Building a Mighty Fortress

After our second war with the British Redcoats in 1812, the United States built many forts like Fort Pulaski to keep our trading ports safe. A French engineer named Simon Bernard helped design these forts using ideas from old European castles. Then, a U.S. Army engineer named Joseph Totten made those ideas work for our needs along the Atlantic Coast.

Many free and enslaved workers worked hard to build Fort Pulaski so it could protect Savannah. Today, its tall brick walls still stand strong, showing how smart planning and hard work can create something that lasts a long time.

The Basics

Time: 30-40 Minutes

Distance: About ⅓ Mile

Directions: See the tour stops on the Map (back page). Begin at the first drawbridge for the first stop, follow the sidewalk to the demilune for the second stop, then enter the fort. Walk clockwise around the first level for the remainder of the tour stops until you end back at the demilune.

Safety:

- No running or shouting.
- No climbing on walls, cannons, or mounds.
- **Caution: The fort does not have railings for stairwells or on the upper level. Avoid walking near the edges and closely supervise young children.**

Stop 1: The Moat

Before Fort Pulaski could rise, engineers had to tame the island.

- In 1829, Cockspur Island was just a soggy salt marsh that vanished at high tide.
- Young Lieutenant Robert E. Lee's first assignment was to turn this island into solid ground.
- He designed a network of **dikes** (raised walls of earth) to protect the island from storms.
- He also designed drainage ditches to drain water from the island. This created dry land to build the fort on.
- Enslaved people dug a canal that linked the moat to the Savannah River. This allowed engineers to control how deep the moat was and it still works!
- The moat was designed to be over 7 feet deep. That's taller than most adults!

? What can you see today that shows how the moat is still filled with water?

➔ Cross over the first drawbridge and follow the sidewalk until you see a sign titled "The Demilune" on your right.

Stop 2: Demilune

You are standing on a triangle shaped island called a **demilune**, which means "halfmoon" in French. Long ago, this area was flat. The grassy hills you see today were added after the Civil War.

- This triangle island was built to protect the fort's only entrance from enemy attack.
- It is surrounded by the moat and once had 28 cannons along its edges!
- Even though it looks different now, the demilune was very important for keeping enemy soldiers from entering the fort.
- At the optional Bonus Stop, you'll get to see the mounds and tunnels that were added later and replaced how the demilune first looked.

? What stopped enemy soldiers from reaching Fort Pulaski?

➔ Cross over the drawbridge and stop once inside the entryway.

Stop 3: Sallyport

This arched tunnel is the only way in and out of the fort.

- The huge wooden doors you see are the original doors from when the fort was built. Each one weighs more than a small car—over 2,000 pounds!
- The lower doors have lots of iron bumps called **axe-breakers**. They were designed to break an attacker's axe so enemies couldn't chop their way inside.
- Look up! To quickly lift the drawbridge, two soldiers inside the tunnel pulled down on long iron handles above the lower set of doors. **(Show Stop 3 image in the back.)**
- As the bridge went up, a heavy iron gate called a **portcullis** dropped down in front of the doors to block the entrance. You can see our wooden replica above the lower set of doors.
- Even if an enemy made it this far, soldiers could still fire muskets through skinny slits in the walls or greet the attackers with the cannon which is pointed at you!

? Why do you think the fort's entrance needed so many layers of protection?

➔ At the top of the sallyport, take a left. Feel free to walk through the rooms on your left as you walk towards the end of the walkway. Enter the first large, archway and follow the wooden floor to the left to reach Stop 4: The Demibastion.

Stop 4: Northwest Demibastion

Step inside this "fort within a fort." A **demibastion** sticks out from the main wall so soldiers could protect the entrance.

- Fort Pulaski has two demibastions, one on each end of the back wall. They were built to help protect the drawbridge and the sallyport (the fort's only entrance).
- Each demibastion had three cannons so soldiers could aim and fire in different directions.

- This big cannon worked together with the cannon in the other demibastion to protect the entrance to the fort. **(Show Stop 4 image.)**
- Look at the floor — those curved grooves once held iron tracks that let the cannon turn smoothly, helping soldiers aim faster and more accurately.

What clues do you see that tell you this space was important for protecting the fort?

➔ Return to the brick walkway and take a left. Stop at the first arched room – casemate – you encounter: Casemate 47. Casemate numbers are painted at the top on the gray doors.

Stop 5: Casemate 47

Ever wonder how soldiers in the 1800s moved massive cannons without forklifts or trucks? Meet the **sling cart**—a simple machine that got a big job done.

- These giant-wheeled carts in front of you are the last original Civil War sling carts left in the country.
- They worked using basic physics: huge wheels + a long lever = serious lifting power.
- The cannon barrel would hang beneath the Y-shaped bar making it easier to move. **(Show Stop 5 image.)**
- Instead of horses pulling the sling carts, 250 U.S. soldiers used ropes to pull big, heavy cannons across the muddy marshes of Tybee Island while getting ready to attack Fort Pulaski.

