#4 C&D Debris | Subcommittee Meeting #4 Summary – Construction & Demolition Debris January 24, 2022 9AM-12PM

Subcommittee meeting #4 of the Construction & Demolition Debris Subcommittee (#4-C&D) was convened virtually via Zoom on January 24, 2022 from 9 AM-12 PM, CST. Attendance for #4-C&D is provided in Table 1 below.

Table 1. #4 C&D Subcommittee Membership and Attendance

Name	Company	Attended 1/24/22
Becky Soglin	Johnson County Planning, Development and Sustainability	Present
Tim Ruth	Home Builders Association of Iowa and Iowa City	Absent
Brian Seals	Waste Commission of Scott County	Present
Hal Morton	Independent	Absent
Seth Shannon	SCHEMMER	Present
Richard Graves	NA	Absent
Damion Sadd	Continental Cement Co.	Present
Kerry Dixon	Engie North America	Present
Les Stohs	Greater Des Moines Habitat for Humanity/Re-Store	Present
Nick Wylie	J Pettiecord	Absent
Cindy Kuhn	Habitat for Humanity Restore in QCA	Absent
Jaime Courtney	Iowa Home Crafters	Present
Jay Iverson	Home Builders Association of Iowa	Present
Ashley Buss	Iowa DOT	Present
Madeline Schmitt	Iowa DOT	Present
Reid Bermel	DNR Internal SMM Team	Present
Laurie Rasmus	DNR Internal SMM Team	Present
Jeff Fiagle	DNR Internal SMM Team	Present
Tom Anderson	DNR Internal SMM Team	Present
Jennifer Wright	DNR Internal SMM Team	Present
Michelle Leonard	Consultant – SCS Engineers	Present
Christine Collier	Consultant – SCS Engineers	Present
Rosa Cruz	Consultant – SCS Engineers	Present
Ketan Shah	Consultant – SCS Engineers	Present
Karen Luken	Sub-Consultant – EESI*	Present

* Economic Environmental Solutions International

A. Subcommittee #4 - C&D Summary

The meeting began with the project consulting team reviewing the agenda for this meeting (see Attachment A), the overall objectives of the Sustainable Materials Management (SMM) – Vision for Iowa project, the process and goals of the project process, and the goals for today's subcommittee meeting. The slides presented for this Subcommittee meeting are included in Attachment B.

The project consulting team presented summaries of life cycle analysis (LCA) reports related to building materials. The presentation included LCAs for asphalt shingles, treated and untreated wood, and drywall. Tables and graphs in attachment B include results of the LCAs. These analyses could be used to help make decisions concerning the use of alternative construction materials that will have the least environmental impact.

The following are summaries of discussions or statements that were made by Subcommittee members concerning the following main topics:

Asphalt Shingles

Subcommittee member discussion:

During this discussion Ashley Buss from the Iowa DOT provided further information on the use of recycled asphalt shingles (RAS) and reclaimed asphalt pavement (RAP). She mentioned that when creating a balanced mix, one has to contend with high temperatures, traffic loads and flexibility of the asphalt. The materials need to meet performance standards for the climates of specific regions. Currently the Iowa DOT allows for high percentages of RAS to be in the mix as long as low temperature cracking test can be passed. The maximum amount of RAS that can be used is due to shingles being highly oxidized and becoming brittle.

The Iowa DOT currently has incentives in place for using RAS and RAP. The Iowa DOT pays for asphalt as a mix to be used as a binding agent. The Iowa DOT reimburses 100% of RAP and approximately 65% of RAS costs for projects. Almost every mix contains these recycled materials due to the Iowa DOT paying for the binder.

Brian Seals from Waste Connections of Scott County was able to give a solid waste agency's perspective on recycling of asphalt shingles. Most of the shingles they receive are from new construction or re-roofing. In 2009 Scott County started a program to reduce the price per ton of tipping from $33-$34 a ton to $22 a ton for separated materials (loads free of waste) to incentivize the separation of shingles to be recycled. There is hesitation to increase incentives due to the volatility of the end market for the shingles.

