



FTW District Guide for Cleaning and Sealing Existing Joints with Pay Items

Fort Worth Bridge Section

June 2023

Revision(s):

REV 1.1: 3/2022 – Update and clarify use of header/polymer nosing on new and existing overlays. Revision 1.1 supersedes Rev. 1.0.

REV 1.2: 6/2023 - Miscellaneous updates to existing notes. Updated images. Added new images. Added new joint types (Type B, PJS, and updated SEJ joint details).

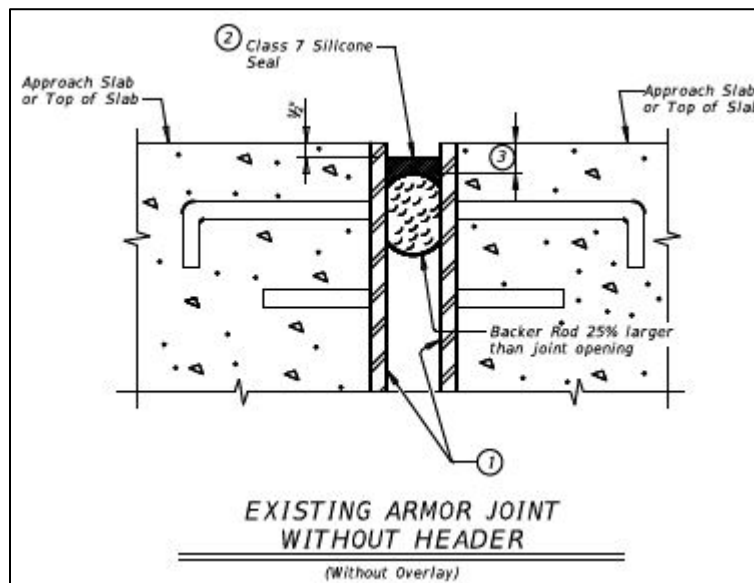
Purpose of Guide:

- Provide Guidance to Designers on the use of the Working Drawings for Joint Details
- Promote Consistency and Clarity on Pay Items to use when Cleaning and/or Sealing Existing Joints

The repair of joints is best performed during colder temperatures when the expansion joint is opened; this is typical for all joints referenced in this guide.

1. **ARMOR JOINT (AJ):**

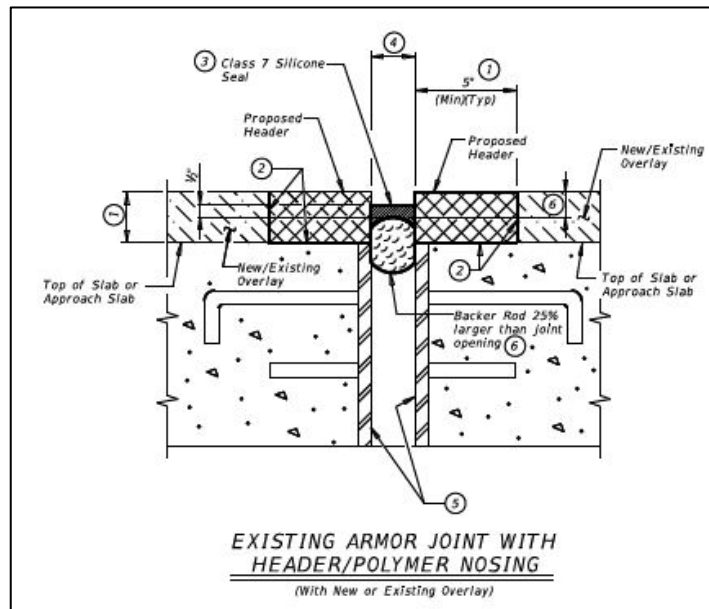
No Existing Overlay



A. Use Pay Item 438-6004 (CLEANING AND SEALING EXISTING JOINTS (CL 7)) (LF).

2. ARMOR JOINT (AJ):

With New/Existing Overlay:



A. Use Pay Item 0454-6008 (HEADER TYPE EXPANSION JOINT) (CF):

1. If the project scope includes an overlay or mill & overlay to a roadway/corridor, then header/polymer nosing is required at the expansion joints. A maximum and minimum of 2 inches of overlay (total depth of overlay) shall be added to the bridge deck, if necessary. The 2 inches is required when using an asphalt-based overlay. If the proposed overlay is something different than coordinate with the Fort Worth Bridge Section to determine if header/polymer nosing is required at the expansion joints. If a bridge deck is overlaid, it must first be sealed prior to applying the overlay. Please contact the Fort Worth Bridge Section for solutions to sealing the bridge deck. If the bridge does not have an overlay and an overlay wants to be added to the bridge deck, please contact the FTW Bridge Section first as this may warrant the bridge to be load rated to confirm that the additional dead load can be supported. If an overlay exists and no milling is planned but the polymer nosing/headers are in poor condition, then replace the polymer nosing/headers using the above-referenced pay item. If polymer nosing/header(s) are added to an overlay with a thickness less than 2 inches, the polymer nosing/header material will be brittle and would promote cracking in the member. It is also not recommended by the polymer nosing/header manufacturer. This pay item is used to pay for just the polymer nosing/header(s).

- If an existing bridge deck has never been overlaid and one wants to be added, first contact the FTW Bridge Section to further discuss and determine if it can be.
- If an existing overlay is to be milled and replaced and the bridge has existing header/polymer nosing at the expansion joints, it is best to remove and replace the existing header/polymer nosing.

2. If the project scope does not include an overlay or mill and overlay, but rather includes, for example, surface treatment (i.e., seal coat), MBGF upgrades, resurfacing (i.e., diamond grinding, shot blasting, skid abrasion, etc.), the bridge joints must still be cleaned and/or sealed if any bridges are located within the construction limits.

