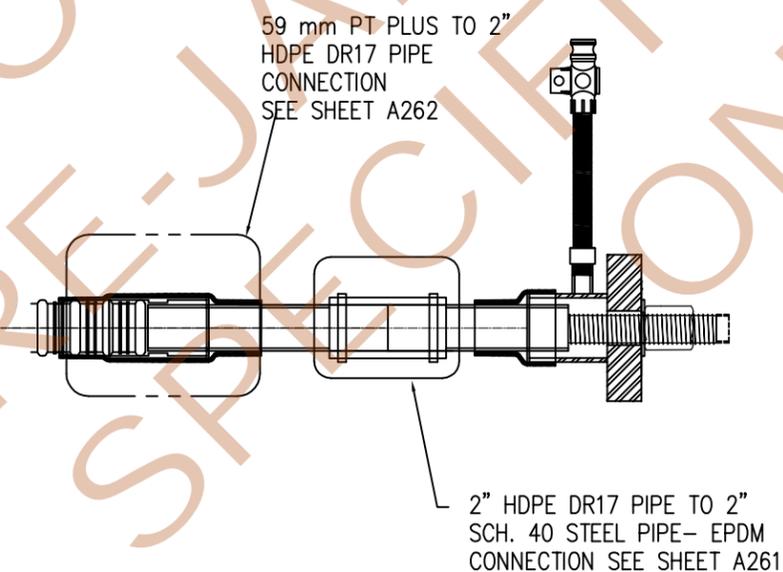


OVERALL ASSEMBLY

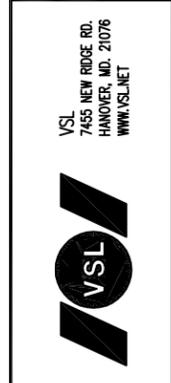


ALTERNATE DESIGN

NOTE:
 1) For 1-1/4" and 1-3/8" PT Bar Segmental Construction, See Detail A263

SEE ALTERNATE DESIGN BELOW

	LA	LA	LA	LA
	BY	BY	BY	BY
	CHK	CHK	CHK	CHK
	APPROVED FOR CONSTRUCTION	APPROVED FOR CONSTRUCTION	APPROVED FOR CONSTRUCTION	REVISION
2	5/16/10	5/12/10	4/12/10	DATE
1				REV.
0				

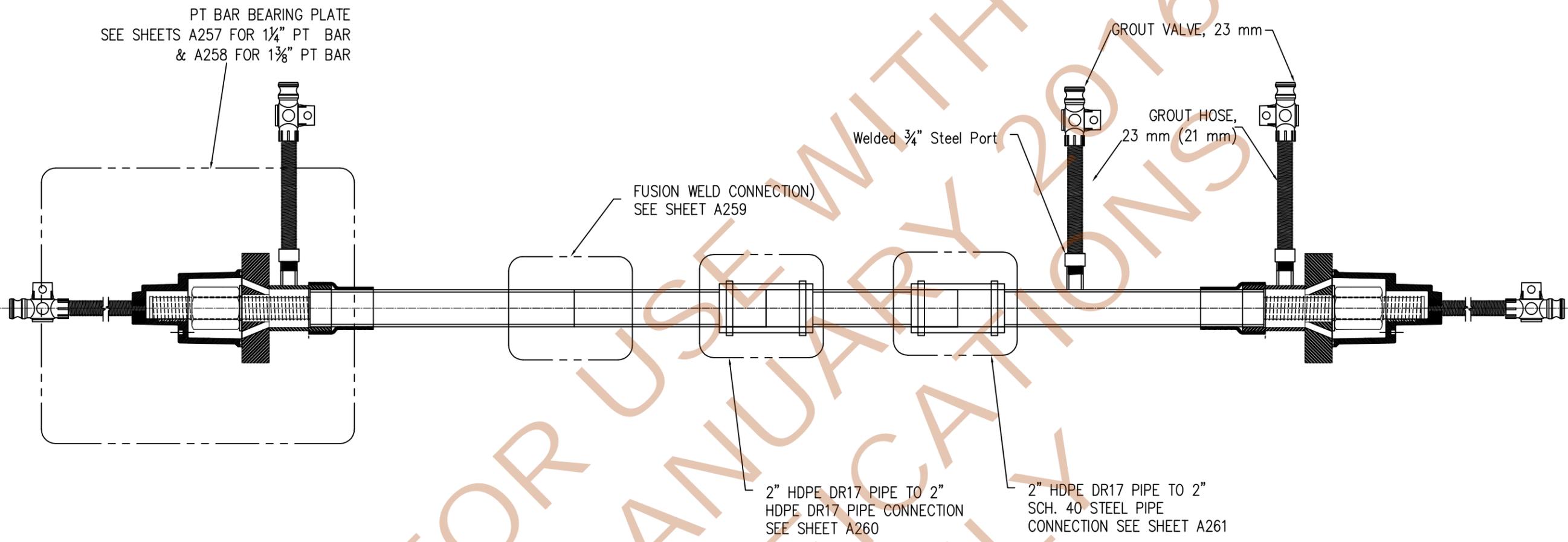


DWG. TITLE: 1-1/4" & 1-3/8" INTERNAL PT BAR ASSEMBLY
 PROJECT: VSL-WILLIAMS FORM ENGINEERING SYSTEMS DRAWING

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SCALE: NONE
 VSL JOB NO:
 VSL DWG. NO. A249

PT BAR BEARING PLATE
SEE SHEETS A257 FOR 1 1/4" PT BAR
& A258 FOR 1 3/8" PT BAR



FUSION WELD CONNECTION
SEE SHEET A259

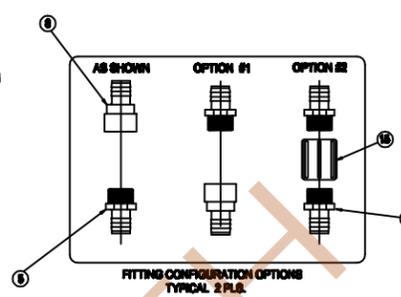
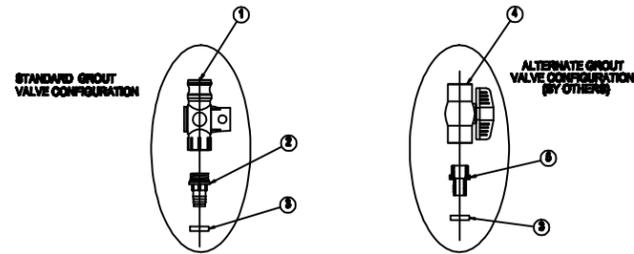
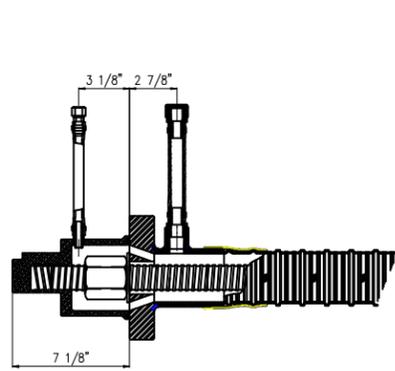
2" HDPE DR17 PIPE TO 2"
HDPE DR17 PIPE CONNECTION
SEE SHEET A260

2" HDPE DR17 PIPE TO 2"
SCH. 40 STEEL PIPE
CONNECTION SEE SHEET A261

OVERALL ASSEMBLY

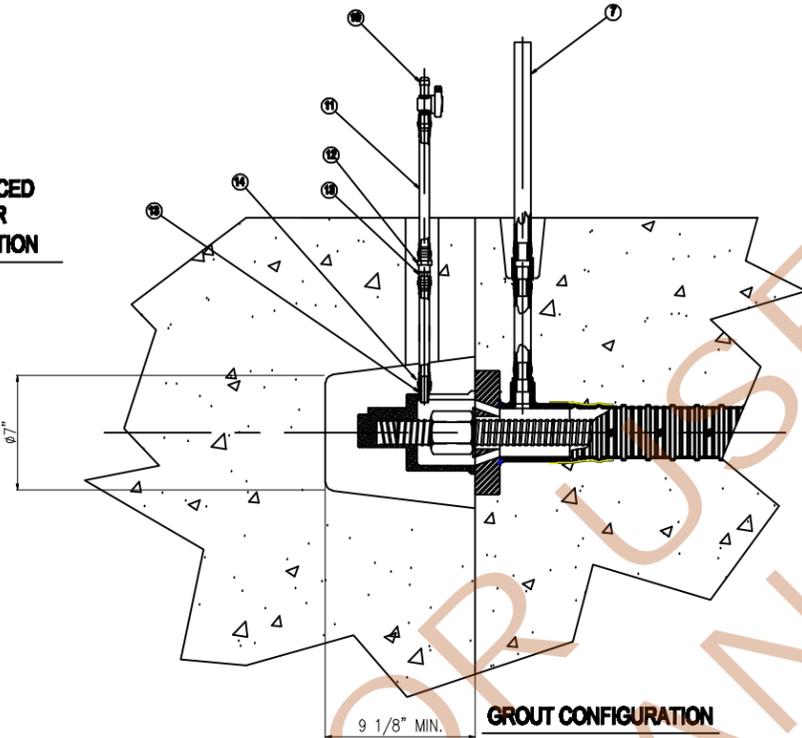
FOR U.S. MANUFACTURING ONLY

VSL	WILLIAMS FORM ENGINEERING CORP. <small>280 ANN ST., N.Y.C. GRAND HARBOR, MI 49804 Ph: 616.365.8220 • Fax: 616.365.2666</small>		VSL 7455 NEW RIDGE RD. HANOVER, MD. 21076 WWW.VSL.NET	DATE 4/12/10 REV. 0	REVISION APPROVED FOR CONSTRUCTION LA SAN BY CHK
DWG. TITLE 1-1/4" & 1-3/8" EXTERNAL PT BAR ASSEMBLY	PROJECT: VSL-WILLIAMS FORM ENGINEERING SYSTEMS DRAWING				
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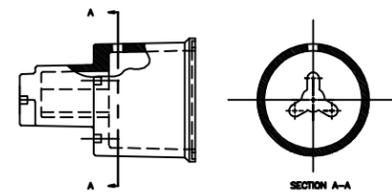


17	1/4" MPT PLUG
16	3/4" FPT CAP
15	3/4" COUPLER PVC (TEMPORARY)
14	SMALL ONE EAR HOSE CLAMP 316 S.S.
13	1/4" MPT TO 1/2" HOSE BARB ADAPTER
12	1/4" FPT TO 1/2" HOSE BARB ADAPTER
11	1/2" ID SMOOTH GROUT HOSE
10	GROUT VENT VALVE
9	3/4" MPT PLUG
8	3/4" FPT TO 3/4" HOSE BARB ADAPTER
7	3/4" ID SMOOTH GROUT HOSE
6	1/4" FPT CAP
5	3/4" HOSE BARB TO 3/4" MPT ADAPTER
4	3/4" FPT BALL VALVE PVC (TEMPORARY)
3	LRG. ONE EAR HOSE CLAMP 316 S.S.
2	GROUT VALVE TO 3/4" GROUT HOSE ADAPTER
1	23MM GROUT VALVE
ITEM	NAME
	Parts List

FOR BALANCED CANTILEVER CONSTRUCTION

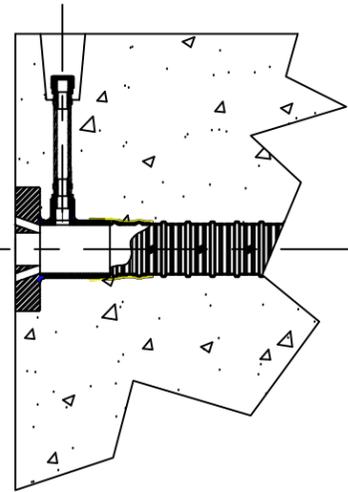


GROUT CAP FIELD MODIFICATION



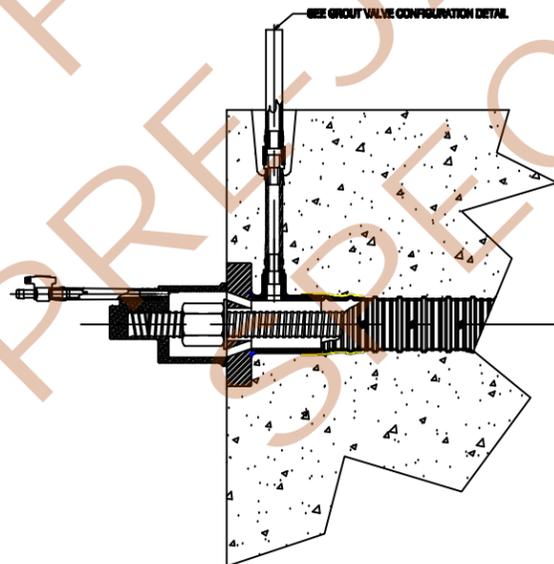
BALANCED CANTILEVER TENDONS

1. INSTALL GROUT CAP (WITH O-RING SEAL) ONTO STRESSED PT BAR BY ROTATION UNTIL GROUT CAP IS FULLY SEATED AGAINST BEARING PLATE
2. USE A 7/16" DIA. DRILL BIT TO DRILL A VERTICAL HOLE AT THE HIGH POINT OF THE GROUT CAP
3. USE A 1/4"NPT TAP TO THREAD THE HOLE. (NOTE THAT ALTHOUGH THE TAP IS 1/4"NPT, THE ID OF THE PLASTIC FITTING IS APPROX. 3/8")
4. INSTALL A 1/4"NPT X 1/2" BARB FITTING FOR GROUTING OR A 1/4"NPT PLUG IF USING THE GROUT CAP FOR PROTECTION.



AS-CAST CONFIGURATION

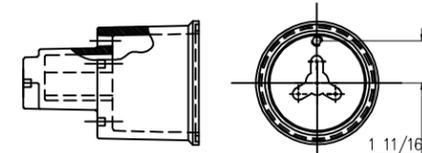
FOR SPAN-BY-SPAN CONSTRUCTION



GROUT CONFIGURATION

FINISHED CONFIGURATION

GROUT CAP FIELD MODIFICATION

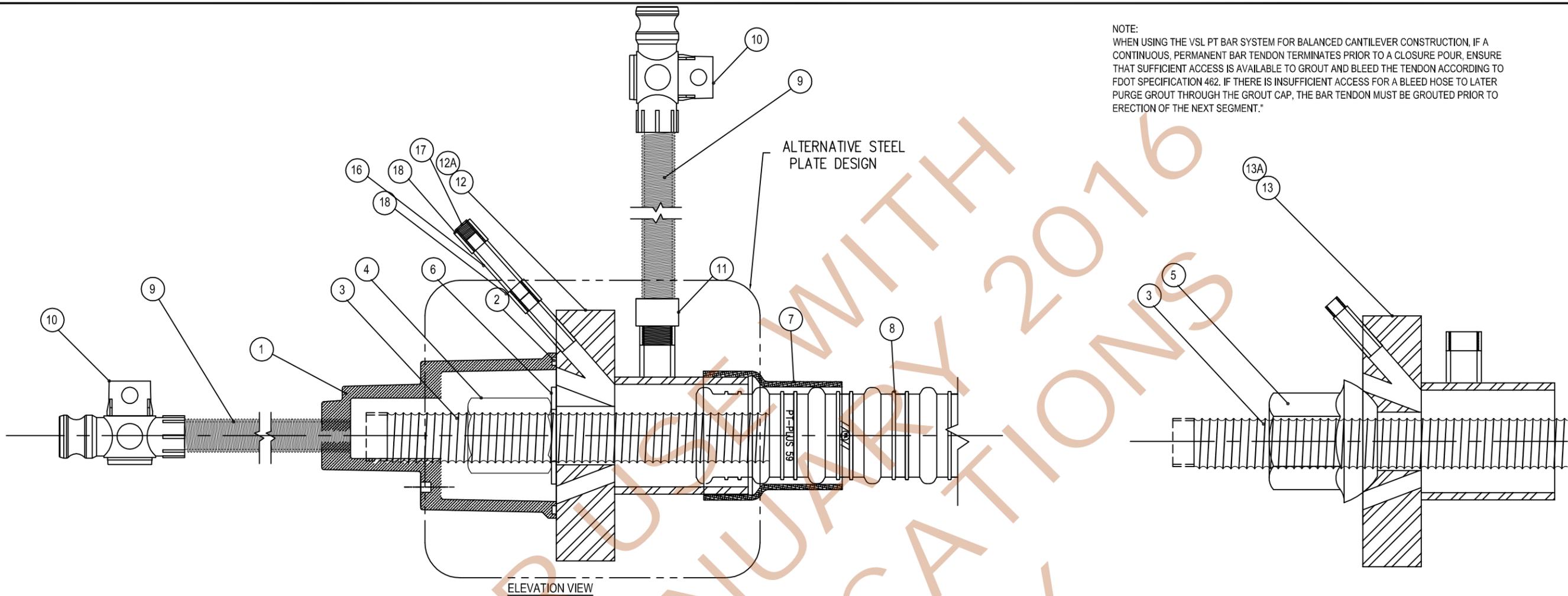


HORIZONTAL TENDONS:

1. INSTALL GROUT CAP (WITH O-RING SEAL) ONTO STRESSED PT BAR BY ROTATION UNTIL GROUT CAP IS FULLY SEATED AGAINST BEARING PLATE
2. USE A 7/16" DIA. DRILL BIT TO DRILL A HORIZONTAL HOLE AT THE HIGH POINT OF THE GROUT CAP
3. USE A 1/4"NPT TAP TO THREAD THE HOLE. (NOTE THAT ALTHOUGH THE TAP IS 1/4"NPT, THE ID OF THE FITTING IS APPROX. 3/8")
4. INSTALL A 1/4"NPT X 1/2" BARB FITTING FOR GROUTING OR 1/4"NPT PLUG IF USING THE GROUT CAP FOR PROTECTION

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VSL WILLIAMS PT BAR GROUTING CONFIGURATION OPTIONS		VSL SYSTEMS DRAWING	
DWG. TITLE:	VSL WILLIAMS PT BAR GROUTING CONFIGURATION OPTIONS	DATE:	9/28/10
PROJECT:	VSL SYSTEMS DRAWING	REV.:	1
SCALE:	AS SHOWN	BY:	MM
VSL JOB NO.:		RELEASED FOR PRODUCTION	
VSL DWG. NO.:	A264	REVISION	



NOTE:
WHEN USING THE VSL PT BAR SYSTEM FOR BALANCED CANTILEVER CONSTRUCTION, IF A CONTINUOUS, PERMANENT BAR TENDON TERMINATES PRIOR TO A CLOSURE POUR, ENSURE THAT SUFFICIENT ACCESS IS AVAILABLE TO GROUT AND BLEED THE TENDON ACCORDING TO FDOT SPECIFICATION 462. IF THERE IS INSUFFICIENT ACCESS FOR A BLEED HOSE TO LATER PURGE GROUT THROUGH THE GROUT CAP, THE BAR TENDON MUST BE GROUTED PRIOR TO ERECTION OF THE NEXT SEGMENT.

ALTERNATIVE STEEL PLATE DESIGN

ALTERNATE DESIGN

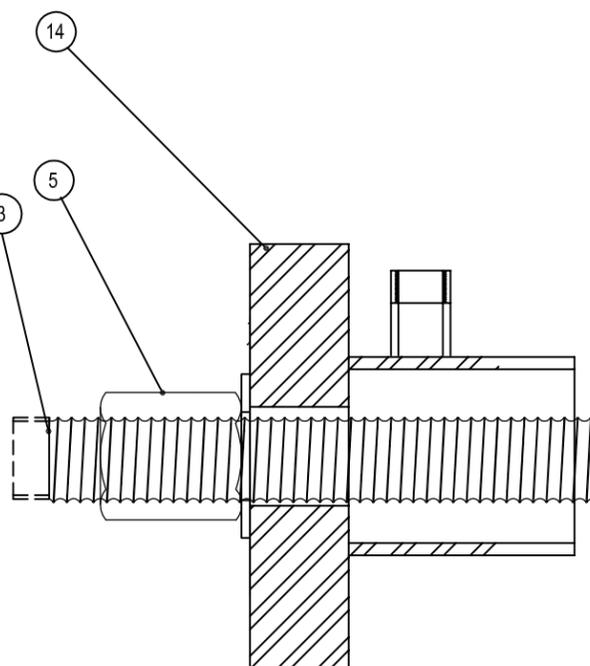
ELEVATION VIEW

ALTERNATE DESIGN 2

ITEM	QTY	DESCRIPTION	MATERIAL	DRAWING REFERENCE	INVENTORY NUMBER
14	1	STEEL BEARING PLATE W/ TRUMPET INSPECTION PORT, 3" SCH. 40 TRUMPET L=3" GALV.	ASTM A-36-01, AASHTO M183, ASTM A-53, ASTM A-512	1V-R7P-002-1	2 OF 4
*13A	1	STEEL BEARING PLATE W/ TRUMPET INSPECTION PORT, GROUT HOLES & 3" SCH. 40 TRUMPET L=4" GALV. W/ BEVELED HOLE FOR DISHED NUT	ASTM A-36-01, AASHTO M183, ASTM A-53, ASTM A-512	1V-R7P-002-1	1 OF 4
*13	1	STEEL BEARING PLATE W/ FRONT INSPECTION PORT, GROUT HOLES & 3" SCH. 40 TRUMPET L=3" GALV. W/ BEVELED HOLE FOR DISHED NUT	ASTM A-36-01, AASHTO M183, ASTM A-53, ASTM A-512	1V-R7P-002-1	3 OF 4
*12A	1	STEEL BEARING PLATE W/ TRUMPET INSPECTION PORT, GROUT HOLES & 3" SCH. 40 TRUMPET L=4" GALV.	ASTM A-36-01, AASHTO M183, ASTM A-53, ASTM A-512	1V-R7P-002-1	1 OF 4
*12	1	STEEL BEARING PLATE W/ FRONT INSPECTION PORT, GROUT HOLES & 3" SCH. 40 TRUMPET L=3" GALV.	ASTM A-36-01, AASHTO M183, ASTM A-53, ASTM A-512	1V-R7P-002-1	3 OF 4
11	1	BEARING PLATE BUSHING 3/4" NPT, 23 mm	P.P.	C675	02DT0316
10	1	GROUT VALVE, 23 mm	P.S.	C500 & C501	02DT0311
9	1	GROUT HOSE, 23 mm (21 mm)	P.E.	C587	02DT0310
8	1	DUCT, WHT PP, 59MM PT-PLUS	P.P.	E09038-4	02DT0412
7	1	HEAT SHRINK	POLYOLEFIN	(CANUSA) PLA-63-YE	02DT0503
6	1	WMS. 32mm (1 1/4") HARDENED WASHER	ASTM F-436-93, TYPE 1, AASHTO M293	1B-R7P-002-3	R9F-11-436
5	1	WMS. 32mm (1 1/4") SPHERICAL HEX NUT	ASTM A-536, 100-70-03, DUCTILE IRON	1B-R7P-002-5	R88-10
4	1	WMS. 32mm (1 1/4") HEAVY DUTY HEX NUT	ASTM A-29-93A GRADE C-1045	1B-R7P-002-2	R73-10
3	1	WMS. 32mm (1 1/4") GRADE 150 TYPE II, KSI A.T.B.	ASTM A-722-97,M275	1B-R7P-002-1	R71-10
2	1	WMS NYLON REINFORCED END CAP O-RING	BUNA-N 70 D.	-	-
1	1	WMS NYLON REINFORCED END CAP	ASTM D-4066, S PA-0221 ASTM D-5989, S PA-0231	1B-R7P-001-6	R78K103207

ITEM	QTY	ITEMS BY OTHERS
18	1	1/4" NPT SS316 PIPE COUPLING, 150PSI RATED
17	1	1/4" NPT SS316 PIPE HEX SOCKET PLUG, 150PSI RATED
16	1	1/4" NPT SCH40 PIPE, GALV. (LENGTH VARIES PER PROJECT)

- INSTALLATION PROCEDURES**
- 1) ATTACH BEARING PLATE (#12, 12A, 13 OR 13A) PERPENDICULAR TO 59MM DUCT USING HEATSHRINK SLEEVE (#7). ASSEMBLE TRUMPET (#13) INTO THE BEARING PLATE (#6). SEE HEATSHRINK INSTRUCTIONS FOR INSTALLATION.
 - 2) INSTALL DUCT AND DUCT COUPLERS. LIGHTLY GREASE COUPLERS WITH ASSEMBLY GREASE TO ENSURE SEAL. (BY OTHERS)
 - 3) FOR VERTICAL INSPECTION PORT, INSTALL 1/4" PIPE COUPLING (#18), THEN 1/4" PIPE (#16) TO EXTEND OUT OF THE CONCRETE, THEN INSTALL ANOTHER 1/4" PIPE COUPLING (#18) AND FINALLY ATTACH THE 1/4" PIPE HEX SOCKET PLUG (#17).
 - 4) INSTALL PT BAR (#3) EXTENDING 5.0" TO 5.7" PAST FACE OF BEARING PLATE.
 - 5) INSTALL HEX NUT (#4) AND HARDENED WASHER (#6) OR SPHERICAL NUT (#5).
 - 6) INSTALL BEARING PLATE BUSHING (#11) TO BEARING PLATE, THEN THE GROUT HOSE (#9) TO THE BUSHING AND FINALLY THE GROUT VALVE (#10) TO THE GROUT HOSE. SEAL ALL CONNECTIONS WITH 5 WRAPS OF TEFLON TAPE (BY OTHERS) OR BONDUIT OR SIMILAR (BY OTHERS).
 - 7) AFTER CONCRETE PLACEMENT ONLY STRESS BAR IF CONCRETE HAS REACHED REQUIRED STRENGTH SPECIFIED ON DRAWINGS
 - 8) ELONGATION SHOULD BE WITH IN +/- 7%
 - 9) INSTALL O-RING(#2) INTO GROUT CAP(#1) AND THREAD GROUT CAP ON BAR.
 - 10) GROUT TENDON PER GROUTING SPEC.



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APPROVED FOR CONSTRUCTION	6/16/10	3	REV.	DATE	REVISION	BY	CHK
APPROVED FOR CONSTRUCTION	5/25/10	2					
APPROVED FOR CONSTRUCTION	5/18/10	1					
APPROVED FOR CONSTRUCTION	4/19/10	0					

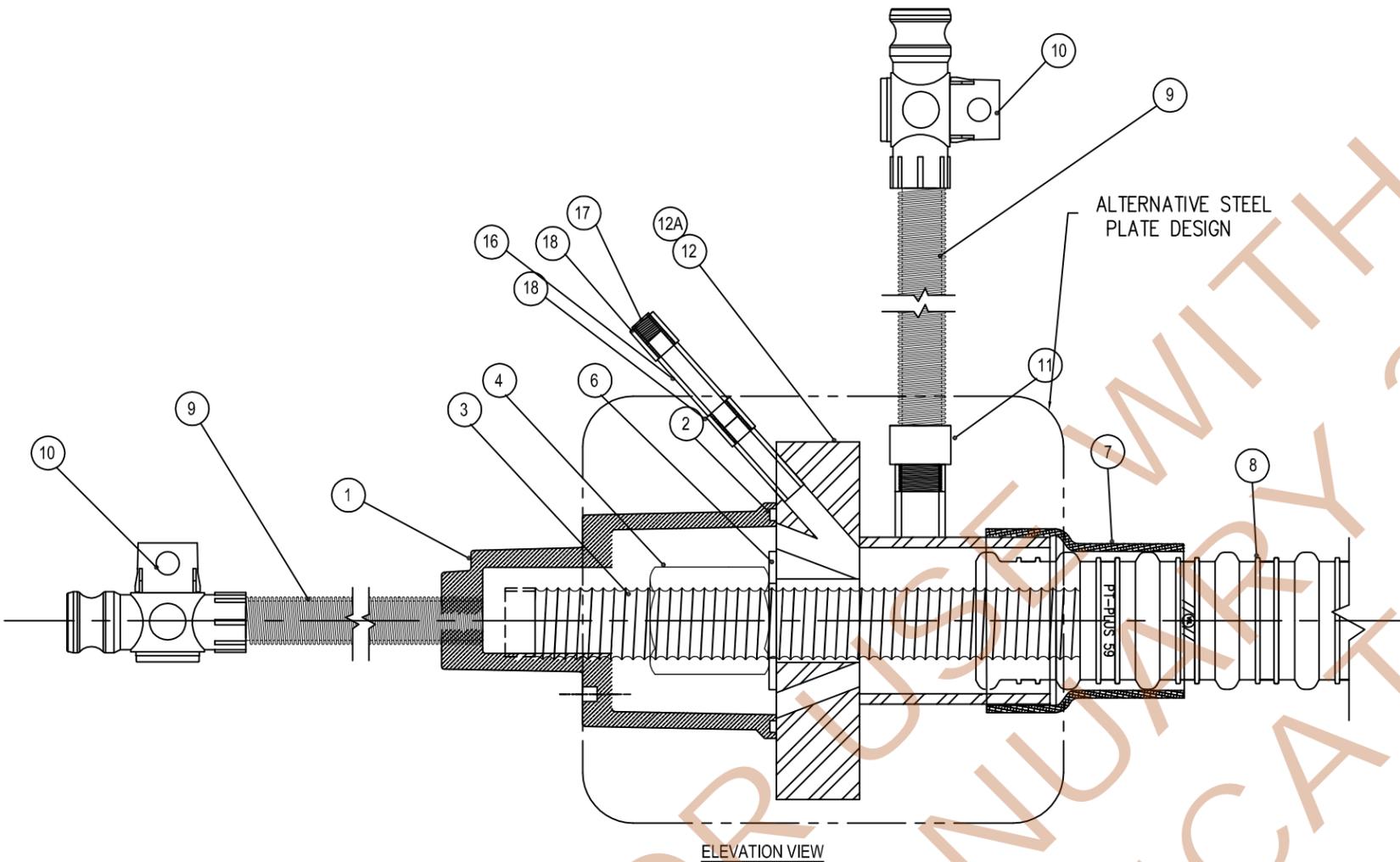
WILLIAMS FORM ENGINEERING CORP.
280 SUNNYSIDE BLVD., GARLAND HARBOR, MN 55934 • PH: 612.363.2229 • FX: 612.363.2668

VSL
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HANOVER, MD. 21076
WWW.VSL.NET

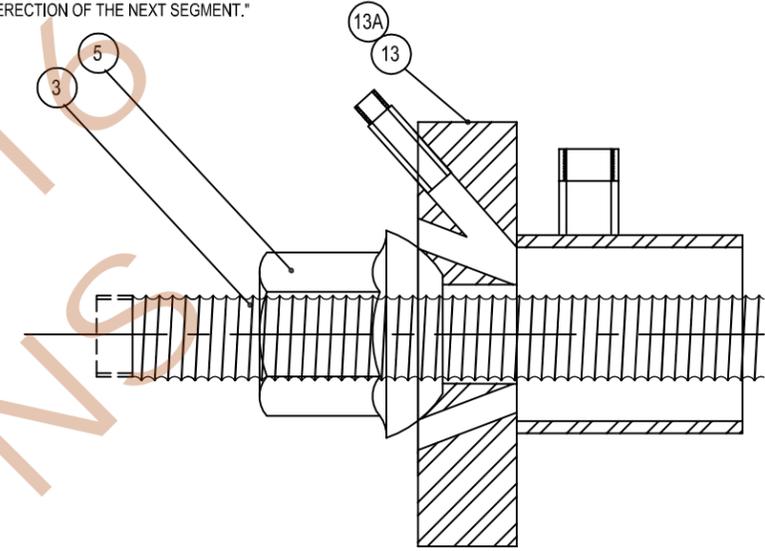
DWG. TITLE: 1-1/4" INTERNAL PT BAR BEARING PLATE
PROJECT: VSL-WILLIAMS FORM ENGINEERING SYSTEMS DRAWING

SCALE: NONE
VSL JOB NO:
VSL DWG. NO. A251

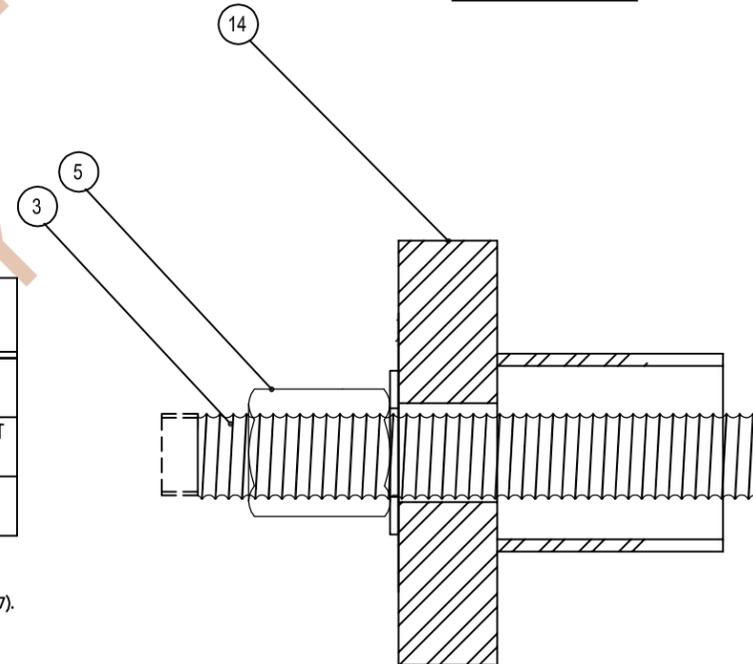
* DETAIL ELEVATION AND ALTERNATE VIEWS SHOW BOTH INSPECTION PORTS. ONE INSPECTION PORT REQUIRED FOR EACH PLATE PER ITEM DESCRIPTION.



NOTE:
WHEN USING THE VSL PT BAR SYSTEM FOR BALANCED CANTILEVER CONSTRUCTION, IF A CONTINUOUS, PERMANENT BAR TENDON TERMINATES PRIOR TO A CLOSURE POUR, ENSURE THAT SUFFICIENT ACCESS IS AVAILABLE TO GROUT AND BLEED THE TENDON ACCORDING TO FDOT SPECIFICATION 462. IF THERE IS INSUFFICIENT ACCESS FOR A BLEED HOSE TO LATER PURGE GROUT THROUGH THE GROUT CAP, THE BAR TENDON MUST BE GROUTED PRIOR TO ERECTION OF THE NEXT SEGMENT.



