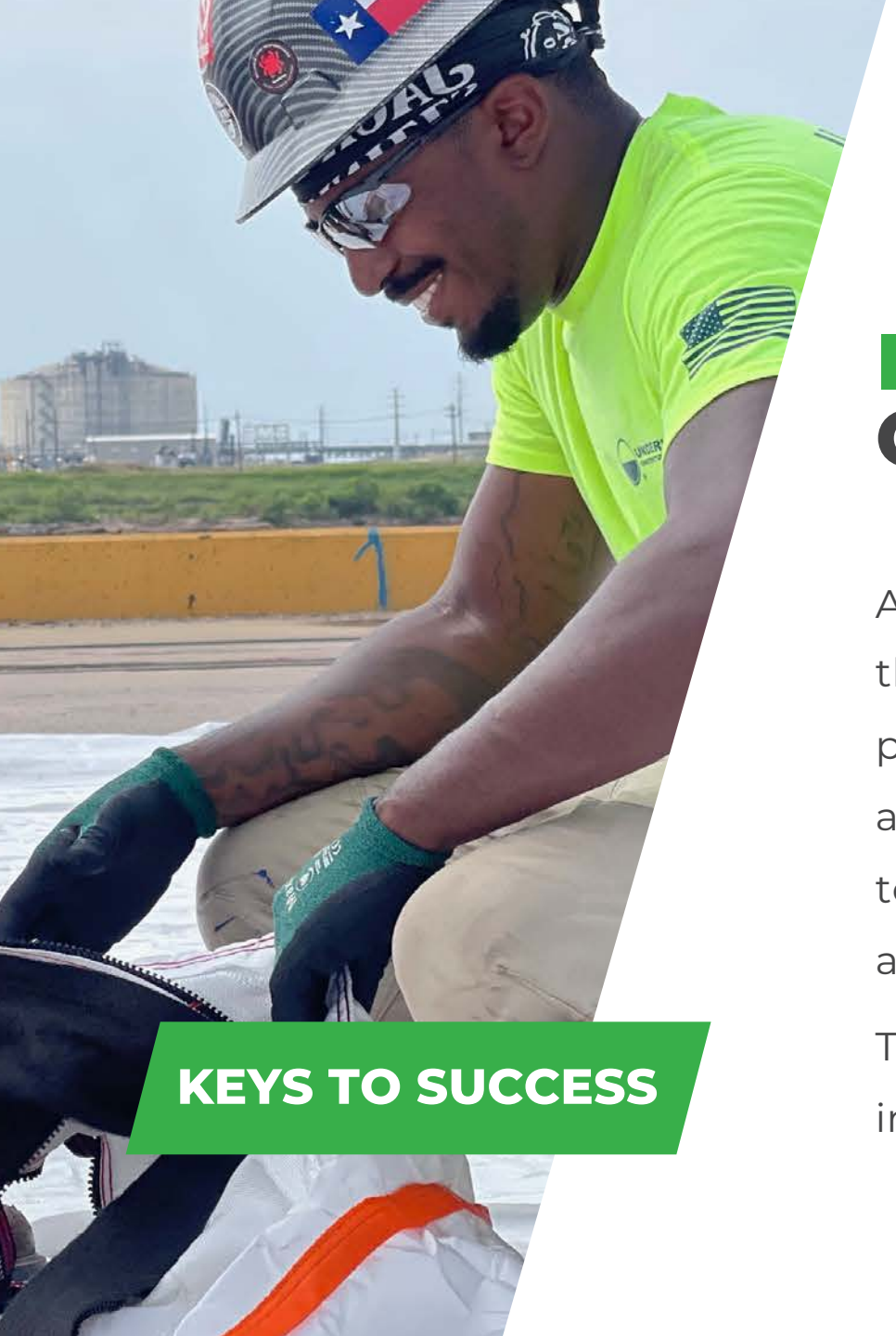
INSTALLATION HANDBOOK

Synthetex®

Guidelines for a successful HYDROTEX® fabric formwork installation



KEYS TO SUCCESS

INSTALLATION OVERVIEW

After surveying, staking and grading the site, HYDROTEX® fabric formwork panels are carefully rolled out, placed along the project site area, zipped together, and filled with fine aggregate concrete in situ.

This handbook offers step-by-step instruction for a successful installation.

ON-SITE CREW MEMBERS SHOULD WEAR:

SAFETY HATS

GLASSES OR GOGGLES

RUBBER GLOVES

BOOTS

HYDROTEX®
INSTALLATION

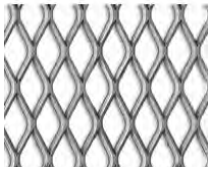
PPE for a Successful Installation

EXCAVATOR

DITCH WITCH

CONCRETE PUMP
WITH HOPPER & HOSE

WIRE MESH FOR
TOP OF HOPPER



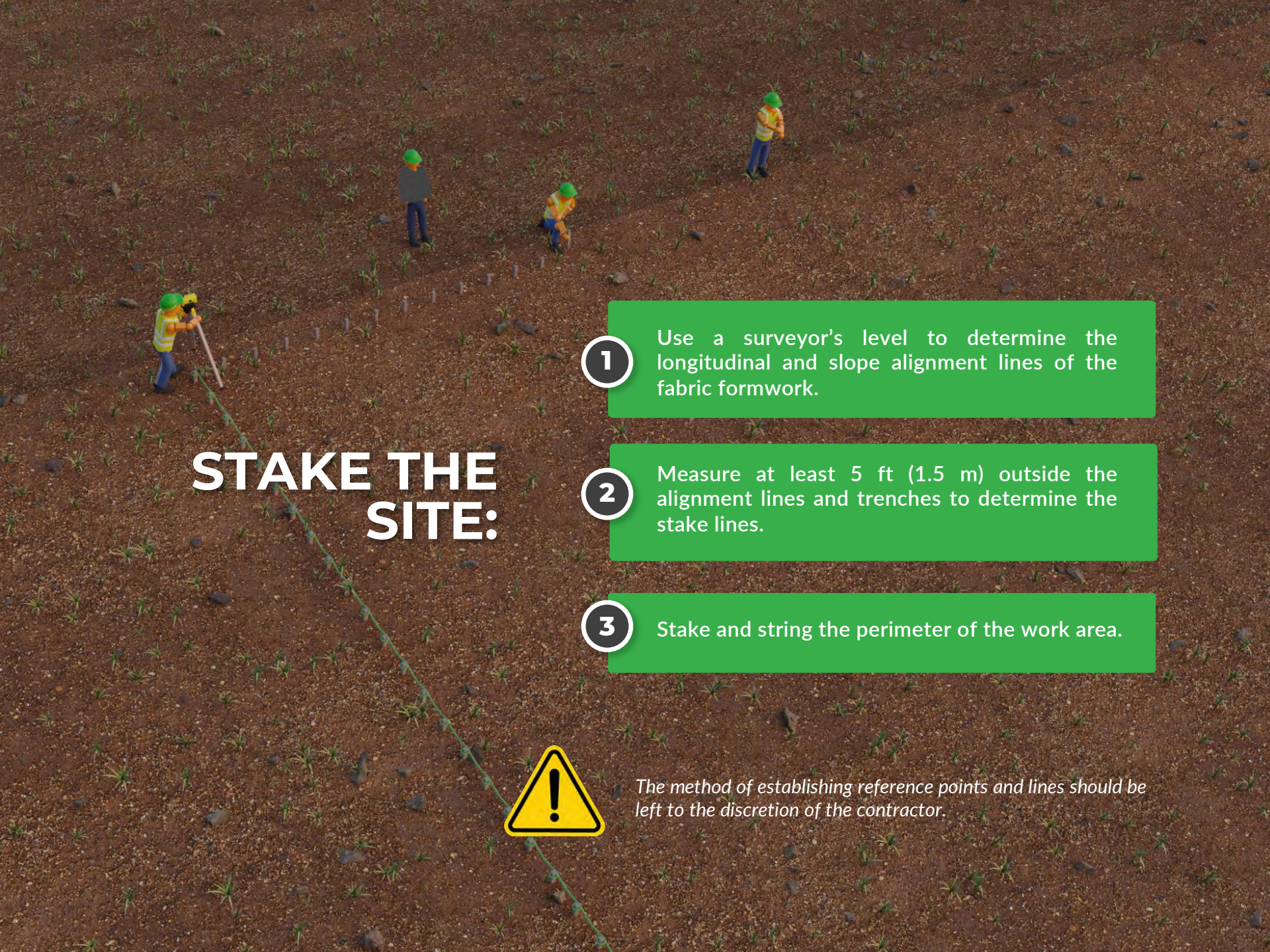
FLOW CONE TO
TEST GROUT

INSTALLATION
HANDBOOK

READY-MIX TRUCK

HYDROTEX® INSTALLATION

Tools for a Successful Installation



STAKE THE SITE:

