

## **PAVEMENT MANAGEMENT PRIMER**

### **Community Road and Pavement Maintenance and Renovation in Central Florida**

Pavement is typically the highest-cost replaceable component in private residential communities, contributing significantly to private Community Association living costs.

Private communities have flourished in the area, and the homeowners within them are responsible for their own infrastructure maintenance and replacement. The sun and rain in Central Florida brings an onslaught of oxidation and weathering to the asphalt. These issues compound the need for the professional Community Association Managers (CAMs) to be educated upon the best management practices for prudent pavement management.

Proper maintenance and preservation will prolong a roadway's life, and would therefore reduce the yearly assessments that will be necessary to replace the pavement at the end of its useful life.

This document has been prepared to serve as a 'Pavement Management Primer' for Central Florida Community Association Managers and HOA members, for these reasons:

- So that they may better understand what they can *best* do to maintain their roads, and thereby minimize the necessary roadway replacement assessments;
- To provide some information that should be helpful in guiding the professional manager upon the maintenance and restoration work that will become necessary.

#### **Pavement Preservation Maintenance**

Pavement is likely the biggest and certainly one of the quickest-*depreciating* investments for a private community, it will need replacement every 12-15 years or so. Numerous state and federal studies have demonstrated and concluded that proper and periodic maintenance extends pavement life, and also therefore helps with deferring the large capital expenditures and the assessments upon the residents for replacement of the asphalt. Funds should be budgeted for maintenance of the roads, in addition to the capital accounts hopefully meant for major reconstruction (this is a required ordinance item in Orange County, upon gated and communities and communities with privately owned roads and infrastructure).

As to the maintenance, the private sector maintains parking lots with periodic 'seal coats'; we all have seen newly treated shopping center parking lots. It is interesting that Central Florida

governments do no preservation upon the public roads under their domain, however. They wait for the big replacement work; this is at least in part, if not largely, due to concerns over liability should the potential for reduced skid resistance lead to accidents. The reduced skid resistance is a concern, but with proper product application, this will be minimized. Also, gated or private residential communities are not a place where speeding should take place, and most typically the private communities do not have the capital replacement funds that the government has. Are not self-funded communities better served, in seeking to maintain the pavement, and thusly either limit assessments or prolong them? This is a community decision, no doubt - as it affects the pocketbooks of everyone living there.

Numerous products of various are available in the Central Florida marketplaces that provide at least some degree of pavement maintenance. *Seal coating* is the most conventional, and this term is also quite a 'catch-all' for the various products. There is an array of products and applications that a community manager or association may be quoted upon, by vendors all touting their products as the 'best', or the 'best for the buck'. Mostly these days they do all help, but some much better than others!

The application of slurry, which is a mixture of the 'sealcoat' material, water, and sand, is the most common Central-Florida treatment. The specifications vary widely, upon the mix, and the application rates. Most often, these slurries are fundamentally comprised of either a petroleum/asphalt-based emulsion, or a coal-tar based product. There are benefits and drawbacks to each type. The coal-tar based product is not as environmentally 'green' as the asphalt emulsion, but often has a superior life span, and is resistant to engine oil spills. The asphalt emulsions have been benefited by technology over the years, and with the typical co-polymers that are now conventionally included in the mix, the upgraded products are proving up as feasible cost-effective options.

Also well promoted with the marketplace, are '*restorative*' products, much like seal-coats, but which additionally have demonstrated *some* degree of pavement surface penetration, and some limited rejuvenation of the very top asphalt wearing surface by revitalizing the asphalt binder, which is the 'glue' As that these products need to be able to penetrate the asphalt, the condition of the asphalt wearing surface is even more critical in determining the viability of this more-expensive application, also, these methods may not be able to be used on pavement that has previously been seal coated; a professional should be able to determine this.

Each roadway within communities has wear, and specific conditions and issues. All roadways experience oxidation, which stiffens up the asphalt binder within the pavement, which leads to the deterioration in more physically-observed conditions, such as raveling, and a variety of other pavement distresses. Both the seal-coat and the restorative products can help with curtailing oxidation, typically.

Where pavement structure is lost - that is if the gravel in the pavement is 'popping-out'; the addition of sand at rates of 3 to 4 pounds/gallon is applicable. The correction of structural pavement distresses is limited or not applicable with these surface applications, however.



The application specifications, like the product itself, are important in selecting the correct maintenance pavement coating; as well is the work itself! The coating process almost invariably consists of two (2) applications, and then the restriping is to follow. There is ample information on the web, as to the various types of maintenance treatments, and the specific benefits of each. (If this is overwhelming to you- may we take this opportunity to suggest that you get a professional to assist you in your decisions?)

