



# Growing Grass: Empowering the People

APWA Minnesota – Fall Conference  
November 21, 2019

# The Local Road Research Board



IN ANNUAL  
FUNDING



NEW PROJECTS  
EACH YEAR



ACTIVE  
PROJECTS



**12 CITY/COUNTY  
BOARD MEMBERS**



**100+ TAP CITY/  
COUNTY MEMBERS**





# Who is the Local Road Research Board?

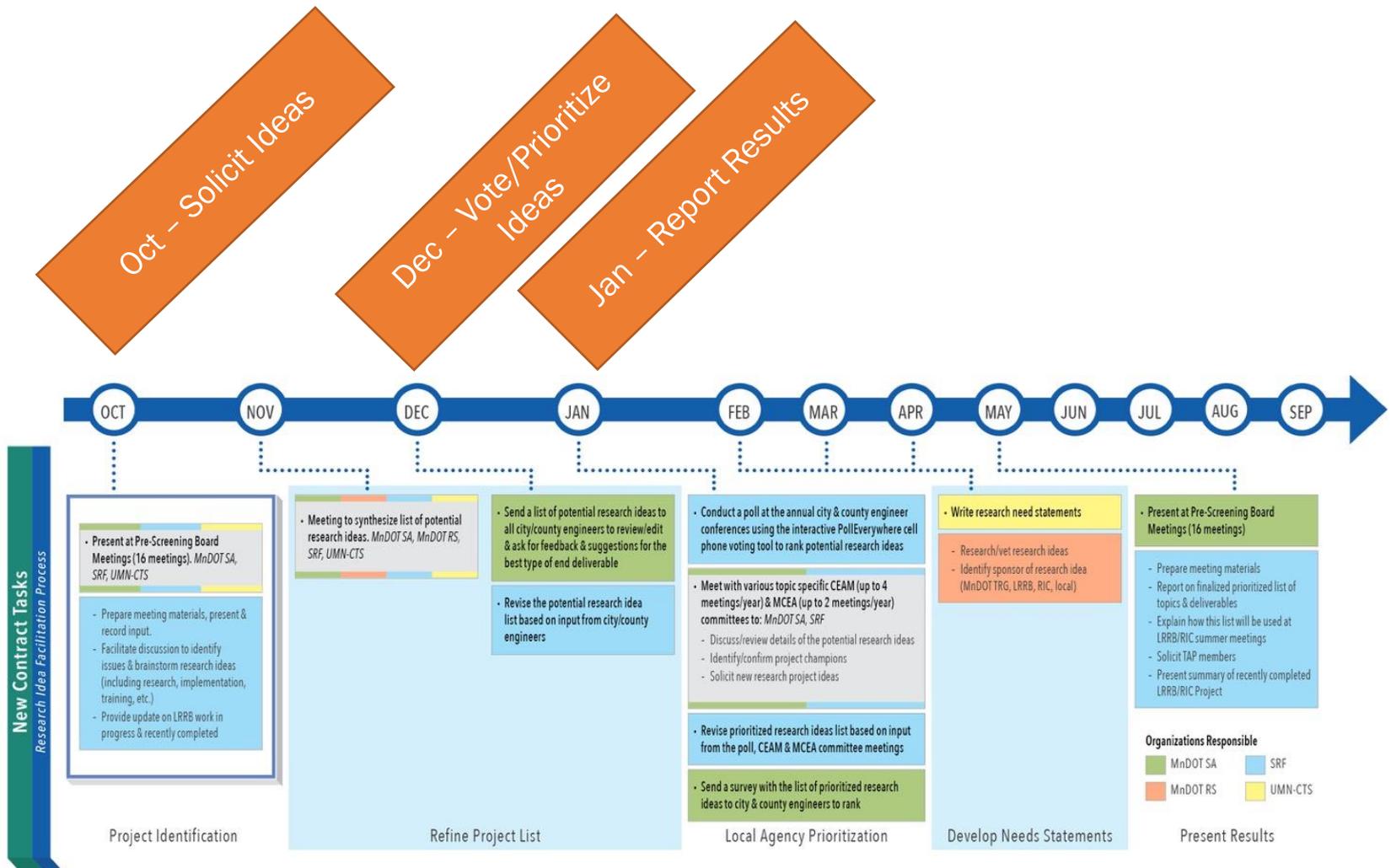
- Mitch Rasmussen-Kristine Elwood, MnDOT State Aid
- Jim Foldesi, St. Louis County
- Kaye Bieniek, Olmsted County
- Kent Exner, City of Hutchinson
- Kevin Western, MnDOT Office of Bridges and Structures
- Laurie McGinnis, U of M CTS
- Lyndon Robjant (Chair), Carver Co
- Paul Oehme, City of Lakeville
- Tim Stahl, Jackson County
- Katie Walker, MnDOT Research



## Who is the Research Implementation Committee?

- Ben Worel, MnDOT Road Research
- Guy Kohlnhofer, Dodge County
- Hafiz Munir, MnDOT RS
- Dave Conkel, MnDOT State Aid
- John Brunkhorst, McLeod County
- Kaye Bieniek, Olmsted County
- Kelvin Howieson, MnDOT District 3
- Kristine Elwood, MnDOT State Aid
- Mike Flaagan (Chair), Pennington Co
- Stephanie Malinoff, U of M CTS
- Steve Bot, City of St. Michael
- Will Manchester, City of Minnetonka

# The Research Process



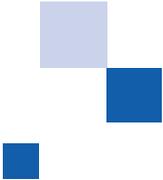
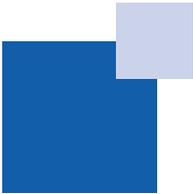
# What was the issue?

- Boulevards are difficult places to grow grass because of the harsh environment, in general.
- Agencies feel the pressure to restore the grass to its original form after a reconstruction project.
- Residents and businesses are concerned about the impacts to their private yards.



# The Technical Advisory Panel

Name	Organization
Paul Oehme	City of Lakeville
David Bolf	City of Hermanton
Thomas Johnson-Kaiser	MnDOT
Derek Northenscold	City of Edina
John Pratt	City of Detroit Lakes
Joseph Stadheim	City of New Ulm
Dwayne Stenlund	MnDOT
Jon Trappe	University of Minnesota
Cindy Voigt	City of Duluth
Eric Watkins	University of Minnesota
Matt Wegwerth	City of Grand Rapids
Andrew Witter	Sherburne County
Nicole Buehne	SRF Consulting Group
Sean Jergens	SRF Consulting Group
Michael Marti	SRF Consulting Group



# What was the goal?

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- Provide local agencies with:
  - Recommendations on the best practice to establish healthy turfgrass in boulevards
  - Tools to engage residents and businesses on how they can support turf maintenance
  
- Provide:
  - Resource guide
  - Two-page handout
  - Homeowner education video



# Project Process

Comprehensive Literature Search

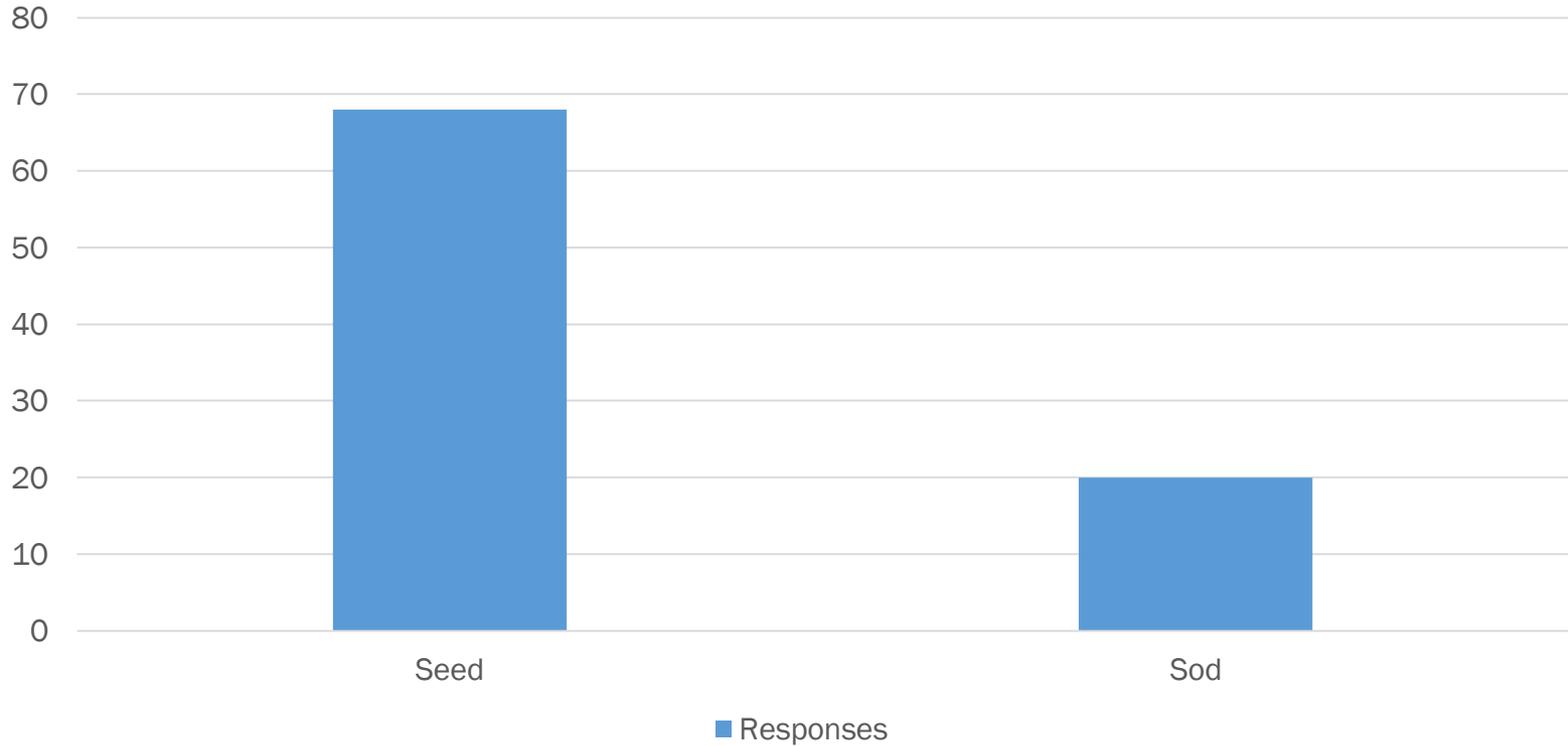
Interviews with:

