soil compaction and condition soil by shattering soil, providing soil amendments and pulverizing the upper layer of soil.

PART 2 - PRODUCTS

2.1 MATERIALS

- B. Organic Compost
 - 1. Oma-Gro as produced by the City of Omaha's compost facility located at 15705 Harlan Lewis Road, Bellevue, Nebraska 68123, Phone: (402)444-6655 or approved equivalent.
 - 2. Contractor shall verify product availability and shall be responsible for procuring material if not available from the City of Omaha's compost facility.

2.2 EQUIPMENT

- A. Deep soil shattering shall be accomplished using a subsoiler capable of shattering the soil to a minimum 6-inch depth. The subsoiler shall have a minimum of three high-life wing shanks set at a maximum horizontal spacing of 30 inches. Two of the shanks shall be set in line with the power unit's wheels/tracks to remove any soil compaction related to the soil shatter operations. An agricultural disk, chisel plow or bulldozer with ripper shall not be used for deep soil shattering.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare areas shown to receive deep cultivation by removing topsoil according to Standard Specification 801.
- B. Complete grading operations within areas to receive deep cultivation in accordance with the Drawings.

3.2 DEEP CULTIVATION

- A. Perform deep soil shattering with spacing on implement shanks set so that subsoil between shanks is fully shattered at the 6-inch depth. Soil shattering operations shall not be performed if soils are frozen, wet, or muddy.

- B. Upon completion of subsoil operations, spread topsoil evenly on designated areas to a depth, which after settlement and compaction, shall be three (3) inches, unless otherwise directed by Construction Manager. Thoroughly till entire area to a depth of no less than 8 inches to fully break up soil clods and till topsoil into upper 8 inches of soil. Do not undertake operation if organic material or subgrade is frozen.
- C. After topsoil placement and tillage, amend all areas to receive deep cultivation by placing a minimum two-inch depth of organic matter to full extent of the area. Thoroughly till entire area to a depth of no less than eight inches to fully break up soil clods and provide uniform planting bed of pulverized soil ready to receive seed. Do not undertake operation if organic material or subgrade is frozen.
- D. If compaction occurs within deep cultivated areas after tilling operations are complete, the Contractor shall loosen soils within the compacted areas utilizing a rotary device capable of reaching a depth of eight inches below the surface.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

- A. Construction Manager shall measure deep cultivated soil preparation for payment by the number of square yards cultivated, furnished, installed, and accepted.
- B. Payment will be made as defined in Specification 1065 unless otherwise indicated in the Contract Documents.

4.2 BID ITEM COVERED WITHIN SPECIFICATION

<u>Description</u>	<u>Unit</u>
Soil Preparation – Deep Cultivation	Square Yard

END OF SECTION