

a little less grey

a little more green

The Depave Guide

replacing impervious parking lot with green spaces



Based on "How to Depave: A Guide to Freeing Your Soil"
by Depave

Adapted with permission, and
with grateful acknowledgment to
the Depave team in Portland, OR

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GETTING FROM GREY TO GREEN

**WE'VE GOT WAY TOO MUCH PAVED IMPERVIOUS SURFACE.
IT'S MAKING OUR CITIES FLOOD AND OUR STREAMS UNHEALTHY.**

Impervious surface that covers our roads, parking lots, driveways, and roofs is the most widespread obstacle to protecting water quality in rivers and streams. It causes flooding and has significant negative effects on the environment.

Parking lots are a major problem, not just in urban areas but everywhere. Aside from increasing runoff volume, parking lots contribute nutrient and chemical contaminants from road salt, degraded asphalt, worn tire treads, automotive fluids, fertilizers, and herbicides. They also increase the heat island effect, making buildings nearby, and automobiles parking there, use more energy to cool down.

As a typical example, 31% of the land in Cuyahoga County in Northeast Ohio is covered in impervious surface. Parking lots represent 14% of that total. The Center for Watershed Protection sets 25% impervious as the level above which serious damage is done to water quality. If we could convert half of that 14% to absorptive greenspace, we could reach the point where we can protect rather than degrade our water, air, and human health.

There are a lot of things you can do to transform an overpaved place in your neighborhood into a greener and healthier space. Opportunities to shrink paved areas abound wherever businesses have more parking lot than they need, or where abandoned lots in urban neighborhoods have disintegrated into particles of asphalt that wash into storm drains.

This Depave Guide is designed to give an overview of how you can organize, plan, and carry out projects to remove excess pavement and replace grey spaces with green ones.

For more information, and additional resources, contact depaveneo@cuyahogariver.org.



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WORKING ON THE RIGHT SITE

So you have a parking lot with space to depave, and you want to put in a green space. Great!

First, you need to confirm that the site is depavable, and that means checking the soil under the paving to make sure it's not contaminated and that it's okay to expose it or plant in it.

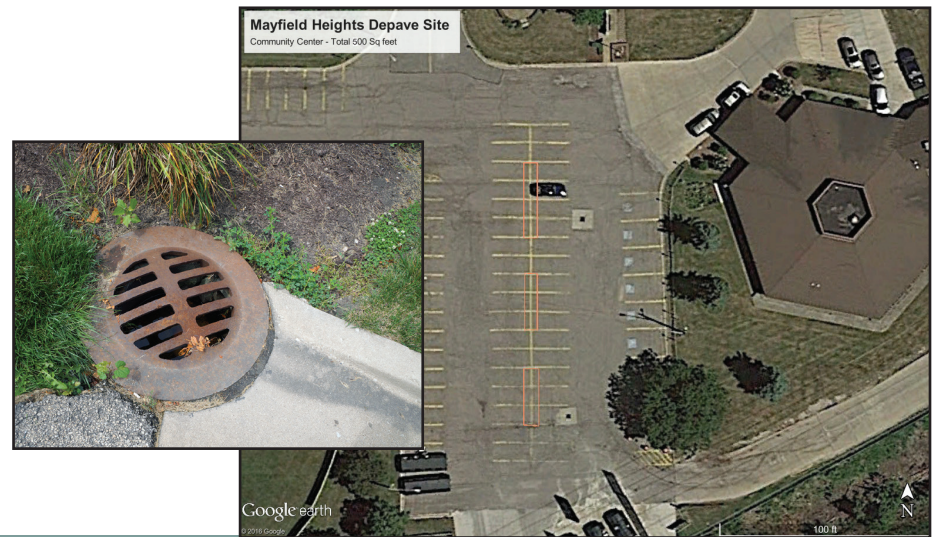
Then, once that's confirmed, you need a plan, and a good plan starts with good questions:

- What do you want the new greenspace to do?
If your purpose is to capture and filter stormwater, then you want to look at how water flows over the surface. If there's a storm drain in the lot, your depaved space should be upgrade from it, between where the water falls and the drain so that water goes into the garden before it gets to the drain. If there's no drain, your best depave space would be at the low point where rain runoff gathers. If you just want to reduce the amount of pavement overall, any position will work.
- How much space do you have to work with?
For a first-time project, start small. Even if your ultimate plan involves a big space, we recommend starting with a project that depaves and replants about 500 square feet. That can be the first section of the larger project area. Once you've done a small space you'll know what you need for the bigger project.

The main steps in the planning process are:

1. Get written approval for the project from the site owner.
2. Research the history of the site to learn what might be in the soil.
3. Test the soil for contamination.
4. Create a vision for your future greenspace.
5. Draw a site plan.

See Appendix C for a full Depaving Checklist.



SITE HISTORY & SOIL HEALTH

What's in the soil?

Soil condition may influence your post-depaving plans, so it is important to take the time to research this prior to depaving. Knowing the history of your site can help determine the condition of the soil underneath the pavement.

A good place to start is at your local library or assessor's office with Sanborn Maps. Land deeds are also helpful to acquire information about previous land-owners and land uses. Your city's building or planning department, or historical organization might have knowledge of whether or not there was ever a potentially polluting facility on the site.

Lead is the most commonly found dangerous contaminant in urban soils. Scraping and sanding paint, or chipping and flaking of lead paint from older construction and older houses is a common source. Also, old leaded gasoline may have settled in the soil and been paved over.

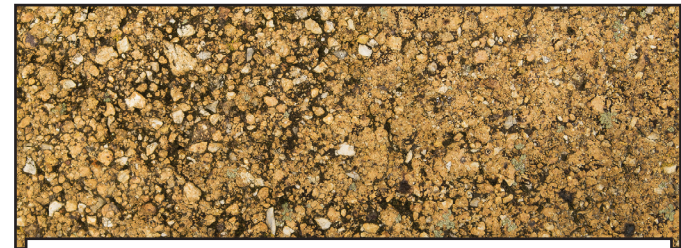
TESTING SOIL CONDITION

Depave discourages community members from removing pavement that is covering contaminated soil. If contamination is currently present in the soil, the contamination is capped and is not causing negative environmental or health impacts. Removing the pavement may do more harm than good. We strongly recommend testing the soil under the pavement before any pavement is removed.

What to test for?

If the post-depave plan does not include growing food, we recommend testing for: Lead, Cadmium, Hydrocarbons, and Arsenic. If the post-depave plan includes growing food, you'll also want to test for organochlorine pesticides.

Refer to Appendix A
for our soil testing procedure and how to understand the results of your soil test.



TESTING INFILTRATION

Will the existing soil work for a rain garden?
An infiltration test will help determine if the soil on the property is suitable for certain types of stormwater management systems, such as a rain garden. You might have to remove soil and add amendments to improve drainage.

This test measures how quickly water can soak in and flow through the soil. This test can be easily performed with a few simple materials.

Refer to Appendix B
for detailed step-by-step instructions on how to perform an infiltration test.

CREATING THE VISION

Once you have a good idea of the site conditions, you can begin to explore the possibilities for improvement. A well executed depaving can help revitalize a neighborhood space. Whether for stormwater, play, farming, or wildlife, planning for the end uses of your site will hone your vision and help you develop a site plan to implement your project.

HOLD A DESIGN CHARRETTE

The people who will use the site should have a voice in the site design.

A design charrette is an event where people involved in the project, who work, learn, or worship at the site, or community members who might use the site, gather to share ideas and suggestions to develop a site plan.

It is the best way to elicit ideas and wishes before the project is done, and to insure that the project meets the host's or the community's needs.

Planning a charrette

Identify key participants - These should include:

- ☐ A facilitator, preferably a neutral party without a personal interest in what comes out of the process.
- ☐ The site owner, or a representative with knowledge of how the site is used, who will be using it, and their ability to maintain the redesigned site.
- ☐ A design professional - A landscape architect, if possible.
- ☐ A scribe to record the ideas, suggestions, and issues as they arise.

Pick a date - If possible, the charrette should happen in a season when the ground is clear and existing features such as plants and trees are in leaf. If that's not possible, take photos in season to be used later in the charrette.

Invite general participants - These are the folks who will use the site or live nearby, and anyone else from the community or local government who might have useful input and be able to (de)pave the way forward.



The charrette process

Explain the purpose and the goal - Keep it simple. You plan to remove some paving and replace it with green space. The depaving could be part of a larger plan for other uses, so you're gathering all ideas for a big vision, which could affect where to remove pavement and what to put in its place. You've invited the stakeholders to share their thoughts and ideas.

Show the site as it is - Walk the site and have aerial images for design work. Indicate how water flows across the surface and the most strategic placements to capture stormwater.

Ask questions - What isn't on the site that could be, or what could make the place a more welcoming space? What kind of education could happen there? Who can help with funding, resources, volunteers?

Recruit a project team - These are the people who will go forward to make the project happen.

DESIGN COMPONENTS

STORMWATER MANAGEMENT

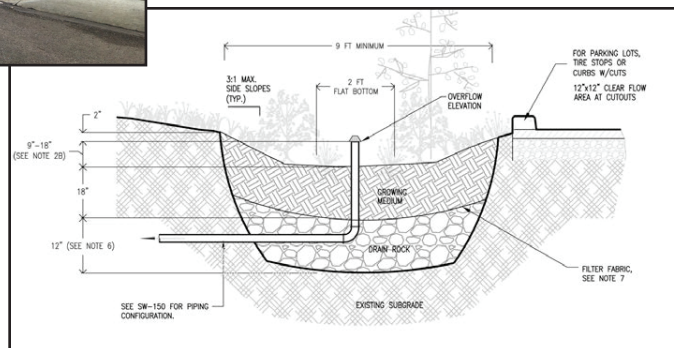
One of the major benefits of depaving is mitigating stormwater runoff through the removal of impervious surfaces. Depaving is one of the best ways to reduce stormwater runoff coming from buildings and parking lots. Once depaved, there are a number of methods to help stormwater infiltrate into the soil, keeping contamination out of our rivers and streams and helping to keep nutrients in the soils on site. The most common stormwater management devices are bioswales and rain gardens, which require minimal infrastructure.

Some cities provide financial incentives for on-site stormwater management. Check with your local stormwater management agency to see if there is such an incentive program.



Bioswales

These are basically rain gardens that also have a pipe connected to the main storm sewer. The top of the pipe is covered with a grate and extends above the soil to just below the surrounding ground level. When rain or runoff fills the depression, excess water flows into the pipe and enters the main sewer system. Bioswales are cost-effective, typically costing less than a piped drainage system, and some storm water utilities that offer discounts only do so if a bioswale is installed rather than a rain garden.



VEGETATED RAIN GARDENS and BIOSWALES

Rain Gardens

These are landscaped depressions that are either excavated or created with bermed side slopes. Stormwater runoff is deposited into the basin from a downspout or a sloped impervious surface (parking lot), where it is temporarily stored until it infiltrates into the ground. As the runoff percolates down, the vegetation slows it and allows it to infiltrate into the ground while sediments and other pollutants settle out. Rain gardens can be planted with a variety of trees, shrubs, grasses, and ground covers. Similar to other gardens, rain gardens are likely to need watering and weed pulling during the first one to three years; but with proper construction and maintenance, a rain garden can last indefinitely.

DESIGN COMPONENTS

TREES & NATURESCAPING

Adding trees to your landscape is easy, attractive, and provides many stormwater benefits. Trees hold rainfall in their roots, leaves and branches, decreasing stormwater runoff volume by 35% or more during small storm events.

Deciduous trees also provide shade for vehicles, reducing the gas used to cool air conditioners in summer and holding snow on their branches in winter. Their leaves clean the air and breathe out moisture to cool the area.

Native plants' deep roots soak up more stormwater than exotic species, support our region's native wildlife, are adapted to local climates, are naturally resistant to native pests and diseases, and require less maintenance and water than non-natives.

LEARNING GARDENS

Schools can use depaving projects to create learning gardens and increase children's exposure to nature. Most schools have excess paved surfaces that can be converted to outdoor classrooms and land labs.

These types of gardens don't have to be primarily storm water management areas. Any place where plants and soil replace pavement is a boon to the environment and reduces runoff.

In addition to adding green to the property, these offer opportunities to teach how nature works, where food comes from, as well as counting and patterning for younger students and biology and botany for older students.

FOOD GARDENS

Sites at community spaces, faith-based facilities, and other properties are perfect for creating food gardens and orchards. Raised beds over depaved spaces are useful where infiltration is low, and allow convenient access. Community gardens bring people together in common cause and promote cooperation as they provide fresh, healthy produce for use by the facility or to donate to food banks.



DESIGN COMPONENTS

PLANTERS

If you have limited space, or if you want to have above-ground features for seating or other uses, or want a decorative way to keep vehicles away from the planting area, you might consider adding elevated planters.

Infiltration planters

These are structures or containers with open bottoms to allow stormwater to slowly infiltrate into the ground. They contain a layer of gravel, a layer of soil, and a layer of vegetation. Infiltration planters are not recommended for soils that do not drain well, like clay soils.

Flow-through planters

These are structural landscaped reservoirs with impervious bottoms or are placed on impervious surfaces. These planters are filled with gravel, soil, and vegetation and are typically waterproofed. Like in a bioswale, excess water collects in a perforated pipe at the bottom of the planter and drains to a destination point, which could be your rain garden or bioswale.

Planters can come in any shape or size, can be made of stone, concrete, brick, plastic lumber, or wood, and can hold a variety of plants. The cost of planters depends on the size and type of material used, but generally planters are less expensive than more conventional stormwater management facilities.



ADDITIONAL RAIN HARVESTING and STORMWATER STORAGE DEVICES

You can use rain barrels or cisterns to capture rainwater or snowmelt flowing from a roof, and then direct the runoff into your garden or bioswale, if your city allows this. An oversize pot can be placed on your garden to catch falling water, and it can become a fountain with the installation of a battery-powered pump.

CREATING THE PLAN

THE SITE PLAN

A site plan is a detailed drawing of the site, including what changes are being proposed. A detailed site plan is usually required in order to get a permit from the city. If a permit is not required, the plan will still be very helpful in determining what materials will be needed to complete the project, develop the budget, and envision how it will look when the project is complete.

Your site plan should clearly depict:

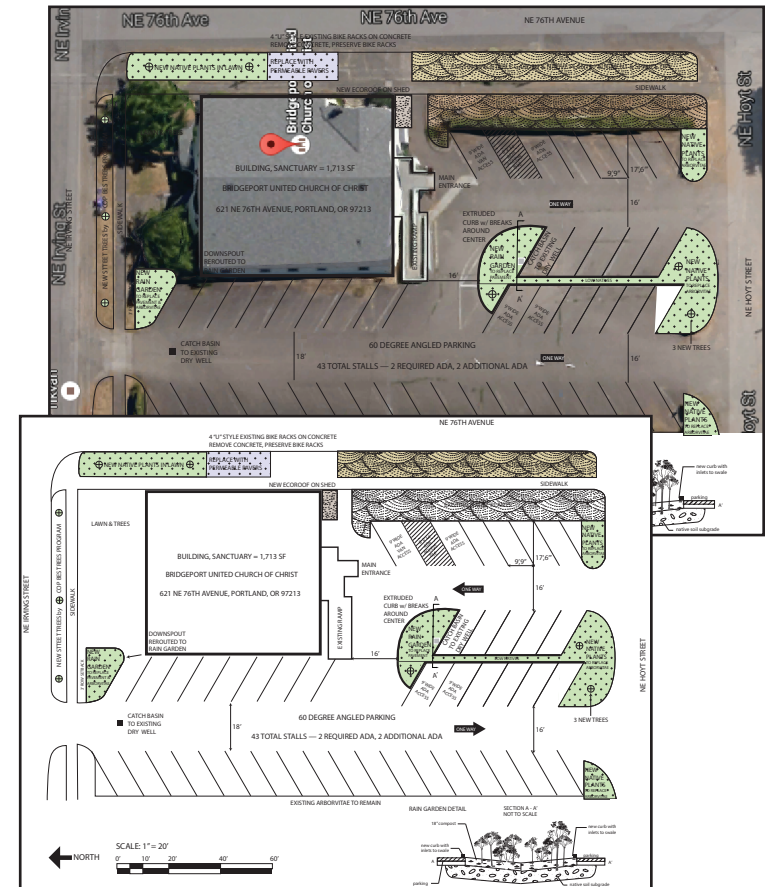
- where you propose to depave,
- a scale, north arrow, and arrows showing water flow across the site,
- the location of stormwater drains,
- existing and proposed structures and trees,
- a plant list with the common and botanical name, quantities, and the size (of the container) you plan to purchase, and
- important project notes, like where the water hookup is for the pavement saw, and watering the new plants, if you're using a hose.

These drawings do not need to be polished documents, but do need to be drawn to scale and thoroughly detail the elements of your proposal. Other drawings, such as sections through the area and details of additional features help as well. And you'll want a second plan for the event itself (see the next page.)

MEASURING UP

Be sure your site plan includes measurements. These will let you calculate how much pavement and base material you'll be removing, which will tell you how many dumpsters you'll need in order to dispose of paving and how much soil and mulch you'll need

You'll also want to be sure that the new green spaces leave room for vehicles to maneuver through the site, turn corners, and get into and out of remaining parking spaces.



CREATING THE PLAN

EVENT LOGISTICS - The operations plan

Create a site plan for event day staging and logistics. Some of the tasks should be completed before depaving day. Decide if you will be depaving and replanting all in one day or in separate events.

BDD (Before Depaving Day)

Where's the water?

You will want to do the cutting during the week before the event. The pavement saw needs water to cool its blade as it cuts. A hose can hook up to the building, or a hydrant (in which case you'll need the fire department to open the valve.) Otherwise you'll need a bucket brigade to pour water on the blade as you cut.

Staging the site

For depaving day you will want to have the dumpsters, soil, mulch, and plants as close to the depaving areas as possible. Your main site plan, or a second project event plan, should show where these things should be placed so that deliveries, and dumpster removals, can go smoothly and nothing is put on top of the depave areas. Leave room for the truck that brings and removes the dumpsters, and if the site is close to a roadway consider blocking off a section of curb space for the dumpsters.

Will you need port-a-johns?

If so, have them delivered the day before event day.

Paperwork!

Your pre-event communication with volunteers should include liability waivers for them to sign and return to the event organizers before the event. If you're planning on a child-friendly event (kids are great for picking up small pieces of paving, distributing water, etc.,) make sure that they are accompanied by a parent or adult and that a parent signs the waiver.

THE PEOPLE PLAN

You're not going to do this alone, so getting your project/event team together needs to happen as early as possible. You can use the design charrette to identify potential team leaders.

Put out a call for volunteers, set up a contact for registration, and send out liability waivers for them to sign and return.

There should be one overall project manager and a set of team leaders. Your team leaders should have specific jobs on event day, so try to assign these ahead of time.

Registration table - Signing in volunteers, verifying that waivers are signed or on file, and that everyone has gloves and eye protectors.

Tool tracking - Distributing tools, making sure they are where people need them, and collecting them after use.

Safety oversight and First Aid - Watching to make sure tools are handled safely and helping with minor scrapes.

Dumpster deliveries - One or two people should be in the dumpster receiving and piling up the pieces of paving, and another should be on the ground helping to load.

Barrow-istas - Moving pavement to the dumpster with wheelbarrows and hand carts.

Depavers and Diggers - Overseeing pavement and gravel removal, and then the moving of soil into the planting areas.

Planters and Mulchers - Placing the plants, overseeing planting and mulching.

PLANNING II

CITY PERMITS

The permitting process can be simple or more complicated, depending on the elements of your plan.

Projects that involve excavating large areas, installing bioswale pipes, or treating stormwater on site with a rain garden, may take longer to permit than projects that simply involve replacing pavement with garden space. Depending on the size, there may be additional stormwater regulations.

If the land you want to depave is currently a parking lot, you may need to get permission from the city to reduce the number of parking spaces. A certain amount of off-street parking is required for many commercial and residential properties. Inquire with your city's building department or city engineer to see if your proposed project requires a permit, or a waiver of building requirements.

EVENT CONSIDERATIONS

Make the transformation of your space, however big or small, a celebration! Promote your event through the community, on and offline, well in advance, to ensure you get a good crew of helpers.

Provide food and refreshments to keep volunteers fueled — depaving is a hard day's work. Make sure there is an area to take a load off in the shade. Take the time to make your event safe, as well as fun, by preparing leaders ahead of time with the right safety procedures, and provide volunteers with gloves, glasses, and dust masks. Add in other festivities and music to polish off your depaving — try hosting your event in conjunction with other neighborhood activities to add more life the your event.

CHECK FOR UTILITY LINES



Before you finalize your plan, you'll need to know where any utility lines might be buried. The national 'call before you dig' number is 811. This free service alerts the utility companies to come out and mark your property showing where the water, electric, gas, and any cable lines are buried. In Ohio, you can check out oups.org for procedures and more information.

Someone will be sent to tag the street and property.

- Red is for electricity, cables, conduit,
- Yellow means gas, oil, or petroleum,
- Orange signifies communication, alarm or signal lines,
- Blue and Purple indicate water lines, and
- Green shows sewers and drain lines.

A yellow line across your proposed work site can be dangerous so be careful!!! Gas leaks are no fun.

BUDGETING AND FUNDING

Once you know the size of your depaving area, and the material and depth of the pavement, you can figure out the cubic yards of pavement you'll be removing and soil and mulch you'll need to bring in. Your planting plan will tell you what trees and plants you'll need.

Your budget should include those items, plus dumpster rental and removal, equipment rental, tools, testing costs, insurance, permit fees, and any other expenses you identify as you make your operational plan.

Funding can come from grants, property owner contributions, local service organizations, online crowdfunding, and other sources.

SURFACE TYPE

Before you get started, the impervious surface needs to be broken down into smaller pieces that can be lifted by one or two people. This can be done either using a diamond-blade saw, for asphalt, or a jackhammer for concrete.

IS IT CONCRETE?

Concrete is harder and more durable than asphalt, so depaving large areas of concrete by hand will be too difficult. For anything larger than a few hundred square feet, you should hire a demolition contractor.

Also, not many construction debris collection companies recycle it. But it can be reused to construct walkways, flower beds, fire pits, retaining walls and other outdoor structures. If you or your neighbors can't use your leftovers, you might post it online to find a taker. Otherwise, you'll have to budget not just for dumpsters, but to pay a tipping fee as well. Contact local construction debris companies.

ASPHALT - RECYCLE IT!

Asphalt is softer and lighter than concrete and is not suitable for reuse as a long-lived building material. Depaving vast areas of asphalt can easily be accomplished by hand. It is readily recycled by local pavement processing companies into a crushed rock aggregate used in construction projects. In order to ensure the asphalt gets recycled, it is best to keep materials separate; one dumpster for asphalt, and one for gravel that you dig out of the planting beds and other debris.



ORDER YOUR DROP BOX(ES)

Contact a local garbage hauler to get drop boxes - dumpsters - delivered to your project site before you start your depaving work.

Make sure the box is as close as possible without being in the way and that the doors are facing toward the removal area (marked out with paint).

A standard 10-yard drop box can accommodate about 400-500 square feet of asphalt., but concrete is heavier, so you may not fill the box to the hilt.

Your materials plan will tell you how many dumpsters you need to have for your project. The hauler will tell you how much one can hold, based on how heavy the load is relative to the roads they will have to use.

PRE-EVENT DEPAVING PREP

PREPARING ASPHALT WITH A SAW

A diamond-blade walk-behind saw is used to create a straight perimeter bordering an area of pavement that is going to be preserved, or for large areas that will be removed by hand. Cutting asphalt up into a grid is the best way to prepare large surfaces for hand removal with pry bars. These saws work well for cutting straight lines, and are also great for cutting tree wells or any work done in the public right-of-way in which some of the pavement remains and a neat clean line between the two areas is desired.

The saw and diamond blade can be rented from a local equipment rental store. An open bed truck is needed to transport the saw to and from the site. A hose and outdoor water spigot will be needed to cool the blade while running the saw. If that's not available, you'll need to hook the hose into a hydrant or, as a last resort, recruit a bucket brigade to carry water from the nearest source to pour on the blade as you cut.

Everyone involved should wear eye protection and ear-covering hearing protection.



BREAKING UP CONCRETE WITH A JACKHAMMER

A saw and a prybar just won't cut it with concrete; you'll need a jackhammer! This tool is inexpensive to rent and simple to use. The chisel and point bits are best for concrete.

When using the jackhammer, positioning is key. Your job is to keep it from falling over, and angling it when it needs to be angled. First create cracks with the point bit, and then "explore" the cracks using the chisel bit to make them bigger. This is all easier if the concrete has room to move (i.e. break), so work from the edges toward the center. If you encounter rebar, it might be best to call in a professional to remove it, as steel-reinforced concrete is much stronger.

Always wear sound-cancelling, ear-covering headsets and heavy gloves.



PRE-EVENT DEPAVING PREP

TOOLS - WHAT YOU'LL NEED

PRY BARS

A pry bar is a long steel bar that works extremely well for prying up pieces of asphalt and concrete. The pry bar is the best depaving tool! Use it in conjunction with a smaller piece of asphalt placed underneath the bar next to a crack — like a seesaw — to leverage pieces out of the ground and reduce the strength needed to pry up pavement. Pry bars can be purchased at most hardware stores.

PICKAXES

Pickaxes can be useful to pry up the chunks of concrete or asphalt. They usually have one sharp pointed end and one flat end. Use extreme caution when swinging these and always make sure no one is standing behind you.

SLEDGEHAMMERS

Sledgehammers can be used to help break up big pieces of asphalt. If the saw blade didn't quite cut all the way through the asphalt, a sledgehammer will really help to make that last crack. As with the pickaxe, use extreme caution when using a sledgehammer and always double check to make sure there is no one behind you.

WHEELBARROWS

Construction-grade wheelbarrows are used to transport the broken up asphalt or concrete to the drop box. When working on a large area, it is best to work from back to front in order to make sure the wheel barrow has a clear hard surface to roll on. Don't forget a ramp, so you can get your wheelbarrow into the drop box — a long 2' x 10' ramp, or something even larger, will be really helpful.

HAND TRUCKS

Hand trucks can be used to transport overly heavy blocks of material. Using a wide metal or wood ramp, the hand truck can be wheeled directly into the dropbox for easy unloading of pavement blocks.



DEPAVING DAY - PEOPLE PREP

GET READY!

The time has come for your big event.

You've got the registration area set up and people are signing in, you've assigned them to various tasks and teams, and they're raring to go.

GET SET!

Gather everyone together, thank them for coming, introduce yourself, and tell them what they'll be doing. Tell them where the bathrooms are.

GET SAFE

Go over the safety procedures - eye and hearing protection, lifting from the knees and not the back, being aware of what's going on around them and making sure their tools aren't going to injure someone else.

Tell them where the first aid kit is, and identify the safety leader.

Remind adults to keep an eye on children, especially their own, and keep them out of harm's way.

GET LOOSE

Lead everyone in stretching exercises for shoulders, back, hips, and legs.

GET DEPAVING!

SAFETY FIRST, LAST, AND ALWAYS

Gloves and closed toed shoes, preferably hiking boots, are a must when depaving.

Eye & ear protection is mandatory for anyone using, or working near, a pavement saw or jackhammer.

A dust mask and long pants are highly recommended.



DEPAVING HOW TO

TECHNIQUE

Now is the time to get the material off the ground and into a dropbox to be hauled away or into a pile to be reused.

If the area was cut into squares using a saw, it is best to start with either a pickaxe or a pry bar. It is helpful when cutting the asphalt if you cut and remove several small triangles at the corners of a few squares to give yourself easy places to start prying.

Starting at a corner of one of the squares, use a prybar to pick away at a corner until the tool can get slightly under the slab. Once one end of the bar is under the surface, push the other end all the way down until the square starts to come up. Have a friend stick another bar under the same square and do the same. Both bars working together should be enough to get the heavy chunk off the ground.

Once the asphalt square is separated from the others, at least two people will be needed to lift or lever the block into a wheelbarrow. Wheeling a wheelbarrow full of asphalt can be very heavy and it can easily tip over, so be careful not to over-fill.

From the wheelbarrow, the asphalt will need to be placed in a dropbox. There are two ways to get the asphalt into the dropbox:

- Ramp it. You can either use a big piece of plywood or you can rent a metal ramp at any local tool rental location.
- Toss it. If the box is closed at the end, and if there is nobody inside it piling pieces up, carefully toss smaller pieces over the edge into the box. If the box is open at the end, toss pieces in carefully so that the volunteer piling them up can move them to leave room for more.



PLANTING PREP

SUBSURFACE REMOVAL

Beneath the pavement, there is typically about four to six inches of gravel.

There are a number of ways to remove the gravel in order to get to the soil and leave room for new soil with good drainage.

1. With small sites, the gravel can easily be shoveled out of the newly depaved area and reused to create walkways through gardens, filling potholes, creating drainage areas, etc.
2. For larger sites, the gravel can be removed using heavy machinery. You can hire a local contractor to do this work, or rent a small backhoe or bobcat from a heavy equipment facility and do it yourself. If kept separate from other materials, gravel can also be hauled away in a dropbox and recycled at a local reuse facility.

If you are replanting on the same day as the depaving, and you'll need to use equipment, add it to your logistics plan. In any case, add the cost to your budget.

SOIL RESTORATION

The biggest problem caused by heavy impervious surfaces is soil compaction.

The weight of the pavement crushes macropores - the small spaces between the soil aggregate - preventing water, air, and roots from moving through the soil.

For small sites, a spading fork or a pickaxe should be sufficient to break up the compacted soil enough to begin amending it. Using farm implements, like a “deep-ripper” or a “chisel plow”, will be more efficient in breaking apart dense soil at larger sites. After the soil is broken up and aerated, mixing in organic matter such as compost or a 3-way blended soil mix will help create a healthier soil profile and bring your site back to life.



PLANTING

LANDSCAPING

Now for the fun part! Using your site plan and planting plan as a guide, your team can begin to bring the site to life.

While depaving is a great summer activity, you may want to wait until fall to plant, when the temperature is cooler and trees are going dormant. Determine the best time of year to begin planting in your area to ensure the highest possible survival rate for the plants.

IF YOU'RE DOING A DONE-IN-A-DAY DEPAVING/PLANTING

If you plan to plant in the summer right after your depaving, you'll want to get your trees and shrubs ordered in early spring, and if they're delivered long before your event make sure they get watered frequently and fully.

If your event is in early spring or late fall, have the plants delivered as close to event day as possible, and set aside a safe place for them to wait away from the heavy work. Keep them well watered.

IF YOUR PLANTING DAY IS A SEPARATE EVENT

You may want to have two totally separate events, depaving in summer and planting in fall, or depaving in fall and planting in spring. This gives you an opportunity to involve more people, but it also means double the volunteer organizing.

Having created the planting plan right at the beginning, with the depaving plan, lets you seek out the best trees and plants for the site.



APPENDIX A - TESTING SOIL

SAMPLING SUPPLY CHECKLIST

- ☐ Hand held concrete saw or core drill.
We recommend using a hand held, gas powered concrete saw. Although using a core drill will create a cleaner sample hole, it is much more time-consuming.
- ☐ Water source and hose for operating the concrete saw.
- ☐ Safety Gear – safety glasses, ear protection, work gloves, long pants and protective shoes.
- ☐ Digging & Sampling Tools – You'll need tools that can work in tight spaces to dig out core debris, fish out rocks and gravel, and eventually get to the soil to pull out viable samples. Use at least one larger tool, such as a thin garden spade or a hori hori knife, in order to get out major scoops. An old butter knife and table spoon also work as well.
- ☐ Sample Jars – These are needed when collecting a soil sample. Ideally, these jars should be cleaned to laboratory grade standards (not just dishwashed at home). The soil testing company should provide jars.
- ☐ Cooler – A cooler is the best way to store and transport a soil sample. Heat can break down certain pollutants that can be found in soil, thereby compromising the integrity of the sample.



SOIL SAMPLING INSTRUCTIONS

The first step in testing your soil is to contact a soil-testing lab that will take and test the soil samples. You'll need to cut holes in the pavement in order to expose the soil.

Cutting (with hand held concrete saw) – Ensure the saw is running with the water fully connected. Turn on the saw and then slowly drop the spinning blade onto the first hole location. Do not press hard on the saw as it starts to grind into the paved surface. Let the saw blade do the work. After a while, you may feel the blade passing through into a different strata (possibly bumpy if it is a stone layer, or smoother if it is straight into soil). In this manner, make two more cuts to form a triangle. Using a digging tool, carefully remove the triangle and fish out pavement debris and any stones that might be found in the subgrade beneath the paved layer.

Sampling – Using a clean spoon or other small implement, collect a soil sample. Use laboratory grade jars when possible. Once the sample is collected (4 ounces is the recommended minimum), seal jar lid and place in an iced cooler (ideal) or shaded area. We recommend taking samples from three locations on the property and mixing the samples to create a composite sample.

Clean Up – Replace pavement triangles back in holes, fill remainder of holes in with pea gravel or sand. Tamp down with foot — do your best to eliminate a tripping hazard. Give the area a quick broom sweep to clear any remaining debris.

Send in sample – The soil testing company will tell you the best way to return the samples to them. One to two weeks after they receive your sample, they will send you the results.

Most state urban residential maximum levels are:

Lead: 400 ppm, Cadmium: 78 ppm, Arsenic: 1 ppm

These are the maximum levels for urban residential soils. This *does not mean that it is safe to grow edible plants* in these soils. This safety limit is based on the typical exposure to contaminants in a home setting.

APPENDIX B - INFILTRATION

PERFORMING AN OPEN PIT INFILTRATION TEST

For projects that include a stormwater feature, like a rain garden, an infiltration test should be performed as early as possible in the project process.

In order to establish the rate at which rainwater will soak into the soil underneath the pavement, you'll need to dig down to the native soil as close as possible to the area that you will be depaving. This test can take up to three hours, following the steps below, and will be useful should you need to acquire a permit for the project.

1. **Dig a hole** to the depth of the bottom of the proposed planting bed - typically about 18 to 24 inches. A post hole digger is the best tool for this job. You will also need a measuring stick or tape measure. If you encounter a layer that is too solid to dig through or that has standing water, try digging in another location.
2. **Fill the hole** with water to one half the maximum depth of the proposed bed, and record the exact depth of the water and the time. Check the water level at regular intervals (every 1 to 10 minutes depending on how fast the water soaks into the soil) for one hour or until all of the water has infiltrated. Record the distance the water has dropped in the time period.
3. **Repeat this process two more times** as close together as possible to accurately portray the soil's ability to infiltrate at different levels of saturation. The third test will give you the most accurate measurement of the soil's fully-saturated infiltration rate.

Many states and municipalities have issued their own guidelines on how to conduct an infiltration test.

Check with authorities, universities, or others in your area for local guidance.

Depth of Evacuation: _____		
Test 1: _____	Test 2 : _____	Test 3 : _____
Date: _____	Date: _____	Date: _____
Time: _____	Time: _____	Time: _____
Initial water depth: _____	Initial water depth: _____	Initial water depth: _____
Final water depth: _____	Final water depth: _____	Final water depth: _____
Duration of test: _____	Duration of test: _____	Duration of test: _____
Infiltration rate: _____	Infiltration rate: _____	* Infiltration rate: _____

* The pit infiltration rate is the result of the third test.

$$\text{Pit Infiltration Rate} = \frac{\text{Initial Water Depth} - \text{Final Water Depth (inches)}}{\text{Duration of test (hours)}}$$

APPENDIX C - CHECKLIST

DEPAVING CHECKLIST

For a first time depaving project, we highly recommend starting small, 500 square feet or less. Once you've got a site in your sights, follow these steps to guide your project:

- ☐ Get written approval from the property owner
- ☐ Research the history of your site
- ☐ Perform an infiltration test & soil test
- ☐ Create a team and develop a vision
- ☐ Locate utilities - call before you dig
- ☐ Draw up a site plan and a planting plan
- ☐ Make a budget and secure funds
- ☐ Get permits if necessary
- ☐ Schedule depaving date & organize event
- ☐ Publicize event, recruit volunteers & donations
- ☐ Draw up an event space diagram
- ☐ Order dumpsters, soil, mulch, plants
- ☐ Prepare the surface - outline the area & cut it up
- ☐ Depave - make it a celebration & take photos!
- ☐ Dig out and remove gravel
- ☐ Amend and add soil
- ☐ Plant native trees and plants
- ☐ Put up a sign
- ☐ Celebrate
- ☐ Plan, schedule and perform maintenance

BUDGET BASICS

Setting up a spreadsheet at the very beginning of your planning will help you make decisions along the way. What will you need to pay for, what can you get donated, and what can you borrow? Here are just a few items to consider:

ITEM	QUANTITY	COST	TOTAL
Dropbox/Dumpsters			
Saw rent for soil test			
Saw rent for depaving			
Tools			
Safety - eye/ear protection			
Soil + delivery			
Mulch + delivery			
Plants			
Signs/event banner			
T-shirts			

THANKS FOR DEPAVING!

NOTES and IDEAS

We hope that this guide will help you put a little bit of paradise where once there was paving.

Once you've done a successful project, you'll be able to lead others, and the greening will spread. We hope that you'll share your experience with others in your community and help organize additional projects. h

If, for your own project, you engage partners in your community with knowledge of your site and its history, and a level of expertise in soils, plants and trees, stormwater management, construction, neighborhood organizing, and volunteer groups, you'll have both a better project and a core team in place to help others.

City service and building departments, and city engineers, can be invaluable team members as you prepare for, and work your way through, a project.

You'll never look at a parking lot in the same way again.

The DepaveNEO crew

Made possible with a grant from the Ohio Environmental Education Fund
Ohio Environmental Protection Agency



DepaveNEO is a program of Cuyahoga River Restoration, the nonprofit organization in Northeast Ohio that works to restore, revitalize, and protect the Cuyahoga River watershed and Lake Erie through action, collaboration, and outreach. In addition to depaving and general watershed improvement, we work to:

- Remove (delist) the The Cuyahoga River Area of Concern from the federal list of degraded Great Lakes waterways;
- Improve and protect aquatic life - fish and bugs - in our streams, river, and lake through our Habitat for Hard Places program; and
- Restore and protect the forest canopy that contributes to the health of streams and aquatic life through our Cuyahoga ReLeaf® program
- Present River Day each year to connect organizations and individuals to their streams, watersheds, and the Great Lakes basin.

Learn more at cuyahogariver.org.

