EMPORIA
City of Emporia

** AGENDA**

City Commission Study Session

Wednesday, February 12, 2020
Conference Room 1AB
516 Mechanic Street
10:00 a.m.

- ESU Update with President Garrett.
- Prepare to begin working on Commission Goals.
- Lift Stations Discussions.
- Discuss Chip Seal Program.
- Update and List for Alley Maintenance.

Joint Luncheon w/Emporia Library Board
At the Emporia Public Library Conference Room

Tentative Agenda for February 19th Commission Meeting at 7:00 p.m.

- City Commission Reports and Comments
- Consent Agenda
- Public Comment
- Approve Ordinance for St. Patrick's Day Beer Garden.
- Approve Contract with BG Consultants for Lift Stations
- Tax Abatements on Roosevelt Lofts, Simmons, and Cargill.
- Consider Accepting Housing Rehabilitation Grant From The Kansas Department Of Commerce CDBG Program.
- Report from City Manager on City Activities.

**If you need accommodations due to a disability to participate in this event, meeting, or activity, or alternative format of written materials contact Jeff Lynch, City of Emporia ADA Coordinator at least 48hours before the event at 620-343-4275 or jlynch@emporia-kansas.gov*

EMPORIA
City of Emporia

Memo

TO: City Commission

FROM: City Manager McAnarney

CC: Department Heads

DATE: February 7, 2020

SUBJECT: Commission Goals

Discuss dates with Commissioners to start goal setting sessions.

EMPORIA
City of Emporia

Memo

TO: City Commission

FROM: Dean Grant, Director of Public Works

CC: Department Heads

DATE: February 6, 2020

SUBJECT: Lift Stations Replacement/Rehab of #1, #2, #5 and #15

BG Consultants will be at the February 12th commission study session to discuss the replacement/rehab of lift stations #1, #2, #5 and #15. Both lift station #1 and lift station #2 are over 40 years old, and they have had no significant rehabilitation since they were put into service in that 1970s. In 2017 one of the two pumps at lift station #1 failed and had the be replaced, so there are still 3 pumps, between the two (2) lift stations that are over 40 years old. Lift station #15 is budgeted to have the pumps replaced this year, however, it needs to also be resized to handle the flows that it receives. Lift station #5 needs to have the pumps replaced, as well as some preventative maintenance on the concrete structure. We would like to have all 4 lift stations replaced/rehabbed in 2021, so we would like to start design by this spring.

EMPORIA
City of Emporia

Memo

TO: City Commission

FROM: Dean Grant, Director of Public Works

CC: Department Heads

DATE: February 6, 2020

SUBJECT: Chip Seal Asphalt Resurfacing

Discuss replacing our slurry seal program with a chip seal program for asphalt resurfacing.

Attached: Asphalt Surface Treatments for Preventative Maintenance

ASPHALT SURFACE TREATMENTS

Preventive Maintenance

Chip Seal - Slurry Seal - Cape Seal

Ben Vagher
Corey Martenson
Heath Russo

A-1 CHIPSEAL COMPANY

1

"It is incumbent on every generation to pay its own debts." - Thomas Jefferson

2

Reasons to use Surface Treatments

- To extend the useful life of asphalt surface by keeping air and water out, and stopping oxidation
- Cost effective treatments that will stretch your maintenance dollars giving you a strong return on investment
- Improves safety by correcting existing problems
- Strong believer in preventative maintenance
- Looking for aesthetic value which creates buyer / customer acceptance and value

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Asphalt Surface Treatments

- ✓Crack Seal
- ✓Seal Coat
- ✓Chip Seal
- ✓Slurry Seal
- ✓Cape Seal
- ✓Micro Slurry Seal
- ✓Double Chip Seal
- ✓Armor Seal
- ✓REAS
- ✓Thin Lift Overlays

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Surface Preparation

- Asphalt patching & leveling
- Crack sealing – Correctly
- Sweep & clean asphalt surface
- Striping removed if necessary
- Vegetation removed
- Oil spots removed if necessary
- Notification

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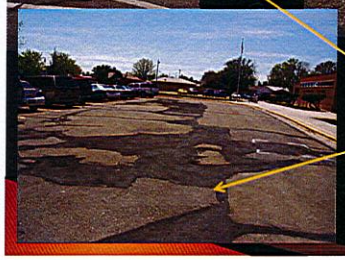
Crackseal



Blow out Cracks
Material in Cracks Only
Strike Off - Minimal Band
Do Not Puddle Material

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Chip Seal

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What is Chip Seal ?

