

Prior to Photography:

1. Obtain Modified Camera and Filters
2. **Document** Camera Model, Type of Filters Purchased, Ensure they will be housed and stored properly
3. Set a day with Berit For the photography.
 - a. Ask if an easel can be obtained if you want to attempt IRT
4. Reserve from the SMART
 - a. LED Lamps-dracast
 - b. Camera and filters
 - c. Foot candle checker
5. Reserve the following Materials from the VRC:
 - a. TriPod (**logan ask**)
 - b. Color Checker (**logan ask**)
 - c. VRC laptop with access to Lightroom on it.
 - d. Tethering cable (**logan ask**)
 - e. SD
 - f. Pantone Strips (Optional)
6. Buy tethering software if needed
 - a. Possible free softwares: Icarus Camera Control; Sofortbild

Pre-Viewing day

1. Check that camera tethers to a computer
2. Check that filters screw on, are unscratched
 - a. Can they be layered?
3. Charge camera battery
4. Play around with camera a bit
 - a. Familiarize yourself with settings, live view
5. Make a google doc where you can record all the settings for each photo; it will take a while to find the optimal combination of settings

During Viewing day

1. Set up
 - a. Position painting so it is vertically planar
 - b. Set the lamps at a 45 degree angle
 - i. Illuminance levels below 200 FC
 - ii. Lights at about 6 feet away
 - c. Turn off all other lights
 - d. Tripod
2. Tether Camera to Computer
 - a. Software + cable + usb stick
3. Determine Settings:
 - a. Camera RAW: Prevent distortion of image (occurs via pixel compression to JPEG).

- b. Menu > White Balance: Preventing tint shifting of image using a neutral color card or something very white to calibrate camera.
 - c. Focal length: Determines angle of opening (i.e. zoom). 55-60mm is ideal for large objects.
 - d. ISO: Determines sensitivity to light. Lower values ideal to prevent over-exposure. 100-200.
 - e. Set to B&W mode or Saturation to -100 (recommended but not necessary)
 - f. Camera Mode: Manual - since infrared plane is different than IR plane, must control these settings with live-view or tethering
 - i. F-stop: Determines depth of field by changing size of lens opening. The lower the f-stop, the higher the aperture, the lower the depth of field. Go between f5.6-f11 (f8 is considered norm)
 - ii. Shutter speed: since IR requires longer exposure, need slower shutter speed
 - iii. Exposure Compensation: Toggle between 3 values. But generally, shutter speed should do most of the work
 - iv. Finally: focus - this is difficult bc the IR plane is different. Need to preliminarily focus without the filter, and then adjust. Live view should help
4. Figure out a process to record settings for each photo
 - a. Google doc
 5. For each photo
 - a. Adjust shutter speed for sharpness and lightness
 - b. Toggle between exposure values if needed
 6. Figure out a process to save files nicely
 7. Beginning period: adjust all settings until photo comes out good

Post-Processing

1. Managing the File
 - a. Convert camera RAW file (.NEF or .CR2) to .DNG - i.e., digital negative. Doesn't compress image.
 - b. Upload image to program such as BRIDGE
2. Processing
 - a. Convert to grayscale or B&W or set saturation to -100
 - b. In bridge, Set Brightness and Contrast to zero. This removes the manipulation of the image that cameras have been programmed to add (for aesthetic purposes).
 - c. Make Tone Curve linear.
 - d. Use the White Balance tool on the N8 square on the color card (grey following white square). This ensures that the RGB values on the square are equivalent in magnitude. The color card has been manufactured such that this is true. (Good for infrared too)

- e. Use the Color Sampler tool on the N8 square on the color card. Adjust the exposure until the RGB values are within +/- 5 of 200. This ensures that the photo is correctly exposed.
 - f. Consider extenuating factors: If there is incorrect or inconsistent placement of color card or the histogram shows minimal overlap of RGB curves, adjust other aspects of image.
 - g. Consider sharpening ...
3. Saving the File
- a. Save as .TIFF (more archival) or as high-resolution JPEG (8-12 recommended). This ensures minimal distortion of image during compression. If possible, save original .DNG files

Future Viewing Days

- [Consider doing IRT](#) !!!!!!!!
 - If you get it sorted with Bridget that you will do the imaging there, the set up will be a little different. If you want to do the IRT, I would first check out what would be possible in the VRC and if it won't work because of space and set up, then you might need the Smart for that. I am not sure if Bridget could get the lights to point outward, but it may be possible. They are on movable metallic arms.

SOURCES:

- NMAH internship
- Chopensource
- PhotoDoc Book