

60.20.2 Surface Stabilization

It is critical that temporary and permanent surface stabilization be provided as soon as possible to reduce erosion at the source. There are several acceptable methods to stabilize bare ground: revegetation by seeding or sodding, mulching, erosion control blankets, soil binders, rock topping, structural topping such as concreting, etc. Temporary seed and surface stabilization methods can be used if the area will be disturbed later in the development. The area should be permanently revegetated or surfaced when no further land disturbance will occur.

Bare ground must be stabilized by revegetation, mulching, erosion control blankets and netting, soil binders, rock surfacing, structural topping, or other approved techniques. See ESC 3 for use of appropriate surface stabilization methods for sheet flow.

The following provisions shall apply to surface stabilization:

1. Surface stabilization must effectively stabilize at least 70% of the total disturbed site area.
2. Surface stabilization may be suspended from portions of the project area which have an active building permit. Upon completion of the building activity, the site must be permanently stabilized.
3. Non-degradable mats shall be used only as a permanent installation, and in areas that will not be mowed.
4. Surface stabilization shall be scheduled as provide in **Table 60-5** below:

Table 60-5 Soil Stabilization Schedule

Soil Disturbance Activity or Condition	Required Stabilization Time
Soil disturbance has ceased in areas greater than 2,000 square feet.	14 days
After construction of dikes, swales, diversions, and other concentrated flow areas	5 days
When slopes are steeper than 3 horizontal to 1 vertical	7 days
When slopes are greater than 3% and longer than 150 feet.	14 days
Perimeter controls around soil stockpiles.	End of workday
Stabilization or covering of inactive stockpiles.	30 days
When land disturbance is completed, permanent soil stabilization must be installed.	30 days

60.20.2.1 Temporary Seeding

Temporary seeding and mulching shall be applied to all cleared, unvegetated, or sparsely vegetated soil surfaces where vegetative cover is required for less than 1 year. Temporary seeding shall germinate to a density of at least 70% of the total disturbed site area. Temporary seeding may be used for diversions, dams, temporary sediment basins, temporary road banks, topsoil stockpiles, and any other exposed areas of a construction site, which meet velocity and other requirements for its use.

Temporary seeding may be suspended from individual lots located in the project area, which have an active building permit. Upon completion of the building activity, the site shall be permanently vegetated.

60.20.2.1.1 Seed

Seed must be clean, relatively free of weed seed and other contaminants, and comply with the Federal Seed Act and the Missouri State Seed Law. Seed that has become wet, moldy, or otherwise damaged in transit or storage is not acceptable. Turf mixes can be used with no more than 10% Kentucky bluegrass and at least 20% perennial rye.

60.20.2.1.2 Seedbed Preparation

Seedbed preparation is essential for the seed to germinate and grow. For broadcast seeding and drilling, loosen the top 3 to 6 inches of soil. Lime and fertilizer should be incorporated by disking. If recent tillage or grading operations have resulted in a loose surface, additional tillage may not be required. If rainfall caused the soil surface to become sealed or crusted, surface tilling will be required prior to seeding.

The seedbed area shall be tested by an approved nursery for proper application rates of lime and fertilizer. Results of the test are to be sent to the County inspector with the recommended application rates. Mulching or the addition of stockpiled topsoil is required on all seedbeds prior to the placement of seed wherever there are inadequate amounts of topsoil. Mulch shall be applied after seeding for protection and to aid in seed germination. Mulch shall be placed in accordance with the mulching section of this document.

In lieu of soil testing for land disturbance sites less than two (2) acres, the following fertilizer and lime rates shall be applied:

Table 60-6 Soil Amendment Rates

Soil Amendment Material	Application Rate (Lb per Acre)	
Fertilizer	Nitrogen (N)	30 ¹
	Phosphate (P ₂ O ₅)	90 ¹
	Potash (K ₂ O)	90 ¹
Lime	1,000 ²	

¹Increase the rate by 25% for slopes steeper than 5:1.
²Rate is in effective neutralizing material (ENM) units.

60.20.2.1.3 Temporary Seeding Rates and Times

In areas that are on slopes flatter than 4:1 and that are not within watercourses, seeding shall be applied at the rates and times specified in **Table 60-7** and **Table 60-8**. Seed shall be evenly spread with a broadcast seeder, drill, or hydro seeder. The proper depth is 1/4 to 1/2 inches deep for legumes and grasses such as annual ryegrass and up to 1 and 1/2 inches for cereal grains. If the seed is applied by a broadcast method, the area will be rolled or culti-packed immediately after seeding on a prepared seedbed only. Rolling or culti-packing is not required if the broadcast seeding rate is increased by 50 percent. Other seed species and mixtures can be

proposed prior to planting, as recommended by an agronomist, competent nursery company, or refer to NRCS MOFOTG Code 340 (Cover Crop) in Appendix D.