- A Chip Seal is a single layer of asphalt emulsion binder that it covered by embedded aggregate (one stone thickness), with its primary purpose being to seal the underlying pavement surface and prevent water intrusion. The aggregates purpose is to protect the asphalt layer and provide a skid-resistant wearing surface.

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Materials – Asphalt Binder

- CRS-2P or CRS-2R (differences)
- Compatibility with aggregate
- Testing of the binder (is it worth the expense?)
- Certificate of Compliance PDF
- Temperature of Oil – Storability
- Volume vs. Weight (correction table) insert

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Material – Cover Coat

- One size aggregate (3/8" X ¼")
- Different sizes (Micro, ¼", 3/8", ½")
- 100% fractured faces – crushed quarry
- Cubical in size – no arrowheads
- Hardness of the cover coat (low 20 LA)
- Bonds well with the Asphalt Binder
- Where to apply the different sizes

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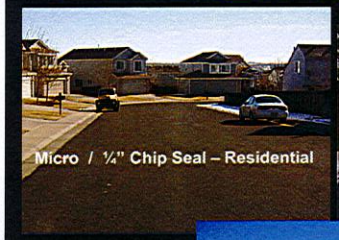
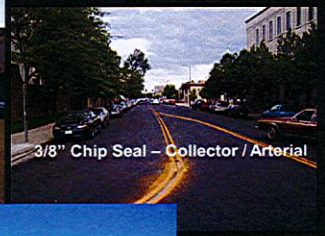
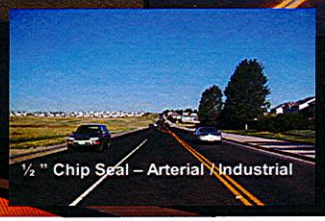
Materials (Aggregate Application)







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Equipment – Distributor Truck

- Most important piece of equipment
- Computerized shot rate system
- Calibration of distributor truck ??
- A minimum of two distributor trucks – why?
- Properly performing – spray bar
- Utilize the computer to determine square yards
- Proper maintenance – very important

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Equipment – Chip Spreader

- Self propelled with a minimum of 20' hopper
- Adjusted to apply a uniform application of Chip
- Does the computer work on the chip spreader?
- Calibration of the chip spreader
- Proper maintenance

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Equipment – Rollers

- 5-10 ton rubber tire rollers
- A minimum of two – what is the correct number?
- Proper tire pressure
- No steel wheel roller
- Which rollers are safe?

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Equipment – Sweepers

- Minimum of two vacuum brooms – required
- No mechanical pick-up brooms – why?
- Usage of side delivery brooms
- Latest in broom technology
- Proper equipment so you can recycle cover coat

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Material Application Table

Material	¼" Chipseal	3/8" Chipseal	½" Chipseal
CRS-2P Chip Seal	.30-.34 Gal/SY	.36-.40 Gal/SY	.40-.46 Gal/SY
CRS-2P Fogseal	.10 Gal/SY Minimum	.11 Gal/SY Minimum	.12 Gal/SY Minimum
Cover Coat Aggregate	20 lbs/SY Minimum	23 lbs/SY Minimum	28 lbs/SY Minimum

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Bituminous Application

- Application rate depends on different variables
  - Aggregate size, temperature, traffic volume, road condition, time of year
- Shot rate changes during the day – why?
- Paper usage vs. squeegee man – starts & stops
- Expect splotching on curb line
- Correct overlap on meet lines
- Utilization of shot sheet

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Cover Coat Application

- How do you use the computer on the chip spreader?
- Visual determination of proper application rate
- Correct distance between distributor & spreader
- Proper amount of water on cover coat
- Leave a 4" meet line for the next pass
- How to do overlaps
- Salt & pepper look - yes or no?
- Application rate is adjusted during the day

