Best Practices for Boulevard Turf Design and Maintenance

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Introduction

Boulevards are the vegetated area, often dominated by turfgrasses, located just behind the curb along a roadway. Often, they are the grassy buffer space adjacent to the roadway. Boulevards serve the essential functions of providing snow storage space for roads and sidewalks, a place for rain and runoff to soak into the ground, and attractive green space in our neighborhoods and cities. However, boulevards are often a difficult place for grass to grow because of the harsh environment with exposure to sun, foot traffic, and salt residue from winter maintenance. Turfgrass installation is often the last item completed during a road construction project. Residents and business owners may be especially concerned that boulevards are properly restored because they lie adjacent to private yards and lawns. City officials, residents, and the turf installer all desire that boulevards be restored to healthy, lush turfgrass. The following best practices are recommended for the successful establishment of healthy turfgrass in boulevard locations.

Design Phase Considerations

SEED VS. SOD

- There are pros and cons to both sod and seeding, based on the unique site conditions and project goals.

- Sod is a better choice for erosion prone areas or if immediate visual benefit is needed.

- Seeding may provide a better long-term result, and is more cost effective; however, seed will take longer to fully establish and this needs to be communicated to residents.

- Low-input grasses (fine fescues) require different seeding dates and establishment care than traditional Kentucky bluegrass-based turf seed mixes.

SALT TOLERANCE

- The MNST-12 mix (currently not in the MnDOT Standard Specification) has been developed for salt-tolerant sod production.

- According to research, the MNST-12 (comprised primarily of fine fescues) seed/sod mix provides the best drought and salt tolerance.
  - It has been tested and found to be suitable for salt tolerance on Minnesota roadsides.

- Sod should be specified as MnDOT Type ‘Salt Tolerant’.

TIME OF YEAR

- Sodding has a wider planting window.
  - Best time for sodding is spring (April 15 to June 10) or fall (Aug 10 – Nov 1).
  - However, salt tolerant sod does best in spring; this is due to the slower rooting of fine fescues when compared to Kentucky bluegrass. Fully established root systems are advantageous prior to the onset of winter.
  - Late fall sod installation should not be placed within the first 10’ in areas that are expected to receive heavy deicing agents. Stabilize this immediate area with some form of erosion prevention and sod in the spring dates above.

- Best time for seeding traditional turf mixes is late summer/early fall (Aug 1 – Sept 15).

- Best time for seeding low-input turf mixes such as MNST-12 is late summer/early fall (Aug – Sept) only, as they are more susceptible to heat and drought during establishment compared to other turfgrass species.
Construction and Maintenance Practices

**SOIL PREPARATION AND PLACEMENT**

Quality soil is the critical foundation of successful turf re-establishment. It is the goal to preserve the biological activity of the boulevard before, during, and after construction. However, if the soil structure, microbial life, and vegetation is compromised, then importing new soil may be necessary.

- The turf installer should remove all construction debris, including rocks, concrete, contaminated soil, and pavement chunks from the boulevard prior to soil placement. During construction, do not allow the turf installer to empty concrete wash water into the boulevard or any other turf establishment areas.
- Inspector and turf installer should perform a walk-through to approve the boulevard condition before topsoil placement.
- Subsoil should be scarified or ripped to loosen and roughen the surface texture. The teeth of a backhoe are an acceptable method.
- Regardless of whether topsoil is salvaged or imported,
  - 6” of topsoil should exist after settlement. If topsoil is borrowed, up to 8” should be placed in the boulevard and graded 1” to 2” “high” to account for settling. Finish soil grade should match the back of curb elevation.
  - A 50% topsoil and 50% compost (meeting requirements of MnDOT compost type 2) mix is recommended and results in approximately the correct organic content level for turf establishment.
  - The contractor should perform a soil test for organic matter content, pH, and base nutrients by the University of Minnesota or other qualified soil laboratory. (include adequate time for soil test – approximately 1 month before results are available)
    Depending on the soil test results, the following actions may be required:
    A. Good loam topsoil, with a neutral pH between 6.5 – 7.0 and at least 4% organic matter content. No amendment or modification is necessary.
      i. Most common cause of failure is salinity or high pH.
    B. If soil test results do not meet the criteria above, then import topsoil borrow meeting the specifications of MnDOT 3887.
    C. Or, import a mix of 50% topsoil and 50% compost type 2.
- Turf installer should provide sample test results for each component of the topsoil mix for approval prior to mixing or placement.
- Inspector and turf installer should perform a walk-through to approve boulevards before seeding or sodding.