- UofM's Turfgrass Science
- MnDOT Office of Environmental Sciences

Survey sent to all cities/counties through  
State Aid

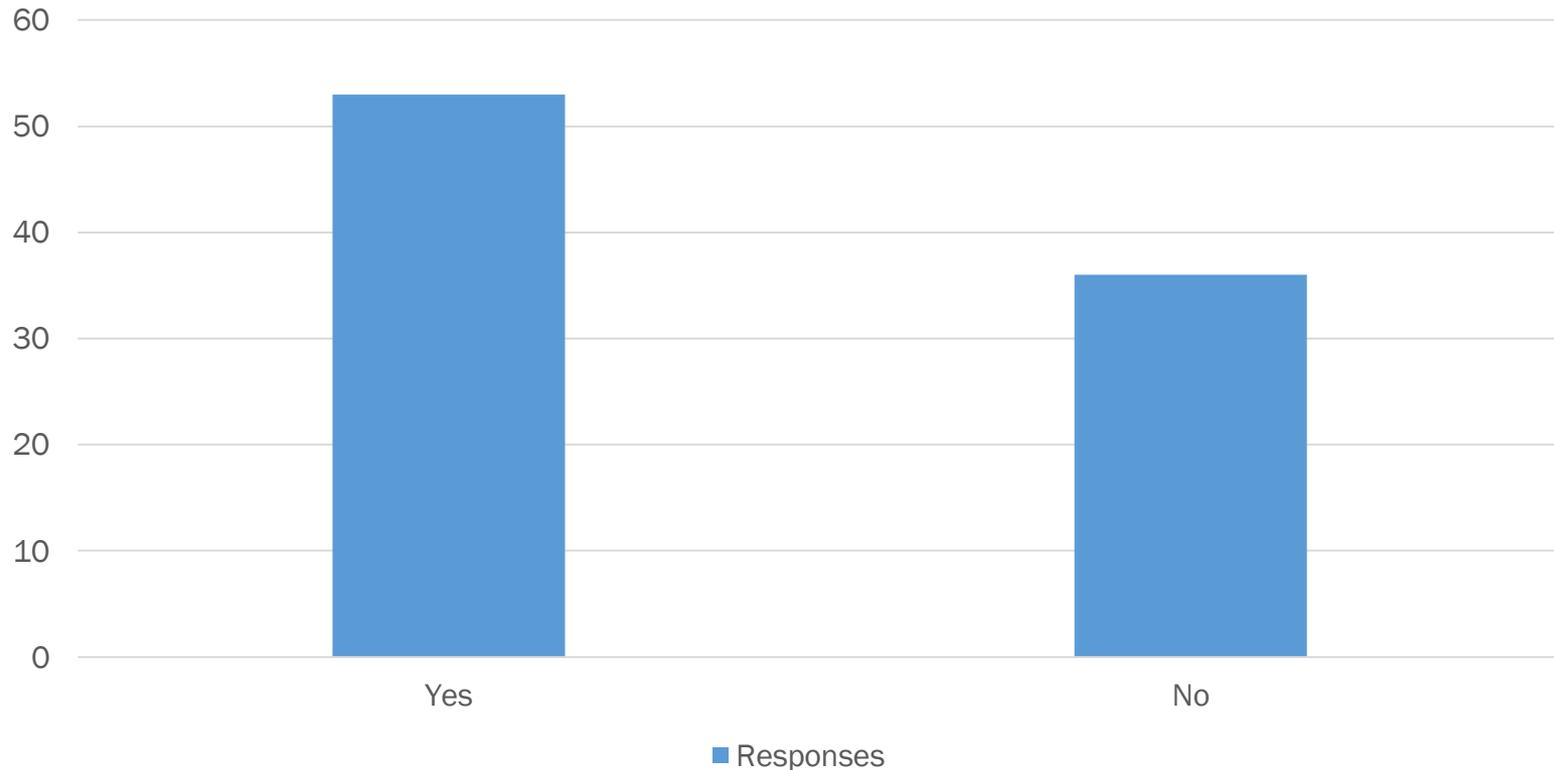
TAP Experience/Case Studies

# Current Typical Practice by Agencies



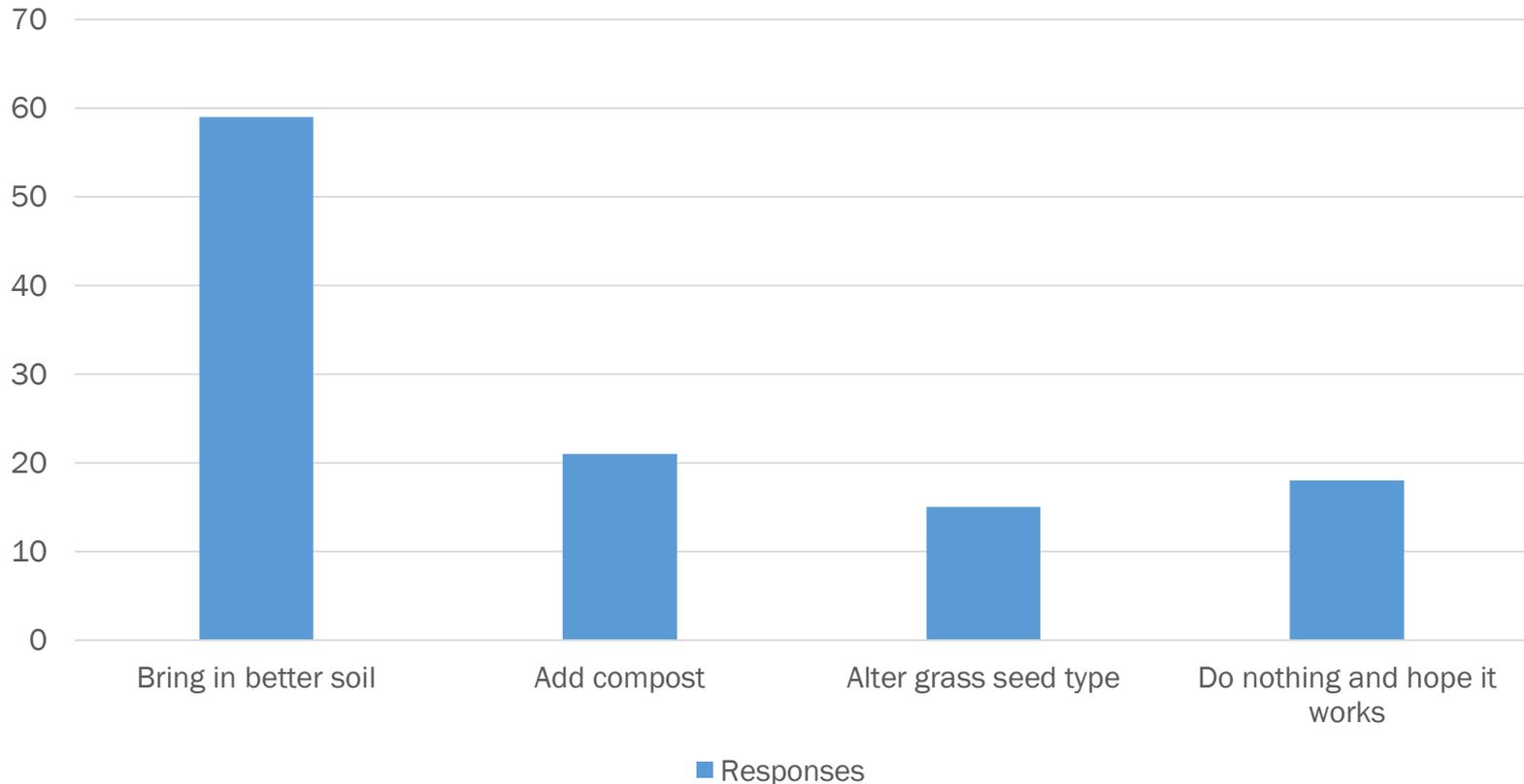
- Although majority of responses showed seeding was more typical, survey responders submitted questions on challenges with sod.
- Identified a need to cover both practices.