- If the existing bridge deck has an existing overlay and there are no polymer nosing/headers at the existing expansion joints, the Area Office can choose to add header/polymer nosing at the expansion joints if the existing overlay shows signs of distress at the expansion joint locations (i.e., spalling of existing overlay, raveling of existing overlay, crack in existing overlay, etc.).

3. The designer will need to determine the cubic feet of header material, which means that core testing through the TxDOT Lab needs to be requested to determine the thickness of existing overlay material. Please note that in most cases the existing polymer nosing/overlay may not be uniform in thickness, so the results of the core testing may not provide a precise value but should provide a good estimate of cubic feet of material. It is considered best practice to add a note to the plans that lets the Contractor know the existing overlay identified on the plans is based on X inches thick of overlay, per the core results. Use the thicker core for estimating purposes and show this thickness on the plans. This pay item is used to pay for the polymer nosing/header material only.

B. Use Pay Item 438-6004 (CLEANING AND SEALING EXISTING JOINTS (CL 7)) (LF):

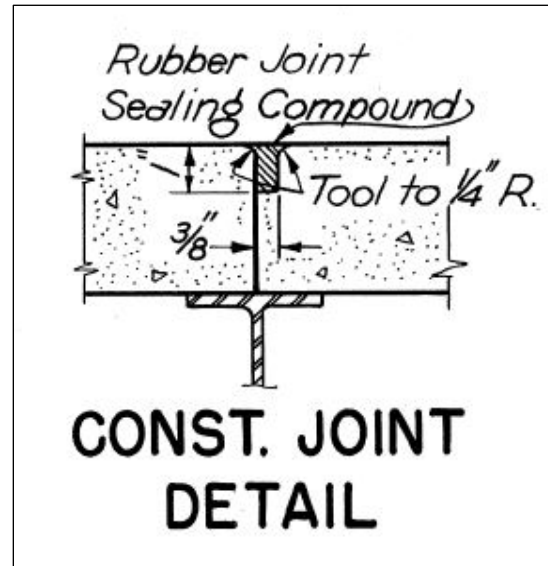
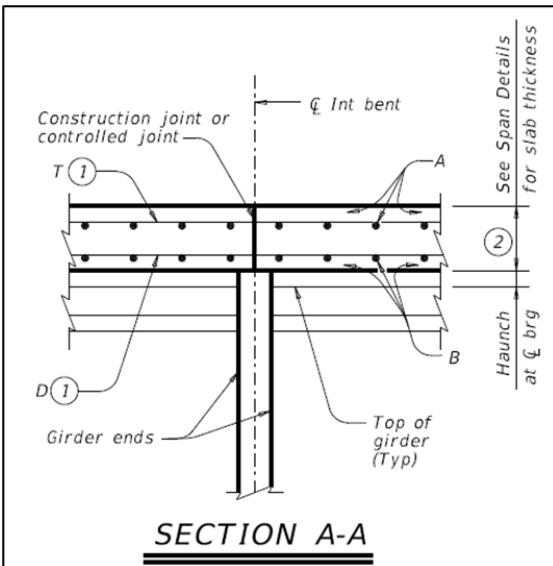
1. Use this pay item in conjunction with 454-6008 in order to pay for the cleaning and the sealant when adding polymer nosing/headers. If no polymer nosing/headers are added than do not include pay item 0454-6008.

3. CONSTRUCTION/CONTROLLED JOINT (CJ):

No Existing Overlay

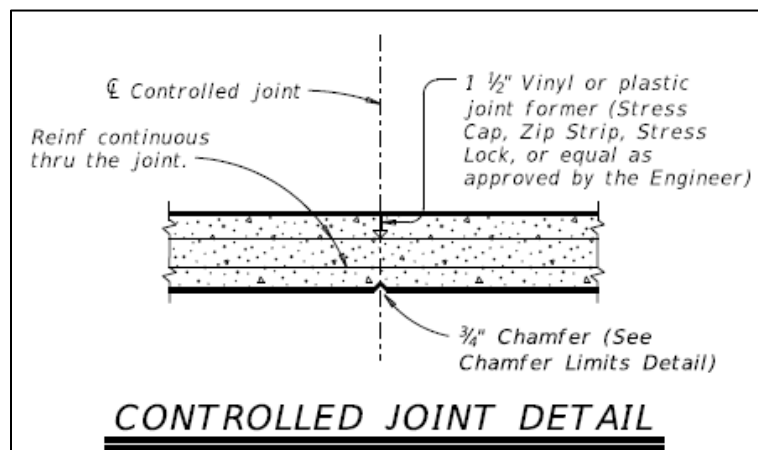
Definitions:

Construction Joint (a.k.a. cold joint): Joint that is used when a new section of concrete is poured adjacent to another concrete section that has already set. In some older plan sets you may see what is referred to as a type B joint which is depicted in the below image. A groove is incorporated into the type B joint to fill with rubber compound. Not all type B joints are necessarily the width shown and can vary.

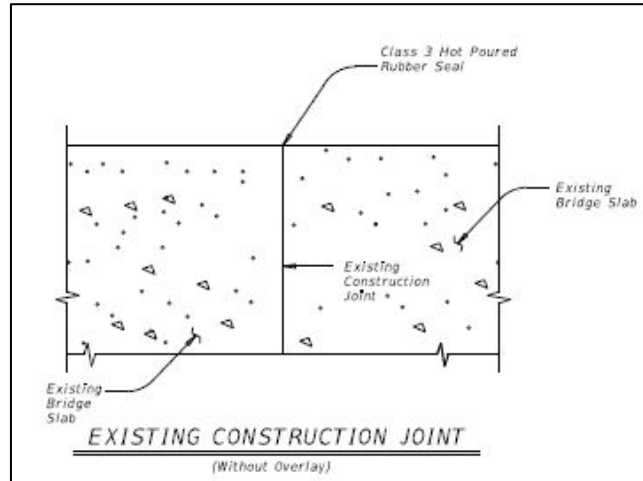


Also referred to as a Type B Joint

Controlled Joint: Joint that is used to induce cracking in a controlled manner. Typically, the joint is formed via a tool (i.e., saw-cutting or use of a Z-Strip).



