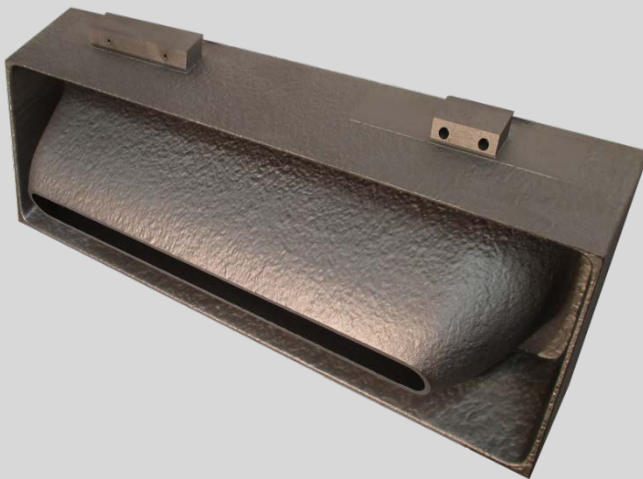




## Central Police Station (CPS), Hong Kong

Hycast Metals has successfully engaged with high profile architects, engineers, contractors and projects in Hong Kong since 1998. Consequently, Hycast was invited to submit a proposal for the manufacture and supply of 8,200 aluminium bricks to be incorporated in the Central Police Station restoration project, Hong Kong. Hycast was asked to make this submission, as the architect was not satisfied with current offerings from 70 worldwide suppliers.

Hycast Metals as a company has a strong structural engineering and metallurgical base, as a foundation. Hycast offered a low pressure die cast casting, incorporating the granite texture with a unique finish for aluminium. This is what the architect was seeking. Hycast won the contract on quality.



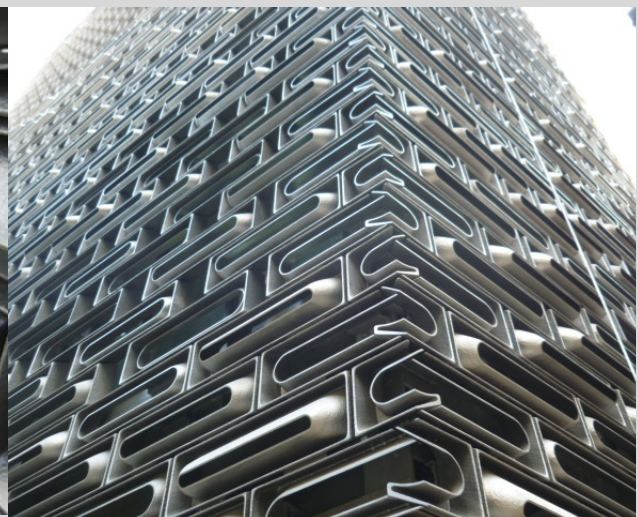
**Full Brick - Brick No: 0025**



**Corner Brick - Brick No: 0087 & 0989**

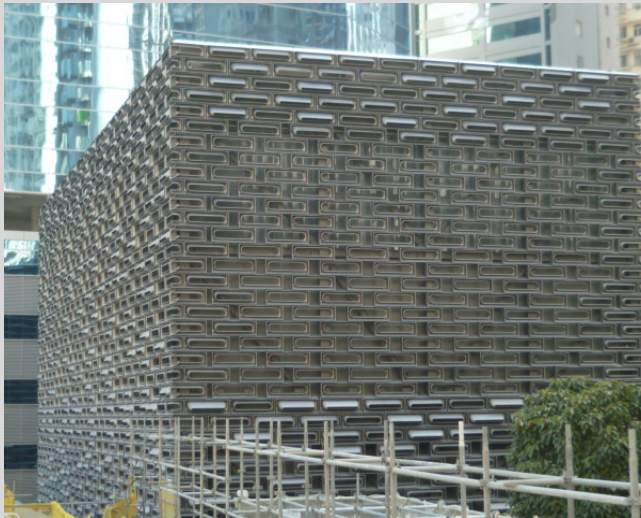


**Arbuthnot Auditorium - North Facade**



**Typical Corner Detail**





**Arbuthnot Auditorium - West Facade**



**Arbuthnot Auditorium - North East View**



**Arbuthnot Auditorium - East Facade**



**Arbuthnot Auditorium - North East Corner**





**Old Bailey Galleries -NW View - Staunton Street,**



**SW Corner View - Old Bailey Street**



**Old Bailey Galleries - SW Corner**



**Reflection off Arbutnot Rd neighbour**



### **Manufacturing Design Issues**

Hycast met with architects Herzog de Meuron and Rocco and prime contractor Gammon in Hong Kong in October 2011. Hycast evaluated engineering issues involved with the required aluminium castings, in the environmental category 5 that Hong Kong experiences.

### **Step-by-step challenges**

1. Granite textured 3D model  
The concept of creating a 3D file with a 2mm thick granite textured surface was the first step to overcome. First step was to find a suitable texture! This task was achieved utilizing several skills.
2. Die Design  
The casting simulation took 18 interactions to achieve the design criteria. The normal number of interactions is 2.
3. Die Manufacture  
The die needed to allow the 50kg part to be extracted, with a 2mm rough texture on all surfaces, and not having undercuts which would prevent the casting from being extracted.
4. Casting material  
The client required recycled aluminium to be used. This introduced inconsistencies in the chemical analysis, which needed to be sourced.
5. Low Pressure Die casting  
Continual fine tuning was required throughout the manufacturing process, as tolerance was an issue.
6. Machining  
The machining of large aluminium castings is generally avoided by machinists because of inevitable inconsistencies. A separate CAD file for each of the 8,200 bricks was necessary as each brick is effectively different, due to varying support conditions.
7. Surface Finishing  
The surface finish had to be "invented". The innovation had to comply with the relevant ISO Standard on coatings for aluminium. The major issue was this surface protection method.
  - Extruded aluminium, with 0.2% silicon, can be protected with a marine grade anodized finish.
  - Low Pressure Die castings with 7% silicon, makes standard anodizing impossible.
  - The brick surface needed special attention to ensure adhesion of the finish.
  - The brick surface could not look "painted". The surface offers variable reflective qualities.
8. Tracking
  - Tracking each and every unique casting, accounting for testing, rejecting and passing, along the process.
  - Shipping bricks on pallets, so that erection could follow a unique design path.
9. The client/consultant/main contractor/contractor/Hycast chain



The fair, honest and open relationship between the parties involved with the project assisted in bringing the manufacture of this unique architecture facade element (brick) to a successful conclusion.

**Conclusion**

The challenges set in the manufacture of the Central Police Station (CPS) Revitalisation brick were met, as a result of collaboration between architects, contractors and the manufacturing team of companies with innovative engineering based experience.