

Soil Quality Restoration on Existing Turf

Landowner Name: _____ Date of Soil Quality Restoration: _____

Address: _____

Square footage of area treated _____ (Please attach map of area treated)

Depth of Aeration _____ Source of Compost _____

Tons/Cubic Yards of Compost Applied _____ Average Depth of Compost Applied _____

Was supplemental seeding applied? Circle Yes or NO

Reason for supplemental seeding (patchy grass, dead spots, etc.) _____

Is the supplemental seeding mix compatible with the existing turf grass? Circle Yes or No

If supplemental seeding was applied, what was the seeding rate and what was planted?

Notes: _____

Soil Quality Restoration Steps:

1. Soil Quality Restoration is typically completed during the spring and fall. Avoid summer applications when compost can burn the grass.
2. Contact Iowa One Call to have utilities marked. Locate and mark private utilities, sprinklers, underground pet fencing, etc.
3. Mow existing vegetation to a height of approximately 2-3 inches. (Avoid mowing if there is a risk of frost.)
4. Aerate to a depth of 4 inches (6 to 9 inches preferred).
5. Based on site conditions, apply ½-3/4 inch compost blanket over the mowed area. Grass should be poking through the compost application. If grass isn't showing, pull grass through compost layer with rake until you can see grass.
6. If needed, apply seed as specified or incorporate seed into the compost blanket if using a pneumatic blower. If supplemental seeding is applied, water twice daily (morning and evening) until vegetation is established.

I certify that soil quality restoration was done according to the information/steps above.

Landscaper Name and Company _____

Soil Quality Restoration (SQR) on Undisturbed Sites.**Method 1**

Method 1 is intended to preserve areas determined to have a healthy uncompacted A-horizon to a depth of at least 8 inches with a B and C horizon that appear to be intact. Prior to any site design, available information shall be reviewed to determine existing soil conditions. Geotechnical studies, coring, soil pits or other soil tests shall be performed on-site as needed to document the health of the soil and the ability to absorb the water quality volume.

Applicant _____ Date _____

Submitted by _____ Location _____

1. Attach copy of Soil Management Plan including site and soil maps.
2. What is the size of the SQR area in square feet? _____
3. Please attach documentation describing existing soil conditions.

10,000 square feet: Take 1 core per 1,000 square feet
 10,000-20,000 square feet: Take 1 core per 2,500 square feet
 20,000-43,560 square feet: Take 1 core per 5,000 square feet

Provide a lab analysis or follow these guidelines:

- a. Is there 8 inches of dark brown to black soil? ___yes ___no
 (If yes, 2% Organic Matter criteria is met.)
- b. After a ribbon test, does the ribbon break off at 1" of length? ___yes ___no
 (If yes, 25% clay content or less is met.)
- c. Does the soil break up into granules resembling cake crumbs or small curd cottage cheese?
 ___yes ___no
 (If yes, granular soil structure exists and the bulk density criteria is met.)
- d. Is the B Horizon (layer below topsoil) light brown to yellowish? yes___ no___
 (If yes, non-hydric soils and separation from high water table exist.)

4. Identify how the area to be preserved will be protected from compaction. (i.e. construction fence)
Include the locations of methods on a map.

5. Describe the erosion and sediment control measures used to protect the soil quality restoration area until vegetation is established.

FOR REVIEWERS USE ONLY

Design appears to comply with applicable design standards, and local, state, and federal requirements.

Design does not appear to comply with applicable design standards, and local, state, and federal requirements.

Comments: _____

Name of Reviewer: _____ Date: _____

Signature: _____

Soil Quality Restoration (SQR) on Undisturbed Sites

Method 2

Method 2 is intended to preserve undisturbed areas that have intact A, B, and C Horizons where the topsoil may never have developed to a depth of 8 inches but due to good soil structure and adequate porosity have a Hydrologic Soil Group of A or B and have percolation rates of 1 inch or more per hour. Method 2 is typically intended for sandy or timber soils.

Applicant _____ Date _____

Submitted by _____ Location _____

1. Attach copy of soil management plan including site and soil maps.

2. What is the size of the SQR area in square feet? _____

3. Please attach documentation describing existing soil conditions.

- 10,000 square feet: Take 1 core per 1,000 square feet
- 10,000-20,000 square feet: Take 1 core per 2,500 square feet
- 20,000-43,560 square feet: Take 1 core per 5,000 square feet

Provide a lab analysis or follow these guidelines:

- a. What is the depth of dark brown to black topsoil? _____
- b. After a ribbon test, does the ribbon break off at 1" of length? ___yes ___no
(If yes, 25% clay content or less is met.)
- c. Does the soil break up into granules resembling cake crumbs or small curd cottage cheese?
___yes ___no
(If yes, granular soil structure exists and the bulk density criteria is met.)
- d. Is the B Horizon (layer below topsoil) light brown to yellowish? yes___ no___
(If yes, non-hydric soils and separation from high water table exist.)

