

10/27/2022

**PS= $\emptyset$ <sup>®</sup> Steel Reinforcement  
Splice System  
Installation Manual  
Tech Sales, LLC.**

## Table of Contents

<b>FOREWORD</b> .....	2
<b>SUPPLEMENTAL PRODUCT ACKNOWLEDGEMENT</b> .....	3
<b>COMPONENTS TYPICALLY INCLUDED WITH THE PS=Ø® REINFORCEMENT SPLICE SYSTEM</b> .....	3
<b>IMPORTANT – GENERAL &amp; SAFETY INFORMATION</b> .....	4
<b>OVERVIEW</b> .....	6
<b>PS=Ø® APPLICATIONS</b> .....	8
<b>Figure 1.1 PS=Ø® Relief Joint at Mid-span</b> .....	8
<b>Figure 1.2 PS=Ø® Relief Joint at Mid-span with Stressing Strip</b> .....	9
<b>Figure 1.3 PS=Ø® Relief Joint at 1/5-span</b> .....	10
<b>Figure 1.4 PS=Ø® Relief Joint at 1/5-span with Stressing Strip</b> .....	11
<b>Figure 1.5 PS=Ø® Relief Joint at Wall</b> .....	12
<b>Figure 1.6 PS=Ø® Relief Joint at Wall with Stressing Strip</b> .....	13
<b>Figure 2 PS=Ø® STEEL REINFORCEMENT SPLICE SYSTEM - BODY DETAILS</b> .....	14
<b>Figure 3 PS=Ø® COUPLER OVERALL DIMENSIONS</b> .....	15
<b>Figure 4.1 THREADED BAR INSTALLATION PROCEDURE</b> .....	16
<b>Figure 4.2 Torque for Tapered Threads PS=Ø®</b> .....	16
<b>INSTALLATION PROCEDURE</b> .....	18
<b>Figure 5 PS=Ø® COUPLER INSTALLATION IN POUR #1</b> .....	19
<b>Figure 6.1 PS=Ø® FORM PLACER</b> .....	20
<b>Figure 6.2 Slotted PS=Ø® Installation Continuation End Taped</b> .....	20
<b>PS=Ø® STEEL REINFORCEMENT SPLICE SYSTEM COUPLER GROUTING PROCEDURE</b> .....	23
<b>FINAL JOINT GROUTING PROCEDURE</b> .....	26
<b>PS=Ø® COUPLER AFTER COUPLER &amp; JOINT GROUTING</b> .....	26
<b>Figure 7.1</b> .....	26
<b>PS=Ø® COUPLER AFTER COUPLER &amp; JOINT GROUTING</b> .....	27
<b>Figure 7.2</b> .....	27
<b>PS=Ø® COUPLER AFTER COUPLER &amp; JOINT GROUTING</b> .....	28
<b>Figure 7.3</b> .....	28
<b>PS=Ø® COUPLER AFTER COUPLER &amp; JOINT GROUTING</b> .....	29
<b>Figure 7.4</b> .....	29

## FOREWORD

The Tech Sales, LLC. PS=Ø® Steel Reinforcement Splice System is a ductile cast iron mechanical reinforcement coupler designed to exceed the ACI 318 Building Code Type 1 and Type 2 requirements for developing mechanical reinforcing steel bar splices, in both tension and compression, a minimum of 125% of the specified yield strength and the minimum of the specified ultimate tensile strength (90 ksi for grade 60 ksi) for ASTM A615 grade 60 and A706 grade 60 reinforcing steel specifications. To achieve the design capacity of the PS=Ø® Steel Reinforcement Splice System, it is imperative that all procedures shown in this manual are followed. All references to ACI as part of the IBC are the approved ACI year associated with the year of the approved IBC.

Before beginning any project, the user must read the entire manual and must have a thorough understanding of the installation process. For technical assistance on the Tech Sales, LLC. PS=Ø® Steel Reinforcement Splice System please contact Tech Sales, LLC. representatives.

## **SUPPLEMENTAL PRODUCT ACKNOWLEDGEMENT**

1. MasterFlow® 885 is a grout produced by MASTER BUILDER SOLUTIONS of BASF.
2. MasterFlow® 4316 is a grout produced by MASTER BUILDER SOLUTIONS of BASF.
3. Silcoseal Classic® or Silcoseal Select are liquid bond breakers produced by Nox-Crete®.
4. PVC grout tube/port pipes ¾" diameter or 1" diameter depending on the application.
5. Plastic caps for grout tube/port pipes and later used to cap port holes until grouted.
6. Rebar grommets for sealing rear opening and rebar.
7. Sheetmetal (22 gauge) tag / Form Placer. See drawing (Figure 4.1).
8. Optional plastic V-joint, sheet metal angle, plastic angle or ethafoam closed cell rod for joint grout stop.

## **COMPONENTS TYPICALLY INCLUDED WITH THE PS=Ø® REINFORCMENT SPLICE SYSTEM**

1. PS=Ø® coupler standard or slotted.
2. PVC pipe ¾" diameter or 1" diameter depending on the application.
3. Plastic caps for grout tube/port pipes and later used to cap port holes until grouted.
4. Sheetmetal (22 gauge) tag / form placer.
5. Attachment screws (short and longer) or nails.
6. Rebar rubber grommets for sealing rear opening and rebar at rear PS=Ø® opening.
7. Optional bottom joint closure, plastic V-joint. (On request).
8. Silcoseal Classic® is a liquid bond breaker produced by Nox-Crete.
9. Hand sprayer for bond breaker.
10. MasterFlow® 885 or 4316 are grouts produced by MASTER BUILDER SOLUTIONS of BASF for PS=Ø® and joint fill.
11. Plastic mixing bucket (5 gal).
12. Plastic measuring container.
13. Mixing paddle.
14. 2-inch diameter by 4-inch slump tube.
15. Slump sheet with 6 to 10-inch circles.
16. Funnel (for gravity feed)
17. Optional hand pump (for pump feed).
18. Optional rebar threaded and/or non-threaded.

## IMPORTANT – GENERAL & SAFETY INFORMATION

1. Only Tech Sales, LLC. authorized materials should be used to complete the PS=Ø® Steel Reinforcement Splice System.
  - 1.1 Do not install PS=Ø® Steel Reinforcement Splice System, except as detailed in the procedures outlined in this manual or PS=Ø® approved shop drawings.
  - 1.2 Do not alter materials without written Tech Sales, LLC. authorization.
  - 1.3 Do not substitute materials without written Tech Sales, LLC. authorization.

**Failure to comply with the above may result in hazards to the workers, improper splices or damaged items being connected.**

2. Install the PS=Ø® Steel Reinforcement Splice System in accordance with described procedures.
  - 2.1 Personnel should be properly trained and knowledgeable with the approved installation procedures.
3. Unusual applications or conditions may exist which require a special consideration.
  - 3.1 Consult with Tech Sales, LLC. personnel if field conditions prevent the installation of the PS=Ø® Steel Reinforcement Splice System per the approved installation procedures.
  - 3.2 Provide adequate ventilation where natural airflow is insufficient, this will prevent personnel from breathing concentrations of dust or fumes.
4. MasterFlow® 885 is the required high strength, performance precision grout for use with the PS=Ø® Steel Reinforcement Splice System (In the coupler cavity). Unauthorized use of other grout will void all warranties whether express or implied. Refer to BASF 885 Installation Guide and related documents prior to beginning the work with the grout.
  - 4.1 Avoid breathing concentrations of grout dust as it may be hazardous to health. Provide adequate ventilation where natural airflow is insufficient, this will prevent personnel from breathing concentrations of dust. Refer to MasterFlow® 885 literature for additional health hazards.
  - 4.2 Avoid skin and eye contact with grout. Refer to MasterFlow® 885 literature for care procedures in the event of skin and eye contact with grout.
  - 4.3 Avoid ingestion of grout. Refer to MasterFlow® 885 literature for care procedures in the event of ingestion of grout.
  - 4.4 Storage of MasterFlow® 885 grout should be in a clean, dry, secure area and should be restricted to access by authorized personnel only. Refer to MasterFlow® 885 literature for additional storage requirements.

- 4.5 Discard any torn, wet, or otherwise damaged bags. Discard any bags which may have become wet or where material clumping is observed. Material consistency should be that of free-flowing fine powder.
  - 4.6 Determine the expiration date of each bag of MasterFlow® 885. Refer to lot numbers at the end panel of each bag. Do not use and discard bags of MasterFlow® 885 that have exceeded the manufacture expiration date of 1 year.
  - 4.7 Refer to grout mixing directions located on the bag for proper mixing guidelines or contact Tech Sales, LLC.
  - 4.8 Refer to pump fill or gravity fill installation instructions located in this manual for proper installation guidelines.
  - 4.9 The recommended temperature range for the MasterFlow® 885 is 45° to 90°F (7° to 32°C). Refer to MasterFlow® 885 literature for additional requirements.
  - 4.10 Do not use more than 16.7% water by weight of dry grout. Do not add any additives or admixtures to the MasterFlow® 885.
  - 4.11 Yield-one 55-lbs bag (25 kg) of MasterFlow® 885 grout mixed with approximately 9.2-lbs (4.17 kg) or 1.11 gallons (4.20 L) of potable water provides approximately 0.43 ft.<sup>3</sup> (0.012 m<sup>3</sup>) of grout.
  - 4.12 For 4316 see bag instructions.
5. While working on the job site, observe all federal, state, and local safety regulations.
    - A. Wear hard hat and safety glasses.
    - B. Wear gloves.
    - C. Use respiratory protection.
    - D. Prior to installation of MasterFlow® 885, understand all operating, mixing and safety instructions found this on the MasterFlow® 885 grout bag and in BASF literature.
  6. Deviations from the specified recommendations outlined in this manual will void the Tech Sales, LLC. PS=Ø® Steel Reinforcement Splice System and MasterFlow® 885 warranty. It is the responsibility of the user or users to observe proper grouting conditions (e.g., temperature, water to cement ratio, placing consistency, etc.) and utilize quality workmanship.
  7. Tech Sales, LLC. reserves the right to revise these documents contained herein for any reason including but not limited to conformity with standard established by various agencies, utilization of advances in the state of the technical arts, or reflection of changes in the design of any component, techniques, or procedures described or referred to herein.
  8. To ensure you have the most recent edition of this manual contact Tech Sales, LLC.