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Rolling of Cover Coat

- First pass happens immediately behind chipspreader
- Number of passes – two / three
- Proper number of rollers – based on width/production
- Speed of rollers (10 MPH) – keep up with production
- Haul trucks can help with rolling – staggered
- Best rolling is existing traffic – use it
- Allow traffic on Chip Seal – ASAP

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Sweeping of Cover Coat

- How soon can I sweep the Chip Seal?
- Important to sweep ASAP – safety reasons
- Proper Protocol for brooming?
- Production of brooming should match Chip Seal production
- It is important to recycle the cover coat?
- How do you recycle the cover coat?
- Final brooming – after fogseal

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Fogseal Application

- What good is fogseal?
- Fogseal within 24 hours of brooming
- What time of day works best?
- Application rate for different size of cover coat
- Cure time of fogseal
- A moving operation – similar to striping
- Dilution rate of fogseal – 60/40
- Striping can be applied within a few days

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Utility Protection

- Usage of building paper – precut
- Chip Seal tabs are used to hold paper in place
- No coverage for fogseal application – why?
- Building paper is removed after rolling with clean-up crew

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Weather Limitations

TEMPERATURE TABLE	¼" Chip Seal	3/8" Chip Seal	½" Chip Seal
Surface Temperature (minimum)	≥ 55 °	≥ 65 °	≥ 70 °
Ambient Temperature (daily high)	≥ 65 °	≥ 70 °	≥ 75 °

No construction shall take place when either the ambient or pavement surface temperature fall below the specification (see table), or when the pavement is moist, or when the weather is or may be detrimental. Detrimental weather is defined as rain showers, cool temperatures, moist pavements, threat of rain showers, or other environmental factors which could affect the performance of the Chip Seal construction. Emulsion shot rate should be adjusted accordingly depending on current temperatures within above material application specifications.

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Slurry Seal

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What is a Slurry Seal?

- A Slurry Seal is a cold mixed asphalt. It consists of a graded aggregate, a binder, fines and additives. It is a hard wearing surfacing for pavement preservation.

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What Does Slurry Seal Consist of?

- Mixture of:
  - Asphalt Emulsion (Approximately 14% by total aggregate)
  - Water (Approximately 12% by total aggregate)
  - Aggregate (Type I, II or III)
  - Cement
  - Additives

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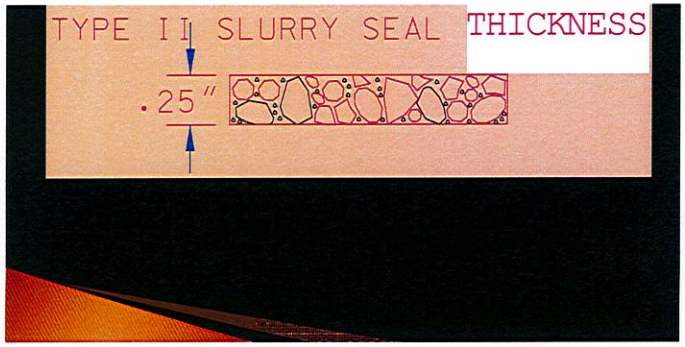
Maximum allowable thickness of Slurry is 1 ½ times maximum rock size



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Slurry Seal is Used for:

- ✓ Providing a new wearing surface for existing pavements
- ✓ Restoring surface texture by providing a skid-resistant wearing surface
- ✓ Improving waterproofing characteristics
- ✓ Correcting raveling
- ✓ Providing a new surface where weight restrictions preclude the use of heavier overlays
- ✓ An alternative to a seal coat / asphalt overlay

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TYPES OF SLURRY SEAL

AGGREGATE TYPE	LOCATION	SUGGESTED APPLIATION RATE
TYPE I	Parking Lots, Driveways, Bike Lanes	8-12 lb./sq. yd.
TYPE II	General Purpose, Urban & Residential Streets, Arterial Routes	10-18 lb./sq. yd.
TYPE III	High Speed Roads, Industrial Estates	15-22 lb./sq. yd.