## Number of agencies with restricted timeframes for when seeding/sodding takes place



- Although most responded “yes,” more agencies than anticipated do not have a set timeframe when seeding/sodding takes place.
- Potential to provide guidance on recommended timeframes depending on seed or sod type.

# Agencies' response to when there are poor insitu soils



- Although most agencies responded that they bring in better soils or do something, a surprising number responded, “do nothing and hope it works.”
- Reiterated the need for guidance on best practices for soil preparation

# Survey Results: Additional Topics of Concern

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Impact of salt

Which seed/sod mixtures to use

Application of fertilizer

Scheduling – when are the best times

Practical/economic watering techniques

Contractors and the warranty period

Residential collaboration and satisfaction

# What was the solution?



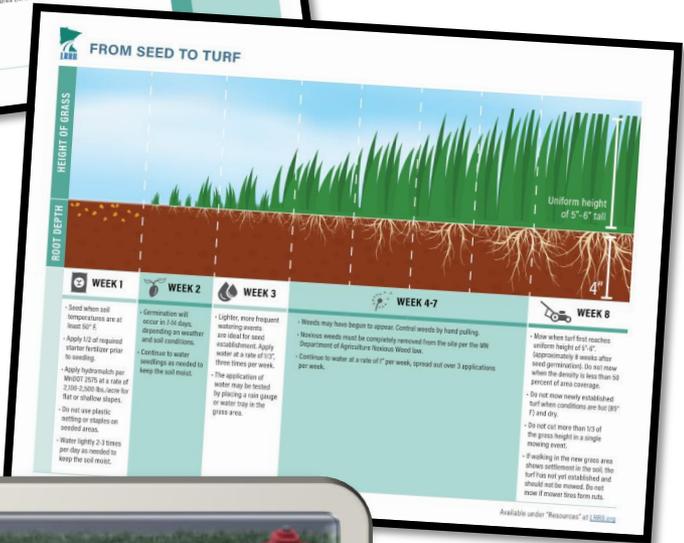
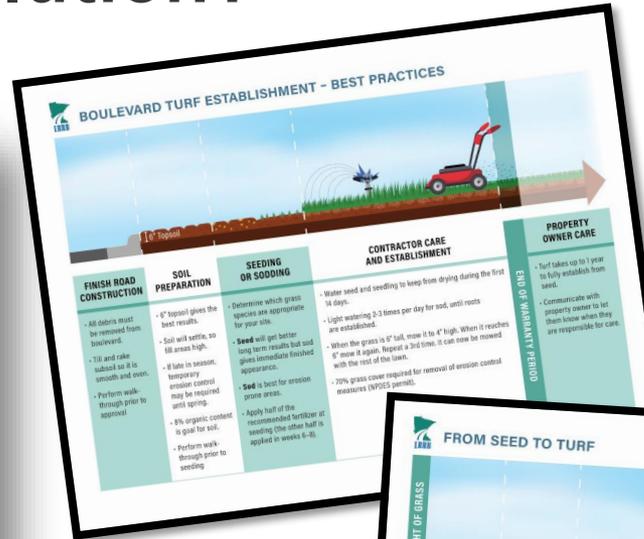
## Best Practices for Boulevard Turf Design and Maintenance

Report Number 2019RIC09 | May 2019



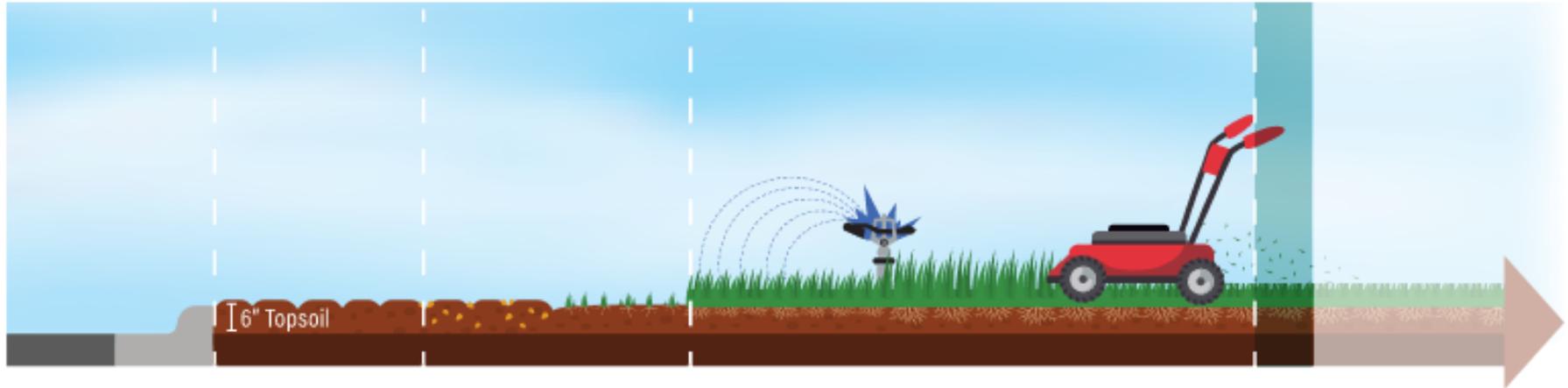
Authors:  
 Sean Jergens,  
 SRF Consulting Group  
 Mike Marti,  
 SRF Consulting Group  
 Nicole Buehne,  
 SRF Consulting Group

Minnesota Local Road Research Board | Minnesota Department of Transportation Office of Research & Innovation  
 395 John Ireland Boulevard, MS 330, St. Paul, Minnesota 55155-1899 | lrrb.org





# BOULEVARD TURF ESTABLISHMENT - BEST PRACTICES



FINISH ROAD CONSTRUCTION	SOIL PREPARATION	SEEDING OR SODDING	CONTRACTOR CARE AND ESTABLISHMENT	END OF WARRANTY PERIOD	PROPERTY OWNER CARE
<ul style="list-style-type: none"> <li>All debris must be removed from boulevard.</li> <li>Till and rake subsoil so it is smooth and even.</li> <li>Perform walk-through prior to approval</li> </ul>	<ul style="list-style-type: none"> <li>6" topsoil gives the best results.</li> <li>Soil will settle, so fill areas high.</li> <li>If late in season, temporary erosion control may be required until spring.</li> <li>8% organic content is goal for soil.</li> <li>Perform walk-through prior to seeding</li> </ul>	<ul style="list-style-type: none"> <li>Determine which grass species are appropriate for your site.</li> <li><b>Seed</b> will get better long term results but sod gives immediate finished appearance.</li> <li><b>Sod</b> is best for erosion prone areas.</li> <li>Apply half of the recommended fertilizer at seeding (the other half is applied in weeks 6-8).</li> </ul>	<ul style="list-style-type: none"> <li>Water seed and seedling to keep from drying during the first 14 days.</li> <li>Light watering 2-3 times per day for sod, until roots are established.</li> <li>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.</li> <li>70% grass cover required for removal of erosion control measures (NPDES permit).</li> </ul>		<ul style="list-style-type: none"> <li>Turf takes up to 1 year to fully establish from seed.</li> <li>Communicate with property owner to let them know when they are responsible for care.</li> </ul>

# Design Phase Considerations

## *Seed vs Sod*

- Sod
  - Better for erosion prone areas
  - Provides immediate visual benefit
- Seeding
  - Potential better long-term result
  - More cost effective
  - Takes longer to fully establish  
*(needs to be communicated to residents).*

