EXTINGUISH THE TORCH MEETING
SESSION ONE

FIN: 435165-1/3-52-01 & 435167-1/3-52-01
Contract No.: E8Q41
Project: Resurfacing & Safety Upgrades of SR 91 between MM 178-185
Contractor: Community Asphalt Corp.
Project Acceptance Date: 10/31/2018
Counties: Okeechobee and Indian River

MEETING AGENDA

1. Introductions
   CEI Senior Project Engineer: Harold Dubon, P.E., Carnahan, Proctor and Cross, Inc.
   CEI Project Administrator: Glenn Bridges, P.E., Carnahan, Proctor and Cross, Inc.
   FTE Project Manager: Christopher NeSmith, P.E.
   FTE Design Project Manager: Patrick Muensch, P.E.
   Engineer of Record: Kimberly Gail Glass, P.E., Comprehensive Engineering Services, Inc.
   Contractor Project Manager: Joel Acevedo
2. Project Scope of Work
3. Contract Time and Money
4. Supplemental Agreements and Work Orders – See Attachment
5. Contractor's Notices of Intent to File Claims
   1) NOI No. 01 Emergency Repairs to Base Failure Areas – Closed
   2) NOI No. 02 Density Delays – Closed
   3) NOI No. 03 Guardrail Repairs - Closed
6. Review and discussion of Lessons Learned incorporated into the Summary Report

   a) What worked well:

   b) Lessons learned – what needed improvement

LESSONS LEARNED

SUMMARY REPORT

Carnahan, Proctor and Cross, Inc.
Harold Dubon, PE – Senior Project Engineer
Glenn Bridges – Project Administrator

Florida Turnpike Enterprise
Christopher NeSmith, PE – Construction Project Manager
Patrick Muensch, PE – Design Project Manager

Kimberly Gail Glass, PE – Engineer of Record
Comprehensive Engineering Services, Inc.
201 S. Orange Ave, Suite 1300
Orlando, FL 32801

Michael L. Hebert, PE – Structural Engineer of Record
Florida Bridge & Transportation, Inc.
633 Dartmouth Street
Orlando, FL 32804

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1) PROJECT DESCRIPTION & LIMITS:

GENERAL	
Description & Limits:	Milling and Resurfacing with Safety Improvements from MP 178.2 to MP 185.0
FPNs:	435165-1-52-01, 435165-3-52-01, 435167-1-52-01 & 435167-3-52-01
Contract No:	E8Q41
Counties:	Okeechobee & Indian River
Contractor:	Community Asphalt Corp.

2) CONTRACT DETAILS:

CONTRACT TIME	
Original Contract Days:	**280**
Contract Begin Date:	**May 30, 2017**
Original Contract Completion Date:	**March 5, 2018**
Type	**CONTRACT DAYS**
Weather Days:	128
Holiday Days:	43
Special Event Days:	16
Time Extension Days:	**53**
TOTAL DAYS ADDED:	**240**
Allowable Contract Days:	**520**
Final Acceptance Date:	**October 31, 2018**
Percent Days Added (Other than Weather, Holiday or Special Event Days):	**18.93%**
Performance Measure (Is the Contract Time Increase <20%):	**Yes**

CONTRACT AMOUNT	
Original Contract Amount:	**$15,839,502.04**
Contract Changes:	**$407,161.06**
Revised Contract Amount:	**$16,246,663.10**
Percent Amount Added (SAs):	**1.03%**
Performance Measure (Is the Contract Amount Increase <10%):	**Yes**
Final Estimate Amount:	**$ pending**

3) PERFORMANCE MEASURES - Review of Reasons if Measures are Exceeded:

- **N/A – Performance Measures for both Contract Time and Contract Amount are within acceptable parameters.**

4) REQUEST FOR INFORMATION (RFI'S)

- **RFI 0001** – Crash Cushion, on plan sheet 31, phase 1B shows installing a temporary crash cushion at station 473+85 which is on bridge deck over Fort Drum Creek. Existing superstructure contains post-tension tendons and precast slab units. Manufacturer's installation manual requires drilling into the superstructure which is not allowed per Design Standards. Our thought is to extend the temporary barrier from station 472+25 to 473+85 and eliminate crash cushion. Would temporary barrier wall be acceptable pinned between the units over the bridge deck? **CLOSED:** EOR said it would be acceptable.

- **RFI 0002** – Missing Pay Item (706-3), Retro-reflective Pavement Markers – **CLOSED:** Matter resolved with the FTE, CEI and contractor. **CLOSED:** Temporary Retroreflective Pavement Markers are included under 102-78. Permanent final surface RPMs are included under 710-90 (Lump Sum). Per the Basis of Estimates Manual: "Includes payment for painted final surface pavement markings (1 or 2 applications of 710 paint), including RPMs (1 application)."

5) LESSONS LEARNED – ENTERED INTO PROJECT SOLVE (See attachments)

1. Emergency Response Plan

- **ISSUE SUMMARY:** Within this project we encountered two base failures, causing a lengthy emergency lane closure, which created a traffic backup of 7 miles. Challenges came when we attempted to obtain material supplies of Filter fabric and #57 stone in the middle of the night/weekend.

RESOLUTION: We developed a plan to have on hand, enough material readily available as a precautionary measure, in case a similar failure occurred on the project again. We also made the decision to only use "static mode" compaction of the multiple asphalt lifts.

2. Cooling Time for Deep Mill Asphalt Sections

- **ISSUE SUMMARY:** The base failures early on in the project had us rethink the construction method of the asphalt placement. One of the factors we believe contributed to the failure was insufficient cooling time for the thick asphalt mat in the deep mill sections. A timeline for the asphalt placement/failure and subsequent changes to paving operations/cooling time is as follows:
- On the night of 9/24/17, milling and paving took place in a deep mill section of the northbound Turnpike mainline. A pavement failure was spotted not long after the lane was opened to traffic on the morning of 9/25/17 between Sta 267+90 and 270+74. The lane was closed and Community Asphalt mobilized to remove/repair the approximate 285' failing section. Community Aspahlt began removing the failing asphalt section. Upon removal of the asphalt, excessive moisture was found in the underlying base material. Ultimately, 13" of asphalt/base material were removed before stable material was encountered. The area was proof rolled and it was decided that we would repair the area with four lifts of Traffic level D mix. Once

each lift reached a temperature of 160 degrees, the subsequent lift was placed. The first two lifts were composed of 3" of SP 12.5 mix and the final two lifts were composed of 3.5" of SP 19 mix.

- On the night of 10/10/17, milling and paving took place in a deep mill section of the northbound Turnpike mainline. A pavement failure was spotted not long after the lane was opened to traffic on the morning of 10/11/17 between Sta 302+66 and 306+91. The lane was closed and Community Asphalt mobilized to remove/repair the approximate 425' failing section. Community Aspahlt began removing the failing asphalt section. Upon removal of the asphalt, excessive moisture was found in the underlying base material. Ultimately, 13" of asphalt/base material were removed before reaching the subgrade material. The subgrade material was in question and it was decided that it should be removed down to the embankment. A total of 30" of material was removed. Once the area was proof rolled, this repair section involved placing 24" of 57 stone wrapped in filter fabric. The #57 stone was placed in three lifts (16" , 4" and 4") and rolled to seat the rock. The two 4" lifts were placed by the paving machine to have a level surface. The remaining six inches were to be composed of asphalt placed in two 3" lifts.

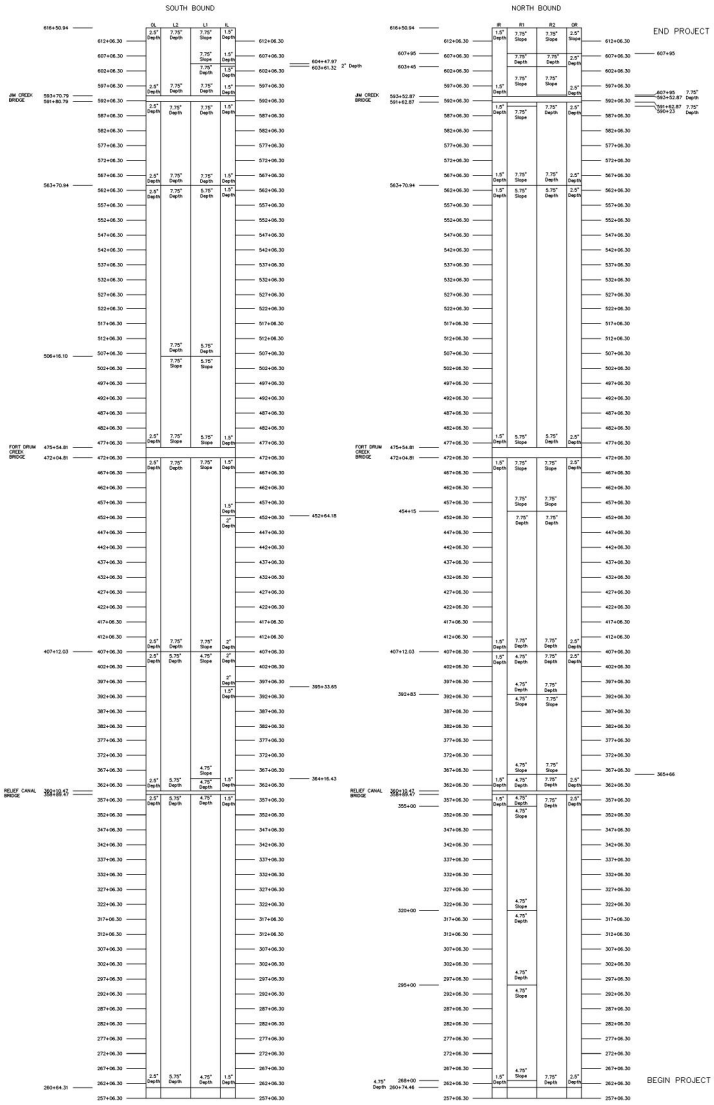
RESOLUTION:

- A test section to determine asphalt mat cooling time was scheduled for 11/29/17-11/30/17. Prior to milling, a core was cut and the limerock base and subgrade were sampled for moisture and gradation information. After the milling took place, a core was again cut and the limerock base and subgrade were sampled for moisture and gradation. The material below the subgrade was sampled for moisture, gradation and classification. The thermal-couple was installed along the milled surface. After the first layer of asphalt was placed, temperature readings were taken and recorded every 15 minutes. Cores were taken after the 1 hr, 2hr and 4hr mark from the beginning of asphalt placement. The limerock base and subgrade were sampled for moisture and gradation. After six hours, the second lift of asphalt placement began. Prior to the second lift of asphalt placement, a core was cut and the limerock base and subgrade were again sampled for moisture and gradation. After the second layer of asphalt was placed, temperature readings were taken and recorded every 15 minutes. Cores were taken after the 1 hr, 2hr 4hr and 6hr mark from the beginning of asphalt placement. After the 6^{th} hour, temperature readings were taken and recorded every hour. After the 12^{th} hour, temperature readings were taken every three hours. After 24 hours, a final core was taken and the limerock base and subgrade were sampled for moisture and gradation.
- Based on the data gathered, it was determined that six hours of cooling time was sufficient before opening up to traffic. Due to the contractor's sequence of operations, we went to twelve hour shifts. Milling throughout the night and paving during the daytime. This sequence of operations and allowing the pavement to cool sufficiently before opening to traffic appears to have minimized the possibility of any additional pavement failures.