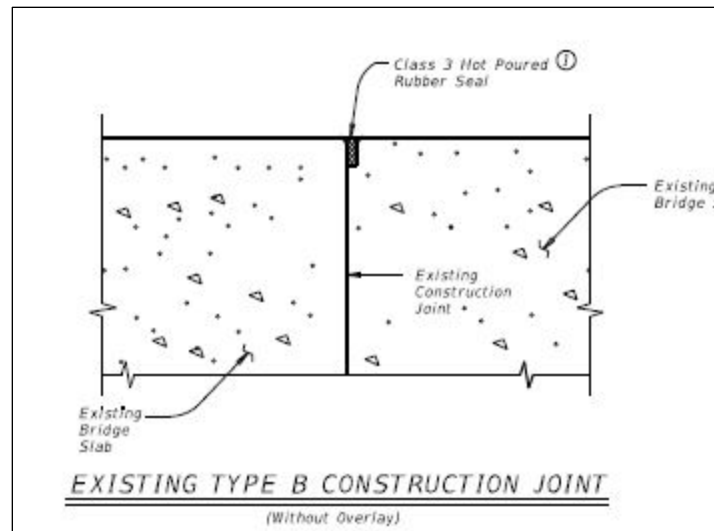
A. Use Pay Item 438-6002 (CLEANING AND SEALING EXISTING JOINTS (CL3)) (LF):



1. If no overlay exists on the bridge deck and the construction/controlled joint is showing signs of opening on the top or leaking from the bottom of the deck, then use this pay item.

Reference Bridge Preservation Guide:

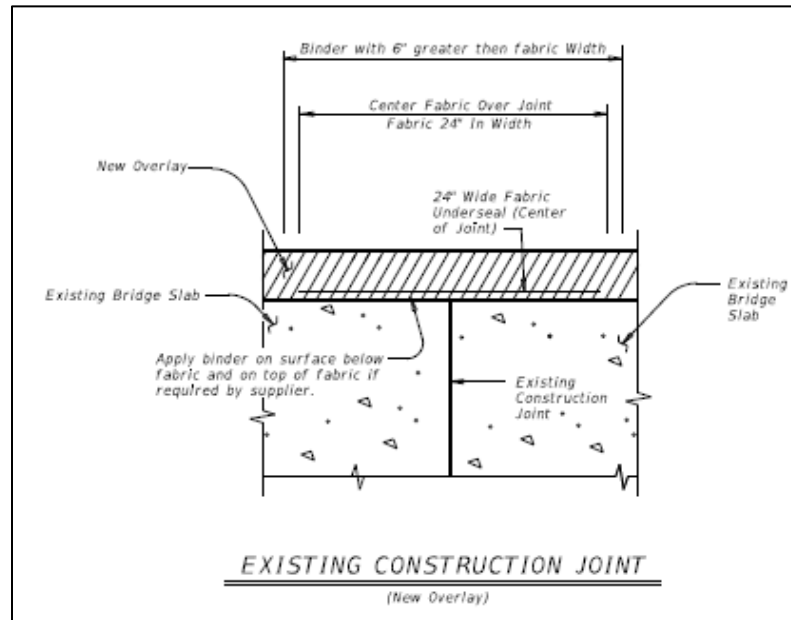
<https://tntoday.dot.state.tx.us/BRG/Documents/Site%20Documents/Field%20Operations/Bridge%20Preservation%20Guide/TxDOT%20Bridge%20Preservation%20Guide.pdf> for additional information.



2. If no overlay exists on the bridge deck and the Type B construction joint is showing signs of opening on the top or leaking from the bottom of the deck, then use this pay item.

