International Slurry Surfacing Association

MICRO-SURFACING
(QUALITY CONTROL)

A Guide To Quality Construction

This publication has been produced by the International Slurry Surfacing Association (ISSA) to serve as a tool to assist contractor members and buyer agencies in specifying and recognizing quality construction practices for Micro-Surfacing projects. This document is meant to serve as a training and educational tool only, and in no way should the procedures discussed here be viewed as the only definitive solution or procedural methods that are used on Micro-Surfacing projects.

As is the case in all construction activities there are many methods to achieve the desired results. This document has been designed to hopefully point out a method or procedure that may assist the contractor and buyer agency in recognizing some of the things that can be done to realize a successful project.

Slide 1 Micro-Surfacing

Micro-Surfacing is a polymer modified, asphalt emulsion based, dense graded, cold mixed, quick setting, asphalt resurfacing material. It is designed to be applied in a semi-liquid condition with a specialized mixing and paving machine. By design it chemically changes from a semi-liquid material to a dense cold mix material that is able to carry normal traffic within one hour after application.

Slide 2 West Texas I-20

Interstate 20 in the West part of Texas that has been resurfaced with Micro-Surfacing. Notice the good cosmetics of the surface, the good edge line, and the lack of any appreciable center line joint. This is what you as a contractor and as a buyer of a Micro-Surfacing project had in mind when you started on the project. This as an example of the type of work this process should give you on a four lane type of highway.

Slide 3 Northwest Nebraska two lane project

A two lane project in the Sand Hills of Nebraska that was resurfaced with Micro-Surfacing material. Again notice the good cosmetics of the surface, the lack of surface imperfections, the straight edge lines, and good center line joint. An example of what you should expect from two lane work with Micro-Surfacing.

Slide 4 Residential type work

This last slide shows the other type of asphalt resurfacing done with Micro-Surfacing materials. A conventional city residential street resurfaced as a maintenance seal. Notice the good cosmetics, good center line joint, and the lack of any construction related surface defects.

Slide 5 Unacceptable four lane work

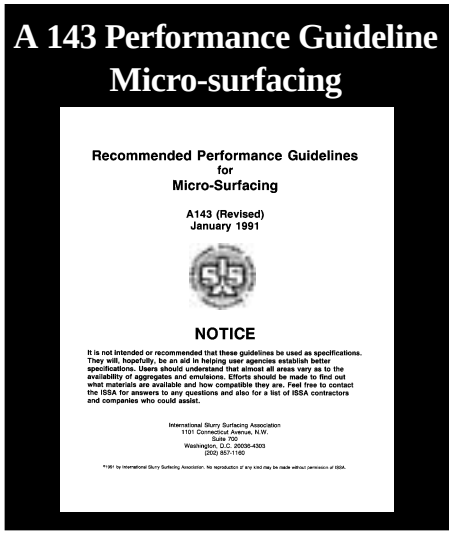
Now that you have seen what acceptable Micro-Surfacing looks like, here are some examples of unacceptable work that has been bought by some buyer agencies. This project was laid with the mixture out of control and breaking too fast for the contractor to keep the material in that semi-liquid state as it was being placed on the road. This type of condition will harm the materials ability to bond to the existing road surface as well as being unacceptable cosmetically.

Slide 6 Unacceptable two lane work

Another example of unacceptable work that was bought by a state agency. Here also the mixture was breaking too fast for the contractor to lay the material correctly. In this case the contractor tried to put too much water in the mix to help slow down the chemical breaking process. This flushed the asphalt up to the surface and traffic stripped it off of the aggregate. Micro-Surfacing has a chemical retarding agent that is used to slow down this breaking process that will help stop this problem. Also note the bad edge lines and total disregard for surface aesthetics.

Slide 7 Unacceptable residential work

This is an example of unacceptable residential type work. Notice the drag marks at the outside edge, and the overrun of material in the curb line. This type of edge line and cosmetics of the surface is unacceptable workmanship. As a buyer agency your contract should allow you to receive remedial work from the contractor to correct these types of problems.



Slide 8 ISSA A-143 Specification writing guideline

How do we get a good Micro-Surfacing project? It's not luck that determines whether you get an acceptable project, but rather a combination of many things. As we go through the remainder of this presentation we will talk about the many different steps that can be taken to insure a successful project. First the buyer must have a good specification and set of plans. This slide is a document prepared by ISSA that is an aid in writing specifications. It is a document that gives the current material, equipment, and construction techniques acceptable to ISSA for Micro-Surfacing. This document is not intended to be a specification, but is rather, intended to be a guide that can be used to help in writing specifications.

