

Provision of Architectural Designs of
Protection and Visitor Facilities for
Rock Carvings and Inscription in Hong Kong

FINAL REPORT

15th March 2012

THE UNIVERSITY OF HONG KONG 香港大學
faculty of architecture 建築學院
Community Project Workshop 社區項目工作坊

TABLE OF CONTENTS

1. Project Background and Brief	3
2. Site Analysis, Geological and Historical Research	6
3. About the Project Team	16
4. Summary on Consultations with Advisors	18
First Consultation	
Second Consultation	
5. International References	26
6. Previous Design	32
7. Design Proposals	44
8. Specifications of Materials	87
9. Quotations of Construction Costs	92



1 Project Background and Brief

Scope of Work

The Community Project Workshop (CPW) was commissioned by the Antiquity Monument Office (AMO) to conduct a research study and design proposal for the protection and visitor facilities at 9 rock carving and inscription sites from April 2011 to March 2012.

The project has covered the following tasks:

1. To prepare three proposed architectural design options and drawings of protection and visitor facilities.
2. To suggest construction materials which are compatible with the surrounding environment of the sites and in accordance with the proposals of the Study;
3. To conduct geological and historical research, to substantiate the proposed architectural designs; and
4. To provide an estimate of the construction costs of all proposed facilities.
5. To consult and interview the 4 advisors from the Consultation Study on the Preservation of Rock Carvings and Inscription in Hong Kong.

The Sites

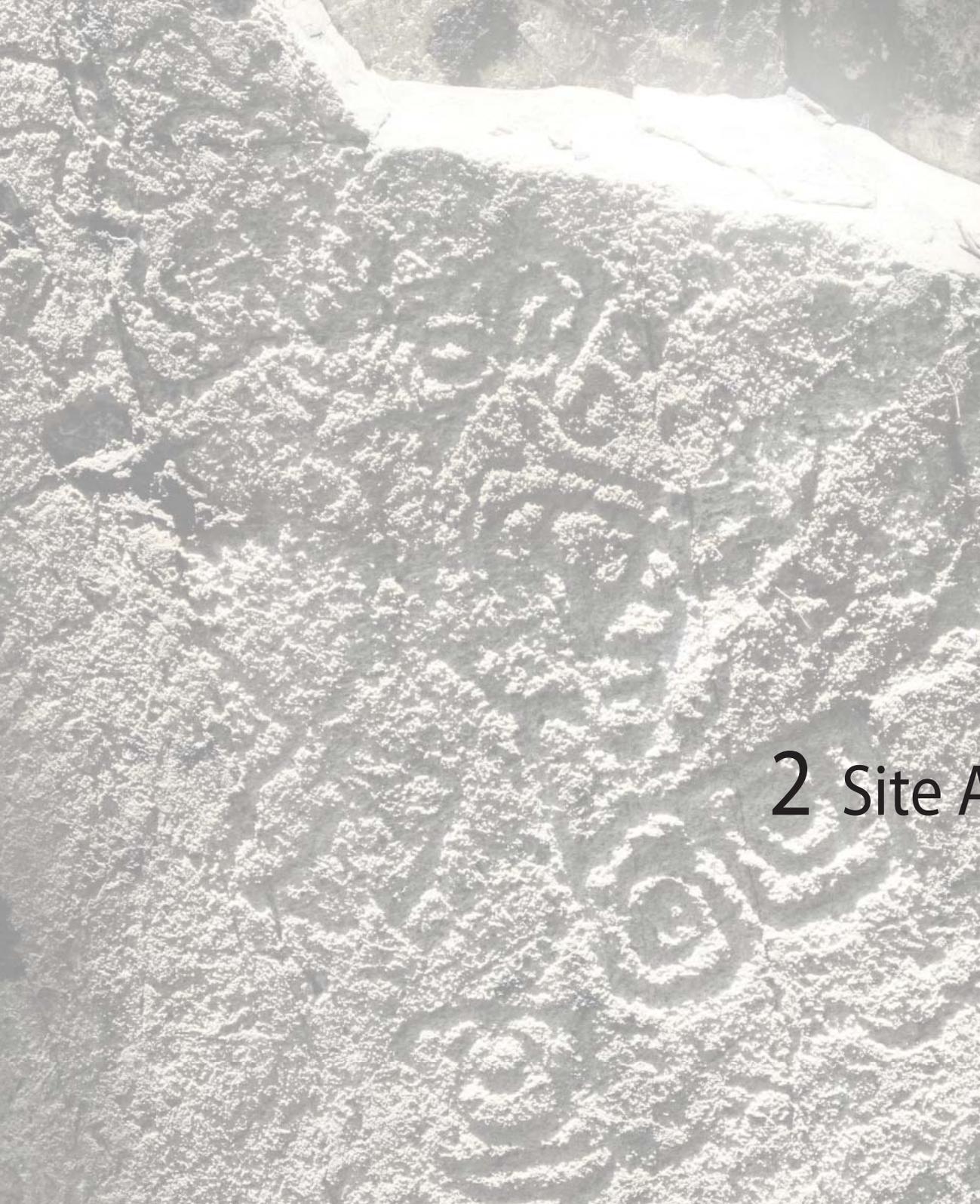
The Antiquities and Monuments Office (AMO) has selected 9 ancient rock carvings and inscriptions for this study. Through study we aim to design feasible protection and visitor facilities for these monuments which present high historical and cultural significance.

The 9 rock carving sites are:

- Site 1_Tung Lung Chau
- Site 2_Po Toi Island
- Site 3_Cheung Chau
- Site 4_Wong Chuk Hang
- Site 5_Big Wave Bay
- Site 6_Lung Ha Wan
- Site 7_Shek Pik
- Site 8_Joss House Bay
- Site 9_Kau Sai Chau



Location map of rock carving sites



2 Site Analysis, Geological & Historical Research



Site 1_Tung Lung Chau

Date of site visit: 2 August 2011

Year of declaration as declared monument: 1979

Location: On the northern coast of Tung Lung Chau overlooking Joss House Bay

Size (W x H): approx. 300 x 200 cm

Remarks: recorded in San On Gazetteer

Patterns: features in a dragon pattern

Existing Facilities:

- Stainless steel shelter with Perspex covers
- Concrete viewing platform and footbridge
- Concrete water diversion dam
- Concrete platform for the shelter

Observation of present site condition:

- Natural setting being ignored
- Opening at the sides allow the carvings to be touched
- Deleterious effects of concrete on the rock



Present condition of existing facilities

The engraved design at Tung Lung Chau is the largest and most impressive in Hong Kong, with a height of 180cm and a width at base of 240cm. It was executed on a large boulder that stands out somewhat from the other coastal rocks and is only 4 to 5m above sea level.

As at Po Toi, a fracture divides the motifs of this carving. On the right, there seems to be a highly ornate bird although only the head and possibly feet are distinguishable from the swirls and elaboration; to the left there is a conglomerate of figures with several 'eyes' and other non-distinct units. The carving is also similar to the Po Toi group in setting – on a remote rocky coast distant from any possible settlement. Tung Lung Island itself has no known prehistoric sites.



Current appearance of the carving



Current appearance of the carving

Site 2_Po Toi Island

Date of site visit: 2 August 2011

Year of declaration as declared monument: 1979

Location: On two coastal rock cliffs located at the southern part of Po Toi Island

Size (W x H):

Left - approx. 160 x 200 cm

Right - approx. 200 x 140 cm

Patterns: The rock carving consists of lines resembling stylized animal and fish patterns on the left and spirals with inter-locking style on the right.

Some five meters almost vertically above the sea, a small ledge affords access to the group of Po Toi Carvings, which faces south. The designs are cut on a fine-grained rock (porphyritic microgranodiorite) that occurs as a narrow (15m wide) dyke in the surrounding coarse granite. The indented dyke is visible from some distance away because of its heavy weathering into small platforms and boulders, whereas the granite on both sides slopes gradually into the sea.

Two large carvings measuring 130 x 50cm and 90 x 45cm dominate. Interestingly, on the main carving the two engravings are separated by a rock feature 70cm wide which also separates the motifs. The pattern to the left is in a more abstract, zoomorphic style, while the other is composed of spirals in an inter-locking arrangement with some more abstract elements on the periphery. The presence of these two styles in association is extremely important in dating other carvings such as those at Cheung Chau and Tung Lung, which are of the 'zoomorphic type' only. The smaller designs on the nearby boulder are more linear, and have little resemblance to any other carvings.

Existing Facilities:

Left

- Iron frame protective shelter with Perspex covers for the carving
- Concrete platform for the shelter
- Concrete barriers for the carving
- Viewing platform

Right

- Concrete platform for the rock carving
- Chains barrier for carving
- Concrete water diversion dam for the carving

Observation of present site condition:

- Temporarily stabilized
- Natural process of spalling off from the rock surface in thin layers
- Failure of the water diversion dam
- Shelter damaged after recent typhoon
- Concrete platform/concrete block
- Archaeological and natural setting altered
- The Perspex case may create micro-climate
- Insufficient ventilation
- Growth of micro-organisms



Present condition of existing facilities

Site 3_Cheung Chau

Date of site visit: 2 August 2011

Year of declaration as declared monument: 1982

Location: On a boulder below the Warwick Hotel, East Bay

Size (W x H):

(L) approx. 30 x 40cm

(R) approx. 110 x 250cm

Patterns: two groups of similar design with several carved lines surrounding small depression

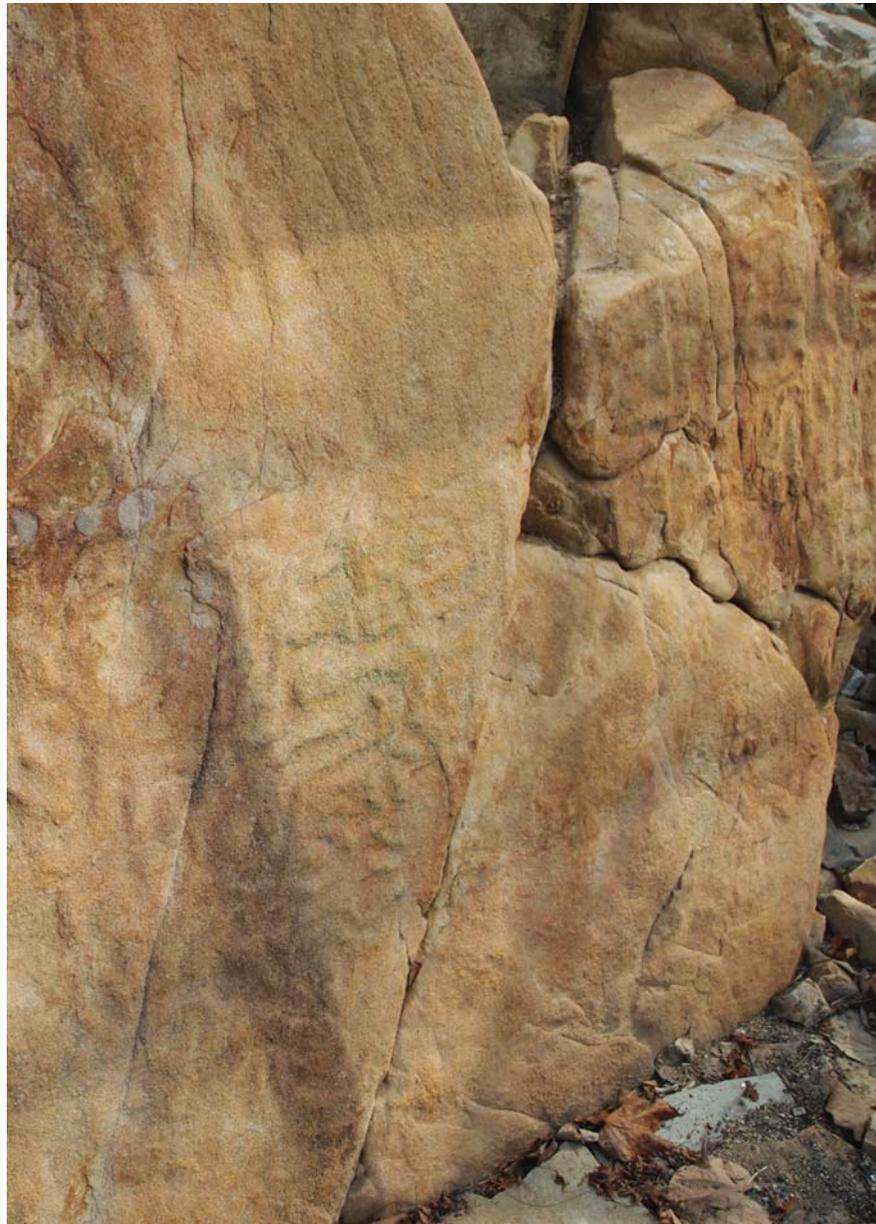
Existing Facilities:

- Concrete water diversion dam
- Stainless steel frame with glass panels

Observation of present site condition:

- One large rock face is experiencing degradation
- Water dripping from the roof
- Wind focused by the openings
- Condition of the rock outcrop is not very stable.
- The enclosure of the rock carving has space at the top large enough for a person to climb through and gain access to the carvings

The carving is situated on the southeastern portion of the long tombolo forming Cheung Chau island, where a large village flourishes today, and where several prehistoric sites have been found. The carving is in a rock outcrop separating the main bay from a small cove to the south. The rock is a medium-grained feldspar porphyritic dyke in a context of coarse granite. Perhaps because of the fact that it stands only 4m above a sometimes exposed shoreline, the pattern is now heavily eroded. Still visible are several curving lines around small depressions in an area of about 50cm².



Current appearance of the carving



Present condition of existing facilities

Site 4_Wong Chuk Hang

Date of site visit: 4 August 2011

Year of declaration as declared monument: 1984

Location: 3 main groups of carvings on a vertical rock surface at the side of a stream course

Size (W x H): approx. 200 x 300cm

Remarks: Unlike other rock carvings that are usually located near the coast, this carving is away from the sea.

Patterns:

Meandering and spiral designs suggesting stylised animal motifs

The patterns of the carving at Wong Chuk Hang are on a vertical rock face just above a small stream. There are two sets of spirals, an anthropomorphic or zoomorphic figure, and some other less distinct patterns. They bring to mind the combination of geometric and stylish zoomorphic motifs at Po Toi. There is absolutely no question here that these are carvings of the same style and probably the same age.

What is unique and most important about this new carving is its location – in a narrow ravine just above a small stream. Unlike all the other Bronze Age carvings, this one is quite distant from the sea, about one kilometre at present. Even though the coastline would have been slightly more inland 3000 years ago, it would still have been at least 500m or more from the sea. It is also quite high above sea level, at around 35m.

Its discovery gives a new dimension to the interpretation of local rock carvings, as clearly this one is not related to the sea. The location may have been chosen to mark the source of a perennial fresh water stream, as the site might formerly have been near a spring.

Existing Facilities:

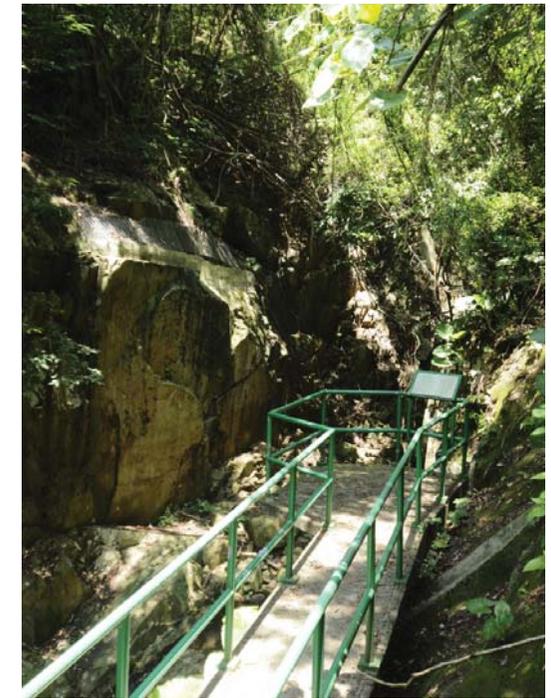
- Concrete water diversion dam
- Concrete viewing platform

Observation of present site condition:

- Stable
- Ineffectual concrete dam directly above the rock face as illustrated by the drip lines below it
- Presence of insects
- There are remnants of squatter huts and chunam on the slope above



Current appearance of the carving



Present condition of existing facilities



Current appearance of the carving

Site 5_Big Wave Bay

Date of site visit: 4 August 2011

Year of declaration as declared monument: 1978

Location: On a rock cliff at the eastern end of the Big Wave Bay, Hong Kong Island

Size (W x H): approx. 200 x 110 cm

Patterns: Geometric and animal patterns

Existing Facilities:

- Iron frame shelter with timber ceiling
- Concrete viewing platform

Observation of present site condition:

- Carving condition is stable
- No evidence of biological growth
- Most easily accessible rock among all hence more vulnerable to vandalism
- Failure of concrete dam above the rock (trapping instead of diverting water)

The carving at Big Wave Bay is situated on the coastal rock platforms on the eastern arm of the bay, in a fine-grained volcanic rock, some 5 to 6m above sea level. The worked surface measures 90 x 180cm and faces southwest across the bay. The pattern is obviously zoomorphic, although there are also geometric elements below. This carving, like Shek Pik, is near a beach and small valley, but no archaeological remains have been found nearby or in the extensively cultivated valley north of the bay, despite several surveys.



Present condition of existing facilities

Site 6_Lung Ha Wan

Date of site visit: 4 August 2011

Year of declaration as declared monument: 1983

Location: On a vertical face of a badly weathered boulder facing east

Size (W x H): approx. 140x 140 cm

Patterns: Geometric patterns that may resemble stylized animals or bird forms

Existing Facilities:

- Viewing platform with monument plaque and steel railings

Observation of present site condition:

- Facing east (prevailing wind)

- High level of weathering and wind erosion in this rock

The engraving is located on the vertical face of a rocky area, in very close proximity with the sea. The site is facing east, from where the wind was blowing during our visit. There has always been a debate whether it is an engraving or shapes created by natural erosion of the rock surface.



Current appearance of the carving



Present condition of existing facilities



Current appearance of the carving

Site 7_Shek Pik

Date of site visit: 8 August 2011

Year of declaration as declared monument: 1979

Location: On a slope near the base of the Shek Pik Reservoir Dam

Size (W x H): approx. 30 x 80cm

Remarks:

- First report in 1938 by Chen Kung-chieh

Patterns: geometirc patterns composed of spiral squares and circles

Existing Facilities:

- Concrete water diversion dam
- Wooden shelter with steel frame

Observation of present site condition:

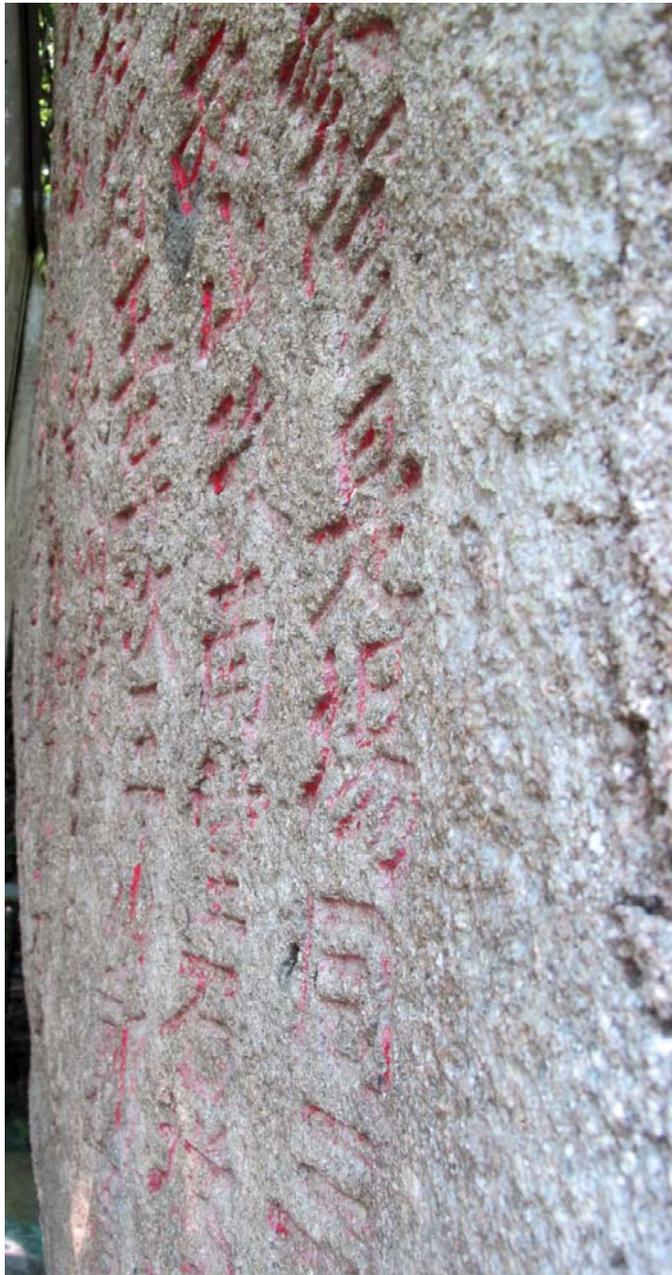
- Potential hazards, mostly created by human intervention
- Pavilion allows air flows, but still alters the natural condition
- Blocking of UV leads the to growth of micro-organisms that may cause damage
- The amount of lichen and other growths on the rock seems to be more than in the 1970s
- Concrete poses a great hazard to the rock

Shek Pik was one of the first Bronze Age sites to be excavated in Hong Kong. The Main archaeological site was found in a sandbank behind the beach on the south-facing Tung Wan bay. The Shek Pik carving is unusual: it is the only one discovered with archaeological remains.

The carving is approximately 5 to 6m above sea level, and 300m from the sea, in a medium-grain volcanic rock outcrop at the base of a small hill. Several parts of the rock face are carved, with the largest pattern being a design of square spirals 60 by 40cm. Close-by is another square spiral, a spiral, and a concentric circle design. The rock face is very heavily weathered, and the grooves difficult to trace (at best only 5mm deep).



Present condition of existing facilities



Current appearance of the carving

Site 8_Joss House Bay

Date of site visit: 4 August 2011

Year of declaration as declared monument: 1979

Location: On a boulder near the Tin Hau Temple

Size (W x H): approx. 150 x 120cm

Remarks: records a visit by a salt administration officer to Fat Tong Mun in 1274

Patterns: Inscription

Existing Facilities:

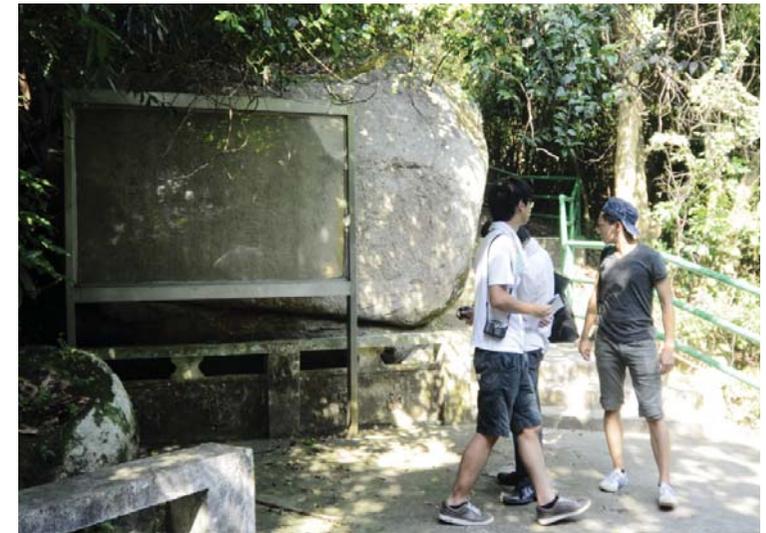
- Perspex protective screen with stainless steel frame

Observation of present site condition:

- Stable condition
- Perspex screen does not provide adequate protection, as much of the inscription can be touched from under the screen
- The outer edges should have been blocked with some kind of chainlink or grill

The inscription is located on a pedestrian path leading to the nearby Tin Hau Temple. It was carved on a tuff boulder, using one of its vertical surfaces. A landing platform with cement benches was built at the level of the boulder containing the inscription, allowing for visitors to take a rest.

The inscription represents the cyclical year of Jiaxu of the Xianchun reign during the Southern Song Dynasty, equivalent to 1274. It is the oldest dated inscription in Hong Kong, and makes reference to the salt production in this region, of high relevance for the history of Hong Kong.