## OVERVIEW

The PS= $\emptyset$ <sup>®</sup> Steel Reinforcement Splice System is designed to connect rebar conforming to ASTM A615 grade 60 and ASTM A706 grade 60. The connection incorporates a ductile cast iron coupler with a taper threaded mild reinforcement bar on one end and mild reinforcement bar with a special high early non-shrink cementitious grout, securing the bar in the PS= $\emptyset$ <sup>®</sup> coupler cavity. The coupler is produced as a steel casting, tapered threads are machined using the specified threader equipment. Pre-threaded bars can be provided by most reinforcing bar fabricators. The threads are right hand and tapered to match the accompanying coupler when assembled and in accordance with the PS= $\emptyset$ <sup>®</sup> Steel Reinforcement Splice System recommended procedure, this splice will meet or exceed the ACI 318 and IBC building codes.

The basic installation is for post-tensioned or mild reinforced cast-in-place concrete slabs, where conventional pour-strips are normally used to reduce slab cracking caused by volume change and structural restrains. The pour-strip is typically a four-foot to eight-foot open space (i.e. gap) between and first cast slab and a second cast slab. The two slab castings are structurally joined when the pour-strip is cast with concrete, after about 28 to 56 days. The PS= $\emptyset$ <sup>®</sup> Steel Reinforcement Splice System is meant to reduce the open space between the slab castings to ¼" to 1" after the volume change (i.e. shortening) has occurred.

The following description is for the basic installation where slab #2 is cast directly to the previously cast slab #1, eliminating the traditional pour strip. Similar procedures/installations also apply to other application including 1) a stressing strip application and 2) a wall application or any other similar applications approved by Tech Sales, LLC.

The couplers are typically installed in the first cast slab. The optional plastic V-joint is also installed in the first cast slab. If other joint closures are used, they should be installed, as necessary. Using the PS= $\emptyset$ <sup>®</sup> Steel Reinforcement Splice System, the second cast slab is cast directly to the first cast slab (i.e. no end form/bulkhead for the second cast slab only a de-bonding/bond breaker agent (Silcoseal Select) on the first cast slab). Assembly of the connection is normally done in two separate stages for installation (i.e. threaded rebar in first cast slab and grouted rebar in second cast slab).

### NOTE:

**THE SHORING SUPPORTING THE FIRST AND SECOND CAST SLAB EDGES SHALL NOT BE REMOVED UNTIL AFTER THE PS= $\emptyset$ <sup>®</sup> STEEL REINFORCEMENT SPLICE SYSTEM COUPLERS HAVE BEEN GROUTED WITH MasterFlow<sup>®</sup> 885 AND THE GROUT HAS ACHIEVED A MINIMUM STRENGTH OF 8,000 PSI, UNLESS THE EOR DETERMINES THE SLABS ARE SELF-SUPPORTING. ALSO, AFTER THE JOINT BETWEEN THE FIRST AND SECOND CAST SLABS HAS ALSO BEEN GROUTED WITH AN APPROVED (BY ENGINEER OF RECORD (EOR)) GROUT HAVING A MINIMUM STRENGTH OF THE SPECIFIED STRENGTH OF THE SLABS. ALL FORMING AND SHORING REMOVEAL IS THE RESPONSIBILITY STATED IN THE CONSTRUCTION CONTRACT DOCUMENTS.**

The PS= $\emptyset$ <sup>®</sup> Steel Reinforcement Splice System coupler is installed in the first cast slab. The PS= $\emptyset$ <sup>®</sup> Steel Reinforcement Splice System coupler's threaded end is fastened to the threaded reinforcing

steel bar's male end and is turned into the coupler's female threads to the specified torque. The PS=Ø® Steel Reinforcement Splice System coupler is installed with the rear of the coupler body, (the open end) for the continuation rebar, butted and sealed to the slab form bulkhead using the supplied Form Placer (Figure 4.1) and supplied grommet. This seals the coupler open end to prevent concrete cement paste from entering the coupler body. The threaded rebar is in the direction away from the second slab casting. The PS=Ø® Steel Reinforcement Splice System approved shop drawings will clearly show installation and complete positioning details. The coupler body is held in position by the from placer and the chaired rebar, which is threaded into the front of the PS=Ø® coupler prior to installation.

All reinforcement bars and post-tension tendons shall be fully stabilized prior to casting to prevent any movement during concrete placement. The PS=Ø® coupler shall be installed in a horizontal position.

Prior to the second slab casting, the debonding agent shall be applied to the edge of the concrete of the slab one casting that will be adjacent to the slab two casting. The continuation rebar extending into the second slab two casting shall be fully inserted into the rear of the PS=Ø® coupler, installed in slab one casting.

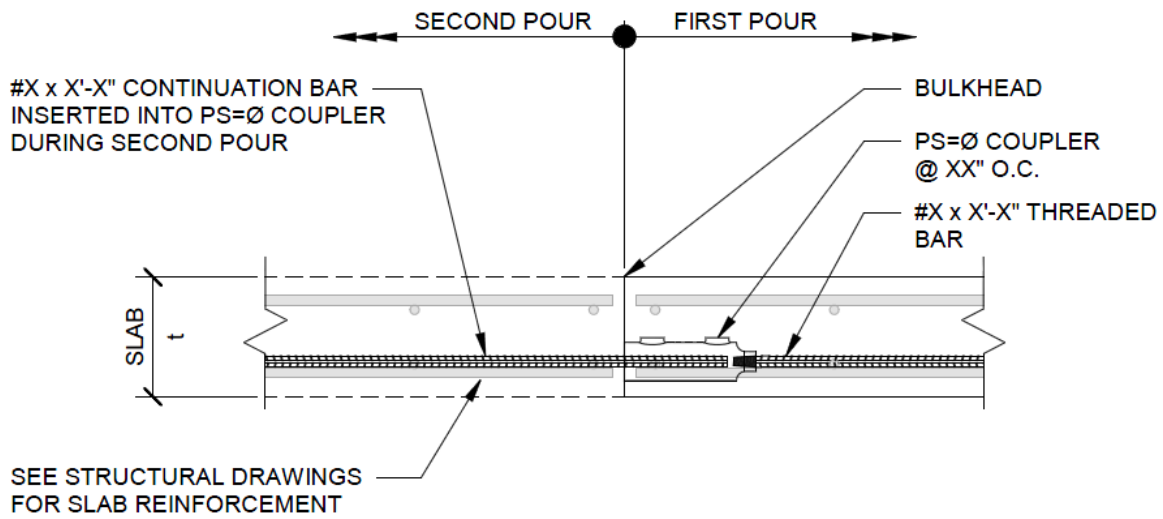
Following the second slab concrete casting and after a waiting period of 28 days or as specified by the Engineer of Record (EOR), the coupler body shall be filled with MasterFlow® 885. The special ready to use grout, MasterFlow® 885, is designed to maintain its fluidity for an extended period while achieving high early strength. MasterFlow® 885, at 72°F (22°C), can develop a compressive strength up to 5,000 PSI (34 MPa) after 1 day, 6,000 PSI (41 MPa) after 3 days, 8,000 PSI (55 MPa) after 7 days, and 10,000 PSI (69 MPa) after 28 days. These times may vary based on field temperature conditions. Refer to the MasterFlow® 885 temperature charts for additional information. To ensure a proper connection, the addition of water must be maintained in strict accordance with MasterFlow® 885 recommended procedures. The temperature of the grout during placing and curing must be maintained within the recommended guidelines. The application or use of grout other than MasterFlow® 885 without written approval by Tech Sales, LLC., voids all warranties both expressed and implied.

Following the grouting the PS=Ø® Steel Reinforcement Splice System couplers, the construction joint shall be grouted with an approved grout of the same or greater strength than the slab concrete. The joint must be formed and supported from below with appropriate flat forming material and appropriately supported by shoring posts or another method (i.e. plastic angle).

There is an optional plastic V-joint available on request. This plastic joint does provide for a joint grout stop without the need of forming from below. This joint is shown in figure 4.



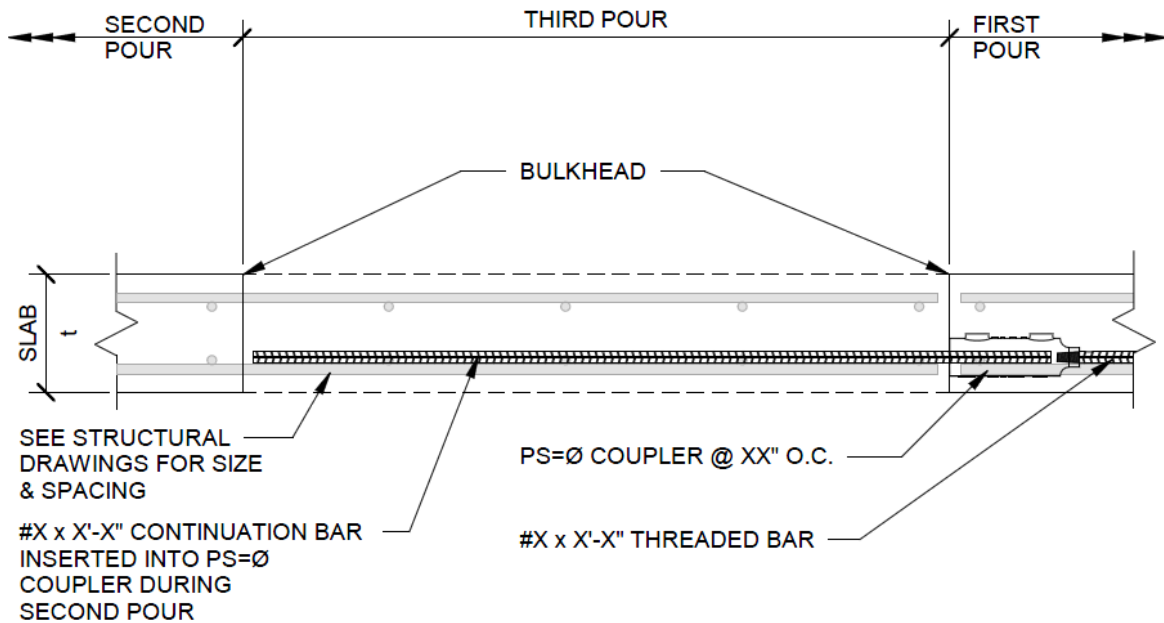
## PS=Ø® APPLICATIONS



### NOTES:

1. APPLY NOX-CRETE SILCOSEAL CLASSIC BOND-BREAKER BETWEEN FIRST AND SECOND POUR.
2. THE PS=Ø RELIEF JOINT TO REMAIN OPEN FOR XX DAYS.
3. AFTER THE TIME PERIOD SPECIFIED ABOVE, THE PS=Ø COUPLERS AND JOINT TO BE GROUTED WITH BASF MASTERFLOW 885 HIGH-PRECISION, NONSHRINK METALLIC-AGGERATE GROUT.
4. SEE PS=Ø MANUFACTURE DATA FOR MORE INFORMATION.