Slide 9 Material Mix Design

After the project is let and before the contractor goes to work a mix design must be submitted to the buyer, showing what the contractor plans on using for materials and in what proportion he will mix them. The mix design will also give the values of each of the materials used, for comparison to the requirements given in the material specifications. Also before construction starts the mixing and lay-down machine must be calibrated, to insure that each of the ingredients used in the mix are in the correct proportions.

Slide 10 Where not to use Micro-Surfacing

Keep in mind that this is a thin lift of asphalt resurfacing material that will not bridge over or correct failed asphalt areas. These types of failed asphalt must be corrected before you can successfully resurface them.

Slide 11 Micro-Surfacing over failed asphalt

As the last slide pointed out, obliviously failed areas must be corrected before they can be resurfaced. Here is an example of an area that was not corrected before being resurfaced. Notice where the lay down machine has broken through the bad area and left an unacceptable surface blemish.

Slide 12 Asphalt patch area

This is an example of a repaired asphalt area that is suitable for resurfacing with Micro-Surfacing material. You already know how to patch asphalt, so we won't spend any time discussing it, but one point needs to be made about patching for Micro-Surfacing. This material does a very good job of filling in depressions in the road surface, which we will talk about later, but it is not very effective at smoothing out a bump or protrusion. Therefore it is preferable to leave any patching areas with a correct profile or a slightly shallow profile rather than a raised profile.

Slide 13 Pushed up edge line

Another area that should be addressed before a Micro-Surfacing application is plastic deformation or pushed up asphalt on the surface. Here is an example where the surface lift has pushed up at the edge line. Once again the Micro-Surfacing material does a good job of filling in any low spots in the surface but it is not very effective when used to correct high areas in the road. The accepted method of correcting this type of problem is to cold mill the high areas of the pavement before you Micro-Surface.

Slide 14 Cold milling the edge line

When this type of corrective action is used it is noteworthy to mention that you do not need to mill inches of material off of the surface. Rather do a skip mill operation where you only remove that portion of pavement that is pushed up and let the Micro-Surface material fill in any low areas in the pavement. Of course the Micro-Surfacing material will not correct the problem in the asphalt surface that caused the movement initially but it will buy you some time on the road.

Slide 15 Reflective crack through Micro-Surfacing

As seen here a crack has reappeared through two year old Micro-Surfacing material. Large reflective cracks should always be treated prior to any asphalt resurfacing material being applied. It is recommended that some type of crack sealing material be used before any Micro-Surfacing is applied. It is the buyers decision of what type of crack seal material to use, as there are many types available. You must remember to insure that the crack sealing material is compatible with asphaltic materials.

Slide 16 Fresh material over a large crack

Lets go over crack preparation work prior to a Micro-Surfacing. This is an example of a Micro-Surfacing material placed over an unprepared crack. The crack appears to be filled, but even though we have a polymer modification in our asphalt we still can not stop full depth reflective cracks from reappearing. Micro-surfacing is somewhat effective on retarding small oxidation and hairline cracks , but not large reflective cracks.

Slide 17 Crack sealing

Large cracks must be sealed with something prior to resurfacing. One method that has gained a lot of acceptance is a polypropoline, or polyester fiber suspended in an AC-10 asphalt and applied hot, through a wand. This slide is an example of this type of crack seal operation. The crack needs to be cleaned with compressed air, then the crack seal material is applied into and over the crack. There are many different types of crack sealers available and we aren't promoting one over the other, but we are promoting that some type of crack work be done.

Slide 18 Crack sealed street ready for resurfacing

This is an example of a street that is prepared for Micro-Surfacing, with the crack sealing operation already done. Remember that most Micro-Surfacing applications are applied at a very thin application rate per square yard. Therefore we have found that it works best when the crack sealing operation is done early enough that traffic can run on the seal material and pound it down into the crack or flatten it out on the road surface. This will allow the thin lift of Micro-Surfacing material to cover the crack sealer without leaving a bump in the road.

Slide 19 Debonding of Micro-Surfacing due to road contaminates

When preparing a road for resurfacing it is important to insure that you are bonding asphalt to asphalt and not have any contaminates between that bond. Here is an example of a one year old Micro-Surfacing material that has come loose from the original pavement because the road was not sufficiently cleaned ahead of the application. This happens to be an animal carcass that was left on the pavement and surfaced over. The material has come off of the contaminate and left an unsurfaced area.

