



**FLASH-BUTT WELDING**

# IMPROVING EFFICIENCY THROUGH SOLUTION-BASED ENGINEERING



## **The Challenge**

With ever-increasing traffic volumes, maintenance of way engineers must continually search for ways to keep track quality and safety high. Fewer and shorter work windows are making this increasingly difficult. In virtually all cases, there is a clear operational value associated with “fixing it right the first time.” When railroads suffer rail service failures, or ultrasonic rail detector cars discover internal defects, historically the best solution has been to protect the defect with joint bars or install a plug with joint bars or correct the defect by making a thermite weld. None of these repair methods offer the metallurgical quality or performance longevity of an electric flash-butt weld, but flash-butt repair welding has been perceived to be cost prohibitive, except in areas of high repair density.

# SOLUTION

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Holland LP, a recognized leader in electric flash-butt welding operations and technology, has developed some outstanding tools for repair welding and joint elimination at a cost that is in line with the added value provided to the railroad. All Class 1 railroads in North America have come to rely on Holland's cutting-edge technology and operational expertise to provide the most cost effective repair welding/joint elimination over the life cycle of the rail, thus helping them reduce joint and defect counts improving service reliability and transportation speed.

## Puller-Lite

- Over 160 tons of pulling capacity - independent of the 72-ton welder head
- Reduced size and weight - can be suspended together with the welder head from the same truck boom
- Improved hydraulics and puller alignment capabilities yield faster closure welding operations
- Reduction of on-track support equipment and personnel

## Low Consumption Rail Welding

- Holland's exclusive Intelliweld® control system provides unparalleled control over the flashing process and rail consumption
- Simple computer program adjustments allow us to tailor rail consumption to your requirements for localized track structures and target rail neutral temperatures
- Lab and field testing results have validated the performance of the Low Consumption Weld - as little as 0.875 (7/8") inches of rail consumption. Low consumption flash butt welding was incorporated into the 2009 AREMA Electric Flash-Butt Welding Specification.
- Lower rail consumption reduces the amount of de-clipping and clipping required, improving productivity and reducing labor costs for closure welding

## Operational Flexibility

Working extensively with most North American railroads, Holland has pioneered the use of both high joint density/high production repair welding crews as well as small crews for railroad subdivisions with lower joint/defect density and support crew availability.





# EXTENDING OUR REACH TURNOUT WELDING SOLUTIONS

## CHALLENGE

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Turnouts are one of the most costly components of track structure, and critical to the capacity and velocity improvements that railroads undertake.

Each turnout requires a number of joints or welds in its construction and installation in track. For example, a No. 11 turnout requires 12 welds, and a No. 24 turnout requires 22 welds. Mechanical joints are ill-suited to heavy tonnage and high speed lines, where rail-end batter and cracking becomes a persistent future maintenance issue. Welding the rails in the turnouts is a preferred solution, either by thermite or electric flash butt welding processes. Of those options, electric flash butt welding has been proven to reduce post-installation maintenance burdens because of the superior metallurgical properties of parent metal to parent metal fusion compared to a thermite weld's filler metal.

In comparing the cost of thermite welding crews for turnouts vs. flash-butt welding crews, the quality of welds and the productivity of welding operations is critical. The initial cost for thermite welding may seem attractive, but future maintenance outlays will be substantially higher than for a flash-butt welded turnout, and some railroads are struggling to find and train sufficient thermite welding personnel to do this work.

Conventional flash-butt welding trucks have to spend a significant portion of the available work hours repositioning for welder head access to the weld locations, thus reducing the crew's daily productivity.

## SOLUTION

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Holland's Extended Reach MobileWelder®, a boom-crane equipped portable welding system, which is capable of deploying the welder head up to 40 feet (32 feet with welder head and puller) to the side of the truck. On a flat working surface with turnouts laid out for welding, it can move along one side of the turnout and make the required welds with minimal repositioning of the truck. Productivity of the operation is significantly enhanced. The Extended Reach MobileWelder is hi-rail equipped so it can weld on track together with Holland's Puller-Lite, like conventional Holland MobileWelders, and has the capability of welding from a right of way road onto the track, or from one track to an adjacent track, depending on the distance between track centers. It can be used effectively for various flash butt welding applications including joint elimination and defect repair.

These efficiency and productivity enhancements assist railroads in meeting critical turnout installation program deadlines, dramatically reduce the up-front cost differential between high-quality flash-butt welding and less desirable joining alternatives, and reduce long-term turnout maintenance expenses.

