

Workshop Item *Dan Schluender, City Engineer*

Title

Sod Replacement Project

Executive Summary

There has been a significant amount of sod failures this year on Street Reconstruction projects that were constructed in 2019 and 2020. The sod on these projects were successfully growing prior to the high temperatures and drought that occurred in the summer of 2021. The City Council desired to better understand the current process, the root causes of sod failures, and discuss options to reduce this on future projects.

Background

Current Boulevard Restoration Process

Beginning in 2018, the City accelerated its Street Reconstruction program to address overdue maintenance and failing pavements throughout the City. Sod placement is used as part of the boulevard restoration behind the new curb and gutter installations. The typical contracting methodology is for the General Contractor to hire a sod company subcontractor to perform this work. The sod subcontractor is responsible for the installation of the black dirt below the sod, installation of the sod, and watering for 30 days to ensure that the sod has a chance to root. The City inspectors review the sod placement at the end of the 30 day warranty period to verify that it is still green, has started to take root and is in the growing process. This 30 day warranty period must end prior to November 1 or the remaining days are carried over into the following year. At the end of the warranty period any failed sod is required to be replaced by the sod subcontractor before they are released of responsibility for their product.

At that point the sod becomes the responsibility of the adjacent property owner to take over maintenance including watering, mowing, fertilizing, and future health of the grass. The property owners are given instructions on how to maintain the sod including the amount of water needed and cautions regarding mowing.

Causes for Sod Failure

Sod failures due to the health of the installed product are caught during the 30 day warranty period and a replacement is required before the project is complete. A new 30 day warranty period is initiated for any replacement within the warranty period.

It is abundantly clear when driving these project areas that some property owners took more care than others to make sure their sod was successful. See Image 1.

Sod failures after the initial 30 day warranty period are due to two main causes. First is failure of the property owner to continue deeply watering the sod for proper root growth and establishment. The second cause is mowing the new sod too often and especially too short.

This picture shows where the installed sod was 'scalped' very short and the black dirt is showing through. See Image 2.

Sod should be allowed to stay longer during its first growing season after installation to absorb nutrients and shade the root system from drying out in the sun. Below is an example where you can see the property owner let the sod grow longer than the rest of the yard to help it establish. See Image 3.

Other contributing factors include the amount of tree canopy in an area, amount and intensity of daily sun exposure, and direction of the streets. The hot temperatures and drought in the summer of 2021 made this worse and was the main cause of failure on all these projects. See Image 4.

Costs to Replace Failures on Projects over the Past Three Years

City staff surveyed the projects from 2019, 2020, and 2021 to measure the approximate amount of failed sod on each project and determine an estimated cost to replace it. The total is a little under 23,000 SY of 99,100 SY of sod placed.

The replacement cost includes removal/excavation, regrading, addition of two inches of new black dirt, and re-sodding. This estimate would include a standard 30 day warranty on the new sod.

A summary is below:

Project Year	Project No.	Project Name	Sod Placed (SY)	Estimated Dead Sod Percentage	Total Replacement Cost
2019	18-16	Lever Street Area Reconstructions	15984	5.00%	\$8,486.80
2019	18-17	Jefferson St Reconstructions Clover Leaf Parkway Area	8546	60.00%	\$47,633.40
2019	18-18	Reconstructions	728	0.00%	\$0.00
2020	19-07	2020 Street Reconstructions	9273	10.00%	\$7,931.45
2020	18-17	Jefferson St Reconstructions	9960	35.00%	\$34,423.00
2020	18-17	105th Avenue Recon	7052	30.00%	\$20,863.40
2020	18-17	115th Avenue Area Rehab	3936	20.00%	\$7,220.80
2020	18-18	Clover Leaf Parkway Reconstruction	10590	45.00%	\$46,103.75
2020	19-18	132nd Ave/Taylor St Reconstructions	13976	20.00%	\$25,660.80
2021	19-16	Polk Street Area Reconstructions	3111	10.00%	\$2,974.15
2021	21-06	2021 Street Reconstructions 132nd Ave/Hastings Street	13965	10.00%	\$12,833.25
2021	21-07	Rehabilitations	1890	10.00%	\$2,564.50
2021	21-08	99th Ave-101st Ave Rehabilitation	1900	10.00%	\$829.00
					\$217,524.30

Options to Improve Success Rates

Several ideas have been proposed to improve the success rate of a replacement program and for future street reconstruction projects.

