

**Background Information**

Flexpipe Spoolable Products may be terminated underground with either a flange or a weldneck fitting. Alternatively, with proper support, it can be brought to surface and terminated above ground. The purpose of the riser support is to prevent unnecessary shear or tensile loads on the pipe that could be caused by settling of backfill and earth movement.

**About this Bulletin**

This Bulletin highlights the recommendations for terminating Flexpipe Spoolable Products and transitioning to another pipeline material. This Bulletin serves as a supplement to the Flexpipe Technical Manual and the Flexpipe Pipe Installation Guide. To obtain a copy of Flexpipe documents, please visit [www.Flexpipesystems.com](http://www.Flexpipesystems.com) and search the Technical Library.

**Flexpipe Spoolable Products Riser Guidance**

There are several methods to transition from buried to an above ground connection with Flexpipe Spoolable Products: Flexpipe riser chutes, rigid pipe risers, and virgin or compacted soil riser chutes. Depending on the installation and pipeline operating conditions, one method may be more suitable than another.

A pile-supported riser (Flexpipe riser chute or rigid pipe riser) is required to transition Flexpipe Spoolable Products from buried to an above ground connection for:

- Installations in areas with known freezing and thawing cycles, or
- Installations in areas with the potential for ground settling, subsidence, or movement.

**NOTE!**

Any above ground fitting must be covered with white pipeline tape. Flexpipe Spoolable Products should be protected from mechanical damage similar to other piping materials above ground, depending on expected hazards in the area. Flexpipe Spoolable Products are a ductile material and can withstand reasonable impact even at low temperatures.

**NOTE!**

It is required to have a minimum of 1 m (3 ft.) of straight pipe adjacent to all fittings. This requirement does not apply to end fittings that are within a Flexpipe riser chute.

## Flexpipe Riser Chutes

Flexpipe riser chutes are curved C-channel steel structures that are designed to protect Flexpipe Spoolable Products from ground movement caused by settlement or freezing and thawing cycles. The Flexpipe riser chutes are the standard method for bringing Flexpipe Spoolable Products to an above ground connection.

Flexpipe riser chutes require steel piles to support the riser chute and prevent movement. Refer to the Flexpipe Pipe Installation Guide for information on the installation of a Flexpipe riser chute. Drawings of the riser chutes are available in the Appendix of this document. Ask your Flexpipe representative for the latest version of the riser drawings, which includes sizing specifications and detailed notes on installation.



**Figure 1: Flexpipe installed in a Flexpipe riser chute**

### CAUTION!



The majority of Flexpipe riser chute issues are due to poor support at the ends of the riser chute. Proper end support is required for all Flexpipe riser chute installs. See riser installation guidance in the Flexpipe Pipe Installation Guide.

## Rigid Pipe Risers

A rigid pipe riser allows for the transition from Flexpipe to another pipeline material below ground. Rigid pipe risers are typically made from steel or rigid fiberglass. It is recommended to use a rigid pipe riser to transition Flexpipe Spoolable Products from buried to an above ground connection for:

- Applications with liquid velocities over 5 ft/s, or
- Applications with severe on/off cycles, slug flow, or water hammer.



**Figure 2: Flexpipe connected to a rigid (steel) pipe riser**

Rigid pipe risers require steel piles to support the riser and prevent movement. Refer to the Flexpipe Pipe Installation Guide for information on the installation of a rigid pipe riser. Drawings of rigid pipe risers are available in the Appendix of this document. Ask your Flexpipe representative for the latest version of the riser drawings, which includes sizing specifications and detailed notes on installation.

## Virgin or Compacted Soil Riser Chutes

In select instances, a virgin or compacted soil riser may be used to support the Flexpipe Spoolable Product as it transitions from buried to an above ground connection. Virgin or compacted soil risers should only be used in areas that do not have freezing and thawing cycles.

Virgin or compacted soil risers:

- Must be excavated in a way that creates a smooth bottom with gradual grade transitions with a radius equal to or greater than the minimum operating bend radius shown in **Table 1**.
- If using a compacted soil riser, the material used for the riser must have a soil modulus of 1000 psi or greater.

- The riser bottom must adequately support the pipe. The riser bottom must be free from large rocks that may impinge on the pipe. It is recommended to remove any rocks larger than 51 mm (2 in) in diameter.
- The soil used for backfill must be free from rocks and debris that could damage the pipe. It is recommended to remove any rocks larger than 75 mm (3 in) from the backfill for a minimum of 150 mm (6 in) from the pipe in all directions.
- The backfill embedment material must have a soil modulus of 1000 psi or greater.
- The unsupported Flexpipe from the ground to the above ground connection should be minimized. Refer to **Table 2** for the recommended maximum pipe support spacing for Flexpipe Spoolable Products.
- The above ground fitting connection must be at either a 45 or 90-degree angle.

