

# Agreement No. SLO 03/2020 Study for Enhancement of Trails and Connectivity in Lantau

## Task 7a Executive Summary (Rev. 4) P20222/T7a/005

August 2023



## **1 INTRODUCTION & BACKGROUND**

### **1.1 Background of the Study**

1.1.1 Wings & Associates Consulting Engineers Limited (WINGS) is engaged by Civil Engineering and Development Department (CEDD) as the consultant to conduct the study for the agreement, "SLO 03/2020 – Study for Enhancement of Trails and Connectivity in Lantau". According to the brief of SLO 03/2020, Clause no. 6.8, Task 7, Final Report shall be delivered by the consultant.

### **1.2 Description of the Study**

1.2.1 Lantau Island is undergoing rapid changes in recent years, a number of major economic and housing development are being planned and constructed in north Lantau. At the same time, Lantau is famous for its network of scenic hiking trails, which link up sites of natural, cultural heritage and ecological interests. To further enhance these trails for public enjoyment and promote public awareness on nature and cultural conservation, CEDD collaborating with Agriculture, Fisheries and Conservation Department (AFCD) to take forward the enhancement of trails by linking up nearby recreation, cultural and ecological resources with supporting facilities.

1.2.2 There are three main missions of this Study:

- i. To develop a set of Prototype Precast Modules (Standard Details for CEDD) For improvement of existing trails and construction of new trails in Hong Kong
- ii. To identify and propose a routing to form a Round-the-Lantau Route & Local Trail Loops in order to improve the connectivity of hiking trails in Lantau.
- iii. To identify Defects on Existing Trails in Lantau and propose Repairing Works and Improvement Works by using the Prototype Precast Modules as trial use.

### **1.3 Sections of Trails to be covered**

1.3.1 The sections of Trails to be covered for this Study are as follow:

1. Sham Shui Kok
2. Keung Shan
3. Mui Wo
4. Fa Peng Teng
5. Luk Keng / Yam Tsai
6. Tai O
7. Pui O
8. Chi Ma Wan Peninsula
9. Sha Lo Wan Tsuen
10. Yi O

## 2 CURRENT SITUATION OF HIKING TRAILS IN LANTAU

### 2.1 Current trails maintenance method

2.1.1 The current trails maintenance method within the scope of Hong Kong Country Park is following a natural approach named “手作步道” in Chinese. It means that the maintenance works shall be **carried out by bear hands** without the help of heavy machine. The materials shall be **natural and local**, mainly fallen trees, rocks and soil from the trail. There is **no absolute standard**, the design is based on on-site determination by experienced workers. As a result, the time of maintenance is variable.



Fig. 2.1.1 Current trails maintenance method



Fig. 2.1.2 Current trails maintenance method

2.1.2 The main benefit of such method is that it **respects the nature** by retaining **the original profile and feature**. Also, the soil ground surface is soft which does less damage to ankle when compared with cement paving.

2.1.3 The significant shortcoming of such method is the **long construction time**. Due to the lack of local material, transportation of other natural material and workmanship, the time of maintenance works is usually long. Also, as the priority of such method is targeting the nature instead of hiker, **safety** is another concern. For example, “手作步道” does not have railing since no grouting in subsurface is allowed. Since such maintenance method is mainly carried out by volunteers, the **workmanship** is another concern.

### 3 BIM APPLICATION

#### 3.1 Workflow of BIM Application

3.1.1 The workflow for preparation of this report would be as follow:

- 1) Site Inspection
- 2) Selection of Surveying Scope
- 3) 3D Scanning
- 4) Collection of Point-Cloud Data
- 5) Data Merging by Civil 3D software
- 6) Trail Design Development by BIM
- 7) Mock-up Works
- 8) Design Review

3.1.2 After Site Investigation and Surveying Works, the **point cloud data** was collected. The raw data (.las) would be processed into BIM by using software including **ReCap** and **Civil 3D**.

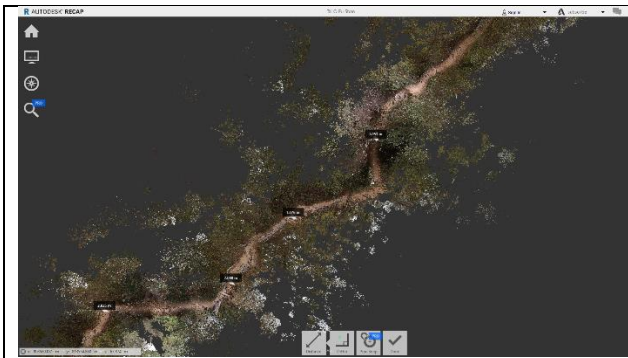


Fig. 3.1.1 Point Cloud Model in ReCap

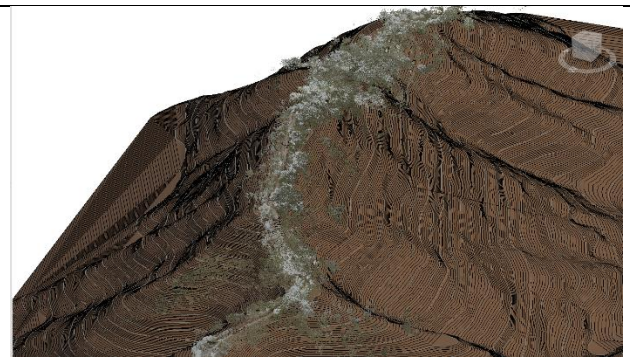


Fig. 3.1.2 Merging Point Cloud into Terrain

3.1.3 After the process of converting the Point cloud data into Civil 3D, the **terrain** of the corresponding location would be merged according to the coordinates. Hence the feature and the contour of the trail could be ready for the **installation of Prototype Precast Modules in Revit**.

3.1.4 When the terrain was ready in Revit, the BIM families of Prototype Precast Modules would be installed into the terrain model. The installation of Prototype Precast Modules would be based on the **gradient and width** of the trail in order to maintain the original profile and feature.



Fig. 3.1.3 Conversion to Enscape Rendering

## 4 SURVEYING WORKS

### 4.1 Background of Surveying Works

4.1.1 According to the workflow of BIM Application of this Study, implementation of surveying works is the fundamental step of trail design. The purpose of surveying was to obtain **terrain information** such as gradient and width of the trail. So that it is possible to **study the critical location** to carry out enhancement work. There would be two methods of Surveying, they are **Terrestrial 3D Laser Scanning** and **Aerial Survey** respectively.

### 4.2 Terrestrial 3D Laser Scanning

4.2.1 The scope of Terrestrial 3D Laser Scanning includes 12 locations as follow:

- 1) Tai O Hiking Trail
- 2) Keung Shan Hiking Trail
- 3) Mui Wo (South) Hiking Trail
- 4) Fa Peng Teng & Tai Shan Hiking Trail
- 5) Chi Ma Wan Peninsula Hiking Trail (Location 1 of 2)
- 6) Chi Ma Wan Peninsula Hiking Trail (Location 2 of 2)
- 7) Mui Wo (North) Hiking Trail
- 8) Luk Keng & Yam Tsai Hiking Trail
- 9) Sham Shui Kok Hiking Trail
- 10) Yi O & Tsin Yue Wan Hiking Trail
- 11) Open Space at Area 29
- 12) Sha Lo Wan Tsuen Hiking Trail

4.2.2 The deliverables from Ambit shall be the point cloud data in .las format and panoramic image in .jpg format. The point cloud data would then be transferred to .rcs format to be input to BIM.

### 4.3 Aerial Survey

4.3.1 The scope of Aerial Survey includes 4 locations as follow:

- 1) Yi O & Tsin Yue Wan Hiking Trail
- 2) Chi Ma Wan Peninsula Hiking Trail
- 3) Tai O Hiking Trail
- 4) Tung Wan Tau Hiking Trail

4.3.2 There were two methods Aerial Survey, including **photogrammetry** and **LiDAR**. Photogrammetry is a technic which produces 3D model by meshing the photos, the product is relatively realistic and detailed in term of visualization. While LiDAR is the technic which can scan through the blockage of tree surface to obtain a more accurate terrain of the trail.

## 5 IMPROVEMENT OF HIKING TRAIL

### 5.1 Identified Defects on the Existing Trails

5.1.1 This section aimed to show the general condition of existing environment of the trails. The works of this section were designed to be carried out on the superficial surface of the ground. The focus of this section would be on the ground condition of the trail, at the highlighted existing problematic spots of the trails with the brief description of the enhancement works.

#### Tai O

5.1.2 Tai O was selected for Trail Improvement Works. The trail was steep except for the existing concrete road near the pavilion. The site is located on a small hill named Fu Shan, and the surface is heavily eroded which is filled with small rocks. The width of the trail is wide and contour is clear along the trail. Potential hazard is slippery due to the heavily eroded trail surface.



Fig. 5.1.1 Site condition of Fu Shan



Fig. 5.1.2 Site condition near Tai O Barrack

5.1.3 Tai O would require the installation of Prototype Precast Modules – Stairs, Step, Railing, Water Bar and Boardwalk. The design aimed to enhance the eroded trail surface especially at the east of the trail. The current setting was dangerous as only a thin loose rope along the side of the steep slope was provided for the hikers as support. Railing would be the most urgent part to be constructed. Boardwalk was proposed at the northeast of the trail to widen the trail and connect to the stairs at the same time. Stairs and Step shall only be installed at critical points with gradients of 20° to 30°. Water Bar would be installed at the top and bottom of the stairs to prevent further erosion by surface runoff.

5.1.4 The current section near the barrack was heavily covered by vegetation. Currently only advanced hikers who were able to bushwhack could deal with the ambiguous environment. Proposed works for this section was clearance of vegetation to widen the trail and clarify the path to attract less experienced hikers.

## 5.2 Proposed Improvement Works

5.2.1 The Proposed Works would be identified by alphabet for easy understanding as follow:

- a) reinstatement/reconstruction of eroded trails;
- b) stabilization/reconstruction of loose steps;
- c) local widening of narrow trails;
- d) provision of alternative routes for over-steepened trails;
- e) provision of leverage points for high steps;
- f) provision/improvement of drainage system;
- g) provision of thematic planting works alongside the trails; and
- h) rehabilitation of the widened trails due to over-trampling by visitors.

5.2.2 The following table summarized proposed PPMs, associated works, estimated duration and cost for the proposed works..

Trail Locations	Priority	Proposed Works	Description of Works	Proposed PPMs	Estimated Duration	Estimated Cost
Sham Shui Kok	Medium	a, b, e, f, h	➤ Enhance the trail surface.	Step, Railing, Water Bar	2.5 month	1.2M
Keung Shan	Medium	a, b, c, e	➤ Widen the trail. ➤ Tree Pruning.	Step, Railing, Water Bar	1.5 month	1.2M
Mui Wo	Medium	a, b, c, d, e, f	➤ Form Local Loop. ➤ Enhance the trail surface at Butterfly Hill. ➤ Widen the trail.	Step, Railing, Water Bar	2.5 month	1.2M
Fa Peng Teng	High	a, b, e, h	➤ Enhance the eroded trail surface of the Local Loop.	Step, Railing, Water Bar, Boardwalk	3 months	7M
Luk Keng / Yam Tsai	Medium	a, c, d, f	➤ Provide new trail. ➤ Enhance the trail surface near ponds. ➤ Tree Pruning.	Step, Railing, Boardwalk	2.5 month	1.2M
Tai O	High	a, b, e, f	➤ Enhance the eroded trail surface. ➤ Provide support and protection to hikers	Stair, Step, Railing, Water Bar, Boardwalk	4.5 months	6.4M
Pui O	Low	/	➤ Clearance of blocking vegetation.	Step, Railing, Water Bar	0.75 month	0.35M

Chi Ma Wan Peninsula	Low	/	<ul style="list-style-type: none"> <li>➤ Clearance of blocking vegetation.</li> </ul>	/	0.75 month	0.35M
Sha Lo Wan Tsuen	Medium	c, d	<ul style="list-style-type: none"> <li>➤ Provide diversion of trail near Wind Profiler Station at the coast.</li> <li>➤ Clearance of blocking vegetation.</li> </ul>	Step	1.5 month	1.2M
Yi O	Medium	a, b, c, d, f	<ul style="list-style-type: none"> <li>➤ Provide diversion of trail near Kai Kung Shan.</li> <li>➤ Clearance of blocking vegetation.</li> </ul>	Step, Railing, Water Bar	2.5 month	1.2M



## 6 PROTOTYPE PRECAST MODULES (PPMS)

### 6.1 Types of Prototype Precast Modules

6.1.1 In general, the following list shows the categories of Prototype Precast Modules to be developed for this Study:

- 1) Steps
- 2) Stairs
- 3) Railing
- 4) Boardwalk
- 5) Water Bar
- 6) Handrail Post

6.1.2 Based on the above categories, there are more types with a **total number of 22 types**. There are 3 types of Steps, 1 type of Stairs, 11 types of Railing, 3 types of Boardwalk, 2 types of Water Bar and 2 types of Handrail Post.

6.1.3 The design approach of the Prototype Precast Modules should follow the 2 elements, **Safety and Sustainability**. The following chapters will describe how Safety and Sustainability are considered in different parts of the design.

### 6.2 Materials

#### WPC

6.2.1 To cope with the requirement from both CEDD and the brief, a local manufacturer named HM Environmental Technologies Limited (HM) had been contacted. HM is the **first and only** WPC products provider at the moment which uses wood waste as raw material in Hong Kong. It has its own factory in Sheung Shui which maintain a **local recycle on wood waste**. The dimension and shape are **tailor made** by developing new molds.

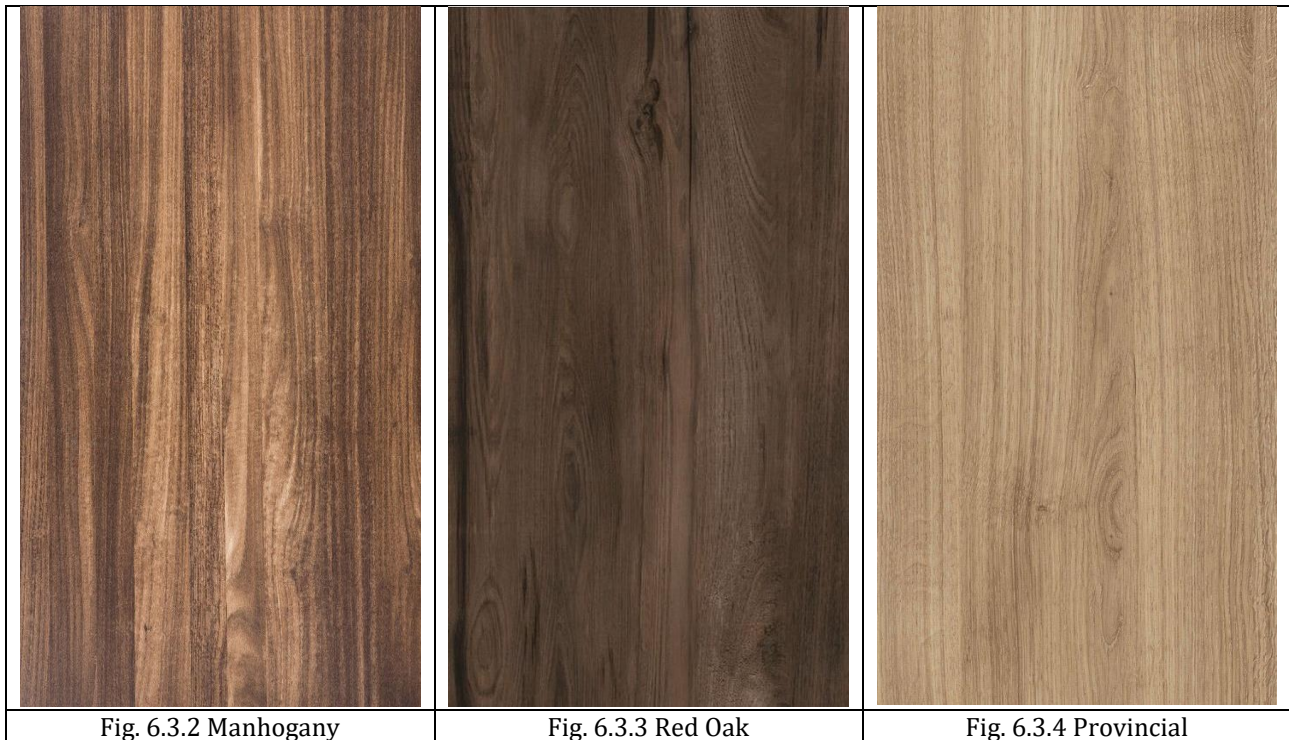


Fig. 6.3.1 Sample of WPC

6.2.2 The main concerns are **appearance** and **surface slip resistance**. The wood grain feature on the surface of the material makes it look realistic compared with a real wood log. The wood grain surface can provide more friction to the contact surface which will have a smaller chance of slippery. HM provided some samples of different

types of wood grain pattern and color, confirming that the WPC should fulfill the requirement of **R11 value**. According to DIN 51130, the R11 anti-slip rating refers to the slip resistance on a 19°-27° inclined plane with oil lubrication. It can be used in commercial areas and outdoor environments with high presence of water. The risk of slipping in wet conditions can be reduced to a moderate level.

6.2.3 The 3 color schemes would be Manhogany, Red Oak and Provincial; while the wood grain pattern would be Rough Cedar and Hand Hewn. Such approach provides a more flexible and natural appearance.



6.2.4 To sum up, there are several benefits of adopting WPC over other existing used material. First is that WPC is **readily available**. There is no time lag to collect the fallen trees. Second is that WPC allow the **customization of shape, pattern and color**, which is more flexible and adaptive to the natural environment when compared to cement paving. Third is the provision of **slip resistance** to achieve R11 value, which is safer than some existing stone steps especially during rain time. Fourth is the **light weight** of WPC because of its small shape in components and hollow design, which allows easy transportation when compared to stone. Fifth is the **recyclability** of WPC, as the WPC is produced by recycled wood waste, the damaged or aged WPC can be recycled again to reproduce new WPC.

6.2.5 Following is a table showing the comparison with other existing materials:

	Availability	Customization of pattern and color	Light weight for transportation	Adjust Slip Resistance	Recycling
WPC	✓	✓	✓	✓	✓
Cement Paving	✓	✓	×	✓	×

	Availability	Customization of pattern and color	Light weight for transportation	Adjust Slip Resistance	Recycling
Natural Wood	×	×	×	×	✓
Natural Stone	×	×	×	×	×

### DP Drain Nutrition Geotextile

- 6.2.6 Geotextile is adopted as a mitigation measure to **improve erosion** in the trail. The main purpose of geotextile is to allow water to drain through while **protecting and retaining the soil**.
- 6.2.7 The commonly used geotextile for construction is usually black in color and made from synthetic polypropylene, which is against the design approach of this Study.
- 6.2.8 To adopt a natural approach, DP Drain Nutrition Geotextile is selected. It consists of a **natural brownish nutritive layer**, and another synthetic layer of grey geotextile. Overall, the product is around 60-70% natural in term of material.
- 6.2.9 This product suits to the site works because of the following features:
- i. Bigger pore size between textiles, good adhesion ability of soil particle.
  - ii. Flexible, can cater for ground deformation.
  - iii. Excellent drainage and protection ability.
  - iv. Provide long term slow-release fertilizer that can help growth of plant.



Fig. 6.3.5 Natural Brownish Nutritive Layer



Fig. 6.3.6 Layer of grey geotextile

## 6.3 Sustainable Design Considerations

### Drainage System

- 6.3.1 Precast Water Bar is the solution which **avoids the deposition of sedimentation by surface runoff**. The design of PPMs Water Bar is to **divert surface runoff** away from the trail, usually installed at the top of the slope. The outlet of the water is diverted to the channel which is lined with **guide rocks** to reduce the impact of erosion from water.
- 6.3.2 The suggested **mitigation measure** will be adoption of **natural geotextiles** in the design of PPMs along the trail. Geotextiles allow water to pass through but **prevent the loss of soil**.

### Transportation

- 6.3.3 Transportation of Prototype Precast Modules **shall not disturb the environment** of the countryside. Hence, **no heavy construction vehicle** shall be used for site works. PPMs shall be **hand-carried** by the workers.
- 6.3.4 First is that the **dimension** of the Prototype Precast Modules shall be limited to **around 1.2 m long**. Second is that the **weight** of an entire Prototype Precast Modules shall be limited to **maximum 20 kg**, by using **hollow** shape design and controlling the usage of dowel bar. The travel time and duration of site works can be reduced.

## 6.4 Installation

- 6.4.1 The approach which allows the Prototype Precast Modules to be harmonious to the environment is to make good use of the excavated local materials as the **backfill materials**. Such approach can **reduce the wastage of material** during excavation process, and the backfilling can also contribute to stabilize the PPMs. Also, the **Natural Nutrition Geotextile** will be installed at the bottom of PPMs, to prevent further erosion. The installation design of Prototype Precast Modules - Step which **secure and retain the soil** and respect the natural contour of the hiking trail can improve the sustainability and stability.
- 6.4.2 To simplify the on-site works, the installation design takes an easy approach. First of all, **bolt and nut** are used for connecting the parts. Besides, the length of **dowel bar** is controlled to 40 cm so it can be easily inserted by **hammer**. Third is that the grouting material is simply hand-mix in-situ cement which can easily carried out. Moreover, the size of the PPMs is delicate that excavation amount will be small. Handy tools like **shovel** and **portable jet hammer** are already capable for excavation.

## 6.5 Safety Considerations

- 6.5.1 Regarding the WPC used for Step and Stairs, there is a requirement of **slip resistance**. Taking Chapter 11.87 (4) of the General Specification for Civil Engineering Works (vol. 1, 2006 edition) as reference, the mean slip/skid resistance of a sample shall not be less than 45 Skid Resistance Value for units in footways and cycle tracks. By converting the Slip Resistance Value, it is equivalent to **R11 value** of Ramp Test. This value is the requirement of WPC such that the PPMs is fulfilling the safety measure at wet condition. The slippery ground condition of trail can be improved.
- 6.5.2 Along the steep terrain of the hiking trail, Prototype Precast Modules - Railing would be suggested based on the gradient of terrain. So, hikers will be provided with **support and protection** of falling from the cliff.

## 7 TRAIL IMPROVEMENT WORKS IN TAI O

### 7.1 Selection of Locations

7.1.1 Trail Improvement Works of Prototype Precast Modules would be carried out in **Tai O**. Besides verifying the practicability of the proposed design of Prototype Precast Modules, another purpose would be enhancing the eroded trails from **Fu Shan to Po Chue Tam** which had been requested by the public over the decade.

### 7.2 Proposed Quantity

7.2.1 The total length of the proposed trail is 420m, while **220m** out of it will be the total length of works.

7.2.2 11 types of PPMs were proposed to be installed on the site. The categories were Step, Stairs, Railing, Water Bar, Boardwalk and Viewing Platform. The following table shows the details of types and quantities.

Type		Quantity
PPM Step	Type 1	12 nr.
	Type 2	190 nr.
	Type 3	200 nr.
PPM Stairs	Type 1	5 nr.
	Type 2A	50 nr.
	Type 3	12 nr.
PPM Railing	Type 1	4 m
	Type 2	46 m
	Type 3	290 m
PPM Water Bar		18 nr.
PPM Boardwalk		4 nr.

### 7.3 Design Review

7.3.1 The Trail Improvement Works in Tai O were completed in the end of October 2022. A set of drawings of can be referred to **Appendix A** – As-Built Drawing of Trail Improvement Works in Tai O.

7.3.2 The total length of the trail is 520m, while 250m out of it will be the total length of as-built works.

7.3.3 The types of the as-built PPMs and corresponding quantities were updated and listed in the following tables:

Type		Quantity
PPM Step	Type 1	12 nr.
	Type 2	141 nr.
	Type 3	181 nr.
PPM Stairs	Type 1	29 nr.
	Type 2A	25 nr.
	Type 3	45 nr.
PPM Railing	Type 1	63 m
	Type 2	96 m
	Type 3	219 m
PPM Water Bar		9 nr.
PPM Boardwalk		4 nr.
PPM Viewing Platform		2 nr.

7.3.4 From the Table in Section 7.3.3, Type 2 and 3 of PPM Step, Type 3 of PPM Stairs and Type 3 of PPM Railing were constructed the most in the Trail Improvement Works.

7.3.5 Some details of PPM Step, Stair, Railing, Water Bar and Boardwalk are suggested to be modified and revised due to the construction difficulties encountered by the Contractor. The comments are listed below:

- 1) Consider cancelling WATERBAR module (100x100mm) and replace it with 200x100mm module, i.e. replace it with 200x100mm module to replace two pieces of 100x100mm module
- 2) Consider cancelling STAIRS module (180x100mm) and replace it with STEP module (200x100mm)
- 3) For RAILING TYPE 3, Rope-type railing (similar to RAILING TYPE 2) with 150mm dia POST module is recommended instead of WPC-type railing,
- 4) Recommend installing End Caps off site to ensure better appearance, and enhance cost effectiveness.
- 5) Consider the size reduction of RAILING.
- 6) For STEPS Module, it is preferable to use the size of 180x100mm instead of 200x100mm.

7.3.6 A set of drawings can be referred to **Appendix C** – Drawing of Optimized Design of PPM Step, Stair, Railing, Water Bar and Boardwalk.

8.1.1 WINGS has also provided some comments on the Optimization of PPM Railing Type 1, 2 and 3. Nevertheless, the optimized design should be further reviewed and discussed by the follow-up consultant in Detailed Design Stage. The graphic sketches of the PPM Railing Type 1, 2 and 3 can be referred to **Appendix D** - Graphical Sketch of Optimized Design of PPM Railing Type 1,2 and 3.

## 8 CONNECTIVITY OF HIKING TRAILS IN LANTAU

### 8.1 “Round-the-Lantau” Route

8.1.2 The main task of enhancement of trails and connectivity is to form a “Round-the-Lantau-Route”. As the largest Island in Hong Kong, Lantau Island is well known for its large variety and amount of hiking trails. The idea of “Round-the-Lantau-Route” is to connect existing trails and new trails to be constructed to allow hikers to enjoy the seashore section of Lantau Island. The length of the “Round-the-Lantau-Route” was initially to be around 100 km and has been lengthened into around 150 km after utilizing coastal area and Local Loops. Please refer to **Appendix B** - the Map of Round the Lantau Route.

8.1.3 Since the entire “Round-the-Lantau-Route” is about 150 km long, there are suggestions of hiking-day-trip which aim for family to enjoy sections of Round-the-Lantau-Route within one day.

8.1.4 There are **6** hiking-day-trips suggested to complete the entire “Round-the-Lantau-Route”. Each trip has the length of around **15 km** which generally takes **5 hours** to complete. The general difficulty of hiking-day-trip is easy.

Trip No.	Trail(s)	Length	Duration	Transportation
1	Tung O Ancient Trail	13.6 km	4 hours	MTR, Bus and Ferry
2	Lantau Trail Section 7 & 8	15.3 km	4 hours	Bus and Ferry
3	Lantau Trail Section 9, 10 and 11	16.8 km	5.5 hours	Bus
4	Lantau Trail Section 12 & Islands Nature Heritage Trail, Mui Wo Section	15.3 km	5.5 hours	Bus and Ferry
5	Trails in Sham Shui Kok & Trail between Fa Ping Teng and Tai Shan	13.3 km	5 hours	Bus and Ferry
6	Road P1	12 km	4 hours	MTR and Bus

### 8.2 Local Loops

8.2.1 Besides the overall “Round-the-Lantau-Route” design, some Local Loops would also be suggested to allow hikers to further explore the beauty of Lantau Island. The scope of Local Loops includes the following locations:

1. Fa Peng Teng
2. Tung Wan Tau
3. Chi Ma Wan Peninsula
4. Tai O
5. Ngong Ping
6. Nei Lak Shan
7. Mui Wo
8. Luk Keng

## 9 TRAILS IMPROVEMENT & CONNECTIVITY

### 9.1 Scope of Works

9.1.1 The Trail Improvement Works shall be carried out after the completion of Site Mock-up Works and collection of relevant reviews and evaluations on Prototype Precast Modules. The purpose of Trail Improvement Works was to **demonstrate the workability and durability** of the design of trails. After the completion of Phase 1 Trail Improvement Works, evaluation would be collected and CEDD will determine the implementation of the following phases.

### 9.2 Phasing Plan

9.2.1 All the site works within the scope of this study are divided into 4 parts. Part A includes the Trail Improvement Works at Tai O Fu Shan. Part B includes the Phase 1 Trail Improvement Works at Fa Peng Teng. Part C includes the Phase 2 Trail Improvement Works at Mui Wo, Yi O and Sha Lo Wan Tsuen. Part D includes the Phase 3 Trail Improvement Works at Luk Keng, Tai O (near Barrack) and Sham Shui Kok.

9.2.2 The following table shows the details of the locations and the relevant information.

Part	Location	Work	Purpose	Country Park Area
A	Tai O	Site Mock-up Works	Testing for the feasibility of PPMs	Outside
B	Fa Peng Teng	Trail Improvement Works (Phase 1)	Formation of RLR	Outside
C	Mui Wo	Trail Improvement Works (Phase 2)	Formation of Local Loop	Outside
	Yi O	Trail Improvement Works (Phase 2)	Formation of Seashore Alternative Route	Within
	Sha Lo Wan Tsuen	Trail Improvement Works (Phase 2)	Formation of Seashore Alternative Route	Outside
D	Luk Keng	Trail Improvement Works (Phase 3)	Formation of Local Loop	Outside
	Tai O (near Barrack)	Trail Improvement Works (Phase 3)	Formation of Local Loop	Outside
	Sham Shui Kok	Trail Improvement Works (Phase 3)	Formation of RLR	Within

9.2.3 The sequence of Part A to D is listed according to the priority. Part A is carried out within the Study Period. After the evaluation of Part A and B, CEDD will decide whether to carry out Part C and D or not. As Part C and D are less critical when compared to Part A and B. The works are mainly tree pruning and provide minimal number of PPMs.



## **10 RESPONSE TO QUESTIONS RAISED FROM THE PUBLIC**

### **10.1 Objective of this section**

10.1.1 This section serves a purpose to reply to the questions raised from the public regarding the WPC material.

### **10.2 Durability of HM's WPC products exposed in outdoor environment**

10.2.1 The life expectancy of WPC products is about 10 years. From the test results (flexural strength before and after aging), the material specifications are still up to standard after aging process. Moreover, our HM's products have already been applied at Three Pacific Place and Y · PARK for two years. Also, WPC is a mature technology with 15-20 years of development and history. It is a durable material for outdoor environment.

### **10.3 Service life of WPC products**

10.3.1 It is suggested that the materials shall be inspected and replaced after about 10 years if necessary. Under normal usage and without external damage, the possibility of loose particles formed from aging WPC products is not high.

### **10.4 Recycling method of WPC products**

10.4.1 The material could be returned to HM Environmental Technologies Limited after the product life cycle. It could be recycled and used as raw materials for production of future products.

### **10.5 Fire-retardant property of WPC products**

10.5.1 In order to improve the fire resistance of WPC products, talc powder is added into the raw materials. Black patch and white smoke are observed on WPC surfaces after performing the burning test on samples. The smell from burning WPC is similar to that from burning wood. Cigarette butts might leave burns on PPM surfaces, but they could be removed by sanding paper. A Test had been done to understand the migration of certain elements.

### **10.6 Method of removing graffiti**

10.6.1 Sanding paper (60 to 80 Grit) could be used to remove graffiti and stains. Also, specific stain removing grease could be applied if necessary.

## 11 RECOMMENDATIONS & CONCLUSION

### 11.1 Recommendations

11.1.1 With the aim to improve the Connectivity in Lantau, the Map of Round-the-Lantau Route has been developed. Hiking-day-trips and Local Loops have been recommended for hikers. Hikers can base on the Attraction Points, length, duration, intermediate exit point and transportation method to pick the route which meets their interest.

11.1.2 The categories of Prototype Precast Modules have been developed as follow:

Category	Type
1) Steps	3
2) Stairs	1
3) Railing	11
4) Boardwalk	3
5) Water Bar	2
6) Handrail Post	2
<b>Total</b>	<b>22</b>

11.1.3 WPC which recycle local wood waste has been suggested to be the material of PPMs, while DP Drain Nutrition Geotextile has been recommended to enhance the adhesion of soil and PPMs. The 3 color schemes would be Manhogany, Red Oak and Provincial; while the wood grain pattern would be Rough Cedar and Hand Hewn. Such approach provides a more flexible and natural appearance.

11.1.4 The Phasing Plan of works has also been suggested. Trail Improvement Works at Tai O Fu Shan, and the contract documents of Trail Improvement Works in Fa Peng Teng are covered within the Study Period. Based on the result and evaluation of these mentioned works, CEDD will make decision of implementation of remaining phases of improvement works.

### 11.2 Conclusion

11.2.1 Round-the-Lantau Route of 100 km with Local Loops of 50 km has been formed to allow hikers to further enjoy the seashore routes of Lantau Island. The design approach was to maintain the original profile and feature to the largest extent. As a result, the works would mainly be connecting the existing trails and improve the ground condition by adopting Prototype Precast Modules.

11.2.2 The design of improvement works had utilized the latest technology of BIM. Terrestrial 3D scanning and Aerial Survey had been carried out to obtain LiDAR and Photogrammetry of the trails. The defects and critical locations can be located in the model. BIM software such as Revit, Civil 3D, Recap, Enscape had been adopted to design the PPMs and the installation on the trails. Such design method can shorten the construction period and have better control on the quantity of materials which causes less wastage and disturbance to hikers and environment.

11.2.3 The design has stroke the balance between Safety and Sustainability. The provision of PPMs allows hikers to access the trails in Lantau in a safer manner. While the material and construction method promote recycling and environmental conservation.

**END OF TEXT**

## **Appendix A**

### **As-Built Drawing Of Trail Improvement Works In Tai O**

B.D. REF. / /  
 F.S.D. REF. / /

NOTES:  
 1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.  
 2. ALL LEVEL ARE IN METRES WITH REFERENCE TO HONG KONG PRINCIPAL DATUM (mPD).

**TRAIL IMPROVEMENT WORKS IN TAI O (FROM FU SHAN TO PO CHUE TAM)**

Drawing No.	Rev.	Drawing Title
WAC/20222/MUW/CS/001	-	CONTENT SHEET OF TRAIL IMPROVEMENT WORKS IN TAI O
WAC/20222/MUW/GN/001	-	GENERAL NOTES OF TRAIL IMPROVEMENT WORKS IN TAI O
WAC/20222/MUW/C/006	-	LAYOUT PLAN OF TRAIL IMPROVEMENT WORKS IN TAI O (FROM FU SHAN TO PO CHUE TAM)
WAC/20222/MUW/C/101	-	SCOPE OF TRAIL IMPROVEMENT WORKS IN TAI O (FROM FU SHAN TO PO CHUE TAM) (SHEET 1 OF 5)
WAC/20222/MUW/C/102	-	SCOPE OF TRAIL IMPROVEMENT WORKS IN TAI O (FROM FU SHAN TO PO CHUE TAM) (SHEET 2 OF 5)
WAC/20222/MUW/C/103	-	SCOPE OF TRAIL IMPROVEMENT WORKS IN TAI O (FROM FU SHAN TO PO CHUE TAM) (SHEET 3 OF 5)
WAC/20222/MUW/C/104	-	SCOPE OF TRAIL IMPROVEMENT WORKS IN TAI O (FROM FU SHAN TO PO CHUE TAM) (SHEET 4 OF 5)
WAC/20222/MUW/C/105	-	SCOPE OF TRAIL IMPROVEMENT WORKS IN TAI O (FROM FU SHAN TO PO CHUE TAM) (SHEET 5 OF 5)
WAC/20222/C/PPM/002	-	TYPICAL DETAILS OF PRECAST MODULES - STAIRS (TYPE 1)
WAC/20222/C/PPM/002-1	-	TYPICAL DETAILS OF PRECAST MODULES - STAIRS (TYPE 2A)
WAC/20222/C/PPM/002-3	-	TYPICAL DETAILS OF PRECAST MODULES - STAIRS (TYPE 3)
WAC/20222/C/PPM/003	-	TYPICAL DETAILS OF PRECAST MODULES - STEP (TYPE 1)
WAC/20222/C/PPM/004	-	TYPICAL DETAILS OF PRECAST MODULES - STEP (TYPE 2)
WAC/20222/C/PPM/005	-	TYPICAL DETAILS OF PRECAST MODULES - STEP (TYPE 3)
WAC/20222/C/PPM/006	-	TYPICAL DETAILS OF PRECAST MODULES - RAILING (TYPE 1)
WAC/20222/C/PPM/007	-	TYPICAL DETAILS OF PRECAST MODULES - RAILING (TYPE 2)
WAC/20222/C/PPM/008	-	TYPICAL DETAILS OF PRECAST MODULES - RAILING (TYPE 3)
WAC/20222/C/PPM/009	-	TYPICAL DETAILS OF PRECAST MODULES - WATERBAR
WAC/20222/C/PPM/010	-	TYPICAL DETAILS OF PRECAST MODULES - BOARDWALK
WAC/20222/C/PPM/011	-	FIXING DETAILS OF GEOTEXTILE AND DETAILS OF BACKFILLING
WAC/20222/C/PPM/012	-	COLOR CODE & WOOD GRAIN PATTERN DRAWING
WAC/20222/C/PPM/013	-	TYPICAL DETAILS OF PRECAST MODULES - VIEWING PLATFORM
WAC/20222/MUW/C/009	-	TEMPORARY STORAGE AREAS
WAC/20222/TS/C/003	-	LAYOUT PLAN OF TREE PRUNING AT TAI O FU SHAN
WAC/20222/TS/C/101	-	SCOPE OF TEE PRUNING AT TAI O FU SHAN (SHEET 1 OF 6)
WAC/20222/TS/C/102	-	SCOPE OF TEE PRUNING AT TAI O FU SHAN (SHEET 2 OF 6)
WAC/20222/TS/C/103	-	SCOPE OF TEE PRUNING AT TAI O FU SHAN (SHEET 3 OF 6)
WAC/20222/TS/C/104	-	SCOPE OF TEE PRUNING AT TAI O FU SHAN (SHEET 4 OF 6)
WAC/20222/TS/C/105	-	SCOPE OF TEE PRUNING AT TAI O FU SHAN (SHEET 5 OF 6)

**AS-BUILT**

REV. DATE DESCRIPTION DRAWN CHECKED APPROVED  
 ALL MEASUREMENTS MUST BE CHECKED AT THE SITE - DO NOT SCALE DRAWING  
 - ALL DRAWING SPECIFICATIONS AND THEIR COPY RIGHT ARE THE PROPERTY OF  
 ENGINEERS, ARCHITECTS, DESIGNERS AND SHALL BE RETURNED AT THE  
 COMPLETION OF THE WORK - THIS DRAWING IS NOT VALID FOR CONSTRUCTION  
 PURPOSES UNLESS EXPRESSLY CERTIFIED.