After receiving the shingles they are ground along with aluminum nails that are not strong enough to withstand the grinding process. This material is then used in a mix or gravel roads. Brian also mentioned some of the challenges from using the ground asphalt shingles. Locally they have struggled with making sure all ingredients meet specifications for hot mix asphalt (HMA). There are also concerns with using the ground asphalt material on gravel roads. Scott County conducted a 3-year pilot study using three separate mixes on a three mile road. One of the more evident concerns was that although using RAS on gravel roads reduced dust, after the second year, residents were noticing black dust that they had not experienced before. Scott County did not move forward with using RAS in gravel due to the results of this pilot study. Brian will provide the pilot study results (see Attachment C) to the Subcommittee to learn more information and to see if there was anything that could have been done differently to make the use of RAS more effective.

Questions that came up during this discussion were:

- How can we facilitate for the use of RAS?
- What is the policy for its use?
- Are there greater incentives that can be offered to generators to provide clean material and to facilities that process the materials into usable RAS?

Ashley and Brian Seals from Waste Connection of Scott County both agreed that from their experience the use of RAS was correlated with the price of oil. When prices of oil are low it might make more economical sense for the use of virgin asphalt. When prices of oil are high other products are prioritized over making asphalt leaving mix the better economical choice.

Treated and Untreated Wood

- Subcommittee member discussion:
    - The question posed was: What are the strategies the state could implement in regards to treated and untreated wood? Below is a summary of the response from the Subcommittee members.
        - Untreated wood is not commonly used in facades and it would be worthwhile to research what other building materials can be compared to treated wood? The following material could potentially be used as an alternative to treated wood for building facades:
            - Aluminum; and
            - Painted steel.

Drywall

- Subcommittee member discussion:
    - Drywall has its challenges when it comes to its disposal. Once drywall absorbs moisture, there is potential for the leaching of hydrogen sulfide. When pelletizing drywall, it has to be kept dry throughout the whole process. In the past, there have been alternatives to drywall but the installation of these alternatives was different. These alternative materials required using different set of screws and proved harder to work with.
    - Questions were asked about potential uses of dry wall such as:
        - Is it acceptable to use drywall in gravel driveways?
        - Can gypsum be used in concrete?
        - Is there other technology out there to be able to use the materials to create a different product?

Strategies

The project consulting team followed the materials discussion with a presentation of immediate (0-3 years) suggested strategies.

Upstream Measures

- Incentivize building repurpose and material reuse
- Subcommittee member discussion:
    - There are currently no programs that incentivize separating materials at job sites for reuse or recycling. Subcommittee members believe that, based on their experience, taking time to separate C&D materials at project sites is not cost effective and most will not participate without an incentive. A suggestion was made to incorporate education on sustainability in training for builders. Jamie Courtney from Iowa Home Builders already does this since sustainability is one of the company's core values.

Consumer Actions

- Educating consumer
- Subcommittee member discussion:
    - Jamie Courtney mentioned that his company charges a fee for recycling the project materials. Clients often seek out his company and are willing to pay more for the recycling of project materials rather than have the materials disposed. In Jamie's experience he has found that there are clients who are seeking out building materials that have a low environmental impact and desire working with companies that have environmentally friendly practices. As an industry, more can be done to educate clients on what is best in terms of the environmental impact of their building projects.

End of life

- Support donation and deconstruction facilities
- Subcommittee member discussion:
    - Jamie Courtney mentioned that when they have left over material they no longer have use for them and often donate them to schools for use in wood workshops. This is an informal set up and just based on people they know but it is a potential way to divert left over materials. Another suggestion made was using left over lumber for use as bedding for livestock. This brings up the potential for synergy between the C&D and Organics Subcommittees to speak about processing organics that come from the C&D industry.
    - Habitat for Humanity is a good facility to donate to but often has limitations on what they can take.
        - Most contractors do prefer to take stuff like appliances to Habitat for Humanity for free as opposed to having to pay for it to be recycled.

        - Habitat for Humanity does pickups for homeowners wanting to donate materials.
        - There is a deconstruction team at Habitat for Humanity that is able to surgically remove cabinets so that they are in good condition to be resold.
    - Ames, Iowa has a resource recovery plant. The city turns materials into energy for the community.
- Pose the question to the Iowa DOT of changing "May" to "Shall" for RAS 5%.
- Subcommittee member discussion:
    - The percent of RAS used is dependent on economic and cold temperature crack tests which is the main concern when using RAS. There is not enough research on the recyclability of roads that use RAS. The Iowa DOT does not want to jeopardize the integrity of the highway system by incorporating more recycled materials.
- Incentivize development of C&D facilities
- Subcommittee member discussion:
    - Iowa State University does not have storage for C&D waste and could make use of a C&D facility.

