


	<b>Bowling Green, Kentucky</b> <b>Stormwater Best Management Practices (BMPs)</b> <b>Erosion Prevention Practices (EPPs)</b>	<b>EPP-08</b>																		
	<b>Activity: Surface Roughening (SR)</b>																			
<b>PLANNING CONSIDERATIONS:</b>  <b>Design Life:</b> 1 yr  <b>Acreage Needed:</b> Minimal  <b>Estimated Unit Cost:</b> Medium  <b>Monthly Maintenance:</b> 10% of Installation		  																		
	<table border="1"> <thead> <tr> <th colspan="3" data-bbox="410 810 1424 856">Target Pollutants</th> </tr> <tr> <th data-bbox="410 856 810 903">Significant ♦</th> <th data-bbox="810 856 1135 903">Partial ♦</th> <th data-bbox="1135 856 1424 903">Low or Unknown ◇</th> </tr> </thead> <tbody> <tr> <td data-bbox="410 903 560 949">Sediment ♦</td> <td data-bbox="560 903 729 949">Heavy Metals ◇</td> <td data-bbox="729 903 898 949">Nutrients ◇</td> </tr> <tr> <td data-bbox="410 949 560 995">Oil &amp; Grease ◇</td> <td data-bbox="560 949 810 995">Bacteria &amp; Viruses ◇</td> <td data-bbox="810 949 1060 995">Floatable Materials ◇</td> </tr> <tr> <td></td> <td data-bbox="1060 903 1229 949">Oxygen Demanding Substances ◇</td> <td data-bbox="1229 903 1424 949">Toxic Materials ◇</td> </tr> <tr> <td></td> <td data-bbox="1060 949 1229 995">Construction Waste ◇</td> <td></td> </tr> </tbody> </table>		Target Pollutants			Significant ♦	Partial ♦	Low or Unknown ◇	Sediment ♦	Heavy Metals ◇	Nutrients ◇	Oil & Grease ◇	Bacteria & Viruses ◇	Floatable Materials ◇		Oxygen Demanding Substances ◇	Toxic Materials ◇		Construction Waste ◇	
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<b>Description</b>  <b>Suitable Applications</b>  <b>Approach</b>	<p>This BMP corrects the affects of runoff velocities, sediment trapping and sheet flow length by constructing small furrows across a slope, and utilizing construction equipment to track soil surface. The primary function of surface roughening is to temporarily stabilize a slope until it can receive permanent vegetation.</p> <ul style="list-style-type: none"> <li>➤ All exposed construction slopes.</li> <li>➤ Exposed soils where seeding, planting, and mulching will benefit from surface roughening.</li> <li>➤ Areas that have the potential for erosion of clay (smooth, hard surfaces), silt or sand sized particles.</li> </ul> <p>Roughening methods include:</p> <ul style="list-style-type: none"> <li>➤ Terracing, (see <a href="#">EPP-13</a>)</li> <li>➤ Fill Slope Roughening</li> <li>➤ Grooving</li> <li>➤ Roughening with tracked machinery</li> </ul> <p>Factors to be considered in choosing a method are</p> <ul style="list-style-type: none"> <li>➤ Slope steepness</li> <li>➤ Mowing requirements</li> <li>➤ Soil type</li> </ul>																			

**Installation  
Procedures****Fill Slope Roughening**

- Place fill slopes with a gradient steeper than 3:1 (H:V) in lifts not to exceed 8 in., and make sure each lift is properly compacted.
- The face of the slope should consist of loose, uncompacted fill 4 in. to 6 in. deep.
- Use grooving, furrowing, or tracking to roughen the face of the slopes, if necessary.
- Apply seed, fertilizer and mulch then track or punch in the mulch. See Permanent Seeding (EPP-06), Temporary Seeding (EPP-05), and Mulching (EPP-10) BMPs.
- Do not blade or scrape the final slope face.

**Grooving - Cuts, Fills, and Graded Areas**

- Slopes that will be maintained by mowing should be no steeper than 3:1 (H:V).
- To roughen these areas, create shallow grooves by normal tilling, disking, harrowing, or use a cultipacker-seeder. Make the final pass of any such tillage on the contour.
- Make grooves formed by such implements close together, less than 10 in. apart and 3 in. deep.
- Excessive roughness is undesirable where mowing is planned.
- Practice should be used on slopes no longer than 200 feet.