SIGNATURE FOR SUBMISSION/ CONSTRUCTION  
 \_\_\_\_\_  
 L.T. HUNG  
 HOP TAI CONSTRUCTION CO. L.T.D.

PROJECT NO: 20222  
 DRAWN BY: KL  
 DESIGNED BY: JC  
 CHECKED BY: TC DF  
 APPROVED BY: VT  
 SCALE: AS SHOWN  
 CAD FILE: WAC\_20222\_MUW\_CS\_001

PROJECT:  
 SLO 15/2020  
 TRAIL IMPROVEMENT WORKS IN TAI O  
 (FU SHAN TO PO CHUE TAM)

DRAWING TITLE:  
 CONTENT SHEET OF  
 TRAIL IMPROVEMENT WORKS IN TAI O

DRAWING NO: WAC/20222/MUW/CS/001  
 REV: -



**GENERAL:**

- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
- ALL LEVELS ARE IN METRES WITH REFERENCE TO HONG KONG PRINCIPAL DATUM (mPD).
- THIS DRAWING CONTAINS ONLY GENERAL NOTES. SPECIFIC NOTES PERTAINING TO PARTICULAR ELEMENTS OF WORK ARE SHOWN ON EACH DRAWING.
- ALL COORDINATES ARE IN ACCORDANCE WITH H.K.(1980) GEOMETIC DATUM.
- THE LATEST REVISIONS OF ALL STANDARD GOVERNMENT DRAWINGS SHALL BE USED.
- ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE GENERAL SPECIFICATION FOR CIVIL ENGINEERING WORKS 2020 EDITION OR PARTICULAR SPECIFICATION.
- THE CONTRACTOR SHALL EXERCISE DUE CARE DURING THE WORK ON SITE TO AVOID DAMAGE TO ADJACENT STRUCTURES, ROADS, FOOTWAYS, UTILITIES AND SERVICES.
- TEMPORARY SHORING FOR EXCAVATED TRENCHES SHALL BE DESIGNED WITH DUE CONSIDERATION SITE.
- ALL WORKS AND MATERIALS SHALL CONFORM TO CURRENT BUILDING REGULATIONS AND HONG KONG STANDARDS. IN PARTICULAR THE FOLLOWING REGULATIONS AND STANDARDS SHALL BE AS PART OF THESE GENERAL NOTES.
  - BUILDING (CONSTRUCTION) REGULATIONS, 1990
  - CODE OF PRACTICE FOR STRUCTURAL USE OF DEAD AND IMPOSED LOAD 2011
  - CODE OF PRACTICE FOR PRECAST CONCRETE CONSTRUCTION 2016
  - CODE OF PRACTICE FOR STRUCTURAL USE OF CONCRETE 2013
  - CODE OF PRACTICE ON WIND EFFECTS IN HONG KONG 2004
  - CODE OF PRACTICE FOR STRUCTURAL USE OF STEEL 2011
- PROPOSED HIKING TRAIL AND STAIRCASE ALIGNMENT SHOWN ON DRAWINGS ARE INDICATIVE ONLY. DETAILED INITIAL SITE SURVEY SHOWING THE EXISTING GROUND LEVELS, EXISTING TREES, PLANTS, FENCE, POSTS, FEATURES, GRAVES, URNS, ELEMENTS AND ETC., SHALL BE CONDUCTED BY THE CONTRACTOR AND SUBMITTED TO THE SUPERVISOR FOR REVIEW WITHOUT COMMENT AT LEAST 2 WEEKS PRIOR TO COMMENCEMENT OF WORKS AND THE EXACT ALIGNMENT OF THE PROPOSED HIKING TRAIL AND STAIRCASE TO BE DETERMINED ON SITE AFTER REVIEW WITHOUT COMMENT ON THE INITIAL SITE SURVEY BY THE SUPERVISOR.
- THESE DRAWINGS DO NOT PURPOSE TO INCLUDE ANY NECESSARY PRECAUTIONS, ITEMS OR COMPONENTS REQUIRED FOR CONSTRUCTION SAFETY. ALL SUCH PRECAUTIONS ITEMS OR COMPONENTS MUST BE SUPPLIED BY THE CONTRACTOR.
- THE CONTRACTOR SHALL SUBMIT CONSTRUCTION METHOD, MATERIAL SPECIFICATION AND CONSTRUCTION PROGRAMME TO THE SUPERVISOR FOR APPROVAL PRIOR TO COMMENCEMENT OF WORKS.
- ALL STRUCTURAL STEELWORKS ARE DESIGNED IN ACCORDANCE WITH THE CODE OF PRACTICE FOR THE STRUCTURAL USE OF STEEL 2011.
- THE STRENGTH OF NON-SHRINK STRUCTURAL GROUT SHALL BE 30MPa.

**NOTES FOR WOOD PLASTIC COMPOSITE (WPC):**

- THE MATERIAL PROPERTIES OF PPMS SHALL COMPLY AS FOLLOWS TABLE.

PROPERTIES	TESTING STANDARD OR EQUIVALENT	TARGET VALUES
(1) DENSITY	ASTM D792	1.2 TO 1.4 G/CM <sup>3</sup>
(2) WATER ABSORPTION	ASTM D1037	NOT MORE THAN 1.5%
(3) SHORE A HARDNESS	ASTM D2240	NOT LESS THAN 95
(4) TENSILE STRENGTH	ASTM D638	NOT LESS THAN 7MPA
(5) FLEXURAL STRENGTH	ASTM D6109	NOT LESS THAN 25MPA
(6) COMPRESSIVE STRENGTH	ASTM D695	NOT LESS THAN 27MPA IN LENGTH DIRECTION & 13MPA IN WIDTH DIRECTION
(7) SHEAR STRENGTH	ASTM D6435	NOT LESS THAN 6.1MPA
(8) COEFFICIENT OF LINEAR THERMAL EXPANSION	ASTM D696	NOT MORE THAN 70X10 <sup>-6</sup> K <sup>-1</sup>
(9) SHELF LIFE	AGING TEST	NOT LESS THAN 10 YEARS (FOR ITEM 3 TO 8)
(10) FASTENERS WITHDRAWAL	ASTM D6117	ASTM D6117
(11) CREEP RECOVERY	ASTM D7032	NOT LESS THAN 75%
(12) FORMALDEHYDE LEVEL	ASTM D5582	NOT MORE THAN 0.1MG/L
(13) ANTI-SLIP PROPERTIES	DIN 51130:2014	NOT LESS THAN CATEGORY R11 IN OUTDOOR(WET) CONDITION

- THE CONTRACTOR SHALL BE RESPONSIBLE TO CARRY OUT RELEVANT TESTING TO DEMONSTRATE THE COMPILATION WITH THE REQUIREMENTS.
- THE CONTRACTOR SHALL REFER TO THE ATTACHED PARTICULAR SPECIFICATION FOR THE MATERIAL SUBMISSIONS.
- THE CONTRACTOR SHALL REQUIRE THE WPC MANUFACTURER TO PROVIDE AT LEAST 10 YEARS GUARANTEE AGAINST THE FOLLOWING DAMAGE IN OUTDOOR ENVIRONMENT IF THE INSTALLATION SEQUENCE AND DETAILS ARE FULLY COMPLIED WITH THE MANUFACTURER RECOMMENDATIONS.
  - CRACKING
  - OIL DAMAGE
  - UV DEGRADATION
  - COLOUR FADE
  - FROST DAMAGE
  - ANTI-FUNGI AND ANTIMICROBIAL
- THE PPMS SHALL BE ECO-FRIENDLY AND SUSTAINABLE MATERIAL MADE BY COMBINING LOCAL RECYCLED WOOD WASTE, LOCAL RECYCLED PLASTIC WASTE.

- THE CONTRACTOR SHALL CONDUCT RELEVANT TESTING TO ENSURE THEIR WPC MATERIAL COMPLY WITH THE SPECIFIED VALUES OF MATERIAL.
- THE CONTRACTOR SHALL PROPOSE TESTING TO ENSURE THEIR WPC MATERIAL IS AN ENVIRONMENT FRIENDLINESS MATERIAL AND WILL NOT EMIT HARMFUL CHEMICAL DURING THE WEATHERING SUCH AS SUNLIGHT AND HEAVY RAINING OVER THE 10 YEARS OF GUARANTEE PERIOD.
- THE WPC PRODUCTS SHALL BE WEATHER-RESISTANT, SHALL NOT BE ROT IN WET ENVIRONMENT AND SHALL NOT EMIT ANY HARMFUL MATERIAL IN OUTDOOR ENVIRONMENT.
- THE COMPOSITION OF WPC PRODUCTS SHALL NOT INCLUDE HEAVY METAL, FORMALDEHYDE, NOR OTHER CARCINOGENIC SUBSTANCE.
- THE WPC PRODUCTS SHALL BE NON-FLAMMABLE. THE CONTRACTOR SHALL CARRY OUT TESTING TO DEMONSTRATE THE WPC PRODUCTS ARE NON-FLAMMABLE.
- FOR PPM STEP, STAIR AND BOARDWALK, THE SLIP RESISTANCE OF WPC PRODUCT SHALL BE R11 OR BETTER IN OUTDOOR (WET) CONDITION.
- THE SLIP RESISTANCE (R11 OR BETTER) ON THE SURFACE SHALL BE MAINTAINED THROUGHOUT THE GUARANTEE PERIOD UNDER NORMAL WEAR AND TEAR USAGE.
- THE CONTRACTOR SHALL PROVIDE TESTING CERTIFICATES TO DEMONSTRATE THE SLIP RESISTANCE FOR THE PPMS STAIRS AND STEPS BE R11 OR BETTER ON THE SURFACING OF PEDESTRIAN USE.
- THE MANUFACTURER OF WPC PRODUCTS SHALL DEMONSTRATE THAT THEIR PRODUCTS CAN RESIST OF THE FOLLOWING:
  - RESISTING ANY PUNCHING BY SHARP OBJECTS WITHOUT ANY DAMAGE;
  - DRILLED BY HAND DRILL WITHOUT ANY DAMAGE;
  - SAWED WITHOUT ANY DAMAGE; AND
  - NAILED BY HAMMER WITHOUT ANY DAMAGE.
- CAPPING PLATES SHALL BE PROVIDED FOR BOTH END OF HOLLOWED WPC PRODUCTS. THE CAPPING PLATE SHALL BE DEMONSTRATED THAT THEY ARE NOT EASILY TO BE REMOVED DUE TO VANDALISM THROUGHOUT THE GUARANTEE PERIOD UNDER NORMAL WEAR AND TEAR USAGE. THE APPEARANCE AND TEXTURE OF CAPPING PLATE SHALL BE MATCHED WITH THE PROPOSED PPM TEXTURES AND COLOR.
- PLUG COVERS SHALL BE PROVIDED FOR HOLES ON WPC PRODUCTS FOR PREVENTING WATER SEEPAGE AND AESTHETIC. THE PLUG COVER SHALL BE DEMONSTRATED THAT THEY ARE NOT EASILY TO BE REMOVED UNDER NORMAL WEAR AND TEAR AND VANDALISM THROUGHOUT THE GUARANTEE PERIOD. THE APPEARANCE AND TEXTURE OF PLUG COVER SHALL BE MATCHED WITH THE PROPOSED PPM TEXTURES AND COLOR.
- A TRIAL PRODUCTION FOR VERIFYING THE PATTERNS AND COLOR CODES SHALL BE CARRIED AND BE ACCEPTANCE BY THE GOVERNMENT REPRESENTATIVE / SUPERVISOR PRIOR TO THE FORMAL PRODUCTION.
- EACH TYPE OF PPM SHALL BE ASSEMBLED IN THE LOCAL FACTORY IN THE TRIAL PRIOR TO THE FORMAL INSTALLATION ON SITE.
- THE TOLERANCE OF DIMENSIONS (LENGTH X WIDTH X HEIGHT) FOR EACH PPM SHALL NOT EXCEED +/- 2MM.
- ACCORDING TO CLAUSE 6 OF THE SPECIAL CONDITIONS OF CONTRACT, THE STEEL MOULDS OF PROTOTYPE PRECAST MODULES SHALL BECOME THE GOVERNMENT PROPERTY AFTER THE COMPLETION OF WORKS.

**NOTES FOR DOWEL BARS:**

- TESTING FOR DOWEL BARS SHALL COMPLY WITH CONSTRUCTION STANDARD CS2 : 2012 OF HONG KONG.
- THE DOWEL BAR SHALL BE STAINLESS STEEL GRADE 1.4301 (304) IN ACCORDANCE WITH BS EN 10088-2:2005.

**NOTES FOR MESH FABRIC:**

- THE SPECIFIED CHARACTERISTIC STRENGTH (fy) OF A252 MESH FABRIC SHALL BE 500N/mm<sup>2</sup>.

**NOTES FOR STANDARD MIX CONCRETE:**

- THE STANDARD MIX CONCRETE SHALL BE GRADE 30/20S UNLESS OTHERWISE STATED.
- THE STANDARD MIX CONCRETE SHALL COMPLY WITH CLAUSE 16.15 OF GENERAL SPECIFICATION FOR CIVIL ENGINEERING WORKS (2020 EDITION).
- THE REQUIRED SLUMP VALUE OF THE STANDARD MIX CONCRETE SHALL BE 75mm.
- THE SAMPLING REQUIREMENT FOR SLUMP TEST AND COMPRESSIVE STRENGTH TEST SHALL COMPLY WITH CLAUSE 2.24 IN QUOTATION SPECIFICATION.

**NOTES FOR THE ROPE FOR THE HANDRAIL OF PROTOTYPE PRECAST PRECAST MODULES – RAILING (TYPE 2):**

- THE ROPE FOR THE HANDRAIL OF PRECAST MODULES – RAILING (TYPE 2) SHALL BE POLYPROPYLENE ROPE.
- THE DIAMETER OF THE POLYPROPYLENE ROPE SHALL BE 24mm.
- THE MINIMUM TENSILE STRENGTH (BREAKING STRENGTH) OF THE ROPE SHALL BE 30KN.
- THE ROPE SHALL BE UV RESISTANT.
- THE TESTING METHOD OF THE ROPE’S TENSILE STRENGTH SHALL COMPLY WITH ASTM D4268.

**NOTES FOR STEELWORKS:**

- THE STEELWORKS SHALL COMPLY WITH BS EN 1090:PART 2 AND THE SECTION 18 OF THE GENERAL SPECIFICATION FOR CIVIL ENGINEERING WORKS (2020 EDITION).
- EXCEPT SPECIFIED OTHERWISE, ALL STRUCTURAL STEEL GRADE SHALL BE S275J0 (CLASS 1), IN ACCORDANCE WITH BS EN 10025-1:2004.
- EXCEPT SPECIFIED OTHERWISE, ALL STEEL BOLT SHALL BE GRADE 4.6, IN ACCORDANCE WITH BS4190:2014.
- ALL STEEL SHALL BE GALVANIZED TO BS EN ISO 1461 WITH A MINIMUM THICKNESS OF 85 µm.
- THE COLOR OF PAINT SHALL FOLLOW DRAWING NO. WAC/20222/C/PPM/012.
- PAINT SYSTEM OF STEELWORKS SHALL FOLLOW CLAUSE 16.4 OF THE STRUCTURES DESIGN MANUAL FOR HIGHWAYS AND RAILWAYS.

**PAINT SYSTEM II**

TO BE APPLIED TO: STRUCTURAL STEELWORKS  
 LIFE TO FIRST MAINTENANCE: MORE THAN 15 YEARS, HIGH DURABILITY AS DEFINED IN BS EN ISO 12944 PART 5

PRETREATMENT: TWO-PACK ETCH PRIMER

PRIMER: TWO-PACK EPOXY ZINC PHOSPHATE PRIMER, 80 µm MINIMUM TOTAL DRY-FILM THICKNESS

UNDERCOAT: TWO-PACK MICACEOUS IRON OXIDE EPOXY UNDERCOAT, 140 µm MINIMUM TOTAL DRY-FILM THICKNESS

FINISH: TWO-PACK POLYURETHANE FINISH COAT, 100 µm MINIMUM TOTAL DRY-FILM THICKNESS

- TESTING FOR STRUCTURAL STEELWORK SHALL BE CARRIED OUT IN ACCORDANCE WITH SECTION 18 OF THE GENERAL SPECIFICATION FOR CIVIL ENGINEERING WORKS (2020 EDITION).

**NOTES FOR STAINLESS STEEL WORKS:**

- ALL STRUCTURAL STEELWORKS ARE DESIGNED IN ACCORDANCE WITH THE CODE OF PRACTICE FOR THE STRUCTURAL USE OF STEEL 2011.
- ALL STAINLESS STEELWORKS SHALL BE X5CrNi18-10 GRADE 1.4301(304) OR EQUIVALENT AND TO BS EN 10088-2:2005

**NOTES FOR GEOTEXTILE:**

- THE FABRIC MATERIAL FOR GEOTEXTILE SHALL BE AN UV-STABILIZED NONWOVEN POLYPROPYLENE GEOTEXTILE WITH A MINIMUM TENSILE STRENGTH OF 4.5KN/m AND PERMEABILITY GREATER THAN 50 l/m<sup>2</sup>/sec AND LESS THAN 160 l/m<sup>2</sup>/sec FOR A 100mm HEAD OF WATER.

B.D. REF.	/	/
F.S.D. REF.	/	/



REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
<small>ALL MEASUREMENTS MUST BE CHECKED AT THE SITE - DO NOT SCALE DRAWING          - ALL DRAWING SPECIFICATIONS AND THEIR COPY RIGHT ARE THE PROPERTY OF ENGINEERS, ARCHITECTS, DESIGNERS AND SHALL BE RETURNED AT THE COMPLETION OF THE WORK - THIS DRAWING IS NOT VALID FOR CONSTRUCTION PURPOSES UNLESS EXPRESSLY CERTIFIED.</small>					

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

\_\_\_\_\_  
 L.T. HUNG  
 HOP TAI CONSTRUCTION CO. L.T.D.

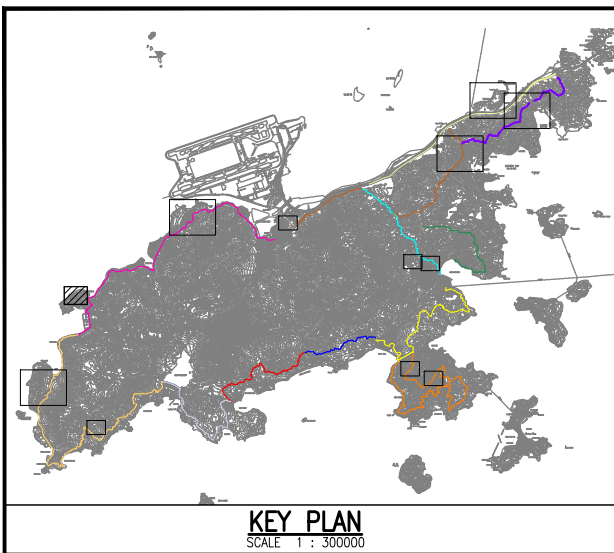
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DRAWN BY:	KL		
DESIGNED BY:	JC		
CHECKED BY:	DF	TC	
APPROVED BY:	VT		
SCALE:			
CAD FILE:	WAC_20222_MUW_GN_001		

PROJECT:  
**SLO 15/2020**  
**TRAIL IMPROVEMENT WORKS IN TAI O (FU SHAN TO PO CHUE TAM)**

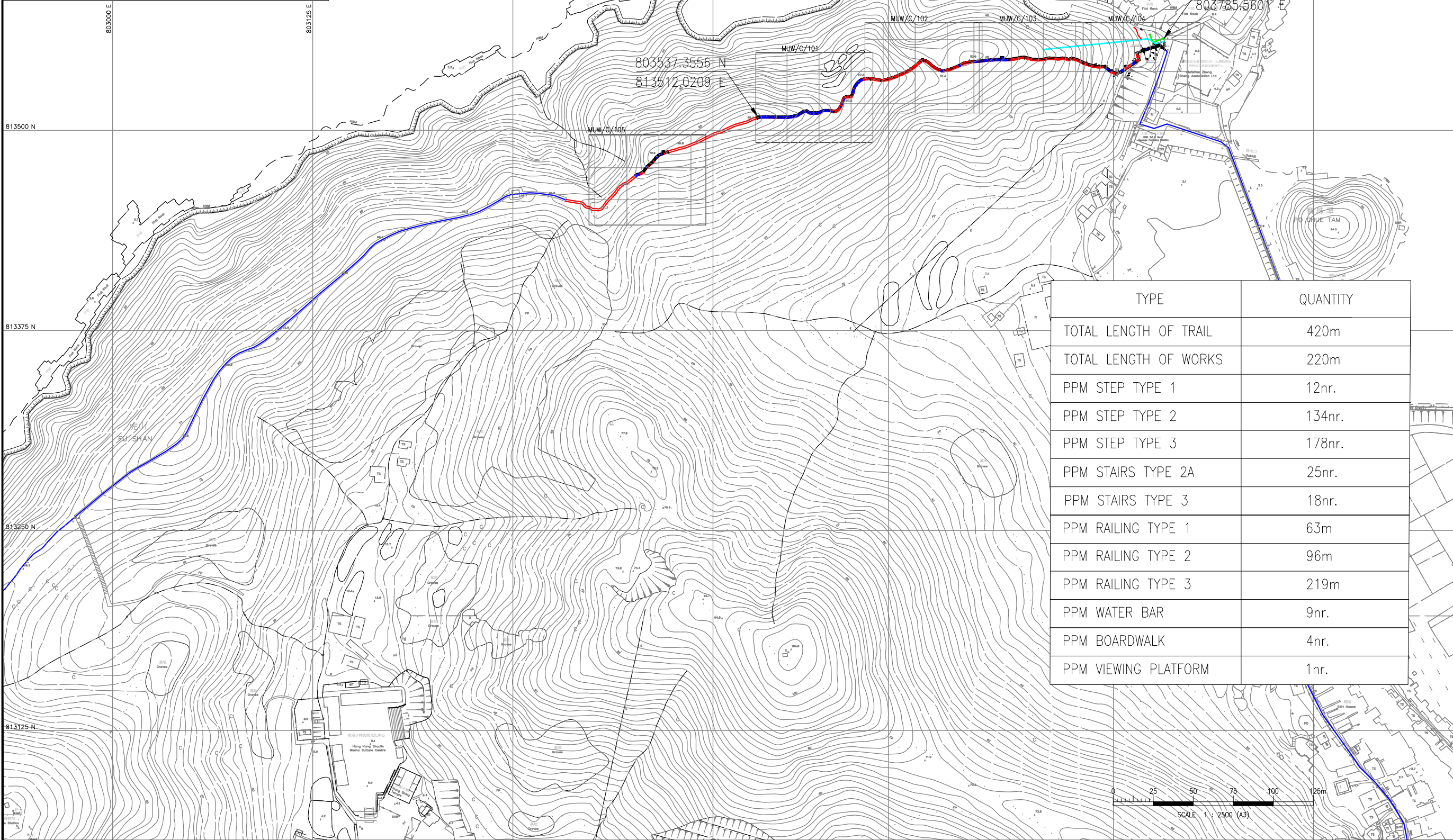
DRAWING TITLE:  
**GENERAL NOTES FOR TRAIL IMPROVEMENT WORKS IN TAI O**

DRAWING NO:	WAC /20222 /MUW /GN /001	REV:	-
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**KEY PLAN**  
SCALE 1 : 300000



B.D. REF. / /  
F.S.D. REF. / /

- LEGEND:**
- EXISTING HIKING TRAIL
  - CONCERNED SECTION OF HIKING TRAIL TO BE IMPROVED
  - BOUNDARY OF COSTAL PROTECTION AREA
  - PPM STEP TYPE 1
  - PPM STEP TYPE 2
  - PPM STEP TYPE 3
  - PPM RAILING TYPE 1
  - PPM RAILING TYPE 2
  - PPM RAILING TYPE 3
  - PPM WATER BAR
  - PPM BOARDWALK
  - PPM STAIRS TYPE 1A
  - PPM STAIRS TYPE 2A

TYPE	QUANTITY
TOTAL LENGTH OF TRAIL	420m
TOTAL LENGTH OF WORKS	220m
PPM STEP TYPE 1	12nr.
PPM STEP TYPE 2	134nr.
PPM STEP TYPE 3	178nr.
PPM STAIRS TYPE 2A	25nr.
PPM STAIRS TYPE 3	18nr.
PPM RAILING TYPE 1	63m
PPM RAILING TYPE 2	96m
PPM RAILING TYPE 3	219m
PPM WATER BAR	9nr.
PPM BOARDWALK	4nr.
PPM VIEWING PLATFORM	1nr.

**AS-BUILT**

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

ALL MEASUREMENTS MUST BE CHECKED AT THE SITE - DO NOT SCALE DRAWING  
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PURPOSES UNLESS EXPRESSLY CERTIFIED.

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

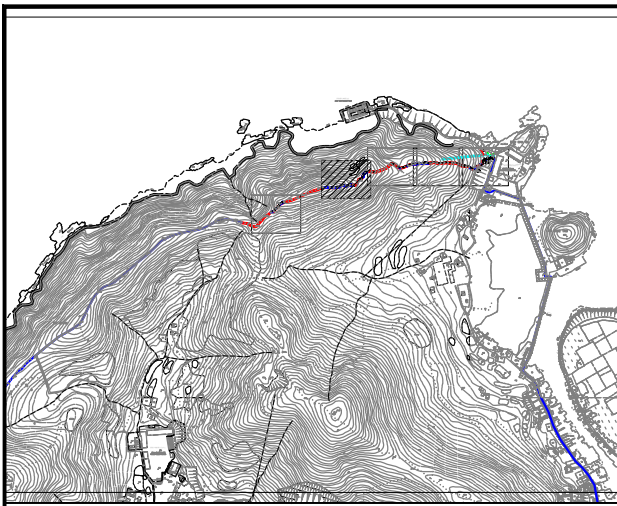
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DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	DF TC
APPROVED BY:	VT
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PROJECT:  
**SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)**

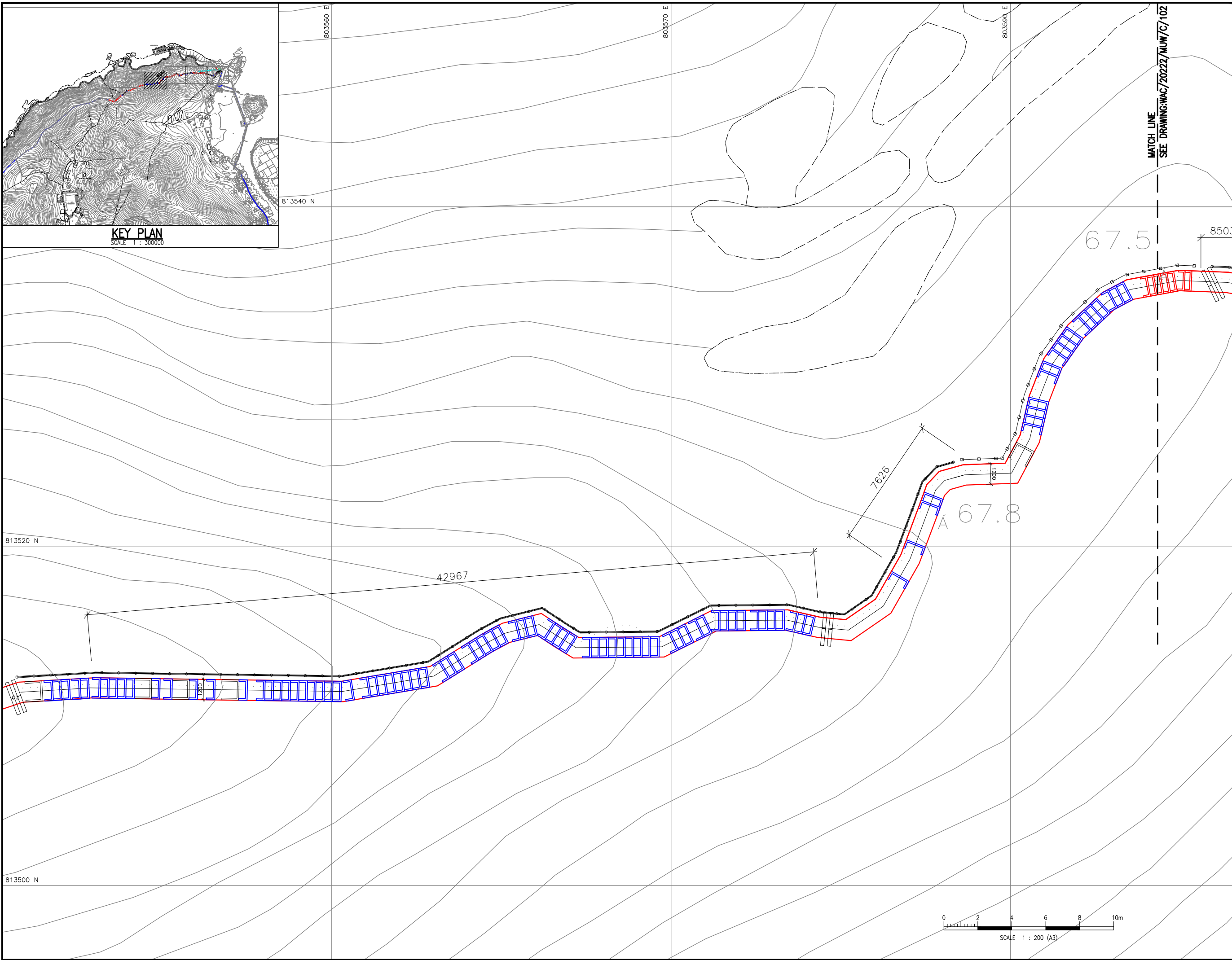
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**LAYOUT PLAN OF TRAIL  
IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)**

DRAWING NO:	WAC/20222/MUW/C/006	REV:	-
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SCALE 1 : 2500 (A3)



**KEY PLAN**  
SCALE 1 : 300000



B.D. REF.	/	/
F.S.D. REF.	/	/

- LEGEND:**
- EXISTING HIKING TRAIL
  - CONCERNED SECTION OF HIKING TRAIL TO BE IMPROVED
  - PPM STEP TYPE 1
  - PPM STEP TYPE 2
  - PPM STEP TYPE 3
  - PPM RAILING TYPE 1
  - PPM RAILING TYPE 2
  - PPM RAILING TYPE 3
  - PPM WATER BAR
  - PPM BOARDWALK
  - PPM STAIRS TYPE 1
  - PPM STAIRS TYPE 2A

**AS-BUILT**

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

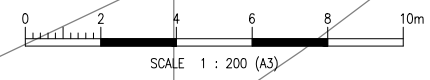
L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

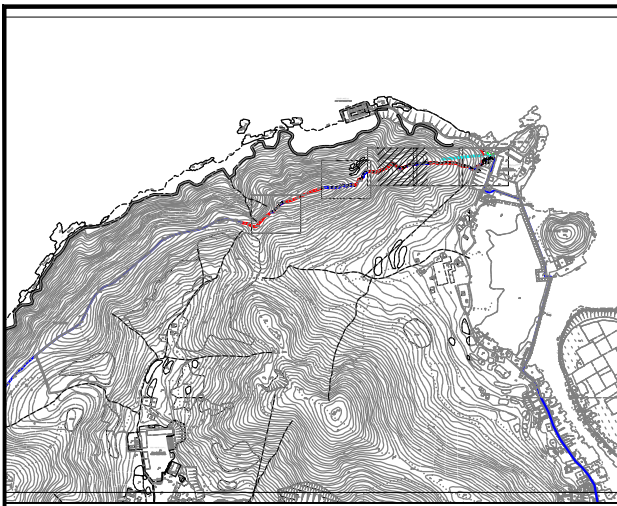
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DESIGNED BY:	JC
CHECKED BY:	DF TC
APPROVED BY:	VT
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PROJECT:  
SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)

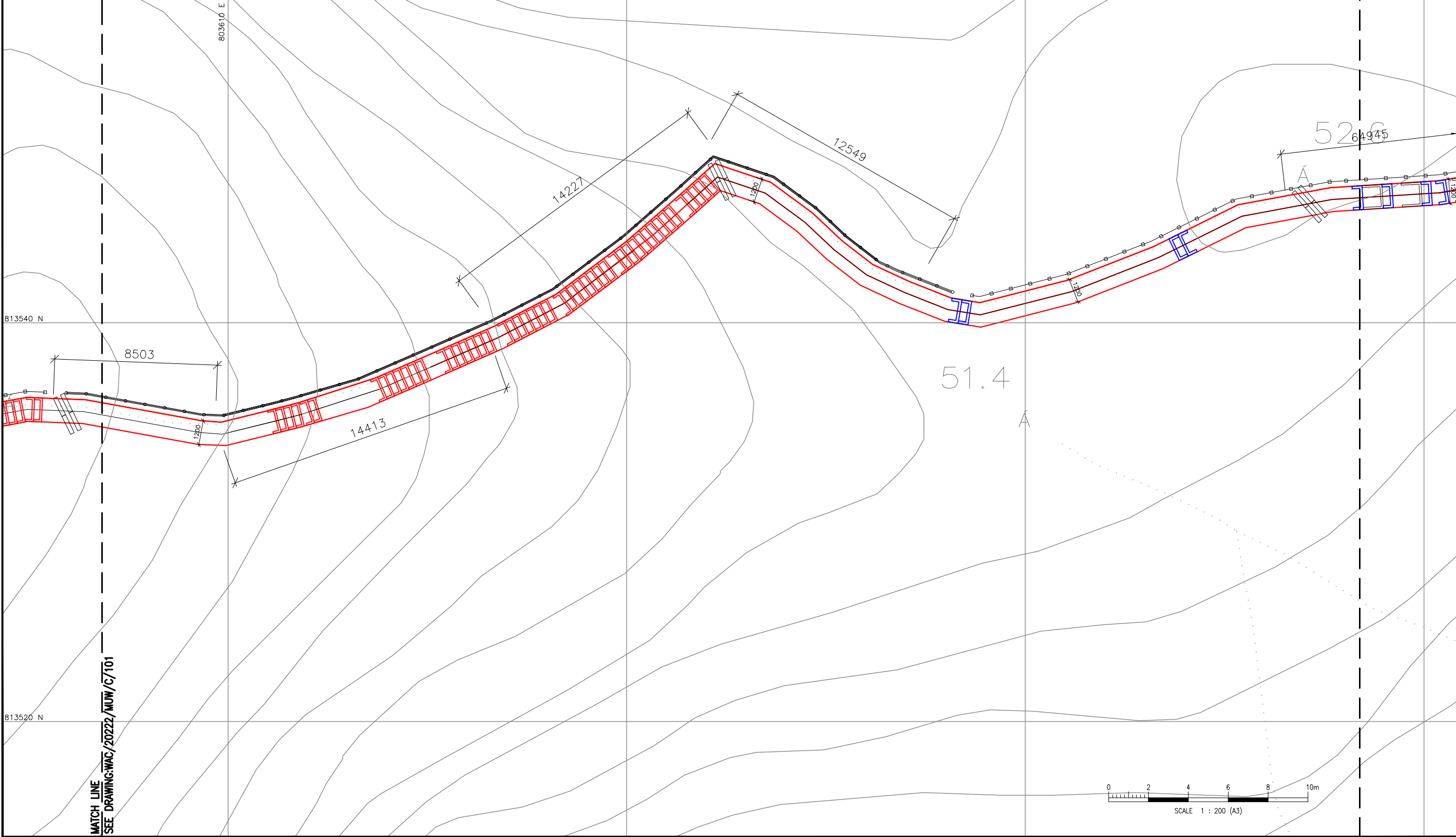
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SCOPE OF TRAIL IMPROVEMENT  
WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)  
(SHEET 1 OF 4)

DRAWING NO:	WAC/20222/MUW/C/101
REV:	-





**KEY PLAN**  
SCALE 1 : 300000



B.D. REF. / / /  
F.S.D. REF. / / /

LEGEND:

- EXISTING HIKING TRAIL
- CONCERNED SECTION OF HIKING TRAIL TO BE IMPROVED
- PPM STEP TYPE 1
- PPM STEP TYPE 2
- PPM STEP TYPE 3
- PPM RAILING TYPE 1
- PPM RAILING TYPE 2
- PPM RAILING TYPE 3
- PPM WATER BAR
- PPM BOARDWALK
- PPM STAIRS TYPE 1
- PPM STAIRS TYPE 2A

**AS-BUILT**

REV. DATE DESCRIPTION DRAWN CHECKED APPROVED  
ALL MEASUREMENTS MUST BE CHECKED AT THE SITE - DO NOT SCALE DRAWING  
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COMPLETION OF THE WORK - THIS DRAWING IS NOT VALID FOR CONSTRUCTION  
PURPOSES UNLESS EXPRESSLY CERTIFIED.