Slide 20 Debonded areas

This is another example of debonding of the surfacing material from the existing pavement surface. This illustrates an area where virgin aggregate from the dump trucks that are feeding the lay down machine have spilled rock on the road and it was then surfaced over. The point that needs to made clear here, is that good cleaning must be done on the road before any Micro-Surfacing can be applied or it may not stick or bond to the road.

Slide 21 Micro-Surfacing stockpile area

Lets now take a few minutes to go over the stockpile site, the support equipment, and the lay down machine. This first slide shows a stockpile area where the aggregate is screened, weighed, and loaded onto dump trucks for delivery to the lay down machine. We suggest that even though the aggregate is select crushed material, that it be screened to remove any oversize particles and contaminates before it is loaded onto trucks. Also in most areas of the country the aggregate is then weighed and a ticket made that is delivered to the lay down inspector. At the stockpile site the dump trucks are loaded with emulsified asphalt and water while they are being loaded with aggregate.

Slide 22 Oversize material at the screening plant

This shows why it is recommended that a screening plant be used to screen the aggregate before it is delivered to the lay down machine. The pile of material that can be seen below the screen is oversize aggregate that was in the material when it was delivered from the quarry. Also there is some dirt and grass that the loader operator got into when he was picking up material to load. Any oversize material or contaminates that you can remove from the aggregate before it gets to the lay down machine will help with surface cosmetics on the road.

Slide 23 Lift bed dump support

There are basically three methods of delivering the materials to the lay down machine. This is one method where conventional dump trucks have liquid tanks on each side of their dump beds that hold the emulsified asphalt on one side and the water on the other side. They lift their beds to charge the lay down machine with aggregate and fill the machine with the liquids. This method works well enough if the project is out in the open spaces, but does not work well if there are overhead obstructions on the road.

Slide 24 Conveyor belt dump support

As shown here the lift bed dump support method may not work very well when the roadway has overhead obstructions such as power line or heavy tree growth. The method shown here is a conventional dump truck that has been fitted with a slide in support unit that holds the liquids in a tank on each side and has a conveyor to discharge the aggregate without having to lift the truck bed. This method will solve the lifting of the bed problem in obstructed areas that was just discussed.

Slide 25 Tractor trailer type support unit

The last material delivery system we'll talk about is a tractor trailer unit as shown here. This method also has storage tanks on each side of the trailer for delivering the liquids to the lay down machine and a conveyor system for delivering the aggregate, without lifting the trailer bed. This method is basically the same as the insert method except that the contractor can haul more material out to the lay down machine.

Slide 26 Surface drag marks

We need to talk about one of the common problems associated with this type of work; which is a drag mark. A drag mark is when an oversize particle of rock becomes lodged under the strike off device of the lay down box, and while being pulled along with the machine leaves a furrow in the surface. This problem is the main reason that we are recommending that a screening device be used in the stockpile to remove any oversize material before it gets to the lay down machine. We will discuss how to deal with these marks in a moment.

Slide 27 Cold mix and oversize material drag marks

Here we see some more of those oversize material drag marks along with another type of drag mark. The larger mark seen here is caused by a ball of broken Micro-Surfacing mix or cold mix which is caught in the lay down box strike off. This type of problem occurs when the mixture is changing from a semi-liquid flowable material to a cold mix material before it is deposited on the road surface. This mixture is out of control and the lay down process should be stopped while the contractor determines how to slow the breaking process down enough to eliminate this problem.

Slide 28 Squeegee removal of drag marks

There are basically two methods of repairing these drags marks once they appear in the road surface. The traditional method is to remove them with a hand tool called a squeegee as shown here. Someone simply walks out into the fresh mix and removes the mark with a hand tool while another person is working with a different tool to remove the obstruction from the lay down box strikeoff plate. This method works well but it requires a well trained person to remove the offending mark and his foot prints without leaving an unsightly appearance in the mix. As mentioned there are two methods of removing these marks and we will talk about the other method in a moment.

Slide 29 Surface imperfections after hand work

As mentioned earlier the removal of drag marks with a hand tool requires a well trained person, so that the surface cosmetics after the drag mark has been removed is not worse than before the hand work was done. As shown here the hand work has left imperfections in the surface that are not acceptable and probably look worse that the original drag mark did. Contractor personal training is the key here.

