

COMPUTER INTERFACE FOR RAPID DESIGN AND COST ESTIMATION WITH RESIDENTS

Priority: SOON



What is proposed?

- Extension of the existing house redesign and cost estimation procedure into an *in-sitio* computer-aided process.
- Modifications are discussed with the homeowner in his house and incorporated on-the-spot.
- The process parallels the 'one-stop' philosophy of future upgrading procedure.

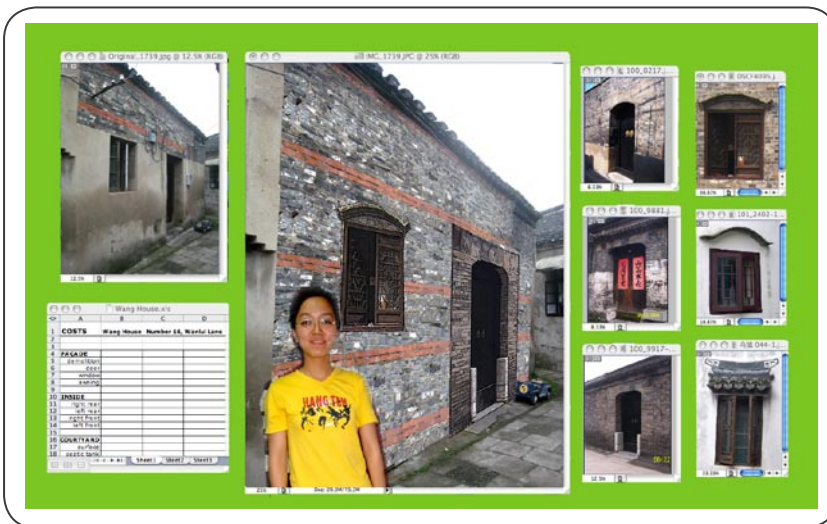
Why is this useful?

- A rapid process of accessing and deciding on modifications improves the delivery of upgrading by substantially speeding the process.
- The *in-sitio* use of a printer allows instant documentation of the decisions, available for use by the resident immediately.
- The all-at-once process promotes trust and confidence through the immediate documentation, and allows residents to directly monitor the upgrading construction.
- The novelty of computer use may increase interest in upgrading by both professional and homeowner, and contribute to a fundamental acceptance of residents as partners.

What needs to be done to get it going?

- The various components for house estimation and modification are already available. The PUD Guidelines provide the appropriate choices in visual format, the cost estimation follows the standard format with unit costs already in use.
- Instead of bringing the house data (plan sketch, photographs of house) back into the office and developing the modifications and costs there, the process does this task *in-sitio*, saving considerable time.
- The skill level of facilitators - those that meet with the homeowner - may need to be improved, particularly in standard computer applications (PhotoShop, Excel).
- A trial team of 2-3 persons would need to test and refine the process. The team may include: planning bureau designer with computer skills, Old City community liaison to facilitate discussions with home and provide continuity with other programmes, and GTZ advisor as initial catalyst and support.
- The current menu of approved upgrading elements (The PUD Guidelines) would need to be further refined and coupled more directly with unit costs.

Printed output of facade modifications with costs. Owner is included in photo as confirmation of decisions.



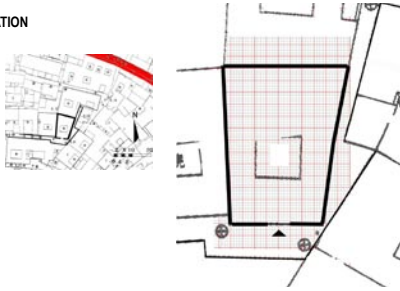
PREPARATION IN OFFICE

1 - GET PROPERTY PLAN INFORMATION

Get digital plan and save in a file 'Property Boundaries'. Include overall dimension. Often this is in AutoCAD format. It useful to save as a jpeg file also.

Superimpose grid at 0.25m as reference for dimensions.

This becomes the BASIC PLAN FOR REDESIGN



2 - PRE-LOAD LAPTOPS

Load PUD Data Folders. Two forms of data are included:
 - Element images saved in jpeg format: doors, windows, etc.
 - Element costs: units costs of the various elements to be used for cost estimation

Outside

- Facades
 - doors
 - windows
 - awnings
 - surfaces
- HVAC Units
- Solar water heaters
- Roof

Inside

- Interior walls
 - surfaces
 - window walls
- Flooring
 - courtyard stone
 - wooden floor
- Kitchen equipment
 - sink
 - cabinet
 - counter
 - range
 - range hood
 - refrigerator
 - other?
- Bathroom equipment
 - toilet
 - sink
 - bathtub/shower

Element	Image	Cost	...
Target (2x facade)			
Transition			
Interior (2x)			

3 - SET-UP WORKING SCREEN ON LAPTOP

- **Base image:** reserve space for reduced original image at upper left for comparison to changes - Photoshop program
- **Working image:** reserve space for large image in middle for modifications - Photoshop program
- **Choices:** Set up library of elements at right, from PUD Data Folders
- **Spreadsheet:** install at lower left for recording costs