Present condition of existing facilities



Site 9_Kau Sai Chau

Date of site visit: 12 August 2011

Year of declaration as declared monument: 1979

Location: A flat vertical rock surface at the north western coast of Kau Sai Chau

Size (W x H): approx. 80 x 140 cm

Remarks:

- The carving is 2m above the water mark. It can only be viewed under rising or setting sun

Patterns: Zoomorphic motif similar to other rock carvings

Existing Facilities:

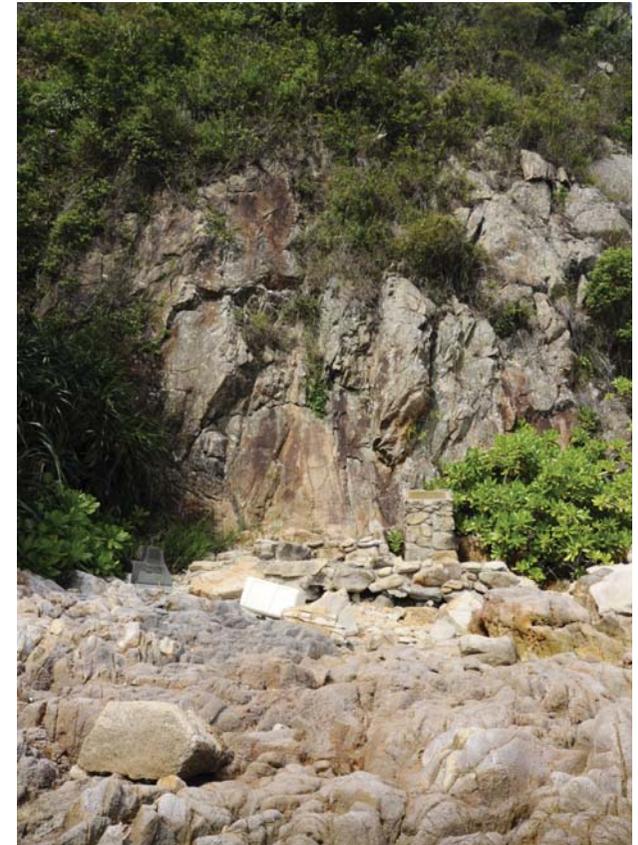
- Concrete platform with monument plaque

Observation of present site condition:

- Poor accessibility and can only be reached by sea
- Very heavily weathered, especially the lower half
- The carving is not easily visible

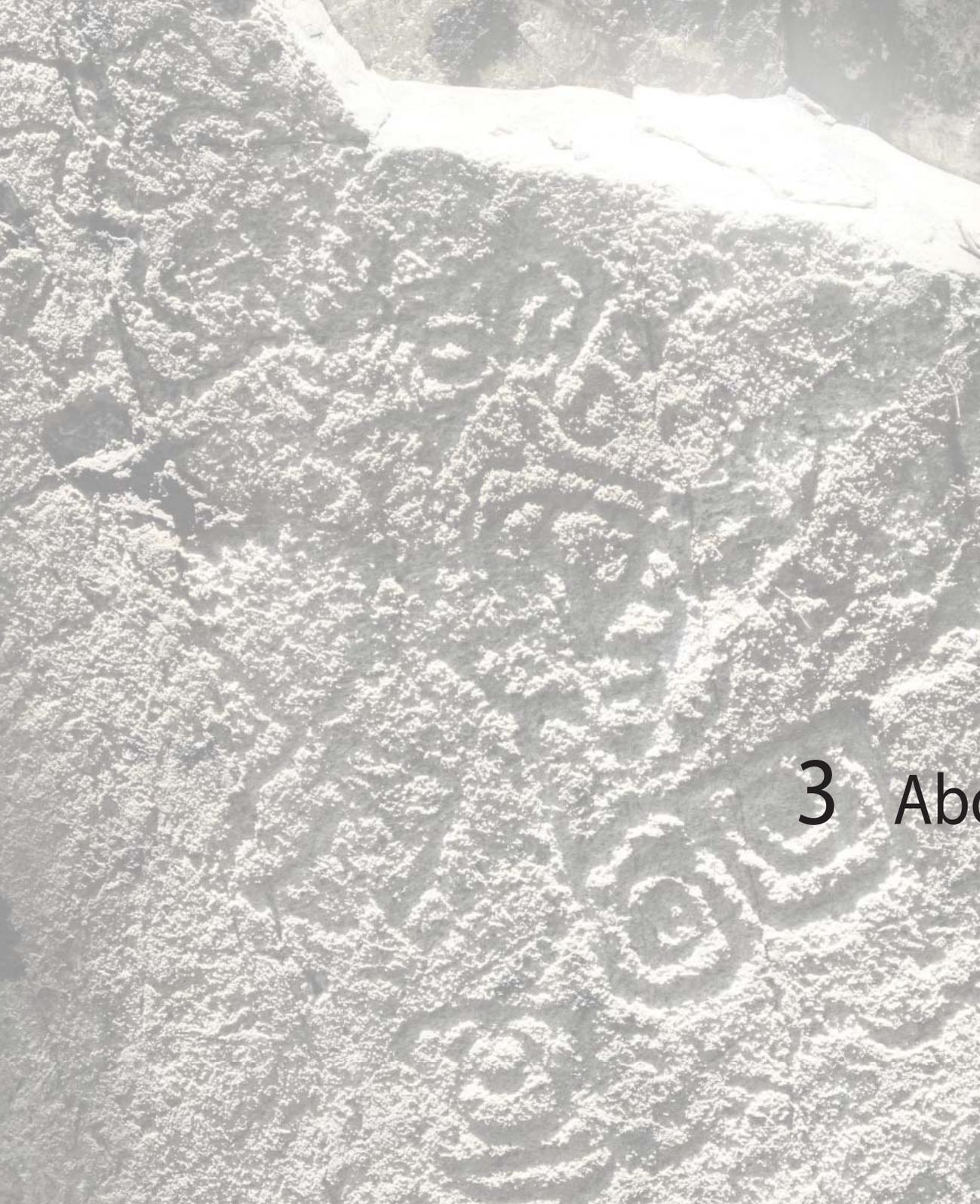
The bottom of the worked surface of the carving at Kau Sai Chau is hardly 2m. above the highest water mark (storm debris), which is at the base of the rock itself. The design is badly weathered on its lower half, indicative no doubt of its exposure to waves in times of heavy storm. The relatively low elevation of this carving is most significant, and may be taken as evidence that the sea has not been above its level since the carving was done, probably in the period 1500-700 B.C.

The carving (which measures 40 x 60cm) faces southeast toward Sharp Island. In terms of general setting and manner of execution, it is very similar to other carvings previously described. Its pattern seems to occupy a somewhat intermediary position between the main styles: curvilinear elements are worked into an abstract image. It could be called a stylized 'emblem'. There is little question that the carving belongs to the same period as the others found along the coast.



Current appearance of the carving

Present condition of existing facilities



3 About the Project Team



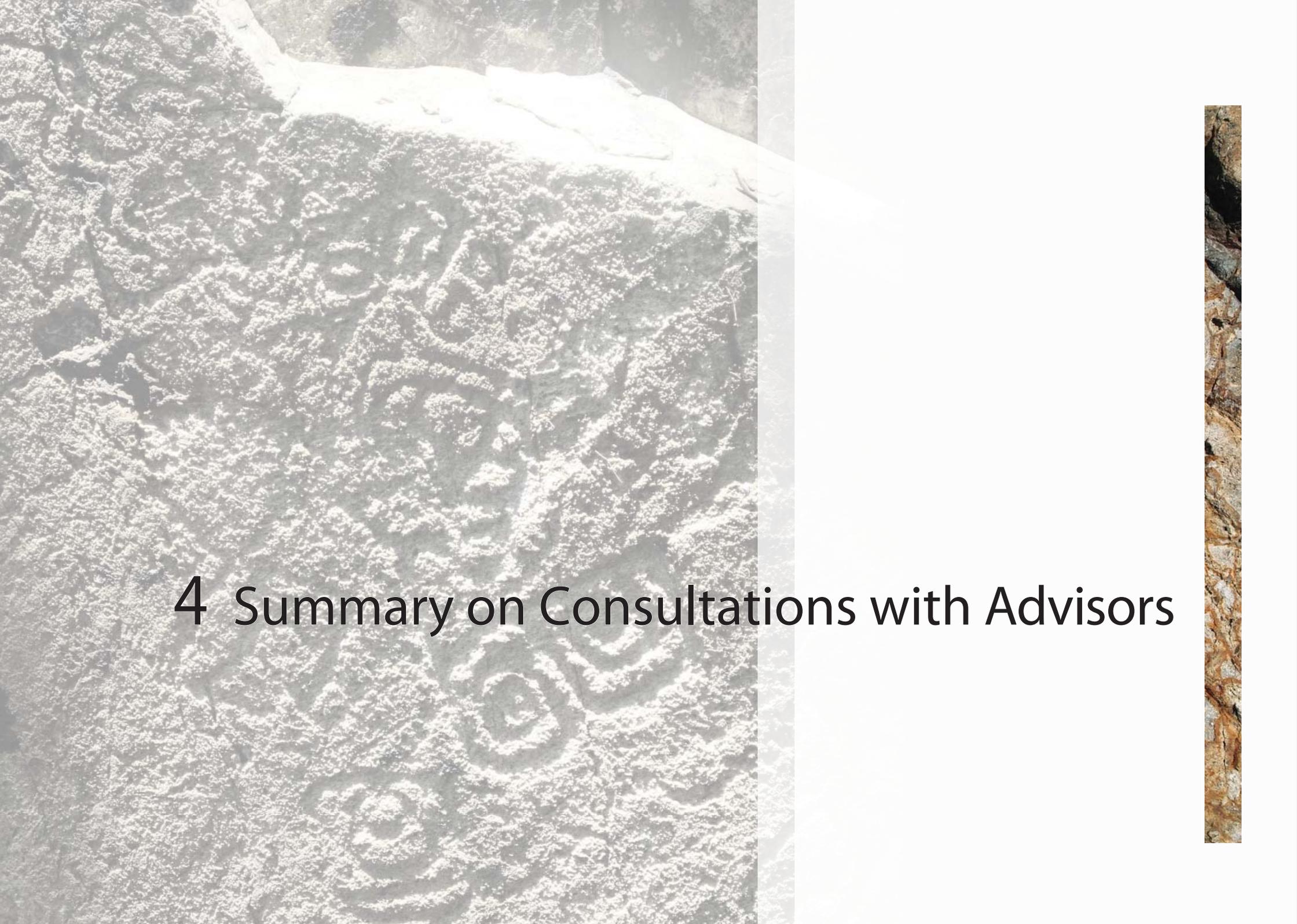
Community Project Workshop (CPW)

The Faculty of Architecture at The University of Hong Kong is a comprehensive school of architecture, renowned for its teaching, research and community engagement. A significant number of academic staff is actively involved in professional services, including the designing of, and planning for, community projects. They are also engaged in a broad range of community-based projects in China, Hong Kong, and Macau.

The Community Project Workshop (CPW), Faculty of Architecture, the University of Hong Kong provides design and consultancy services to government and non-government organizations, and undertakes other non-commercial projects requiring interdisciplinary expertise drawn from all the disciplines of the Faculty: Architecture, Landscape Architecture, Real Estate and Construction; and Urban Planning and Design. We also reach out to other faculties within the University and external consultants, as required.



Top & middle:
Restoration Works at Tai Ping Old Bridge Project
Bottom left & right: ArtAlive@Park



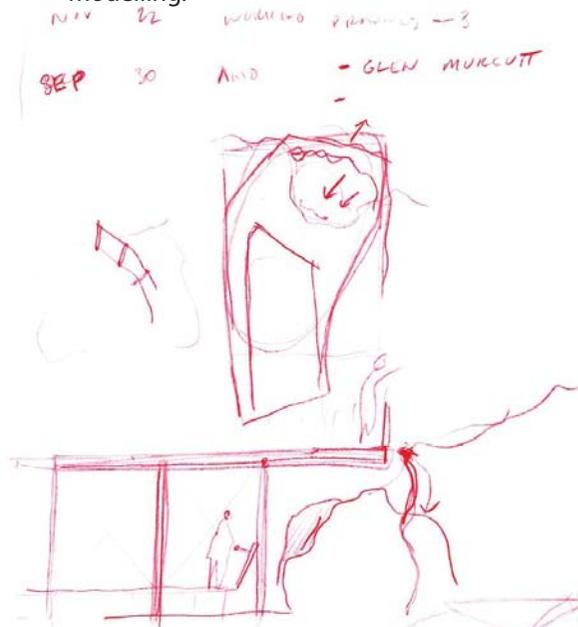
4 Summary on Consultations with Advisors

Consultation with Mr. Jason Carlow
Assistant Professor of Faculty of Architecture
22 September, 2011



Key considerations:

1. Light structures should be used to minimize site intervention
2. One 'architectural language' should be applied to different design approaches for consistency
3. Existing or vernacular fencing methods and materials should be used wherever possible (e.g. stainless steel, wire mesh and cable)
4. A more detailed measurement report should be used as the design basis. The laser scanning technology, for example, might help our 3D modelling.



Top: sketch describing relationship of footpath and rock
Bottom: sketch section of rock and visitor and facility



Consultations with experts

The CPW reviewed all the recommendations in the consultancy reports and consulted the four experts, exchanging views with them through emails. Meetings with Dr. Richard Engelhardt and Mr. William Meacham were also held to discuss in detail.

Consultations with Mr. William Meacham

Honorary Research Fellow, Centre of Asian Studies,
Hong Kong Institute for Humanities and Social Sciences, HKU
27 September, 2011 and 17 October, 2011

Maintaining environmental equilibrium to prevent microclimate

From the findings conducted by the four advisors to the Consultancy Studies of the Ancient Rock Carvings, it is observed that there are some diverse opinions among the advisors' reports. For example, some advisors advocate the use of covered shelters to protect the rocks from rain, while others believe that the covered shelters could create negative micro-climate impacts to the rocks. From discussions with Mr. William Meacham, we learned that the importance of achieving environmental equilibrium is a critical consideration in the preservation of the rock carvings. Their preservation is not only dependent upon the sustainment of air ventilation, natural surface wash-off from rainwater, but also natural sunlight, ground water and sea spray. (Section II.3. Meacham's Consultancy Study of the Ancient Rock Carvings)



Setting the Archaeological value as a priority

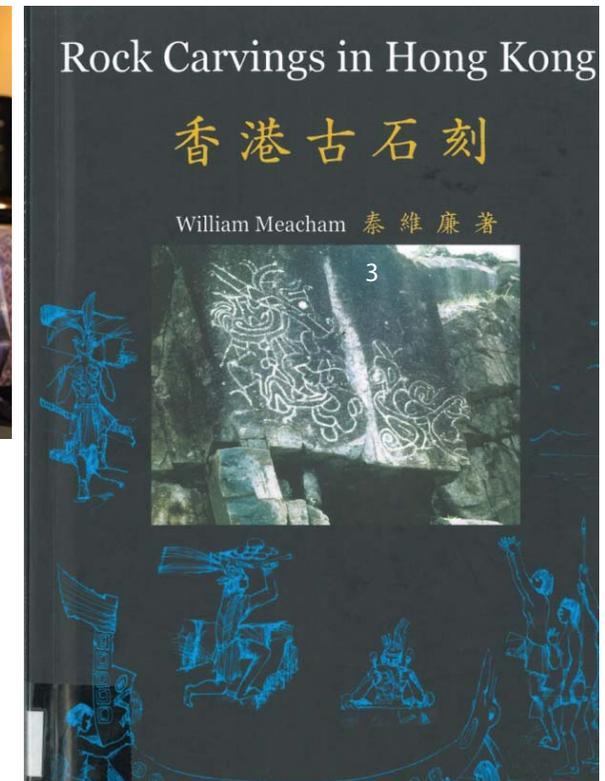
In addition to advocating the historical values of the physical rock carvings, the geographical setting and historical context of the rocks should also be preserved. It was noted that at some of the existing sites with rock carvings, concrete platforms have been constructed thereby 'obscuring' the archaeological settings of the carvings (Section II.4. Meacham's Consultancy Study of the Ancient Rock Carvings). In order to fully reveal the archaeological and historical settings where ritual gatherings might have been accommodated, Meacham suggests the removal of concrete plinths and revealing the original cobble stones, such as at the sites at Po Toi and Big Wave Bay.

Removal of Perspex cases to prevent microclimate

Mr. Meacham is concerned that the presence of a covering shelter would alter the micro-climate and the stability of the rocks. He suggests the removal of all the Perspex cases and advocates the natural intervention of sea spray, wind, rain, and sun rays (Section I.1. Meacham's Consultancy Studies of the Ancient Rock Carvings). Additionally, in order to protect the rocks from vandalism, it was recommended to install a barrier approximately an arms-length away from the rocks so as to diminish the temptation to reach the rocks and potentially damage them. By removing the Perspex cases, and installing a simple protective barrier in front of the rocks, this scheme aims to eliminate the microclimate for the rocks and to minimize the temptation to vandalize them.

Selecting simple building materials such as steel cables

The CPW team has conducted two separate sessions to discuss design progress of the proposed scheme. It was agreed that the selection of new building materials should not overpower the natural beauty of the rock carvings. Therefore, building materials that are simple such as wire mesh and cables are recommended as good options. The CPW team proposed several design options that received positive feedback from consultation sessions with Mr. Meacham. Other than the support of the choice of simple materials, it was noted that performing regular maintenance to the new intervention is equally important. Regular inspections and maintenance such as cleaning and repainting the intervention are necessary to ensure the sustainability of the rock carvings.



Rock Carvings in Hong Kong by William Meacham

Consultations with Dr Richard Engelhard

Visiting Research Professor, Architectural Conservation Programme, University of Hong Kong

& Dr. Lynne DiStefano

Adjunct Associate Professor, Advisor of ACP

6 October, 2011 and 21 October, 2011



Focus on Conservation Interpretation Facilities

Aside from giving physical protection to the rock carvings, it was recommended that the provision of conservation interpretation facilities is equally important. Our team recommends that a number of new conservation interpretation designs be incorporated into the protection scheme. For example, it is recommended to incorporating both text and graphic images onto the handrail to provide a graphic context of the sites to visitors. Engraved line drawings depicting a copy of the ancient rock carvings, maps showing the existing geographical context, colour illustrations to demonstrate historical and conservation significance are some recommendations that can be incorporated into an interpretative signage program.

Selecting simple building materials

The CPW team conducted two separate sessions to discuss design progress for the proposed scheme. It was found that the selection of the new building materials should not overpower the natural beauty of the rock carvings. Therefore, recommended building materials for this proposal include the following stainless steel, wire mesh, and cables.

Providing more education to visitors and the future generation

It was found that the use of enclosed shelters and cages are not favoured in the new design scheme. The methodology to shelter the rocks is seen as a passive measure to prevent vandalism. Further, it was found that even with the most 'enclosed' shelter cannot prevent those who are determined to vandalise the rocks. Fortunately, there have been no cases of deliberate vandalism to heritage sites in Hong Kong and hence it is recommended that the focus should be educating the public regarding the understanding and appreciation of heritage. According to Dr Engelhard, more effort should be put into interpretation of the sites, and appreciation and understanding of heritage monuments.

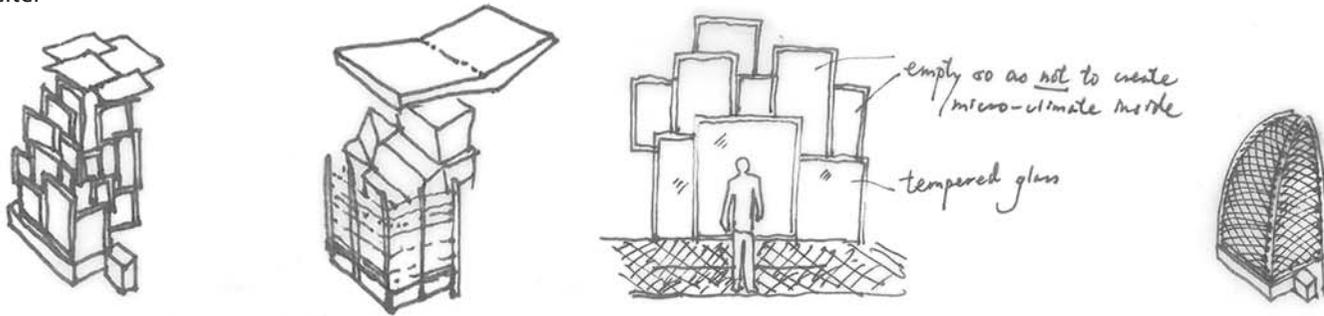
Regular maintenance by LCSD

It is understood that maintaining nine monuments requires laborious work. In addition to regular inspections and cleaning, the advisors recommend that there be a review of the cleaning techniques and methodology. Using heavy chemicals might remove short-term mold issues but may have long-term irreversible damage to the rocks. Therefore, it is recommended that in advance of carrying out any cleaning, that the cleaning crew be accompanied by an AMO professional team to evaluate, inspect and to ensure that an appropriate cleaning methodology is formulated which will not contravene the advisors' suggestions. Other than cleaning of mole, regular maintenance such as repainting, removal of rust and other house-keeping measures should be carried out by LCSD frequently.