Slide 30 Dirty strike off drags

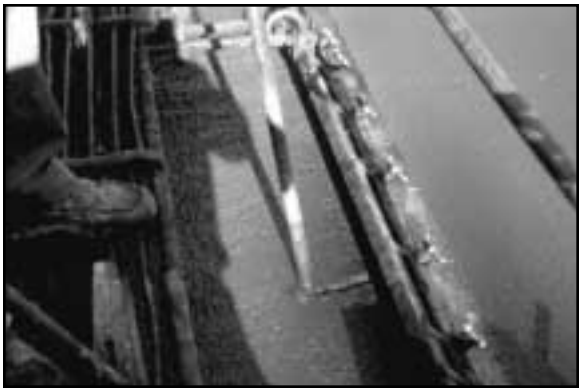
This as an example of another type of drag mark that can be in a Micro-Surfacing project. This type of mark is much shallower and smaller than those we have just talked about. These imperfections are caused when the lay down box strike off becomes dirty with small particles of aggregate and asphalt, sticking to the final strike off plate causing this indention in the surface.

Slide 31 Dirty strike off drag marks

Another example of dirty strike off drag marks in the surface. As shown here this type of problem is most commonly seen when a transverse joint is made. When making a transverse joint the lay down box is lifted off of the road and the asphalt and fine particles have a chance to harden on the strike off plate. The solution to this problem is to physically remove any material that has dried on the strike off every time a transverse joint is made or when this type of surface problem becomes apparent. We will talk about this in greater detail when we are going over how to make a transverse joint.

Slide 32 Secondary strike off device

As we said earlier there are two methods of correcting drag marks, so lets discuss the newer method. This device is called a “secondary strike off”, it is a surface texturing and surface cosmetic improvement device. The secondary strike off mounts directly behind the lay down box primary strike off and is in contact with the fresh mix. It will remove most surface imperfections without requiring someone to walk in the mix and remove them with a hand tool. This device does not actually remove what is causing the drag mark in the primary strike off, that still must be removed by hand. But this device will correct the imperfections in the surface while you are working to remove the cause.

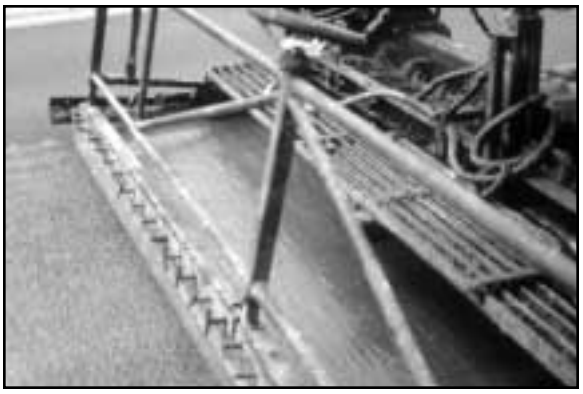


Slide 33 Secondary strike off removing drag mark

An example of the secondary strike off removing a large drag mark. A drag mark is purposely put into the fresh mix here to demonstrate the ability of the strike off, in removing it.

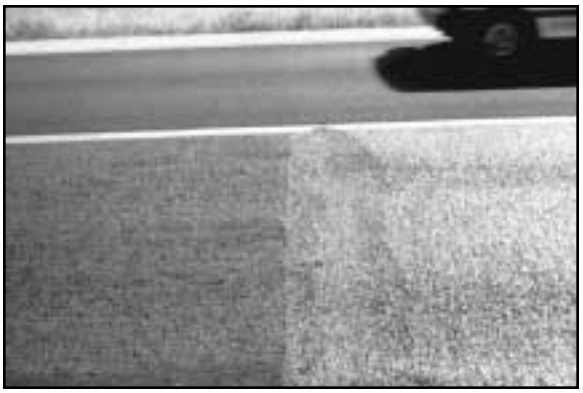
Slide 34 Secondary strike off removing dirty primary strike off marks

This is an example of the secondary strike off removing the serrations in the surface that are associated with the primary strike off being dirty.



Slide 35 Secondary strike off improving the surface texture

This last example of the secondary strike off shows how it can improve the surface texture and cosmetics as well as correcting drag marks. Here you see a wet shiny surface on the mix between the primary strike off and the secondary strike off, that indicates a mixture that has too much total liquids in it. While the contractor is working to lower the total liquids in the mix the secondary strike off is correcting the surface texture.