Staff first proposes to improve the communication process to the property owners regarding their responsibilities after the warranty period. In 2020, a sod care notice was developed by staff and given to property owners on several of the 2020 street reconstruction projects. This notice served to educate property owners on the warranty period and how to care for the sod, explaining the recommended frequency and amount of watering and how to mow the new sod before and after the warranty period ends.

In 2021, this notice was given to property owners on all of the street reconstruction projects. The notice will continue to be used on all future street projects and staff will increase the frequency of communications with property owners via project

web pages, email updates, mailings, and social media posts. At a minimum, the property owners should receive notices at the time of sod placement, at the end of the warranty period, and in April/May of the following year as we enter the new growing season.

Another item we can add is to extend the time period the contractor waters the sod to 45 or 60 days. This would be a separate bid item in the contract that the City can then control if we have a rainy year versus a dry year. Contractor watering is done by water truck driving by slowly to spray the new sod with a heavy dose of water. This is not a complete substitute for slow regular watering by irrigation systems or sprinklers. We estimate this could cost between \$15,000 (additional 15 days) to \$30,000 (additional 30 days).

The last item is to wait until the third week of August or later to begin the restoration. This timing has the watering period end in the fall when the weather can begin to cool off again. By comparison, sod or seed placed in May or June would be turned over to the property owner 30 to 60 days later in July-August, typically the hottest and driest time of the year.

Extending Warranty Periods

Staff talked with several other cities and sod companies about the option to extend the warranty period. A few cities have a 45 day warranty period and do admit that it significantly increases cost. Sod companies are resistant to this concept as they do not have control of how the sod is maintained over that period. They cannot control the watering or mowing being performed by the property owners. Several have commented that they simply would not bid on a project requiring a 60 day warranty or they would need to significantly increase the bid price to manage the risk they would be taking on. Based on this industry research, staff does not recommend extending warranty periods beyond the standard 30 days for our projects.

Hydro-seeding as an alternative to sod for some or all areas of failure

There is always the concern that a sod replacement will result in the same failures if not cared for properly. We hope that our instruction on mowing are followed better on a replacement project. In-ground irrigation systems greatly improve the success rates but not many properties have them.

Hydro-seeding is a reasonably priced alternative to sod. Hydro-seed is a mixture of seed, mulch, and fertilizer that is supplied in a larger tanker and sprayed on the

bare ground using hoses after removal of the dead sod. See Image 5.

Grass will germinate and begin to appear in a week to ten days and be long enough to mow in three to four weeks. This method still requires all the watering and care of sod or the rest of the lawn. The area should not be walked on during the germination and initial growth establishment period.

This alternative would still require removal/excavation of the dead patches, regrading, addition of new black dirt, and then the hydro-seeding. We estimate the total cost could be closer to \$120,000 for the entire area.

Strategic Plan Relationship

This project is a component of our street improvement program for well-maintained infrastructure.

Financial Impact

Costs for any project will need to come from the General Fund Reserves or the Pavement Management Program fund.

Questions for the City Council

1. Does the City Council want to pursue a replacement project to address dead sod areas from the 2019, 2020, and 2021 Street Reconstruction projects?
2. Is there a preference on type of restoration?
 - All sod replacement
 - Sod only for irrigated lawns and hydro-seed in other areas
 - Hydro-seed replacement for all areas
3. Does the City Council want to increase the watering days from 30 to 45 or 60 days?