Certain items that need to be considered by the Community Association Manager include:

- Will the vendor communicate well in front of the work; will they supply work-area/schedule maps? What barricading will they do?
- What is proposed as to notifications, and traffic-control, and as to any important temporary pavement markings (stop bars & crosswalks?)
- Tow trucks may need to be used; this is a typically CAM commitment/management item!
- Is there oil-staining from vehicles? If this is of much consequence, are these areas to be pre-spot treated by the vendor? With what?
- Make the contractor responsible for cleanup and seal-coat tracking prevention!
- What pavement paint will be provided? Are the stop-bars and crosswalks that are proposed comparable to the markings that are to be replaced? These couple of items are typically required by local jurisdictions to be thermoplastic, which is more involved and expensive than paint.
- What about inclement weather- both suspending the work, perhaps even creating the need for rework?
- Is there some pavement that should be replaced, prior to sealing? Who will demarcate and measure this?

Proposals by the various vendors will also invariably reference contract conditions, such as remobilization charges, notification responsibilities, etc. It is important that the product and application specifications be stated, confirmation that certain contractor-enacted quality control and post-construction ‘punch-list’ where correction & cleanup will be made; and that all conditions of the ‘contract’ be understood – especially, if the ‘contract’ is limited to the vendor’s proposal execution!

Prior to enlistment of your anticipated vendor, a vetting of their anticipated construction procedures could be most helpful in achieving the objectives with as few disruptions upon community as can be made. Perhaps the inherent work in making for a smooth treatment operation is a big reason for community managers to want to defer the work- it doesn’t have to be that way, however. *Community managers and HOA individuals should not have to be also the managers for these kinds of undertakings; if this is the issue, there are outside professional resources to source this management work t; don’t let this be a reason not to maintain the roads!* Otherwise, enlist a reputable contractor who will provide warranty of their specified work, and with some planning, analyzing, scheduling, and notifications to the residents, it will pay off in the long run!



Typically, a sealcoat application should be placed every 3-5 years. An estimate for the cost would be in the neighborhood of \$1.00/ square yard of pavement, per 3-or 4 year treatment. Some products may cost more, but also provide a corresponding or slightly higher value (lasting longer). A good maintenance budget would be \$0.25-0.35/Square Yard /per year, upon the pavement.

### **Pavement Remediation Management**

Pavement maintenance is not a ‘one size fits all’ criteria, obviously. Sometimes, a ‘maintenance’ seal-coat type application upon portions of the roads is applicable, but other roadway areas need additional restoration. If you are to seal, get the remedial pavement patching done prior, so it will be sealed with the rest of the pavement.

Quite often, some pavement areas should be replaced, as they are just too worn out, and treatment would do nothing for any structural deficiencies, or water-ponding problems.

This work is typically performed in localized areas, usually on a limited basis, augmenting other pavement remediation activities. The costs of this ‘removal and replacement’ of asphalt is relatively expensive on a per-yard basis, and its projected lifetime use would likely be no longer than the surrounding distressed areas (these areas will be overlaid, likely, when the other areas are). Therefore, this work should be limited to the worst of the failing areas, or areas that are anticipated to fail prior to overall pavement rehab. .

Perhaps some areas even would be best overlaid, where a new pavement layer is placed over the existing pavement at the end of its feasible life. This operation can be performed, if the existing pavement is not too fractured, is intact and sufficiently bonded to the pavement structure below; and this underlying structure is sufficient, and not failing. Overlaying, too, could be performed upon the whole of the community – this is what is ultimately to be done, in replacement or overtopping of the asphalt, when the time comes.

The cause for any localized pavement failure should be determined, if it is not exclusively due to age. If underlying problems with the base are a contributing cause, the base should be remediated too, as it provides requisite support for the asphaltic wearing surface.

Sometimes, pavement and base failures are due to a moisture problem, brought about by any of several reasons- too high of a water table, excessive irrigation, or from ponded water within depressed pavement areas. The moisture problems need to be curtailed to the extent that it is feasible. These depressions may be otherwise caused by a variety of issues, such as insufficient below-grade compaction over utility systems or crossings, or infiltration of soils beneath the roadway into the sanitary or stormwater piping systems. The cause should be determined, and remediation’s made, otherwise the area will need to be fixed again.



Thusly, an objective pavement remediation assessment for the community roads is in order. It is also beneficial to provide the description of the proposed work, along with providing a clear understanding of what & where, prior to bid solicitation, to help with ‘apples-to-apples’ bid comparisons. Then, as to actual contracting, it is wise to add qualification notes to the contract, as relevant to the work and your expectations.

The relevant pavement rehab process is dependant upon the severity and type of pavement distresses that are prevalent. The pavement will often suffer from several types of distresses; therefore the rehab work will usually involve several separate processes, which could include the following:

- Roadway curb and drainage structure repair (if the road or curb settled once, it may again!).
- Cleaning (always – and watch the dust!)
- Spot treatments (upon leaked engine fluid areas)
- Seal or slurry coating or other preservative coating placement (no tracking allowed!)
- Pavement removal and replacement
- Underdrain placement (if groundwater continues to deteriorate pavement)
- Roadway crossings placement (retrofit options upon irrigation system-now is the time!)
- Overlay placement
- Pavement markings and stripping replacement

### **Roadway Repave Management**

There comes a point where the *asphaltic wearing surface* of the roadway will need to be replaced. Roadway repaving in Central Florida communities typically consists of the ‘overlay’ process. In this operation, hot-mix asphalt (HMA) pavement is placed over the existing road; this may or may not be placed over the existing asphalt wearing surface.