4. Identify how the area to be preserved will be protected from compaction. (i.e. construction fence)
Include the locations of methods on a map.

5. Describe the erosion and sediment control measures used to protect the soil quality restoration area until vegetation is established.

FOR REVIEWERS USE ONLY

Design appears to comply with applicable design standards, and local, state, and federal requirements.

Design does not appear to comply with applicable design standards, and local, state, and federal requirements.

Comments: _____

Name of Reviewer: _____ Date: _____

Signature: _____

Soil Quality Restoration (SQR) for Disturbed Sites

Method 3

Method 3 is intended for sites that have eight or more inches of topsoil present, but soils have been compacted by land disturbing activities. The goal is to recreate a healthy soil profile through tillage on areas that have been severely disturbed by construction activities.

Applicant_____ Date_____

Submitted by_____ Location_____

1. Attach copy of Soil Quality Management Plan including site and soil maps. (Include statement on the condition of the soil when tillage is to be performed.)
2. What is the size of the SQR area in square feet? _____
3. Please attach documentation describing existing soil conditions. (including depth of compacted topsoil)

10,000 square feet: Take 1 core per 1,000 square feet
 10,000-20,000 square feet: Take 1 core per 2,500 square feet
 20,000-43,560 square feet: Take 1 core per 5,000 square feet

Provide a lab analysis or follow these guidelines:

- a. Is there 8 inches of dark brown to black soil? ___yes ___no
(If yes, 2% Organic Matter criteria is met.)
- b. After a ribbon test, does the ribbon break off at 1" of length? ___yes ___no
(If yes, 25% clay content or less is met.)
- c. Is the B Horizon (layer below topsoil) light brown to yellowish? yes___ no___
(If yes, non-hydric soils and separation from high water table exist.)

4. Identify the depth of tillage and type of tillage tools to be used. Attach photos of tillage tool(s) to be used. _____

5. Provide a copy of the planting plan with quantities of seed or plants used and a listing of species and rates applied. _____

6. Describe the erosion and sediment control measures used to protect the soil quality restoration area until vegetation is established. _____

FOR REVIEWERS USE ONLY

Design appears to comply with applicable design standards, and local, state, and federal requirements.

Design does not appear to comply with applicable design standards, and local, state, and federal requirements.

Comments: _____

Name of Reviewer: _____ Date: _____

Signature: _____

Soil Quality Restoration (SQR) for Disturbed Sites

Method 4

Method 4 is intended for sites where 8 inches of topsoil is present. Prior to construction, topsoil is stripped and stockpiled. After construction, topsoil is respread, so there is 8 inches of uncompacted topsoil over the site. Tillage will be performed as necessary to address excessive compaction.

Applicant _____ Date _____

Submitted by _____ Location _____

1. Attach copy of Soil Quality Management Plan including site and soil maps.
2. What is the size of the SQR area in square feet? _____
3. Please attach documentation describing existing soil conditions.

10,000 square feet: Take 1 core per 1,000 square feet
 10,000-20,000 square feet: Take 1 core per 2,500 square feet
 20,000-43,560 square feet: Take 1 core per 5,000 square feet

Provide a lab analysis or follow these guidelines:

- a. Is there 8 inches of dark brown to black soil? ___yes ___no
(If yes, 2% Organic Matter criteria is met.)
- b. After a ribbon test, does the ribbon break off at 1" of length? ___yes ___no
(If yes, 25% clay content or less is met.)
- c. Does the soil break up into granules resembling cake crumbs or small curd cottage cheese?
___yes ___no
(If yes, granular soil structure exists and the bulk density criteria is met.)
- d. Is the B Horizon (layer below topsoil) light brown to yellowish? yes___ no___
(If yes, non-hydric soils and separation from high water table exist.)

4. Identify areas on a map where topsoil will be stripped and stockpiled. Also include erosion and sediment control measures used to protect stockpile.

5. Identify the depth of the topsoil layer to be stripped and replaced.

6. Identify the depth of tillage and type of tillage tool(s) to be used to ensure 8" of decompacted topsoil after respread. Attach photos of tillage tool(s) to be used.