Slide 36 Good transverse joint

This is an example of a good transverse joint in a Micro-Surfacing mix. Making transverse joints with any asphalt material is a difficult process and in this next group of slides we will talk about how to construct those joints when using Micro-Surfacing. The method we will be discussing for constructing a good transverse joint is not the only correct method that may be used, but is one of the methods.

Slide 37 Removal of cold mix

Because of the very quick setting nature of the Micro-Surfacing mix, it is important that the contractor not try to empty the lay down box material when making a construction joint. Once fresh material is no longer being discharged into the lay down box, the material being carried along that is all ready there will quickly change from a semi-liquid state to a cold mix state. This change may occur before the material in the box can be deposited onto the road surface, and if the contractor tries to lay all of the material in the box before making his joint the cold mix material he is depositing may not adhere to the road surface. It is recommended then when making a transverse joint, that when the mixing unit is shut off, that the material that is present in the box be picked up and disposed of.

Slide 38 Cleaning the primary strike off

When the lay down machine has stopped it is important to take this time to physically remove the build up of asphalt and fines that are present on the primary strike off. As we discussed previously this build up of material causes drag marks or serrations in the road surface, and it needs to be removed every time the lay down machine stops.

Slide 39 Surface clean up

After the strike off has been cleaned and the machine is ready to start its lay down process again it should be noted that all cold mix material and contaminates on the road surface should be cleaned up. If this clean up process is not done these contaminates will be picked up by the lay down box and may become drag mark particles that will need to be removed while the machine is in motion. It is simpler to remove this material before the machine is moving.

Slide 40 Preparing for a transverse butt joint

Transverse joints with the Micro-Surfacing system need to be butt joints not overlap joints. The recommended method of making a good butt joint is to first cut a straight edge line into the existing mix as demonstrated here. Then the lay down box is placed at this cut out point perpendicular to the road. The lay down box is then charged with fresh material and the lay down process proceeds down the road. A hand tool is then used to dress up the transverse joint.

Slide 41 Completed transverse butt joint

This is another example of a good transverse butt joint that was constructed using the method we have just discussed. Notice that the line is perpendicular with the road with good aesthetics. There is not a double thickness of material as would be evident if an overlap joint was used. A joint like this will not be evident in a short period of time, as it will quickly blend into the overall road appearance.

Slide 42 Unacceptable transverse joint

This is an example of a transverse joint that was built as an overlap joint. Notice the gap under the straight edge on the joint, which shows an elevation difference. This gap will cause a bump to be felt when traveling over the joint. Also the discolored material that is evident here is cold mix material that was picked up by the lay down box when it was pulled over the fresh or tender mix at the joint. This bump and discolored area will remain in the road surface long after the project is completed.

Slide 43 Unacceptable transverse joint

Here is another example of an unacceptable transverse joint. This joint shows an area that has too much total liquids in the Micro-Surfacing material. The texture of the joint should be the same as the rest of the road surface and not be unsightly or flushed as shown here. Also you will notice foot prints and other defects in the joint caused by workers trying to correct the defect at the joint, rather than constructing it correctly the first time.

Slide 44 Good longitudinal joint

This slide shows a good longitudinal joint in a four lane section of roadway. Constructing a longitudinal joint on a four lane highway is relatively easy as the normal process of constructing the road will insure that the longitudinal joint application will be placed when the first application of material is well cured and stable. It simply requires the contractor take care to minimize the overlap of material at the joint interface. A maximum overlap at a longitudinal joint should not exceed four inches at a typical joint.

Slide 45 Working the joint overlap down by hand

As we pointed out in the previous slide, an overlap of up to four inches is permissible on a longitudinal joint, but care should be taken to minimize the thickness of the material at this joint. Here a worker is working the second application of material down at the joint with a squeegee to minimize the thickness. This is an acceptable practice to aid in smoothing out the transition and ride when going from one lane to the other.

Slide 46 Working the joint overlap down with a squeegee and secondary strike off

Another technique that is being used is to feather or minimize the material at the joint with a hand squeegee placed between the primary and secondary strike offs as shown here.