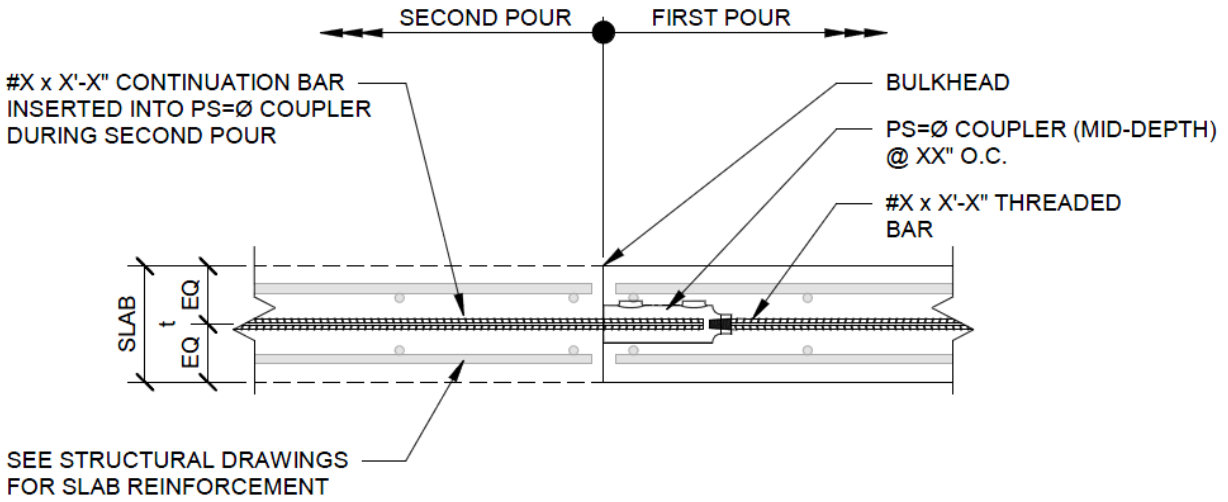
**Figure 1.1 PS=Ø® Relief Joint at Mid-span**



NOTES:

1. APPLY NOX-CRETE SILCOSEAL CLASSIC BOND-BREAKER BETWEEN FIRST AND THIRD POUR.
2. THE PS=Ø RELIEF JOINT TO REMAIN OPEN FOR XX DAYS.
3. AFTER THE TIME PERIOD SPECIFIED ABOVE, THE PS=Ø COUPLERS AND JOINT TO BE GROUTED WITH BASF MASTERFLOW 885 HIGH-PRECISION, NONSHRINK METALLIC-AGGERATE GROUT.
4. SEE PS=Ø MANUFACTURE DATA FOR MORE INFORMATION.

**Figure 1.2 PS=Ø<sup>®</sup> Relief Joint at Mid-span with Stressing Strip**

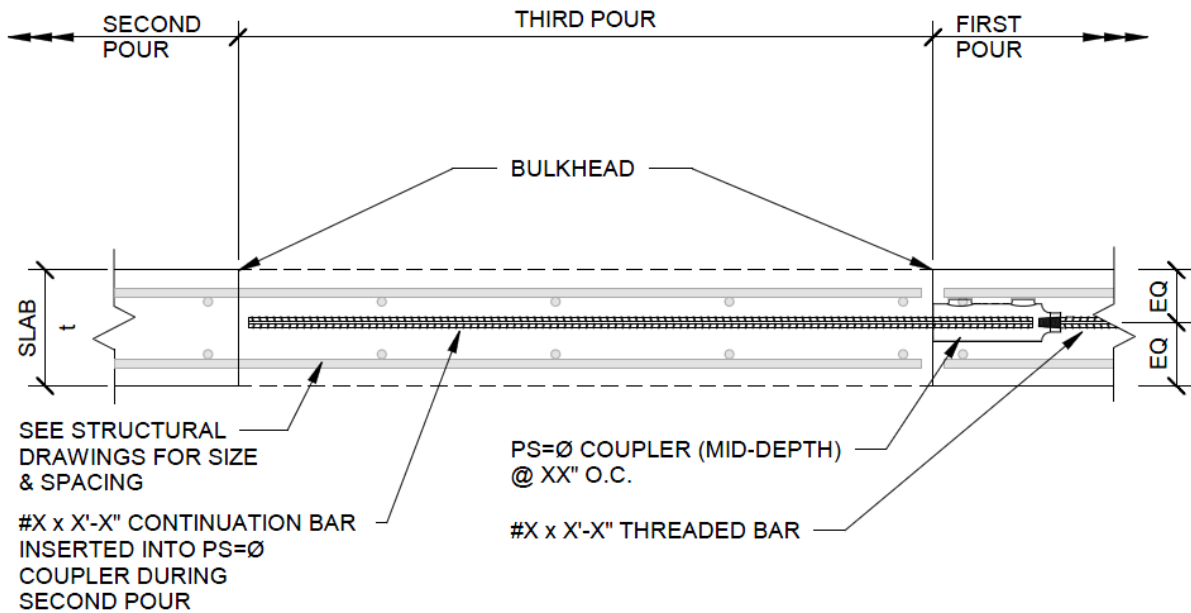


**NOTES:**

1. APPLY NOX-CRETE SILCOSEAL CLASSIC BOND-BREAKER BETWEEN FIRST AND SECOND POUR.
2. THE PS=Ø RELIEF JOINT TO REMAIN OPEN FOR XX DAYS.
3. AFTER THE TIME PERIOD SPECIFIED ABOVE, THE PS=Ø COUPLERS AND JOINT TO BE GROUTED WITH BASF MASTERFLOW 885 HIGH-PRECISION, NONSHRINK METALLIC-AGGERATE GROUT.
4. SEE PS=Ø MANUFACTURE DATA FOR MORE INFORMATION.

**Figure 1.3 PS=Ø<sup>®</sup> Relief Joint at 1/5-span**

**In this application care should be taken when placing the continuation rebar to ensure the rebar rests on the bottom of coupler rear hole when the coupler is located is the short cantilever. In case where the coupler is on the opposite side the rebar should be located at the top of the rear opening.**

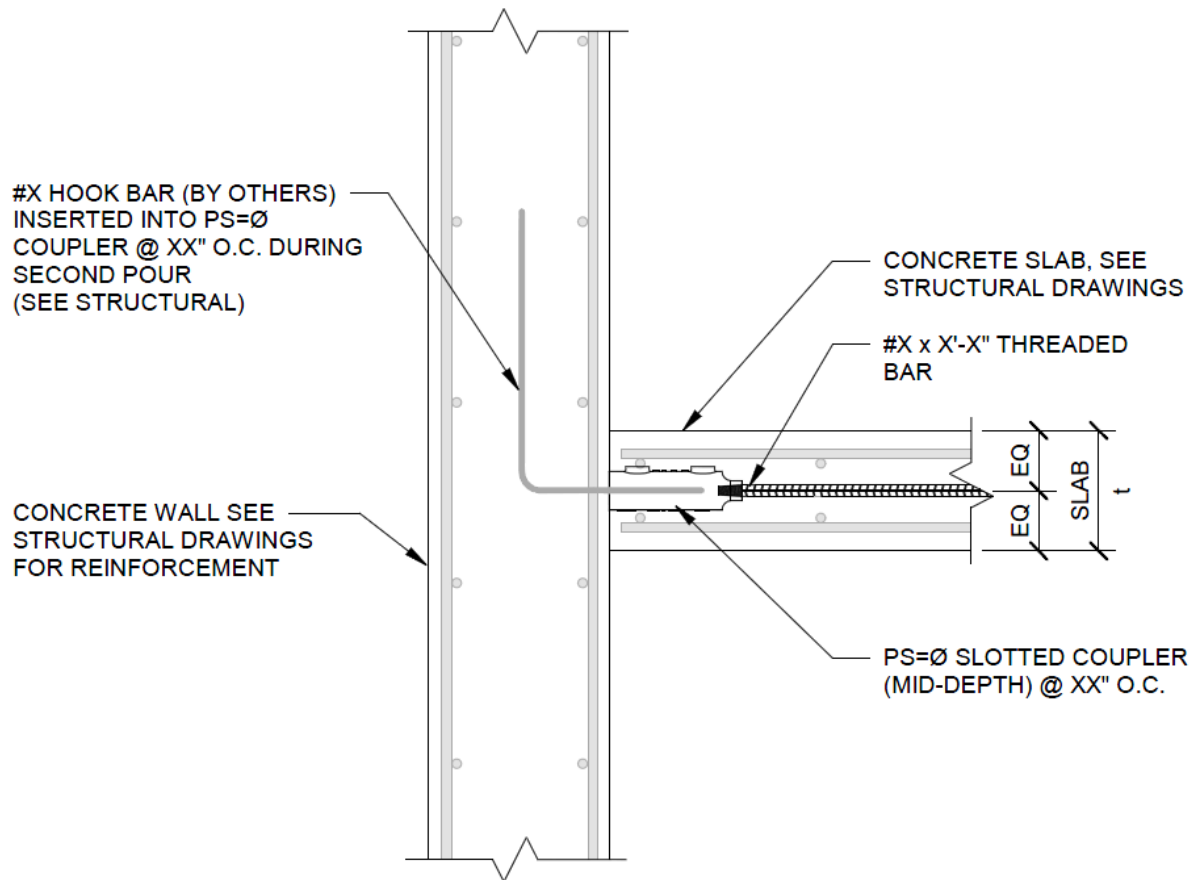


NOTES:

1. APPLY NOX-CRETE SILCOSEAL CLASSIC BOND-BREAKER BETWEEN FIRST AND THIRD POUR.
2. THE PS=Ø RELIEF JOINT TO REMAIN OPEN FOR XX DAYS.
3. AFTER THE TIME PERIOD SPECIFIED ABOVE, THE PS=Ø COUPLERS AND JOINT TO BE GROUTED WITH BASF MASTERFLOW 885 HIGH-PRECISION, NONSHRINK METALLIC-AGGERATE GROUT.
4. SEE PS=Ø MANUFACTURE DATA FOR MORE INFORMATION.