ALTERNATE DESIGN 1



ALTERNATE DESIGN 2

ITEM	QTY	DESCRIPTION	MATERIAL	DRAWING REFERENCE	INVENTORY NUMBER
14	1	STEEL BEARING PLATE W/ 3" SCH. 40 TRUMPET L=3" GALV.	ASTM A-36-01, AASHTO M183, ASTM A-53, ASTM A-512	1V-R7P-001-1	3 OF 5 5 OF 5
*13A	1	STEEL BEARING PLATE W/ TRUMPET INSPECTION PORT, GROUT HOLES & 3" SCH. 40 TRUMPET L=4" GALV. W/ BEVELED HOLE FOR DISHED NUT	ASTM A-36-01, AASHTO M183, ASTM A-53, ASTM A-512	1V-R7P-001-1	4 OF 5
*13	1	STEEL BEARING PLATE W/ FRONT INSPECTION PORT, GROUT HOLES & 3" SCH. 40 TRUMPET L=3" GALV. W/ BEVELED HOLE FOR DISHED NUT	ASTM A-36-01, AASHTO M183, ASTM A-53, ASTM A-512	1V-R7P-001-1	2 OF 5
*12A	1	STEEL BEARING PLATE W/ TRUMPET INSPECTION PORT, GROUT HOLES & 3" SCH. 40 TRUMPET L=4" GALV.	ASTM A-36-01, AASHTO M183, ASTM A-53, ASTM A-512	1V-R7P-001-1	4 OF 5
*12	1	STEEL BEARING PLATE W/ FRONT INSPECTION PORT, GROUT HOLES & 3" SCH. 40 TRUMPET L=3" GALV.	ASTM A-36-01, AASHTO M183, ASTM A-53, ASTM A-512	1V-R7P-001-1	2 OF 5
11	1	BEARING PLATE BUSHING 3/4" NPT, 23 mm	P.P.	C675	02DT0316
10	1	GROUT VALVE, 23 mm	P.S.	C500 & C501	02DT0311
9	1	GROUT HOSE, 23 mm (21 mm)	P.E.	C587	02DT0310
8	1	DUCT, WHT PP, 59MM PT-PLUS	P.P.	E09038-4	02DT0412
7	1	HEAT SHRINK	POLYOLEFIN	(CANUSA) PLA-63-YE	02DT0503
6	1	WMS. 36mm (1 3/8") HARDENED WASHER	ASTM F-436-93, TYPE 1, AASHTO M293	1B-R7P-001-3	R9F-12-436
5	1	WMS. 36mm (1 3/8") SPHERICAL HEX NUT	ASTM A-536, 100-70-03, DUCTILE IRON	1B-R7P-001-16	R88-11
4	1	WMS. 36mm (1 3/8") HEAVY DUTY HEX NUT	ASTM A-29-93A GRADE C-1045	1B-R7P-001-2	R73-11
3	1	WMS. 36mm (1 3/8") GRADE 150 TYPE II, KSI A.T.B.	ASTM A-722-97,M275	1B-R7P-001-1	R71-11
2	1	WMS NYLON REINFORCED END CAP O-RING	BUNA-N 70 D.	-	-
1	1	WMS NYLON REINFORCED END CAP	ASTM D-4066, S PA-0221 ASTM D-5989, S PA-0231	1B-R7P-001-6	R78K113607

ITEM	QTY	ITEMS BY OTHERS
18	1	1/4" NPT SS316 PIPE COUPLING, 150PSI RATED
17	1	1/4" NPT SS316 PIPE HEX SOCKET PLUG, 150PSI RATED
16	1	1/4" NPT SCH40 PIPE, GALV. (LENGTH VARIES PER PROJECT)

INSTALLATION PROCEDURES

- ATTACH BEARING PLATE (#12, 12A, 13 OR 13A) PERPENDICULAR TO 59MM DUCT USING HEATSHRINK SLEEVE (#7). ASSEMBLE TRUMPET (#13) INTO THE BEARING PLATE (#6). SEE HEATSHRINK INSTRUCTIONS FOR INSTALLATION.
- INSTALL DUCT AND DUCT COUPLERS. LIGHTLY GREASE COUPLERS WITH ASSEMBLY GREASE TO ENSURE SEAL. (BY OTHERS)
- FOR VERTICAL INSPECTION PORT, INSTALL 1/4" PIPE COUPLING (#18), THEN 1/4" PIPE (#16) TO EXTEND OUT OF THE CONCRETE, THEN INSTALL ANOTHER 1/4" PIPE COUPLING (#18) AND FINALLY ATTACH THE 1/4" PIPE HEX SOCKET PLUG (#17).
- INSTALL PT BAR (#3) EXTENDING 5.0" TO 5.7" PAST FACE OF BEARING PLATE.
- INSTALL HEX NUT (#4) AND HARDENED WASHER (#6) OR SHERICAL NUT (#5).
- INSTALL BEARING PLATE BUSHING (#11) TO BEARING PLATE, THEN THE GROUT HOSE (#9) TO THE BUSHING AND FINALLY THE GROUT VALVE (#10) TO THE GROUT HOSE. SEAL ALL CONNECTIONS WITH 5 WRAPS OF TEFLON TAPE (BY OTHERS) OR BONDUIT OR SIMILAR (BY OTHERS).
- AFTER CONCRETE PLACEMENT ONLY STRESS BAR IF CONCRETE HAS REACHED REQUIRED STRENGTH SPECIFIED ON DRAWINGS
- ELONGATION SHOULD BE WITH IN +/- 7%
- INSTALL O-RING(#2) INTO GROUT CAP(#1) AND THREAD GROUT CAP ON BAR.
- GROUT TENDON PER GROUTING SPEC.

* DETAIL ELEVATION AND ALTERNATE VIEWS SHOW BOTH INSPECTION PORTS. ONE INSPECTION PORT REQUIRED FOR EACH PLATE PER ITEM DESCRIPTION.

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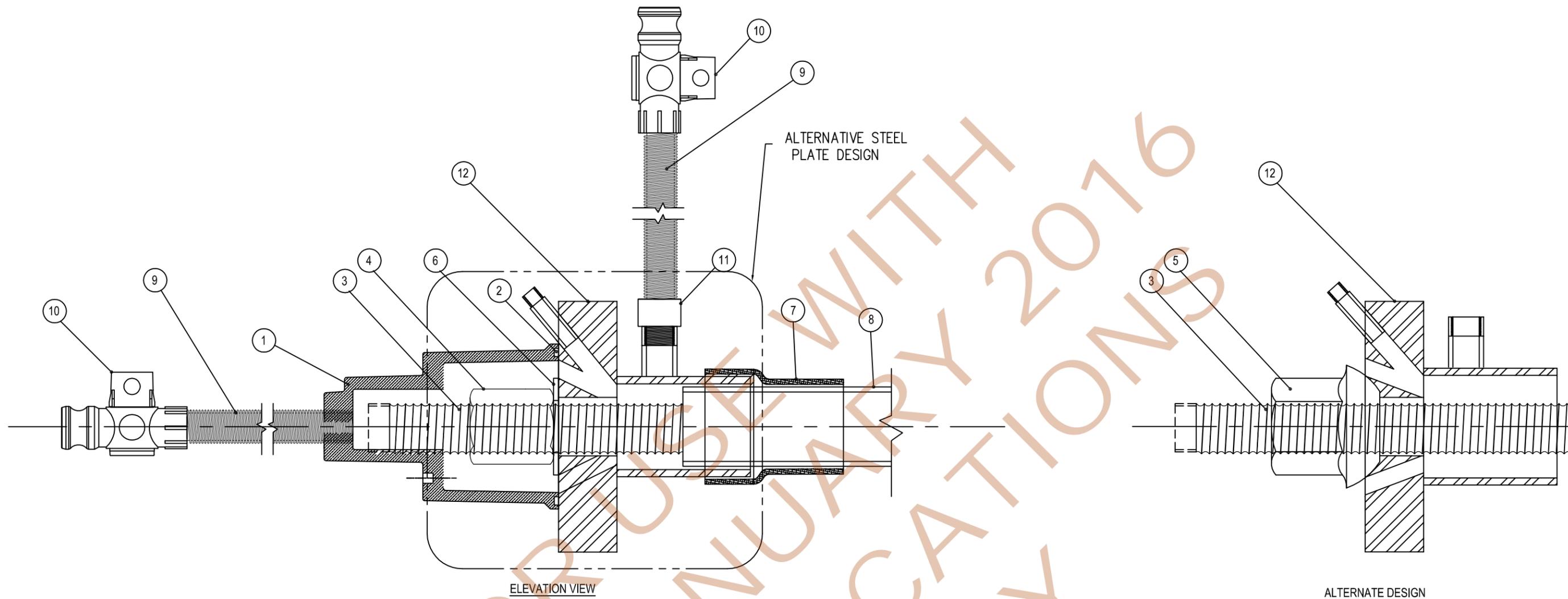
APPROVED FOR CONSTRUCTION	6/16/10	REV.	DATE	REVISION	BY	CHK
APPROVED FOR CONSTRUCTION	5/25/10					
APPROVED FOR CONSTRUCTION	5/18/10					
APPROVED FOR CONSTRUCTION	4/19/10					


 VSL
 7455 NEW RIDGE RD.
 HANOVER, MD. 21076
 WWW.VSL.NET

DWG. TITLE: 1-3/8" INTERNAL PT BAR BEARING PLATE
 PROJECT: VSL-WILLIAMS FORM ENGINEERING SYSTEMS DRAWING

SCALE: NONE
 VSL JOB NO:
 VSL DWG. NO. A252

WILLIAMS FORM ENGINEERING CORP.
 280 ANNETT AVE., GARLAND HARBOR, MI 48034, PH: 616.365.0229 • FX: 616.365.2668



ITEM	QTY	DESCRIPTION	MATERIAL	DRAWING REFERENCE	INVENTORY NUMBER
12	1	STEEL BEARING PLATE W/ FRONT INSPECTION PORT, GROUT HOLES & 2.5" SCH. 40 TRUMPET L=3" GALV.	ASTM A-36-01, AASHTO M183, ASTM A-53, ASTM A-512	1V-R7P-002-1	4 OF 4
11	1	BEARING PLATE BUSHING 3/4" NPT, 23 mm	P.P.	C675	02DT0316
10	1	GROUT VALVE, 23 mm	P.S.	C500 & C501	02DT0311
9	1	GROUT HOSE, 23 mm (21 mm)	P.E.	C587	02DT0310
8	1	2" HDPE DR-17	P.P.		
7	1	HEAT SHRINK	POLYOLEFIN	(CANUSA) PLA-63-YE	02DT0503
6	1	WMS. 32mm (1 1/4") HARDENED WASHER	ASTM F-436-93, TYPE 1, AASHTO M293	1B-R7P-002-3	R9F-11-436
5	1	WMS. 32mm (1 1/4") SPHERICAL HEX NUT	ASTM A-536, 100-70-03, DUCTILE IRON	1B-R7P-002-5	R88-10
4	1	WMS. 32mm (1 1/4") HEAVY DUTY HEX NUT	ASTM A-29-93A GRADE C-1045	1B-R7P-002-2	R73-10
3	1	WMS. 32mm (1 1/4") GRADE 150 TYPE II, KSI A.T.B.	ASTM A-722-97,M275	1B-R7P-002-1	R71-10
2	1	WMS NYLON REINFORCED END CAP O-RING	BUNA-N 70 D.	-	-
1	1	WMS NYLON REINFORCED END CAP	ASTM D-4066, S PA-0221 ASTM D-5989, S PA-0231	1B-R7P-001-6	R78K103207

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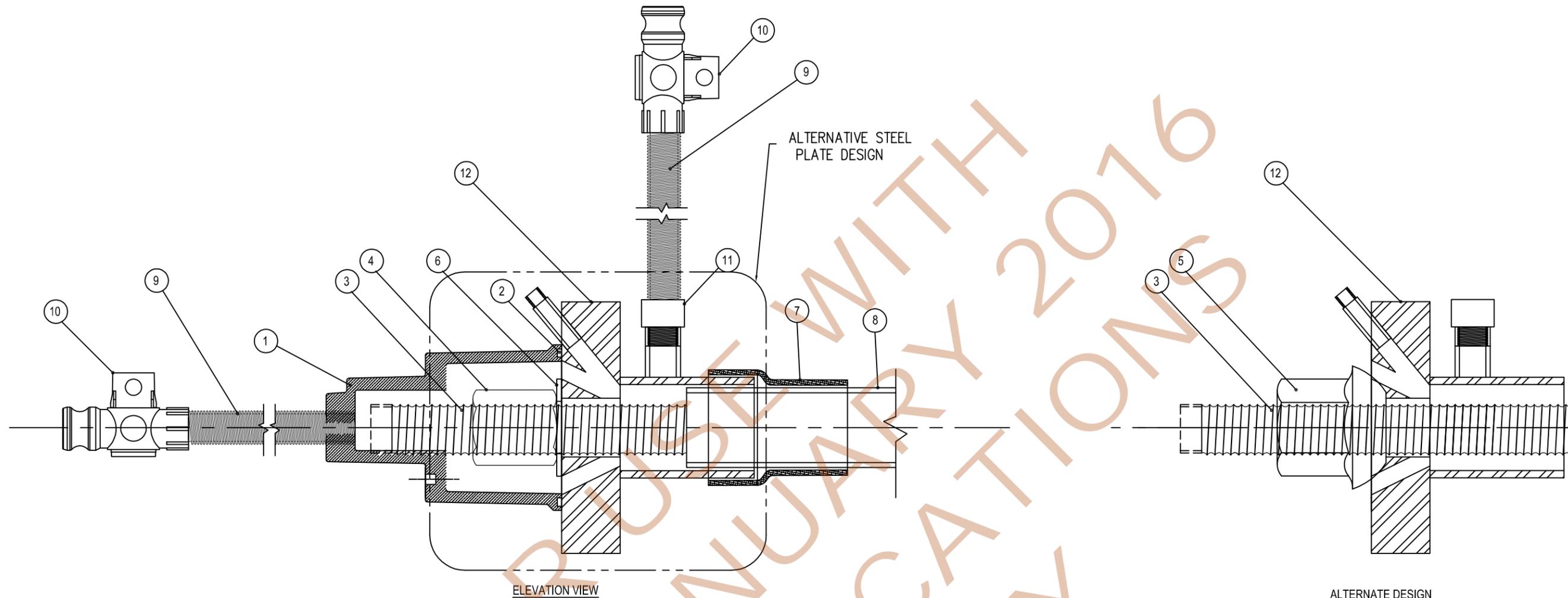
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WILLIAMS
 FORM ENGINEERING CORP.
280 ANNISTON, GRAND HARRIS, IN 46041 PH: 616.365.6220 • FX: 616.365.2688

1-1/4" EXTERNAL PT BAR
 BEARING PLATE
 PROJECT: VSL-WILLIAMS FORM ENGINEERING SYSTEMS DRAWING
 DWG. TITLE:

SCALE: NONE
 VSL JOB NO:
 VSL DWG. NO.
A257



ALTERNATIVE STEEL
PLATE DESIGN

ELEVATION VIEW

ALTERNATE DESIGN

ITEM	QTY	DESCRIPTION	MATERIAL	DRAWING REFERENCE	INVENTORY NUMBER
12	1	STEEL BEARING PLATE W/ FRONT INSPECTION PORT, GROUT HOLES & 2.5" SCH. 40 TRUMPET L=3" GALV.	ASTM A-36-01, AASHTO M183, ASTM A-53, ASTM A-512	1V-R7P-001-1	1 OF 5
11	1	BEARING PLATE BUSHING 3/4" NPT, 23 mm	P.P.	C675	02DT0316
10	1	GROUT VALVE, 23 mm	P.S.	C500 & C501	02DT0311
9	1	GROUT HOSE, 23 mm (21 mm)	P.E.	C587	02DT0310
8	1	2" HDPE DR-17	P.P.		
7	1	HEAT SHRINK	POLYOLEFIN	(CANUSA) PLA-63-YE	02DT0503
6	1	WMS. 36mm (1 3/8") HARDENED WASHER	ASTM F-436-93, TYPE 1, AASHTO M293	1B-R7P-001-3	R9F-12-436
5	1	WMS. 36mm (1 3/8") SPHERICAL HEX NUT	ASTM A-536, 100-70-03, DUCTILE IRON	1B-R7P-001-16	R88-11
4	1	WMS. 36mm (1 3/8") HEAVY DUTY HEX NUT	ASTM A-29-93A GRADE C-1045	1B-R7P-001-2	R73-11
3	1	WMS. 36mm (1 3/8") GRADE 150 TYPE II, KSI A.T.B.	ASTM A-722-97,M275	1B-R7P-001-1	R71-11
2	1	WMS NYLON REINFORCED END CAP O-RING	BUNA-N 70 D.	-	-
1	1	WMS NYLON REINFORCED END CAP	ASTM D-4066, S PA-0221 ASTM D-5989, S PA-0231	1B-R7P-001-6	R78K113607

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					CHK



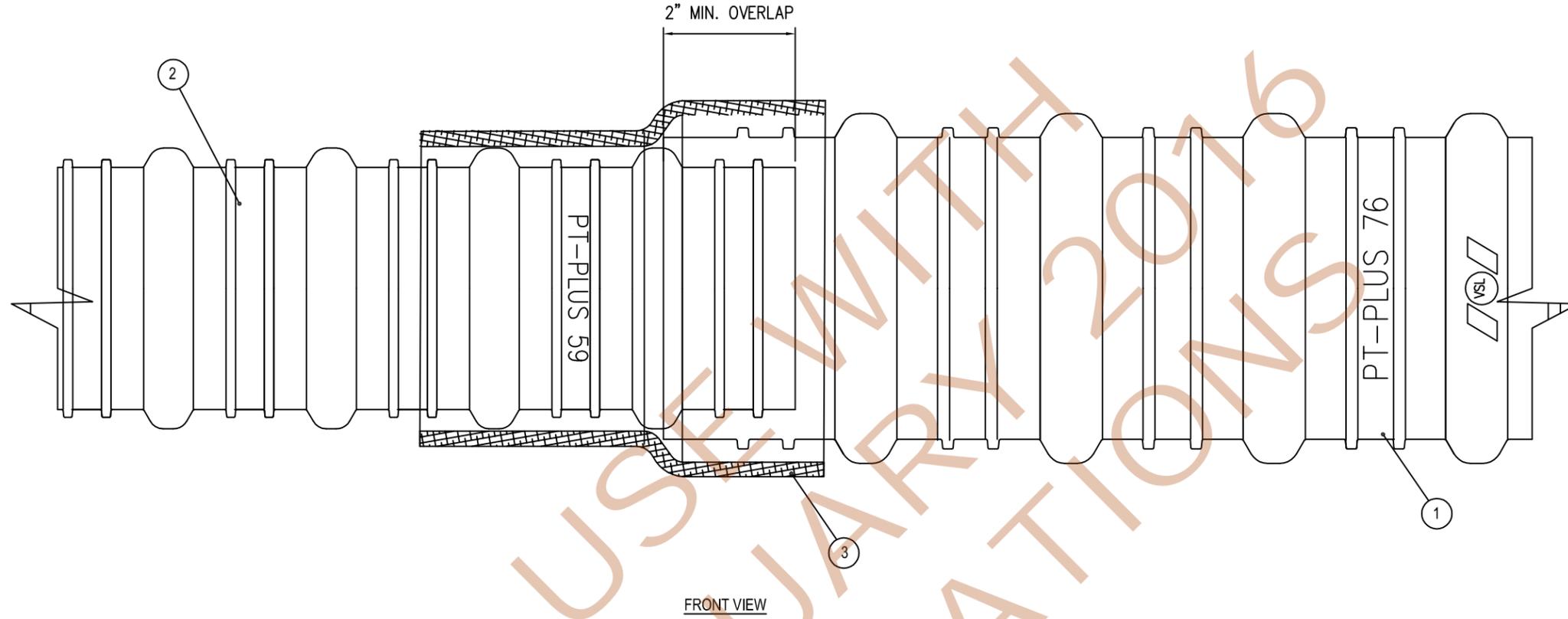
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DWG. TITLE: 1-3/8" EXTERNAL PT BAR BEARING PLATE
PROJECT: VSL-WILLIAMS FORM ENGINEERING SYSTEMS DRAWING

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SCALE: NONE
VSL JOB NO:
VSL DWG. NO. A258



FRONT VIEW

ITEM	QTY	DESCRIPTION	MATERIAL	DRAWING REFERENCE	INVENTORY NUMBER
3	1	HEATSHRINK SLEEVE (6" LONG)		-	(CANUSA) PLA-63-YE
2	1	DUCT, WHT PP, 59 MM PT-PLUS	ASTM D401	E09038-4	02DT0412
1	1	DUCT, WHT PP, 76 MM PT-PLUS	ASTM D401	E09037-3	02DT0426

NOTE: CENTER HEAT SHRINK OVER JOINT

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BY	SAN MM	APPROVED FOR CONSTRUCTION	REVISION
CHK			

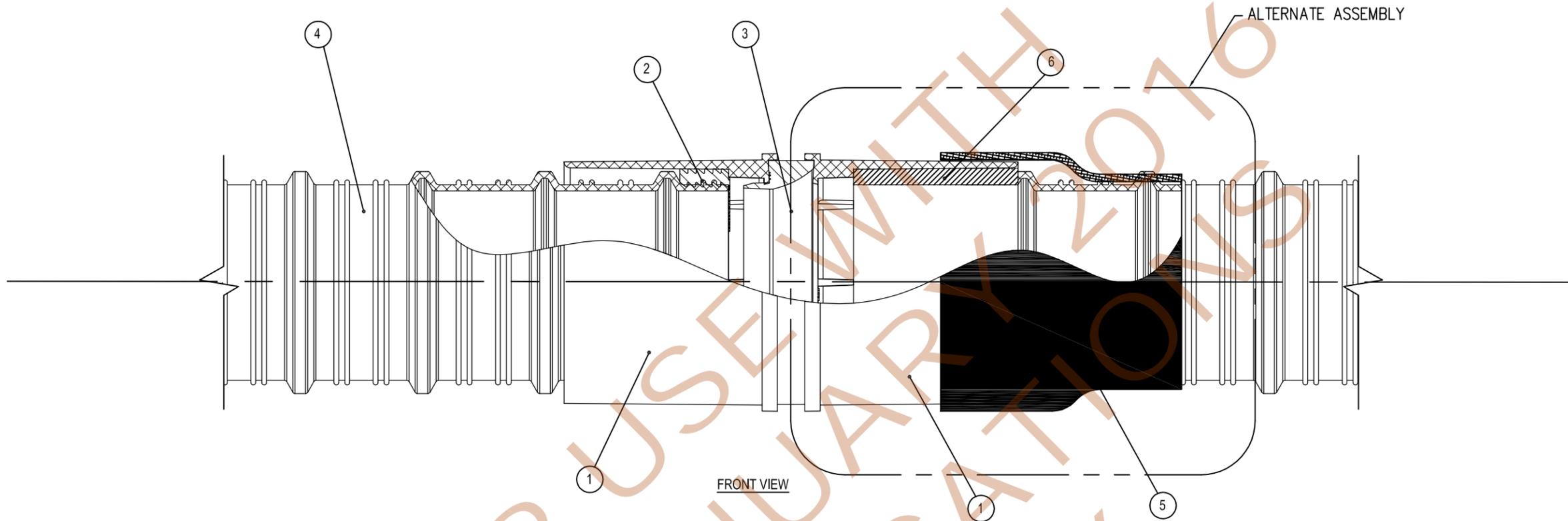
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DWG. TITLE: TYPICAL 76MM PT PLUS DUCT
TO 59MM PT PLUS DUCT - HEATSHRINK CONNECTION

PROJECT: VSL
SYSTEMS DRAWING

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SCALE: NONE
VSL JOB NO:
VSL DWG. NO. A254



ITEM	QTY	DESCRIPTION	MATERIAL	DRAWING NUMBER	INVENTORY NUMBER
6	1	INSERT	PE	-	-
5	1	HEAT SHRINK	POLYOLEFIN	-	CANUSA PLA-90-YE
4	--	DUCT, WHT PP, 76 MM PT-PLUS	PP	E0937-3	02DT0426
3	1	FACE SEAL	PP	C648	02SC07603
2	2	HUB SEAL	SANTOPRENE	C647	02SC07602
1	2	HUB	SANTOPRENE	C646	02SC07601

NOTE: ALTERNATE ASSEMBLY ACCEPTABLE ONLY WHEN PRE-FABRICATED BY VSL. ALTERNATE ASSEMBLY DOES NOT ALTER STANDARD INSTALLATION PROCEDURES.

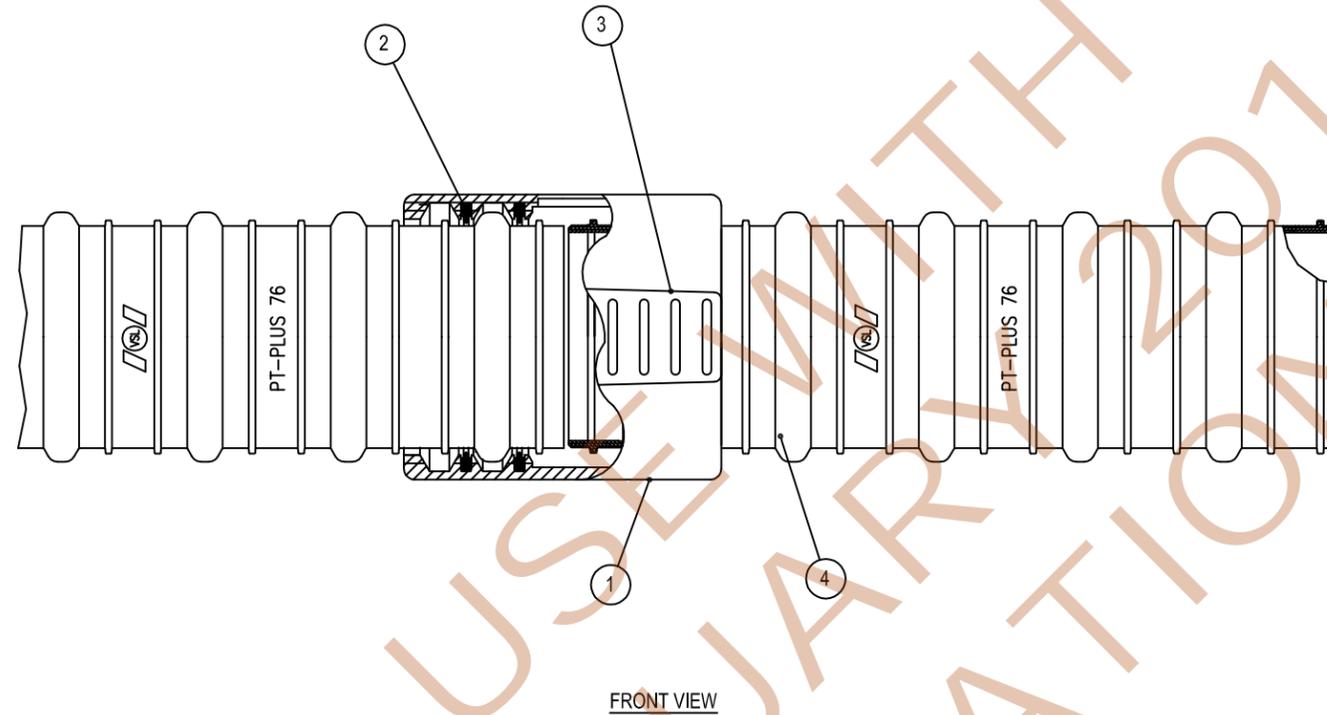
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1	2/23/10	APPROVED FOR CONSTRUCTION	SAN MM	

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DWG. TITLE: TYPICAL 76 MM PT-PLUS SEGMENTAL DUCT COUPLER CONNECTION
PROJECT: VSL SYSTEMS DRAWING

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SCALE: NONE
VSL JOB NO:
VSL DWG. NO. A240



ITEM	QTY	DESCRIPTION	MATERIAL	DRAWING NUMBER	INVENTORY NUMBER
4		DUCT, WHT PP, 76 MM PT-PLUS	ASTM D4101	E0937-3	02DT0426
3	2	COUPLER CLAMP, 76 MM PT-PLUS	ASTM D4101		02DT0029
2	2	SEAL (INCLUDED IN COUPLER HALF)			02DT0027
1	2	COUPLER HALF, 76 MM PT-PLUS	ASTM D4101	E0941-2	02DT0027

REV.	DATE	REVISION	BY	CHK
1	4/5/06	APPROVED FOR CONSTRUCTION	VEN	ZX

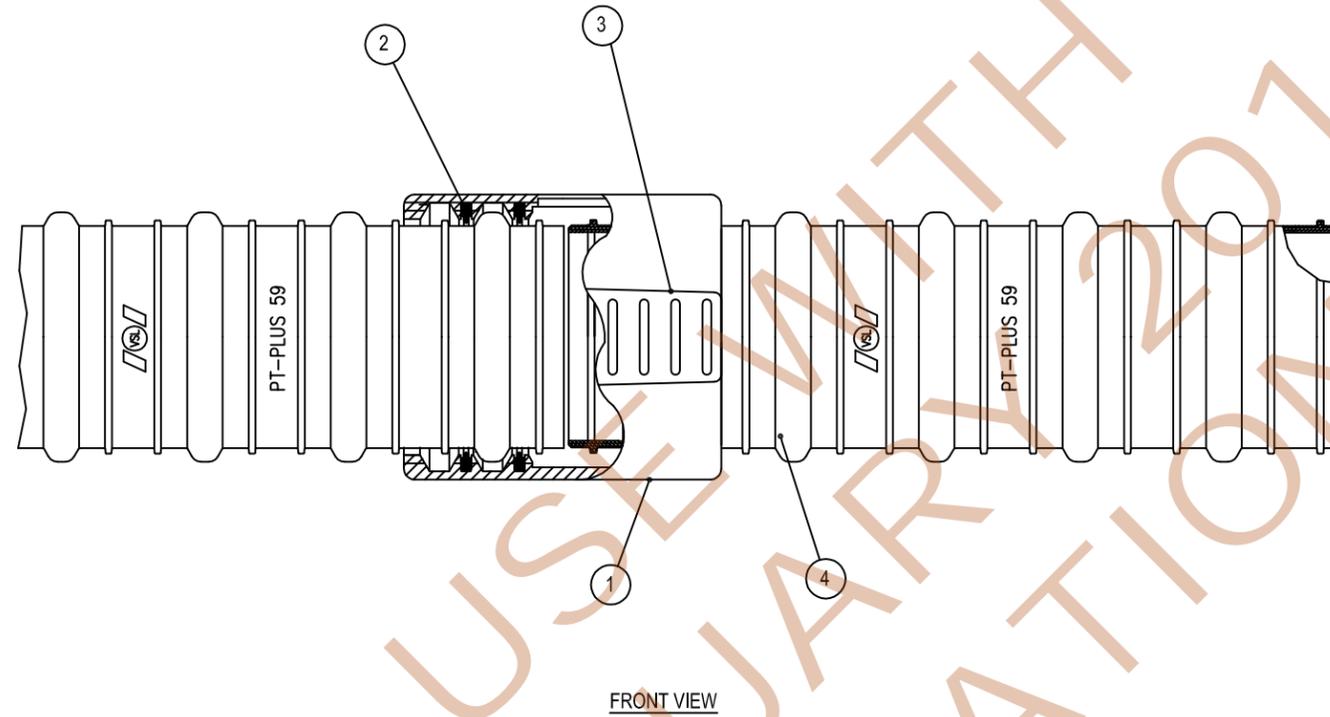
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DWG. TITLE: TYPICAL 76 MM PT-PLUS DUCT TO DUCT CONNECTION
PROJECT: VSL SYSTEMS DRAWING

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SCALE: 1:2
VSL JOB NO:
VSL DWG. NO. A190

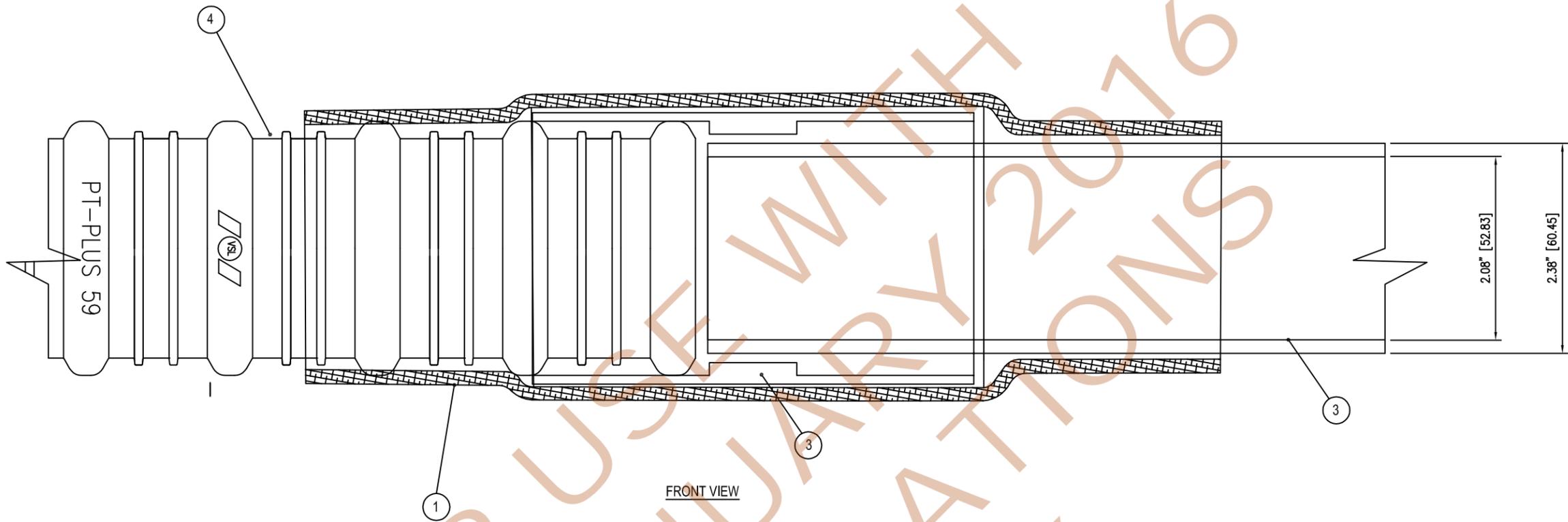


ITEM	QTY	DESCRIPTION	MATERIAL	DRAWING NUMBER	INVENTORY NUMBER
4		DUCT, WHT PP, 59 MM PT-PLUS	ASTM D401	E09038-4	02DT0412
3	2	COUPLER CLAMP, 59 MM PT-PLUS	ASTM D401	C628	02DT0015
2	2	SEAL (INCLUDED IN COUPLER HALF)			02DT0013
1	2	COUPLER HALF, 59 MM PT-PLUS	ASTM D401	E0942-2	02DT0013

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SCALE: 1:2
VSL JOB NO:
VSL DWG. NO. A183



FRONT VIEW

ITEM	QTY	DESCRIPTION	MATERIAL	DRAWING REFERENCE	INVENTORY NUMBER
4	1	DUCT, WHT PP, 59 MM PT-PLUS	ASTM D401	E09038-4	02DT0412
3	1	2" SCH. 40 PIPE GALVANIZED	ASTM A53	-	-
2	1	SLIP ON COUPLER	HDPE	(GTI 220205)	(GTI 220205)
1	1	HEATSHRINK SLEEVE (12" LONG)	-	-	(CANUSA) PLA-55-YE

NOTE: NO TEXT OR MARKINGS ON SCHEDULE 40 GALVANIZED STEEL PIPE.
CENTER HEAT SHRINK OVER JOINT.

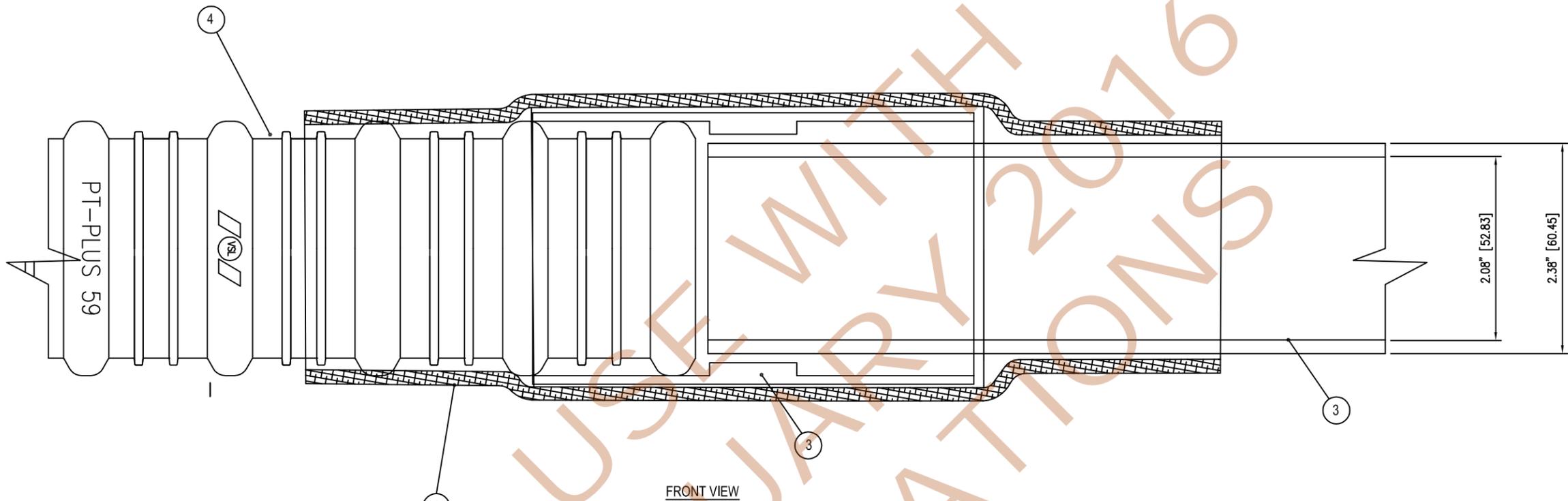
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DWG. TITLE: TYPICAL 2" GALVANIZED STEEL SCH. 40 PIPE TO 59MM PT PLUS DUCT - HEATSHRINK CONNECTION
PROJECT: VSL SYSTEMS DRAWING

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SCALE: NONE
VSL JOB NO:
VSL DWG. NO. A255



FRONT VIEW

ITEM	QTY	DESCRIPTION	MATERIAL	DRAWING REFERENCE	INVENTORY NUMBER
4	1	DUCT, WHT PP, 59 MM PT-PLUS	ASTM D401	E09038-4	02DT0412
3	1	2" HDPE PIPE DR-17	ASTM D3350	-	-
2	1	SLIP ON COUPLER	HDPE	(GTI 220205)	(GTI 220205)
1	1	HEATSHRINK SLEEVE (12" LONG)	-	-	(CANUSA) PLA-55-YE

NOTE:
 1) HDPE PIPE RUNNING LABEL READS: 2" IPS/DR17/DRISCOPEX 4100/PE4710/PE3408.