**SEEDING INSTALLATION**

- If seeding, use a hydromulch application with sufficient functional longevity and performance to withstand weather, irrigation, and other impacts (e.g. reinforced fiber matrix per MnDOT 2575, at a rate of 2,100-2,500 lbs./acre). Mulch cover must be maintained by the turf installer until germination at no cost to the owner.
- Do not use plastic netting or staples on seeded areas.

**FERTILIZER**

- Always test soil fertility and organic matter prior to seed or sod application
  - When the results of a soil test are available, follow the recommendations of the qualified soil laboratory. Collect soil cores or shallow garden shovel samples to fill a 2 gallon bucket from the topsoil stockpile or after placement. Thoroughly blend the collected soil samples, and send a defined quantity of soil as required by the soil test laboratory.
  - If no soil test results are available, apply a granular commercial grade fertilizer (MnDOT 3881 Fertilizer Type 3) at 350 lbs./acre in a 22-5-10 NPK ratio, per the requirements of MnDOT 2575.
- Incorporate fertilizer, lime and other soil amendments into the soil with light raking.
• If possible, apply half of the fertilizer at the time of seeding, and the other half 6 to 8 weeks later once the seedlings are developing. This split application ensures adequate nutrient uptake.
  – Look for evidence of yellowing leaves, red leaf margins or other signs of compromised seedling vigor.
• Do not use “weed and feed” type fertilizers during the first year.

**WATERING**

• The turf Installer must submit a watering schedule to the Engineer for approval.

• Watering is necessary until the seeded/sodded grass reaches a uniform height of 4” – 5” with 4” deep roots.

• A 1,000-gallon water tank will cover 500 sq. yd (or 4,500 sq. ft) with 1/3” of water.

• Two passes per water application are preferred, to ensure no runoff from the seeded or sodded areas.

• U of M Turf Researchers have developed a method for running temporary irrigation from a fire hydrant or other water source that can be used to water seeded and sodded sites.

• Property owners should be encouraged to water as a supplement to the turf installer’s required watering.

• **Sod watering:**
  – After placement, sod must be watered to infiltrate the soil to a soil depth of 6”. Since it may be difficult to monitor infiltration, watering should be done at 6 gallons of water per sq. yd (which mimics approximately a 1” rain event).
  – During the first week of establishment, water lightly 2-3 times per day as needed to keep sod moist, until sod is rooted. Sod can be tested by pulling up on the corner of various sod strips and if it does not pull away from the soil it is rooted.
  – For dormant sod, water until the sod is frozen in place.
  – After the first week, turf Installer should apply 1/3” of water every other day (2 gallons per sq. yd every other day) to sod. The application of water may be tested by placing a rain gauge or water tray in the area.

• **Seed watering:**
  – Amount of water necessary is a function of the soil stabilization cover (germination BMP). Blanket categories and hydromulch types differ in water retention (polymers) and drying intervals. Using erosion prevention covers designed for seed germination will help conserve applied water.
  – Lighter, more frequent watering events are ideal for seed establishments.
  – During the first 10-14 days after the initial watering, water lightly 2-3 times per day as needed to keep the soil and seedlings moist.
  – After 10-14 days, turf Installer should apply 1/3” of water every other day (2 gallons per sq. yd every other day) to seed. The application of water may be tested by placing a rain gauge or water tray in the area.

