INDUSTRIAL PHOTOGRAPHY

Considerations | Practices | Approaches

Lisa Sookraj

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1 Purpose

Guide Overview

This manual will assist photographers looking to move into the nuanced niche of industrial photography. The information compiled here includes guiding principles, approaches, and considerations that apply to this area of specialization. It is assumed that the photographers using this guide have experience in other areas of photography and possess a basic knowledge of photography concepts (such as lighting, composition, and equipment specifications).

When to Use This Guide

Photographers should consult this guide when:

- Preparing to practice.
- Planning requirements for an upcoming project.
- Scouting subjects and locations.
- Purchasing equipment.
- Shooting.

While certain equipment brands or models recommended by professional photographers are mentioned, you are encouraged to do your own research. Ask fellow photographers, read reviews and articles from respected professionals, and post questions in forums.

This manual will not go into great detail on matters of lighting and composition that photographers should already be aware of. It will also only touch briefly on how to pursue a career in industrial photography. Note that tips that apply to finding work in any business, including other forms of photography, apply here as well.

This guide serves as a comprehensive starting point, but there is a wealth of supplementary information available online. Links to useful resources can be found in the Resources section of this guide.

Skillset

An industrial photographer must be a professional with strong communication skills, both through the lens and otherwise. You must be able to think on your feet, solve problems, and communicate well through the lens and with your clients. Depending on the locations you find yourself shooting at, you may also need to invest in specialty equipment and practice ahead of time to familiarize yourself with it.

The next page features a list of skills and personality traits required to succeed as a photogr-pher. This information is taken from My Majors' photographer career profile.

Valuable Photographer Skills

- Active listening.
- Speaking.
- Social perceptiveness.
- Service orientation.
- Complex problem solving.
- Judgment and decision making.
- Time management.
- Coordination.
- Critical thinking.
- Active learning.
- Reading comprehension.
- Monitoring.
- Instructing.
- Writing.
- Persuasion.
- Management of personal resources.
- Operations analysis.
- Learning strategies.
- Negotiation.

Knowledge Area Assets

- Customer and personal service.
- Sales and marketing.
- Computer and electronics.
- Fine arts.
- English language.
- Communications and media.
- Psychology.
- Administration and management.
- Economics and accounting.
- Production and processing.
- Design.
- Clerical.

Important Activities

- Thinking creatively.
- Selling or influencing others.
- Establishing and maintaining interpersonal relationships.
- Getting information.
- Using and obtaining relevant knowledge
- Judging the quality of things.
- Inspecting, identifying, and monitoring.
- Guiding, directing, and motivating.
- Making decisions and solving problems.
- Communicating with people.
- Processing information.
- Organizing, planning, and prioritizing.
- Performing physical activity.
- Developing objectives and strategies.
- Estimating quantifiable characteristics.
- Handling and moving objects.
- Monitoring and controlling resources.
- Resolving conflicts and negotiating.

Work Styles

- Dependability.
- Attention to detail.
- Cooperation.
- Adaptability/Flexibility.
- Self control.
- Integrity.
- Stress tolerance.
- Persistence.
- Initiative.
- Concern for others.
- Independence.
- Leadership.
- Social orientation.
- Analytical thinking.

2 Context

Industrial Photography Overview

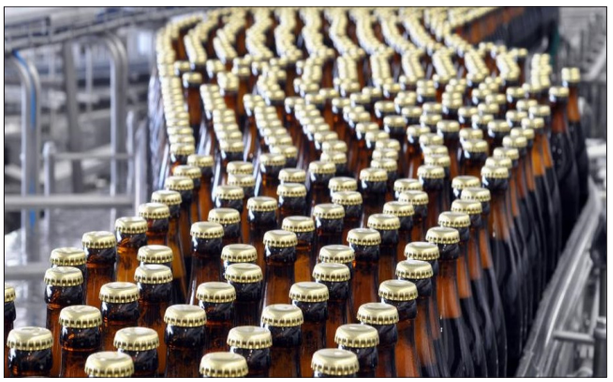
Industrial photography captures corporate, industrial, and manufacturing environments, depicting any related situation or outcome a company wants to show their audience.

Industrial photography is used in three categories of industry, but predominantly the first two.

- Primary: steel mills.
- Secondary: metal components (like screws, nuts, and bolts).
- Tertiary: retail (products made with steel, like tools, auto parts and vehicles).

Photographs of industrial locations (warehouses, plants, or factories) give the audience a behind the scenes peak at production, effectively promoting a company's products and services. Businesses use these images to communicate with customers and other businesses, showcasing their industrial process, machines, and techniques.

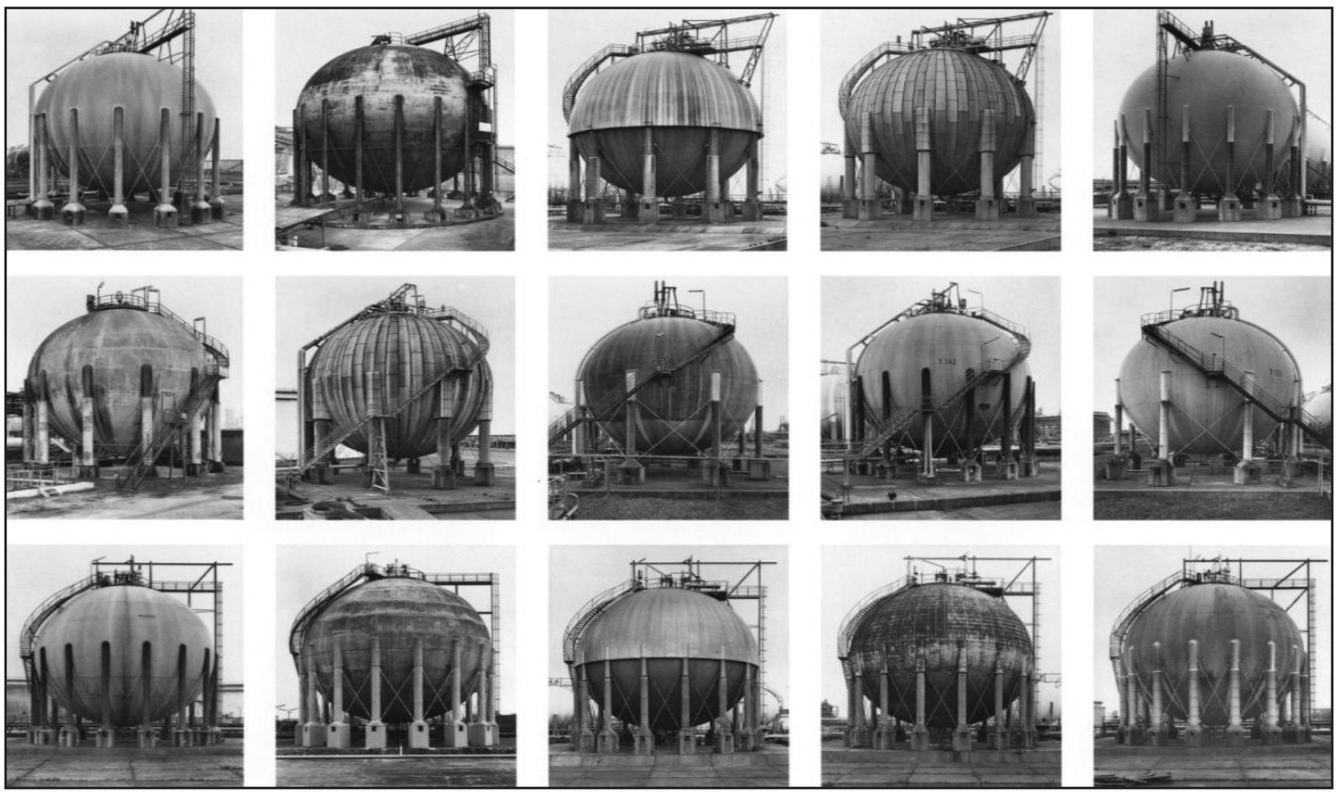
As an industrial photographer, you may be tasked with producing an individual image, or a series of images that document a full process.



These images may be used in reports, brochures, presentations, catalogues, books, magazines, and in digital formats like websites.

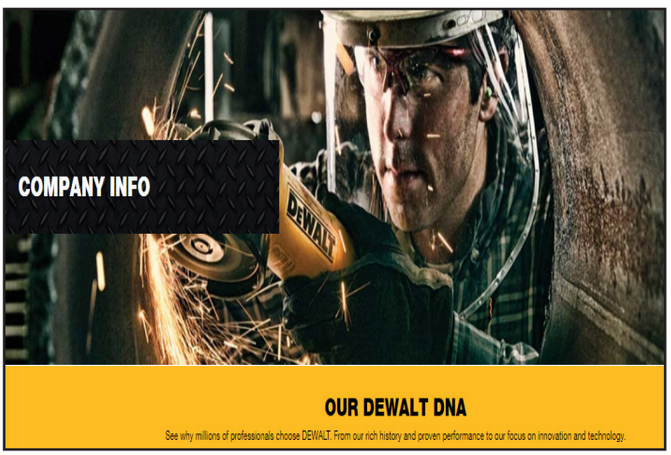
History

Industrial photography's roots are in 19th century vernacular photography. Photos were taken for archiving purposes, capturing creations and processes without interpretation. Photographers were amazed by the repetition of forms in structures and machines throughout the industrial revolution.



Industrial photography depicted how workers and machines worked together. This evolved into modern interpretive photography, which captured the feel of an environment.

