

Jumpstart Your Drawings!

Hand Drawing with High Technology



Tradigital drawing class – even drawing with a laptop!



Design student drawing with a traditional approach.



Drawing with a Logitech lo pen – laptop records every stroke!

*In recent years, architects and their clients have begun to rediscover the benefits of using **Traditional Imaging** techniques such as sketching, drawing and physical modeling to communicate their design concepts. **Digital Imaging** and 3D visualization has become quite sophisticated and even more complicated, forcing many small offices into difficult cost and time commitments in order to remain current with the quickly evolving software. Now, there is a new trend in visual communication that combines the best hand drawing techniques, advanced reprographics, digital imaging and computer-generated information. I call this merging of paper and pixels “**Tradigital Imaging**” and I hope you can embrace these new visualization techniques and try using them on your next projects. Good Luck!*

- Jim Leggitt, FAIA

SOLVING THE LOW TECH / HIGH TECH GAP

When 3D computer modeling became popular with architectural offices and universities a decade ago, most traditional methods of design visualization began to fade away and practically disappear from the practice of design. Young designers entering the profession were quite proficient with 3D modeling software, Photoshop and other computer based visualization techniques, but knew little about traditional visualization techniques that were once dominant in the pre-computer years. On the other hand, many experienced architects skilled in hand drawing and sketching techniques, now in the leadership positions of firms, have never had the opportunity or time to learn the technical complexities or keep up with the confusing stream of upgrades required to excel in computer visualization.

About four years ago, I observed that a gap was widening between the “high tech” younger designers and the hands-on “low-tech” veteran designers. Those of us positioned between the two groups were the first to take notice and begin to search for ways to integrate the two extremes together. I also noticed that clients, once dazzled by computer-generated design images, had become accustomed to the ho-hum technical precision of those images and began demanding a more human quality and authenticity to the design visualization representing their beloved projects. More puzzling information surfaced regarding client perceptions that supported my conviction that there needed to be an “in-between” visualization technique. Computers now have become so extremely fast and efficient that many clients believe that a computer generated 3D rendering takes only a very short time to create. Those same clients also think that original drawings and sketches created by

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Tradigital image combines SketchUp model and hand rendering.



Drawing small 4"x4" images can be fast and informal.



Cars, furniture, landscaping, people add detail to the sketch.

hand take much longer to produce – when in fact, they are much quicker to create! In this rapidly changing business with shorter deadlines and decreasing fees, architects are now discovering that quick sketches and hand drawings – integrated with 3D computer models are quite effective for communicating their ideas. New hybrid drawings allow architects to communicate their designs combining the defendable accuracy of 3D digital imaging with the rich character and humanity of traditional hand drawings. I've named this composite visualization process "**Tradigital Imaging**", which incorporates a wide variety of visualization techniques that are quick to produce, popular with clients and extremely easy to create.

TRADITIONAL IMAGING: BACK TO THE BASICS

Hand-generated drawings offer what computer-generated design images lack: character, personality, imperfection and an authentic, one-of-a-kind quality. "**Traditional Imaging**" can only be found – so far – in drawings done by hand. A landscape architect recently told me, "Graphics should sell the emotion of design, not necessarily the reality of design." He believes that visual material in successful presentations must show not only the basic layout and concept of a design, but also the character and feeling. The amount of time and money you invest in the project can be directly controlled by the smart decisions you make at the onset of your visualization process. Determine how large your **Drawing Size** will be. Understand what **Drawing Entourage** will be used to communicate the overall character and emotion of your image. Be aware of **Drawing Speed** in order to manage your time, and pick the right **Drawing Tools** for the project. Successful management of these variables will maximize your visualization effort with the most efficient use of your resources.

Keep it Small. Working small is an optimum approach to most drawing projects. Scanning and reprographic options are now at such a high quality that you can create drawings at small formats and enlarge them with these high-resolution digital machines.