Slide 47 Excessively overlapped transverse joint

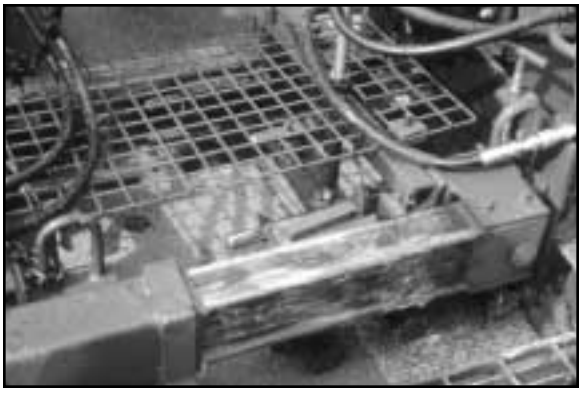
When the maximum overlap of four inches is exceeded it is impossible to work the two passes of material down to any acceptable degree. Here we see an overlap of approximately eighteen inches and the associated problem of having a double thickness of material. This excessive overlap will cause an elevation difference in the mix that will cause a bump when transitioning from one lane to the other as is evident by the gap seen under the straight edge.

Slide 48 Overlapping fresh mixture at the longitudinal joint

It was pointed out previously that making a longitudinal joint when the second application is placed next to a completely cured first application is simply a matter of minimizing the overlap and working the second application down. When making this longitudinal joint where the first application is still in a tender or fresh state the process is a little harder to do. As shown here the lay down box will tear the fresh mix and create an unsightly appearance.

Slide 49 Inside skids on the lay down box

An aid in stopping this tearing of the fresh mix when making a longitudinal joint is to use what is called an inside skid on the lay down box. The lay down box is pulled along the road surface with its weight being carried on long runners or skids, and this skid riding on the fresh mixture is the cause of the tearing we are discussing. The corrective procedure is to mount another skid on the inside of the lay down box. This allows the outside skid that is in contact with the fresh mixture to be raised up so that it does not tear the mix. The weight of the lay down box is now being carried on the inside skid which is in contact with the unsurfaced portion of the road.



Slide 50 Hydraulically adjustable lay down boxes

Another device that is helpful in stopping this tearing of the fresh mixture is a hydraulic box that will allow the contractor to quickly change the width of his lay down box. With the introduction of these hydraulically adjustable boxes the contractor can change the width of the box in approximately ten minutes. Also these boxes are fitted with inside skids at the factory which further helps the problem as we discussed previously.

Slide 51 Longitudinal alignment

This is an example of the type of longitudinal alignment that can be achieved with the Micro-Surfacing system. This is an Interstate project in Nebraska where the out side lane was rut filled then surfaced. Notice the straight edge lines which were placed inside of the existing paint line.

Slide 52 Acceptable edge lines

Another example of an acceptable edge line or longitudinal line on a four lane roadway. Notice that this system can produce a very straight and clean edge line.

Slide 53 Unacceptable longitudinal alignment

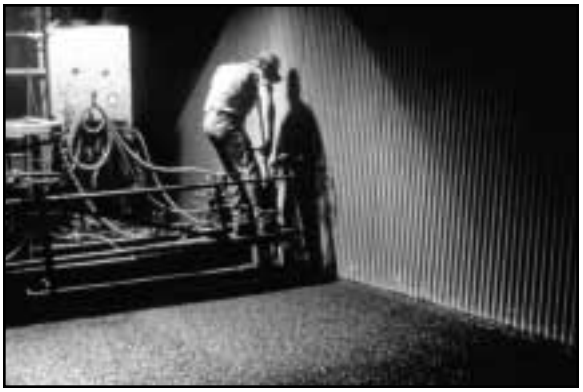
This is an example of an edge line that should not have happened or been accepted by the buyer agency. As seen here the mixture had too much total liquids in the system, which ran off onto the shoulder. The mixture should have had some of the liquids removed which would have stopped the free liquid run off. Also the operator of the lay down machine has a side shift device that was used to over correct the alignment at the location shown.

Slide 54 Another example of a bad edge line

This residential location also has a problem with the longitudinal alignment that should not have happened. This problem is also associated with the mixture being laid in too wet of a condition, allowing the mixture to flow past the end of the box. A properly designed and applied Micro-Surfacing material should not have excess liquids free in the mix. Also the driver of the lay down machine was not following a straight line when he was steering the machine.

Slide 55 String line edge lines?

If the contractor has difficulty in achieving a straight edge line, one thing that may help this is too require him to put down a string line to use as his guide mark for alignment. We are not recommending that all projects require a string line. Normally the existing paint line at the edge of the road is adequate for the contractor to use as his guide mark, but if he is not able to achieve the alignment that is desired, then a string line guide mark will normally improve the alignment.