**Table 1: Minimum Operating Bend Radius**

Flexpipe Spoolable Products	Minimum Operating Bend Radius	
	(m)	(ft)
2"	1.2	4
3"	1.8	6
4"	2.1	7
5"	3.1	10
6"	3.4	11

**Table 2: Recommended Maximum Pipe Support Spacing**

Recommended maximum support spacing				
Flexpipe Spoolable Products	Liquid Service		Gas Service	
	(m)	(ft)	(m)	(ft)
2"	1.1	3.5	1.2	4
3"	1.2	4	1.5	5
4"	1.5	5	1.7	5.5
5"	1.5	5	1.8	6
6"	2.4	8	2.9	9.5



**Figure 3: Properly supported virgin soil riser**



**Figure 4: Improperly supported virgin soil riser - pipeline is not supported by virgin or compacted soil**

### Surface Pipelines with no Riser

When Flexpipe Spoolable Products are installed on the surface, the above ground connection must be at a 45-degree angle. **Figure 5** shows an unacceptable above ground connection as the connection is at a 180-degree angle. The unsupported Flexpipe from the ground to the connection should be minimized. Refer to **Table 2** for the recommended maximum pipe support spacing for Flexpipe Spoolable Products.



**Figure 5: Unacceptable - above ground connection must be at a 45-degree angle for surface pipelines**

For additional guidance on surface pipeline installations, refer to the Flexpipe Pipe Installation Guide.