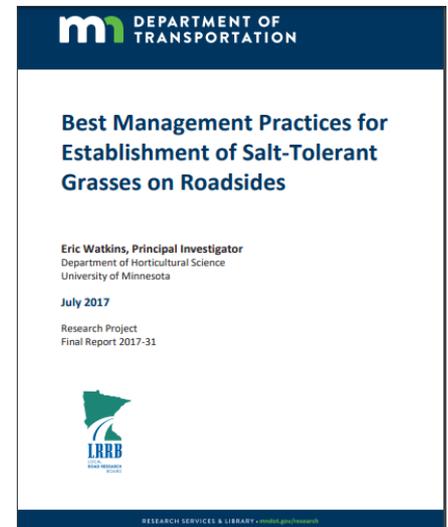


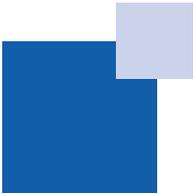
Images from [UofM](#)

# Design Phase Considerations

## *Salt Tolerance*

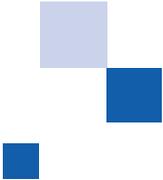
- The MNST-12 mix
  - Developed for salt-tolerant sod production
  - Research by the U of M  
[lrrb.org](http://lrrb.org), search “MNST-12”
  - Comprised primarily of fine fescues
  - Currently not in the MnDOT Standard Specification
- Sod should be specified as:  
MnDOT Type Salt Tolerant





# Design Phase Considerations

## *Time of Year*



- Sod

- April 15-June 10; August 10–October 31
- Salt tolerant sod – best in Spring (slower rooting)
- If installing sod in late fall
  - Do not place within the first 10ft of roadway (deicing agents)
  - Stabilize with some form of erosion prevention; sod in the spring

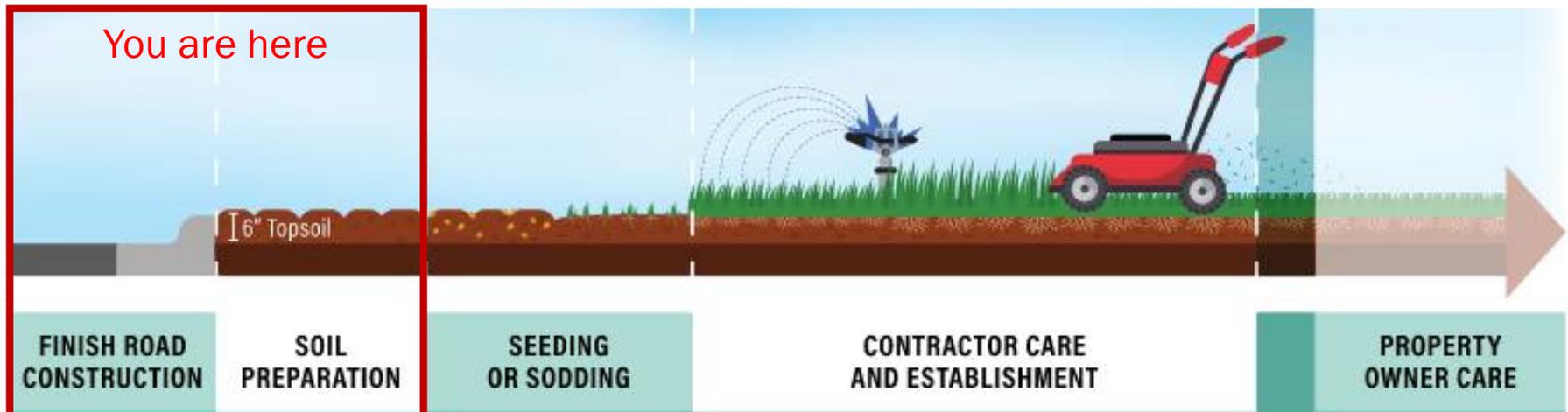
- Seed

- August 1 – September 15
- MNST-12
  - More susceptible to heat and drought*

# Construction and Maintenance Practices

## *Soil Preparation and Placement*

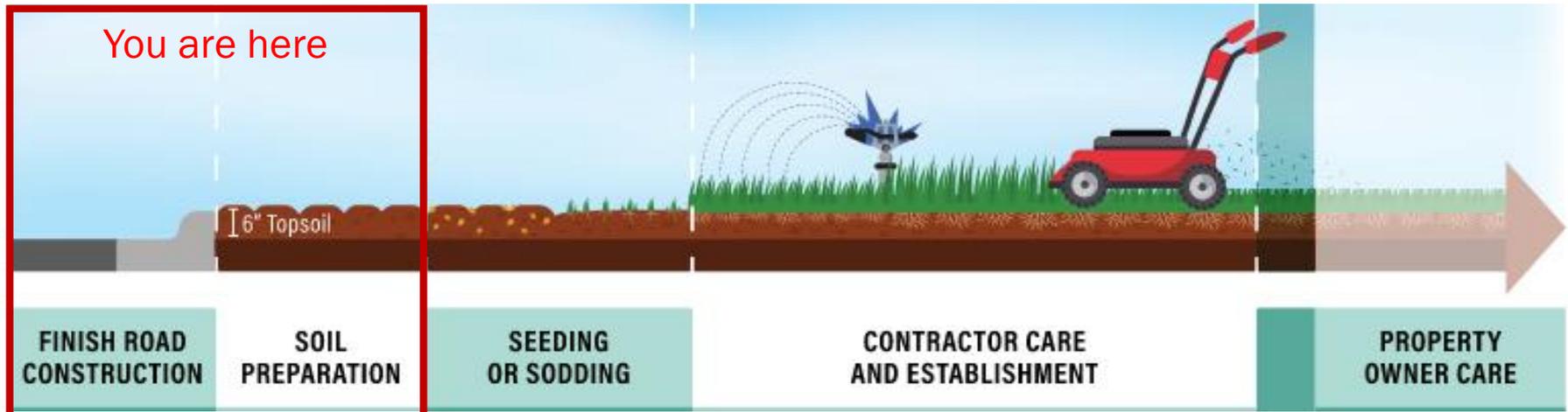
- Quality soil is the critical
- Import new soil if comprised
- Goal to preserve the biological activity of the boulevard before, during, and after construction.



# Construction and Maintenance Practices

## *Soil Preparation and Placement*

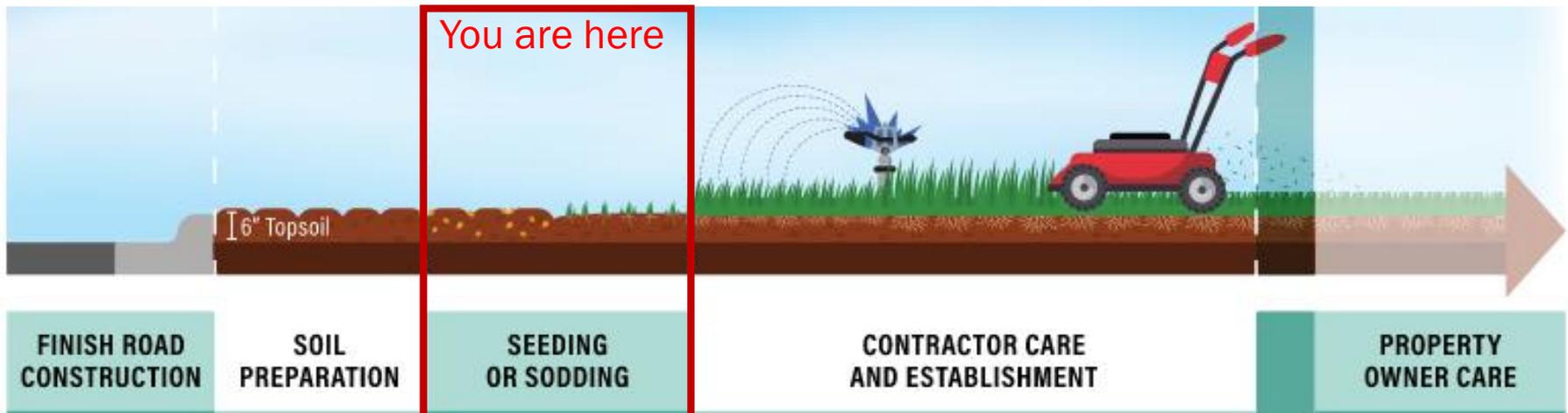
- Remove all construction debris; do not empty concrete wash water into the blvd
- Perform a walk-through before topsoil placement
- Subsoil should be scarified or ripped. (Ex. teeth of a backhoe)
- Regardless of whether topsoil is salvaged or imported:
  - 6" of topsoil should exist after settlement; finish grade should match the back of curb
  - A 50% topsoil and 50% compost (meeting requirements of MnDOT compost type 2)
  - Perform a soil test for organic matter content, pH, and base nutrients; Adjust if necessary
- Perform a walk-through to approve boulevards before seeding or sodding