4. CONSTRUCTION/CONTROLLED JOINT (CJ):

With New Overlay

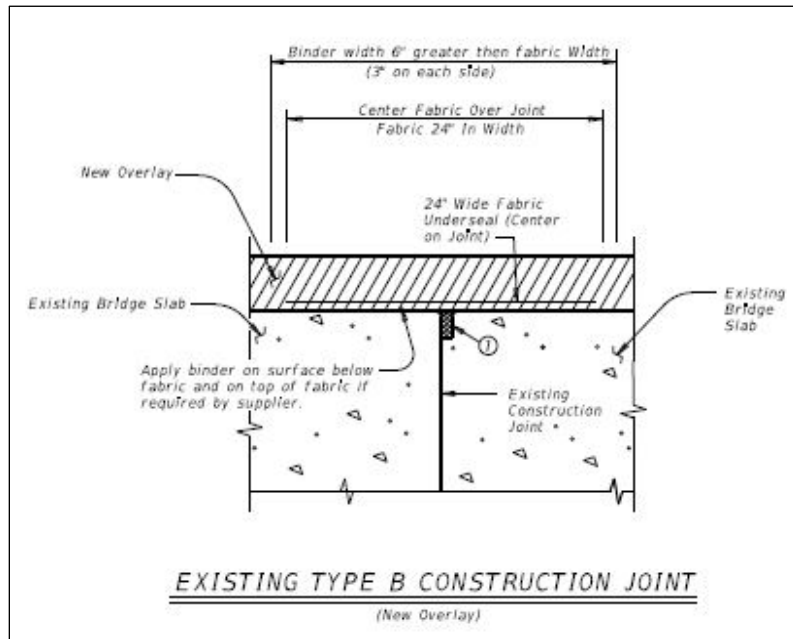


A. Use Pay Item 438-6009 (CLEANING EXISTING JOINTS) (LF):

1. Use this pay item to pay for the cleaning of existing construction joint.

B. Use Pay Item 356-6021 (PAV JT UNDERSEAL (24")) (LF):

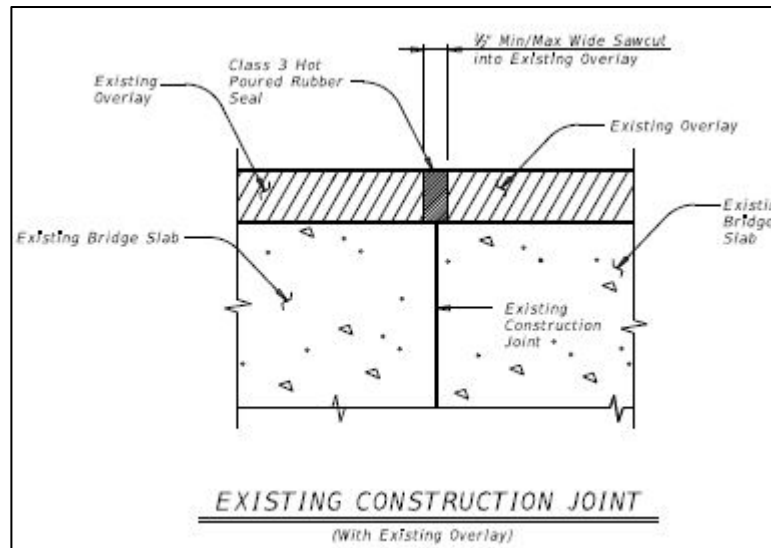
2. Use this pay item in conjunction with 438-6009 to pay for the fabric and binder. When using an underseal be sure the design team is aware and is coordinated amongst the various team members since a binder is also used above and below the fabric.



- C. Use Pay Item 438-6002 (CLEANING AND SEALING EXISTING JOINTS)(CL 3)(LF):
3. Use this pay item to pay for the cleaning and sealing of existing Type B construction joint.
- D. Use Pay Item 356-6021 (PAV JT UNDERSEAL (24")) (LF):
4. Use this pay item in conjunction with 438-6009 to pay for the fabric and binder. When using an underseal be sure the design team is aware and is coordinated amongst the various team members since a binder is also used above and below the fabric.

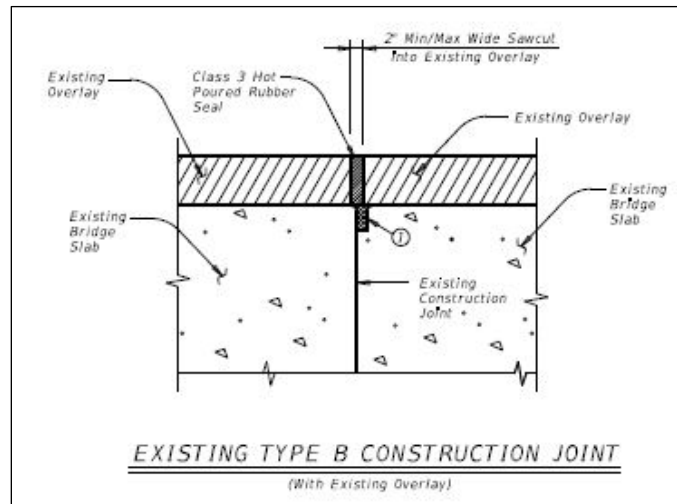
5. CONSTRUCTION/CONTROLLED JOINT (CJ):

With Existing Overlay



A. Use Pay Item 438-6002 (CLEANING AND SEALING EXISTING JOINTS (CL3)) (LF):

1. If an existing overlay is present, then use this pay item to seal any openings over the construction/controlled joint.

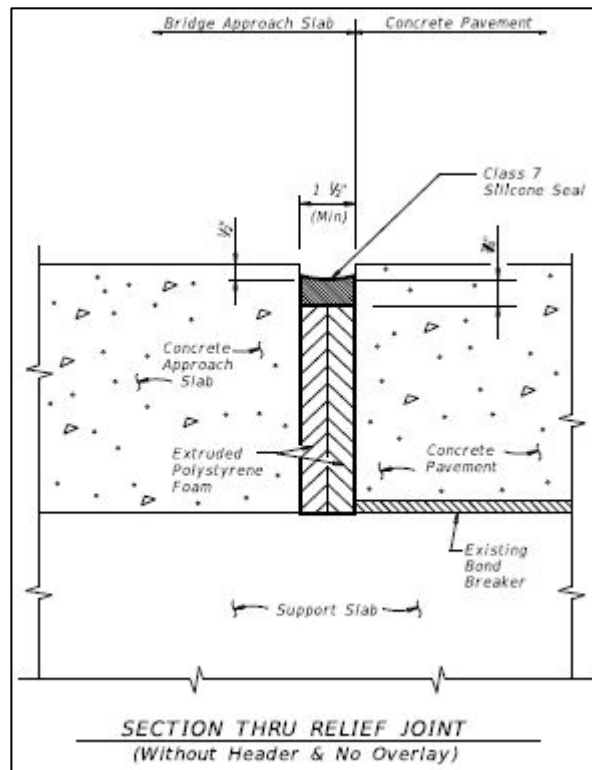


B. Use Pay Item 438-6002 (CLEANING AND SEALING EXISTING JOINTS (CL3)) (CL3) (LF):

2. If an existing overlay is present, then use this pay item to seal any openings over the construction/controlled joint. Be sure double the quantity for this pay item as you have two areas that will need to be cleaned and sealed with Class 3 hot rubber.