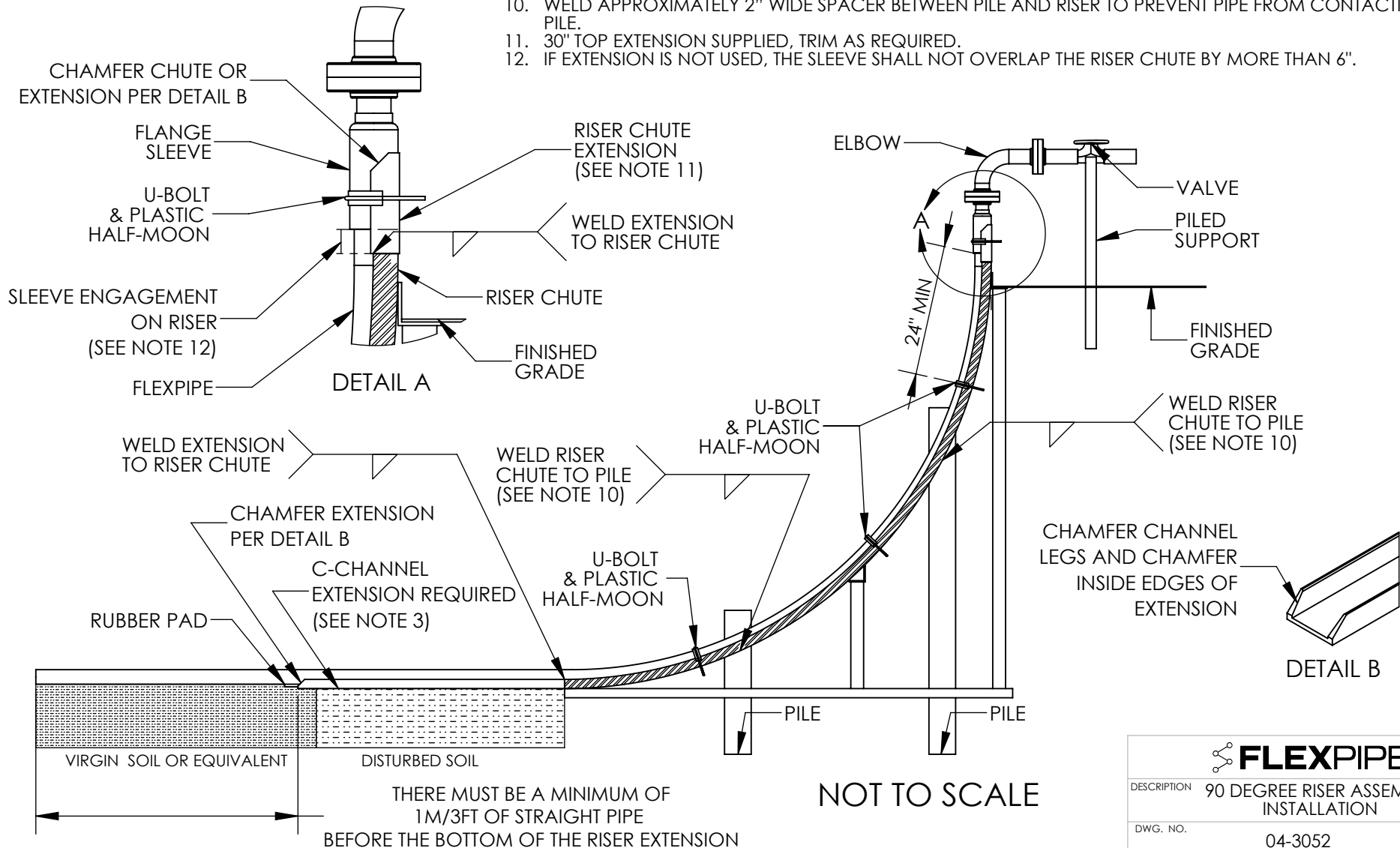


**Figure 6: Acceptable surface pipeline support**

AS SHIPPED RISER SPECIFICATIONS			
RISER SIZE	2"	3"	4"
HEIGHT	80 1/8"	80 3/4"	93"
LENGTH	53"	75"	88"
U-BOLT KIT QTY.	3	4	5

**NOTES:**

1. INSTALL THE RISER CHUTE FIRST THEN THE CONNECTED PIPES.
2. FPLP IS NOT TO BE LOADED BY EXTERNAL PIPING.
3. EXTEND THE BOTTOM OF THE RISER CHUTE HORIZONTALLY WITH STEEL C-CHANNEL UNTIL IT REACHES VIRGIN SOIL OR EQUIVALENT SUPPORT.
4. U-BOLTS SHOULD BE SNUG. DO NOT OVERTIGHTEN!
5. A RUBBER PAD IS TO BE PLACED BETWEEN THE FPLP AND THE RISER CHUTE END.
6. PLASTIC HALF-MOONS ARE TO BE PLACED BETWEEN THE FPLP AND EACH OF THE U-BOLTS.
7. WRAP ABOVE GROUND FITTINGS WITH PETROLATUM TAPE AND LIGHT-COLOURED PIPELINE TAPE AFTER INSTALLATION FOR PROTECTION AGAINST WATER.
8. CHAMFER END OF EXTENSION AT TOP AND BOTTOM PER DETAIL B.
9. SEE TABLE 'AS SHIPPED RISER SPECIFICATIONS' FOR U-BOLT KIT QUANTITIES. U-BOLTS SHALL BE DISTRIBUTED EVENLY ALONG THE RISER LENGTH.
10. WELD APPROXIMATELY 2" WIDE SPACER BETWEEN PILE AND RISER TO PREVENT PIPE FROM CONTACTING PILE.
11. 30" TOP EXTENSION SUPPLIED, TRIM AS REQUIRED.
12. IF EXTENSION IS NOT USED, THE SLEEVE SHALL NOT OVERLAP THE RISER CHUTE BY MORE THAN 6".



