

GROUND FRAME™

Installation Instructions

Modular



OVERVIEW

The Ground Frame Foundation System provides a solid, stable, and efficient foundation that captures and preserves the supporting strength and natural functions of the Earth's soil and provides connection to the structure above.

IMPORTANT NOTE:

- Prior to commencing work, all installations must be reviewed by Ground Frame engineering team or the project engineer of record.
- Ensure all permits have been obtained.
- Check for buried utilities, mark on site as per local building codes.
- Have all required tools and equipment outlined on page 4.
- Wear proper safety gear.



Safety Glasses



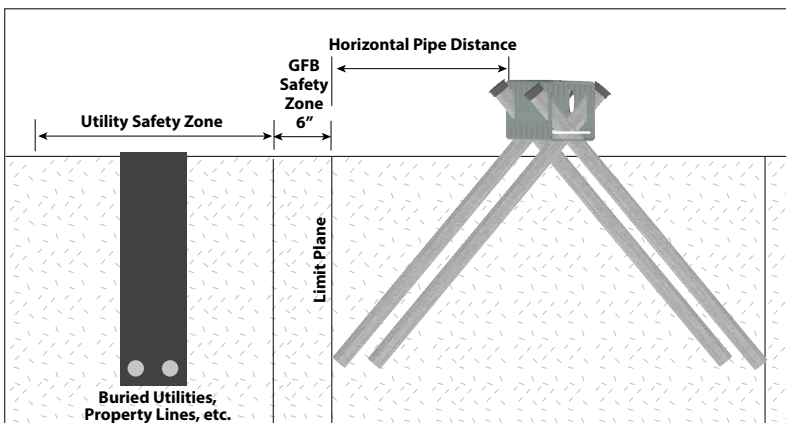
Ear Protection



Steel Toe Work Boots



Rubber Insulated Gloves

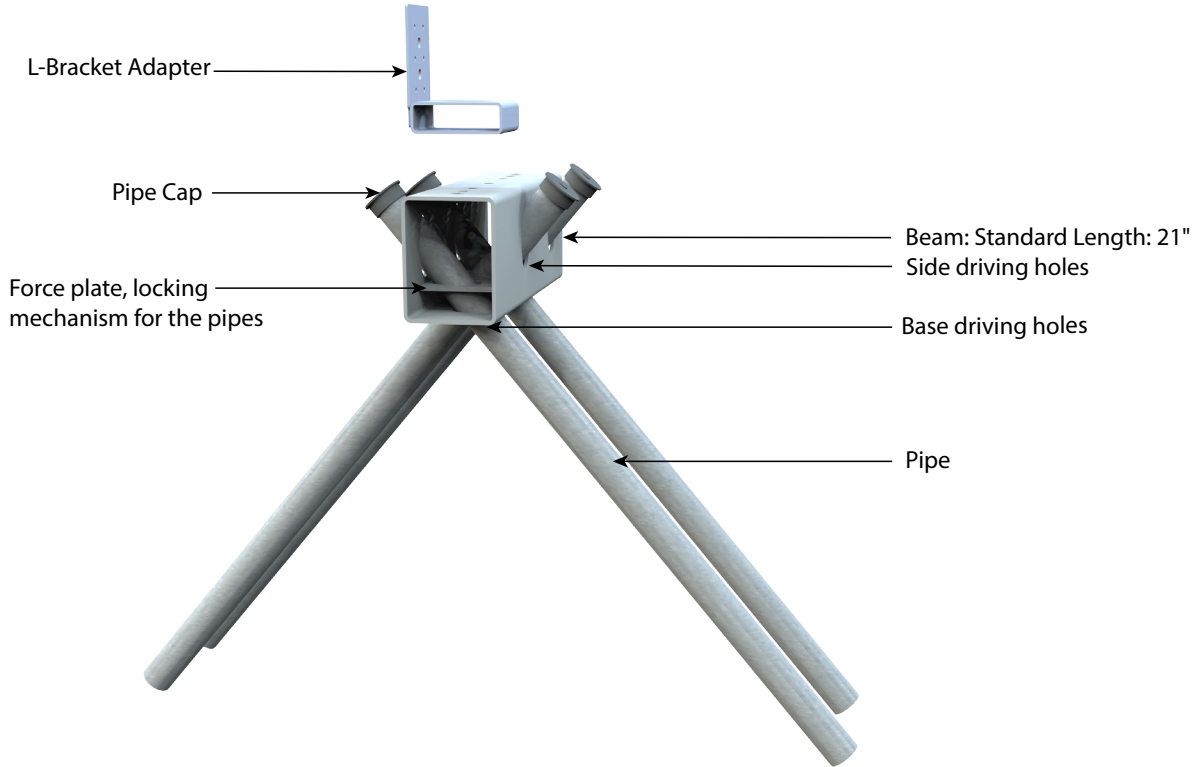


Horizontal Pipe Distance

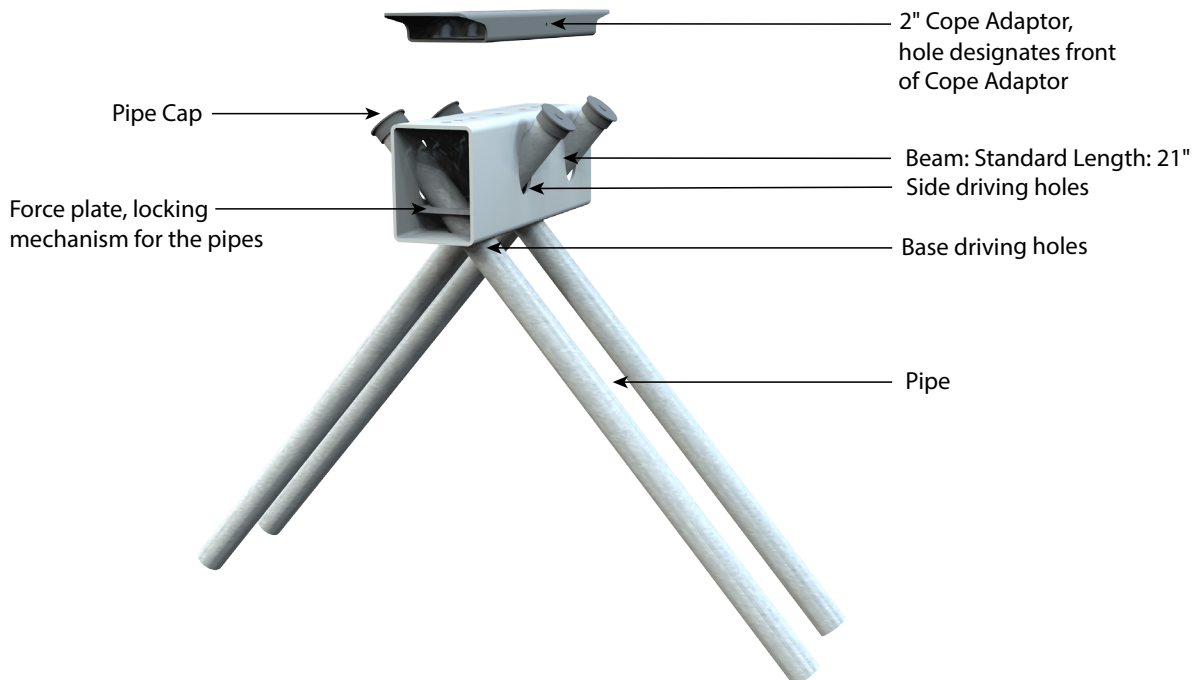
Measured from horizontal center of anchor bolt to vertical pipe end limit

Pipe Length (Inches)	Horizontal Pipe Distance (inches)
	Pipe at 90 degrees Perpendicular to limit plane
50	29
63	38
84	51