- *Drawings that are 8½" x 11" or smaller can easily be scanned on an inexpensive flat bed scanner and then enlarged and printed.*
- *Drawings 11"x17" or smaller can be color copied on high quality copiers.*
- *With an 11"x17" flat bed scanner, you can scan larger drawings and piece them together in PhotoShop.*
- *Small drawing formats allow you edit down drawing detail, keeping your time investment to a minimum.*

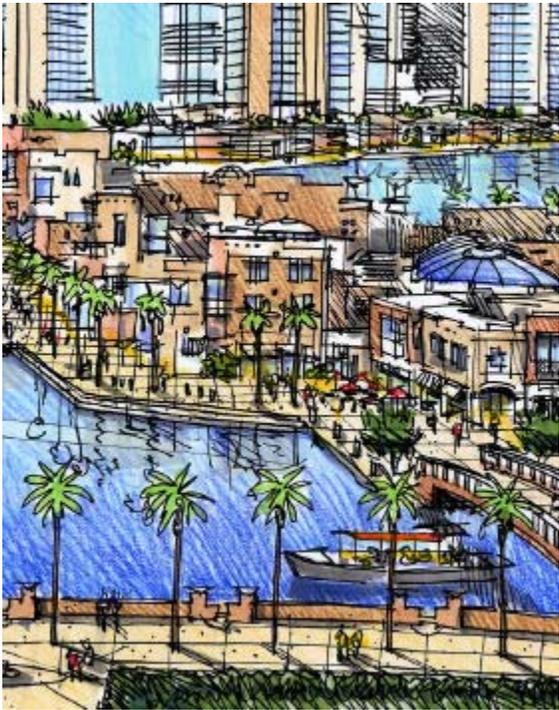
Add Entourage. The character of a drawing depends on a careful integration of your primary design concept, your "big idea" with secondary drawing elements or "entourage". Many drawings lack people, cars, trees, landscaping, graphics, furniture, and other informative objects that give the drawing scale, emotion and place.

- *Learn to confidently draw people and make sure to add enough figures to your drawing in order to give the image a lively and active quality.*
- *Determine what landscape elements are appropriate for the setting and draw a variety of trees, groundcover, and natural elements that reinforce the location and climate.*

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Quick concept sketch with annotation.



Ink drawing with colored with markers and Prismacolor pencils.



Typical desktop supplies – keep your inventory to a minimum!

- Take time to carefully delineate signage and graphics.
- Interior and exterior furniture and lighting are important elements that give character to a drawing.
- When appropriate, add cars for scale and activity.

Draw Fast. The amount of time it takes to create a drawing can be shortened if you draw with an abbreviated technique using a minimal amount of detail. Two “gesture drawings” without much detail might take less time than a single, more detailed drawing...and in most cases, communicate more information about the design.

- Practice drawing with minimal information, rapidly drawn hatching, rough shapes and overlapping linework.
- Use moderate detail for information drawn in the foreground, while using minimal detail for objects in the distance.
- Avoid using a straight edge in your drawings as it slows the hand drawing process and adds potential time consuming detail.

Use Simple Tools. Your drawing toolbox can either be a costly collection of pens, pencils, markers and supplies, or an inexpensive set of basic items. With the enormous selection of graphic products offered to designers, it is often a difficult task picking supplies and keeping an updated inventory. Here are my favorite “time-tested” drawing products:

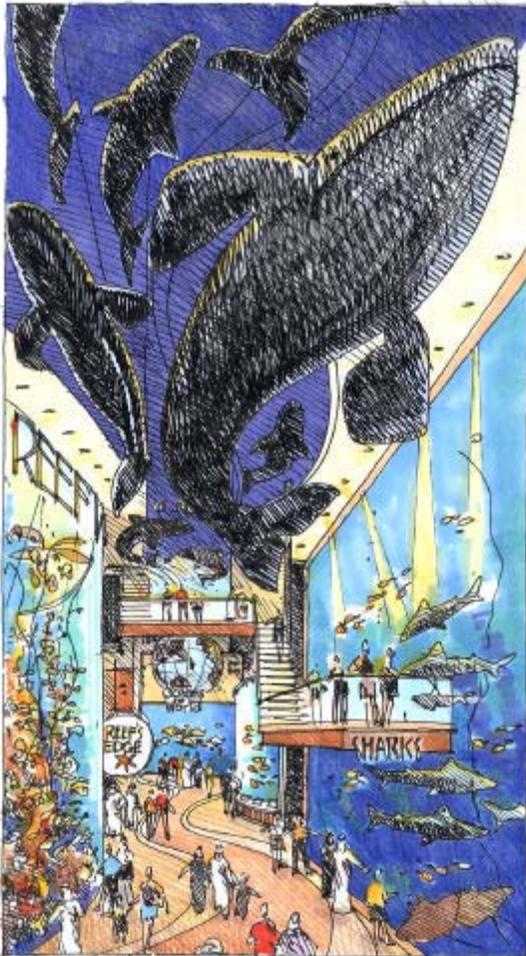
- **Sanford Col-erase Pencil.** Carmine Red Wood pencil for creating red pencil mock-up drawings.
- **Berol Draughting 314 Pencil.** Wood pencil with a soft graphite lead, deep black tones, ideal for sketching, smudges easily.
- **Sanford Prismacolor Pencil / Berol Prismacolor Pencil.** (Sanford and Berol company names appear on different pencils) Wood pencil, soft leads, light-resistant pigment, sold individually or in boxed sets of 12, 24, 48, 72, 96, and 120. Most of the color pencil drawings in my book *Drawing Shortcuts* were made with this pencil. The Prismacolor black pencil is a great non-smearing sketching pencil.
- **Pentel Sign Pen.** Felt tip (fiber tip) pen, water base ink, medium tip, ideal for quick sketches. Half of the drawings in my book *Drawing Shortcuts* were made with this pen. Alcohol-based AD markers can be applied directly over pen lines without smearing the linework.
- **Staedtler Lumocolor 318 “F” Pen.** Plastic tip pen, permanent ink, lightfast, quick drying on mylar, refillable, available with different point options (F, S, M). Half of the drawings in my book *Drawing Shortcuts* were made with this pen. Will smear if it comes in contact with solvent-based AD markers.
- **Staedtler Lumocolor 311 “F” Pen.** Same pen options as the 318 pen, but has non-permanent (water-based) ink. Linework not as black or dense compared to the 318 pens.
- **Pilot Fineliner Marker Pen.** This water-base fine point pen has a rich black ink and is a great companion pen used with the broader tipped Pentel Sign Pen.
- **Chartpak AD Marker.** Best performing colored marker I’ve ever used. All of the colored marker drawings in my book *Drawing Shortcuts* were done with these markers. Sold individually or in different themed sets of 12, 25 and 100. **Ideal 36 Colors:** Cool Gray #1, #2, #3, #4, #5, #7, Naples Yellow, Cadmium Yellow, Cadmium Orange, Cadmium Red, Salmon, Deep Salmon,

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Sketching with different ink pens and a Prismacolor pencil.



Imagination sketch on vellum with markers and color pencils.

Peach, Pale Flesh, Flesh, Mauve, Pale Indigo, Purple Sage, Lilac, Willow, Apple Green, Moss Green, Grass Green, Light Olive, Slate Green, Evergreen, Turquoise Green, Sky Blue, Blueberry, Azure, Buff, Suntan, Light Sand, Sand, Pale Cherry, Mocha.

- **3M Scotch Brand Artist's Tape.** Smooth white acid-free tape that peels up easily. 60 yard rolls come in ½", ¾" and 1" widths.
- **Staedtler Mars Plastic Eraser.** Straightforward white plastic eraser, great for general erasing needs.
- **Koh-I-Noor Electric Eraser.** Durable machine with a slip-chuck that holds 7" erasing strips. Use the standard white erasers. Beware of the imbibed erasers as they can often leave an oily residue on the paper or Mylar surface.
- **Panasonic KP-4A Pencil Sharpener.** Portable battery powered pencil sharpener for drawing away from the office. Best portable I've seen.
- **X-Acto No. 1 Knife.** The industry standard with the number 11 blades. Buy blades in bulk packages as they dull quickly.
- **Bienfang Tracing Paper.** This standard white tracing paper is available in 12", 18", 24" and 36" wide rolls. Inexpensive.
- **Clearprint 1000H Drafting Velum.** This tracing vellum is a popular technical paper. It's transparent, smooth and durable. Available in precut sheets and standard length rolls.
- **AZON Herculene Film.** Mylar is available in precut sheets and rolls, single mat finish or double mat finish, in 3 and 4 mil thickness. I prefer drawing with the thinner single mat material as it is much more transparent.

TRADITIONAL IMAGING: DRAWING OPTIONS

There are many fundamental drawing techniques that aren't reliant on any form of technical equipment or computer assistance. They're based on simple "hand-eye" coordination mixed with a creative imagination. These basic drawing options can include **Imagination Drawings**, sometimes referred to as storyboards, or cartoons; **Observation Drawings**, often associated with travel; **Perspective Drawings**, **Parametric Drawings** and what I call **Recycled Drawings**, which originate from already existing images.