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BY	SAN	MM	CHK
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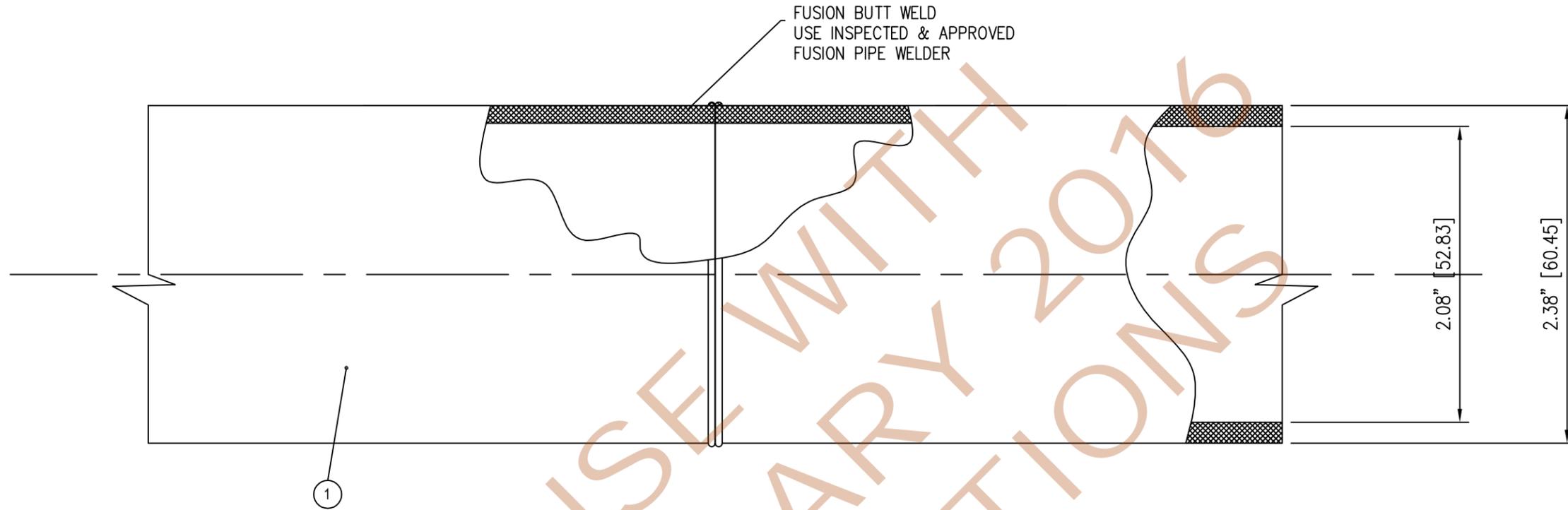
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DWG. TITLE: TYPICAL 2" HDPE DR17 PIPE
 TO 59MM PT PLUS DUCT - HEATSHRINK CONNECTION

PROJECT: VSL
 SYSTEMS DRAWING

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SCALE: NONE
 VSL JOB NO:
 VSL DWG. NO. A262



ELEVATION VIEW

ITEM	QTY	DESCRIPTION	MATERIAL
1	2	2" PLASTIC HDPE PIPE DR-17	HDPE ASTM D 3350

NOTE: 1.) HDPE PIPE RUNNING LABEL READS: 2" IPS/DR17/DRISCOPLX
4100/PE4710/PE3408.

2.) SEE VSL BUTT-WELDING PROCEDURE

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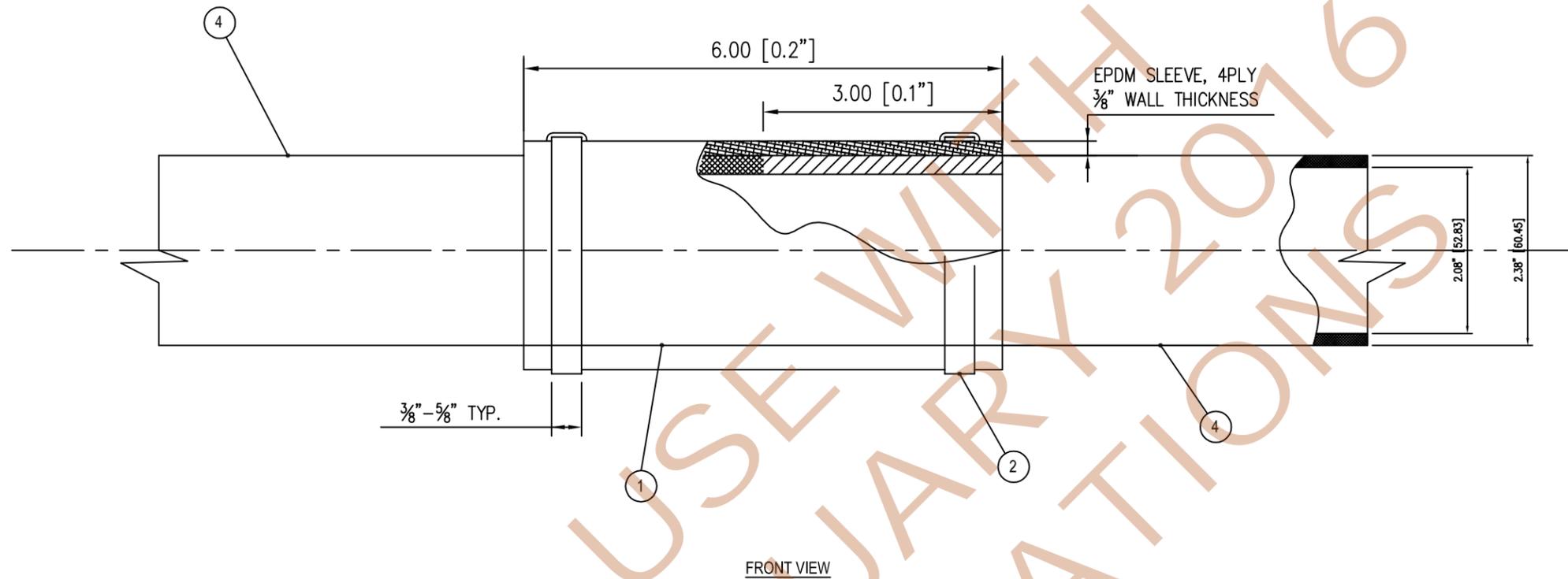

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DWG. TITLE: TYPICAL 2" HDPE PIPE TO 2" HDPE PIPE
FUSION WELDED CONNECTION

PROJECT: VSL
SYSTEMS DRAWING

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SCALE: NONE
VSL JOB NO:
VSL DWG. NO.
A259



FRONT VIEW

ITEM	QTY	DESCRIPTION	MATERIAL
4	2	2" HDPE PIPE DR-17	ASTM D3350
2	2	STAINLESS STEEL PUNCH LOCK BANDS	ASTM A240 316L
1	1	EPDM SLEEVE	EPDM ASTM D 1171

NOTE:

- 1) INSTALL 6" EPDM SLEEVE
- 2) INSTALL 2 SS BAND CLAMPS
- 3) CENTER EPDM SLEEVE OVER THE JOINT
- 4) APPLY 80 TO 120 LBS SEATING FORCE PER PUNCH LOCK.
- 5) EPDM SLEEVE HAS NO TEXT OR MARKINGS. EPDM IS BLACK IN COLOR.
- 6) HDPE PIPE RUNNING LABEL READS: 2" IPS/DR17/DRISCOPLEX 4100/PE4710/PE3408.

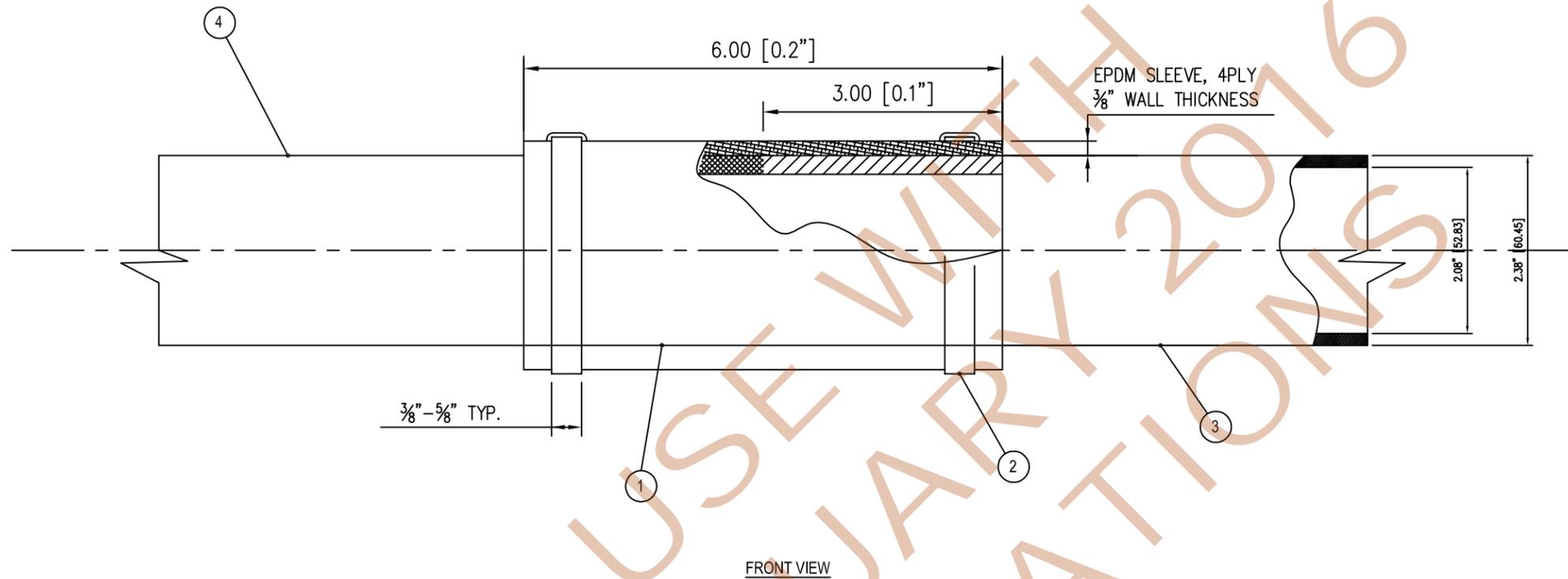
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DWG. TITLE: TYPICAL 2" HDPE PIPE TO 2" HDPE PIPE - EPDM CONNECTION
PROJECT: VSL SYSTEMS DRAWING

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SCALE: NONE
VSL JOB NO:
VSL DWG. NO. A260



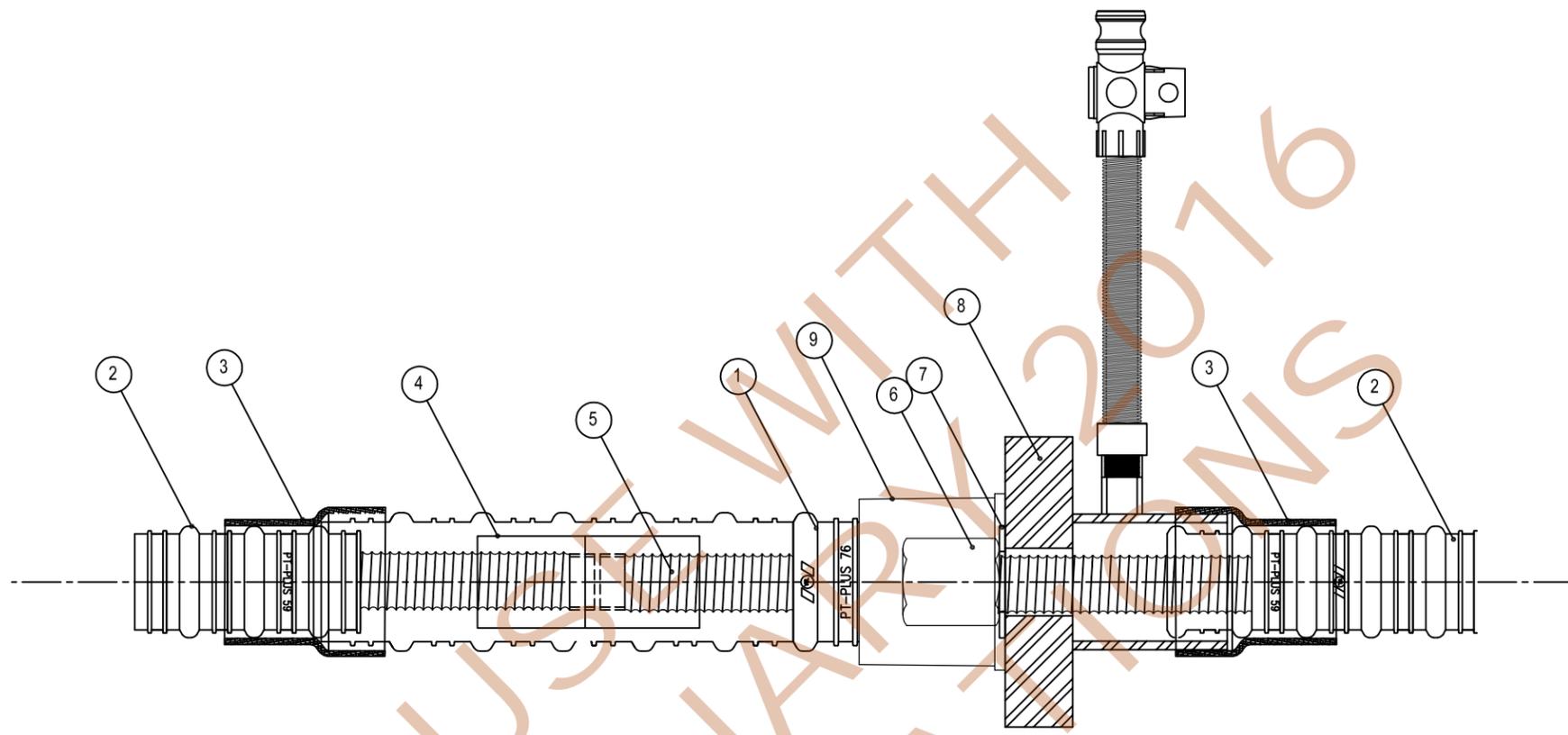
ITEM	QTY	DESCRIPTION	MATERIAL
4	1	2" HDPE PIPE DR-17	ASTM D3350
3	1	2" SCH. 40 PIPE GALVANIZED	ASTM A53
2	2	STAINLESS STEEL PUNCH LOCK BANDS	ASTM A240 316L
1	1	EPDM SLEEVE	EPDM ASTM D 1171

NOTE:

- 1) INSTALL 6" EPDM SLEEVE
- 2) INSTALL 2 SS BAND CLAMPS
- 3) CENTER EPDM SLEEVE OVER THE JOINT
- 4) APPLY 80 TO 120 LBS SEATING FORCE PER PUNCH LOCK.
- 5) EPDM SLEEVE HAS NO TEXT OR MARKINGS. EPDM IS BLACK IN COLOR.
- 6) HDPE PIPE RUNNING LABEL READS: 2" IPS/DR17/DRISCOPLEX 4100/PE4710/PE3408.

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4/13/10	SAN MM								
REV.	REVISION								
0	APPROVED FOR CONSTRUCTION								
<p>VSL SYSTEMS DRAWING</p>									
<p>DWG. TITLE: TYPICAL 2" HDPE PIPE TO 2" GALVANIZED SCHEDULE 40 STEEL PIPE - EPDM CONNECTION</p>									
<p>PROJECT: VSL</p>									
<p>SCALE: NONE</p>									
<p>VSL JOB NO:</p>									
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OVERALL ASSEMBLY

ITEM	QTY	DESCRIPTION	MATERIAL	DRAWING REFERENCE	INVENTORY NUMBER
9	1	PT BAR SEGMENTAL COUPLER	PP	C676	2SC07601
8	1	BEARING PLATE	ASTM A-36-01, AASHTO M183, ASTM A-53, ASTM A-512	1V-R7P-002-1 1V-R7P-001-1	2 OF 4 3 OF 5 5 OF 5
7B	1	WMS. 36mm (1 3/8" nom.) HARDENED WASHER	ASTM F-436-93, TYPE I, AASHTO M293	1B-R7P-001-3	R9F-12-436
7A	1	WMS. 32mm (1 1/4" nom.) HARDENED WASHER	ASTM F-436-93, TYPE I, AASHTO M293	1B-R7P-002-3	R9F-11-436
6B	1	WMS. 36mm (1 3/8" nom.) HEAVY DUTY HEX NUT	A-29-93a GRADE C1045	1B-R7P-001-2	R73-11
6A	1	WMS. 32mm (1 1/4" nom.) HEAVY DUTY HEX NUT	A-29-93a GRADE C1045	1B-R7P-002-2	R73-10
5B	1	WMS. 36mm (1 3/8" nom.) GRADE 150KSI TYPE II ALL-THREAD BAR	ASTM A-72297 AASHTO M275	1B-R7P-001-1	R71-11
5A	1	WMS. 32mm (1 1/4" nom.) GRADE 150KSI TYPE II ALL-THREAD BAR	ASTM A-72297 AASHTO M275	1B-R7P-002-1	R71-10
4B	1	WMS. 36mm (1 3/8" nom.) STOP TYPE COUPLING	A-29 GRADE C1045. HT	1B-R7P-001-4	R72-11
4A	1	WMS. 32mm (1 1/4" nom.) STOP TYPE COUPLING	A-29 GRADE C1045. HT	1B-R7P-002-4	R72-10
3	1	HEATSHRINK SLEEVE (6" LONG)		-	(CANUSA) PLA-63-YE
2	1	DUCT, WHT PP, 59 MM PT-PLUS	ASTM D401	E09038-4	02DT0412
1	1	DUCT, WHT PP, 76 MM PT-PLUS	ASTM D401	E09037-3	02DT0426

NOTE: CENTER HEAT SHRINK OVER JOINT

REV.	DATE	REASON	BY	CHK
2	5/25/10	APPROVED FOR CONSTRUCTION	LA	SAN
1	5/18/10	APPROVED FOR CONSTRUCTION	LA	SAN
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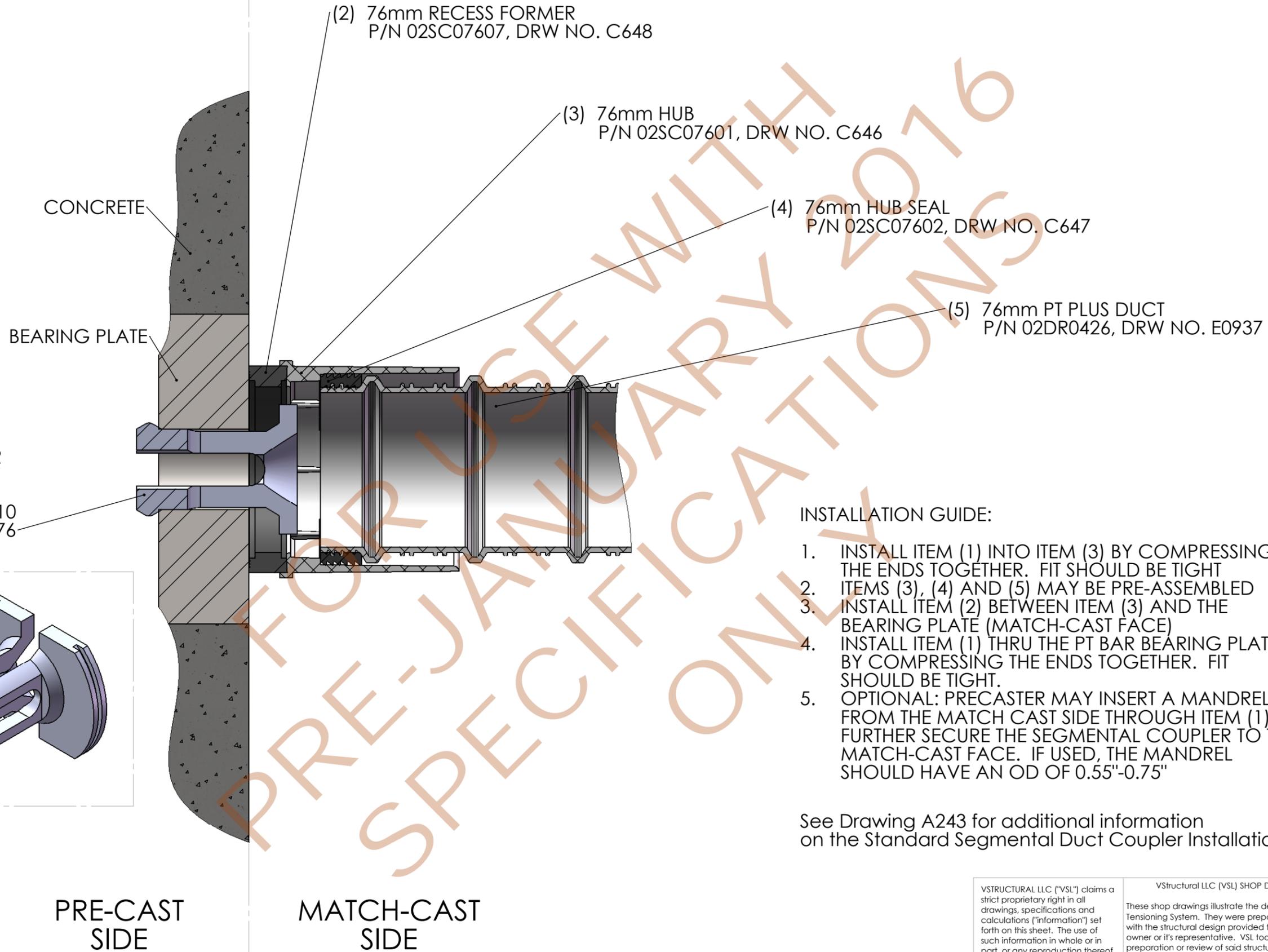
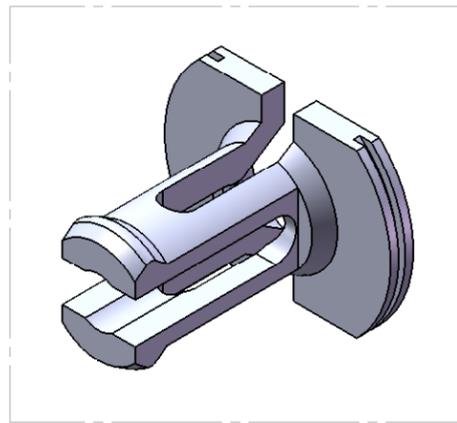


DWG. TITLE: 1-1/4" & 1-3/8" INTERNAL PT BAR SEGMENTAL COUPLER ASSEMBLY
PROJECT: VSL-WILLIAMS FORM ENGINEERING SYSTEMS DRAWING

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SCALE: NONE
VSL JOB NO:
VSL DWG. NO. A263

(1) 76mm PT BAR
MATCH-CAST
FORM TOOL
P/N 02SC07610
DRW NO. C676



INSTALLATION GUIDE:

1. INSTALL ITEM (1) INTO ITEM (3) BY COMPRESSING THE ENDS TOGETHER. FIT SHOULD BE TIGHT
2. ITEMS (3), (4) AND (5) MAY BE PRE-ASSEMBLED
3. INSTALL ITEM (2) BETWEEN ITEM (3) AND THE BEARING PLATE (MATCH-CAST FACE)
4. INSTALL ITEM (1) THRU THE PT BAR BEARING PLATE BY COMPRESSING THE ENDS TOGETHER. FIT SHOULD BE TIGHT.
5. OPTIONAL: PRECASTER MAY INSERT A MANDREL FROM THE MATCH CAST SIDE THROUGH ITEM (1) TO FURTHER SECURE THE SEGMENTAL COUPLER TO THE MATCH-CAST FACE. IF USED, THE MANDREL SHOULD HAVE AN OD OF 0.55"-0.75"

See Drawing A243 for additional information on the Standard Segmental Duct Coupler Installation

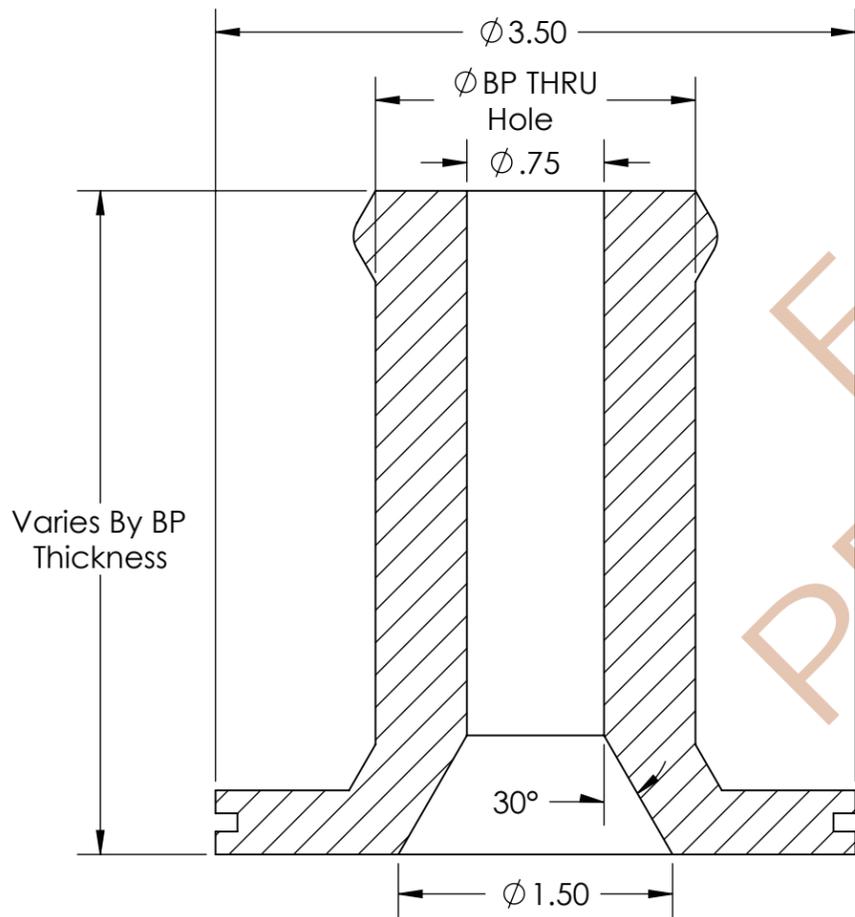
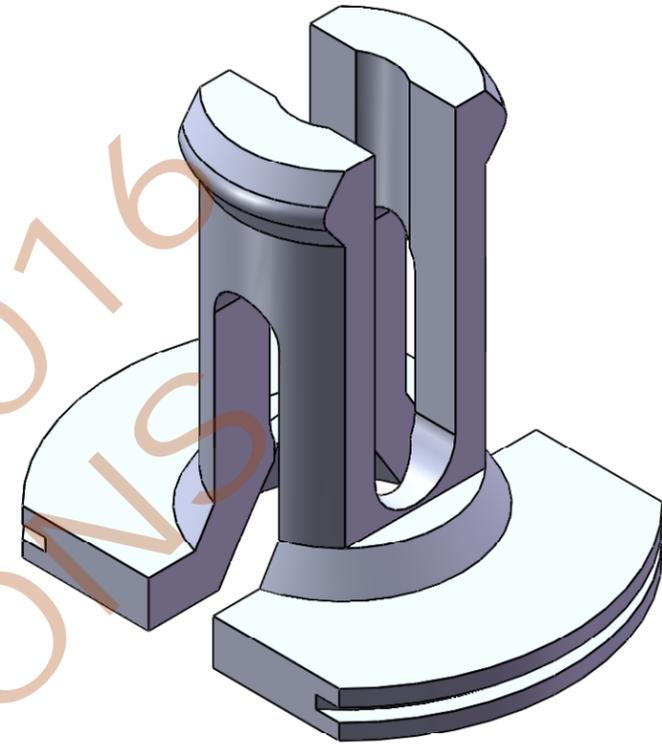
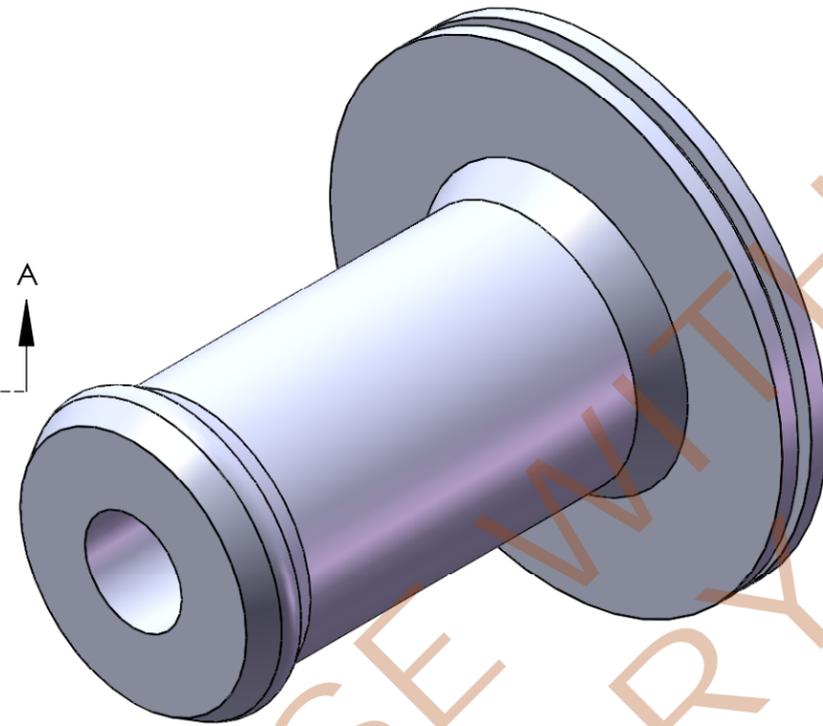
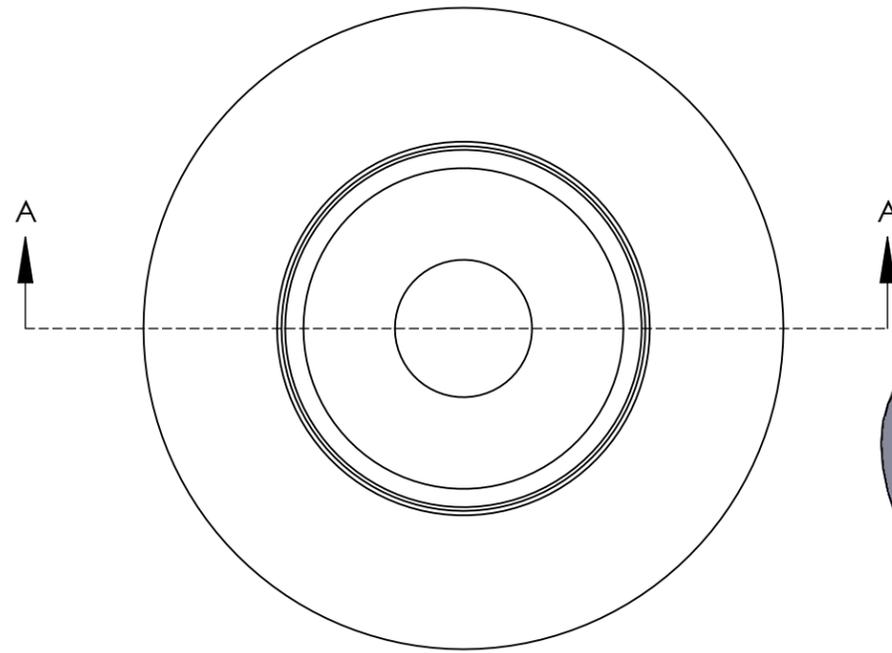
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VStructural LLC (VSL) SHOP DRAWING

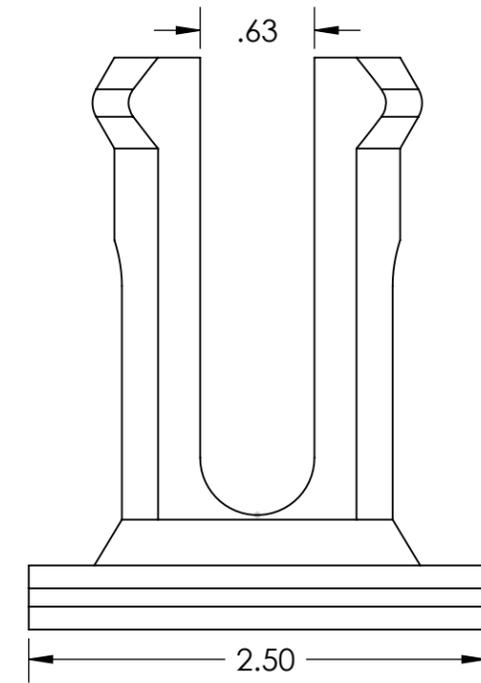
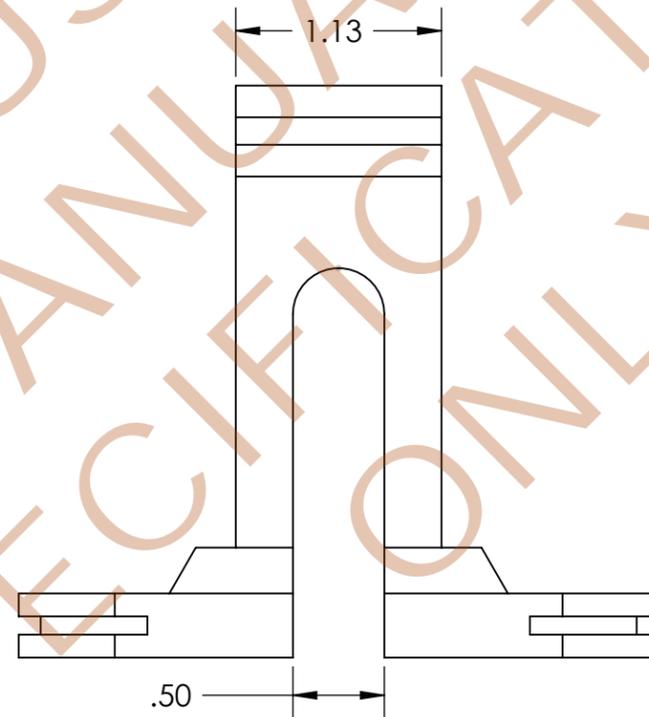
These shop drawings illustrate the details of the VSL Post-Tensioning System. They were prepared in conformance with the structural design provided to VSL by project owner or its representative. VSL took no part in the preparation or review of said structural design and VSL DISCLAIMS ANY LIABILITY for it. The stamp or seal of a VSL employee on these shop drawings pertains only to the transfer of the forces required by the engineer of record on the structural drawings, and not to the adequacy of the structural design. NO WARRANTY, EXPRESSED OR IMPLIED, as to the adequacy of the structural design is made by virtue of any such stamp or seal.