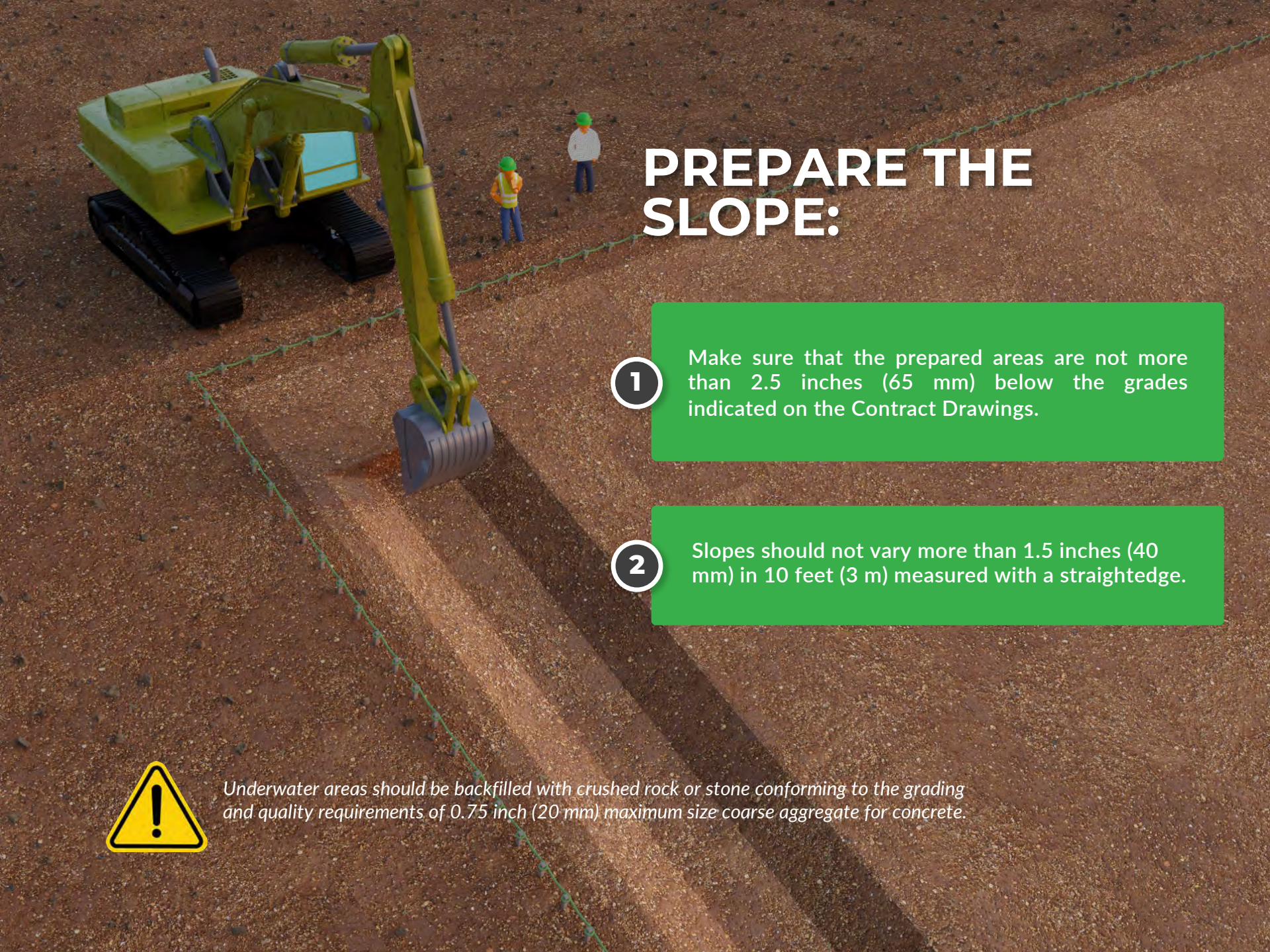
1. Use a surveyor's level to determine the longitudinal and slope alignment lines of the fabric formwork.
2. Measure at least 5 ft (1.5 m) outside the alignment lines and trenches to determine the stake lines.
3. Stake and string the perimeter of the work area.

The method of establishing reference points and lines should be left to the discretion of the contractor.

GRADE THE WORK AREA:

1. Using standard excavating, grading and compaction equipment, grade and compact the project area according to the Contract Drawings.
2. Remove all vegetation, projecting rocks, roots, and all other obstructions to keep the fabric from snagging or tearing.
3. Bring up the grade of any areas below allowable grades with the material specified in Contract Specifications.

Failure to follow these instructions may cause the fabric formwork to bridge, thus leaving a void beneath the structure, or become distorted due to excess settlement during installation, causing material shortage and other filling irregularities.



PREPARE THE SLOPE:

1. Make sure that the prepared areas are not more than 2.5 inches (65 mm) below the grades indicated on the Contract Drawings.

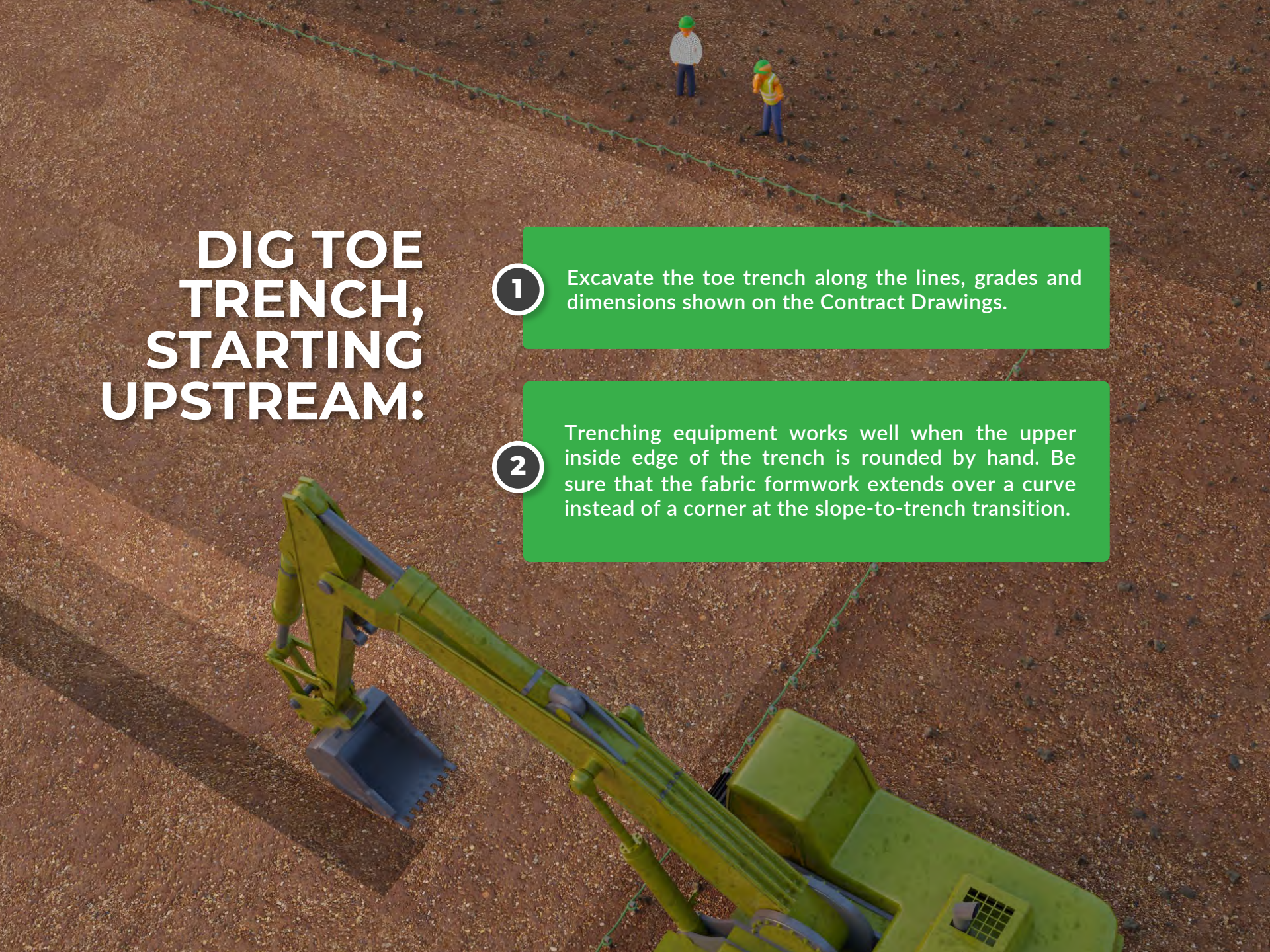
2. Slopes should not vary more than 1.5 inches (40 mm) in 10 feet (3 m) measured with a straightedge.