7. Provide calculations and quantities of topsoil to be stockpiled and respread:

____ Depth of topsoil (in feet) [For example: 8" of topsoil = 8"/12" = 0.67 ft of topsoil]

____ Depth of topsoil (in feet) x ____ SF of treated area = ____ CF of topsoil

____ CF of topsoil / 27 cf/cy = ____ CY of topsoil

____ CF of topsoil x 90 lbs/cf = ____ lbs of topsoil/2,000 lbs/ton = ____ tons of topsoil

8. Provide a copy of the planting plan with quantities of seed or plants used and a listing of species and rates applied. _____

9. Describe the erosion and sediment control measures used to protect the soil quality restoration area until vegetation is established. _____

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Design appears to comply with applicable design standards, and local, state, and federal requirements.

Design does not appear to comply with applicable design standards, and local, state, and federal requirements.

Comments: _____

Name of Reviewer: _____ Date: _____

Signature: _____

Soil Quality Restoration (SQR) for New Lawns:

Use this checklist when SQR will be used to improve the soils on site and provide credit to manage the water quality volume from adjacent impervious surface areas

Method 5

The goal of Method 5 is to create an 8 inch thick healthy profile through a combination of tillage and respread of topsoil. Method 5 combines 4-7 inches of topsoil and tillage to achieve an 8 inch soil profile depth. Method 5 requires a minimum of 4 inches of topsoil being respread. Tillage depth varies between 1-4 inches depending on depth of topsoil spread. *Runoff must be distributed evenly across the SQR area if SQR area will be used to manage the water quality volume from adjacent impervious surfaces.*

Applicant _____ Date _____

Submitted by _____ Location _____

1. Attach copy of Soil Quality Management Plan including site and soil maps.
2. What is the size of the SQR area in square feet? _____
3. What is the drainage area flowing onto the SQR area? (Include the SQR area)

(The drainage area may need to be divided into multiple subwatersheds in order to ensure that the runoff will be distributed evenly as sheet flow over SQR areas.)

_____ AC _____ SF _____ % Impervious

4. How will runoff be distributed evenly as sheet flow over the SQR area?

5. Please attach documentation of existing soil conditions including description of topsoil to be used and *percent of organic matter present from lab analysis.*

Table: Recommended tillage and topsoil depths for soil quality restoration to achieve an 8-inch deep healthy soil profile.

Method	Initial Tillage Depth of Subsoil (inches)	Topsoil Depth
5	1	7
5	2	6
5	3	5
5	4	4

6. Identify depth of tillage and type of tillage tool(s) to be used. Attach photos of tillage equipment to be used. _____

7. Provide the calculations and quantities of materials applied as amendments

Topsoil:

____ Depth of topsoil (in feet) [For example: 4" of topsoil = 4"/12" = 0.33 ft of topsoil]

____ Depth of topsoil (in feet) x ____ SF of treated area = ____ CF of topsoil

____ CF of topsoil / 27 cf/cy = ____ cy of topsoil needed

____ CF of topsoil x 90 lbs/cf = ____ lbs of topsoil/2,000 lbs/ton = ____ tons of topsoil needed

8. Provide a copy of the planting plan with quantities of seed or plants used and a listing of species and rates applied. _____

9. Describe the erosion and sediment control measures used to protect the soil quality restoration area until vegetation is established. _____

10. If the area being treated with Soil Quality Restoration will give credit for managing runoff from impervious surfaces show calculations for determining that the storage capacity of the treated area meets or exceeds the water quality volume (WQv), please complete the following items. Please attach your calculations. (See example at end of document.)

Input from Table 6:

- a. _____ % Organic Matter by weight (See example at end to convert % Organic Matter from your lab analysis to % Organic Matter by Weight)
- b. _____ Available Water Storage (in/8 in soil)

Input from Table 8:

- c. _____ Excess Water Storage (Subtract 1.25 inches from Available Water Storage above)
- d. _____ List factor used to determine maximum impervious area to be treated

*(If you need to extrapolate excess water volume to determine the factor in Table 8, divide Excess Water Storage inches by 1.1875 to get factor to determine maximum impervious areas to be treated. For example, 0.5 inches/1.1875 = 0.42.)

11. How many square feet of impervious surface can be managed by the Soil Quality Restoration area.
_____ (Multiply available SQR area x factor = sq ft of impervious surface site can manage)

12. Provide a copy of the planting plan with quantities of seed or plants used and a listing of species and rates applied. _____

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Design appears to comply with applicable design standards, and local, state, and federal requirements.

Design does not appear to comply with applicable design standards, and local, state, and federal requirements.

Comments: _____

Name of Reviewer: _____ Date: _____

Signature: _____

Example: Assume Method 5 will use 4 inches of tillage and 4 inches of topsoil.