B. Research Request List

Through the discussions and in follow up discussions, various topics have been identified for further research. These are provided below.

- Correlation between oil prices and amount of RAS used.
- Scott County study of RAS in gravel roads pilot study.
- What other end markets are there for RAS besides mix and gravel roads.
- What are the options to reuse/recycle gypsum and drywall.

C. Other Notes

Other items of note from the #4-C&D meeting are as follows:

- Stakeholder meeting will be in May to present the latest project information. The hope is that this meeting will be in person.

Attachments:

Attachment A: Agenda

Attachment B: PowerPoint Presentation

Attachment C: Additional Information

Attachment A
Agenda

Subcommittee Meeting #4 – Construction and Demolition Debris

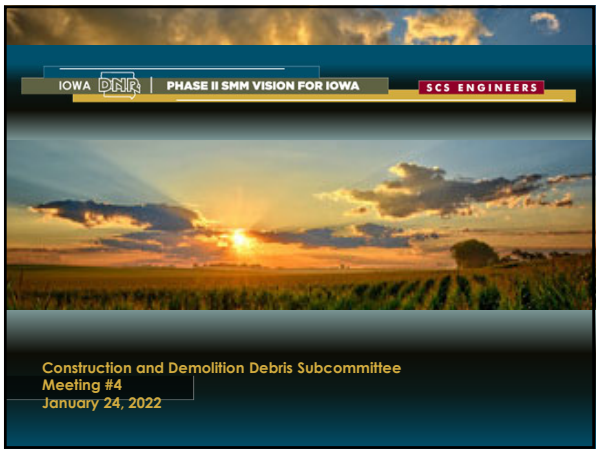
January 24, 2022

9:00AM – 12:00PM (CST)

Virtual Meeting

1. Discuss LCA and CLF Information
2. Discuss Prioritized Materials
3. Discuss Prioritized Strategies
4. Identify Next Steps and Timeline

Attachment B
PowerPoint Presentation



Agenda

- Review LCA Data
- Discuss Prioritized Materials
- Discuss Prioritized Strategies
- Identify Next Steps and Timeline

LCA Data for Building Materials

- Asphalt Shingles Comparison
- Treated and Untreated Wood Comparison
- Drywall Comparison

Asphalt Shingles Comparison

Mix 1:	Plain mix, containing no RAP or RAS with 5% virgin liquid asphalt binder
Mix 2:	15% RAP, 3% RAS, and 4.2% virgin liquid asphalt binder
Mix 3:	20% RAP and 4.3% virgin liquid asphalt binder
Mix 4:	35% RAP and 2.8% virgin liquid asphalt binder

RAS: Recycled asphalt shingles
RAP: Reclaimed asphalt pavement

Impact category	Reference unit	Mix 1	Mix 2	Mix 3	Mix 4
Acidification	kg SO_2eq	2.68E−01	2.28E−01	2.23E−01	1.74E−01
Eutrophication	kg Neq	1.24E−02	1.25E−02	1.19E−02	8.83E−03
Global Warming	kg CO_2eq	5.86E+01	3.59E+01	3.85E+01	5.13E+01
Ozone Depletion	kg CFC-11eq	5.28E−09	4.25E−09	4.41E−09	3.16E−09
Photochemical ozone formation	kg O_3eq	4.68E+00	5.23E+00	4.87E+00	3.61E+00

- Platform used: OpenLCA
- Normalization scheme: US-CA 2008/2005
- Impact assessment method: TRACI 2.1.