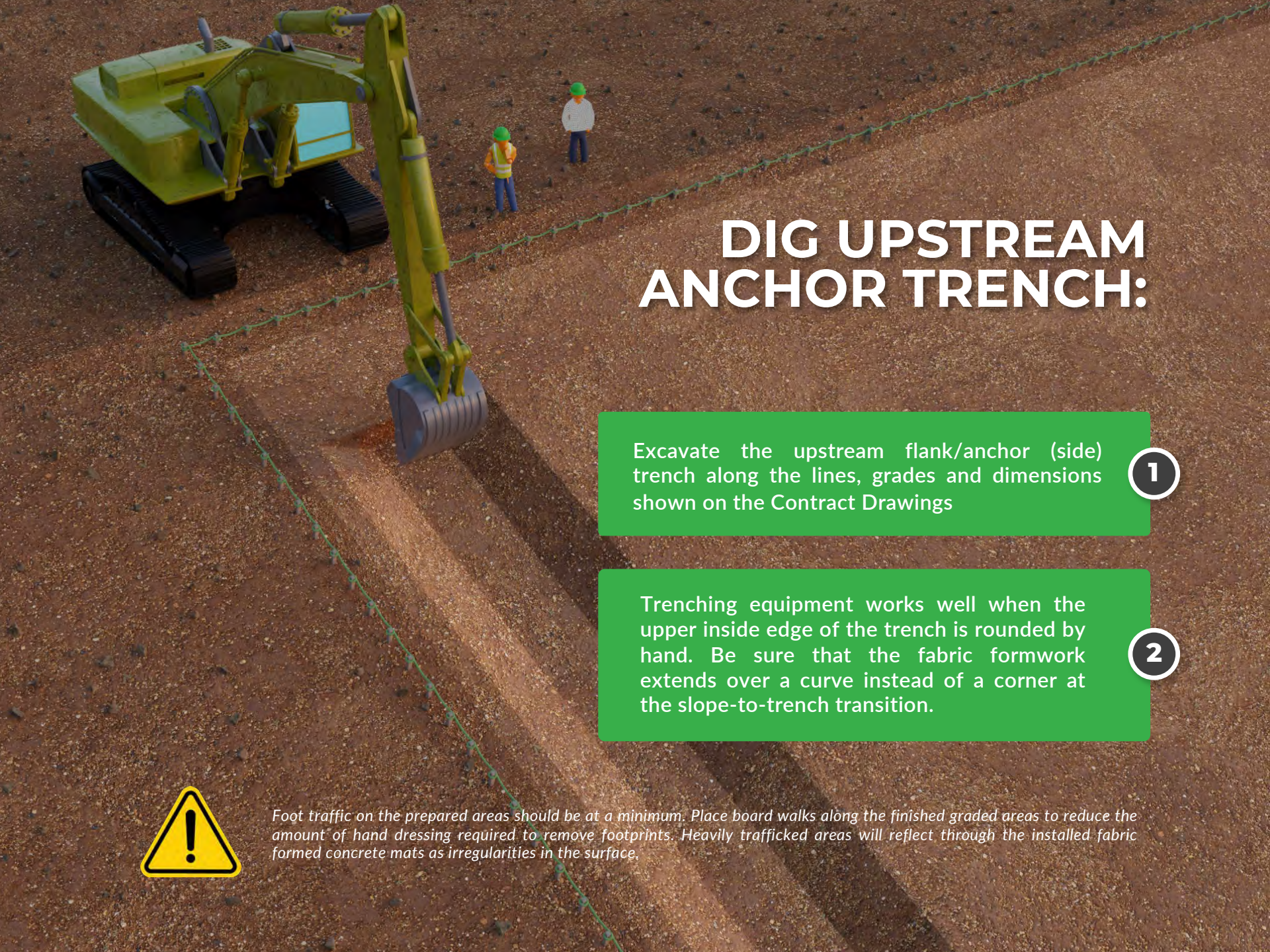
Underwater areas should be backfilled with crushed rock or stone conforming to the grading and quality requirements of 0.75 inch (20 mm) maximum size coarse aggregate for concrete.

DIG TOE TRENCH, STARTING UPSTREAM:

1. Excavate the toe trench along the lines, grades and dimensions shown on the Contract Drawings.

2. Trenching equipment works well when the upper inside edge of the trench is rounded by hand. Be sure that the fabric formwork extends over a curve instead of a corner at the slope-to-trench transition.





DIG UPSTREAM ANCHOR TRENCH:

1. Excavate the upstream flank/anchor (side) trench along the lines, grades and dimensions shown on the Contract Drawings

2. Trenching equipment works well when the upper inside edge of the trench is rounded by hand. Be sure that the fabric formwork extends over a curve instead of a corner at the slope-to-trench transition.

Foot traffic on the prepared areas should be at a minimum. Place board walks along the finished graded areas to reduce the amount of hand dressing required to remove footprints. Heavily trafficked areas will reflect through the installed fabric formed concrete mats as irregularities in the surface.

DIG DOWNSTREAM ANCHOR TRENCH:

1. Excavate the downstream flank/anchor (side) trench along the lines, grades and dimensions shown on the Contract Drawings

2. Trenching equipment works well when the upper inside edge of the trench is rounded by hand. Be sure that the fabric formwork extends over a curve instead of a corner at the slope-to-trench transition.

Freshly excavated and graded slopes are highly subject to erosion and should be protected from water runoff, flowing water and waves.

DIG APRON TRENCH:

Using a Ditch Witch, dig the apron trench along the lines, grades and dimensions shown on the Contract Drawings (upstream to downstream).

PLACE FILTER FABRIC* AT STARTING POINT:

1. Begin by placing filter fabric from the upstream flank trench and work to the downstream end, unless Contract Drawings indicate a different starting point.

2. If filter fabric is required beneath the formwork, then place it in accordance with the Contract Drawings & Specifications or the sublayer manufacturer's guidelines. Be sure that filter fabric is placed in the Flank (sides), Apron (top) and Toe (bottom) trenches.