**Furrowing**

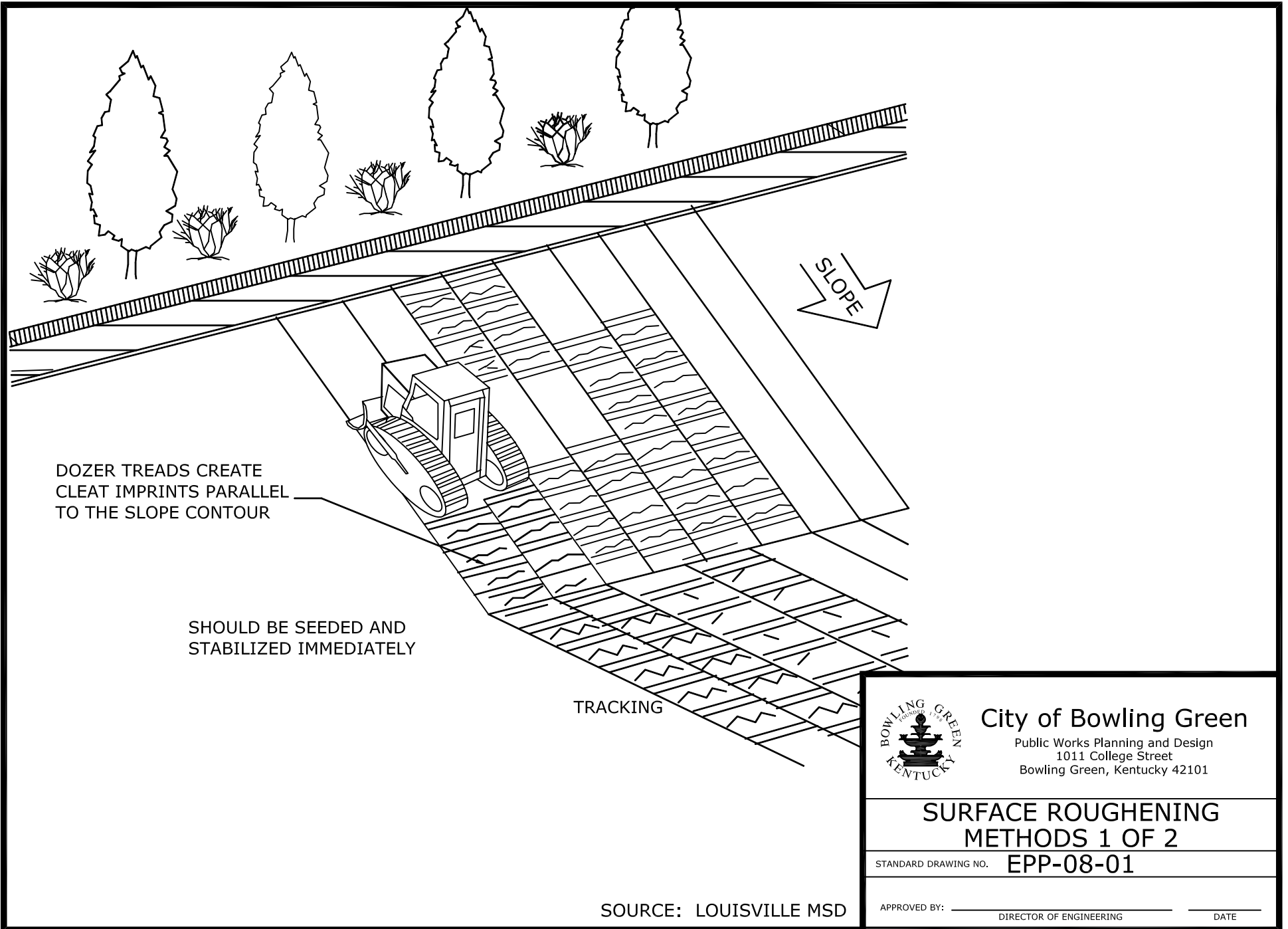
- Slope no greater than 3:1 (H:V)
- Use equipment to cut a 6" deep furrow while placing cut material below furrow
- Cut furrows along the contour and at a minimum spacing of 50'.
- Practice should not be used on slope longer than 200 feet.