# Construction and Maintenance Practices

## *Seed Installation*

- Use a hydromulch application with sufficient longevity and performance (i.e. MnDOT 2575)
- Must be maintained by the turf installer until germination at no cost to the owner.
- Do not use plastic netting or staples



# Construction and Maintenance Practices

## *Fertilizer*

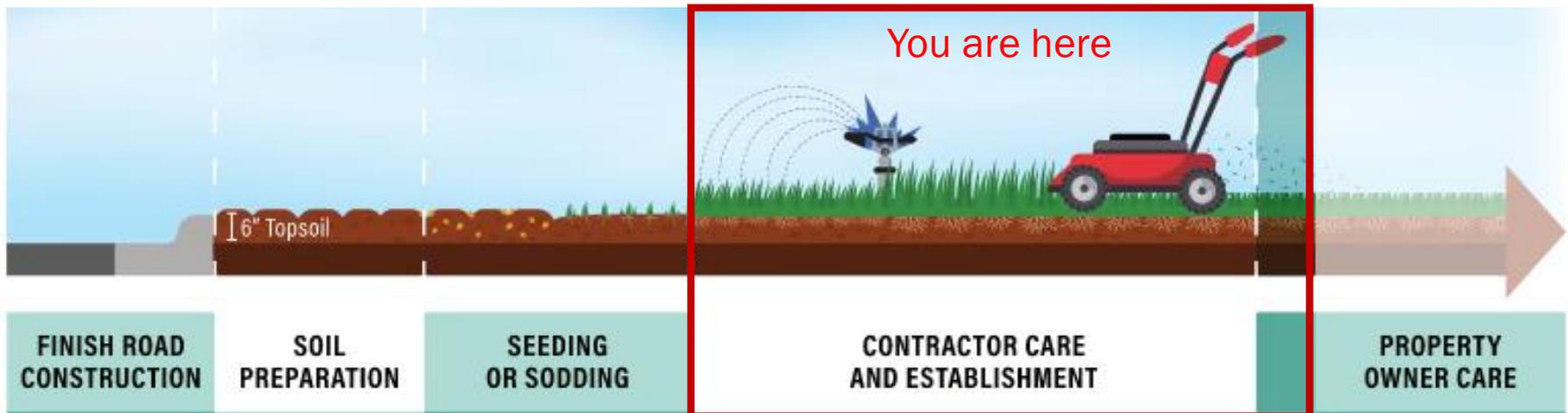
- Test soil fertility and organic matter prior to seed or sod application
  - Follow laboratory recommendations
  - If no test results: apply MnDOT 3881 Fertilizer Type 3 at 350 pounds/acre
- Incorporate into the soil with light raking.
- Apply half of the fertilizer at the time of seeding; the other half 6-8 weeks later
- Do not use “weed and feed” type fertilizers during the first year.



# Construction and Maintenance Practices

## *Watering*

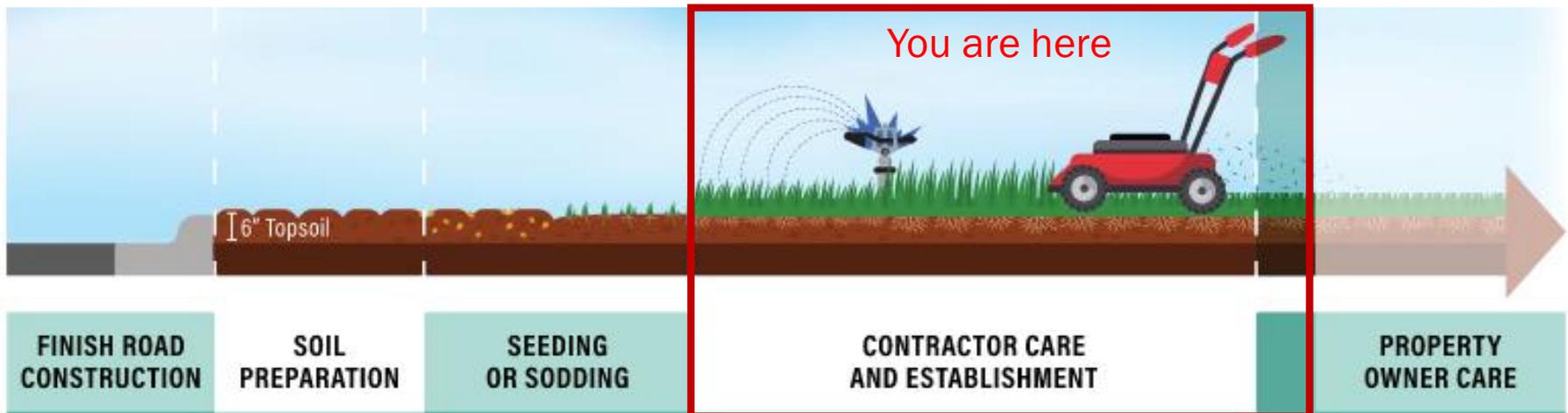
- Installer must submit a watering schedule for approval.
- Watering is necessary until the grass reaches a uniform height: 4–5” with deep roots (4”).
- Application rate should be low to ensure no runoff.
- Property owners should be encouraged to supplement watering.



# Construction and Maintenance Practices

## *Watering - Sod*

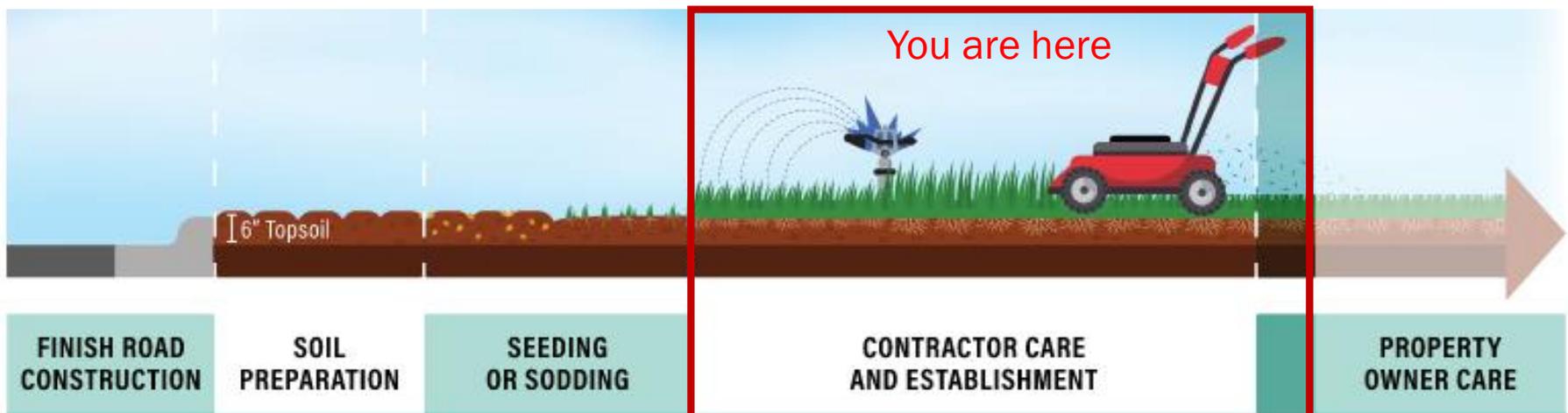
- Water to infiltrate soil to a depth of 6”  
Recommend 6 gallons/yd<sup>2</sup>; mimics a 1 inch rain event
- Week 1: Water lightly, 2-3 times per day to keep sod moist
- Week 2+: Water 1/3” of water every other day (2 gallons/yd<sup>2</sup> every other day )
- Dormant: Water until the sod is frozen in place.