Use your Imagination. Many of the first visual ideas put on paper are in the form of small sketches, quickly generated to capture the big ideas of a design direction. These informal drawings are often called "storyboards" and may have numerous annotations and arrows added to the image. Cartoons also fall into this type of drawing. Imagination drawings tend to be the size of postcards and are usually not colored.

- *Imagination drawings are usually 8½"x11" or smaller.*
- *These images often form the basis for the final drawing and are traced directly over for the final drawing.*
- *Some imagination drawings begin with a red pencil "block out" and then traced over and refined with an ink pen.*

Stop, Look and Draw. Purchase a small sketchbook and take it along on your next trip. Reserve some time to sit down and sketch an interesting scene or a detail from a building. Many people develop the discipline to make observation sketches and design notes in journals, which become ongoing records of their creative process.

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One-point eye level perspective of street scene.

- *Small sketchbooks are both easy to pack and less intimidating than large drawings pads*
- *Occasionally scan the drawings from your sketchbook and keep a permanent record of your images. Tape a business card in your sketchbook in case the book is misplaced.*

The Right Perspective. There are three types of perspective drawings. The one-point perspective with its single vanishing point is the least complicated and quickest type of perspective to draw. The two-point perspective with double vanishing points creates a much more realistic and interesting drawing. The three-point perspective involves three vanishing points and not only is extremely confusing to draw, but often has a distorted appearance similar to a photograph taken with a wide angle lens.

- *Although you can create a perspective using a formal layout technique, you can “eyeball” the perspective and come close to the same results in far less time.*
- *Ground-level or “eye-level” perspectives are most common to view, but experiment with different reference elevations in order to improve the information being shown in the drawing. Roof-level and aerial views of scenes might show more general information than if the drawing view was from ground level.*



Canal drawing (above) recycled into an updated scene (below).

Simple Parametrics. A parametric drawing, or paraline drawing is a three-dimensional drawing in which no lines converge. There's no perspective or horizon line in this type of drawing. Of the many different variations of these drawings, the “axonometric” and “isometric” drawing types are most commonly used. Parametric drawings are always aerial views, and you need to have a floor or site plan to work from. This drawing type is a good choice when the floor plan information is complex, or when you don't have the time or tools to create a true perspective drawing.

- *Axonometric drawings are created by placing a plan on the table surface, rotating it 30 or 45 degrees and then tracing over the plan while adding 3-dimensional characteristics to the objects. “Axos” tend to appear as aerial drawings generated from very high altitudes.*
- *Isometric drawings are drafted from floor plans, measured and regenerated with lines at 30-degree angles to the base of the page.*

Recycle your Images. Older, existing drawings are great templates for creating new drawings. Perspective views, scaled figures, and various elements in existing drawings can all be retraced, reassembled and modified to create new drawings. In severe deadlines, tracing over existing drawings to generate new images can have huge time and cost benefits.

- *Keep copies or scans of all drawings you create and always look for opportunities to “trace and modify” any former drawing that might serve as a “base” for a future drawing.*
- *Recycled people and cars from previous drawings are easier to draw than creating new images from scratch.*

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DIGITAL IMAGING: CADD SOFTWARE



ArchiCAD 3D model of a residential design.



AutoCAD 3D model composited with a photograph.



Simple SketchUp 3D model of a residence without context.



Complex interior model using SketchUp.

CADD History. Architects have come through an incredible journey of business technology in the past two decades. The manual drafting and design process of our profession was extremely time consuming and inflexible. The answer came with the development of CADD (Computer Aided Design and Drafting), based on AutoCAD and Intergraph corporation hardware and software. It was not uncommon to purchase a CADD workstation for \$40,000. The microcomputer was born in 1976 and later joined by the IBC-PC in 1981, running MS-DOS. In 1983, AutoCAD 1.4 DOS was introduced on two 45k floppy discs, and ran on a 4.7mhz IBM PC with 64k ram. Rapid development of AutoCAD software continued between 1984 and 1990, with numerous releases for the rapidly improving PC's and Macs. Around 1998, engineers and designers started to see the value of viewing details in a 3-dimensional view. The 3D modeler was introduced in 1991 in both Mac and DOS versions. In 1997, AutoCAD released 14 for Windows NT/95 at a cost of \$4,000. Autodesk Architectural Desktop was released in 2000, followed by Architectural Studio and Revit in 2002. Today, it is no longer unrealistic to create computer-generated simulations that are so close to reality that users believe they are in real world simulations. High end graphics and virtual reality systems are everywhere.....at a cost.

