



Custom Steel Inlet/Catch Basin Risers:

The Better Way to Raise Inlet/Catch Basins to Grade on Roadway Repaving Projects

Custom fit steel inlet/catch basin risers are stronger, lighter, and much faster to install than conventional alternatives.

A report sponsored by American Highway Products

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There is no way to know how many catch basins are installed in the United States, but the number is certainly in the millions. They're one of the most common roadway features of all, right up there with manholes, and paving contractors and municipal maintenance crews spend a great deal of time keeping them level with pavement. This is especially true when streets are being repaved; raising dozens (or hundreds in some cases—see below) of catch basins to final grade is often thought of as a tedious chore that takes many hours of valuable crew time and requires costly lane closures. Or sometimes, catch basins are simply left at their original grade, forming potholes a couple of inches deep—this is a 'solution' that creates significant problems in terms of potential damage to vehicles and roadways.

It is the premise of this paper that custom steel risers are the best way to raise inlet/catch basin grates to final grade after repaving projects. They save money and time compared to excavation and manual raising of utility frames, they are lighter, stronger, and better fitting than cast iron risers, and they leave grates precisely at final grade, eliminating potential damage and liability due to the creation of new potholes and exposed asphalt edges.

How much does it cost to manually raise catch basins to grade?

By any measure, excavating catch basin frames and raising them manually is an expensive, labor-intensive task. "These structures are often in curbs," points out Scott Fier, owner of American Highway Products (AHP makes several paving-related products, including catch basin and manhole risers, and manhole safety ramps). "So excavation requires jackhammering of asphalt and concrete, and then lifting of frames or new concrete risers, plus new pavement and concrete in the roadway and curb! Total costs range from \$1,500 to \$4,000 per inlet, plus the costs and inconvenience of lane closures."

Studies of the costs of raising catch basins to grade are hard to find, but there is good data on the costs of manually raising manholes to grade, and in some ways the two tasks are very similar—both take place during or after repaving operations, both require excavation and manual raising of utility frames, and both require the placement of new asphalt and/or concrete as a final step. A 2010 white paper* about the use of manhole risers noted:

"By analyzing time logs and maintenance reports, some road maintenance supervisors have been able to quantify the labor costs

* [1] *Saving When Repaving: How to cut manhole raising costs by 81% and extend new pavement lifespan with adjustable manhole risers*, American Highway Products

of raising manholes. In Shoreline, Washington (near Seattle) for example, the wastewater district maintenance manager analyzed three years of maintenance records and determined that raising manholes was costing about \$500 per manhole for labor and materials. In this case, the district was covering the manhole at time of paving, then jackhammering new pavement at a later date, and digging out the manhole frame and raising with precast grade rings. In a similar scenario, the Southern California city of Ontario found that labor costs were \$360 per manhole when using precast grade rings."



Because they are customizable in fine increments, steel risers leave inlets and catch basin grates precisely at grade.

But note that the manual raising of manhole frames is a considerably more straightforward process than the manual raising of inlet / catch basins—typically, manholes are not near curbs, so jackhammering is easier and new curb-and-gutter replacement is not needed. Concrete grade rings are also commonly used in manhole raising, and similar pre-cast structures are not readily available for catch basin frames. So Fier's \$1,500 - \$4,000 figure (which is based on conversations with paving contractors and municipal roadway maintenance department heads) seems reasonable.

Jackhammering also creates heavy debris in the form of concrete and asphalt chunks that need to be shoveled up and trucked offsite—this adds up to several additional hours of work per project, plus additional exposure to strain injuries. Liability of workers in traffic is always a concern, and when it can be eliminated that is a big benefit.

But in fact, raising inlets and catch basins with risers takes just minutes, as demonstrated by case studies published in paving trade journals.

Manual raising is usually performed after final pavement lifts, and can require additional lane closures, and patching of new pavement. By contrast, riser installation can be worked into the paving workflow, usually just before final lift, and requires no patching.

Given these significant costs, the use of custom risers could take several hours and still be cost-effective compared to other methods. But in fact, raising catch basins with risers takes just minutes, as demonstrated by case studies published in paving trade journals.

Catch basin raising costs: three case studies

I-39 in Wisconsin: About 100 catch basin risers were used on a large overlay project on Wisconsin's I-39 highway. The catch basins were atypically close to a concrete barrier wall, and raising to grade by conventional means would have required temporary removal of the wall, plus additional lane closures. To avoid change orders, the Wisconsin Department of Transportation (WisDOT) approved, for the first time, the use of steel catch basin risers manufactured by American Highway Products. Riser use was considered entirely successful by WisDOT and by the paving contractor, Payne & Dolan, Inc.



Steel risers are typically installed just before final paving lifts, as in this I-39 example.

Payne & Dolan Project Manager Sam Bilhorn, P.E. said, **"Really, they take about five minutes to place."** Sometimes, due to variations in the original inlets, a little field fitting is required, but even that was unusual. We used about a hundred on the

"All we had to do was remove the grates and install the risers."