# Construction and Maintenance Practices

## *Watering - Seed*

- Erosion prevention covers will help conserve applied water.
- Lighter, more frequent watering events are ideal
- Weeks 1-2: Water lightly, 2-3 times per day to keep sod moist
- After Week 2: Water 1/3" of water every other day (2 gallons/yd<sup>2</sup> every other day)

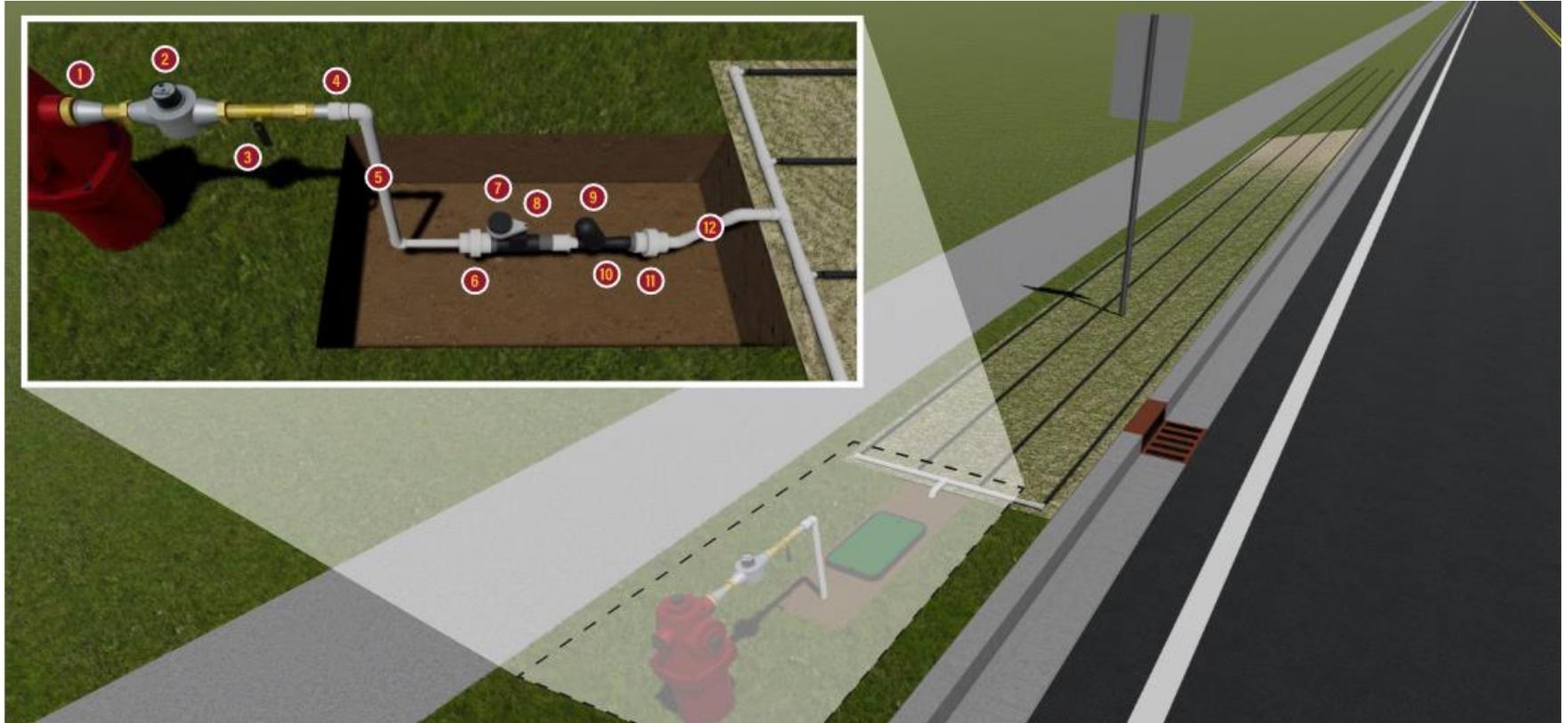


# Temporary Roadside Irrigation System

- University of Minnesota Turf Researchers developed an alternative method for running temporary irrigation from a fire hydrant or other water source.



# Temporary Roadside Irrigation Assembly



1 Check valve/backflow preventer

2 Hydrant meter

3 Ball valve

4 Connection to irrigation control assembly

5 Connection from hydrant meter

6 Union

7 Programmable irrigation controller

8 Irrigation control valve

9 Filter

10 Pressure reducer

11 Union

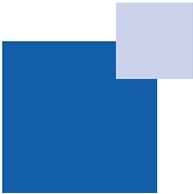
12 Connection to header

# City of Edina

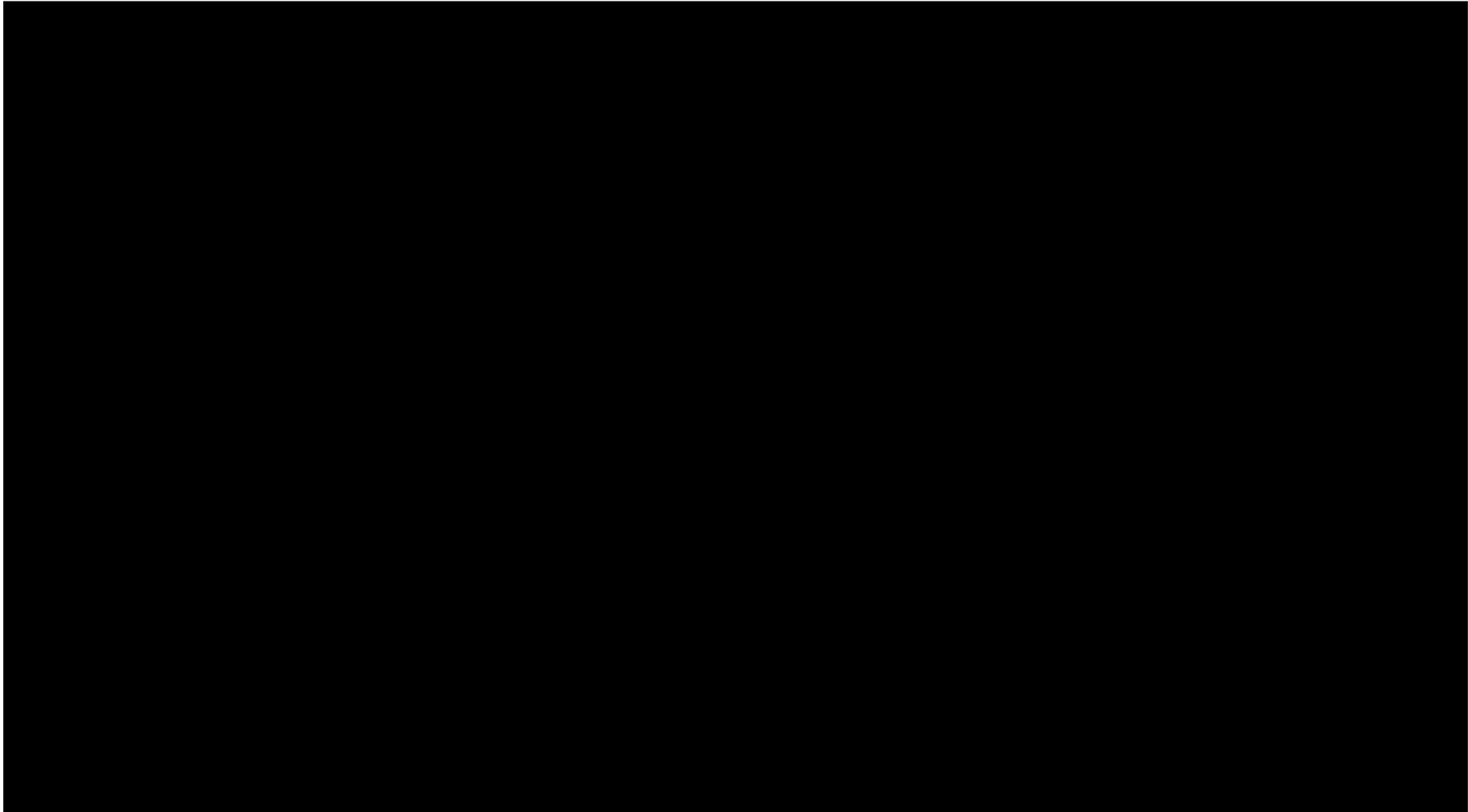
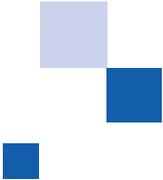
## *Temporary Roadside Irrigation System Pilot Project*

- City of Edina received OPERA funds to develop the roadside irrigation system





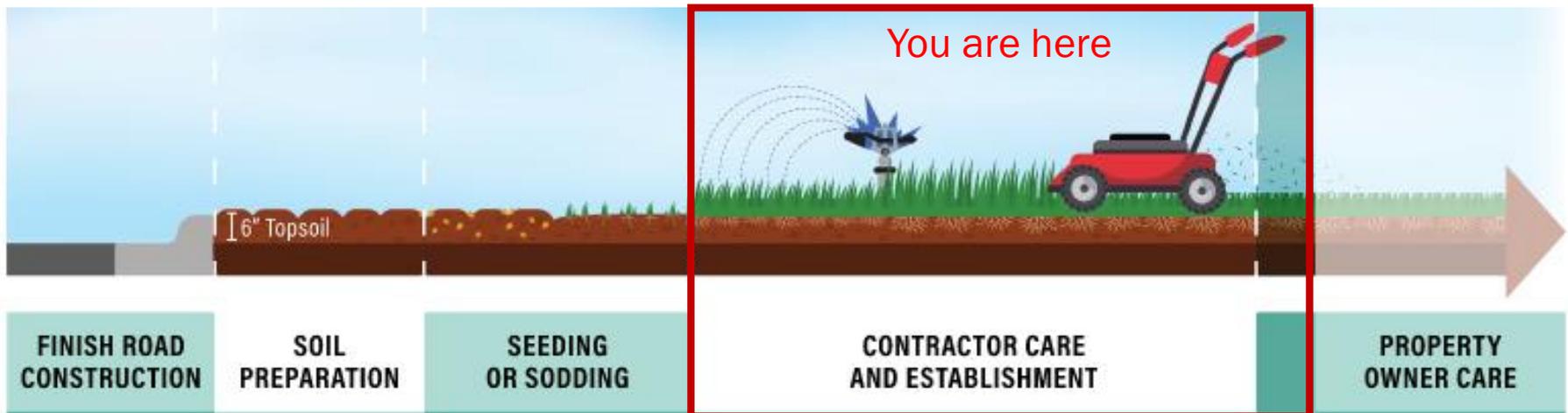
# City of Edina - Video



# Construction and Maintenance Practices

## *Weed and Pest Control*

- The best method to prevent weeds and pests is to grow healthy turfgrass.
- Remove all weeds as often as necessary to keep and maintain healthy turf.
- State law requires the removal of state-listed noxious weeds.