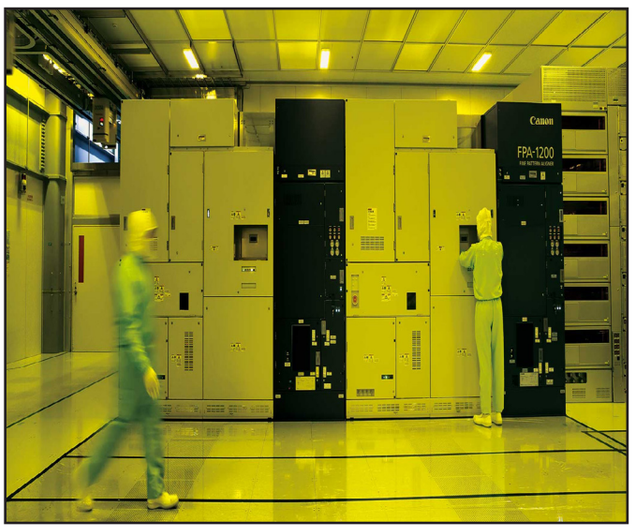
Industrial photography today is even more conceptual; industrial photos tell a story, often to sell an idea.



Subjects

Industrial photography subjects can be anything related to a company's products, facilities, infrastructure, ambiance, or its employees—especially those involved in manufacturing sectors. Work largely takes place on location. Products may be shown alongside related elements. Industrial subjects offer stark material. Images can be gritty, visceral, and raw, or polished and beautiful.

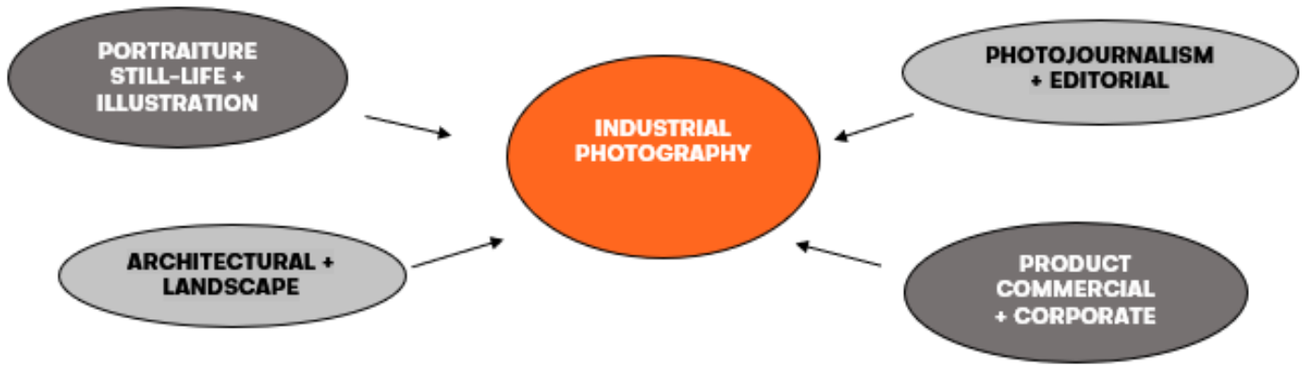
See the images throughout this manual and the websites mentioned in the Resources section of this guide for examples.

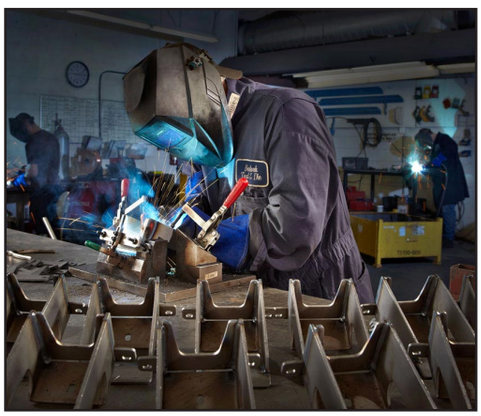


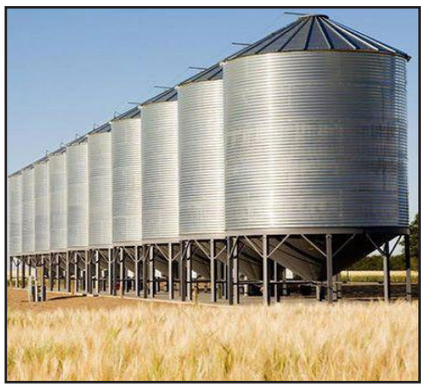
Cross-section

Industrial photography involves skills from other areas of photography. It also presents a myriad of unique challenges for a photographer, including safety concerns, specialized equipment, and bustling environments that require a photographer to think fast and solve problems. The pay off is both exciting and satisfying. If you manage to master the art of industrial photography, you will be well-equipped to excel at any other type of location work.

The link between industrial and architectural photography is no surprise, but industrial images also tell a story like editorial images. Portraiture plays a role too, as industrial images may be portraits of employees or feature them for scale, interest, or to convey a sense of active productivity in a facility.







Types of Shots

Industrial photographers produce four main types of shots:

- On-site.
- Product.
- Portrait.
- Architectural.

Industrial photography shares much with corporate, product, and commercial photography today. Photos are often taken on-site and intended for advertising, promotion, or technical documentation purposes.

The photographer must understand the client and their needs so they can accurately communicate the correct corporate values or marketing messages.

3 Projects

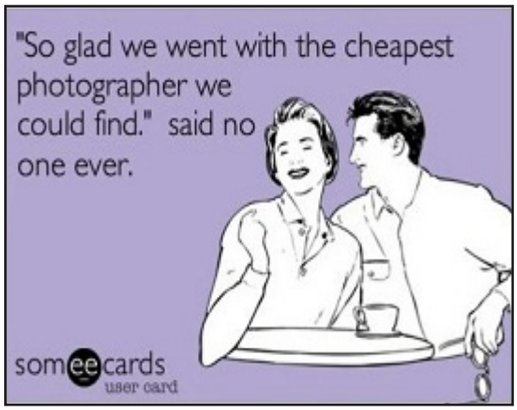
Initial Considerations

Preparing questions and answers is key when considering a new project. You will need to ask who, what, why, when, where, and how. Other common questions and considerations are listed in the table below.

GENERAL: TIPS + ETIQUETTE	▪ Be polite and diplomatic. ▪ Take care and be diligent. ▪ Consider what is safe and unsafe to do. ▪ Be aware of personal and assignment limitations.
CONCEPT: QUESTIONS TO ASK YOURSELF	▪ Is the concept interesting to you? ▪ Is it a good learning opportunity? ▪ Will the project look good in your portfolio?
CONCEPT: ANSWERS TO PREPARE FOR CLIENT	▪ Will their concept work? ▪ Is their concept good? ▪ Can you achieve the results they have in mind? ▪ What ideas do you have to contribute?
TIME + COST: ANSWERS TO PREPARE FOR CLIENT	▪ How long will the project take? ▪ How much will the project cost? ▪ When can they have the finished product?

Estimating Time and Cost

Market your skills competitively but work within reason. When providing time and cost estimates, be conservative while offering a reasonable rate.



Plan to deliver the project as fast as you can. Gain a solid understanding of your client, their needs, and their project schedules, then factor in some lee-way. Being able to provide accurate time estimates comes with experience.

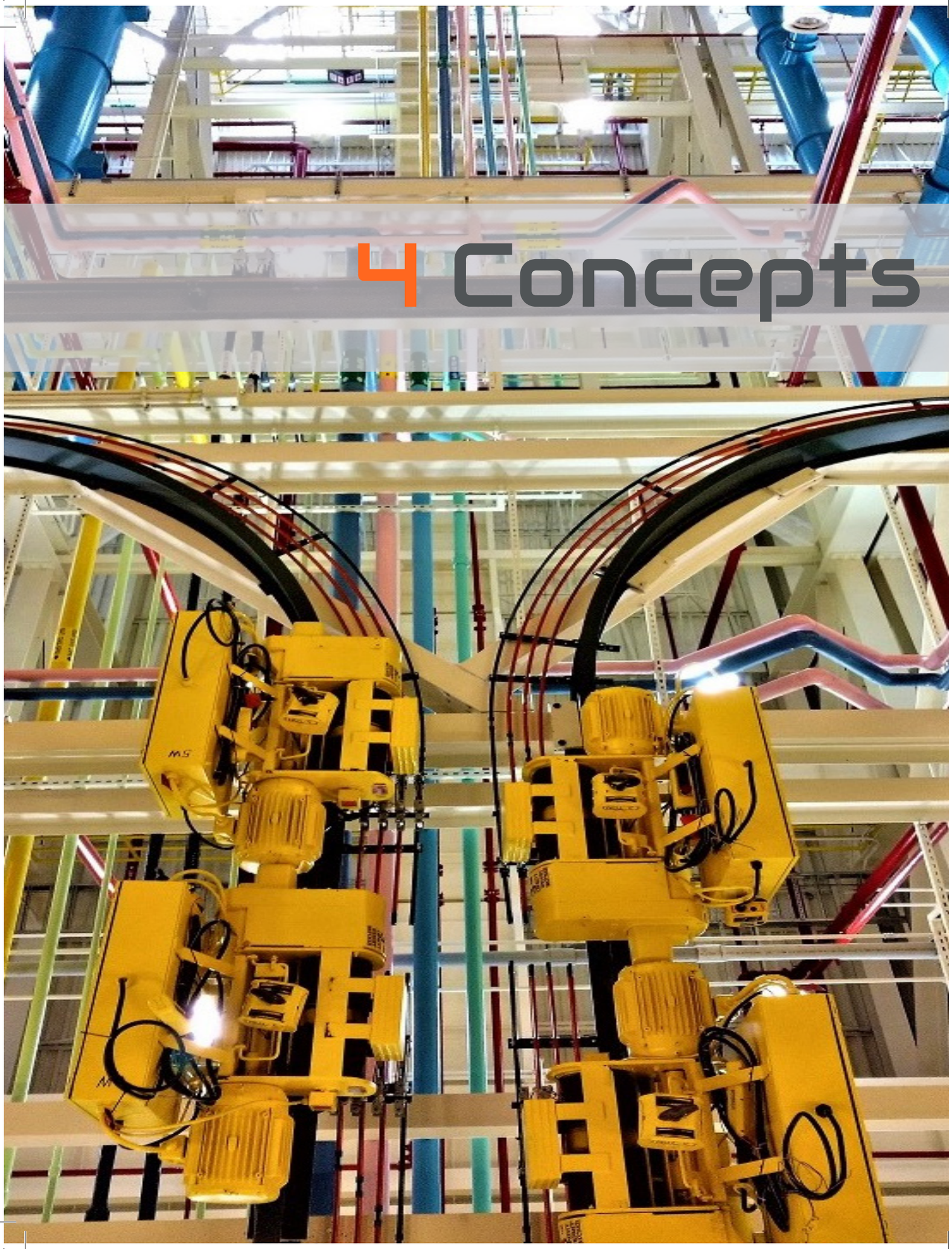
Determine if the budget is appropriate for the project. If the budget is too small, strategize and discuss concerns with the client. Your experience level will also influence your rate.