Spreadsheet for keeping track of costs

4 - PREPARE EQUIPMENT

Test equipment to assure proper fit



Digital camera, with cable for download to computer

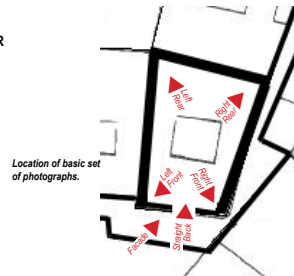
Laptop, with sufficient battery power and memory

Printer, battery powered, best with Bluetooth cable-less connection

START SESSION AT HOMEOWNER'S HOUSE

1 - PHOTOGRAPH HOUSE ELEMENTS AND OWNER

Photograph:
 - Facade
 - Inside: minimum 4 isometric images
 - Photograph owner, for later insertion in images to personalize



Number 6 - Area 2



FACADE

Straight Back



RightRear

LeftRear



LeftFront

RightFront

Owner

2 - DEVELOPMENT OF OPTIONS - INTERACTIVE SESSION WITH RESIDENT

(Note: Ideally both plan and inside/outside of house can be visible simultaneously on screen. Screen size limitations makes this unfeasible; second choice to keep plan layered behind elements for ready recall.)

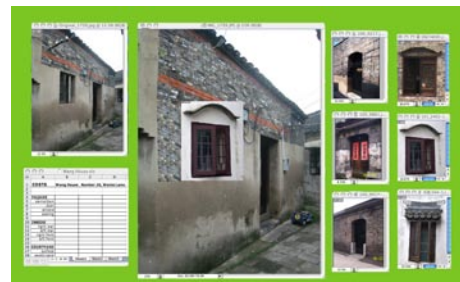
DESIGN THE ELEMENTS

Open image. (Start with Facade, then progress to inside.)
 Place small copy as 'base image' in upper left of screen

Develop options, drawing on PUD Data Folders for images

Save options

- Do 'screen dump'; label to keep track, and save
- Keep option open and layer images for easy recall and comparison



DESIGN PLAN

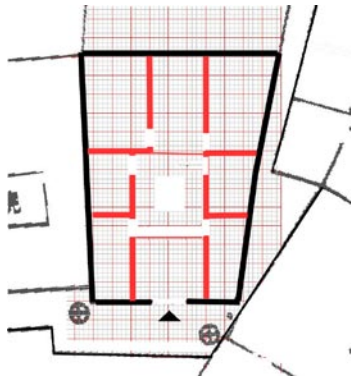
Open BASE PLAN image. Place small copy as 'base image' in upper left of screen

Develop options, coordinate design of elements.

Save options

- Do 'screen dump', label to keep track, and save

- Keep option open and layer images for easy recall and comparison



DETERMINE COSTS

Determine costs from Cost Data Folders. Keep cost file accessible to simultaneously compare costs of the various options being considered. As changes are made, add the costs to the spreadsheet.

Save data in spreadsheet, keeping running total.

The cost data and documentation needs to be coordinated with the existing estimation sheets used in the upgrading process in the more recent participating houses.

COSTS Wang

FAÇADE	
demolition	
door	
window	
awning	
INSIDE	
right rear	
left rear	
right front	
left front	
surface	
septic tank	
drains	

5 July 2007 - Goethert

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4 - PRINT THE SAVED 'SCREEN DUMPS' AND GIVE TO HOMEOWNER

The images record the changes discussed with the homeowner, and the last set includes the estimated costs.

Three sets of options would be printed:

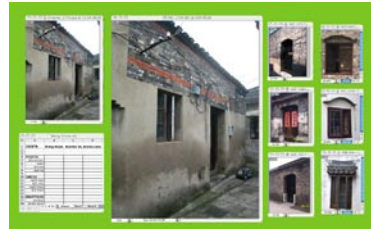
- facade
- interior, from several views to capture full house
- plan

Each option includes the cost implications

Example shows facade modification.

A similar process is followed for the interior and the plan.

Starting base



Initial selection of modifications for window and door



Final modifications of window, door, and wall, along with removal of electrical boxes and wiring.

Add photo of owner as confirmation of changes.



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NOTES

Team Tasks:

Three main tasks:

- discuss and design plan options
- discuss and design element options
- discuss and determine cost related to options
- print

Number of team members:

Feasible to do by one person. Discusses with resident while modifying house. Two persons would be best.

Technical Notes:

- PhotoShop or equivalent is used as the basic programme. The facilitator must dominant use of the program.
- Excel or other spreadsheet is used to keep track of costs.
- 'Screen dump' technique is needed to save intermediate steps. For PC, press 'PrtScn' key (print screen) and paste into Photo-shop. For Mac, use Grab command.
- AutoCAD may be easier for some in redesigning plan.

All programs should be open simultaneously to facilitate use, specifically Photoshop and Excel.