Slide 56 Vertical abutment alignment

As can be seen here the lay down machines are designed to allow the contractor the ability to maintain a very straight edge line if the contractor so desires. When pulling the lay down box next to a vertical wall it requires very good machine control and the ability to maintain that control. Straight edge lines are possible.

Slide 57 Six foot rut box work

This industry currently has only two sizes of rut boxes available. This slide shows the six foot rut box typical application. Note that when both ruts in a lane are filled with this box, twelve feet of the road is surfaced which requires the two passes make a longitudinal joint. The design and operation of a rut box is such that the outside edge is able to be laid with less material than the center part of the box. This allows what is called feathering of the rut box edge where very little material is applied. This promotes very good longitudinal joints with a rut box.

Slide 58 Five foot rut box work

Seen here are two passes of rut box work with a five foot rut box. The five foot box will leave a gap between the applications, and will normally be followed with a surface application on top of the rut work. Notice again that the five foot rut box will feather the outside edge material down so that the edge of the rut work is as thin as possible.

Slide 59 Unacceptable rut work

Here is a project done with rut box work only, where the contractor overran the project by sixty five percent simply because he did not try to feather the outside part of the mix down as the design of the box promotes. This excess material was not needed to re-profile the rutted section and should not have been accepted.

Slide 60 Under filled rut work application

This slide illustrates a rut application where the rut was under filled with material. The design and intent of rut work is to completely fill each individual rut with enough material to correct the roads profile. In this slide, that has not be accomplished. When the surface application is applied over the rut work, the under filled area will not have the same cross section as the rest of the surface.

Slide 61 Correct patching procedure

On most projects there will be some areas that the contractor and buyer will want to correct with another application of material, or patch. This slide shows such an area, where a patch has been done correctly. It is normally accepted that when a patch is required, the patched area should have the same surface cosmetics as the rest of the road. This is accomplished by requiring that all patching be done with the same lay down box that was originally used to surface the road.

Slide 62 Unacceptable patch work

This is an example of an area that was patched without using the accepted lay down box method we just discussed. Here the contractor discharged material directly onto the road surface and hand tooled the patch in. As can be seen here this method leaves a completely different texture and appearance than the rest of the road, and should be ruled an unacceptable patching process. As pointed out earlier it is recommended that if an area requires a patch it should be patched with the same process and equipment that originally surfaced that area.

Slide 63 Unacceptable patching

Another example of an unacceptable patch area. Once again the contractor elected to do the patching by simply hand working some mix into the problem area with a hand tool. Remember that if an area requires a patch it should be done with the same device that originally laid the material in that area.

Slide 64 Hand work areas

There are times that the lay down machine will not be able to reach or maneuver into an area to lay the material. In these cases it becomes necessary to hand work the mixture over these areas. This is an example of hand working an intersection approach. It is important to remember that the material is designed to cure very quickly and it will be necessary for the contractor to have extra people available to assist in the hand work process. The mixture must be spread and smoothed before it changes from a semi-liquid state to a cold mix state.

Slide 65 Burlap drag on a hand applied area

After the mixture is applied with hand tools it will need to be smoothed up with a burlap drag as shown here. The hand tools will leave ridges and valleys in the mixture as you can see in this slide. It is necessary to go over all hand work areas with a drag mop to remove these surface imperfections. This is the only time that a burlap drag mop is used on a Micro-Surfacing project.

Slide 66 In town traffic conditions

This slide is an in town high traffic area that has been Micro-Surfaced successfully, without excessive traffic damage. When working in town it becomes important for the contractor to devise methods to protect his fresh material from damage caused by traffic getting onto the mix before it has had a chance to cure sufficiently.

Slide 67 Damaged area from early traffic crossing

This is an example of the damage that traffic can cause when it crosses the mixture before it is sufficiently cured. These wheel marks will remain in the road surface if they are not patched. It is the contractors responsibility to eliminate this type of problem as he should have been aware of the traffic problems before he bid the project.

Slide 68 Extra traffic control cones

Perhaps the best method to keep traffic from driving on your material before you want them too, is to use additional cones to channel the traffic out of the areas that are not ready for them. Here we see where cones are spaced much closer together than is normally required, but by doing this vehicles are not as likely to cross over the fresh material and cause the damage we looked at on the previous slide.