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Emulsions

1. CSS-1h
2. CQS-1h ← emulsion used
3. QS-1h
4. SS-1h

Emulsion specifications are formulated for compatibility with the aggregate and meet mix design parameters.

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Aggregate Characteristics

- Hard Aggregate - LA abrasion less than 20
- Shape Slurry aggregates must have fractured faces in order to form the required interlocking matrix (rounded aggregates result in poor mix strength)
- Texture - Rough surfaces bonds better with emulsions
- Age & Reactivity - Aggregates that are crushed recently, have a higher surface charge than weathered aggregates
- Clean Materials - Clay, dust and silt can cause poor cohesion

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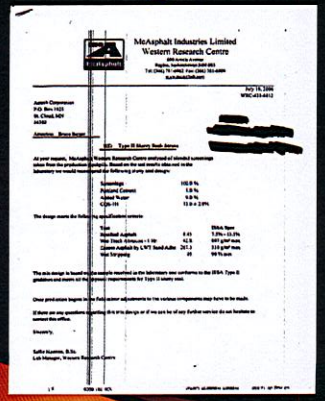
Mix Design


McAsphalt Industries Limited
Western Research Centre

[redacted]

BEFORE WORK BEGINS:

- ✓ A contractor submitted mix design covering the specific material to be used on the project.
- ✓ A qualified laboratory shall present certified test results for the contractor's approval.
- ✓ No substitution of materials will be permitted unless first tested and approved by the laboratory preparing the mix design.

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ISSA
Gradation Requirements

SIEVE SIZE	TYPE II-% PASSING	STOCKPILE TOLERANCE
3/8"	100	+-7%
#4	90-100	+-7%
#8	65-90	+-7%
#16	45-70	+-7%
#30	30-50	+-7%
#50	18-30	+-6%
#100	10-21	+-4%
#200	5-15	-0.03

Aggregate is accepted at job location or stockpile. The stockpile shall be accepted based on 5 gradation tests according to AASHTO-T2.

After the mix design gradation is submitted, each sieve shall not very by more than the stockpile tolerance and still remain within the gradation band.

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Roadway Preparation

✓Cracks ¼" or greater should be filled with crack sealing material and be allowed to cure prior to slurry placement.

✓Crack sealant that has not cured or that has been tacked may stick to tires on the slurry paver.

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Weather Concerns

- Medium to heavy rain can wash slurry seal oil from roadway
- Can cause aggregate separation
- May require total removal of damaged Slurry Seal
- Takes a minimum of an hour (plus) to be cured adequately

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Items to Monitor

- Ensure calibration is completed before placement of slurry seal
- Ensure inappropriate materials do not contaminate slurry from digging too low in stockpile
- Monitor stockpile segregation
- Moisture in stockpile needs to be consistent
- Monitor air and surface temperatures for limits as specified in the special provision
- Monitor weather conditions
- Monitor roadway ahead for last minute contamination

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Items to Monitor – Cont'd

- Check yield on a regular basis
- Monitor slurry for drag marks
- Ensure the centerline overlap does not create a safety hazard due to buildup of slurry on edge
- Adjust squeegee (secondary strike-off) angle for best or preferred surface texture
- Ensure traffic control is maintained and minimal delays to the public
- Acquire samples of materials, as required
- Watch for slurry not overlapping at centerline
- Periodic measurement of Slurry Seal widths
- Watch for washboard effect in the placed Slurry Seal

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Example of Excel Spreadsheet Yield Check

DATE AUG 10-06 TUE 12/13

BEG REV	END REV	DIFF	RATE ON DIAL	LBS USED	TONS USED	OIL BY DIAL	OIL USED BY DIAL	OIL WT PER GAL	GAL USD BY DIAL
0	13900	13900	35.71	496369	[illegible]	5	69500	8.53	[illegible]

BEG STATION	END STATION	DIFF	WIDTH	SQ YDS	YIELD BY DIAL
32564	15405	17159	12.5	23831.94	[illegible]