# Construction and Maintenance Practices

## *Mowing*

- Do not cut more than 1/3 of the grass height
- Encourage property owners not to mow until after the construction period
- Do not mow when hot and/or dry (above 85 °F).
- Do not mow if footprints or mower tires leave ruts; the turf has not yet established.



# Construction and Maintenance Practices

## *Mowing – Seed vs. Sod*

- Seed
  - Do not mow until turf first reaches a uniform 5” - 6” (approximately 8 weeks after seed germination).
  - Do not mow until density is greater than 50%
- Sod:
  - Only mow after rooting has taken place (tug test)
  - Grow to 4”; then mow to 2” or 3” (repeat 2 times).
  - Can then be cut to 2” and turned back to the property owner



# Construction and Maintenance Practices

## *Repair, Payment and Warranty*

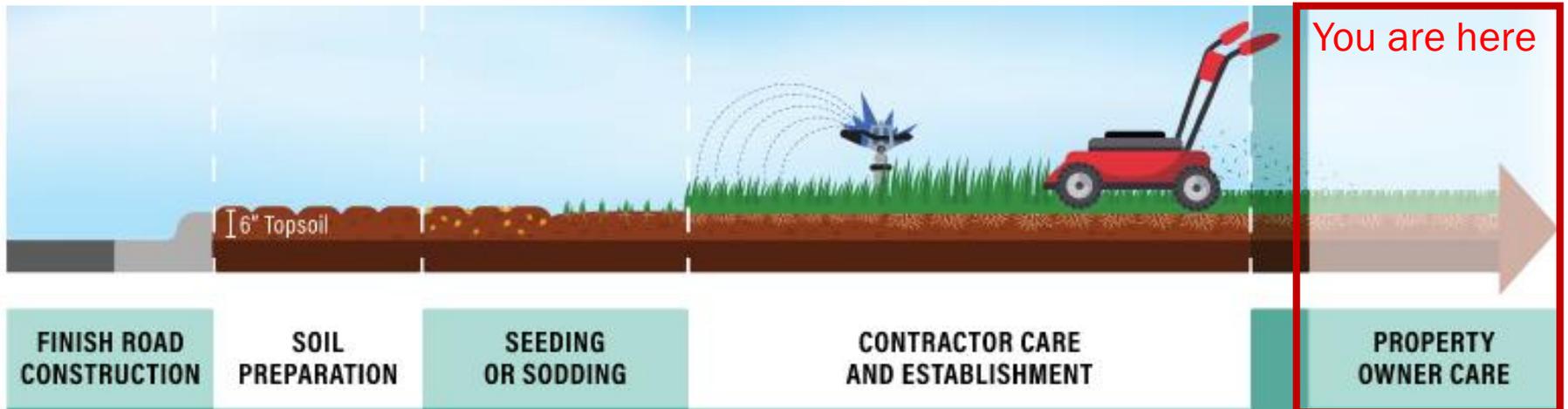
- Installer must repair any damage within warranty period
  - MnDOT Standard Specification 2575 is 30 days.
  - 60 days is preferred to establish roots
- Conduct a final walk-through with installer to verify
  - Healthy
  - uniform cover
  - weed-free turf with no bare/dead areas greater than 3 inches.

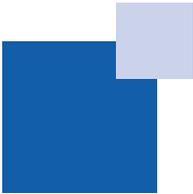


# Construction and Maintenance Practices

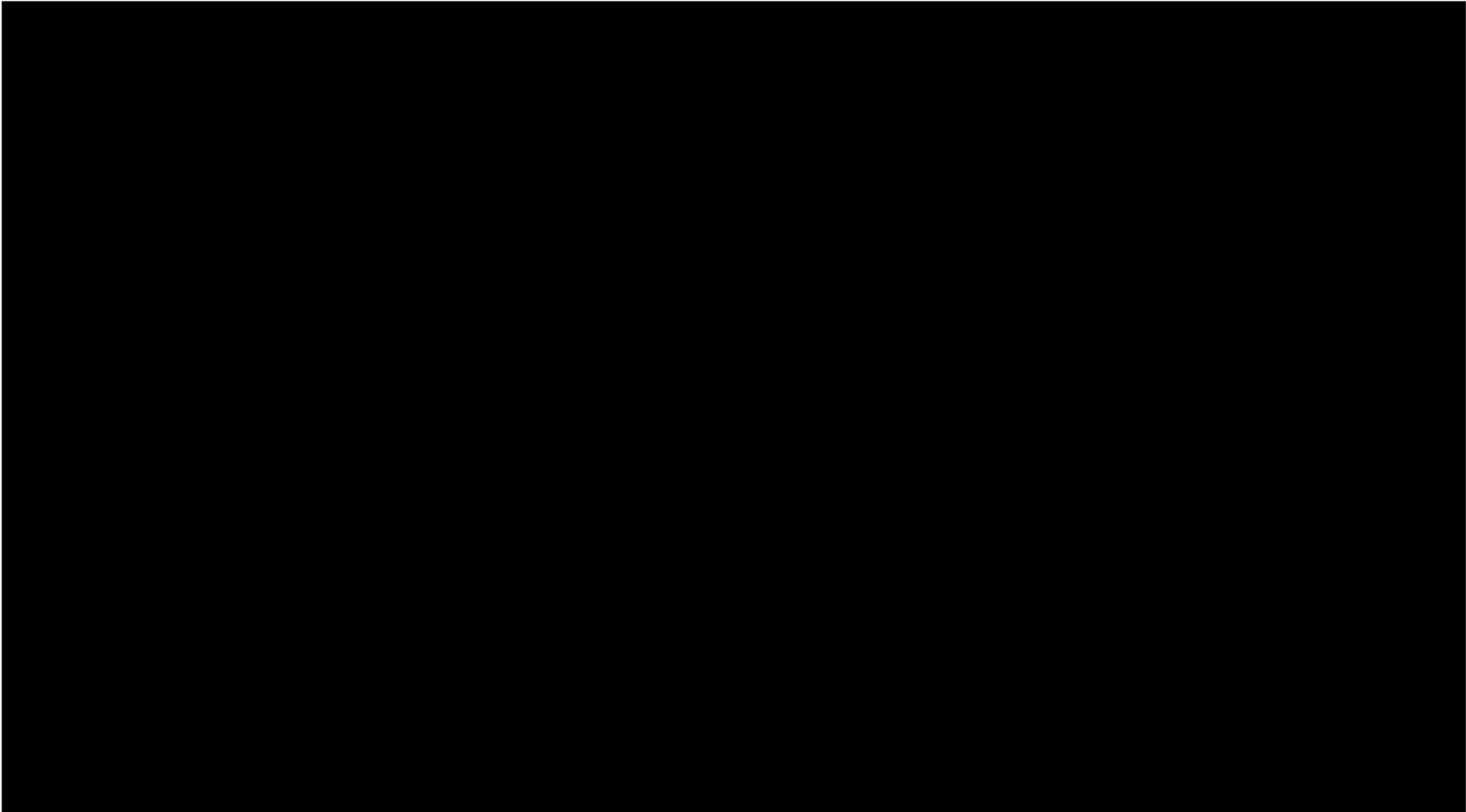
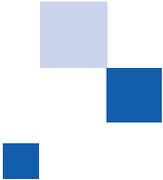
## *Communication to Property Owners*

- Send out communication during Contractor maintenance and before the warranty period ends
- Typical practices:  
websites, mailed letters, electronic newsletters, and door hangers
- New LRRB Products:
  - YouTube video
  - Illustrative Graphics