Preparing for the Shoot

The key to a good shoot is learning as much as you can in advance. Pre-visualizing and planning make for better shots.

Try to scout the location ahead of time. Factor scouting into the budget and time frame when negotiating your contract. If this is not an option, ask your client for shots of the location. Considering the questions on the next page will help you understand project details and requirements so you can overcome obstacles in advance.

CONCEPT + AUDIENCE	What do your images need to communicate? Is it about the company, product, service, and/or employees?	▪ Clarify what the desired statement is. Your photos must make it directly or indirectly. ▪ This may be to show what a product is used for or to promote or sell a product or a company's capabilities
	Who is the target audience?	▪ Who will the images be shown to? ▪ Who are the images intended for? ▪ This may include buyers, users, and/or stakeholders.
	How will the images be used and distributed?	▪ Determine the context of use. ▪ This may be a combination of digital, printed, projected, or reproduced at different sizes.
KEY CONTACTS	Who will be your on-site contacts?	▪ Who should you seek upon arrival? ▪ Ensure the right people are informed (site manager, client, employees).
	Will you have everyone's co-operation?	▪ Employees should be willing and able to offer information and assistance.
SITUATION + LOGISTICS	What are you allowed to do/move?	▪ What are you NOT allowed to do/move? ▪ Ensure the subjects that you need will be available to shoot.
	Will subjects/shooting areas be clean?	▪ Ask if you'll need to assist with cleaning or work around messes.
	What permits and clearance will be required?	▪ Ensure permits and clearances are requested in advance and ready upon your arrival.
	What kind of electricity is available on site?	▪ Determine if the voltage is stabilized. If not, it can blow out your lighting equipment. Bring grounded adaptor plugs and voltage converters if necessary.
	What problems can you expect to find?	▪ What problems can you expect to find? Clarify the specifics of the shoot.

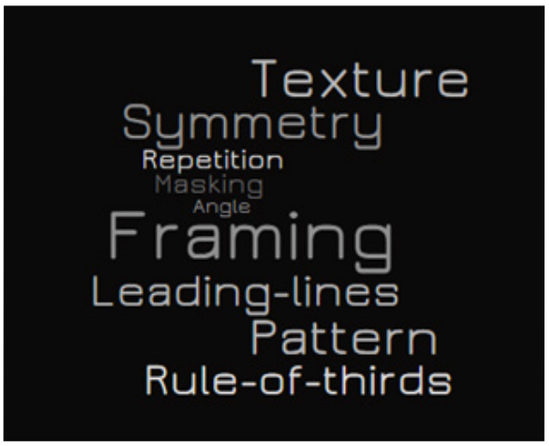


4 Concepts

Composition

A client may ask you to make a subject look clean and marketable (for advertising purposes) or realistic and gritty (for safety or training purposes). Either way, you must have a watchful, patient eye to create a dynamic portrait of industry at work.

The typical composition rules of photography apply to industrial images. Industrial subjects often make it easy to arrange a compelling image, full of angles, texture, leading lines, pattern, repetition, and symmetry.

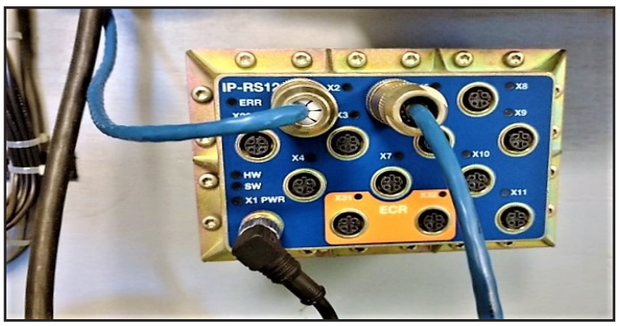


Composition Tips

- Look for traditional, bold, powerful compositions based on thirds or symmetry.
- Create a narrative.
- Capture everything relevant.
- Pay attention to detail.
- Be creative and use angles to create dramatic shots.
- Ensure policies and procedures are followed in your images (e.g. employees are wearing the required personal protective equipment—also known as PPE).

Macro Photography

An industrial photographer must be able to obtain the best viewpoint. Miniature details of components like technical hardware, electronics, or machine parts complement bulky machines and messy surroundings. Extreme close-ups of tools at work are also compelling. Closeup and macro photography skills are valuable when working with such subjects. To take these shots, you may need a macro lens and equipment like ring flashes in your kit.



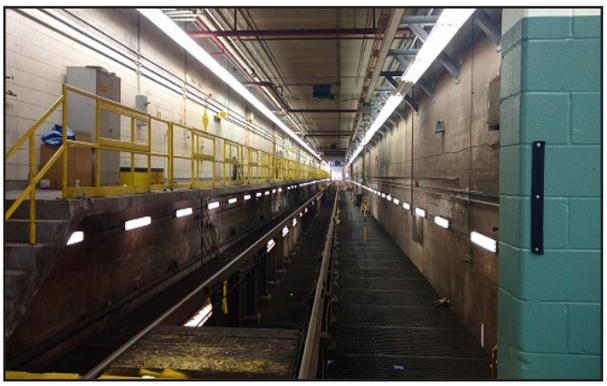
Tripod Use

Clarity is key in industrial photography. Blurriness is a novice error. Tripods are essential to capture architecturally straight lines, which look odd if the camera is even slightly tilted. If you don't have a tripod, find something perfectly level to place your camera on.

- Use a tripod to avoid camera shake.
- Make sure the tripod doesn't limit your perspective.
- Use a remote shutter release (or self timer) for even more stability.

Be Unique

Industrial settings often involve fine details, massive scale, and interesting interiors. Shooting could involve all of a photographer's equipment. However, like architectural photographers, industrial photographers should create a unique style for themselves using limited methods. Try shooting a variety of subjects using one of the approaches below.



- Choose a specific angle to shoot from.
- Create a sense of expansive space.
- Work with reflective surfaces.

Industrial photographers must find ways to bring intensity to reality and the mundane. They must interpret subjects in a way that creates drama and interest. Images must not only be polished with balanced hues and highlights, but also effectively convey meaning instantly.

Use wide-angle lenses and backlight or seek detail and abstraction to create interest.

Lighting

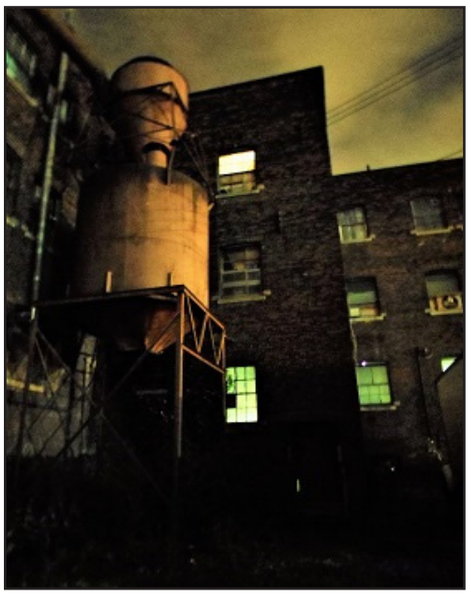
Powerful images combine texture, tone, and shadow with dimensional character. Highlights and shadows give depth to an image. Subjects must be lit with directional light. For indoor industrial shoots, you can often work with ambient light combined with one light component for fill. Invest in your own light stands but rent a lighting kit along with a battery pack.

- Powerpack systems allow you to split output symmetrically or asymmetrically among attached flash heads, bias to certain lights, use others just for fill, or distribute an even load to all lights.
- Light banks provide a controllable diffusion pattern, enclosing light on all sides. They control spill light better than umbrellas. Use light banks for larger subjects and portraits.

Low-light

Consider the following when evaluating lighting.

- What kind of light is there?
- When is the best time to take the photo?
- What gear do you need? (e.g. tripod, flash, fast lens, flashlight).



When light is limited, it's important to let as much of it in the lens as possible. Use a wide aperture or a low f-stop and a wide lens, if possible.

Low-light conditions usually require slow shutter speeds. Use manual modes for full control or shutter priority mode, which automatically chooses the right shutter speed for your shot and selects the remaining settings.

Flash

Mixed light in factories is problematic when shooting with film. However, digital cameras shoot at 200–400 1SO, which allows you to mix available light with flash. You can use your camera's auto white balance to solve mixed lighting issues.

Adjust your flash using your camera's manual mode. If you have a pop-up flash, adjust it to half power or 1/16 to eliminate the dreaded flash-look.