GROUND FRAME BEAM AND L-BRACKET ADAPTOR OVERVIEW

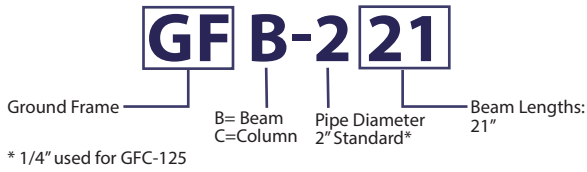


GROUND FRAME BEAM AND COPE ADAPTOR OVERVIEW

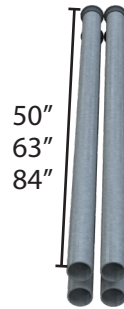


GROUND FRAME SMART PART NUMBERS

Simplify field inventory checks using our smart part numbers.



GFB-221



2" Pipe

Note: 2.35" actual pipe dimension.



Weld Block Adaptor



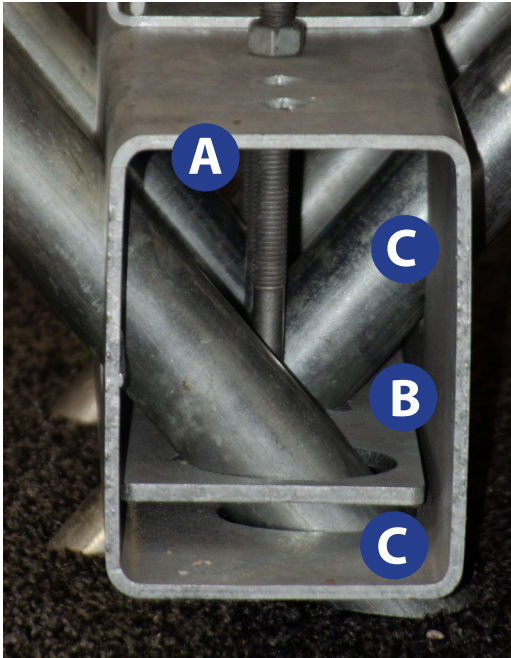
L-Bracket Adaptor



2" Cope Adaptor

BEFORE YOU BEGIN

Check Pipes for Proper Slide



- A** Anchor bolt
- B** Force plate
- C** Driving holes - side and base

The anchor bolt and force plate are factory set for proper pipe slide, but may have altered during shipping and handling.

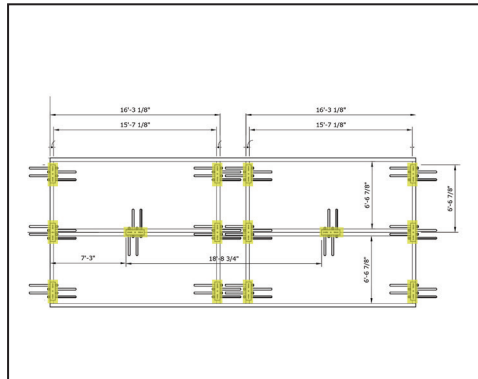
Pipes should easily slide through holes. If pipes do not easily slide, loosen locking bolt. **Do NOT force the pipes through the beam/column holes.**

If the bolt is fully loosened and the pipes do not easily slide, contact Ground Frame customer service.