6. RELIEF JOINT (RJ):

No Existing Overlay

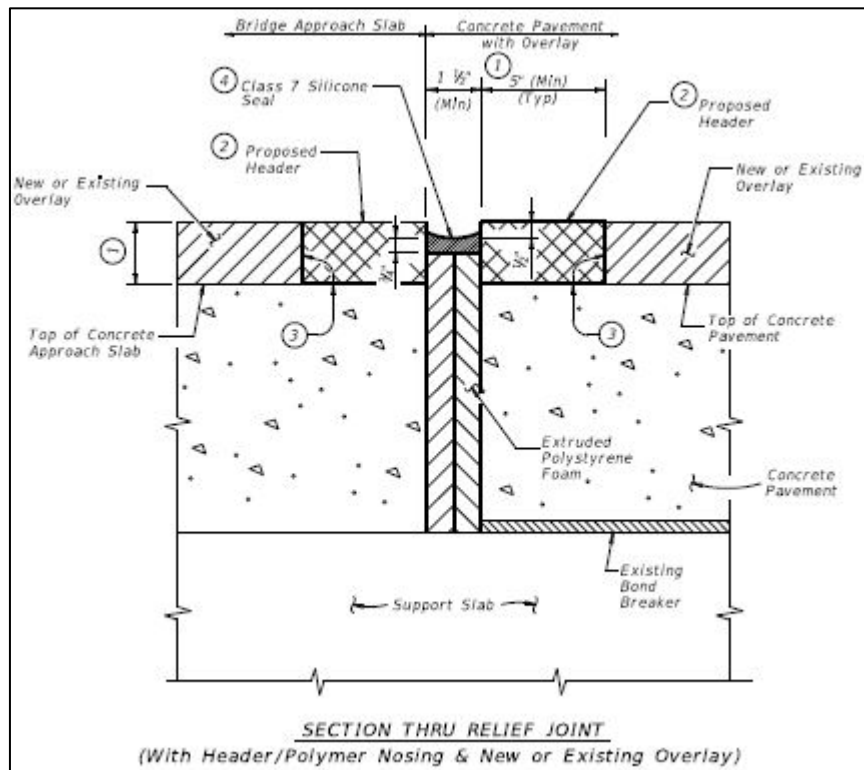


A. Use Pay Item 438-6010 (RESIZING AND SEALING JOINTS) (LF)

1. If joint opening is greater than 1.5 inches but less than 4 inches, then saw cutting is not required, just clean and reseal the relief joint with pay item listed above. If the joint opening is greater than 4 inches, contact the FTW Bridge Section as this will entail having to break back the roadway pavement and rebuild to reset the joint opening to 1.5 inches. If the width of the joint is less than 1.5 inches anywhere along its length, restore the 1.5-inch joint opening by cutting the full depth of the concrete pavement and then cleaning and sealing the joint which will all be paid for with the pay item identified above. Do not cut the approach slab or the support (sleeper) slab. If the slab needs to be broken back than contact FTW Bridge as this will require a different pay item and details.

7. RELIEF JOINT (RJ):

With New/Existing Overlay:



A. Use Pay Item 0454-6008 (HEADER TYPE EXPANSION JOINT) (CF):

1. If the project scope is to include an overlay or mill and overlay to a roadway/corridor than header/polymer nosing shall be added at the relief joints. A maximum and minimum of 2 inches of overlay (total depth of overlay) shall be added to the bridge deck. If the bridge does not have an overlay and an overlay wants to be added to the bridge deck, please contact the FTW Bridge Section first as this may warrant the bridge to be load rated to confirm that the additional dead load can be supported. If an overlay exists and no milling is planned but the polymer nosing/headers are in poor condition then just replace the polymer nosing/headers using the above-referenced pay item. Please note that if a bridge deck is overlaid it must first be sealed prior to applying the overlay. Please contact the Fort Worth Bridge Section for solutions to sealing the bridge deck. If polymer nosing/header(s) are added to an overlay with a thickness less than 2 inches, the polymer nosing/header material will be brittle and would promote cracking in the member. It is also not recommended by the polymer nosing/header manufacturer. This pay item is used to pay for just the polymer nosing/header(s).

- If an existing bridge deck has never been overlaid and one wants to be added, first contact the FTW Bridge Section to further discuss and determine if it can be.

- If an existing overlay is to be milled and replaced and the bridge has existing header/polymer nosing at the expansion joints, it is best to remove and replace the existing header/polymer nosing.

2. If the project scope does not include an overlay or mill and overlay, but rather includes, for example, surface treatment (i.e., seal coat), MBSG upgrades, resurfacing (i.e., diamond grinding, shot blasting, skid abrasion, etc.), the bridge joints must still be cleaned and/or sealed if any bridges are located within the construction limits.

- If the existing bridge deck has an existing overlay and there are no polymer nosing/headers at the existing expansion joints, the Area Office can choose to add header/polymer nosing at the expansion joints if the existing overlay shows signs of distress at the expansion joint locations (i.e., spalling of existing overlay, raveling of existing overlay, crack in existing overlay, etc.).

3. The designer will need to determine the cubic feet of header material, which means that core testing through the TxDOT Lab needs to be requested to determine the thickness of existing overlay material. Please note that in most cases the existing polymer nosing/overlay may not be uniform in thickness, so the results of the core testing may not provide a precise value but should provide a good estimate of cubic feet of material. It is considered best practice to add a note to the plans that lets the Contractor know the existing overlay identified on the plans is based on X inches thick of overlay, per the core results. Use the thicker core for estimating purposes and show this thickness on the plans. This pay item is used to pay for the polymer nosing/header material only.

B. Use Pay Item 438-6010 (RESIZING AND SEALING JOINTS) (LF):

1. Use this pay item in conjunction with 454-6008 to pay for the cleaning, resizing (if needed), and the sealant. If no polymer nosing/headers are added, then do not include pay item 0454-6008.