Slide 69 Dusting at an intersection

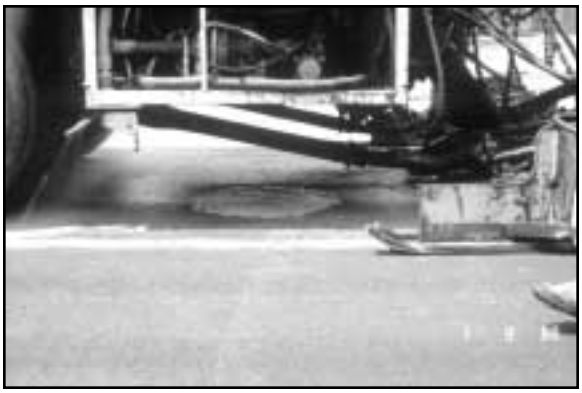
There are times when a contractor must allow traffic across the fresh mixture before he would like too, normally at an intersection where crossing traffic is not diverted. In this instance the industry has a method to minimize the damage this crossing traffic will cause. This method is called “dusting”, and it is accomplished by spreading some of the virgin mix aggregate over the fresh material to act as a barrier to not allow vehicle tires to sink down into the mixture.

Slide 70 Crossing a dusted area

We can see here where a vehicle is crossing the fresh mixture on a dusted area without indenting the Micro-Surface and leaving a wheel print. It should be noted that even when an area is dusted the early crossing of the mixture will still leave some surface blemishes and the road will have a temporary aggregate dust stain at the dusted location. The dusting procedure is not a perfect control of the traffic blemish problem but it is better than doing nothing at those locations where you must allow traffic to cross the material early.

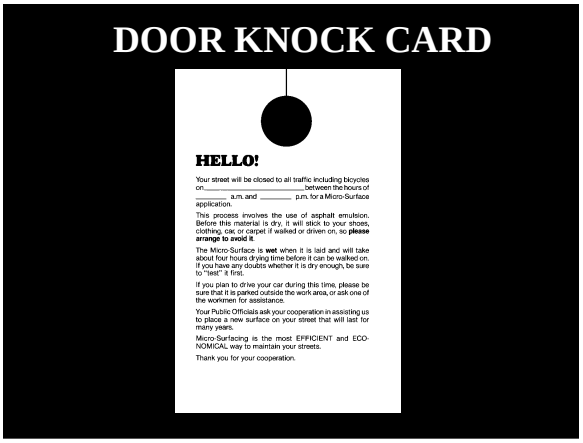
Slide 71 Manhole protection

Manholes and utility covers must be protected from the Micro-Surfacing material to insure that they are serviceable after the application of material. Here we see a manhole cover that is being covered by material without any protection. The Micro-Surfacing material will stick to the metal of these covers so tightly that removal of it later will be very difficult.



Slide 72 Protected Manhole

The accepted procedure is to cover the utility covers with a plastic material before surfacing over them and then removing the plastic when the road is opened. This allows for easy removal of the material from the cover and puts the utility entrance back into service.



Slide 73 Door knock card

This slide shows an easy device that the contractor can use to improve his public relations when on a city project. Any time a contractor is going to close or alter a street to normal traffic he should notify the residents and businesses that are going to be affected by his operations. This notification is usually done by sending someone up to the affected home or business and telling people what is going to take place on their street and what they will need to do to accommodate the construction activities. If that person is not at home this card is left on their door explaining what is going to take place on their street.

Slide 74 Successful construction

When the specifications are written correctly, the plans spell out what is expected of the contractor, the road is correctly prepared, the contractor has a good mix design and quality control system, this is what you as a buyer agency should get from a Micro-Surfacing project. A quality asphalt resurfacing operation and a resurfaced road that you can be proud of, which will last for many years.

Slide 75 ISSA logo

If you need any help in setting up a Micro-Surfacing project or have any questions that you would like answered contact your local ISSA contractor or the ISSA headquarters directly.

Notes:

For more information about other ISSA programs, publications, benefits, and activities, please contact:

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A Guide To Quality Construction

This publication is produced and distributed worldwide by the International Slurry Surfacing Association (ISSA). ISSA is an international non-profit organization composed of individuals, corporations, and governmental agencies who provide the industry with machinery, materials, and services. The objectives of ISSA include:

- Provide technical data for monitoring and upgrading asphalt slurry systems (slurry seal and Micro-Surfacing) products;
- Advocate and encourage public and private interest in the use of asphalt slurry systems as efficient, effective, cost-saving, and safe additions to road maintenance programs;
- Encourage and promote ethical quality construction practices by all members of this association within the industry; and
- Aid all members of the association in furthering the success of asphalt slurry systems.

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