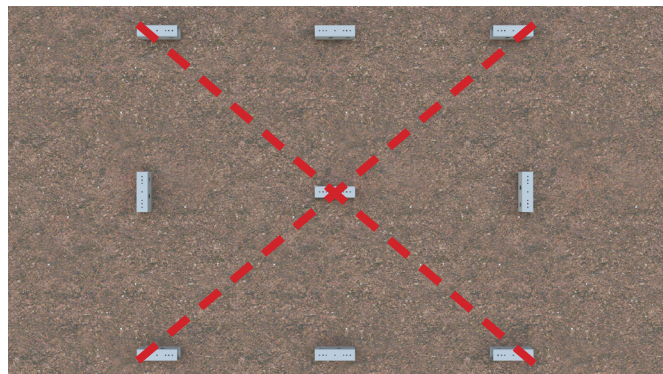
SITE PREPARATION



1. Clear and level site as per approved plans. Ensure proper site drainage and desired floor height.



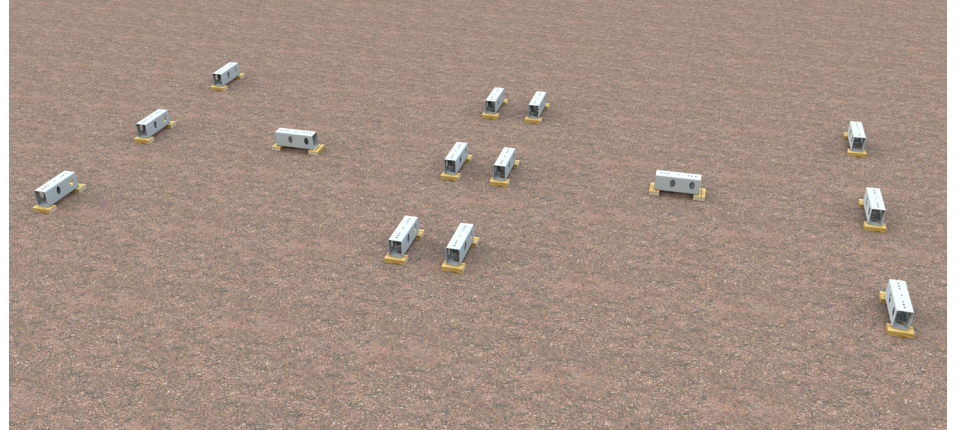
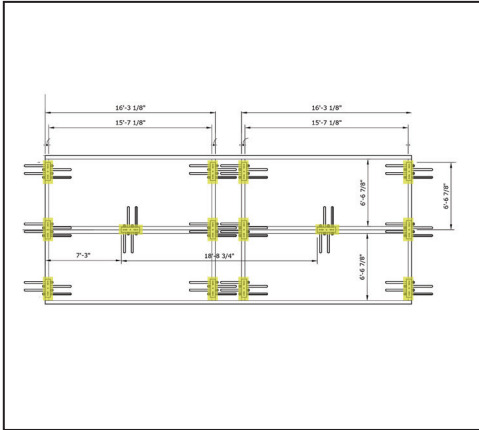
2. Using the dimensioned layout as a guide, establish the building border with a string line.



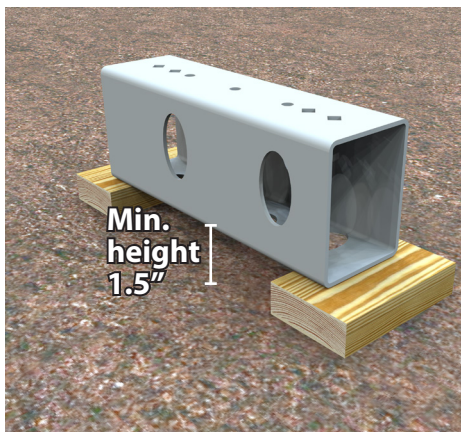
3. Measure diagonally to ensure the border is squared.



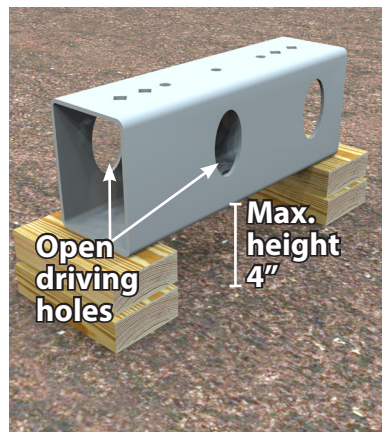
4. Find the elevation of a "Master Corner" (the highest corner).



