- HY built CH2 as head contractor in partnership many subcontractors and suppliers
- HY operates nationally with offices in SA, NT, VIC, NSW and TAS
- Annual turnover around $600M and 420 staff
- HY has an extensive reputation for ESD construction

60L Green Building

- HY built the 2003 MBA Environmental Award winning 60L Green Building project
  – 60 Leicester Street, Carlton, Victoria

K2 – 5 star equivalent

- K2 Public Housing project, Windsor
- Project Value $28M

Kangan TAFE, Docklands – 5 star

- Kangan Batman TAFE
  – Automotive Centre of Excellence
- Project Value $16M

Goulburn Valley Base Hospital – 5 star

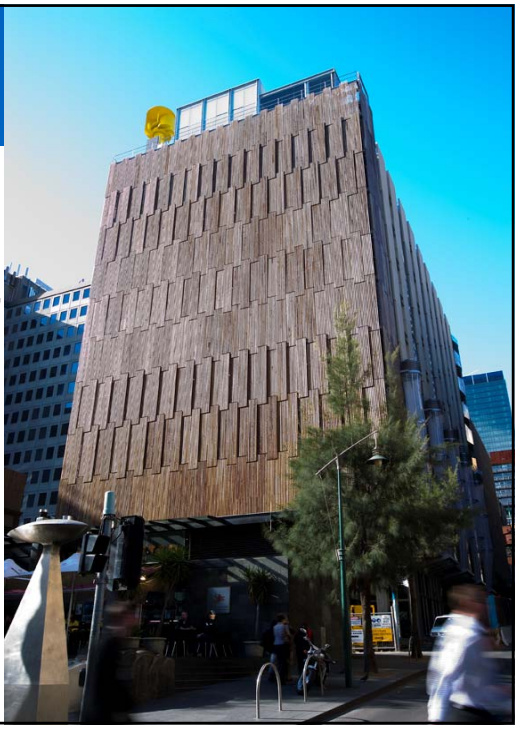
- Goulburn Valley Base Hospital
- Project Value $9M

Lyell McEwin Hospital, SA

- Project Value $90M
- Rated for 5 Green Star classification

CH2 – 6 star

- Council House 2 – 218 – 242 Lt Collins St, Melbourne
- Project Value $51.4M



CH2 Video Presentation

The CH2 Experience

- CH2 harnesses simple ideas to achieve clever solutions to sustainable energy savings for the life of the building.

To quote Mick Pearce, MCC Project Architect:

"CH2 incorporates many sustainable technologies which are not new, but have never before been assembled in one building in such a highly intergraded fashion."

The 12 Major Construction Challenges

1. Greater than 80% waste recycling required
   - The limited site area dictated the waste management approach
   - HY and Collex Calleja joint venture adopting co-mingling of waste to achieve more than 85% recycled content by weight

CH2 Construction Challenges

2. Installation of Chilled Ceiling Panels and Chilled Beam “state of the art” air conditioning technology

CH2 Construction Challenges

3. Phase Change Material
   - Complex PCM storage requirement

     30,000 stainless steel spheres in 3 holding tanks
   - Imported PCM product and spheres
   - Complex chilled water reticulation through PCM which freezes at 15°C

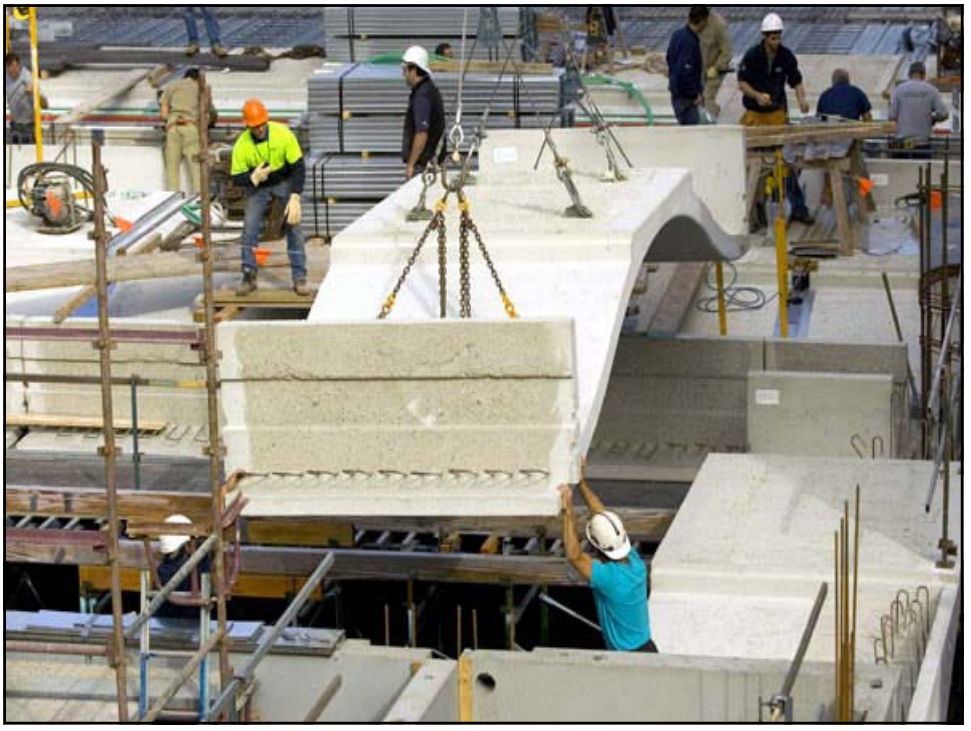
CH2 Construction Challenges

4. Imported Black Water treatment plant with complex water reticulation design
5. Unique timber construction double glazed windows to all 10 floor levels – extensive prototype testing required
6. Recycled timber Western Facade automated shutter system
7. Complex Building Automation system installation with 12 month building services commissioning period
8. Shower towers – simple design concept and complex construction and commissioning requirements