3. Development of the Millings Spreadsheet

ISSUE SUMMARY: The project plans had 30 different typical sections for cross slope correction and milling depths. Within these typical sections, the plan notes would refer you to multiple sheets to determine the construction sequence which became extremely time consuming. With the cross referencing of multiple sheets, this also became very confusing for the contractor.

COMMUNITY E8Q41 MILLING DEPTHS



RESOLUTION: A milling depth/cross slope spreadsheet was developed to give a clear and concise direction to both the CEI staff and the contractor. This took the different typical sections and condensed them into one page. The CEI and the Contractor would get together each night prior to the milling operation to review the spread sheet. These reviews helped ensure everyone was on the same page, which ultimately increased production and minimized confusion. A similar milling depth/cross slope summary sheet should be developed by the EOR as part of the plans to give a clear and concise direction to both the CEI staff and the Contactor.

4. Rumble Strip Overlay

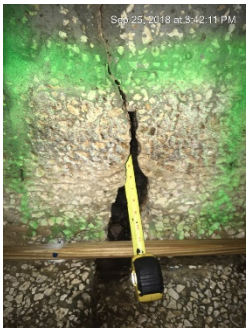
ISSUE SUMMARY: Community's project quantified the overlay of the rumble strips as part of their lump sum MOT. The project included the asphalt in the 334 pay item with required tracking and testing. On the Ranger project (E8Q45), their Project Manager thought they had included the tonnage as part of the lump sum MOT because that is the way it has been done in the past. After reviewing other projects, it

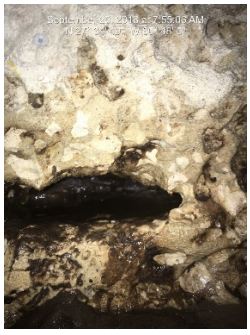
was determined that this item is being paid for in multiple ways and not consistently.

RESOLUTION: After further reviews and discussions of this issue, we believe all temporary asphalt, including the overlaying of rumble strips need to be included in the contract as a "lump sum Special Detour" item. The recommendation is based on a design memo and current Basis of Estimates procedures. Including the rumble strip overlay as a lump sum Special Detour will bring consistency to all projects and will keep contractors bidding on the same items. Using the lump sum Special Detour item would keep the asphalt as temporary (no testing and no tracking required) and the designers would not need to summarize the asphalt quantities. Designers needs to identify the following: station to station, the shoulder being covered (inside or outside), ¾" temporary asphalt 2' wide, and the purpose (to cover rumble strips).

5. Box Culvert Operations

ISSUE SUMMARY: After de-silting and/or de-watering box culvert at Station 452+80 MP 183.5, contractor located areas of extensive damage requiring Spall repairs before gunite could be applied.

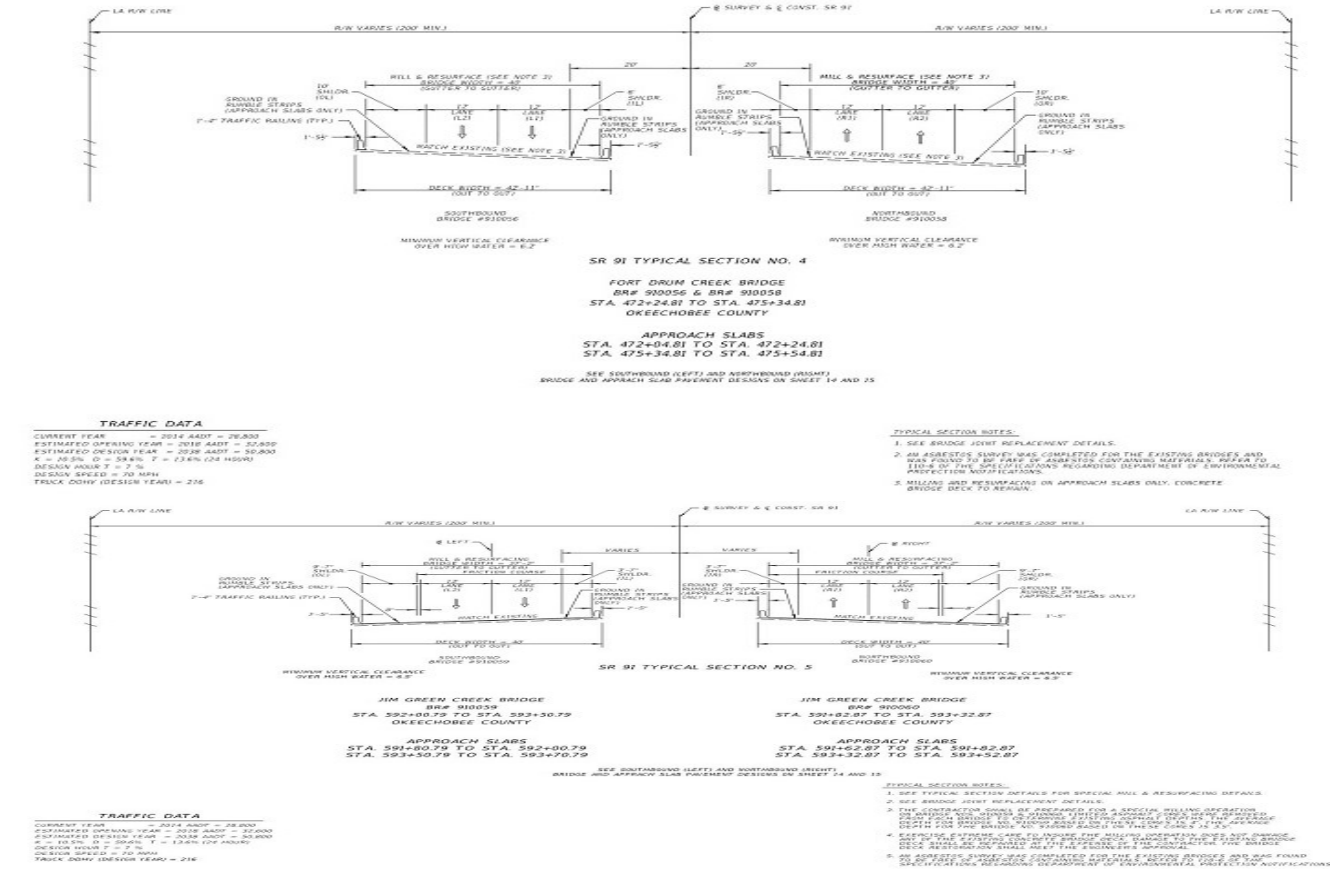




RESOLUTION: During the ERCAR reviews, the existing culverts should be desilted and dewatered if necessary, for an accurate assessment during the Plans Design process.

6. Bridge Joint Material Overrun

ISSUE SUMMARY: The typical sections for the bridges showed milling 2.25". The asphalt thickness over the existing bridge deck was much thicker. All of the remaining asphalt within the 16" polymer nosing system had to be removed down to the bridge deck. This was due to the polymer not adhering to asphalt. This additional asphalt thickness had to be removed which significantly increasing the cubic footage of polymer**.**



Bridge joint prior to the installation of the polymer nosing system

RESOLUTION: During design, the EOR should review the asphalt coring reports to determine the existing asphalt thickness over the bridge decks. The polymer quantity at the bridge joints should then be quantified based on the existing asphalt thickness at the joints. This information should also be shown in the detail sheets. This will provide a more accurate representation of the amount of polymer material needed to perform the work.

COST INCREASE: $47,254.60
TIME INCREASE: 0 Days

8. Hill Blocks View Signs

ISSUE SUMMARY: Signs were originally shown in plans and installed, although they were not recommended by Turnpike officials.

RESOLUTION: Exclude these signs from Plans.

6) SUMMARY OF ISSUES – ORGANIZED BY FUNCTIONAL AREA

- **CHANGES: GUARDRAIL AND SHOULDER REPAIRS**
  - **Aggregate Cost:** ***$56,542.34 added by WO to remove and repair or replace guardrail and posts damaged by 3rd party throughout project and flowable fill for shoulder repair.***
  - **Aggregate Time:** ***0 Days added.***

- **SPECIFICATION DISCREPANCIES:**
  - **Aggregate Cost:** ***N/A***
  - **Aggregate Time:** ***N/A***

- **UNUSUAL ITEMS RESOLVED IN THE FIELD (No Cost):**
  - **Aggregate Time:** ***N/A***

- **CLAIMS or NOIs:**
  - **NOI No. 01 Emergency Repairs To Base Failure Areas – Closed**
  - **NOI No. 02 Density Delays – Closed**
  - **NOI No. 03 Guardrail Repairs – Closed**

7) OUTSTANDING WORK TO BE DONE AFTER FINAL ACCEPTANCE

- None.

WORK ORDERS AND SUPPLEMENTAL AGREEMENTS

Financial Project ID: **435165-1-52-01, 435165-3-52-01 and 435167-1-52-01, 435167-3-52-01**
Contract Number: **E8Q41**

Work Orders/Supplemental Agreements

Work Order Number	FIN ID	Description of Work	Total Cost of Work/Days
WO No. 999-25-01	435165-1(3)-52-01, 435167-1(3)-52-01	2 additional days of Flextime	**$0.00**
WO No. 999-25-03	435165-3	3rd Party guardrail damage	**$2,916.03**
WO No. 999-25-04	435165-3	3rd Party guardrail damage	**$52,362.30**
WO No. 999-25-02	435167-1	Flowable Fill for abandoned Gopher Tortoise burrow	**$1,264.01**
WO No. 999-25-03	435167-1	Sign Sheeting Overlay	**$990.00**

Supplemental Agreement Number	FIN ID	Description of Work	Total Cost of Work/Days
SA No. 28	435165-1(3)-52-01, 435167-1-52-01	Plan Revisons 1 & 2, Technical Special Provison T-401	**$120,025.20**
SA No. 34	435165-1(3)-52-01, 435167-1(3)-52-01	Hurrican Irma	**$11,513.23**
SA No. 03	435165-1(3)-52-01, 435167-1(3)-52-01	Asphalt base Failure Repairs	**$297,966.09**

TIME EXTENSIONS

Contract: E8Q41

FIN: 435165-1-52-01/435167-1-52-01
435165-3-52-01/435167-3-52-01

Contractor: Community Asphalt Corp, Inc.