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

PROJECT NO:	20222		
DRAWN BY:	KL		
DESIGNED BY:	JC		
CHECKED BY:	DF	TC	
APPROVED BY:	VT		
SCALE:	A3 1:2500		
CAD FILE:	WAC_20222_MUW_C_006_101_102_103_104		

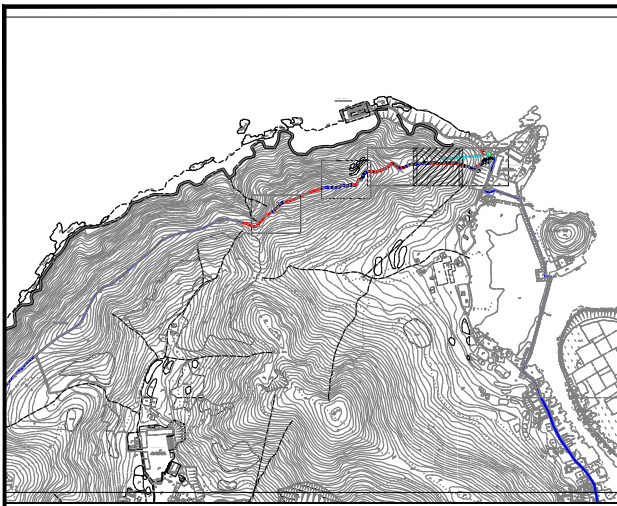
PROJECT:  
SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)

DRAWING TITLE:  
SCOPE OF TRAIL IMPROVEMENT  
WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)  
(SHEET 2 OF 4)

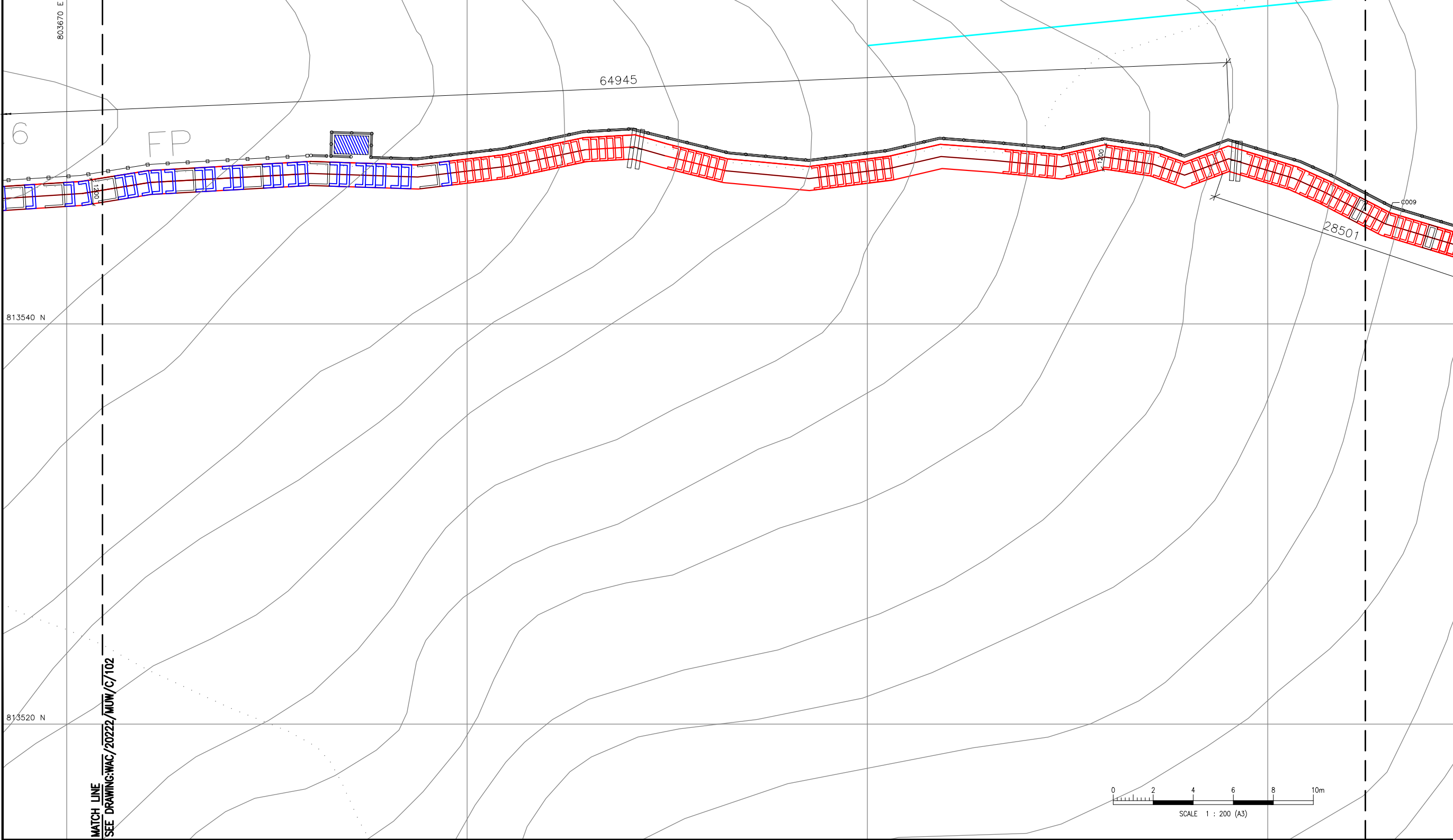
DRAWING NO:	WAC/20222/MUW/C/102	REV:	-
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**KEY PLAN**  
SCALE 1 : 300000



B.D. REF.	/	/	/
F.S.D. REF.	/	/	/

**LEGEND:**

- EXISTING HIKING TRAIL
- CONCERNED SECTION OF HIKING TRAIL TO BE IMPROVED
- BOUNDARY OF COASTAL PROTECTION AREA
- PPM STEP TYPE 1
- PPM STEP TYPE 2
- PPM STEP TYPE 3
- PPM RAILING TYPE 1
- PPM RAILING TYPE 2
- PPM RAILING TYPE 3
- PPM WATER BAR
- PPM BOARDWALK
- PPM VIEWING PLATFORM
- PPM STAIRS TYPE 1
- PPM STAIRS TYPE 2A

**AS-BUILT**

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

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SIGNATURE FOR SUBMISSION/ CONSTRUCTION

L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	DF TC
APPROVED BY:	VT
SCALE:	A3 1:2500
CAD FILE:	WAC_20222_MUW_C_006_101_102_103_104

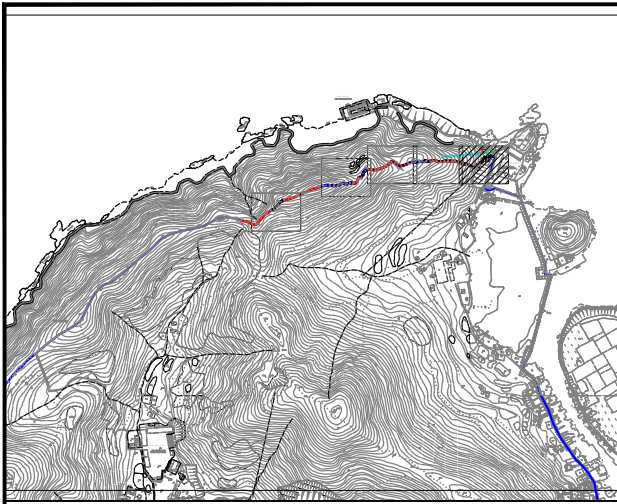
PROJECT:  
SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)

DRAWING TITLE:  
SCOPE OF TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)  
(SHEET 3 OF 4)

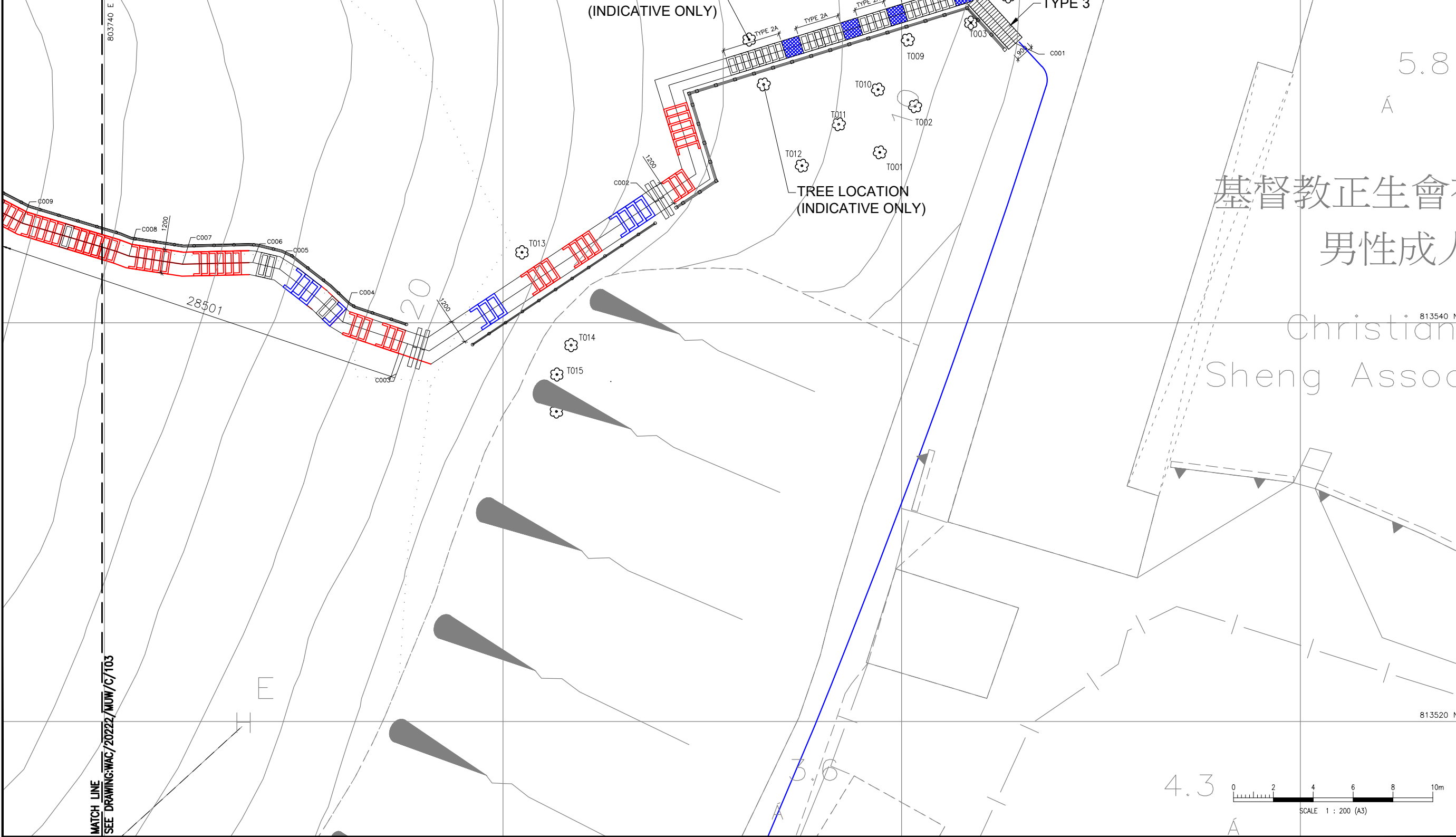
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REV:	-

0 2 4 6 8 10m  
SCALE 1 : 200 (A3)

**WINS & ASSOCIATES CONSULTING ENGINEERS LTD.**



**KEY PLAN**  
SCALE 1 : 300000



B.D. REF.	/	/	/
F.S.D. REF.	/	/	/

- LEGEND:**
- EXISTING HIKING TRAIL
  - CONCERNED SECTION OF HIKING TRAIL TO BE IMPROVED
  - BOUNDARY OF COASTAL PROTECTION AREA
  - PPM STEP TYPE 1
  - PPM STEP TYPE 2
  - PPM STEP TYPE 3
  - PPM RAILING TYPE 1
  - PPM RAILING TYPE 2
  - PPM RAILING TYPE 3
  - PPM WATER BAR
  - PPM BOARDWALK
  - TREE
  - EXISTING CATCHPIT
  - EXISTING U-CHANNEL
  - PPM STAIRS TYPE 1
  - PPM STAIRS TYPE 2A

**AS-BUILT**

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

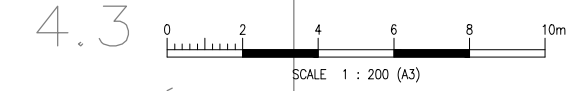
L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

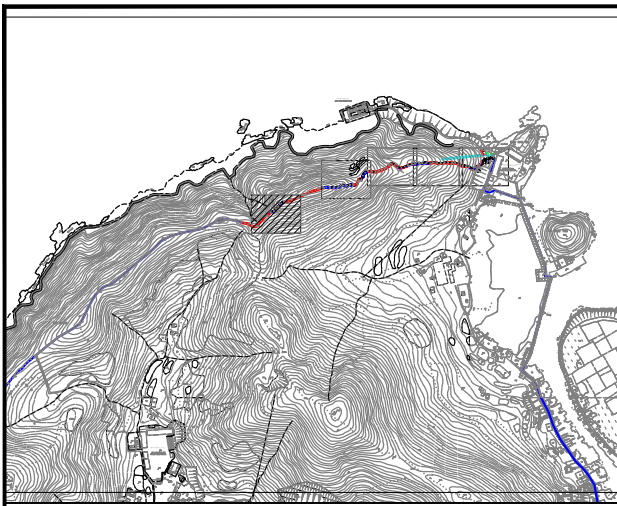
PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	DF TC
APPROVED BY:	VT
SCALE:	A3 1:2500
CAD FILE:	WAC_20222_MUW_C_006_101_102_103_104

PROJECT:  
**SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)**

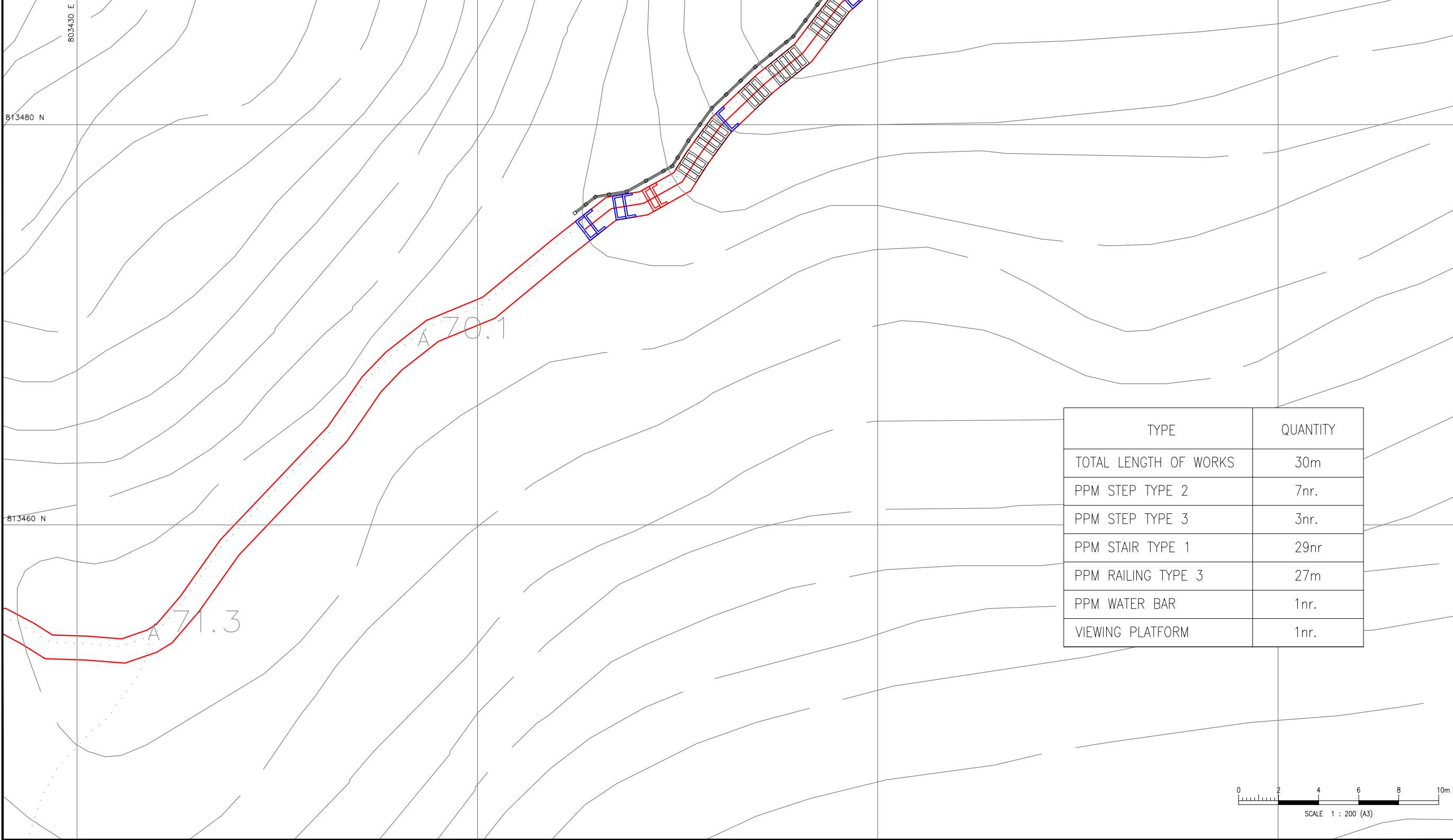
DRAWING TITLE:  
**SCOPE OF TRAIL IMPROVEMENT  
WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)  
(SHEET 4 OF 4)**

DRAWING NO:	WAC/20222/MUW/C/104
REV:	-





**KEY PLAN**  
SCALE 1 : 300000



B.D. REF.	/	/
F.S.D. REF.	/	/
<b>LEGEND:</b>		
	EXISTING HIKING TRAIL	
	CONCERNED SECTION OF HIKING TRAIL TO BE IMPROVED	
	PPM STEP TYPE 2	
	PPM STEP TYPE 3	
	PPM RAILING TYPE 3	
	PPM WATER BAR	
	PPM VIEWING PLATFORM	
	PPM STAIRS TYPE 1	

**AS-BUILT**

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

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SIGNATURE FOR SUBMISSION/ CONSTRUCTION

\_\_\_\_\_  
 L.T. HUNG  
 HOP TAI CONSTRUCTION CO. L.T.D.

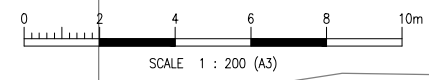
PROJECT NO:	20222		
DRAWN BY:	KL		
DESIGNED BY:	JC		
CHECKED BY:	DF	TC	
APPROVED BY:	VT		
SCALE:	A3 1:2500		
CAD FILE:	WAC_20222_MUW_C_006_101_102_103_104		

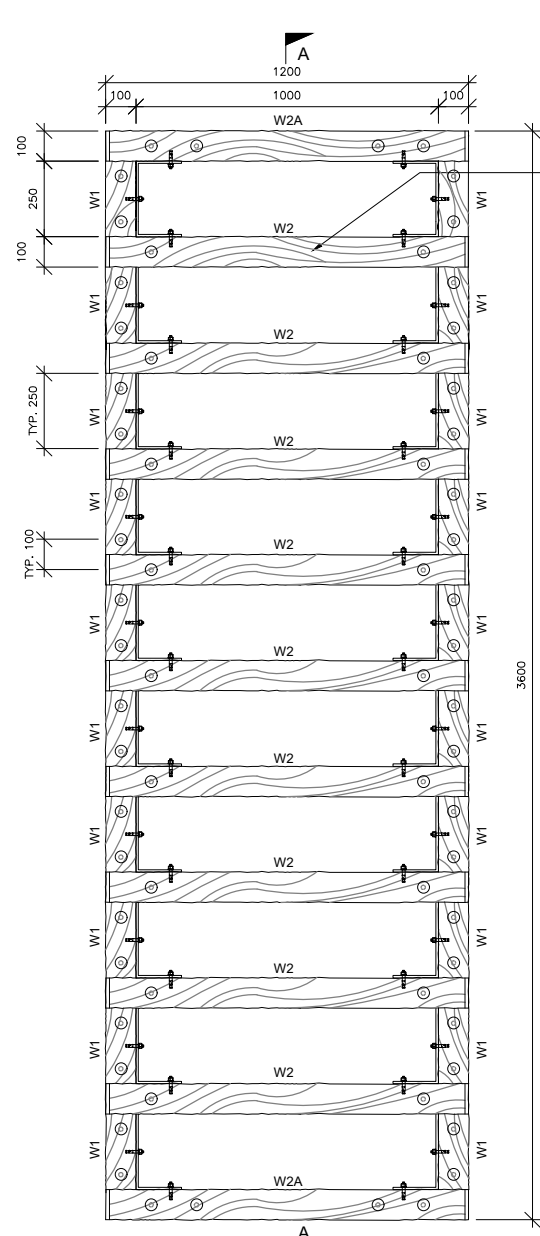
TYPE	QUANTITY
TOTAL LENGTH OF WORKS	30m
PPM STEP TYPE 2	7nr.
PPM STEP TYPE 3	3nr.
PPM STAIR TYPE 1	29nr
PPM RAILING TYPE 3	27m
PPM WATER BAR	1nr.
VIEWING PLATFORM	1nr.

PROJECT:  
 SLO 15/2020  
 TRAIL IMPROVEMENT WORKS IN TAI O  
 (FU SHAN TO PO CHUE TAM)

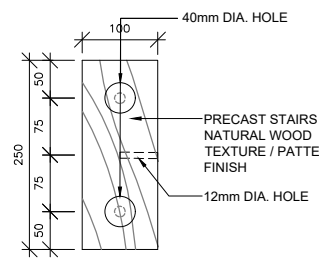
DRAWING TITLE:  
 SCOPE OF TRAIL IMPROVEMENT  
 WORKS IN TAI O  
 (FU SHAN TO PO CHUE TAM)  
 (SHEET 5 OF 5)

DRAWING NO:	WAC/20222/MUW/C/105
REV:	-

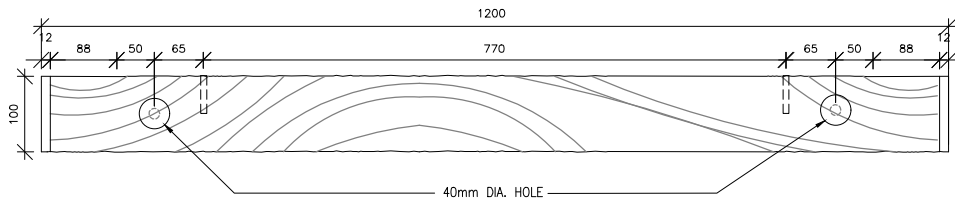




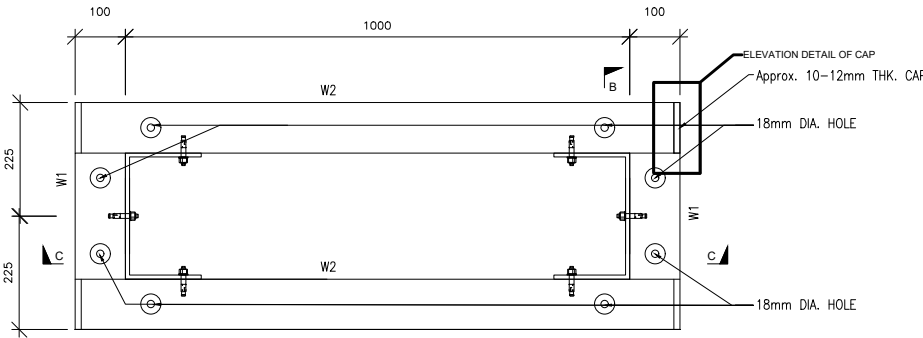
**PLAN OF PRECAST MODULES - STAIRS**  
SCALE 1:25 (A3)



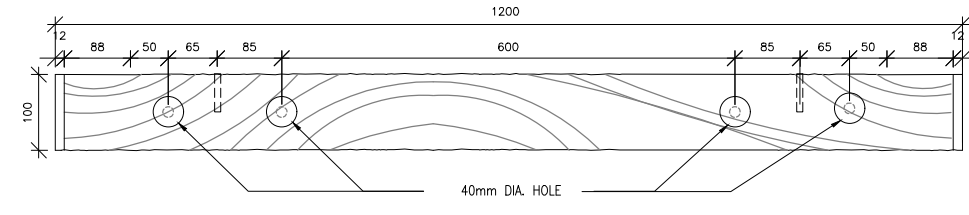
**PLAN OF W1**  
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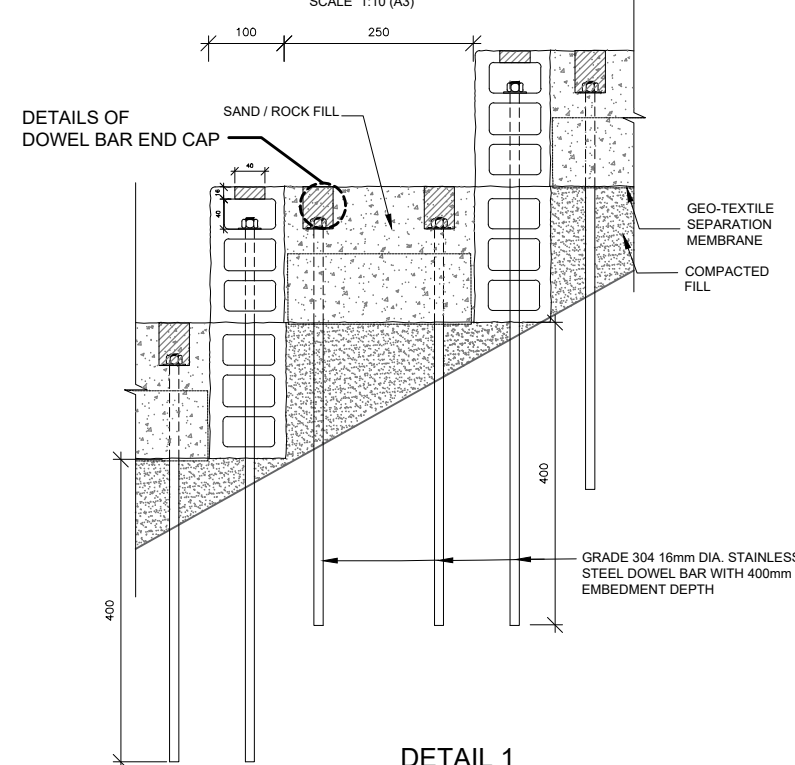
**PLAN OF W2**  
SCALE 1:10 (A3)



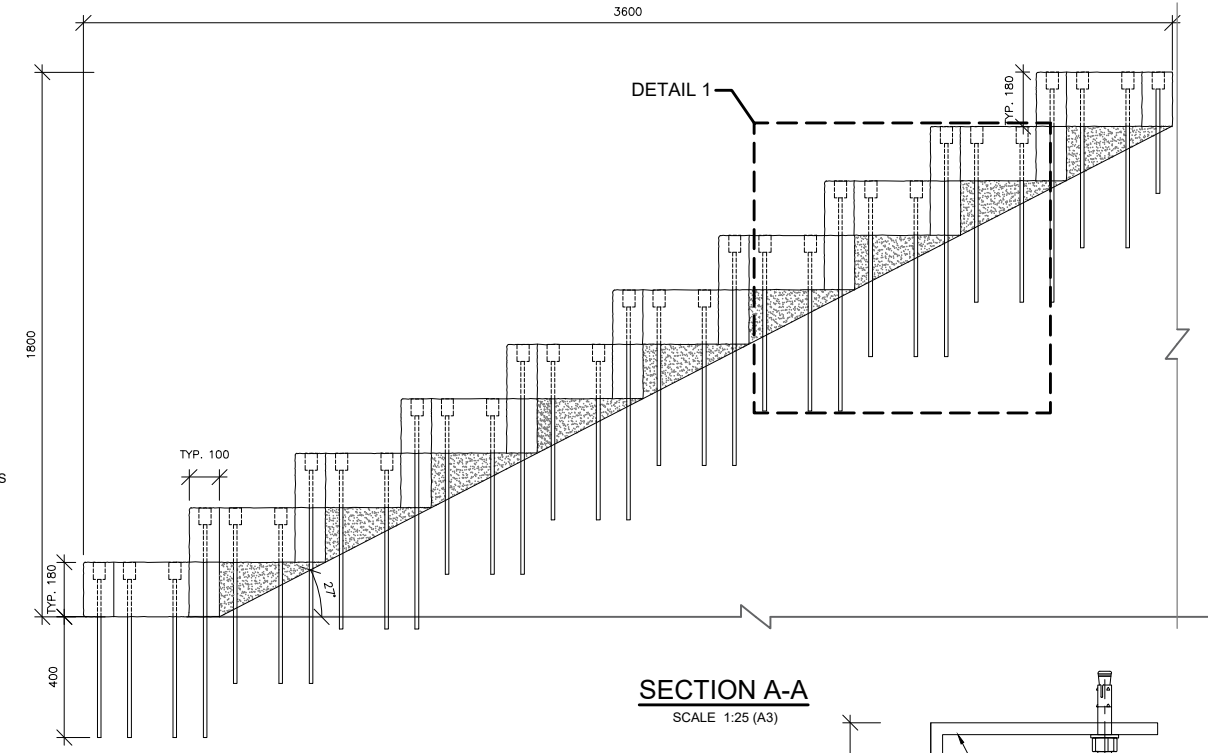
**PRECAST MODULES - STAIRS DETAIL**  
SCALE 1:10 (A3)



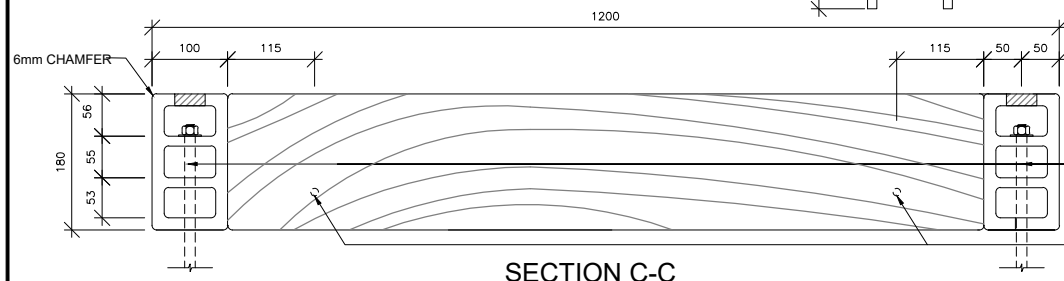
**PLAN OF W2A**  
SCALE 1:10 (A3)



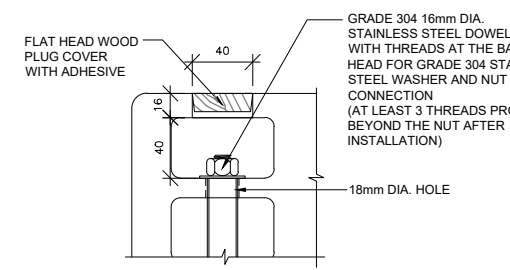
**DETAIL 1**  
SCALE 1:10 (A3)



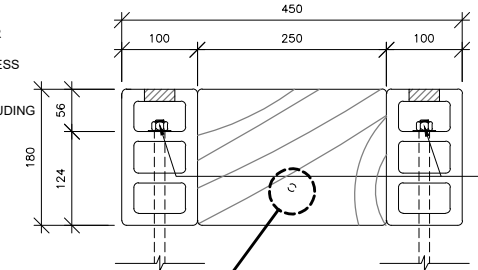
**SECTION A-A**  
SCALE 1:25 (A3)



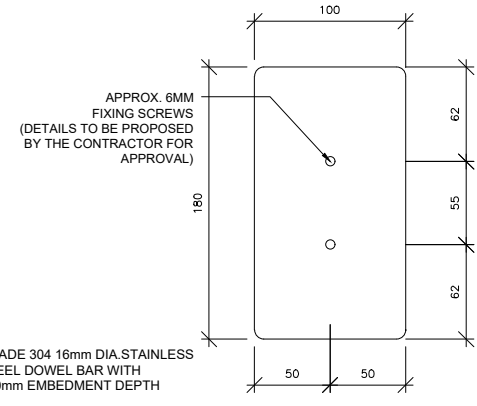
**SECTION C-C**  
SCALE 1:10 (A3)



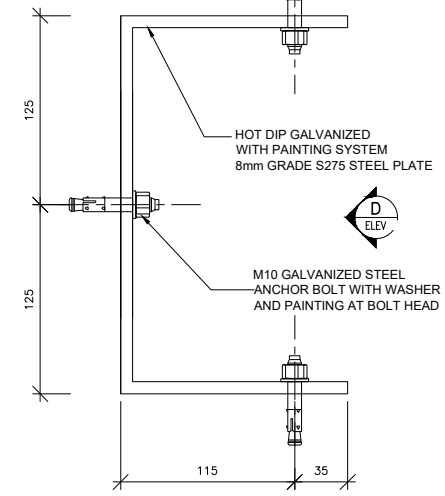
**DETAILS OF DOWEL BAR END CAP**  
SCALE 1:5 (A3)



**SECTION B-B**  
SCALE 1:10 (A3)



**ELEVATION DETAIL OF CAP**  
SCALE 1:5 (A3)



**DETAILS OF CORNER CONNECTING PLATE**  
SCALE 1:5 (A3)

B.D. REF.	/	/
F.S.D. REF.	/	/

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
  - ALL LEVEL ARE IN METRES WITH REFERENCE TO HONG KONG PRINCIPAL DATUM (mPD).
  - FOR GENERAL NOTES, REFER TO DRAWING NO. WAC/20222/MUW/GN/001 AND SPECIFICATION FOR THE WPC MATERIAL'S PROPERTIES.
  - PRE-ASSEMBLY TRIAL OF THE PRECAST MODULES SHALL BE CARRIED OUT AT MANUFACTURING FACTORY BEFORE DELIVERING TO THE SITE.
  - EACH PRECAST STEP SHALL NOT BE OVERLAPPING WHEN CONSTRUCTED IN SERIES.
  - COLOR AND PATTERN OF PPMs SHALL REFER TO DRAWING NO. WAC/20222/PPM/C/012.
  - FOR ALL RECTANGULAR PPMs, 6mm CHAMFER SHALL BE PLACED ON THE EDGE.
  - ON-SITE MODIFICATION, SUCH AS TRIMMING, INSITU CONCRETE MIXING, HOLE DRILLING AND ADJUSTING ANGLE, SHALL BE CARRIED OUT BY THE CONTRACTOR. SO THAT THE PPMs WILL FIT INTO THE ACTUAL SITE CONDITION.
  - FORMATION FOR STAIRS & STEP, SUCH AS CUT AND FILL OF THE GROUND SURFACE IN MINIMAL EXTENT, SHALL BE CARRIED OUT BY THE CONTRACTOR.