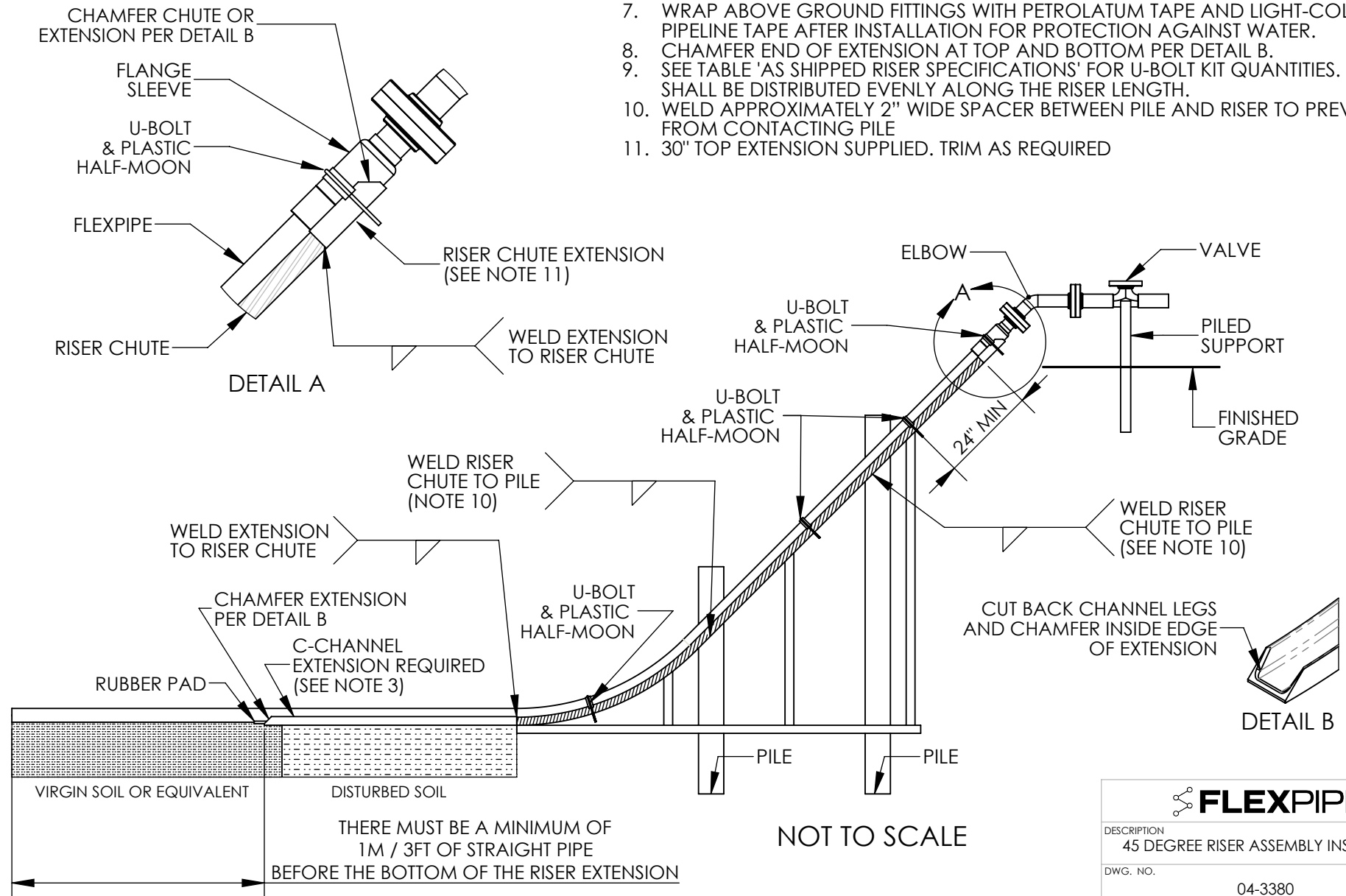
DESCRIPTION	90 DEGREE RISER ASSEMBLY INSTALLATION	
DWG. NO.	04-3052	REV. 18

**AS SHIPPED RISER SPECIFICATIONS**

RISER SIZE	2"	3"	4"	5"	6"FPHT
HEIGHT	74 1/2"	85 1/8"	82"	83 1/2"	83 3/4"
LENGTH	92 1/2"	112"	114"	133 3/4"	132 11/16"
U-BOLT KIT QTY.	3	4	5	5	5

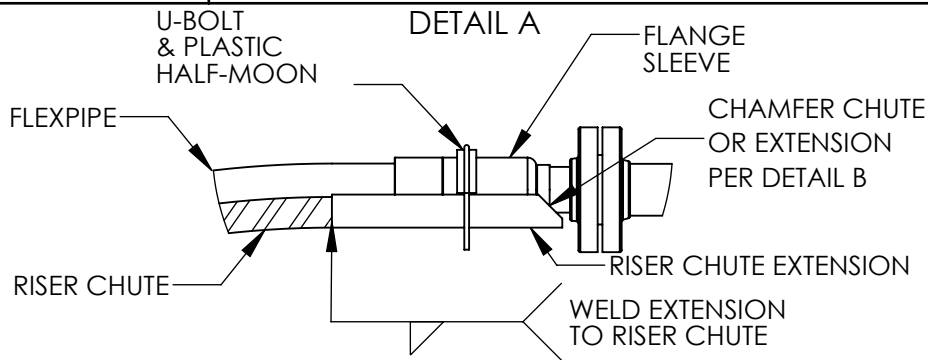
**NOTES:**

1. INSTALL THE RISER CHUTE FIRST THEN ANY CONNECTED PIPES.
2. FPLP IS NOT TO BE LOADED BY EXTERNAL PIPING.
3. EXTEND THE BOTTOM OF THE RISER CHUTE HORIZONTALLY WITH STEEL C-CHANNEL UNTIL IT REACHES VIRGIN SOIL OR EQUIVALENT SUPPORT.
4. U-BOLTS SHOULD BE SNUG. DO NOT OVERTIGHTEN.
5. A RUBBER PAD IS TO BE PLACED BETWEEN THE FPLP AND THE RISER CHUTE END.
6. PLASTIC HALF-MOONS ARE TO BE PLACED BETWEEN THE FPLP AND EACH OF THE U-BOLTS.
7. WRAP ABOVE GROUND FITTINGS WITH PETROLATUM TAPE AND LIGHT-COLOURED PIPELINE TAPE AFTER INSTALLATION FOR PROTECTION AGAINST WATER.
8. CHAMFER END OF EXTENSION AT TOP AND BOTTOM PER DETAIL B.
9. SEE TABLE 'AS SHIPPED RISER SPECIFICATIONS' FOR U-BOLT KIT QUANTITIES. U-BOLTS SHALL BE DISTRIBUTED EVENLY ALONG THE RISER LENGTH.
10. WELD APPROXIMATELY 2" WIDE SPACER BETWEEN PILE AND RISER TO PREVENT PIPE FROM CONTACTING PILE
11. 30" TOP EXTENSION SUPPLIED. TRIM AS REQUIRED