**Figure 1.4 PS=Ø<sup>®</sup> Relief Joint at 1/5-span with Stressing Strip**

In this application care should be taken when placing the continuation rebar to ensure the rebar rests on the bottom of coupler rear hole when the coupler is located is the short cantilever. In case where the coupler is on the opposite side the rebar should be located at the top of the rear opening.

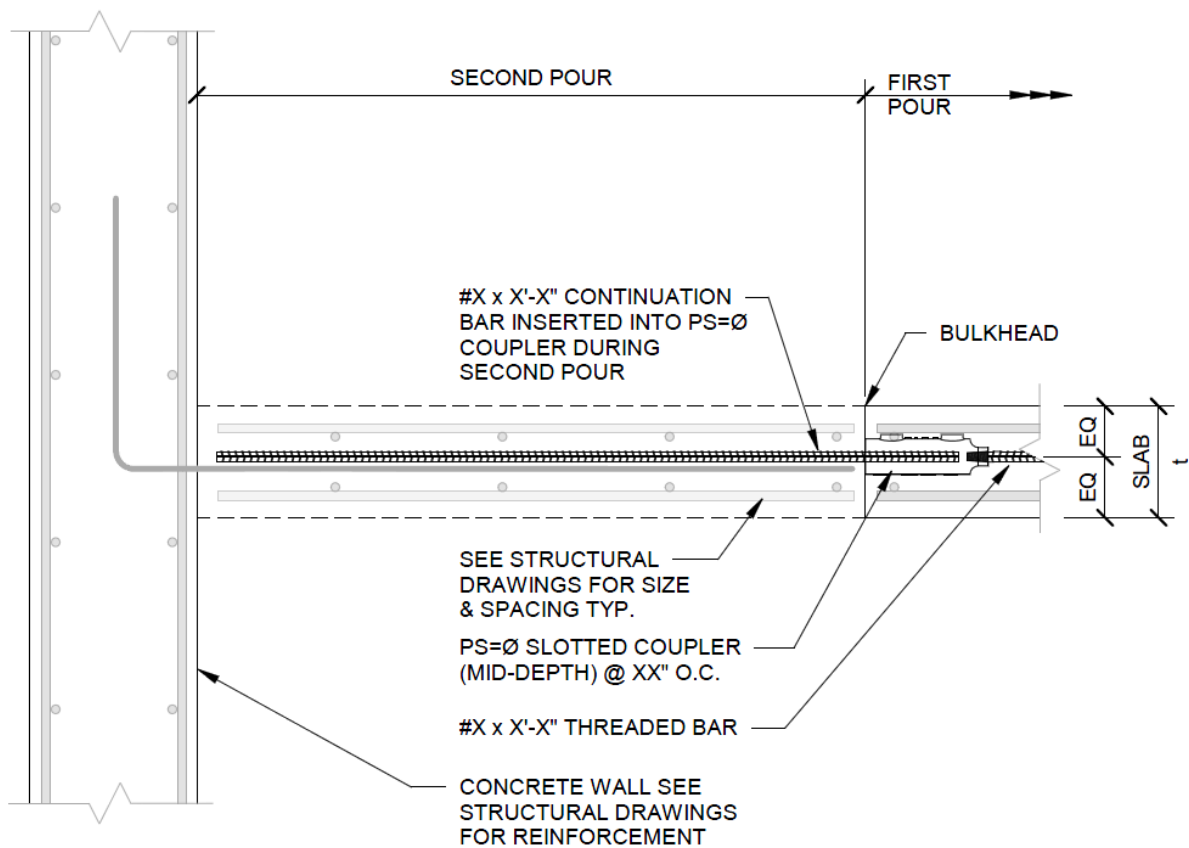


**NOTES:**

1. APPLY NOX-CRETE SILCOSEAL CLASSIC BOND-BREAKER BETWEEN SLAB AND WALL POURS.
2. THE PS=Ø RELIEF JOINT TO REMAIN OPEN FOR XX DAYS.
3. AFTER THE TIME PERIOD SPECIFIED ABOVE, THE PS=Ø COUPLERS AND JOINT TO BE GROUTED WITH BASF MASTERFLOW 885 HIGH-PRECISION, NONSHRINK METALLIC-AGGERATE GROUT.
4. SEE PS=Ø MANUFACTURE DATA FOR MORE INFORMATION.

**Figure 1.5 PS=Ø® Relief Joint at Wall**

**In this application care should be taken when placing the coupler to the wall rebar to ensure the coupler rests on the top of the rebar and if any rebar is visible between the wall and the coupler that length should be debonded with tape or similar.**



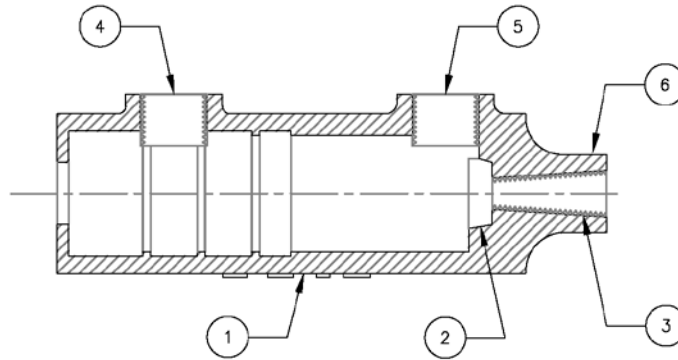
NOTES:

1. APPLY NOX-CRETE SILCOSEAL CLASSIC BOND-BREAKER BETWEEN FIRST AND SECOND POUR.
2. THE PS=Ø RELIEF JOINT TO REMAIN OPEN FOR XX DAYS.
3. AFTER THE TIME PERIOD SPECIFIED ABOVE, THE PS=Ø COUPLERS AND JOINT TO BE GROUTED WITH BASF MASTERFLOW 885 HIGH-PRECISION, NONSHRINK METALLIC-AGGERATE GROUT.
4. SEE PS=Ø MANUFACTURE DATA FOR MORE INFORMATION.

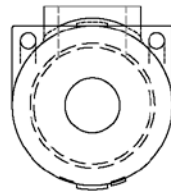
**Figure 1.6 PS=Ø<sup>®</sup> Relief Joint at Wall with Stressing Strip**

In this application care should be taken when placing the continuation rebar to ensure the rebar rests on the top of coupler rear hole.

PS= $\emptyset$ <sup>®</sup>

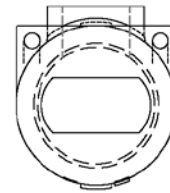


ITEM #	DESCRIPTION	STANDARD ITEM INCLUDED
1	PS= $\emptyset$ <sup>®</sup> COUPLER	✓
2	ALIGNMENT RECESS	✓
3	TAPERED THREADS	✓
4	3/4"∅-1"∅ NPT THREADED INLET	✓
5	3/4"∅-1"∅ NPT THREADED OUTLET	✓
6	STANDARD HEX END	✓