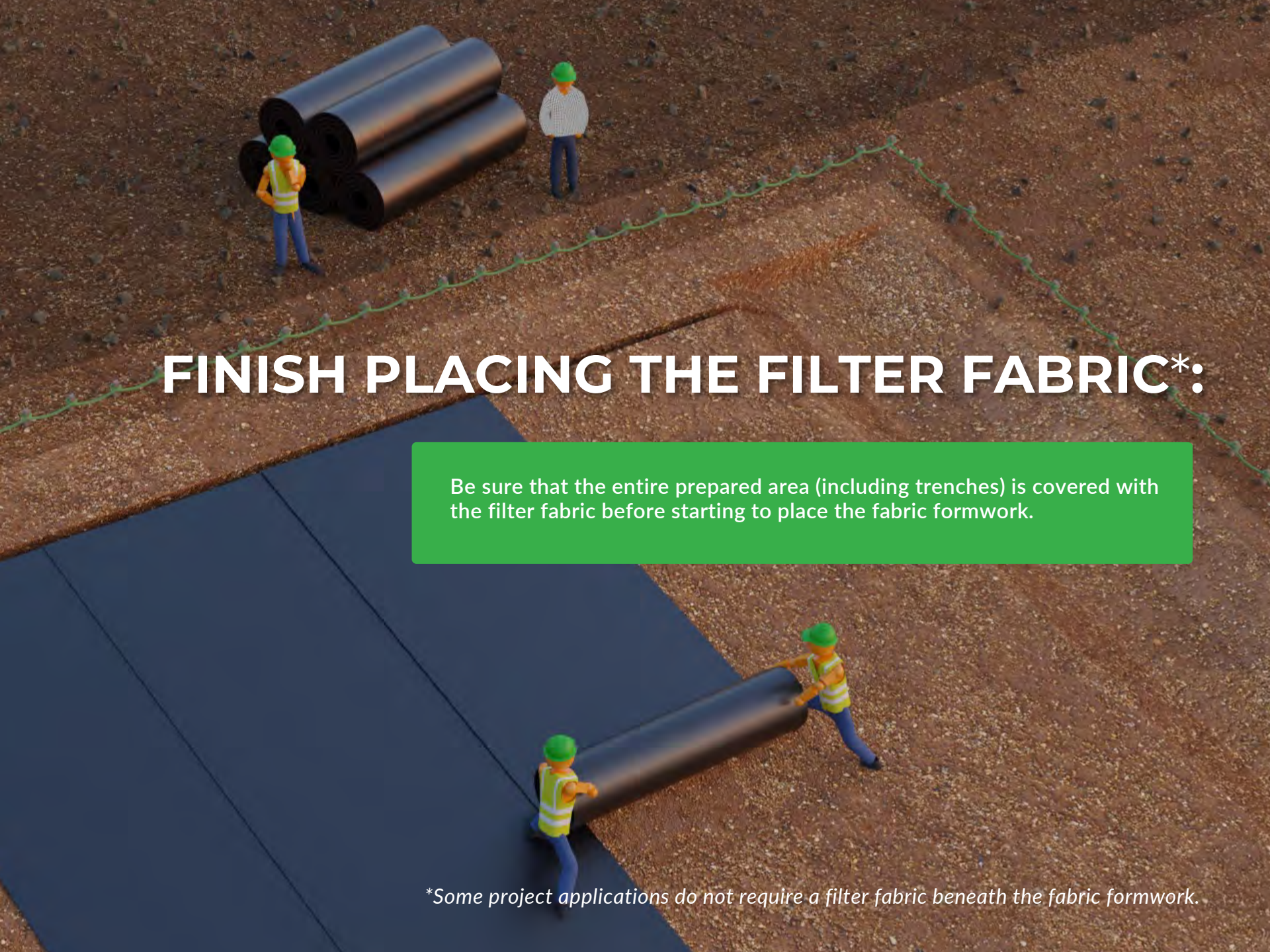
The method of establishing reference points and lines should be left to the discretion of the contractor.

**Some project applications do not require a filter fabric beneath the fabric formwork.*

CONTINUE PLACING THE FILTER FABRIC*:

Continue to rollout and place the filter fabric across the prepared area being sure to overlap filter fabric rolls a minimum of 2 feet or according to Contract Drawings & Specifications.

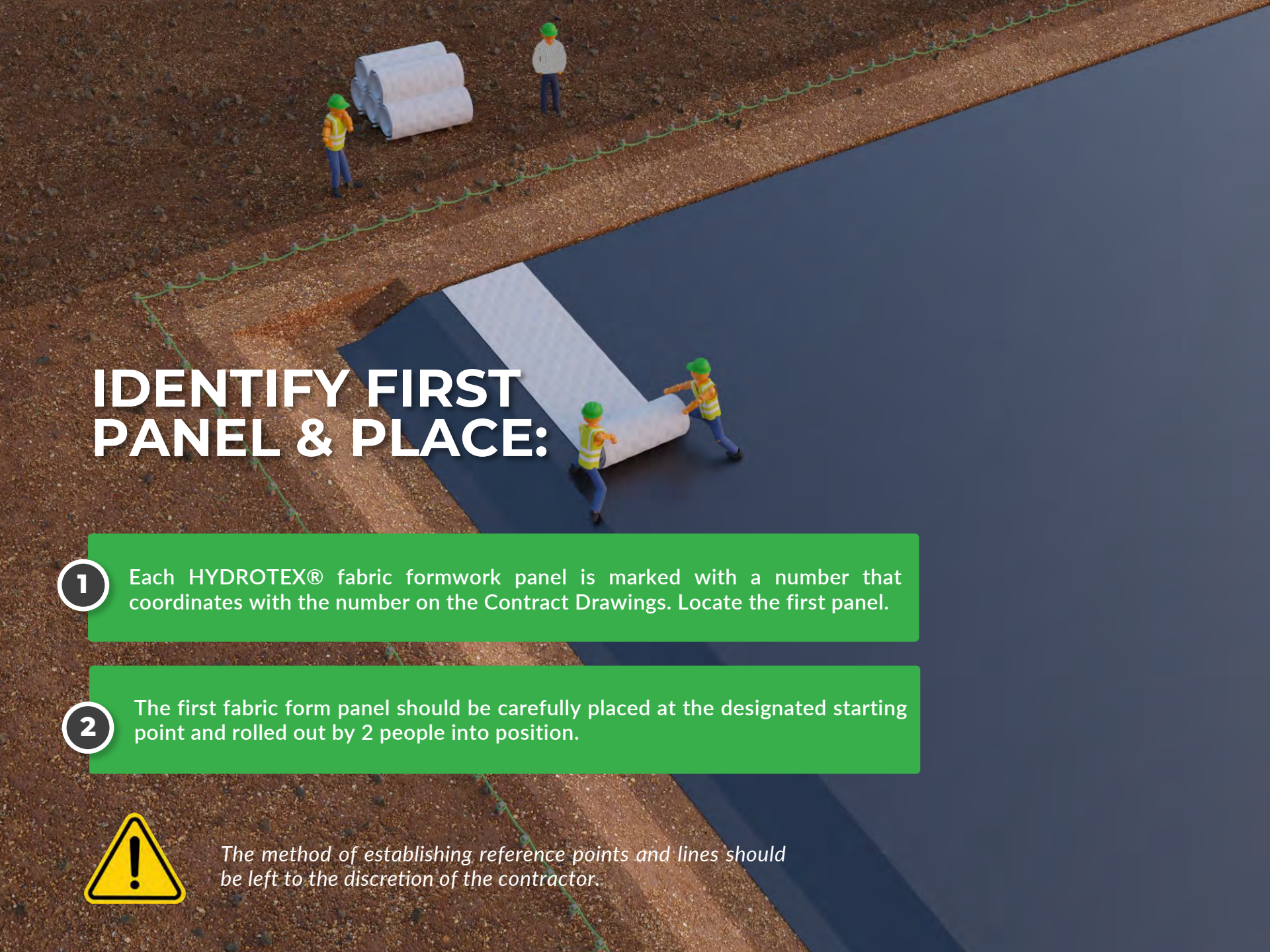
**Some project applications do not require a filter fabric beneath the fabric formwork.*



FINISH PLACING THE FILTER FABRIC*:

Be sure that the entire prepared area (including trenches) is covered with the filter fabric before starting to place the fabric formwork.

*Some project applications do not require a filter fabric beneath the fabric formwork.



IDENTIFY FIRST PANEL & PLACE:

1. Each HYDROTEX® fabric formwork panel is marked with a number that coordinates with the number on the Contract Drawings. Locate the first panel.

2. The first fabric form panel should be carefully placed at the designated starting point and rolled out by 2 people into position.