Source: Life Cycle Assessment of Asphalt Mixtures in Support of an Environmental Product Declaration, Mukherjee,2016

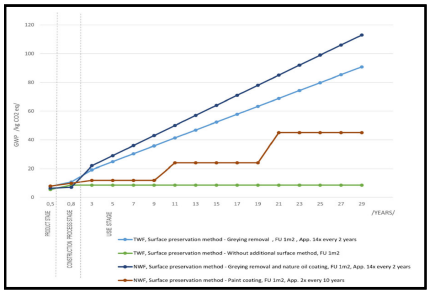
Treated and Untreated Wood Comparison

Surface Methods Applied During Use Stage B1 + B2		Non-Heat-Treated Wood Façade (NWF)		Thermally Modified Wood Façade (TWF)	
Without additional surface preservation method			-		X
Greying removal	Frequency of application in years		-	X	App. 14x every 2 years
Greying removal and natural oil coating	Frequency of application in years	X	App. 14x every 2 years		-
Paint coating	Frequency of application in years	X	App. 2x every 10 years		-

Platform used: Simapro
Impact assessment method: IMPACT 2002+.

Source: Life Cycle Assessment of Coated and Thermally Modified Wood Façades, Buryova and Sedlak,2021

Treated and Untreated Wood Comparison



Source: Life Cycle Assessment of Coated and Thermally Modified Wood Façades, Buryova and Sedlak,2021

Drywall Comparison

Platform used: Simapro

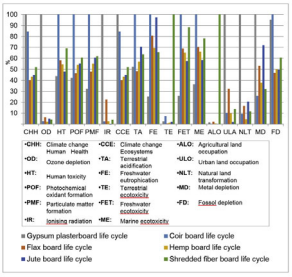
Impact assessment method: IPCC GWP 100a, and Recipe End point method.

Comparison between 1 kg of Plasterboard and 1 kg of Petroleum based epoxy resin.

Impact category	Units	Gypsum plasterboard	Petroleum based epoxy resin
Abiotic depletion	kg Sb eq	2,52E-07	1,19E-06
Abiotic depletion (fossil fuels)	MJ	29,996372	122,42557
Global warming (GWP100a)	kg CO2 eq	2,1386249	6,9448216
Ozone layer depletion (ODP)	kg CFC-11 eq	1,63E-07	1,41E-08
Human toxicity	kg 1,4-DB eq	0,048522658	0,68101491
Fresh water aquatic ecotox.	kg 1,4-DB eq	0,003153629	0,89204571
Marine aquatic ecotoxicity	kg 1,4-DB eq	53,231855	4848,7284
Terrestrial ecotoxicity	kg 1,4-DB eq	0,00281531	0,029100246
Photochemical oxidation	kg C2H4 eq	0,000335308	0,001196045
Acidification	kg SO2 eq	0,005004837	0,041101898
Eutrophication	kg PO4--- eq	0,000804968	0,006681138

Source: Comparative Life Cycle Assessment of gypsum plasterboard and a new kind of bio-based epoxy composite containing different natural fibers, Quintana et al. 2018

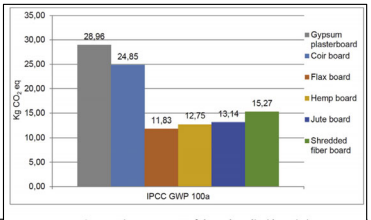
Drywall Comparison



Characterization using the Recipe Endpoint (H) method.

Source: Comparative Life Cycle Assessment of gypsum plasterboard and a new kind of bio-based epoxy composite containing different natural fibers, Quintana et al. 2018

Drywall Comparison



Comparative assessment of the carbon dioxide emissions.

Mass per m².

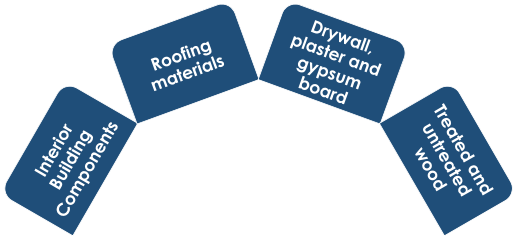
Product	Mass(Kg)	Fiber %	Fiber mass(Kg)	Epoxy %	Epoxy mass (Kg)
Flax board	5,08	49	2,4892	51	2,5908
Jute board	5,08	44	2,2352	56	2,8448
Coir board	7,61	22	1,6742	78	5,9358
Hemp board	4,31	32	1,3792	68	2,9308
Shredded cotton board	4,89	27	1,3203	73	3,5697

Source: Comparative Life Cycle Assessment of gypsum plasterboard and a new kind of bio-based epoxy composite containing different natural fibers, Quintana et al. 2018