Standard Coupler

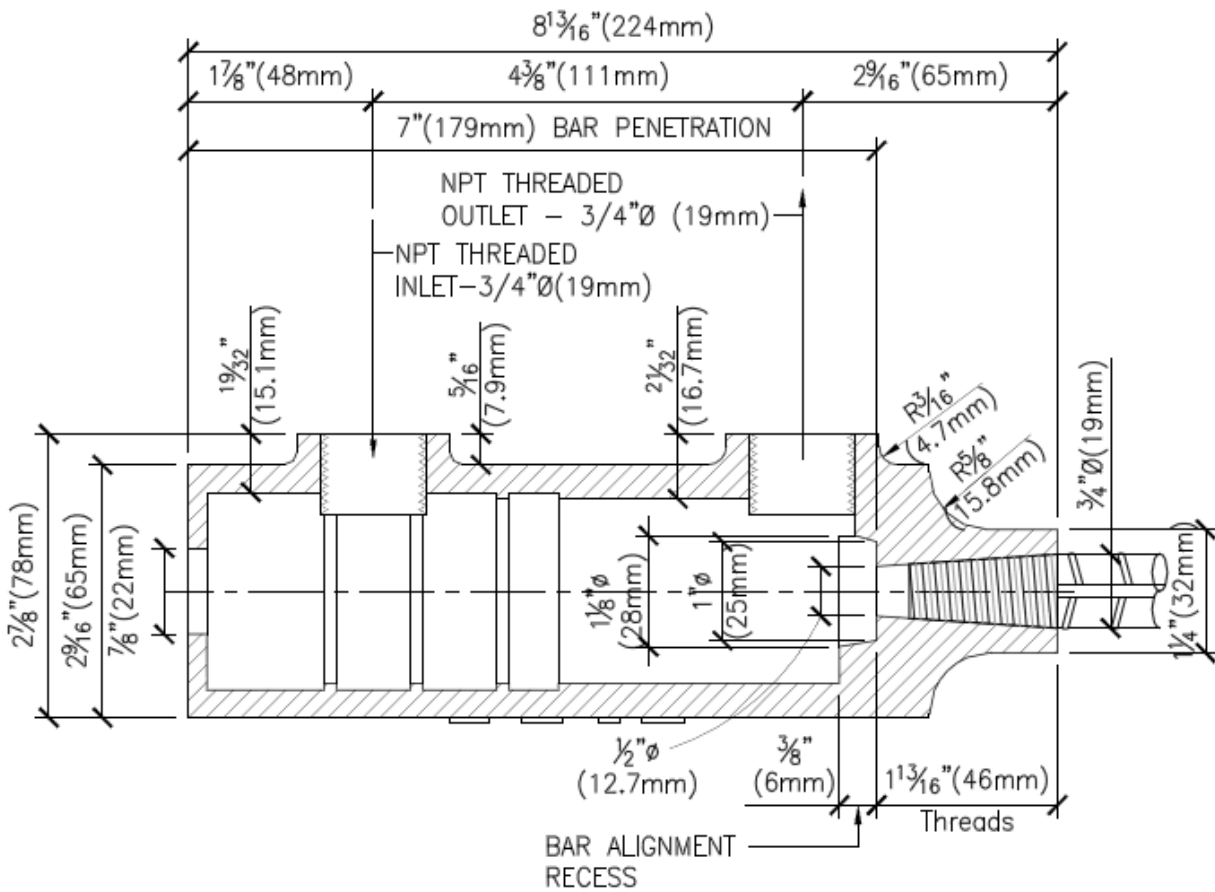
End view of coupler



Slotted Coupler  
(Lateral Movement)

**Figure 2 PS= $\emptyset$ <sup>®</sup> STEEL REINFORCEMENT SPLICE SYSTEM - BODY DETAILS**

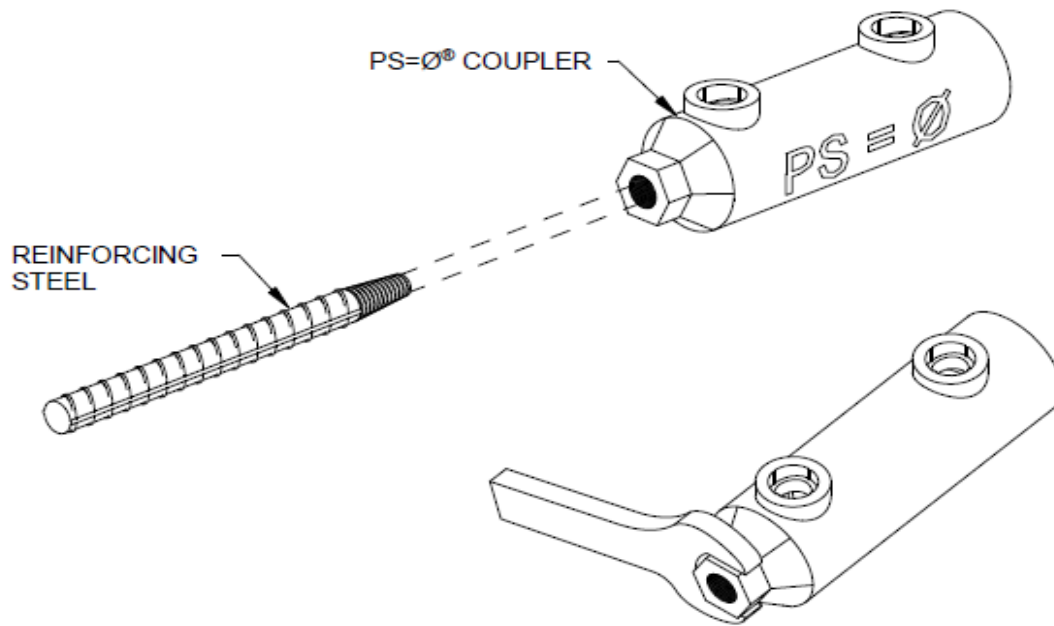
PS=Ø<sup>®</sup> COUPLER DIMENSIONS



PS=Ø<sup>®</sup> - LONGITUDINAL SECTION

Figure 3 PS=Ø<sup>®</sup> COUPLER OVERALL DIMENSIONS





#### A. ATTACHING COUPLER TO REBAR

1. EXAMINE REINFORCING THREADED BAR END TO ASSURE IT IS CLEAN & NOT DAMAGED. CLEAN AS REQUIRED WITH A WIRE BRUSH.
2. INSTALL REINFORCING TAPERED THREADED BAR END INTO PS=Ø® COUPLER BY TURNING WITH PIPE WRENCH UNTIL TIGHT - APPROXIMATELY 4 1/2 TURNS.
3. WHILE HOLDING THE BAR STATIONARY WITH PIPE WRENCH, ROTATE THE COUPLER WITH A STANDARD TORQUE WRENCH UNTIL THE CONNECTION IS FULLY TIGHTENED & ACHIEVES 130 ft-lb (176 N-m).

**Figure 4.1 THREADED BAR INSTALLATION PROCEDURE**

Bars Size	Torque
#6	130 ft-lbs
#7	160 ft-lbs
#8	200 ft-lbs

**Figure 4.2 Torque for Tapered Threads PS=Ø®**

Confirm which couple thread you received on the job site. The rebar thread must be matched to the appropriate coupler thread.

**Taper Threaded Rebar:**

The above torque table shall be used to set the appropriate torque for taper threaded rebar. The taper thread is 6°. The hole at the bottom of the threads is smaller than the top (i.e. end of coupler). When tight the end of the rebar threads is even with the end of the coupler with no perimeter gap.

**Parallel Threaded Rebar:**

The parallel threaded rebar uses the National Course Thread. The #1 item above shall be used regarding cleaning or damaged threads. The parallel thread simply must be hand tightened. It is recommended that a pair of 2-foot handle pipe wrenches be used to snug the rebar to the coupler with a reasonable effort as the last rebar threads engage the coupler threads.

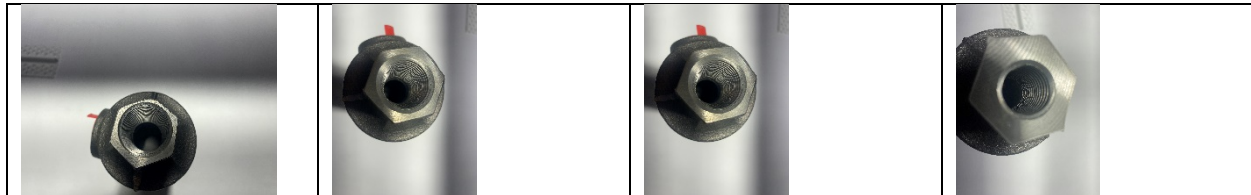
**Identifying the threads:**

**Tapered #8**

**Tapered #7**

**Tapered #6**

**Straight #6**



T#8    T#7    T#6    S#6



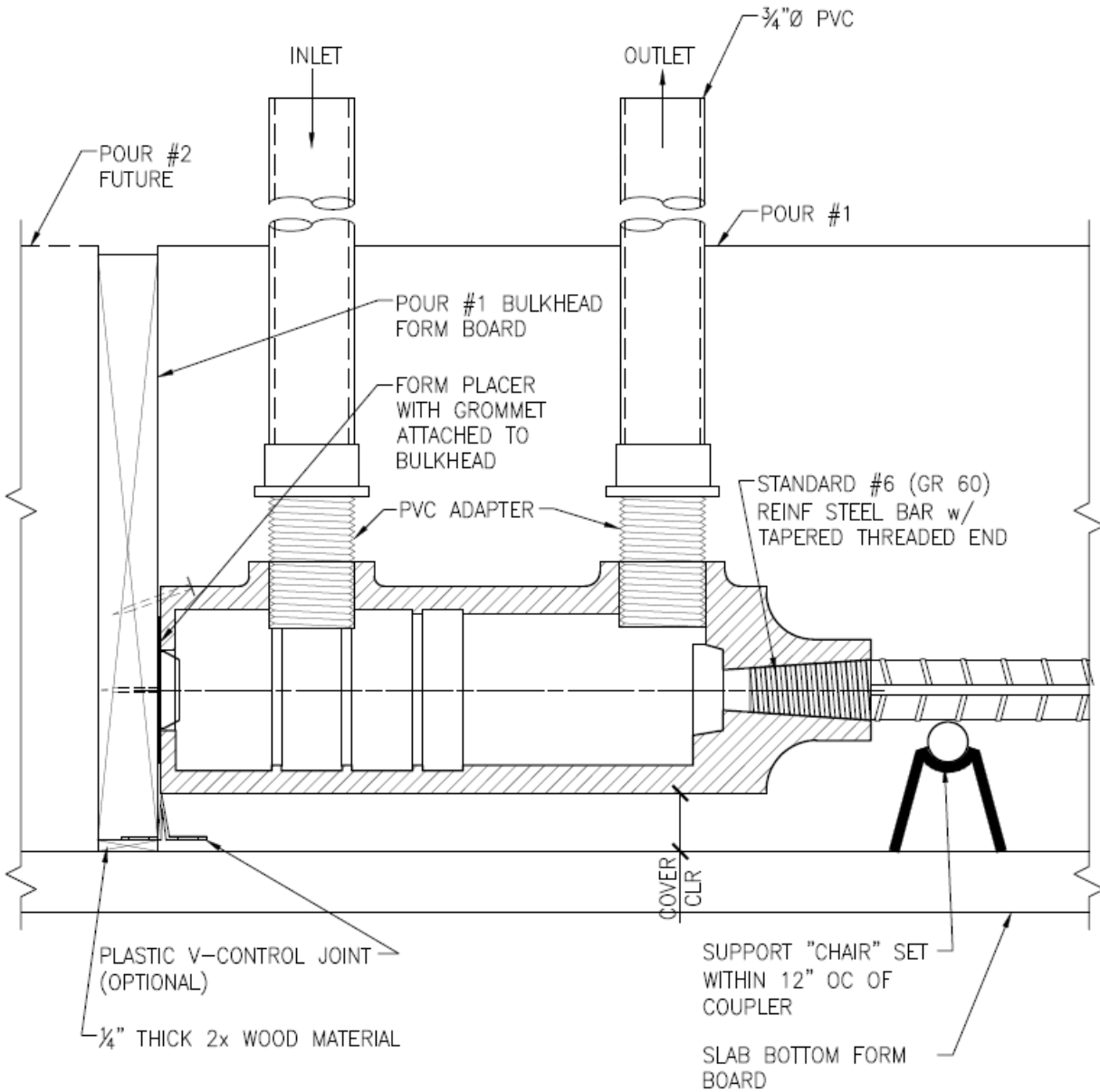
**Figure 4.4 PS=Ø® Threads Including Rebar**