Digital Competition. There are over 50 manufacturers of CADD software used for architectural drafting and modeling. The six companies highlighted are regarded as the most popular among architects. **AutoDESK AutoCAD 2004** software is the 2D drafting/detailing and 3D design tool used by more designers worldwide than any other CAD software. **Autodesk Architectural Desktop** software improves productivity, coordination, collaboration and visualization. With the new VIZ Render visualization feature, you can quickly communicate your design intent with updateable Photorealistic 3D modeling, rendering and animation without having to export your design. **Bentley MicroStation** is a single comprehensive platform for design and engineering projects, suitable for 3D modeling, data versatility, work-group productivity and application development. **Graphisoft ArchiCAD** offers more control over your design while maintaining accuracy and efficiency in documentation. This Building Information Authoring Tool creates a central database of 3D model data from which you can extract complete plans, sections, elevations, details, renderings, schedules, animations and VR scenes. **Autodesk Form Z** is a general purpose solid and surface modeler with an extensive set of 2D and 3D form manipulating and sculpting capabilities. This is a popular design tool for all allied design professions that deal the articulation of 3D spaces and forms. **Ashlar-Vellum Designer Elements** products evolved from Vellum Draft, Vellum 3D and Vellum Solids and offers integrated products such as Graphite, Cobalt, Xenon, Argon and Neon. Finally, **@Last Software SketchUp** presents a completely new way to design in 3D. Developed for the conceptual design process, this inexpensive and easy-to-learn software allows for easy 3D form creation, modification and communication. It also exchanges data with all standard CAD, 3D modeling, image editing and illustration applications. I'm using SketchUp for most of my Tradigital Imaging projects.

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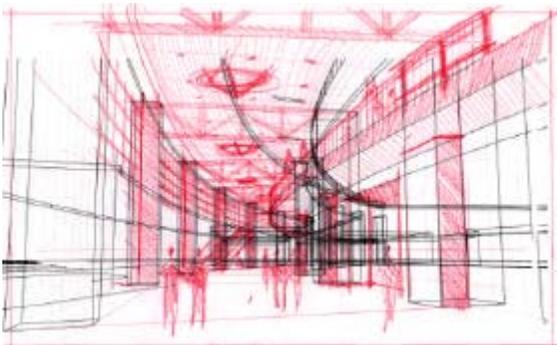
DIGITAL IMAGING: PRESENTATION SOFTWARE



Composite sketch using reverse graphics and photography.

There are several companies that are at the leaders in image editing software. **Adobe Photoshop** helps you create and produce the highest quality graphics and images for print and the Internet. I'm using Photoshop for image manipulation, editing, color correction, typography, digital photographs, and general "fine tuning" of my scanned drawings. The batch-renaming tool is useful for naming and storing digital photographs. **Adobe Illustrator** is a vector graphics program with tools for publishing artwork in print or on the Internet. **Adobe InDesign** is an ideal desktop publishing program that links with Photoshop/Illustrator files for graphic production. InDesign effectively replaces Quark Xpress, once the leading graphics software program. **Corel DESIGNER** is a vector illustration package specifically designed to help engineering and technical design professionals in the production of technical graphics. **CorelDRAW** combines graphic design, page layout, photo-editing and vector animation tools. Corel Painter is a highly realistic digital sketching and painting application. Compatible with Photoshop, it lets you combine advanced painting capabilities with photo editing. **Macromedia Dreamweaver** is software for building web sites and applications. It provides powerful combination of visual layout tools, application development features and code editing support. **Flash** allows designers and developers to integrate video, text, audio, and graphics into projects allowing for interactive marketing and presentations.

TRADITIONAL IMAGING: MERGING PAPER AND PIXELS



Tradigital Imaging is the process in which traditional hand drawing techniques are combined with a digital imaging source. The origination of any digital image can be a digital photograph, scanned image, computer 3D model and many other options. They can be used individually or in a series of combinations. Generally, tradigital images can be categorized in two primary methods of visualization; 1) **overlay and trace** method, and 2) **composite modeling** method.

TRADITIONAL IMAGING: OVERLAY AND TRACE



Simple AutoCAD 3D model with redline mockup (above) and the final sketch drawn with ink and colored with markers.