For channels, embankments, and slopes of 4:1 or steeper, seeding shall be a mixture of K31 fescue and rye at a rate of 400 pounds per acre.

Table 60-7 Temporary Fall Seeding

Plant Species	Rate ¹ (lb/acre)	Seeding Times
Side-Oats	65	8/16 – 9/30
Winter Rye	50	8/01 – 10/15
Winter Wheat	60	8/01 – 10/15
Orchard Grass	120	8/01 – 10/15
Perennial Ryegrass	80	8/01 – 10/15
Tall fescue, Smooth Brome	80	8/01 – 10/15
K-31 Fescue	120	9/01 – 11/15
Ladino Clover	2 ²	8/15 – 9/15
Crimson Clover	6 ²	8/15 – 9/15
Orchard Grass and Oats or Rye	15 ² / 40 ²	8/15 – 9/15

¹If using aerial seeding or other broadcast method to apply seed without rolling or culti-packing, increase seeding rates by 50 percent.

²Pure live seed (PLS)

Table 60-8 Temporary Spring Seeding

Plant Species	Rate ¹ (lb/acre)	Seeding Dates
Winter Rye	50	3/15 – 5/31
Spring Oats	65	3/15 – 5/31
Annual Ryegrass	4 ²	3/15 – 6/15
Sudangrass	16 ²	4/15 – 6/15
K-31 Fescue	30 ²	3/15 – 5/31
Red Clover & Oats	2 ² / 30 ²	3/15 – 5/31

¹If using aerial seeding or other broadcast method to apply seed without rolling or culti-packing, increase seeding rates by 50 percent.

²Pure live seed (PLS)

60.20.2.1.4 Submittals & Follow-up Care

The following submittals are required prior to temporary seeding:

1. Soil test report
2. Seeding date
3. Fertilization mixture and rate
4. Seed mixture(s) and rate(s), supplier, purity percentage
5. Mulching material(s) and application rate(s)
6. Mowing height and schedule

Seeded areas shall be re-fertilized 4 weeks after initial seeding. All areas identified as bare and sparse (less than 30% ground cover) during the inspection shall be re-seeded and mulched. Grass shall not be cut until 4 inches of growth occurs.