Discussion…

- LCAs
- Prioritized Materials
- Prioritized Strategies
- Next Steps

Material Types Selected



Suggested Strategies & Timelines

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Attachment C
Additional Information

Final Report: Recycled Asphalt Shingles on Gravel Roads Grant

Grant Project: 18-G550-07

For additional information contact:
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Waste Commission of Scott County
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January 13, 2022

RE: Recycled Asphalt Shingles on Gravel Roads Grant – 18-G550-07 Annual Report

Angela Kersten, County Engineer for Scott County Secondary Roads Department, graciously put together the following information for our report:

In May of 2018, the Waste Commission of Scott County (WCSC) in partnership with the Scott County Secondary Roads Department (SCSRD) built a 3.1 mile road surfacing test section consisting of ground shingles mixed with aggregate, for the purpose of investigating short and long term benefits of using recycled asphalt shingles (RAS) on gravel roads. The materials used to build the test section included:

- RAS obtained from the Scott Area Landfill (made from tear-off shingles with one pass through the grinder)
- Aggregate typically used for surfacing (Scott County Modified Class 'D' Crushed Stone which is defined as 100% passing the 1¼" sieve, 90-100% passing the 1" sieve, 10-30% passing the No. 8 sieve, 5-12% passing the No. 200 sieve, the abrasion shall not be more than 45%, the mudball maximum is 4%, and the freeze/thaw loss shall not be more than 10%.)

The 3.1 mile gravel road was divided into 9, approximately equal in size, test sections. Varying mixing proportions were placed and are shown below:

Section 1: 2 parts RAS: 1 part aggregate – Delivered Mixed – Compacted
Section 2: 2 parts RAS: 1 part aggregate – Delivered Mixed
Section 3: No application
Section 4: 2 parts RAS: 1 part aggregate – Mixed on Road
Section 5: 1.5 parts RAS: 1 part aggregate - Delivered Mixed – Compacted
Section 6: 2 parts RAS: 1 part aggregate – Mixed on Road – Compacted
Section 7: 1.5 parts RAS: 1 part aggregate - Delivered Mixed
Section 8: 1.5 parts RAS: 1 part aggregate – Mixed on Road – Compacted
Section 9: 1.5 parts RAS: 1 part aggregate – Mixed on Road

The "Mixed on Road" sections were built by scarifying existing aggregate from the road and blading it into a windrow along the edge of the road using a motor grader. RAS was delivered to the road with a dump truck and placed along the center of the road. The motor grader mixed the RAS and aggregate together and spread

it uniformly across the road. After monitoring the mixed on road sections for the past two and a half years, the SCSRD has determined that by scarifying existing rock from the road and placing it in a windrow it is difficult to determine the quantity of aggregate that is obtained from the scarification process. Each section that is built on the road using this process does not appear to have a uniform mix design. This variation appears to be contributing toward instability of the road surface. During the summer of 2019, our motor grader operator bladed the mixed on road sections nearly twice as often as the delivered mixed sections. In 2020, our motor grader operator bladed all sections approximately bi-weekly. The majority of the blading season in 2021 was very dry. Therefore, the road was not bladed as frequently due to lack of moisture to properly blade the road. The "Mixed on Road" sections had washboards, scaling, potholes, loose aggregate, and material build-up along the edges of the road. Sections 8 and 9 also had a very fine, powder like, aggregate-RAS mixture on the surface of the road that was loose and dusty.

The "Delivered Mixed" sections were built by placing pre-mixed RAS and aggregate on the existing road surface. The SCSRD delivered RAS and virgin aggregate to General Asphalt Construction Company (GACC.) GACC blended the RAS and virgin aggregate together using mixing equipment that consisted of two bins to store the materials separately, mixing wheel, weigh belt, and conveyor belt. GACC pre-mixed the materials into the two different ratios described above and conveyed the material into a stockpile. The material was loaded into SCSRD dump trucks. The dump trucks delivered the pre-mixed material to the road and placed the material along the center of the road. The motor grader spread the material uniformly across the road. After monitoring the delivered mixed sections for the past two and a half years, the SCSRD has determined that these sections required less maintenance blading for the first year and a half and then approximately the same frequency of maintenance blading as the other road sections. As mentioned above, the majority of the blading season in 2021 was very dry and the road was not bladed as frequently due to lack of moisture to properly blade the road. Throughout the year, the "Delivered Mixed" sections had washboards and potholes. Towards the end of summer and fall, these sections also had loose aggregate and material build-up along the edges of the road. Sections 1 and 2 had the poorest ride quality throughout the year.