2. If joint opening is greater than 1.5 inches but less than 4 inches, then saw cutting is not required, just clean and reseal the relief joint with pay item listed above. If the joint opening is greater than 4 inches, contact the FTW Bridge Section as this will entail having to break back the roadway pavement and rebuild to reset the joint opening to 1.5 inches. If the width of the joint is less than 1.5 inches anywhere along its length, restore the 1.5-inch joint opening by cutting the full depth of the concrete pavement and then cleaning and sealing the joint which will all be paid for with the pay item identified above. Do not cut the approach slab or the support (sleeper) slab. If the slab needs to be broken back than contact FTW Bridge as this will require a different pay item and details.

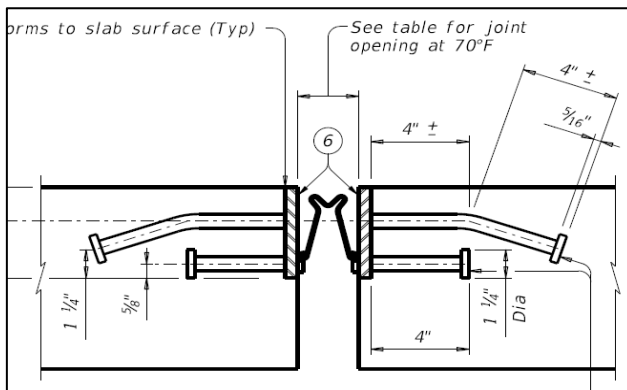
8. Sealed Expansion Joint (SEJ):

No Existing Overlay

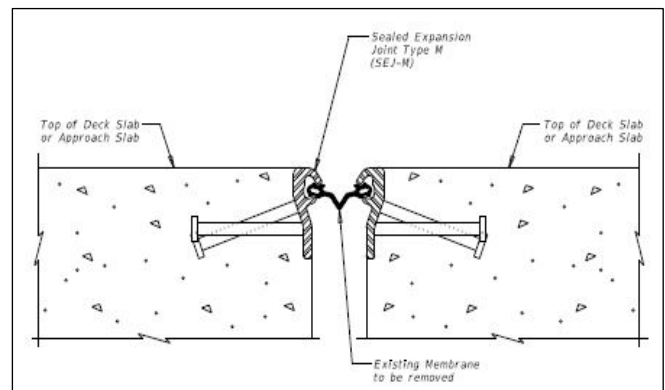
Definitions:

Sealed Expansion Joint (SEJ): Typically used when thermal expansion/contraction distances exceed what can be accommodated with other type joint systems that TxDOT uses (i.e. armor joint with sealant).

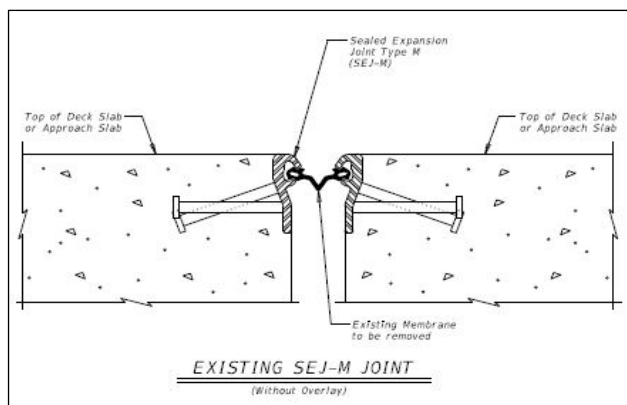
- SEJ-B: An SEJ Type B ('B' = Bonded Connection) joint system utilizes a rubber membrane that is attached to the steel plates with an adhesive system provided by the manufacturer.
- SEJ-M: An SEJ Type M ('M' = Mechanical Connection) joint system utilizes a rubber membrane that is attached to the steel plates by sliding the membrane through a preformed slot in the plates. This steel slot will lock the rubber membrane in place.



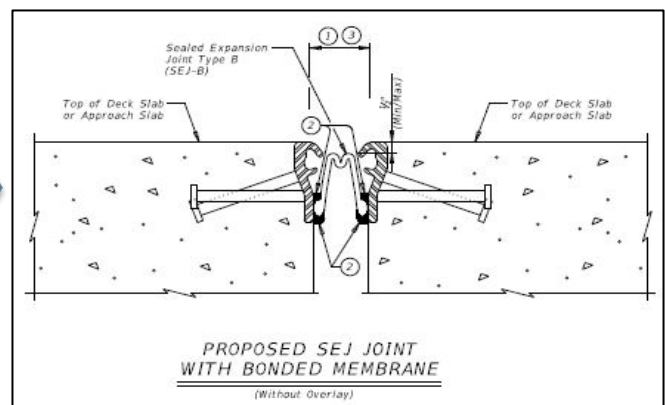
SEJ - Type B (Bonded)



SEJ - Type M (Mechanical)

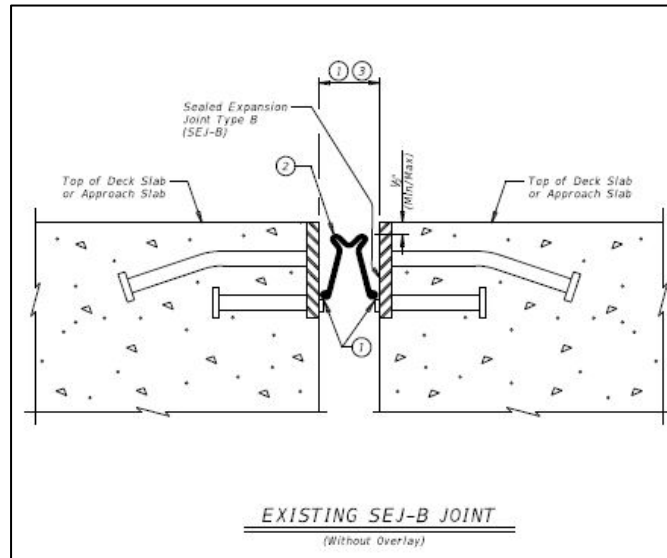


EXISTING SEJ-M JOINT
(Without Overlay)



PROPOSED SEJ JOINT
WITH BONDED MEMBRANE
(Without Overlay)

Existing SEJ-M membrane joint replaced with an SEJ-B type expansion joint (Without Overlay).