## INSTALLATION PROCEDURE

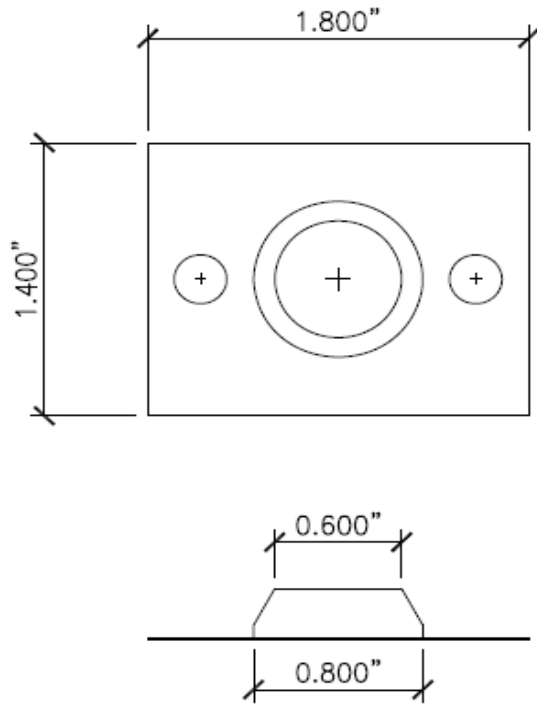
### First Cast Slab:

The coupler shall be secured to the threaded rebar to be installed in the first cast slab. The positioning of the couplers shall be in accordance with the approved PS=Ø® shop drawings. The coupler is to be securely supported by the Form Placer and the chaired threaded rebar to prevent any movement during concrete placement. The form placer is secured to the form bulkhead by 2 small screws. The proper sized grommet is positioned in the rear opening of the PS=Ø®. Next the PS=Ø® coupler is fitted to the Form Placer with grout ports positioned up, then screwed to form bulkhead through the 2 - ¼-inch holes in tabs at the rear of the PS=Ø® coupler with slightly longer screws. The supplied PVC pipes, either threaded or unthreaded PVC with threaded adapters is installed. These PVC pipes either 1" or ¾" matching the PS=Ø® coupler threads are then capped with the supplied plastic caps to prevent concrete from entering the coupler during the concrete slab casting. The two PVC port pipes shall protrude above the top of concrete level a minimum of 4". These PVC pipes are cut off at the top of the slab at any time.

PS=Ø® COUPLER SET IN POUR #1 w/  
PVC INLET & OUTLET PIPE



**Figure 5 PS=Ø® COUPLER INSTALLATION IN POUR #1  
Low Slab Location (mid-span)**



**Figure 6.1 PS=Ø® FORM PLACER**



**Figure 6.2 Slotted PS=Ø® Installation Continuation End Taped  
Duct tape with X-cuts**

Install all the reinforcement bars and post-tension tendons (if a PT slab) per the Contract Documents for the first cast slab.

To avoid intrusion of cement slurry/paste into the coupler, it is important that the following areas be inspected prior to the slab that contains couplers:

1. Check to see that the PS= $\emptyset$ <sup>®</sup> Steel Reinforcement Splice System thread rebar is properly installed and sufficiently tight.
2. Make sure the inlet and outlet ports are sealed to the coupler. Make sure the tubes are capped to prevent entry of concrete or concrete slurry during the slab casting.
3. Check to see that the PS= $\emptyset$ <sup>®</sup> coupler is sufficiently sealed to prevent entry of concrete slurry. Often duct tape is adhered over the rear hole of the PS= $\emptyset$ <sup>®</sup> couple prior to attaching the PS= $\emptyset$ <sup>®</sup> coupler to the tag attached to the form.
4. Check that the PS= $\emptyset$ <sup>®</sup> coupler is perpendicular to the form and PVC tubes are near vertical and perpendicular to the bottom of the slab form.
5. Make sure that the dimensions meet those defined in this instruction manual or project plans or PS= $\emptyset$ <sup>®</sup> approved shop drawings. **Also, if any PS= $\emptyset$ <sup>®</sup> couplers are installed in the second cast slab be sure any exposed rebar between the first cast slab and the coupler is de-bonded.**

**NOTE: When casting the concrete into the slab which contains the coupler, make sure not to disturb the coupler and/or any of the PVC port pipes as this may cause the pipe(s) to slip out of the inlet ports. If concrete or concrete slurry enter the assembly, the coupler may be rendered useless and require replacement.**

When all other requirements of the Contract Documents and the supporting placement drawings are complete and inspected the casting of concrete can be completed for the first cast slab.

Once enough hardening/curing of the first slab occurs such that bulkhead form removal can be achieved without damage to the concrete, the Form Placer should be removed leaving the rubber grommet in the PS= $\emptyset$ <sup>®</sup>. Remove the end form and visually inspect any the rear coupler opening. If the rubber grommet is not present, replace it when the rebar for the second casting slab is installed into the coupler cavity. During this process make sure that the rebar remains clean without concrete slurry or debris.

Second Cast Slab:

The continuation rebar is installed fully into the coupler first cast slab in the first casting and secured with the second cast slab rebar. Be sure the grommet sealing the rebar to the coupler is installed.

**Note: PS= $\emptyset$ <sup>®</sup> used as temporary dowel at about a 1/5 span.**

In case where the PS= $\emptyset$ <sup>®</sup> is used as a dowel and the PS= $\emptyset$ <sup>®</sup> is in the short cantilever part of the span (i.e. normally 1/5 span), care should be taken to be sure the continuation rebar is position at the bottom of the rear open of the PS= $\emptyset$ <sup>®</sup> (i.e. rebar should be in direct contact with the bottom of the rear hole of the PS= $\emptyset$ <sup>®</sup>). This is to minimize any free differential vertical movement between the slab of pour #1 the slab of pour #2.

Further, the next adjacent full span to the 1/5 span cantilever should be sufficiently shored for dead/self and construction loads to minimize the shorter 1/5 span cantilever from deflecting upward prior to the load of the 4/5 span being applied to short 1/5 span cantilever. Once 4/5 span is supported by the 1/5 span, the final dead/self-load equilibrium is achieved. Once the second slab/pour is stressed and concrete slabs are close (i.e. no stressing strip) dowel action of PS=Ø® is available, strength should be checked by the EOR before form removal.

The previous note is for the contractor and the EOR to fully resolve as to form removal time and a safe shoring requirement both during construction and final plan to fully improve the final concrete product and schedule.

Install all the reinforcement bars and post-tension tendons per the Contract Documents for the second slab casting.

Apply the bond breaker to the face of the first cast slab within two to four hours prior to casting the second slab. Follow Nox-Crete instructions After all other requirements of the placing drawings are complete and inspected the casting of concrete can be completed for the second cast slab. Prevent contaminants from entering the clean PS=Ø® coupler during slab casting. Check that the tubes are sealed by capping.

# PS=Ø® STEEL REINFORCEMENT SPLICE SYSTEM COUPLER GROUTING PROCEDURE

Estimated number of splices per 55 lb. (25 kg) bag is about 20 each. This can vary due to slab depth.

The value given above is an estimate only, assuming maximum rebar imbedded in the coupler. Actual value will vary depending upon jobsite practice and conditions.

It is important to determine the amount of grout for an application to consider adding an additional 10% to account for scrap or waste material.

For all fill applications, include the volume of the inlet and outlet ports in the volume determination. These volumes become significant in applications for a coupler located near the bottom of a thicker slab where the inlet and outlet ports become longer.

## 1. Preparation

### 1.1 Materials and equipment needed for proper use and installation:

To permit rapid and continuous work with MasterFlow® 885 it is recommended that all necessary tools and materials be as near to the work area as possible. See additional equipment list for pump fill installation.

- Potable water
- Flow monitoring use either of the following:
  - Flow monitoring equipment per ASTM C939
  - 2" diameter by 4" plastic pipe with an 8" diameter template
- Paddle/propeller mixing blade
- Mixing bucket (5 gallon)
- Appropriate measuring containers
- Towel
- Funnel
- Thermometer, preferably digital for hot and cold weather
- Commercial/hand grout pump or funnel for gravity feed
- 2" (55 mm) cube test molds per ASTM C109

### 1.2 Preparation for grout:

Before working with MasterFlow® 885, remove all debris, oil, dirt, and moisture from the slab areas and sleeves/couplers to be filled with grout. If for any reason water fills a coupler use high pressure compressed air to remove. Further, use a water absorbent material (i.e. cotton cloth) inserted into the ports down to the bottom of the coupler to verify the couple body is dry. The flowable grout will force any remaining minor water from the coupler body. To help ensure a quality structural connection, it is important to provide a routine quality control process during the mixing and installation of the grout. Refer to relevant sections of this



instruction manual or contact Tech Sales, LLC. and observe all warnings and cautions noted.

**Note: For a list of suitable equipment and accessories see the manual or contact Tech Sales, LLC.**

1.3 Grout temperatures:

The standard (ambient temperature of the grout) working temperature range for installation of the PS=Ø® Steel Reinforcement Splice System sleeve reinforcing bar and MasterFlow® 885 is 45°F to 90°F (7°C to 32°C) Do not let grout temperature fall below 45°F (7°C) until after final set, precautions must be taken to keep MasterFlow® 885 from freezing (32°F; 0°C) during initial setting as it will result in insufficient strength. Refer to cold-weather instructions in this manual or contact BASF.