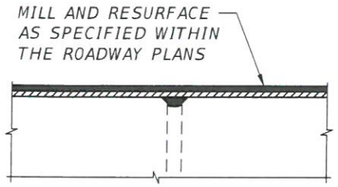
Description:	Total Days Granted:	Compensable:	Explanation:
Plan Revision SA	33	0	“Compensation calculated as per 4-3.2.1.4.a”
Base Failures	20	0	“Compensation calculated as per 4-3.2.1.4.a”

All Other time granted has been Weather, or weather recovery in addition to Holidays/Special Events included in the Contract.

SHOP DRAWINGS

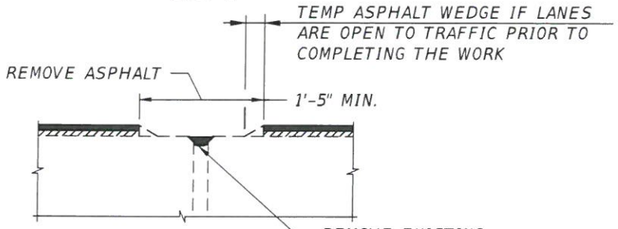
N/A

WARRANTY INFORMATION



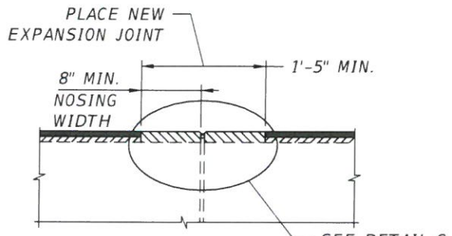
SECTION A-A

STEP 1



SECTION A-A

STEP 2



SECTION A-A

STEP 3

SECTION A-A NOTES:

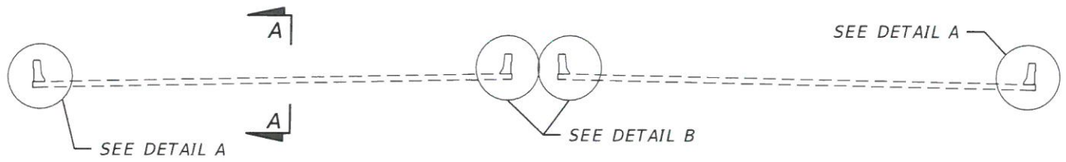
STEP 1. MILL AND RESURFACE THE BRIDGE DECK.

STEP 2. AFTER MILLING AND RESURFACING IS COMPLETE, REMOVE ASPHALT OVER THE JOINTS. REMOVE THE MINIMUM WIDTH SHOWN OR AS REQUIRED TO MEET THE MANUFACTURER'S RECOMMENDATIONS. REMOVE EXISTING BINDER.

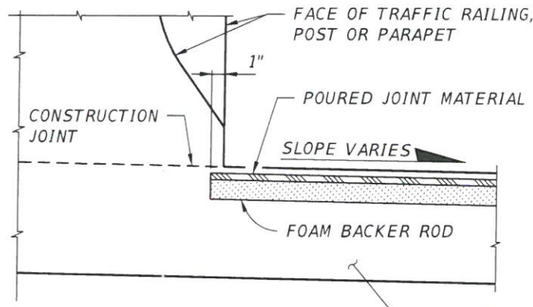
STEP 3. PLACE NEW EXPANSION JOINT SEALS ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

JOINT REPAIR NOTES:

1. JOINTS SHALL BE CLEANED AND APPROVED BY THE ENGINEER BEFORE INSTALLATION OF JOINT SEAL.
2. SHOP DRAWINGS: THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO INSTALLATION. THE DRAWINGS SHALL INCLUDE COMPLETE FABRICATION AND INSTALLATION DETAILS FOR EACH JOINT LOCATION, INCLUDING ALL MITERED JOINTS AND SPLICES.
3. INSTALLATION: THE JOINT SYSTEM INSTALLER SHALL BE LICENSED BY THE MANUFACTURER. A COPY OF THE LICENSING CONTRACT SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. INSTALLATION OF THE JOINT SYSTEM SHALL BE IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. THE CONTRACTOR SHALL SHOW PROOF THAT THE MANUFACTURER'S REPRESENTATIVE WAS PRESENT DURING JOINT INSTALLATION AND THAT THE MANUFACTURER'S REPRESENTATIVE APPROVED INSTALLATION AS PART OF THE WRITTEN WARRANTY.
4. WARRANTY: THE CONTRACTOR SHALL PROVIDE THE OWNER WITH A WRITTEN WARRANTY OF THE INSTALLED SYSTEM AGAINST LEAKAGE, ADHESIVE FAILURE, AND JOINT SYSTEM MATERIAL FAILURE FOR A PERIOD OF FIVE (5) YEARS FOLLOWING INSTALLATION. THE WARRANTY AND MANUFACTURER'S REPRESENTATIVE LETTER SHALL BE SUBMITTED TO THE TURNPIKE STRUCTURES MAINTENANCE OFFICE.
5. ACTUAL JOINT OPENING AND ASPHALT THICKNESS WILL VARY.
6. VERIFY EXISTING JOINT OPENINGS AND ASPHALT THICKNESS BEFORE ORDERING JOINT MATERIAL. SEE TYPICAL SECTION DETAILS SHEETS 34 AND 35 FOR SPECIAL MILLING DETAILS AND ASPHALT THICKNESSES.
7. FURNISH AND INSTALL POURED JOINT MATERIAL AND BACKER ROD IN ACCORDANCE WITH SPECIFICATIONS SECTIONS 459 AND 932 USING TYPE D SILICONE SEALANT MATERIAL. FURNISH AND INSTALL POLYMER NOSING SYSTEM IN ACCORDANCE WITH TECHNICAL SPECIAL PROVISION FOR POLYMER NOSING SYSTEM.
8. THE EXPANSION JOINTS SHALL BE INSTALLED AFTER THE MILLING AND RESURFACING ON THE BRIDGE HAS BEEN COMPLETED.



BRIDGE TYPICAL SECTION



DETAIL B

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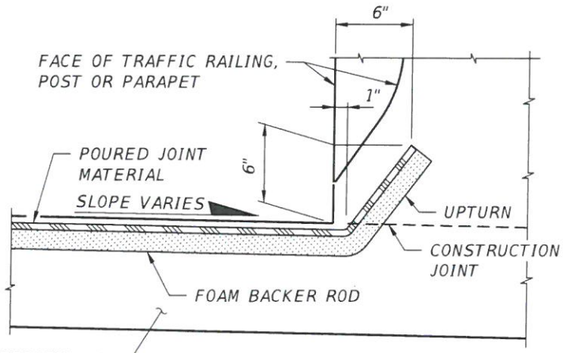
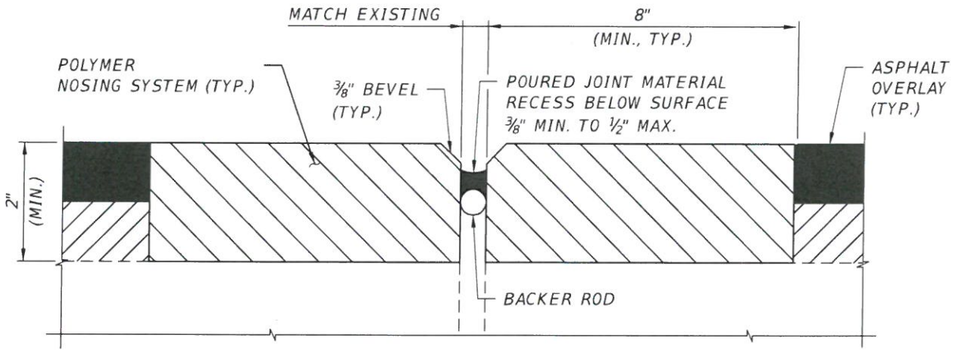


DETAIL A

(LOW SIDE)



DETAIL C

BRIDGE DECKS TO BE MILLED AND RESURFACED AND JOINTS REPLACED

BRIDGE NO.	BRIDGE DESCRIPTION	MILEPOST	# OF JOINTS
880067 NB	SR 91 OVER RELIEF CANAL	180.1	4
880059 SB	SR 91 OVER RELIEF CANAL	180.1	4
910060 NB	SR 91 OVER OUTFALL DITCH	184.6	6
910059 SB	SR 91 OVER OUTFALL DITCH	184.6	6

BRIDGE NOS. 880059, 880067 910059 & 910060

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

FBT - FLORIDA BRIDGE AND TRANSPORTATION, INC.
633 DARTMOUTH STREET
ORLANDO, FL 32804
(407) 513-9709
CERT. OF AUTH. NO. 26379
ENGINEER OF RECORD: Michael L. Hebert, PE
FL REGISTRATION NO. 50596

DRAWN BY: CEM 08-16
CHECKED BY: MLH 08-16
DESIGNED BY: MLH 08-16
CHECKED BY: MN 08-16

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	OKEECHOBEE	435165-1-52-01
	INDIAN RIVER	435167-1-52-01

SHEET TITLE: BRIDGE JOINT REPLACEMENT DETAILS (1 OF 2)

REF. DWG. NO.

PROJECT NAME: RESURFACE OKEECHOBEE AND INDIAN RIVER COUNTY
MP 178.287 TO MP 185.0 NB/SB

SHEET NO. 139

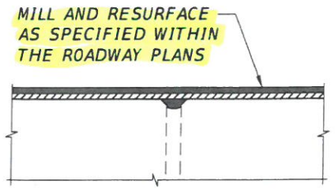
330-8 Joints.

330-8.1 General: When laying fresh mixture against the exposed edges of joints, place it in close contact with the exposed edge to produce an even, well-compacted joint after rolling.

330-8.2 Transverse Joints: Place the mixture as continuously as possible to minimize transverse joints. When constructing permanent transverse joints, meet the surface requirements as defined in 330-9. Construct temporary transverse joints in such a manner to allow traffic to pass over it. When resuming the paving operation, construct a transverse joint by cutting back on the previously placed pavement at a location where the straightedge requirements are met. At the project limits, tie into the adjoining pavement layers as shown in the Plans.

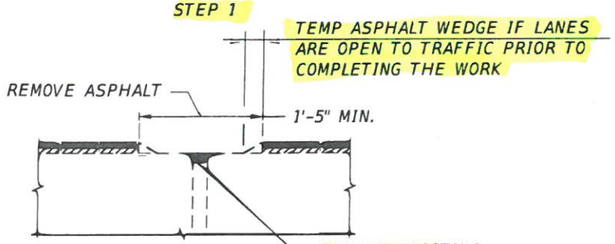
330-8.3 Longitudinal Joints: Place each layer of pavement so all longitudinal construction joints are offset 6 to 12 inches laterally between successive layers. Plan offsets in advance so the longitudinal joints of the friction course are not in wheel path areas. The longitudinal joints for friction course layers should be within 6 inches of the lane edge or at the center of the lane. The Engineer may waive this requirement where offsetting is not feasible due to the sequence of construction.