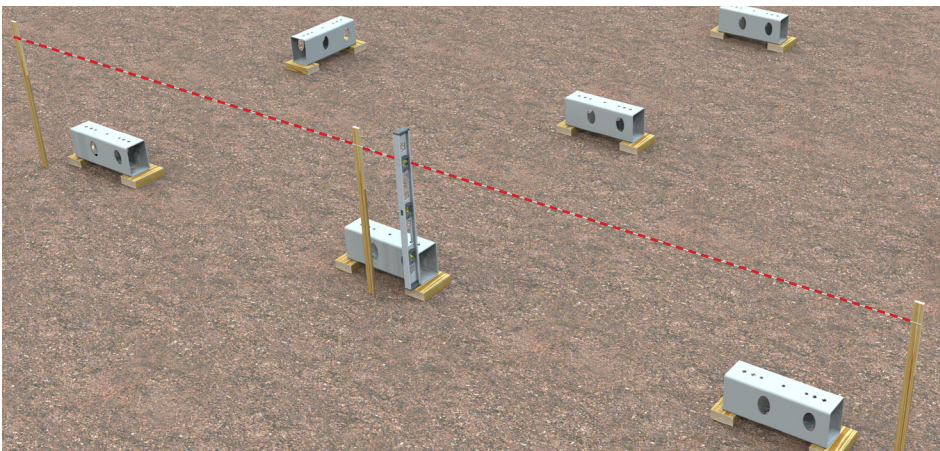
5. Using the dimensioned layout, roughly stage the Ground Frame steel beams. It is best practice to start in the corners.



6. Block and shim the end of steel beams to the same level as the master corner. Minimum block height is 1.5" from master corner.



7. Maximum block height is 4". Ensure driving holes remain open and are not blocked by shims.



8. Verify all outer dimensions according to the dimensioned layout. Ensure steel beams are plumb, level, and square to the overall layout.



Best practice is to cradle the beam with 4 stakes to ensure it stays on layout when driving pipes.

PIPE INSTALLATION

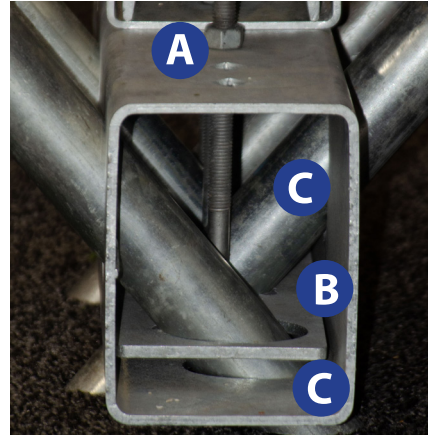
Ground Frame strongly recommends using a two-person crew for pipe driving.

Ground Frame pipes are not refusal driving systems. All pipes must be driven to their full length to provide specified bearing, uplift and lateral capacities.



9. Upon leveling completion, gather and stage Ground Frame pipes.

- A** Anchor bolt
- B** Force plate
- C** Driving holes - side and base



10. Ensure the pipe can easily slide through the side driving hole.

Important Note: If pipe does not easily slide, loosen the nut (on top of beam), lowering the force plate.