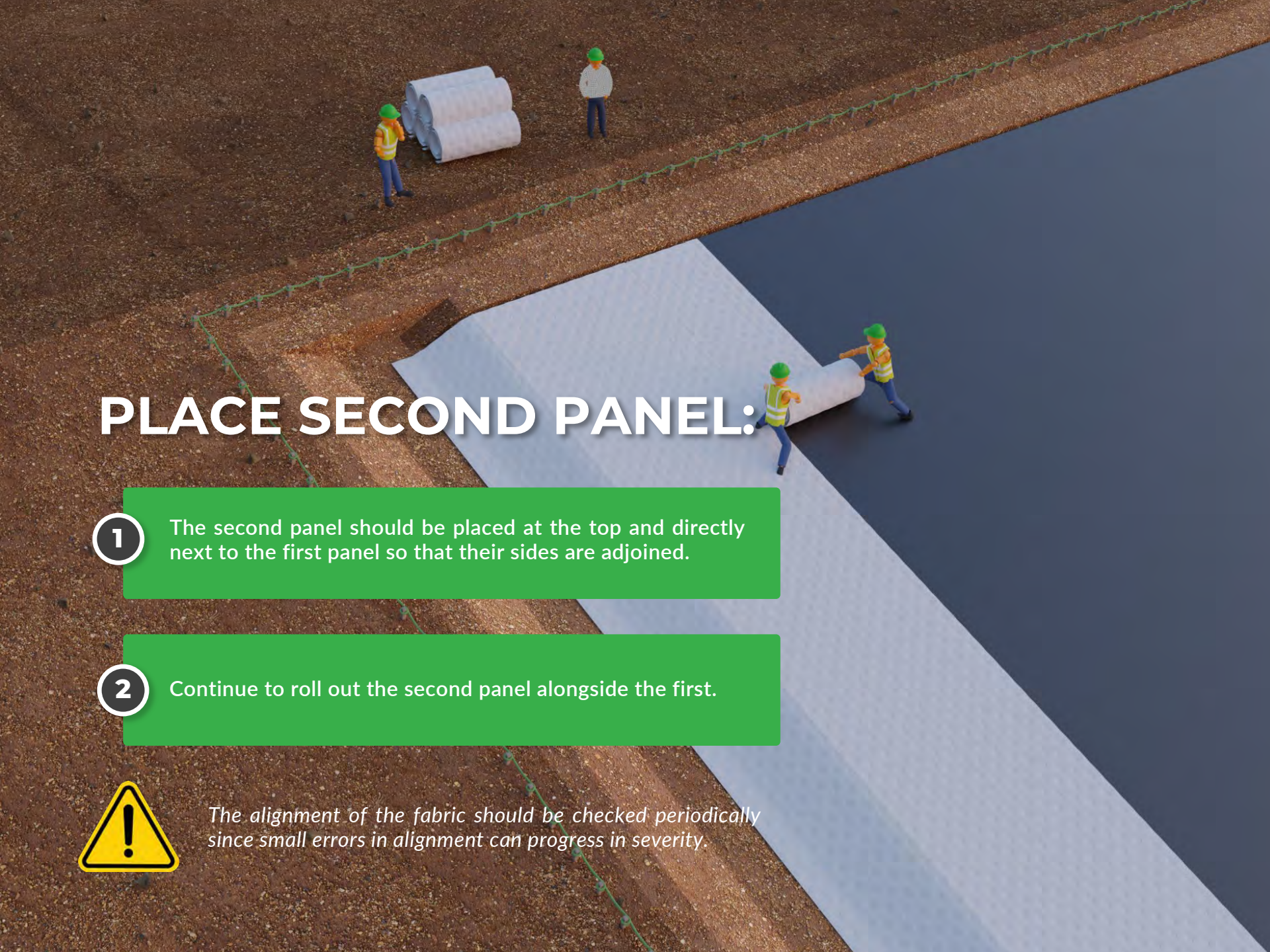
The method of establishing reference points and lines should be left to the discretion of the contractor.

EXTEND FIRST PANEL:

1. Extend the first panel by pulling its leading side into the upstream flank trench. Be sure that the sides and the ends of the panel are exactly parallel to their respective alignment lines.

2. Fabric form panels should be placed loosely but without folds, to allow for proper filling with fine aggregate concrete.

Panels that are stretched or taut will not allow the fabric to properly contract, causing them to not fill to their required concrete thickness.



PLACE SECOND PANEL:

1. The second panel should be placed at the top and directly next to the first panel so that their sides are adjoined.

2. Continue to roll out the second panel alongside the first.

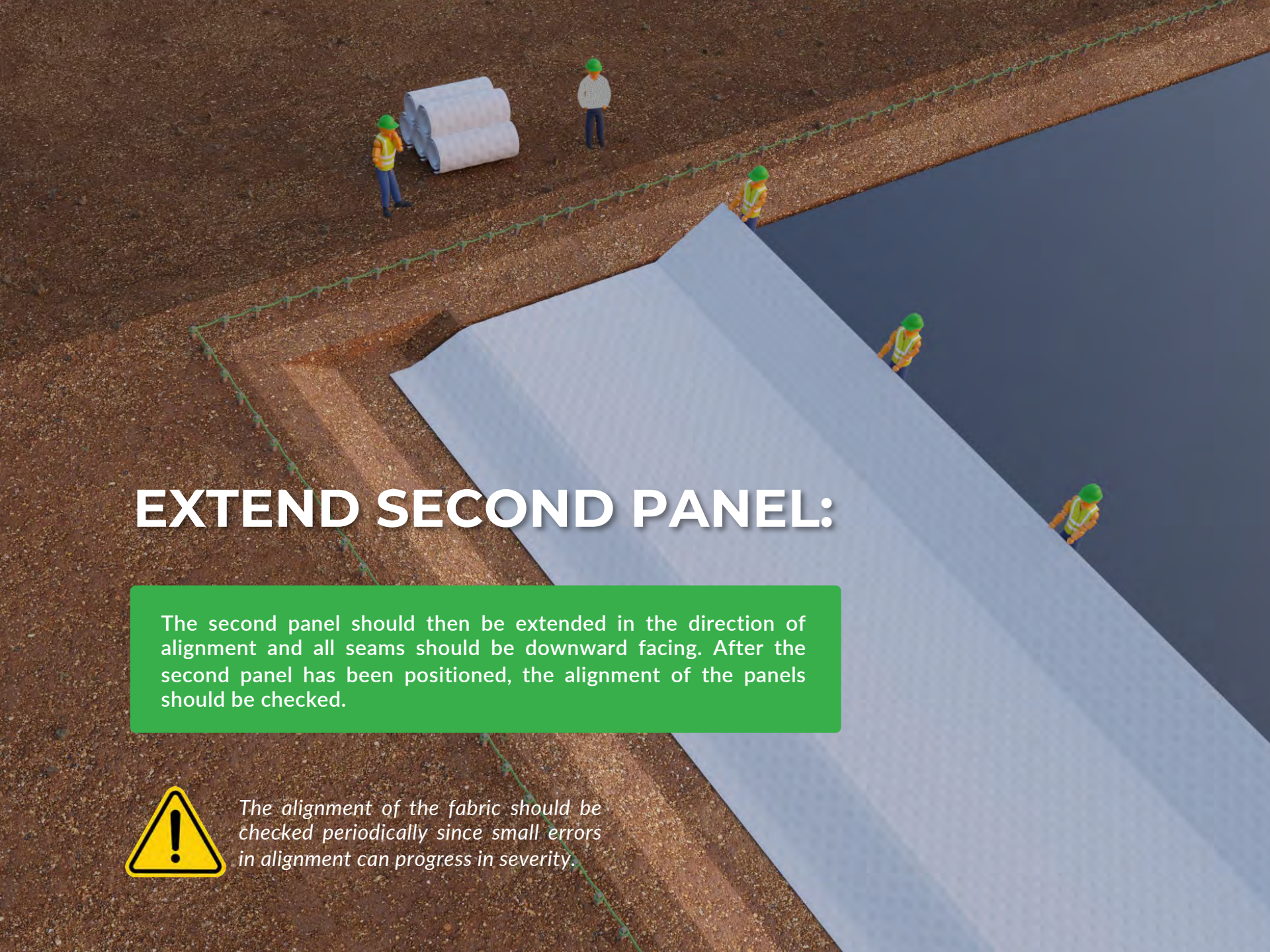
The alignment of the fabric should be checked periodically since small errors in alignment can progress in severity.

ZIP FIRST AND SECOND PANELS TOGETHER:

1. Using one of the zipper pulls sent with the formwork, zip the bottom layers of the first and second panels together.

2. Then zip the top layers of the first and second panels together.

Panel alignment is also important in providing a uniform and attractive appearance in the finished installation.



EXTEND SECOND PANEL:

The second panel should then be extended in the direction of alignment and all seams should be downward facing. After the second panel has been positioned, the alignment of the panels should be checked.

The alignment of the fabric should be checked periodically since small errors in alignment can progress in severity.

CONTINUE PLACING FORMWORK:

1. The remaining panels should be placed side-by-side in the same manner as the first and second panels.

2. Take care in the alignment and placement of each panel to avoid adjustments to all panels after placed.

To protect the formwork before it is filled, only place the number of panels that can be filled with concrete within 24-48 hours of placement.

INSTALLATION PROCESS

After grading, fabric formwork panels are placed along the project site area, zipped together, then filled with concrete.

CONCRETE MIX IS KEY TO SUCCESS!

1. Fine aggregate concrete is a mixture of Portland cement, fine aggregate (sand) and water, that when properly proportioned and mixed will produce a pumpable grout.

2. Fine aggregate concrete should be pre-mixed, following our mix requirements at a concrete batch plant and delivered by ready-mix trucks to the site.

If a continuous supply of concrete cannot be assured a reserve of concrete should be maintained in a holding hopper equipped with an agitator.

RECIPE FOR SUCCESS!