Overlay and Trace Method. The use of technical equipment in aiding the hand drawing process began around 1800 with the Camera Lucida. For centuries before the prism-based apparatus was invented, artists created drawings using a simple (pin hole) Camera Obscura, in which an outdoor scene was projected through a small hole in a wall upside down onto a surface in a darkened room. Modern cameras, copiers, scanners, modems are now acceptable tools used to assist in the drawing process. It is important to understand how each high-tech option functions and how it can be integrated with the hand drawing process. A simple breakdown of options can be described as **Copier/Scanner Sourced Drawings** - those generated from scanned images or copier reproductions and composites, **Photo Sourced Drawings** - generated from images taken with digital and film-based cameras, **Internet Sourced Drawings** - created directly from the Internet, and **Computer Sourced Drawings** - hand drawings traced directly from a computer generated 3D wireframe perspective or solid model.

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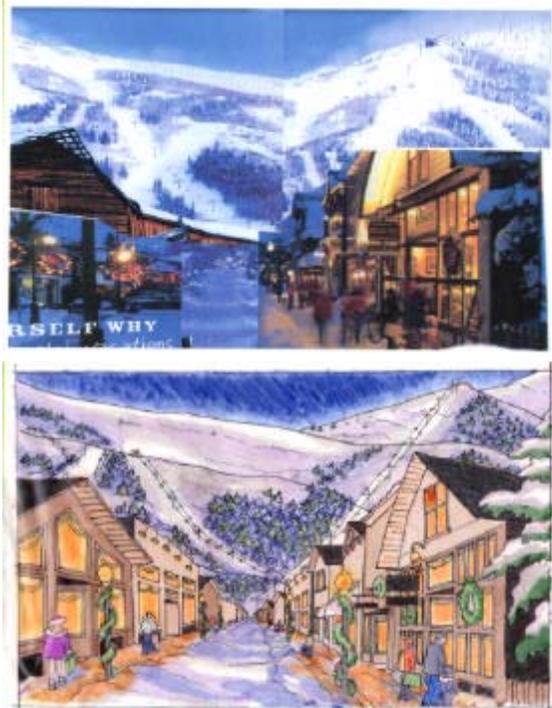


Capturing a digital image using a Palm Zire 71 PDA.

Regardless of the image source, the drawing process is the same. You first enlarge or reduce the image base information according to whatever finished size your drawing is going to be. You next block out your drawing with an overlay of vellum and a red pencil. This is the “redline mock-up” that is shown throughout *Drawing Shortcuts*. Finally, the mock-up is traced again with either a black pencil or felt tip pen to create the final (original) drawing. Color can then be added or left as a black and white drawing.

Copier/Scanner Sourced Drawings. Copier and scanner technology has evolved very quickly in recent years. Traditional toner based copiers are being replaced by a new generation of digital machines with remarkable color reproduction, clarity and wide ranging enlargement and reduction capabilities. Scanners are inexpensive, high resolution, adjustable and very accurate.

- *If your drawing size is 11"x17" or smaller, you can easily reproduce it on any standard commercial copier or scanner...in color or black and white.*
- *Most copiers have variable reductions/enlargement ranges from 50-200%. Some have 10-400% capabilities.*
- *Purchase high quality papers and use a consistent paper for all of your copying projects.*
- *Scan your original images at a resolution range of 150 to 300 dpi. Save as either a TIFF or JPEG*



Student drawing sourced from images found on the Internet.

Photo Sourced Drawings. Drawing from photographs is both economical and timesaving. Polaroid pictures, 35mm slides and 35mm color prints were at one time quite popular sources for creating drawings. The fast developing Polaroid instant picture was hard to beat as a quick image source. Although color slides were expensive and took time to develop, they could easily be projected and traced to create large presentation drawings. Color prints were inexpensive and quick to process at grocery store film labs. These older formats have now been replaced by filmless digital photography. Digital cameras are overtaking the market with higher resolution cameras and downward prices. New digital single lens reflex cameras (DSLR's) are below \$1,000, allowing the user to interchange lenses on a sophisticated camera body. All digital images are filed in computers or other storage devices.

- *Standard 4"x6" color prints can either be enlarged on a copier or scanned and printed for use as a drawing base.*
- *Digital photography is the quickest method for capturing an image, downloading information and printing an enlargement as a drawing source...in less than five minutes.*
- *Image management and retrieval is a challenge with digital photography. Electronic imaging eliminates the storage of film negatives and multiple paper prints.*

Internet Sourced Drawings. Search engines like Google and Yahoo have options for retrieving visual images of any given subject. Those images can be saved and easily used as sources of information for tracing and creating drawings. Photoshop is used for image manipulation and composition. Any image that shows up on the Internet can be saved onto your computer. The image resolution may be poor quality, but the image captured can provide a valuable reference in the drawing process. Using the “print

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Sketch overlay composited with a SketchUp model base.