330-8.4 Placing Asphalt Next to Concrete Pavement: When placing asphalt next to concrete pavement, construct the joint as shown in the Plans.



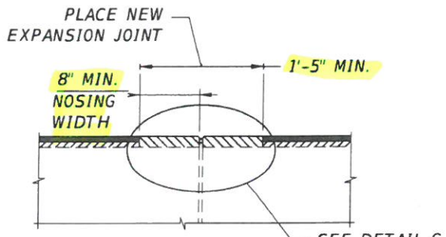
SECTION A-A

STEP 1



SECTION A-A

STEP 2



SECTION A-A

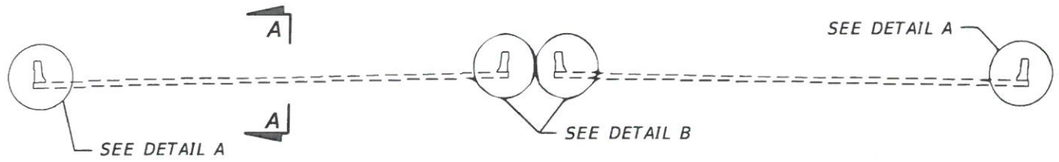
STEP 3

SECTION A-A NOTES:

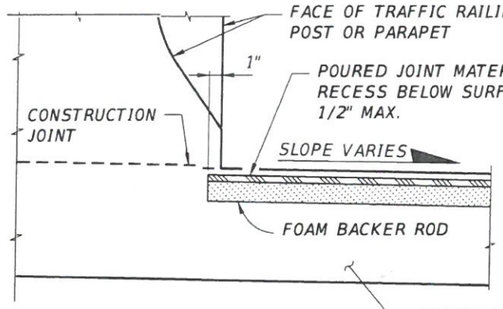
STEP 1. MILL AND RESURFACE THE BRIDGE DECK.

STEP 2. AFTER MILLING AND RESURFACING IS COMPLETE, REMOVE ASPHALT OVER THE JOINTS. REMOVE THE MINIMUM WIDTH SHOWN OR AS REQUIRED TO MEET THE MANUFACTURER'S RECOMMENDATIONS. REMOVE EXISTING BINDER.

STEP 3. PLACE NEW EXPANSION JOINT SEALS ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

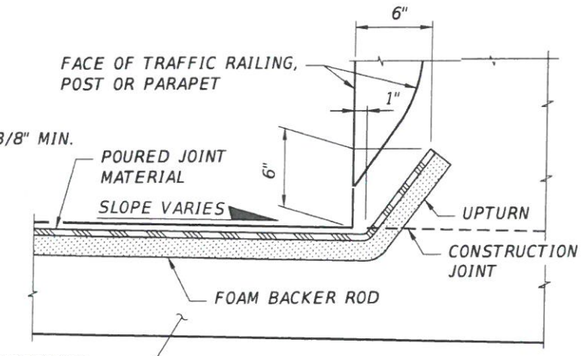


BRIDGE TYPICAL SECTION



DETAIL B

(HIGH SIDE)

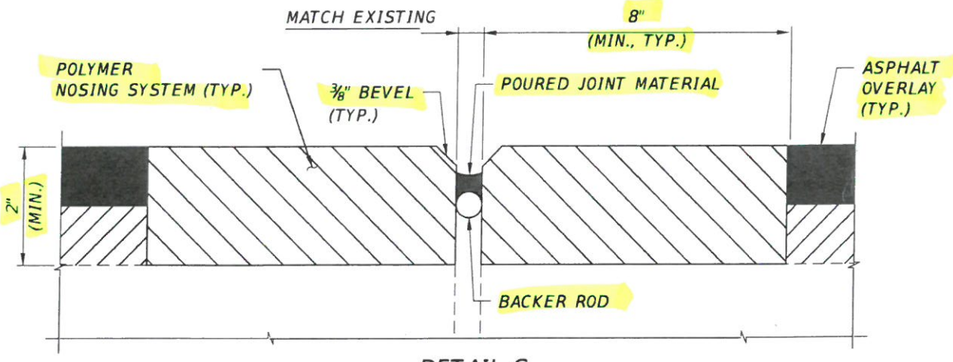


DETAIL A

(LOW SIDE)

JOINT REPAIR NOTES:

1. JOINTS SHALL BE CLEANED AND APPROVED BY THE ENGINEER BEFORE INSTALLATION OF JOINT SEAL.
2. SHOP DRAWINGS: SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO INSTALLATION. THE DRAWINGS SHALL INCLUDE COMPLETE FABRICATION AND INSTALLATION DETAILS FOR EACH JOINT LOCATION, INCLUDING ALL MITERED JOINTS AND SPLICES.
3. INSTALLATION: THE JOINT SYSTEM INSTALLER SHALL BE LICENSED BY THE MANUFACTURER. A COPY OF THE LICENSING CONTRACT SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. INSTALLATION OF THE JOINT SYSTEM SHALL BE IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. SHOW PROOF THAT THE MANUFACTURER'S REPRESENTATIVE WAS PRESENT DURING JOINT INSTALLATION AND THAT THE MANUFACTURER'S REPRESENTATIVE APPROVED INSTALLATION AS PART OF THE WRITTEN WARRANTY.
4. WARRANTY: PROVIDE THE OWNER WITH A WRITTEN WARRANTY OF THE INSTALLED SYSTEM AGAINST LEAKAGE, ADHESIVE FAILURE, AND JOINT SYSTEM MATERIAL FAILURE FOR A PERIOD OF FIVE (5) YEARS FOLLOWING INSTALLATION. THE WARRANTY AND MANUFACTURER'S REPRESENTATIVE LETTER SHALL BE SUBMITTED TO THE TURNPIKE STRUCTURES MAINTENANCE OFFICE.
5. ACTUAL JOINT OPENING AND ASPHALT THICKNESS WILL VARY.
6. VERIFY EXISTING JOINT OPENINGS AND ASPHALT THICKNESS BEFORE ORDERING JOINT MATERIAL. SEE TYPICAL SECTION SHEET 9 FOR SPECIAL MILLING DETAILS AND ASPHALT THICKNESSES.
7. FURNISH AND INSTALL POURED JOINT MATERIAL AND BACKER ROD IN ACCORDANCE WITH SPECIFICATIONS SECTIONS 459 AND 932 USING TYPE D SILICONE SEALANT MATERIAL. FURNISH AND INSTALL POLYMER NOSING SYSTEM IN ACCORDANCE WITH TECHNICAL SPECIAL PROVISION FOR POLYMER NOSING SYSTEM.
8. THE EXPANSION JOINTS SHALL BE INSTALLED AFTER THE MILLING AND RESURFACING ON THE BRIDGE HAS BEEN COMPLETED.



DETAIL C

BRIDGE DECKS TO BE MILLED AND RESURFACED AND JOINTS REPLACED

BRIDGE NO.	BRIDGE DESCRIPTION	MILEPOST	# OF JOINTS
880068 NB	SR 91 OVER OUTFALL SLOUGH	189.1	6
880060 SB	SR 91 OVER OUTFALL SLOUGH	189.1	6
910064 NB	SR 91 OVER OUTFALL DITCH	186.4	4
910062 SB	SR 91 OVER OUTFALL DITCH	186.4	4

BRIDGE NOS. 880068, 880060, 910064 & 910062

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

FBT - FLORIDA BRIDGE AND TRANSPORTATION, INC.
633 DARTMOUTH STREET
ORLANDO, FL 32804
(407) 513-9709
CERT. OF AUTH. NO. 26379
ENGINEER OF RECORD: Michael L. Hebert, PE
FL REGISTRATION NO. 50596

DRAWN BY: CEM 08-16
CHECKED BY: MLH 08-16
DESIGNED BY: MLH 08-16
CHECKED BY: MN 08-16

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	OKEECHOBEE	435166-1-52-01
	INDIAN RIVER	435168-1-52-01

SHEET TITLE: BRIDGE JOINT REPLACEMENT DETAILS

REF. DWG. NO.

PROJECT NAME: RESURFACE OKEECHOBEE AND INDIAN RIVER COUNTY MP 185.0 TO MP 190.5 NB/SB

SHEET NO. 130

INTERSTATE CONSTRUCTION, LLC
19620 Pines Blvd - Suite 110
Pembroke Pines, FL 33029
Tel.: 754-208-2525
Fax: 754-200-2925

Submittal For Approval

Job:	1793 STATE ROAD NO. 91	***Submittal No:***	1793-001
Project:	RESURFACE TURNPIKE MAINLINE	***Revision No:***	1
FIN:	435165-1-52-01; 435165-3-52-01; 435167-1-52-01; 435167-3-52-01 E8Q41	***Sent Date:***	June 08, 2017

Submittal Title: Bridge Deck Expansion;

- SILSPEC®900 POLYMER NOSING SYSTEM
- Dow Corning® 902 RCSJoint Sealant
- Dow Corning® 888 Silicone JointSealant

Name & Address

Prime Contractor:
COMMUNITY ASPHALT CORP.
9675 NW 117th Ave, Suite 108
Miami, FL 33178

Architect / Engineer Of Record:
COMPREHENSIVE ENGINEERING SERVICES, INC. 201 S. ORANGE AVENUE, SUITE 1300
ORLANDO, FL 32801

Supplier:
Coastal Construction Products
3401 Philips Hwy
Jacksonville, FL 32207

Contractor's Stamp

COMMUNITY ASPHALT, CORP
JUL 12 2017
Contract
Project No: E8Q41
Reviewed by:

Architect's Stamp

Engineer's Stamp

SILSPEC® 900 POLYMER NOSING SYSTEM

■ DESCRIPTION

SILSPEC® 900 POLYMER NOSING SYSTEM (PNS) is a two-component rapid curing liquid polymer that cures to a dense, semi-flexible, weather, abrasion and impact resistant polymer mortar for the construction or repair of expansion and construction joints on bridge and parking decks. The combined polymer is mixed with SILSPEC® 900 Blended Aggregate to form a polymer based mortar for nosing or joint repair. It can also be cured in the "neat" form as a combination sealant primer and protective coating for steel.

SILSPEC® 900 PNS is 100% non-volatile. Due to its relatively low viscosity, SILSPEC® 900 PNS is easy to mix and place. SILSPEC® 900 PNS is one of the more versatile and economical polymer systems available.

■ USES

• SILSPEC® 900 PNS, upon curing, develops a tough, chemical, wear, and impact resistant surface for use in areas exposed to foot or vehicular traffic. (Contact SSI for procedures for obtaining skid resistance.)

• It is ideally suited for use as binder for mortar preparations.