VSL	VStructural LLC Dallas, TX office	15600 Trinity Blvd, Ste 118 Fort Worth, TX 76155	Phone: (817) 545-4807 Fax: (817) 545-4827	ISSUED FOR	BY	CHK
				MM	MM	CHK
VSL 76MM MODIFIED SEGMENTAL COUPLER	INSTALLATION GUIDE FOR PT BAR	NO.	DATE	DESCRIPTION	FOR REFERENCE	
		0	5/4/2010			
SCALE: DO NOT SCALE	DRW NO: A274	SHEET: 1 of 1				

<<< First Turn | Final Part >>>



SECTION A-A



TYPE	BEARING PLATE THICKNESS					BAR SIZE	
	1.5"	1.75"	2"	2.25"	2.5"	1-1/4"	1-3/8"
A	X					X	
B		X				X	
C			X			X	
D				X		X	
E					X	X	
F	X						X
G		X					X
H			X				X
I				X			X
J					X		X

MATERIAL: HDPE or similar,
Natural or Black in color

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FOR USE ONLY
PRE-JANUARY 2016



VStructural LLC
Dallas, TX office
15600 Trinity Blvd, Ste 118
Fort Worth, TX 76155
Phone: (817) 545-4807
Fax: (817) 545-4827

Dallas, TX / Washington, DC / Denver, CO / Pompano Beach, FL / Atlanta, GA

VSL 76mm Segmental
Duct Coupler System

76mm Bar Form Tool
For PT Bar BP

P/N 02SC07610

SCALE: DO NOT SCALE

DRW NO: C676

SHEET: 1 of 1

NO.	DATE	DESCRIPTION	ISSUED FOR	BY	CHK
0	4/1/2010	FOR CONSTRUCTION		MM	CHK

PATENT PENDING

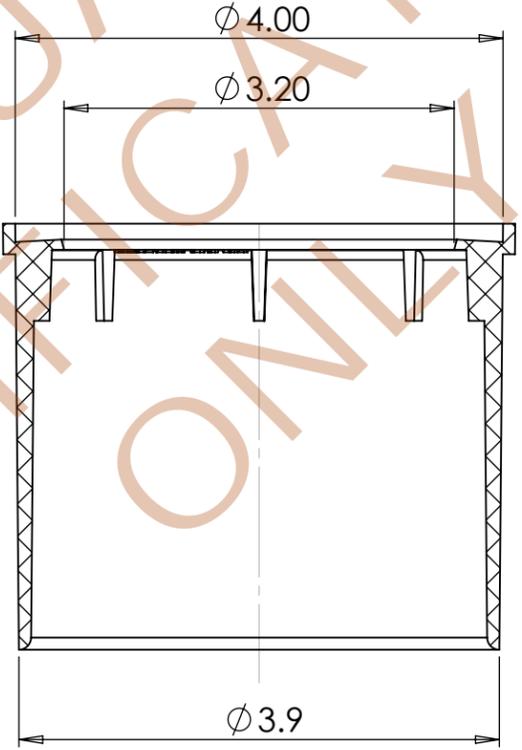
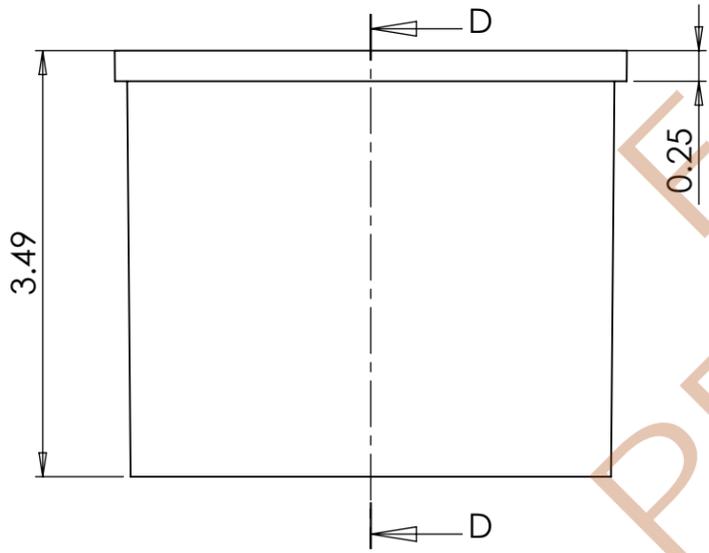
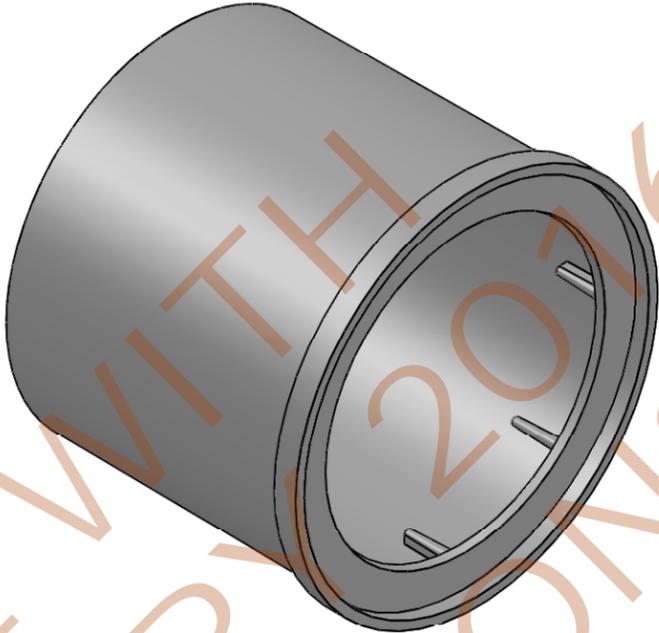
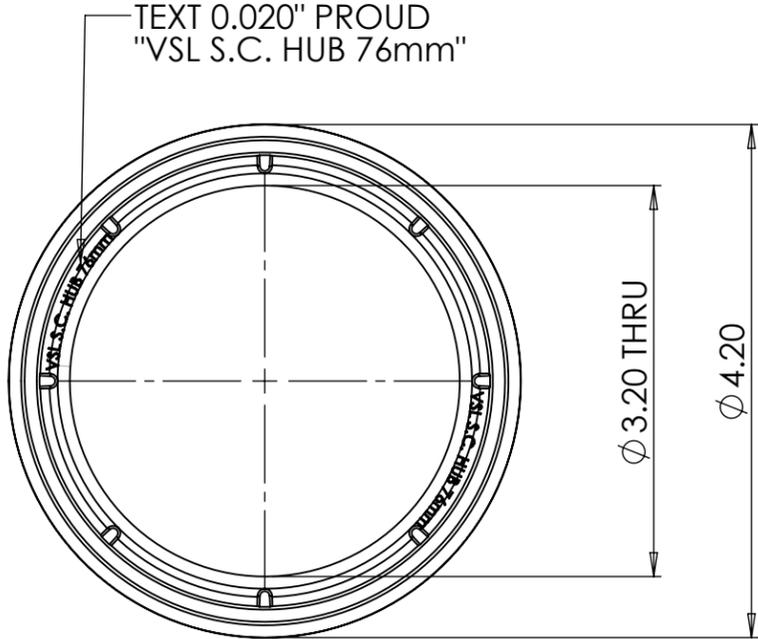
MATERIAL
 PP, White in color
 (per VSL MS 8.1.091209.1)

TOLERANCES

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS IN INCHES

FRACTIONAL	_____	± 1/64
DECIMAL	____.X	± .030
DECIMAL	____.XX	± .010
DECIMAL	____.XXX	± .005
ANGULAR	_____	± 0°30'

SURFACE QUALITY _____ ✓



SECTION D-D

PRELIMINARY SPECIFICATIONS ONLY
 FOR USE WITH VSL 2016

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VSL 76mm SEGMENTAL DUCT COUPLER SYSTEM	VSL		VStructural LLC Dallas, TX office	15600 Trinity Blvd, Ste 118 Fort Worth, TX 76155	Phone: (817) 545-4807 Fax: (817) 545-4827	Dallas, TX / Washington, DC / Denver, CO / Pompano Beach, FL / Atlanta, GA	NO.	DATE	DESCRIPTION	ISSUED FOR	BY	CHK
	HUB	0					10/30/09	PRELIMINARY		MM	GY	
VSL P/N 02SC07601	SCALE: DO NOT SCALE		DRW NO: C646.2		SHEET: 1 of 1		2	1/14/2010	FOR PRODUCTION		MM	GY
							1	11/10/09	FOR REVIEW		MM	GY
							0	10/30/09	PRELIMINARY		MM	GY

PATENT PENDING

MATERIAL

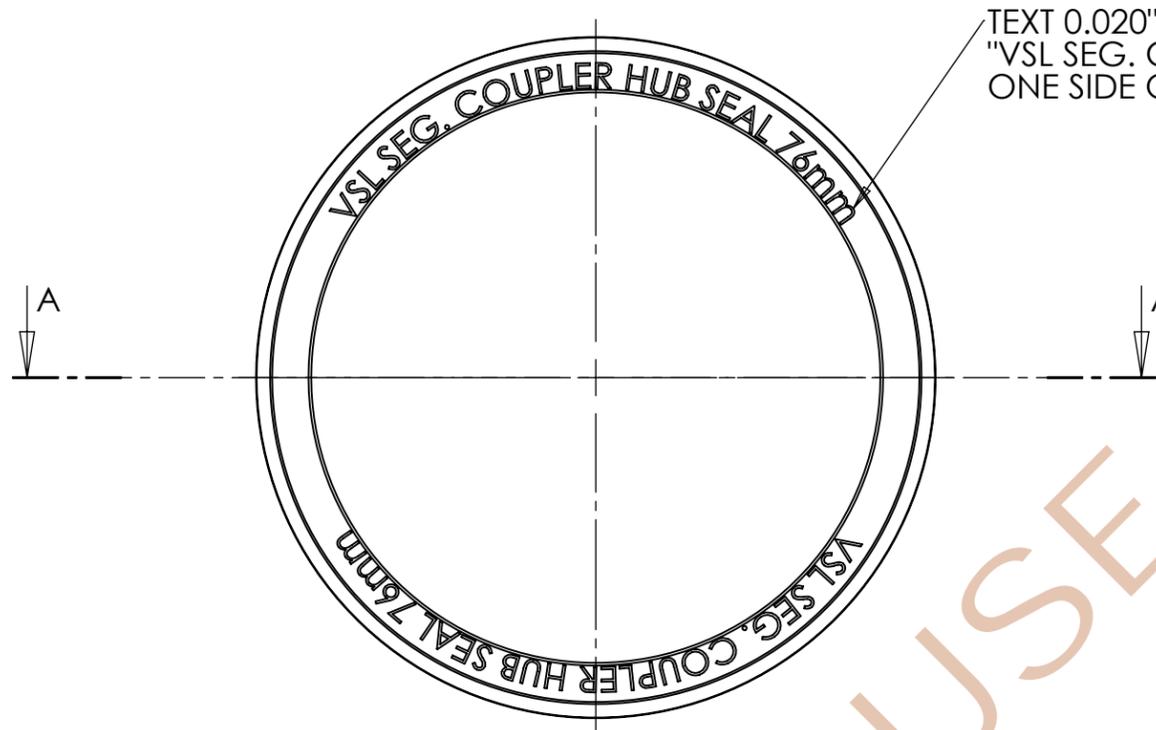
Santoprene, Black in color
(per VSL MS 8.1.091209.2)

TOLERANCES

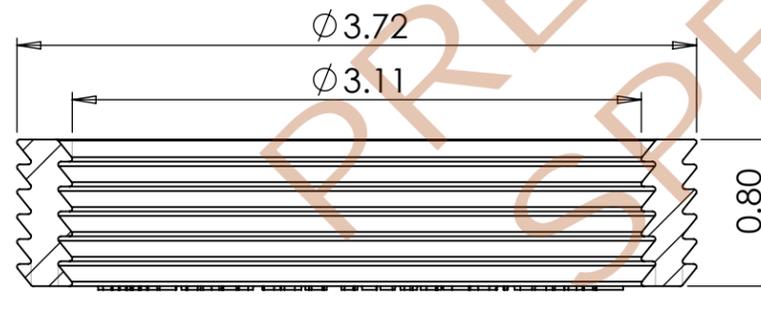
UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES

FRACTIONAL		± 1/64
DECIMAL	.X	± .030
DECIMAL	.XX	± .010
DECIMAL	.XXX	± .005
ANGULAR		± 0°30'

SURFACE QUALITY



TEXT 0.020" PROUD
"VSL SEG. COUPLER HUB SEAL 76mm"
ONE SIDE ONLY



SECTION A-A



FOR USE WITH 2016 PRE-JANUARY SPECIFICATIONS ONLY

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VStructural LLC (VSL) SHOP DRAWING

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 VStructural LLC Dallas, TX office 15600 Trinity Blvd, Ste 118 Fort Worth, TX 76155 Phone: (817) 545-4807 Fax: (817) 545-4827 Dallas, TX / Washington, DC / Denver, CO / Pompano Beach, FL / Atlanta, GA	2	1/14/2010	FOR PRODUCTION	MM	GY	ISSUED FOR BY CHK
	1	11/10/09	FOR REVIEW	MM	GY	
	0	10/30/09	PRELIMINARY	MM	GY	
NO.	DATE	DESCRIPTION				
VSL 76mm SEGMENTAL DUCT COUPLER SYSTEM						
HUB SEAL						
VSL P/N 02SC07602						
SCALE: DO NOT SCALE						
DRW NO: C647.2						
SHEET: 1 of 1						

PATENT PENDING

MATERIAL

Santoprene, Black in color
(per VSL MS 8.1.091209.2)

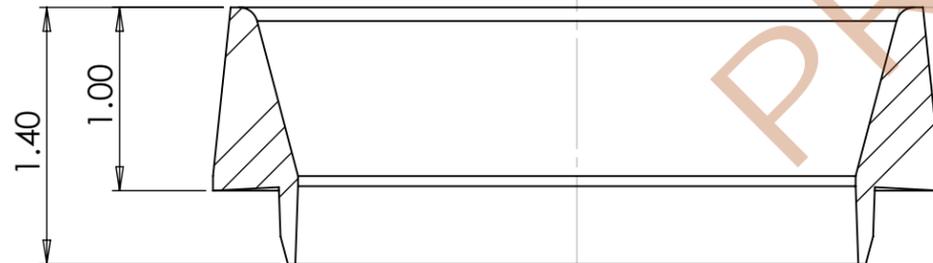
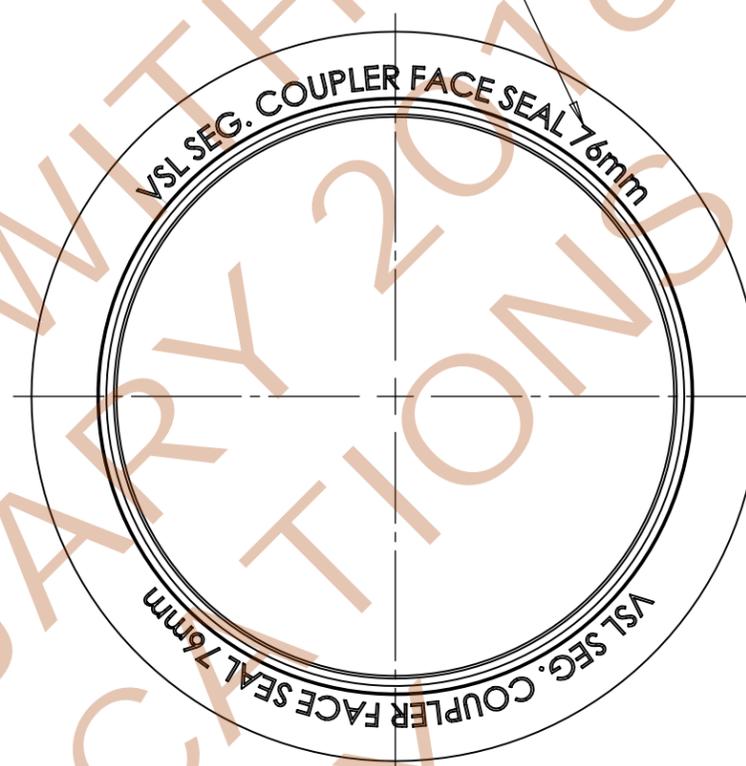
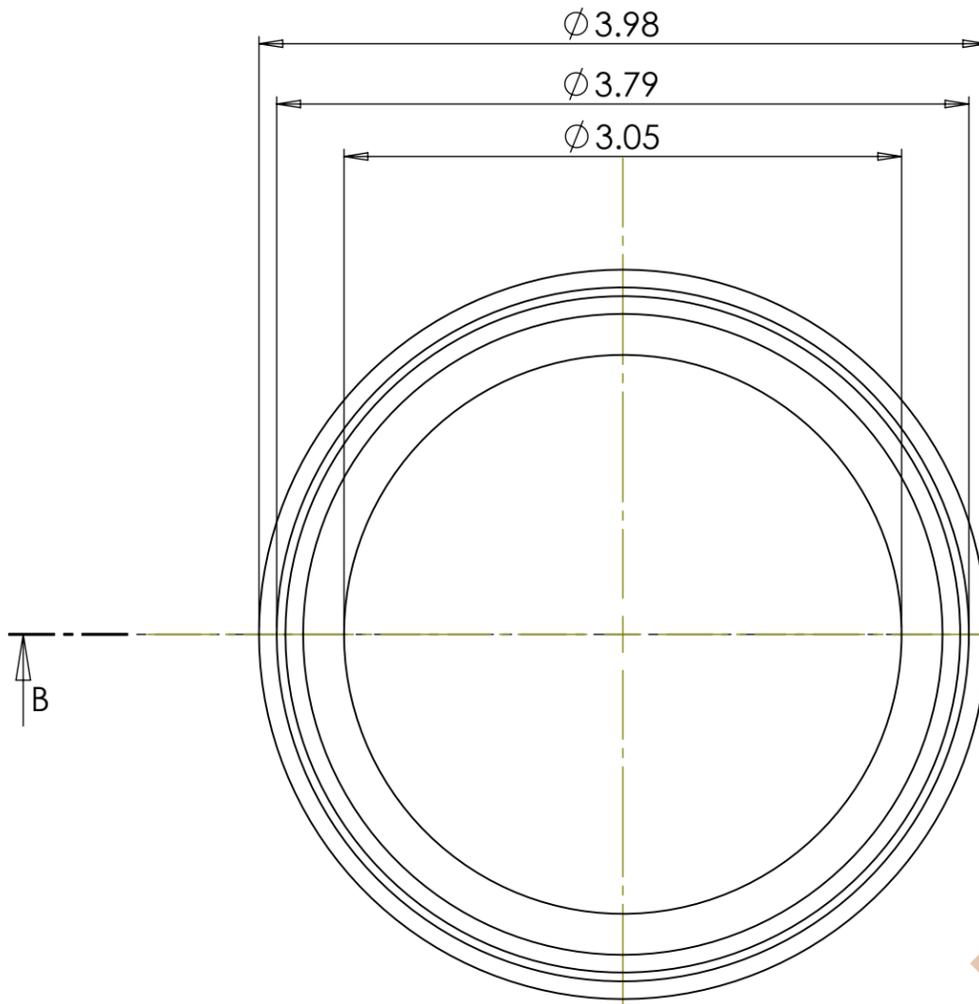
TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES

FRACTIONAL	_____	±	1/64
DECIMAL	.X	±	.030
DECIMAL	.XX	±	.010
DECIMAL	.XXX	±	.005
ANGULAR	_____	±	0°30'

SURFACE QUALITY _____ ✓

TEXT 0.020" RECESSED:
"VSL SEG. COUPLER FACE SEAL 76mm"



SECTION B-B



FOR USE WITH PRECAST CONCRETE ONLY

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VSL 76mm SEGMENTAL DUCT COUPLER SYSTEM	FOR PRODUCTION	1/14/2010	2	VStructural LLC Dallas, TX office 15600 Trinity Blvd, Ste 118 Fort Worth, TX 76155 Phone: (817) 545-4807 Fax: (817) 545-4827	Dallas, TX / Washington, DC / Denver, CO / Pompano Beach, FL / Atlanta, GA
	FOR REVIEW	11/10/09	1		
FACE SEAL	PRELIMINARY	10/30/09	0		
VSL P/N 02SC07603	DESCRIPTION	DATE	NO.	ISSUED FOR	CHK
SCALE: DO NOT SCALE					
DRW NO: C648.2					
SHEET: 1 of 1					

PATENT PENDING

MATERIAL

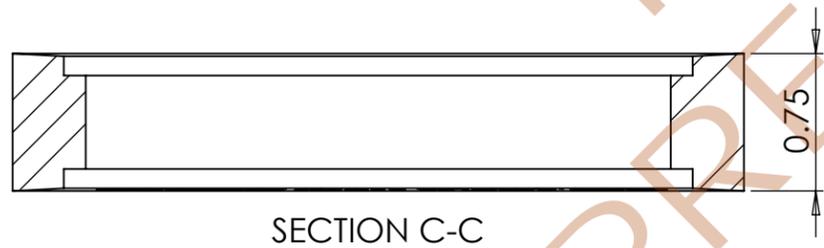
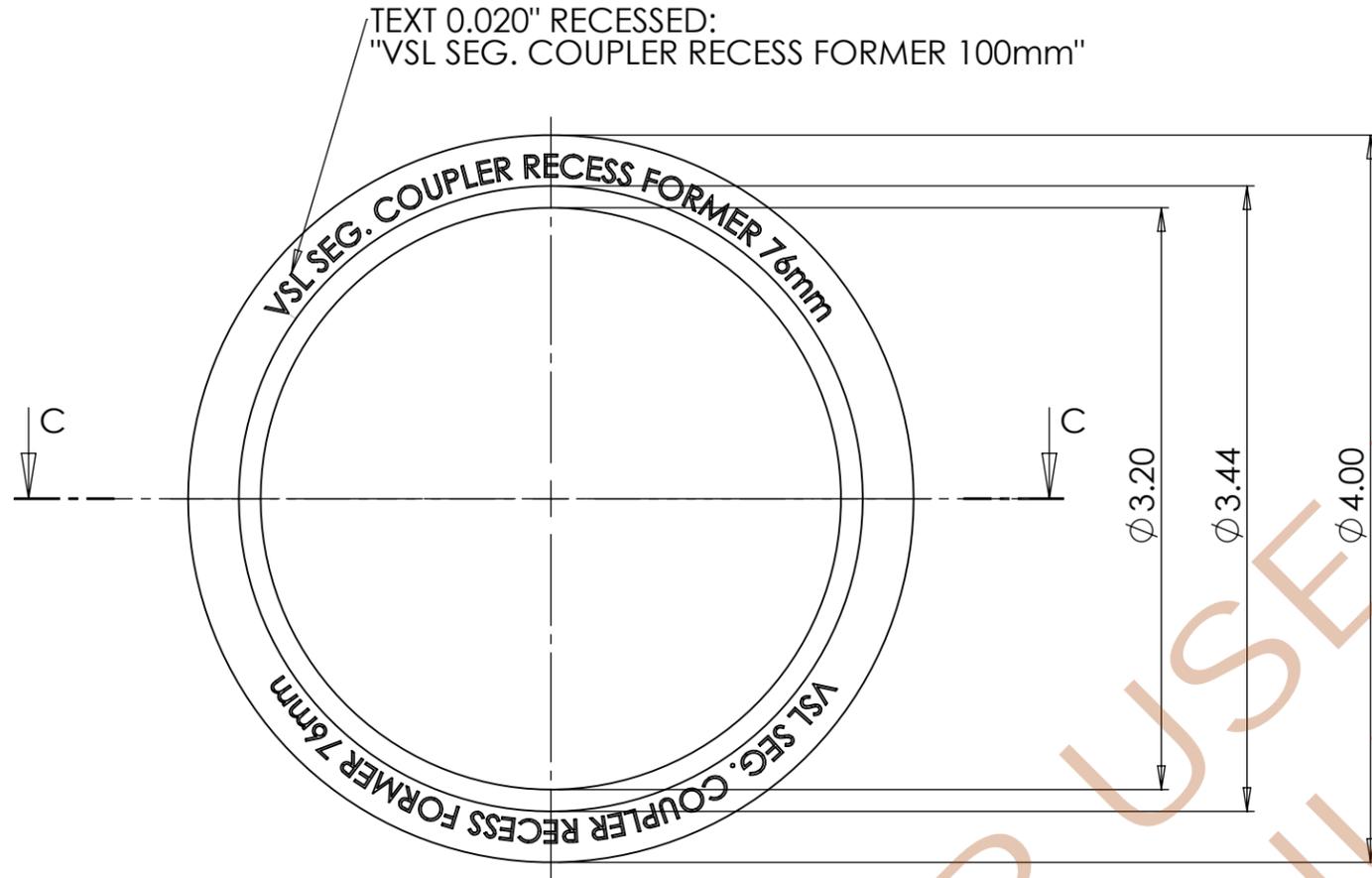
Santoprene, Black in color
(per VSL MS 8.1.091209.3)

TOLERANCES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES

FRACTIONAL		± 1/64
DECIMAL	.X	± .030
DECIMAL	.XX	± .010
DECIMAL	.XXX	± .005
ANGULAR		± 0°30'

SURFACE QUALITY ✓



FOR USE WITH PATENT PENDING VSL SEG. COUPLER RECESS FORMERS ONLY JANUARY 2016

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ISSUED FOR	BY	CHK
	MM	GY
	MM	GY
	MM	GY

NO.	DATE	DESCRIPTION
2	1/14/2010	FOR PRODUCTION
1	11/10/09	FOR REVIEW
0	10/30/09	PRELIMINARY



VStructural LLC
Dallas, TX office

15600 Trinity Blvd, Ste 118
Fort Worth, TX 76155

Phone: (817) 545-4807
Fax: (817) 545-4827

Dallas, TX / Washington, DC / Denver, CO / Pompano Beach, FL / Atlanta, GA

**VSL 76mm SEGMENTAL
DUCT COUPLER SYSTEM**

RECESS FORMER

VSL P/N 02SC07607

SCALE: DO NOT SCALE

DRW NO: C649.2

SHEET: 1 of 1

PATENT PENDING

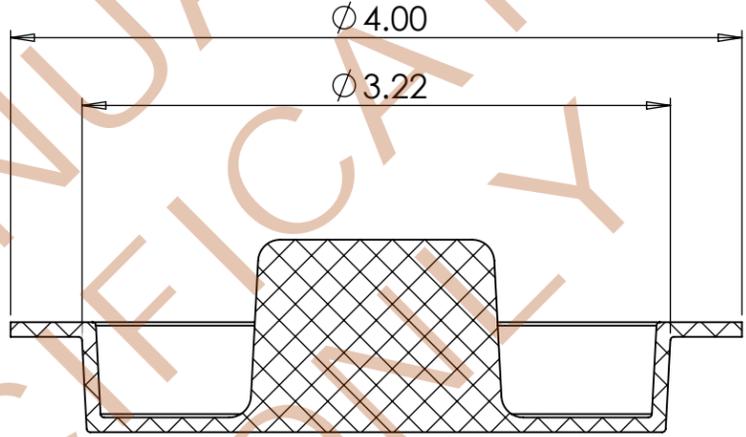
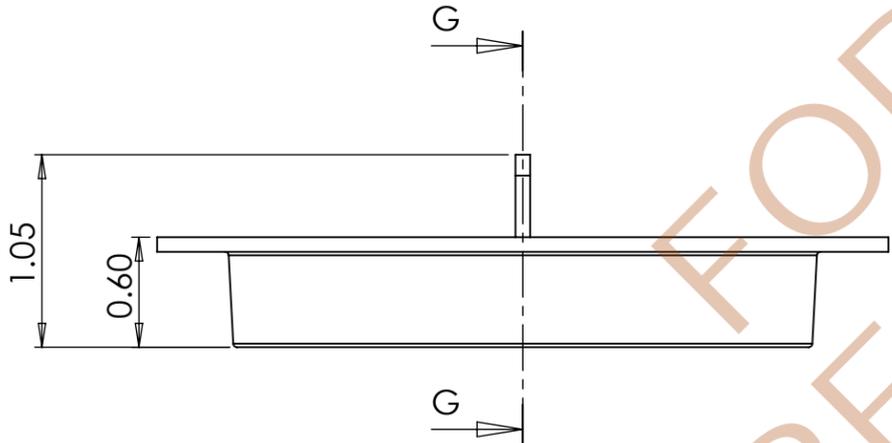
MATERIAL
LDPE

TOLERANCES

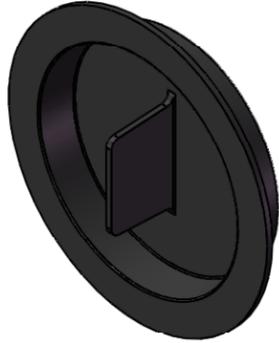
UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES

FRACTIONAL	_____	± 1/64
DECIMAL	____.X	± .030
DECIMAL	____.XX	± .010
DECIMAL	____.XXX	± .005
ANGULAR	_____	± 0°30'

SURFACE QUALITY _____ ✓



SECTION G-G
SCALE 1 : 1

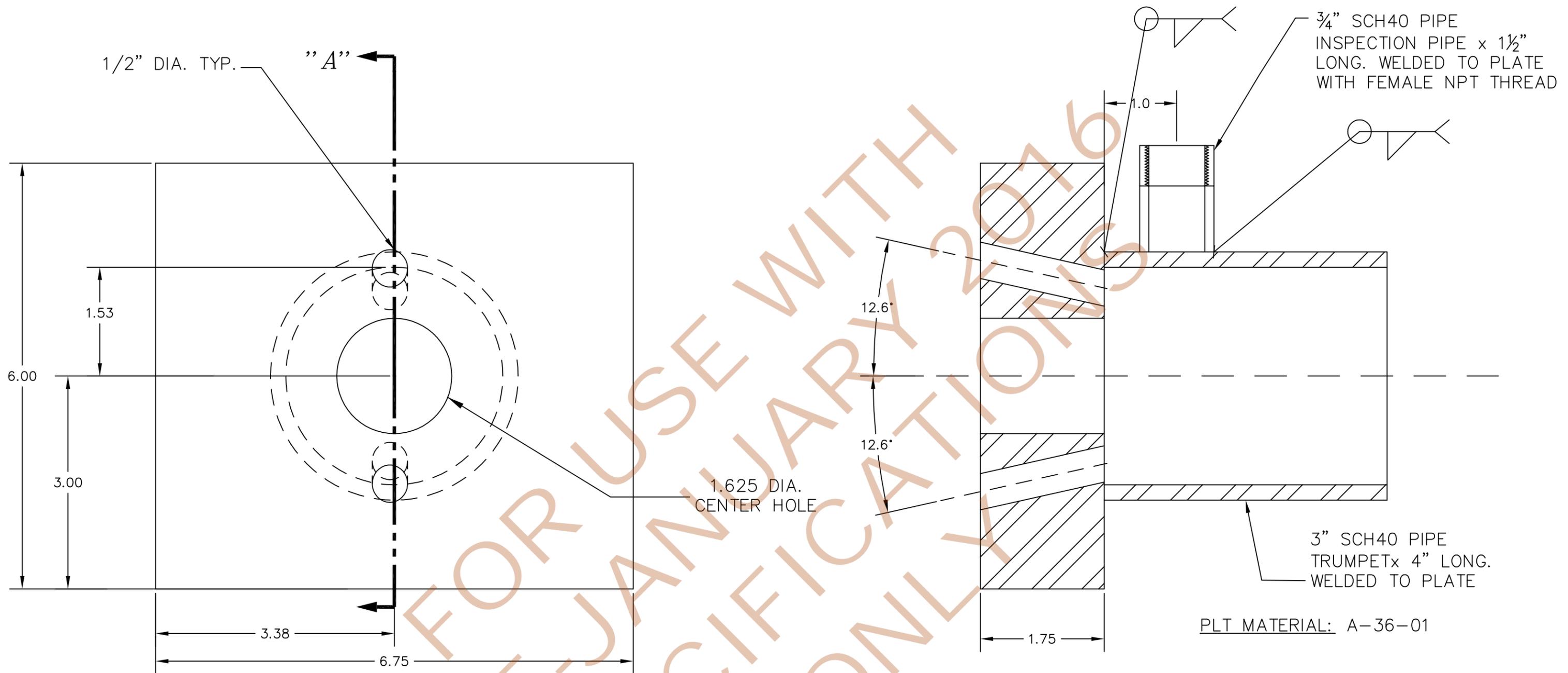


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VSL 76mm SEGMENTAL DUCT COUPLER SYSTEM	VStructural LLC Dallas, TX office	15600 Trinity Blvd, Ste 118 Fort Worth, TX 76155	Phone: (817) 545-4807 Fax: (817) 545-4827	0	1/7/2010	PRELIMINARY	ISSUED FOR	MM	GY	BY	CHK
76mm PROTECTIVE CAP VSL P/N 02SC07606	VSL										
	Dallas, TX / Washington, DC / Denver, CO / Pompano Beach, FL / Atlanta, GA										
	SCALE: DO NOT SCALE										
	DRW NO: C663										
	SHEET: 1 of 1										



1/2" DIA. TYP. "A"

3/4" SCH40 PIPE
INSPECTION PIPE x 1 1/2"
LONG. WELDED TO PLATE
WITH FEMALE NPT THREAD

1.625 DIA.
CENTER HOLE

3" SCH40 PIPE
TRUMPET x 4" LONG.
WELDED TO PLATE

PLT MATERIAL: A-36-01

FINISH: GALV. ASTM A-123.
TOLERANCES UNLESS
OTHERWISE SPECIFIED
.XX, +/- .02, .XXX +/- .010
ANGLES +/- 0°-30'
BURN CUTS +/- .06

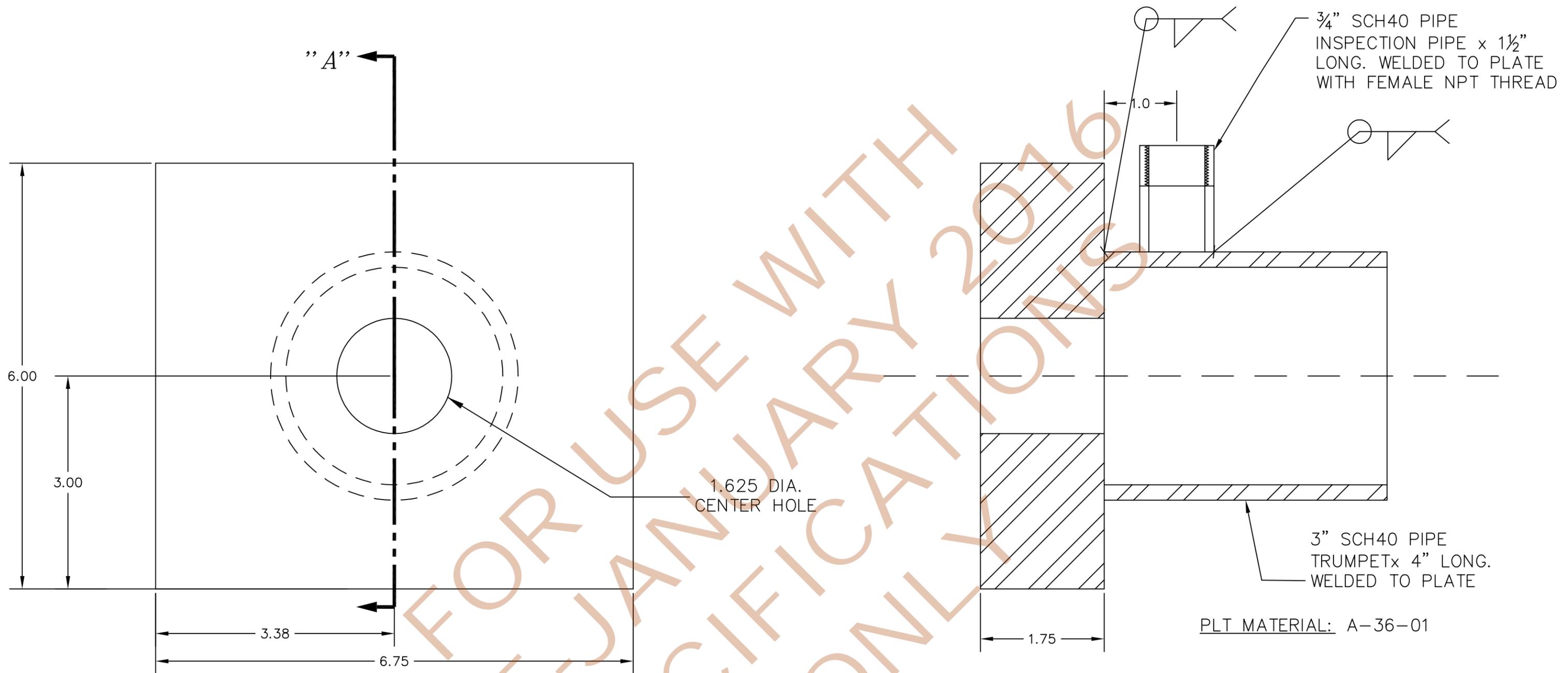
SECTION "A"