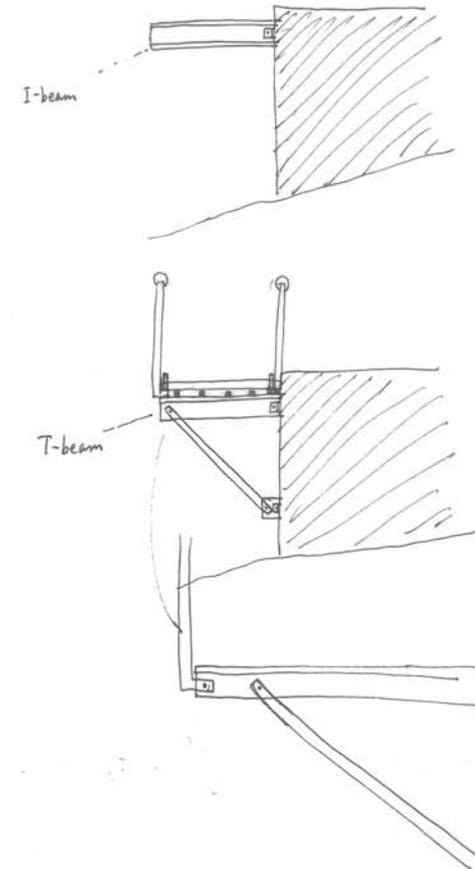
Second consultation with Mr. Jason Carlow
Assistant Professor of Faculty of Architecture
1 November, 2011

Study on typologies

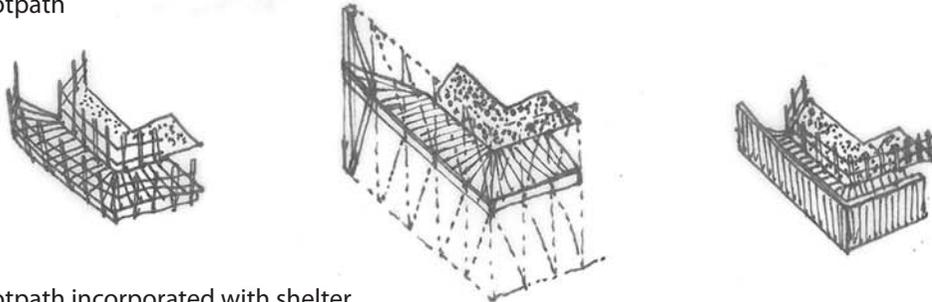
Shelter



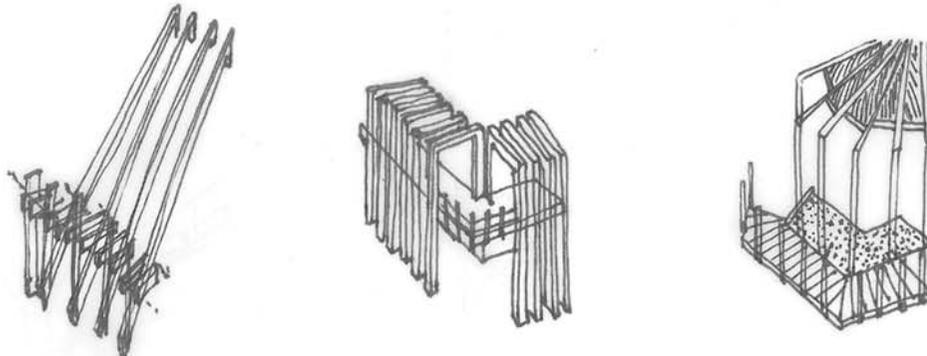
Study on structural details



Footpath



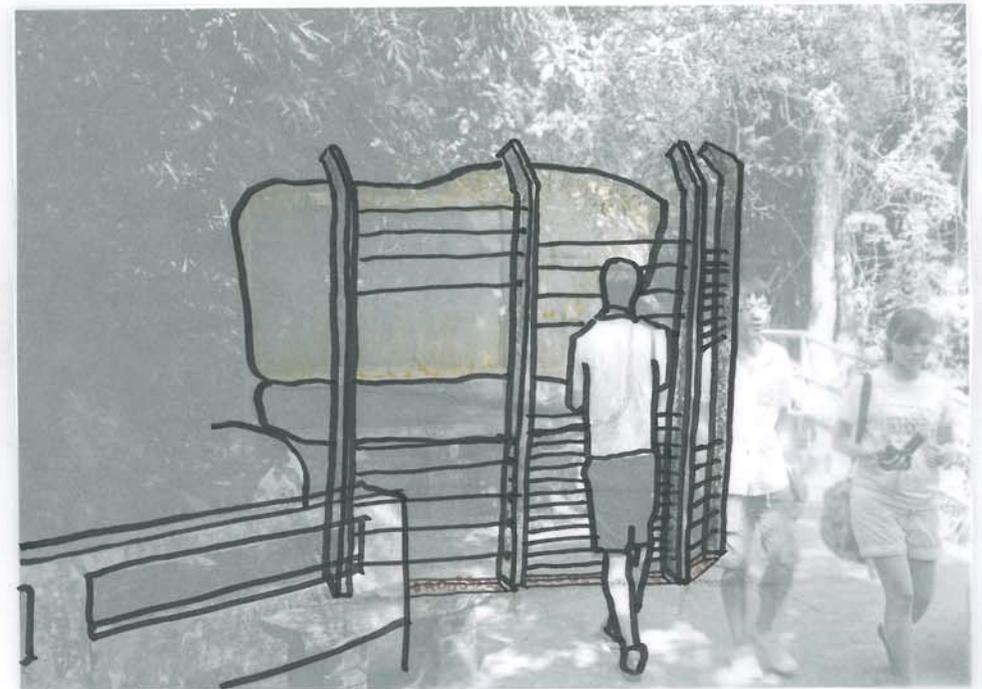
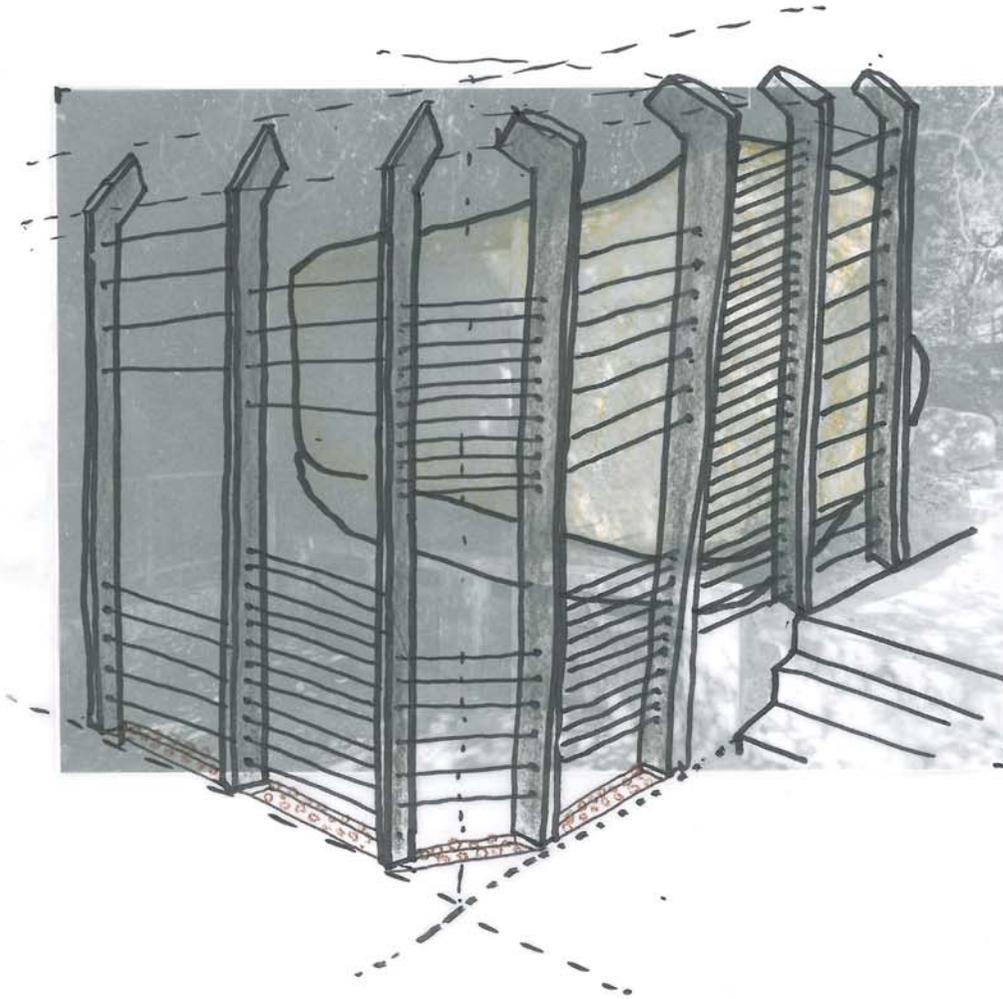
Footpath incorporated with shelter



Second consultation with Mr. Jason Carlow
Assistant Professor of Faculty of Architecture
1 November, 2011

Design sketches

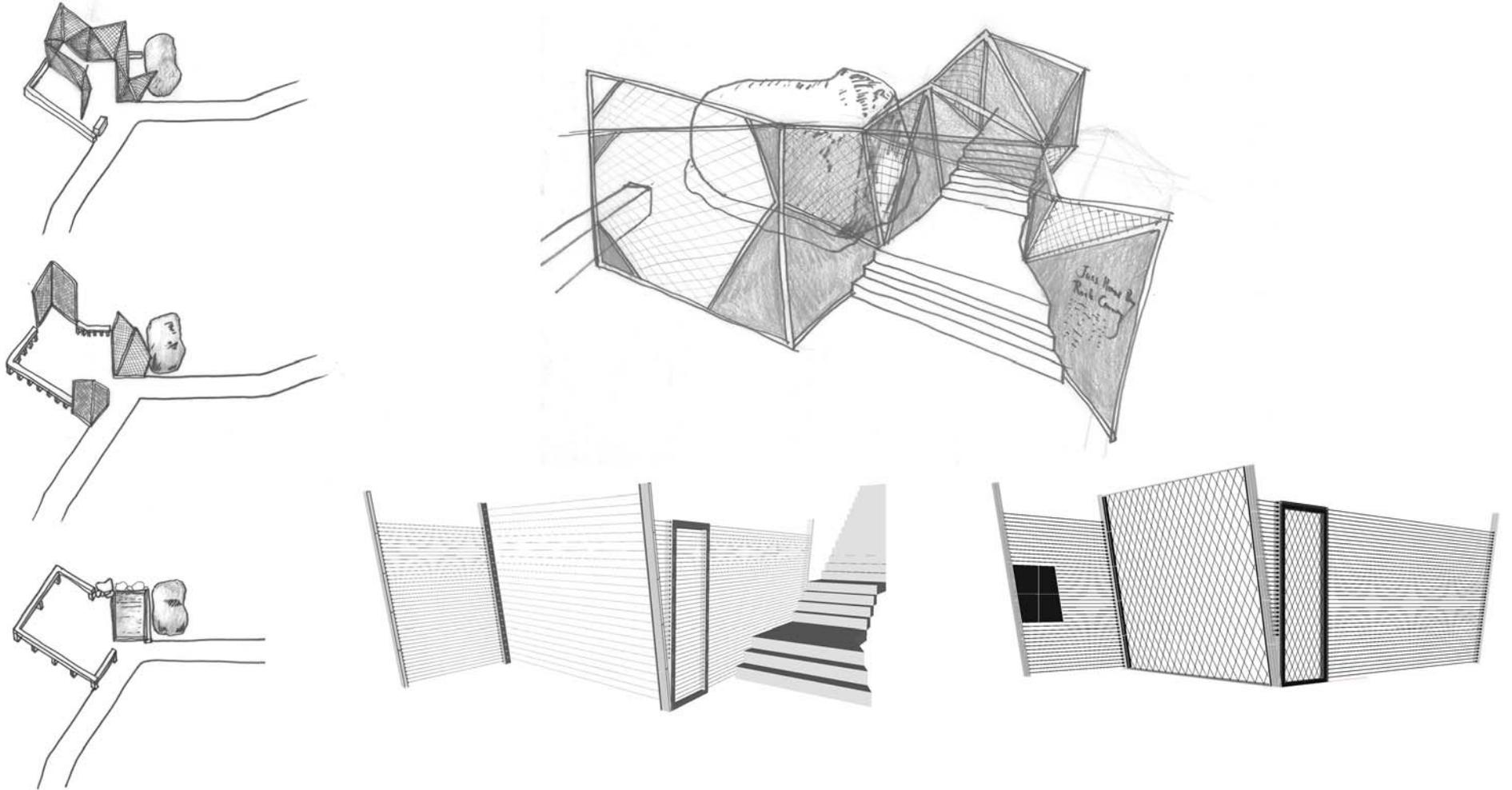
Sketches of stainless steel barrier with wire cables for Joss House Bay



Second consultation with Mr. Jason Carlow
Assistant Professor of Faculty of Architecture
1 November, 2011

Design sketches

Sketches of stainless barrier with wire cables or mesh for Joss House Bay



5 International References



Case Study 1_Rock drawings in Valcamonica, Italy Psychological barrier



Valcamonica, situated on the Lombardy plain, has one of the world's greatest collections of prehistoric petroglyphs – more than 140,000 symbols and figures carved in the rock over a period of 8,000 years and depicting themes connected to agriculture, navigation, war and magic.

The rock drawings of Valcamonica constitute an extraordinary figurative documentation of prehistoric customs and mentality. The systematic interpretation, typological classification, and the chronological study of these configurations in stone have brought about a considerable contribution to the fields of prehistorical study, sociology and ethnology.

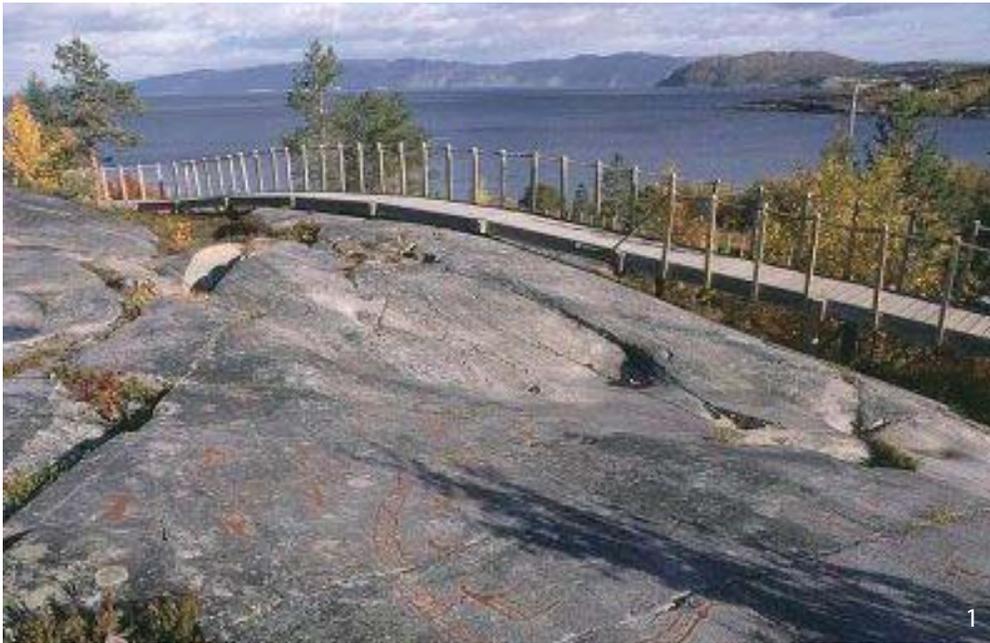
No massive visitor facilities are installed on site so to minimize intervention to the original setting. Visitors are guided to various prehistoric stones by wooden footbridges. There are simple, low fences around some of the rocks, functioning as psychological barriers than physical ones.



1. Simple barrier surrounding rock art in Valcamonica
2. Wooden walkway in Valcamonica
3. Visitors appreciating the rock drawings at short distance

Case Study 2_Rock Art of Alta, Norway

Wooden platform

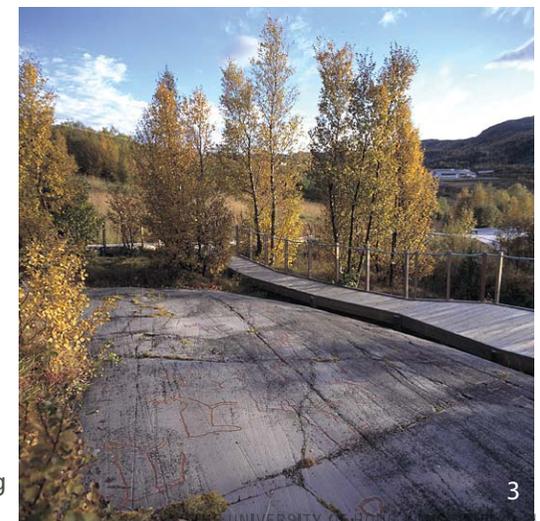


This group of petroglyphs in the Alta Fjord, near the Arctic Circle, bears the traces of a settlement dating from c. 4200 to 500 B.C. The thousands of paintings and engravings add to our understanding of the environment and human activities on the fringe of the Far North in prehistoric times.

The thousands of paintings and engravings located at 45 sites scattered over seven locations illustrate a chronological sequence consisting of four phases. The largest area is at Hjermeluft/Jiepmaluokta, where Alta Museum is situated. Approximately 3,000 figures have been found here. This is the only area open to the public. Some of the rock carvings at Hjermeluft/Jiepmaluokta are linked by wooden footways.

Today many of the figures are difficult to see, some of the figures along the wooden footway are therefore painted with a red colour resembling that of Scandinavian rock paintings. However, the majority of the rock carvings in Alta remain unpainted.

1. Wooden platform which links various rock painting locations
2 & 3. Some of the painted figures and footpaths without railing on the rock-facing side



Case Study 3_Rock carvings in Tanum, Sweden No physical barrier



The rock carvings in Tanum, in the north of Bohuslän, are a unique artistic achievement not only for their rich and varied motifs (depictions of humans and animals, weapons, boats and other subjects) but also for their cultural and chronological unity. They reveal the life and beliefs of people in Europe during the Bronze Age and are remarkable for their large amount and outstanding quality.

There have been many interpretations of the significance of these carvings since research began in the late 18th century. At the present, the generally accepted explanation is that they

are examples of primitive symbolic art. On one hand they are expressions of instrumental art, demonstrating the order of life and the pattern of existence (weapons, wagons, animals, humans) while on the other, they are transcendental art concerned with the other world and the unknown (represented by distorted animals and humans, disembodied hands).

Similar to the previous two examples, the carvings are connected and accessed by wooden walkways. This approach provides good visibility of the rocks.



1-2. Wooden walkways in Tanum

Case Study 4_The High Line, New York City

Use of material



Located on West Side of Manhattan, the High Line runs from Gansevoort Street in Meatpacking District to West 34th Street between 10th and 11th Avenues. Attractions of the park include naturalized planting that is inspired by the self-seeded landscape that grows on disused tracks and the often unexpected views of the city and the Hudson River.

The park has used wire mesh and other transparent materials for its railings and decking. Seating, signage and other visitor facilities are well integrated into the design. The High Line is a very successful redevelopment scheme and has helped revitalizing the community. It has also demonstrated the way to minimize site intervention and integrate a design with the existing environment by using light and transparent materials.

1. Transporent materials used for railing and footpath
2. Environment and visitor facilites are well-integrated
3. Direction sign incorporated into railing



Study on signage and interpretation facilities



1. Hiking Route, The Netherlands

'Prive' means private in Dutch. This sign is placed along a hiking route by the residents on the private drive to prevent hikers and cyclists wandering into the private residential area. These painted stones appear to be a friendly reminder rather than an aggressive warning sign, and they fit perfectly into the natural environment.



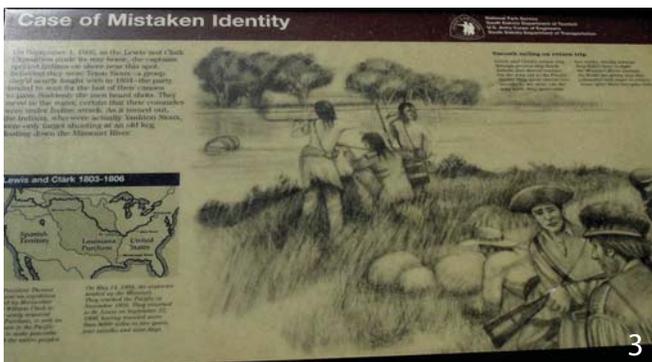
2. Machu Picchu, Peru

This direction sign is simple but it fits the context of Machu Picchu very well. Once seeing the rough arrow, visitors are aware that they are approaching the ancient site before they actually witness the 'Lost City of the Incas'. Similar design could be applied to the rock carvings in Hong Kong to fit their context and get visitors psychologically prepared on their way to the sites.



4. Jiu Gorges National Park, Romania

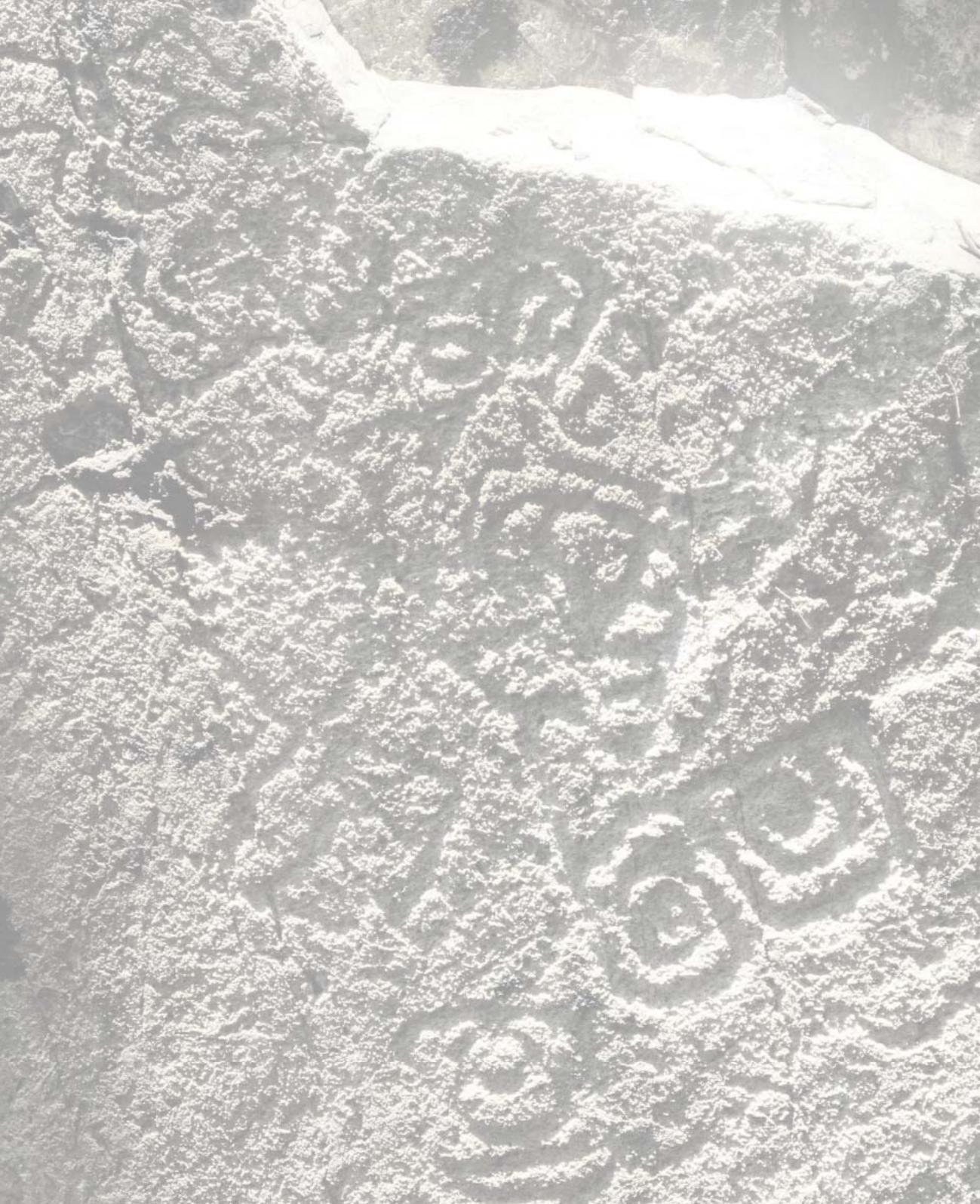
A simple but eye-catching colour scheme is used in these signs for Jiu Gorges National Park. Emerald green graphics are laid on top of white rectangles to create a sharp contrast, and diagonal red lines are superimposed on prohibited activities. A universal colour code is used: green is often used to represent nature while red represents danger or prohibition.



3. Springfield South Dakota, The United States

Springfield South Dakota is a small town near the border of Nebraska. Near Springfield, there are information boards along Missouri River which depict the Lewis and Clark expedition with words and vivid pictures.

For the interpretation boards of rock carvings in Hong Kong, attention should be paid to the text and images to make sure they are educational but interesting for the general public.