1.4 MasterFlow® 885 has a shelf life of 12 months from the date of manufacture as noted on each bag. The grout is to be stored in a cool, dry, indoor environment to ensure shelf life and physical properties. All products that are damaged, exposed to wet conditions, or with a manufacturers date exceeding 12 months should be discarded. The manufacturing date can be referenced on each bag of MasterFlow® 885.

2. MasterFlow® 885 mixing instructions

2.1 Mixing standard temperatures, 45°F to 90°F (7°C to 32°C)

2.2 By using the minimum amount of water to provide the desired workability, maximum strength will be achieved. Whenever possible mix the grout with a mortar mixer or an electric drill with paddles such as ICRI 320.5 type A, D, E, S, G, or H. Put the measured amount of potable water into the mixer bucket and grout then mix until uniform consistency is obtained.

Note: The water required may vary due to mixing efficiency, temperature, and other variables.

- Place estimated water (use potable water only) into the mixer/bucket then slowly add the grout for a fluid consistency. Start with 9.2-lbs (4 kg) or 1.1 gallons (4.2 L) of potable water in the mixer/bucket, add 55-lbs bag (25 kg) of MasterFlow® 885 grout mix, then adding 4 ounces of water at a time, test the grout fluidity until proper fluidity is achieved.
- Flow monitoring use either of the following:
  - The water demand will depend on mixing efficiency, material, and ambient temperature conditions. Adjust the water to achieve the desired flow. Recommended flow is 25–30 seconds using the ASTM C 939 flow common method. Use a minimum amount of water required to achieve the necessary placement consistency.
  - 2" diameter by 4" plastic pipe with a 10" diameter template. Fill 4" high pipe in the middle of the 10" diameter circle template. Ensure the grout

flow does not exceed the 6" circle for good flow and acceptable compressive strength.

- Mix grout for minimum of five (5) minutes after all material and water is in the mixer. Use mechanical mixers only.
- Do not mix more grout than can be placed in approximately 30 minutes.
- Transport by bucket to the couplers being grouted, minimize the transporting distance.
- Do not re-temper grout by adding water and mixing after it stiffens.
- Do not add plasticizers, accelerators, retarders, or other additives.

### 3. Hot and cold weather/winter grouting instructions

3.1 MasterFlow® 885 is designed to be used with the Tech Sales, LLC. PS=Ø® Steel Reinforcement Splice System. Unauthorized use of other grout will void the warranty, whether expressed or implied. The ambient initial temperature of the grout should be in the range of 45° to 90°F (7° to 32°C) for both mixing and placing. For precision grouting, store in mixed grout to produce the desired mix – grout temperature. If bag material is hot, use cold water, and if material is cold, use warm water to achieve a mixing product temperature as close to 70°F (21°C) as possible. If temperature extremes are anticipated or special place and procedures are planned, contact your local Tech Sales, LLC. representative for assistance.

#### 3.2 Cold weather/winter concreting/grouting:

When grouting below 55°F (13°C), Tech Sales, LLC. recommends following ACI 306 cold weather instructions. This involves heating the slabs 1) to be sure any ice in the PS=Ø® has melted and 2) to maintain a 55°F (13°C) to allow the grout to cure and gain strength. Slab temperature should be verified by thermometer placed on top surface and on the bottom surfaces of the slab, to confirm that the temperatures are adequate for grouting (i.e. melting any ice) and curing of the grout in the coupler. Only the slab surrounding the coupler needs to be at the curing temperature. Typically, blankets can be applied to the top surface and the curtain off area to contain the heat from the bottom surface will suffice.

#### 3.3 Hot weather concreting/grouting:

When grouting above 90°F (32°C) referred to IBC 2015 and referenced ACI 318, ACI 305R and ACI 301. Slab temperature should be verified by thermometer placed on top surface and on the bottom surfaces of the slab, to confirm that the temperatures are adequate for curing of the grout in the coupler. Water or ice may be used to reduce the temperature of the slab containing the coupler to achieve a desired temperature. Use cold water to mix with the grout, also keep the dry grout in cooler temperatures.

## FINAL JOINT GROUTING PROCEDURE

### Joint Grouting:

The final joint is grouted with MasterFlow® 885. The mixing instructions outlined and detailed in the previous section apply. Other BASF grouts may be used for the joint provided the strength is equal to or greater than the concrete slabs adjacent to the joint and approved by the EOR.

### PS=Ø® COUPLER AFTER COUPLER & JOINT GROUTING

#### Option 1

PS=Ø® COUPLER SET IN POUR #1 w/  
CONCRETE GROUT SLEEVES

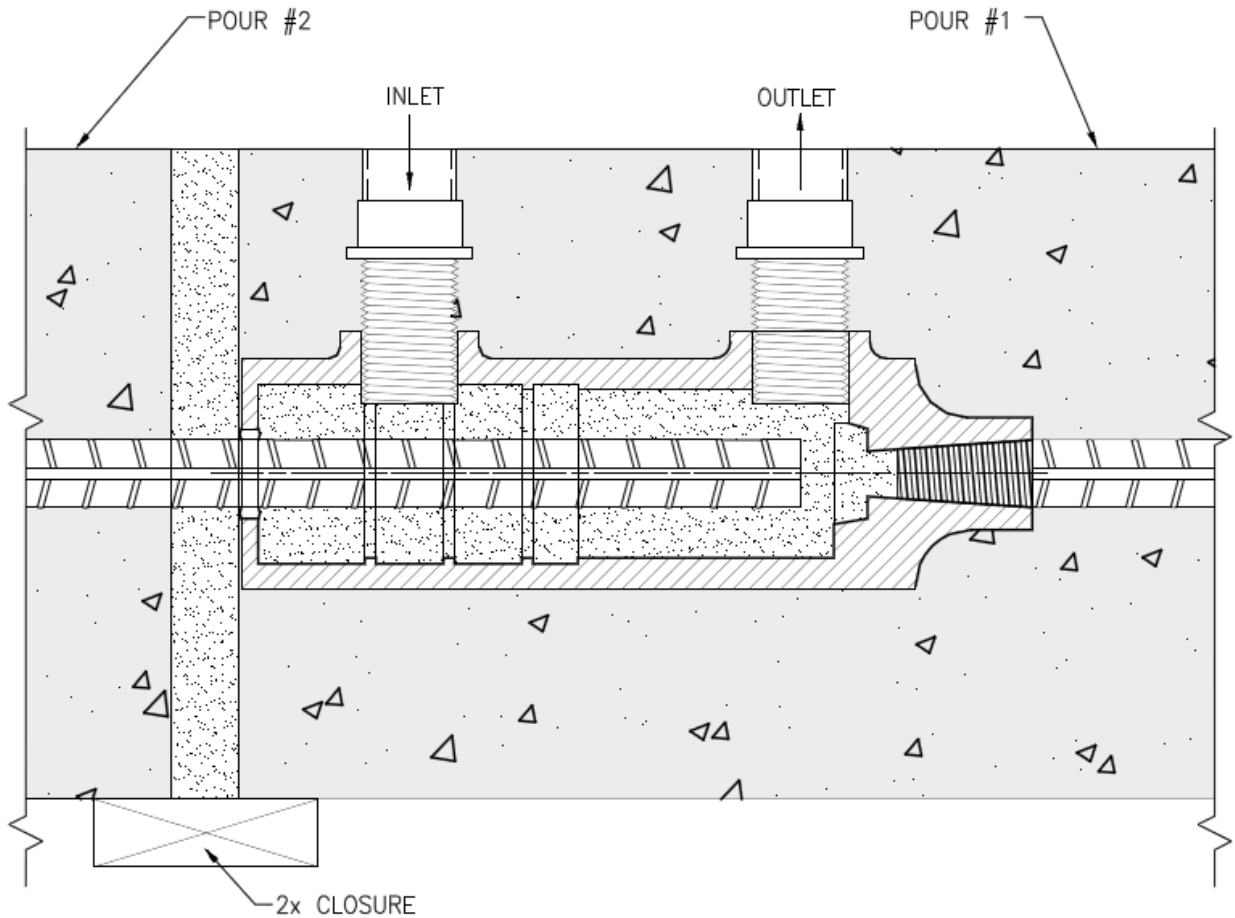
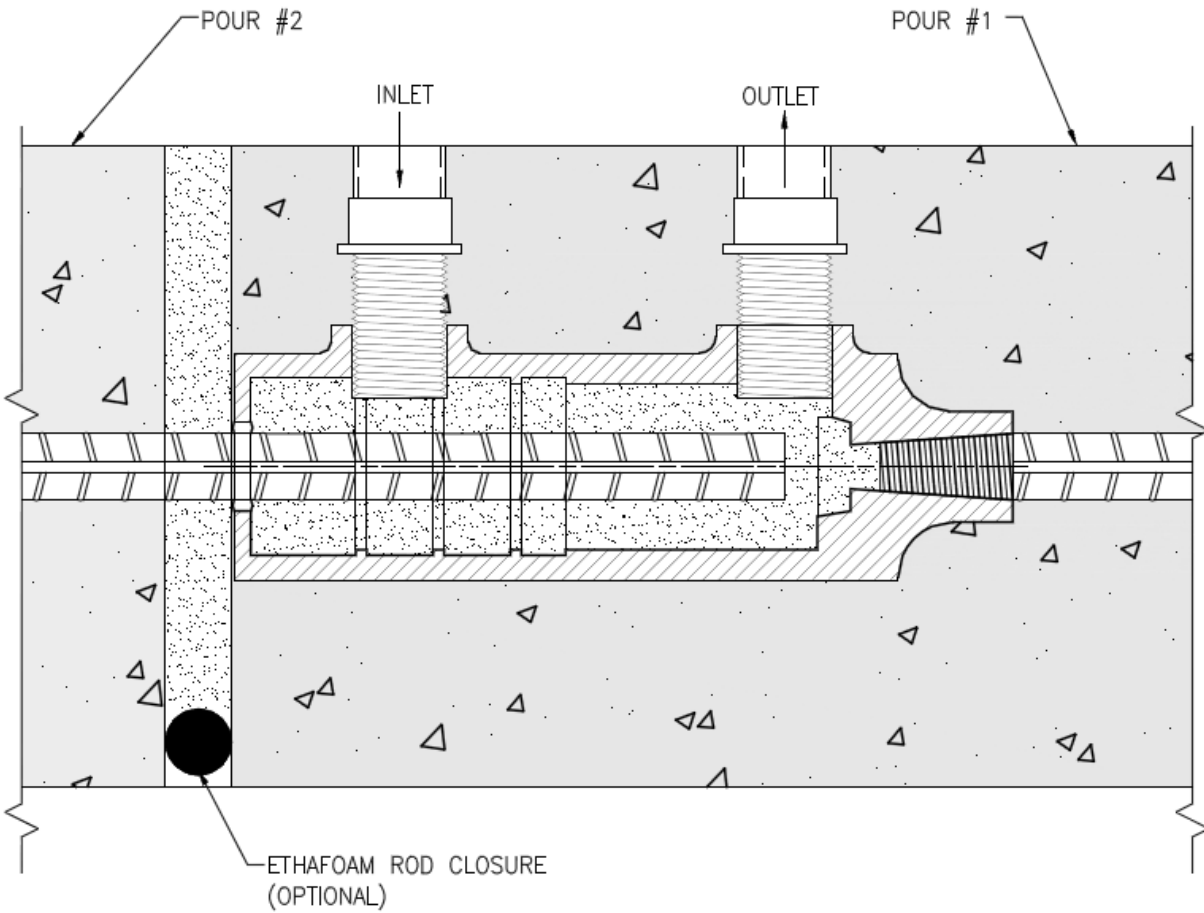