How is a sling cart similar to a wheelbarrow or a wagon?

➔ Continue on the brick walkway and stop at Casemate 45 when you see a large tripod.

Stop 6: Casemate Gin

After using a sling cart to haul cannons to their destination, they still needed to be lifted onto their carriages. How? Just ropes, pulleys, and some serious brainpower.

- What you're looking at is a **casemate gin**—short for "engine"—a simple machine that used levers and pulleys to hoist cannons into place inside the fort.
- The average Fort Pulaski cannon weighed as much as two pickup trucks (10,000 pounds)! Lifting that with muscle alone? Not happening.
- Here's how it worked: a rope was tied to both ends of the cannon barrel and hooked onto the gin's iron hook.
- That rope ran through a series of pulleys and around a roller on the right side.
- A soldier would insert a long wooden lever—called a maneuvering spike—into a notch in the roller and start turning it. As the roller turned, the cannon slowly rose into the air. **(Show Stop 6 image.)**
- For cannons that needed to be placed on the top level of the fort, they used a much taller version called a Garrison Gin.
- It was all about using simple machines to multiply force—turning a few soldiers into a powerful lifting crew.

Compare and contrast the casemate gin with modern lifting equipment like cranes or forklifts. What advantages do we have today that Civil War soldiers didn't?

➔ Continue along the brick walkway and stop at the casemate before the next stairwell.

Stop 7: 42 Pounder Seacoast Cannon

This huge cannon was one of the most powerful weapons used to protect forts like Fort Pulaski from enemy ships.

- This original Model 1831 42-pounder Seacoast Cannon was one of the most powerful weapons of its time, built to defend forts and protect the coast from enemy ships.
- Why "42-pounder"? That's the weight of the iron cannonball it fired—a flying bowling ball with enough force to hit targets up to a mile away.
- Each **casemate** (arched room) was designed to hold one of these cannons, aiming through an **embrasure** (window opening) to fire at approaching ships.
- Fort Pulaski's walls are 7 to 11 feet thick and built to survive direct hits from cannons just like this one.
- The fort's builders were so confident in its strength that one claimed cannons could more easily knock down the Rocky Mountains than Fort Pulaski.
- A team of 5 trained soldiers worked together to load and fire this cannon, managing one shot every 5 minutes.

? If you were a soldier defending the fort, what can you see in this room that makes you feel protected?

➔ Walk around the corner until you see three casemate cannons in a row.

Stop 8: Three Casemate Cannons

These casemates weren't just rooms—they were battle stations built to handle the power of massive cannons like the three you see here.

- Each cannon barrel rested on a rolling carriage, which moved back and forth on elevated tracks.
- To fire the gun, soldiers used large levers to roll the cannon forward so it could fire out the window. When the cannon fired, it would roll backward, but the tracks helped slow it down naturally—right into position to reload.
- Want to aim left, or right? The entire **chassis** (base holding the cannon) could turn along curved iron tracks built into the floor.
- Each shot used 3–5 pounds of black powder, filling the room with thick, choking smoke.
- Each casemate has a special airflow system. Fresh air came in through slots outside, traveled under the wooden floor, and flowed upwards through vents near the cannon. The smoke then rose out of a vent in the ceiling — like a giant chimney! **(Show Stop 8 image.)**

? Why do you think the fort needed so many casemates (cannon rooms) instead of just one?

➔ Continue walking through the casemates or along the brick walkway, past the prison, and enter Casemate 16.

Stop 9: Casemate 16

Fort Pulaski wasn't just strong because of its thick walls — it was strong because of the people who built it. Look closely at the bricks around the damaged window. You might see fingerprints!

- The fort was built with more than 13 million bricks. Some bricks came from far away, and others were made nearby using local clay. **(Show Stop 9 image.)**
- The bricks were made and laid by enslaved workers, whose hard work and skills helped create this giant fort.
- When the bricks were still wet, enslaved children helped flip them over so they could dry. Sometimes their fingerprints stayed in the clay.
- Normally, those bricks were deep inside the walls. But during the Civil War, when part of the wall was damaged, the hidden fingerprints were uncovered and could finally be seen.
- Every brick here has a story, and some stories are written in fingerprints.

? Why is it important to remember the people who made the bricks?

➔ Continue walking to the next corner where you will see three bricked up walls in succession.

Stop 10: Southeast Angle

At first, these walls might look strong and unbreakable. But if you look closely, you can see scars and damage from a huge Civil War battle.

- In 1861, Georgia joined the Confederacy and took over Fort Pulaski. They believed the fort's thick brick walls could stop any attack.
- But in April 1862, the U.S. Army fired a new kind of cannon at this fort—**rifled cannons** that shot spinning, bullet-shaped shells that were much stronger than the older round cannonballs.
- These new cannons were on Tybee Island and could hit targets up to 5 miles away!
- After only 30 hours of firing, the U.S. cannons broke big holes through this corner of the fort, making it too dangerous for the Confederates to stay. They had to surrender.
- A fort that took 18 years to build fell in less than 2 days because new technology was more powerful. **(Show Stop 10 image.)**
- After the battle, the U.S. Army patched the giant holes with new bricks—the same bricks you can see here today.

? Why do you think soldiers patched the holes instead of leaving them open?

➔ Return to the brick walkway and continue walking clockwise around the fort's interior until you reach the final casemate on your left before the stairwell. Walk to the railing near the sign and spot the missing floors.

Stop 11: Southwest Demibastion

In 1925, lightning hit the fort and caused a big fire. The fire burned away the old wooden floors. That accident revealed something amazing — the secret engineering hidden under your feet!

- With the floor gone, you can see the fort's strong support system that helps hold up 13 million bricks.

- Under the floor are **reverse arches**—curved upside-down shapes that help spread out the fort's heavy weight. **(Show Stop 11 image.)**
- Below those arches is the **grillage**, a huge wooden platform that spreads the weight of the fort across the soft marshy ground.
- And at the very bottom are 5,000 wooden **pilings** (similar to telephone poles), some pushed 70 feet into the ground to keep the fort from sinking. That's the length of two yellow school buses!
- All these layers together show how smart planning helped to build a giant brick fort on soft, marshy land.

? Which layer (arches, reverse arches, grillage, or pilings) do you think is the most important for holding up the fort? Why?

➔ Return to the brick walkway and continue walking clockwise around the fort's interior, past Olmstead's Quarters, and enter the next open door on your left.

Stop 12: Cisterns

Fort Pulaski is on an island surrounded by salty water, so soldiers needed a way to collect fresh drinking water. The fort had a clever rainwater system built right into its walls. **(Show Stop 12 image.)**

- The roof wasn't just for keeping rain out — it helped collect clean water. Under the grass is a layer of crushed oyster shells that filtered the rainwater like a natural sponge.
- After the rainwater was cleaned, it flows into hidden basins, then down lead pipes into giant underground water tanks called cisterns.
- Each cistern can hold 20,000 gallons of water, and the fort had ten of them — enough to supply soldiers with water for months.
- When soldiers needed water, they lifted a small hatch in the floor and lowered a bucket into the tank below.
- The system was so well made that it still collects water today — but nobody drinks it anymore because of the old lead pipes!

? Why did the soldiers need to collect rainwater instead of using the water around the island or in the moat?

➔ Return to the brick walkway and exit the fort. Cross the drawbridge and return to the demilune.

Conclusion

Now that you've completed the tour, you've seen that Fort Pulaski is more than just bricks and cannons. It is an amazing place that shows how people used smart ideas and hard work to build, protect, and care for it.

The fort teaches us that building and engineering are always changing. Every part of the fort helps tell the story of how people solved problems in the past.

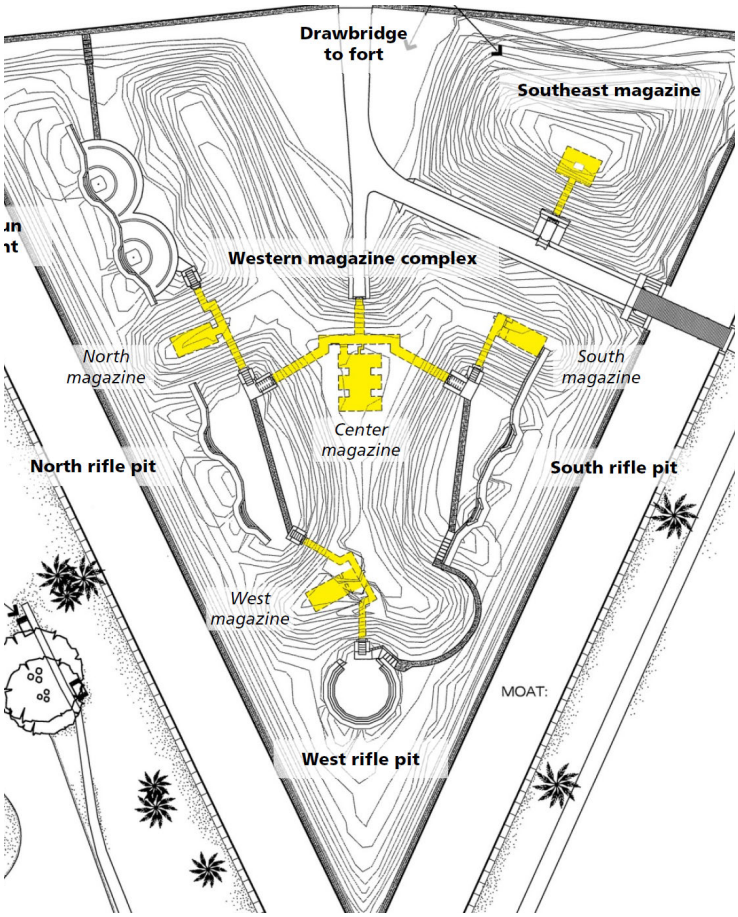
By remembering what you learned and sharing it with others, you can help the National Park Service take care of Fort Pulaski so kids in the future can enjoy it too.

Bonus Stop 13: Demilune Mounds

****Teacher Note:** This stop involves a maze of dark, narrow passageways that are NOT recommended for large groups of elementary students. Should you still want to explore, please break your group into smaller groups led by at least one chaperone. Read the following descriptions before entering the tunnels.

After the Civil War, the triangular demilune got a serious upgrade because brick walls were no match for modern weapons.

- When rifled cannons tore through Fort Pulaski's brick walls in 1862, it was a wake-up call: brick buildings could not stand up to new weapons.
- Engineers turned to a familiar solution—dirt. Dirt was a far better shield against bullet-shaped cannon projectiles than brick.
- After the war, instead of covering the entire fort in dirt, engineers focused on strengthening the demilune, the triangular structure in front of the fort.
- They built large dirt mounds to protect new cannon platforms with underground magazines to safely store ammunition.
- Engineers built the mounds on a foundation of **tabby**—a durable concrete made from oyster shells, sand, lime, and water.
- In 1895, the biggest mound—nicknamed "Big Bertha"—was added. Inside was an electric control panel that could send electric signals through thick black cables to explode underwater bombs in the Savannah River.
- Though no cannons were ever installed and no bombs ever exploded, these upgrades show how fast military engineering had to evolve to keep up with changing technology.

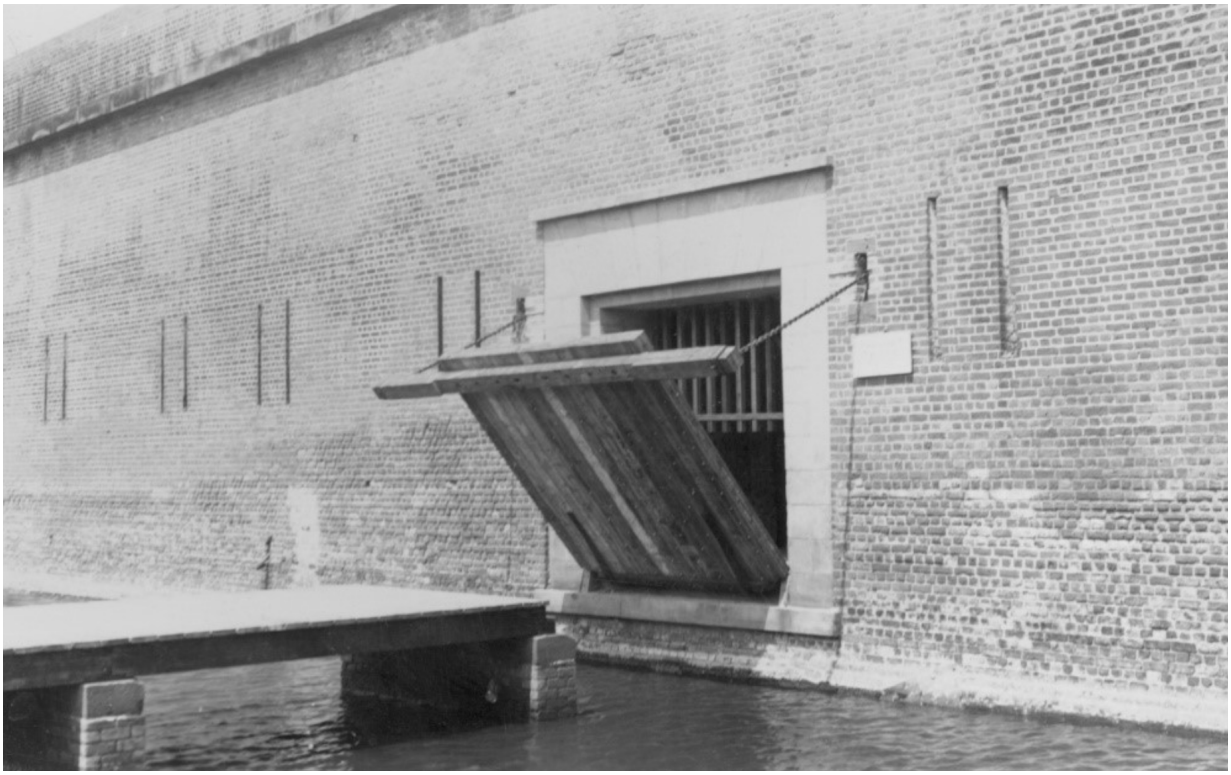


The underground portion is highlighted in yellow.
NPS PHOTO

If you were a soldier, which do you think would better protect you: the brick fort or the earthen demilune mounds?

You are welcome to enter the demilune tunnels and explore! Please help us preserve the mounds by staying on walkways and out of the grass.

Stop 3



The drawbridge being raised in the 1960s.
NPS PHOTO

Stop 4

A cannon guarding the fort's entrance.
NPS/J IRVING

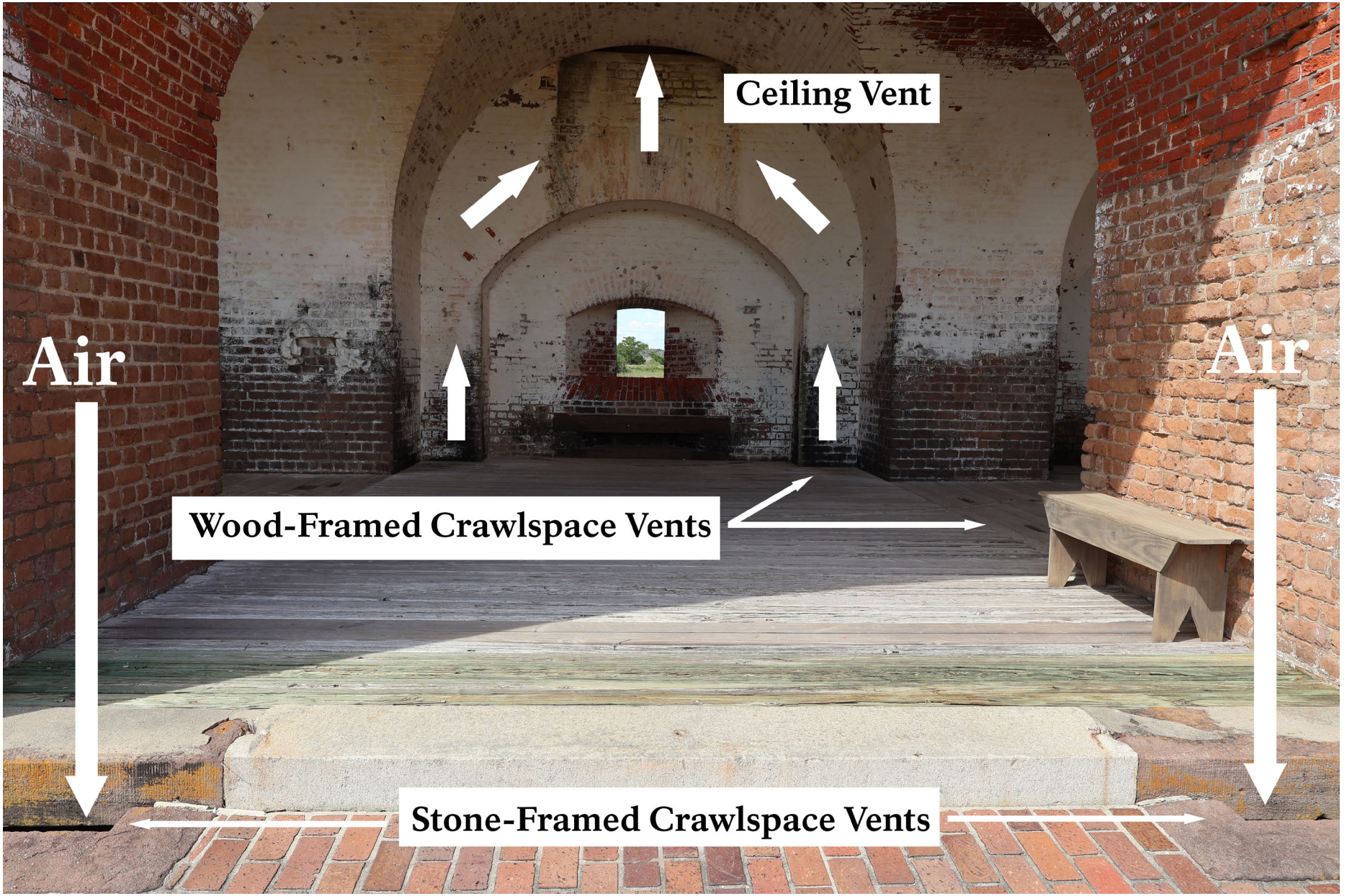
Stop 5

This sling cart is being used to move heavy artillery.
LIBRARY OF CONGRESS

Stop 6

The soldier is inserting a long wooden lever—called a maneuvering spike—into a notch to turn the roller.
NPS PHOTO

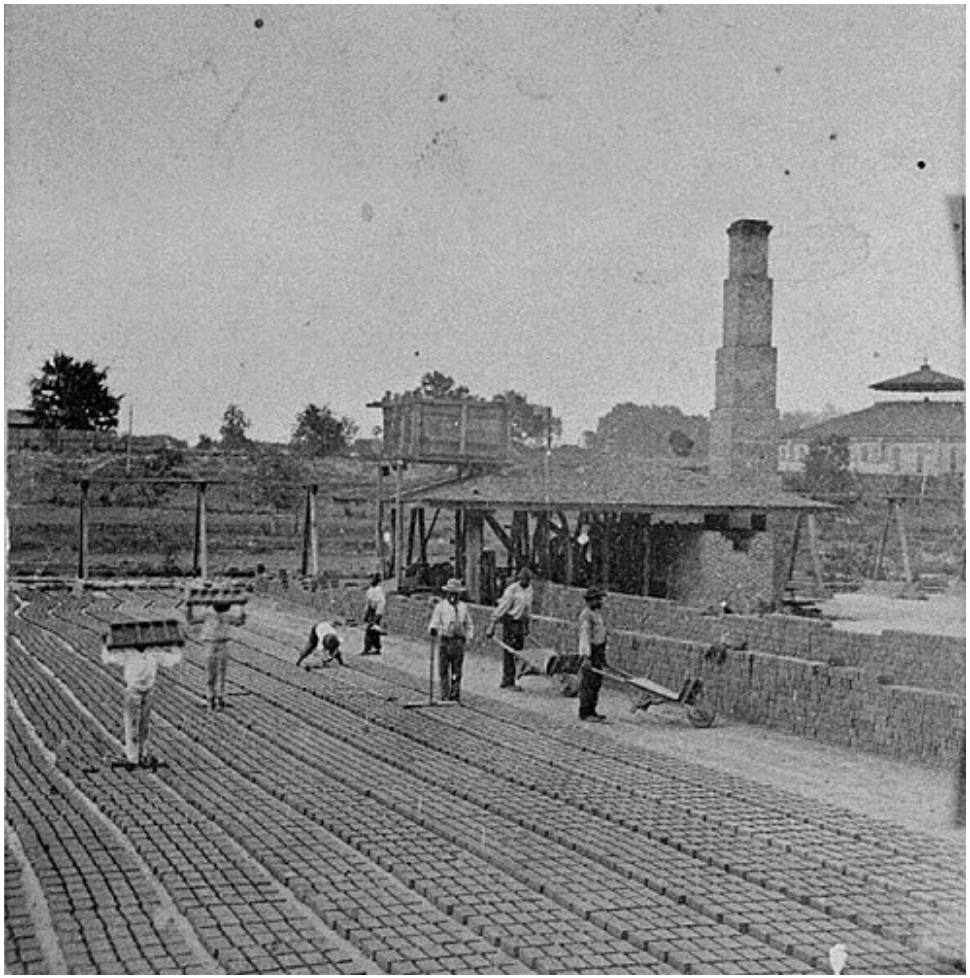
Stop 8



This diagram shows how air moved through casemates.

NPS/J IRVING

Stop 9



Bricks being made in Macon, Georgia, in 1876. The bricks used in the construction of Fort Pulaski were made using the same techniques.

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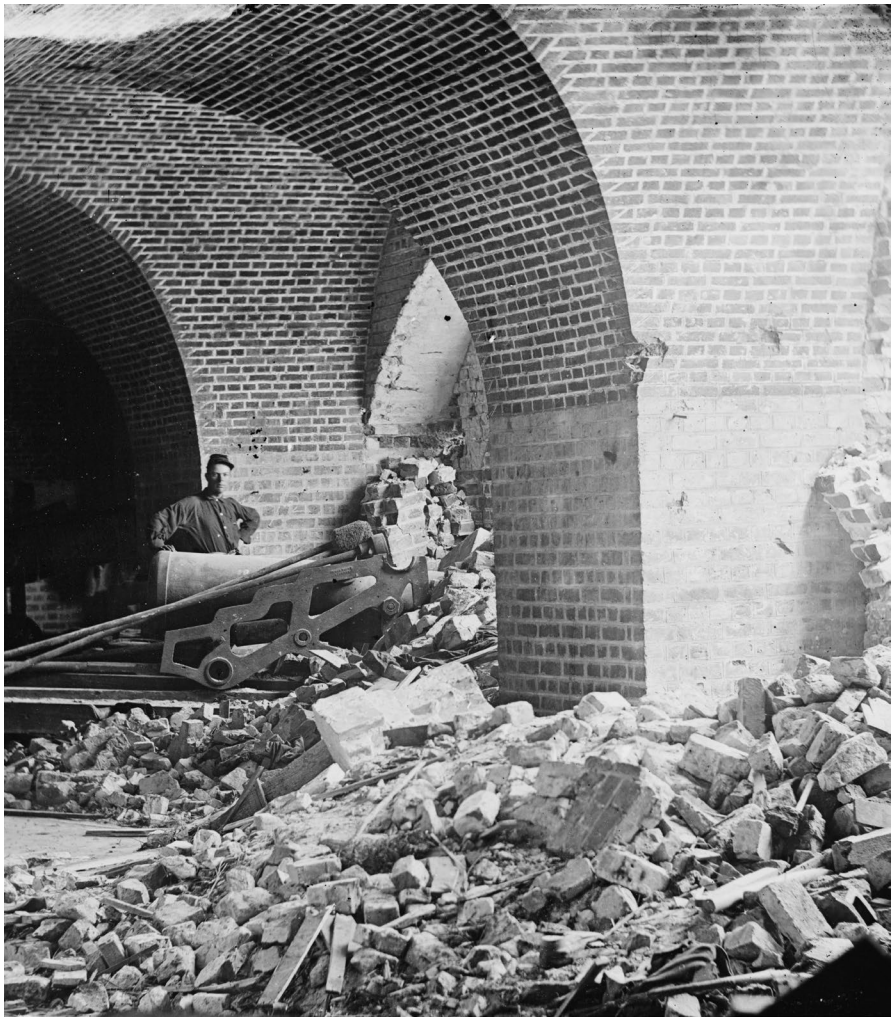
Stop 10