# CUSTOM FLASH-BUTT WELDING SOLUTIONS

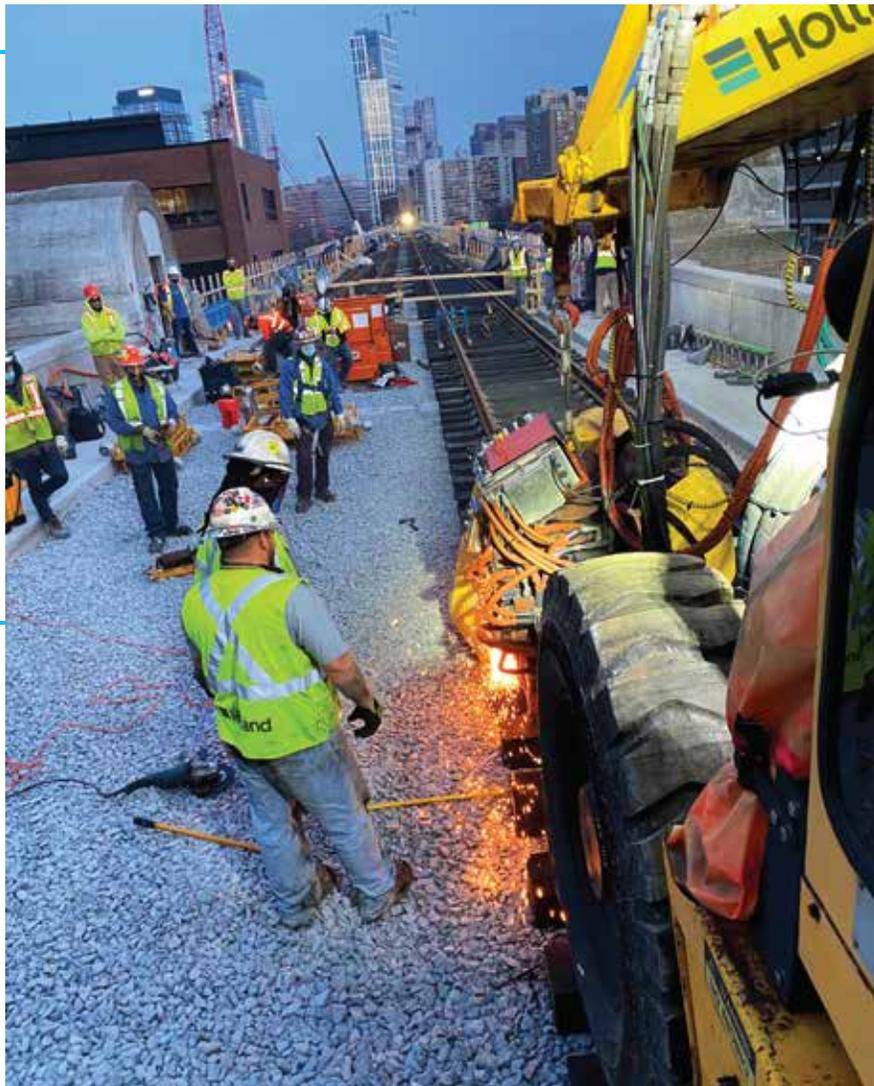
## KEEP AMERICA'S OLDEST TRANSIT SYSTEM RUNNING STRONG

### CHALLENGE

Working to maintain the nation's oldest subway system can be a challenge. In Boston, tight curves, low clearance tunnels, catenary lines, third rail and other restrictions mean that operator and equipment needs vary greatly from project to project. When it comes to making high-quality repairs made via flash-butt welding, equipment configurations can be uniquely challenging.

### SOLUTION

As the designer and manufacturer of the flash-butt welding equipment we operate, Holland has a track record of working directly with our partners to engineer unique solutions for unique circumstances. We have multiple flash-butt welding equipment configurations that have successfully been used in the Boston area on projects such as the MBTA Green Line Extension, MBTA Blue and Red Lines, the MBTA Longfellow Bridge and more. Our flexibility gives us the ability to meet the needs of transit systems across North America.



### TRADITIONAL MOBILEWELDER®

The use of electric flash-butt welds in rapid transit rail operations offers many of the same benefits enjoyed by freight railroads. High-quality flash-butt welds provide a smoother ride, increased durability and the lowest lifetime cost. Our Intelliweld® Control System provides an unmatched degree of accuracy and quality in the production of rail welds.

## TURNOUT MOBILEWELDER®

Our Extended Reach MobileWelder® is a boom-crane equipped portable welding system, capable of deploying the welder head up to 40 feet (32 feet with welder head and puller) to the side of the truck and has the capability of welding from a right of way road onto the track, or from one track to an adjacent track, depending on the distance between track centers.



## HOLLAND MOBILEWELDER® 702

Unit 702 is one of Holland's all-terrain welding systems with the ability and versatility to weld in third-rail territory. This welding unit is designed to access welding locations that a conventional welding truck cannot reach. This unit has been used to weld on transit lines and historic bridges such as the Benjamin Franklin Bridge in Philadelphia, PA and the Lechmere Viaduct in Boston, MA.

## HOLLAND MOBILEWELDER® 60

Unit 60 is a containerized welding system that is used in complex welding locations on transit systems. This modular welding platform is designed to be used to weld CWR in for tunnel projects. Specifically, this unit has been used in Boston's MBTA tunnels and in New York City on the MTA. This modular welding is also a great option for locations where rail trains or spine cars cannot drop CWR.



Email [sales@hollandco.com](mailto:sales@hollandco.com)

Visit [hollandco.com](http://hollandco.com)

Call 708.672.2300