6 Previous Design



Previous Design Site 3_Cheung Chau Option 1: Weaved shelter



Pro:
- Allows ample air flow and will not create micro-climate

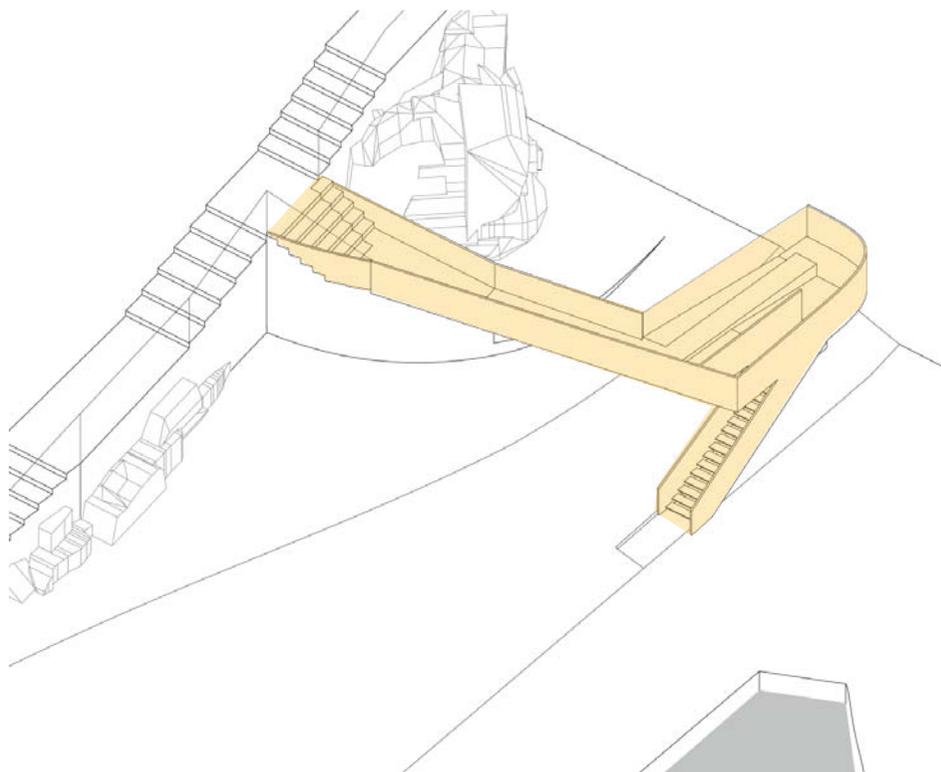
Con:
- The form is visually attractive but may not fit the natural environment

Tests on different opening sizes

Previous Design

Site 3_Cheung Chau

Option 2: Viewing bridge

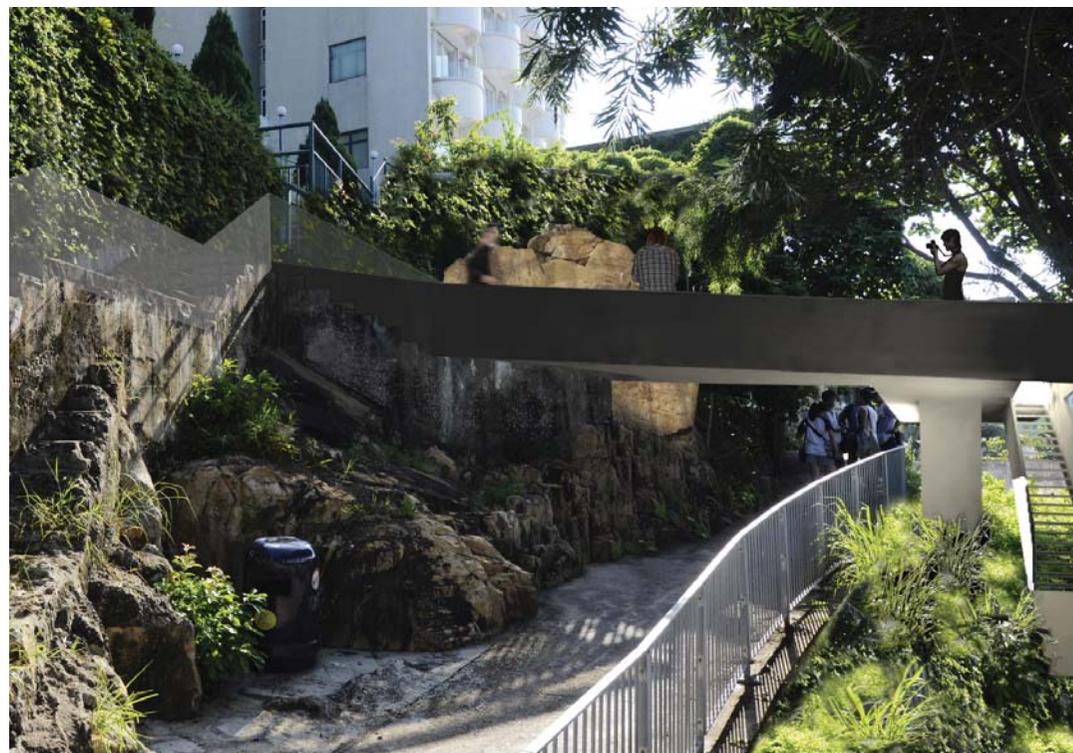


Pros:

- Good visibility
- Extra function as connection between existing footpaths

Cons:

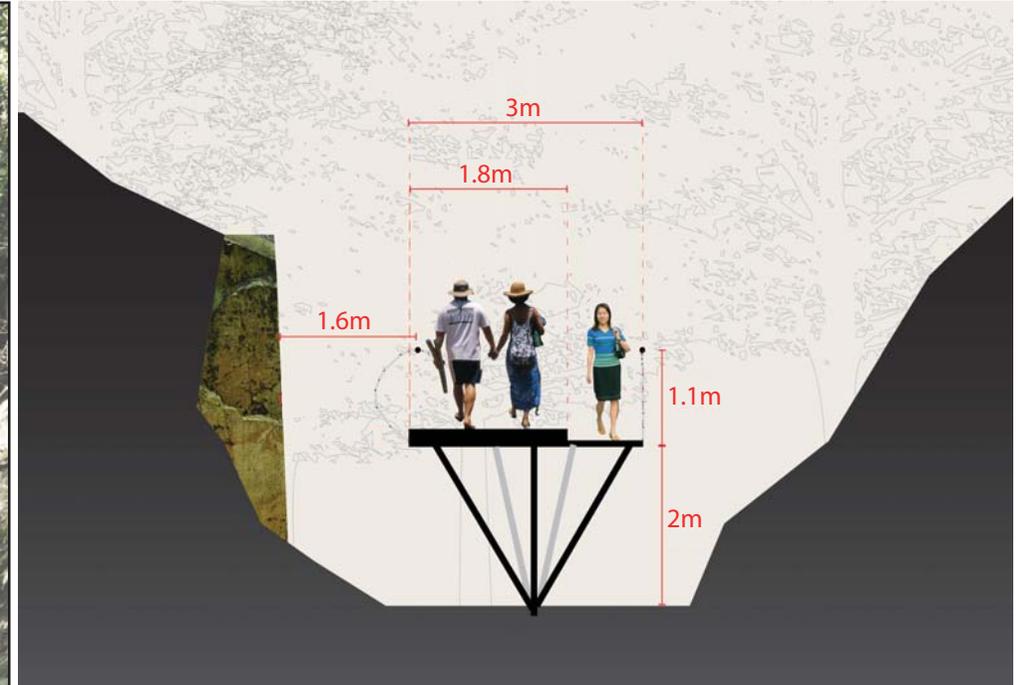
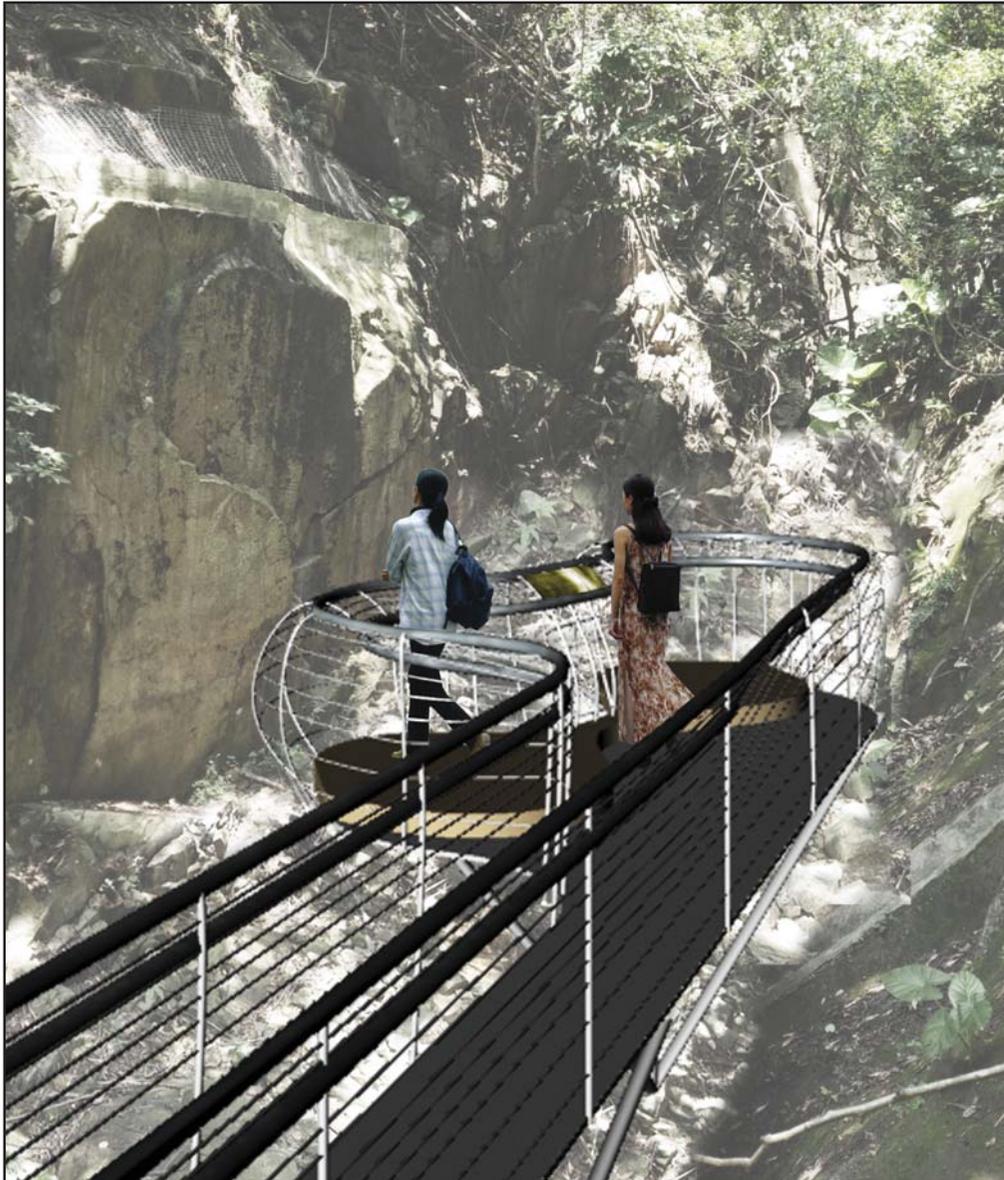
- The bridge is quite bulky and overwhelming
- Can block the view of the rock from the existing footpath



Left: axonometric drawing of the bridge showing its connection with the existing footpath and rock carving

Right: The bridge functions as a viewing platform as well as a connection between the upper and lower existing footpaths

Previous Design Site 4_Wong Chuk Hang Viewing bridge



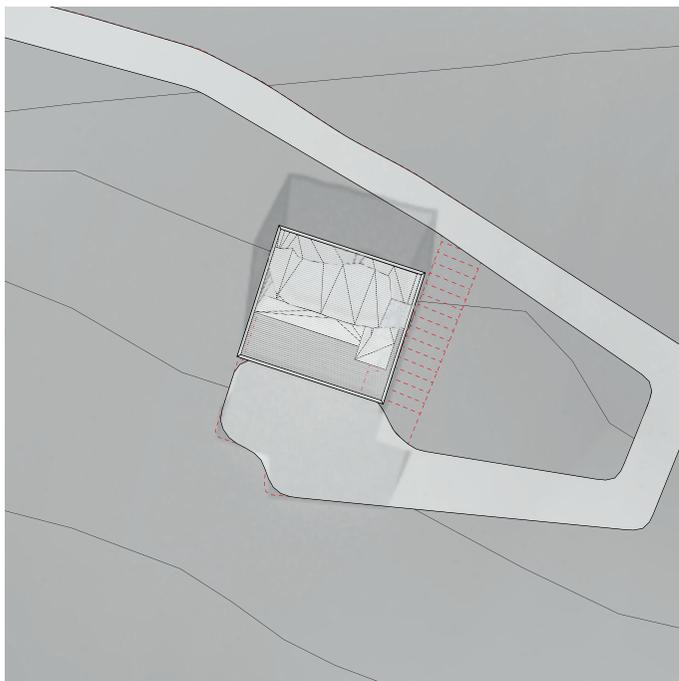
Pros:

- Good visibility
- Viewing platform is more spacious than existing design
- Protection improved as visitors cannot climb through the barrier easily and are kept at a distance away from the rock

Previous Design

Site 5_Big Wave Bay

Option 1: Wavy barrier



Red - existing path right next to the rock
 Light grey - proposed alternative route for diverting visitors and preventing vandalism

Pros:

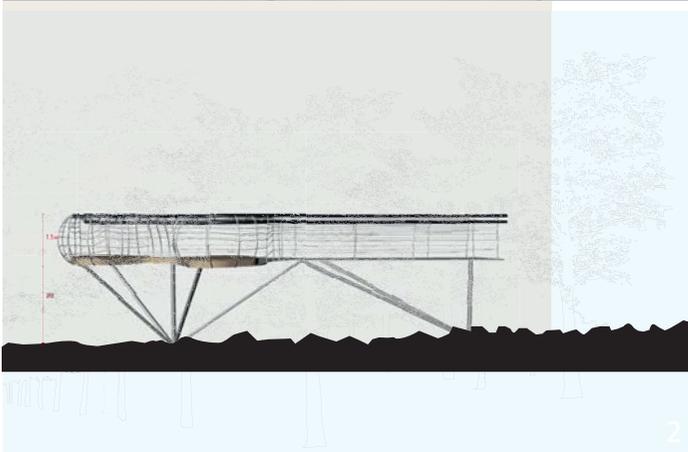
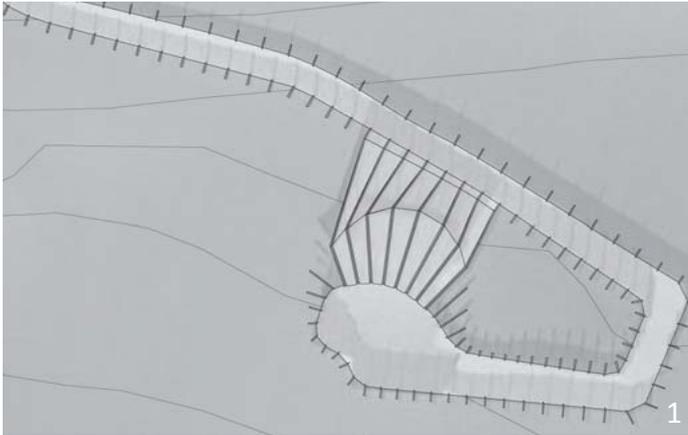
- Allows ample air flow and will not create micro-climate
- Wavy form is more organic than straight cables
- Visibility maintained

Con:

- Still very cage-like and therefore unfriendly to visitors



Previous Design Site 5_Big Wave Bay Option 2: Integrated railing and shelter



1. Plan showing diverted path and how the railing transforms and arches over to become a shelter for the rock
2. Elevation of railing/shelter
3. Wire mesh is used for the railing for its transparent and lightweight appearance

Pros:

- Allows ample air flow and will not create micro-climate
- Railing transforms to double as rain shelter for the rock
- High level of protection

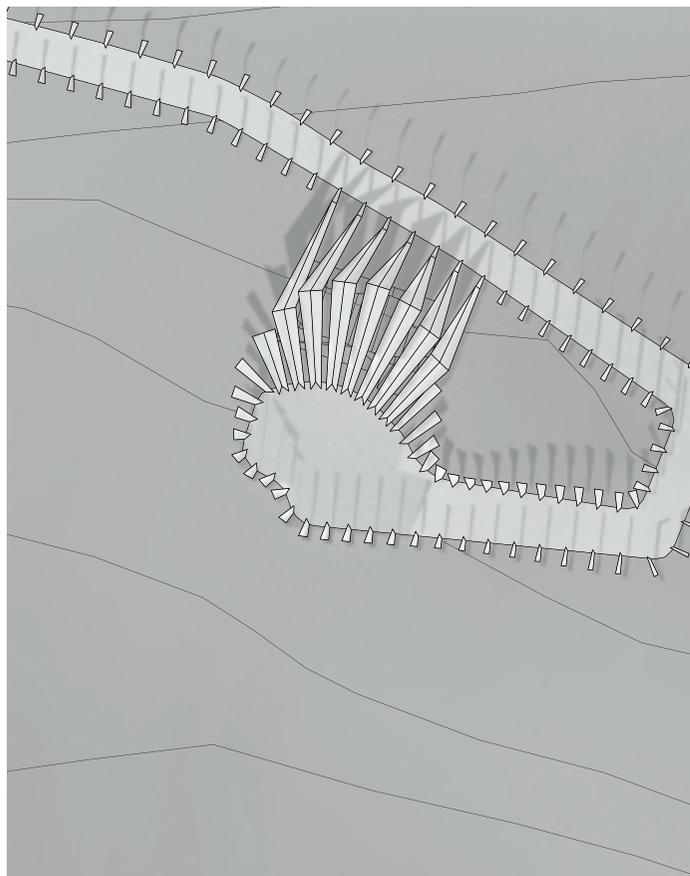
Cons:

- Despite using lightweight materials, the design itself is visually overwhelming
- The need for installing the railing/shelter in such a vast area is questionable

Previous Design

Site 5_Big Wave Bay

Option 3: Railing, shading and gutters integrated unit



Pros:

- Allows ample air flow and will not create micro-climate
- Railing transforms to double as rain shelter for the rock

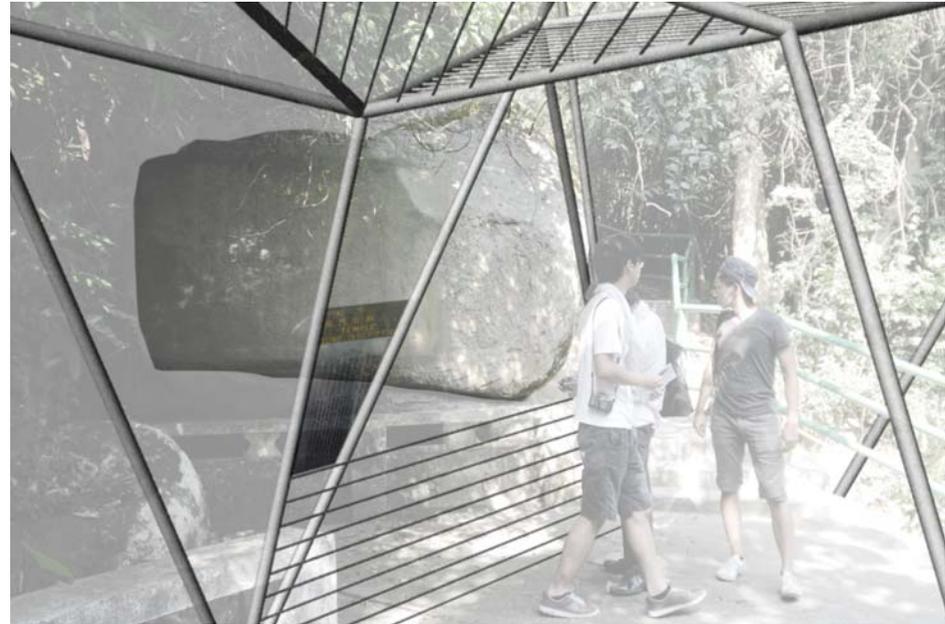
Cons:

- Visually overwhelming

Previous Design

Site 8_Joss House Bay

Faceted shelter with low cable barrier



Shelter in combination with steel cables as barrier

Pros:

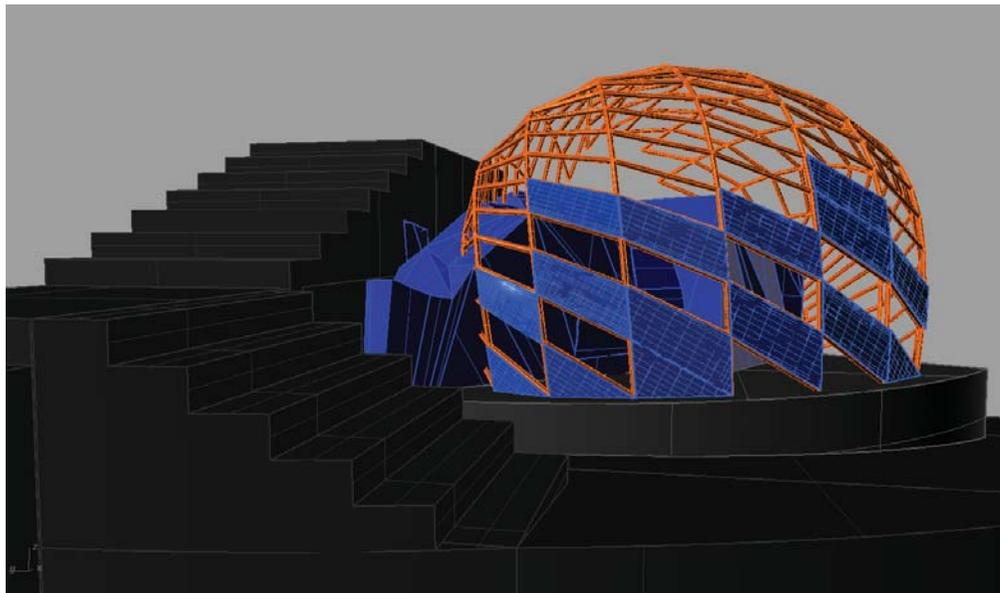
- Allows ample air flow and will not create micro-climate
- Good visibility

Cons:

- Effectiveness of the waist-level protective barrier is low
- Structure is too overwhelming but does not serve practical functions such as rain shelter

Previous Design Further study on shelter form

Option 1: Geodesic dome



Frame can be fully open or clad with panels

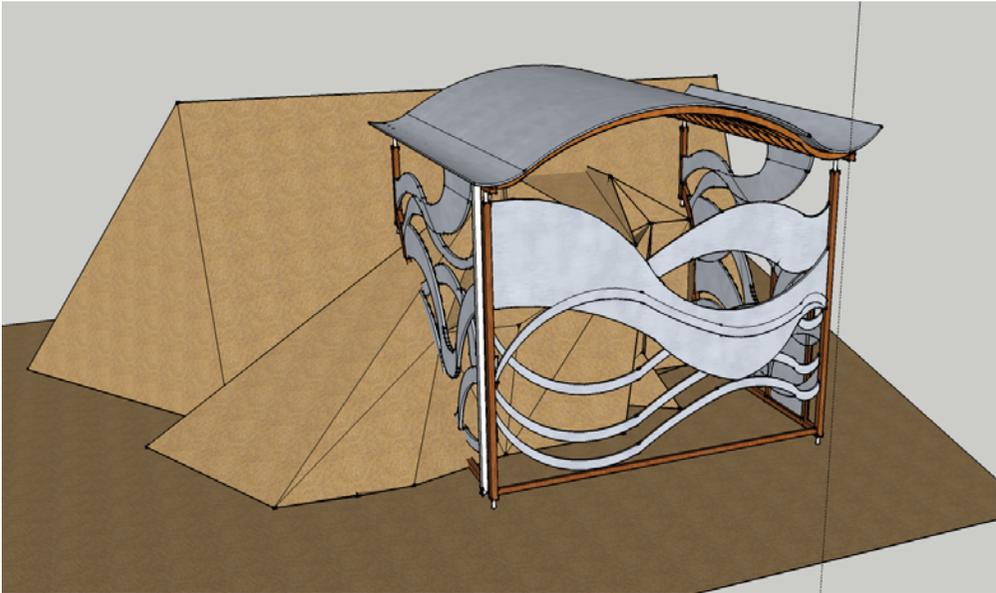
Option 2: Wooden panel modular system



Wooden panels with steel cables

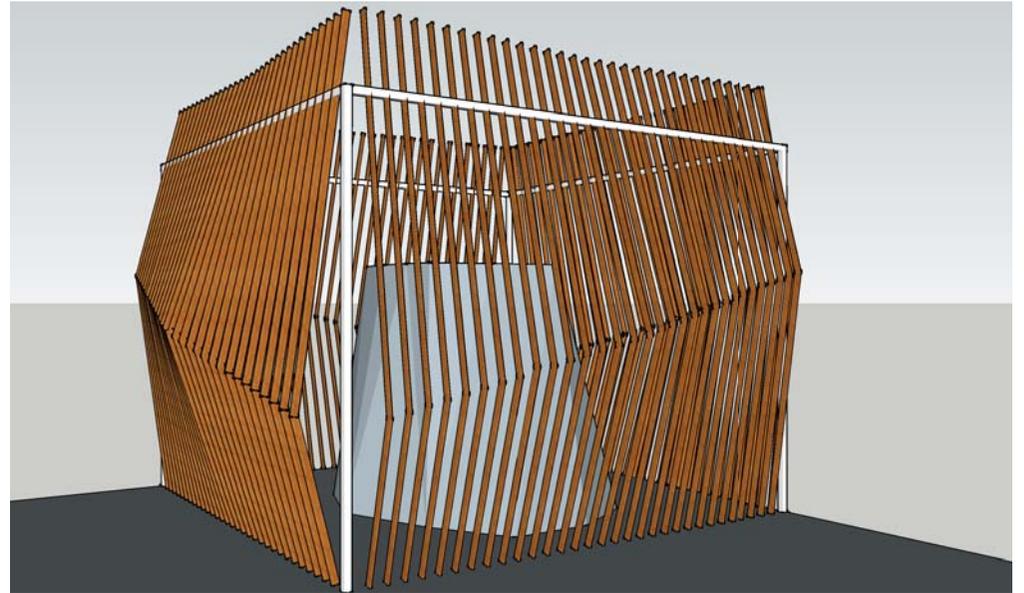
Previous Design Further study on shelter form

Option 3: Shaped fence



Fence with panels in wavy, decorative forms

Option 4: Geometric fence



Geometric fence with angular folds to eliminate the monotony of repeated linear elements