**WEED AND PEST CONTROL**

• During the short window when a contractor is required to maintain the turf until project acceptance, the best method to prevent weeds and pests is to grow healthy turfgrass.

• Turf installer is required to remove all weeds within the turfgrass, as often as necessary to keep and maintain healthy turf. State law requires the removal of state-listed noxious weeds.

**MOWING**

• **Seed:** do not mow until turf first reaches a uniform 5” - 6” in height (approximately 8 weeks after seed germination). Do not mow when the density is less than 50% soil cover.

• **Sod:** only mow after rooting has taken place, when sod cannot be hand pulled or lifted away from the ground. At a minimum, let the grass grow to 4”; then mow to 2” or 3” (do not remove more than the top 1/3 of grass blade height), repeat 2 times. Then it can be cut to 2” and maintenance turned back to the property owner.

• Do not cut more than 1/3 of the grass height in a single mowing event.
• Encourage property owners not to mow until the turf installer has finished their responsibilities during the establishment period; this helps prevent the grass from getting cut too short. Turf installer should mow the turf at least once.

• Do not mow when the weather is hot and/or dry (above 85° F).

• If walking on the area of establishment leaves a footprint, the turf has not yet established and should not be mowed. Do not mow if mower tires form ruts.

**REPAIR, PAYMENT AND WARRANTY**

• It is the responsibility of the turf installer to repair any damaged turf areas during the establishment/warranty period. Warranty per MnDOT Standard Specification 2575 is 30 days from seeding/sodding (additional time can be added, up to 60 days, at the discretion of the Engineer). However, for better success in establishing a good root base, consensus is that 60 days is preferred.

• Conduct a final walk-through with the turf installer to verify that turfgrass is healthy, uniform in density (cover), weed-free turf with no large bare (greater than 3”) or dead areas.

• 100% healthy turfgrass is required prior to acceptance.

**COMMUNICATION**

• Cities have successfully used their websites, mailed letters, electronic newsletters, and pamphlets left on residential door knobs to communicate to property owners regarding turf establishment activities, schedules, and when mowing is allowed.

• If a property maintenance service is used, contact them directly to communicate regarding when grass can be mowed.

• Communication with residents should be sent out during Contractor maintenance and before the warranty period ends.

**TURF RESTORATION PROTOCOLS**

• If the turf is damaged due to construction activities or has failed to grow, it must be restored by the contractor prior to final acceptance.
  – Fix surface erosion rills
  – Fix rut damage
  – Fix soil settling against curb or sidewalk
  – If improper plastic erosion netting was used, remove netting prior to mowing or causing a safety tripping hazard.

• If turf does not grow, collect a soil sample as described above and send to a soil testing laboratory. Follow the recommendations included in the test results, which may include addition of phosphorus, potassium, pH adjustment, or organic matter amendments.

• If the turf is discolored yellow or light green, it may be chlorotic from lack of nitrogen, iron and/or high pH. If it is reddish tinges along the leaf edges, it may have a phosphorus nutrient deficiency. Refer to soil test results and soil lab recommendations for soil amendment/treatment protocol.

• If the turf has been scalped too short by mowing, make sure it is watered properly and withhold mowing until the turf recovers to at least 3” in height.

• If grass and forb weeds were not removed in a timely manner, such that weeds dominate the turf seedlings or long enough to set and disperse weed seeds, the area will require turf restoration starting from the beginning of the seeding or sodding process.

• If the turf exhibits gaps or browning after applying herbicide, then the herbicide product may not have been appropriate for the turfgrass. Consult the herbicide label or turfgrass extension specialist and pay attention to recommendations on environmental conditions (temperature, moisture) suggested at the time of application. Expect to start over.
Project Resources

This guidebook and related educational materials produced by the LRRB are available at lrrb.org/boulevard-turf-maintenance, as well as the following direct links:


Two-page handout: "From Seed to Turf" and "Boulevard Turf Establishment" (also pages 7-8 of this guidebook), mndot.gov/research/reports/2019/2019RIC09H.pdf.

