

King County LinkUp Shingles in Paving Demo Project

Summary of Advisory Group Meeting #3, Tuesday, November 4, 2008

These notes summarize the third meeting of the Advisory Group for the King County LinkUp Shingles in Paving Demonstration Project. The meeting was held on Tuesday, November 4, 2008 at the King Street Center in Seattle, WA.

The following Advisory Group members participated:

- *John Grisham, Woodworth & Company, Inc.*
- *Bob Lee, Kevin Kelsey, Frank Overton, and Victor Woo, KCDOT*
- *Jim Weston and Joe DeVol, WSDOT*
- *John Yeasting, Glacier Recycle*
- *Dick Lilly and Gabriella Uhlar-Heffner, SPU*
- *Preston Horne-Brine, American Roofing Recyclers*
- *Ben Hansen and Steven Read, SDOT*
- *Rick Stewart, Stewart Roofing*
- *Bill Brickey, Wilder Construction Company*

The following project staff participated:

- *Kris Beatty, LinkUp, King County Solid Waste Division (KCSWD)*
- *Julie Colehour, King County LinkUp Consultant Support (Colehour+Cohen)*
- *Michelle Caulfield, Katie Kennedy, King County LinkUp Consultant Support (Cascadia Consulting Group)*
- *Dan Krivit, King County LinkUp Consultant Support (Dan Krivit & Associates) (via phone)*

The following Advisory Group members were absent but were given the opportunity to provide input and feedback on the draft meeting notes:

- *Jeff Uhlmeyer, WSDOT*
- *Jim Eagan, KCDOT*
- *Rick Hess, PSCAA*

MEETING OBJECTIVES

- Provide project update
- Provide road selection update
- Give summary of recycled asphalt shingles (RAS) procurement process
- Describe and discuss significant changes to RAS specification
- Provide updates on project design

KEY OUTCOMES

- There was a brief discussion about how the RAS should be procured (e.g, ITB, RFQ, RFP, donated). County Roads Services representatives explained the importance of using a standard procurement method, and that an invitation to bid (ITB) was the method they were likely to use.
- It will most likely work for shingles to be delivered directly from processor to paving contractor in one, bulk shipment.
- There were several concerns that the requirements in the latest draft RAS specification are too stringent (e.g., restricting supply of shingles to come from “single family, owner occupied” buildings only).

- There was preliminary consensus that the mix types should include 3% RAS and 15% RAP based on draft WSDOT test data from samples in response to the request for information (RFI).

AGENDA ITEM #1: INTRODUCTIONS AND AGENDA

Kris Beatty conveyed the unfortunate news of Merv Reykdal's passing on October 7th. You are welcome to add a note online in his memory at Legacy.com for his family and friends to read.

Kris welcomed several new members to the group, including Preston Horne-Brine, who will represent American Roofing Recyclers, Bob Lee and Frank Overton of KCDOT, and Rick Stewart of Stewart Roofing.

AGENDA ITEM #2: PROJECT UPDATE

Kris Beatty recounted happenings since the start of the project, including

- The advisory group was formed and met twice,
- WSDOT agreed to lead the HMA mix design,
- SPU joined as a funding partner,
- KCDOT committed to supply an overlay paving project, and
- Ecology recently awarded King County Solid Waste Division a \$75,000 Community Planning Grant (CPG) to be used for the project for the next 2 years.

Julie summarized the upcoming schedule (*see Handout: Project timeline*). Several key milestones lie ahead including:

- Completing the HMA mix design,
- Finalizing the procurement process for RAS supply, and
- KCDOT advertising the invitation to bid (ITB) and selecting a contractor for the pavement construction project.

AGENDA ITEM #3: ROAD SELECTION PROCESS

Kevin Kelsey reported that KCDOT has narrowed the list of potential projects down to five roads, mostly in South King County, using the list of criteria recently distributed to the advisory group members. They will likely select the road in January, and then go on to do preliminary testing and document any repairs done to the roadway prior to paving.

AGENDA ITEM #4: RAS PROCUREMENT PROCESS

Kris explained that there were three respondents (American Roofing Recyclers, Woodworth, and Glacier Recycling) to the project request for information (RFI). Joe DeVol has conducted preliminary testing on the samples gathered from the respondents. Rather than issuing a request for qualifications (RFQ), KCDOT plans to purchase the product directly through an ITB.

How would paving contractors want the RAS delivered (Frank Overton)?

- It should not be a problem to receive a bulk load of shingles and find space to store them on site (John Grisham and Bill Brickey).

- It may be a problem for Watson (Victor Woo).

There was a discussion over how best to procure the RAS that included the following suggestions:

- Potential procurement methods include ITB or RFP
- Roll purchase into a construction contract, such as the small-works construction contract
- The processors may be willing to provide this amount of material free of cost

There was a consensus to use the ITB approach such that the County would purchase the RAS material. The RAS specification would provide the technical specifications for the material quality.

AGENDA ITEM #5: UPDATE ON RAS SPECIFICATION

Katie Kennedy provided an overview of the review process.