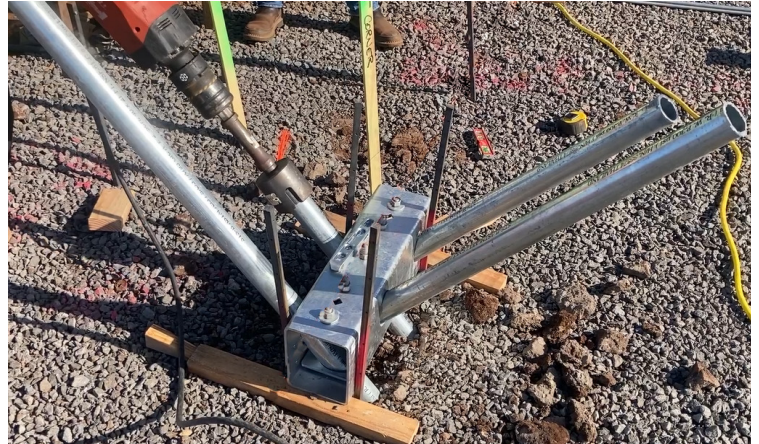


11. To ensure the pipe maintains the proper angle, hold it against the upper ellipse of the side driving hole.



12. Using a sledgehammer, drive the pipe in a few inches, to maintain the proper angle.

GROUND FRAME		Ground Frame Pipe Driving Log											
Head No.	Height	1		2		3		4		5		6	
		min	sec	min	sec	min	sec	min	sec	min	sec	min	sec
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													



13. Prepare the driving log.

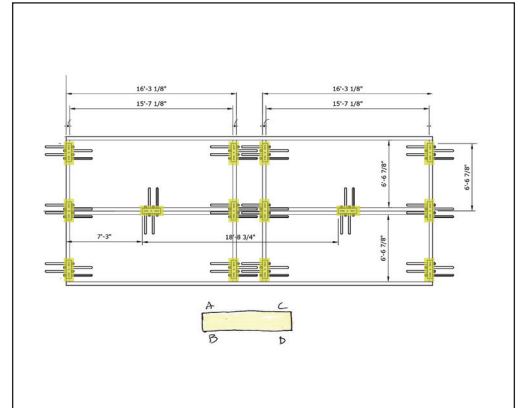
Note: Download template at groundframes.com

14. While holding the pipe up, drive the pipe through the side driving hole, using the jackhammer with the pipe driving bit.

Note: Recommend using the Hilti TE-3000 AVR electric jackhammer for driving pipes.



Pipe No.	A	B	C	D	
No.	Height	A	B	C	D
1		34 sec	42 sec	33 sec	41 sec
2		38 sec	44 sec	52 sec	58 sec
3		38 sec	37 sec	1 min 10 sec	min 41 sec
4		42 sec	39 sec	min 53 sec	min 38 sec
5	1	min 03 sec	min 32 sec	1 min 14 sec	min 41 sec
6	1	min 00 sec	min 45 sec	min 58 sec	min 57 sec
7	1	min 14 sec	min 53 sec	1 min 04 sec	min 48 sec
8	2	min 67 sec	1 min 00 sec	1 min 29 sec	1 min 14 sec
9	1	min 56 sec	min 41 sec	min 46 sec	1 min 32 sec
10	2	min 55 sec	min 43 sec	min 48 sec	min 42 sec
11	1	min 11 sec	min 47 sec	1 min 12 sec	min 38 sec
12	1	min 44 sec	min 38 sec	min 32 sec	min 49 sec



15. Stop driving prior to bit hitting the beam.

16. After each pipe installation note time in driving log.

Tip: Take dimensioned layout, number each beam, and denote the driving time for each side of the beam (A, B, C, D).



17. When pipe hits an obstruction, follow the troubleshooting steps found on page 10.

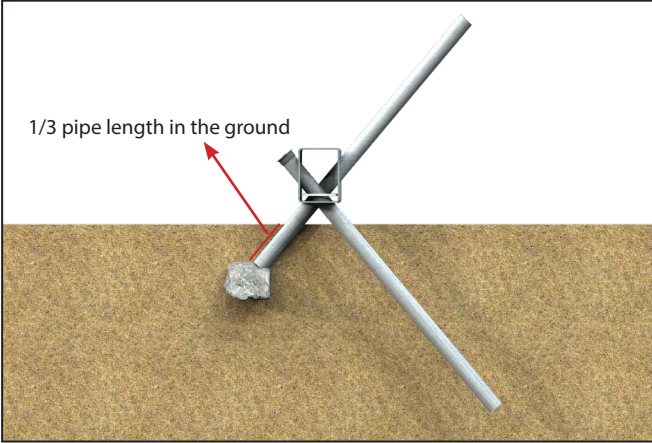


18. Install pipe caps on top of each pipe.

! Cripple walls may be required based on your site conditions.
Walls must be designed, engineered and approved.