• When combined with SILSPEC® AGGREGATE, it can be used to repair damaged expansion and construction joints in bridges, roadway pavements, and parking structures. It can also be used for small repairs.

• Due to its low water absorption, it provides excellent protection against freeze-thaw cycles.

• When used in conjunction with Dow Corning 902 RCS Silicone Sealant it provides an alternative for strip seals, compression seals, and elastomeric devices in new bridge deck expansion joints; and results in substantially improved performance at lower cost.

■ TYPICAL PHYSICAL PROPERTIES

Combined Liquid Components*

Mixing Ratio	1:1 By Volume	
Viscosity	15-25 Poises (Spindle No. 2, 30 RPM, 25º C. ±2º)	ASTM D 2393
Color	Black	
Gel Time, minutes	15-25	AASHTO M-200-73
Elongation, percent	45-65	ASTM D 638#
Tensile Strength, Min. PSI	2000	ASTM D 638#
Shore D Hardness @ 25º C. (77º F.)	65-75	ASTM D 2240

*Test Method Type 1, Molded Specimens, 6.4 mm (.25 in) Thickness

Cured Mortar

Compressive Strength	PSI @ 24 hrs. (Method B)	3000 Min	ASTM C 579
Bond Strength	PSI	2000 Min	ASTM C 882
Abrasion Resistance	Wear Index (Taber H-22)	1.0 Max	ASTM C 501

Aggregate – Supplied by manufacturer.

■ STANDARD TYPE

Will permit cure to a minimum of 7º C. (45º F.) SILSPEC® 900/950 ACCELERATOR can be added to speed curing at low temperatures. Contact SSI for recommendations.

No modification of the material should be attempted without consulting SSI.

Shelf Life is two (2) years from date of shipment if stored below 32°C (90°F).

■ GENERAL USE PROCEDURES

Surface Preparation

Regardless of substrate, SILSPEC® 900 PNS must be applied to clean, dry and sound surfaces for effective bond.

All unsound material must be removed from substrate by chiphammering, sandblasting, or similar mechanical methods.

All loose material must be removed by brushing, vacuuming or blowing. Old paint, rust or other coating must be removed by the proper methods.

Asphalt/Bituminous Substrates

Observe above methods carefully. Do not use solvents. NOTE: While SILSPEC® 900 PNS adheres to asphalt, the asphalt itself has little structural strength. Consequently, we recommend whenever possible, that SILSPEC® 900 PNS be bonded to concrete or sound steel substrate.

Steel Substrates

Surface shall be sandblasted to near white condition.

Mixing of Liquid Components

SILSPEC® 900 PNS is a two-component product (Resin and Hardener); these must be thoroughly combined prior to use in a separate container, in the proper ratio of one volume Base to one volume Reactor. We strongly recommend that the cans be wiped out with a spatula (if this is not done, 10% or more of the material can be left in the container). Therefore, it is critical that the material be scraped out of the cans in order to assure adequate liquid/aggregate ratio. In small batches only, Base and Reactor can be hand-mixed. However, mechanical mixing, using a heavy-duty low speed drill motor with paint-type paddle stirrers, is strongly recommended. Mixing time should not be less than three minutes. Care should be taken to ensure thorough mixing from top to bottom as well as the sides of the container.

CAUTION...water retards the cure of SILSPEC® 900 PNS, therefore if a mixture of clean aggregate and water is used to clean the mixer, extreme care should be taken to ensure that the mixer is thoroughly dry and any uncured material is removed prior to mixing new material.

NOTE... do not mix more material than can be used at one time.

■ MIXING AND PLACING OF MORTAR

Patching and Repairs

The mixed SILSPEC® 900 PNS is made into a mortar by combining one (1) volume of mixed polymer with three and one-half (3.5) volumes of SILSPEC® BLENDED AGGREGATE. After combining the Base and Reactor for a minimum of 3 minutes, it is then placed in a suitable mixer, then add

the SILSPEC® AGGREGATE to produce a mortar. When mixing mortar in a bucket with a drill mixer, never mix more than 1/2 kit at a time. Always measure the materials to insure the proper ratios. *Extreme care* should be taken to insure that the aggregate is mixed uniformly from top to bottom in the bucket. It is extremely important that the material be thoroughly compacted. Care should be taken to assure good compaction on the vertical face of the joint and along the side of the Styrofoam form. Simply smoothing the top with a steel float *is not* compacting the mix. A small margin trowel, or other means, should be used for compaction.

The blended batch must be applied to the surface in 5-10 minutes. Once spread out, working time will be approximately 1/2 hour depending upon temperature. Clean equipment immediately with Citrus Cleaner or other approved solvent.

When using Silspec 900 as an expansion joint header, care should be taken to insure the mortar is even with the plane of the bridge deck or a fraction lower. Leaving the mortar higher than the plane of the bridge deck can subject it to snowplow or other impact damage. If after removal of the forming material the mortar is found to be higher than the adjacent bridge deck or overlay, it may be re-profiled using a hand-held grinder with a diamond cup wheel.

Cure

At 21°C. (70°F.) (substrate & air temperature), the mortar will cure sufficiently to accept traffic in four hours. Higher temperatures will shorten the cure while lower temperatures will lengthen the cure time. For temperatures in excess of 38°C. (100°F.), or lower than 15°C. (60°F.), contact S.S.I. for recommended procedures and cure time.

In cold weather, we recommend that liquid and aggregate be stored in a heated area until just prior to use.

TEMP	WORKING TIME	INITIAL CURE TIME*
50°F	40 min	12 hrs
60°F	30 min	8 hrs
70°F	25 min	5 hrs
80°F	20 min	3 hrs
90°F	15 min	2 hrs
100°F	10 min	1.5 hrs

*Compressive Strength reaches approximately 1000 psi.

■ CAUTION

• During all operations, established safety codes and workman protection must be observed.

• Use of protective creams, clothing, goggles, and rubber gloves are recommended during all phases of handling and use. Read and follow all handling precautions on labels. Use common sense in handling SILSPEC® 900 PNS and all other chemicals.

• Observe good housekeeping rules and regulations during all phases of use and handling of either unmixed or mixed product.

• Ample ventilation should be provided during all periods of sandblasting, mixing and application procedures.

• In accordance with ICC Regulation #49, Item 173.4: Containers containing less than one (1) fluid ounce of liquid are considered non-hazardous material. Empty containers may be crushed and should be disposed of in accordance with state and local regulations

• Remove epoxy immediately with clean, dry towel and wash skin thoroughly with soap and water.

• Good housekeeping rules are always important. Provide ample ventilation in all areas of handling, mixing and use. Avoid prolonged breathing of possible fumes. Minimize skin contact. Use of goggles, rubber gloves and protective creams is recommended. If material gets into eyes, flush thoroughly with clean water for 20 minutes; then seek medical treatment. Observe all safety precautions when using any type of solvent for cleaning tools and equipment.

■ CLEAN UP

All tools, other application or mixing equipment must be cleaned at frequent intervals and while SILSPEC® 900 PNS remains soft and uncured.

For cleaning hand tools, CITRUS CLEANER or other approved solvents are most effective, or cleaning can be accomplished using waterless hand cleaner.

NOTE... some solvents are FLAMMABLE and all safety codes and regulations governing their use must be observed.

■ Contact S.S.I. for further information or installation instructions.

07625-001/133062

800-888-8909 • Fax 918-582-7510 • **www.ssicm.com** • highway@ssicm.com

TULSA
430 S. Rockford
Tulsa, OK 74150
918/587-5567

OKLAHOMA CITY
610 NE 36th St.
Oklahoma City, OK 73105
405/524-9525

DALLAS
2376 Glenda Lane
Dallas, TX 75229
972/243-0676

HOUSTON
2211 Sabine
Houston, TX 77007
713/862-3900

AUSTIN
13815 Immanuel Road
Pflugerville, TX 78660
512/326-1156

SAN ANTONIO
2104 Mannix
San Antonio, TX 78217
210/930-6360

FT. WORTH
351 N Beach Street
Fort Worth, TX 76111
682/647-1881

EL PASO
8350 Burnham Road Ste. 300
El Paso, TX 79907
915/591-6800

McALLEN
1503 Mid-Cities Drive
Pharr, TX 78577-2128
956/782-1341

BATON ROUGE
5813 McCann Drive
Baton Rouge, LA 70809
225/620-0950

Product Information
Silicone
Sealants

DOW CORNING

Dow Corning® 902 RCS Joint Sealant

FEATURES & BENEFITS

- Rapid cure
- Easy to use
- Convenient disposal pak
- High movement capability
- Seals irregular surfaces
- Ultra-low modulus
- Fully elastic
- Good weatherability
- Long-life reliability
- All-temperature gunnability
- Bonds to itself
- Curbs – while self-leveling, can be installed in vertical curb joints when proper damming techniques are used

COMPOSITION

- Two-part silicone rubber

Rapid-cure, self-leveling, two-part silicone rubber sealant designed to seal expansion joints

APPLICATIONS

- *Dow Corning*® 902 RCS Joint Sealant is primarily intended for use in expansion joints found on bridges that vary in width from 1 to 3 inches (25 to 76 mm) at the time of sealing. Wider joints can be sealed; contact your Dow Corning representative for recommendations. The substrate may be concrete/concrete, concrete/steel or steel/steel.
- *Dow Corning* 902 RCS Joint Sealant can be used as the original sealant in new construction or as a remedial repair sealant in existing construction. In new construction, it provides a long-lasting seal that will prolong the life of the structure.
- For use in repair or remedial applications where other joint sealing materials have failed, it can be used to seal irregularly shaped or minor spalled joints.

TYPICAL PROPERTIES

Specification Writers: These values are not intended for use in preparing specifications. Please contact your local Dow Corning sales office or your Global Dow Corning Connection before writing specifications on this product.

Test*	Property	Unit	Result
As Supplied – Part A			
	Color		Dark gray
	Flow, Sag or Slump		Self-leveling
ASTM C 1183	Extrusion Rate	g/minute	354
ASTM D 1475	Specific Gravity		1.3
	Volatile Organic Compounds (VOC)	g/L	34
As Supplied – Part B			
	Color		White
	Flow, Sag or Slump		Self-leveling
ASTM C 1183	Extrusion Rate	g/minute	308
ASTM D 1475	Specific Gravity		1.3
	Volatile Organic Compounds (VOC)	g/L	0
As Installed – At 25°C (77°F) and 50 percent Relative Humidity			
	Skin-Over Time at 25°C (77°F)	minutes	12
ASTM C 679	Tack-Free Time at 25°C (77°F)	minutes	50

TYPICAL PROPERTIES (continued)

Test*	Property	Unit	Result
ASTM D 412 Die C	Joint Elongation[1]	percent	>1200
ASTM D 412 Die C	Joint Modulus[1] at 150 percent	psi (kPa)	9.9
ASTM C 719	Joint Movement Capability[1] 10 cycles	percent	+100/-50
ASTM C 793	Accelerated Weathering, 5000 hours QUV exposure		Pass

*ASTM: American Society for Testing and Materials.
[1]Joint size = ½ inch x ½ inch x 2 inches (13 mm x 13 mm x 51 mm).