- We've received comments from the health departments in King, Snohomish, and Pierce County; Washington State L&I, Puget Sound Clean Air Agency, and Washington State Department of Ecology.
- Key changes have been requiring that the facility be permitted to grind shingles and that they request a copy of the AHERA survey from the roofing contractor.
- Next steps are to check in with the three processors that responded to the RFI, share with roofing contractors for their comments, and email to the regulatory agencies for final review.
- Outstanding issues include the number and protocol for asbestos testing and whether to include WSDOT field operating procedures (FOPs) in the spec. Some commented that it may be best to simply include FOP citations and links as per the current draft RAS spec.

There was a discussion as to whether the spec is too narrow.

- The spec does set a precedent despite the project team's intention for it not to be, and the goal should be to educate local regulators on the testing that has been done across the country, such as those from Dr. Timothy Townsend (John Yeasting).
- The project team's goal is to identify and ensure the selected suppliers and contractors are operating within existing health and environmental regulations. The resulting draft RAS spec incorporates requirements that are specific to our region, which may differ in other states that are allowing the use of RAS in paving applications (Dan Krivit).
- Perhaps the permitting agency requirements should be removed and consolidated into a separate document (Frank Overton).

What about fire retardants in shingles (Kevin Kelsey)?

The LinkUp team has investigated whether fire retardants are a concern, and no evidence was found to that end. Also, the Washington State Department of Ecology considers RAS as an additive in paving to be a safe use of the material, and so does not require a beneficial use

determination (BUD). This is the primary basis on which LinkUp is considering RAS as safe to use in paving (Kris Beatty).

Why is the supply limited to owner-occupied, single-family homes (Bill Brickey)?

This is related to National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations, which are interpreted differently by different states and local agencies (Dan Krivit). *(Clean Air Agency Regulation III, Section 4.02 makes a distinction between owner occupied and non-owner occupied homes. According to this rule, non-AHERA accredited persons are allowed to inspect owner-occupied, single-family roofs prior to demolition or renovation.)*

AGENDA ITEM #6: PROJECT DESIGN

RAP/RAS Approach

Kris reported that KCDOT, WSDOT and KCSWD recently met to discuss whether or not to include RAP in the project. Joe DeVol presented relevant preliminary testing data. *(Handout: WSDOT's RAS Research Project test results tables.)* Joe cautioned that the data being presented is very preliminary based on a limited number of samples in response to the RFI. These tables are being used by WSDOT to develop their mix design calculation templates for incorporating RAS and RAP into mixes.

Joe reported that the total asphalt content of the RAS from the samples from the three respondents averaged 19.6 percent binder (identified as "Pb" within the table "Gradation Averages") and ranged from a low of 16.3 Pb and a high of 22.8 Pb. This compares to the one RAP sample of 4.1 Pb.

One intent of the WSDOT mix design work is to estimate the effective contribution of recycled asphalt from the RAS and the RAP. Then the amount of added virgin liquid binder can be adjusted such that final calculated percent binder (Pb) always ends up at the targeted 5.5 Pb level for the final HMA product. *(See the "Volumetric Comparison" tables, under column "Pb".)*

Joe DeVol reported that the preliminary results indicated that air voids increased with the addition of RAS. Another interesting finding was that air voids decreased with the addition of RAP thus compensating somewhat for the RAS impacts on air voids *(See the "Volumetric Comparison" tables, under column "Va" for air voids.)*

Next, Joe plans to test the asphalt binders. We anticipate the asphalt in the RAP to be stiffer and RAS to be significantly stiffer. One option is to specify a softer-grade of liquid virgin asphalt to compensate for the harder RAS binder. With the instability in the asphalt market right now, though, we don't know if we can even get suppliers to provide a softer-grade of liquid virgin asphalt (e.g., PG 58-16), let alone how much it will cost.

Victor Woo calculated that 3% for the RAS and 15% for the RAP would provide an ideal amount of oil replacement and optimize the air void impacts. Most of the group concurred with this proposed breakdown.

Is the extraction test a realistic measure of the "effective contribution" (asphalt content actually utilized in the HMA drum in full production)?

The extraction tests are more accurate with RAS than RAP (Joe DeVol). The extraction tests measure "total" asphalt content within RAS or RAP or other materials. Only a portion of the total

will actually be utilized as asphalt in the HMA drum. Other research has estimated the effective contribution at 60 to 80 percent of the total asphalt content in the RAS.

Update on paving plan (test sections)

Originally, it was thought that the paving design layout would include four test sections: 1) virgin HMA, 2) HMA with RAS, 3) HMA with RAP, and 4) HMA with RAP and RAS. Victor explained that the design will be simplified to two test sections: 1) HMA with RAP, and 2) HMA with RAP and RAS. The goal is to prove that there's no difference between RAP and RAS in terms of quality.

Does the new test plan still require 30 tons of RAS (Dan Krivit)?

It will be 60 tons of RAS for 2,000 tons HMA (Frank Overton).

Will the test sections be side-by-side (John Grisham)?

No, we'll do consecutive paving on lanes going both directions so the traffic is the same (Victor Woo).

Miscellaneous

Will the market development effort be carried on beyond the publishing of the study report (Steven Read)?

Yes, the King County Solid Waste Division considers this demonstration project as a building block that is part of a larger effort to establish the HMA market for recycled asphalt shingles (Kris Beatty).

NEXT STEPS

- Distribute new pavement test section plan to advisory group
- Make final revisions to RAS spec and distribute to advisory group
- Continue WSDOT mix design tests and discussions to finalize HMA provisional specification