MALP vs. Elastomeric Concrete

Expansion Joint Header Comparison

Elastomeric concrete is commonly specified for expansion joint header (nosing) repairs and new construction. MALP concrete is a cementitious concrete with a 10-year history of successful applications on expansion joints headers.

Material cost per cubic foot is similar between Elastomeric and MALP concretes. Consider ***in-place-cost*** factors such as total time to install (including joint seal), and cost of traffic control when selecting header materials for a particular project.

Below are general installation comparisons. Details may vary, so please check with the individual manufacturers for complete technical data and construction specifications.

	MALP CONCRETE	**ELASTOMERIC CONCRETE**
Site Preparation	Establish block-out for joint header. Remove unsound concrete, oil, and other contaminants. Sandblasting not required. Concrete substrate must be dry (no SSD) Form the joint gap with polystyrene.	Establish block-out for joint header. Remove unsound concrete, and all loose material prior to grit blasting (required) Concrete substrate must be dry (no SSD) Form the joint gap with polystyrene.
Primer	Primer is not required, but it may be recommended by the manufacturer in certain high stress environments.	Mix 30-60 seconds and apply primer with gloves and brush with no puddling. Depending on exact product, apply elastomeric concrete immediately or wait 30 minutes prior to application.
Mixing	TWO COMPONENT MIX Part A: Liquid Activator (Jugs) Part B: Dry Mix (Bags) Empty liquid activator jug(s) in a 5-gallon bucket or pan mixer (mixes 3 kits), add in full bag(s) of dry mix, and mix for approximately 45 seconds, until all dry mix is wetted out.	THREE COMPONENT MIX Part A: White Epoxy Liquid Part B: Black Epoxy Liquid Part C: Aggregate Mix part A and B for from 1 to 5 minutes depending on specific product and temperature. Add Part C aggregate and mix thoroughly until all aggregate is wetted out.
Placement	MINIMUM: 2" lift MAXIMUM: Can be placed to full depth.	MINIMUM: ½" MAXIMUM: 3" lift

Set Time[1] *(Traffic-Ready)*	-5°F – 50°F: 1 - 2 hours[2] 50°F – 70°F: 30 minutes – 1 hour 70°F – 105°F: 15 – 30 minutes[3]	45-65 degree: 3 - 5.5 hours 65-80 degrees: 2 - 3.5 hours 80-95 degrees: 1 - 2.5 hours
After Cure	Remove polystyrene foam board (1 minute)[4] Use concrete grinder to level header to approach concrete if necessary.[5] Sandblasting header face not required. Use angle grinder to bevel edge to 45°	Use a Sawzall to cut through full depth of the polystyrene on both sides and remove pieces. Sandblast the new joint faces to remove foam residue and scarify surface. Use angle grinder to bevel edge to 45°
Install Joint Seal	Follow manufacturer's instructions.[6]	Follow manufacturer's instructions.
Cleanup	Clean tools using water.	Clean tools using acetone or isopropyl alcohol.

Analysis: Expansion joint header repairs and new construction are typically partial-depth applications that bond to Portland cement concrete decks. Because bridges expand and contract with temperature change, the header material must exhibit similar properties, or possess sufficient flexural, bond, and tensile strength necessary to prevent delamination.

Expansion joint seals should be carefully selected and properly installed to accommodate a bridge's continuous expansion and contraction and remain bonded to the header interface.

Thinner header pours are typically better suited to elastomeric materials and thicker pours are typically better suited to MALP. Sloped installation can be problematic for self-leveling elastomeric concrete materials. In colder temperatures (below 50°F), Elastomeric concrete often require additional steps of heating or blanketing to speed cure.

Headers are best finished as flush as possible to the approach and landing for smooth rideability and to protect against impact and abrasion from heavy and constant vehicular traffic. Cracking, debonding, and spalling will result in water and chloride intrusion, and damage to the substructure.

In some repair situations, expansion joint spacing requires the header material to cantilever to close the gap. Elastomeric concretes are not recommended for cantilever applications, and MALP concrete headers should be reinforced with steel bars to withstand the stress.

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[1] FHWA recommends 2500 psi compressive strength (ASTM C-109 or C-39) to accept vehicular traffic.

[2] Use Fast-Set Admixture to speed set times in temperatures under 50°F

[3] Use Slow-Set Admixture and cool activator on ice to extend working time in temperatures over 70°F.

[4] MALP Concrete does not bond to polymers including polystyrene (foam board). Removal is fast and does not leave any residue or mess to cleanup.

[5] Using a walk-behind concrete grinder, MALP concrete can be ground as soon as 15 minutes following final set.

[6] Because MALP concrete mixes fast and sets so fast, installation of the joint sealant can be performed in the same lane closure, saving the cost and time of multiple lane closures to complete an expansion joint. Further, because MALP concrete radiates head during the exothermic reaction, epoxies and silicones can be applied in ambient temperatures below manufacturer's recommended limitations.