Material	Mixing Ratios (lb/yd^3)	Mixing Ratios After Filling (lb/yd^3)
Cement	750 - 850	805 - 915
Sand	2053	2290 - 2190
Water	500	460 - 470
Air	4 oz	N/A

CONCRETE MIX REQUIREMENTS:

WATER ADDITIONS

No additional water should be added to prepared concrete batch until upon arrival to the project site IF NEEDED for flow rate.

The desired flow rate is within 9 to 15 seconds. If flow is less than 9 seconds upon arrival to the job site, then add more water.

All water additions should be completed within 15 minutes from the start of the first water addition. Water additions should be injected into the mixer under such pressure and direction of flow to allow for proper distribution within the mixer.

Turn the drum an additional 40 revolutions, or more, if necessary, at mixing speed, to ensure a homogenous mixture.

Water should not be added to the batch at any time after this.

SAMPLING FOR UNIFORMITY

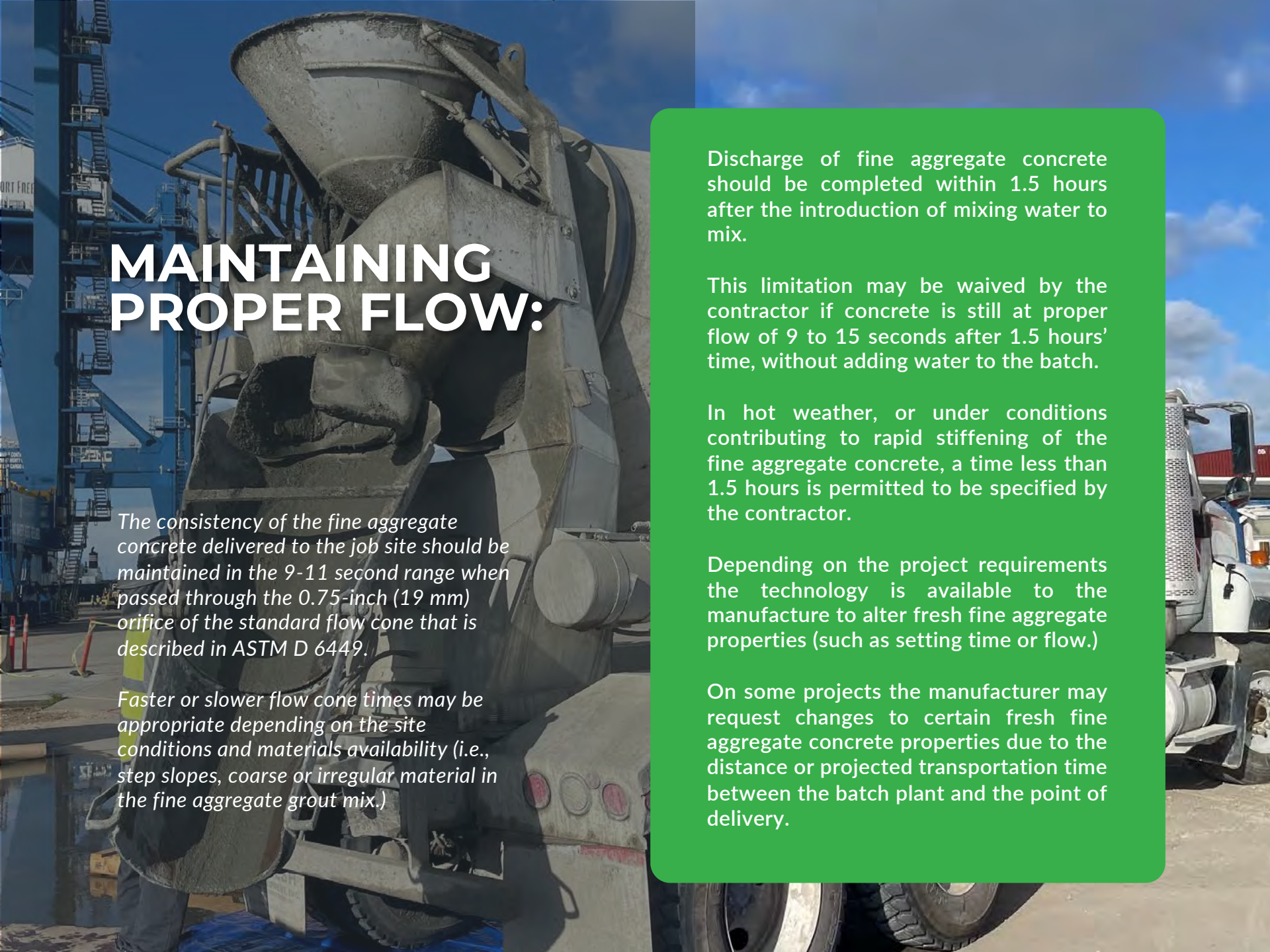
The consistency of the fine aggregate concrete delivered to the job site should be maintained in the 9-11 second range when passed through the 0.75-inch (19 mm) orifice of the standard flow cone that is described in ASTM D 6449

For testing, the fine aggregate concrete should be discharged at the normal operating rate, with care being exercised not to obstruct or retard the discharge by an incompletely opened gate or seal.

As the mixer is being emptied, individual samples should be taken after discharge of approximately 15% and 85% of the load.

No samples should be taken before 10% or after 90% of the batch has been discharged.

Due to the difficulties of determining the actual quantity of fine aggregate discharged, the intent is to provide samples that are representative of widely separated portions, but not the beginning and end of the load.



MAINTAINING PROPER FLOW:

The consistency of the fine aggregate concrete delivered to the job site should be maintained in the 9-11 second range when passed through the 0.75-inch (19 mm) orifice of the standard flow cone that is described in ASTM D 6449.

Faster or slower flow cone times may be appropriate depending on the site conditions and materials availability (i.e., step slopes, coarse or irregular material in the fine aggregate grout mix.)

Discharge of fine aggregate concrete should be completed within 1.5 hours after the introduction of mixing water to mix.

This limitation may be waived by the contractor if concrete is still at proper flow of 9 to 15 seconds after 1.5 hours' time, without adding water to the batch.

In hot weather, or under conditions contributing to rapid stiffening of the fine aggregate concrete, a time less than 1.5 hours is permitted to be specified by the contractor.

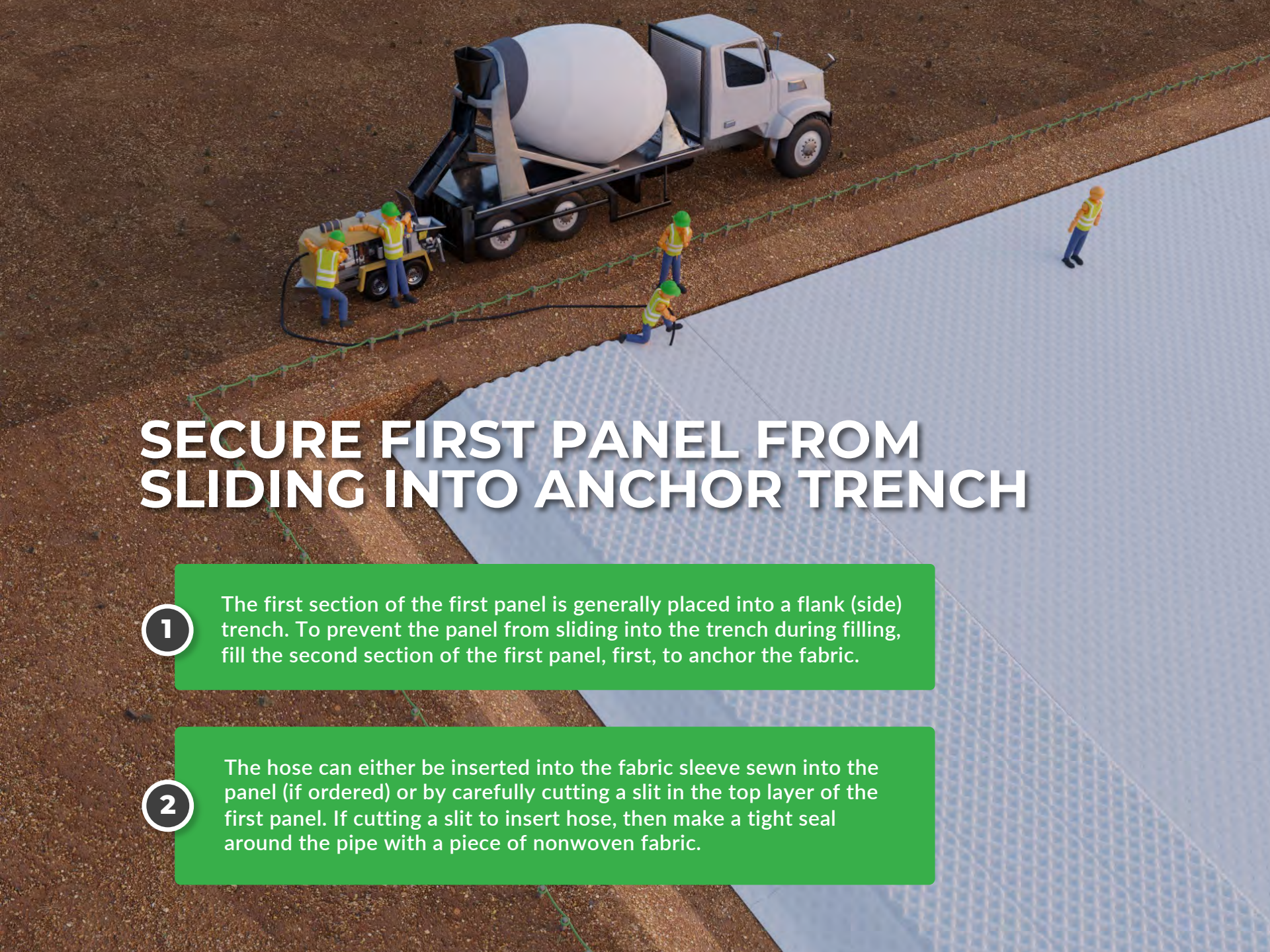
Depending on the project requirements the technology is available to the manufacture to alter fresh fine aggregate properties (such as setting time or flow.)