NOTE: SEE SHEET 1BFK-5-129 FOR BEVELED NUT HOLE DIMENSIONS

WILLIAMS
FORM ENGINEERING CORP.
<http://www.williamsform.com>
280 ANN ST. N.W., GRAND RAPIDS, MI 49504, PH: 616.365.9220 - FX: 616.365.2668

Customer: R7P-32 SYSTEM
Project: 1.75 x 6.00 x 6.75 BEARING PLATE
WITH 1.625 CENTER HOLE, (2) .50 DIA. ANGLED GROUT HOLES
AND .75 DIA. INSPECTION/GROUT PORT ASSEMBLY
ASTM A-36-01, AASHTO M183, FOR 32mm (1 1/4" nom.) GR150 A.T.B.
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DRAWN BY:	SAN	ECO NO.:	---
SCALE:	NTS	C/O:	---
DATE:	04-09-10	APPRO BY:	YB
SHEET NO.	1	WAREHOUSE:	---
TOTAL SHEETS	4	TECH REP:	---
PRINT NO.:	1V-R7P-002-1		REV.
			0



1.625 DIA.
CENTER HOLE

3/4" SCH40 PIPE
INSPECTION PIPE x 1 1/2"
LONG. WELDED TO PLATE
WITH FEMALE NPT THREAD

3" SCH40 PIPE
TRUMPET x 4" LONG.
WELDED TO PLATE

PLT MATERIAL: A-36-01

FINISH: GALV. ASTM A-123.
TOLERANCES UNLESS
OTHERWISE SPECIFIED
.XX, +/- .02, .XXX +/- .010
ANGLES +/- 0°-30'
BURN CUTS +/- .06

SECTION "A"

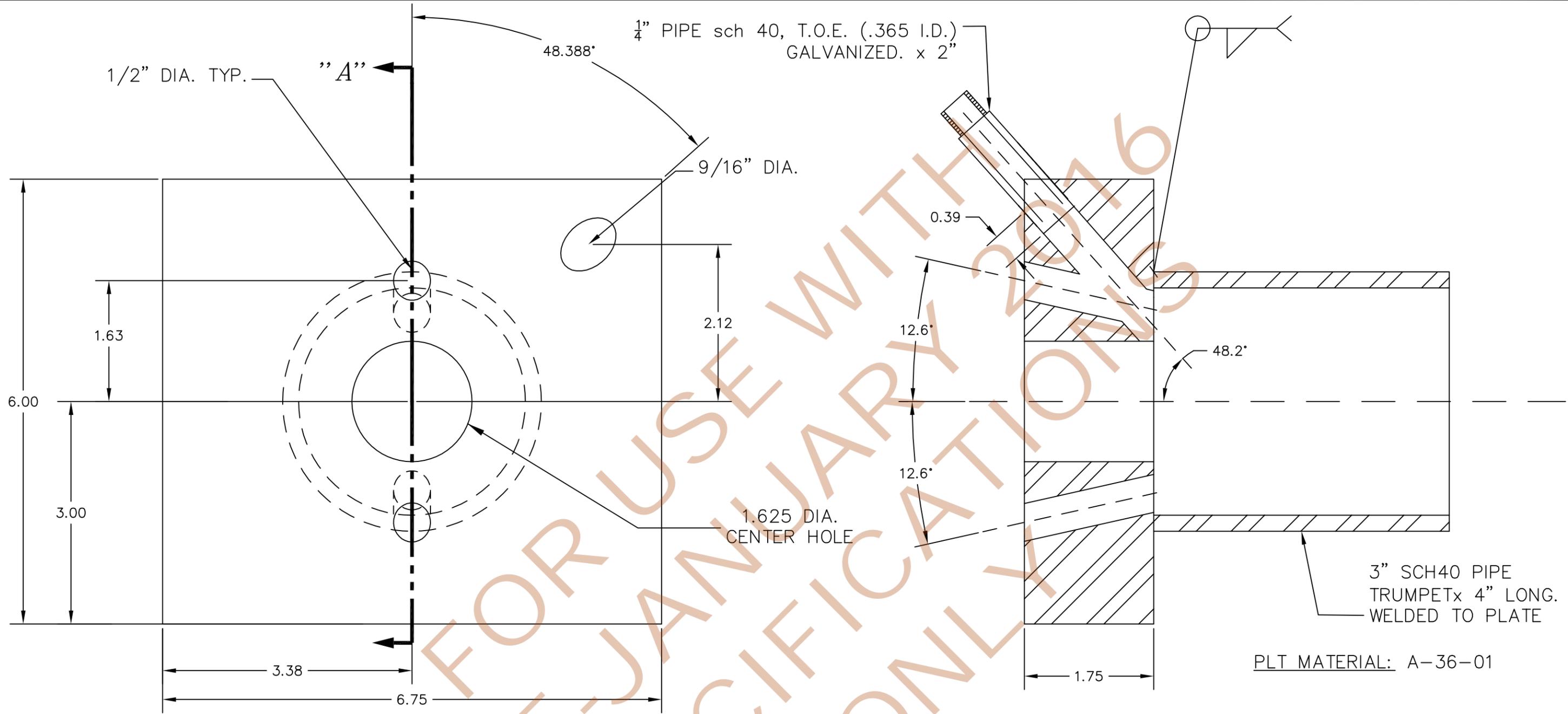
NOTE: SEE SHEET 1BFK-5-129 FOR BEVELED NUT HOLE DIMENSIONS

WILLIAMS
FORM ENGINEERING CORP.
<http://www.williamsform.com>
280 ANN ST. N.W., GRAND RAPIDS, MI 49504, PH: 616.365.9220 - FX: 616.365.2668

Customer: R7P-32 SYSTEM
Project: 1.75 x 6.00 x 6.75 BEARING PLATE
WITH 1.625 CENTER HOLE,
AND .75 DIA. INSPECTION/GROUT PORT ASSEMBLY
ASTM A-36-01, AASHTO M183, FOR 32mm (1 1/4" nom.) GR150 A.T.B.

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DRAWN BY:	SAN	ECO NO.:	---
SCALE:	NTS	C/O:	---
DATE:	04-09-10	APPRO BY:	YB
SHEET NO.	2	WAREHOUSE:	---
TOTAL SHEETS	4	TECH REP:	---
PRINT NO.:	1V-R7P-002-1		REV.
			0



1/4" PIPE sch 40, T.O.E. (.365 I.D.) GALVANIZED. x 2"

1/2" DIA. TYP.

"A"

48.388°

9/16" DIA.

0.39

2.12

12.6°

12.6°

48.2°

1.625 DIA. CENTER HOLE

3" SCH40 PIPE TRUMPET x 4" LONG. WELDED TO PLATE

PLT MATERIAL: A-36-01

FINISH: GALV. ASTM A-123.
TOLERANCES UNLESS OTHERWISE SPECIFIED
.XX, +/- .02, .XXX +/- .010
ANGLES +/- 0°-30'
BURN CUTS +/- .06

SECTION "A"

NOTE: SEE SHEET 1BFK-5-129 FOR BEVELED NUT HOLE DIMENSIONS

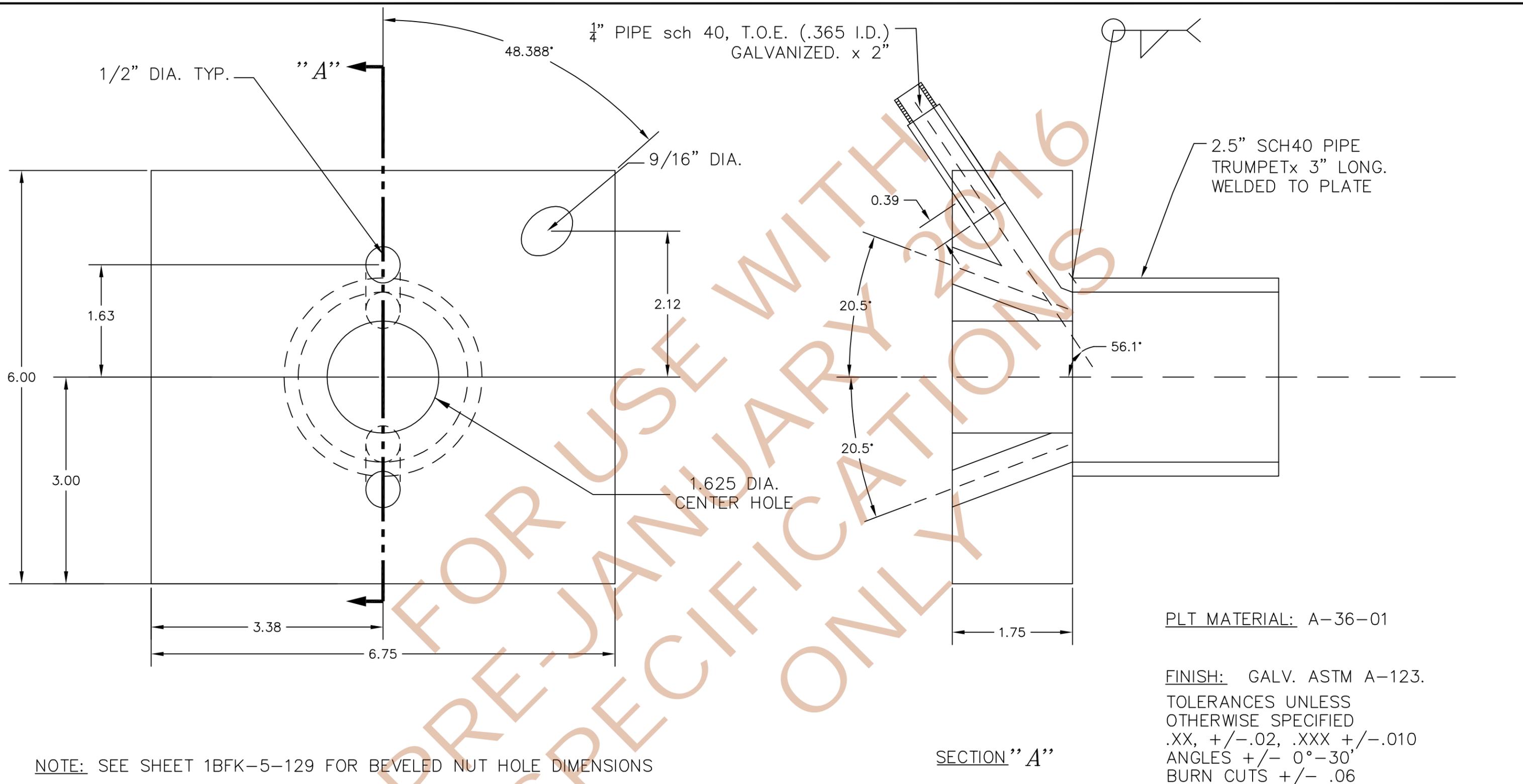
WILLIAMS
FORM ENGINEERING CORP.
<http://www.williamsform.com>
280 ANN ST. N.W., GRAND RAPIDS, MI 49504, PH: 616.365.9220 - FX: 616.365.2668

Customer: R7P-32 SYSTEM
Project: 1.75 x 6.00 x 6.75 BEARING PLATE
WITH 1.625 CENTER HOLE, (2) .50 DIA. ANGLED GROUT HOLES
AND .56 DIA. INSPECTION PORT ASSEMBLY
ASTM A-36-01, AASHTO M183, FOR 32mm (1 1/4" nom.) GR150 A.T.B.

DRAWN BY:	SAN	ECO NO.:	---
SCALE:	NTS	C/O:	---
DATE:	04-09-10	APPRO BY:	YB
SHEET NO.	3	WAREHOUSE:	---
TOTAL SHEETS	4	TECH REP:	---

THIS DRAWING IS THE PROPERTY OF WILLIAMS FORM ENGINEERING CORPORATION AND IS SUBMITTED TO THE CONTRACTOR SOLELY AS A SUGGESTED DESIGN FOR APPROVAL BY HIS JOB DESIGN AGENCY. IT IS SUBJECT TO RECALL AND MUST NOT BE REPRODUCED OR ITS CONTENTS DIVULGED WITHOUT WRITTEN PERMISSION. ALL WILLIAMS PRODUCTS ARE PATENTED OR HAVE PATENTS APPLIED FOR.

PRINT NO.: 1V-R7P-002-1
REV. 0

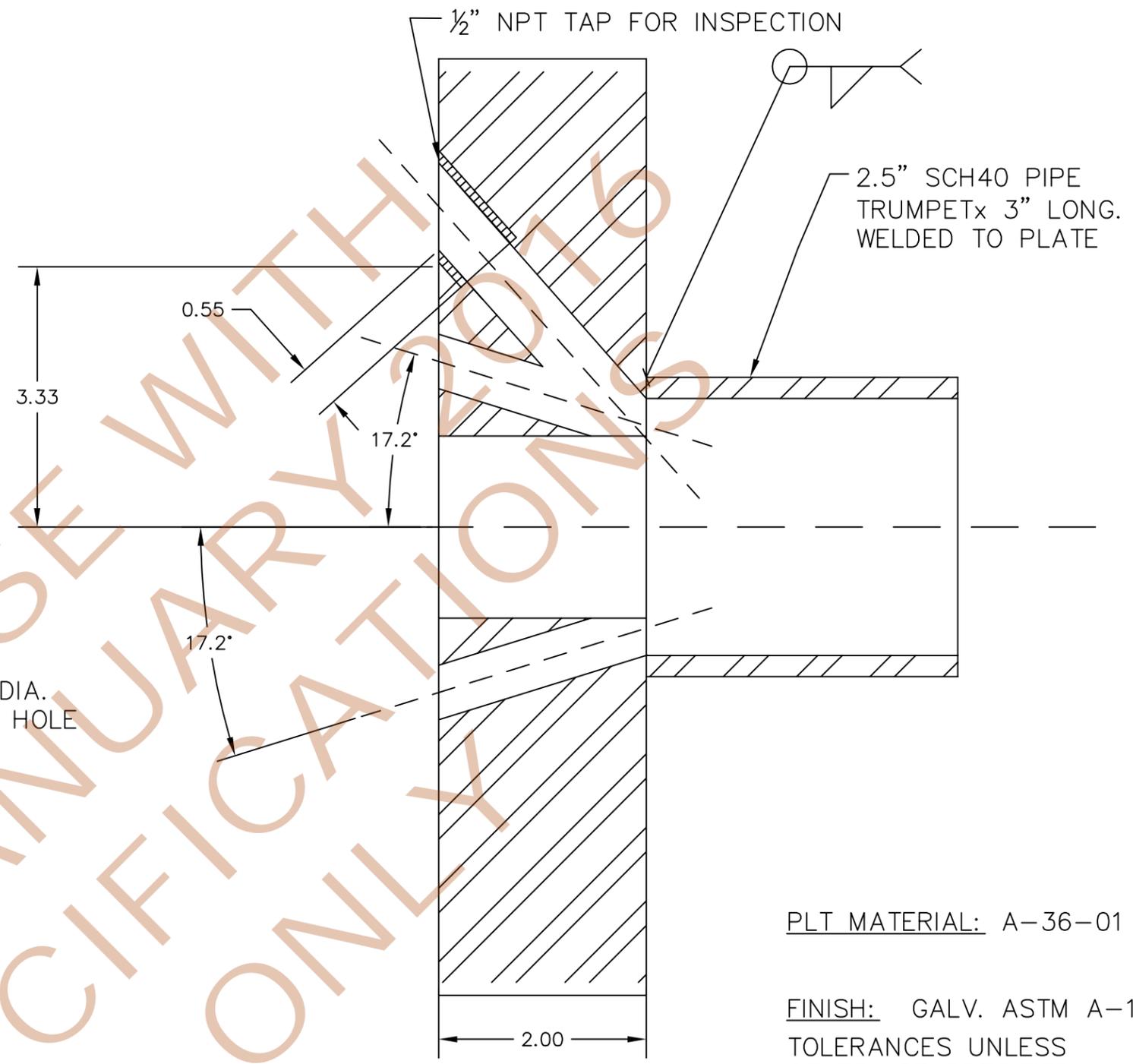
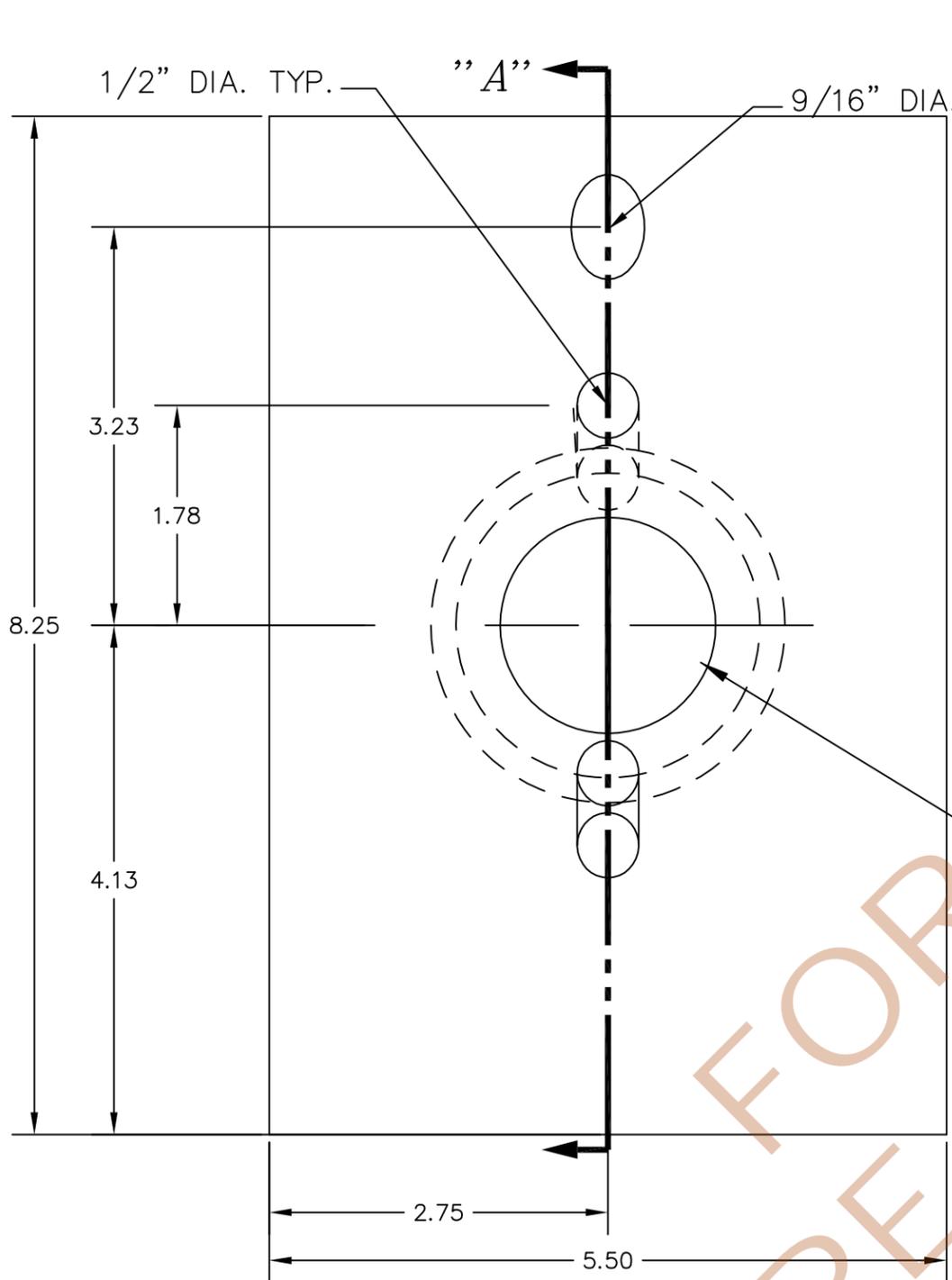


WILLIAMS
FORM ENGINEERING CORP.
<http://www.williamsform.com>
280 ANN ST. N.W., GRAND RAPIDS, MI 49504, PH: 616.365.9220 - FX: 616.365.2668

Customer: R7P-32 SYSTEM
Project: 1.75 x 6.00 x 6.75 BEARING PLATE
WITH 1.625 CENTER HOLE, (2) .50 DIA. ANGLED GROUT HOLES
AND .56 DIA. INSPECTION PORT ASSEMBLY
ASTM A-36-01, AASHTO M183, FOR 32mm (1 1/4" nom.) GR150 A.T.B.

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DRAWN BY:	SAN	ECO NO.:	---
SCALE:	NTS	C/O:	---
DATE:	04-09-10	APPRO BY:	YB
SHEET NO.	4	WAREHOUSE:	---
TOTAL SHEETS	4	TECH REP:	---
PRINT NO.:	1V-R7P-002-1		REV.:
			0



PLT MATERIAL: A-36-01

FINISH: GALV. ASTM A-123.
 TOLERANCES UNLESS OTHERWISE SPECIFIED
 .XX, +/- .02, .XXX +/- .010
 ANGLES +/- 0°-30'
 BURN CUTS +/- .06

NOTE: SEE SHEET 1BFK-5-129 FOR BEVELED NUT HOLE DIMENSIONS

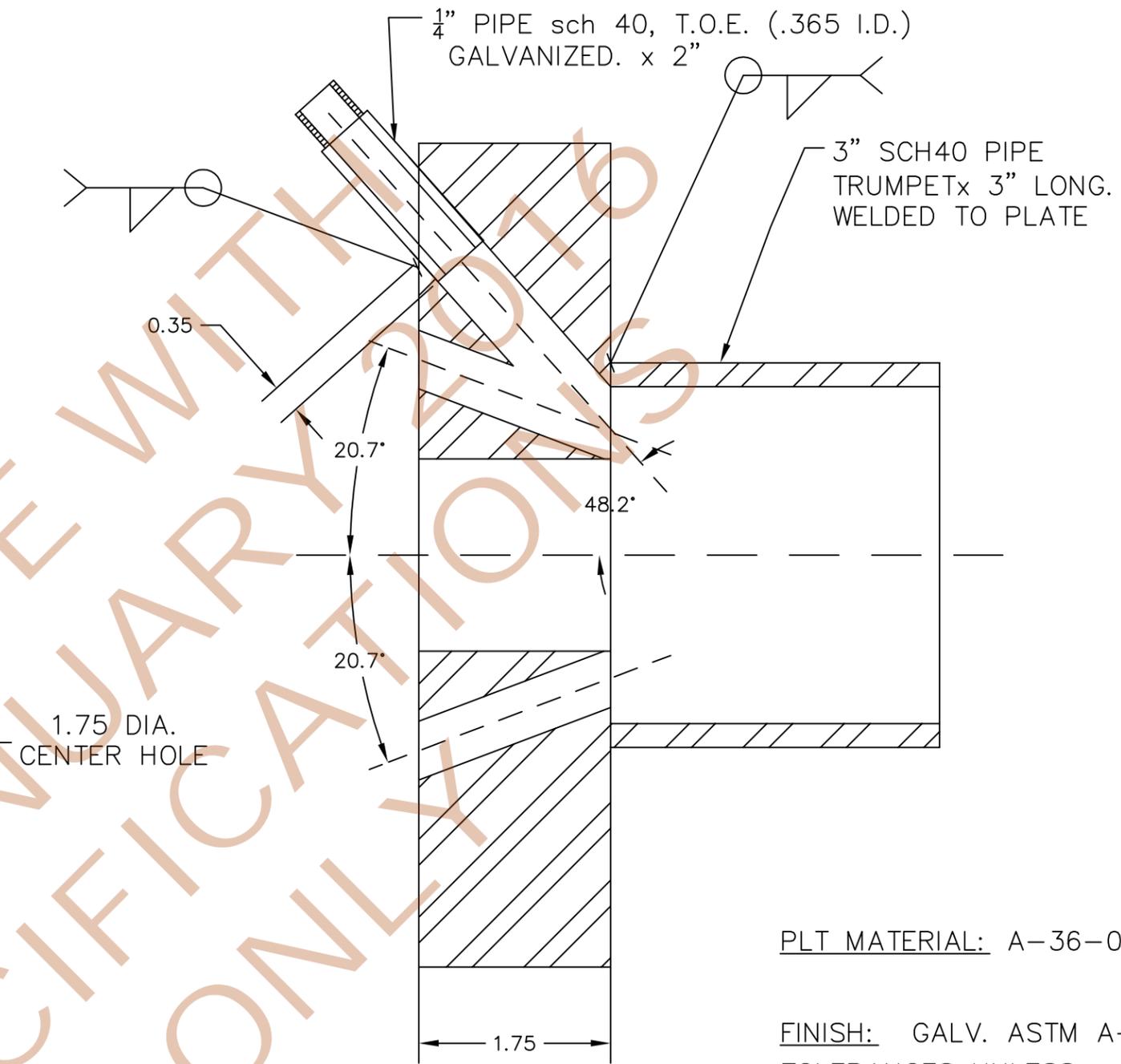
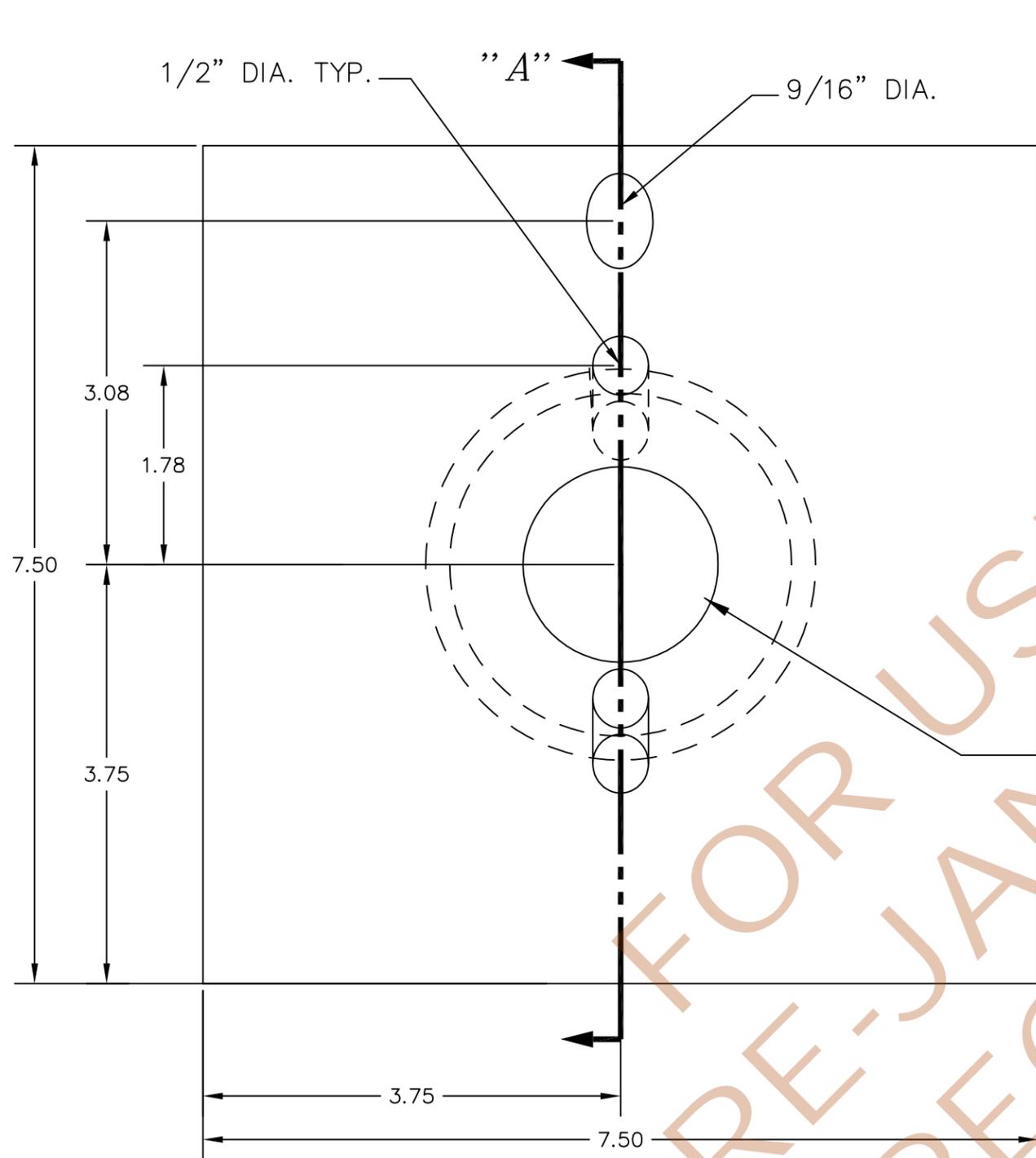
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FORM ENGINEERING CORP.
<http://www.williamsform.com>
 280 ANN ST. N.W., GRAND RAPIDS, MI 49504, PH: 616.365.9220 - FX: 616.365.2668

Customer: R7P-36 SYSTEM
 Project: 2.00 x 5.50 x 8.00 BEARING PLATE
 WITH 1.75 CENTER HOLE, (2) .50 DIA. ANGLED GROUT HOLES
 AND .56 DIA. INSPECTION PORT ASSEMBLY
 ASTM A-36-01, AASHTO M183, FOR 36mm (1 3/8" nom.) GR150 A.T.B.

DRAWN BY:	SAN	ECO NO.:	---
SCALE:	NTS	C/O:	---
DATE:	05-04-10	APPRO BY:	YB
SHEET NO.	1	WAREHOUSE:	---
TOTAL SHEETS	5	TECH REP:	---

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PRINT NO.:	1V-R7P-001-1	REV.	1
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PLT MATERIAL: A-36-01

FINISH: GALV. ASTM A-123.
 TOLERANCES UNLESS OTHERWISE SPECIFIED
 .XX, +/- .02, .XXX +/- .010
 ANGLES +/- 0°-30'
 BURN CUTS +/- .06

SECTION "A"

NOTE: SEE SHEET 1BFK-5-129 FOR BEVELED NUT HOLE DIMENSIONS

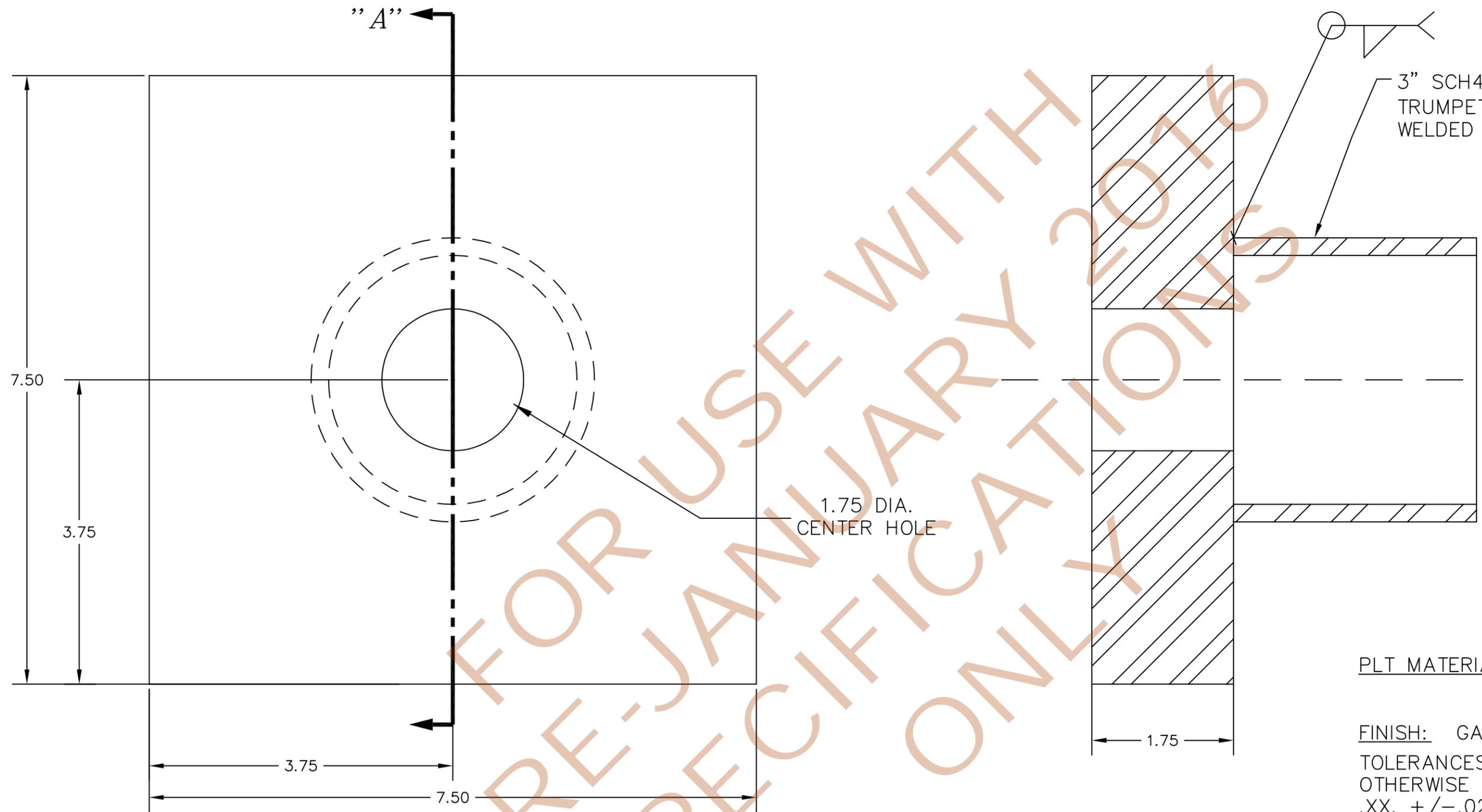
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FORM ENGINEERING CORP.
<http://www.williamsform.com>
 280 ANN ST. N.W., GRAND RAPIDS, MI 49504, PH: 616.365.9220 - FX: 616.365.2668

Customer: R7P-36 SYSTEM
 Project: 1.75 x 7.50 x 7.50 BEARING PLATE
 WITH 1.75 CENTER HOLE, (2) .50 DIA. ANGLED GROUT HOLES
 AND .56 DIA. INSPECTION PORT ASSEMBLY
 ASTM A-36-01, AASHTO M183, FOR 36mm (1 3/8" nom.) GR150 A.T.B.