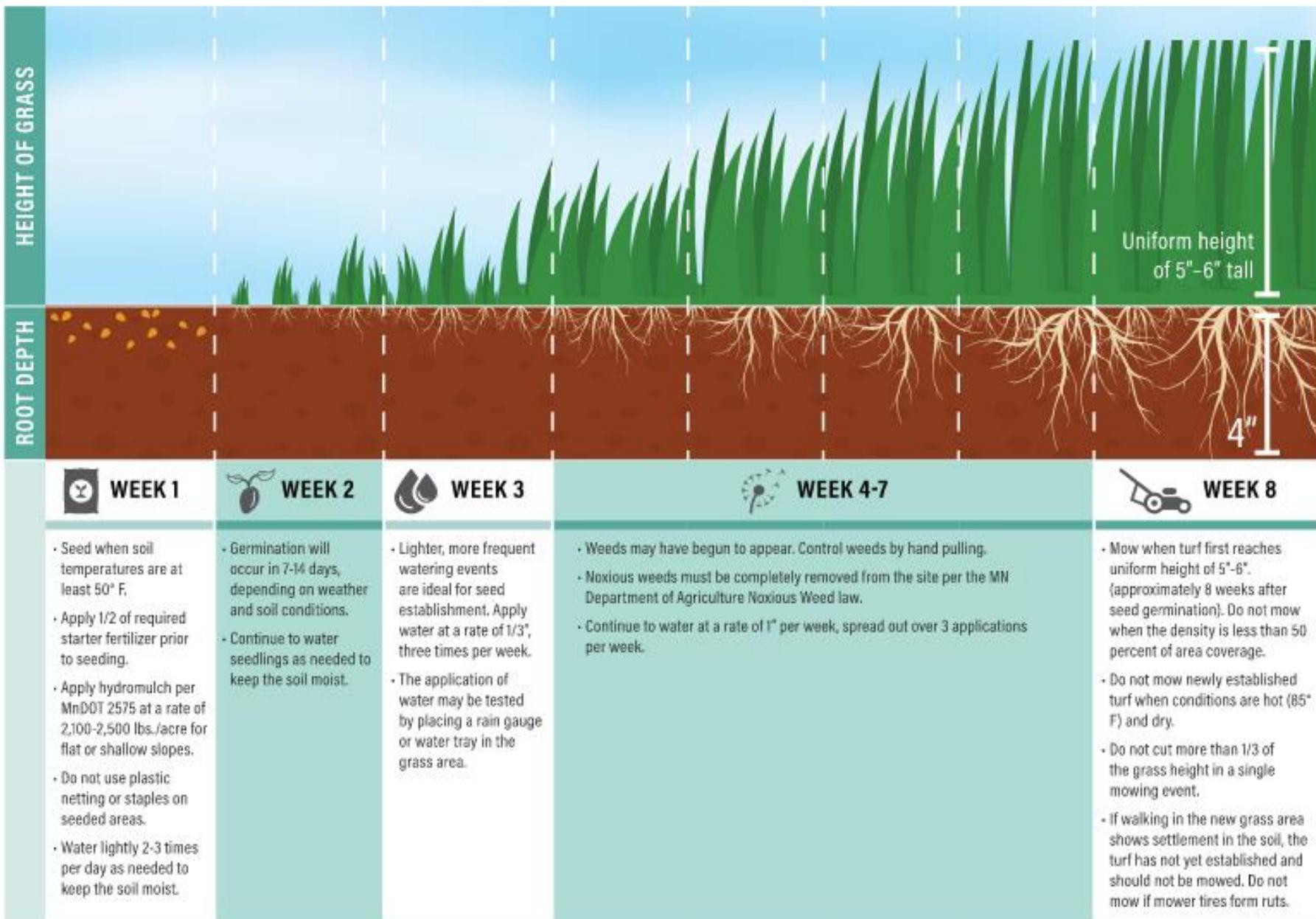


# Growing Green Grass Along Your Street





# FROM SEED TO TURF





HEIGHT OF GRASS

ROOT DEPTH



## 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 203 times per day as needed to keep the soil moist.



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### 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.



- Lighter, frequent watering are ideal until established.
- Water at three times per day.
- The application of water may be tested by placing a rain gauge or water tray in the grass area.

- 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.



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## 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 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.

Department of Agriculture revisited weed law.

- Continue to water at a rate of 1" per week, spread out over 3 applications per week.

seed germination). Do not mow when the density is less than 50 percent of area coverage.

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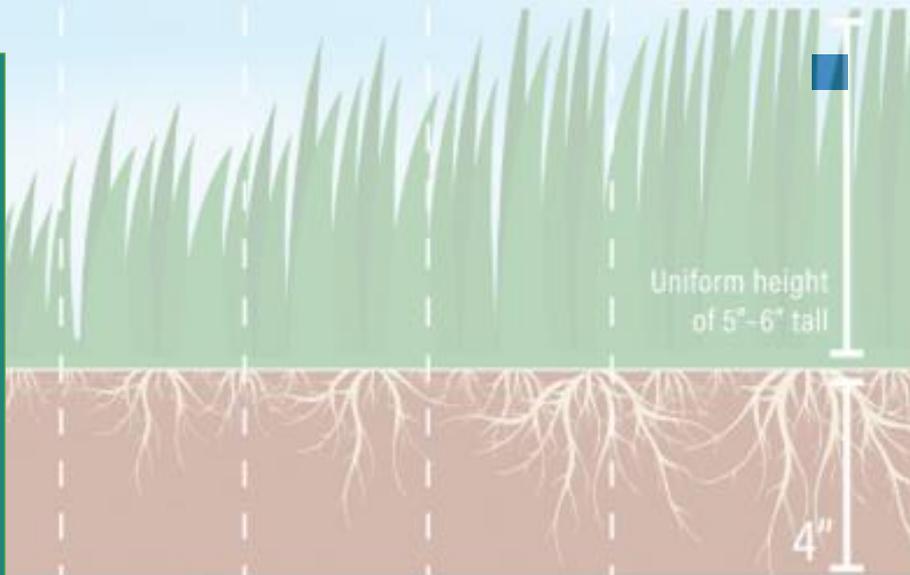
percent of area coverage.

- 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.
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## 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.



WEEK 4-7

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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.
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- 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.

- 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.

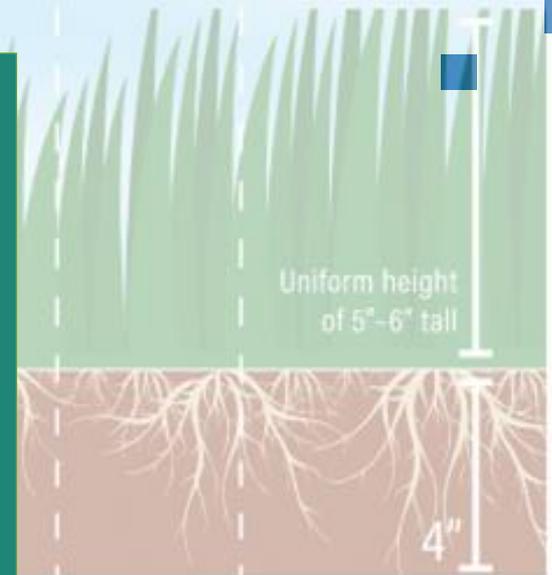
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Uniform height  
of 5"-6" tall

4"



### WEEK 8

d pulling.  
a per the MN  
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# Where to find the Guidebook and Tools



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## Who We Are

*The Local Road Research Board brings important developments to city and county transportation engineers, ranging from new ways to determine pavement strength to innovative methods for engaging the public.*

*[Find out more about the LRRB.](#)*

LRRB Welcomes Research Ideas From Minnesota Transportation Practitioners!

[SUBMIT IDEAS](#)

[www.lrrb.org](http://www.lrrb.org)

Search: boulevard turf

# Where to find the Guidebook



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## BEST PRACTICES FOR BOULEVARD TURF DESIGN MAINTENANCE

**Status:** Complete

**Report Date:** 10/03/2019

### Summary:

Establishing new boulevard grass following a road construction project is difficult, due to sun, foot traffic and salt residue from winter maintenance. A new guidebook, video and instructional handout produced by the Minnesota Local Road Research Board provide contractors, city maintenance workers and homeowners with helpful advice for successfully growing and maintaining healthy turfgrass.

### Final Deliverables:

[Guidebook #2019RIC09](#)

[Other #2019RIC09H](#)

### Related Materials:

[Best Practices for Boulevard Turf Design and Maintenance](#)

- (Brochure/Handout)

[Growing Green Grass Along Your Street: How-To Maintain Residential Boulevard Turfgrass](#) - (Video/Webinar)

### PROJECT PERSONNEL:

Principal Investigator: [Michael Marti](#)

Technical Liaison: [Paul Oehme](#)

Project Coordinator: Not Available

[www.lrrb.org](http://www.lrrb.org)

Search: boulevard turf



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