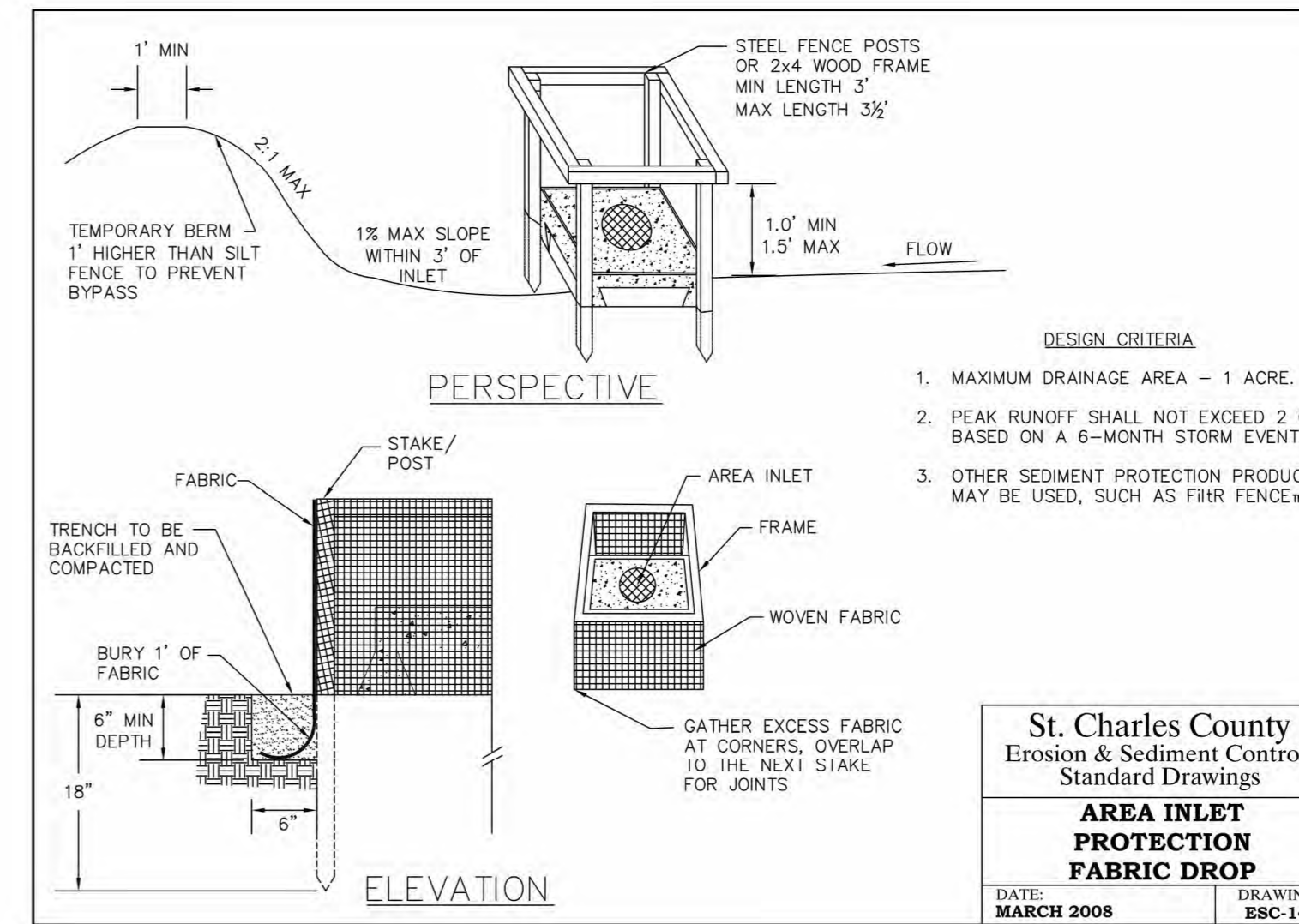
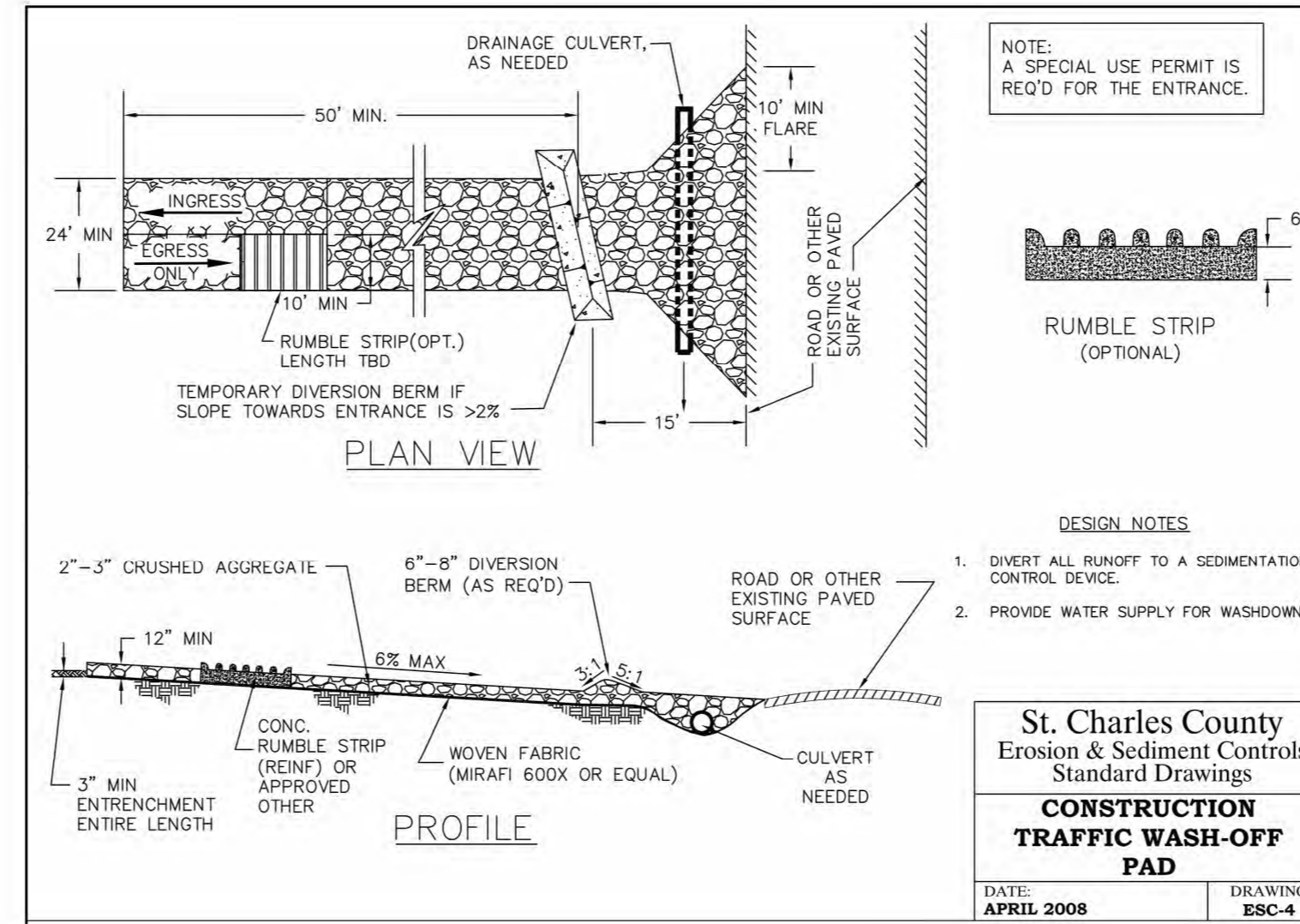
60.20.2.2 Permanent Seeding