SketchUp model (above) used as base for finished sketch (below).



Drawing with pencils on a print of a modified AutoCAD model.

screen” option on your keyboard can likewise save any image that can be seen on your computer screen.

- *When searching for a specific image on the Internet, type in different name variations in order to maximize your image selection. For example, if you are looking for 1950’s images, type in names such as drive-in, hot rod, diner, Elvis, James Dean, etc.*

Computer Sourced Drawings. New drawings can be traced from computer wireframes and 3-d models. The amount of detail, complexities of the computer model and camera views are infinitely variable. As a rule of thumb, learn to create enough visual material in the 3D model to understand the scale, materials and characteristics of the physical space – with minimal time investment. I often build “dirty models” (quick and dirty) that have just enough information to define the design. Computer models never lie about the information that is being presented and are a perfect tool when you are generating a drawing that demands a bit more detail, perspective accuracy, and proportion. I refer to these computer representations as “defendable models”, which clients love due to the truthfulness and precision of the original 3D model, which is then traced over to fashion the completed hand drawing.

- *Many computer visualization programs are available, including Form Z, AutoCAD, ArchiCAD, 3D Studio VIZ, Sketchup and many other products.*
- *Computer wireframes and 3-D models can easily be printed or plotted to the exact size of your final drawing.*
- *Printed on vellum, a computer wireframe can be drawn directly onto and used in the final drawing. This hybrid type of hand-computer generated drawing has the accuracy of the computer image and the character of the hand-drawn sketch.*

TRADITIONAL IMAGING: COMPOSITE MODELING

Composite modeling involves the integration of a hand drawing with digital visualization. This multi-step imaging process has two primary approaches, the first, **Computer Manipulated Drawings** – begins with an existing hand drawing and then digitally alters the image. The second, **Computer Generated Drawings** – is the opposite approach, taking an image created by computer, applying digital effects and finally enhancing the image by hand.

All of the drawing methods identified so far have involved hand drawing directly on some variety paper or mylar. New devices now enable the hand drawing process to be completely electronic, opening up a totally **Paperless Drawing** category, which is very exciting and relatively unknown in the architectural profession.

Computer Manipulated Drawings. Hand drawings that have been scanned at high resolutions can be enhanced and visually manipulated using computer image management programs. The most popular software is Adobe PhotoShop, which can be used to alter, erase, duplicate, color, and enhance a hand drawing. The computer-altered image can be printed at whatever size is required for presentation.

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Adding entourage directly onto a print of a SketchUp model.

- Scan original hand drawings in color at 300dpi. If your drawing is a black and white line drawing, scan it also at 300dpi in the grayscale mode.
- Wacom tablets are beneficial to use when altering images in PhotoShop. It is far easier to use the pressure sensitive pen on the tablet than manipulating the image using a standard keyboard mouse.
- Never alter the original version of any scanned hand drawing. Always save copies of the electronic image and make any changes to the copies, rather than the original file.

Computer Generated Drawings. Tradigital visualists are now beginning with 3D computer models, adding entourage to the images using PhotoShop, and finishing the images with hand drawn textures and color. These new cross-platform drawings are very well received by clients and have encouraged architects to experiment with even better ways to communicate their ideas. I've learned that the fastest and easiest computer generated models can be created with **SketchUp**.

The following series of drawings represent a basic tradigital approach for a computer generated drawing, beginning with a quickly generated SketchUp model, digitally altering the image and completing it by hand. This tradigital process has four distinct steps: 1) model construction, 2) image manipulation, 3) image printing, and 4) hand rendering.



Original SketchUp model.

Step 1 – Model Construction. The SketchUp model of a small lakeside visitor center took only three hours to create. I saved a page view of the building, shown at eye level using a 35mm lens. This model has a line profile setting of 1 and an extended edge setting of 2 in order to keep the linework light. Shadows were turned on and directed to best show the light illuminating interior walls. I then added materials to the walls and roof, carefully adjusting the color to reinforce a weathered façade.