Previous Design Further study on railing design

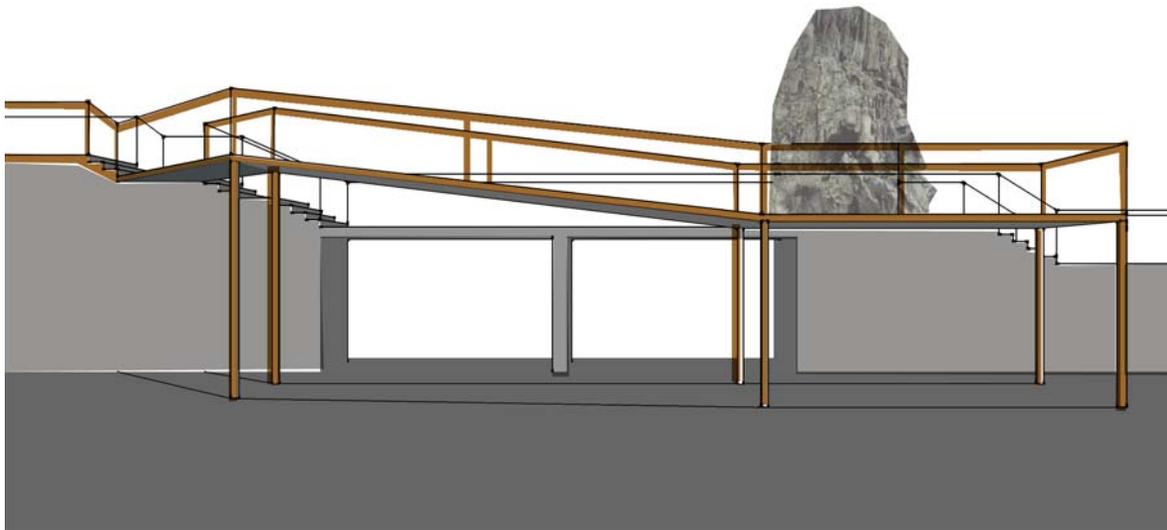
Option 1: Stainless steel
Site 5_Big Wave Bay



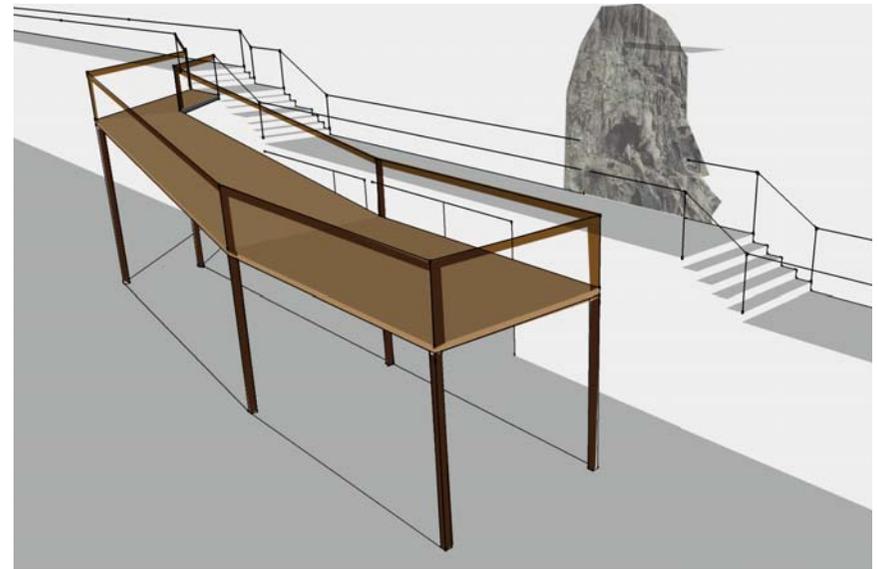
Stainless steel railing with cables and 'picture frame'

Previous Design Further study on railing design

Option 2: Wood-plastic Site 1_Tung Lung Chau

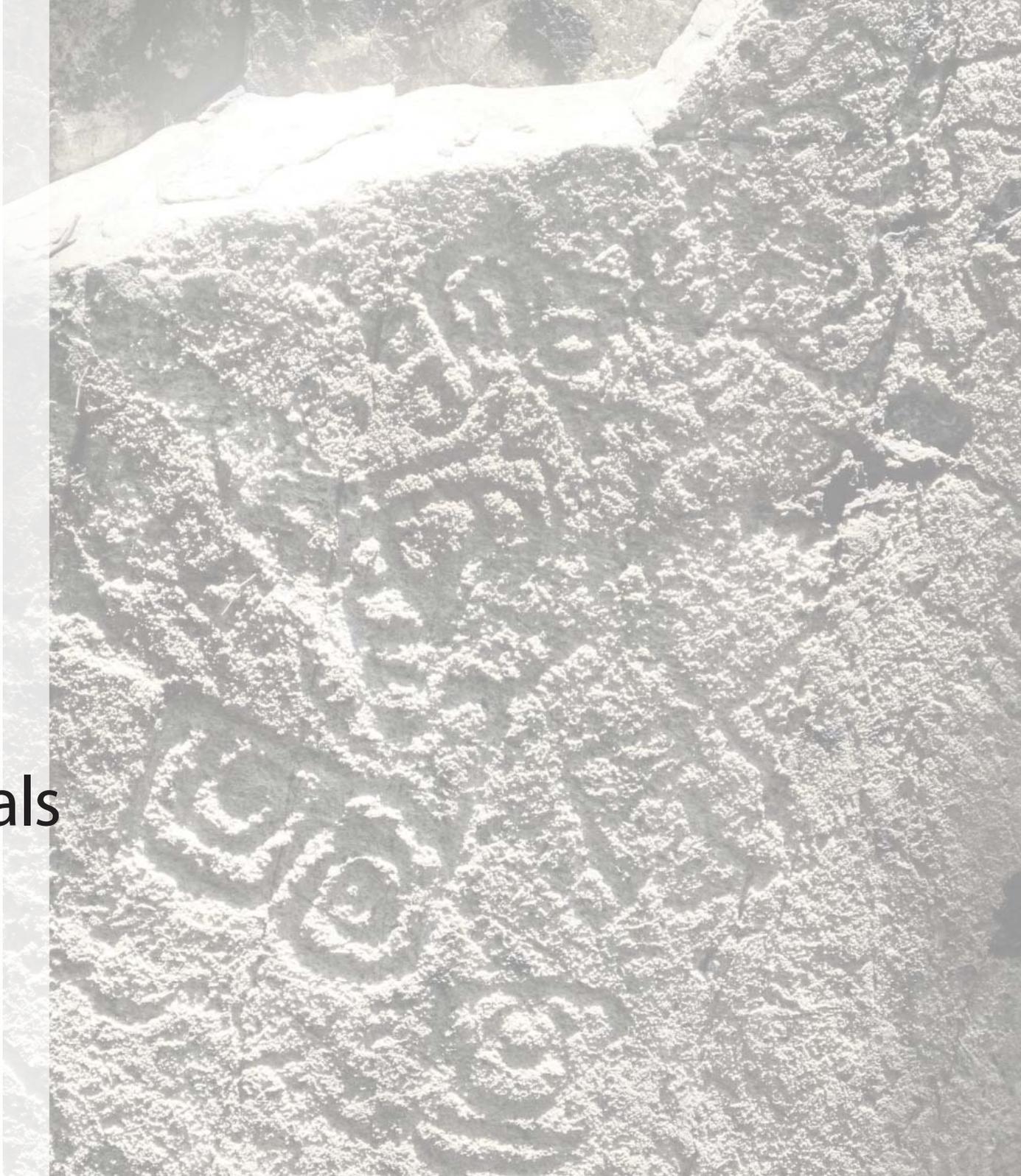


Wooden viewing deck as a more organic option to stainless steel





7 Design Proposals



Design approaches

Our proposal is based on the premise that an 'equilibrium' condition should be achieved so that all rock carvings can be kept in their natural setting while vandalism can be effectively prevented. It is important to protect or restore the original setting as it is a valuable material for anthropological studies, especially in the case of Shek Pik rock carving as the area has undergone considerable geological changes. Leaving the rocks in their original contexts will also maintain their uniqueness and differentiate them from each other.

Depending on the site context and tourist load, levels of protection varies case by case. After discussion with experts from different professions, we agree that the carvings should not be caged in or roofed over as how some of them are now to allow sufficient air flow and higher visibility. In areas with heavy tourist traffic and easy accessibility, protective but light, transparent physical barriers will be erected while in some areas, we propose the construction of a bypass with balustrade to keep visitors at a reasonable distance so that they will not be able to reach the rocks but still see the carving clearly. This kind of physical barrier is more friendly to visitors yet vandalism can be prevented. For the rock carving in Kau Sai Chau, we do not recommend the construction of any barriers as the site is not frequently visited. By not installing eye-catching signs or structures, danger of vandalism will still be kept low as the carving blends well into the environment (camouflage).

Despite differences in designs due to various site conditions, we propose that all the protective structures or visitor facilities should be united in one consistent visual language. This visual hint will help bring out the connection between the rock carvings at different locations across the city. Apart from adopting a consistent design language, warning signs should be included on the interpretation plate to educate visitors against vandalism. Standalone warning signs on posts or vertical surfaces are not used in keeping with visual clarity.

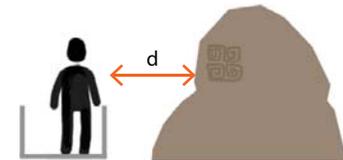
Interpretation plate should be installed at each site to provide background information of each carving. Panel information should not be limited to details of the rock, but also the site and the connection with other 8 rock carvings. For instance, the locations of all 9 carvings should be indicated on a map. Most rock carvings in Hong Kong overlook the sea, but in the case of Shek Pik, the carving is currently located 300m above the coastline. Such information will help visitors understand more about the carving in relation to the geological history.

In the following we will present our proposal with international references in greater details. We hope that by providing minimal but effective protective facilities, a balance between sustainable tourism and monument conservation can be achieved.

3 Approaches:

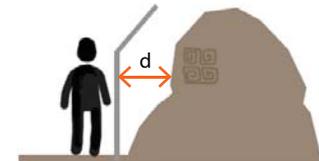
1) Controlled pathway

Protection Level : Medium
Suggested safety distance* $d = 1.6\text{m}$
*exact distance can vary according to different site situations



2) Physical barrier

Protection Level : High (for high accessibility site)
Suggested safety distance* $d = 1.6\text{m}$
*exact distance can vary according to different site situations



3) Interpretative panel as psychological barrier

Protection Level : Low
(for low accessibility site)



Site 1 Tung Lung Chau

Design approach 1 - controlled pathway

	Suggested actions in the Rock Carvings Consultancy Study	Purpose	Suggested architectural approach by CPW
Physical measure	<ul style="list-style-type: none"> To remove Perspex screen To remove metal cage 	<ul style="list-style-type: none"> To increase visibility To prevent formation of micro-climate 	<p>We suggest constructing an extended walkway starting from the existing concrete platform. This is to prevent vandalism by increasing the distance between visitors and the carving.</p> <p>The new walkway is to serve as an alternative route to the steep staircase.</p> <p>Interpretation plate is to be incorporated with the railing structure.</p>
Interpretation plate	<ul style="list-style-type: none"> To be incorporated with the balustrade 	<ul style="list-style-type: none"> To provide more background information of the rock To educate visitors to protect the cultural heritage of Hong Kong 	
Chemical & geographic conditions	<ul style="list-style-type: none"> To remove suspected residue of chalk To conduct further studies on wave action to determine whether to retain the current concrete support 	<ul style="list-style-type: none"> To stabilize the concrete plinth in light of the strong wind load 	
Maintenance	<ul style="list-style-type: none"> Periodical maintenance is essential 	<ul style="list-style-type: none"> To ensure the rock carving is in the equilibrium condition. 	
Other remarks	3D laser scanning is essential for further detailed design as well as actual construction.		



1. Existing Perspex covers can create undesirable micro-climate and impair visibility
2. Part of the existing concrete platform will be demolished
3. Existing cement water diversion dam to be removed since it is not effective and soluble salts from the cement can damage the rock carving
4. By redirecting the footpath, visitors will be kept at a safe distance from the rock without compromising its visibility.

Key

- To be removed
- Proposed structure

Design approach 1 for Site 1 Tung Lung Chau

Controlled pathway

Actions taken in the design



Current situation

Actions taken

Design approach 1 for Site 1_Tung Lung Chau

Controlled pathway
Perspective



Design approach 1 for Site 1_Tung Lung Chau

Controlled pathway
Perspective



Design approach 1 for Site 1_Tung Lung Chau

Controlled pathway

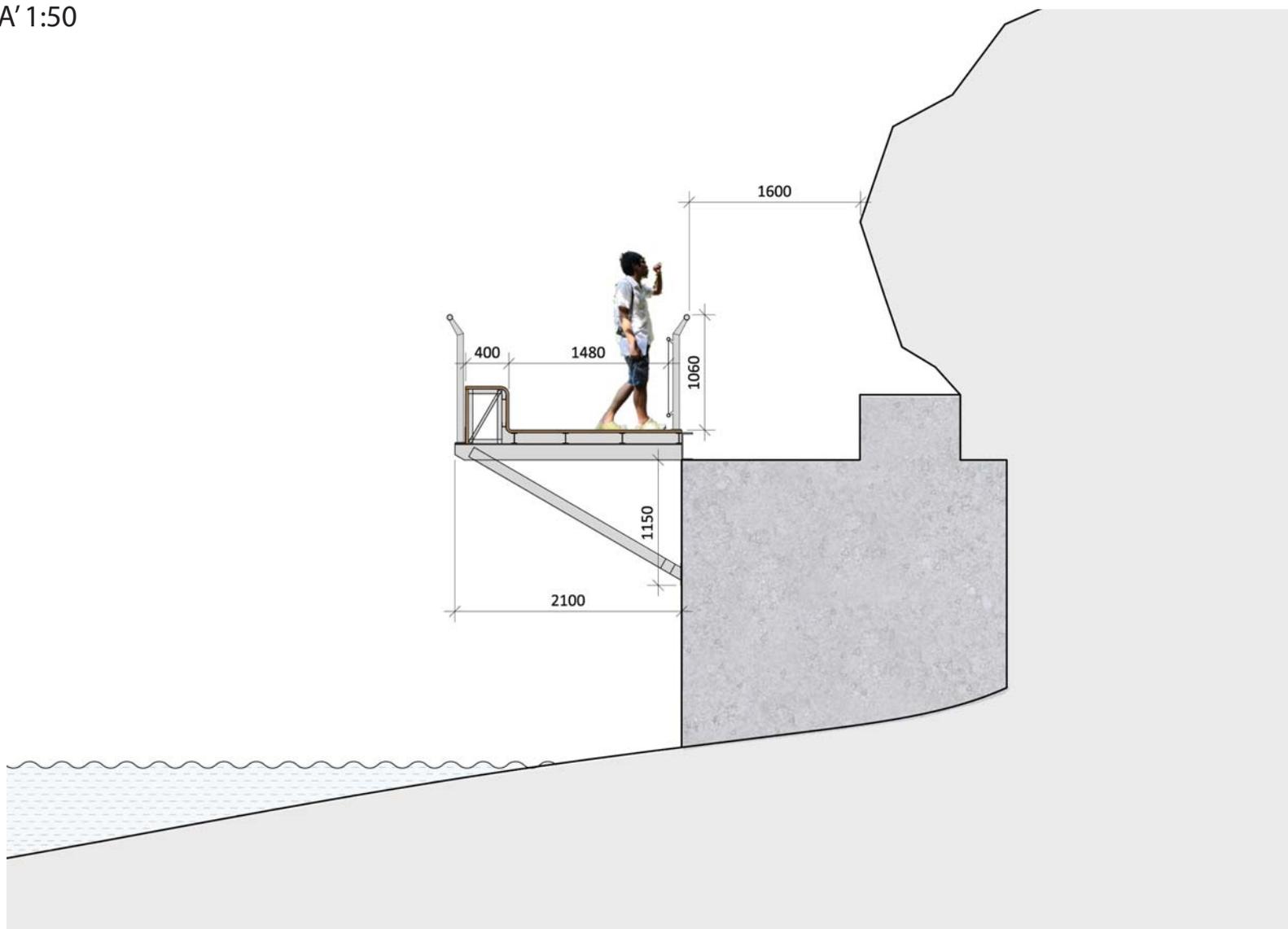
Site plan 1:150



Design approach 1 for Site 1_Tung Lung Chau

Controlled pathway

Section AA' 1:50



Site 2 Po Toi Island

Design approach 1 - controlled pathway

	Suggested actions in the Rock Carvings Consultancy Study	Purpose	Suggested architectural approach by CPW
Physical measure	<ul style="list-style-type: none"> To remove Perspex screen To remove metal cage To replace the cement water diversion dam 	<ul style="list-style-type: none"> To increase visibility To prevent formation of micro-climate To prevent seepage of rain water into the rock 	<p>We propose to construct an extended walkway from the existing concrete platform so that vandalism can be prevented due the increased distance between visitors and the carving.</p> <p>The new walkway is to serve as an alternative route to the existing steep staircase. Interpretation plate is to be incorporated with the railing structure.</p>
Interpretation plate	<ul style="list-style-type: none"> To be incorporated with the balustrade 	<ul style="list-style-type: none"> To provide more background information of the rock To educate visitors to protect the cultural heritage of Hong Kong 	
Chemical & geographic conditions	<ul style="list-style-type: none"> To remove existing concrete base To undertake geo-technical studies 	<ul style="list-style-type: none"> To reveal the original setting To avoid soluble salt from concrete and salt deposition in the long term To acquire information on slope stability and water infiltration 	
Maintenance	<ul style="list-style-type: none"> Periodical maintenance is essential 	<ul style="list-style-type: none"> To ensure the rock carving is in the equilibrium condition 	
Other remarks	3D laser scanning is essential for further detailed design as well as actual construction.		

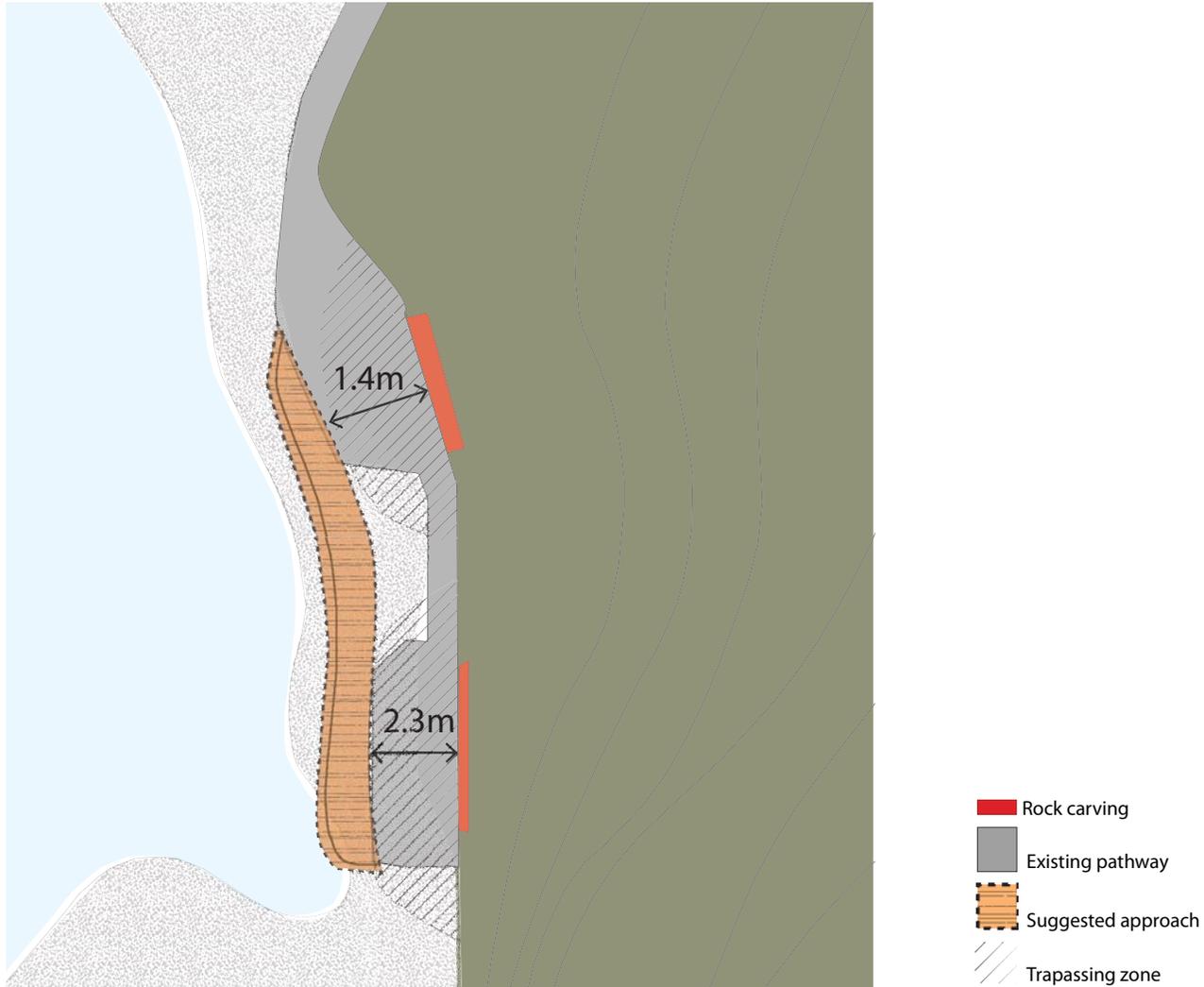


1. Current Perspex cover has lowered visibility and can create micro-climate which is undesirable in terms of conservation in the long term.
2. The walkway will be redirected so that tourists will not get too near to the rock, thus preventing vandalism.

Key

- To be removed
- Proposed structure

Design approach 1 for Site 2_Po Toi Island Controlled pathway



Design approach 1 for Site 2 Po Toi Island

Controlled pathway

Actions taken in the design



Design approach 1 for Site 2_Po Toi Island Controlled pathway



Site 3 Cheung Chau

Design approach 1 - controlled pathway (viewing platform)

	Suggested actions in the Rock Carvings Consultancy Study	Purpose	Suggested architectural approach by CPW
Physical measure	<ul style="list-style-type: none"> To remove glass enclosure to be removed To remove all cement capping on the surface To remove all stone rubble structures To replace the cement water diversion dam with stone, lime-based mortar and clay To remove vegetation in the planter above the rock carving 	<ul style="list-style-type: none"> To prevent formation of micro-climate To increase visibility To prevent growth of micro-organisms To reinstate the natural setting To prevent water seepage and leakage 	<p>We aim to reduce impact to the rock carving to the minimum and keep the visitors away from the rock by construction of a viewing platform which is accessible from two beach side walkways.</p> <p>Interpretation plate is to be incorporated with the railing structure.</p>
Interpretation plate	<ul style="list-style-type: none"> To be incorporated with the balustrade 	<ul style="list-style-type: none"> To provide more background information of the rock To educate visitors to protect the cultural heritage of Hong Kong 	
Chemical & geographic conditions	<ul style="list-style-type: none"> To undertake geo-technical studies 	<ul style="list-style-type: none"> To acquire information on slope stability and water infiltration 	
Maintenance	<ul style="list-style-type: none"> Periodical maintenance is essential 	<ul style="list-style-type: none"> To ensure the rock carving is in the equilibrium condition. 	
Other remarks	<p>*Land ownership to be clarified: - To ensure the maintenance is carried out carefully and well endorsed</p> <p>3D laser scanning is essential for further detailed design as well as actual construction.</p>		



- 1 & 2. Existing stone rubbles look too artificial and do not match with the natural environment. They are affecting the authenticity of rock carving and alter beyond recognition the natural setting which is of archaeological significance.
- 3. The shelter and glass screen adversely create a micro-climate at the rock carving.
- 4. Too many concrete facilities affect the rock carving and alter the natural setting which is of archaeological significance.