Shoot towards existing light sources. This prevents your background from turning all black. Experiment with hot-shoe flash by tilting it towards a wall or ceiling.

Use flash to recreate the effect of daylight. There is a lot you can get away with without making the light look unnatural. You can recreate the effect of light coming in through a window or sunlight on a subject, even if you're shooting inside at night.

Natural Lighting

Try to shoot in natural light, even inside. Natural light exposes ambient natural colour and tone. Artificial light is difficult to use for photographing large machines, which are often made out of reflective materials (like glass and steel). To achieve optimal lighting in your images you must find the right amount, quality, color, and angle of light appropriate for each image.

Take photos on overcast days. This minimizes reflection. Full-cloud cover acts like a large soft box, creating even lighting without harsh shadows.

Shoot in the early morning or late afternoon. The sharp lines of an industrial subject, like a plant or factory, can be softened against the rising or setting sun.

Avoid shooting on full-sun days. Over-head sun produces harsh daylight, resulting in flat, colourless images.

Movement

Capturing movement is another way to create interest. An expert will photograph a conveyor belt and generate interest by highlighting specific areas and blurring out the background. For moving machines or people, use a slower shutter speed to capture movement. This creates a busy, productive feel (moving objects will be out of focus, and still objects will remain clear). If you need a frozen, detailed shot of moving subjects, use a faster speed, a higher ISO setting, and a fast lens.

Reflective Surfaces

You will often shoot subjects that are glass or metal. Shiny surfaces such as glass will reflect anything that stands in front of them, including the light source itself. The goal is to use reflection to brighten subjects and capture shimmer and shine. To do so, you must make the light source visually appealing and allow it to reflect off the desired spot of the subject while exposing its tone and colour.

Unwanted glare and shadow on reflective subjects will need to be edited out of your photos, but there are steps you can take to prevent them in the first place. Set up your lights so they do not reflect off your subject and if you must use camera flash, use a diffuser to soften the light.

With heavy indoor lighting, use diffusion panels or a light tent to minimize glare and reflection. Outdoors, choose the right time of day. Additional resources on how to shoot reflective surfaces can be found in the Resources section of this guide.

5 Preparing

Safety Considerations

Industrial settings and subjects often come with hazards. Make sure you understand all the following safety precautions prior to setting up for your industrial shoot.

RESTRICTIONS	▪ What you are and are not allowed to do. ▪ Know what distance you must keep from certain subjects. Clicking the shutter creates static electricity, which can cause an explosion. ▪ In certain settings (e.g. gas industry, terminal, station, or plant) ask for a safety engineer to brief you.
MACHINES	▪ Understand the machines on site. ▪ Ask what machines do, how they work, what safety measures to follow, and how to avoid accidents during the shoot.
ATTIRE	▪ Ask what protective gear you must wear. ▪ This may include a safety vest, hardhat, protective eye wear, gloves, and/or steel-toed boots. ▪ Do not wear sneakers or dress shoes. ▪ Ask if there are special clothing requirements. ▪ Otherwise wear long pants and a plain 100% cotton (fire-resistant fabric) t-shirt in a bright colour like orange. Do not wear black or grey.

Obtaining Information

1. Make your presence known by announcing your arrival.
2. If you've determined you need cleanup crews, models, or an art director, connect with them, and determine if there are any additional contacts you should connect with (e.g. floor supervisor).
3. Obtain all necessary clearance passes.
4. Review the assignment's parameters.
5. Confirm that what you're scheduled to shoot is accessible.
6. Understand production schedules.
7. Confirm all safety regulations and precautions to take.
8. Obtain and wear the appropriate PPE.
9. Confirm the electricity, voltage, and socket situation.

Setting Up

Once you've obtained all the necessary information, you can proceed with setting up for your shoot.

Evaluating Shooting Locations

1. Walk through the location to view/find shooting locations.
2. Block off shooting areas if necessary.
3. Obtain equipment to gain vantage points (forklifts, cranes, drones) if necessary.
4. Evaluate lighting (and weather, if applicable) conditions.
5. Determine if anything needs to be cleaned or moved.

MESSY AREAS

Take a shot before you start shooting so you can easily restore things to how you found them. If you won't have time to clean up after, consider the following options:

- Try to find a cleaner area to shoot in.
- Ask if the area can be cleaned and return to it later.
- See if you can cover the messy area (e.g. build a wall of products in front of it).

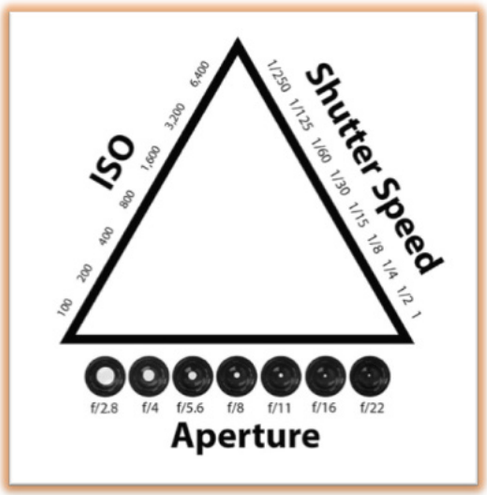
Setting Up Equipment

1. Set up your equipment: laptop, camera, lighting, and powerpacks.
2. Tape down extension cords and electrical wires.
3. Ensure that all of your equipment works and that you have ample power (bars and batteries).
4. Arrange compositions and adjust your camera settings.
5. Take test shots, evaluate, and make necessary adjustments. See the Taking Test Shots procedure in the next section of this guide.

Components Overview

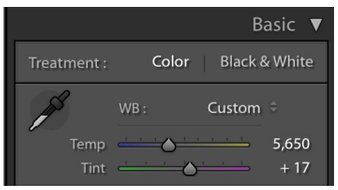
When setting up your camera and evaluating test shots, consider the following as you would with any other photography.

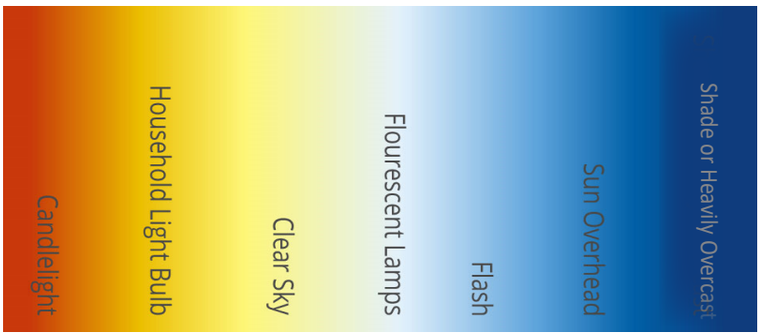
- White balance.
- Exposure triangle.
  - Aperture.
  - Shutter speed.
  - ISO.
- Focus mode (check that autofocus is working).
- Exposure compensation (use Automatic Exposure Bracketing in Continuous Shooting mode).



An understanding of these factors and settings is assumed, but there is a starting point summary in the Resources section of this guide.

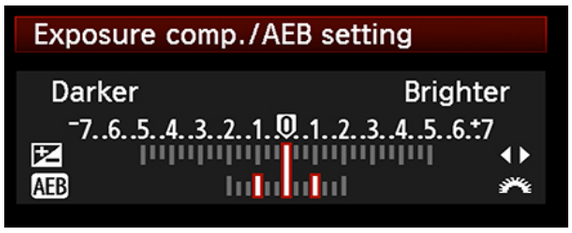
Early setup can alleviate editing hassles later. You can perform basic white balance (colour temperature), cropping, and exposure adjustments to one image, and the settings will be applied to all subsequent images. Digital technology makes focusing a challenge, so it takes some care and finesse. However, you no longer need to know as much about exposure as you once did.

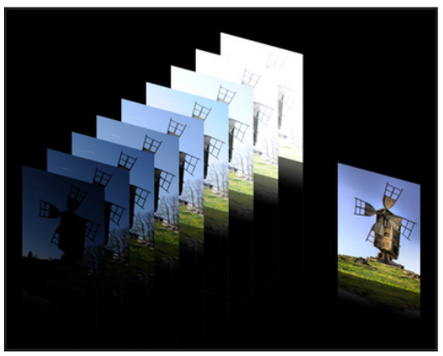




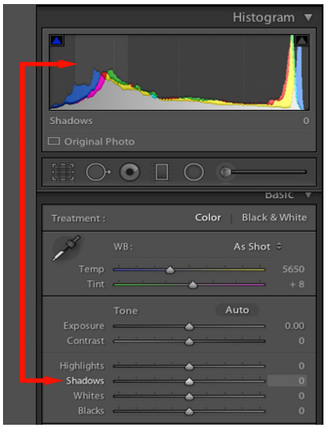
Taking Test Shots (Bracketing)

1. Arrange your composition and take test shots.
2. Ensure photos are being saved and backed up as you work.
3. Blow up test shots (to 100% or 1:1) on your laptop to check the focus and ensure that autofocus is working.
4. Evaluate white balance.
5. Evaluate exposure and light.
6. Evaluate composition.
7. Make necessary adjustments.
8. Repeat as needed.





Use your camera's Automatic Exposure Balance (AEB) function. Take several shots of the same subject using different settings. Interpret the images and associated histograms to evaluate tone, brightness, and exposure.



Noise is common when shooting with long exposures or using high ISO settings. You will find yourself doing both regularly as an industrial photographer. To reduce noise, you can try shooting at lower ISO settings and opening your aperture to its widest setting (i.e. f/2.8). You can also use your camera's High ISO Noise Reduction or Long Exposure Noise Reduction function. The camera will analyse your images and correct any pixels that have been rendered incorrectly.