TROUBLESHOOTING

SHALLOW OBSTRUCTION: ~1/3 Pipe Length in the Ground



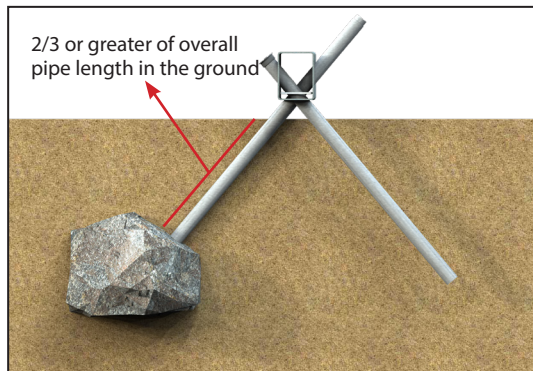
1. Remove pipe.

Tip: Simultaneously spin and pry pipe, using two pipe wrenches with two people.

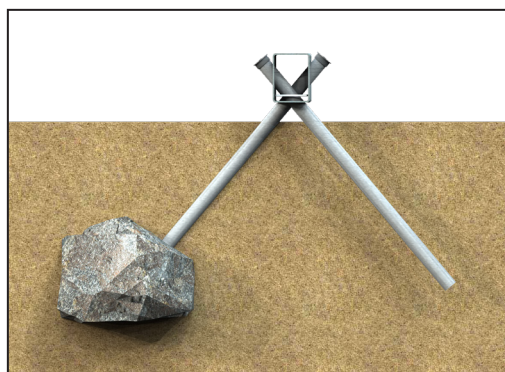
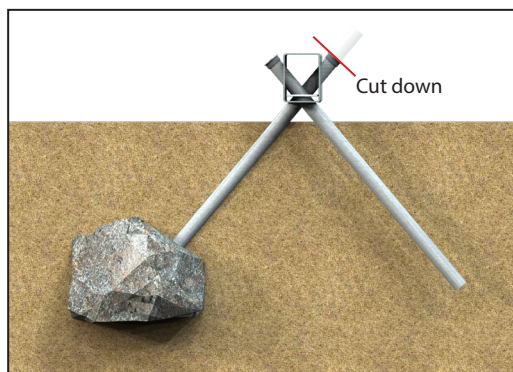
2. Remove obstruction and recompact soil in 6" lifts.

3. Redrive pipe.

DEEP OBSTRUCTION: 2/3 Pipe Length in the Ground



1. Using a sledgehammer, strike the pipe, 3-5 blows, to ensure pipe refusal.



2. Cut the remaining portion of the pipe, above the Ground Frame beam, and cap.

Important Note: Indicate the length of the pipe that was cut off in the driving log.