Green are required inputs and yellow shows desired information

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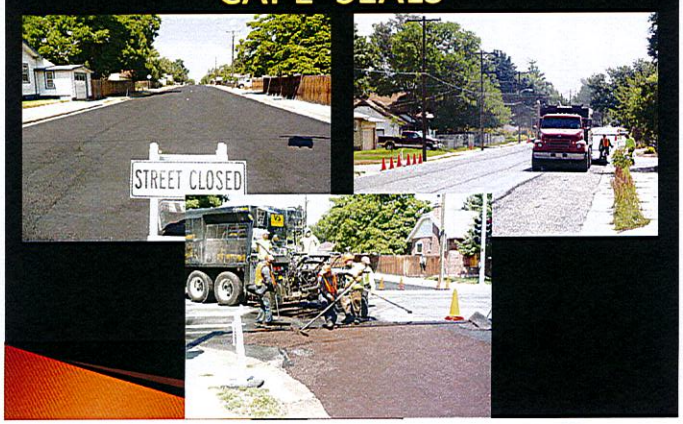
CAPE SEALS



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What is Cape Seal?

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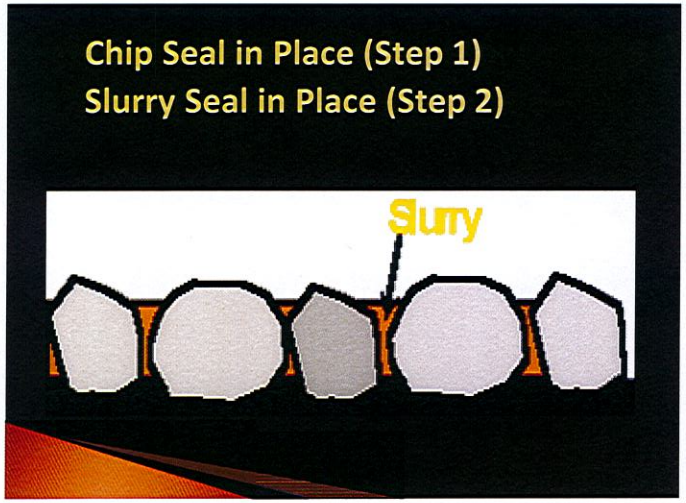
Chip Seal in Place (Step 1)
Slurry Seal in Place (Step 2)
Slurry

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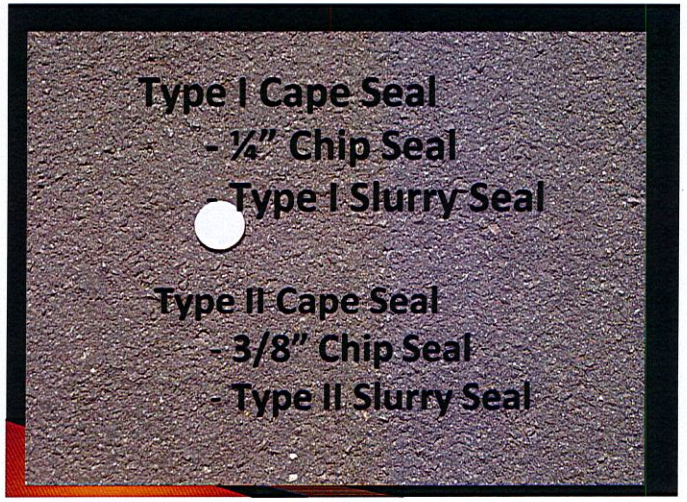
Type I Cape Seal
- ¼" Chip Seal
- Type I Slurry Seal
Type II Cape Seal
- 3/8" Chip Seal
- Type II Slurry Seal

