

SUSTAINABILITY CONSIDERATIONS FOR MATERIALS AND PROCESSES V1

GUIDING PRINCIPLES FOR GRAD-EX 109

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DRAFT VERSION FOR
FEEDBACK FEBRUARY 2024

SUSTAINABILITY GRADIENT							
MORE						LESS	
Re-Use/Salvage/Waste Diversion - Renewable/Biodegradable - Recycled/Recycleable - Non-Recyclable/Non-Biodegradable/Petrochemical							
Paper / Board	Salvaged Cardboard	Recycled Cardboard	Eska Board Box Board	Mat Board Mount Board Illustration Board	Sand Paper	Coated Papers Foam Core	
Wood	Scrap Off cuts	Masonite	FSC Sourced Solid Wood	Balsa, Bass Cork Cradled Panel	Plywood	Mdf Particle Board	
Metal	Scrap Off cuts	Recycled Metal			Foils		
Plastic	Scrap Off cuts	PET Styrene Coroplast		Mylar Acetate	#3 Plastics: Vinyl, PVC. Linoleum	#7 Plastics: ABS, Acrylic, Nylon, Polycarbonate	
Other	Clay, Soil, Sand Stone, Adobe	Saw Dust Playdough	Organic Cotton Felt / Wool	Alginate Beeswax	Plaster Of Paris Gypsum Concrete	Plasticine Sythetic Fabrics Parafin Wax	Fibreglass Rigid Foam Insulation (Eps)
Assembly	Slot + Tab Interlock	Metal Pins, Tacks	Cellulose Glue Gummed Paper Tape	PVA Glue Metal Wire	Masking Tape Double Side Tape	Hot Glue, Epoxy Crazyglue Spray Adhesive	
Colour/Sheen	Natural Engrave Sand / Polish	Natural Patina	Charcoal Soft Pastel	Natural Inks Shellac	Low VOC Latex Acrylic Paint Graphite	Chalk Chemical Patina Etch	Aerosol Spray Sealers + Paints

PLAN

(Refuse/Reduce)

- What is your intent? Do not over-build!
- What salvaged materials are available? Sources of conspicuous waste?
- Integrate Circular Design Principles from outset of planning.
- Plan for materials to be separated into appropriate waste streams at end of life.
- Develop Budget + Time Management documents.
- Consider storing a running collection of salvaged materials.

EXECUTE

(Re-use)

- Identify local / regional sources of more sustainable materials.
- Order material from a single supplier to reduce transport emissions.
- Consider materials with less or recyclable packaging.
- Consider less energy consumptive fabrication methods.
- Develop an Order of Operations to ensure an efficient fabrication work flow.
- Be conscious of Health and Safety considerations related to materials and fabrication.

RAPID PROTOTYPING

- Specify a more biodegradable 3D printing filament: Econofil PLA or Regen PHA.
- “Shell” your 3D prints and re-orient geometry to require less support material.
- When cutting a small shape from a large sheet, design your cut file to maximize usable off-cut.
- Virgin transparent PET plastic can be laser-cut while recycled co-poly materials cannot (release of toxic gas).

AVOID WHERE POSSIBLE

- Foam Core, coated papers, foil laminated papers.
- Aerosol Spray Paints and Spray Adhesives.
- Non-Recyclable Plastics (#3 Vinyl, PVC & #7 Acrylic, ABS, Nylon, Fiberglass, Polycarbonate).
- Epoxy resin, “Crazy Glue”, Hot glue (thermoplastic).
- Pre-fabricated plastic trees and other hobby shop vegetation.

SITE, LANDSCAPE, VEGETATION

- Consider a printed paper site plan instead of a materially intense model base. Or, choose a re-usable base material which will not warp; avoid paints/coatings or adhered grass powders (nylon).
- Collect and dry natural vegetation specimens to act as model trees and vegetation.
- Drill holes in model base for firm glue-less insertion of model trees.
- Laminate scrap wood into blocks for site massing.

OTHER RESOURCES

- Digital Hub: Join the Canvas course [“Environmental Design & Interiors Sustainability Resources”](#).
- Places: Check out the campus Re-Use Depot and scrap bins in numerous shops.
- People: Connect with shop technicians early on in your planning process for time saving advice.
- Community: Tap into existing waste streams as sources of material.
- On your Phone: [TOwaste App – City of Toronto](#)

LIFE CYCLE

(Recycle/Rot)

- Dismantle un-wanted models.
- Contribute scrap materials to shared scrap bins.
- Plan to re-use your model base. Consider a resilient rigid material that could be re-surfaced.
- Verify which plastics are recyclable in your local municipality. Plastics can only be recycled if marked with the appropriate “Resin Identification Code”(ie: plastic #5).

FEEDBACK

- Are there other resources, material recommendations or processes that you’d like to share? Please send comments and questions to: paloisio@ocadu.ca