DRAWN BY: SAN	ECO NO.: ---
SCALE: NTS	C/O: ---
DATE: 04-09-10	APPRO BY: YB
SHEET NO. 2	TOTAL SHEETS 5
	WAREHOUSE: ---
	TECH REP: ---

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PRINT NO.: 1V-R7P-001-1	REV. 0
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1.75 DIA.
CENTER HOLE

3" SCH40 PIPE
TRUMPETx 3" LONG.
WELDED TO PLATE

PLT MATERIAL: A-36-01

FINISH: GALV. ASTM A-123.
TOLERANCES UNLESS
OTHERWISE SPECIFIED
.XX, +/- .02, .XXX +/- .010
ANGLES +/- 0°-30'
BURN CUTS +/- .06

SECTION "A"

NOTE: SEE SHEET 1BFK-5-129 FOR BEVELED NUT HOLE DIMENSIONS

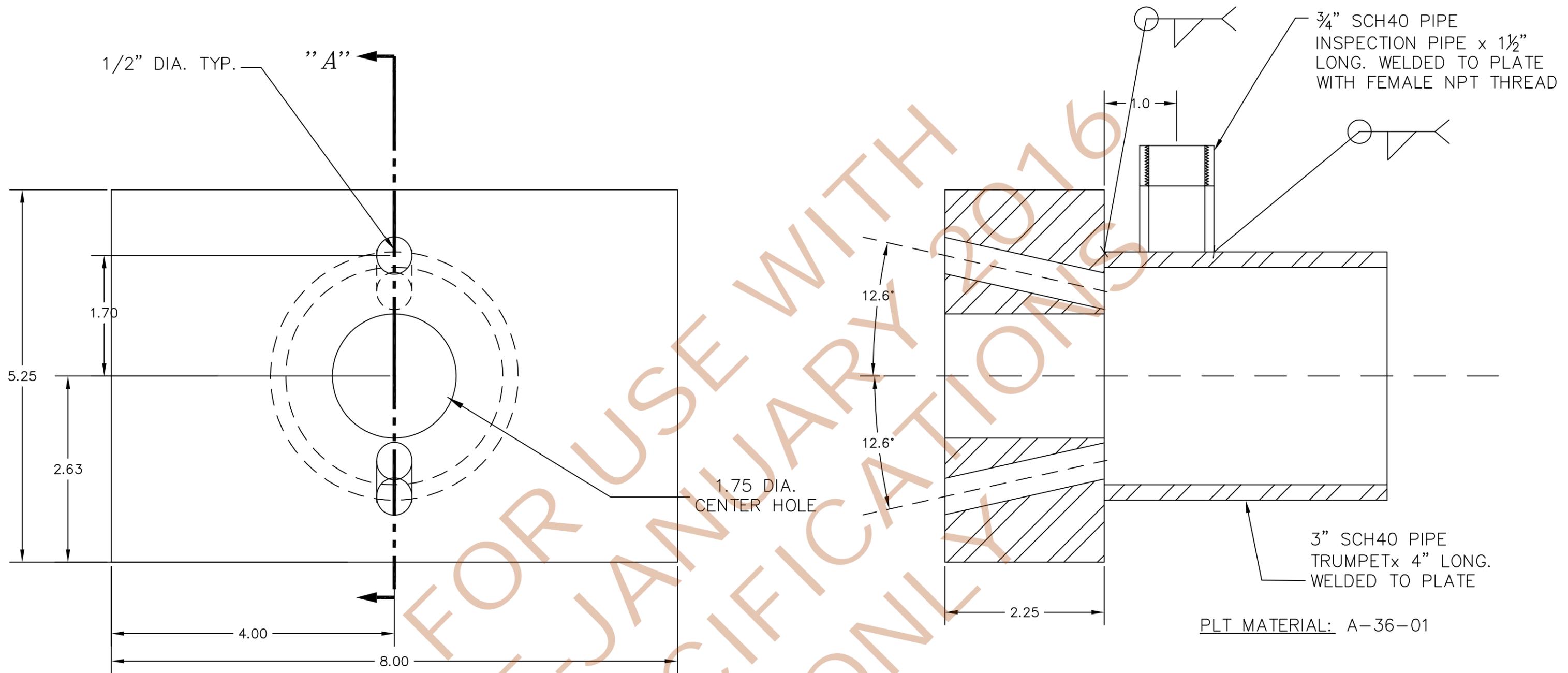
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FORM ENGINEERING CORP.
<http://www.williamsform.com>
280 ANN ST. N.W., GRAND RAPIDS, MI 49504, PH: 616.365.9220 - FX: 616.365.2668

Customer: R7P-36 SYSTEM
Project: 1.75 x 7.50 x 7.50 BEARING PLATE
WITH 1.75 CENTER HOLE
ASTM A-36-01, AASHTO M183, FOR 36mm (1 3/8" nom.) GR150 A.T.B.

DRAWN BY: SAN	ECO NO.: ---
SCALE: NTS	C/O: ---
DATE: 04-09-10	APPRO BY: YB
SHEET NO. 3	TOTAL SHEETS 5
	WAREHOUSE: ---
	TECH REP: ---

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PRINT NO.: 1V-R7P-001-1
REV. 0



PLT MATERIAL: A-36-01

FINISH: GALV. ASTM A-123.
 TOLERANCES UNLESS OTHERWISE SPECIFIED
 .XX, +/- .02, .XXX +/- .010
 ANGLES +/- 0°-30'
 BURN CUTS +/- .06

SECTION "A"

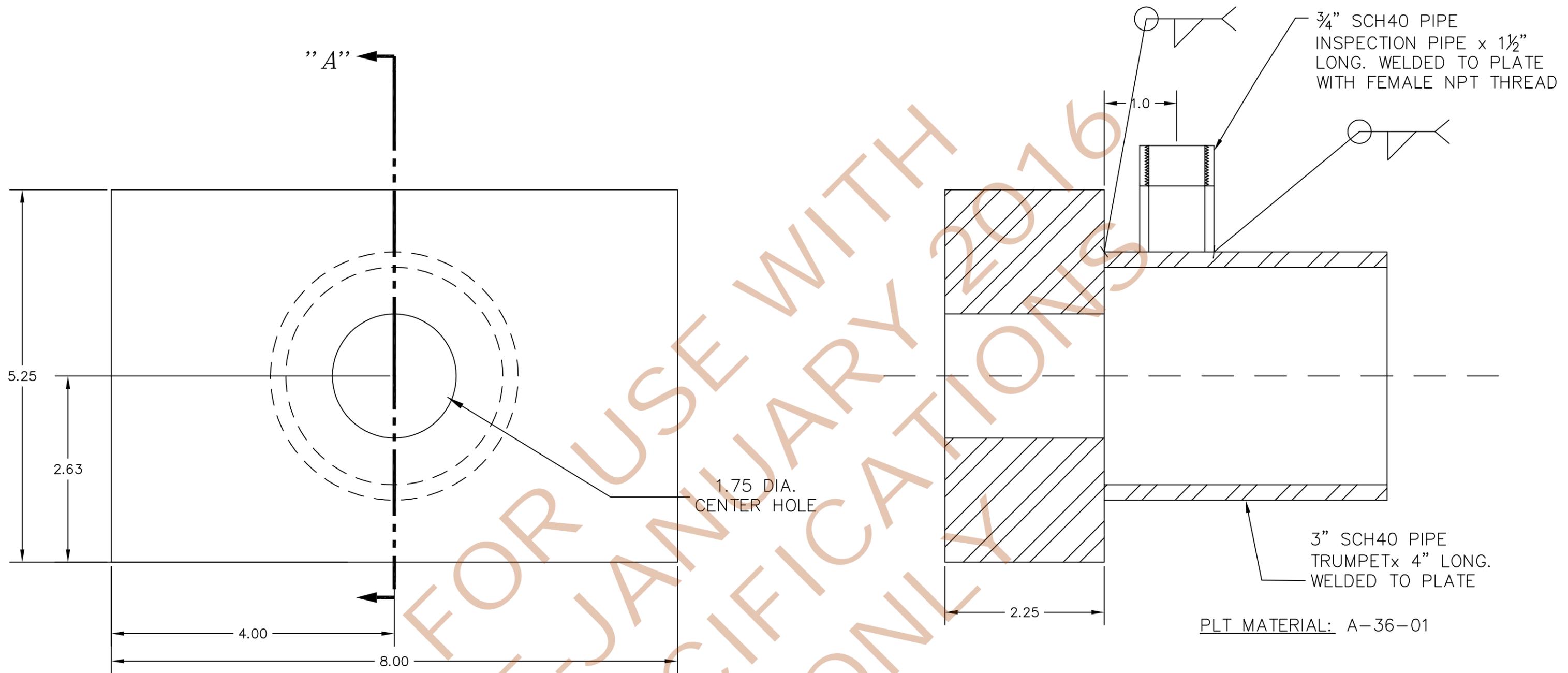
NOTE: SEE SHEET 1BFK-5-129 FOR BEVELED NUT HOLE DIMENSIONS

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 FORM ENGINEERING CORP.
<http://www.williamsform.com>
 280 ANN ST. N.W., GRAND RAPIDS, MI 49504, PH: 616.365.9220 - FX: 616.365.2668

Customer: R7P-36 SYSTEM
 Project: 2.25 x 5.25 x 8.00 BEARING PLATE
 WITH 1.75 CENTER HOLE, (2) .50 DIA. ANGLED GROUT HOLES
 AND .75 DIA. INSPECTION/GROUT PORT ASSEMBLY
 ASTM A-36-01, AASHTO M183, FOR 36mm (1 3/8" nom.) GR150 A.T.B.

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DRAWN BY:	SAN	ECO NO.:	---
SCALE:	NTS	C/O:	---
DATE:	04-09-10	APPRO BY:	YB
SHEET NO.	4	WAREHOUSE:	---
TOTAL SHEETS	5	TECH REP:	---
PRINT NO.:	1V-R7P-001-1		REV.:
			0



NOTE: SEE SHEET 1BFK-5-129 FOR BEVELED NUT HOLE DIMENSIONS

SECTION "A"

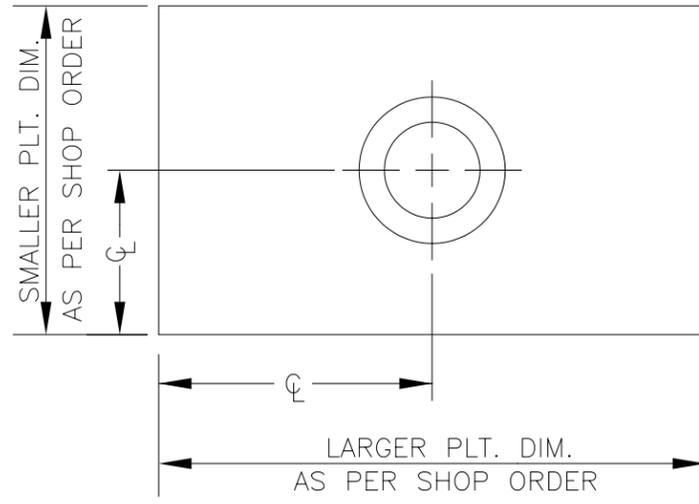
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<http://www.williamsform.com>
 280 ANN ST. N.W., GRAND RAPIDS, MI 49504, PH: 616.365.9220 - FX: 616.365.2668

Customer: R7P-36 SYSTEM
 Project: 2.25 x 5.25 x 8.00 BEARING PLATE
 WITH 1.75 CENTER HOLE,
 AND .75 DIA. INSPECTION/GROUT PORT ASSEMBLY
 ASTM A-36-01, AASHTO M183, FOR 36mm (1 3/8" nom.) GR150 A.T.B.

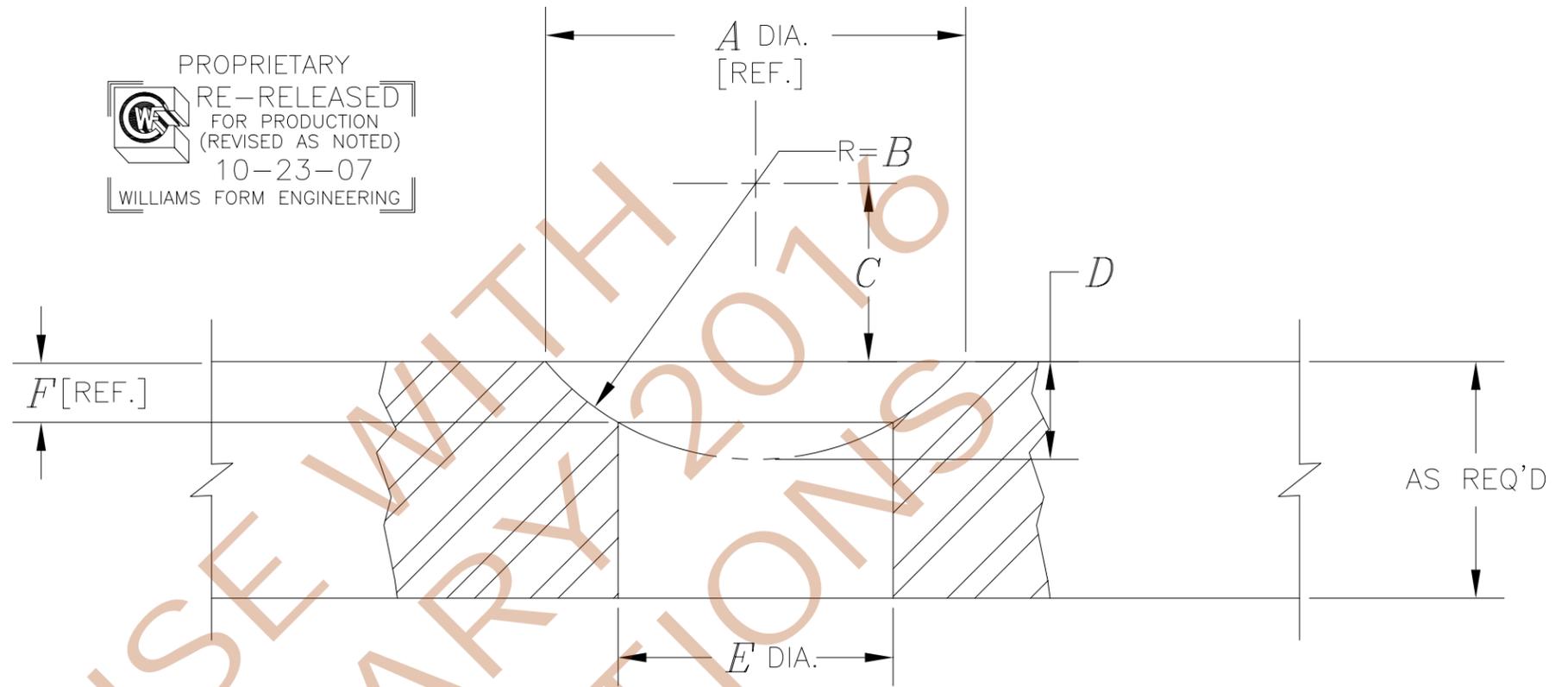
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SCALE: NTS	C/O: ---
DATE: 04-09-10	APPRO BY: YB
SHEET NO. 5	TOTAL SHEETS 5
WAREHOUSE: ---	
TECH REP: ---	

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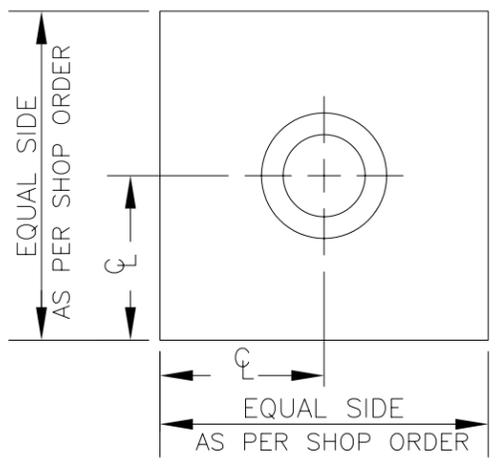
PRINT NO.: 1V-R7P-001-1
 REV. 0



PROPRIETARY
 RE-RELEASED
 FOR PRODUCTION
 (REVISED AS NOTED)
 10-23-07
 WILLIAMS FORM ENGINEERING



C	10-23-07	CAC	ADDED 75mm DIM & MATR'L NOTE
B	11-18-03	CAC	REVISED FOR PRODUCTION
A	1-18-00	CAC	RELEASED TO CAD
REV	DATE	NAME	CHK. CHANGE DESCRIPTION



NOMINAL BAR SIZE (GR150)	A DIA.	B ^{±.010} RAD.	C DIM.	D DIM.	E DIA.	F DIM.
26mm (1" nom.)	2.12	1.50	1.06	.44	1.44	.25
32mm (1 1/4" nom.)	2.68	1.75	1.13	.63	1.75	.38
36mm (1 3/8" nom.)	3.05	1.94	1.18	.75	1.93	.50
46mm (1 3/4" nom.)	3.64	2.19	1.22	.98	2.38	.63
64mm (2 1/2" nom.)	5.00	3.50	2.46	1.13	3.75	.50
75mm (3" nom.)	6.34	4.00	2.44	1.56	3.88	1.06

NOTE: FOR ROUND PLATES AND PLATES WITH DUCT COLLARS, SINGLE OR ANGLED GROUT TUBE HOLES REQUEST PRINT FROM ENGINEERING DEPT.

1 = 75mm PLT MATERIAL ASTM A-572 GR50

TOLERANCES UNLESS OTHERWISE SPECIFIED
 .XX, +/- .03, .XXX +/- .015
 ANGLES +/- 0° - 30'

X:\TODD PART PRINTS\SK1 PLATES\410129 B.dwg, 10/23/2007 11:43:49 AM

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 FORM ENGINEERING CORP.
<http://www.williamsform.com>

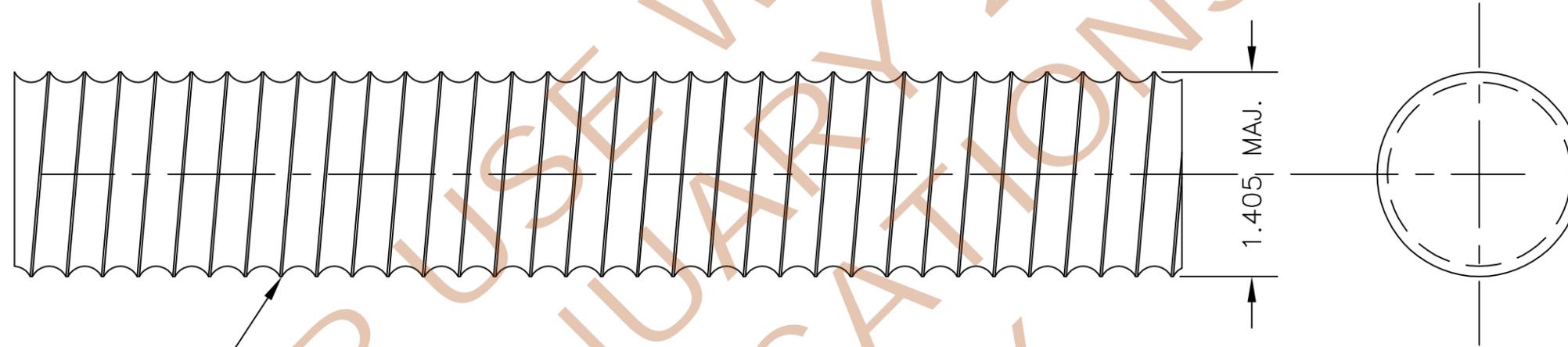
280 ANN ST. N.W., GRAND RAPIDS, MI 49504, PH: 616.365.9220 - FX: 616.365.2668

Customer: _____
 Project: MASTER CHART OF DISHED PLATES FOR GR150 BARS

DRAWN BY: CAC	ECO NO.: 410-1291
SCALE: NTS	C/O:
DATE: 1-18-00	APPRO BY:
SHEET NO. 1	TOTAL SHEETS 1
DESIGNED BY:	
TECH REP:	

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PRINT NO.: 1B-FK-5-129
 REV: C



WMS. 32mm (1 1/4" nom.) GRADE 150 KSI TYPE II, ALL-THREAD-BAR,
 ASTM A-722-97, AASHTO M275.

PRELIMINARY SPECIFICALLY FOR JANUARY 2016 WITH WILLIAMS



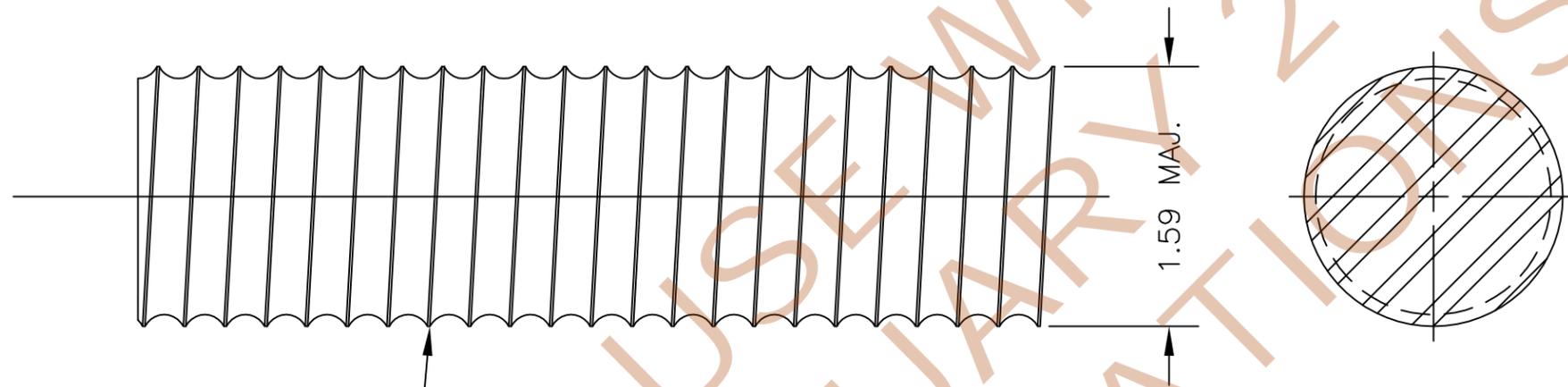
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 FORM ENGINEERING CORP.
<http://www.williamsform.com>
 280 ANN ST. N.W., GRAND RAPIDS, MI 49504, PH: 616.365.9220 - FX: 616.365.2668

Customer: _____
 Project: WMS. 32mm (1 1/4" nom.) GRADE 150 KSI
 ALL-THREAD-BAR DETAIL

DRAWN BY:	RHT	ECO NO.:	440-102-1
SCALE:	FULL	C/O:	---
DATE:	4-22-10	APPRO BY:	
SHEET NO.	TOTAL SHEETS	DESIGNED BY:	---
1	1	TECH REP:	---

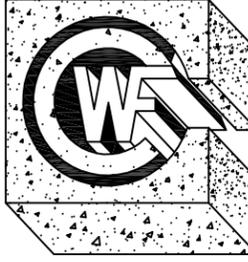
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PRINT NO.: 1B-R7P-002-1
 REV: 



WMS. 36mm (1 3/8" nom.) GRADE 150 KSI TYPE II, ALL-THREAD-BAR,
 ASTM A-722-97, AASHTO M275.

FOR USE WITH 2016
 PRE-SPECIFICALLY ONLY



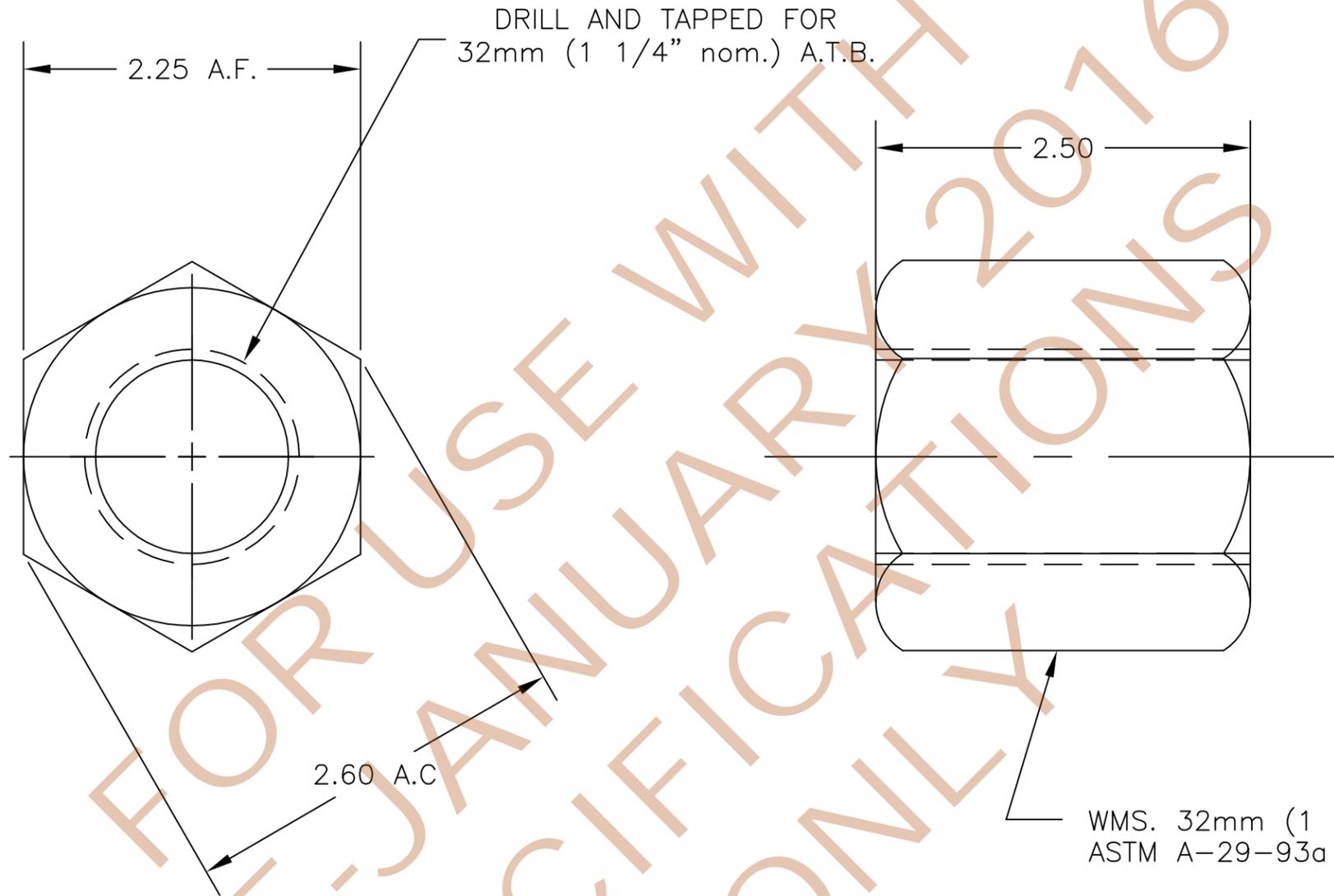
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FORM ENGINEERING CORP.
<http://www.williamsform.com>
 280 ANN ST. N.W., GRAND RAPIDS, MI 49504, PH: 616.365.9220 - FX: 616.365.2668

Customer: _____
 Project: WMS. 36mm (1 3/8" nom.) GRADE 150 KSI
ALL-THREAD-BAR DETAIL

DRAWN BY:	CAC	ECO NO.:	440-101-1
SCALE:	FULL	C/O:	---
DATE:	10-12-04	APPRO BY:	
SHEET NO.	TOTAL SHEETS	DESIGNED BY:	---
1	1	TECH REP:	---

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PRINT NO.: **1B-R7P-001-1** REV: 



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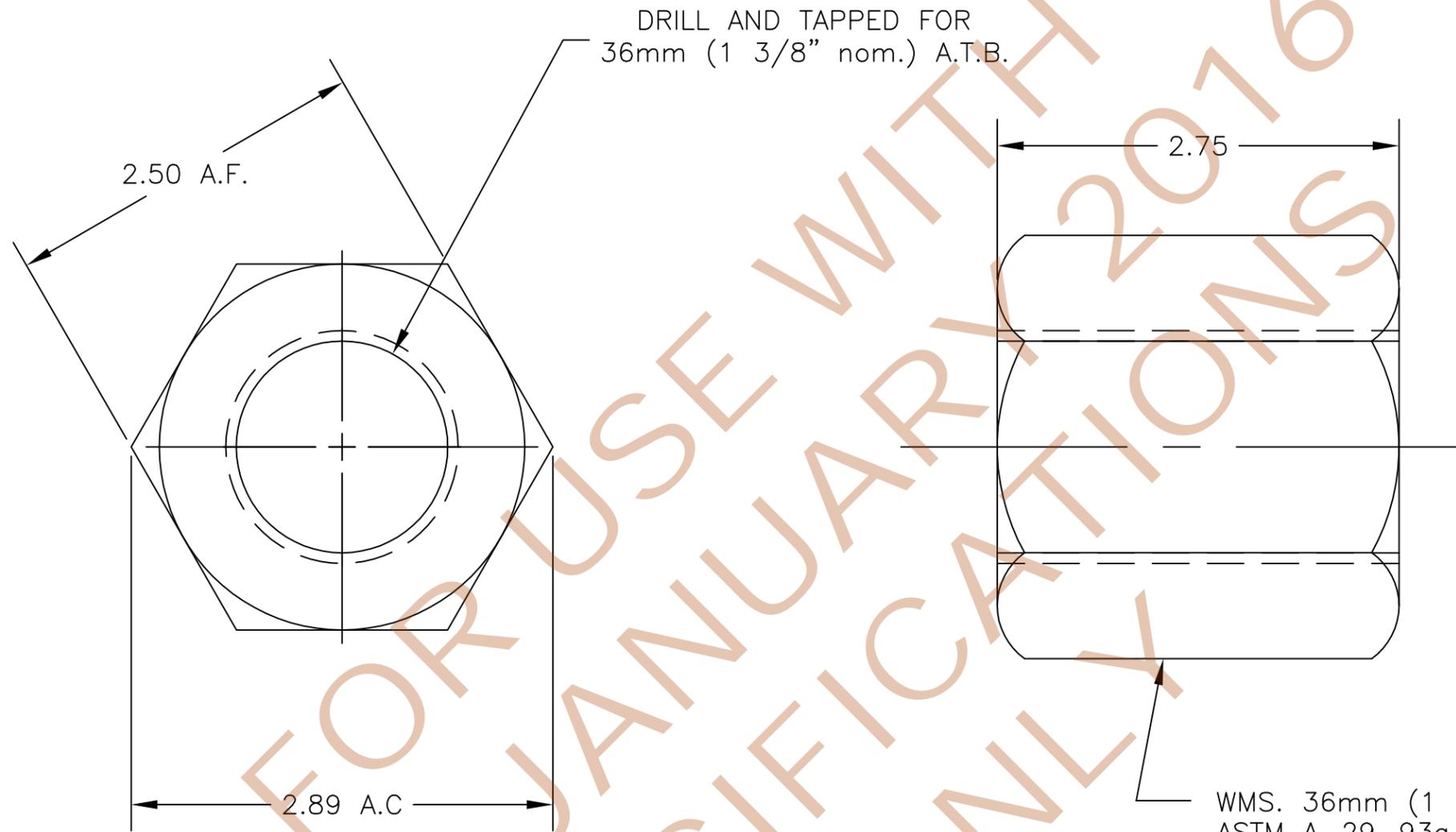
Customer: _____
 Project: WMS. 32mm (1 1/4" nom.) HEAVY DUTY HEX NUT DETAIL

DRAWN BY: RHT	ECO NO.: 440-102-2
SCALE: FULL	C/O: ---
DATE: 4-20-10	APPRO BY: _____
SHEET NO. 1	TOTAL SHEETS 1
	DESIGNED BY: _____
	TECH REP: _____

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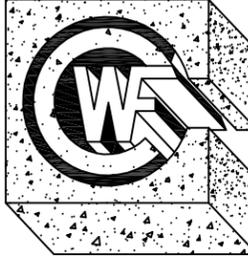
PRINT NO.: 1B-R7P-002-2

REV: 



WMS. 36mm (1 3/8" nom.) HEAVY DUTY HEX NUT:
ASTM A-29-93a GRADE C-1045

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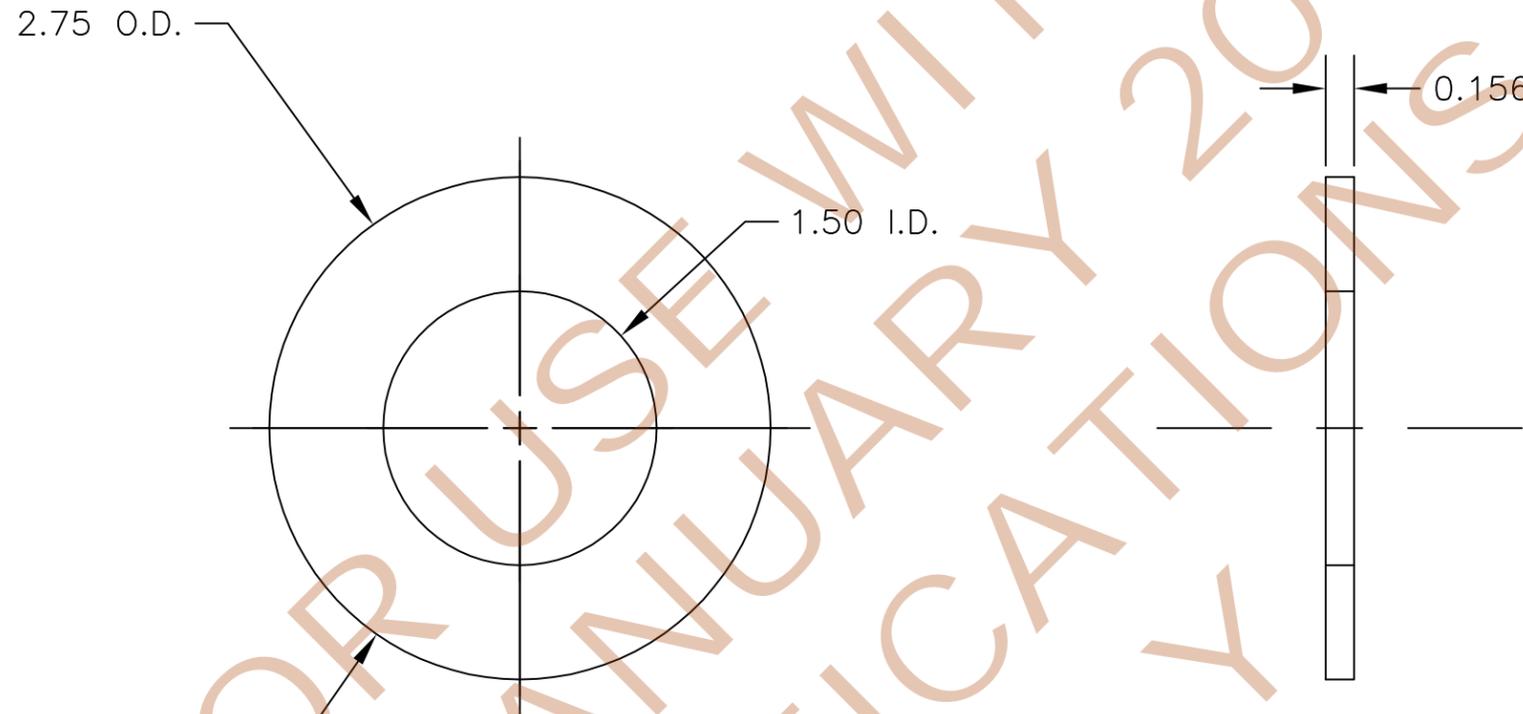
Customer: _____
 Project: WMS. 36mm (1 3/8" nom.) HEAVY DUTY HEX NUT DETAIL

DRAWN BY:	CAC	ECO NO.:	440-101-2
SCALE:	FULL	C/O:	---
DATE:	10-12-04	APPRO BY:	---
SHEET NO.	1	DESIGNED BY:	---
TOTAL SHEETS	1	TECH REP:	---

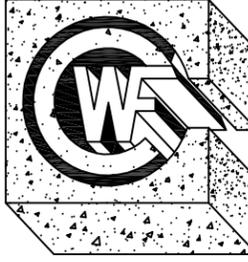
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PRINT NO.: **1B-R7P-001-2**

REV: 