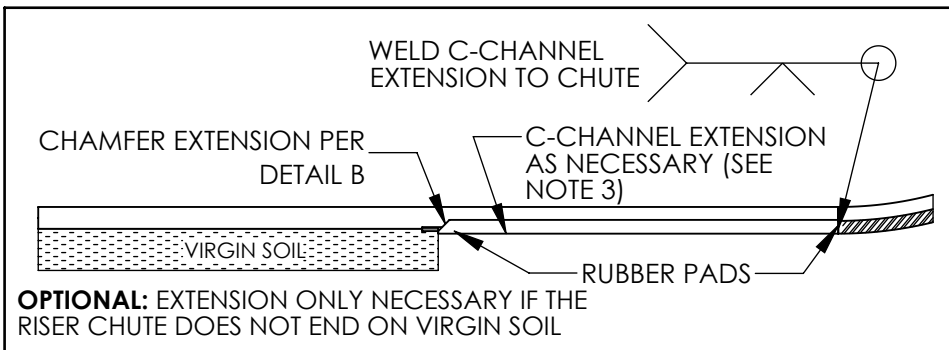
DESCRIPTION  
45 DEGREE RISER ASSEMBLY INSTALLATION



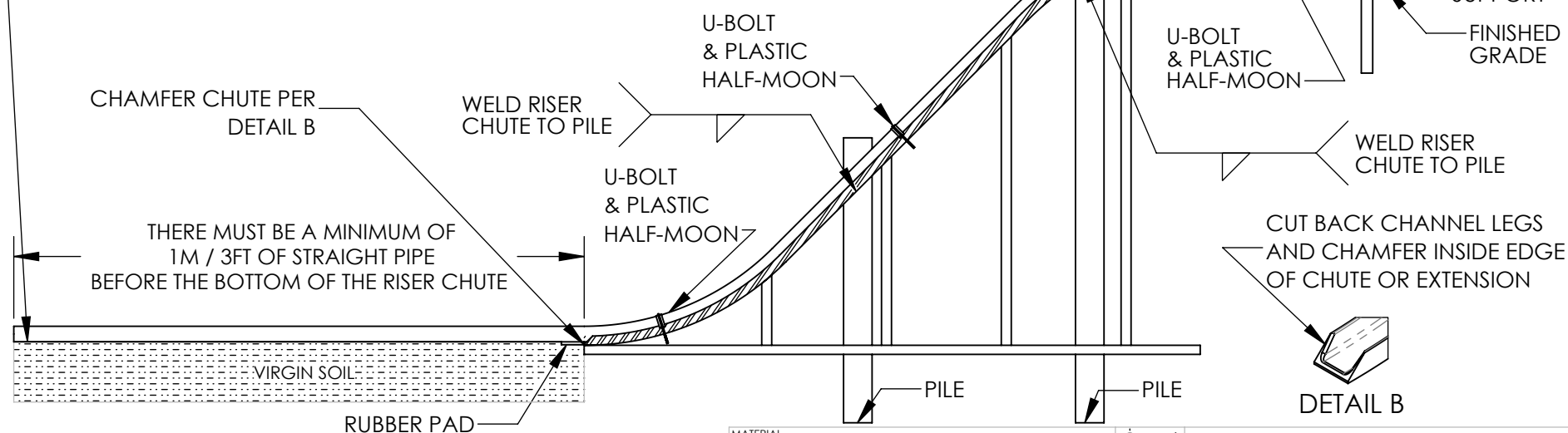


**NOTES:**

1. INSTALL THE RISER CHUTE FIRST THEN THE CONNECTED PIPES.
2. EXTEND THE BOTTOM OF THE RISER CHUTE HORIZONTALLY WITH STEEL C-CHANNEL (NOT SUPPLIED) UNTIL IT REACHES VIRGIN SOIL OR EQUIVALENT SUPPORT.
3. U-BOLTS SHOULD BE SNUG. DO NOT OVER-TIGHTEN!
4. FPLP IS NOT TO BE LOADED BY EXTERNAL PIPING.
5. A RUBBER PAD IS TO BE PLACED BETWEEN THE FPLP AND THE RISER CHUTE END.
6. PLASTIC HALF-MOONS ARE TO BE PLACED BETWEEN THE FPLP AND EACH OF THE U-BOLTS.
7. WRAP ABOVE GROUND FITTINGS WITH PETROLATUM TAPE AND LIGHT-COLOURED PIPELINE TAPE AFTER INSTALLATION FOR PROTECTION FROM WATER AND SOLAR HEATING.
8. CHAMFER END OF CHUTE OR EXTENSION AT TOP AND BOTTOM PER DETAIL B.