The sections noted above as "Compacted" were compacted with a rubber tired roller after the motor grader finished spreading the material. After monitoring the sections for the past three and a half years, the compacted sections require the same amount of maintenance as the non-compacted sections and do not readily show any reduction in maintenance due to compaction.

The SCSRD is continuing to measure dust generated from traffic along the project corridor utilizing the Colorado Dust Collector. Listed below are those results:

Location	1-Jun-18 Dust Generated (g)	30-Oct-18 Dust Generated (g)	28-Feb-19 Dust Generated (g)	28-Mar-19 Dust Generated (g)	16-May-19 Dust Generated (g)	18-Jun-19 Dust Generated (g)	23-Jul-19 Dust Generated (g)
Section 1	0.3	1.2	0.3	0.2	0.7	0.3	0.3
Section 2	0.5	0.6	0.2	0.2	0.9	0.6	0.4
Section 3	1.9	2.3	0.1	1.0	1.6	1.3	1.7
Section 4	0.2	0.3	0.3	0.1	0.5	0.5	0.1
Section 5	0.1	0.5	0.5	0.3	0.8	0.6	0.5
Section 6	0.6	0.4	0.7	0.5	1.8	0.6	0.2
Section 7	0.8	0.6	0.4	0.3	1.2	0.3	0.9
Section 8	0.2	0.4	0.1	0.5	1.5	0.1	0.3
Section 9	0.6	0.8	0.4		0.2	0.2	0.4

Location	21-Apr-20 Dust Generated (g)	7-Jul-20 Dust Generated (g)	14-Oct-20 Dust Generated (g)	3-Dec-20 Dust Generated (g)	7-Jul-21 Dust Generated (g)	23-Nov-21 Dust Generated (g)
Section 1	0.6	2.2	1.9	2.4	2.7	1.8
Section 2	0.8	2.8	2.5	2.7	3.8	1.7
Section 3	1.0	3.7	4.3	1.7	6.7	3.7
Section 4	0.3	1.6	1.1	1.8	2.8	2.1
Section 5	0.5	3.4	3.7	2.3	3.6	2.9
Section 6	0.5	2.8	2.4	2.2	4.4	3.1
Section 7	0.8	4.9	3.7	3.4	4.1	4.8
Section 8	-	1.5	1.6	3.2	2.4	3.3
Section 9	-	2.0	1.7	1.5	1.4	2.2

Location	Average Dust Generated-2018 (g)	Average Dust Generated-2019 (g)	Average Dust Generated-2020 (g)	Average Dust Generated-2021 (g)
Section 1	0.8	0.4	1.8	2.3
Section 2	0.6	0.5	2.2	2.8
Section 3	2.1	1.1	2.7	5.2
Section 4	0.3	0.3	1.2	2.5
Section 5	0.3	0.5	2.5	3.3
Section 6	0.5	0.8	2.0	3.8
Section 7	0.7	0.6	3.2	4.5
Section 8	0.3	0.5	2.1	2.9
Section 9	0.7	0.3	1.7	1.8

The dust collection results show that the untreated section generated the highest amount of dust each year over the study period. Although, Section 7 began to generate a similar amount of dust as Section 3 over the past two years. Once the sections became bladed more frequently, they generated a higher amount of dust. The SCSRD received complaints each year about the “black” dust. A few adjoining residents stated concerns about negative health impacts with breathing the RAS dust.