WMS. 32mm (1 1/4" nom.) HARDENED WASHER:
ASTM F-436-93, TYPE I, AASHTO M293



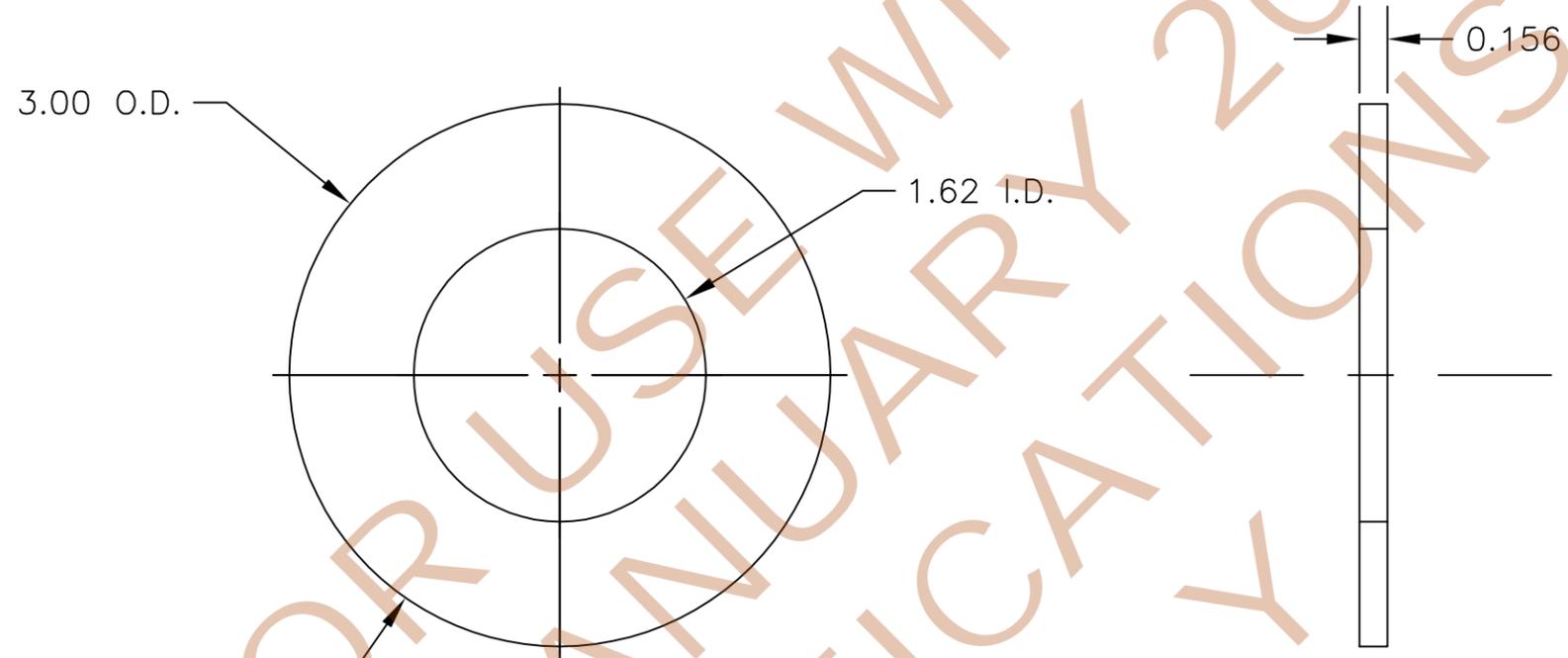
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FORM ENGINEERING CORP.
<http://www.williamsform.com>
280 ANN ST. N.W., GRAND RAPIDS, MI 49504, PH: 616.365.9220 - FX: 616.365.2668

Customer: _____
Project: WMS. 32mm (1 1/4" nom.) HARDENED WASHER DETAIL

DRAWN BY:	RHT	ECO NO.:	440-102-3
SCALE:	FULL	C/O:	---
DATE:	4-20-10	APPRO BY:	
SHEET NO.	TOTAL SHEETS	DESIGNED BY:	---
1	1	TECH REP:	---

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PRINT NO.: 1B-R7P-002-3
REV: 



WMS. 36mm (1 3/8" nom.) HARDENED WASHER:
ASTM F-436-93, TYPE I, AASHTO M293



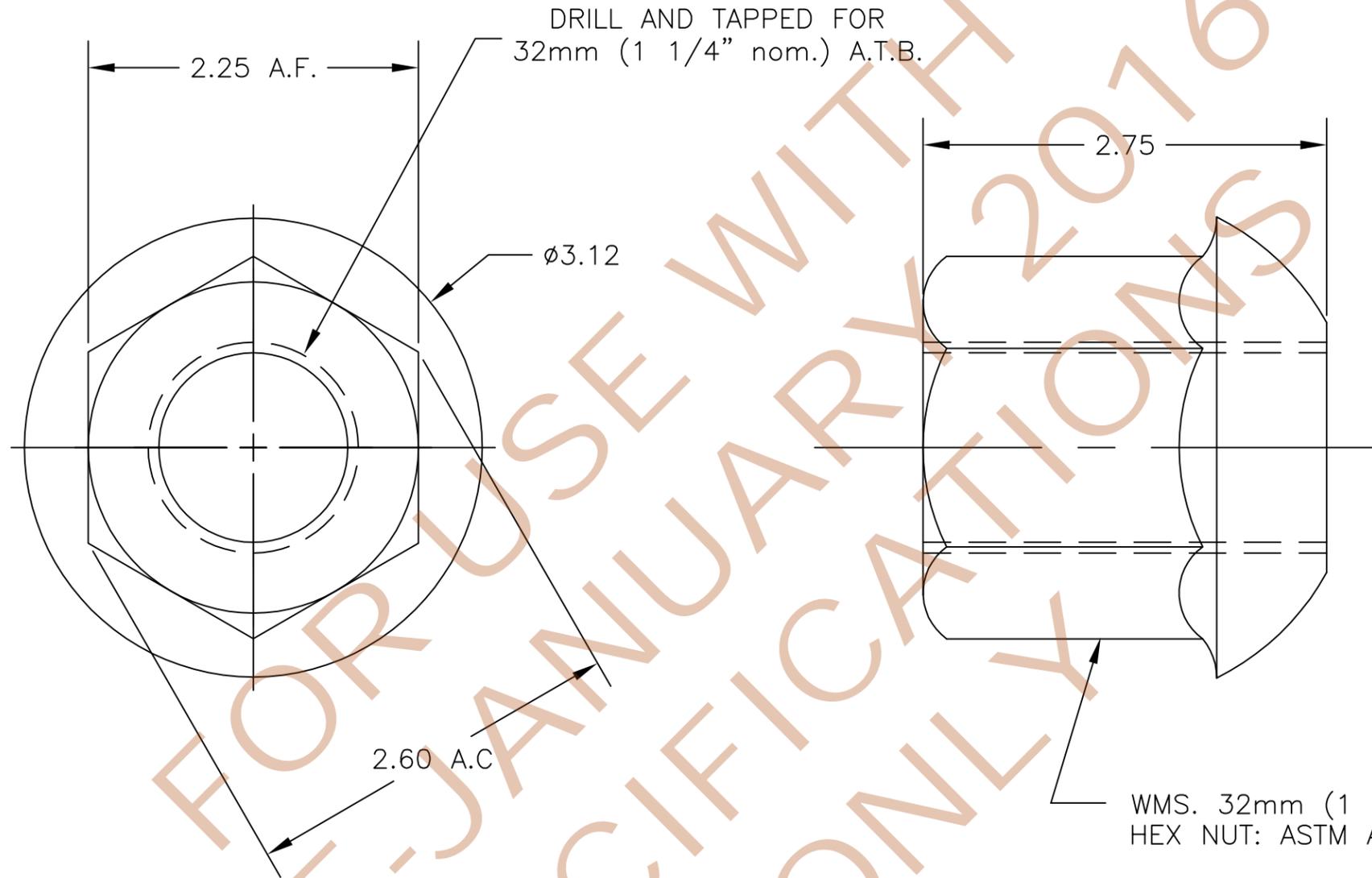
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FORM ENGINEERING CORP.
<http://www.williamsform.com>
280 ANN ST. N.W., GRAND RAPIDS, MI 49504, PH: 616.365.9220 - FX: 616.365.2668

Customer: _____
 Project: WMS. 36mm (1 3/8" nom.) HARDENED WASHER DETAIL

DRAWN BY: CAC	ECO NO.: 440-101-3
SCALE: FULL	C/O: ---
DATE: 10-12-04	APPRO BY: _____
SHEET NO. 1	TOTAL SHEETS 1
	DESIGNED BY: _____
	TECH REP: _____

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PRINT NO.: 1B-R7P-001-3
 REV: 



WMS. 32mm (1 1/4" nom.) HEAVY DUTY SPHERICAL
HEX NUT: ASTM A-536.

PRELIMINARY USE ONLY
 JANUARY 2016
 SPECIFICATIONS



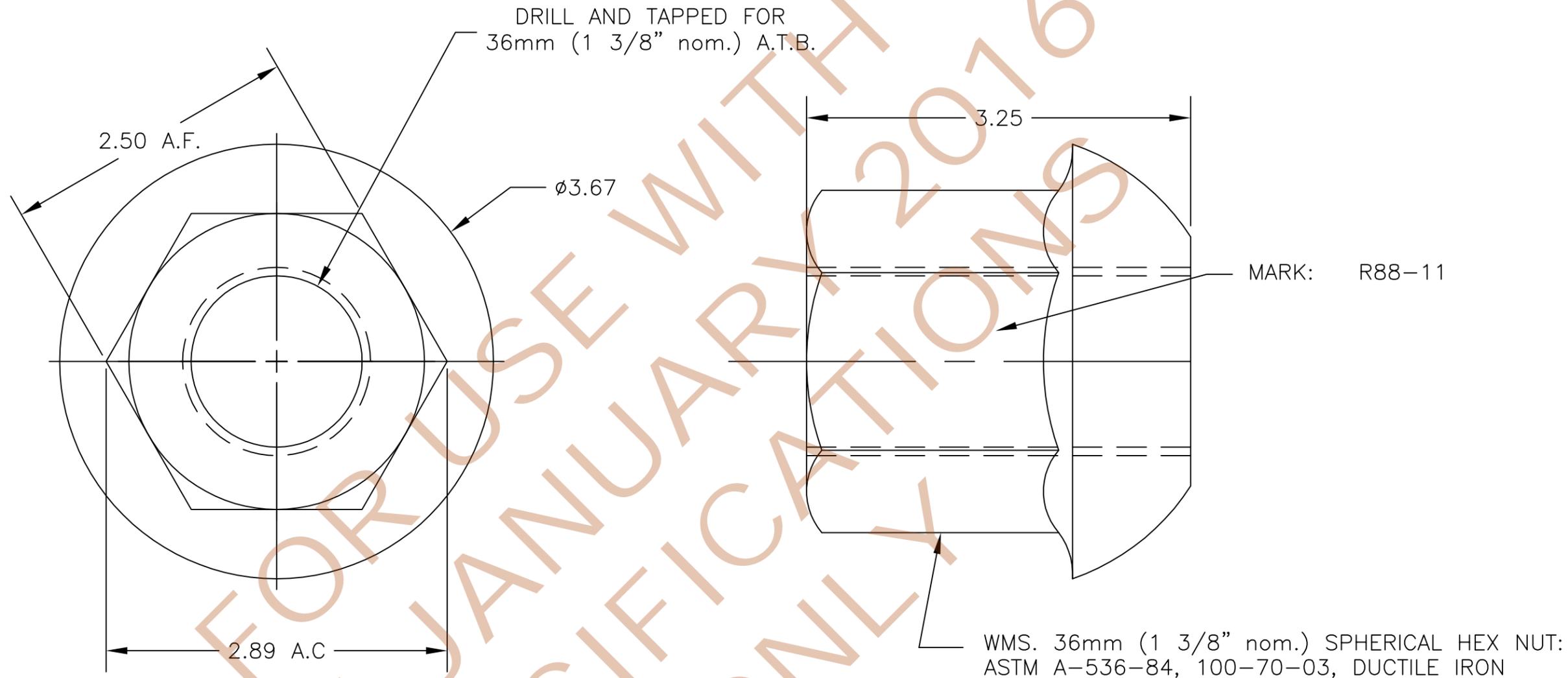
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FORM ENGINEERING CORP.
<http://www.williamsform.com>
280 ANN ST. N.W., GRAND RAPIDS, MI 49504, PH: 616.365.9220 - FX: 616.365.2668

Customer: _____
 Project: WMS. 32mm (1 1/4" nom.) HEAVY DUTY SPHERICAL HEX NUT DETAIL

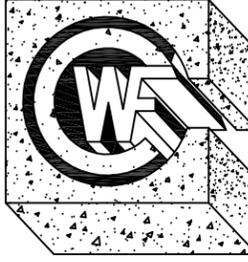
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SCALE:	FULL	C/O:	---
DATE:	4-22-10	APPRO BY:	
SHEET NO.	1	DESIGNED BY:	---
TOTAL SHEETS	1	TECH REP:	---

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PRINT NO.: 1B-R7P-002-5
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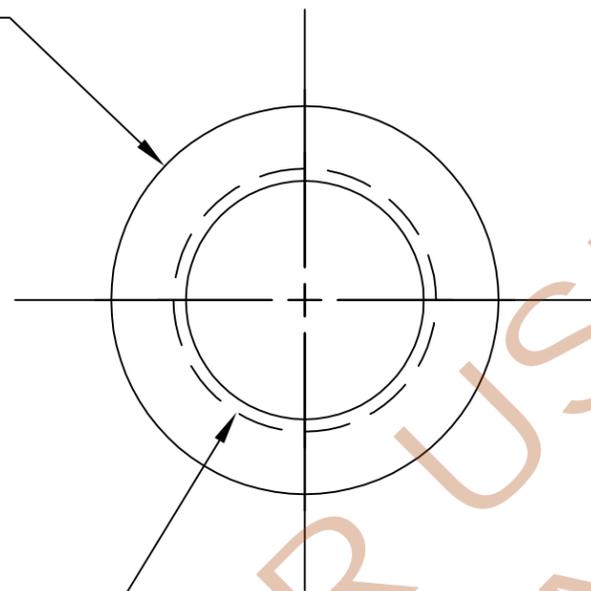
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<http://www.williamsform.com>
280 ANN ST. N.W., GRAND RAPIDS, MI 49504, PH: 616.365.9220 - FX: 616.365.2668

Customer: _____
 Project: WMS. 36mm (1 3/8" nom.) HEAVY DUTY
 SPHERICAL HEX NUT DETAIL
 PART NO.: R88-11

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DRAWN BY: CAC	ECO NO.: 440-101-14
SCALE: FULL	C/O: ---
DATE: 10-12-04	APPRO BY: _____
SHEET NO. 1	TOTAL SHEETS 1
DESIGNED BY: _____	TECH REP: ---
PRINT NO.: 1B-R7P-001-16	REV: \emptyset

2.125 DIA.

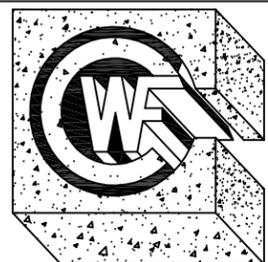


TAP 1 1/4" -4 COIL
GR150



WMS. 32mm (1 1/4" nom.) STOP TYPE COUPLING
A-29 GRADE C1045. HT.

FOR USE WITH 2016
PRE-JANUARY 2016
SPECIFICATIONS ONLY



WILLIAMS
FORM ENGINEERING CORP.

<http://www.williamsform.com>

280 ANN ST. N.W., GRAND RAPIDS, MI 49504, PH: 616.365.9220 - FX: 616.365.2668

Customer: _____
 Project: WMS. 32mm (1 1/4" nom.) STOP TYPE COUPLING.

DRAWN BY:	RHT	ECO NO.:	440-102-4
SCALE:	FULL	C/O:	---
DATE:	4-20-10	APPRO BY:	
SHEET NO.	1	DESIGNED BY:	---
TOTAL SHEETS	1	TECH REP:	---

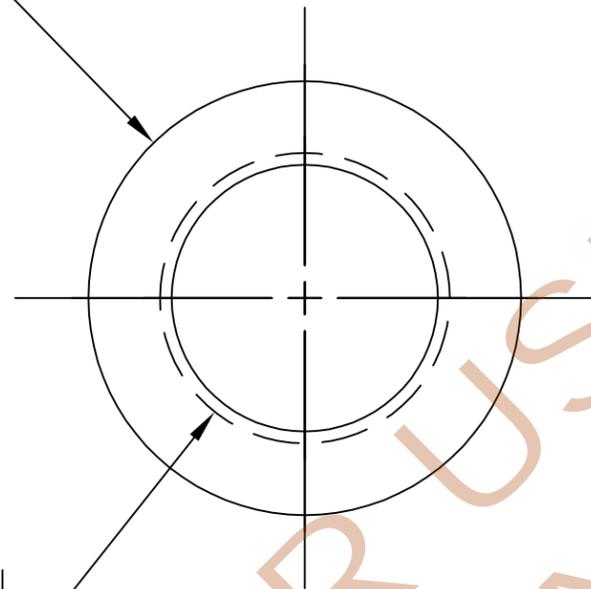
THIS DRAWING IS THE PROPERTY OF WILLIAMS FORM ENGINEERING CORPORATION AND IS SUBMITTED TO THE CONTRACTOR SOLELY AS A SUGGESTED DESIGN FOR APPROVAL BY HIS JOB DESIGN AGENCY. IT IS SUBJECT TO RECALL AND MUST NOT BE REPRODUCED OR ITS CONTENTS DIVULGED WITHOUT WRITTEN PERMISSION. ALL WILLIAMS PRODUCTS ARE PATENTED OR HAVE PATENTS APPLIED FOR.

PRINT NO.:
1B-R7P-002-4

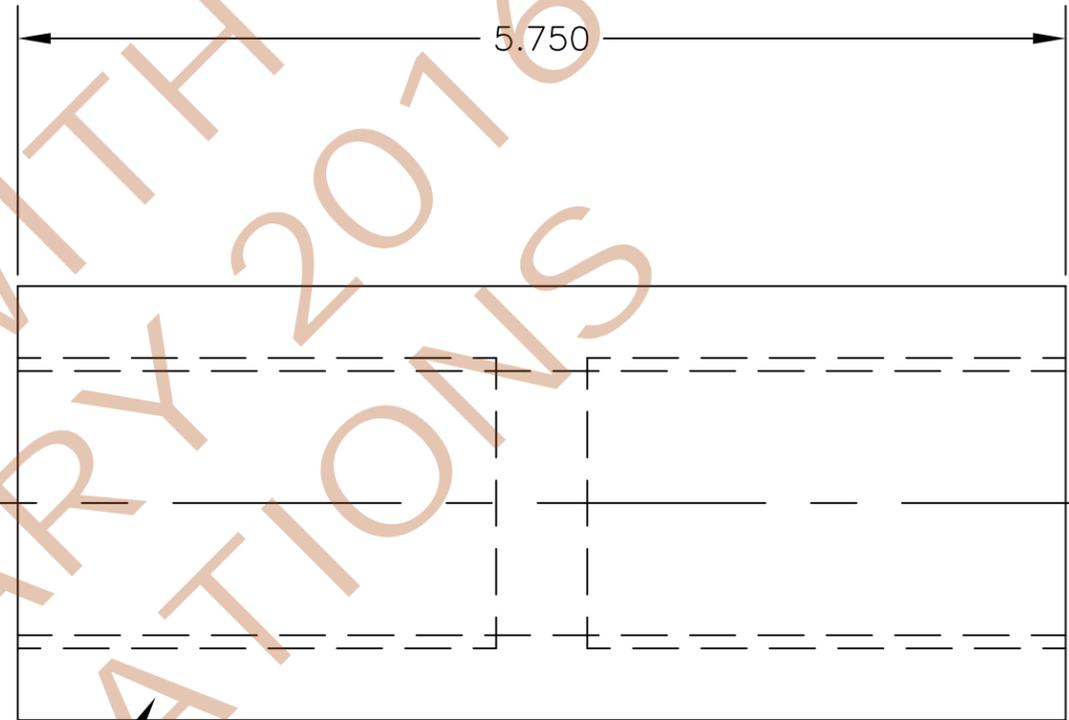
REV:

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2.375 DIA.

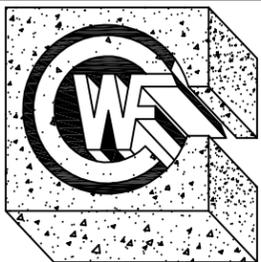


TAP 1 3/8" -4 COIL
GR150



WMS. 36mm (1 3/8" nom.) STOP TYPE COUPLING
A-29 GRADE C1045. HT.

FOR USE WITH 2016
PRE-JANUARY 2016
SPECIFICALLY ONLY



WILLIAMS
FORM ENGINEERING CORP.

<http://www.williamsform.com>

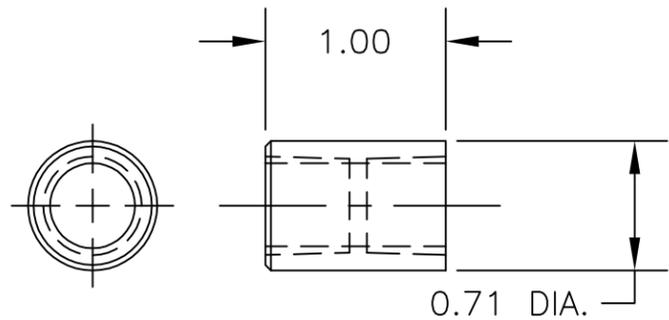
280 ANN ST. N.W., GRAND RAPIDS, MI 49504, PH: 616.365.9220 - FX: 616.365.2668

Customer: _____
Project: WMS. 36mm (1 3/8" nom.) STOP TYPE COUPLING.

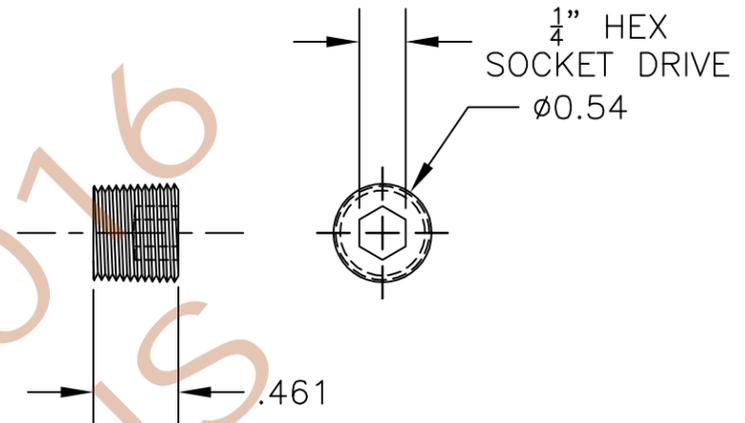
DRAWN BY:	RHT	ECO NO.:	440-101-4
SCALE:	FULL	C/O:	---
DATE:	4-22-10	APPRO BY:	
SHEET NO.	TOTAL SHEETS	DESIGNED BY:	---
1	1	TECH REP:	---

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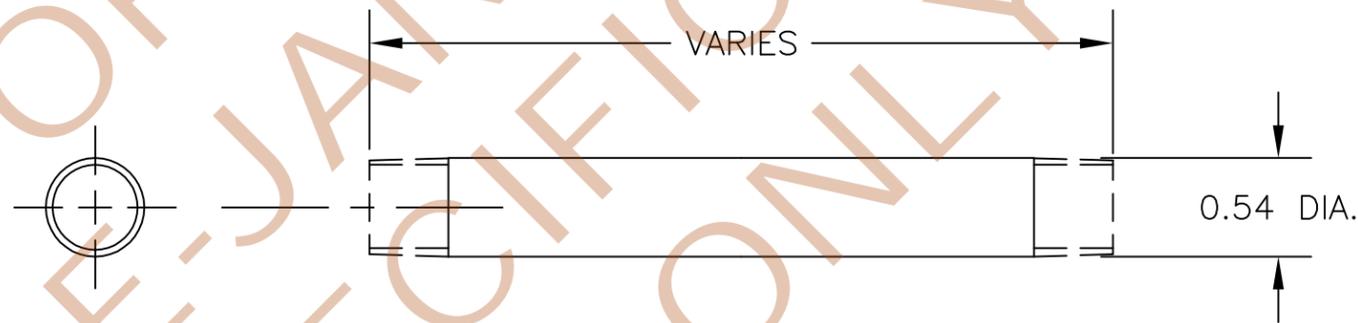
PRINT NO.: 1B-R7P-001-4
REV:



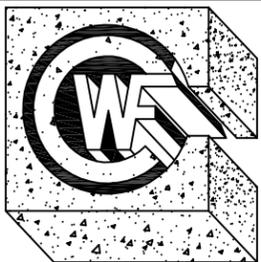
1/4" NPT SS316 PIPE COUPLING, 150 PSI RATED.
PART NO.: STD.



1/4" NPT SS316 PIPE HEX SOCKET PLUG, 150 PSI RATED.
PART NO.: STD.



1/4" NPT PIPE, 150 PSI RATED.
PART NO.: STD.



WILLIAMS
FORM ENGINEERING CORP.

<http://www.williamsform.com>

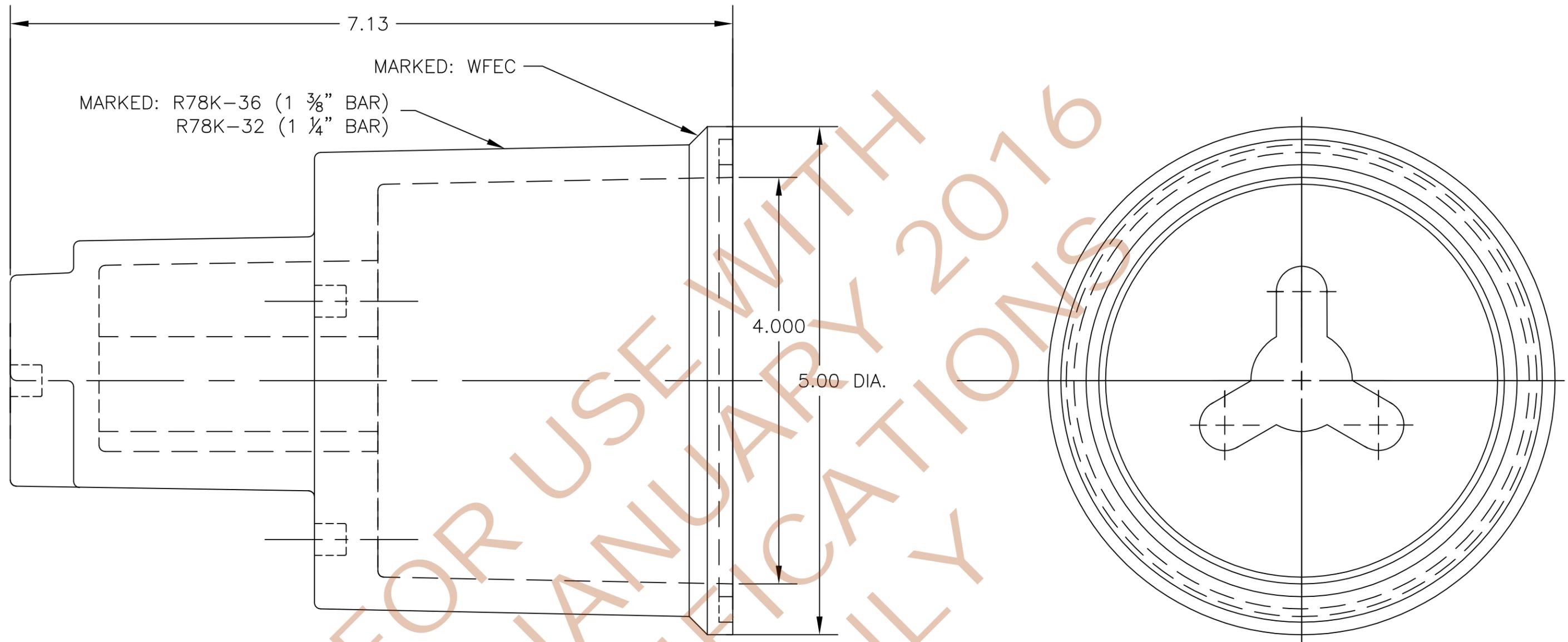
280 ANN ST. N.W., GRAND RAPIDS, MI 49504, PH: 616.365.9220 - FX: 616.365.2668

Customer: FDOT
Project: WMS. STD. PLUG AND PIPE FITTING
FOR INSECTION PORT ASSEMBLY,
AND NYLON REINFORCED END CAP.

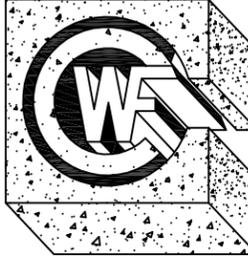
DRAWN BY: <u>SAN</u>	ECO NO.: <u>440-10113</u>
SCALE: _____	C/O: <u>---</u>
DATE: <u>05-18-10</u>	APPRO BY: _____
SHEET NO. <u>1</u>	TOTAL SHEETS <u>1</u>
DESIGNED BY: <u>---</u>	
TECH REP: <u>---</u>	

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PRINT NO.: 1B-R7P-001-13 \emptyset REV: _____



5	WMS. NYLON REINFORCE END CAP	ASTM D-4066, D-5989	—————	R78K113207
5A	NYLON REINFORCED END CAP O-RING	.70 DUROMETER BUNA-N	800347-002	PURCHASED ITEM
5B	POST-TENSIONING GREASE	ASTM B-117 AND D-1743	FIELD APPLIED	S3Z01



WILLIAMS
FORM ENGINEERING CORP.

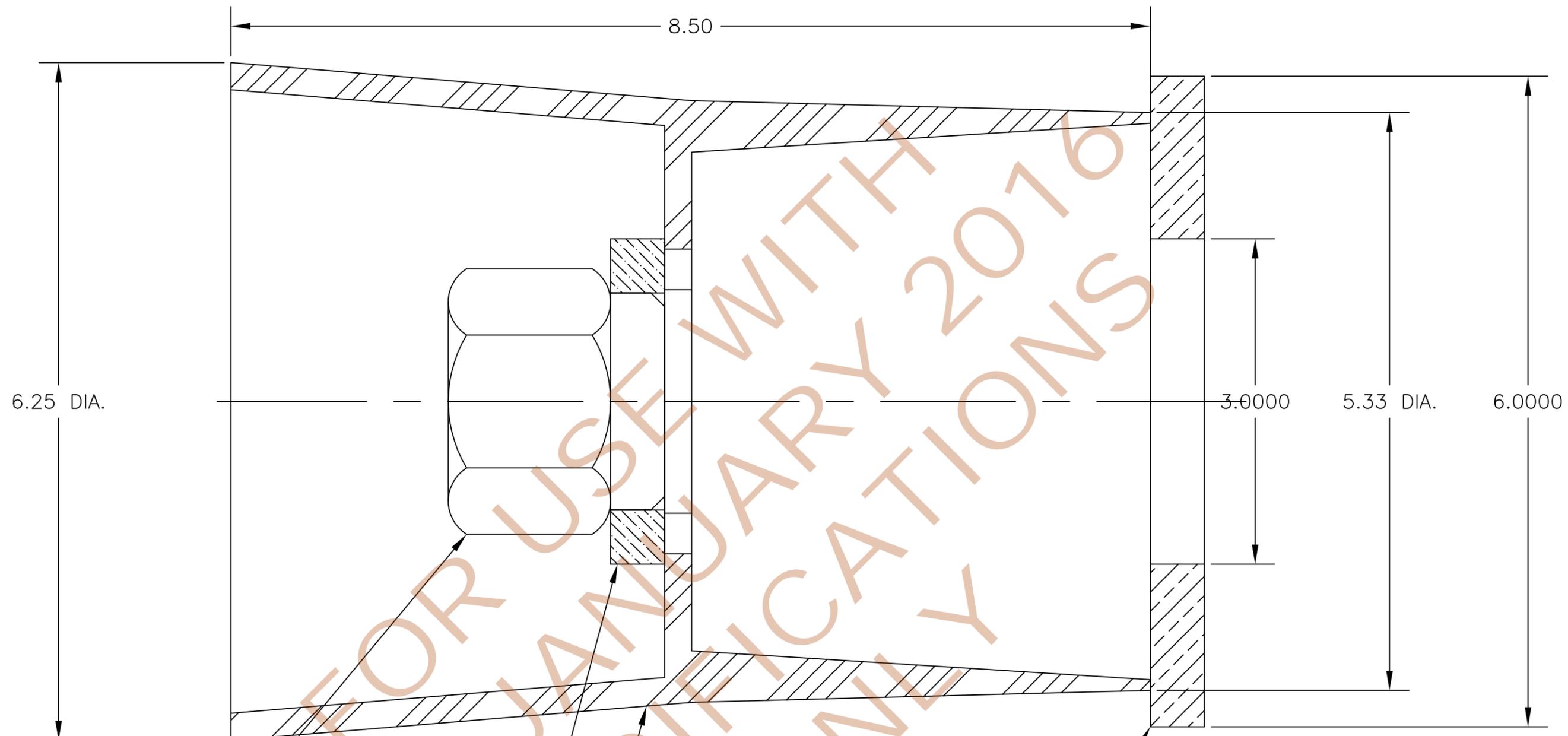
280 ANN ST. N.W., GRAND RAPIDS, MI 49510, PH: 616.365.9220 - FX: 616.365.2668

Customer: _____
 Project: R78K113207
 WMS. NYLON REINFORCED END CAP
 FOR 26MM, 32MM, AND 36 MM 150 KSI BAR.

DRAWN BY:	RHT	ECO NO.:	440-1016
SCALE:	FULL	C/O:	---
DATE:	10-7-04	APPRO BY:	
SHEET NO.	1	DESIGNED BY:	RHT
TOTAL SHEETS	1	TECH REP:	---

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PRINT NO.: 1B-R7P-001-6
 REV



WMS. PE NUT THREADED
FOR 1 1/4" 150
OR 1 3/8" 150 THREAD.

WMS. PLASTIC
NUT GASKET

WMS. REUSABLE
POCKET FORMER.

WMS. .5"x 3"ID x 6"OD. CLOSED CELL
NEOPREME GASKETUS AS REQUIRED.

MARK: R85K



WILLIAMS
FORM ENGINEERING CORP.

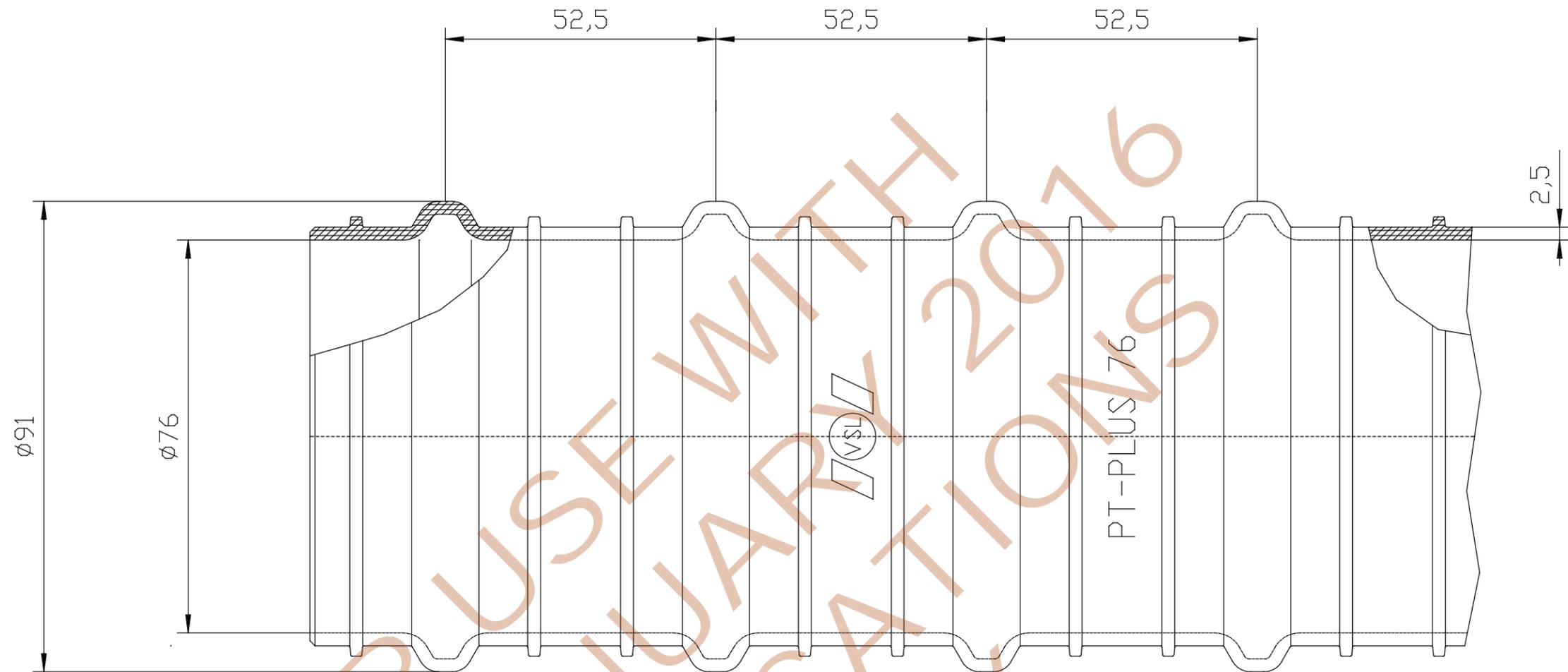
280 ANN ST. N.W., GRAND RAPIDS, MI 49510, PH: 616.365.9220 - FX: 616.365.2668

Customer: _____
Project: R85K
WMS. PE POCKET FORMER ASSEMBLY
FOR 26MM, 32MM, OR 36MM 150 KSI BAR.