9. THE U-BOLT KITS CONTAIN 3, 4, AND 5 U-BOLTS FOR THE 2", 3" AND 4" RISER ASSEMBLIES RESPECTIVELY. THESE U-BOLTS SHALL BE DISTRIBUTED EVENLY ALONG THE RISER LENGTH.



**OPTIONAL:** EXTENSION ONLY NECESSARY IF THE RISER CHUTE DOES NOT END ON VIRGIN SOIL



**NOT TO SCALE**

REV #	DESCRIPTION	REV BY	REV DATE	CHK BY	CHK DATE
14	REVISED DRAWING FROM SHAWCOR TO FLEXPipe	DR	JAN 10, 2024	JP	JAN 10, 2024
13	ADDED NOTE TO SPECIFY NUMBER OF U-BOLT NEEDED	JH	MAY 30, 2018	RP	MAY 30, 2018
12	ADDED NOTE TO CHAMFER TOP OF RISER CHUTE	RP	JAN 18, 2018		
11	ADDED DETAIL VIEW SHOWING HOW TO CUT BACK CHANNEL	RP	NOV 16, 2017		

**MATERIAL**

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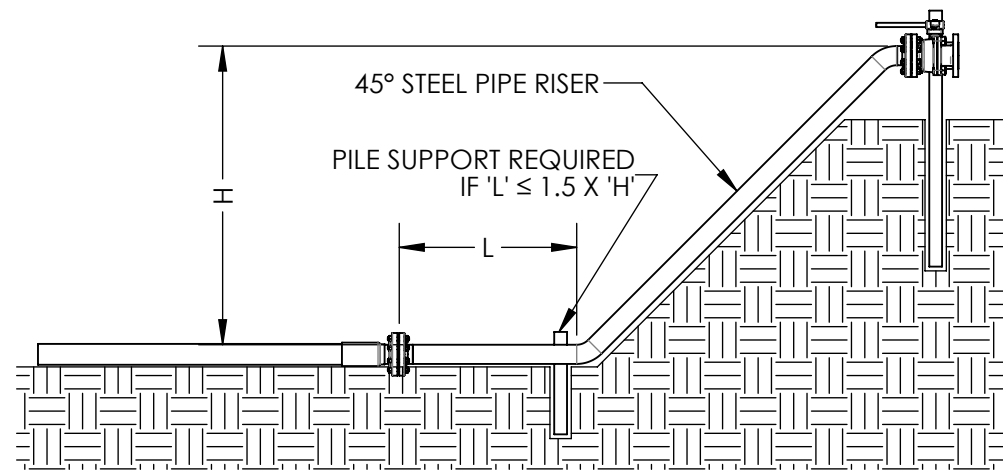
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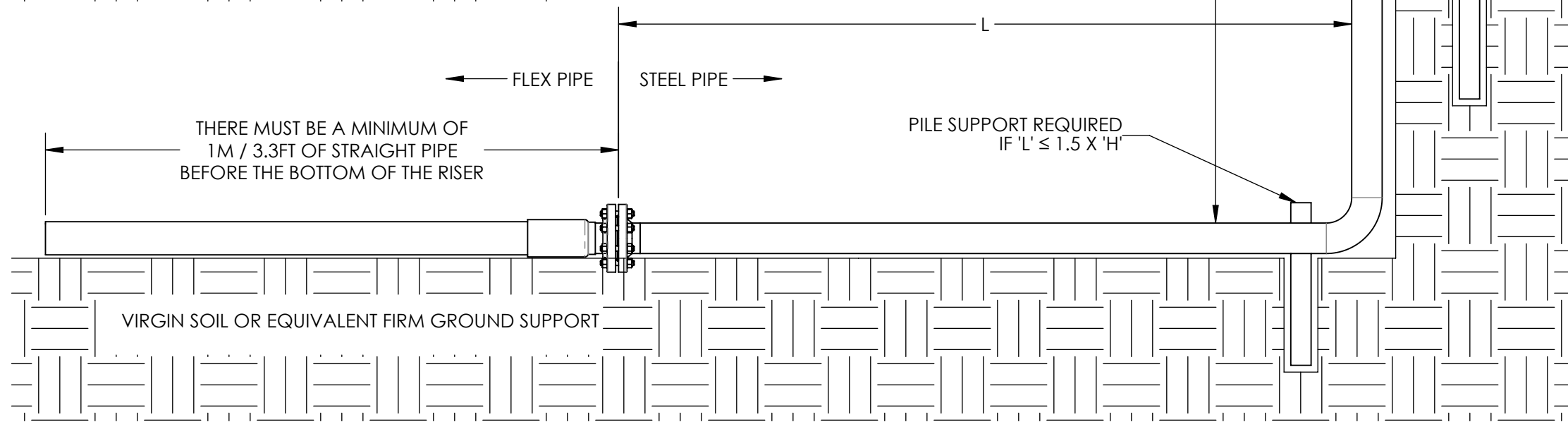
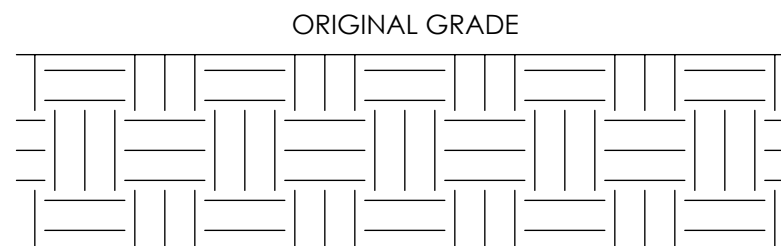