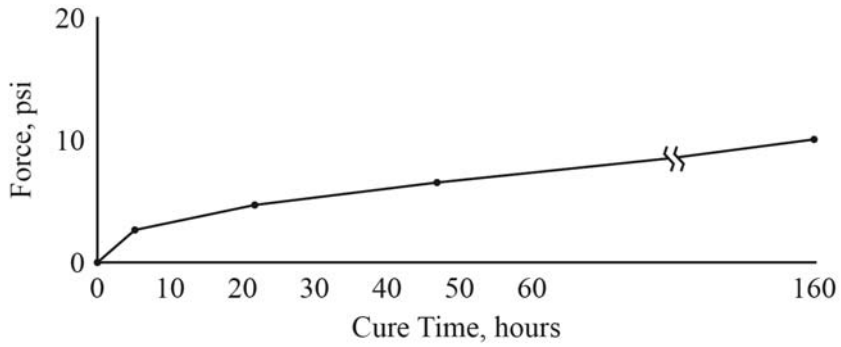
DESCRIPTION

Dow Corning 902 RCS (Rapid Cure Silicone) Joint Sealant is a self-leveling, cold-applied, rapid-cure, two-part, easy-to-install, ultra-low-modulus, 100 percent silicone rubber sealant designed to seal expansion joints that experience both thermal and/or vertical movements due to traffic loading. *Dow Corning* 902 RCS Joint Sealant can be used for new and remedial applications. Its rapid cure is especially well suited for maintenance work, such as bridge joint resealing, where resealing must be completed within a short time period (i.e., less than 8 hours) to minimize traffic disruption.

The ultra-low modulus of *Dow Corning* 902 RCS Joint Sealant allows it to accommodate the high degree of movement associated with expansion joints on bridges. Its rapid cure means it will cure fast enough to accommodate typical daily thermal movements and/or differential joint movement caused by traffic without being damaged (see Figure 1). In comparison, one-part sealants typically require 7 to 21 days to cure and often are prematurely damaged due to excessive movement prior to complete cure.

Dow Corning 902 RCS Joint Sealant is self-leveling, allowing it to conform to irregularly shaped joints. In many instances, this may eliminate the need for minor joint refacing, reducing repair time and cost.

Figure 1: Cure Rate of *Dow Corning* 902 RCS Joint Sealant.[1]



[1]½-inch (13mm) wide joint modulus at 100 percent.

BENEFITS

- Rapid cure – Develops sufficient integrity within 8 hours to accommodate movements associated with bridges
- Easy to use – Self-leveling (no tooling), a two-part formulation with the ease of one-part installation; no pre-mixing or measuring required
- Convenient disposal pak – Available in Dow Corning EZ Pak sausages; easy to load, use and dispose, minimizing waste
- High movement capability – Once cured, the sealant will accommodate movements +100/-50 percent of joint size for joints 1 to 3 inches (25 to 76 mm) wide at the time of installation; the sealant accommodates up to ±50 percent of joint size for joints 3 to 4 inches (76 to 102 mm) wide at the time of installation
- Seals irregular surfaces – Self-leveling characteristics make the sealant ideal for sealing irregular joint surfaces by providing adequate contact to the substrate with no tooling
- Ultra-low modulus – Easily stretches in the joint with little stress on the bond line or joint wall, maximizing the probability of a successful seal with continuous or gradual joint movement
- Fully elastic – Recovers 90 percent or greater of its original dimension under repeated extension and/or compression without cracks or splits
- Good weatherability – The 100 percent silicone rubber is virtually unaffected by sunlight, rain, snow, ozone or temperature extremes; unlike organics, *Dow Corning* 902 RCS Joint Sealant will not stiffen in cold temperatures or soften in

warm weather – it will not degrade or crack with sunlight
- Long-life reliability – Under normal conditions, cured sealant stays rubbery from -45 to 149°C (-50 to 300°F) without cracking, tearing or becoming brittle
- All-temperature gunnability – Consistency and self-leveling characteristics are relatively unchanged over normal installation temperature range
- Bonds to itself – Ideal for maintenance applications where only one traffic lane can be sealed at a time, but a continuous seal is required when the adjacent lanes are sealed
- Curbs – While self-leveling, can be installed in vertical curb joints when proper damming techniques are used

HOW TO USE

Joint Design

A thin bead of silicone sealant will accommodate more movement and result in less bond line stress than a thick bead. *Dow Corning* 902 RCS Joint Sealant should be installed no thinner than 3/8 inch (9 mm) and no thicker than 1/2 inch (13 mm). See Table 1 and Figure 2 for proper bead thickness, joint design and recommended movement ranges.

Application Method

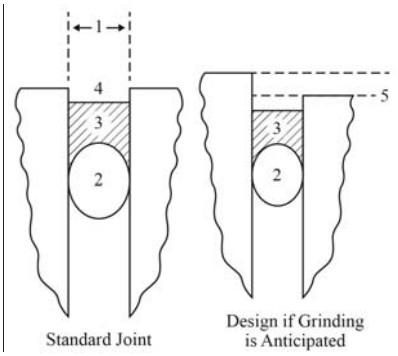
Dow Corning 902 RCS Joint Sealant comes in kits consisting of two 20-fl oz EZ Pak sausages: Part A (black) and Part B (white). With a dual sausage pneumatic gun (such as Model 635-1 supplied by Albion Engineering Co., Inc.[1]), load Parts A and B into the designated sides so that the crimped end is approximately 1/2 inch (13 mm) above the end of the cylinder. To open the sausage pak (see Figure 3), cut off the exposed crimped end of Part B. Repeat this step for Part A. Quickly attach the rear housing and static mixer.

Table 1: Movement Range and Usage Rate.

Joint Width[1],		Movement Rating,	Maximum Sealant Bead Thickness,		Linear Yield[2], 40-oz Kit		Linear Yield[3], 9-gal Kit	
inches	mm	percent	inches	mm	ft	m	ft	m
1	25	+100/-50	1/2	13	9	2.74	260	79.3
1 1/4	32	+100/-50	1/2	13	7.5	2.29	210	64.0
1 1/2	38	+100/-50	1/2	13	6	1.83	160	48.8
1 3/4	44	+100/-50	1/2	13	5	1.52	135	41.1
2	51	+100/-50	1/2	13	4.5	1.37	120	36.6
2 1/4	57	+100/-50	1/2	13	4	1.22	110	33.5
2 1/2	63	+100/-50	1/2	13	3.5	1.07	100	30.5
2 3/4	70	+100/-50	1/2	13	3	0.91	75	22.9
3	76	+100/-50	1/2	13	2.5	0.76	60	18.3
3 1/4	83	±50	1/2	13	2.25	0.69	55	16.8
3 1/2	89	±50	1/2	13	2.1	0.64	50	15.2
3 3/4	95	±50	1/2	13	2	0.61	45	13.7
4	102	±50	1/2	13	1.5	0.46	40	12.2

[1] Joint width as measured at the time of installation.
[2] Yield based on one kit containing two 20-fl-oz EZ Pak sausages. Yield will vary depending on joint design, tooling, backer, placement, waste and experience.
[3] Yield based on one kit containing two 4.5-gallon pails. Yield will vary depending on joint design, tooling, backer, placement, waste and experience.

Figure 2: Recommended Joint Designs.



1. Joint width wide enough to accommodate movement.
2. Proper backer rod placement to prevent three-sided adhesion.
3. Sealant installed to proper depth and width.
4. Sealant recessed a minimum of 1/2 inch (13 mm) below pavement surface.
5. Depth of lowest slab determines the amount of recess required if grinding is anticipated; once grinding is complete, the sealant will have proper recess below the pavement surface.

The materials are then dispensed at a predetermined ratio of 1:1 by volume through the static mixer and into the joint. The extruded material must be gray in color.

Guidelines for the proper use of *Dow Corning* 902 RCS Joint Sealant include:

- The inlet air pressure to the gun should not exceed the gun manufacturer's recommendation.
- The recommended static mixer should have a minimum 1/2 inch (13 mm) inside diameter and sufficient mixing elements to give the desired color. An example of a typical static mixer that can be used is one that has a 12 inch (305 mm) long plastic shell by 1/2 inch

[1] Albion Engineering Co., Inc., 2080A Wheatsheas Lane, Philadelphia, PA 19124, (215) 535-3476.

2014, July 25
Form No. 62-181H-01

(13 mm) inside diameter, with a minimum of 8 inches (203 mm) of mixing elements.
- Prior to attaching the static mixer to the gun, dispense a small amount of material (A and B) to ensure the gun is dispensing both parts.
- To continue using the same static mixer, do not allow elapsed time to exceed 5 minutes when changing kits. The mixer should not remain inactive for longer than 5 minutes.

Installation Procedures
When installing *Dow Corning* 902 RCS Joint Sealant it is critical that the joint be clean and dry prior to and during installation. *Dow Corning* 902 RCS Joint Sealant is primarily intended for Portland cement concrete surfaces or steel joint surfaces.

If other substrate surfaces, such as polymer concrete and asphalt, are to be sealed, contact Dow Corning Technical Service and Development for recommendations.

The detailed recommended installation procedures found in Dow Corning's *Installation Guide for Silicone Pavement Sealants* (Form No. 61-507) and *Dow Corning 902 RCS Joint Sealant Installation Guidelines* (Form No. 62-272) apply to this product. A brief outline of the installation procedures for *Dow Corning* 902 RCS Joint Sealant is included in "Remedial Applications."

Primer Recommendations
When using primers, consult local and state laws for VOC compliance.

For concrete substrates, uniformly coat the entire surface with *Dow Corning*® 1200 OS Primer or *Dow Corning*® P5200 Adhesion Promoter using a clean cloth or brush. Over-application may affect adhesion. Allow a minimum of 10 minutes for the primer to dry prior to sealant application.

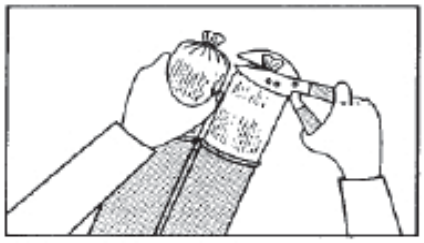
For carbon steel substrates, after sandblasting to "white metal," apply Carboline® Carboguard 635. Please refer to the *Dow Corning Installation Guidelines*, form 62-272 or contact your local Dow Corning representative for specific installation information.