Homeowner education video: “Growing Green Grass Along Your Street”, youtube.com/lrrbmn

Additional Resources

http://roadsideturf.umn.edu/ - this website will become a clearing house with links to U of M turf research, best practices, and recommendations.

OTHER

• MnDOT Standard Specification 2575 “Establishing Turf and Preventing Erosion”


• “Production Requirements for MNST-12 Sod Seed,” Minnesota Crop Improvement Association.

• City of Edina Engineering Department, Example letter to homeowners and Specification for Grading and Landscaping section 14.0 Turf Establishment.

• City of Grand Rapids Engineering Department, Example letter to homeowners


• “Installation and Management of Roadside Turfgrass,” University of Minnesota Department of Horticultural Science. Offered through the University of Minnesota College of Continuing and Professional Studies.

• University of Minnesota Soil Test Lab, Room 135, Crops Research Building, 1902 Dudley Ave., St. Paul, MN 55108. Phone: (612) 625-3101 Email: soiltest@umn.edu

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**FROM SEED TO TURF**

**WEEK 1**
- Seed when soil temperatures are at least 50° F.
- Apply 1/2 of required starter fertilizer prior to seeding.
- Apply hydromulch per MnDOT 2575 at a rate of 2,100-2,500 lbs./acre for flat or shallow slopes.
- Do not use plastic netting or staples on seeded areas.
- Water lightly 2-3 times per day as needed to keep the soil moist.

**WEEK 2**
- Germination will occur in 7-14 days, depending on weather and soil conditions.
- Continue to water seedlings as needed to keep the soil moist.

**WEEK 3**
- Lighter, more frequent watering events are ideal for seed establishment. Apply water at a rate of 1/3", three times per week.
- The application of water may be tested by placing a rain gauge or water tray in the grass area.

**WEEK 4-7**
- Weeds may have begun to appear. Control weeds by hand pulling.
- Noxious weeds must be completely removed from the site per the MN Department of Agriculture Noxious Weed law.
- Continue to water at a rate of 1" per week, spread out over 3 applications per week.
- The application of water may be tested by placing a rain gauge or water tray in the grass area.

**WEEK 8**
- Mow when turf first reaches uniform height of 5"–6". (approximately 8 weeks after seed germination). Do not mow when the density is less than 50 percent of area coverage.
- Do not mow newly established turf when conditions are hot (85° F) and dry.
- Do not cut more than 1/3 of the grass height in a single mowing event.
- If walking in the new grass area shows settlement in the soil, the turf has not yet established and should not be mowed. Do not mow if mower tires form ruts.

Available under "Resources" at LRRB.org
### Boulevard Turf Establishment - Best Practices

**Finish Road Construction**
- All debris must be removed from boulevard.
- Till and rake subsoil so it is smooth and even.
- Perform walkthrough prior to approval

**Soil Preparation**
- 6" topsoil gives the best results.
- Soil will settle, so fill areas high.
- If late in season, temporary erosion control may be required until spring.
- 8% organic content is goal for soil.
- Perform walkthrough prior to seeding

**Seeding or Sodding**
- Determine which grass species are appropriate for your site.
- **Seed** will get better long term results but sod gives immediate finished appearance.
- **Sod** is best for erosion prone areas.
- Apply half of the recommended fertilizer at seeding (the other half is applied in weeks 6-8).

**Contractor Care and Establishment**
- Water seed and seedling to keep from drying during the first 14 days.
- Light watering 2-3 times per day for sod, until roots are established.
- When the grass is 6" tall, mow it to 4" high. When it reaches 6" mow it again. Repeat a 3rd time. It can now be mowed with the rest of the lawn.
- 70% grass cover required for removal of erosion control measures (NPDES permit).

**Property Owner Care**
- Turf takes up to 1 year to fully establish from seed.
- Communicate with property owner to let them know when they are responsible for care.

**End of Warranty Period**

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*Available under “Resources” at [LRRB.org](http://LRRB.org)*