DESCRIPTION  
**S-BEND RISER ASSEMBLY INSTALLATION**

SIZE	DWG NO.	SHEET 1 OF 1	REV.
A	04-3385		14
WEIGHT (LB):			



45° RISER PIPE OPTION



90° RISER PIPE OPTION

NOTES:

1. THIS DRAWING DETAILS BOTH A 45° OR 90° STEEL PIPE RISER INSTALLATION.
2. INSTALL THE STEEL RISER PIPE FIRST, THEN ANY CONNECTED STEEL PIPES.
3. FPLP IS NOT TO BE LOADED BY EXTERNAL PIPING.
4. PILE SUPPORTS ARE ALWAYS RECOMMENDED. IF  $L > 1.5H$ , NO PILE SUPPORT IS REQUIRED IF THE PIPE IS PROPERLY SUPPORTED ON VIRGIN SOIL OR FIRM GROUND SUPPORT.

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REV #	DESCRIPTION	REV BY	REV DATE MMM DD YYYY	CHK BY	CHK DATE MMM DD YYYY
3	REVISED DRAWING FROM SHAWCOR TO FLEXPipe	DR	JAN 10 2024	JP	JAN 10 2024
2	UPDATED TITLE BLOCK AND ADJUSTED NOTES	PH	2020-03-03	RP	2020-03-03
1	ISSUED FOR INFORMATION	RP	2016-09-02	KM	2016-09-02

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SURFACE ROUGHNESS NOT TO EXCEED: 63 µm RA  
BREAK ALL CORNERS 0.005 IN TOLERANCES:  
FRACTIONAL INCH ± 1/32 IN  
ANGULAR: ± 1 DEG  
IMPERIAL ONE PLACE DECIMAL ± 0.1 IN  
IMPERIAL TWO PLACE DECIMAL ± 0.01 IN  
IMPERIAL THREE PLACE DECIMAL ± 0.005 IN