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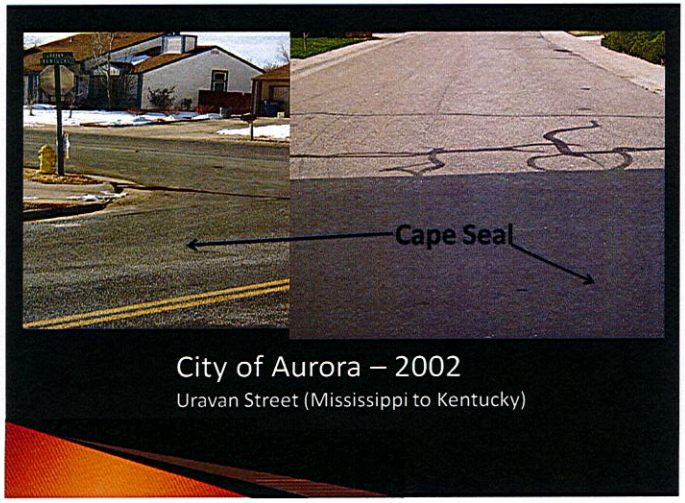
Cape Seal
City of Aurora – 2002
Uravan Street (Mississippi to Kentucky)

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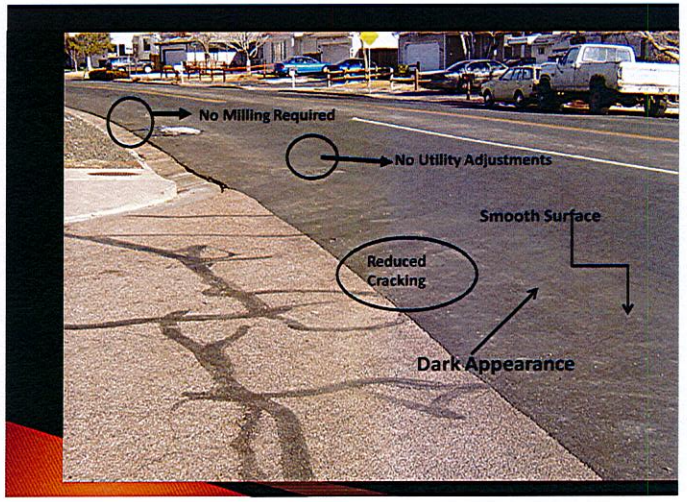
No Milling Required
No Utility Adjustments
Smooth Surface
Reduced Cracking
Dark Appearance

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Benefits of Cape Seals:

- ✓ You get the best of both treatments
- ✓ Cape Seals will last longer (10 plus years)
- ✓ Strong usage for residential streets
- ✓ Less expensive than mill & overlays
- ✓ No milling required
- ✓ No utility adjustments
- ✓ Smooth surface vs. Chip Seal
- ✓ More durable than a Slurry Seal
- ✓ Significantly reduces cracking
- ✓ No snowplow damage

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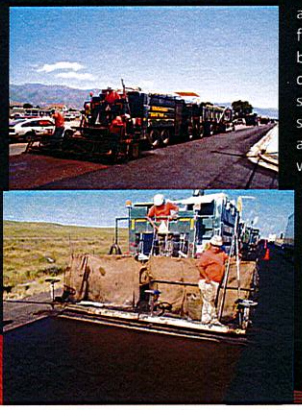
Micro Surfacing



Micro Surfacing is a polymer modified cold-mix paving system that begins as a mixture of dense-graded aggregate, asphalt emulsion, water and mineral fillers. It is applied to existing pavements by a specialized machine, which carries all components, mixes them on site and spreads the mixture onto the road surface. The water is chemically ejected and the surface cures, permitting traffic within one hour in most cases.

Advantages:

- ✓ Very durable
- ✓ Leveling capabilities
- ✓ Rut filling
- ✓ Very fast curing times
- ✓ Excellent for major arterial streets
- ✓ Good looking finished product
- ✓ Smooth appearance
- ✓ Good skid resistance

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Seal Coat

What are Seal Coats?

* Seal Coats consist of a mixture of coal tar, and or emulsified asphalt, water, mineral fillers and various other admixtures.