**Roughening with Tracked Machinery**

- Limit roughening with tracked machinery to soils with a sandy textural component to avoid undue compaction of the soil surface.
- Operate tracked machinery up and down the slope to leave horizontal depressions in the soil, running with the contours of the slope. Do not back blade during the final grading operation.
- Seed and mulch roughened areas to obtain optimum seed germination and growth.
- Periodically check the seeded or planted slopes for rills and washes, particularly after significant storm events, greater than 0.5 in.
- Fill these areas slightly above the original grade, then reseed and mulch as soon as possible.

**Maintenance****Inspection  
Checklist**

- Surface roughened areas inspected after recent wet weather events.
- Rills and washed areas have been re-roughened and re-seeded.
- Practice is maintained and properly functioning; other practices are not required.



DOZER TREADS CREATE  
CLEAT IMPRINTS PARALLEL  
TO THE SLOPE CONTOUR

SHOULD BE SEEDING AND  
STABILIZED IMMEDIATELY

TRACKING

SLOPE



City of Bowling Green

Public Works Planning and Design  
1011 College Street  
Bowling Green, Kentucky 42101

**SURFACE ROUGHENING  
METHODS 1 OF 2**

STANDARD DRAWING NO. **EPP-08-01**

SOURCE: LOUISVILLE MSD

APPROVED BY: \_\_\_\_\_ DATE \_\_\_\_\_  
DIRECTOR OF ENGINEERING

Usage:

To slow erosion, surface roughening by tracking should be done as soon as possible after the vegetation has been removed from the slope.

Tracking can be used with seeding, planting and temporary mulching to stabilize an area.

Tracking should be performed immediately after grading activities have ceased (temporarily or permanently) in an area.

Installation:

It is important to avoid excessive compacting of the soil surface when tracking because soil compaction inhibits vegetation growth and causes higher runoff rates. As few passes as possible should be made with the machinery in order to minimize compaction.

Surface roughened areas by the means of tracking should be seeded and mulched within 14 days.

Inspection and Maintenance:

Inspections should be made every seven (7) calendar days and within 24-hours after each rainfall event that produces ½ - inches or more of precipitation.

If rills (small watercourses that have steep sides and are usually only a few inches deep) appear, they should be re-graded and re-seeded immediately.



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**SURFACE ROUGHENING  
METHOD 1 OF 2**