Roadways may also develop issues with the lower portions of their structure- the subgrade, or the base. The subgrade is below the base, and can be basically *compacted* earth. This type of subgrade is compatible with Orange County’s specification (not Seminole’s, however) for underlying a rigid base, such as soil cement. Otherwise, the subgrade may be *stabilized*, which will provide more support to overlying flexible bases, such as limerock. Typically, problems with the subgrade do not happen, unless there is some soils loss below it, like into a sanitary sewer or storm sewer pipe or structure.

However, problems with the base do occur, most often due to moisture problems, coming from the ground. In these cases, base repair needs to be made, but also provisions need to be made to control the moisture. When the base is to be repaired in limited areas, a good option is the use of



asphalt, or of crushed concrete. The original base material being used for replacement is not usually applicable- limerock really does not like moisture, and soil cement takes too long to cure (these are almost the exclusive types of bases in new construction in Central Florida). Should more extensive base repair be needed, an engineer should be consulted to make evaluations.

The new asphalt roadway surface typically follows the existing pavement grades, especially at the crown and the curb/gutter grades; thusly low areas that have a history of stormwater ponding, will likely continue to do so, unless other actions are taken, such as using additional asphalt in leveling the roadway surface areas. Review any pavement dips and places where water ponds with the vendor, BEFORE their work.

As to the asphalt wearing surface, it is either placed over the old asphalt, portions of the old asphalt, or upon the exposed base. Milling is the operation to remove the old asphalt, by means of the machining process of using rotary cutters to remove the asphalt wearing surface, and it can be limited in some cases, or may be necessary upon the whole of the asphalt pavement surface. In overlaying an existing pavement, in conventional subdivision roads, the milling along the curb (at a minimum) will be required, referred to as ‘curb-reveal’ milling.

Some roadway rehab projects have excessive controlling tie-in constraints, necessitating full surface milling (such as inverted crowns in the roadways, bordered with flush sidewalks). If the pavement surface is failing due to fatigue, and/or has excessive fracturing, total asphalt wearing surface removal and replacement is warranted, in an overlay job.

For the new asphalt to be overlaid upon the existing asphalt wearing surface, the existing pavement should be structurally sound, level, clean and capable of bonding to the overlay. To meet these prerequisites, the existing pavement is usually spot-repaired, leveled, cleaned and then coated with a ‘tack coat’.

What are the paving contractor’s intentions as to tying the overlay into the roadway manholes, and any valve boxes within the roads? If the structures are in the wheel paths, installation of risers upon these structures may be relevant.

The selection of the type of asphalt, and the depth of the proposed overlay, needs to be made. Typically, the types are identified as either SI or SIII, which is a by-gone specification; or SP9.5 or SP12.5, which are ‘Superpave’ asphalt designations. Both SI and SP9.5 are utilized in 1 inch overlays, while any of them can be used in the 1.5 inch overlay. The Type SI and SP12.5 have larger aggregate than SIII or SP9.5, and the surface finish at cul-de-sacs and intersection radial areas, which are hand-worked, can show quite a bit rougher.

The recycled asphalt product (RAP) percentage varies, with Orange County Public Works Department limiting this to 30%, while the Florida Department of Transportation (FDOT) allows 45%. The RAP content limit may not have a huge structural impact, but it may also involve introduction of debris that could decompose (like wood chips) or show poorly in the pavement, such as chunks of tire rubber; it is all in Quality Control, at that point.



Acquire copies of the vendor's certified FDOT mix design, agree on quality control such as core borings, and secure yield calculations upon their work – they make them, get a copy!

An overlay operation is obviously involved, and other items come into play. Specifications upon the various components of the materials and work are needed, to qualify what is to be delivered. The contract terms are very critical, in conveying a 'meeting of the mind' between the HOA and the Contractor. Misunderstandings will be expensive, as big-machine time and excessive asphalt tonnage can quickly run up. Quality control upon the work should be made.

A reputable contractor enlistment is critical, but having a qualified engineer and/or construction manager who is looking out for the community's best interest may be your best hedge in getting what you need, and pay for. As a prerequisite to any of the work, the formulation of a Bid Form, where bids can be compared 'Apples-to-Apples' in determining the award, will be most helpful. You need to control the reconstruction, so that its issues will not control the HOA.

For reserve funding, an estimate for the capital improvement of pavement overlay work, including the miscellaneous extras such as pavement markings, would be in the neighborhood of \$8.00-\$10.00/ Square Yard (this is about a dollar/square foot), in 12-15 years after the original pavement placement.

We thusly recommend that you get all you can out of your community pavement - manage the preservative maintenance, and get professional help where warranted. These both will save you money, in the long run.

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