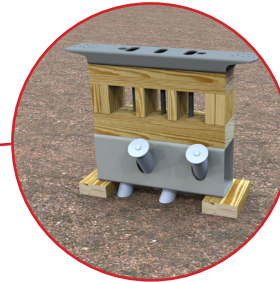
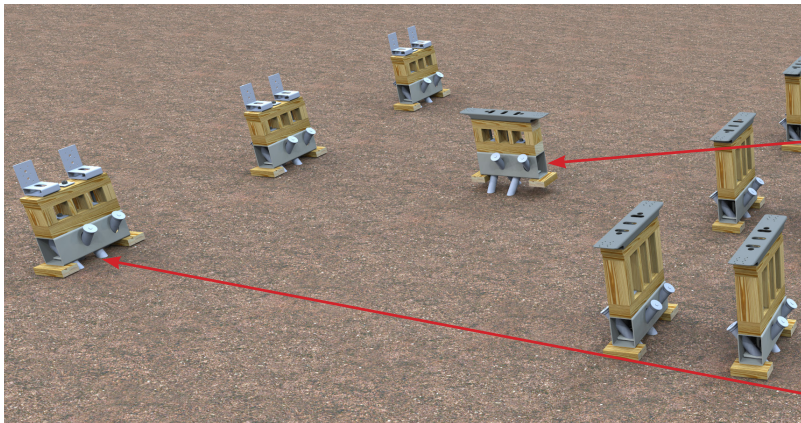
Pipe No.	A	B	C	D
1	min 34 sec	min 42 sec	min 33 sec	min 41 sec
2	min 38 sec	min 44 sec	min 52 sec	min 58 sec
3	min 38 sec	min 37 sec	1 min 10 sec	min 41 sec
4	min 43 sec	min 39 sec	min 53 sec	min 38 sec
5	1 min 03 sec	min 32 sec	1 min 14 sec	min 41 sec
6	1 min 00 sec	min 45 sec	min 58 sec	min 57 sec
7	1 min 14 sec	min 53 sec	R 12" cut off	min 48 sec
8	2 min 07 sec	min 00 sec	1 min 29 sec	1 min 14 sec
9	1 min 56 sec	min 41 sec	min 46 sec	1 min 32 sec
10	2 min 55 sec	min 43 sec	min 48 sec	min 42 sec
11	1 min 11 sec	min 47 sec	1 min 12 sec	min 38 sec
12	1 min 44 sec	min 38 sec	min 32 sec	min 49 sec

Denote refusal (R) and indicate length of pipe that was cut.

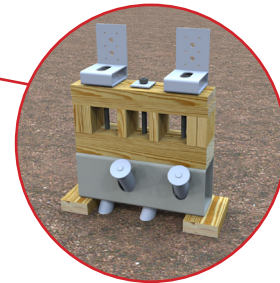
COPE AND L-BRACKET ADAPTOR ADDENDUM

Depending on site conditions, such as a sloped site, Cope and L-Bracket adaptors may be required in conjunction with continuous or small cripple walls. Outlined below are best practices to work with an approved Ground Frame engineered solution.

All cripple walls MUST be engineered to site conditions and approved by Ground Frame. Engineering would include, but not be limited to: wall height, attachment to cripple wall on Ground Frame beam, and bracing.



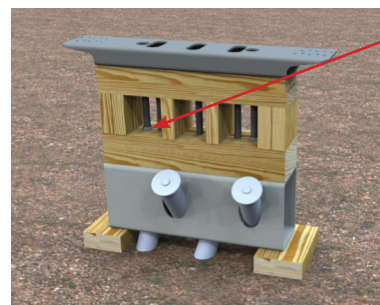
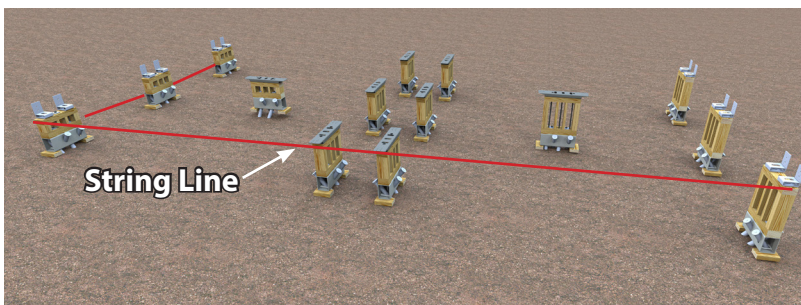
Small cripple wall with Cope Adaptor, built on site to engineered specifications



Small cripple wall with L-Bracket

This slightly sloped site is using both Cope and L-Bracket Adaptors along with 21" Ground Frame beams and small cripple walls.

BEST PRACTICES: COPE AND L-BRACKET ADAPTOR ADDENDUM



Ensure all thread connections are properly tightened to engineered specifications and that force plate bolts are torqued to 50 ft. lbs.

Verify cripple walls are aligned with string line. Ensuring they are square and plumb to overall layout.