On some projects the manufacturer may request changes to certain fresh fine aggregate concrete properties due to the distance or projected transportation time between the batch plant and the point of delivery.

BATCH TICKET INFORMATION

Require the following info for each concrete batch:

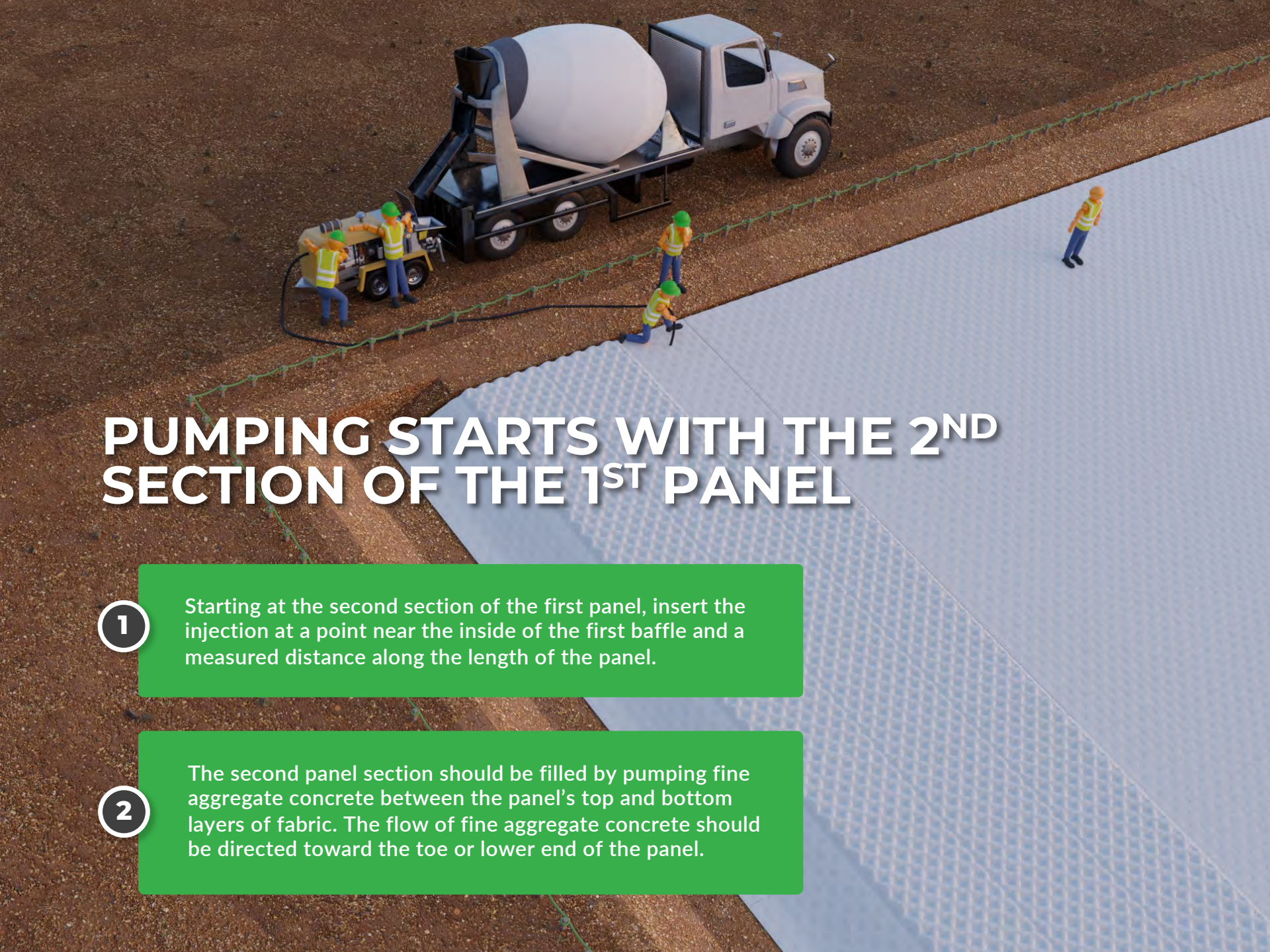
- Ready-mix company name, batch plant or batch plant number.
- Serial number of ticket
- Date
- Truck number
- Specific designation of job (name and location)
- Specific call for designation of the concrete
- Amount of fine aggregate concrete in cubic meters
- Time loaded or of first mixing of cement and fine aggregate
- Amount of water added to the fine aggregate concrete at site
- Type, brand, and amount of cement
- Class, brand, and amount of coal fly ash or pozzolans
- Type, brand, and amount of admixtures
- Source and amount of each metered or weighted water
- Information necessary to calculate the total mixing water
- Amount of fine aggregate
- Ingredients certified as being previously approved
- Signature or initials of manufacturer's representative



SECURE FIRST PANEL FROM SLIDING INTO ANCHOR TRENCH

1. The first section of the first panel is generally placed into a flank (side) trench. To prevent the panel from sliding into the trench during filling, fill the second section of the first panel, first, to anchor the fabric.

2. The hose can either be inserted into the fabric sleeve sewn into the panel (if ordered) or by carefully cutting a slit in the top layer of the first panel. If cutting a slit to insert hose, then make a tight seal around the pipe with a piece of nonwoven fabric.



PUMPING STARTS WITH THE 2ND SECTION OF THE 1ST PANEL

1. Starting at the second section of the first panel, insert the injection at a point near the inside of the first baffle and a measured distance along the length of the panel.

2. The second panel section should be filled by pumping fine aggregate concrete between the panel's top and bottom layers of fabric. The flow of fine aggregate concrete should be directed toward the toe or lower end of the panel.

PUMPING STARTS WITH THE 2ND SECTION OF THE 1ST PANEL (CONT.)

3. The fine aggregate concrete should fill the toe or lower end of the panel, proceeding gradually up and laterally across to the second baffle of the panel and to an elevation not less than 2 feet (500 mm) above the point of concrete injection.

4. Pressure from the concrete fill helps to seal off the point of concrete injection. If the point of concrete injection is not at the crown of the slope, the injection pipe is reinserted further up the panel and the flow of concrete is once again directed down the panel.