Key

- To be removed
- Proposed structure

Design approach 1 for Site 3 Cheung Chau

Controlled pathway (viewing platform)

Actions taken in the design



Design approach 1 for Site 3_Cheung Chau Controlled pathway (viewing platform)



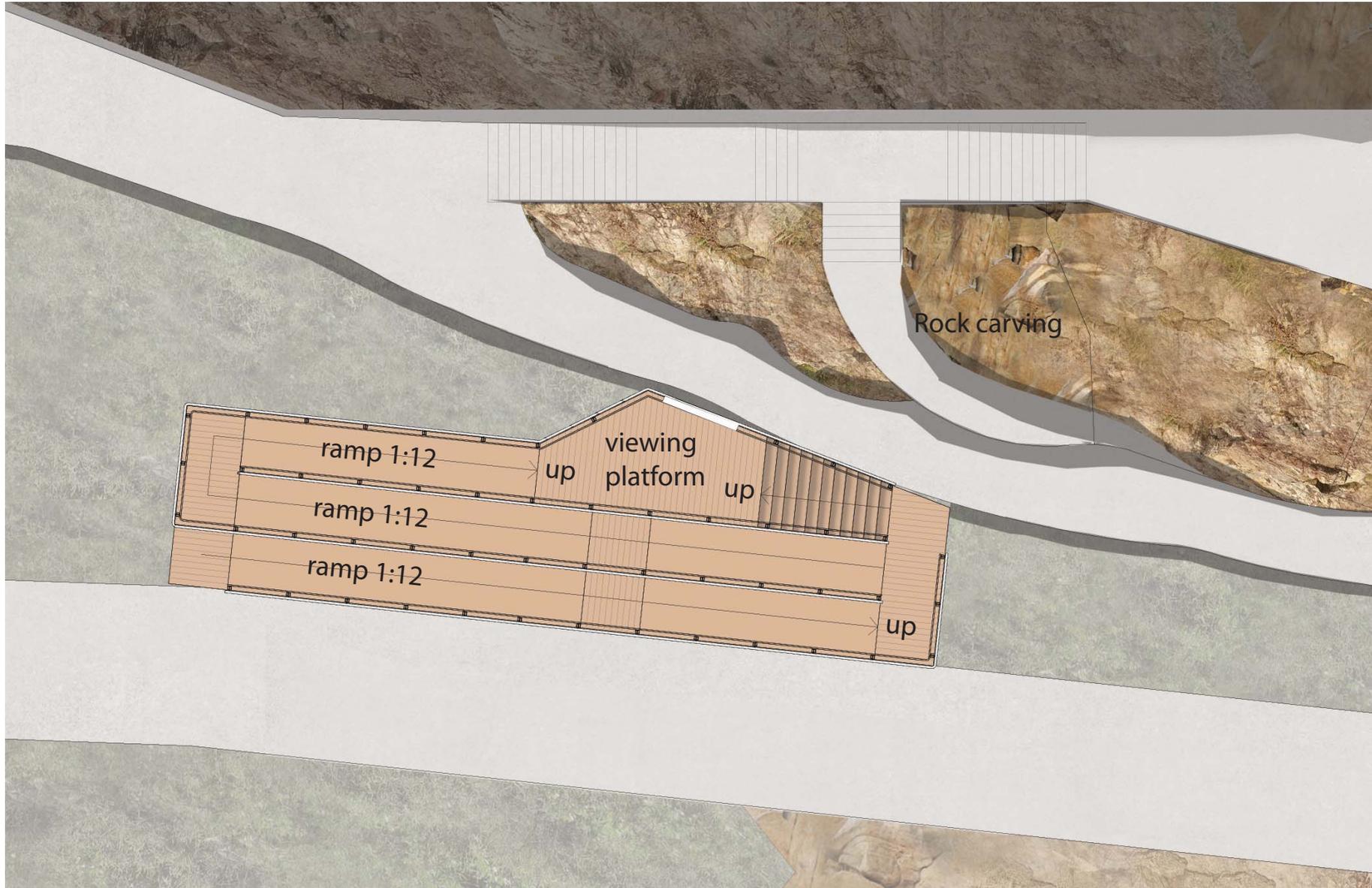
Design approach 1 for Site 3_Cheung Chau

Controlled pathway (viewing platform)



*Disable access will be incorporated in the final design.

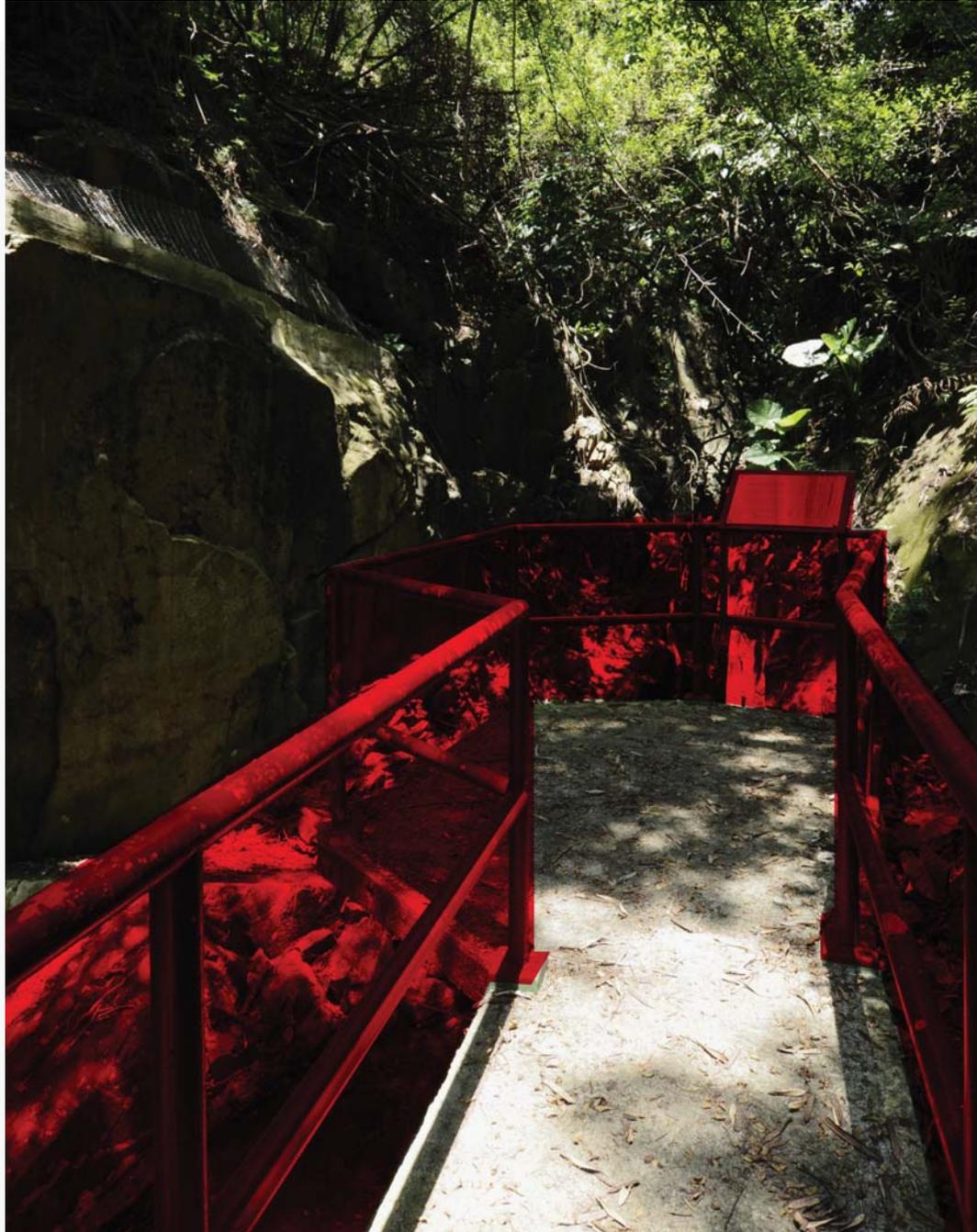
Design approach 1 for Site 3_Cheung Chau Controlled pathway (viewing platform)



Site 4 Wong Chuk Hang

Design approach 1 - controlled pathway

	Suggested actions in the Rock Carvings Consultancy Study	Purpose	Suggested architectural approach by CPW
Physical measure	<ul style="list-style-type: none"> To remove the cement water diversion dam To remove remnants of squatter huts and concrete capping on the slope To extend wooden platform from the existing concrete platform 	<ul style="list-style-type: none"> To avoid problems from soluble salts To enhance drainage To prevent vandalism by increasing the distance between visitors and the carving 	<p>An extended walkway from the existing concrete platform is to be constructed. Vandalism is prevented by increasing the distance between visitors and the carving.</p> <p>The new walkway is to serve as an alternative route to the steep staircase. Interpretation plate is to be incorporated with the railing structure.</p>
Interpretation plate	<ul style="list-style-type: none"> To be incorporated with the balustrade 	<ul style="list-style-type: none"> To provide more information on the historical background of the rock carving To educate visitors to protect the cultural heritage of Hong Kong 	
Chemical & geographic conditions	<ul style="list-style-type: none"> To undertake geo-technical studies 	<ul style="list-style-type: none"> To get information for slope stability and water infiltration 	
Maintenance	<ul style="list-style-type: none"> To maintain the vegetation in the surrounding area regularly Periodical maintenance is essential 	<ul style="list-style-type: none"> To keep the site decent and accessible To ensure the rock carving is in the equilibrium condition 	
Other remarks	3D laser scanning is essential for further detailed design as well as actual construction		



The current level of protection is not sufficient since visitors can get through the railing and reach the carving easily. The balustrade is to be redesigned and incorporate with the new interpretation plate.

Key

- To be removed
- Proposed structure

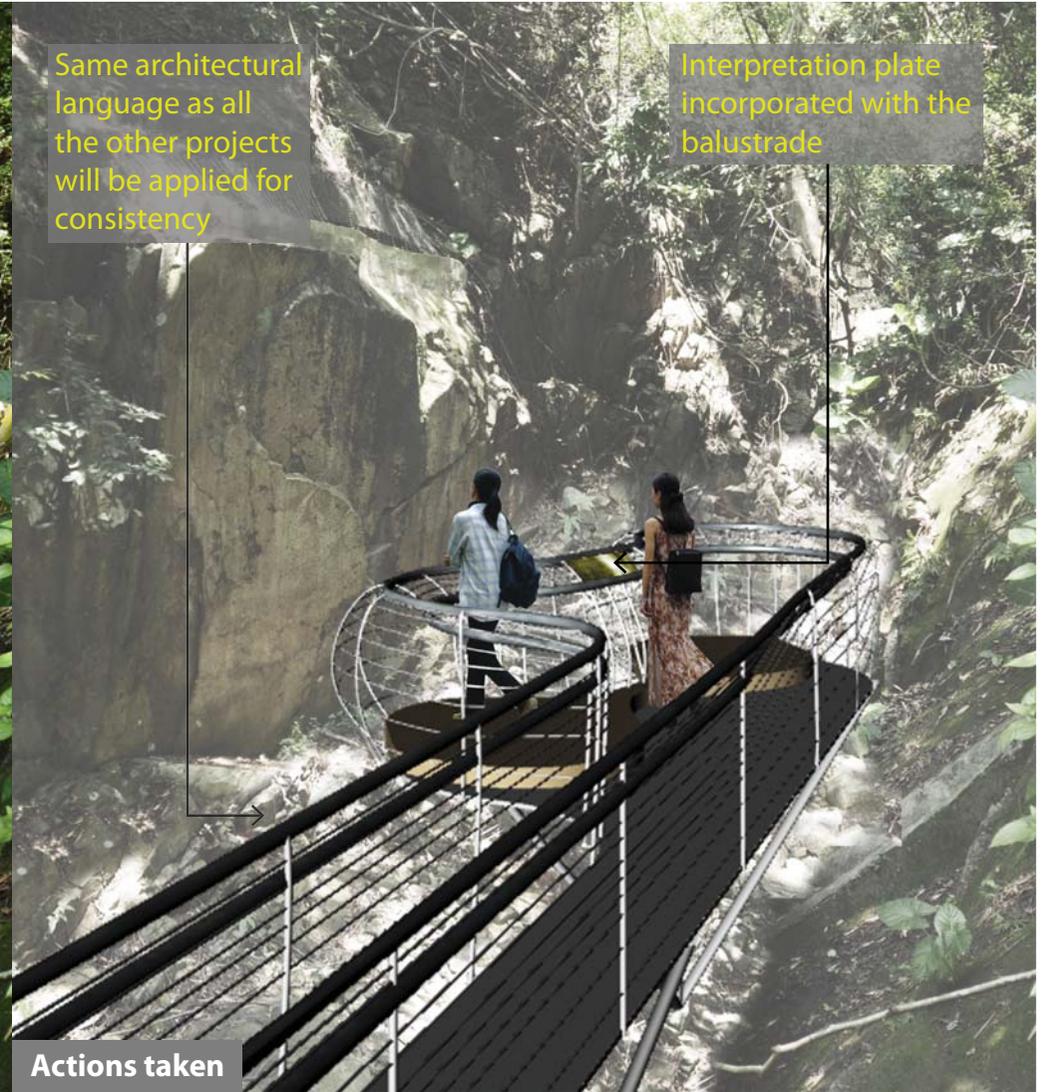
Design approach 1 for Site 4 Wong Chuk Hang

Controlled pathway (viewing bridge)

Actions taken in the design



Current situation

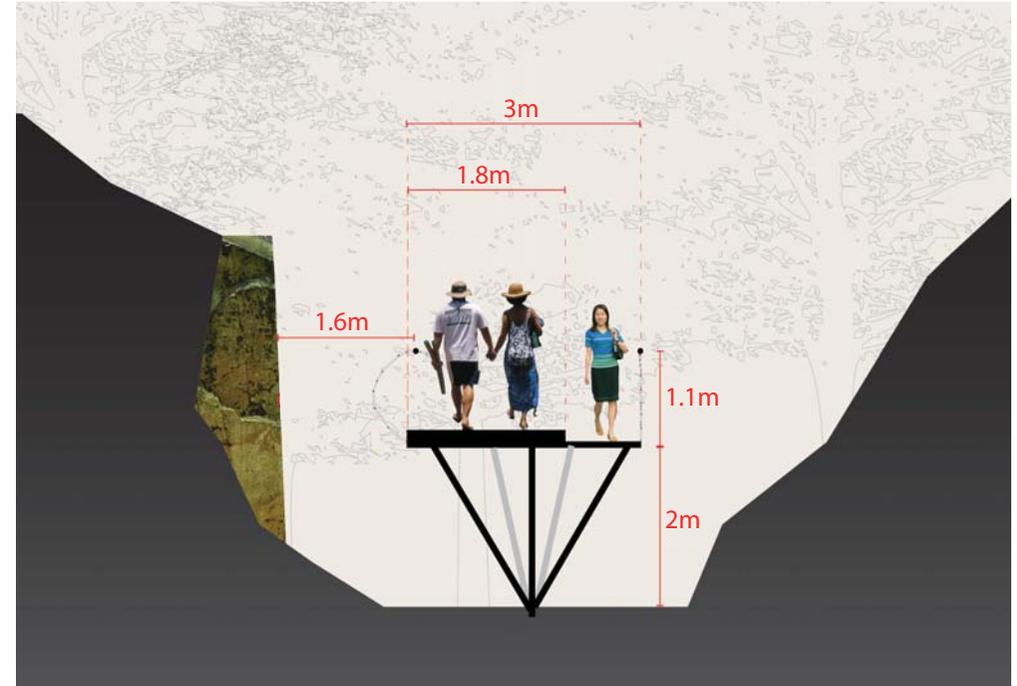
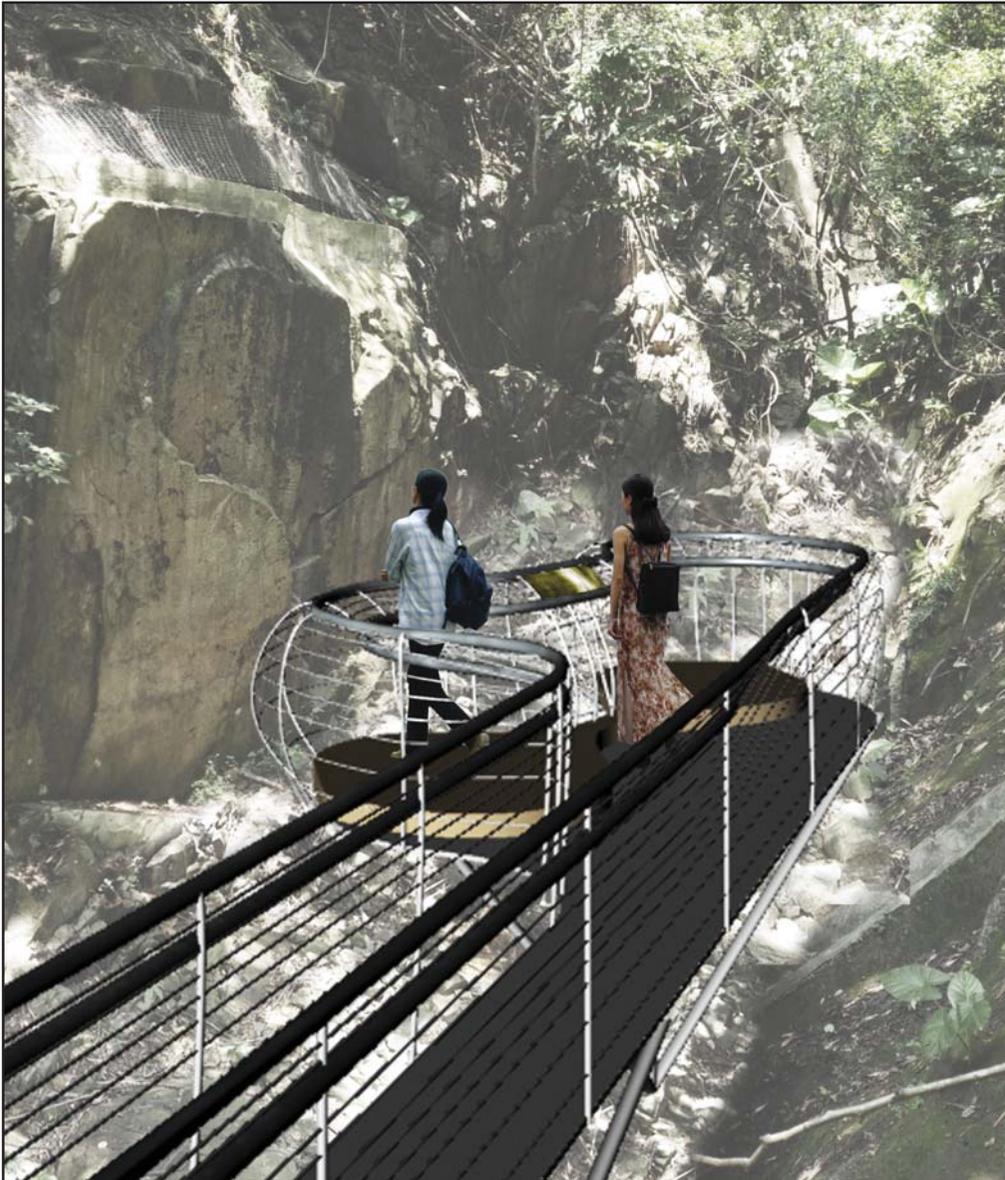


Same architectural language as all the other projects will be applied for consistency

Interpretation plate incorporated with the balustrade

Actions taken

Design approach 1 for Site 4_Wong Chuk Hang Controlled pathway (viewing bridge)



Provision of Architectural Designs of Protection and Visitor Facilities for Rock Carvings and Inscription in Hong Kong

Site 5 Big Wave Bay

Design approach 1 - controlled pathway

	Suggested actions in the Rock Carvings Consultancy Study	Purpose	Suggested architectural approach by CPW
Physical measure	<ul style="list-style-type: none"> To remove Portland cement structures To remove roof structure To remove cement structure along with the cement steps and footpath 	<ul style="list-style-type: none"> To avoid problems from soluble salts To enhance water drainage To prevent formation of micro-climate To reveal natural and original setting of the site To prevent vandalism by redirecting the path 	<p>We suggest to redirect the current footpath by constructing a wooden footbridge. The footbridge will be an effective physical barrier to keep visitors away from the rock yet reducing impact to original setting to the minimum.</p> <p>Interpretation plate is to be incorporated with the railing structure.</p>
Interpretation plate	<ul style="list-style-type: none"> To be incorporated with the balustrade 	<ul style="list-style-type: none"> To provide more background information of the rock To educate visitors to protect the cultural heritage of Hong Kong 	
Chemical & geographic conditions	<ul style="list-style-type: none"> To remove existing concrete plinth 	<ul style="list-style-type: none"> To reveal the original setting To avoid soluble salt from concrete and for protection in the long term 	
Maintenance	<ul style="list-style-type: none"> Periodical maintenance is essential 	<ul style="list-style-type: none"> To ensure the rock carving is in the equilibrium condition. 	
Other remarks	3D laser scanning is essential for further detailed design as well as actual construction.		



1. We propose redirecting the route and building a wooden footbridge which connects to the existing footpath.

2. The roof of the pavilion creates a micro-climate underneath, thus affecting the condition of the rock carving

3. The natural platform in front of the carving was buried in cement structure. This artificial platform along with the cement steps and footpath within 10m of the carving have interfered with the natural setting.

4-5. The current level of protection for the carving is insufficient since visitors can reach the carving.