CH2 Construction Challenges

9. Precast concrete “wave” shape ceiling design with a class 1 finish

The innovative curved concrete ceiling construction posed significant challenge for craneage and placement of these units on the confined site



CH2 Construction Challenges

10. Wind Turbines installation 6m above Northern exhaust stacks

CH2 Construction Challenges

11. Raised Access floor system incorporating 100% fresh air ducting

12. Green Concrete mix design - placement issues

Case Study

- Use of “Green Concrete”
  - Recycled Aggregate and use of Flyash as Cement Replacement

Why is “Green Concrete” important for sustainability?

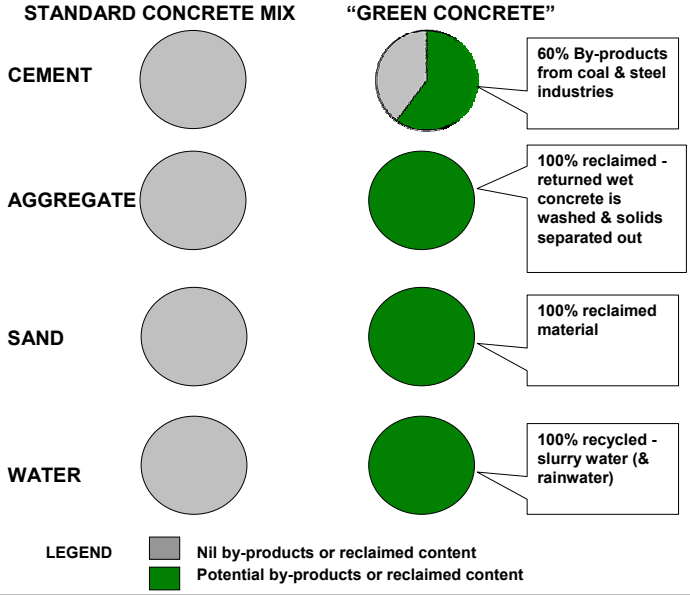
- Reduced impact on the environment
  - Stone, cement, sand & water are recycled
- Concrete’s thermal mass properties can be exploited in low-energy buildings

Northern Facade of Council House 2

“Green Concrete” helped the CH2 project achieve the first 6 Green Star* rating for a Commercial Building in Australia

- “Green Concrete” was used in the insitu cast columns, slabs and walls of the building (photo May 2005)
- “Glenium” super plasticiser admixture was used to produce workable mixtures and high strength capability
- Flyash blended cement used in curved precast ceiling panels

“Green Concrete” uses by-products & reclaimed materials to produce an environmentally friendly mix



"Green Concrete" contains reclaimed aggregate which is superior to Recycled Concrete Aggregate (RCA)

	RECLAIMED AGGREGATE (from surplus wet mix)	**RECYCLED CONCRETE AGGREGATE (RCA) (from demolition sites)**
Suitable for high strength mixes?	**YES** Concrete up to 70MPa from reclaimed aggregate	**NO** 20-25 MPa non structural mixes
Percentage of aggregate content replaced?	100%	30%

Summary

- Easy Gets in ESD Construction

1. Recycling of Waste – Collex Co-mingling on site. Our current records indicate that 97% of the tonnage of all waste at CH2 site is verified as recycled

2. Sourcing of following products has been relatively easy:-
   - Halogen Free wiring
   - Recycled timbers

Summary

- Easy Gets in ESD Construction (cont'd)

3. Finding PVC alternative products is now common practice:-
   - Eg Water and Drainage pipes using HDPE and Polypropylene
4. Achieving the percentage of Recycled reinforcing steel is also easily done as reinforcing suppliers extensively use recycled material
5. Use of Plywoods and natural timbers as an alternative to MDF is readily achieved and is Industrially a strong positive with the work force

Conclusion

- ESD building is very "do-able" – ESD ideas are affordable
- HY are constructing buildings inclusive of ESD features at equivalent cost to standard construction that are healthier and provide significant energy and water savings
- ESD construction works well when a partnering approach with all stakeholders is adopted to achieve agreed outcomes

Conclusion

- Up until now higher construction costs have created barriers to ESD – these costs are being reduced by:
  - Greater competition of material supply
  - Better R&D for warranties and lifecycle duration
  - Improved quality control techniques for recycled steel, concrete and timber supplies to meet Codes
  - Economies from improved technology for building services

Conclusion

- ESD construction is the new **“black”**
  - It looks great – Natural materials selections
  - It feels great – Fresh, clean & healthy air flow
  - It is great for building occupants and future generations
  - Sustainable outcomes are affordable and achievable, they are simply a matter of knowledge and choice

Questions?