Tillage Layer:

4"/12" = 0.33' deep x 1' wide x 1' long = 0.33cf

0.33cf x 90 lbs (assume subsoil) = 29.7 lbs/cf or 30 lbs/cf of subsoil

Topsoil Layer:

4"/12" = 0.33' deep x 1' wide x 1' long = 0.33cf

= 0.33cf x 80 lbs/cf (assume topsoil) = 26.4 lbs/cf

30 lbs/cf + 26 lbs/cf = 56 lbs/cf for total 8 inch soil profile

26lbs/cf / 56 lbs/cf = 46% for topsoil layer

If lab analysis shows 2% Organic Matter:

46% x **2% organic matter** = 0.92% organic matter by weight

At 1% organic matter by weight, then available water storage is **1.03 in/ 8 in soil**. **No excess water storage available to address impervious surface runoff.**

If lab analysis shows 3% Organic Matter:

46% x **3% organic matter** = 1.38% organic matter by weight

At 1.38% organic matter by weight, then available water storage is **1.15 in/ 8 in soil**. **No excess water storage available to address impervious surface runoff.**

(1.33-1.03 = 0.30 /10 = 0.03 per each 0.1)

1.0 = 1.03 in/8 in soil

1.1=1.06 in/8 in soil

1.2 = 1.09 in/8 in soil

1.3 = 1.12 in/8 in soil

1.4 = 1.15 in/8 in soil

1.5 = 1.18 in/8 in soil

1.6 = 1.21 in/8 in soil

1.7 = 1.24 in/8 in soil

1.8 = 1.27 in/8 in soil

1.9 = 1.3 in/8 in soil

2.0 = 1.33 in/8 in soil

If lab analysis shows 4% Organic Matter:

46% x **4% organic matter** = 1.84% organic matter by weight

At 1.84% organic matter by weight, **then available storage is 1.27 in/8 in soil**. 1.27" -1.25" = 0.02" of excess storage
0.02 inches of excess water storage volume / 1.1875 = 0.02 factor x 10,000 square feet = 200 sq ft. Therefore, the SQR area in this example can manage the WQv for 200 sq ft of upstream impervious surface area.

If lab analysis shows 5% Organic Matter:

46% x **5% organic matter** = 2.3% organic matter by weight, then available storage is 1.42

1.42 inches – 1.25 inches = 0.17 inches of excess water storage

0.17 inches of excess water storage volume / 1.1875 = 0.14 factor

0.14 factor x 10,000 sq ft of SQR area = 1,400 sq ft. Therefore, the SQR area in this example can manage the WQv for 1400 sq ft of upstream impervious surface area.

Soil Quality Restoration (SQR) for New Lawns:

Use this checklist when SQR will be performed to improve the soils on site. No credit is given to manage runoff from impervious surface areas.

Method 5

The goal of Method 5 is to create an 8 inch thick healthy profile through a combination of tillage and respread of topsoil. Method 5 combines 4-7 inches of topsoil and tillage to achieve an 8 inch soil profile depth. Method 5 requires a minimum of 4 inches of topsoil being respread. Tillage depth varies between 1-4 inches depending on depth of topsoil spread.

Applicant _____ Date _____
 Submitted by _____ Location _____

1. Attach copy of Soil Quality Management Plan including site and soil maps.
2. What is the size of the SQR area in square feet? _____
3. Please attach documentation of existing soil conditions including description of topsoil to be used.

Table: Recommended tillage and topsoil depths for soil quality restoration to achieve an 8-inch deep healthy soil profile.

Method	Initial Tillage Depth of Subsoil (inches)	Topsoil Depth
5	1	7
5	2	6
5	3	5
5	4	4

4. Identify depth of tillage and type of tillage tool(s) to be used. Attach photos of tillage equipment to be used. _____

5. Identify depth of topsoil planned. _____

6. Provide the calculations and quantities of materials applied as amendments

Topsoil:

____ Depth of topsoil (in feet) [For example: 4" of topsoil = 4"/12" = 0.33 ft of topsoil]

____ Depth of topsoil (in feet) x ____ SF of treated area = ____ CF of topsoil

____ CF of topsoil / 27 cf/cy = ____ cy of topsoil needed

____ CF of topsoil x 90 lbs/cf = ____ lbs of topsoil/2,000 lbs/ton = ____ tons of topsoil needed

7. Provide a copy of the planting plan with quantities of seed or plants used and a listing of species and rates applied.

8. Describe the erosion and sediment control measures used to protect the soil quality restoration area until vegetation is established. _____

FOR REVIEWERS USE ONLY

Design appears to comply with applicable design standards, and local, state, and federal requirements.

Design does not appear to comply with applicable design standards, and local, state, and federal requirements.

Comments: _____

Name of Reviewer: _____ Date: _____

Signature: _____

Soil Quality Restoration (SQR) for New Lawns:

Use this checklist when SQR will be used to improve the soils on site and provide credit to manage the water quality volume from adjacent impervious surface areas.