**AS-BUILT**

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

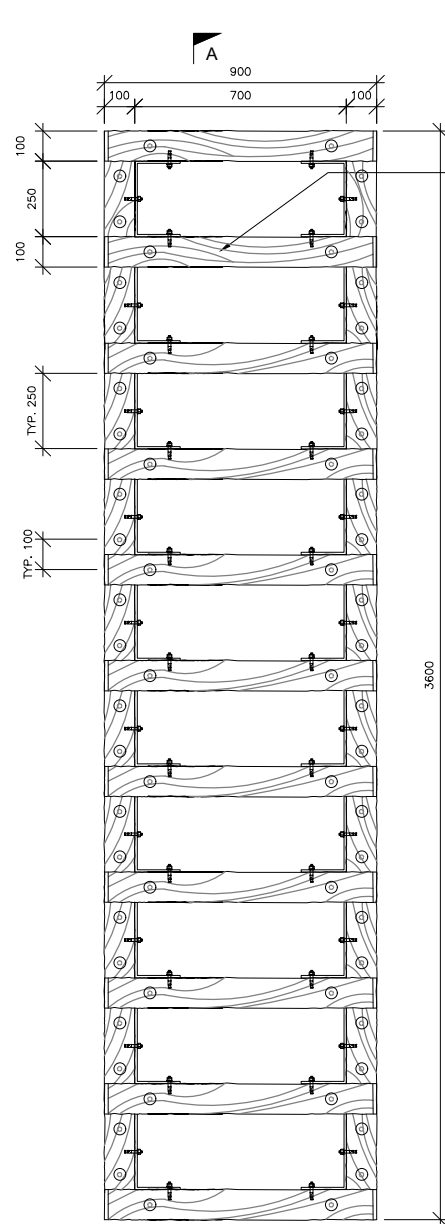
PROJECT NO:	20222
DRAWN BY:	
DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	VT
SCALE:	
CAD FILE:	WAC_20222_C_PPM_002_TYPE1

PROJECT:  
**SLO 15/2020**  
**TRAIL IMPROVEMENT WORKS IN TAI O (FU SHAN TO PO CHUE TAM)**

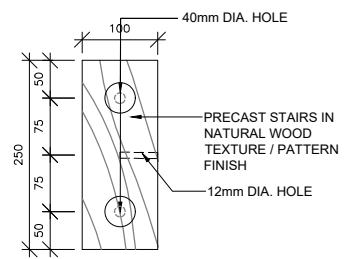
DRAWING TITLE:  
**TYPICAL DETAILS OF PRECAST MODULES - STAIRS (TYPE 1)**

DRAWING NO:	WAC/20222/C/PPM/002
REV:	-

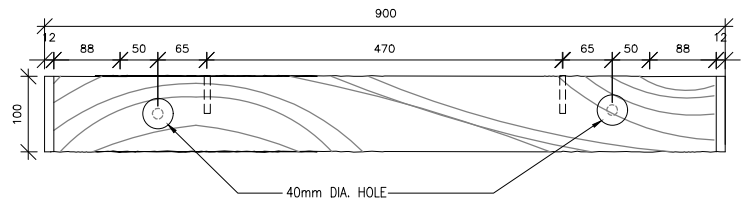




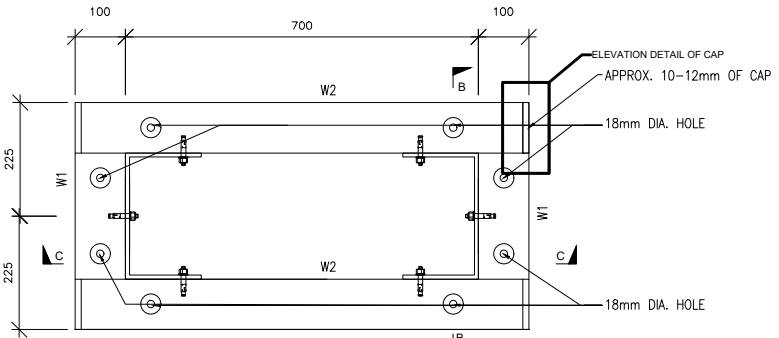
**PLAN OF PRECAST MODULES - STAIRS**  
SCALE 1:25 (A3)



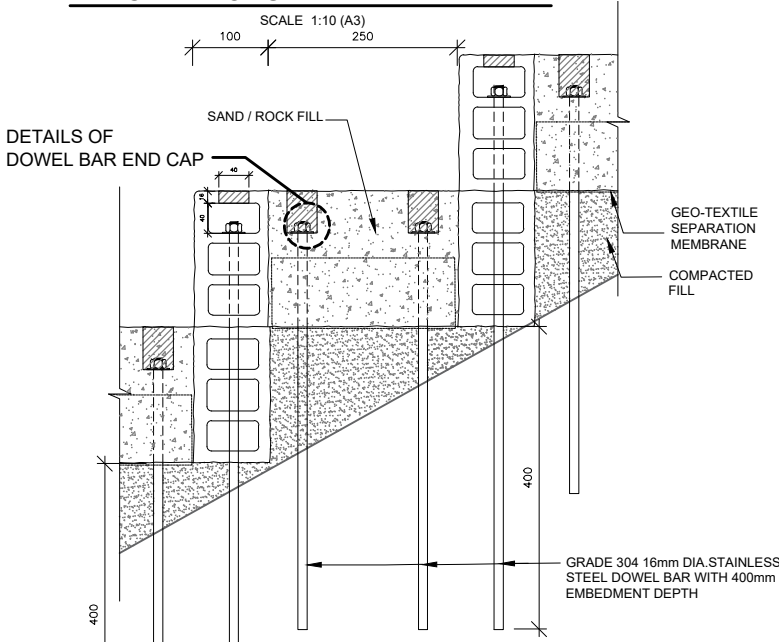
**PLAN OF W1**  
SCALE 1:10 (A3)



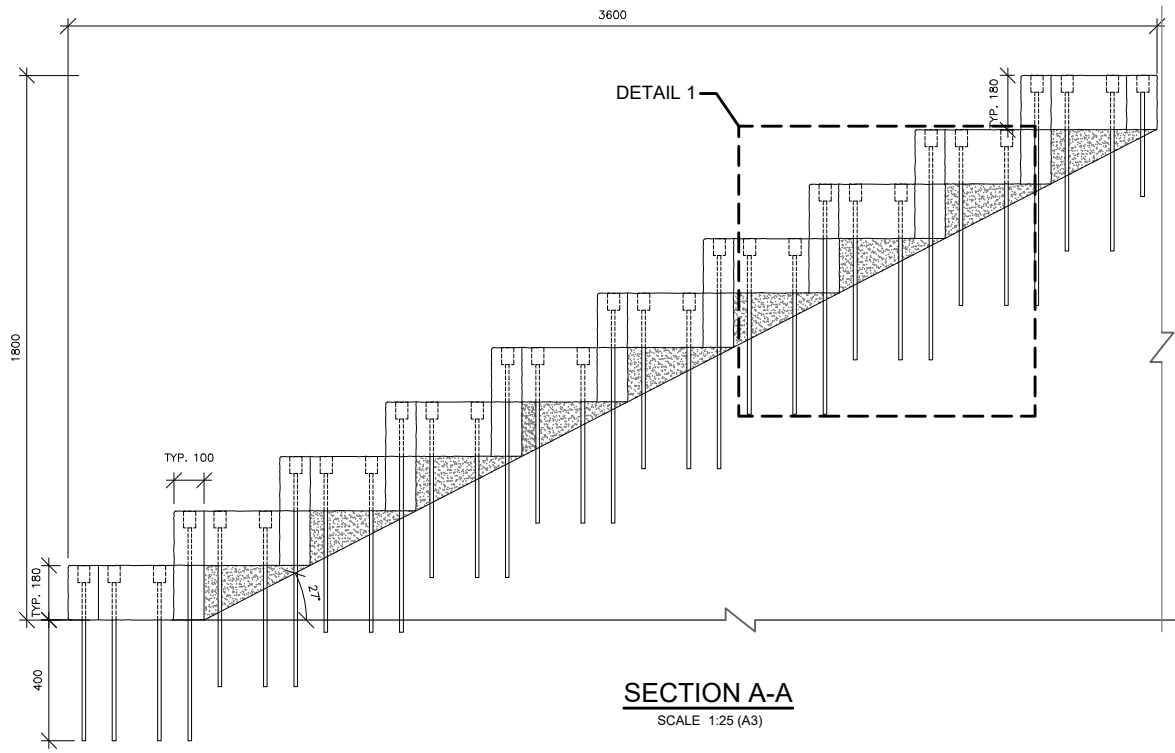
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SCALE 1:10 (A3)



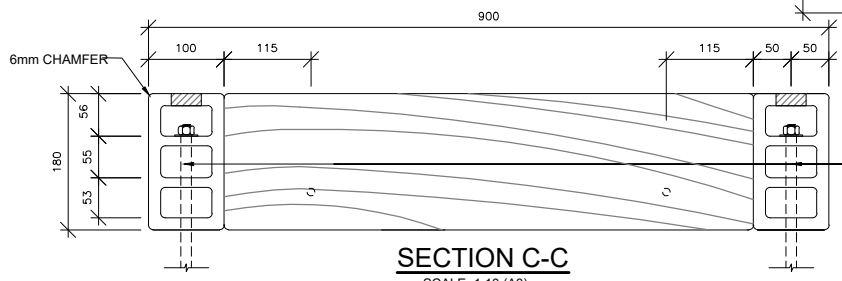
**PRECAST MODULES - STAIRS DETAIL**  
SCALE 1:10 (A3)



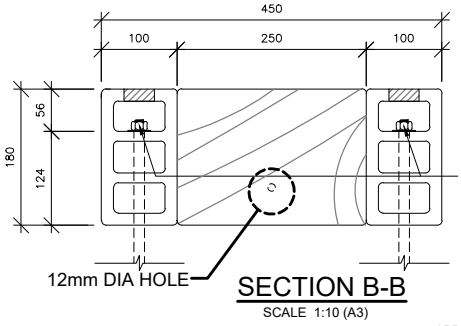
**DETAIL 1**  
SCALE 1:10 (A3)



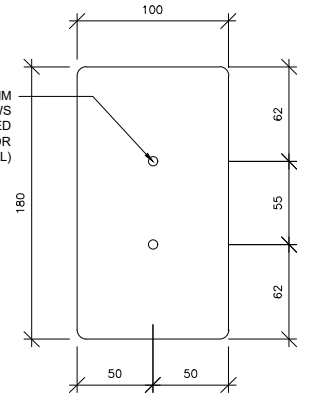
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SCALE 1:25 (A3)



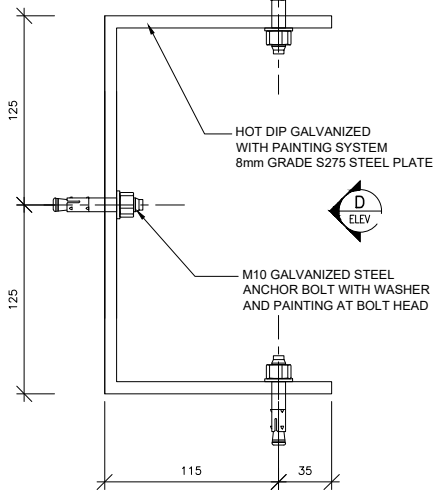
**SECTION C-C**  
SCALE 1:10 (A3)



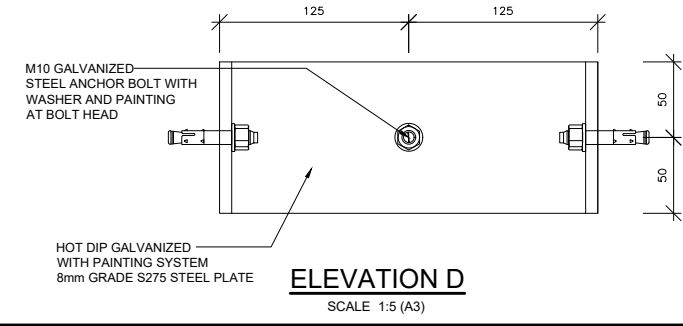
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SCALE 1:10 (A3)



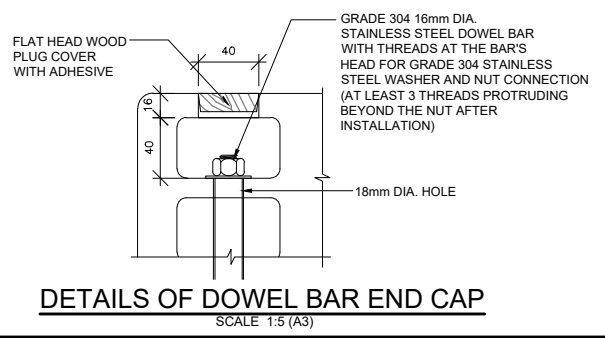
**ELEVATION DETAIL OF CAP**  
SCALE 1:5 (A3)



**DETAILS OF CORNER CONNECTING PLATE**  
SCALE 1:5 (A3)



**ELEVATION D**  
SCALE 1:5 (A3)



**DETAILS OF DOWEL BAR END CAP**  
SCALE 1:5 (A3)

B.D. REF.	/	/
F.S.D. REF.	/	/

- NOTES:**
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  - ALL LEVEL ARE IN METRES WITH REFERENCE TO HONG KONG PRINCIPAL DATUM (mPD).
  - FOR GENERAL NOTES, REFER TO DRAWING NO. WAC/20222/MUW/GN/001 AND SPECIFICATION FOR THE WPC MATERIAL'S PROPERTIES.
  - PRE-ASSEMBLY TRIAL OF THE PRECAST MODULES SHALL BE CARRIED OUT AT MANUFACTURING FACTORY BEFORE DELIVERING TO THE SITE.
  - EACH PRECAST STEP SHALL NOT BE OVERLAPPING WHEN CONSTRUCTED IN SERIES.
  - COLOR AND PATTERN OF PPMs SHALL REFER TO DRAWING NO. WAC/20222/PPM/C/012.
  - FOR ALL RECTANGULAR PPMs, 6mm CHAMFER SHALL BE PLACED ON THE EDGE.
  - ON-SITE MODIFICATION, SUCH AS TRIMMING, INSITU CONCRETE MIXING, HOLE DRILLING AND ADJUSTING ANGLE, SHALL BE CARRIED OUT BY THE CONTRACTOR. SO THAT THE PPMs WILL FIT INTO THE ACTUAL SITE CONDITION.
  - FORMATION FOR STAIRS & STEP, SUCH AS CUT AND FILL OF THE GROUND SURFACE IN MINIMAL EXTENT, SHALL BE CARRIED OUT BY THE CONTRACTOR.

**AS-BUILT**

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

PROJECT NO:	20222
DRAWN BY:	
DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	VT
SCALE:	
CAD FILE:	WAC_20222_C_PPM_002-1_TYPE2A

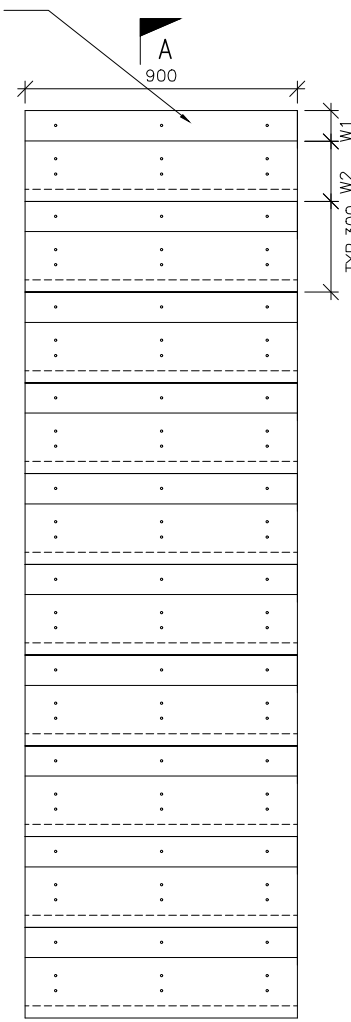
PROJECT:  
**SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)**

DRAWING TITLE:  
**TYPICAL DETAILS OF  
PRECAST MODULES -  
STAIRS (TYPE 2A)**

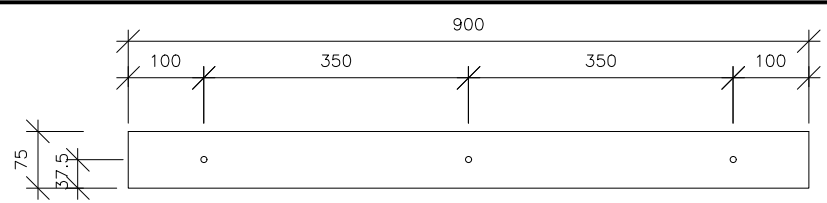
DRAWING NO:	WAC/20222/C/PPM/002-1	REV:	-
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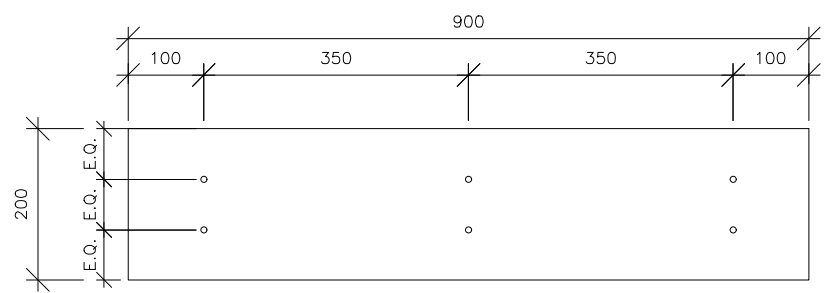
PRECAST STAIRS IN NATURAL WOOD TEXTURE / PATTERN FINISH



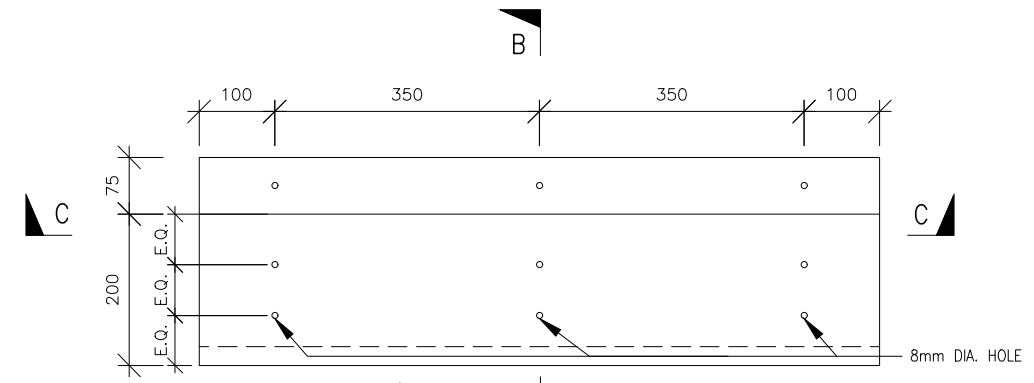
**PLAN OF PRECAST MODULES - STAIRS**  
SCALE 1:25 (A3)



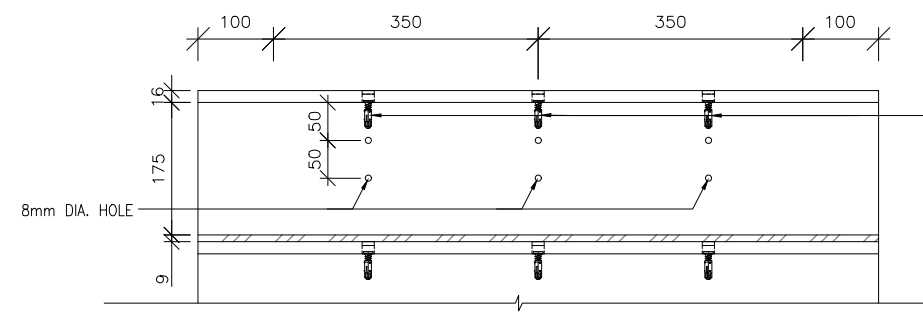
**PLAN OF W1**  
SCALE 1:10 (A3)



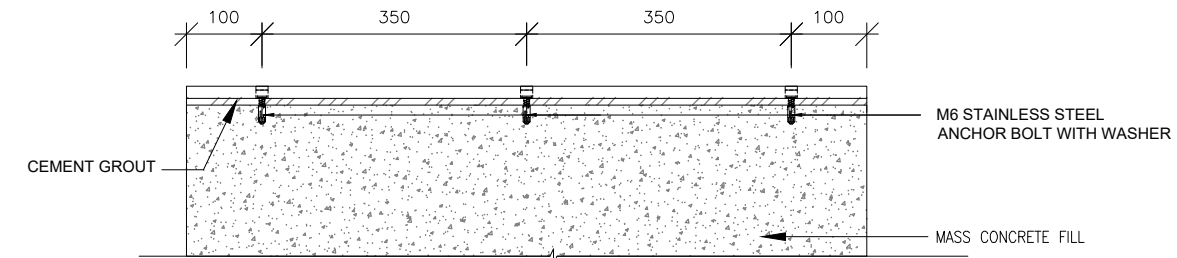
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SCALE 1:10 (A3)



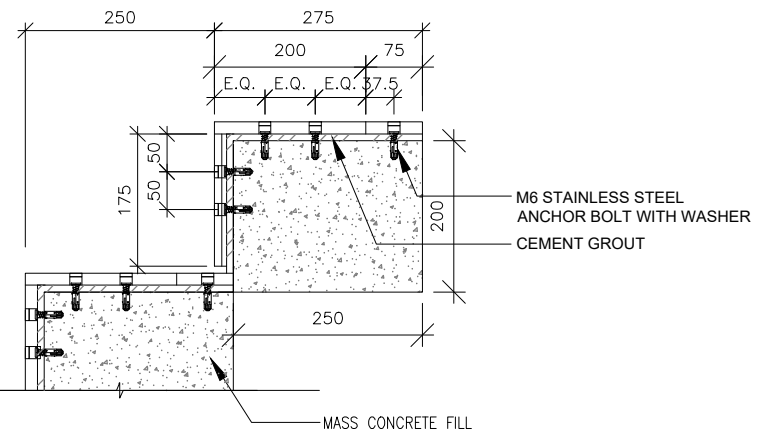
**PLAN OF STAIRS DETAIL**  
SCALE 1:10 (A3)



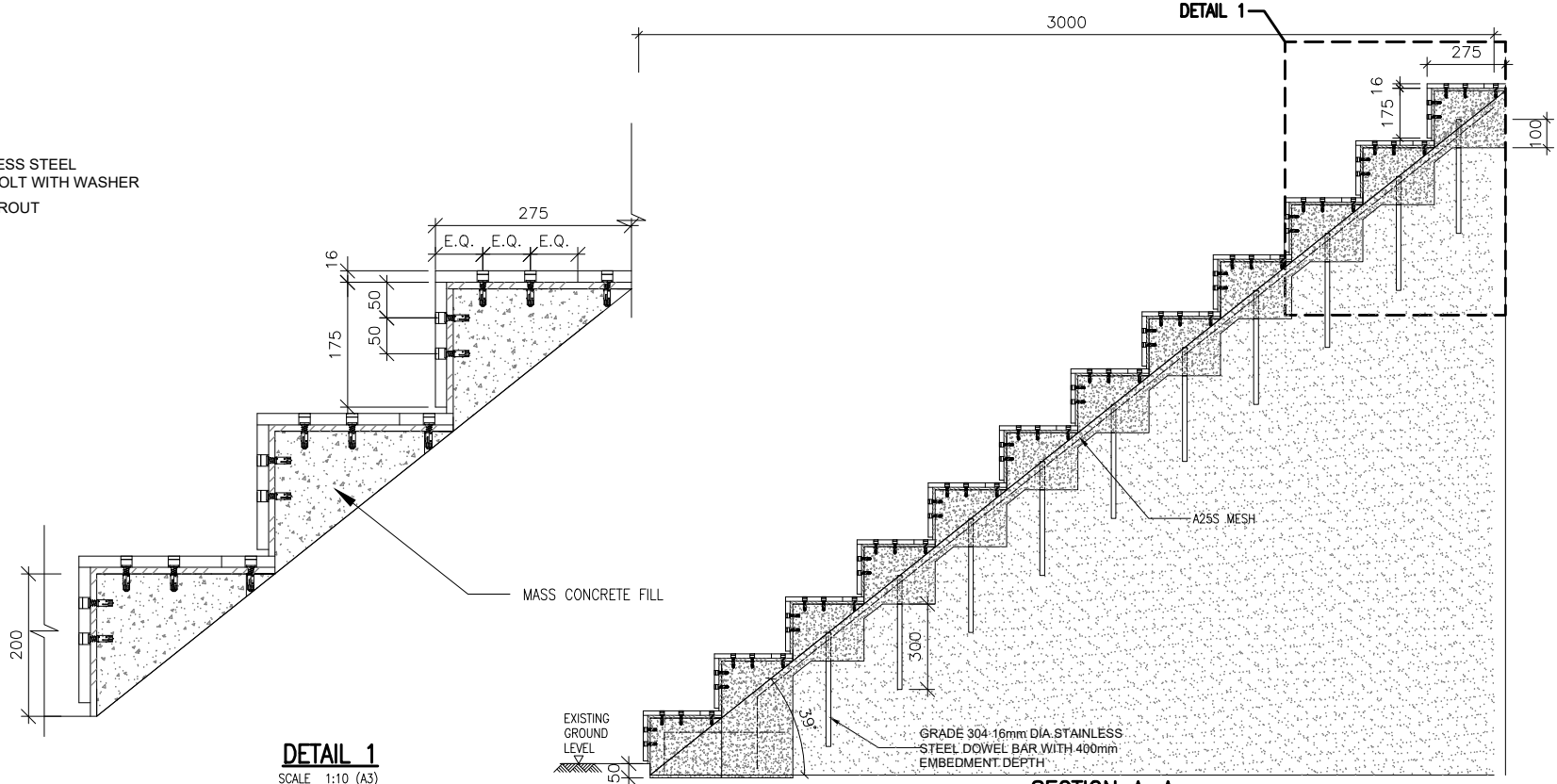
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SCALE 1:10 (A3)



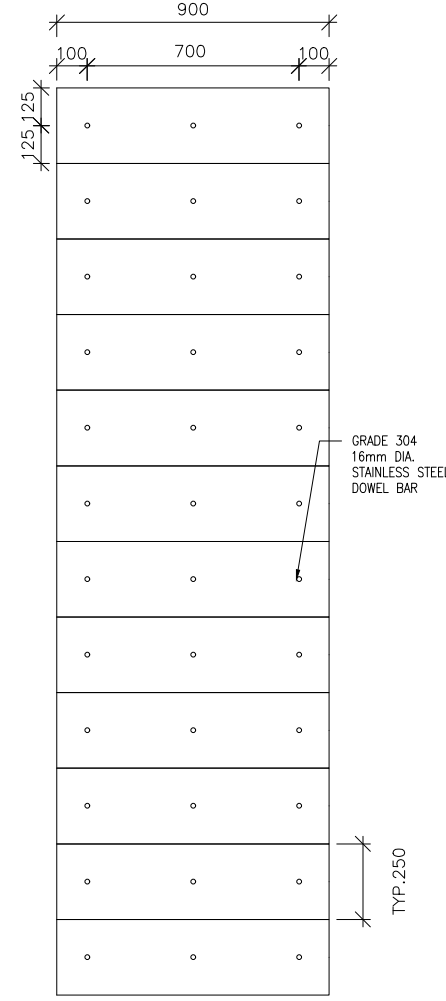
**SECTION C-C**  
SCALE 1:10 (A3)



**SECTION B-B**  
SCALE 1:10 (A3)



**SECTION A-A**  
SCALE 1:25 (A3)



**PLAN OF DOWEL BAR ARRANGEMENT**  
SCALE 1:25 (A3)

B.D. REF.	/	/
F.S.D. REF.	/	/

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  - FOR GENERAL NOTES, REFER TO DRAWING NO. WAC/20222/MJW/GN/001 AND SPECIFICATION FOR THE WPC MATERIAL'S PROPERTIES.
  - PRE-ASSEMBLY TRIAL OF THE PRECAST MODULES SHALL BE CARRIED OUT AT MANUFACTURING FACTORY BEFORE DELIVERING TO THE SITE.
  - EACH PRECAST STEP SHALL NOT BE OVERLAPPING WHEN CONSTRUCTED IN SERIES.
  - COLOR AND PATTERN OF PPMs SHALL REFER TO DRAWING NO. WAC/20222/PPM/C/012.
  - FOR ALL RECTANGULAR PPMs, 6mm CHAMFER SHALL BE PLACED ON THE EDGE.
  - ON-SITE MODIFICATION, SUCH AS TRIMMING, INSITU CONCRETE MIXING, HOLE DRILLING AND ADJUSTING ANGLE, SHALL BE CARRIED OUT BY THE CONTRACTOR. SO THAT THE PPMs WILL FIT INTO THE ACTUAL SITE CONDITION.
  - FORMATION FOR STAIRS & STEP, SUCH AS CUT AND FILL OF THE GROUND SURFACE IN MINIMAL EXTENT, SHALL BE CARRIED OUT BY THE CONTRACTOR.

**AS-BUILT**

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

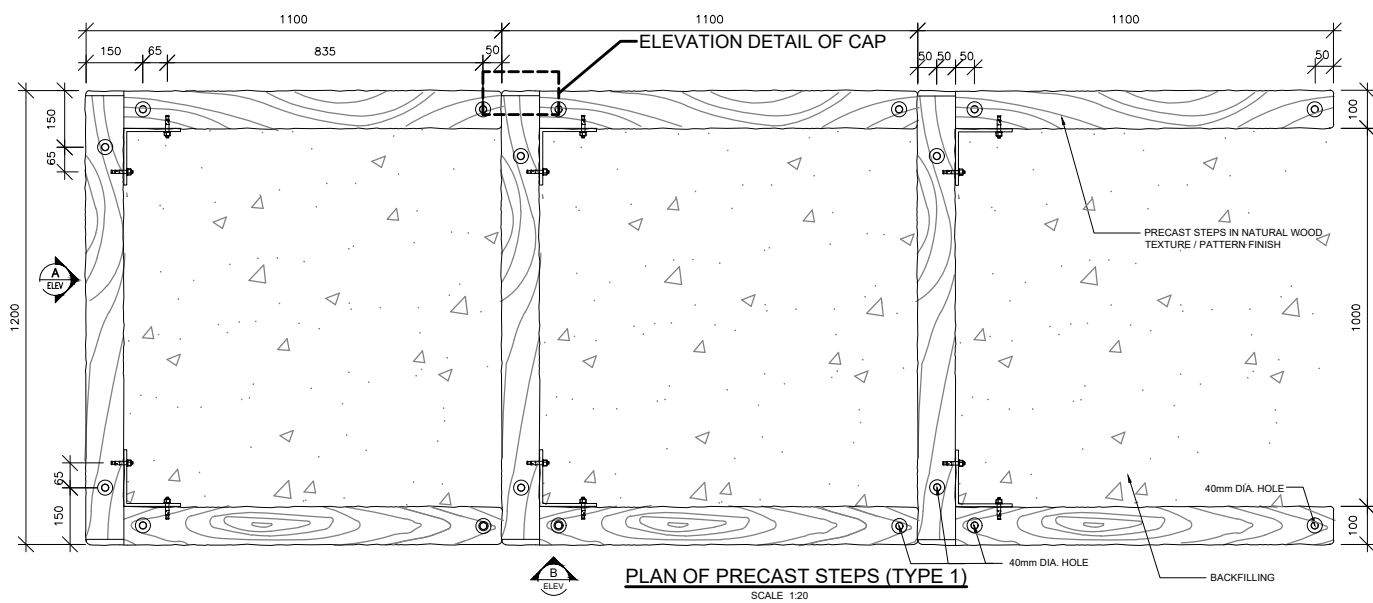
PROJECT NO:	20222
DRAWN BY:	
DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	VT
SCALE:	
CAD FILE:	WAC_20222_C_PPM_002-3_TYPE3

PROJECT:  
**SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)**

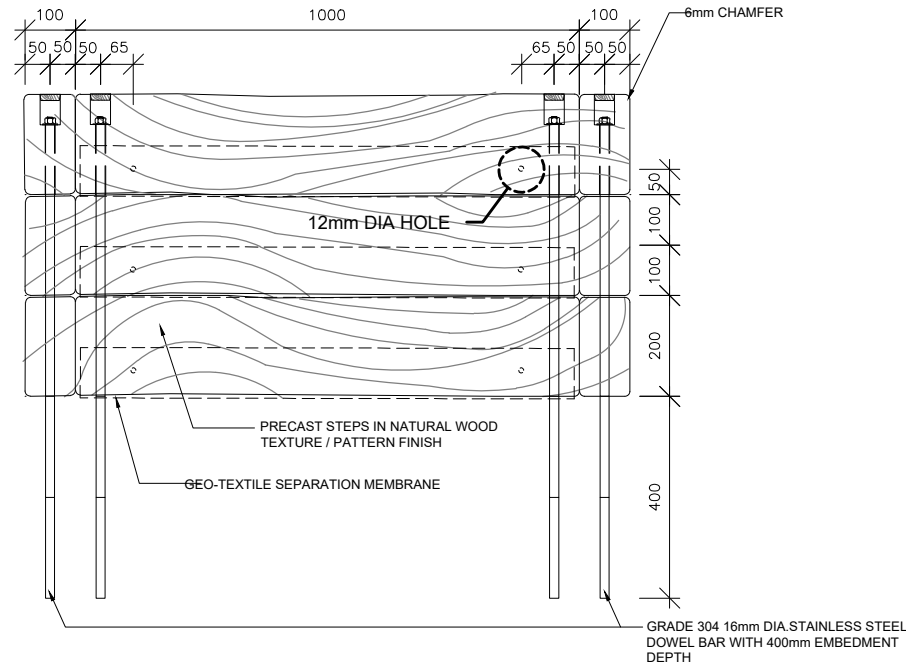
DRAWING TITLE:  
**TYPICAL DETAILS OF  
PRECAST MODULES -  
STAIRS (TYPE 3)**

DRAWING NO:	WAC / 20222 / C / PPM / 002 - 3
REV:	-

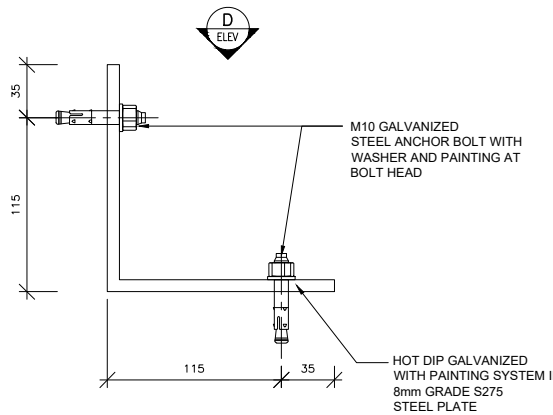
**WINS & ASSOCIATES**  
CONSULTING ENGINEERS LTD.



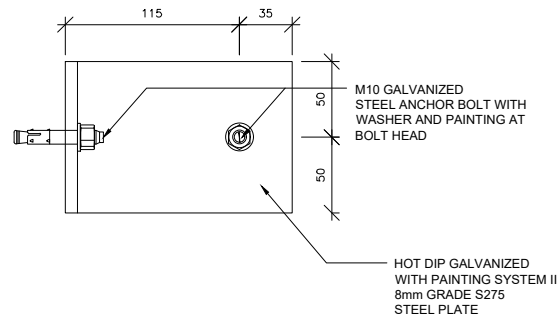
**PLAN OF PRECAST STEPS (TYPE 1)**  
SCALE 1:20



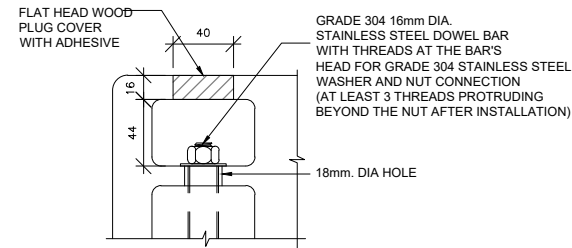
**ELEVATION A OF PRECAST STEPS**  
SCALE 1:20



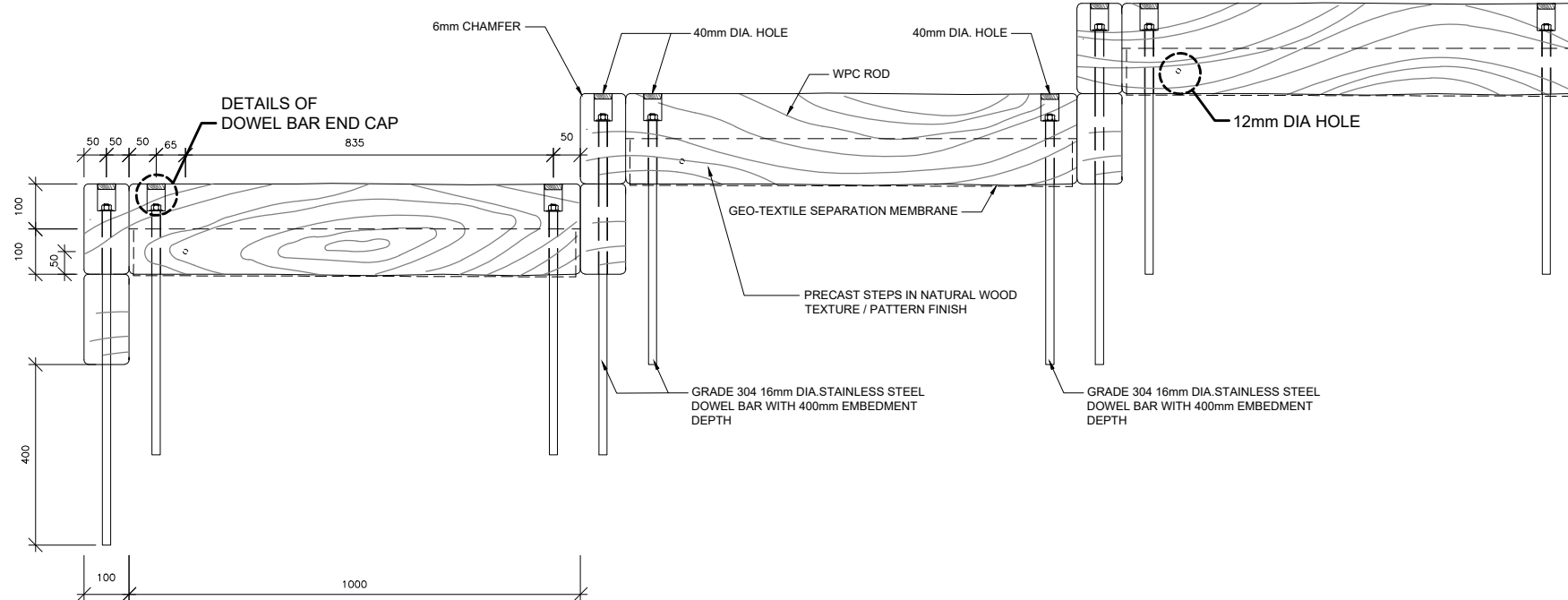
**DETAILS OF CORNER CONNECTING PLATE**  
SCALE 1:5 (A3)



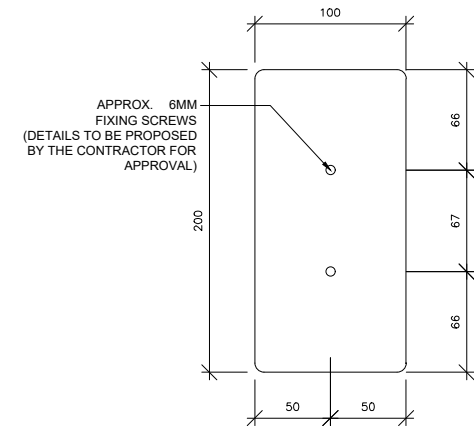
**ELEVATION D OF CORNER CONNECTING PLATE**  
SCALE 1:5 (A3)



**DETAILS OF DOWEL BAR END CAP**  
SCALE 1:5 (A3)



**ELEVATION B OF PRECAST STEPS**  
SCALE 1:20



**ELEVATION DETAIL OF CAP**  
SCALE 1:5 (A3)

B.D. REF.	/	/
F.S.D. REF.	/	/

- NOTES:**
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  - ALL LEVEL ARE IN METRES WITH REFERENCE TO HONG KONG PRINCIPAL DATUM (mPD).
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  - PRE-ASSEMBLY TRIAL OF THE PRECAST MODULES SHALL BE CARRIED OUT AT MANUFACTURING FACTORY BEFORE DELIVERING TO THE SITE.
  - EACH PRECAST STEP SHALL NOT BE OVERLAPPING WHEN CONSTRUCTED IN SERIES.
  - COLOR AND PATTERN OF PPMs SHALL REFER TO DRAWING NO. WAC/20222/PPM/C/012.
  - FOR ALL RECTANGULAR PPMs, 6mm CHAMFER SHALL BE PLACED ON THE EDGE.
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  - FORMATION FOR STAIRS & STEP, SUCH AS CUT AND FILL OF THE GROUND SURFACE IN MINIMAL EXTENT, SHALL BE CARRIED OUT BY THE CONTRACTOR.

**AS-BUILT**

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

ALL MEASUREMENTS MUST BE CHECKED AT THE SITE - DO NOT SCALE DRAWING - ALL DRAWING SPECIFICATIONS AND THEIR COPY RIGHT ARE THE PROPERTY OF ENGINEERS, ARCHITECTS, DESIGNERS AND SHALL BE RETURNED AT THE COMPLETION OF THE WORK - THIS DRAWING IS NOT VALID FOR CONSTRUCTION PURPOSES UNLESS EXPRESSLY CERTIFIED.

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

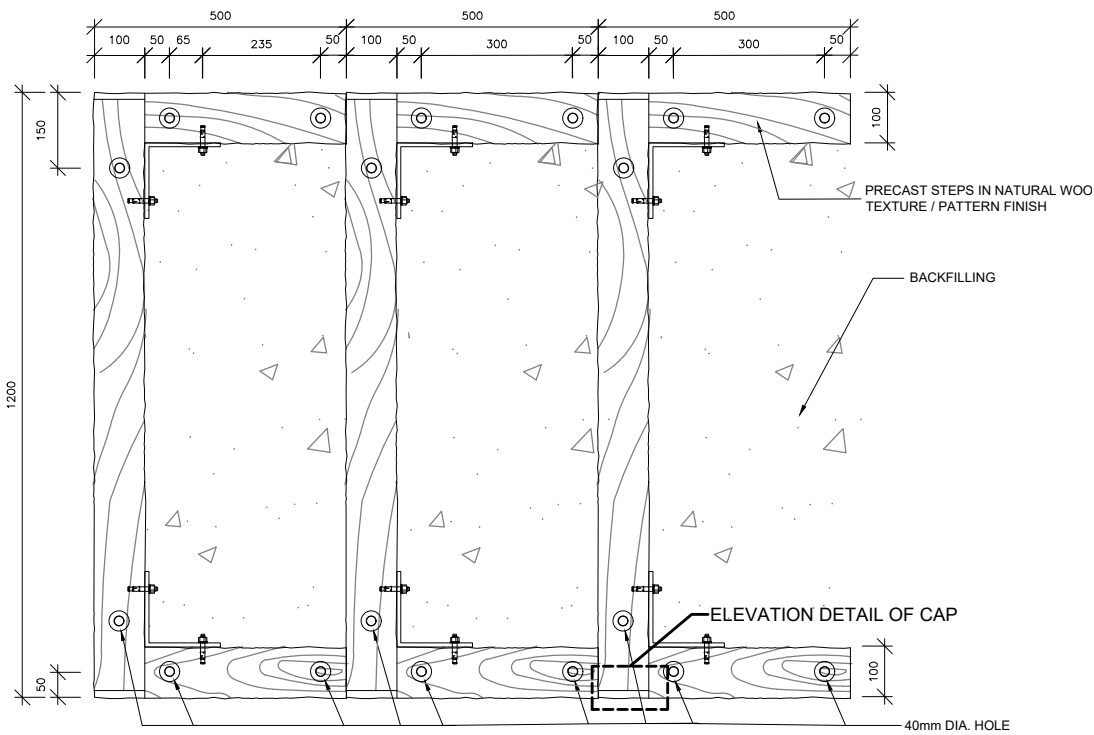
L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	TC DF
APPROVED BY:	VT
SCALE:	AS SHOW
CAD FILE:	WAC_20222_C_PPM_003

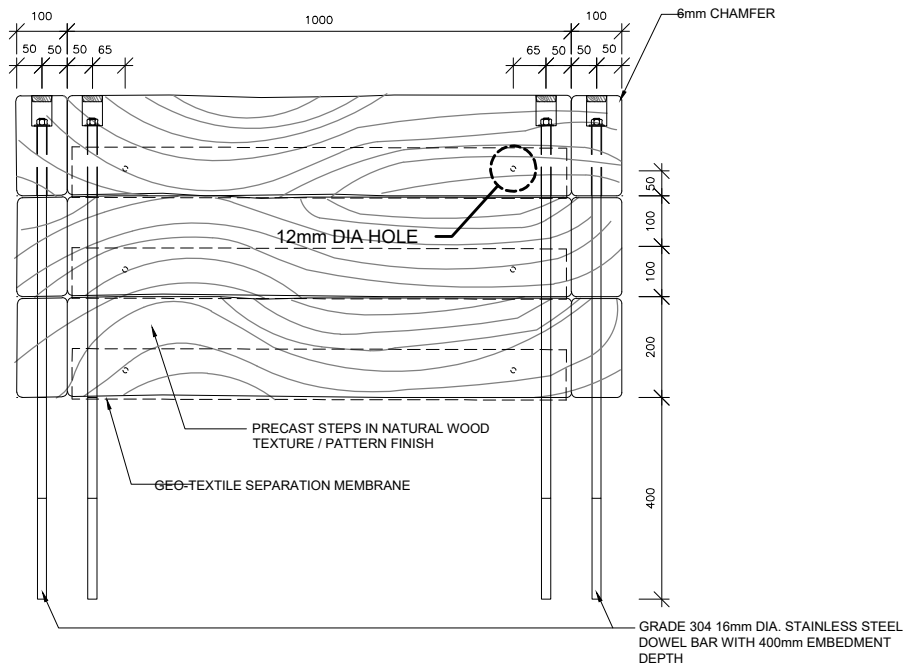
PROJECT:  
SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)

DRAWING TITLE:  
TYPICAL DETAILS OF  
PRECAST MODULES -  
STEPS (TYPE 1)

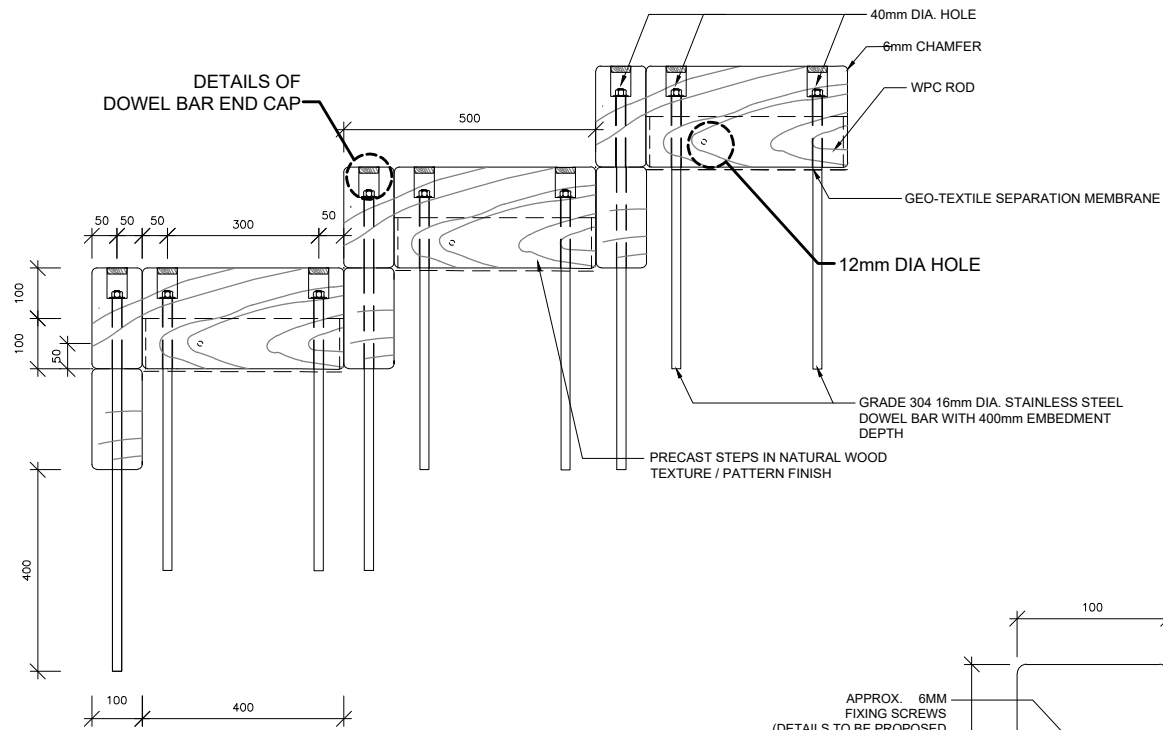
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REV:	-



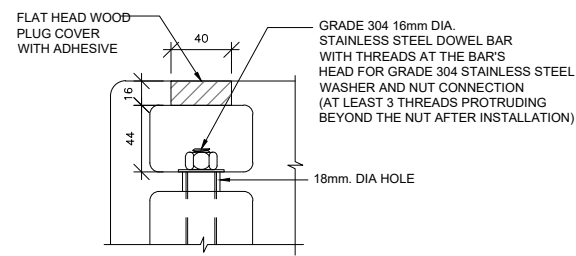
**PLAN OF PRECAST STEPS (TYPE 2)**  
SCALE 1:15



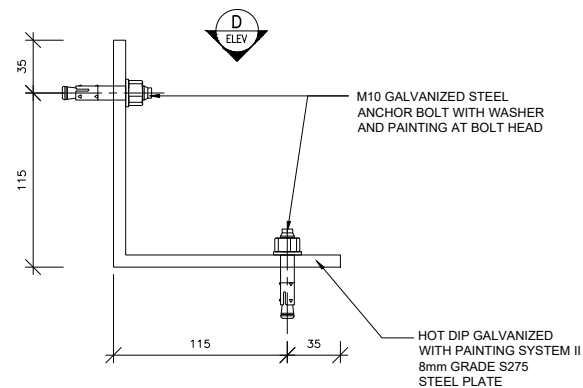
**ELEVATION A OF PRECAST STEPS**  
SCALE 1:20



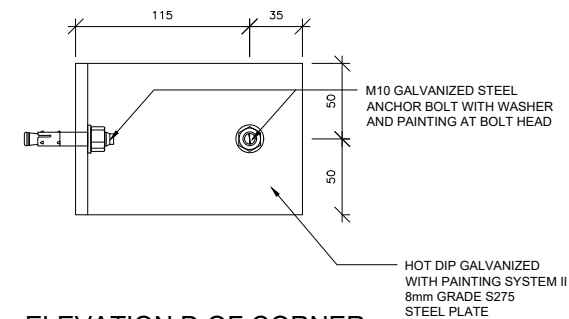
**ELEVATION B OF PRECAST STEPS**  
SCALE 1:20



**DETAILS OF DOWEL BAR END CAP**  
SCALE 1:5 (A3)

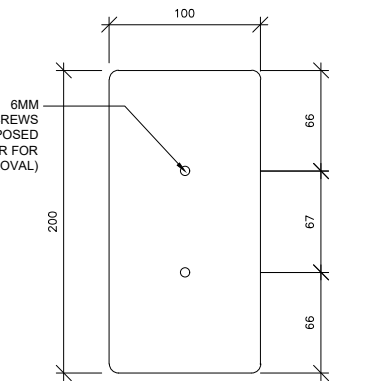


**DETAILS OF CORNER CONNECTING PLATE**  
SCALE 1:5 (A3)



**ELEVATION D OF CORNER CONNECTING PLATE**  
SCALE 1:5 (A3)

APPROX. 6MM FIXING SCREWS (DETAILS TO BE PROPOSED BY THE CONTRACTOR FOR APPROVAL)



**ELEVATION DETAIL OF CAP**  
SCALE 1:5 (A3)

B.D. REF.	/	/
F.S.D. REF.	/	/

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
  - ALL LEVEL ARE IN METRES WITH REFERENCE TO HONG KONG PRINCIPAL DATUM (mPD).
  - FOR GENERAL NOTES, REFER TO DRAWING NO. WAC/20222/MLW/GN/001 AND SPECIFICATION FOR THE WPC MATERIAL'S PROPERTIES.
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**AS-BUILT**

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

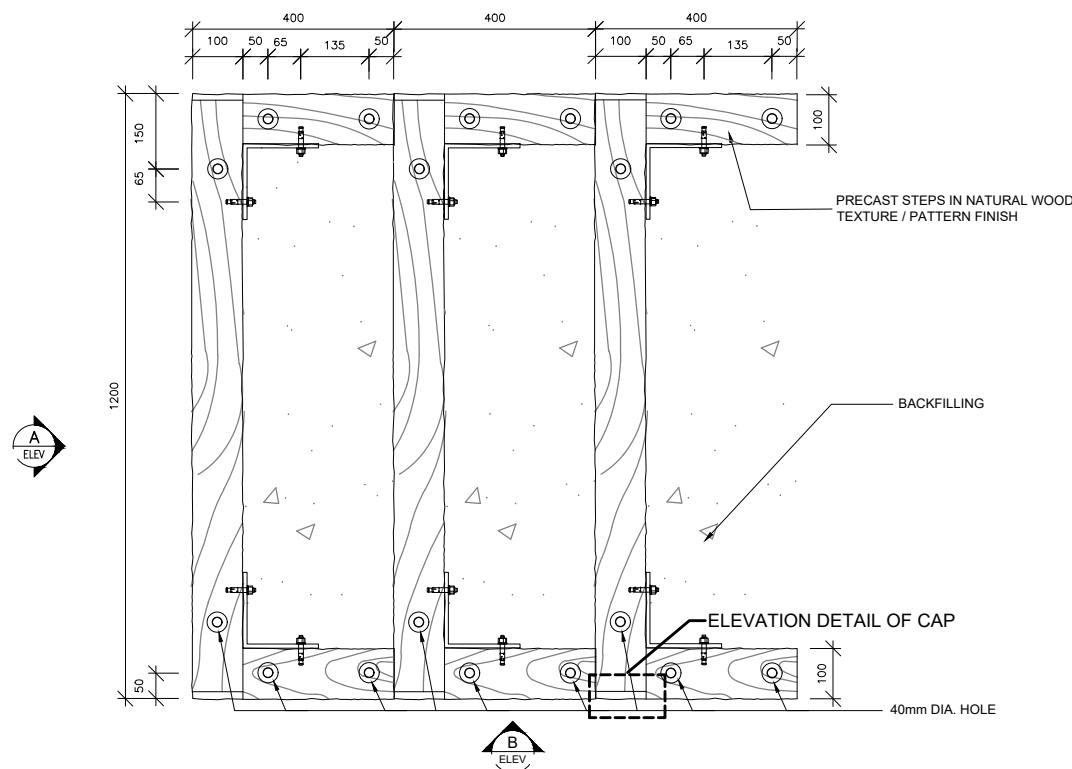
PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	TC DF
APPROVED BY:	VT
SCALE:	AS SHOW
CAD FILE:	WAC_20222_C_PPM_004

PROJECT:  
**SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)**

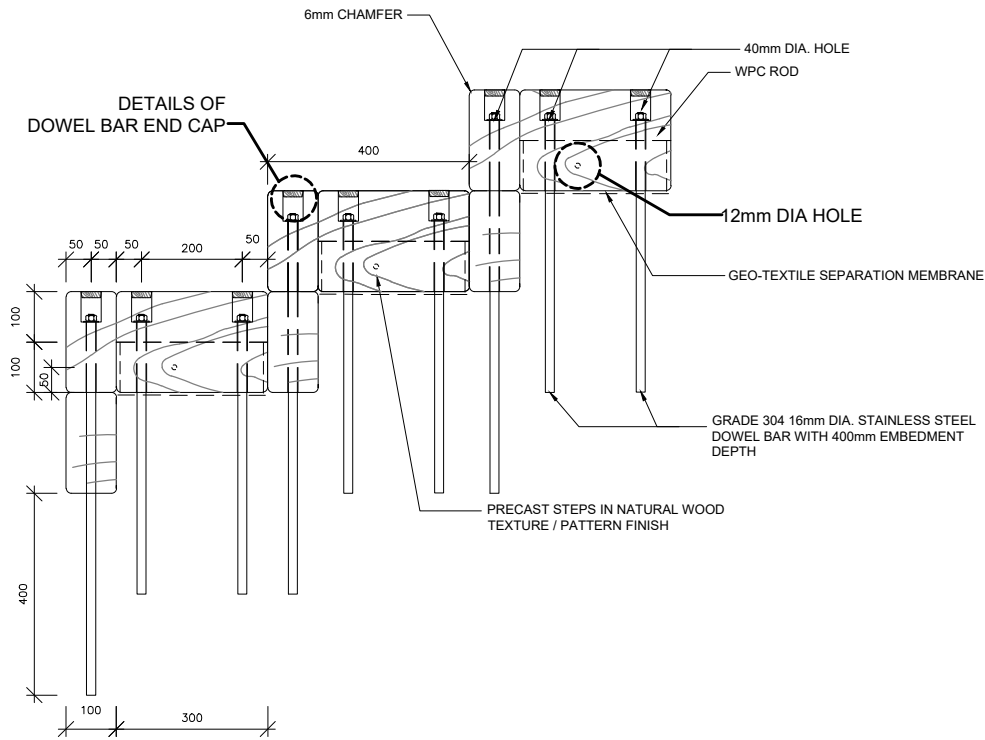
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**TYPICAL DETAILS OF  
PRECAST MODULES -  
STEPS (TYPE 2)**

DRAWING NO:	WAC/20222/C/PPM/004
REV:	-

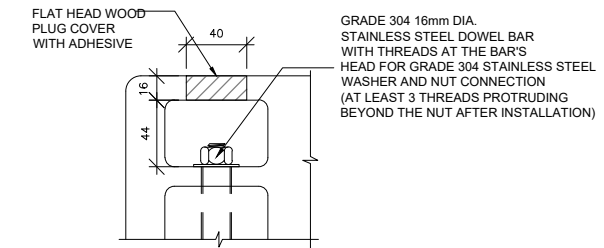




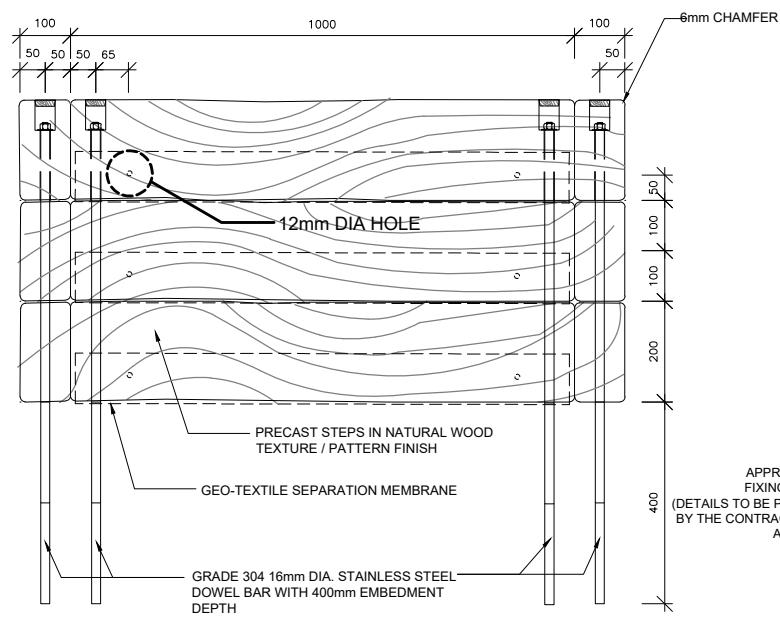
**PLAN OF PRECAST STEPS (TYPE 3)**  
SCALE 1:15



**ELEVATION B OF PRECAST STEPS**  
SCALE 1:20

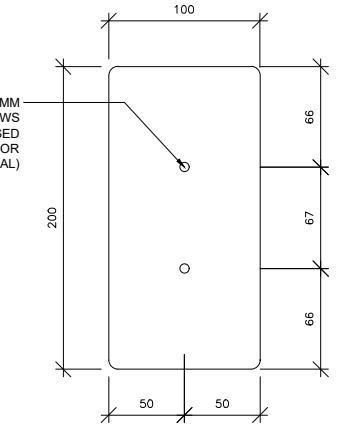


**DETAILS OF DOWEL BAR END CAP**  
SCALE 1:5 (A3)

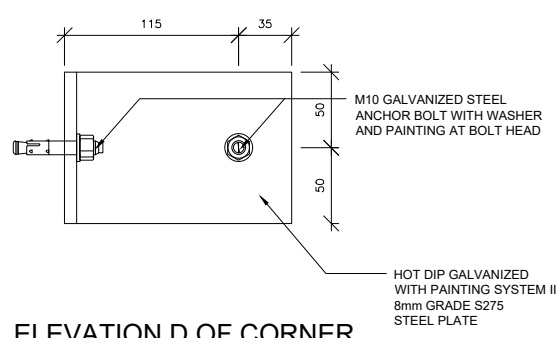


**ELEVATION A OF PRECAST STEPS**  
SCALE 1:20

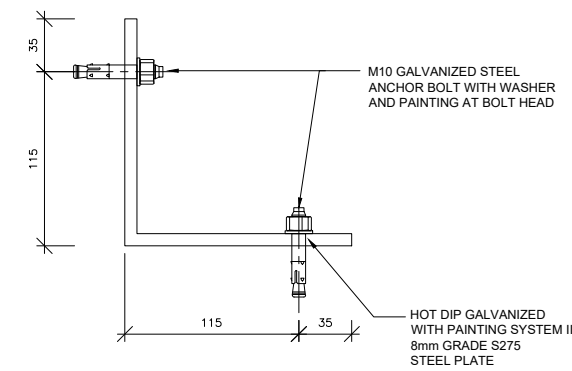
APPROX. 6MM FIXING SCREWS (DETAILS TO BE PROPOSED BY THE CONTRACTOR FOR APPROVAL)



**ELEVATION DETAIL OF CAP**  
SCALE 1:5 (A3)



**ELEVATION D OF CORNER CONNECTING PLATE**  
SCALE 1:5 (A3)



**DETAILS OF CORNER CONNECTING PLATE**  
SCALE 1:5 (A3)

B.D. REF.	/	/
F.S.D. REF.	/	/

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
  - ALL LEVEL ARE IN METRES WITH REFERENCE TO HONG KONG PRINCIPAL DATUM (mPD).
  - FOR GENERAL NOTES, REFER TO DRAWING NO. WAC/20222/MUW/GN/001 AND SPECIFICATION FOR THE WPC MATERIAL'S PROPERTIES.
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**AS-BUILT**

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

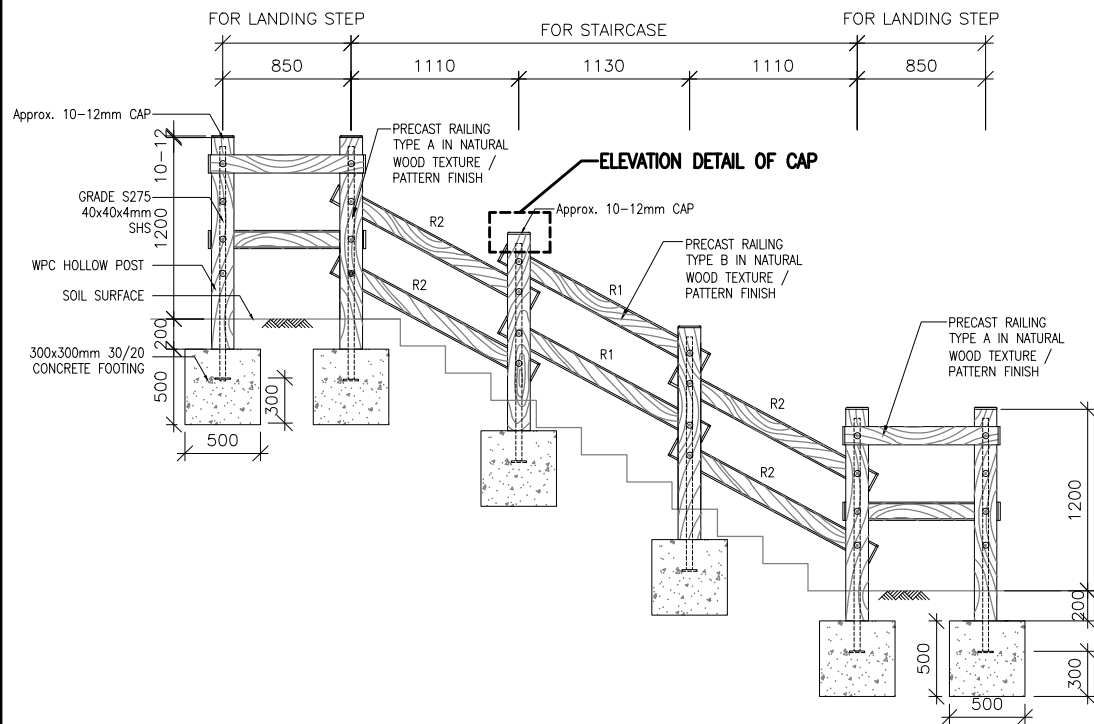
L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	TC DF
APPROVED BY:	VT
SCALE:	AS SHOW
CAD FILE:	WAC_20222_C_PPM_005

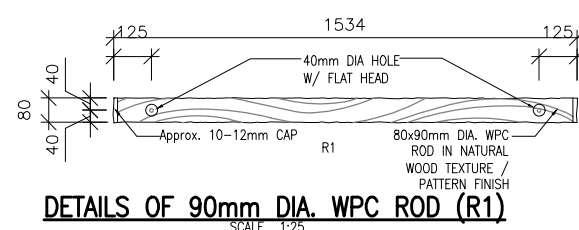
PROJECT:  
**SLO 15/2020 TRAIL IMPROVEMENT WORKS IN TAI O (FU SHAN TO PO CHUE TAM)**

DRAWING TITLE:  
**TYPICAL DETAILS OF PRECAST MODULES – STEPS (TYPE 3)**

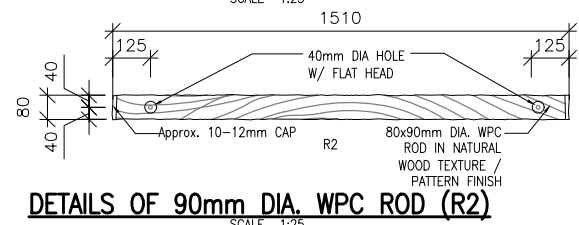
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REV:	-



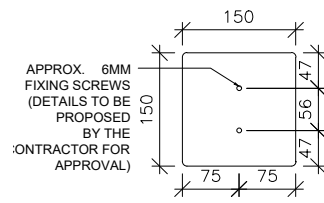
**TYPICAL ELEVATION OF RAILING FOR STAIRCASE**



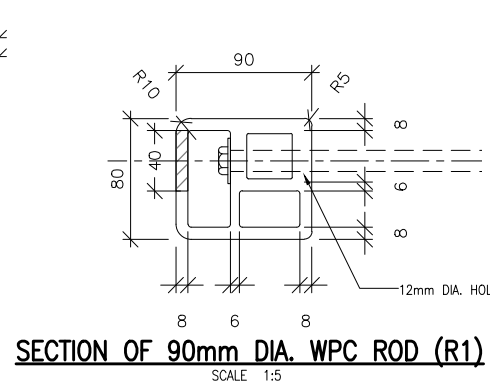
**DETAILS OF 90mm DIA. WPC ROD (R1)**



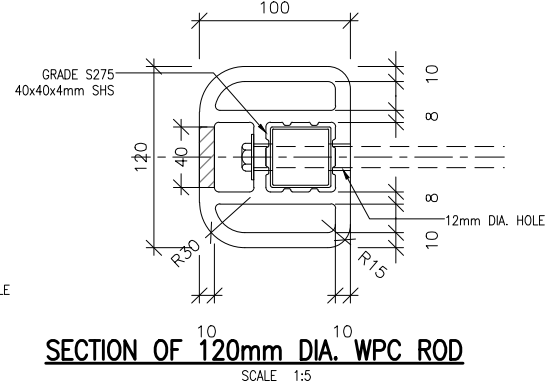
**DETAILS OF 90mm DIA. WPC ROD (R2)**



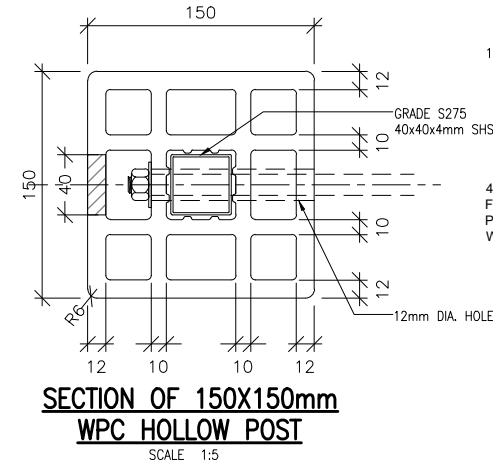
**DETAIL OF CAP (150X150mm WPC HOLLOW POST)**



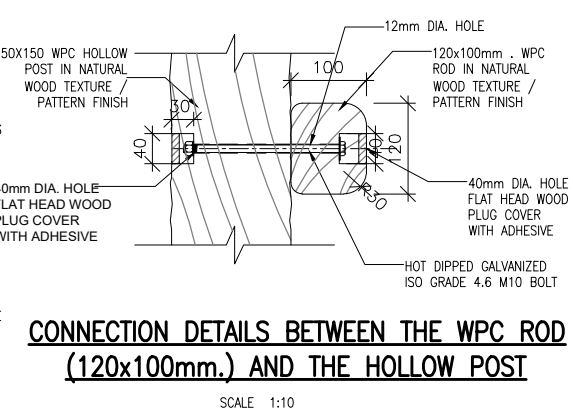
**SECTION OF 90mm DIA. WPC ROD (R1)**



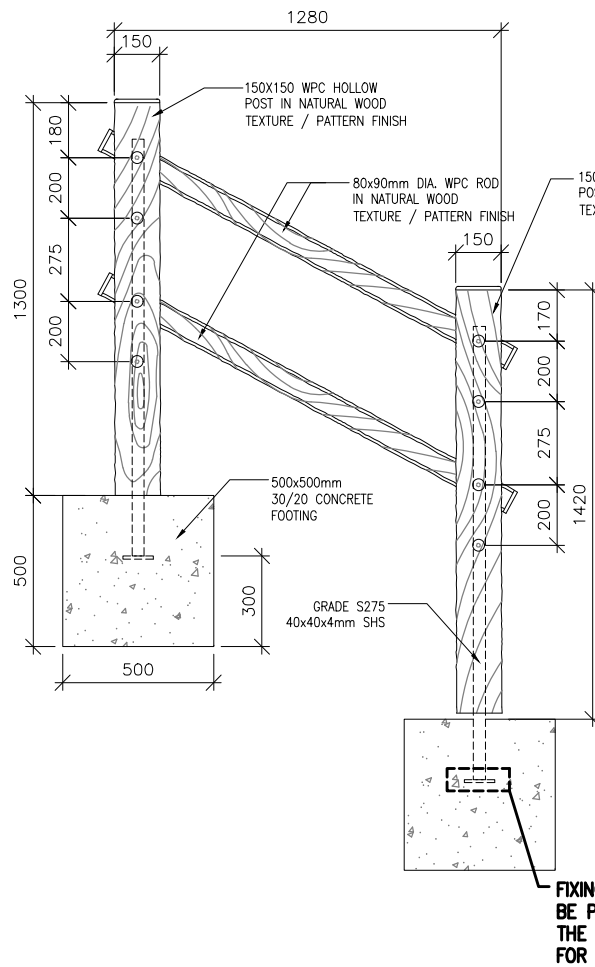
**SECTION OF 120mm DIA. WPC ROD**



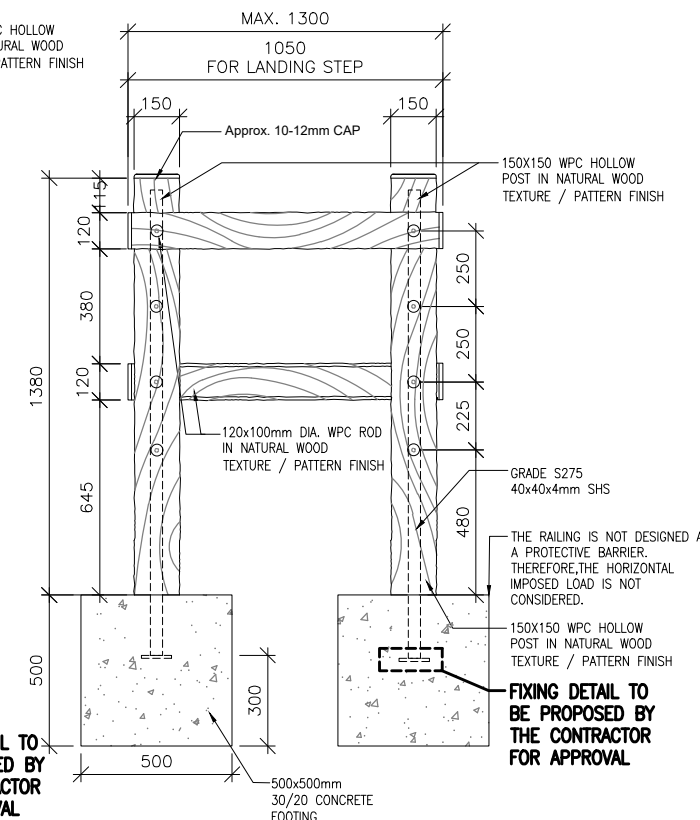
**SECTION OF 150X150mm WPC HOLLOW POST**



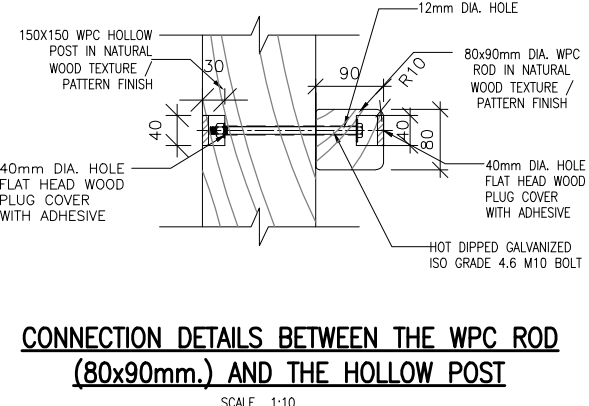
**CONNECTION DETAILS BETWEEN THE WPC ROD (120x100mm.) AND THE HOLLOW POST**



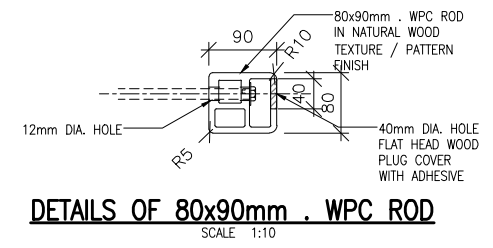
**DETAILS OF PRECAST RAILING TYPE B**



**DETAILS OF PRECAST RAILING TYPE A**



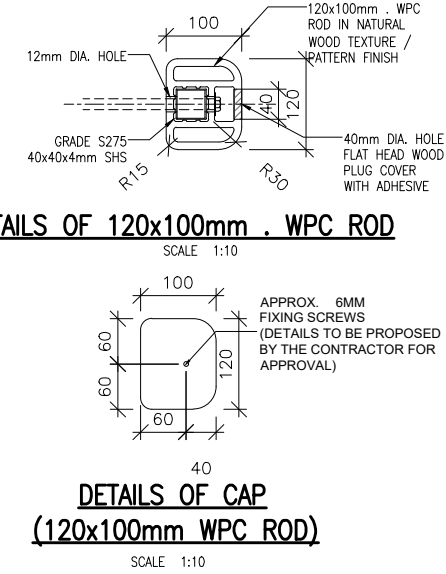
**CONNECTION DETAILS BETWEEN THE WPC ROD (80x90mm.) AND THE HOLLOW POST**



**DETAILS OF 80x90mm WPC ROD**



**DETAILS OF CAP (80x90mm WPC ROD)**



**DETAILS OF CAP (120x100mm WPC ROD)**

B.D. REF.	/	/
F.S.D. REF.	/	/

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  - ALL LEVEL ARE IN METRES WITH REFERENCE TO HONG KONG PRINCIPAL DATUM (mPD).
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**AS-BUILT**

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

ALL MEASUREMENTS MUST BE CHECKED AT THE SITE - DO NOT SCALE DRAWING  
 ALL DRAWING SPECIFICATIONS AND THEIR COPY RIGHT ARE THE PROPERTY OF ENGINEERS, ARCHITECTS, DESIGNERS AND SHALL BE RETURNED AT THE COMPLETION OF THE WORK - THIS DRAWING IS NOT VALID FOR CONSTRUCTION PURPOSES UNLESS EXPRESSLY CERTIFIED.

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

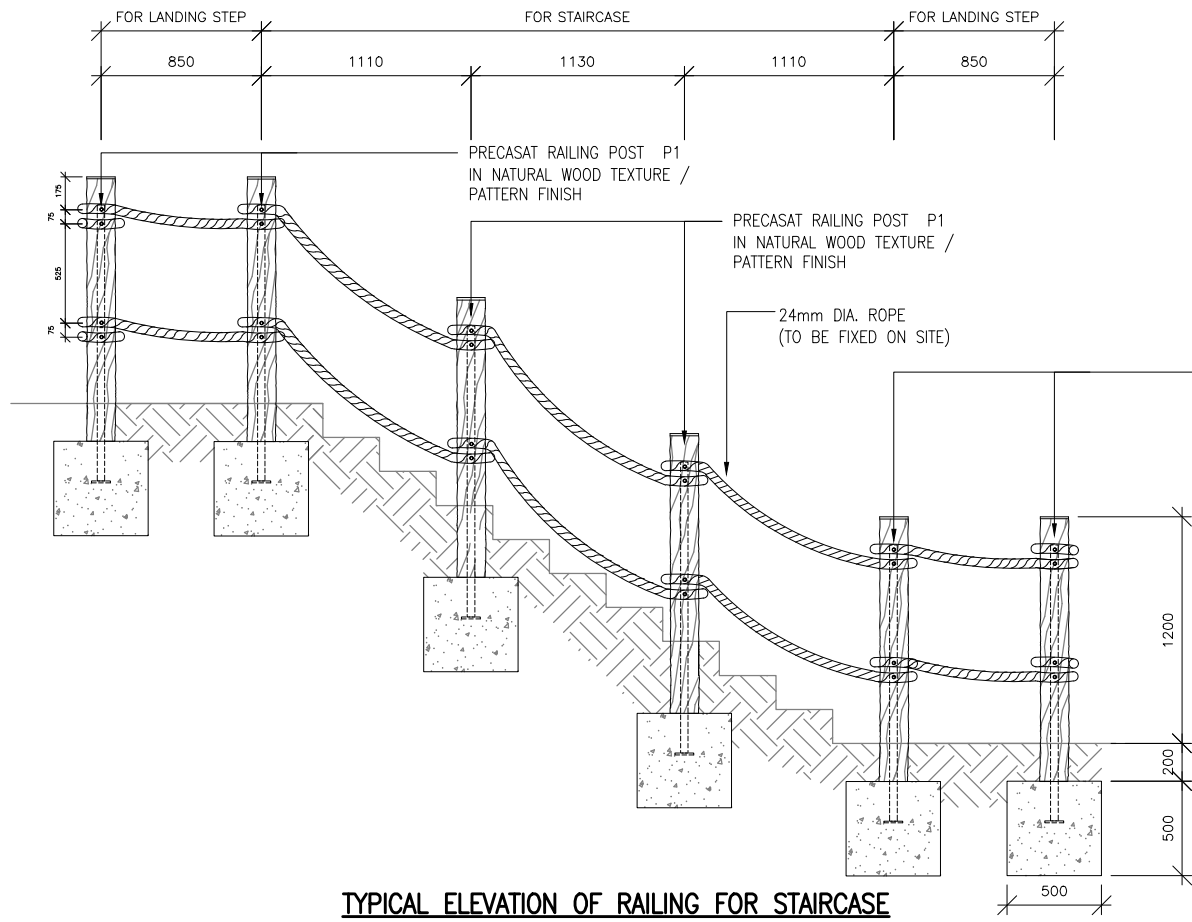
L.T. HUNG  
 HOP TAI CONSTRUCTION CO. L.T.D.

PROJECT NO:	20222
DRAWN BY:	
DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	VT
SCALE:	
CAD FILE:	WAC_20222_C_PPM_006

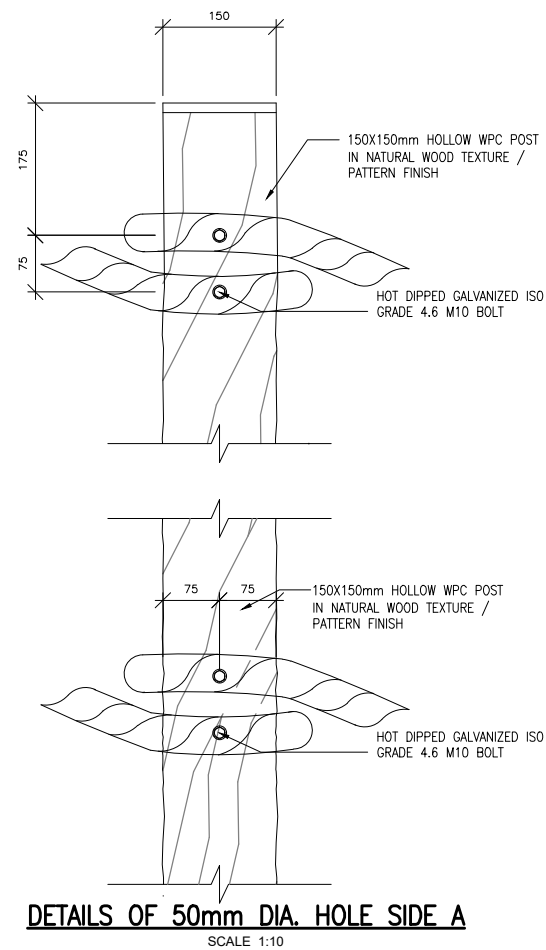
PROJECT:  
**SLO 15/2020**  
**TRAIL IMPROVEMENT WORKS IN TAI O (FU SHAN TO PO CHUE TAM)**

DRAWING TITLE:  
**TYPICAL DETAILS OF PRECAST MODULES - RAILING (TYPE 1)**

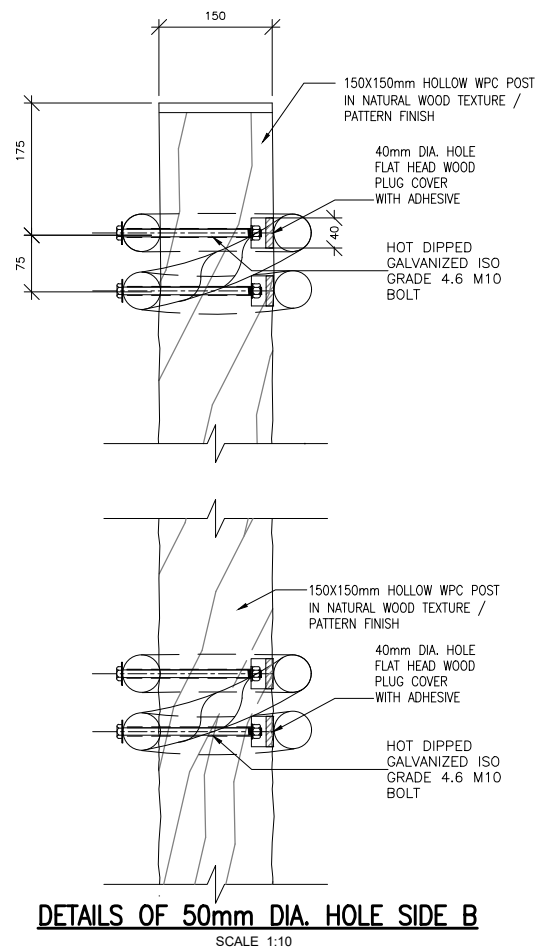
DRAWING NO:	WAC/20222/C/PPM/006
REV:	-



**TYPICAL ELEVATION OF RAILING FOR STAIRCASE**  
SCALE 1:40

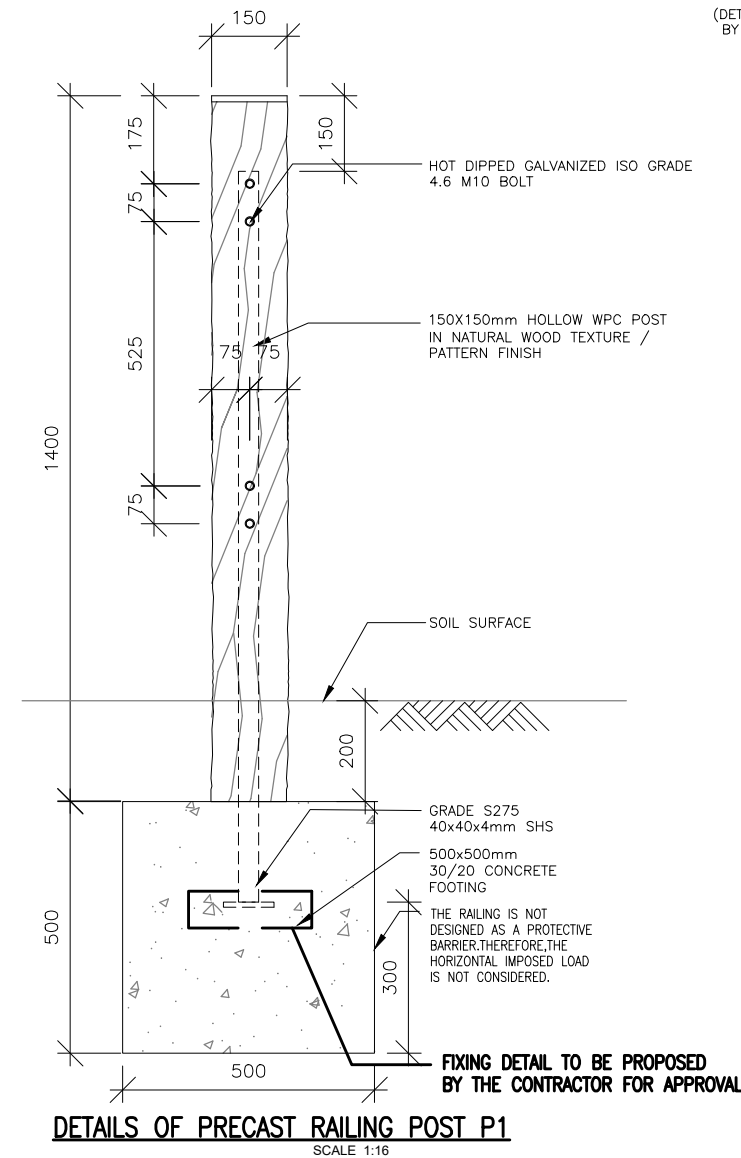


**DETAILS OF 50mm DIA. HOLE SIDE A**  
SCALE 1:10

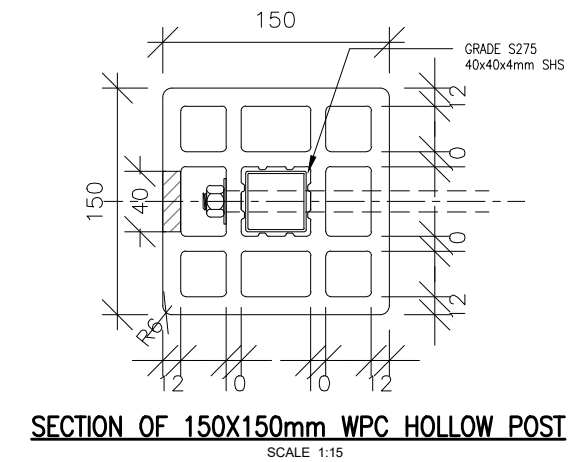
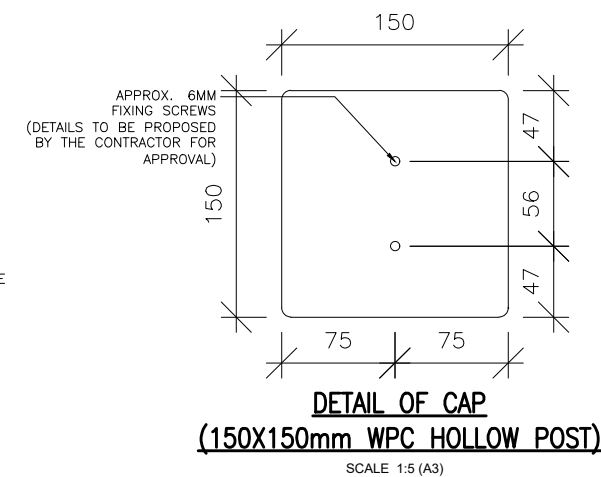


**DETAILS OF 50mm DIA. HOLE SIDE B**  
SCALE 1:10

PRECASAT RAILING POST P1 IN NATURAL WOOD TEXTURE / PATTERN FINISH



**DETAILS OF PRECAST RAILING POST P1**  
SCALE 1:16



B.D. REF.	/	/
F.S.D. REF.	/	/

- NOTES:**
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**AS-BUILT**

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

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SIGNATURE FOR SUBMISSION/ CONSTRUCTION

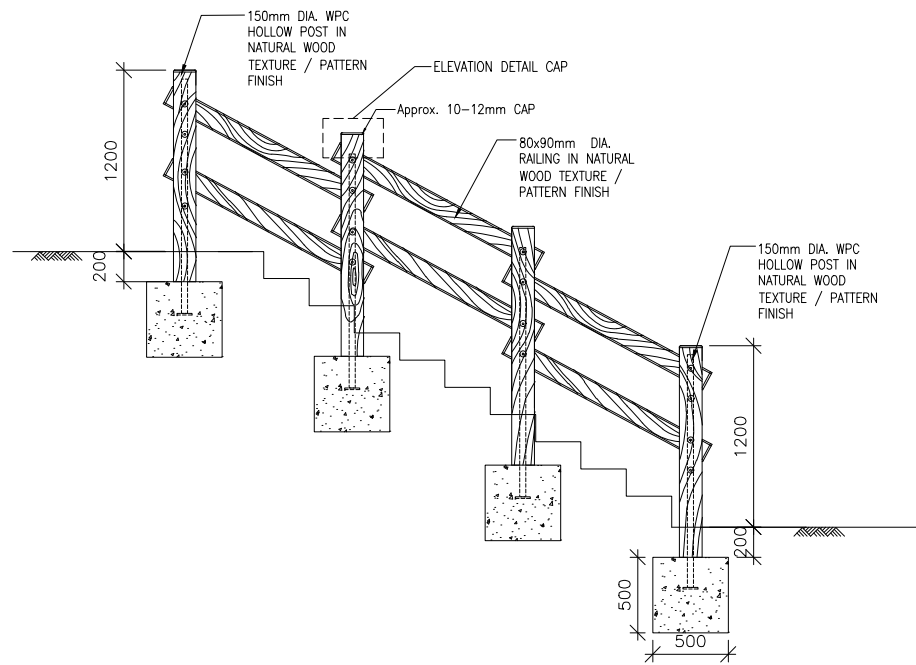
L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

PROJECT NO:	20222
DRAWN BY:	
DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	VT
SCALE:	
CAD FILE:	WAC_20222_C_PPM_007

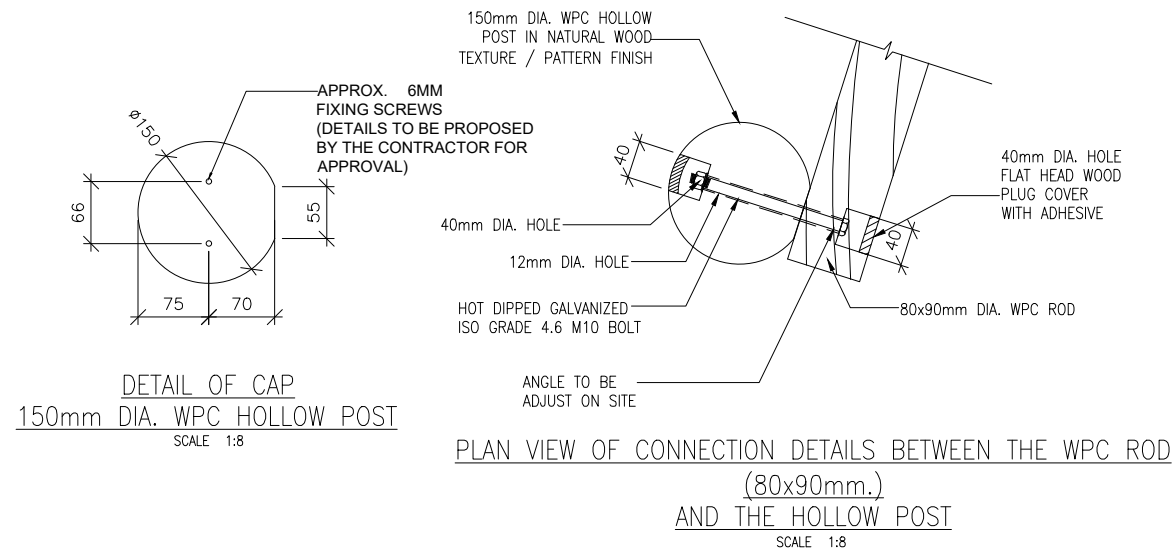
PROJECT:  
SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O (FU SHAN TO PO CHUE TAM)

DRAWING TITLE:  
TYPICAL DETAILS OF PRECAST MODULES - RAILING (TYPE 2)

DRAWING NO:	WAC/20222/C/PPM/007
REV:	-

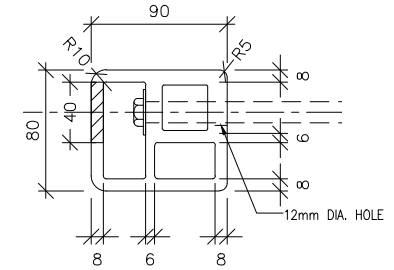


TYPICAL ELEVATION OF RAILING FOR STAIRCASE  
SCALE 1:50

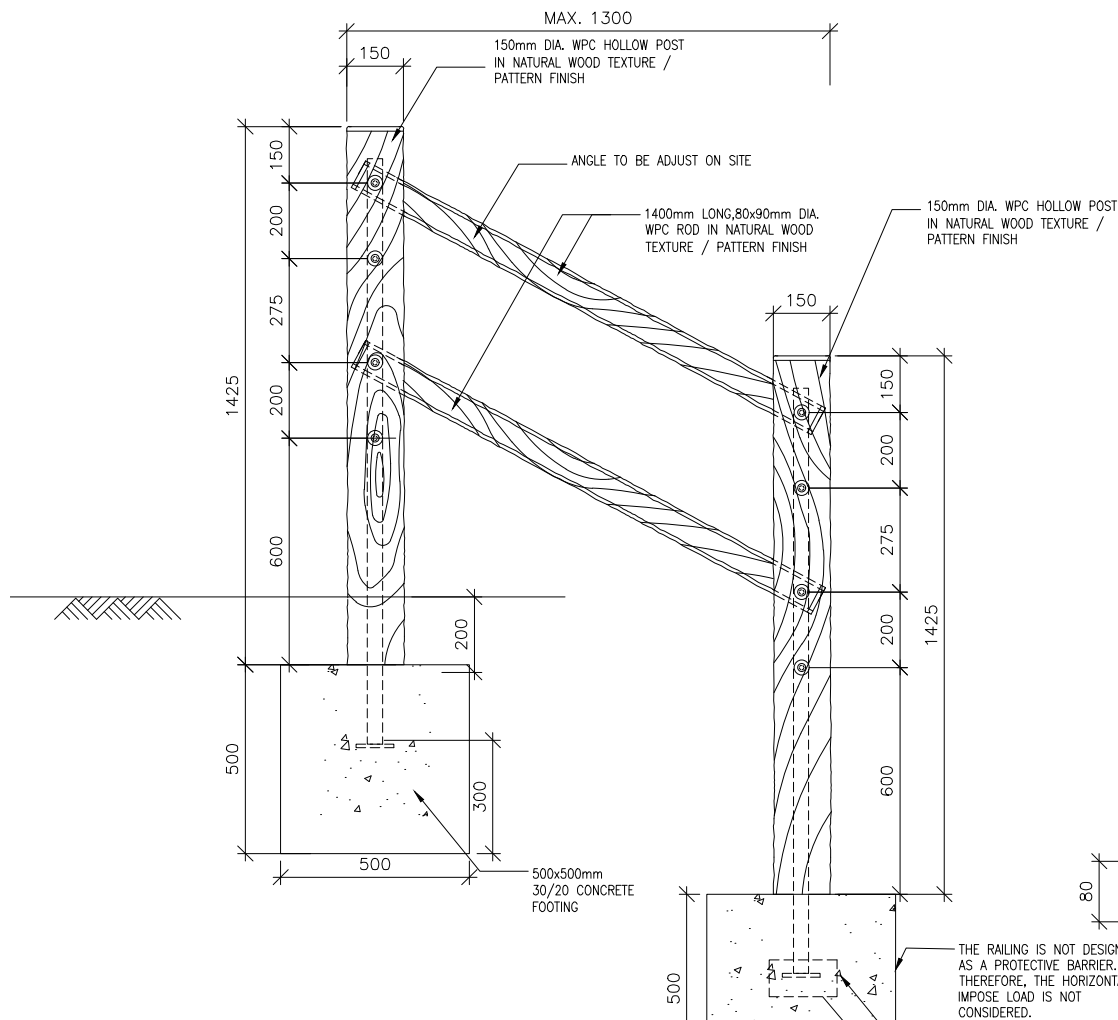


DETAIL OF CAP  
150mm DIA. WPC HOLLOW POST  
SCALE 1:8

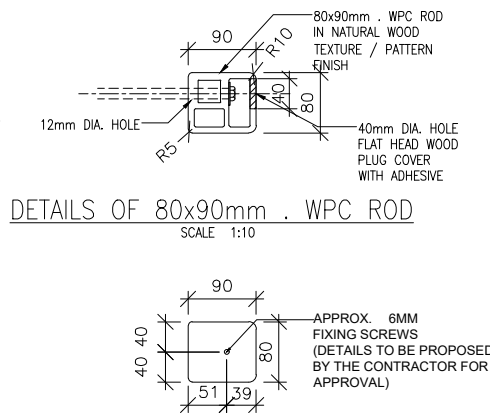
PLAN VIEW OF CONNECTION DETAILS BETWEEN THE WPC ROD  
(80x90mm.)  
AND THE HOLLOW POST  
SCALE 1:8



SECTION OF 90mm DIA. WPC ROD (R1)  
SCALE 1:5

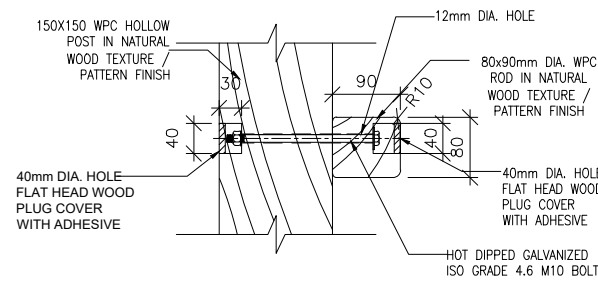


DETAILS OF PRECAST RAILING  
SCALE 1:20

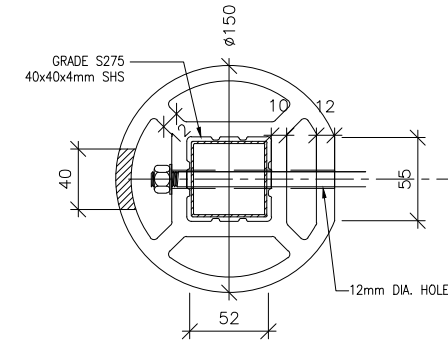


DETAILS OF 80x90mm WPC ROD  
SCALE 1:10

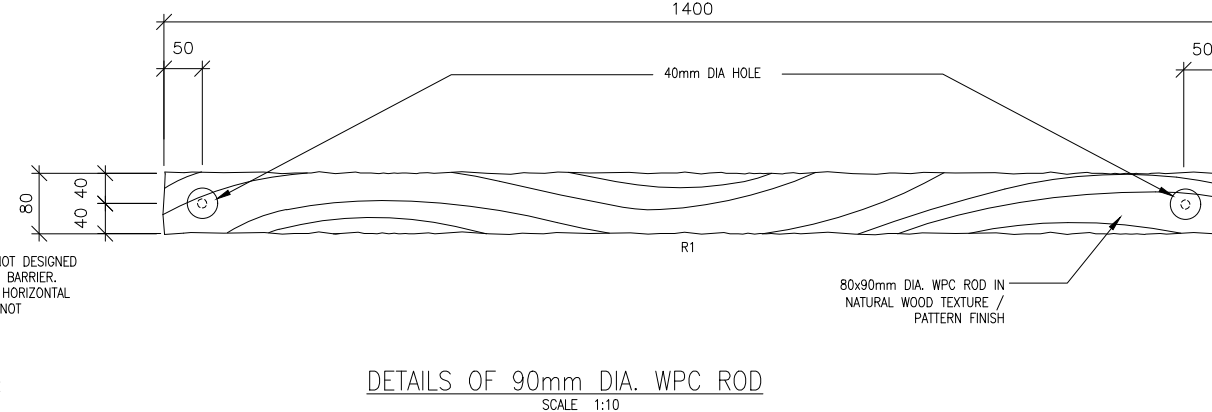
DETAILS OF CAP  
(80x90mm WPC ROD)  
SCALE 1:10



CONNECTION DETAILS BETWEEN THE WPC ROD  
(80x90mm.) AND THE HOLLOW POST  
SCALE 1:10



SECTION OF 150mm DIA. WPC HOLLOW POST  
SCALE 1:5



DETAILS OF 90mm DIA. WPC ROD  
SCALE 1:10

THE RAILING IS NOT DESIGNED AS A PROTECTIVE BARRIER. THEREFORE, THE HORIZONTAL IMPOSE LOAD IS NOT CONSIDERED.

500x500mm 30/20 CONCRETE FOOTING

FIXING DETAIL TO BE PROPOSED BY THE CONTRACTOR FOR APPROVAL

B.D. REF.	/	/
F.S.D. REF.	/	/

- NOTES:
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
  - ALL LEVEL ARE IN METRES WITH REFERENCE TO HONG KONG PRINCIPAL DATUM (mPD).
  - FOR GENERAL NOTES, REFER TO DRAWING NO. WAC/2022/MUN/CN/001 AND SPECIFICATION FOR THE WPC MATERIAL'S PROPERTIES.
  - PRE-ASSEMBLY TRIAL OF THE PRECAST MODULES SHALL BE CARRIED OUT AT MANUFACTURING FACTORY BEFORE DELIVERING TO THE SITE.
  - EACH PRECAST STEP SHALL NOT BE OVERLAPPING WHEN CONSTRUCTED IN SERIES.
  - COLOR AND PATTERN OF PPMs SHALL REFER TO DRAWING NO. WAC/2022/PPM/C/012.
  - FOR ALL RECTANGULAR PPMs, 6mm CHAMFER SHALL BE PLACED ON THE EDGE.
  - ON-SITE MODIFICATION, SUCH AS TRIMMING, INSITU CONCRETE MIXING, HOLE DRILLING AND ADJUSTING ANGLE, SHALL BE CARRIED OUT BY THE CONTRACTOR. SO THAT THE PPMs WILL FIT INTO THE ACTUAL SITE CONDITION.
  - FORMATION FOR STAIRS & STEP, SUCH AS CUT AND FILL OF THE GROUND SURFACE IN MINIMAL EXTENT, SHALL BE CARRIED OUT BY THE CONTRACTOR.
  - THE RAILING IS NOT DESIGNED AS A PROTECTIVE BARRIER. THEREFORE, THE HORIZONTAL IMPOSE LOAD IS NOT CONSIDERED.

**AS-BUILT**

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

ALL MEASUREMENTS MUST BE CHECKED AT THE SITE - DO NOT SCALE DRAWING  
ALL DRAWING SPECIFICATIONS AND THEIR COPY RIGHT ARE THE PROPERTY OF ENGINEERS, ARCHITECTS, DESIGNERS AND SHALL BE RETURNED AT THE COMPLETION OF THE WORK - THIS DRAWING IS NOT VALID FOR CONSTRUCTION PURPOSES UNLESS EXPRESSLY CERTIFIED.

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

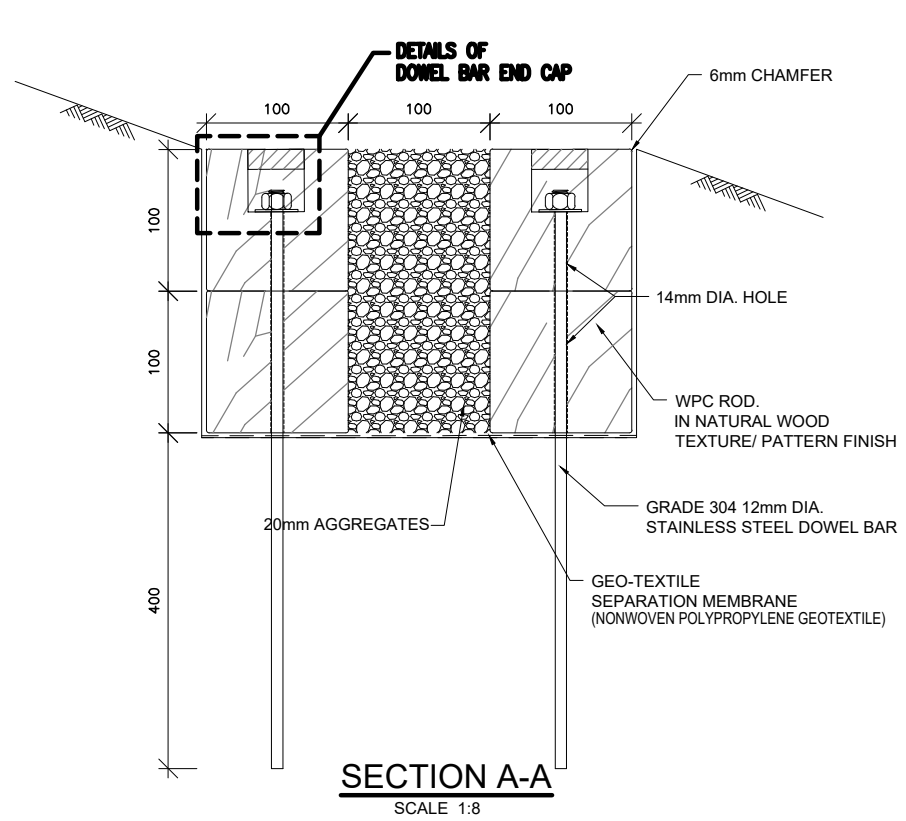
L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

PROJECT NO:	20222
DRAWN BY:	
DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	VT
SCALE:	
CAD FILE:	WAC_20222_C_PPM_008

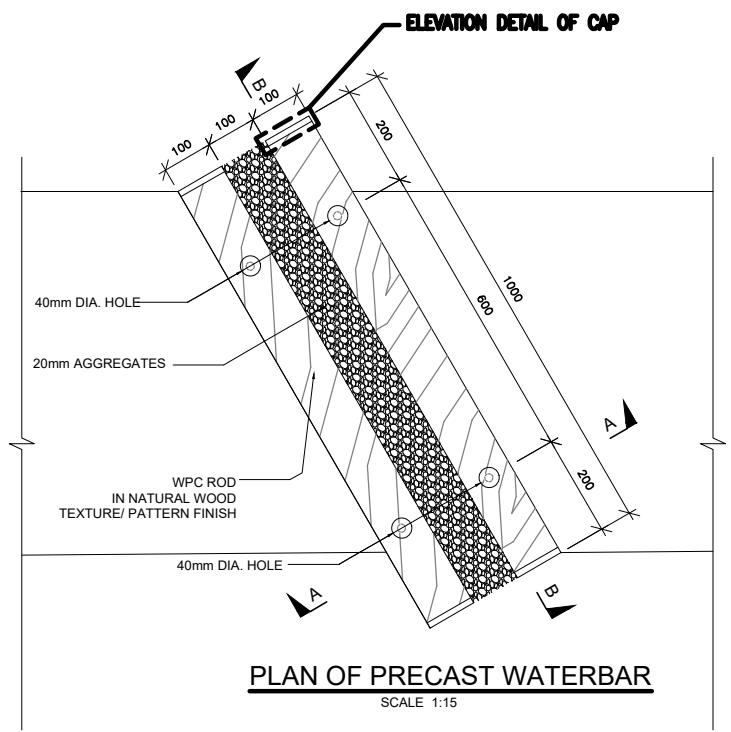
PROJECT:  
SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O (FU SHAN TO PO CHUE TAM)

DRAWING TITLE:  
TYPICAL DETAILS OF PRECAST MODULES - RAILING (TYPE 3)

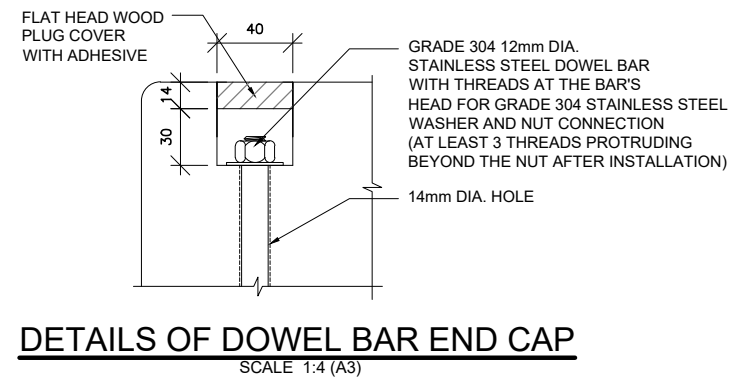
DRAWING NO:	WAC/20222/C/PPM/008
REV:	-



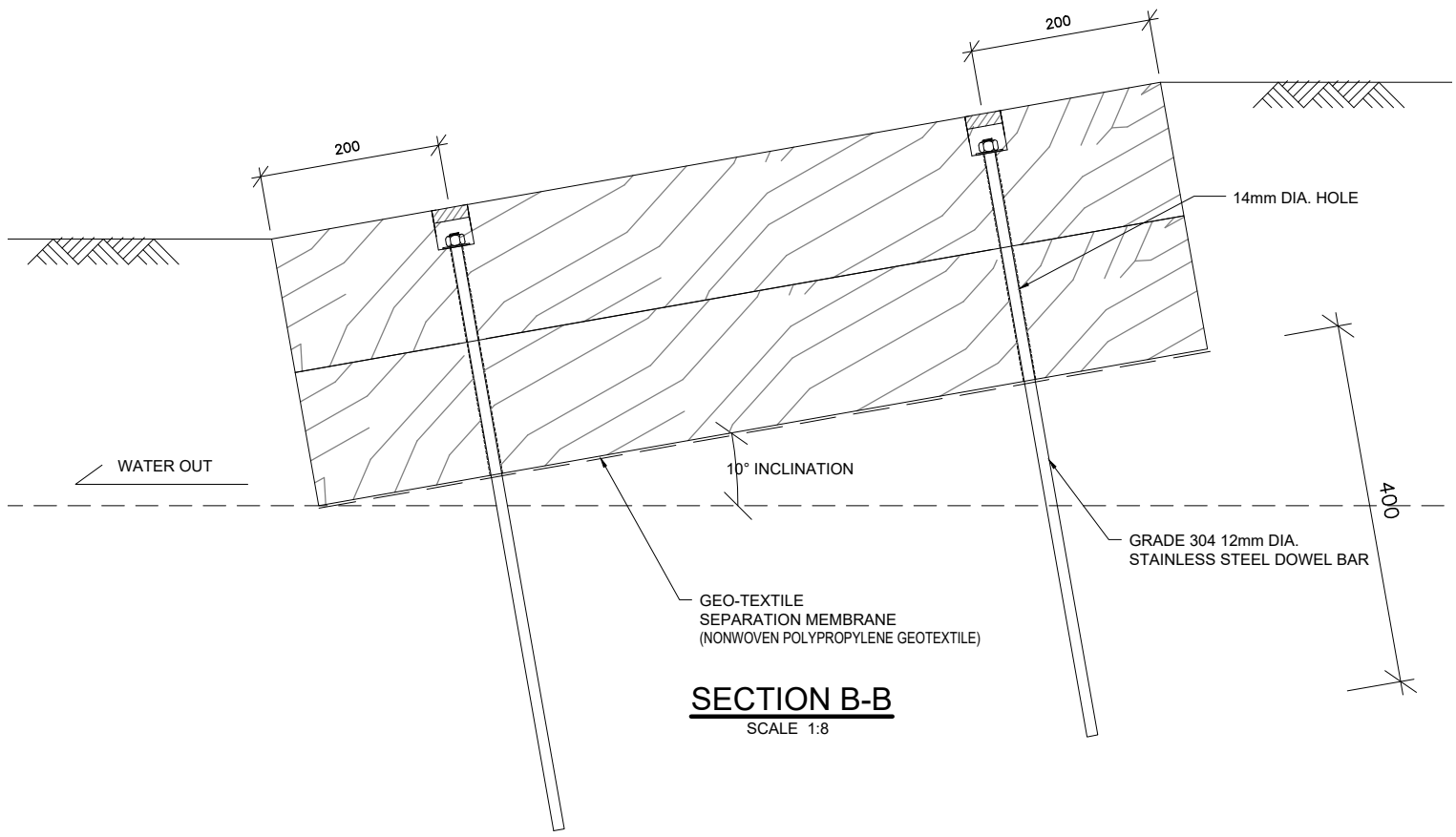
**SECTION A-A**  
SCALE 1:8



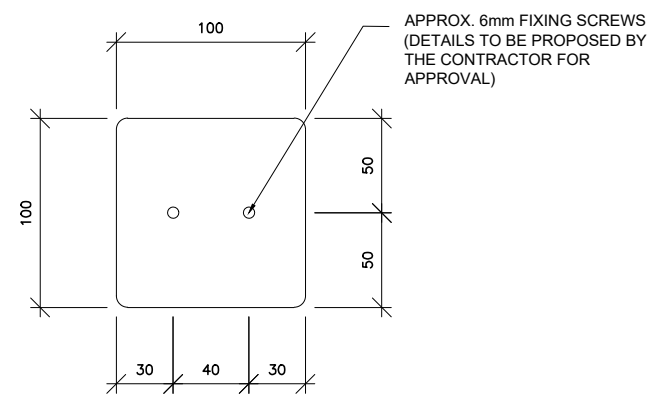
**PLAN OF PRECAST WATERBAR**  
SCALE 1:15



**DETAILS OF DOWEL BAR END CAP**  
SCALE 1:4 (A3)



**SECTION B-B**  
SCALE 1:8



**ELEVATION DETAIL OF CAP**  
SCALE 1:4 (A3)

B.D. REF.	/	/
F.S.D. REF.	/	/

- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
  2. ALL LEVEL ARE IN METRES WITH REFERENCE TO HONG KONG PRINCIPAL DATUM (mPD).
  3. FOR GENERAL NOTES, REFER TO DRAWING NO. WAC/2022/MJW/GN/001 AND SPECIFICATION FOR THE WPC MATERIAL'S PROPERTIES.
  4. PRE-ASSEMBLY TRIAL OF THE PRECAST MODULES SHALL BE CARRIED OUT AT MANUFACTURING FACTORY BEFORE DELIVERING TO THE SITE.
  5. EACH PRECAST STEP SHALL NOT BE OVERLAPPING WHEN CONSTRUCTED IN SERIES.
  6. COLOR AND PATTERN OF PPMs SHALL REFER TO DRAWING NO. WAC/2022/PPM/C/012.
  7. FOR ALL RECTANGULAR PPMs, 6mm CHAMFER SHALL BE PLACED ON THE EDGE.
  8. ON-SITE MODIFICATION, SUCH AS TRIMMING, INSITU CONCRETE MIXING, HOLE DRILLING AND ADJUSTING ANGLE, SHALL BE CARRIED OUT BY THE CONTRACTOR. SO THAT THE PPMs WILL FIT INTO THE ACTUAL SITE CONDITION.
  9. FORMATION FOR STAIRS & STEP, SUCH AS CUT AND FILL OF THE GROUND SURFACE IN MINIMAL EXTENT, SHALL BE CARRIED OUT BY THE CONTRACTOR.
  10. THE LENGTH OF WATERBAR SHALL BE ADJUSTED BASED ON SITE CONDITION.

**AS-BUILT**

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
ALL MEASUREMENTS MUST BE CHECKED AT THE SITE - DO NOT SCALE DRAWING ALL DRAWING SPECIFICATIONS AND THEIR COPY RIGHT ARE THE PROPERTY OF ENGINEERS, ARCHITECTS, DESIGNERS AND SHALL BE RETURNED AT THE COMPLETION OF THE WORK - THIS DRAWING IS NOT VALID FOR CONSTRUCTION PURPOSES UNLESS EXPRESSLY CERTIFIED.					

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

\_\_\_\_\_  
L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

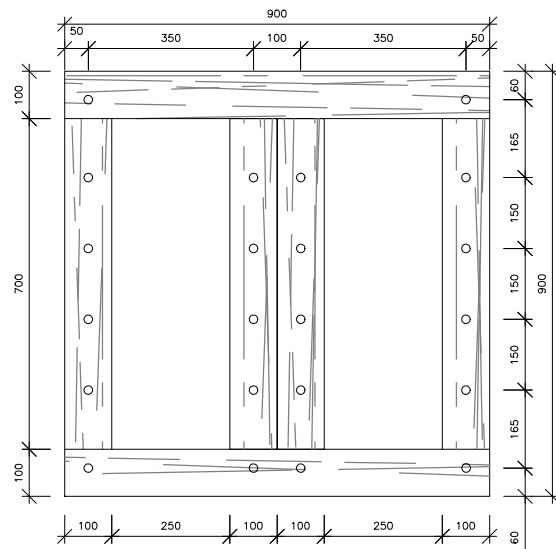
PROJECT NO:	2022
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	TC DF
APPROVED BY:	VT
SCALE:	AS SHOWN
CAD FILE:	WAC_2022_C_PPM_009

PROJECT:  
**SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)**

DRAWING TITLE:  
**TYPICAL DETAILS OF  
PRECAST MODULES -  
WATERBAR**

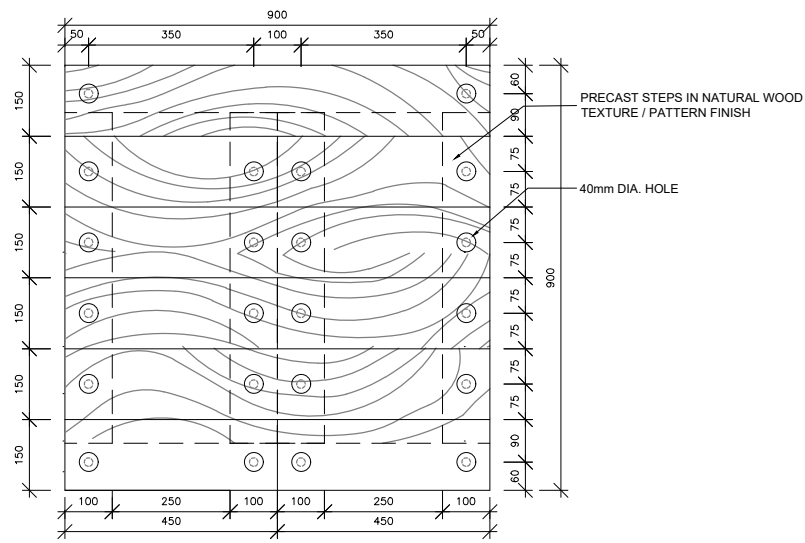
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REV:	-





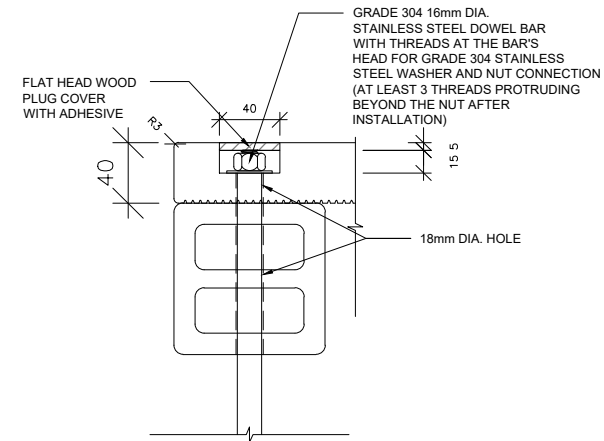
**PLAN OF PRECAST BOARDWALK  
(WITHOUT TOP WPC STRIPES)**

SCALE 1:16



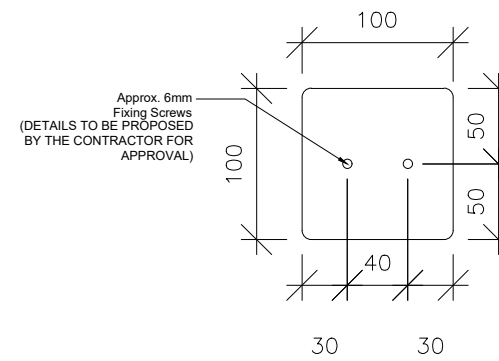
**PLAN OF PRECAST BOARDWALK**

SCALE 1:16



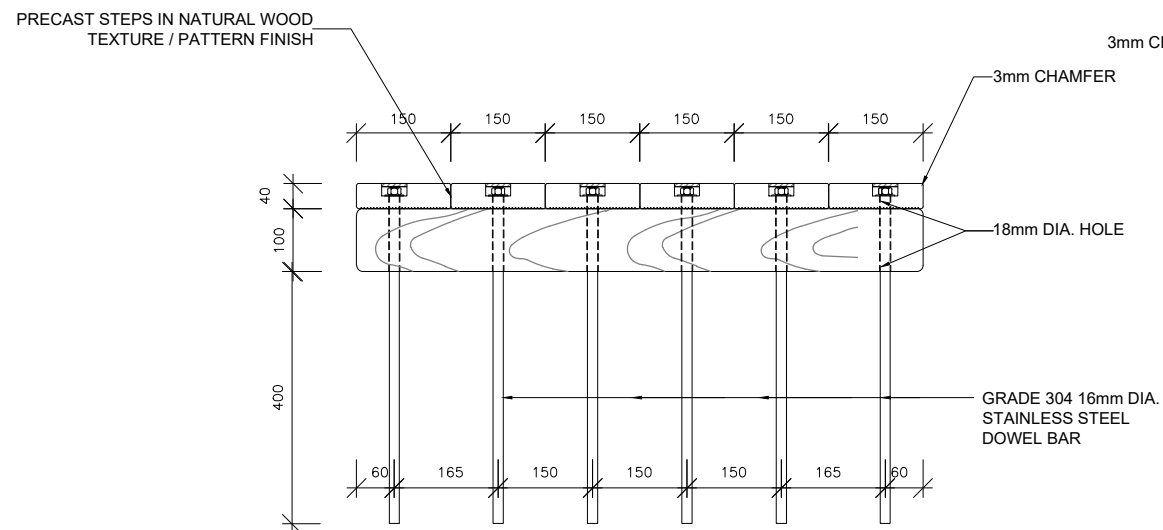
**DETAILS OF DOWEL BAR END CAP**

SCALE 1:5 (A3)



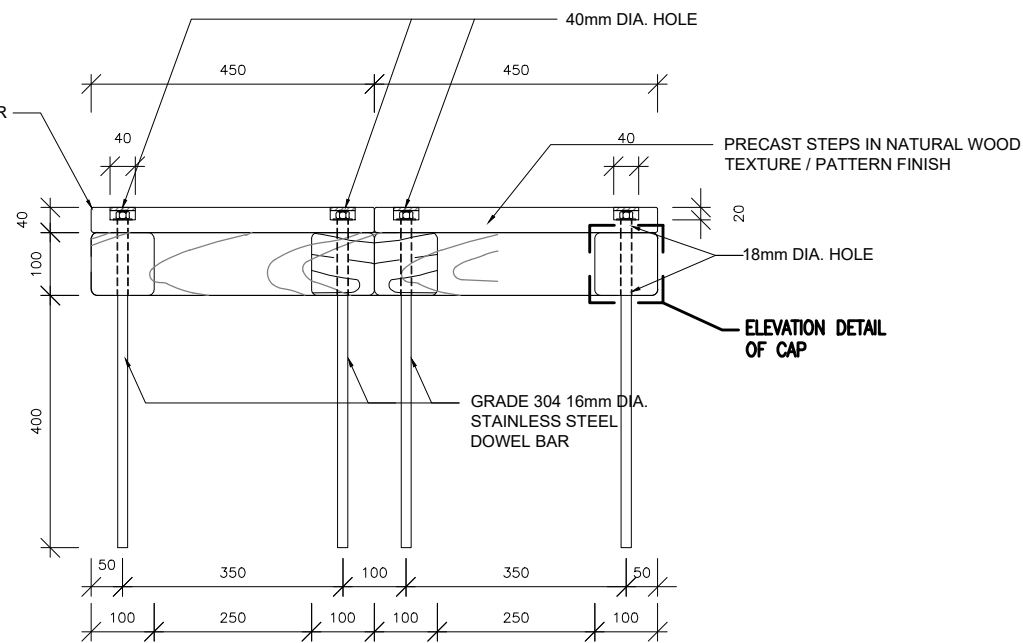
**ELEVATION DETAIL OF CAP**

SCALE 1:5 (A3)



**ELEVATION A OF PRECAST BOARDWALK**

SCALE 1:12



**ELEVATION B OF PRECAST BOARDWALK**

SCALE 1:12

B.D. REF.	/	/
F.S.D. REF.	/	/

**NOTES:**

- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
- ALL LEVEL ARE IN METRES WITH REFERENCE TO HONG KONG PRINCIPAL DATUM (mPD).
- FOR GENERAL NOTES, REFER TO DRAWING NO. WAC/20222/MUM/CN/001 AND SPECIFICATION FOR THE WPC MATERIAL'S PROPERTIES.
- PRE-ASSEMBLY TRIAL OF THE PRECAST MODULES SHALL BE CARRIED OUT AT MANUFACTURING FACTORY BEFORE DELIVERING TO THE SITE.
- EACH PRECAST STEP SHALL NOT BE OVERLAPPING WHEN CONSTRUCTED IN SERIES.
- COLOR AND PATTERN OF PPMs SHALL REFER TO DRAWING NO. WAC/20222/PPM/C/012.
- FOR ALL RECTANGULAR PPMs, 6mm CHAMFER SHALL BE PLACED ON THE EDGE.
- ON-SITE MODIFICATION, SUCH AS TRIMMING, INSITU CONCRETE MIXING, HOLE DRILLING AND ADJUSTING ANGLE, SHALL BE CARRIED OUT BY THE CONTRACTOR. SO THAT THE PPMs WILL FIT INTO THE ACTUAL SITE CONDITION.
- FORMATION FOR STAIRS & STEP, SUCH AS CUT AND FILL OF THE GROUND SURFACE IN MINIMAL EXTENT, SHALL BE CARRIED OUT BY THE CONTRACTOR.

**AS-BUILT**

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

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= ALL DRAWING SPECIFICATIONS AND THEIR COPY RIGHT ARE THE PROPERTY OF ENGINEERS, ARCHITECTS, DESIGNERS AND SHALL BE RETURNED AT THE COMPLETION OF THE WORK - THIS DRAWING IS NOT VALID FOR CONSTRUCTION PURPOSES UNLESS EXPRESSLY CERTIFIED.

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	TC DF
APPROVED BY:	VT
SCALE:	AS SHOWN
CAD FILE:	WAC_20222_C_PPM_010

PROJECT:  
**SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)**

DRAWING TITLE:  
**TYPICAL DETAILS OF  
PRECAST MODULES -  
BOARDWALK**

DRAWING NO:	WAC/20222/C/PPM/010
REV:	-

B.D. REF.	/	/
F.S.D. REF.	/	/

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
  - ALL LEVEL ARE IN METRES WITH REFERENCE TO HONG KONG PRINCIPAL DATUM (mPD).
  - FOR GENERAL NOTES, REFER TO DRAWING NO. WAC/20222/MUM/CN/001 AND SPECIFICATION FOR THE WPC MATERIAL'S PROPERTIES.
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**AS-BUILT**

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

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SIGNATURE FOR SUBMISSION/ CONSTRUCTION

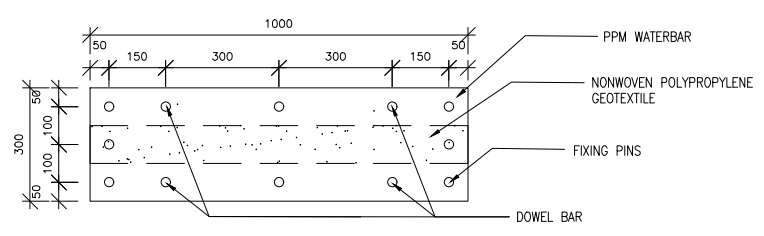
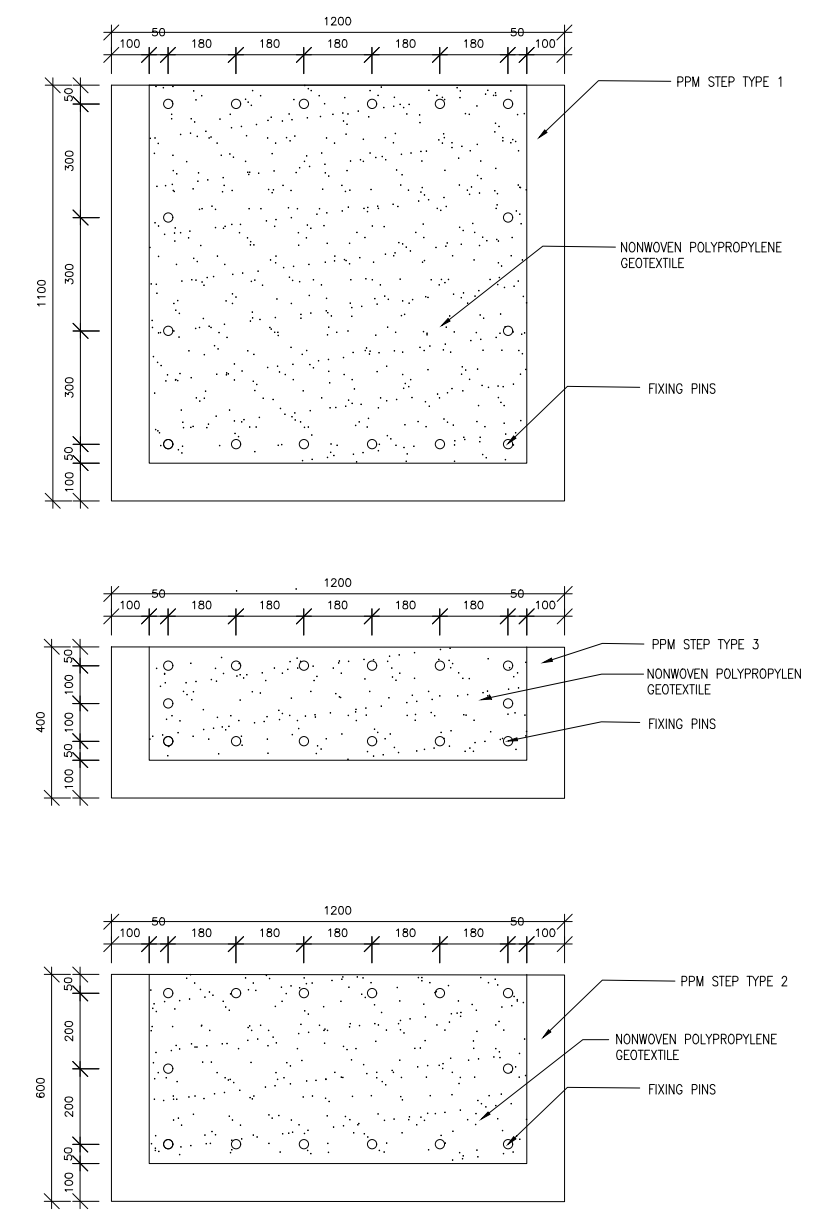
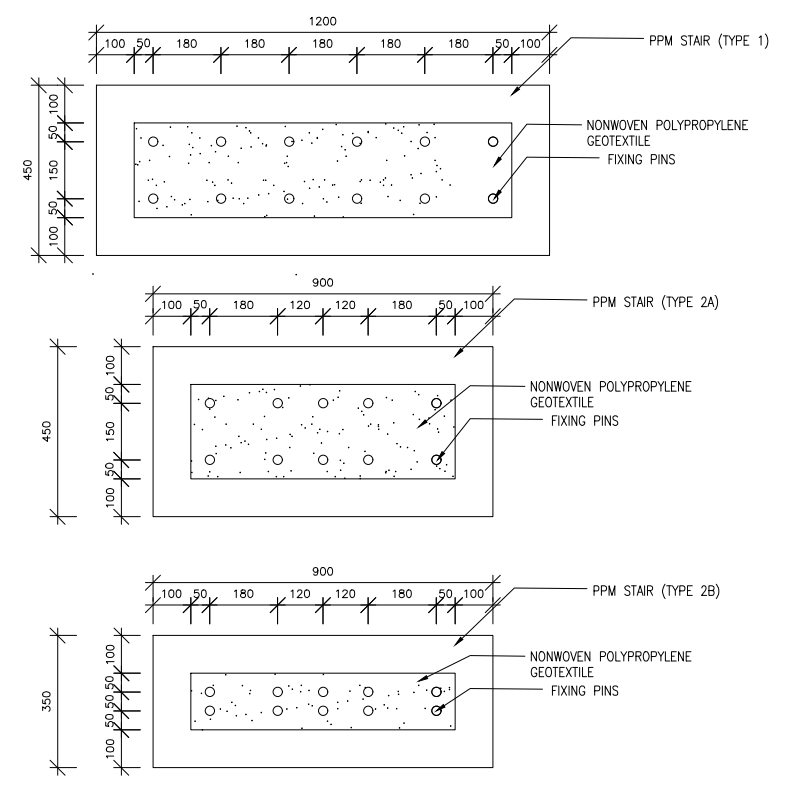
L.T. HUNG  
 HOP TAI CONSTRUCTION CO. L.T.D.

PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	TC DF
APPROVED BY:	VT
SCALE:	AS SHOW
CAD FILE:	WAC_20222_C_PPM_011

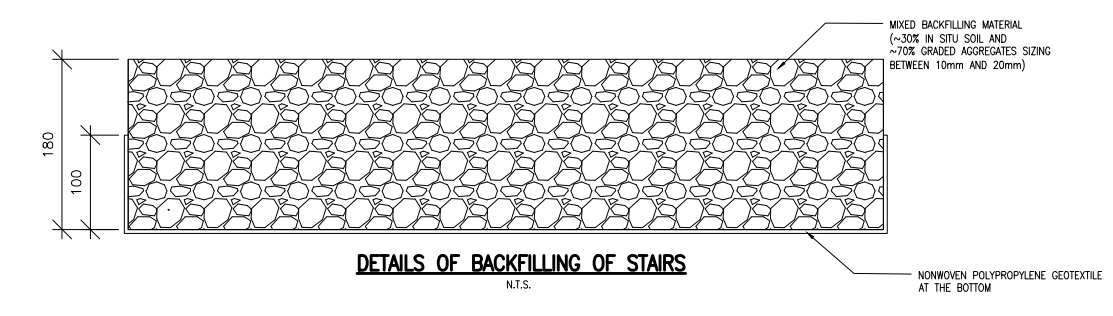
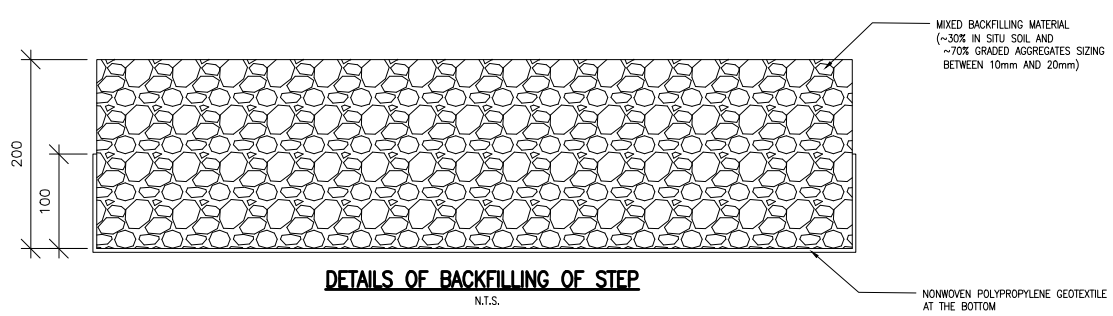
PROJECT:  
 SLO 15/2020  
 TRAIL IMPROVEMENT WORKS IN TAI O  
 (FU SHAN TO PO CHUE TAM)

DRAWING TITLE:  
 FIXING DETAILS OF GEOTEXTILE AND DETAILS OF BACKFILLING

DRAWING NO:	WAC/20222/C/PPM/011	REV:	-
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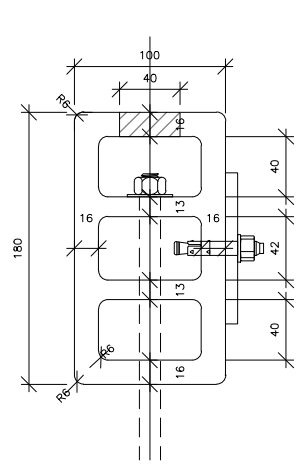


**FIXING DETAILS OF GEOTEXTILE**  
 SCALE 1:20

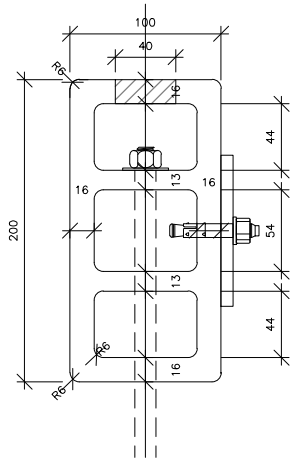


**DIMENSIONS OF MOULDS**

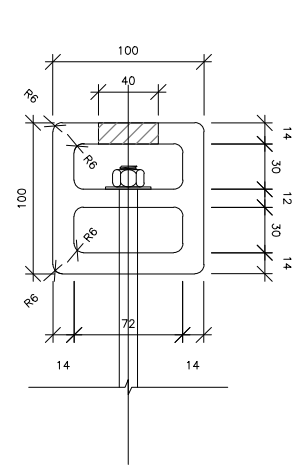
NOTES: TRIAL PANEL OF WPC MATERIAL FOR OPTIMIZING THE SOLIDITY RATIO AND LABORATORY TESTING FOR MATERIAL PROPERTIES AND SLIP RESISTANCE ON MATERIAL SURFACE.



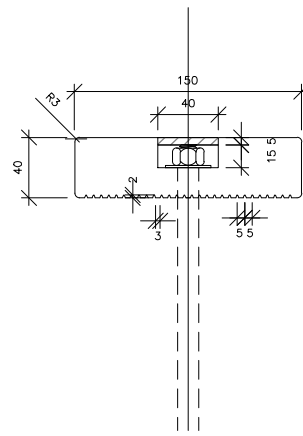
**STAIR**  
SCALE 1:10



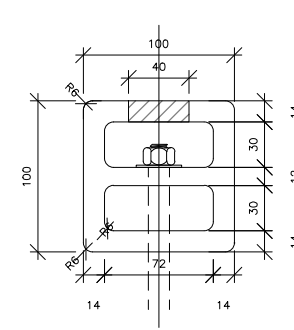
**STEP TYPE 1-3**  
SCALE 1:10



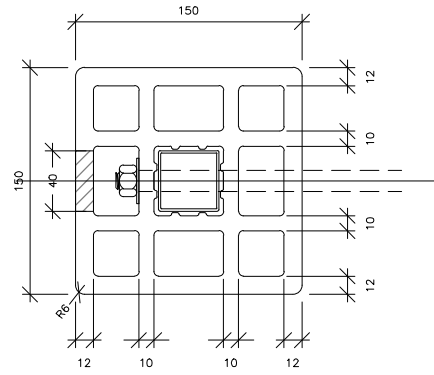
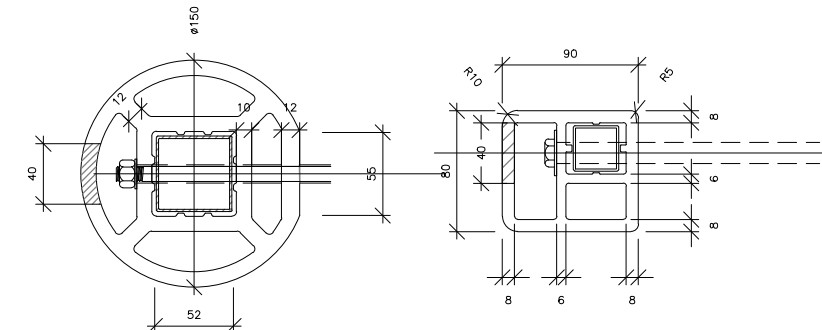
**WATER BAR**  
SCALE 1:10



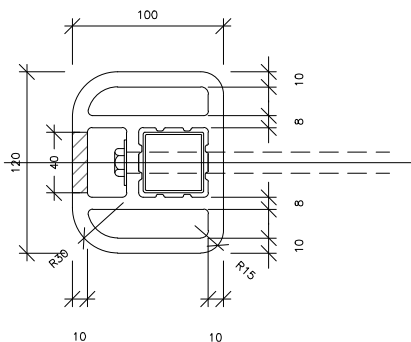
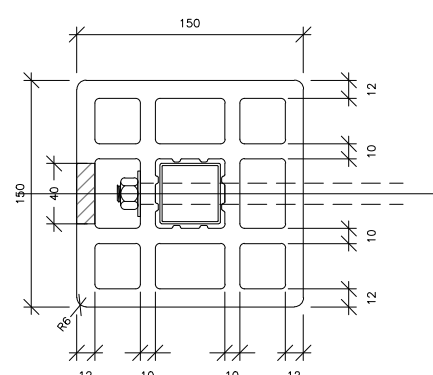
**BOARDWALK**  
SCALE 1:10



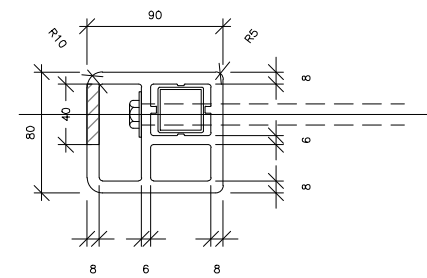
**RAILING TYPE 3**  
SCALE 1:10



**RAILING TYPE 2**  
SCALE 1:10



**RAILING TYPE 1**  
SCALE 1:10



B.D. REF.	/	/
F.S.D. REF.	/	/

- NOTES:**
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  - ALL LEVEL ARE IN METRES WITH REFERENCE TO HONG KONG PRINCIPAL DATUM (mPD).
  - FOR GENERAL NOTES, REFER TO DRAWING NO. WAC/20222/MUM/CN/001 AND SPECIFICATION FOR THE WPC MATERIAL'S PROPERTIES.
  - PRE-ASSEMBLY TRIAL OF THE PRECAST MODULES SHALL BE CARRIED OUT AT MANUFACTURING FACTORY BEFORE DELIVERING TO THE SITE.
  - EACH PRECAST STEP SHALL NOT BE OVERLAPPING WHEN CONSTRUCTED IN SERIES.
  - COLOR AND PATTERN OF PPMs SHALL REFER TO DRAWING NO. WAC/20222/PPM/C/012.
  - FOR ALL RECTANGULAR PPMs, 6mm CHAMFER SHALL BE PLACED ON THE EDGE.
  - ON-SITE MODIFICATION, SUCH AS TRIMMING, INSITU CONCRETE MIXING, HOLE DRILLING AND ADJUSTING ANGLE, SHALL BE CARRIED OUT BY THE CONTRACTOR. SO THAT THE PPMs WILL FIT INTO THE ACTUAL SITE CONDITION.
  - FORMATION FOR STAIRS & STEP, SUCH AS CUT AND FILL OF THE GROUND SURFACE IN MINIMAL EXTENT, SHALL BE CARRIED OUT BY THE CONTRACTOR.
  - THE CAPPING DETAIL SHALL BE PROVIDED BY THE CONTRACTOR FOR THE ENGINEER'S APPROVAL.
  - THE BOLT CONNECTIONS AND STRUCTURAL STEEL SECTIONS ARE INDICATIVE ONLY.

