Hakka Research Projects, ASH-Inc., Canada

• some of these international research projects are unique

01) **BioSphere & Trail** project (on-going):
see Proposals & PPTs at: http://www.HakkaHeritage.com
• for eastern Guangdong, western Fujian & southern Jiangxi
a) selecting best demonstration sites (Figs. 1-3)
b) selecting best partners in Canada, China & the US

02) **Yuan Yuan Lou** preservation initiative, Stage 1: preliminary:
• fact-finding mission, research & compilation of data, into 1st Postcard Abstract (example, Chengqi Fig. 4, 5)
• field trip completed 3 weeks ago (Figs. 6, 7)

03) **Pattern Language** studies**:**
• architectural, engineering, planning, sustainable & Societal
A) Design, Architecture, Engineering, Planning, Feng Shui:
a) Tulous: cataloguing generic (typical) patterns
b) Weilong**:** cataloguing generic (typical) patterns
B) Sustainable Features: wide scope of work to include:
• resource conservation, orientation, renewable energy (Fig. 8), embodied energy, durability, local & global
a) Tulous: sustainable features found in typical tulous
b) Weilong: sustainable features found in typical weilong
C) Social Benefits: conserver lifestyle, micro-industries, community amenities, home schooling, health & safety
a) Tulous: social benefits found in typical tulous
b) Weilong: social benefits found in typical weilong
• for application in modern design, architecture & planning, construction, living & recofitting

04) **Tulou Mass & BTC** study**:** calculations & simulations:
Example 1: Chengqi lou (Figs. 4, 5, 9)
a) calculating total mass in walls, roofs & floors
b) calculating the Building Time Constant (monthly /seasonal thermal decay)
c) writing a simulate program for the above


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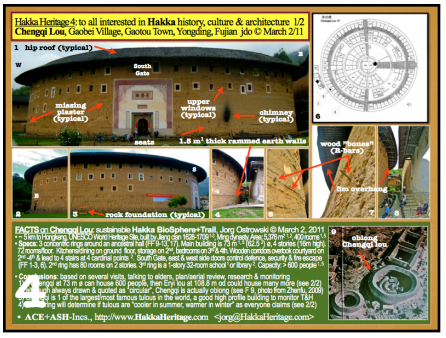

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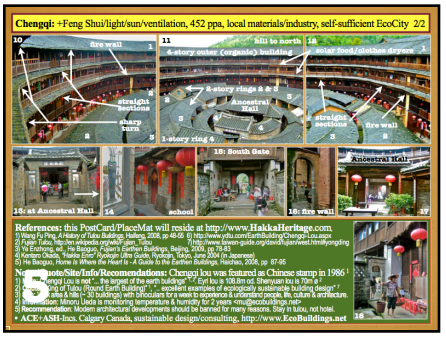

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05) **Rainwater** Study: calculating rainwater potential, for Chengqi lou (Figs. 4, 5, 9), based on previous work (Fig. 10)

06) **Rammed Earth** studies:

- preliminary analysis, research, & design upgrades:

a) Failures: identification, examination & analysis of past structural failures/weaknesses of rammed earth walls found in various tulous in Fujian & Guangdong (Fig. 11), and proposed solutions for improvements & retrofits

b) Circular Form: analysis of any inherent structural benefits of circular vs other shapes for earthquake resistance

c) natural ingredients: simple natural materials to increase:

- bonding of base material (gravel, sand, clay)
- compressive strength (> 10 mPa/1500 psi)
- reinforcement for earthquake resistance (mesh)
- surface hardness (durability)
- rain shedding abilities (new veneer)

d) embodied energy: reducing cement content & distance

e) recofitting: use of exoSkeletal system used in past straw-bale projects (Figs. 12-13), applicable to tulous & our work on the old town of Kashgar (Xinjiang province) (Fig. 15)

07) **Monitoring**:

- 2 year testing of temperature & humidity in Chengqi lou (1 year completed) (Fig. 9), see example Fig. 14

08) **University Foreign Study Program:**

- discussion with various Canadian Universities, especially architecture, planning, engineering schools to collaborate with Chinese partner Universities, for foreign exchange programs & field work (residence/practicums in Hakka tulou/weilong)

09) eco**Postcards**: succinct pictorial & factual summaries on 2 pages, at part of PPT (5 posted, 10 completed)

10) **Postscript & Thank You**: Our research team includes: Jorg Ostrowski, Changying Ma, Karen Braun, Qui Livia, Xiaoyan Li, Terrell Larson, Yuanming Xia & Minoru Ueda

- http://www.HakkaHeritage.com and click on Projects, NSF

Thank you for reading this summary of Hakka R&D work underway by ASH-Inc. in Calgary+Meizhou Comments are welcomed.