Remember that you can edit out noise but can't create sharpness; blurriness is difficult to fix in editing. Shoot and evaluate several test shots at each ISO setting. Determine where noise occurs; look for colour noise, splotches of unusual color, and notable loss of detail.

While taking test shots, decide whether to fix issues physically or edit things out (as you go or in post-production). Instead of moving subjects to a new location, you might replace a background: shoot the background and subjects separately, then put them together in post-production.

6 Shooting

Workflow Concept

A photography workflow consists of the actions you take to edit your photos and share them with your client. A good workflow minimizes time and effort and prevents data loss. Effective workflows are an important part of any photography practice. Location work is more involved than studio work, so having a solid workflow is even more crucial for industrial photographers. It's never too late to establish or improve your process. Determine common problems and tasks you'll face and the best tools and techniques to handle them.

A good photo editing workflow should:

- Use the fewest steps possible.
- Allow for flexibility (e.g. unordered or re-done steps).
- Protect your images short- and long-term.
- Result in excellent looking photos.

Workflow Tasks

Capture →	Import →	Organize →	Develop →	Output
Composition	Storage	Selections	Crop/straighten	Destination?
Lighting	File naming	Ratings	Tone & Color	File settings
Exposure	Database	Collections	Sharpening	Delivery
Focus	Backups	Metadata	Remove artifacts	
			Creative effects	

Tethered Shooting Benefits

There are notable efficiency gains when you shoot tethered using a workflow-centric program like Adobe Lightroom. Transferring, importing, and backing up images all happen continually and a great deal of typical post-production (editing) can happen while shooting. The software is also designed to easily process large batches of RAW images (versus programs like Photoshop, which only handle one image at a time).

Shooting RAW

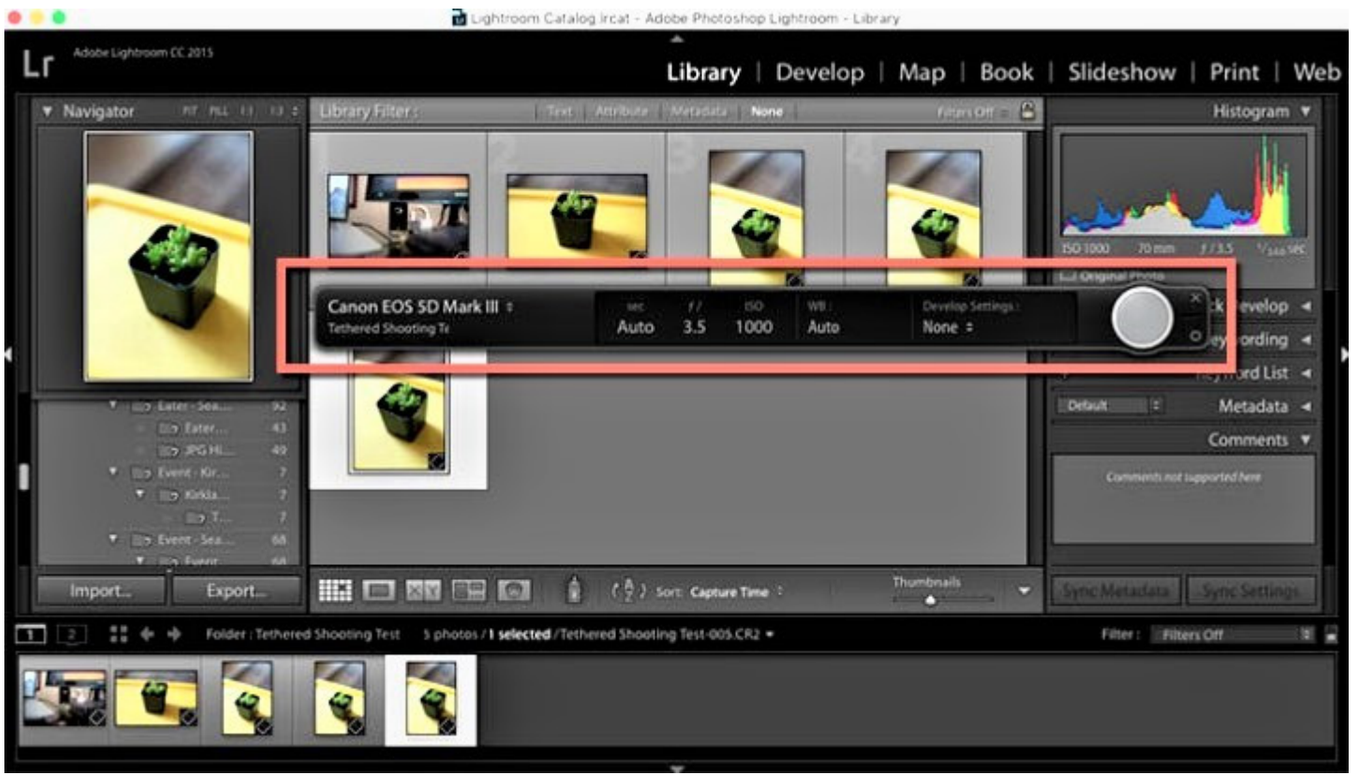
Tethering software is designed to work with RAW image files, the digital equivalent of negatives. Compressed JPEG files result in lost information. RAW files give you more control; you can correct issues that would be inaccessible in JPEGs. You won't accidentally save over your work or find yourself unable to go back to make changes to an image; you can reset to start over. Final images are more detailed with greater depth, levels of brightness, and overall quality.

Tethered Shooting with Lightroom

The quickest and easiest way to shoot tethered is by using Lightroom's Tethered Capture feature.

1. Connect your DSLR camera to your laptop using a USB tethering cable.
2. Turn your camera and laptop on.
3. Open Lightroom.
4. Choose **File** > **Tethered Capture** > **Start Tethered Capture**.
5. In the Tethered Capture Settings dialogue box enter the following information:
   - **Session Name:** specify the names you'd like associated with your photos.
   - **Destination:** folder you'd like your photos saved in.
   - **Metadata and keywords:** add these to make locating photos later easier.
6. Click **Add to Collection** > **Create Collection**.
7. Click **OK**.

A narrow control panel with several remote shooting options and Lightroom's Library (where captured photos will appear) will appear.



Cautions

- Getting too caught up in details while inspecting photos can stall a shoot.
  - Establish expectations with your client to avoid wasting time.
- Photo shoots may take longer than an hour.
  - Have extra batteries on hand and shoot near a wall socket in case you need to plug in.
- Tethering software can be finicky and prone to connection issues.
  - Have a backup plan in case of an outage.

Shooting Tips

- If you see it, shoot it—a composition can change in a moment.
- Expect the unexpected.
- Adapt to changes and the environment.
- Have all your equipment ready at all times.
- Use a variety of lenses.
- Steel subjects look best with apertures of f/8 or f/11.
- High contrast settings typically look better than normal contrast.

7 Editing

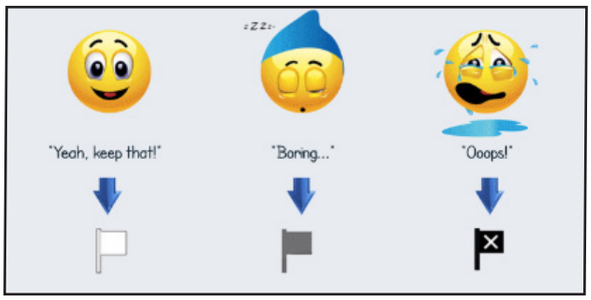
Editing Overview

Image adjustments may occur in the Develop stage of the sample photography workflow and/or during the Capture phase when shooting tethered. Photographers commonly make minor edits and cull while shooting to identify images that need more extensive editing after the shoot.

Flagging Selects

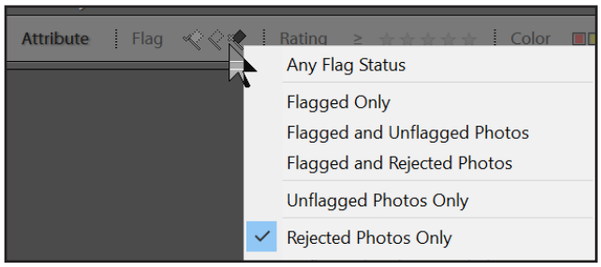
Identify selects using flags in Lightroom. Flags are set in the Library module. Flags designate photos as:

- Flagged.
- Rejected.
- Unflagged (default).



Click on a flag in the Filmstrip or Library filter bar to display and work on photos that you've labeled with a particular flag.

Note: To delete all rejects, choose **Delete Rejected Photos** from the Photo menu.



Flagging Workflow

1. Flag your favourite images.
2. Create a collection called Selects and drag your flagged images into it.
3. Narrow down your selects again.
4. Create a second collection called Images to Process for your final selects. Drag your final selects into it. These images will be in both collections now.
5. Once you process your images, create a third collection called Final and drag final edited images into this collection.
6. Remove final images from the Images to Process collection.

Note: If you have to ask, should I flag this? you're taking too long. Share and consider client input when narrowing down from selects to final (images to process) selects.

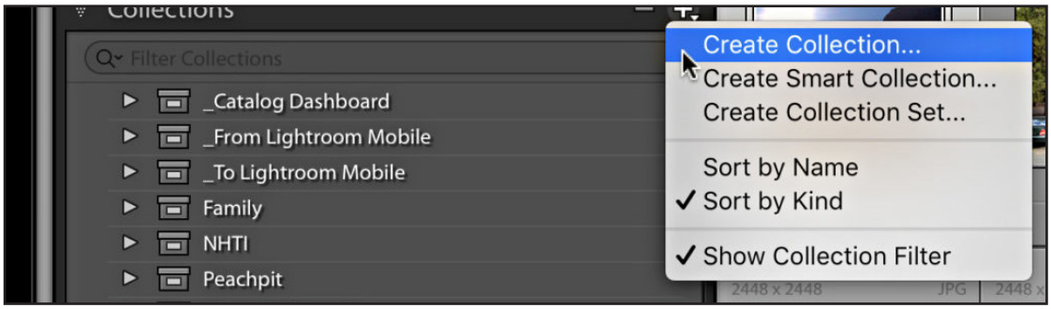
Collections

Collections are like photo albums. They allow you to get to your photos you want to see most often in just one click.