Advantages:

- ✓ Seals existing surface
- ✓ Improves appearance
- ✓ Cost effective
- ✓ Last 3-5 years (double coat)
- ✓ Improves safety

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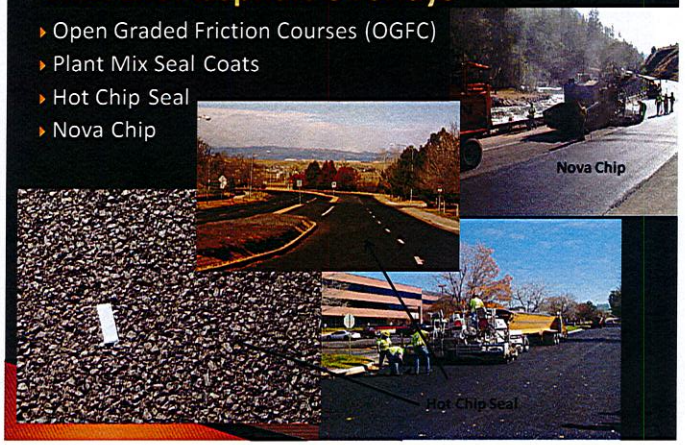
Thin Lift Aasphalt Overlays

- Open Graded Friction Courses (OGFC)
- Plant Mix Seal Coats
- Hot Chip Seal
- Nova Chip



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Double Chip Seals

½" X 3/8" – Double Chip Seal
3/8" X ¼" – Double Chip Seal
3/8" X 3/8" – Double Chip Seal

Advantages:

- ✓ Very Durable
- ✓ Quick application (both layers)
- ✓ Very flexible
- ✓ Reduces and or eliminates cracked
- ✓ Gives extra life to the asphalt
- ✓ Eliminates snowplow damage
- ✓ Very little shedding
- ✓ Will work for deteriorated asphalt

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Thin Lift Asphalt Overlays

- Important to seal existing asphalt pavement
- Existing asphalt needs to be in fair to good shape – structurally
- Used on higher volume roads – collectors / arterials
- Good quality of materials – aggregate & AC
- Proper mix design in place
- Thin lift application – plus or minus 1"
- Edge milling strongly recommended
- Good skid resistance and quiet
- Long lasting 8-12 years depending on traffic usage

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Armor Seal

- ✓ A variation of Chip Seal / Sand Seal
- ✓ Cost effective
  - Oil application
  - Aggregate cost
  - Labor cost
- ✓ Used on low volume (rural roads)
- ✓ Fogseal is not important
- ✓ Condition of equipment – less important
- ✓ Skill level of workers – less important

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REAS

- New innovative surface treatment product (Vance Brothers)
- Slurry Seal with crumb rubber added
- Central mixing plant
  - Pre-mixed material is delivered to job site
  - Quality control is significantly improved
  - Material has a shelf life
- Eliminates the need for staging of equipment, stockpiles and emulsified oil on job sites
- Workability of product is much improved over traditional
- Green / quality surface treatment (7-10 years)

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Proper Application

	Low Volume Roads	High Volume Roads	Residential/ Commercial	Collector Streets	Arterial Streets	High Volume Highways	Parking Lots Large	Parking Lots Small
Crack seal	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Seal Coat	No	No	No	No	No	No	Yes	Yes
Chip Seal	Yes	Yes	Maybe	Yes	Yes	Yes	Maybe	No
Slurry Seal	Yes	Maybe	Yes	Yes	Maybe	No	Yes	Maybe
Cape Seal	Yes	Maybe	Yes	Yes	Maybe	No	Yes	Maybe
Thin Lifts	Yes	Yes	Maybe	Yes	Yes	Maybe	No	No
Micro Slurry Seal	Yes	Yes	No	Yes	Yes	Maybe	No	No
Double Chip Seal	Yes	Yes	Maybe	Yes	Yes	Yes	No	No
REAS	Yes	Maybe	Yes	Yes	Maybe	No	Yes	Yes
Armor Seal	Yes	No	No	No	No	No	No	No

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EMPORIA
City of Emporia

Memo

TO: City Commission

FROM: Dean Grant, Director of Public Works

CC: Department Heads

DATE: February 6, 2020

SUBJECT: Alley Maintenance

Discuss alley maintenance in the downtown area.

An assessment of the alleys will be provided on Monday February 10, 2020.