Backer Recommendations
For joints greater than 3 inches (76 mm) in width at the time of sealing, it may be difficult to obtain backer rod that will stay in place during sealant cure and not be so large that it tears or is punctured during backer installation. Two options for this condition are:
1. Use of a soft, open-cell rod with an impervious skin that will readily compress to smaller joint widths without damage.
2. Increase the size of a standard backer rod by splicing it open and inserting a smaller diameter rod – a practice known as "hot-dogging" (see Figure 4).

Remedial Applications
1. Completely remove existing joint materials from the joint. The technique selected will depend on the material currently in the joint.
2. Clean the joint faces to remove residual contaminants. If wet sawing is used, immediately water wash to remove sawing residue, and sandblast after the concrete has dried. Sawing must be deep enough to accommodate proper sealant depth, backer rod and proper sealant recess. For steel, sandblast to a "near white" (SSPC-SP 10 of the *Steel Structures Painting manual*). Perform sandblasting in two passes – one pass per joint face. Sandblasting should comply with federal and local state laws. Proper protective equipment must be worn.
3. Blow out dust, loose particles and other debris from the joints in only one direction with oil- and water-free compressed air.[2] Surfaces must be clean, dry, frost-free and dust-free and can be checked by running a finger along the joint face. If a white, chalky dust appears on the finger, the joint must be recleaned.
4. Apply recommended primer.
5. Install a backer rod that is a minimum 25 percent oversized into the joint approximately 1 inch (25 mm) below the surface. The backer rod should be continuous. If two pieces must be joined, abut the two ends and tape them together to prevent sealant "run down."
6. Install the sealant in a manner so that the bead thickness is 3/8 inch (9 mm) minimum and 1/2 inch (13 mm) maximum and the sealant is recessed a minimum 1/2 inch (13 mm) below the surface to prevent traffic abrasion (see Table 2). To maximize joint wall wetting, install *Dow Corning* 902 RCS Joint Sealant using a multi-pass technique with the initial passes along each joint wall. All passes should be made in the same direction to minimize air entrapment.
7. When the vertical curb joints are to be sealed, the sealant should also be recessed to damage, especially on bridge joints where snow plows are used.

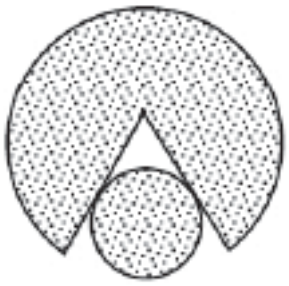
[2]OSHA Regulation. General Rules, Part 1, R-408.10036 Paragraph 1.

Figure 3: How to Load the EZ-Pak Sausage.



Cut off and remove the metal-clipped end of EZPak sausage.

Figure 4: Enlarging Backer Rod by "Hot-Dogging".



The bottom and outer joint edges must be dammed to prevent sealant from "running out" of the joint. The lower end of the vertical joint can be dammed by using a non-sag sealant, such as *Dow Corning*® 888 Silicone Joint Sealant. For the vertical section, damming materials should be positioned so that the installed sealant is sandwiched between the backer rod and the outer damming material. The outer damming material may be another piece of backer rod positioned and held in place with masking tape. Fill the cavity from the bottom up. Allow the sealant to cure prior to removal of outer damming material.

NOTE: If vertical curbs are to be sealed, these should be sealed first. This will allow sufficient time for the sealant to cure so that damming materials can be removed prior to leaving the job site.

Table 2: Recommended Backer Rod Installation (Standard Joint).

Measured in Inches					
Joint Width	1	1 1/2	2	2 1/2	3
Recessed Below Surface, minimum	1/2	1/2	1/2	1/2	1/2
Sealant Thickness, maximum	1/2	1/2	1/2	1/2	1/2
Backer Rod Diameter	1 1/4	2	2 1/4	3	3 1/2
Total Joint Depth, minimum	2 1/4	3	3 1/4	4	4 1/2
Measured in Millimeters					
Joint Width	25	38	51	63	76
Recessed Below Surface, minimum	13	13	13	13	13
Sealant Thickness, maximum	13	13	13	13	13
Backer Rod Diameter	32	51	57	76	89
Total Joint Depth, minimum	57	76	83	102	114

HANDLING PRECAUTIONS

The product contains a proprietary acetamidosilane that liberates N-methyl acetamide (N-MA) during cure. N-MA may cause birth defects based on animal data. Toxicology studies indicate that repeated, prolonged overexposure to N-MA causes an adverse reproductive effect in laboratory animals. Avoid breathing vapors. Do not use in poorly ventilated spaces. Avoid prolonged skin contact. KEEP OUT OF REACH OF CHILDREN.

Fully cured sealant is nonhazardous.

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND MATERIAL SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE MATERIAL SAFETY DATA SHEET IS AVAILABLE ON THE DOW CORNING WEBSITE AT DOWCORNING.COM, OR FROM YOUR DOW CORNING SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CORNING CUSTOMER SERVICE.

USABLE LIFE AND STORAGE

When stored in original, unopened containers between 0 and 32°C (32 and 90°F), *Dow Corning* 902 RCS Joint Sealant has a shelf life of 12 months from date of manufacture. Refer to product packaging for "Use By" date.

Keep containers tightly closed.

PACKAGING INFORMATION

Dow Corning 902 RCS Joint Sealant is supplied in kits consisting of two 20-fl oz (592-mL) EZ Pak sausages. It is also available in kits consisting of two 4.5-gal (17-L) bulk plastic pails upon request.

LIMITATIONS

Dow Corning 902 RCS Joint Sealant is not recommended for continuous water immersion. The sealant should not be installed under totally confined conditions.

Dow Corning 902 RCS Joint Sealant must be recessed below the pavement surface to prevent traffic abrasion or snow plow damage. It must not be installed in joints that cause the sealant to come in contact with traffic

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or exceed its stated capability. For joints expected to be used in pedestrian areas and parking structures, proper engineering practices must be followed.

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

SHIPPING LIMITATIONS

None.

HEALTH AND ENVIRONMENTAL INFORMATION

To support Customers in their product safety needs, Dow Corning has an extensive Product Stewardship organization and a team of Product Safety and Regulatory Compliance (PS&RC) specialists available in each area.

For further information, please see our website, dowcorning.com or consult your local Dow Corning representative.

LIMITED WARRANTY INFORMATION – PLEASE READ CAREFULLY

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer's tests to ensure that our products are safe, effective, and fully satisfactory for the intended end use. Suggestions of use shall not be taken as inducements to infringe any patent.

Dow Corning's sole warranty is that our products will meet the sales specifications in effect at the time of shipment.

Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted.

TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, DOW CORNING SPECIFICALLY DISCLAIMS ANY OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY.

DOW CORNING DISCLAIMS LIABILITY FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

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2014, July 25
Form No. 62-181H-01

Product Information
Silicone
Sealants

DOW CORNING

Dow Corning® 888 Silicone Joint Sealant

FEATURES & BENEFITS

- Can be extruded from -20 to 120°F.
- May be used in joints that are not uniform in width.
- Movement capability 100% extension and 50% compression.
- Low modulus.
- Weather and UV resistant.
- Fuel resistant-short term exposure. Refer to Dow Corning form number 62-207 for more information.
- One component, cold applied, ready-to-use as supplied; dispensed directly from the bulk container into the joint by hand or with an air-powered pump.
- Unprimed adhesion – primer is not required for bonding to Portland cement concrete. For optimum adhesion, the surface must be clean, dry and frost-free.
- Cure time – typically, the sealant will have a skin-over time of one hour or less at standard conditions.

COMPOSITION

- One-part, cold applied, non-sag silicone sealant.

Non-sag silicone joint sealant for Portland cement concrete pavement joints.

APPLICATIONS

- *Dow Corning*® 888 Silicone Joint Sealant can be used for concrete to concrete pavement joints.
- For use in new construction, repair or remedial applications. *Dow Corning* 888 Silicone Joint Sealant may be used to seal joints that are not uniform in width provided the movement capability of the sealant is not exceeded. May also be used in joints with minor spalling.

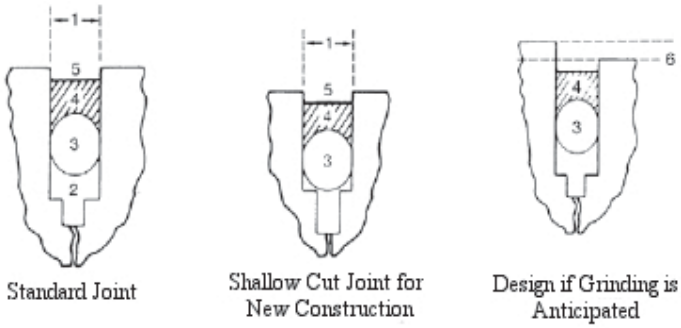
TYPICAL PROPERTIES

Specification Writers: These values are not intended for use in preparing specifications. Please contact your local Dow Corning sales office or your Global Dow Corning Connection before writing specifications on this product.

Test* - Property	Result	D 5893 Requirement
As Supplied		
Color	Gray	
ASTM D 2202, Slump	Pass	<0.30 inches
ASTM C 1183, Extrusion Rate, minimum	72 mL/min	20 mL/min
ASTM C 679, Tack Free Time	Pass	5 hours max
ASTM C 792, Heat Aging	3.05%	10% loss max
ASTM C 661, Durometer Shore A-2	15	25 maximum
ASTM C 792, Specific Gravity	1.48	
Cure Time, ½" x ½"x 2" (73°F, 50% R.H.)	Pass	21 day Cure
As Cured – 21 days at 25°C (77°F) and 50% RH		
Bond, Non-Immersed	Pass	No cracks or separation
Bond, Water Immersed	Pass	No cracks or separation
Bond, Oven Aged	Pass	No cracks or separation
ASTM D 412 (Die C), Ultimate Elongation	≥1000%	600% min
ASTM D 412 (Die C), Tensile Stress @ 150%	28 psi	45 psi max
ASTM C 793, Effects of Accelerate Weathering	Pass	5,000 hours
Resilience	77%	75% min
ASTM C719, Joint Movement Capability, +100/-50 percent, 10 cycles	No failure	

*ASTM: American Society for Testing and Materials.

Figure 1: Good Joint Design



1. Joint width wide enough to accommodate movement. (For additional information on joint width, see papers by Spells and Klosowski, "Silicone Sealants for Use in Concrete Construction," Vol. 1, No. 1, American Concrete Institute, SP-70, 1981; J.B. Cook, "Construction Sealants and Adhesives," Wiley-Interscience, 1970; and J.M. Klosowski, "Sealants in Construction," Marcel Dekker, 1989.).
2. Joint sawed deep enough to allow backer rod/sealant placement and space for pumping of old sealant compounds. NOTE: This applies to standard joints only; void space beneath backer rod in new construction is not needed.
3. Proper backer rod placement to prevent three-sided adhesion.
4. Sealant installed to proper depth and width.
5. Sealant recessed a minimum of 3/8 inch to 1/2 inch (9.53 mm to 12.7 mm) below pavement surface.
6. Depth of lowest slab determines the amount of recess required if grinding is anticipated; once grinding is complete, the sealant will have proper recess below the pavement surface.