A **Collection Set** is a group of nested folders. From the Collections panel, click the plus symbol and choose **Create Collection Set**. For a collection of images from provinces across Canada, name your main collection Canada and have a nested folder for each province.

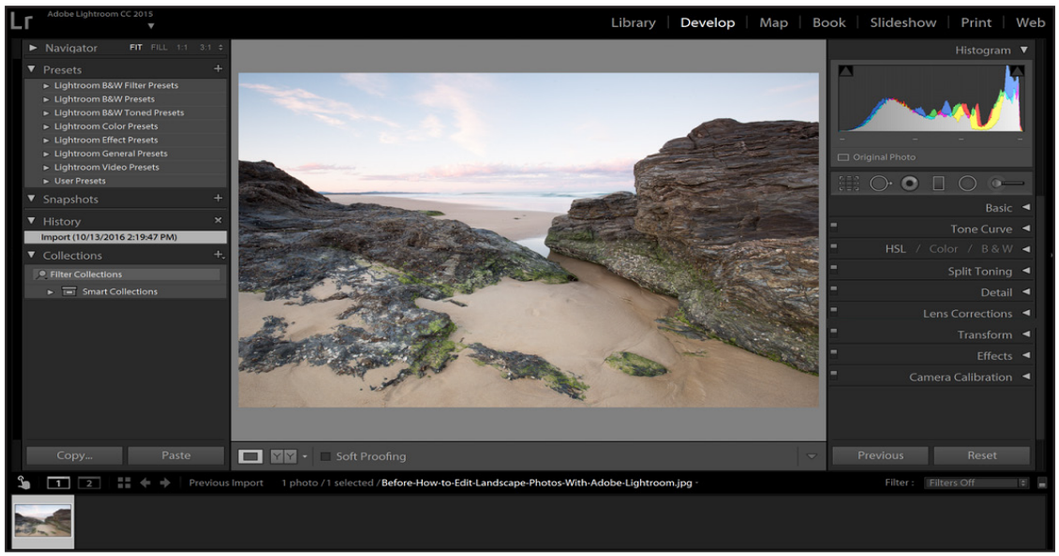
Smart Collections automatically organize themselves as key-worded images register in Lightroom. If you wanted to create a collection for macro photography, add the word "macro" into the name of your photos and Lightroom will automatically add the images to the Macro collection.

More info on selects, naming best practices, and organizing files in Lightroom can be found in the Resources section of this guide.



Applying Adjustments

While shooting tethered, use the live view on your laptop screen to review images. From your laptop you can control your camera settings, including shutter speed, aperture, ISO, and more. You can also use tools as you shoot, (e.g. masking or marker lines) allowing you to match shots easily and ensure that your composition meets specific requirements.



General Editing Workflow

The **General Editing Workflow** acknowledges a hierarchy for common image adjustments, with global adjustments preceding dependent ones.

Phase 1: Global Adjustments

1. **Crop and straighten.** Cropping is significant as it changes the composition. Crop early in the process but use a method that allows you to adjust later.
2. **Correct distortion.** Most lenses introduce some distortion to a picture. Correct distortion as one of your first steps.
3. **Adjust exposure and tones.** Tonal contrast refers to the variation between light and dark tones. Tonal range refers to the levels of brightness of each pixel, from white to black. Setting these points can have a major impact on an image, so do so before adjusting colour.
4. **Adjust white balance and color.** White balance plays the biggest role in the colour of a photo. Fix major colour cast issues before adjusting tone. Adjust tone before white balance, then make colour adjustments (e.g. saturation and vibrance).

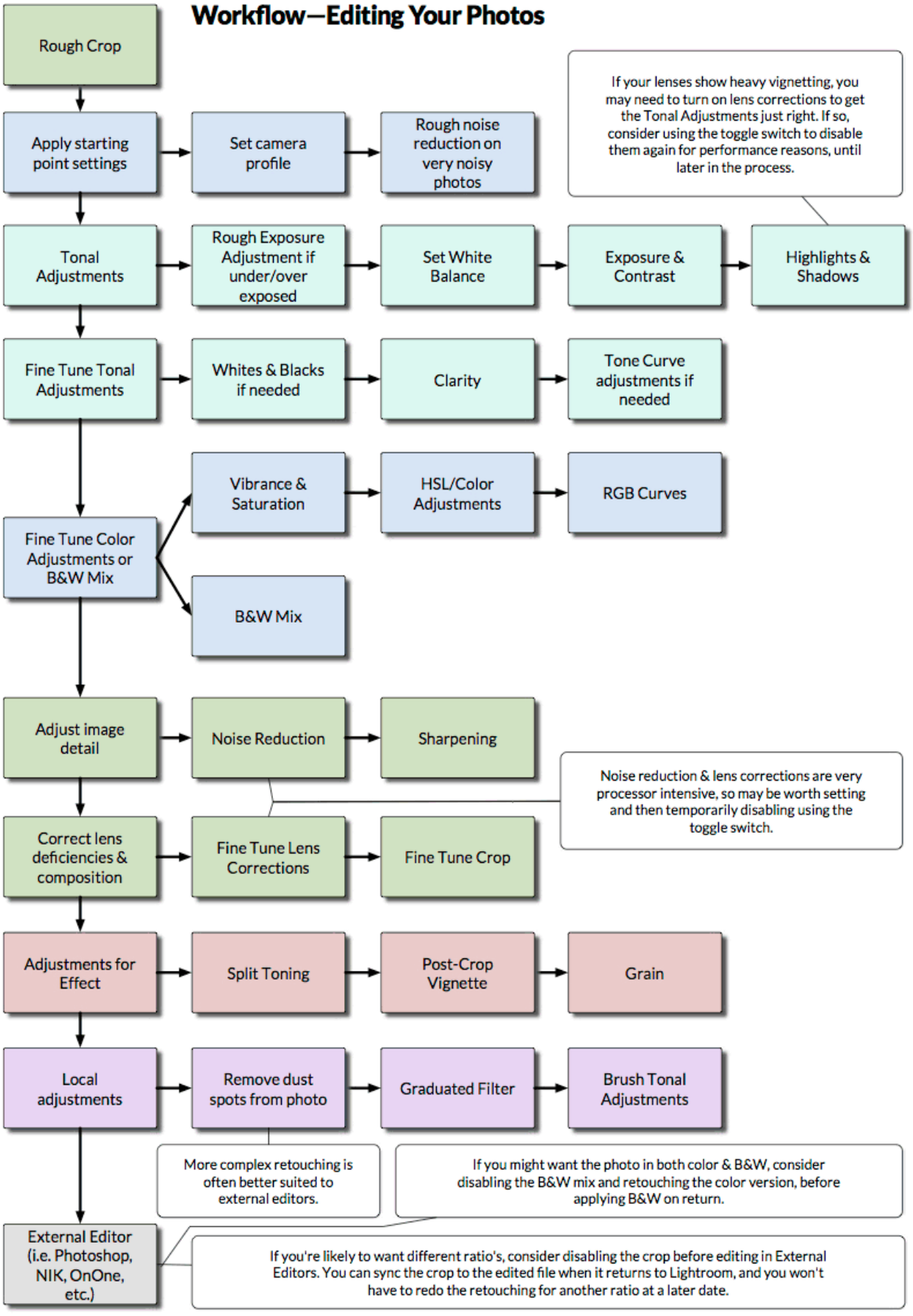
Phase 2: Selective Adjustments

These adjustments may be local adjustments or adjustments that need to be made after global adjustments. Either way, these steps should be performed later in the editing process.

1. **Apply local adjustments.** These are edits to small areas of the picture (e.g. dodging and burning, or lightening and darkening) and selective colour adjustments. Make local adjustments after global adjustments.
2. **Apply noise reduction.** Zoom in to look for noise (soft coloured blobs or grainy speckles). Photos that are significantly underexposed or taken using high ISO speeds have the most noise. Apply noise reduction after you set tone and color (which affect the appearance of noise).
3. **Apply sharpening.** Sharpening relates to contrast, the relative lightness or darkness of adjacent pixels along line edges. More contrast equals more sharpness. Zoom in to sharpen images after you've set the global tone range, because the overall contrast will impact sharpness.
4. **Perform retouching.** Retouching removes unwanted elements from an image. These may be artifacts—undesirable results of digital processing, like chromatic aberration, fringing, or sensor dust spots— or compositional elements, like unwanted objects you wish to remove.
5. **Apply special effects.** After you've corrected technical issues, consider applying further stylistic adjustments and special effects.

Lightroom Editing Workflow

The **Lightroom Editing Workflow** on the next page is a more detailed graphic representation of a workflow for editing in Lightroom. More details on working in Lightroom can be found in the Resources section of this guide and online at www.thelightroomqueen.com.