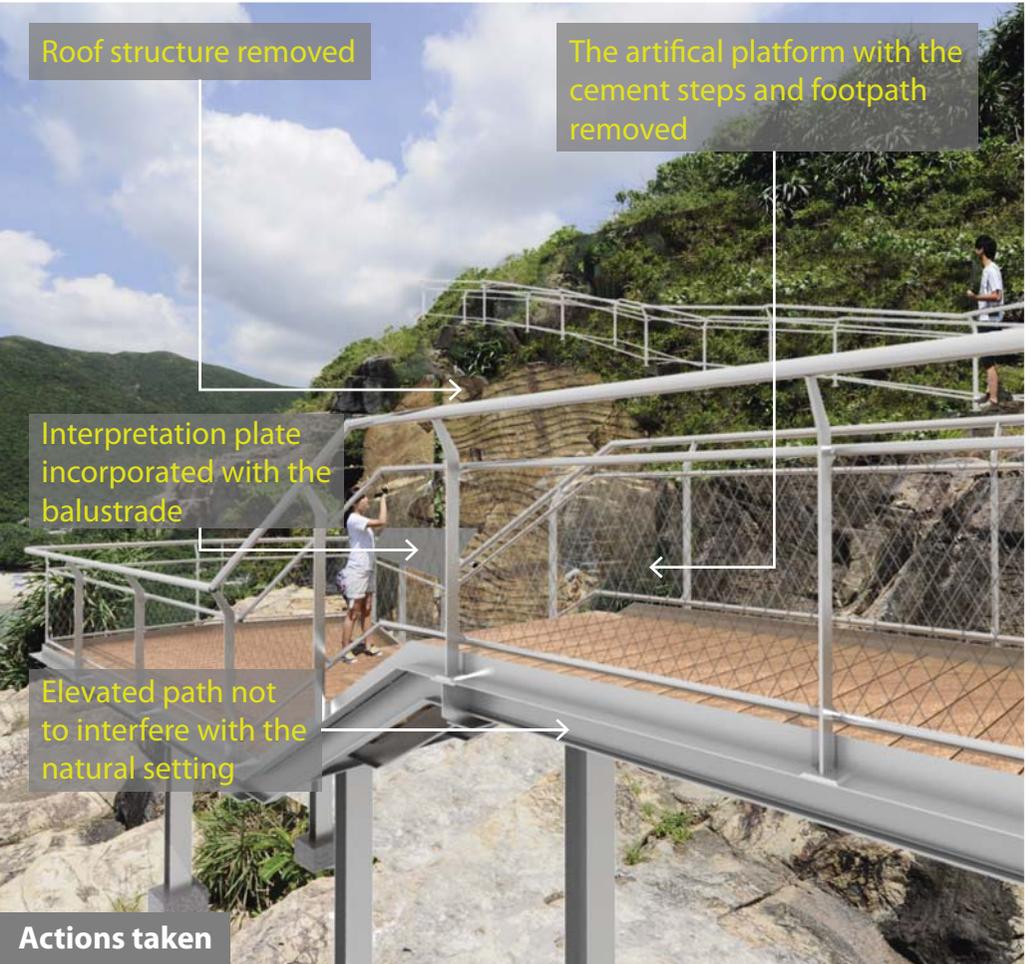
Key

- To be removed
- Proposed structure

Design approach 1 for Site 5 Big Wave Bay

Controlled pathway

Actions taken in the design

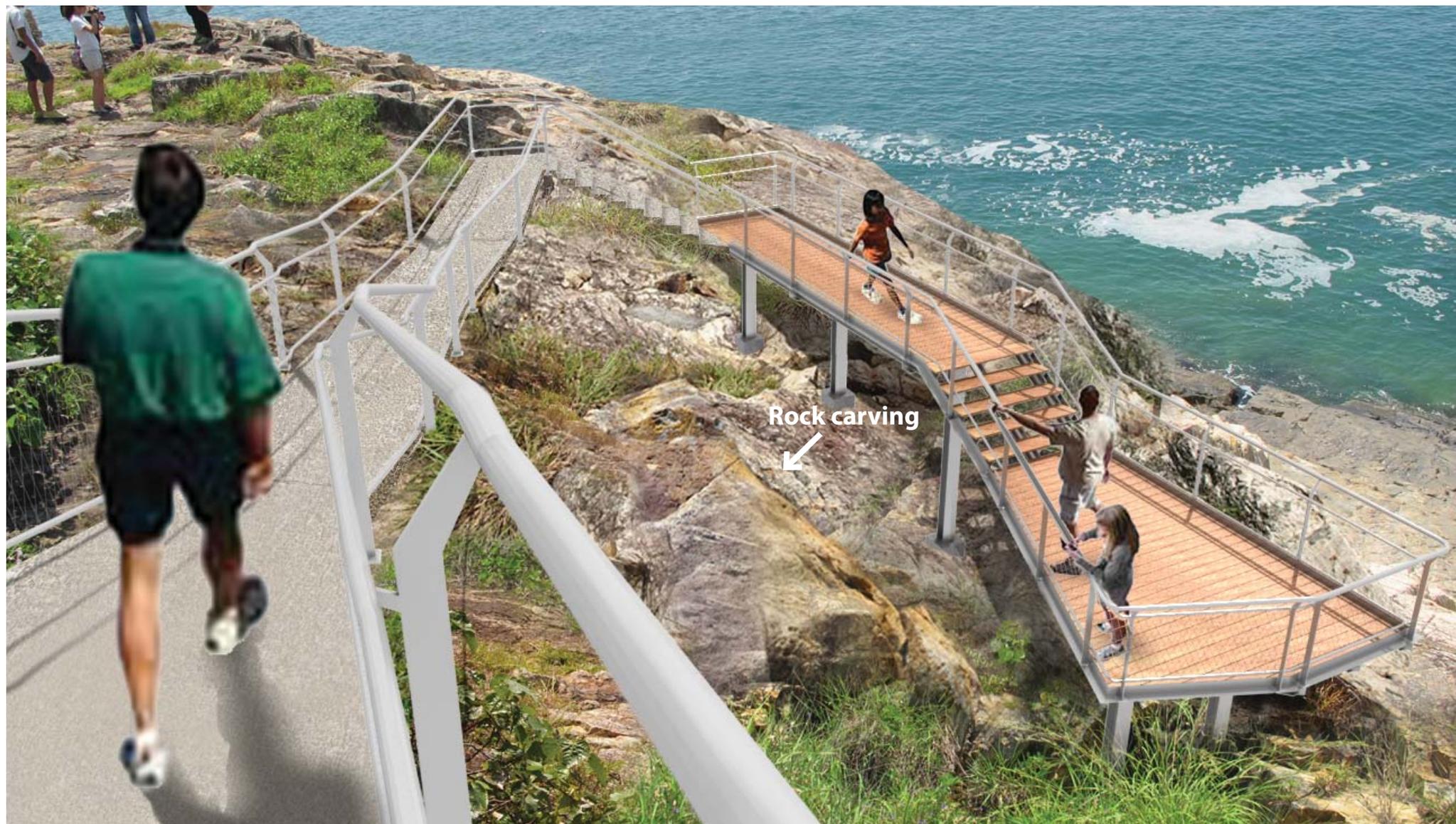


Design approach 1 for Site 5_Big Wave Bay
Controlled pathway
Perspective



Design approach 1 for Site 5_Big Wave Bay

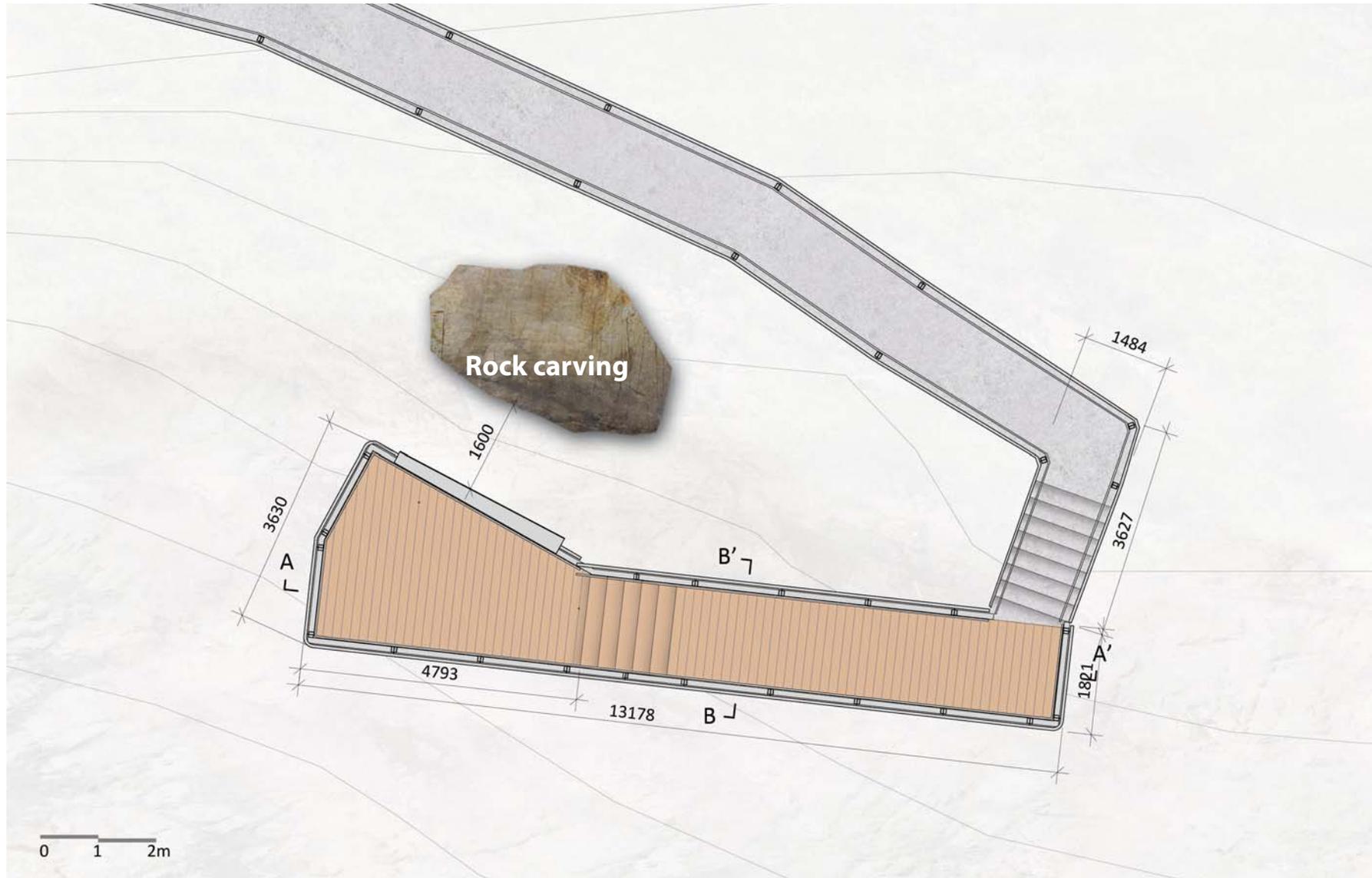
Controlled pathway
Perspective



Design approach 1 for Site 5_Big Wave Bay

Controlled pathway

Site plan 1:150

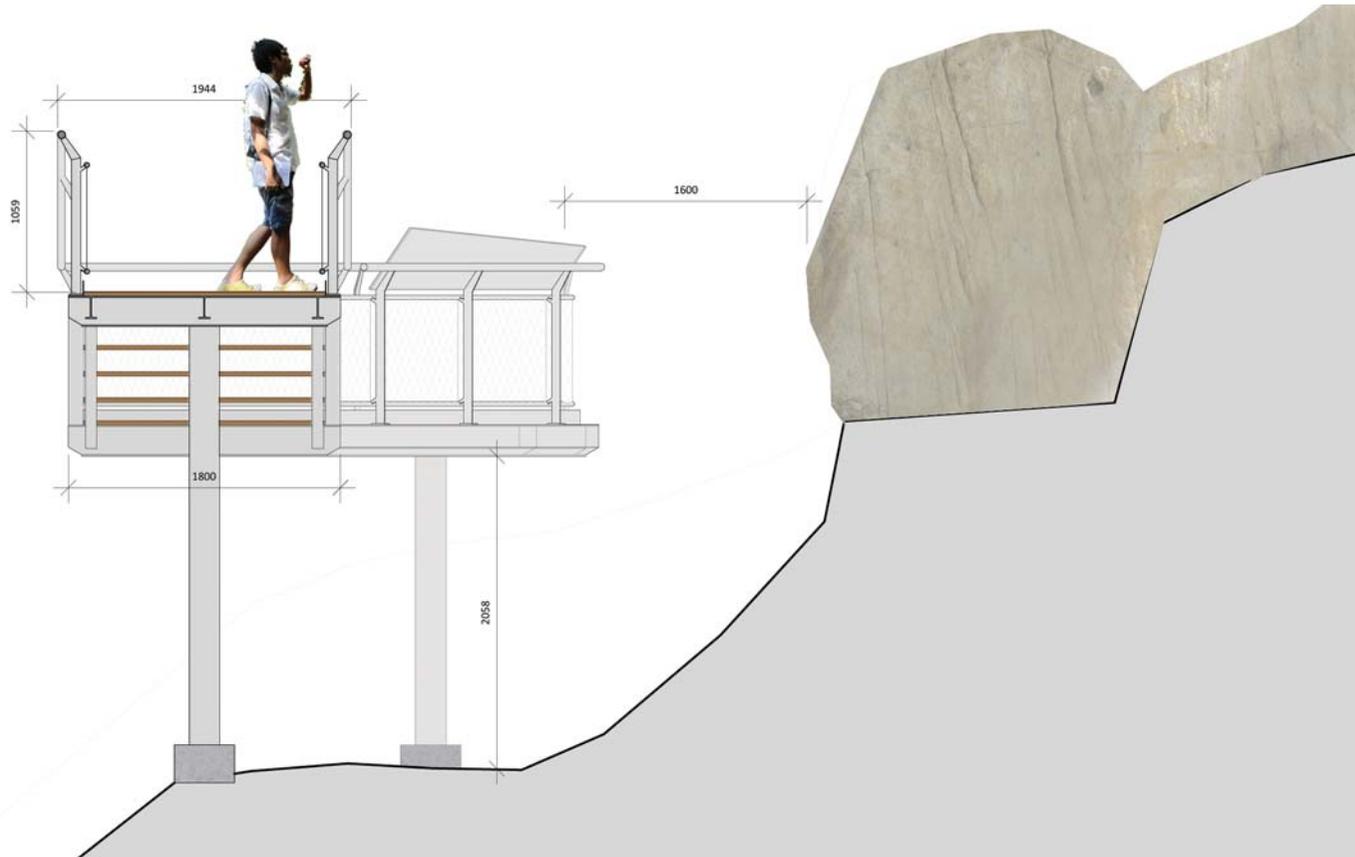


Design approach 1 for Site 5_Big Wave Bay

Controlled pathway
Section AA' 1:50



Design approach 1 for Site 5_Big Wave Bay
Controlled pathway
Section BB' 1:50



Site 6 Lung Ha Wan

Design approach 1 - controlled pathway

	Suggested actions in the Rock Carvings Consultancy Study	Purpose	Suggested architectural approach by CPW
Physical measure	<ul style="list-style-type: none"> To remove Perspex screen 	<ul style="list-style-type: none"> To increase visibility 	<p>We suggest to redirect the current footpath by constructing a wooden footbridge. The footbridge will be an effective physical barrier to keep visitors away from the rock yet reducing impact to original setting to the minimum.</p> <p>Interpretation plate is to be incorporated with the railing structure.</p> <p>*It is agreed among the experts that the site should not be developed into a popular tourist destination so to ensure minimum disturbance to the carving and the environment. It has also been strongly recommended that the site is to have minimal infrastructure.</p>
Interpretation plate	<ul style="list-style-type: none"> To be incorporated with the balustrade 	<ul style="list-style-type: none"> To provide more background information of the rock To educate visitors to protect the cultural heritage of Hong Kong. 	
Chemical & geographic conditions	<ul style="list-style-type: none"> To undertake geo-technical studies 	<ul style="list-style-type: none"> To acquire information on slope stability and water infiltration 	
Maintenance	<ul style="list-style-type: none"> Periodical maintenance is essential 	<ul style="list-style-type: none"> To ensure the rock carving is in the equilibrium condition. 	
Other remarks	3D laser scanning is essential for further detailed design as well as actual construction.		



The concrete steps will be removed to reduce accessibility of the site so that the rock can be protected away from tourists. A new interpretation plate will be installed.

Key

■ To be removed

■ Proposed structure

Design approach 1 for Site 6 Lung Ha Wan

Controlled pathway (remove steps)

Actions taken in the design



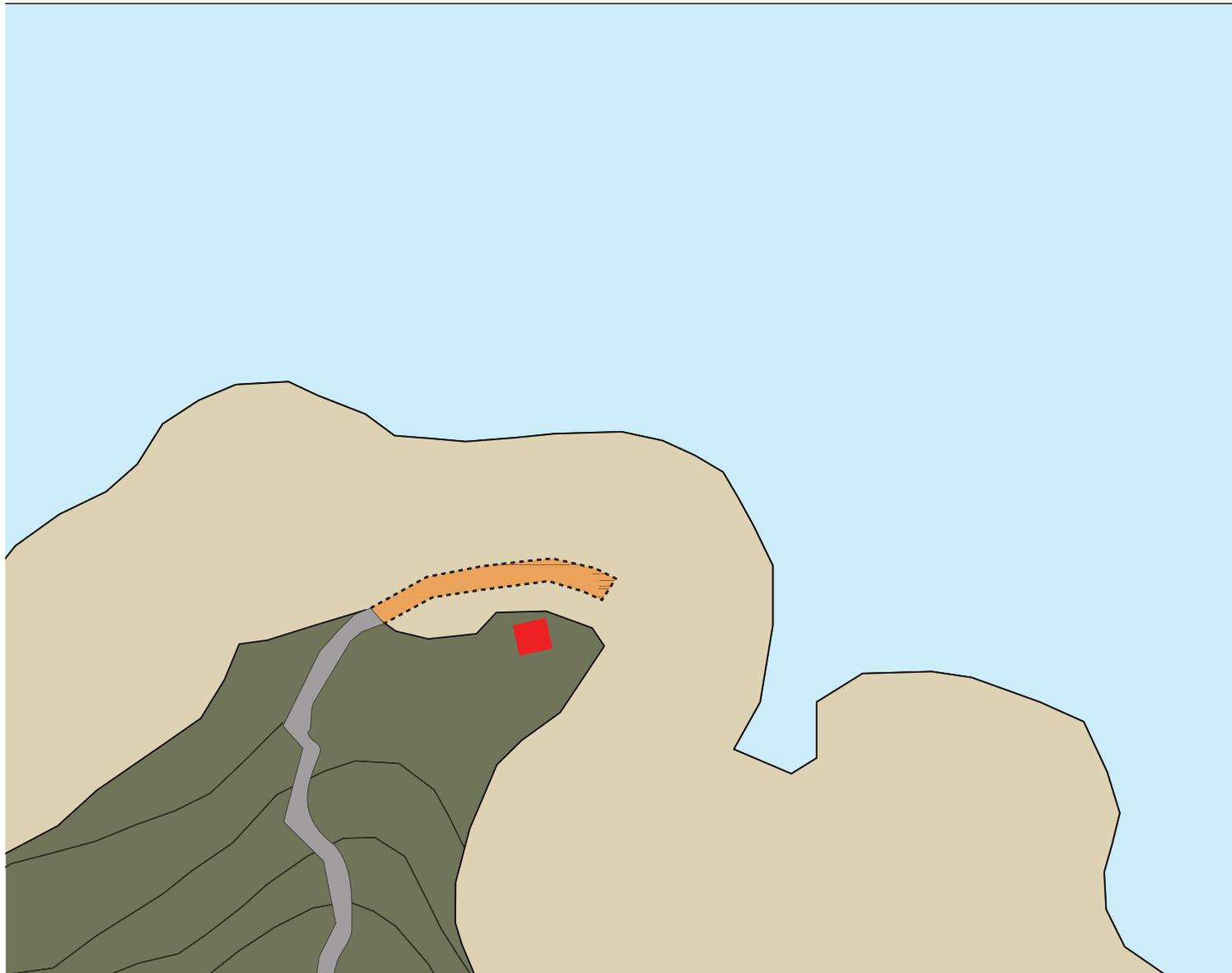
Design approach 1 for Site 6_Lung Ha Wan Controlled pathway (remove steps)



Provision of Architectural Designs of Protection and Visitor Facilities for Rock Carvings and Inscription in Hong Kong

Design approach 1 for Site 6_Lung Ha Wan

Controlled pathway (remove steps)

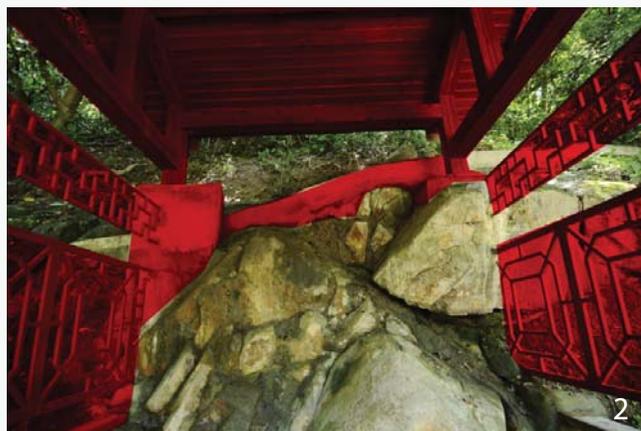


- Rock carving
- Existing pathway
- Suggested approach

Site 7 Shek Pik

Design approach 1 - controlled pathway

	Suggested actions in the Rock Carvings Consultancy Study	Purpose	Suggested architectural approach by CPW
Physical measure	<ul style="list-style-type: none"> To remove all concrete from the surrounding area of the carving To remove roof structure To erect wooden fence around the refuse collection point 	<ul style="list-style-type: none"> To avoid problems from soluble salts To enhance water drainage To prevent formation of micro-climate To create a better environment around the rock carving site and to enhance the visiting experience for the public To prevent spreading of odours from the refuse collection point 	<p>A wooden footbridge to be constructed as an effective physical barrier to keep visitors away from the rock yet keeping impact to original setting to the minimum.</p> <p>Interpretation plate is to be incorporated with the railing structure.</p> <p>*We also recommend that the condition of the footpath to the rock carving be improved.</p>
Interpretation plate	<ul style="list-style-type: none"> To be incorporated with the balustrade To add information about the rock's original setting 	<ul style="list-style-type: none"> To provide more background information of the rock To educate visitors to protect the cultural heritage of Hong Kong. This is the only site which setting has been altered due to natural geomorphological process 	
Chemical & geographic conditions	<ul style="list-style-type: none"> To remove existing concrete To remove part of the top soil 	<ul style="list-style-type: none"> To reveal the original setting To avoid soluble salt from concrete and for protection in the long term To expose the buried rock carving 	
Maintenance	<ul style="list-style-type: none"> Periodical maintenance is essential 	<ul style="list-style-type: none"> To ensure the rock carving is in the equilibrium condition. 	
Other remarks	3D laser scanning is essential for further detailed design as well as actual construction.		



1. We suggest putting up low fences outside the refuse collection point so that visitors can enjoy a more pleasant walk to the site.
- 2 & 3. Shelter to be removed to allow air flow and avoid micro-climate. The concrete water diversion dams need to be replaced to prevent water seeping into the rock.
4. The unused well is to be removed.

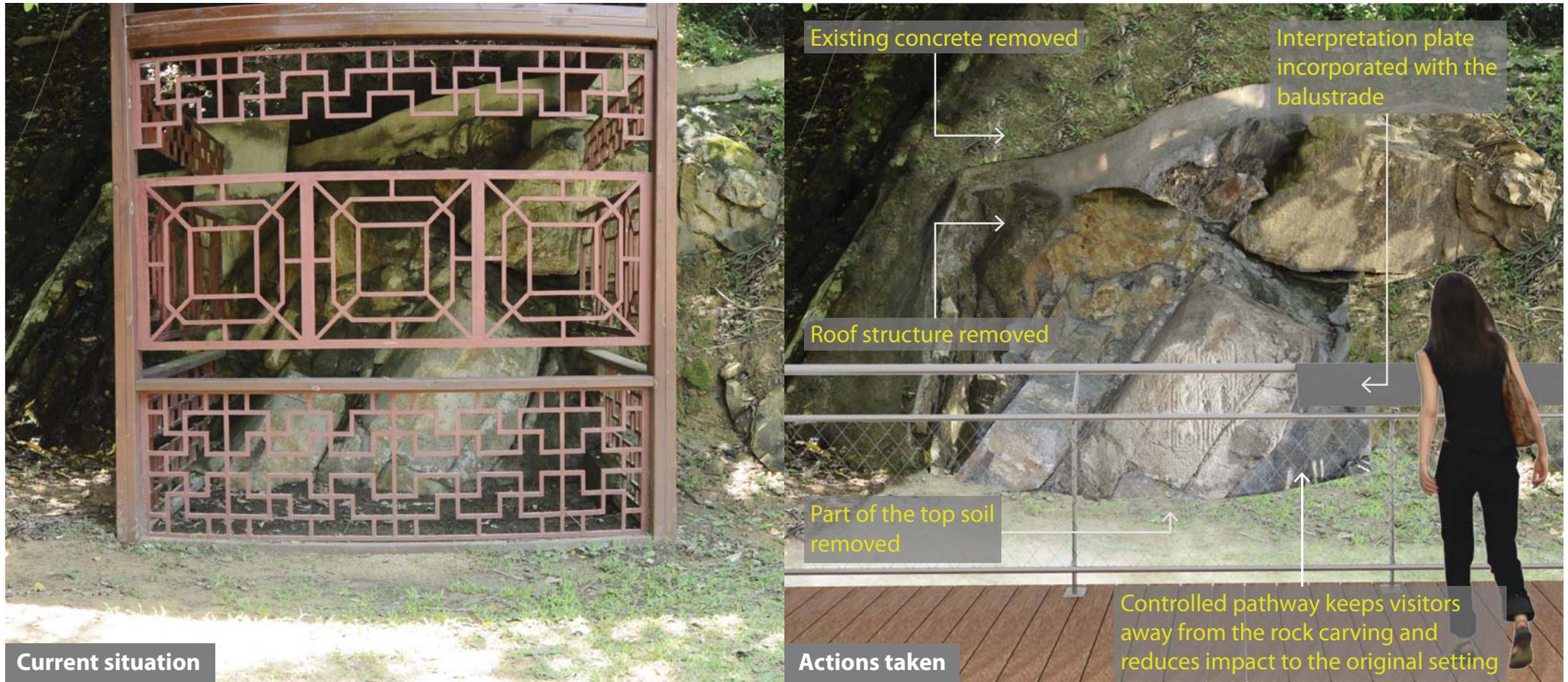
Key

- To be removed
- Proposed structure

Design approach 1 for Site 7 Shek Pik

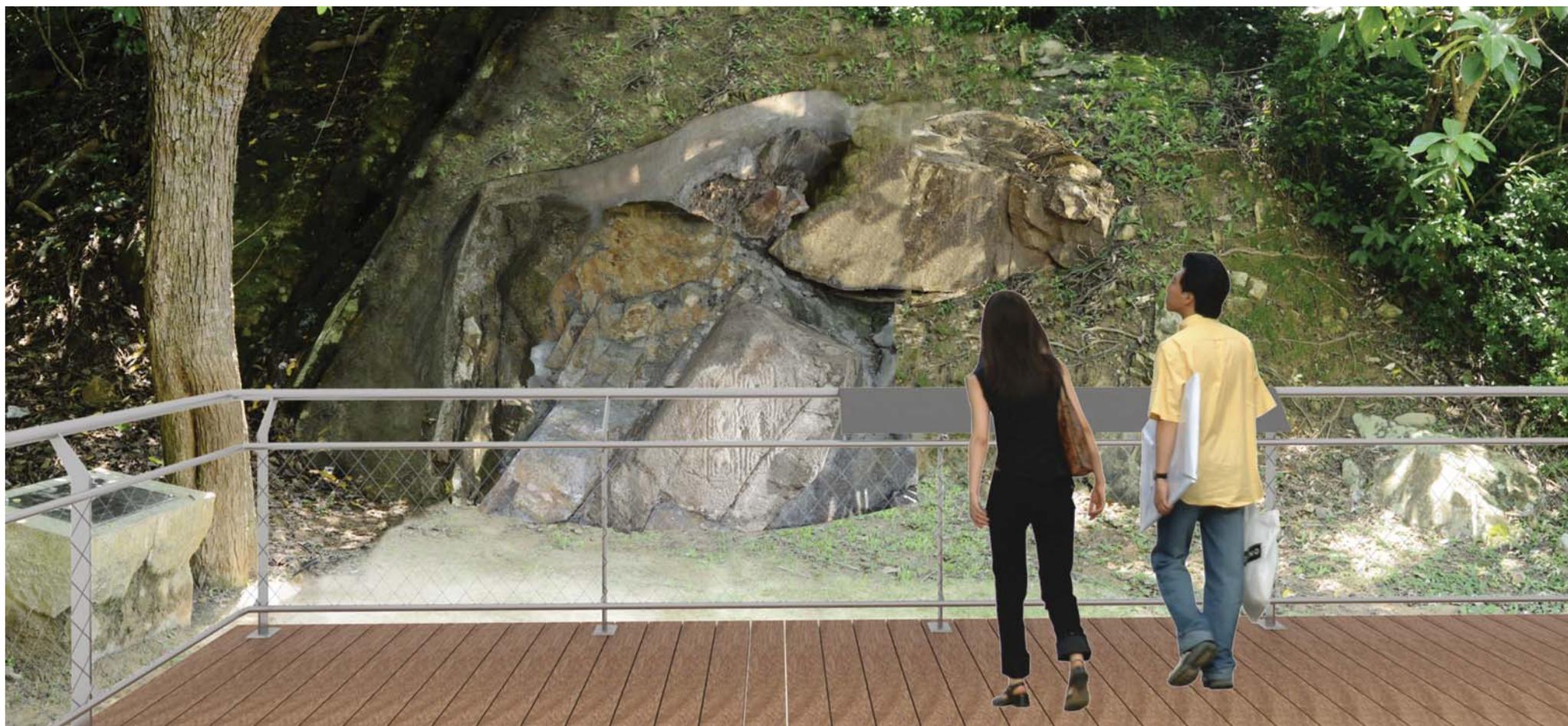
Controlled pathway

Actions taken in the design



Design approach 1 for Site 7_Shek Pik

Controlled pathway
Perspective



Design approach 1 for Site 7_Shek Pik Controlled pathway



Site 8 Joss House Bay

Design approach 2 - physical barrier

	Suggested actions in the Rock Carvings Consultancy Study	Purpose	Suggested architectural approach by CPW
Physical measure	<ul style="list-style-type: none"> To remove Perspex screen 	<ul style="list-style-type: none"> To increase visibility 	<p>Being the only readable rock inscription, it is most prone to vandalism. We propose erecting a physical barrier as the area has constraints for extensions or construction of alternative pathway.</p> <p>Interpretation plate is to be incorporated with the barrier structure.</p>
Interpretation plate	<ul style="list-style-type: none"> To be incorporated with the balustrade 	<ul style="list-style-type: none"> To provide more background information of the rock To educate visitors to protect the cultural heritage of Hong Kong. 	
Chemical & geographic conditions	<ul style="list-style-type: none"> To remove existing concrete plinth 	<ul style="list-style-type: none"> To reveal the original setting To avoid soluble salt from concrete and protect the rock in the long term 	
Maintenance	<ul style="list-style-type: none"> Periodical maintenance is essential 	<ul style="list-style-type: none"> To ensure the rock carving is in the equilibrium condition. 	
Other remarks	<p>It has been mentioned that a lot of people visit the site during Tin Hau Festival.</p> <p>3D laser scanning is essential for further detailed design as well as actual construction.</p>		



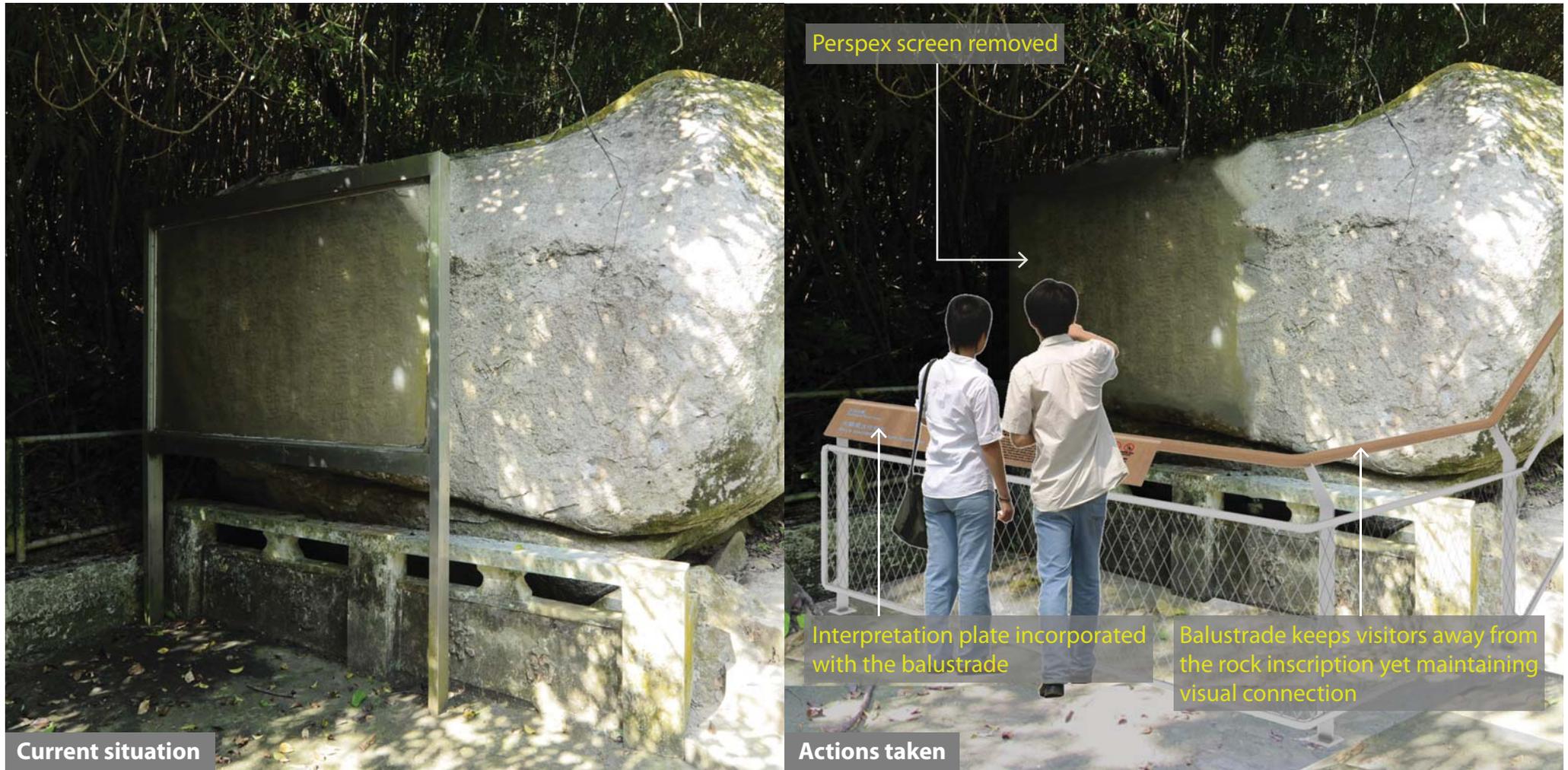
Key

- To be removed
- Proposed structure

1. Even though there is currently a Perspex screen in front of the rock, it is easy to reach the carving through the gap between the screen and the rock.
2. The Perspex screen has lowered visibility of the carving.
3. Interpretation plate is to be redesigned and incorporated with the new balustrade.

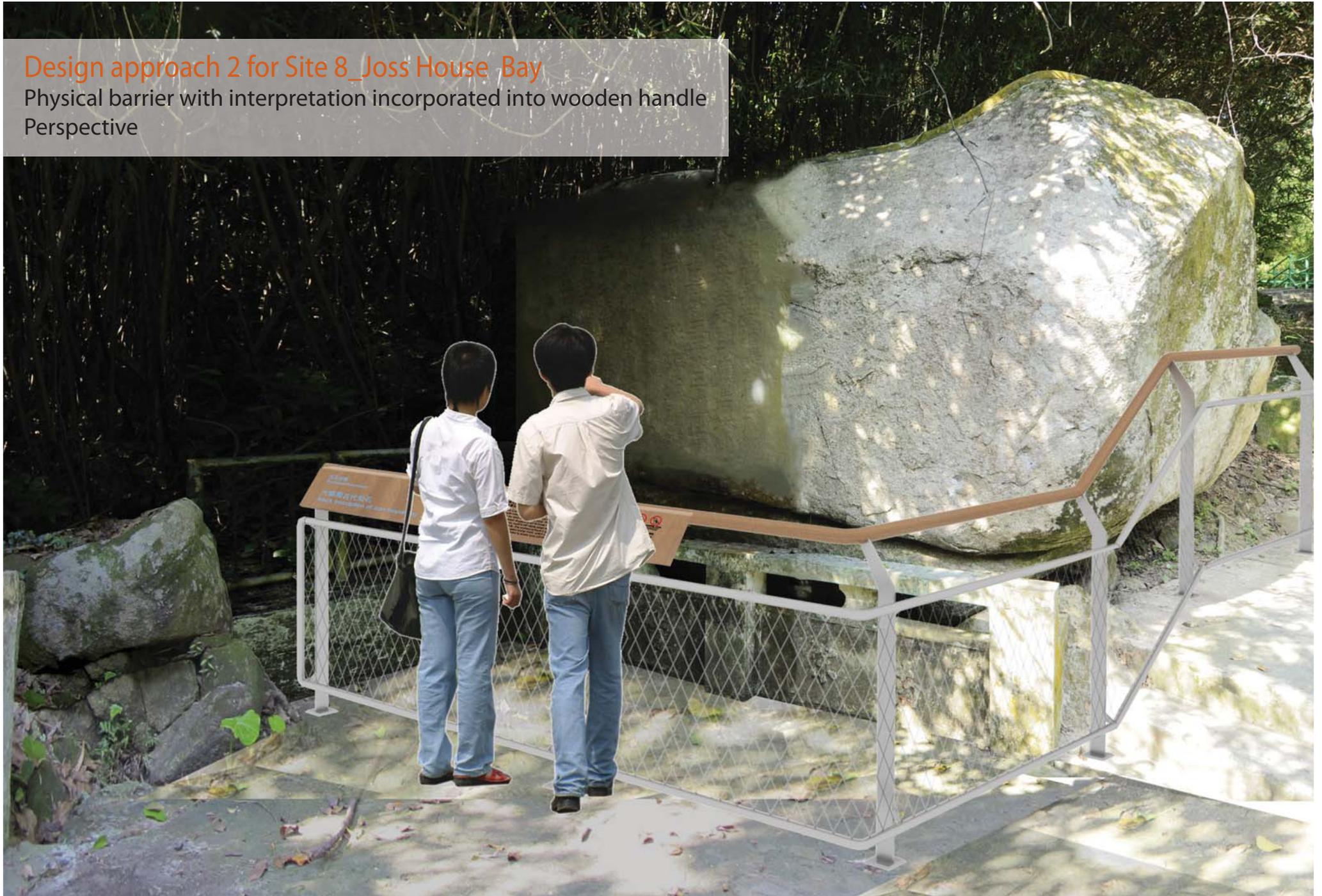
Design approach 2 for Site 8 Joss House Bay

Physical barrier with interpretation incorporated into wooden handle
Actions taken in the design



Design approach 2 for Site 8_Joss House Bay

Physical barrier with interpretation incorporated into wooden handle
Perspective



Provision of Architectural Designs of Protection and Visitor Facilities for Rock Carvings and Inscription in Hong Kong

Site 9 Kau Sai Chau

Design approach 3 - Interpretative panel as psychological barrier

	Suggested actions in the Rock Carvings Consultancy Study	Purpose	Suggested architectural approach by CPW
Physical measure	<ul style="list-style-type: none"> To stabilize rocks above the carving To remove all existing structures 	<ul style="list-style-type: none"> To increase visibility To prevent formation of micro-climate 	<p>Only a standalone interpretation plate is to be installed.</p> <p>*It is agreed among the experts that the site should not be developed into a popular tourist destination so to ensure minimum disturbance to the carving and the environment. It has also been strongly recommended that the site is to have minimal infrastructure.</p>
Interpretation plate	<ul style="list-style-type: none"> To be incorporated with the balustrade 	<ul style="list-style-type: none"> To provide more background information of the rock To educate visitors to protect the cultural heritage of Hong Kong. 	
Chemical & geographic conditions	<ul style="list-style-type: none"> To remove existing concrete base 	<ul style="list-style-type: none"> To reveal the original setting To avoid soluble salt from concrete and salt deposition in the long term 	
Maintenance	<ul style="list-style-type: none"> Periodical maintenance is essential 	<ul style="list-style-type: none"> To ensure the rock carving is in the equilibrium condition. 	
Other remarks	3D laser scanning is essential for further detailed design as well as actual construction.		



Key

■ To be removed

■ Proposed structure

The site is not frequently visited by tourists. Only the interpretation plate is to be replaced.

Design approach 3 for Site 9 Kau Sai Chau

Interpretative panel as psychological barrier

Actions taken in the design



Current situation

Actions taken

A low profile railing added to keep visitors away from the rock carving and reduces impact to the original setting

Interpretation plate replaced

Design approach 3 for Site 9_Kau Sai Chau

Interpretative panel as psychological barrier

Perspective



Design approach for interpretation plate

The interpretation plate is a very important part of the protection measure for the rock carving not only because it helps educating the visitors about the historical value of the rock, but it can also convey the warning message in a more gentle and visually pleasing way.

The design approaches for the 9 sites may vary depending on specific site condition, but all interpretive facilities shall be united under one consistent design language.



Existing interpretation plates for the carvings

We suggest to include the following information on the interpretation plates:

1) Locations of the 9 sites

This is to provide a consistent image and identity to the 9 rock carving sites. We hope that by providing a location map, visitors will be encouraged to visit the other sites in the future.

2) Historical and archaeological background of the rock carving

During the consultation meetings, consultants emphasized the unique value of keeping the rock in its original setting. It is therefore important that information on the historical and archaeological background of the rock is understood by the public.

(* For site 8, Shek Pik, the rock carving site has undergone significant geographical change and it is essential to mention this piece of information on the interpretation plate.)

By providing adequate information of the rock carvings, it is hoped that visitors will have a better understanding of their significance and hence treasure these historical monuments more, and chance of vandalism can be minimized in return.

3) Replicating the rock carving pattern

Visitors can feel the urge to climb over barriers to touch the rock carvings out of curiosity. To prevent this, we suggest replicating the carving pattern on the interpretation plate so that visitors can see the pattern clearly without causing any potential harm to the rock.

4) Warning sign

Warning signs should be included to warn against undesirable behaviours such as littering and vandalism.

Interpretation plate design





8 Specifications of Materials

Study on various construction materials

Wood-plastic Composite

Wood-plastic is made from a composite of wood fibre and plastic. Wood-plastic is lightweight and resistant to corrosion. Unlike timber, it does not rot and is not affected by insects. As it is a relatively new material, durability is yet to be proved, but warranty period can vary from 5 to 30 years depending on the manufacturer. It is fairly strong with high resistance to impact but is not a structural material. It can deform slightly in extremely hot weather but is more stable than timber. General applications include outdoor deck, cladding, railing etc.

Wood-plastic composite comes in hollow or solid forms and in different colours. It can be moulded with or without simulated grain details. No surface treatment like varnishing, sanding etc. is needed. It is therefore a low-maintenance material that allows flexibility in design. The only concern from the experts is that it might appear bulky.



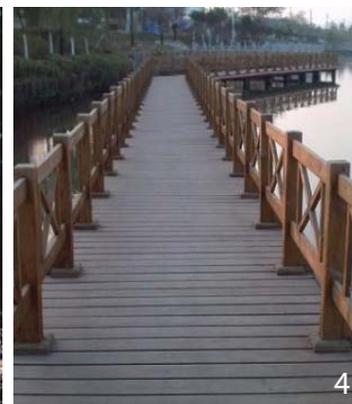
1



2



3



4

1. Wood-plastic decking, railing and seating
2. Wood-plastic composite members
3. Park signage in wood-plastic
4. Wood-plastic riverside footpath



Stainless Steel 316L

Stainless steel 316L is the low carbon version (0.03% carbon maximum) of stainless steel 316. The low carbon content makes it easier to weld. 316L is known as the ‘marine grade’ stainless steel. It is extremely resistant to water, heat and corrosion but can exhibit slight surface corrosion if the surface has not been polished after welding or grinding. It is highly durable and strong as a structural material, and the surface corrosion aforementioned does not affect its structural integrity or its lifetime. Regular maintenance is required every 6 to 12 months in coastal and rural areas to maintain the appearance.

316L comes in various finishing options and forms including angles, sheets, hollow sections, wire mesh etc. The material’s neutral look goes well with many different types of materials and is therefore very versatile. It can withstand harsh climates and chloride environments, and is often used in marines. We suggest the material to be used for structural frames, walkway structures and interpretive facilities.



Image sources

1. Stainless steel signage along Salem Creek, North Carolina
- 2-4. Various stainless steel finishes
5. Die-cut stainless steel
6. Stainless steel tubes



Mesh (X-Tend, Stainless Steel 316)

X-Tend is a wire mesh made from grade 316 stainless steel cables. It is corrosion-resistant, has a high load capacity & long spans. The mesh can be bent into various shapes and can even be used as a 3D structural element. The flexible diamond pattern is climb resistant and prevents a secure foothold. Diamond sizes and cable diameters can be customized (diamond size: 20mm to 200mm, cable diameters: 1.0mm to 4.0mm).

General applications include balustrade, vertical greening, enclosures etc. Cleaning is needed every 6 to 12 months in coastal and rural environments to maintain the appearance.



1. Mesh detail
2. Mesh used for outdoor pathway in Landesgartenschau, Germany

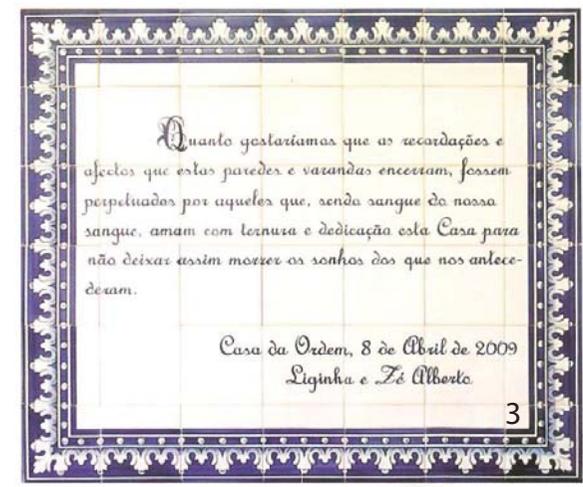


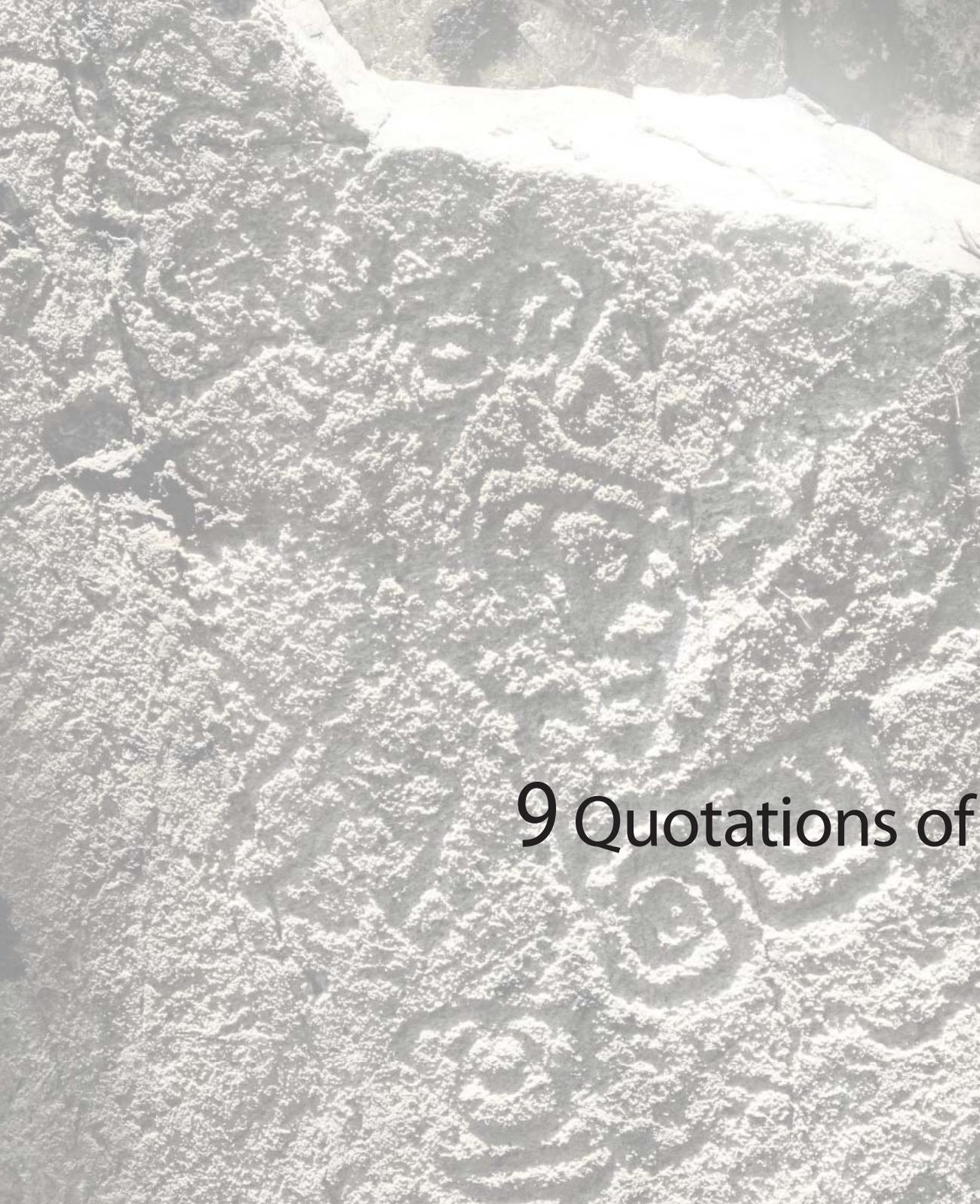
Ceramic Tile

Ceramic tiles are highly resistant to water due to its density. Tiles can be glazed, matte or unglazed. Water absorption rate of glazed tiles is as low as below 0.5 percent. Glazed tiles are stain-resistant and extremely durable (can last up to 50 years).

Although ceramic tiles are extremely hard, it can be brittle when bent (standard breaking strength is >90 pounds for wall tiles and >250 pounds for floor tiles). A backing has to be used to support the tile if it is used for interpretation plates. Information can be etched, hand-painted or screen printed onto the tiles.

1. Tourist info plate at the Mayan ruins at San Gervasio
2. Pyramid of Chichen Itza, Mexico
3. Ceramic tiles printed with graphic patterns





9 Quotations of Construction Costs

Quotation of material costs

Ceramic tiles for one interpretative panel

Company	Item	Description	Quantity	Unit rate	Amount (EUR)	Amount (HKD) (1 EUR = 10.2 HKD)
Simex	Ceramic tile size 1	60cm x 40cm	8	115	920.00	9,384.00
	Cerramic tile szie 2	100cm x 40cm	9	228	2,052.00	20,930.40
	Transportation fee	By plane (30-40 days)			1,080.00	11,016.00
	Transportation fee	By ship (65-75 days)			750.00	7,650.00

Wire mesh for all balustrades at Tung Lung Chau, Cheung Chau, Big Wave Bay & Joss House Bay

Company	Item	Description	Quantity	Unit rate	Amount (HKD)
Widevelop	X-Tend wire mesh	Product: X-Tend Safety Net Material: Stainless Steel 316 Model: 80/2	85m ²	1,280.00/m ² less 20% = 1,024.00/m ² * *Discount is valid for the above quantity only. Fixing kit and installation at extra cost	87,040.00

Quotation of construction costs

Extended walkway for Site 1_Tung Lung Chau

Company	Item	Description	Amount (HKD)	
Hanki Contractors (HK) & Associates Limited	A. Preliminaries	1. Water & power supply	15000.00	
		2. Temporary working platform for working area	35000.00	
		3. Transport materials, equipment & labours etc.	15000.00	
		4. Removal upon & made good after completion of the works	10000.00	
		5. Supervision for the work	50000.00	
		6. Insurance	80000.00	
			Sub-total:	205,000.00
	B. Extended footpath	Supply and installation of the following:		
		1. 9090mm(L) x 5240(w) cantilevered structure attached to the existing concrete base		
		2. Wood-plastic decking		
		3. Stainless steel beams and bracing		
		4. Stainless steel balsutrades with steel wire meshing		
			Sub-total:	512,000.00
C. A shelter for the rock inscription	1. Stainless steel balsutrades with steel wire meshing			
	2. Stainless steel board with engraving			
		Sub-total:	156,000.00	
		Total:	<u>873,000.00</u>	