DESCRIPTION

Dow Corning 888 Silicone Joint Sealant is a one-part, non-sag silicone material that cures to a low-modulus silicone rubber upon exposure to atmospheric moisture. Can be applied over a wide temperature range.

APPLICABLE STANDARDS

- ASTM D 5893 Type NS
- FAA P-605 for silicone joint sealants
- Meets SS-S-200E (section 4.4.12) Flame Test Requirements
- EN 14187-5 Hydrolysis Test

HOW TO USE

Please refer to the *Dow Corning Silicone Pavement Sealants Installation Guide*, form number 61-507.

HANDLING PRECAUTIONS

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USABLE LIFE AND STORAGE

Keep stored in original, unopened containers at or below 32°C (90°F). Refer to product packaging for "Use By" date. Keep containers tightly closed.

PACKAGING INFORMATION

Dow Corning 888 Silicone Joint Sealant is supplied in 29-fl oz (857-mL) dispos-able plastic cartridges, 4.5-gal (17-L) bulk pails, and 50-gal (189-L) bulk drums.

LIMITATIONS

Dow Corning 888 Silicone Joint Sealant is not recommended for continuous water immersion. It should not be applied in totally confined spaces where the sealant is not exposed to atmospheric moisture.

Not intended for use with asphalt.

The sealant should never be applied to wet or damp asphalt or concrete pavements or installed during inclement weather.

Dow Corning does not promote or warrant the use of *Dow Corning*® brand sealants in applications associated with spill containment areas of any kind.

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

SHIPPING LIMITATIONS

None.

HEALTH AND ENVIRONMENTAL INFORMATION

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DOW CORNING DISCLAIMS LIABILITY FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

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Table 1: Recommended Backer Rod Installation (Shallow Cut)[1]

Measured in Inches						
Joint Width	1/4	3/8	1/2	3/4	1	>1
Recessed Below Surface	3/8	3/8	3/8 to 1/2	3/8 to 1/2	1/2+	Contact
Sealant Thickness	1/4	1/4	1/4	3/8	1/2	Dow Corning
Backer Rod Diameter	3/8	1/2	5/8	7/8	$1^1/_4$	
Total Joint Depth	$1–1^1/_8$	$1^1/_8–1^1/_4$	$1^1/_4–1^3/_8$	$1^5/_8–1^3/_4$	$2^1/_4–2^3/_8$	
Measured in Millimeters						
Joint Width	6	9	13	19	25	
Recessed Below Surface	9	9	9 to 13	9 to 13	13+	
Sealant Thickness	6	6	6	9	13	
Backer Rod Diameter	9	13	16	22	32	
Total Joint Depth	25–29	29–32	32–35	41–45	57–60	

[1]On road surfaces where grinding is planned at a later date, the sealant and backer rod should be installed so that sealant is approximately 3/8 inch (9.35 mm) below the road surface after grinding is complete. An additional small amount should be added to allow for surface imperfections on the bottom and to provide room for old sealant to pump up from below during rehabilitation work in the summer months.

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LESSONS LEARNED

Turnpike Lesson Learned

Entry Date	11/26/2018
Issue Title	Emergency Response Plan
Project	E8Q41, 435165-1-52-01, 435167-1-52-01, Resurface Turnpike (SR91) (MP 178 to 185)
Main Contact:	Glenn E. Bridges, PE
Discipline	Construction
Roadway Spec	
CSI Spec.	DIVISION 01 00 00 GENERAL REQUIREMENTS
Design Index	
Key Word(s)	

Issue Detail:

Within this project we encountered two base failures, causing a lengthy emergency lane closure, which created a traffic backup of 7 miles. Challenges came when we attempted to obtain material supplies of Filter fabric and 57 stone right away.

Resolution:

We developed a plan to have on hand, enough material readily available as a precautionary measure, in case a similar failure occurred on this project. We also made the decision to only use "static mode" compaction of the multiple asphalt lifts.

Lesson Learned:

Turnpike Lesson Learned

Entry Date	Nov 26, 2018
Issue Title	Inputing Information into MAC
Project	E8Q41, 435165-1-52-01, 435167-1-52-01, Resurface Turnpike (SR91) (MP 178 to 185)
Main Contact:	Glenn E Bridges
Discipline	Construction
Roadway Spec	
CSI Spec.	
Design Index	
Key Word(s)	

Issue Detail:

The contractor can input information as part of their QC plan withing MAC and save it, but it cannot be reviewed unless it has been submitted.

Resolution:

Contractor must hit the Submit Button on MAC screen.

Lesson Learned:

Also contractor needs to continue entering information as they receive it in order to keep the process moving forward.

Turnpike Lesson Learned

Entry Date 11/26/2018

Issue Title Development of the Millings Spreadsheet

Project E8Q41, 435165-1-52-01, 435167-1-52-01, Resurface Turnpike (SR91) (MP 178 to 185)

Main Contact: Glenn E Bridges, PE

Discipline Construction

Roadway Spec

CSI Spec.

Design Index

Key Word(s)

Issue Detail:

Development of the Milling Spreadsheet

The project plans had 21 different typical sections for cross slope correction and milling depths. Within these typical sections, the plan notes would refer you to multiple sheets to determine the construction sequence which became extremely time consuming. With the cross referencing of multiple sheets, this also became very confusing for the contractor.

Resolution:

A milling depth/cross slope spreadsheet was developed to give a clear and concise direction to both the CEI staff and the contractor. This took the different typical sections and condensed them into one page. The CEI and the Contractor would get together each night prior to the milling operation to review the spread sheet.

Lesson Learned:

These reviews helped ensure everyone was on the same page, which ultimately increased production and minimized confusion. A milling depth/cross slope "roll plot" should be developed as part of the plans to give a clear and concise direction to both the CEI staff and the Contactor.

Turnpike Lesson Learned

Entry Date	Nov 26, 2018
Issue Title	Rumble Strip Overlay
Project	E8Q41, 435165-1-52-01, 435167-1-52-01, Resurface Turnpike (SR91) (MP 178 to 185)
Main Contact:	Glenn E Bridges, PE
Discipline	Construction
Roadway Spec	
CSI Spec.	
Design Index	
Key Word(s)	

Issue Detail:

Other projects quantify the overlay of the rumble strips by using different pay items. Ranger's project included the asphalt in the 334 pay item with required tracking and testing. The contractor's project manager actually thought they had included the tonnage in their lump sum MOT because that is the way it has always been done in the past. To the contractor's surprise, the CEI had to ask for a Roadway Report showing the tonnage placed to cover the rumble strips under the 334 pay item.

Resolution:

After more review of this issue, we believe all temporary asphalt, including overlaying of rumble strips needs to be included in the contract as a "lump sum Special Detour" item. This recommendation is based on a design memo and current Basis of Estimates procedures.

Lesson Learned:

Including the rumble strip overlay as a lump sum Special Detour will bring consistency to all projects and will keep contractors bidding on the same items. Using the lump sum Special Detour item would keep the asphalt as temporary (no testing and no tracking required) and the designers would not need to summarize the asphalt quantities. The designers needs to identify the following: station to station, the shoulder being covered (inside or outside), ¾" temporary asphalt 2' wide, and the purpose (to cover rumble strips).

Turnpike Lesson Learned

Entry Date	Nov 26, 2018
Issue Title	Box Culvert Spall Repairs
Project	E8Q41, 435165-1-52-01, 435167-1-52-01, Resurface Turnpike (SR91) (MP 178 to 185)
Main Contact:	Glenn E Bridges, PE
Discipline	Construction
Roadway Spec	
CSI Spec.	
Design Index	
Key Word(s)	

Issue Detail:

After de-silting and/or de-watering Contractors located other areas of extensive damage requiring Spall repairs before gunite could be applied.

Resolution:

Lesson Learned:

Culverts should be de-watered or de-silted during the Plans Design process.

Turnpike Lesson Learned

Entry Date	Nov 19, 2018
Issue Title	Base Failures in Deep Milled Surface
Project	E8Q41, 435165-1-52-01, 435167-1-52-01, Resurface Turnpike (SR91) (MP 178 to 185)
Main Contact:	Glenn E Bridges, PE
Discipline	Construction
Roadway Spec	
CSI Spec.	
Design Index	
Key Word(s)	

Issue Detail:

Several Base failures occurred in sections that were deep milled causing several traffic delays as a result of lane closures needed for emergency repairs.

Resolution:

Development of a plan to have on hand, enough material available as a precautionary measure, in case a similar failure occurred on this project. We also made the decision to only use "static mode" compaction of the multiple asphalt lifts. Switching to non-vibratory and allow for a minimum of 6 hours of cooling time before switching traffic. Another suggestion was that if we find yielding material after milling operation was to continue in removing 3 inches at a time until you find firm and non-yielding material. If firm and non-yielding material is not found stop at the 3' mark and place 2' of # 57 stone rapped in filter fabric and 12" of structural asphalt and let cool.

Lesson Learned:

Have enough material on hand in the even of an emergency.

Turnpike Lesson Learned

Entry Date	Nov 26, 2018
Issue Title	Bridge Joint Materials Overrun
Project	E8Q41, 435165-1-52-01, 435167-1-52-01, Resurface Turnpike (SR91) (MP 178 to 185)
Main Contact:	Glenn E Bridges, PE
Discipline	Construction
Roadway Spec	
CSI Spec.	
Design Index	
Key Word(s)	

Issue Detail:

The typical sections for the bridges showed milling 2.25". The asphalt thickness over the existing bridge deck was much thicker. All of the remaining asphalt within the 16" polymer nosing system had to be removed down to the bridge deck. This was due to the polymer not adhering to asphalt. This additional asphalt thickness had to be removed which significantly increasing the cubic footage of polymer.

Resolution:

During design, the EOR should review the asphalt coring reports to determine the existing asphalt thickness over the bridge decks.

Lesson Learned:

The mill depth at the bridge decks should then be established based on the existing asphalt thickness. This is so that we remove as much of the existing asphalt to minimize the polymer material overrun.

Turnpike Lesson Learned

Entry Date	Nov 26, 2018
Issue Title	Hill Blocks View Signs
Project	E8Q41, 435165-1-52-01, 435167-1-52-01, Resurface Turnpike (SR91) (MP 178 to 185)
Main Contact:	Glenn E Bridges, PE
Discipline	Construction
Roadway Spec	
CSI Spec.	
Design Index	
Key Word(s)	

Issue Detail:

Sign shown in plans were installed by Contractor. Turnpike did not approve of these signs and the signs had to be removed.

Resolution:

Exclude these items from plans.

Lesson Learned: