

Services Guide

Paving Contractors

**NOTE 1: This information is pulled from credible sources. This information is a guide. Any information used from this guide must be re-contextualized (no copying and pasting). Re-contextualize information incorporating SEO and business specifics.*

**NOTE 2: For MCP websites, stick to general information and avoid specifics.*

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1. PAVING CONTRACTORS OVERVIEW

1.1 GENERAL INFORMATION

<https://en.wikipedia.org/wiki/Pavement>
<http://www.procoatbc.ca/driveway-repairs.html>

- Pavement is a surface covering that is typically made up of materials such as asphalt, concrete, and stone.
- In landscape architecture pavement is part of the hardscape – sidewalks, road surfaces, patios, courtyards
- Some paving contractors only do paving, but many will provide a range of other services related to pavement, including excavation, grading, crack sealing, line painting and winter services like snow removal

1.2 SEO

Keywords (First Row – BEST, Last Row – LEAST)

○ Asphalt	○ Concrete	○ Stamped Concrete	○ Driveway Pavers
○ Driveway Sealing	○ Hardscaping	○ Grading	○ Asphalt Contractors
○ Paving Contractor	○ Drainage System	○ Concrete Driveway	○ Concrete Pavers
○ Concrete Repair	○ Asphalt Paving	○ Concrete Resurfacing	○ Asphalt Road

2. ASPHALT

General:

<http://www.richmondblacktop.com/blog/coloured-asphalt-for-your-next-project/>
<http://www.richmondblacktop.com/blog/benefits-recycled-asphalt/>
<http://www.palmieribrospaving.ca/paving-services/asphalt-patching-and-repair/>

- Asphalt is a mixture of aggregates, binder and filler

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- Asphalt can be coloured to a wide range of earth toned shades – muted oranges, greens or blues.
- Asphalt should last between 20-25 years
- Common culprits of asphalt damage include weather, tree roots growing up underneath, excessive loads, poor drainage and substandard installation
- Asphalt maintenance (filling small cracks, removing stains and using sealcoat) is inexpensive and lowers the frequency of more costly repairs (such as complete replacement, patching or grading)

2.1 BENEFITS OF ASPHALT

<http://superiorpaving.ca/why-asphalt/>

<http://www.wispave.org/benefits-of-asphalt/>

<http://www.richmondblacktop.com/blog/benefits-recycled-asphalt/>

- Creates a smooth surface for driving, which allows superior contact with vehicle tires for a safer (and more enjoyable) ride
- A low-cost building material - typically costs half the price of concrete per square foot.
- Asphalt roads can be built more quickly and cost-effectively than other pavement types
 - Can be paved one lane at a time
 - Projects can often be completed in one day or overnight
- Asphalt is durable, weather-resistant and relatively flexible so it won't crack under stress
- Asphalt out-performs concrete in cold weather
- Asphalt is environmentally-friendly
 - It is 100% recyclable
 - It is the most recycled material in North America
 - The recycling process is similar to the installation process of new asphalt. The asphalt pieces are tumbled and heated to about 300 degrees Fahrenheit in an asphalt recycler. Once appropriately heated, the asphalt is laid onto the desired surface.

2.2 TYPES OF ASPHALT PAVING

<http://www.myasphaltpavingproject.com/paving-applications/speciality-applications/>

Type	Description
Municipal	<ul style="list-style-type: none">○ Contractors have to work with standard bidding and requisition processes○ Most commonly used for roads, paths, running tracks and playgrounds

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Residential	<ul style="list-style-type: none"> ○ Commonly used for patios and decks, entrance ways, steps and risers, retaining walls, curbing and driveways ○ Enhances your property and gives it a lasting and functional finishing touch
Commercial	<ul style="list-style-type: none"> ○ Regular commercial work includes parking lots and curbing ○ Specialty work includes high quality equipment pads
Industrial	<ul style="list-style-type: none"> ○ Asphalt is commonly used for railway beds, airport runways, taxiways, ports, landfill caps, mine roads, freight yards, log yards and work sites ○ Agricultural uses include cattle feed lots, poultry house floors, barn floors and greenhouse floors. ○ Asphalt has proven to be more resilient than concrete in silage bunker silos and storage pads as the acidity of the runoff may eat away concrete surfaces.
Waterproofing	<ul style="list-style-type: none"> ○ The Environmental Protection Agency has approved asphalt use as a primary liner for both sanitary and hazardous waste landfills. ○ Asphalt applications help with water storage, flood control, erosion, and conservation problems. ○ It is also commonly used in fish hatcheries, reservoir liners, industrial retention ponds, drainage canals, sea walls and dikes to control beach erosion.

2.1 ASPHALT SERVICES

<http://www.epa.org/asphalt.php?c=78>

<https://www.angieslist.com/articles/driveway-repair-should-you-patch-resurface-or-replace.htm>

<https://en.wikipedia.org/wiki/Sealcoat>

<http://www.palmieribrospaving.ca/paving-services/asphalt-patching-and-repair/>

<http://www.procoatbc.ca/hot-rubber-crack-repair.html>

<http://www.forconstructionpros.com/article/12045283/benefits-of-sealcoating-asphalt-pavement>

Service/Product	Description
Paving	<ul style="list-style-type: none"> ○ Common paving applications for asphalt include roads, driveways, parking lots, sport courts, sidewalks and curbs ○ Involves the installation of asphalt pavement
Crack Filler Repair	<ul style="list-style-type: none"> ○ Small repairs are completed with liquid crack fillers ○ Repairing asphalt is effective for pavement with cracks that are between

	<p>¼ and ½ of an inch wide. These cracks don't indicate any deeper damage and can be repaired easily</p>
Hot Rubber Crack Repair	<ul style="list-style-type: none">○ Uses a hot rubberized sealant (either hot rubber or liquid asphalt) to fix cracks○ Typically used for parking lots, roads, runways, driveways○ The crack is filled from bottom to top to prevent air bubbles from forming which can create weak spots.
Patching	<ul style="list-style-type: none">○ When water freezes, it expands and enlarges any small pavement cracks. When this process repeats a pothole or noticeable crack forms.○ Patching involves cutting out the damaged area of pavement, repairing the base layers and putting in new asphalt on top.○ Patching is a good option for areas where aesthetics aren't as important and longevity of the repair is vital.
Resurfacing	<ul style="list-style-type: none">○ Resurfacing is ideal for pavement with a sound foundation but a lot of grade depressions or large sections of cracks resembling alligator skin.○ Involves removing the top layer of pavement and replacing it with a new layer.○ Looks like a complete replacement but is substantially less expensive.
Sealcoating	<ul style="list-style-type: none">○ Sealcoat is a bituminous liquid mixture that is applied to asphalt.○ Since asphalt is a petroleum-based product, other petroleum products (vehicle oil and gasoline) may react with its surface and speed up the degradation process. The sealcoat acts as a temporary barrier against these materials.○ Sealcoating is essential in pavement preservation and extending the life of asphalt pavement.○ There are primarily three types of asphalt sealers. They are commonly known as coal tar, asphalt emulsions, and acrylics. All three have their advantages but are typically chosen by the contractors' preference unless otherwise specified.

3. CONCRETE

General:

- Concrete is a mixture of water, cement and aggregate (sand or gravel)
- Concrete's greater stiffness means that a subbase is rarely needed, although sometimes one is used to provide a good working platform for paving operations

3.1 BENEFITS OF CONCRETE

http://www.pna-inc.com/sites/default/files/submittal-files/industrial_concrete_paving_article_Concrete%20construction_nov%202013.2012-2.pdf
<http://www.richmondblacktop.com/concrete-paving/>

- Concrete is an incredibly strong substance – much stronger than asphalt.
- It is not susceptible to softening in hot conditions – it’s durable and able to withstand harsh weather systems.
- Has a small environmental footprint – concrete is 100% recyclable.
- Concrete delivers durability, serviceability, aesthetics, and low life-cycle costs.
- Concrete pavements often continue to perform well, long after the first fatigue cracks have developed.
- If concrete does crack, it will usually crack in one line, making the replacement of damaged areas efficient and easy.

3.2 CONCRETE SERVICES

<http://www.palmieribrospaving.ca/paving-services/concrete-paving/>
<http://polycreterestorations.com/capabilities/concrete-repair-vancouver/>
<http://absoluteconcreterepa-px.rtrk.ca/services.htm>
<http://www.homeadvisor.com/r/concrete-resurfacing/#.V-06luYyWVM>
<https://www.thisoldhouse.com/ideas/all-about-concrete-pavers>

Service/Product	Description
Paving	<ul style="list-style-type: none">○ Concrete pavement is used for surfaces that will have to withstand high point loads, such as docking areas, garbage bin pads and other applications involving repetitive impacts○ Can also be used for driveways, walkways, steps, culvert ends, garage slabs, curbs, retaining walls, and commercial parking lots
Pavers Installation	<ul style="list-style-type: none">○ Many paving contractors also install concrete pavers, which are interlocking/architectural slabs that can be used for paths, patios and driveways

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	<ul style="list-style-type: none">○ Pavers are an attractive alternative to traditional pavement, more affordable than stone, more colorful than brick, and more durable than asphalt
Repairs	<ul style="list-style-type: none">○ Generally only for surface-level cracks, caused by poor construction practices, climate/moisture and improper placement of reinforcement steel○ Visual signs of concrete deterioration are cracks, rust stains, efflorescence, water leakage, concrete spalling and hollow sounding delaminations. Other signs of deterioration include wear, exposed aggregates, discoloration and settlement. If you notice these symptoms you will need to repair your concrete.○ Repairing concrete is very important for maintaining the longevity and safety of a building or structure.○ Successful repair procedures take into account the cause of the cracking. For example, if the cracking is due to drying shrinkage, then the cracks will likely stabilize after a period of time. But if the cracks are due to a foundation problem, filling the cracks will be useless until the foundation is fixed
Resurfacing	<ul style="list-style-type: none">○ Resurfacing is a thin cement-based overlay that is poured over existing concrete and adheres to create a beautiful and smooth new surface.○ Can give outdoor and indoor surfaces a new finish without the hassle of a complete replacement.○ Uses the existing concrete structure as the base, and the concrete resurfacing material goes directly on top of the existing concrete area○ Significantly cheaper than complete replacement○ Resurfacing can involve adding overlays, sawcut patterns, stamping or etching to carve a pattern into the surface to look like stone, or exposed aggregate finishes

3.3 CONCRETE PAVING

Concrete Paving Process:

http://iti.northwestern.edu/cement/monograph/Monograph2_3.html

Steps	Description
1. Mixing	<ul style="list-style-type: none">○ Mixing of concrete is a very important step for achieving good final properties, and one that can be quite difficult without the right

	<p>equipment. This is one of the best reasons for using ready-mixed concrete.</p> <ul style="list-style-type: none">○ Mixing distributes the aggregate evenly throughout the cement paste, ensures that all of the cement has been fully saturated in water, removes large air voids, breaks up agglomerated clusters of cement particles and allows air entraining admixtures to generate the correct air void system.○ Undermixing leaves large flaws and thus results in inferior strength, while overmixing wastes time and energy and can destroy entrained air voids.
2. Placing	<ul style="list-style-type: none">○ Once the concrete has been adequately mixed, it must be placed into the formwork that defines its final position and shape. If the concrete is to be reinforced, the rebar must already be in place so the concrete can flow around it.○ If the concrete mixing truck can be located close to (and higher than) the site, then the concrete can be poured directly into the forms. In cases where this is not possible, the concrete can be transferred in buckets by a crane or by wheelbarrow.
3. Consolidation	<ul style="list-style-type: none">○ Once the concrete is in place, it should be consolidated to remove large air voids developed during placement and to make sure that the concrete has flowed into all of the corners and nooks of the formwork. This process is also called compacting.○ The two most common methods of consolidation are vibration and roller compacting.○ Vibration is a mechanical process that transfers pulses of shear energy to the concrete, usually by a probe that is inserted several inches into the concrete. Each pulse of shear energy momentarily liquefies the concrete, allowing it to flow very freely. This is the standard consolidating method for general construction projects with the exception of roads.○ Vibration is a noisy and labor-intensive step, requiring expensive and specialized equipment. For this reason, there is growing use of self-consolidating concrete which flows freely (through the use of chemical admixtures) so mechanical consolidation is not needed○ Roller compaction is a simpler and more cost-effective technique that is suitable for roads and very large mass concrete structures such as dams. A specialized vehicle with a heavy roller on the front is driven over the fresh concrete to drive it into place and remove excess air.
4. Finishing	<ul style="list-style-type: none">○ For concrete floors and pavements, the appearance, smoothness, and durability of the surface is particularly important.○ Finishing refers to any final treatment of the concrete surface after it has been consolidated to achieve the desired properties. This can be as simple as pushing a wide blade over the fresh concrete surface to make it

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	<p>flat.</p> <ul style="list-style-type: none">○ Floating and troweling is a process of compacting and smoothing the surface which is performed as the concrete is starting to harden. This is standard procedure for driveways and sidewalks.○ After concrete has hardened, mechanical finishing can be used to roughen the surface to make it less slippery or to polish the surface as a decorative step.
5. Curing	<ul style="list-style-type: none">○ Once concrete has been placed and consolidated it must be allowed to cure properly to develop good final properties.○ Proper curing of concrete generally comes down to two factors, keeping it moist and keeping it supported.○ Hydration of cement involves reaction with water. To cure properly, the cement paste must be fully saturated with water. To keep fresh concrete moist, it can be covered with plastic or damp fabric to prevent evaporation, or sprayed periodically with water.○ If hydration reactions slow or stop during curing, the cement will not gain its full strength and it will generate internal stresses that can cause cracking.

Types of Concrete Paving

<http://bowmark.ca/services/>

Type	Description
Municipal	<ul style="list-style-type: none">○ Contractors have to work with standard bidding and requisition processes○ Includes civic revitalization, new road and utility installations, road re-builds and infrastructure projects.
Residential	<ul style="list-style-type: none">○ Patios and decks, entrance ways, steps and risers, retaining walls, curbing and driveways.○ Concrete elements can enhance your property and give it a lasting and functional finishing touch.
Commercial	<ul style="list-style-type: none">○ Regular work includes curbing and mounting fixtures in parking areas, parking lots for retail sites.○ Specialty work includes high quality equipment pads.
Industrial	<ul style="list-style-type: none">○ Pavement for 18-wheel truck traffic at industrial sites such as distribution centers and warehouses, intermodal and logistics centers, manufacturing

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plants, truck stops, and big-box retail facilities are ideal locations for the use of concrete.

- There don't seem to be many contractors who advertise that they do industrial concrete paving.

3.4 CONCRETE REPAIRS

Types of Concrete Repairs

<http://absoluteconcretereпа-px.rtrk.ca/services.htm>

<http://theconstructor.org/concrete/methods-of-crack-repair/886/> - this website has diagrams for some of these methods

<http://www.vector-construction.com/concrete-replacement>

Note: Many paving contractors provide some concrete repair services. This is a fairly exhaustive list for a paving contractor. There are specialized concrete restoration companies who use other more intensive methods such as rebar replacement, but paving contractors typically don't go that far.

Type	Description
Epoxy Injection	<ul style="list-style-type: none">○ Epoxy injections can restore structural integrity and eliminate moisture in cracks.○ This method is ideal for repairing cracks smaller than 1/8 of an inch. Cracks can be injected from one or both sides of a concrete member, vertical and overhead.○ Similar to urethane injection, epoxy injection allows the resin to migrate and fill all tributaries (micro cracks) using high-pressure injection to restore structural integrity.
Urethane Injection	<ul style="list-style-type: none">○ This method is used to stop water ingress through cracks in below grade, floor, vertical and overhead concrete repairs, and will repair all different sizes of slab depth.○ The ideal repair method for water ingress in cracks smaller than 1/8 of an inch because of the urethane resin's ability to migrate and fill all tributaries (micro cracks) that exist within the larger crack itself.
Stitching	<ul style="list-style-type: none">○ Stitching involves drilling holes on both sides of the crack and grouting in U-shaped metal units with short legs (staples or stitching dogs) that span the crack.○ Stitching may be used when tensile strength must be re-established

	across major cracks.
Overlay & Surface Treatments	<ul style="list-style-type: none">○ Fine surface cracks in structural slabs and pavements may be repaired using either a bonded overlay or surface treatment if there will not be further significant movement across the cracks.○ Unbounded overlays may be used to cover, but not necessarily repair a slab.○ Overlays and surface treatments can be appropriate for cracks caused by one-time occurrences and which do not completely penetrate the slab.
Additional Reinforcement	<ul style="list-style-type: none">○ Involves inserting reinforcing bars and bonding them in place with epoxy○ Process: sealing the crack, drilling holes that intersect the crack plane at approximately 90 degrees, filling the hole and crack with injected epoxy and placing a reinforcing bar into the drilled hole.○ The reinforcing bars can be spaced to suit the needs of the repair. They can be placed in any desired pattern, depending on the design criteria and the location of the in-place reinforcement.
Slabjacking	<ul style="list-style-type: none">○ Slabjacking is useful for repairing sunken concrete○ Involves drilling holes through the concrete and pumping slurry under it to lift the concrete until it is even. The holes are then filled to resemble the slab as closely as possible
Removal & Replacement	<ul style="list-style-type: none">○ Replacement is necessary when concrete displays deep, widespread cracks, sunken slabs, frost heave or excessive spalling or pitting on the surface (basically if the problem is structural or too widespread to fix with the above methods)○ Replacement is the best option for large-scale projects, weak slabs, and old concrete○ Involves breaking up and removing the entire concrete slab and pouring new concrete in its place○ Contractors also provide hauling and disposal services for the old concrete

3.5 CONCRETE RESURFACING

Resurfacing Process:

<http://www.homeadvisor.com/r/concrete-resurfacing/#.V-06luYyWVM>

Steps	Description
1. Cleaning	<ul style="list-style-type: none">○ The old surface is washed with a power washer to get rid of dirt and grime.
2. Repairing the Cracks	<ul style="list-style-type: none">○ Cracks are primed, reinforced with fabric, then covered with a polymer concrete that is smoothed out evenly with the rest of the concrete surface.
3. Repairing the Holes	<ul style="list-style-type: none">○ Holes are filled in with an epoxy mortar.
4. Covering the Surface	<ul style="list-style-type: none">○ Once all the repairs are made, the surface is primed, then covered with a spray-on polymer concrete, which is then finished with a trowel.
5. Colouring and Sealing	<ul style="list-style-type: none">○ Decorative colouring is then applied, if you want it, and a seal coat that will protect the new surface from the elements.
6. Curing	<ul style="list-style-type: none">○ Then, you wait. Plan on not using the new concrete surface for 48-72 hours while the surface dries completely.

4. RELATED SERVICES

Note: Many paving contractors offer services related to pavement in order to be more of a “one-stop-shop”, as these services are necessary for pavement maintenance

4.1 EXCAVATION

<https://burnabyblacktop.ca/our-services/excavation-grading/>

<http://www.catmanduexcavating.ca/our-services/excavating>

- Most paving companies offer pavement removal for old, damaged pavement so they can proceed with a new installation.
- Since they have the equipment for removing pavement, contractors tend to offer excavation services for other projects such as repurposing an area for a green space.
- Excavation services include:
 - Earthwork
 - Backfilling

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- Fine grading
- Ditch work
- Concrete & asphalt breaking / removal

4.2 HARDSCAPING

<http://danwaypaversllc.com/>

- Pavement contractors can lay pavement for permanent landscape features like patios, decks, paths, and retaining walls.
- Hardscaping provides the framework for plants and other elements
- Tends to involve interlocking pavers, natural stone, asphalt and concrete
- Also involves grading and excavating
- Contractors may be certified with the ICPI (Interlocking Concrete Pavement Institute)

4.3 GRADING

https://en.wikipedia.org/wiki/Grading_%28engineering%29

<https://en.wikipedia.org/wiki/Grader>

<http://excavatingtips.com/excavating-tips/what-is-grading-of-land/>

https://en.wikipedia.org/wiki/Cant_%28road/rail%29

- Grading is the work of ensuring a level base, or one with a specified slope, for construction work such as a foundation, the base course for a road or a railway, or landscape and garden improvements, or surface drainage.
- Grading is used by construction contractors to level soil or material for base use of buildings, and roadways, parking lot bases, driveway bases, and sub grade bases.
- The earthworks created for such a purpose are often called the sub-grade or finished contouring
- Grading is often done using heavy machinery such as bulldozers and excavators to roughly prepare an area, and a grader for a finer finish.
 - A grader is a machine with a long blade used to create a flat surface – this is the finish grade
 - On paved roads, graders are used to prepare the base course to create a wide, flat surface upon which to place asphalt.
 - Graders are also used to set native soil foundation pads to finish grade prior to the construction of large buildings.
 - Graders can produce inclined surfaces, to give cant (camber) to roads. The cant or camber of a road refers to the change in height between the two edges. This provides for banked turns which allow cars to maneuver through curves more easily.
- Proper grading of the area before starting a project is a key way to ensure that water won't pool in certain areas, or run towards garages and houses causing damage.

4.4 DRAINAGE INSTALLATION

<https://burnabyblacktop.ca/our-services/drainage-installation/>

<http://www.rvapaving.com/drainage.html>

<http://www.fordasphalt.com/parking-lot-drainage/>

<https://en.wikipedia.org/wiki/Berm>

General

- Having the proper drainage incorporated with your paving project is an essential part of effective pavement maintenance.
- Water accumulation on or around your driveway, walkway or parking lot can cause premature wear and tear.
- The presence of standing water on the parking lot surface is not good. Standing water can promote early deterioration and failure. Small cracks become larger cracks and subsurface erosion, which starts small, builds over time.
- Contractors who provide drainage services will usually improve drainage of an existing installation and do overhauls/install new drainage solutions for damaged parking lots or driveways

Signs You Have a Drainage Problems

- Pooling/standing water
- Water running down the middle of your paved surface
- Sand, rocks or what looks like a dusty residue in low spots across your paved surface (this is a result of water breaking down your asphalt and carrying the sand and silt from the asphalt with it)

Drainage Installation/Improvement Solutions

Note: Paving companies tend to be vague on the types of installation they install, and they all seem to have their own definition of what it entails. These are some possible options.

- Re-grading the surface to slope enough to force water to run towards drainage systems
- Taking the collected water to proper drains. This can be done by placement of new catch basins or trench drains. In some situations, berms can be an effective means of “steering” water away from problem areas and avoiding the problem to start with. Berms are raised barriers that control erosion and sedimentation by reducing the rate of surface runoff.
- Installing a plastic, stainless steel or concrete trench
- Installing curbing to direct the flow of water out of the paved area

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- Installing drains and inlets throughout the paved area

4.5 WINTER SERVICES

<http://www.curtispaving.com/services/salting--snow-removal>

- Common winter services provided by paving contractors include snow plowing, snow removal and de-icing
- Ensures driveways, walkways and parking lots are properly taken care of
- Prevents lawsuits and liability claims in the event that someone slips and falls on your property due to an icy sidewalk or parking lot
- Paving companies are trained and equipped to preserve pavement surfaces while providing effective ice and snow removal

4.6 LINE PAINTING

<http://www.procoatbc.ca/strata-parking-lots-and-line-painting.html>

- Not only do you need to keep your parking lot in good repair for reasons of client safety, but it's also crucial to maintain crisp, neat parking lines to ensure safe, orderly parking.
- No matter how good the initial paint job, parking lot lines will fade over time. Restriping should be a part of your parking lot maintenance in order to maintain the lot's safety and aesthetic.
- Many factors contribute to parking lot line fading including traffic flow and weather. It's important to remember these factors when considering a parking lot line painting routine.
- On average, restriping your lot every 12 to 18 months to keep the parking lot lines looking bright and visible is recommended.