DRAWN BY:	RHT	ECO NO.:	440-1018
SCALE:	FULL	C/O:	---
DATE:	10-18-04	APPRO BY:	
SHEET NO.	1	DESIGNED BY:	RHT
TOTAL SHEETS	1	TECH REP:	---

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PRINT NO.: 1B-R7P-001-8
REV



Weight/Gewicht: 0,58 kg/m
 INVENTORY No. 02DT026

II I I	II I I	II I I	II I I	II I I
qty.	description	item	material	remarks
1	PT-PLUS 76	1	PP	



 PT-PLUS 76

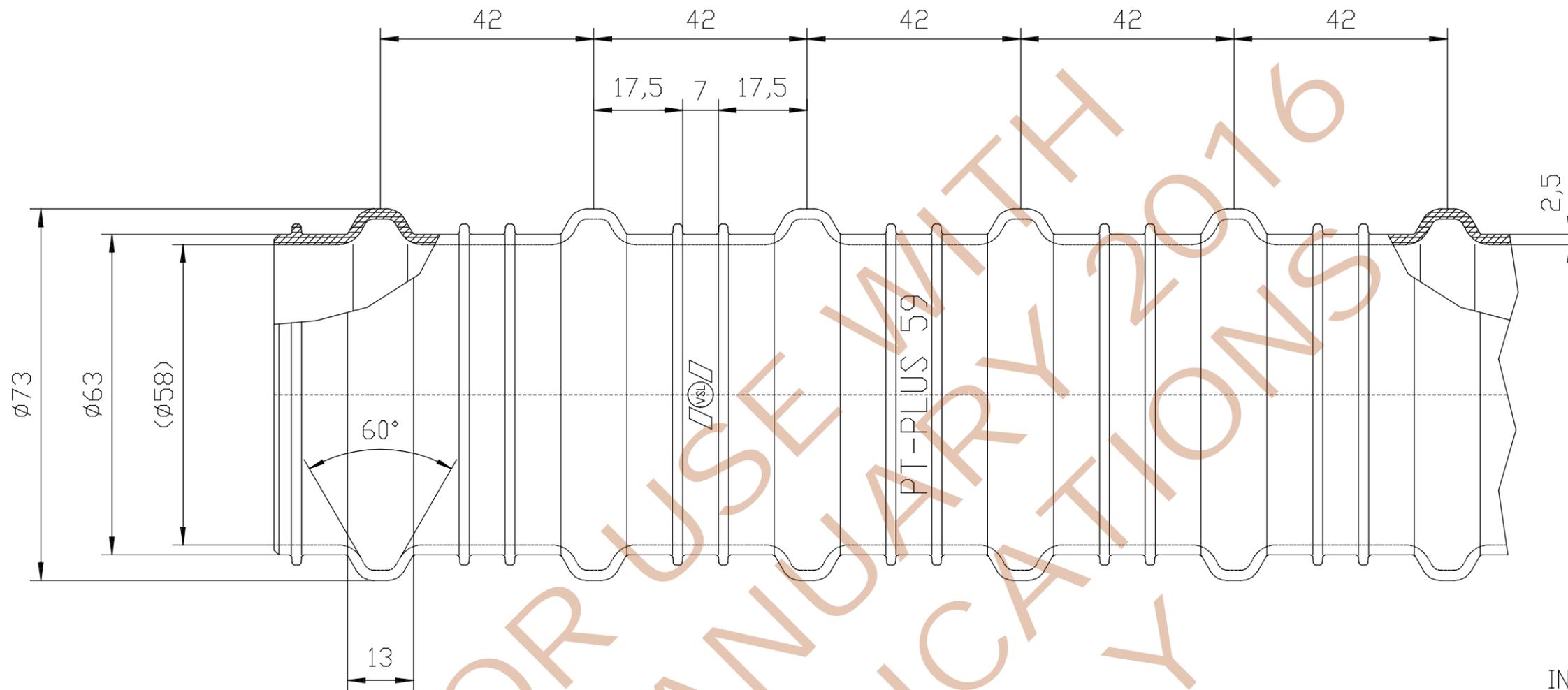
 } marking every 2 m

 MINIMUM BEND RADIUS: 16FT



rev.	2.) PP war MDPE 1.6.92 HB 3.) Add Inventory No. FEB-18-97	scale	1:1
proj./job	PT-PLUS System	drawn	16.01.1992 HB
title	DUCT/HULLROHR PT-PLUS 76	checked	LI
		subst. by/for	
		proj.no	E0937-3

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INVENTORY No. 02DT0012

Weight/Gewicht: 0,44 kg/m

qty.	description	item	material	remarks
1	H?llrohr PT-PLUS 59	1	PP	



PT-PLUS 59

Bezeichnungen alle 2 m
marking every 2 m



rev. 2.) PP war MDPE 1.6.92 HB
3.) Nennwandstärke war 2mm 28.6.93 HB
4.) Add inventory No.

proj./job PT-PLUS System

title DUCT/HULLROHR
PT-PLUS 59

scale 1:1

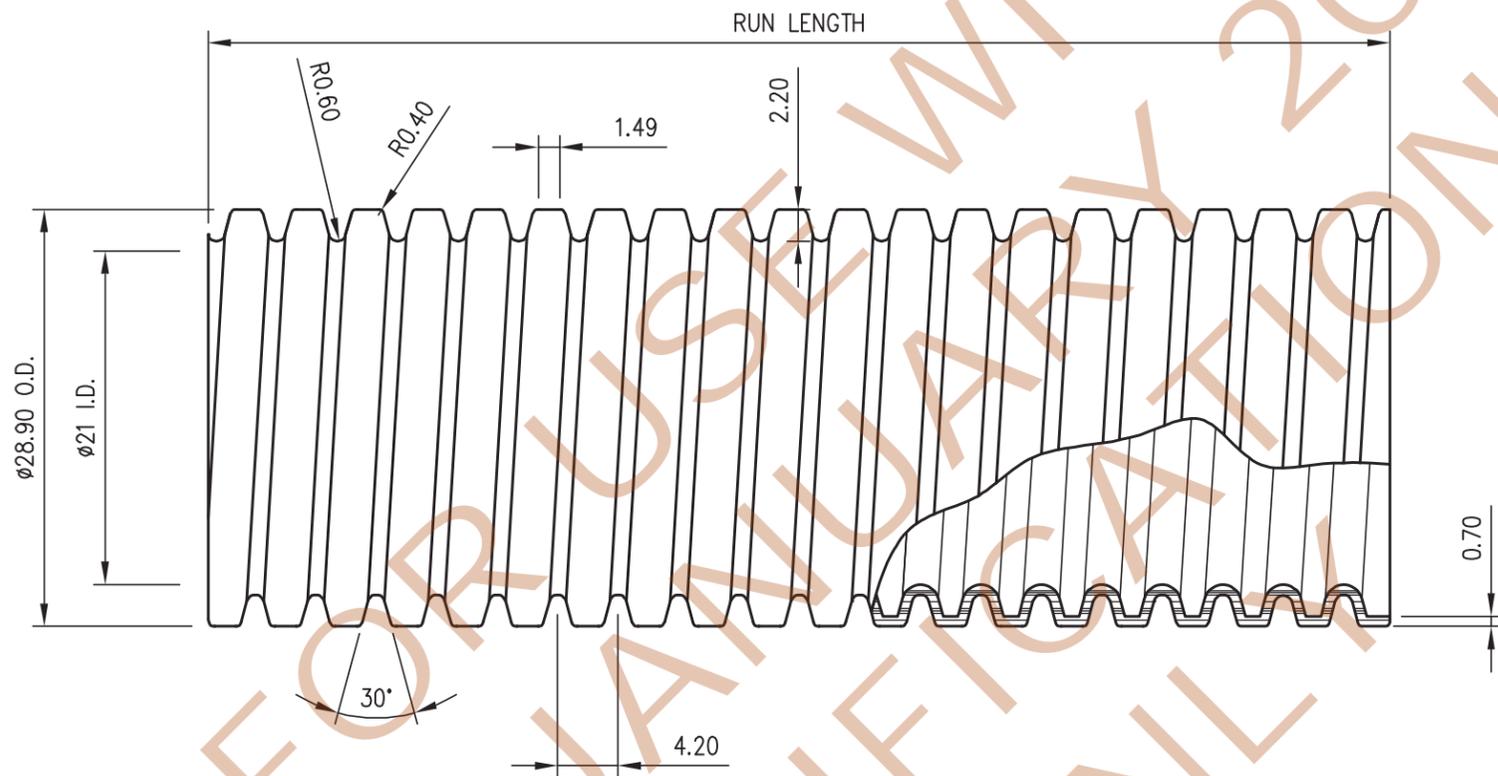
drawn 16.01.1992 HB

checked LI

subst. by/for

proj.no

E09038-4



TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN MILLIMETERS.

0 THROUGH 50mm	±0.5
51mm THROUGH 100mm	±1.0
MORE THAN 100mm	±1.5
ANGULAR	±1/2°
SURFACE QUALITY	✓

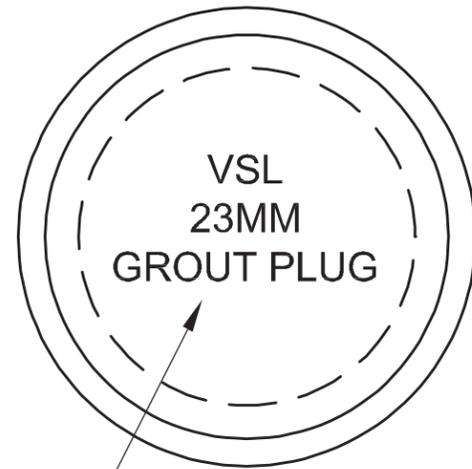
NOTES:
 1) BREAK SHARP EDGES .25 MAX.
 2) REMOVE ALL BURRS.
 3) ALL RADII 1mm UNO
 4) DO NOT SCALE DRAWING.
 5) DIMENSIONS IN MM SHALL CONFORM TO DIN 1685 GTB16 TOLERANCES
 6) MATERIAL: PP
 INVENTORY No. 02DT0310

FOR JAMES WILLY 2016 PRE-SPECIFICATIONS

VSL 7465 NEW RIDGE RD. HANOVER, MD. 21076 WWW.VSL.NET	 VSL	23MM GROUT HOSE FABRICATION	VSL SYSTEMS DRAWING	1 REV.
			4/26/04	DATE
			RELEASED FOR PRODUCTION	BY
			REVISION	CHK
				GDI NDS

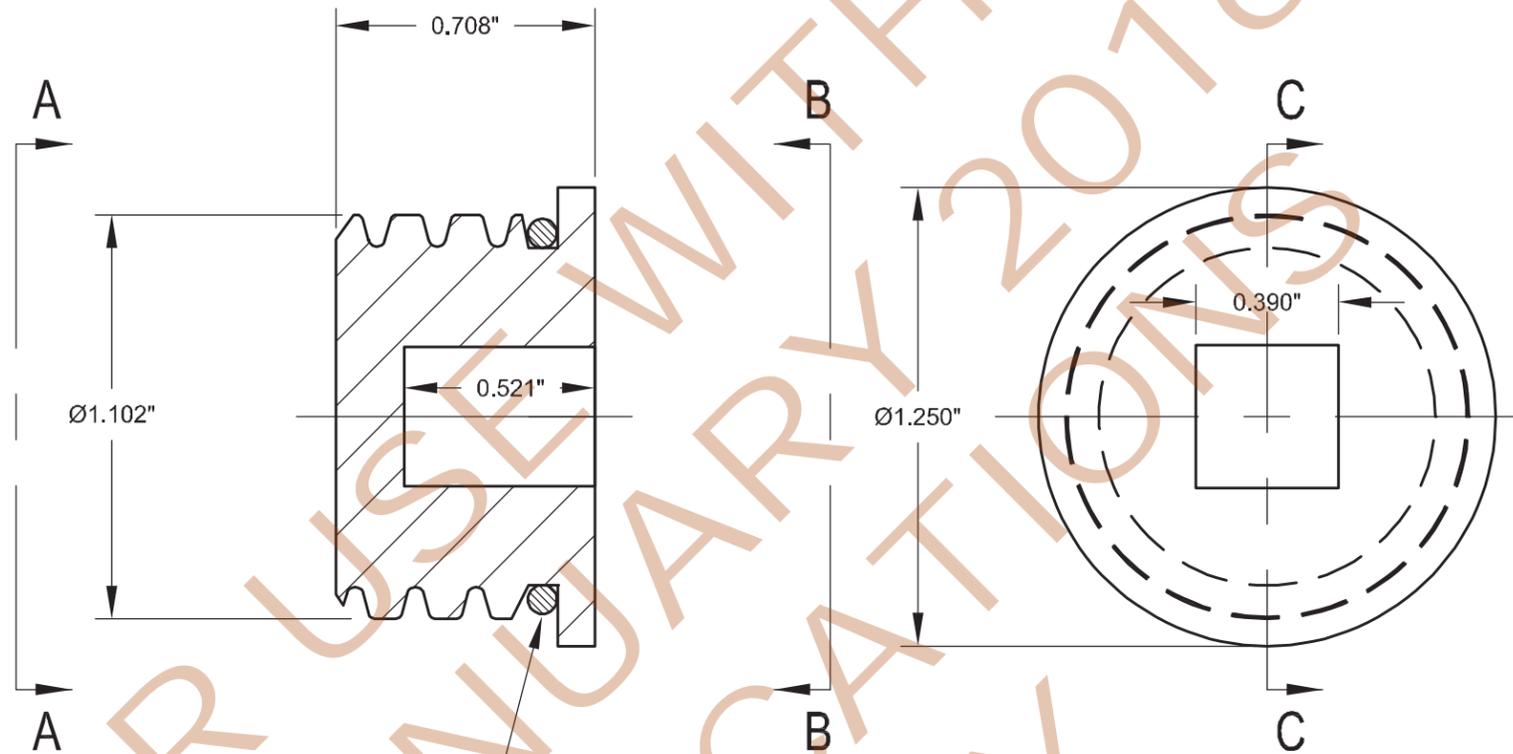
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DWG. TITLE: 23MM GROUT HOSE FABRICATION
 PROJECT: VSL SYSTEMS DRAWING
 SCALE: 2:1
 VSL JOB NO:
 VSL DWG. NO. C587



VIEW A-A

.1" LETTERING
RECESSED



O-RING
(PARKER #212)
INSTALL DURING
MANUFACTURING

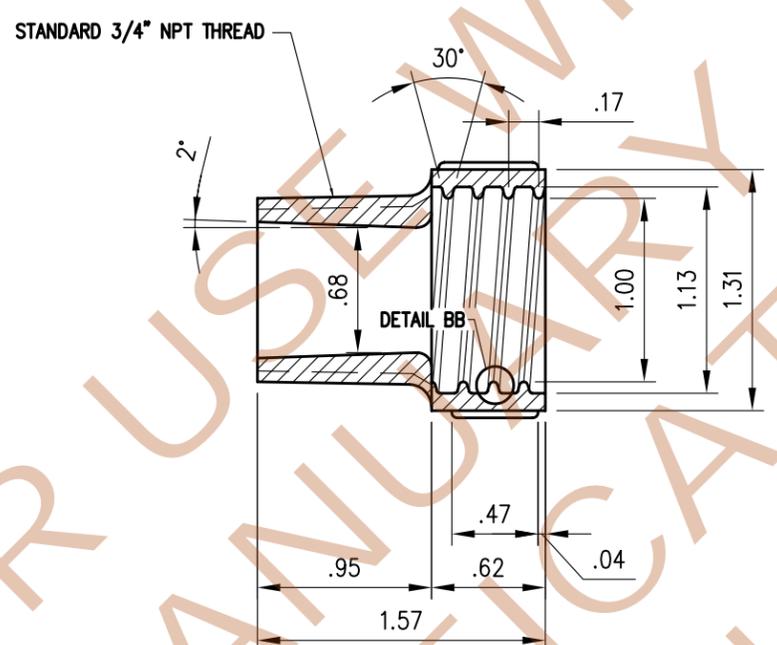
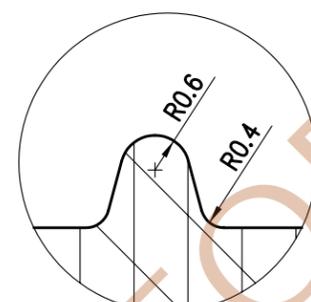
SECTION C-C

VIEW B-B

TOLERANCES	
UNLESS OTHERWISE SPECIFIED	
DIMENSIONS IN INCHES.	
FRACTIONAL _____	± 1/64
DECIMAL _____.X ____	± .030
_____.XX ____	± .010
_____.XXX ____	± .005
ANGULAR _____	± 1/2°
SURFACE QUALITY $\sqrt{\quad}$	
NOTES:	
1) BREAK SHARP EDGES .010 MAX.	
2) REMOVE ALL BURRS.	
3) DO NOT SCALE DRAWING.	
4) DIMENSIONS SHOWN THUS "(XX)" ARE IN MILLIMETERS.	
5) DIMENSIONS IN MM SHALL CONFORM TO DIN 1685 GTB16 TOLERANCES	
5) MATERIAL: POLYPROPYLENE BLACK	
5) INVENTORY No. 02DT0341	

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VSL 7465 NEW RIDGE RD. HANOVER, MD, 21076 WWW.VSL.NET		DATE	
VSL		REV.	DATE
23MM GROUT PLUG FABRICATION		2	1/02/07
VSL SYSTEMS DRAWING		1	4/26/04
DWG. TITLE:		MATERIAL CHANGE (BLACK)	
PROJECT:		RELEASED FOR PRODUCTION	
SCALE: 2:1		BY	CHK
VSL JOB NO.:		GDH	GDH
VSL DWG. NO.:		BY	BY
C583		REVISON	REVISON

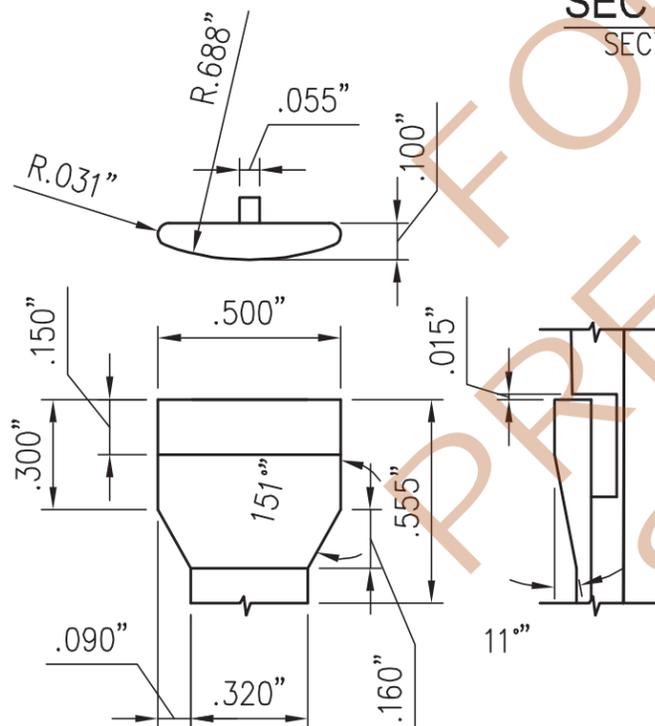
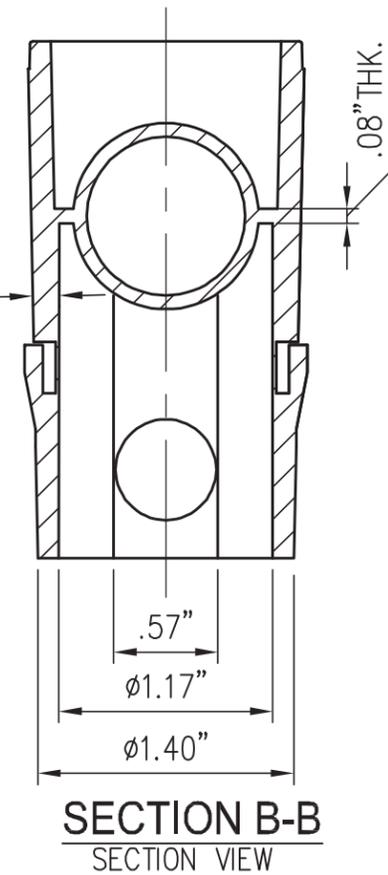
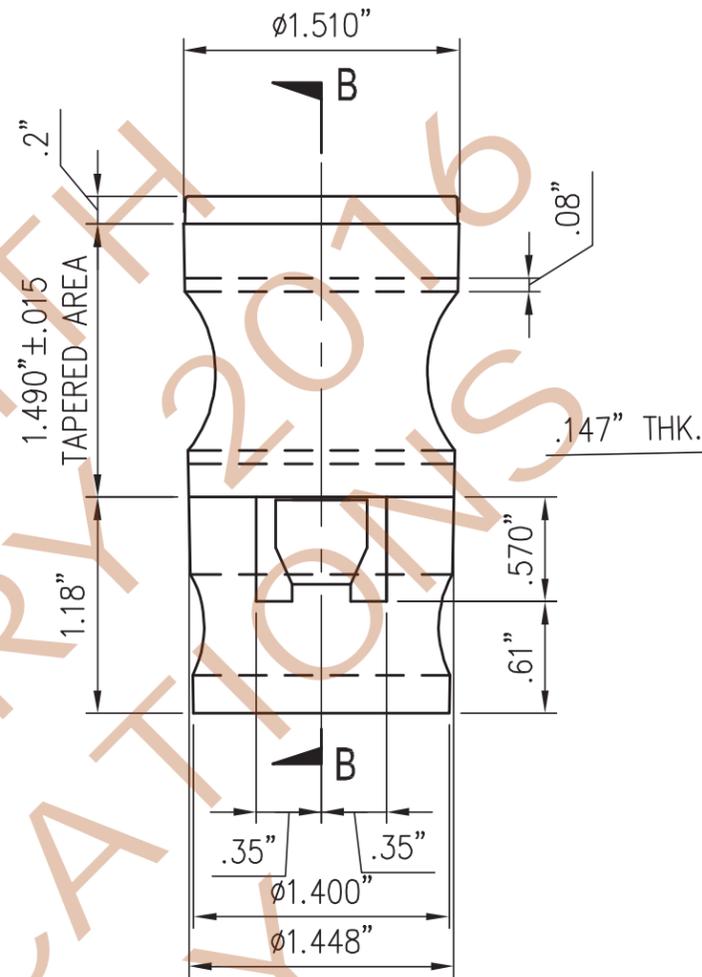
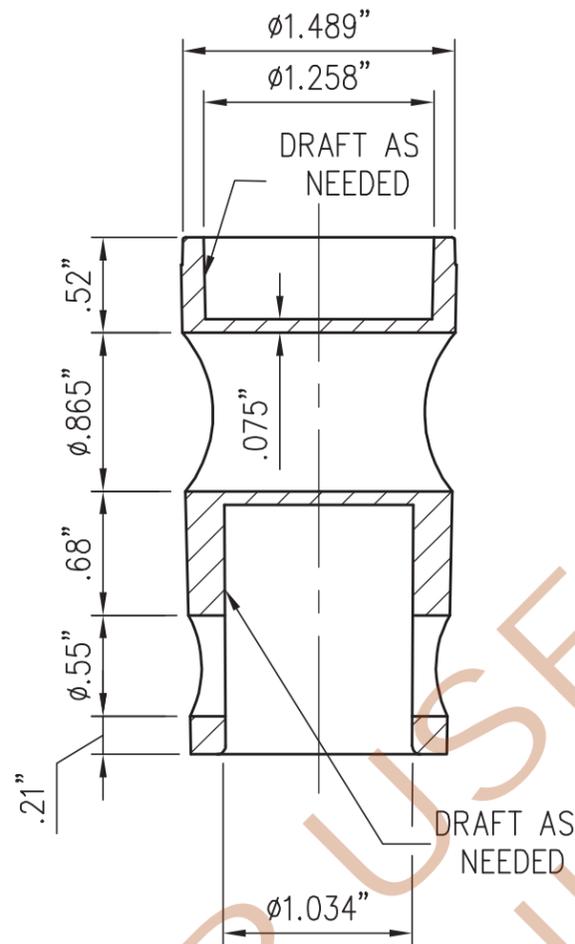
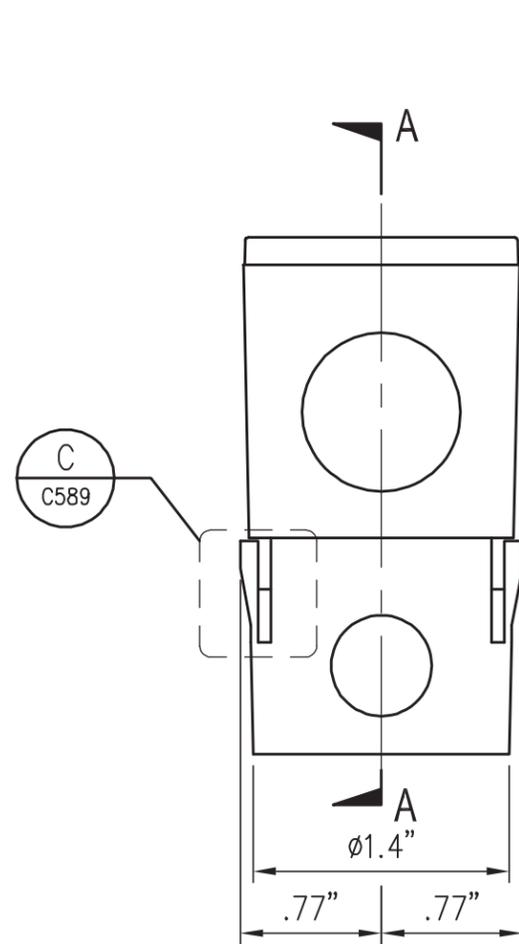


FOR US ONLY 2016
PRE-JANUARY SPECIFICATIONS ONLY

GENERAL NOTES
 1) MATERIAL: PP, BLACK OR NATURAL IN COLOR
 2) SCALE: DRAWING NOT TO SCALE
 INVENTORY No. 02DT0316

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VSL 7455 NEW RIDGE RD. HANOVER, MD. 21076 WWW.VSL.NET	 VSL	3/4" NPT - 23MM GROUT BUSHING	5/5/10 8/6/08	APPROVED FOR PRODUCTION PRELIMINARY NOT FOR PRODUCTION
VSL SYSTEMS DRAWING	DATE	REV.	BY	CHK
SCALE: NTS	VSL JOB NO:	VSL DWG. NO.	C675	



DEATAIL VIEW
LOCKING TANG
SCALE: 2:1

SECTION A-A
SECTION VIEW

SECTION B-B
SECTION VIEW

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES.

FRACTIONAL _____ ± 1/32
DECIMAL ____ .X ____ ± .030
 ____ .XX ____ ± .010
 ____ .XXX ____ ± .005

ANGULAR _____ ± 1/2°
SURFACE QUALITY √

NOTES:
1) BREAK SHARP EDGES .010 MAX.
2) REMOVE ALL BURRS.
3) DO NOT SCALE DRAWING.
4) DIMENSION W/* CRITICAL DIMENSION
5) MATERIAL: HIPS COLOR BLACK
5) INVENTORY: 02DT0330

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DATE	REV.	DATE	REV.	BY	CHK
4/26/04	1	6/22/05	2	GDH	GDH
RELEASED FOR PRODUCTION		BLACK COLOR ADDED			
VSL		VSL		VSL	
VALVE		GROUT SHUTOFF VALVE		SYSTEMS DRAWING	
DWG. TITLE:		PROJECT:		SCALE: 1:1 UNO	
C589		C589		VSL JOB NO:	
C589		C589		VSL DWG. NO.	



CanusaTube™ - PLA

Tubular sleeve for pipeline corrosion protection

For more than 35 years, Canusa-CPS has been a leading developer and manufacturer of specialty pipeline coatings for the sealing and corrosion protection of pipeline joints and other substrates. Canusa-CPS high performance products are manufactured to the highest quality standards and are available in a number of configurations to accommodate many specific project applications.

Product Description

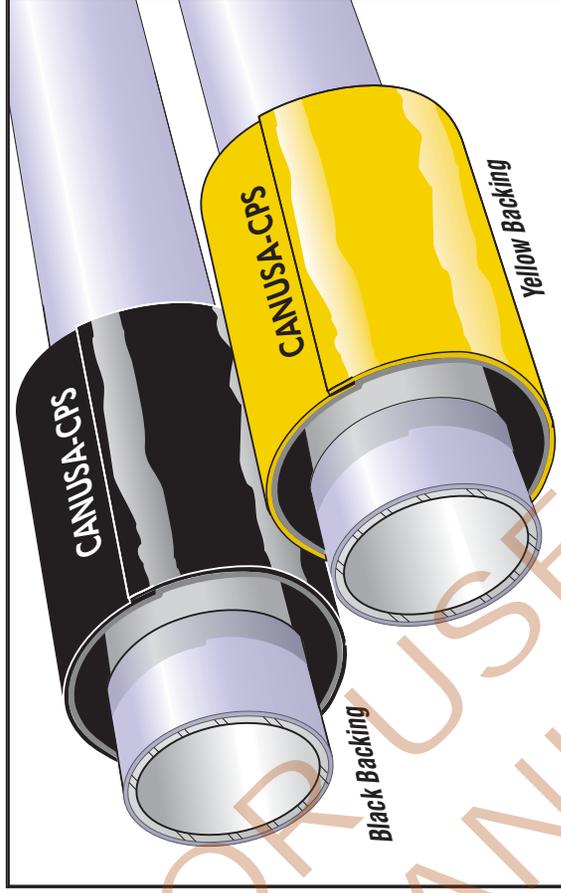
The CanusaTube™ is a heat shrinkable tubular sleeve designed for corrosion protection of buried and exposed steel pipelines. CanusaTube™ consists of a crosslinked polyolefin backing, coated with a protective heat sensitive adhesive which effectively bonds to steel substrates and common pipeline coatings including polyethylene and fusion bonded epoxy.

Features & Benefits

Rapid & Reliable Installation
Because CanusaTube™ consists of a unique tubular configuration that has been factory constructed, quick and reliable field installation is easy to accomplish. CanusaTube™ is available with a specially formulated adhesive to accommodate demanding operating temperatures and soil stress conditions. To further optimize installation, CanusaTube™ is available in yellow which includes a thermochromic indicator to visually confirm proper installation.

Long Term Corrosion Protection

CanusaTube™ provides excellent resistance to cathodic disbondment resulting in effective long term corrosion protection. The high performance crosslinked backing in combination with the specially formulated adhesive is engineered to have excellent resistance against temperature cycling, and chemical and environmental attack.



Saves Time & Money

With CanusaTube's™ unique construction, less time is required handling, positioning and installing separate closures. With the application of heat, this feature allows for fast, simple and complete installation of the sleeve. No additional costly primers are required. This minimizes installation time and labour costs while promoting high production rates. CanusaTube™ is also available in a high shrink ratio for high profile joint protection. Consult the High Shrink data sheet for additional information.

Applications

-  Oil & Gas
 -  Girth-Weld Joints
 -  Water Pipelines
 -  Pre-Insulated Pipes
 -  Utility Poles
- #### Configurations
-  CanusaTube™
 -  2-Layer
 -  Standard Shrink

Pipe Sizes

 55 - 315 (2" - 12")

Temperature Range

 up to 55°C (131°F)

Approvals

 DIN 30672

The product selection chart shown here is intended as a guide for standard products. Consult your Canusa representative for specific projects or unique applications. The following are typical values based on Black, Heavy Duty (L) Sleeves.

CanusaTube™ - PLA

Product Selection Guide Choose your sleeve based on your Pipe Diameter

Nominal Pipe Diameter DN (inches)	Outside Pipe Diameter mm (inches)	Tubular Sleeve PLA XXX-YYY ZZ	Tubular Sleeve Diameter	
			As Supplied mm (in)	Fully Recovered mm (in)
50 (2)	61 (2.4)	PLA 55-YYY ZZ	90 (3.5)	55 (2.3)
65 (2.5)	76 (3)	PLA 63-YYY ZZ	90 (3.5)	63 (2.5)
80 (3)	89 (3.5)	PLA 90-YYY ZZ	120 (4.8)	81 (3.3)
90 (3.5)	102 (4)	PLA 100-YYY ZZ	130 (5)	90 (3.5)
100 (4)	114 (4.5)	PLA 115-YYY ZZ	145 (5.5)	98 (3.8)
125 (5)	141 (5.5)	PLA 125-YYY ZZ	160 (6.3)	110 (4.3)
150 (6)	168 (6.6)	PLA 170-YYY ZZ	205 (8)	140 (5.5)
200 (8)	219 (8.6)	PLA 230-YYY ZZ	260 (10)	180 (7)
250 (10)	273 (10.7)	PLA 280-YYY ZZ	315 (12.3)	211 (8.3)
300 (12)	324 (12.8)	PLA 315-YYY ZZ	360 (14)	245 (9.5)

Shrink Range

For pipe diameters > DN300 (12"), consult your Canusa representative.

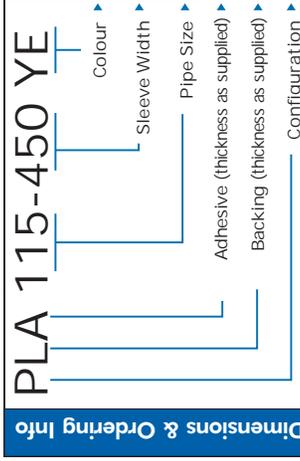
Operating Characteristics

Pipeline Operating Temperature	Celsius	Fahrenheit	Hot Melt
	70°	158°	PLA
	60°	140°	
	50°	120°	
	40°	104°	
	30°	85°	
Minimum Installation Temp.			60 (140)
Resistance to Circumferential Forces			very good
Resistance to Soil Stress			very good
Resistance to Axial Pipe Movement			very good
Main Line Coating Compatibility			PU, PE, FBE, PP

Typical Product Properties

Adhesive	Softening Point Lap Shear	Test Standard ASTM E28 DIN 30 672	Unit °C (°F) N/cm ² (psi)	PLA 72 (162) 60 (87)
Backing	Specific Gravity	ASTM D792		0.93
	Tensile Strength	ASTM D638	MPa (psi)	20 (2900)
	Elongation	ASTM D638	%	600
	Hardness	ASTM D2240	Shore D	46
	Abrasion Resistance	ASTM D1044	mg	45
Sleeve	Volume Resistivity	ASTM D257	ohm-cm	10 ¹⁷
	Dielectric Voltage Brkdown.	ASTM D149	kV/mm	20
	Impact	DIN 30 672	class B	pass
	Indentation	DIN 30 672	class B	pass
	Peel	ASTM D1000	N/cm (pli)	50 (29)
Sleeve	Peel	DIN 30 672	N/cm (pli)	35 (20)
	Cathodic Disbondment	ASTM G8	mm rad	13
	Water Absorption	ASTM D570	%	0.05
	Low Temp. Flexibility	ASTM-D2671-C	°C (°F)	-32 (-26)
	DIN Approval	DIN 30 672	class	B50
	Fully Recovered Thickness		mm (mils)	2.3 (92)

How To Order:



Standard Ordering Options

YE - Yellow, BK - Black
300mm, 450mm, 600mm, 900mm (12", 18", 24", 36")
55mm - 315mm (2" - 12")
A - 0.75 mm (30 mils)
L - 0.80 mm (31 mils)
P - Tubular

Min. Sleeve Width = Bare Steel Dimension + 50 mm (2") min. on each side of the pipe joint.

The above represent standard ordering options. Consult your Canusa representative for any unique project requirements.



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Canusa warrants that the product conforms to its chemical and physical description and is appropriate for the use stated on the installation guide when used in compliance with Canusa's written instructions. Since many installation factors are beyond our control, the user shall determine the suitability of the products for the intended use and assume all risks and liabilities in connection therewith. Canusa's liability is stated in the standard terms and conditions of sale. Canusa makes no other warranty either expressed or implied. All information contained in this installation guide is to be used as a guide and is subject to change without notice. This installation guide supersedes all previous installation guides on this product. E&OE

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