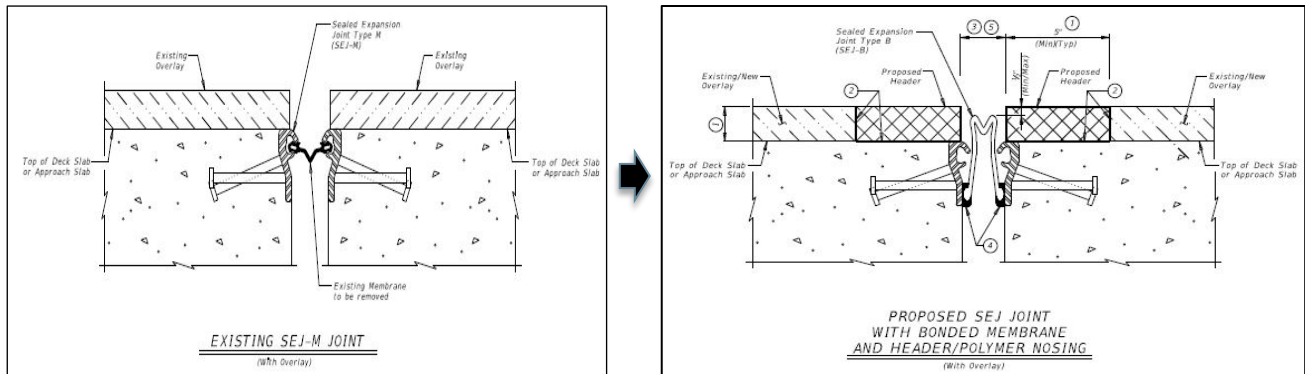
Existing SEJ-B membrane replaced with new membrane (No Overlay).

A. Use Pay Item 0785-6005 (BRIDGE JOINT REPAIR SEJ) (LF):

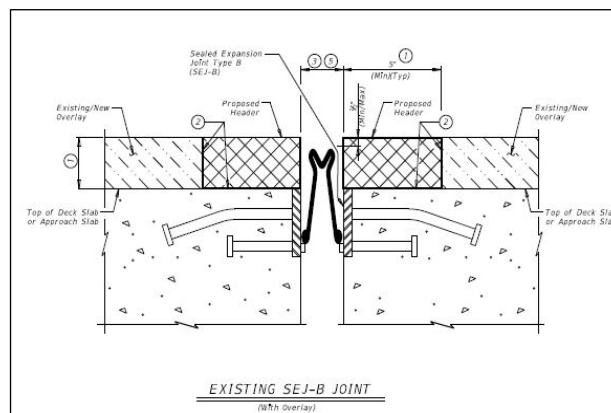
1. If the rubber membrane is damaged or torn and needs to be replaced with a new membrane, use this pay item. Replacing rubber membranes can be extremely difficult so be sure that the joint is expanding and contracting the way it should and not closed shut before adding this repair. Replace the entire length of rubber membrane whether it is an existing bonded or mechanical type joint. If the existing joint is a mechanical type connection than convert to a bonded type as shown above. A bonded type connection is the preferred joint type as it is easier to replace than if it was a mechanical connection.

9. Sealed Expansion Joint (SEJ):

With New/Existing Overlay



Existing SEJ-M membrane joint replaced with an SEJ-B type expansion joint (With Overlay).



Existing SEJ-B membrane replaced with new membrane (With Overlay).

A. Use Pay Item 0454-6008 (HEADER TYPE EXPANSION JOINT) (CF):

1. If the project scope is to include an overlay or mill and overlay to a roadway/corridor than header/polymer nosing shall be added at the expansion joints. A maximum and minimum of 2 inches of overlay (total depth of overlay) shall be added to the bridge deck. Please note that if a bridge deck is overlaid it must first be sealed prior to applying the overlay. Please contact the Fort Worth Bridge Section for solutions to sealing the bridge deck. If polymer nosing/header(s) are added to an overlay with a thickness less than 2 inches, the polymer nosing/header material will be brittle and would promote cracking in the member. It is also not recommended by the polymer nosing/header manufacturer. This pay item is used to pay for just the polymer nosing/header(s).

- If an existing bridge deck has never been overlaid and one wants to be added, first contact the FTW Bridge Section to further discuss and determine if it can be.
- If an existing overlay is to be milled and replaced and the bridge has existing header/polymer nosing at the expansion joints, it is best to remove and replace the existing header/polymer nosing.

2. If the project scope does not include an overlay or mill and overlay, but rather includes, for example, surface treatment (i.e., seal coat), MBGF upgrades, resurfacing (i.e., diamond grinding, shot blasting, skid abrasion, etc.), the bridge joints must still be cleaned and/or sealed if any bridges are located within the construction limits.

- If the existing bridge deck has an existing overlay and there are no polymer nosing/headers at the existing expansion joints, the Area Office can choose to add header/polymer nosing at the expansion joints if the existing overlay shows signs of distress at the expansion joint locations (i.e., spalling of existing overlay, raveling of existing overlay, crack in existing overlay, etc.).
3. The designer will need to determine the cubic feet of header material, which means that core testing through the TxDOT Lab needs to be requested to determine the thickness of existing overlay material. Please note that in most cases the existing polymer nosing/overlay may not be uniform in thickness, so the results of the core testing may not provide a precise value but should provide a good estimate of cubic feet of material. It is considered best practice to add a note to the plans that lets the Contractor know the existing overlay identified on the plans is based on X inches thick of overlay, per the core results. Use the thicker core for estimating purposes and show this thickness on the plans. This pay item is used to pay for the polymer nosing/header material only.