A soldier stands in the rubble created by the bombardment of Fort Pulaski.

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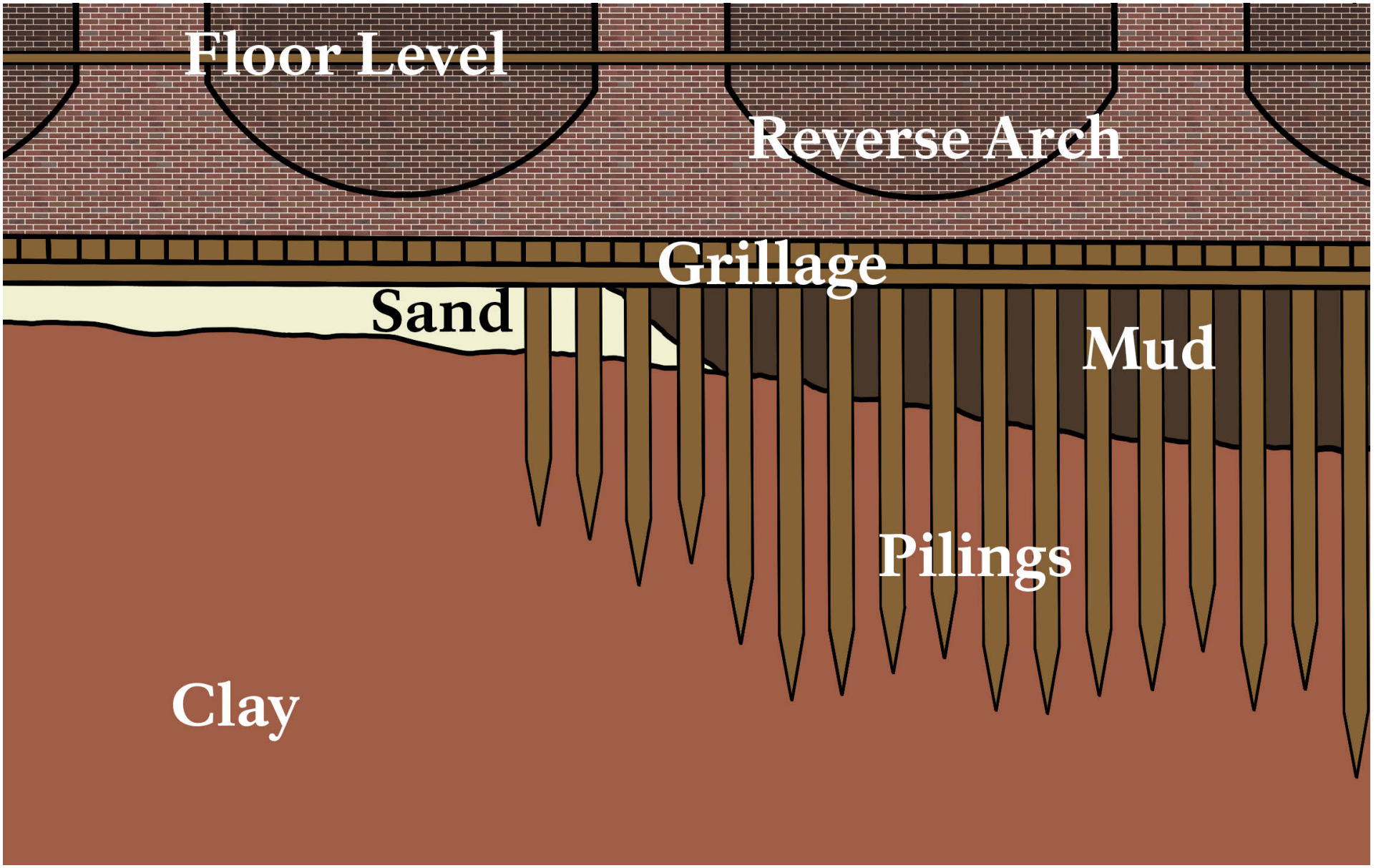
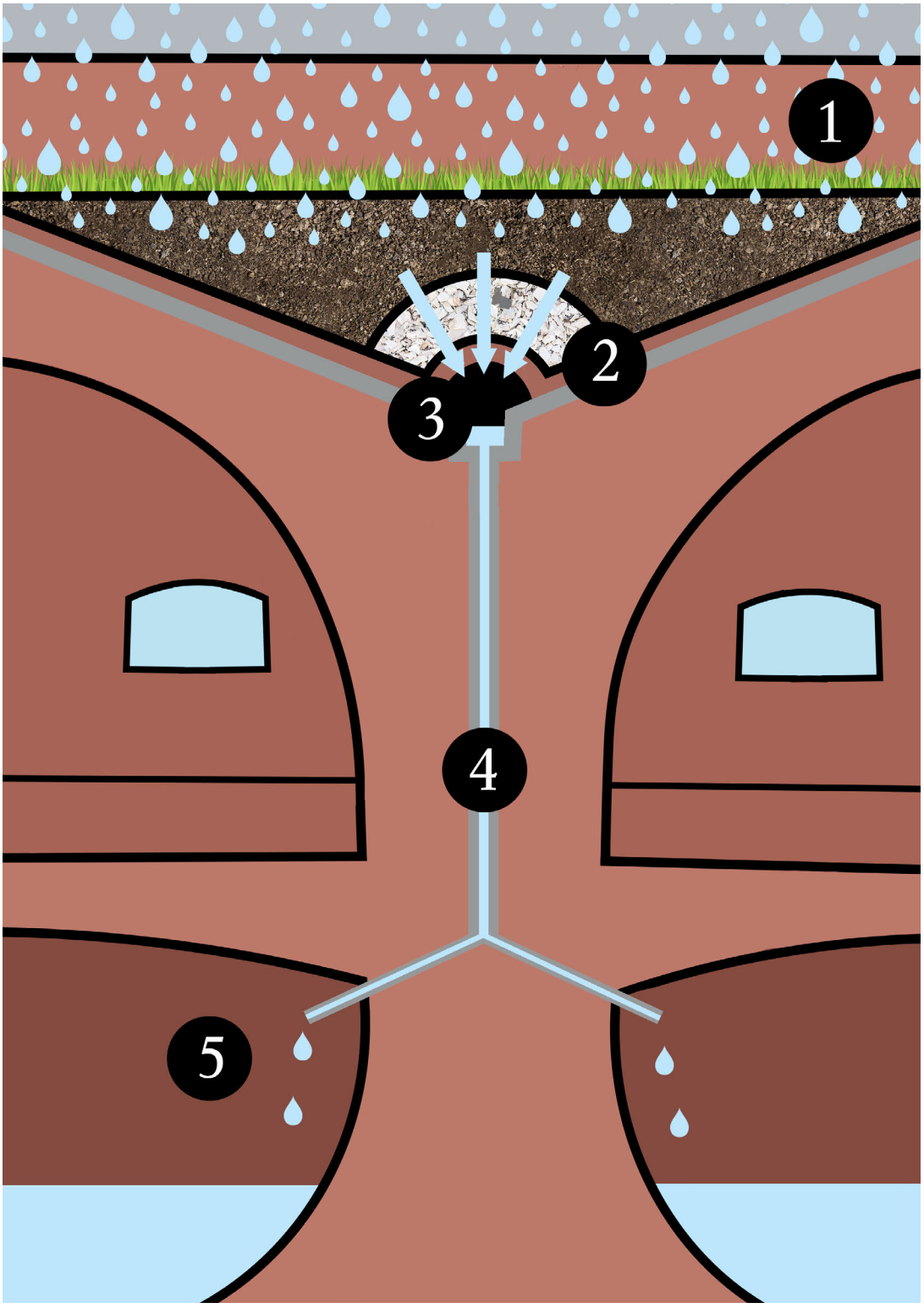
Stop 11



Model showing the grillage and pilings supporting the heavy walls of the fort. Not to scale.

NPS/J. IRVING

Stop 12



This is how the cistern collects water:
1. Rain soaks into the dirt of the terreplein.
2. This rainwater drains into a layer of oyster shells. This removes dirt from the water.
3. Next, the water drains into a hidden basin.
4. Water flows down in lead pipes.
5. The Pipes lead to the cisterns under the floor, which stored fresh water for the soldiers.

Model not to scale.
NPS/J. IRVING

Map