DESCRIPTION  
45°/90° STEEL PIPE RISER ASSEMBLY INSTALLATION

SIZE	DWG NO.	SHEET 1 OF 1	REV.
B	04-4071		3
WEIGHT (LB): -			

**TABLE 1: RECOMMENDED MAXIMUM SUPPORT SPACING**

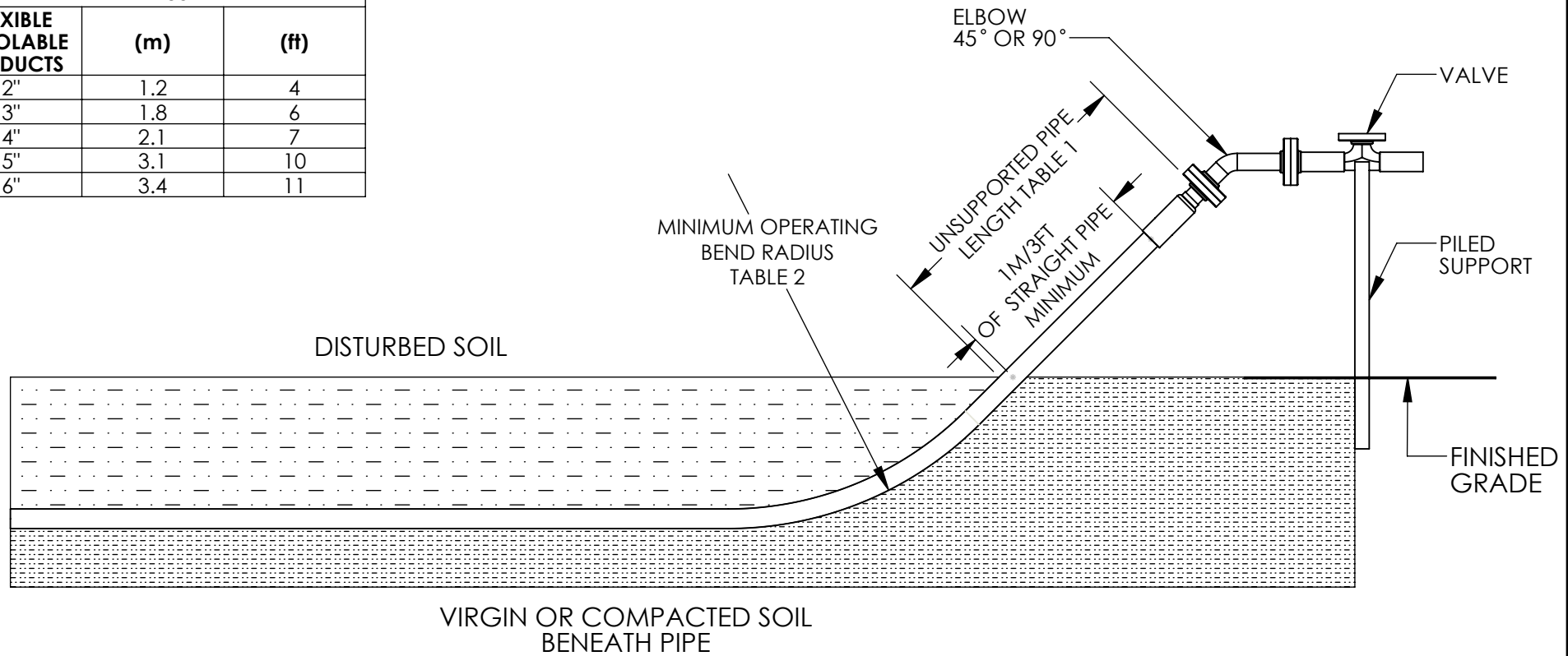
FLEXIBLE SPOOLABLE PRODUCTS	LIQUID SERVICE	
	(m)	(ft)
2"	1.1	3.5
3"	1.2	4
4"	1.5	5
5"	1.5	5
6"	2.4	8

**TABLE 2: MINIMUM OPERATING BEND RADIUS**

FLEXIBLE SPOOLABLE PRODUCTS	(m)	(ft)
2"	1.2	4
3"	1.8	6
4"	2.1	7
5"	3.1	10
6"	3.4	11

**NOTES:**

1. THE FLEXPipe MUST BE SUPPORTED BY VIRGIN OR COMPACTED SOIL BENEATH THE PIPELINE.
2. FLEXPipe MUST NOT BE LOADED BY EXTERNAL PIPING.
3. WRAP THE ABOVE GROUND FITTING WITH PETROLATUM TAPE AND WHITE PIPELINE TAPE AFTER INSTALLATION.
4. SEE TABLE 1 FOR RECOMMENDED MAXIMUM PIPE SUPPORT SPACING.
5. SEE TABLE 2 FOR THE MINIMUM OPERATING BEND RADIUS



MATERIAL -

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DESCRIPTION			
VIRGIN OR COMPACTED SOIL RISER, 2" TO 6"			
SIZE	DWG NO.	SHEET 1 OF 1	REV.
A	04-4049		5
WEIGHT (LB):			

REV #	DESCRIPTION	REV BY	REV DATE	CHK BY	CHK DATE
5	REVISED DRAWING FROM SHAWCOR TO FLEXPipe	DR	JAN 10, 2024	JP	JAN 10, 2024
4	ADDED 6" PIPE. ADDED RECOMMENDED MAXIMUM SUPPORT SPACING, REVISED NOTES TO MATCH RISER BULLETIN.	DR	APR 06, 2023	JP	MAY 18, 2023
3	ADDED 5" PIPE. CHANGED DESCRIPTION, UPDATED TITLE BLOCK, ADDED 'EQUIVALENT SUPPORT' NOTE	RP	JUN 29, 2021	JP	JUN 29, 2021
2	NOTES EDITED	PWM	AUG 14, 2015		