Method 6

Method 6 is intended to be used when there is not enough topsoil onsite and compost is readily available. One inch of topsoil is blended with one inch of compost (for a total of 2 inches) and applied as a surface blanket over 6 inches of tilled subsoil. Tillage is performed a second time to a minimum depth of 4 inches in order to incorporate the topsoil and compost blend into the upper portion of the subsoil to create an 8 inch thick healthy soil profile.

Runoff must be distributed evenly across the SQR area if SQR area will be used to manage the water quality volume from adjacent impervious surfaces.

Applicant _____ Date _____

Submitted by _____ Location _____

1. Attach copy of Soil Quality Management Plan including site and soil maps.

2. What is the size of the SQR area in square feet? _____

3. What is the drainage area flowing onto the SQR area? (Include the SQR area)

(The drainage area may need to be divided into multiple subwatersheds in order to ensure that the runoff will be distributed evenly as sheet flow over SQR areas.)

_____ ac _____ SF _____ % Impervious

4. How will runoff be distributed evenly as sheet flow over the SQR area?

5. Please attach documentation showing existing soil conditions including description of topsoil to be used and *percent of organic matter from lab analysis*.

Table: Recommended tillage, topsoil, and compost depths for soil quality restoration to achieve an 8 inch deep healthy soil profile.

Method	Initial Tillage Depth of Subsoil (inches)	Topsoil Depth (Inches)	Compost Depth (Inches)	Secondary Tillage Depth of Subsoil (inches)
6	6	1	1	4

6. Will 1st tillage pass be 6" deep? Yes _____ No _____

7. Identify type of tillage tool(s) to be used. Attach photos of tillage equipment to be used.

8. Topsoil Depth to be Respread _____

9. Compost depth _____ Source of Compost _____

10. Percent Organic Matter of Compost _____

11. Will second tillage pass be 4" deep? Yes _____ No _____

12. If the area being treated with Soil Quality Restoration will give credit for managing runoff from impervious surfaces show calculations for determining that the storage capacity of the treated area meets or exceeds the water quality volume (WQv). Please attach calculations. (See example at end of document.)

Input from Table 6:

- a. _____ % Organic Matter by weight (See example at end to convert % Organic Matter from your lab analysis to % Organic Matter by Weight)
- b. _____ Available Water Storage (in/8 in soil)

Input from Table 8:

- c. _____ Excess Water Storage (Subtract 1.25 inches from Available Water Storage above.)
- d. _____ Factor to determine maximum impervious area to be treated
(*If you need to extrapolate excess water volume to determine the factor in Table 8, divide Table 8 Excess Water Storage inches by 1.1875 to get factor to determine impervious areas to be treated. For example, 0.5 inches/1.1875 = 0.42)
- e. _____ SF of impervious area that can be treated with SQR area

13. Provide the calculations and quantities of materials applied as amendments

Topsoil:

____ Depth of topsoil (in feet) [For example: 1" of topsoil = 1"/12" = 0.083 ft of topsoil]

____ Depth of topsoil (in feet) x ____ SF of treated area = ____ CF of topsoil

____ CF of topsoil / 27 cf/cy = ____ cy of topsoil needed

____ CF of topsoil x 90 lbs/cf = ____ lbs of topsoil/2,000 lbs/ton = ____ tons of topsoil needed

Compost:

____ SF x ____ depth in inches of compost application x 0.0031 = ____ CY of compost needed

____ CY x 1,200 lbs/CY (on average) divided by 2,000 lbs = ____ tons of compost needed

14. Provide a copy of the planting plan with quantities of seed or plants used and a listing of species and rates applied. _____

15. Describe the erosion and sediment control measures used to protect the soil quality restoration area until vegetation is established. _____

FOR REVIEWERS USE ONLY

Design appears to comply with applicable design standards, and local, state, and federal requirements.

Design does not appear to comply with applicable design standards, and local, state, and federal requirements.

Comments: _____

Name of Reviewer: _____ Date: _____

Signature: _____

Example 1: Assume Method 6 will use 6 inches of tillage and 1 inch of topsoil and 1 inch of compost.
Assume compost is 40% Organic Matter (O.M.) and Topsoil is 2% Organic Matter (O.M.).
Assume 1" of compost = $1"/12" = 0.083$ ft x 1' long x 1' wide = 0.083 cf of compost
Assume 1" of topsoil = $1"/12" = 0.083$ ft x 1' long x 1' wide = 0.083 cf of topsoil
Assume 6" of tilled soil = $6"/12" = 0.5$ ft x 1' long x 1' wide = 0.5 cf of tilled soil

To convert organic matter % to organic matter % by weight:

0.083 cf of compost/ 27 cf/cy = 0.0031 cy of compost x 1200 lbs/cy compost = 3.7 lbs of compost

0.083 cf of topsoil x 80 lbs/cf = 6.64 lbs of topsoil

0.5 cf of tilled soil x 90 lbs/cf = 45 lbs of soil

3.7 lbs compost + 6.64 lbs of topsoil + 45 lbs of tilled soil = 55.34 lbs in 8-inch profile

3.7 lbs of compost/ 55.34 lbs in 8" profile = 6.7% of weight of compost x 40% O.M. = 2.67% O.M. by weight

$(0.067 \times 0.4 = 0.0268 \times 100 = 2.67\%)$

6.64 lbs topsoil/ 55.34 lbs in 8" profile = 12% of weight is topsoil x 2% O.M. = 0.24% O.M. by weight
 2.67% O.M. + 0.24% O.M. = 2.91% O.M. by weight

Go to table 6: Assume 3% : $1.62" - 1.25" = 0.37$ inches of extra storage

Go to table 8

$0.37/1.1875 = 0.31$ factor

$10,000$ square feet of SQR area x $0.31 =$ SQR can address 3100 square feet of impervious surface.

Example 2: Use same assumptions above except assume compost is 27% Organic Matter (O.M.)

3.7 lbs compost/ 55.34 lbs in 8" profile

6.7% of weight of compost x $27\% = 1.8\%$ O.M. by weight

1.8% O.M. + 0.24% O.M. = 2.04% O.M.

Assume 2% O.M by weight

Go to table 6.

2% O.M. by weight = 1.33 inches of storage

1.33 inches – 1.25 inches = 0.08 inches

$0.08/1.1875 = 0.067$ x $10,000$ sq ft of SQR = 674 square feet. SQR can address 674 sq ft of impervious surface.

Soil Quality Restoration (SQR) for New Lawns:

Use this checklist when SQR will be used to improve the soils on site. No credit is given to manage runoff from impervious surface areas.

Method 6

Method 6 is intended to be used when there is not enough topsoil onsite and compost is readily available. One inch of topsoil is blended with one inch of compost and applied as a surface blanket over 6 inches of tilled subsoil. Tillage is performed a second time to a minimum depth of 4 inches in order to incorporate the topsoil and compost blend into the upper portion of the subsoil to create an 8 inch thick healthy soil profile.

Applicant _____ Date _____
 Submitted by _____ Location _____

1. Attach copy of Soil Quality Management Plan including site and soil maps.
2. What is the size of the SQR area in square feet? _____
3. Please attach documentation showing existing soil conditions including description of topsoil to be used.

Table: Recommended tillage, topsoil, and compost depths for soil quality restoration to achieve an 8- inch deep healthy soil profile.

Method	Initial Tillage Depth of Subsoil (inches)	Topsoil Depth (Inches)	Compost Depth (Inches)	Secondary Tillage Depth of Subsoil (inches)
6	6	1	1	4

4. Will 1st tillage pass be 6" deep? Yes _____ No _____

5. Identify type of tillage tool(s) to be used. Attach photos of tillage equipment to be used.

6. Compost depth _____ Source of Compost _____

7. Percent organic matter of compost _____

8. Will 2nd tillage pass be 4" deep? Yes _____ No _____

9. Provide the calculations and quantities of materials applied as amendments

Topsoil:

____ Depth of topsoil (in feet) [For example: 1" of topsoil = 1"/12" = 0.083 ft of topsoil]

____ Depth of topsoil (in feet) x ____ SF of treated area = ____ CF of topsoil

____ CF of topsoil / 27 cf/cy = ____ cy of topsoil needed

____ CF of topsoil x 90 lbs/cf = ____ lbs of topsoil/2,000 lbs/ton = ____ tons of topsoil needed

Compost:

____ SF x ____ depth in inches of compost application x 0.0031 = ____ CY of compost needed

____ CY x 1,200 lbs/CY (on average) divided by 2,000 lbs = ____ tons of compost needed

10. Provide a copy of the planting plan with quantities of seed or plants used and a listing of species and rates applied. _____

11. Describe the erosion and sediment control measures used to protect the soil quality restoration area until vegetation is established. _____

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Design appears to comply with applicable design standards, and local, state, and federal requirements.

Design does not appear to comply with applicable design standards, and local, state, and federal requirements.

Comments: _____

Name of Reviewer: _____ Date: _____

Signature: _____

Soil Quality Restoration (SQR) for New Lawns:

Use this checklist when SQR will be used to improve the soils on site and provide credit to manage the water quality volume from adjacent impervious surface areas.