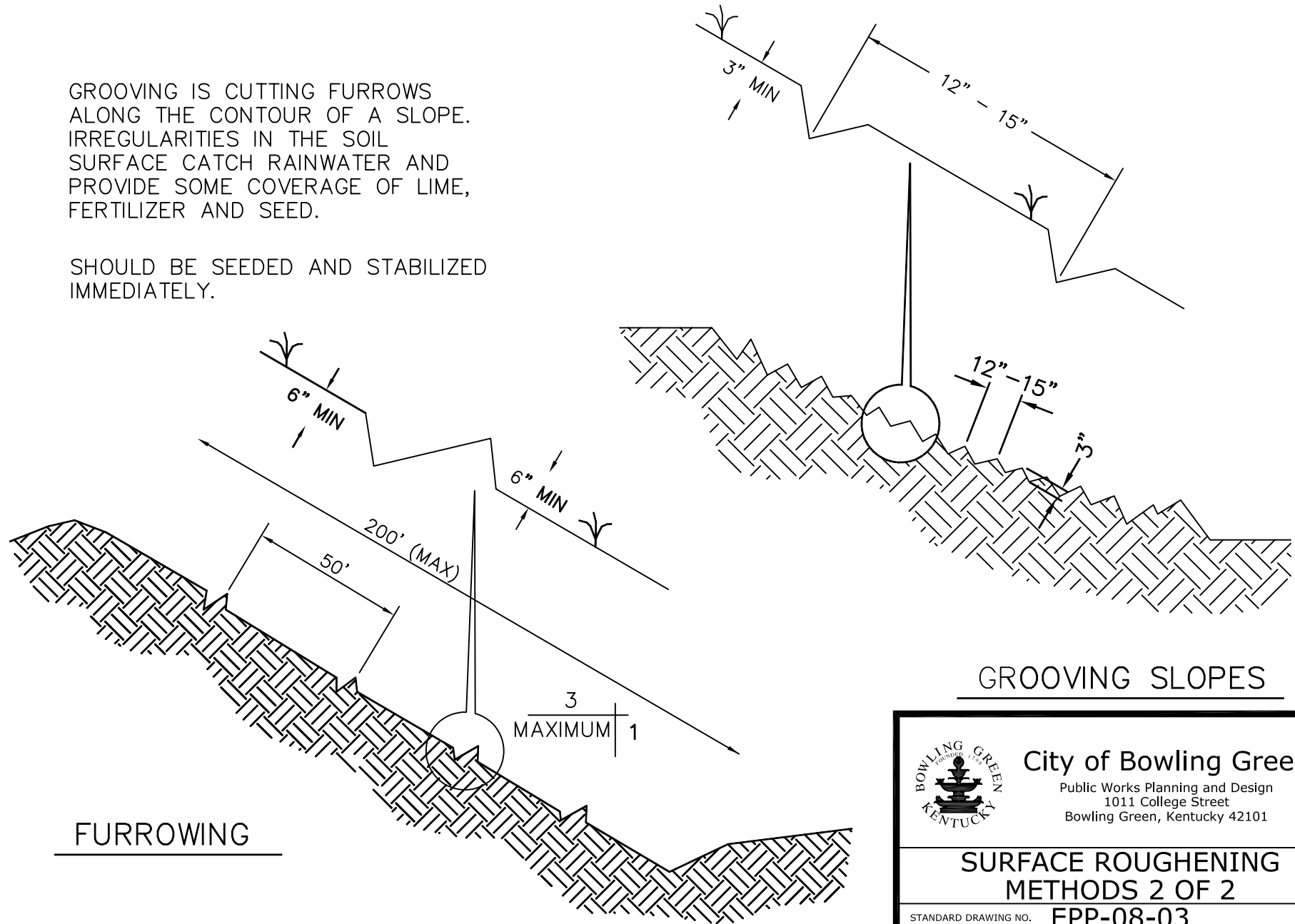
STANDARD DRAWING NO. **EPP-08-02**

APPROVED BY: \_\_\_\_\_ DATE \_\_\_\_\_  
DIRECTOR OF ENGINEERING

SOURCE: LOUISVILLE MSD


GROOVING IS CUTTING FURROWS ALONG THE CONTOUR OF A SLOPE. IRREGULARITIES IN THE SOIL SURFACE CATCH RAINWATER AND PROVIDE SOME COVERAGE OF LIME, FERTILIZER AND SEED.

SHOULD BE SEEDED AND STABILIZED IMMEDIATELY.



FURROWING

GROOVING SLOPES

	<b>City of Bowling Green</b> Public Works Planning and Design 1011 College Street Bowling Green, Kentucky 42101	
	<b>SURFACE ROUGHENING METHODS 2 OF 2</b>	
STANDARD DRAWING NO. <b>EPP-08-03</b>		APPROVED BY: _____ DATE _____
		DIRECTOR OF ENGINEERING _____

SOURCE: LOUISVILLE MSD

Usage:

To slow erosion, slope grooving should be done within 7 days after the vegetation has been removed from the slope.

Slope Grooving can be used with seeding and planting to stabilize an area.

Installation:

Slope Grooving may be installed with any appropriate implement that can be safely operated on the slope and will not cause undue compaction. Suggested implements include discs, chisel plows and the teeth on a front-end loader bucket. Such grooves should be a minimum of 3-inches deep and no further than 15-inches apart.

Areas that are graded in this manner should be seeded within 14 days.

Inspection and Maintenance:

Inspections should be made every seven (7) calendar days and within 24-hours after each rainfall event that produces 1/2-inches or more of precipitation.

If rills (small watercourses that have steep sides and are usually only a few inches deep) appear, they should be re-graded and re-seeded immediately.



City of Bowling Green

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Bowling Green, Kentucky 42101

**SURFACE ROUGHENING  
METHOD 2 OF 2**

STANDARD DRAWING NO. **EPP-08-04**

APPROVED BY: \_\_\_\_\_ DATE \_\_\_\_\_  
DIRECTOR OF ENGINEERING

*SOURCE: LOUISVILLE MSD*