After land disturbance activities have been completed in an area, permanent seeding shall be applied. Permanent seeding is the establishment of perennial vegetation on disturbed areas for periods longer than 12 months. Permanent seeding is used when vegetation is designed to permanently stabilize the soil. Particular care is required to establish a thick cover of permanent grass.

Refer to sections 60.20.2.1.1, 60.20.2.1.2, and 60.20.2.1.4 and to NRCS MOFOTG Code 342 (Critical Area Planting) in Appendix D for permanent seeding guidelines.

60.20.2.3 Sodding

Sodding is the use of a vegetative cover to provide immediate erosion control in disturbed areas. Sodding is well suited for stabilizing erodible areas such as grass-lined channels, stormwater detention basins, diversions, swales, slopes, and filter strips because it provides an instant vegetative cover with an established root system. Placement of sod on slopes steeper than 10% should be staked.



SILTATION CONTROL NOTES:

1. Siltation control shall be installed prior to any grading or construction operation and shall be inspected and maintained as necessary to insure their proper function until sufficient vegetation has been established to prevent erosion control.
2. The maintenance of all siltation controls shall be the responsibility of the developer.
3. Additional siltation control may be required as directed by the local governing authority.
4. All grading areas shall be protected from erosion by erosion control devices and/or seeding and mulching as required by the local governing authority.
5. Additional siltation control devices may be required as directed by the local governing authority.

CONSTRUCTION SCHEDULE OF BMP'S:

1. Install construction entrance, parking and washdown area. Construction parking area to be utilized as designated equipment, maintenance and fuel area. Remove when vehicles no longer access unpaved areas.
2. Prior to clearing, siltation fences are to be installed at the perimeter of the land as shown. Remove when permanent vegetation of slope is established and approved by the local governing authority.
3. Install inlet protection around existing area inlet prior to land disturbance. Remove after contributing drainage areas have been adequately stabilized and approved by the local governing authority.
4. Construct rock check dams once drainage swale is constructed. Remove when upstream areas are stabilized with vegetation and approved by the local governing authority.
5. Seed and mulch all disturbed areas when grading operations are completed.

EROSION CONTROL REQUIREMENTS:

1. Soil stabilization shall be completed with five days of clearing or inactivity in construction.
2. If seeding or another vegetative erosion control method is used it shall become established within two weeks or the local governing authority may require the site to be reseeded or a non-vegetative option employed.
3. Techniques shall be employed to ensure stabilization on steep slopes and in drainageways.
4. Soil stockpiles must be stabilized or covered at the end of each workday, or perimeter controls must be in place to prevent silt from the stockpile from leaving the site.
5. The entire site must be stabilized, using a heavy mulch layer or another method that does not require germination to control erosion, at the close of the construction season.
6. Techniques shall be employed to prevent the blowing of dust of sediment from the site.
7. Techniques shall be employed to divert upland runoff past disturbed slopes.

SEEDING SCHEDULE:

Vegetation shall be established on exposed soil after a phase of rough or finished grading has been completed or areas where no activity will occur for 30 days. See seeding rates on sheet 16 of this plan.