Method 7

The intention of Method 7 is to create an engineered healthy soil profile onsite where topsoil is absent by importing compost and possibly sand. Method 7 involves 6” of initial tillage. Two inches of compost is then spread and a second tillage pass of 4” is performed. *Runoff must be distributed evenly across the SQR area if SQR area will be used to manage the water quality volume from adjacent impervious surfaces.*

Applicant _____ Date _____

Submitted by _____ Location _____

1. Please attach a copy of the Soil Quality Management Plan including a site and soil maps.
2. What is the size of the SQR area in square feet? _____
3. What is the drainage area flowing onto the SQR area? (Include the SQR area)

(The drainage area may need to be divided into multiple subwatersheds in order to ensure that the runoff will be distributed evenly as sheet flow over SQR areas.)

_____ AC _____ SF _____ % Impervious

4. How will runoff be distributed evenly as sheet flow over the SQR area?

Table: Recommended tillage, topsoil, and compost depths for soil quality restoration to achieve an 8 inch deep healthy soil profile.

Method	Initial Tillage Depth of Subsoil (inches)	Topsoil Depth	Compost Depth (Inches)	Secondary Tillage Depth of Subsoil (inches)
7	6	0	2	4

5. Will 6" of tillage take place before 2" of compost is applied?
Yes _____ No _____
6. Will 4" of tillage take place after 2" of compost is applied?
Yes _____ No _____
7. Identify type of tillage tool(s) to be used. Attach photos of tillage equipment to be used?

8. Compost depth _____ Source of Compost _____
9. Percent Organic Matter of Compost _____
10. Identify type of tillage tool(s) to be used. Attach photos of tillage equipment to be used.

11. If the area being treated with Soil Quality Restoration will give credit for managing runoff from impervious surfaces show calculations for determining that the storage capacity of the treated area meets or exceeds the water quality volume (WQv), please complete the following items. Please attach your calculations. (See example at end of document.)

Input from Table 6:

- a. _____ % Organic Matter (OM) by weight (See example at end to calculate % OM by weight)
- b. _____ Available Water Storage (in/8 in soil)

Input from Table 8:

- c. _____ Excess Water Storage (Subtract 1.25 inches from Available Water Storage above)
- d. _____ List factor to determine maximum impervious area to be treated
*(If you need to extrapolate excess water volume to determine the factor in Table 8, divide Table 8 Excess Water Storage Inches by 1.1875 to get factor to determine maximum impervious area to be treated. For example, 0.5 inches/1.1875 = 0.42)
- e. _____ SF of impervious area that can be treated with SQR area

12. Provide the calculations and quantities of materials applied as amendments

Compost:

_____ SF x _____ depth in inches of compost application x 0.0031 = _____ CY of compost needed

_____ CY x 1,200 lbs/CY (on average) divided by 2,000 lbs = _____ tons of compost needed

13. Provide a copy of the planting plan with quantities of seed or plants used and a listing of species and rates applied. _____

14. Describe the erosion and sediment control measures used to protect the soil quality restoration area until vegetation is established. _____

FOR REVIEWERS USE ONLY

Design appears to comply with applicable design standards, and local, state, and federal requirements.

Design does not appear to comply with applicable design standards, and local, state, and federal requirements.

Comments: _____

Name of Reviewer: _____ Date: _____

Signature: _____

Example 1: Assume Method 7 will use 6 inches of tillage and 2 inches of compost with **40% Organic Matter (O.M.)** on 10,000 square feet.

2"/8" profile is compost at 40% Organic Matter
 $2"/12" = 0.167'$ Deep x 1' Wide x 1' Long = 0.167 cf

1 cy compost = 1200 lbs

$0.167 \text{ cf} / 27 \text{ cf per cy} = 0.0062 \text{ cy} \times 1200 \text{ lbs/cy} = 7.4 \text{ lbs}$ compost in 8-inch profile

Total weight of the 8 inch profile:

1 cf of soil = 90lbs

0.5' or 6 inches of tilled soil = 45 lbs

7.44 lbs of compost + 45 lbs of tilled soil = 52.44 lbs in 8" profile

% of total weight that's compost = $7.44 \text{ lbs} / 52.44 \text{ lbs}$ in 8 inch profile = ~14%

14% of weight x 40% OM = 5.6 % OM by weight

Go to Table 6 and find column (Available Water Storage in/8 in soil)

5.6% OM is between 5 and 6. Available Water Storage in/8 in soil is 2.51 for 6 and 2.22 for 5.

$2.51 + 2.22 = 4.73 / 2 = 2.37$ Available Water Storage in/8 in soil.

$2.37" - 1.25" = 1.12$ inches of available storage above the Water Quality Volume.

Go to Table 8 under column titled Excess Water Storage Volume and find 1.12.