Workflow—Editing Your Photos
Rough Crop
Apply starting point settings
Set camera profile
Rough noise reduction on very noisy photos
If your lenses show heavy vignetting, you may need to turn on lens corrections to get the Tonal Adjustments just right. If so, consider using the toggle switch to disable them again for performance reasons, until later in the process.
Tonal Adjustments
Rough Exposure Adjustment if under/over exposed
Set White Balance
Exposure & Contrast
Highlights & Shadows
Fine Tune Tonal Adjustments
Whites & Blacks if needed
Clarity
Tone Curve adjustments if needed
Fine Tune Color Adjustments or B&W Mix
Vibrance & Saturation
HSL/Color Adjustments
RGB Curves
B&W Mix
Adjust image detail
Noise Reduction
Sharpening
Noise reduction & lens corrections are very processor intensive, so may be worth setting and then temporarily disabling using the toggle switch.
Correct lens deficiencies & composition
Fine Tune Lens Corrections
Fine Tune Crop
Adjustments for Effect
Split Toning
Post-Crop Vignette
Grain
Local adjustments
Remove dust spots from photo
Graduated Filter
Brush Tonal Adjustments
More complex retouching is often better suited to external editors.
If you might want the photo in both color & B&W, consider disabling the B&W mix and retouching the color version, before applying B&W on return.
External Editor (i.e. Photoshop, NIK, OnOne, etc.)
If you're likely to want different ratio's, consider disabling the crop before editing in External Editors. You can sync the crop to the edited file when it returns to Lightroom, and you won't have to redo the retouching for another ratio at a later date.

Editing Tips

Create harmonious colour.

- Use the HSL sliders in Lightroom to adjust colour hues to create harmony.
- These sliders can also be used to desaturate colors that are too dominant, which may distract from the main subject.
- Only highlight colours that are in harmony with each other. Use a color wheel to evaluate colour harmony, then desaturate or saturate colours as necessary.

Take the time to make selective adjustments.

- Make selective (or local) adjustments to specific elements to avoid applying unnecessary adjustments to a whole image.
- Use Luminosity Masks or Saturation Masks to selectively adjust the brightness, saturation, and contrast of specific areas.

Avoid applying 100% Clarity.

- Avoid pushing Lightroom's Clarity slider to 100%, especially for global adjustments. Clarity can bring out textures and details, but often does more harm than good when applied to the whole image. It adds a significant amount of noise and lowers the overall quality of the image file.
- Only apply clarity locally, as some elements in your images (e.g. landscape elements like the sky) will not need it.

Look for dust spots.

- If images will be enlarged or printed, even the smallest dust spots will be visible. View your images at 100% to look for any possible dust spots, then use Lightroom's Spot Removal Tool to remove them.
- This work can be tedious depending on how dirty your lens is. Try to keep your lenses as clean as you can at all times.

8 Saving

Saving Overview

Save your files in a minimum of two places at all times. Keep the files for the shoot in all locations you've saved them to until the project has been delivered to your client. You may also choose to save an additional copy of your files while shooting by syncing your files to save to a cloud storage host (like odrive or Dropbox). See the Equipment and Resources sections of this guide for helpful recommendations.

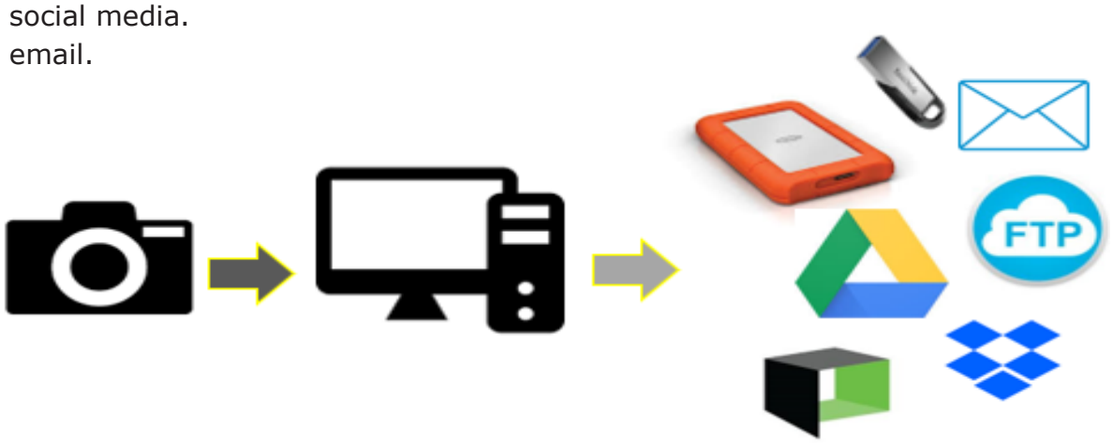
Saving Images

1. Save RAW images to your camera's memory card. **Backup #1.**
2. Transfer the images to your laptop. Image capture software, like Lightroom, will automatically do this for you as you take photos.
3. Back up the image files on a portable hard drive hourly. **Backup #2 (hard drive A).**
4. Transfer the portable external hard drive images onto a second external hard drive back at your home or office. **Backup #3 (hard drive B).**
5. Archive the images after post-production. Copy files onto a third hard drive. If possible, store this one at another location for safety. **Backup #3 (hard drive C).**
6. Deliver the files to the client.

Delivering Images

95% of clients require electronic files (versus printed photos). The delivery method will depend on the project and client. There are several digital delivery options.

- FTP (file transfer protocol).
- Your personal website's image archive.
- A link to cloud storage files (Dropbox or Google Drive).
- An external hard drive or USB drive.
- Via social media.
- Via email.



9 Equipment

Equipment Overview

Equipment is very costly. Photographers typically own tripods and other accessories but rent lighting components on a per-project basis. Build some of the rental costs into your creative fee when quoting clients for projects, as most clients will not agree to full rental costs. Do not rent all of your equipment, or the cost to the client will be too high. Certain components may only cost $50/day to rent, so do your research to determine what makes sense.

Overhead costs should be covered by the job. Start out as an assistant; once you have experience you can branch out and decide what equipment to purchase. Choose wisely when renting and investing in equipment. Ask fellow photographers for recommendations and do research (forums, reviews, and established photographers' websites online) to learn about the best models and brands to fit your budget.

Brands like Canon and Nikon offer bundles which include the camera body, lenses, and other accessories. Look for components that are compatible, compact, lightweight, designed well, and offer solid performance.

Camera and Lens Choices
Nicholas Ghouldhurst, Industrial Photographer

- Two DSLR cameras
  - Canon EOS 5D Mark III cameras.
- L series 300 mm lens.
  - With a wide aperture, this lens works well to capture employees in action framed against a blurry background or moving machinery in the distance.
- L series 24–105 mm lens.
  - Has many uses. Shooting up close with a wide aperture creates drama. At 110 mm it's ideal for portraits and framing action.

Camera	2 DSLR camera bodies with auto-focus and high ISO and tethering capabilities.	▪ Use one as a backup, or have it prepared with another lens. ▪ Try to get the latest body so it will work with a wide range of lenses and your tethering software. ▪ Canon and Nikon devices are compatible with the most gear.
Lenses	11–24 mm.	▪ A good zoom lens is key to capturing subjects while maintaining a safe distance.
	24–70 mm.	▪ This is a sharp mid-range zoom. Wide and fast lenses (e.g. aperture under f/2.8) capture subjects of all sizes.
	70–100 mm.	▪ A good macro lens is recommended, though optional. ▪ These lenses are ideal for closeups of tiny parts and abstractions in low-light conditions.
	100–200 mm.	▪ This lens would give you an edge but would notably increase your costs. ▪ The fastest, longest lenses with the widest apertures are the most expensive, costing thousands each.
Camera Bags + Luggage	Cart.	▪ You will usually need a full cart of gear for industrial shoots.
	Two large bags on wheels.	▪ These bags are for light stands etc.
	Smaller soft cases.	▪ These bags are for small accessories.
	Photo luggage.	▪ Made of durable plastic that is impact resistant, water-tight, hard, sturdy, and lightweight.
	Foam inserts and dividers.	▪ Use these to customize and organize your cases.

Accessories etc.	20x20 ripstop nylon sheets.	▪ Bring one black and one white to all of your shoots. ▪ These pack up small and work well as solid backgrounds when needed.
	Battery power pack.	▪ Rely on battery packs over electrical or hardwired connections ▪ Remember that packs can be heavy and have maintenance costs. ▪ Broncolor is a reliable brand.
	Lens care kit, jeweler's screwdrivers.	▪ Keep any tools you may need to adjust your gear organized and accessible.
	Gaffer tape.	▪ Choose black and grey. ▪ Use to tape down electrical cords, secure lights, or cover problem areas in compositions.
	Insurance coverage.	▪ Purchase a policy to protect all of your valuable gear. ▪ The deductible may be $800/year for $30,000 of coverage.
	Golf umbrella.	▪ For shooting in the rain.

Attire	Safety boots, vest, and helmet.	▪ It's wise to own your own safety gear that meets current standards.
	100% cotton t-shirt.	▪ Favour non-flammable fibres. ▪ Choose orange or white, not black or grey.

Lighting Components	Power packs.	▪ Choose 2–3 power packs that are 10 amps each. ▪ Dynalite is a trusted brand.
	Flash heads.	▪ Choose 3 smaller flash units instead of one larger one for greater flexibility.
	Lighting kit.	▪ Look for a malleable kit that will work for most of your jobs. ▪ It should be able to transform into several spotlights, a light bank etc.
	Optical slaves.	▪ Choose 2–3 optical slaves that support Through the Lens (TTL) shooting.
	Radio flash trigger + Flash sync cable.	▪ Look for a flash trigger that can trigger a flash from a decent distance and is compatible with your camera.
	Umbrellas.	▪ These act as bounce light sources. ▪ Silver is more diffusive, while white and shoot-through varieties act as light banks. ▪ Umbrellas are less expensive and easier to set up than light banks and take up less space, but they create more spill light.
	Softbox.	▪ Choose a silver lining for greater contrast and light transmission, while white lining maintains neutral colors. ▪ A softbox controls the shape and direction of light more than an umbrella and limits light-spill. ▪ Broncolor is a trusted brand.