ESTIMATED SCHEDULE OF OPERATIONS:

Proposed start of operations – April 2016

Approximate durations:

Install construction parking and washdown area	1 day	(April 2016)
Install perimeter silt fence	2 days	(April 2016)
Clearing	3 days	(April 2016)
Rough Grading	3 weeks	(April–May 2016)
Install rock check dams	1 day	(May 2016)
Sewer installation	3 weeks	(May–June 2016)
Install inlet protection	1 day	(June 2016)
Final grading & vegetation	1 week	(July 2016)
Removal of BMP's	When conditions are met	

Note: Schedule durations are subject to change due to weather conditions. Some operations will have overlapping time frames.

ROUTINE INSPECTIONS & MAINTENANCE:

BMP's & Site are to be inspected on a regular schedule (once per week minimum) and within 48 hours of a rain event that causes storm water runoff to occur onsite. Written inspection reports shall be submitted to the local governing authority.

CONTAINMENT FAILURE PLAN:

In the event of any loss of contained sediment:

1. Repair any damaged siltation fences.
2. Clean up any necessary silted areas.
3. Restore any necessary silted areas.
4. Provide documentation of actions & mandatory reporting to local governing authority

ESTIMATED BMP QUANTITIES:

Item	Quantity	Unit
Siltation fence:	950	L.F.
Parking & Washdown area:	2	Ea.
Seeding, mulch and fertilizer areas:	1.09	Ac.
Straw Bale Check Dam:	0	Ea.
Rock Check Dam:	0	Ea.
Rock Check Dam w/ Sediment Trap:	0	Ea.
Inlet protection:	7	Ea.
Temporary Sediment Traps:	0	Ea.
Temporary Sediment Basins:	0	Ea.

CONTROL REQUIREMENTS FOR CONSTRUCTION MATERIALS:

1. Spill prevention and control facilities for materials such as paint, solvents, petroleum products, chemicals, toxic or hazardous substances, substances regulated under the Resource Conservation and Recovery Act (RCRA) or the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and any waters generated from the use of such materials and substances, including their containers. Any containment systems employed to meet this requirement shall be constructed of materials compatible with the substances contained and shall be adequate to protect both surface and ground water.
2. Collection and disposal of discarded building materials and other construction site wastes.
3. Litter control.
4. Control of concrete truck washouts.
5. Assurance that on-site fueling facilities will adhere to applicable federal and state regulations concerning storage and dispensers.
6. Provision of sufficient temporary toilet facilities to serve number of workers.

PERMITTEE (OWNER/DEVELOPER) SHALL AMEND THE SWPPP WHENEVER:

1. Design, operation or maintenance of BMP's is changed.
2. Design of the construction project is changed that could significantly affect the quality of the storm water discharges.
3. Site operator's inspections indicate deficiencies in the SWPPP or any BMP.
4. Inspections by the local governing authority or by the Missouri Department of Natural Resources indicate deficiencies in the SWPPP or any BMP.
5. The SWPPP is determined to be ineffective in significantly minimizing or controlling erosion or excessive sediment deposits in streams or lakes.
6. The SWPPP is determined to be ineffective in preventing pollution of waterways from construction wastes, chemicals, fueling facilities, concrete truck washouts, toxic or hazardous materials, site litter or other substances or wastes likely to have an adverse impact on water quality.
7. Total settleable solids from a storm water outfall exceeds 0.5 mL/L/hr if the discharge is within the prescribed proximity of a "Valuable Resource Water" as defined by the MDNR.
8. Total settleable solids from a storm water outfall exceeds 2.5 mL/L/hr for any other outfall.
9. The local governing authority or Missouri Department of Natural Resources determines violations of water quality standards may occur or have occurred.

PERMITTEE (OWNER/DEVELOPER) SHALL:

1. Notify all contractor and other entities (including utility crews, government employees, or their agents) who will perform work at the site, of the existence of the SWPPP and what actions or precautions shall be taken while onsite to minimize the potential for erosion and the potential for damaging any BMP.
2. Determine the need for and establish training programs to ensure that all site workers have been trained, at a minimum, in erosion control, material handling & storage and housekeeping.
3. Provide copies of the SWPPP to all parties who are responsible for installation, operation or maintenance of any BMP.
4. Maintain a current copy of the SWPPP on the site at all times.

PROJECT TITLE:
CULVERS OF O'FALLON-
BRAMBLETT CROSSING

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Jefferson City, MO 65109
SWPPP Details

P+Z No: 3805.08.02
Approval Date:
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City No.

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