CONTINUE FILLING SECTIONS OF FIRST PANEL

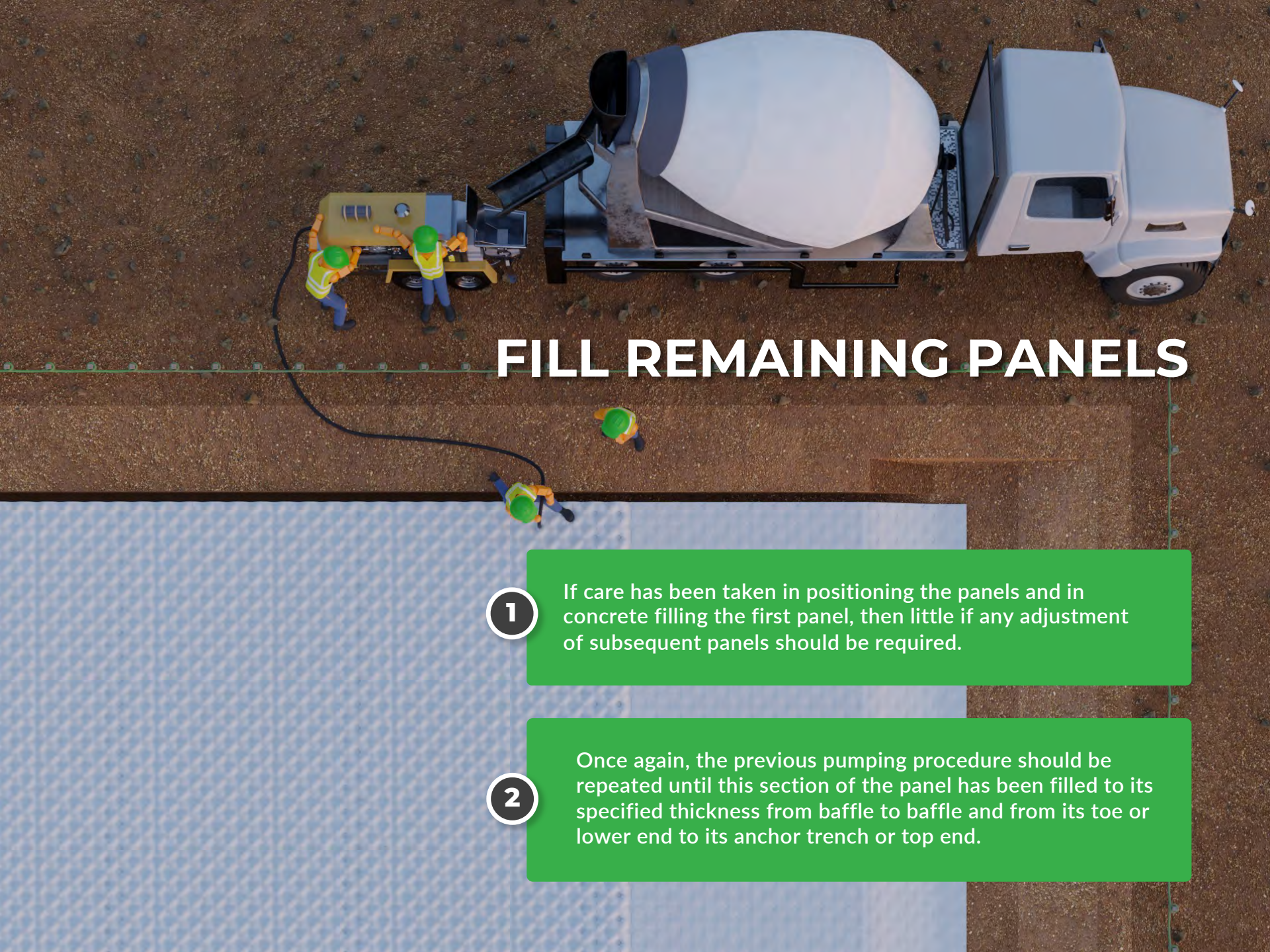
Repeat until the second section of the first panel has been filled to its specified thickness from baffle to baffle and from the toe or lower end to the top end.

As fine aggregate concrete is pumped into the fabric formwork, excess mixing water will be expelled through the fabric and the concrete will stiffen rapidly. When pumping fabric forms with relatively thin cross-sectional thickness, down a long slope, across a wide section or on a relatively flat surface above water, it may be desirable to wet down the fabric prior to pumping concrete.

FILL ANCHOR TRENCH OF FIRST PANEL

Once the first panel has all sections filled except the anchor trench, the anchor trench section can then be filled. The injection pipe should then be moved to the other side of the first baffle and inserted at a point near the baffle and a measured distance along the length of the panel.

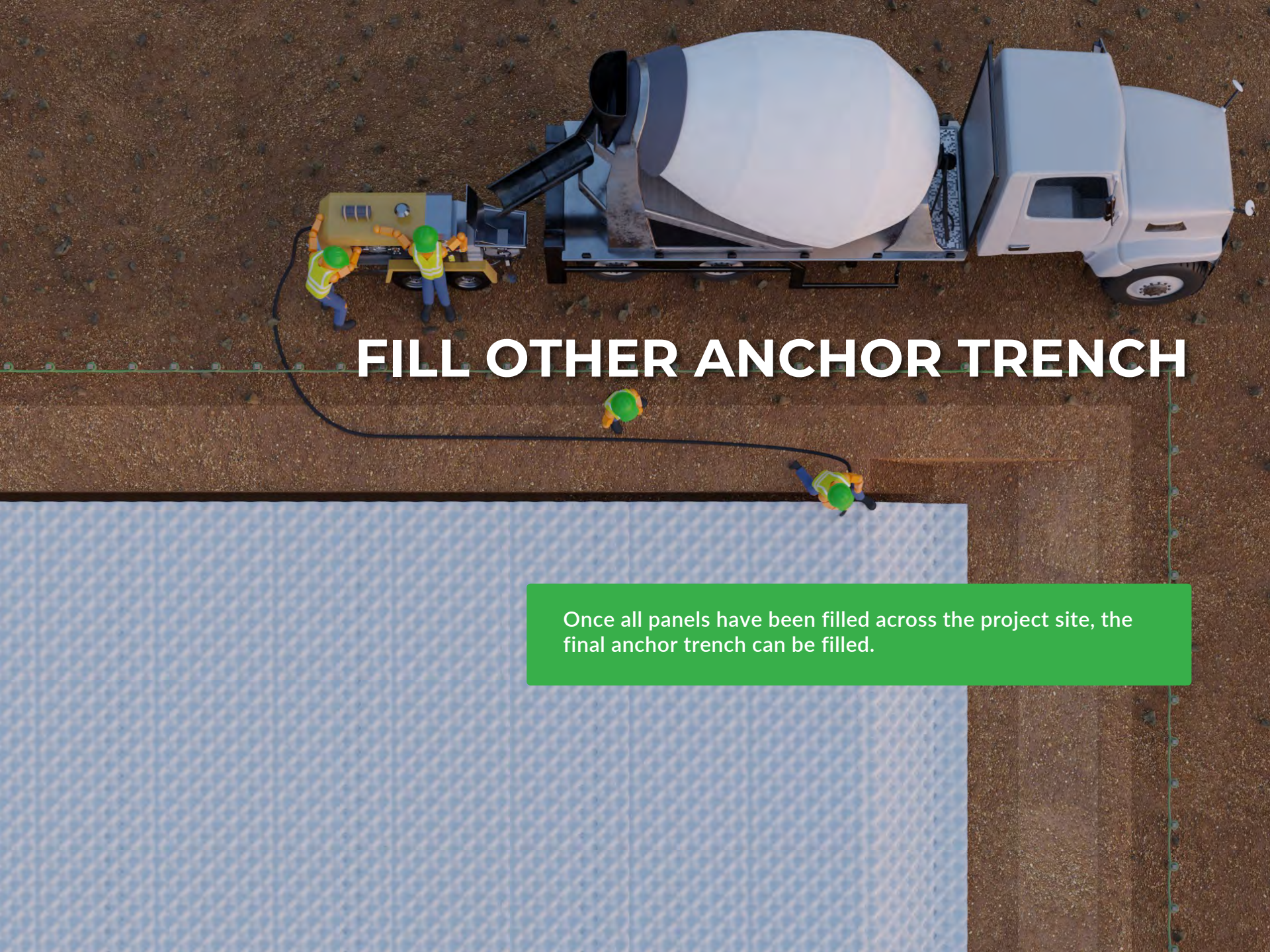
Care must be taken, when pumping fabric forms to assure that the fabric is not over pressurized. Over pressurization may cause bursting of filter points, bands or interwoven perimeters or may cause rupturing of interwoven drop cords. The style of the fabric form and field conditions will often determine the rate of vertical rise of the concrete that may be realized in pumping.



FILL REMAINING PANELS

1. If care has been taken in positioning the panels and in concrete filling the first panel, then little if any adjustment of subsequent panels should be required.

2. Once again, the previous pumping procedure should be repeated until this section of the panel has been filled to its specified thickness from baffle to baffle and from its toe or lower end to its anchor trench or top end.



FILL OTHER ANCHOR TRENCH

Once all panels have been filled across the project site, the final anchor trench can be filled.