1 - THE 3 GEOMETRIC RULES

1.1 - CONTROL
- Measure some long distances between well-defined points.
- Define a minimum of one vertical distance (either using plumb line or vertical features on the building) and one horizontal.
- Do this on all sides of the building for control.
- Ideally, establish a network of 3D co-ordinated targets or points by a loop traverse around the building.

1.2 - WIDE AREA STEREO PHOTOCOVER
- Take a ‘ring’ of pictures around the subject with an overlap of at least 60%.
- Take shots from a height about half way up the subject, if possible.
- Include the context or setting: ground line, skyline etc.
- At each corner of the subject take a photo covering the two adjacent sides.
- Include the roof, if possible.
- No image should lack overlap.
- Add orthogonal, full façade shots for an overview and rectification.

1.3 - DETAIL STEREO PHOTOCOVER
Stereo-pairs should be taken:
- Normal case (base-distance-ratio 1:4 to 1:15), and/or
- Convergent case (base-distance-ratio 1:1 to 1:15).
- Avoid the divergent case.
- Add close-up ‘square on’ stereo-pairs for detail and measure control distances for them or place a scale bar in the view. Check photography overlaps.
- If in doubt, add more shots and measured distances for any potentially obscured areas.
- Make sure enough control (at least 4 points) is visible in the stereo image area.

2 - THE 3 CAMERA RULES

2.1 - CAMERA PROPERTIES
- Fixed optics if possible. No zooming! Fully auto-focus.
- Fixed focus distance. Fix at infinity, or a mean distance using adhesive tape, but only use one distance for the ‘ring’-photography and one distance for close-ups.
- The image format frame of the camera must be sharply visible on the images and have good contrast.
- The true documents are the original diapositives, negatives or digital ‘RAW’ equivalents. Set the camera to use the camera its highest quality format.
- Include the roof, if possible.
- Include the context or setting: ground line, skyline etc.
- At each corner of the subject take a photo covering the two adjacent sides.
- Include the roof, if possible.
- No image should lack overlap.
- Add orthogonal, full façade shots for an overview and rectification.

2.2 - CAMERA CALIBRATION
Use the best quality, highest resolution and largest format camera available:
- ‘Medium’ format is better than small format. A large sensor is better than a smaller one.
- A wide-angle lens is better than narrow angle for all round photography. Very wide-angle lenses should be avoided.
- Calibrate the camera with a fixed focus lens and tape it there.
- Standard calibration information is needed for each camera/lens combination and each focus setting used. Shooting the calibration screen before capture with each lens will help.
- A standardised colour chart should be used in each sequence of frames.

2.3 - IMAGE EXPOSURE
Consistent exposure and coverage is required.
- Work with consistent illumination: beware deep dark shadows!
- Use HDR to capture difficult, unbalanced exposures.
- Plan for the best time of day
- Use a tripod and cable release/remote control to avoid camera movement and get sharp images.
- Use a panoramic tripod head to get parallax-free panoramic imagery
- Use the right media: Black-and-white is sufficient for tracing off lines but colour has some advantages for interpretation and documentation of colours.
- Use RAW or ‘high quality’ and ‘high sensitivity’ setting on digital cameras.
- Geotaging the images is recommended.

3 - THE 3 PROCEDURAL RULES

3.1 - RECORD PHOTO LAYOUT
Make witnessing diagrams of:
- The ground plan with the direction of north indicated.
- The elevations of each façade (at an appropriate scale 1:50, 1:100 - 1:500).
- Photo locations and directions (with frame numbers).
- Single photo coverage and stereo coverage.
- Control point locations, distances and plum-belines.
- If using ‘natural’ points a clear diagram showing each point is required.

3.2 - LOG THE METADATA
Include the following:
- Site name, location and geo-reference, owner’s name and address.
- Date, weather and personnel. Client, commissioning body, artists, architects, permissions, obligations, etc.
- Cameras and optics, focus and distance settings.
- Calibration report, including the geometric and radiometric results if available.
- Description of place, site, history, bibliography etc.

Remember to document the process as you go.

3.3 - ARCHIVE
Data must be complete, stable, safe and accessible:
- Check completeness and correctness before leaving the site.
- Save images to a reliable location off the camera. Save RAW formats to convert into standard TIFFs. Remember a CD is not forever!
- Write down everything immediately.
- The original negatives are archive equivalents. Set the camera to use the camera its highest quality format.
- The true documents are the original diapositives, negatives or digital ‘RAW’ equivalents. Set the camera to use the camera its highest quality format.
- Include the roof, if possible.
- Include the context or setting: ground line, skyline etc.
- At each corner of the subject take a photo covering the two adjacent sides.
- Include the roof, if possible.
- No image should lack overlap.
- Add orthogonal, full façade shots for an overview and rectification.

The above text is adapted from a paper presented by Peter Waldhäusl (University of Technology, Vienna, Austria) and Cliff Ogleby (Dept. of Geomatics, University of Melbourne, Australia), at the ISPRS Commission V Symposium “Close Range Techniques and Machine Vision” in Melbourne, Australia, 1994. Simple rules that are to be observed for photography with non-metric cameras have been written, tested and published at the CIPA Symposium in Sofia in 1998.