The SCSRD is also monitoring the condition of the road. A road condition rating report was developed for our maintenance blading operator to document the road condition prior to performing maintenance blading. Each section of road that requires blading is scored based on the severity of rutting, washboarding, potholes, loose aggregate, scaling and crown shape. Shown below is a report of the road condition on August 27, 2018:

Road Surface Condition Rating Report

Road Name: 190th Street **Date: 08/27/18** **Inspector Name: Angie Kersten** **Road Condition: Dry**

Score	Rutting	Washboarding	Potholes	Loose Aggregate	Scaling	Crown
9	No or negligible ruts	No or negligible corrugations	No or negligible potholes	No or negligible loose aggregate	No or negligible scaling	Cross slope 4%; Good rooftop shape
8	Ruts less than 1" deep and less than 5% of the roadway surface area	Less than 1" deep; less than 10% of the roadway surface area	Most small potholes less than 1" deep and less than 1' in diameter	Berms less than 1" deep; Loose aggregate less than 3/4" thick	Scaling less than 1/4" deep; less than 10% of roadway surface area	
7						
6	Ruts between 1"-3" deep and 5% to 15% of the roadway surface area	1"-2" deep; 10% to 25% of the roadway surface area	Considerable potholes less than 3" deep and less than 2' in diameter	Berms less than 2" deep; Loose aggregate less than 1.5" thick	1/4"-1/2" deep; 10% to 25% of the roadway surface area	
5						
4	Ruts between 3"-6" deep and 10% to 40% of the roadway surface area	2"-3" deep; over 25% of the roadway surface area	Many potholes up to 4" deep and 3' in diameter	Berms between 2"-4" deep	1/4"-1/2" deep; 25% to 50% of the roadway surface area	Cross slope 3% to 4%; Good rooftop shape
3						
2	Ruts between 6"-12" deep	Deeper than 3"; over 30% of the roadway surface area	Up to 8" deep and greater than 4' in diameter	Berms greater than 4" deep	1/4"-1/2" deep; 50% to 75% of the roadway surface area	1% to 3%
1	Ruts over 12" deep	Impassable	Impassable	Sand Dunes	Over 75% of the roadway surface area	Less than 1%

Section #	Rutting	Washboarding	Potholes	Loose Aggregate	Scaling	Crown
1						
2						
3						
4	9	9	6.5	9	8	9
5	9	9	7	8.5	7	9
6						
7						
8	9	4	8	8	6	9
9	9	5	8.5	8	6	9

Notes:

Roger Hamann (Blade Operator) lightly bladed Sections 7-9 one time a few months after the sections were built, due to washboarding and potholes.

These reports were completed in 2018 and 2019 each time the road was bladed. In 2020, the road was bladed approximately bi-weekly and received the same frequency of maintenance as the un-treated section. Therefore, the blade operator discontinued completing the reports.

Photo 1: Section 4, August 27, 2018

Photo 2: Section 5, August 27, 2018

Photo 3: Section 8, August 27, 2018

Photo 4: Section 4, August 13, 2019

Photo 5: Section 5, August 13, 2019

Photo 6: Section 8, August 13, 2019

Photo 7: Section 4, January 13, 2021

Photo 8: Section 5, January 13, 2021

Photo 9: Section 8, January 13, 2021

Photo 10: Section 4, November 23, 2021

Photo 11: Section 5, November 23, 2021

Photo 12: Section 8, November 23, 2021

Starting in August 2018 and through 2019, the SCSRD performed maintenance blading along the project corridor in various sections approximately once per month. The sections that were mixed on the road required approximately twice as much maintenance than the delivered mixed sections. The 1.5:1 delivered mixed sections were performing the best and had been spot bladed the least amount of time. All sections

tended to lose aggregate that forms a berm along the edges of the road. Section 4 has had the most problems with scaling. The section that received no application was bladed weekly throughout the summer and fall.

In 2020, all sections were bladed approximately bi-weekly. Depending on the severity of conditions the sections were spot bladed when appropriate. The sections with a higher percentage of RAS to rock mixture required more time and effort to loosen the more tightly packed surface to fill potholes and eliminate rumble strips. In 2020, a portion of Section 6 received two separate surface applications (May and July) of calcium chloride to reduce dust. The adjacent homeowner requested and contracted for the dust control applications. Periodic dust collections have continued and all sections are producing more dust in 2020. This could be contributed to the increase in frequency of blading and breakdown of granular material. The SCSRD has received minimal feedback from residents over the past three years. The feedback is both positive and negative. Annually, a few residents have shared that they are favorable of the road condition and are most happy with Sections 1 and 2. In addition, a few different residents have shared that the road rides rough and they are not favorable of the road condition.