Figure 7.1

# PS= $\emptyset$ <sup>®</sup> COUPLER AFTER COUPLER & JOINT GROUTING

## Option 2

PS= $\emptyset$ <sup>®</sup> COUPLER SET IN POUR #1 w/  
CONCRETE GROUT SLEEVES



**Figure 7.2**

# PS=Ø® COUPLER AFTER COUPLER & JOINT GROUTING

## Option 3

PS=Ø® COUPLER SET IN POUR #1 w/  
CONCRETE GROUT SLEEVES

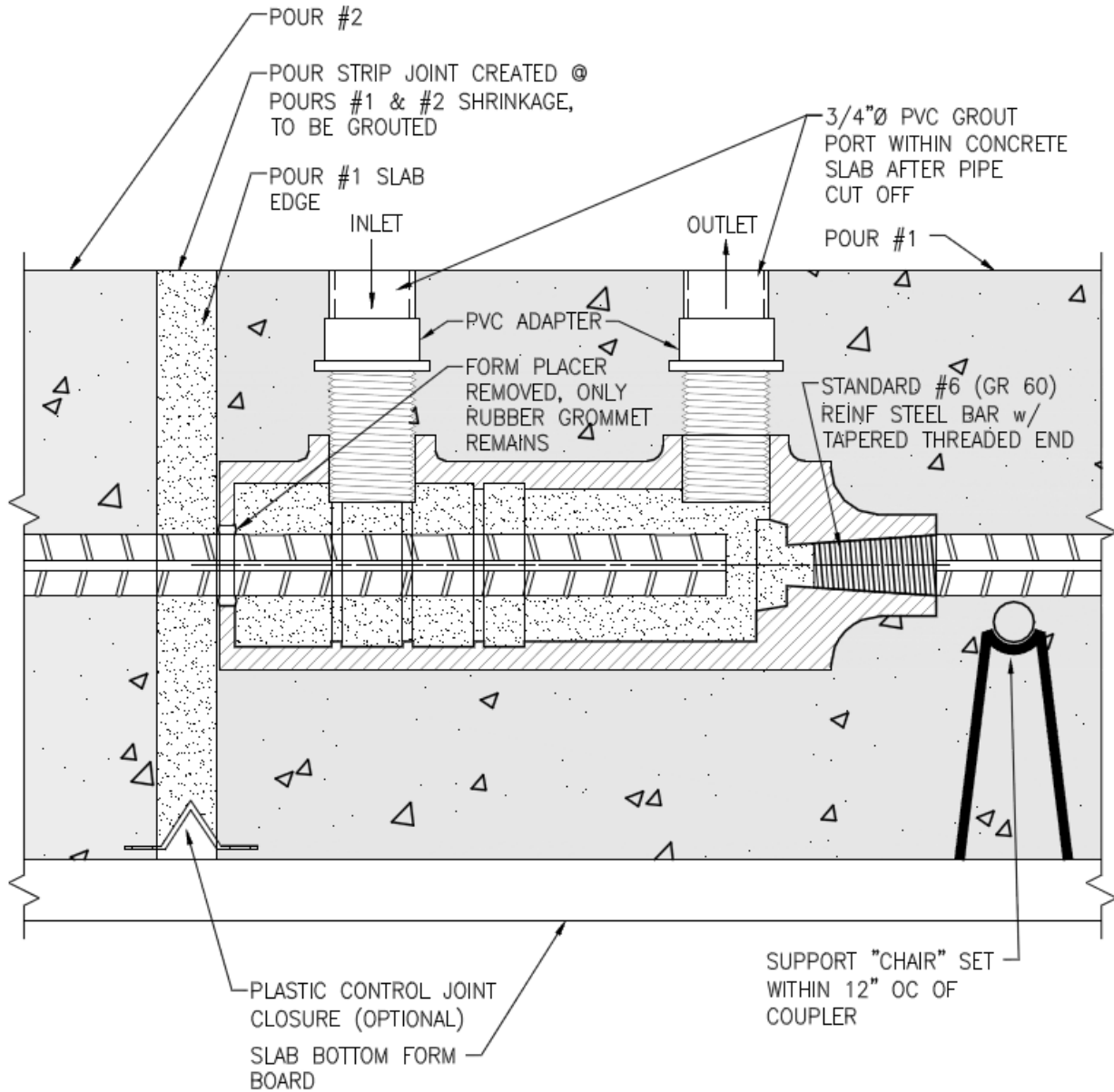
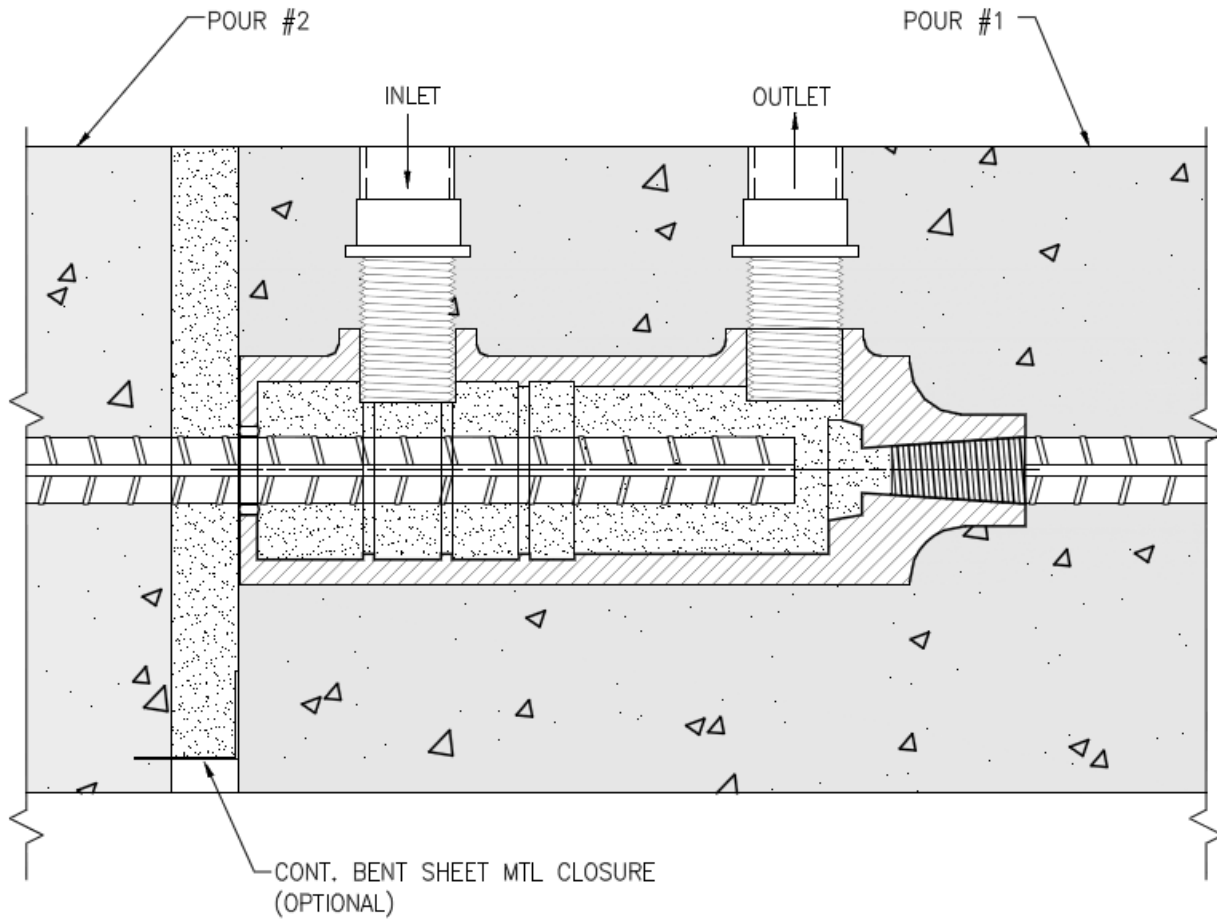


Figure 7.3

# PS=Ø® COUPLER AFTER COUPLER & JOINT GROUTING

## Option 4

PS=Ø® COUPLER SET IN POUR #1 w/  
CONCRETE GROUT SLEEVES



**Figure 7.4**