B. Use Pay Item 0785-6005 (BRIDGE JOINT REPAIR SEJ) (LF):

1. If the rubber membrane is damaged or torn and needs to be replaced with a new membrane, use this pay item.

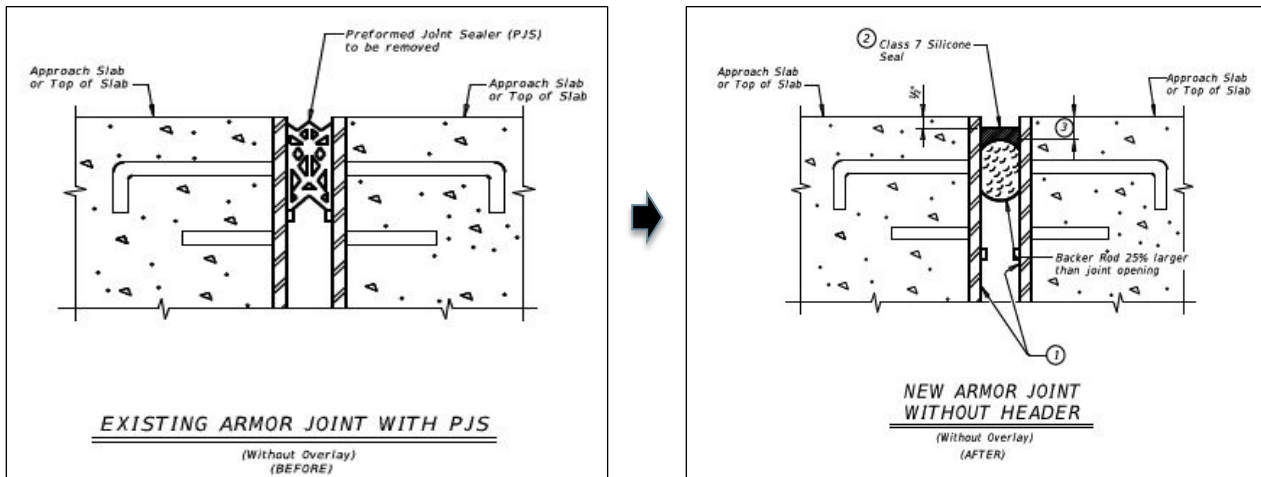
10. CLEANING JOINTS:

A. Use Pay Item 438-6009 (CLEANING EXISTING JOINTS) (LF):

1. If there is no need to repair damaged plates, steel headed studs, spalled concrete around the joint(s), or replace the sealant because it is in good shape and we just need to clean out the loose debris, use this pay item. You can use this pay item to clean relief joints, armor joints, and sealed expansion joints (SEJ) as well if the membrane does not need to be replaced, and only debris removed. For structures with an existing overlay that have polymer nosing/headers, if the polymer nosing/headers and joint sealant is in good shape, then use this pay item. If the existing polymer nosing/headers need to be replaced with new polymer nosing/headers then use the pay items listed above to pay for replacement of polymer nosing/header material and use pay item listed above for cleaning and sealing joints since the sealant may have to be removed or may get damaged when removing and replacing existing polymer nosing/header material.

11. Armor Joint with Preformed Joint Sealer (PJS):

With No Overlay

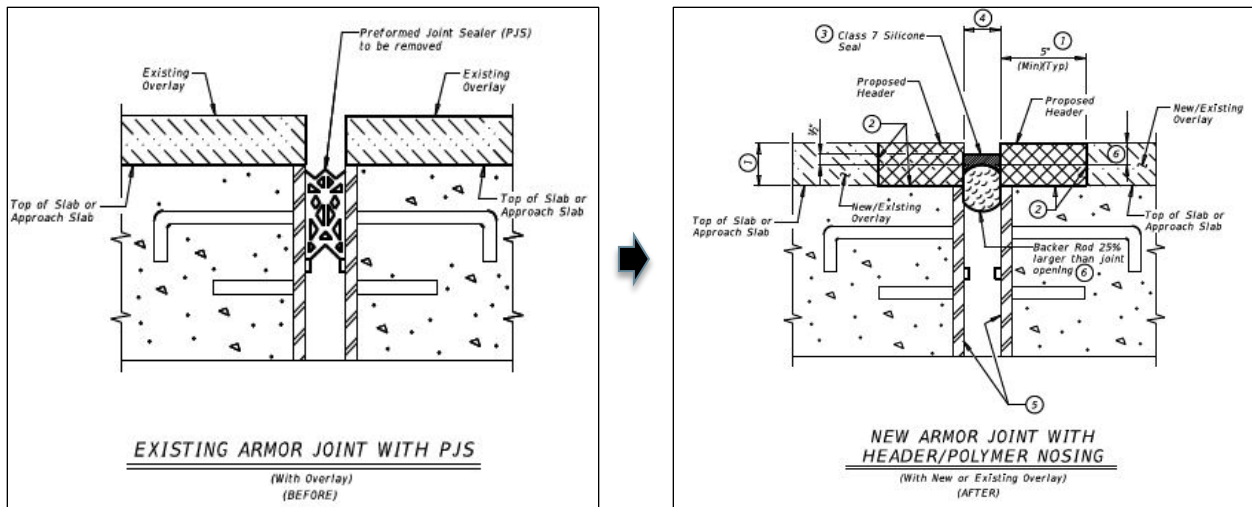


A. Use Pay Item 438-6004 (CLEANING AND SEALING EXISTING JOINT(S)(CL 7)) (LF):

1. If the rubber membrane is damaged or torn and needs to be replaced, use a backer rod and Class 7 Sealant with the pay item identified above.

12. Armor Joint with Preformed Joint Sealer (PJS):

With New/Existing Overlay



A. Reference Armor joint Section 2 for information related to polymer nosing/header and cleaning and sealing of existing joint. Same information applies to this condition.