I-39 project, and had no problems at all." WisDOT Project Manager Curt Neuhauser said, "All we had to do was remove the grates and install the risers," he said. "We didn't have to remove the barrier wall, and we

didn't even have to dig out any roadway. The proof is in the pudding, of course, but we like how they worked on this project, and we'll be using them again*."

Route 78 in New Jersey:

About 450 catch basin risers were used on a widening and rehabilitation project that took place on a section of Route 78 in New Jersey. Given the extraordinary number of catch basins, paving contractor Crisdel Group decided to use catch basin risers for the first time. Project Manager Chester L. Symosh



On Route 78, 450 catch basins ended up perfectly flush with new paving.

III said, "They're a very well made product. Many have been installed for months (at time of interview) and we have had no problems at all." Regarding installation, Symosh added, "We had no issues. Everything

* WisDOT smooths catch basin overlay, Roads & Bridges 2014

delivered was of good workmanship and has held up very well. **They're also quick to install. You place adhesive on the existing frame, set the riser, and lock it in with set screws. It takes about five to seven minutes, with hand tools, and could hardly be easier.****

I-64/I-255 Interchange in East St. Louis: 100 catch basin risers were used during the resurfacing of the I-64/I-255 Interchange in East St. Louis. Paving contractor Keeley & Sons Inc. had used such risers previously, typically about 10-15 per year, so this was a major investment in a trusted solution. Per contract, lane closures had to be minimized. "I'm really glad we had the risers available," says Keeley & Sons Project Engineer Bob Germann. "Without them, we would have been forced to hammer out the existing frames and pour new concrete; it could have taken a couple of weeks just on that part of the job." Instead, all catch basins were raised to grade after the binder course and before the final paving lift... in just two days.[†]



On this I-64/I-255 resurfacing project, the project engineer estimated that use of 100 steel risers saved nearly two weeks of construction time.

Steel risers compared to cast iron risers

Catch basin risers made of cast iron are commonly used, and are worth considering on some projects. But steel risers are a demonstrably better solution in several ways, including customizability and fit, strength, weight, convenience, performance, and safety.

Customizability and Fit: Due to their manufacturing process, which requires the creation of an expensive mold, cast iron risers are available in a limited range of sizes, and cannot be customized for particular applications. By contrast, steel risers can be quickly and inexpensively produced to order, with riser heights starting at $\frac{3}{4}$ ", going up in $\frac{1}{4}$ " increments. Grate thickness, length and width can be ordered in $\frac{1}{16}$ " increments. They can even be made with varying edge dimensions so that sloped surfaces can be matched. For the paving contractor or municipal crew, this means that every catch basin in a project can be raised precisely to final grade, and each riser

^{*} *Minor Decision, Major Improvement: New Jersey Contractor Tries Something New on a Project Requiring 450 Catch Basin Risers*, Allied Paving Equipment Publication, July 2014

[†] *Stormwater treatment does not affect tight working windows on I-64/I-255 interchange in East St. Louis*, Roads & Bridges

will fit snugly with no rattling or popping out. The precise match to final grade also eliminates exposed pavement edges, which in turn eliminates cracking and crumbling around catch basins and extends roadway life.

Strength: Catch basin risers, as manufactured by American Highway Products, are made of A36 mild carbon steel, a material that is much stronger than cast iron; A36 steel's ultimate tensile strength is 58,000–80,000 psi, while the ultimate tensile strength of gray cast iron risers is about 25,000 psi. This means that steel risers can be thinner and lighter than cast iron risers made for the same purpose.

Weight: A typical steel riser weighs about 50 pounds; cast iron risers weigh about twice as much, at all sizes. This significantly lower weight makes steel risers more convenient and easier to work with when installing, and also during shipping, warehousing, and transporting to the job site.

Safety: Because they are lighter than cast iron risers, steel risers reduce the risk of back and other musculoskeletal strain injuries, and also reduce the risk of pinching injuries. Since they are also much quicker to install, compared to manual raising, they reduce crew exposure to traffic and construction hazards.

Clearly, compared to cast iron risers, catch basin risers made of steel are the better solution for most paving crews.

Catch Basin Risers by American Highway Products

An American firm based in Bolivar, Ohio, American Highway Products Ltd. has been making manhole risers, catch basin risers, and related roadway utility products for several decades. Their inlet/catch basin risers and monument box risers are made of A36 steel to your job specifications, with riser heights starting at ¾" and going up in ¼" increments so that any catch basin configuration can be matched exactly. American Highway Products Catch Basin Risers can even be made with inclined catch basin grate seats that match sloped roadway surfaces. These perfectly customized products can be delivered within one to two weeks of your order, at reasonable cost.

If you have any questions about this paper, or about the use of custom steel catch basin risers on your project, please give us a call. Our experienced staff can consult with you on the particular risers you need and take you through the measuring and ordering process. And, we are happy to visit with you at your location to demonstrate how the risers are measured and installed. As this paper shows, catch basin risers from American Highway Products are the best performing, least expensive option available, and will start saving you time and money immediately!