Step 2 – Image Manipulation. I then exported the SketchUp view as a JPEG, brought it into PhotoShop 7.0 and resized the image resolution to 200 dpi. I began adding landscape elements and people to the image using **RPC's** (Rich Photorealistic Content) from ArchVision. RPC image packages include people, landscaping, cars and backgrounds, and can be found at www.archvision.com. Plants, trees and people were carefully sized and placed into the composition, applying a 75% transparency in order to minimize the "photographic" dominance of the objects. Using the grass brush and sponge brush in PhotoShop, I drew in the grass, beach texture and water ripples. Each RPC entourage group (trees, shrubs, people) was kept on a separate layer in order to easily manipulate each element within that grouping. When I was satisfied with the composition, I then archived a copy of the image file and flattened the layers. The next important step involved **image filtering**, one that required some creative experimentation and patience. Image filtering softens the hard linework of the SketchUp model and distorts the obvious photographic character of the people. This digital "blending" of the image is key to preparing the image for the printing and hand rendering steps. I first applied the "facet" filter to the image and added a "spatter" filter to really fragment the linework and give it a pencil-like quality. Filtering is highly adjustable and difficult to achieve without a few attempts. It took numerous efforts to get the right combination of filtered effects before finally arriving at the soft "look" I wanted.



SketchUp model with RPC elements added in PhotoShop.

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Final image filtered with Photoshop and plotted on bond paper.

Step 3 – Image Printing. Prior to plotting the image on my office HP Designjet 5000ps color plotter, I desaturated the image color (-30) in PhotoShop. This technique decreased the vibrant colors of the RPC entourage and provided a more neutral color palette for applying the colored pencil in the final hand-rendering step. In order to have more surface area for adding color and detail, I enlarged the image to 12" x 20" and then plotted the image on 48# high-resolution presentation paper (PJ148-R36100 by Accuplot). The toothy matt finish of this heavyweight coated paper is ideal for layering solid colors and adding white highlights.

Step 4 – Hand Rendering. The final and most exciting step in this Tradigital Imaging exercise was the application of colored pencil. I used a variety of Prismacolor pencils to completely disguise all of the photography and evidence of the SketchUp model. The people now appear to have been drawn by hand. Hard edges on the stonewall were softened with brown and gray pencils and the overall landscaping was heavily "modeled" with the soft pencils highlighting the pine trees and giving the grass more texture. Footprints were added to the beach and white pencil highlights were added to the window mullions, roof edges and people. Dark blue pencil enhanced the glass.



Prismacolor pencils add character, highlights and texture.

Adding colored pencil to the plotted image took only one hour and transformed the composite SketchUp model and RPC photographs into what now appears to be a completely hand drawn rendering. Total time invested in this image, start to finish is less than 8 hours; three to build the model, another three hours to manipulate the image, one hour to plot the image and another hour to hand render it with colored pencils.

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Drawing with a Wacom Cintiq (above) and InkLink (right).



AutoCAD 3D model (above) modified in PhotoShop and digitally sketched using a Wacom Cintiq.

What's Next: Paperless Drawings! There have been recent introductions of high-resolution interactive devices made by Wacom and Sony. Coupled with PhotoShop, this equipment allows one to create hand drawings directly into the computer, without the need for an original "paper drawing". This process replicates the actual actions of creating a drawing by hand, only it is completely done in the computer.

- *The Sony Clie, Wacom Cintiq 18x and the Seiko InkLink are several of many new products that enable individuals to sketch and draw directly into an electronic device.*



Jim Leggitt at a children's drawing workshop.

For more **Jumpstart Your Drawing!** information, please contact me at:

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Jim Leggitt, FAIA, is an architect, urban planner and professional illustrator at RNL Design, with over 30 years experience in the industry. He lectures annually about architectural visualization techniques and has conducted drawing workshops for universities, architectural firms and professional organizations throughout the country for over a decade. His drawing workshops at the 2001, 2002, 2003 and 2004 AIA National Conventions were scored the best pre-conference workshops. His popular national convention seminars consistently attract over 300 attendees. He currently teaches a drawing course to graduate students at the University of Colorado in Denver and offers professional continuing education drawing workshops to architectural firms, design schools and AIA regional conferences throughout the year. Jim has authored DRAWING SHORTCUTS: Developing Quick Drawing Skills Using Today's Technology, published in 2002 by John Wiley and Sons. This highly visual guide brings together the best of traditional and digital drawing techniques to help architects and designers generate sketches and presentation drawings quickly and effectively. Jim has served as President of the Denver Chapter AIA and Director on the AIA Colorado Board.