In 2021, all sections were bladed approximately the same amount of time as the control gravel section 3. The majority of the blading season in 2021 was very dry. Therefore, the road was not bladed as frequently due to lack of moisture to properly blade the road. Throughout the year, all sections had washboards, scaling, potholes, loose aggregate, and material build-up along the edges of the road. Sections 1 and 2 had the most severe washboards that contributed to a poor ride quality. The hard packed surface was difficult to blade and the lack of moisture added to the problem. Starting in mid-summer, there was also a very fine, powder like, aggregate-RAS mixture on the surface of the road that was loose and dusty. It was most noticeable in Sections 6 and 7. Again in 2021, a portion of Section 6 received two separate surface applications (May and July) of calcium chloride to reduce dust. The adjacent homeowner requested and contracted for the dust control applications. However, this time they asked for a light layer of rock to be incorporated into the surface prior to the first application. The SCSRD has received only negative and more frequent feedback from adjacent property owners this past year. The feedback includes poor ride quality and a strong dislike for the “black” dust. Three residents have called over the past year with concerns that they have had considerably more flat tires since the RAS was placed in 2018. The control gravel section 3 was re-rocked in October of 2021, in accordance with our regular maintenance practices.

In 2018-2019, the SCSRD shared information about the project with Iowa county road departments and other professionals. The Scott County Engineer presented about the project on September 19, 2018 at the 2018 Iowa Streets and Roads Conference and on December 13, 2018 at the 72nd Iowa County Engineer’s Conference. The Assistant Scott County Engineer presented about the project on April 4, 2019 at the 2019 American Public Works Association Iowa Chapter Spring Conference. The SCSRD also received requests for information about the project from several Iowa county road departments. The SCSRD did not present on the project in 2020 or 2021. This is attributed to the cancellations of workshops and conferences due to the COVID-19 pandemic. During 2021, the SCSRD received requests for information about the project from a few Iowa county road departments.

By incorporating RAS into our aggregate surfaced roads, we strived to achieve the following goals:

1. Realize an overall cost savings by comparing before and after costs that include cost of materials, labor and equipment costs associated with maintenance blading, and reduction in loss of aggregates.
2. Reduce asphalt shingle waste going into the landfill.
3. Reduce quantity of virgin aggregates placed on the road surface.

4. Realize a reduction in the frequency of maintenance blading by mitigating wash boarding and potholes.
5. Reduce dust particulate air pollution.

In regards to Goal No. 1, the total cost to build the project was $91,574. SCSRD expended $42,534 on labor and materials. General Asphalt's costs to pre-mix the RAS and aggregate was $23,224. WCSC provided the RAS for the project at a cost of $25,816 ($8.00/ton). For the first two years, SCSRD did realize a reduction in maintenance blading of the road. However, starting in 2020, SCSRD expended the same effort and at times additional effort to maintain the road. SCSRD resurfaced Section 3 with aggregate in 2021. SCSRD is planning to resurface all of the test sections with aggregate in 2022. Therefore, SCSRD has not seen a reduction in costs associated with resurfacing the road with aggregate. SCSRD typically resurfaces each gravel road, with a similar traffic count as 190th Street, with aggregate every 3 to 5 years.

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In regards to Goal No. 2, this goal was a success. WCSC was able to keep 3,227 tons of asphalt shingles out of the landfill.

In regards to Goal No. 3, SCSRD did not reduce the amount of virgin aggregate placed on the road surface. SCSRD hauled in aggregate to build the pre-mixed sections and SCSRD is planning to place virgin aggregate on the road in 2022.

In regards to Goal No. 4, SCSRD did realize a reduction in maintenance blading for the first two years. However, the final two years required the same and at times additional effort to maintain the road. The washboards in the test sections were more difficult to fix then the washboards in the control section.

In regards to Goal No. 5, SCSRD did see a reduction in dust particulate air pollution with the test sections in comparison to the control section. Throughout the duration of the monitoring period, the control section provided the highest dust generation. However, the dust generated in the test sections was black in color and SCSRD received some negative feedback from adjoining land owners in regards to the RAS dust.

Submitted by: Angela Kerstans, Scott County Engineer, Scott County Secondary Roads

The Waste Commission and Scott County Secondary Roads concluded that at this time the best use of the recycled asphalt shingles is in the asphalt process. The Commission will continue to use the RAS on the roads at the Scott Area Landfill as a dust suppressant.