Lighting Supports	Two tripods.	▪ Look for fibre frames with sturdy, tubular legs, a centre brace, and a platform large enough for your camera.
	Portable light stands.	▪ Manfrotto is known for lightweight stands at reasonable prices.
Lighting Accessories	Spare flash tubes. Reflectors/Snoots. Barndoors. Honeycomb grids. Lighting filters and/or gels.	▪ Digital allows you to solve many options in post-production via your editing software, so these are optional accessories. ▪ Purchase or rent as needed.

Basic Lighting System

One power pack, (min. 800 w/s) a few flash heads, umbrellas, stands, and a light bank.

Backup + Archiving Equipment	Memory card.	▪ Choose a quality memory card for your camera.
	Solid-state drive.	▪ SSD drives have transfer speeds up to 10 times faster than a typical hard drive and run quieter and cooler. ▪ SSDs have no moving parts, making them more durable, reliable, and less likely to fail with transportation.
	1–2 portable external hard drives.	▪ Choose hard drives that are 2–3 TB max, so as to not have all your images on one drive, which could potentially fail.
	1–2 other external hard drives.	▪ Invest in quality hard drives for additional backups and archiving at your home or office. ▪ A 5400 rpm HDD drive should be sufficient, but you may wish to explore RAID arrays.

Tethering + Editing Software	A good laptop.	▪ A MacBook Pro is recommended. ▪ Look for high-resolution screen, SSD, thin profile, and compatibility with your tethering software. ▪ The cost could be $3000–4000.
	RAW image capture/editing software for tethered shooting.	▪ Adobe Lightroom (or Capture One). A comparison is included below this chart. ▪ Make sure it's compatible with your cameras. ▪ Choose software that you, your assistant, and your clients will be comfortable with.
	Carbon Copy Cloner or Folder Watch.	▪ If you wish to sync to cloud storage to create an additional backup while shooting.
	Focus stacking software.	▪ Optional. ▪ For product photos that are sharp from front to back, use focus stacking software. ▪ Helicon Focus is a popular choice.
	JerkStopper cable.	▪ Find a means to avoid accidentally yanking your USB cable out from your camera.

Note: Also consider how to store and share your files online. Popular coud storage options include Dropbox and Amazon Prime. Many photographers opt to have an image archive linked to their personal website. Photoshelter is a photographer favourite, offering unlimited storage and a user-friendly mobile app.

Tethering Accessories	Remote camera trigger.	▪ Optional but recommended. ▪ Yongnuo RF 605 is an affordable and fairly reliable option.
	15–foot USB tether cable.	▪ Invest in a good tether cable like those made by Tether Tools.
	Extra laptop chargers, batteries, and accessories.	▪ Back-ups are a must.
	Tether table/platform for your laptop.	▪ Good options include Tether Tools' Aero Table or Inovativ's DigiPlate Lite. ▪ Look for an aluminum platform that turns into a utility table when attached to a tripod or light stand.

Tethering Software Comparison

Lightroom

Lightroom allows you to easily make books and email small jpegs to clients, who appreciate its ease of use when viewing selects. The software offers an impressive array of editing options and an intuitive interface.

Some users find the transfer speed (from pressing the camera's shutter to Live View) slow. Images are written to the camera's memory card, then transferred, creating two saved copies. It takes about 1 second for each image to appear on your laptop screen. Lightroom also has some functional issues (doesn't recognize the camera on occasion). See the Resources section of this guide for how to troubleshoot such issues.

Capture One

Capture One offers faster transfer speeds than Lightroom, along with more options and control. The photos don't write to your camera's internal memory card, but directly to your laptop. While photos appear on your laptop screen faster, they do not appear on the camera's LCD screen, nor will a copy of the images be saved to your camera's memory card.

Equipment Tips

Brands aren't the key concern; the key is how you control and handle your equipment to achieve the best results. That said, look for proven reliability, durability, and consistency. A true camera system will accept most major accessories and be backed by solid customer support.

- Choose a trusted brand, like Canon, Nikon, or Hasselblad.
- Remember that your camera should remain relevant, even as new models come out; if you lose a lens to an accident, it should be easy to replace.
- Look for a camera that stands up to rigors of the site (dust and moisture) and is well sealed against elements.
- Choose a camera that fits your shooting style and the subjects you expect to shoot.

Expanding Your Kit

Invest in the best essential equipment you can afford and rent as needed. Expand your kit over time, replacing older equipment with newer items that can handle a larger variety of tasks with greater ease. You can start out with a minimal kit if you're creative and know your technical stuff. Invest in the best essential equipment you can afford and rent other items as needed.

Organization and Transportation

- Organize equipment, have it ready, ensure it works, and have backups.
- Know where to find all of your components and return them there after use.
- Understand what is involved in transporting the equipment you need to a shooting location, problems you may encounter, and how to overcome them.

Know Your Stuff

- Know which lens works best in which situations.
- Know the capabilities of all your equipment components (what results can be achieved and how to use the components necessary to achieve them).
- Know how to set up lights such that they serve your purpose without interfering with others or creating hazards.

10 Actions

Industrial Photographers Today

Photographers today must be able to adapt to change. You must stay on top of technological advances, meet faster turnaround times, and be able to adapt to the changing face of industry and client needs.

There is less of a demand for industrial photography today due to the prevalence of stock photography. Clients care less about precision and quality (71 DPI is sufficient for websites, where most images appear now). You can get away with less technical ability and knowledge than in the earlier days of photography, but you must be passionate, excited, and offer unique, impressive ideas.

Most client contact takes places over email. Most industrial photographers today are found by clients, who have reviewed their online portfolio. You can pay for a high SEO ranking to appear on the first page of search results for industrial photography in your city. Clients from disparate lands may contact you to shoot something located in your city.

Getting Started

Approach your passion for industrial photography like any other creative and/or professional goal. Research, planning, strategizing, and practice are all key to success. This guide is a great starting point. As a next step, explore the links in the Resources section.

Research

- Familiarize yourself with industrial photography approaches and considerations.
- Do your research—study the work of successful industrial photographers.
  - Several photographers are listed in the Resources section of this guide.
  - Consult magazines, books, and websites to see how subjects and settings have been captured. Emulate the approaches with your own flair.

Practice

- Continue to build experience with the photography you already know to enhance your portfolio.
- Seek opportunities in areas of photography related to industrial photography (architecture, editorial, portraiture, and commercial/corporate/product).
- Look for opportunities to show new skills in your portfolio.
- Practice and experiment. Each situation will require different techniques, but you will cultivate a sense of the best settings and approaches through trying things.
- Work as an assistant for an experienced industrial photographer.

Promote

- Create an online portfolio that provides good examples.
  - Your work should be presented well and consist of at least 10–15 images that illustrate a wide range of skills and abilities.
- Pay for a high SEO ranking for your portfolio website.

Online Portfolio Tips

- Keep your design simple. It should be inviting and easy to view your work.
- Choose a design that complements your photography and brand.
- Be selective when choosing your work.
- Make contacting you easy.
- Include links to social media.
- Stay up to date and update your design over time.
- Study the online portfolios of photographers you respect, industrial photographers, and photographers recognized for having exemplary portfolio websites.

Finding Work

- Ask your personal network.
- Approach magazine publishers.
- Create accounts for stock/travel photo sites to sell individual images.
- Consider artistic industrial photography and showing/selling your work.
- Begin with smaller and easier projects. Once you've confident, start accepting bigger assignments from larger companies.
- Present your work to big corporations in industries that need images for annual reports, brochures, manuals, and web-sites.

Maintaining Work

- Create good work.
- Show and maintain value.
- Build a reputation. Through word of mouth, your sales should go up.

11 Resources

Online Resources

These resources provide supplementary information on topics explored in this manual and act as a good starting point beyond this manual. Additional information is easily accessible online.

CHAPTER 1: PURPOSE

Career Profile and Required Skills

My Majors

www.mymajors.com/career/industrial-photographer

CHAPTER 2: CONTEXT

Industrial Portrait Tips

The Slanted Lens

www.theslantedlens.com/2015/industrial-portraits

CHAPTER 3: PROJECTS

Photography Industry Landscape

Talor Davidson

www.taylordavidson.com/photo-industry

CHAPTER 4: CONCEPT

Composition Basics

Photography Course

www.photographycourse.net/compositional-rules-in-photography-start-here

Shooting Glass and Translucent Objects

Learn My Shot

www.learnmyshot.com/how-to-photograph-glass-and-translucent-objects

Shooting Reflective Objects

Lightbox Industrial Photography

www.lightbox-industrial.com/category/lighting-technique

DSLR Camera Basics

Nikon

www.imaging.nikon.com/lineup/dslr/basics/04/07.htm

Macro Photography

Amateur Photographer

www.amateurphotographer.co.uk/technique/macro_photography/macro-photography-how-to-shoot-insects-69200

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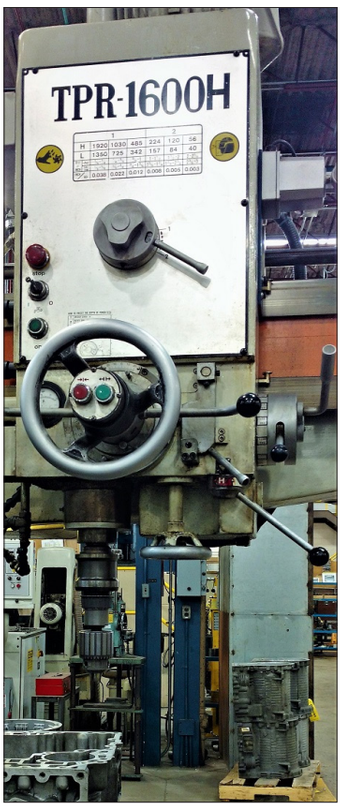

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