$1.12 / 1.1875 = 0.94$

10,000 square feet of SQR area x 0.94 = SQR can address 9400 square feet of impervious surface runoff.

Example 2: Assume Method 7 will use 6 inches of tillage and 2 inches of compost with **27% Organic Matter (O.M.)** on 10,000 square feet.

2"/8" profile is compost at 27% Organic Matter

$2"/12" = 0.167'$ Deep x 1' Wide x 1' Long = 0.167 cf

1 cy compost = 1200 lbs

$0.167 \text{ cf} / 27 \text{ cf per cy} = 0.0062 \text{ cy} \times 1200 \text{ lbs/cy} = 7.4 \text{ lbs}$ compost in 8" profile

Total weight of the 8 inch profile:

1 cf of soil = 90lbs

0.5' or 6 inches of tilled soil = 45 lbs

7.44 lbs of compost + 45 lbs of tilled soil = 52.44 lbs in 8" profile

% of total weight that's compost = $7.44 \text{ lbs} / 52.44 \text{ lbs}$ in 8 inch profile = ~14%

14% of weight x 27% OM = 3.78 % O.M. by weight

Go to Table 6 and find column (Available Water Storage in/8 in soil)

4% O.M. with 8" profile = $1.92" - 1.25 = 0.67"$ extra available storage

Go to Table 8 under column titled Excess Water Storage Volume and find factor.

$0.67" / 1.1875 = 0.56$

10,000 square feet of SQR area x 0.56 factor = SQR can address 5600 square feet of impervious surface runoff.

Soil Quality Restoration (SQR) for New Lawns:

Use this checklist when SQR will be performed to improve the soils on site. No credit is given to manage runoff from impervious surfaces.

Method 7

The intention of Method 7 is to create an engineered healthy soil profile onsite where topsoil is absent by importing compost and possibly sand. Method 7 involves 6” of initial tillage. Two inches of compost is then spread and a second tillage pass of 4” is performed.

Applicant _____ Date _____

Submitted by _____ Location _____

1. Attach copy of the Soil Quality Management Plan including site and soil maps.
2. What is the size of the SQR area in square feet? _____

Table: Recommended tillage, topsoil, and compost depths for soil quality restoration to achieve an 8 inch deep healthy soil profile.

Method	Initial Tillage Depth of Subsoil (inches)	Topsoil Depth	Compost Depth (Inches)	Secondary Tillage Depth of Subsoil (inches)
7	6	0	2	4

3. Will 6 inches of tillage take place before 2” of compost is applied?
Yes ____ No ____

4. Will 4 inches of tillage take place after 2” of compost is applied?
Yes ____ No ____

5. Identify type of tillage tool(s) to be used. Attach photos of tillage equipment to be used.

6. Compost depth _____ Source of Compost _____

7. Percent Organic Matter of Compost _____

8. Provide the calculations and quantities of materials applied as amendments

Compost:

_____ SF x _____ depth in inches of compost application x 0.0031 = _____ CY of compost needed

_____ CY x 1,200 lbs/CY (on average) divided by 2,000 lbs = _____ tons of compost needed

9. Provide a copy of the planting plan with quantities of seed or plants used and a listing of species and rates applied. _____

10. Describe the erosion and sediment control measures used to protect the soil quality restoration area until vegetation is established. _____

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Comments: _____

Name of Reviewer: _____ Date: _____

Signature: _____

Soil Quality Restoration (SQR): Retrofitting Existing Lawns Method 8

Method 8 is used to improve soil quality to support existing vegetation and reduce runoff on areas already developed and built upon.

Applicant _____ Date treated _____

Submitted by _____ Project location _____

1. Please attach a map or aerial photo of the soil quality restoration area.
2. What is the size of the SQR area in square feet? _____
3. Depth of aeration _____ inches Depth of compost application _____ inches
4. Source of compost _____
5. Describe any treatments other than aeration and a ½" to ¾" blanket of compost (i.e. placing a 2 inch compost in areas devoid of vegetation and re-seeding)

6. Total quantity of compost to be applied _____ tons / Cy
7. Show calculations for compost quantities:
_____ SF x _____ depth of application x 0.0031 = _____ CY of compost needed
CY x 1,200 lbs/CY (on average) divided by 2,000 lbs = _____ tons of compost
8. Will supplemental seeding be applied? ___yes ___no
9. Reason for supplemental seeding (patchy grass, dead spots, etc.) _____
10. Is the supplemental seeding mix compatible with the existing turf grass? Circle Yes or No
11. If supplemental seeding will be applied, what is the seeding rate and what will be planted? _____

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Design does not appear to comply with applicable design standards, and local, state, and federal requirements.

Comments: _____

Name of Reviewer: _____ Date: _____

Signature: _____