**LEGEND:**  
 FLAT HEAD WOOD PLUG COVER WITH ADHESIVE

**AS-BUILT**

REV. DATE. DESCRIPTION. DRAWN. CHECKED. APPROVED.  
 ALL MEASUREMENTS MUST BE CHECKED AT THE SITE - DO NOT SCALE DRAWING  
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SIGNATURE FOR SUBMISSION/ CONSTRUCTION  
 L.T. HUNG  
 HOP TAI CONSTRUCTION CO. L.T.D.

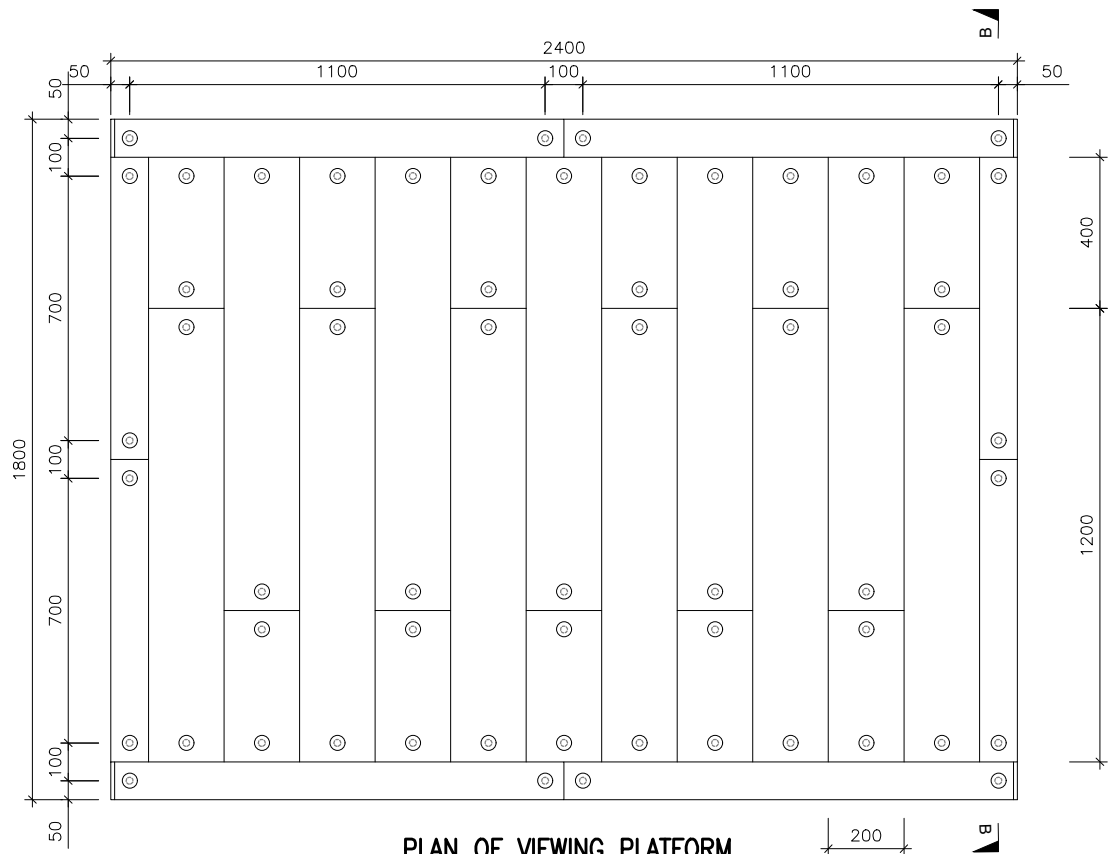
PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	TC DF
APPROVED BY:	VT
SCALE:	AS SHOW
CAD FILE:	WAC_20222_C_PPM_012

PROJECT:  
 SLO 15/2020  
 TRAIL IMPROVEMENT WORKS IN TAI O (FU SHAN TO PO CHUE TAM)

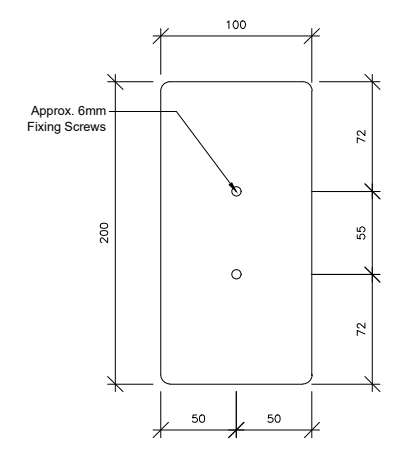
DRAWING TITLE:  
 COLOR CODE & WOOD GRAIN PATTERN DRAWING

DRAWING NO:	WAC/20222/C/PPM/012
REV:	-

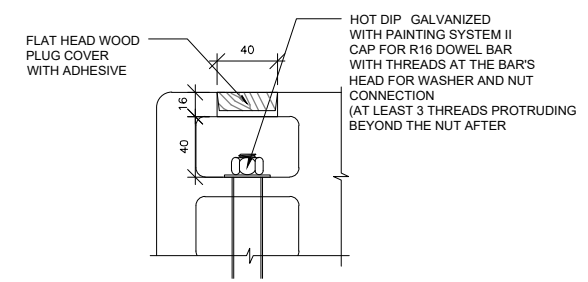




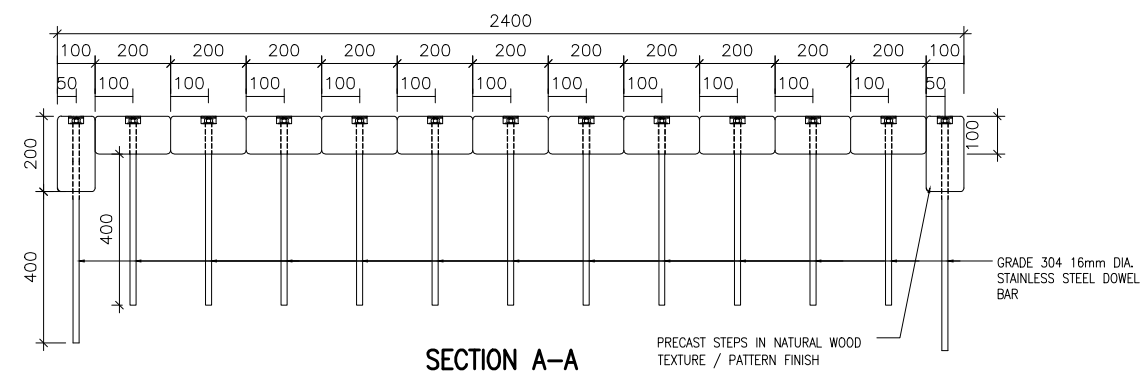
**PLAN OF VIEWING PLATFORM**  
SCALE 1:20 (A3)



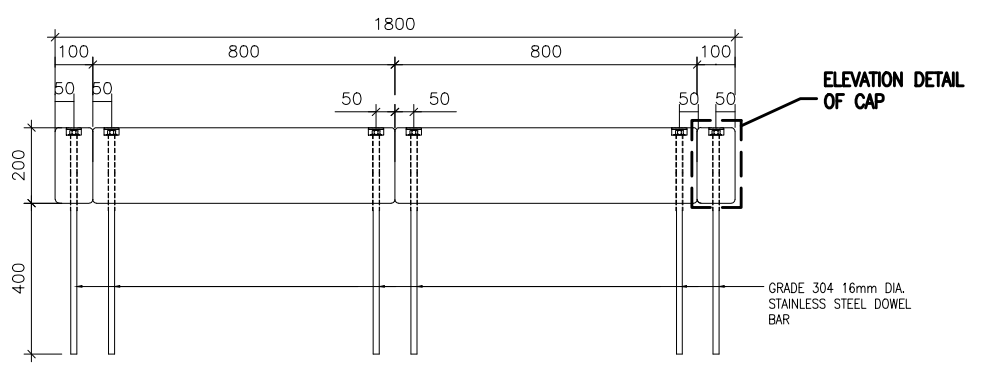
**ELEVATION OF DETAILED CAP**  
SCALE 1:5 (A3)



**DETAILS OF DOWEL BAR END CAP**  
SCALE 1:5 (A3)



**SECTION A-A**  
SCALE 1:20 (A3)



**SECTION B-B**  
SCALE 1:20 (A3)

B.D. REF.	/	/
F.S.D. REF.	/	/

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
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  - PRE-ASSEMBLY TRIAL OF THE PRECAST MODULES SHALL BE CARRIED OUT AT MANUFACTURING FACTORY BEFORE DELIVERING TO THE SITE.
  - EACH PRECAST STEP SHALL NOT BE OVERLAPPING WHEN CONSTRUCTED IN SERIES.
  - COLOR AND PATTERN OF PPMs SHALL REFER TO DRAWING NO. WAC/20222/PPM/C/012.
  - FOR ALL RECTANGULAR PPMs, 6mm CHAMFER SHALL BE PLACED ON THE EDGE.
  - ON-SITE MODIFICATION, SUCH AS TRIMMING, INSITU CONCRETE MIXING, HOLE DRILLING AND ADJUSTING ANGLE, SHALL BE CARRIED OUT BY THE CONTRACTOR. SO THAT THE PPMs WILL FIT INTO THE ACTUAL SITE CONDITION.
  - FORMATION FOR STAIRS & STEP, SUCH AS CUT AND FILL OF THE GROUND SURFACE IN MINIMAL EXTENT, SHALL BE CARRIED OUT BY THE CONTRACTOR.

**AS-BUILT**

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

ALL MEASUREMENTS MUST BE CHECKED AT THE SITE - DO NOT SCALE DRAWING  
= ALL DRAWING SPECIFICATIONS AND THEIR COPY RIGHT ARE THE PROPERTY OF ENGINEERS, ARCHITECTS, DESIGNERS AND SHALL BE RETURNED AT THE COMPLETION OF THE WORK - THIS DRAWING IS NOT VALID FOR CONSTRUCTION PURPOSES UNLESS EXPRESSLY CERTIFIED.

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

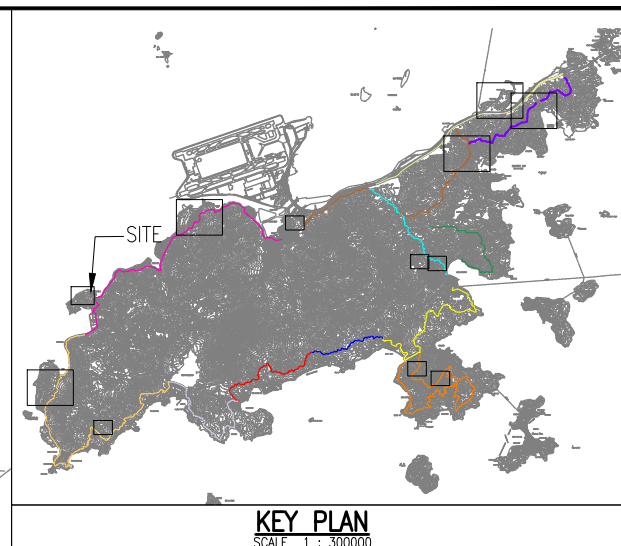
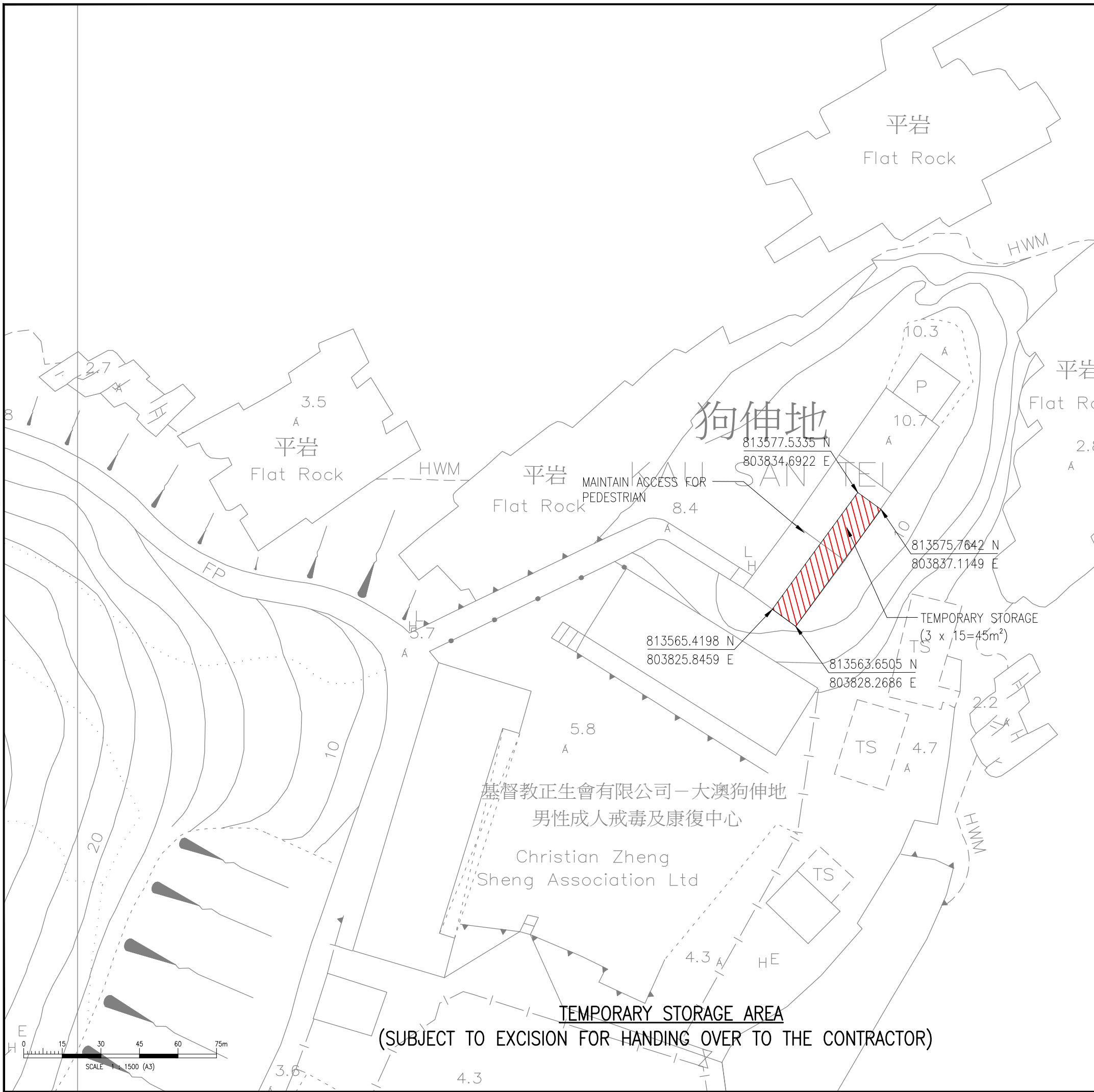
L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	TC DF
APPROVED BY:	VT
SCALE:	AS SHOWN
CAD FILE:	WAC_20222_C_PPM_010

PROJECT:  
SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O (FU SHAN TO PO CHUE TAM)

DRAWING TITLE:  
TYPICAL DETAILS OF PRECAST MODULES - VIEWING PLATFORM

DRAWING NO:	WAC/20222/C/PPM/013
REV:	-



B.D. REF. / /  
F.S.D. REF. / /

- NOTES:
1. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE TO THE SECURITY OF THE TEMPORARY STORAGE AREA. ANY LOST OF MATERIAL IN THE ABOVE MENTIONED LOCATION SHALL BE COVERED BY THE CONTRACTOR.
  2. THE CONTRACTOR SHALL BE RESPONSIBLE TO KEEP THE MATERIAL PROTECTED IN GOOD CONDITION FOR CONSTRUCTION.
  3. THE CONTRACTOR SHALL MAINTAIN ACCESS FOR PEDESTRIAN TO THE PAVILION IN KAU SAN TEI.

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
ALL MEASUREMENTS MUST BE CHECKED AT THE SITE - DO NOT SCALE DRAWING - ALL DRAWING SPECIFICATIONS AND THEIR COPY RIGHT ARE THE PROPERTY OF ENGINEERS, ARCHITECTS, DESIGNERS AND SHALL BE RETURNED AT THE COMPLETION OF THE WORK - THIS DRAWING IS NOT VALID FOR CONSTRUCTION PURPOSES UNLESS EXPRESSLY CERTIFIED.					

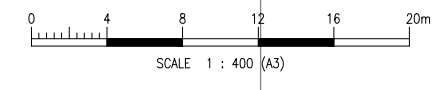
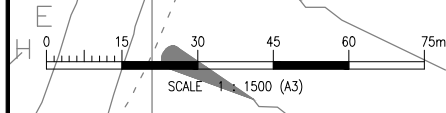
SIGNATURE FOR SUBMISSION/ CONSTRUCTION

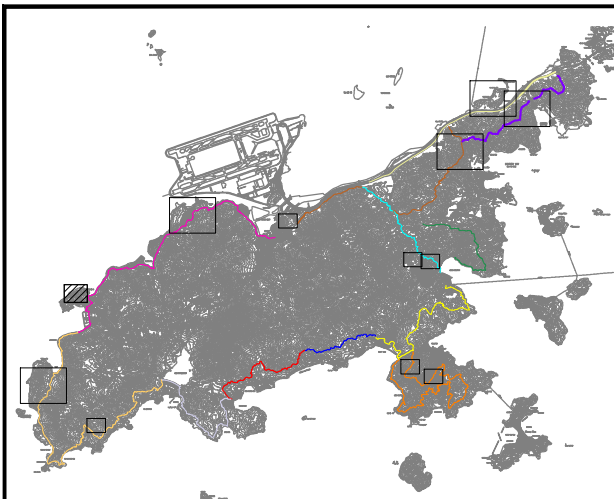
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DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	DF TC
APPROVED BY:	VT
SCALE:	A3 1:2500
CAD FILE:	WAC_20222_MUW_C_009

PROJECT:  
**SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)**

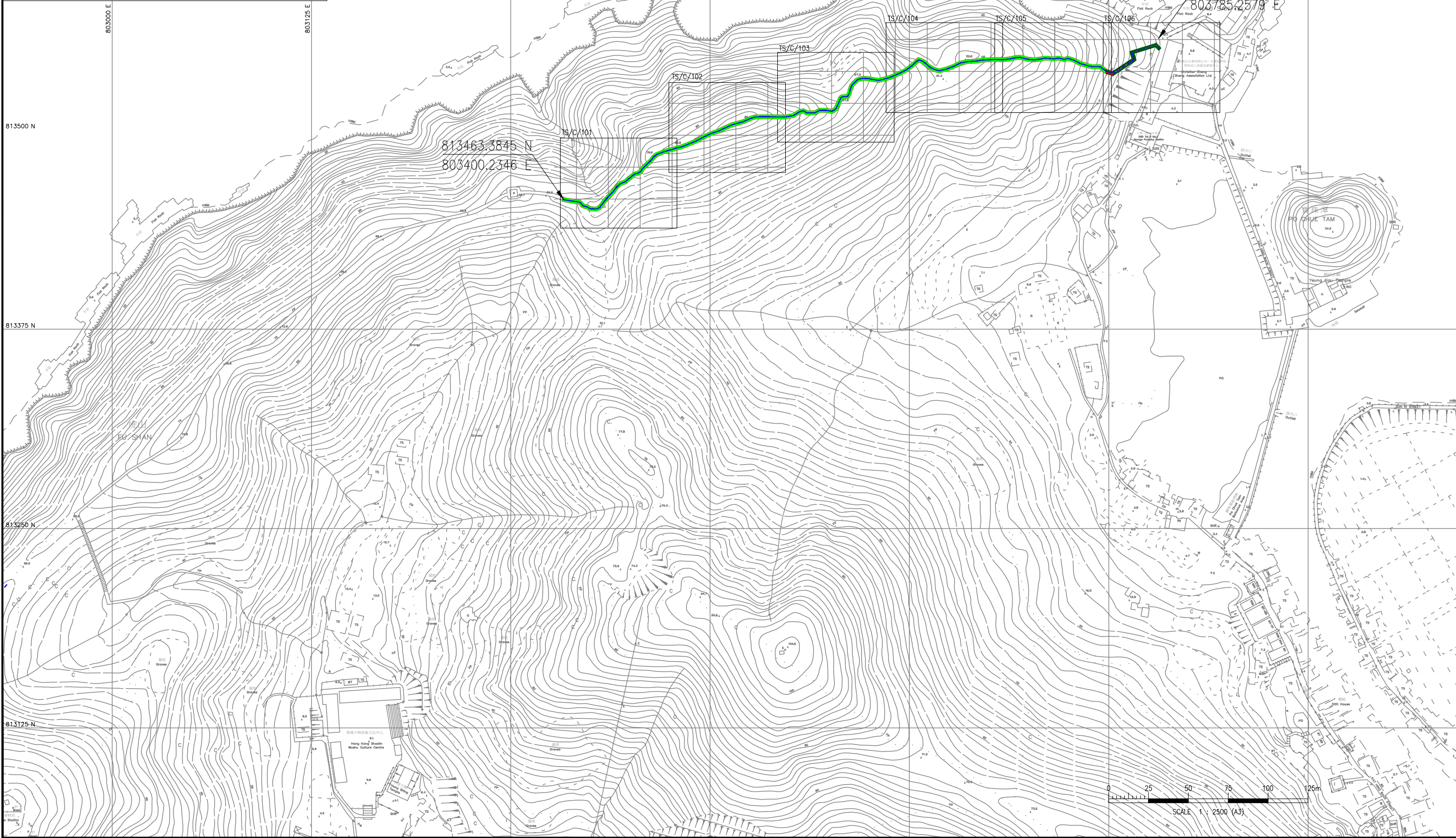
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**TEMPORARY STORAGE AREA**

DRAWING NO:	WAC/20222/MUW/C/009
REV:	-







**KEY PLAN**  
SCALE 1 : 300000



B.D. REF. / /  
F.S.D. REF. / /

- LEGEND:
-  TREE PRUNING AREA
  -  HYDROSEEDING AND MAKE GOOD OF THE SOIL PROFILE TO MATCH WITH THE EXISTING GROUND LEVEL

**AS-BUILT**

REV. DATE. DESCRIPTION. DRAWN. CHECKED. APPROVED.  
ALL MEASUREMENTS MUST BE CHECKED AT THE SITE - DO NOT SCALE DRAWING - ALL DRAWING SPECIFICATIONS AND THEIR COPY RIGHT ARE THE PROPERTY OF ENGINEERS, ARCHITECTS, DESIGNERS AND SHALL BE RETURNED AT THE COMPLETION OF THE WORK - THIS DRAWING IS NOT VALID FOR CONSTRUCTION PURPOSES UNLESS EXPRESSLY CERTIFIED.

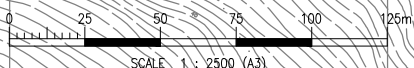
SIGNATURE FOR SUBMISSION/ CONSTRUCTION  
  
L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

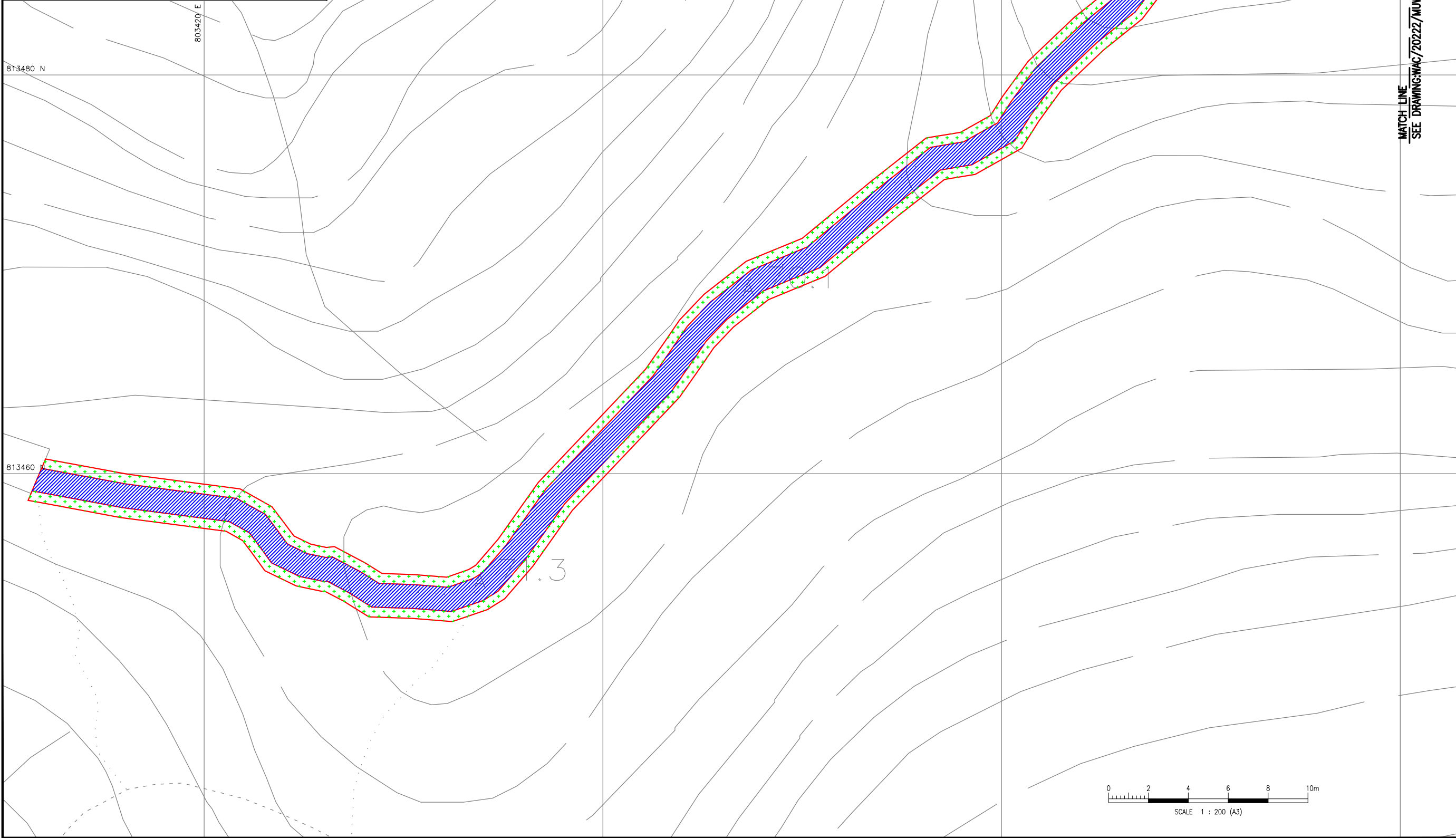
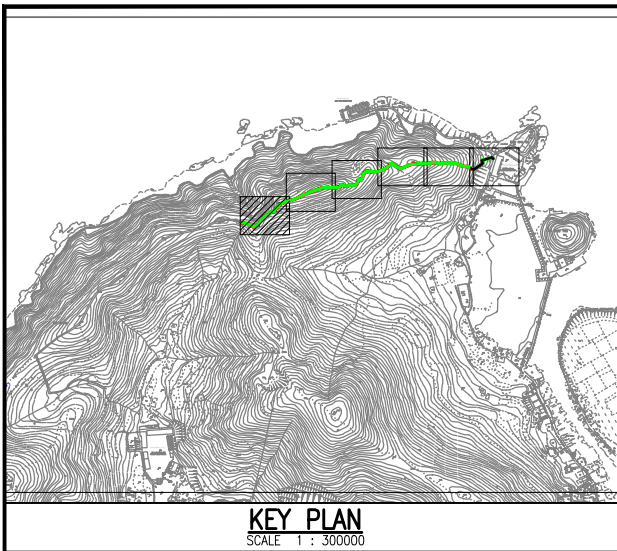
PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	DF TC
APPROVED BY:	VT
SCALE:	A3 1:2500
CAD FILE:	WAC_20222_TS_C_003

PROJECT:  
**SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)**



DRAWING TITLE:  
**LAYOUT PLAN OF TREE PRUNING  
AT TAI O FU SHAN**

DRAWING NO:	WAC/20222/TS/C/003	REV:	-
-------------	--------------------	------	---





B.D. REF. / /  
F.S.D. REF. / /

- LEGEND:**
-  TREE PRUNING AREA
  -  HYDROSEEDING AND MAKE GOOD OF THE SOIL PROFILE TO MATCH WITH THE EXISTING GROUND LEVEL

MATCH LINE  
SEE DRAWING: WAC/20222/MUW/C/102

**AS-BUILT**

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

ALL MEASUREMENTS MUST BE CHECKED AT THE SITE - DO NOT SCALE DRAWING  
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SIGNATURE FOR SUBMISSION/ CONSTRUCTION

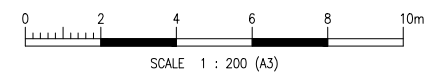
\_\_\_\_\_  
L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

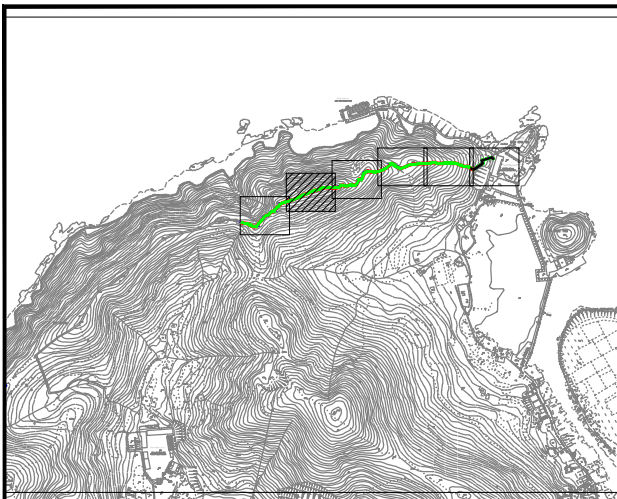
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DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	DF TC
APPROVED BY:	VT
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PROJECT:  
SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)

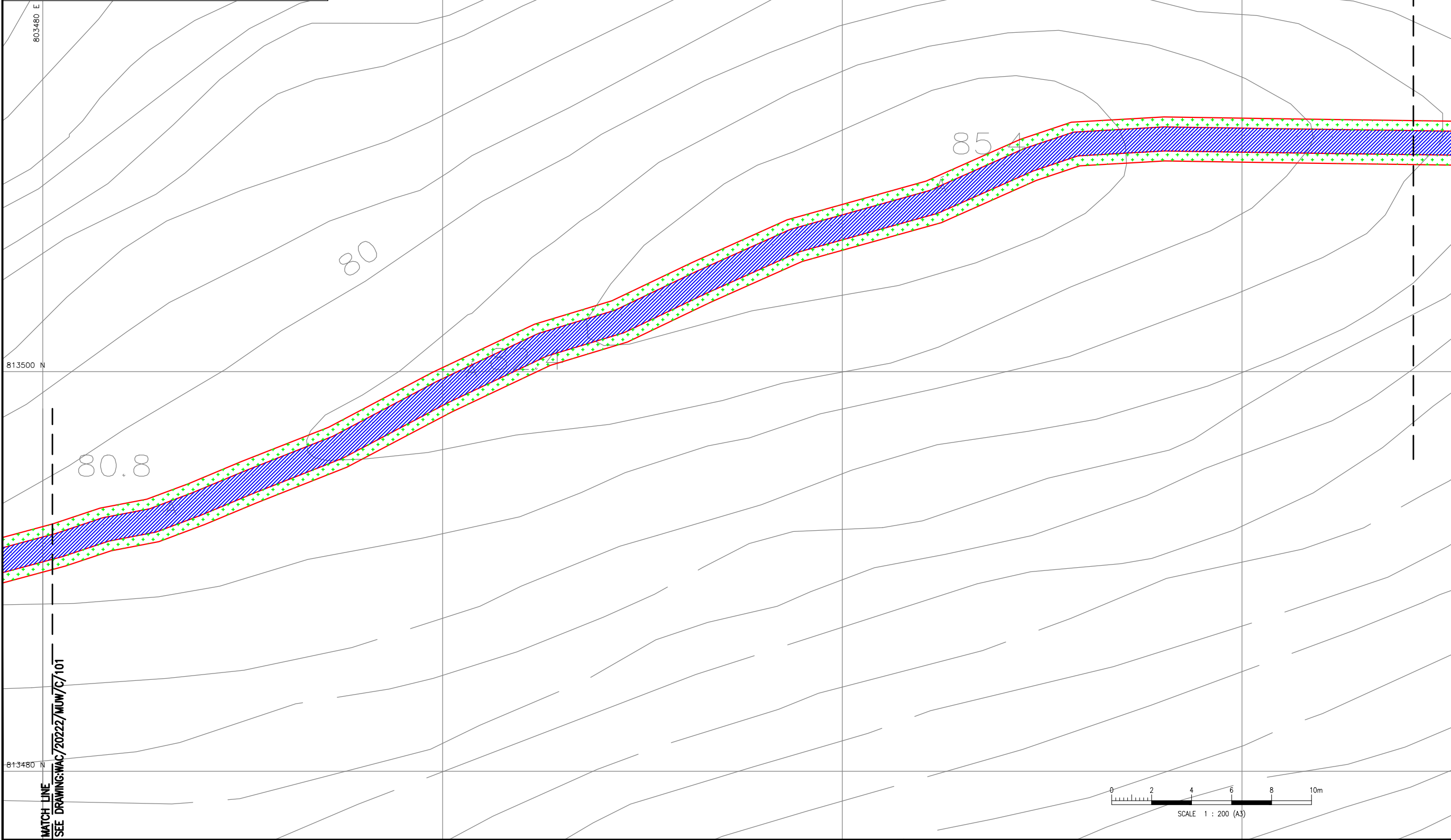
DRAWING TITLE:  
SCOPE OF TREE PRUNING AT  
TAI O FU SHAN  
(SHEET 1 OF 6)

DRAWING NO:	WAC/20222/TS/C/101
REV:	-





**KEY PLAN**  
SCALE 1 : 300000



B.D. REF.	/	/
F.S.D. REF.	/	/

- LEGEND:**
- TREE PRUNING AREA
  - HYDROSEEDING AND MAKE GOOD OF THE SOIL PROFILE TO MATCH WITH THE EXISTING GROUND LEVEL

MATCH LINE  
SEE DRAWING: WAC/20222/MUW/C/103

MATCH LINE  
SEE DRAWING: WAC/20222/MUW/C/101

**AS-BUILT**

REV. DATE. DESCRIPTION. DRAWN. CHECKED. APPROVED.  
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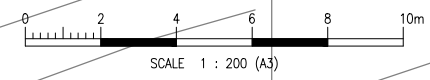
SIGNATURE FOR SUBMISSION/ CONSTRUCTION  
  
L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

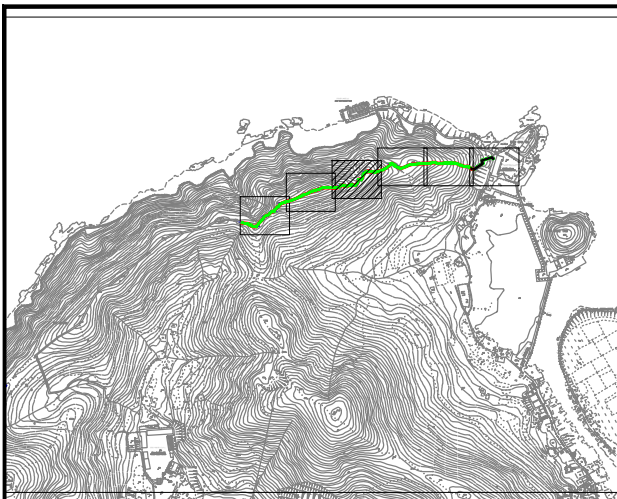
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DESIGNED BY:	JC		
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PROJECT:  
SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)

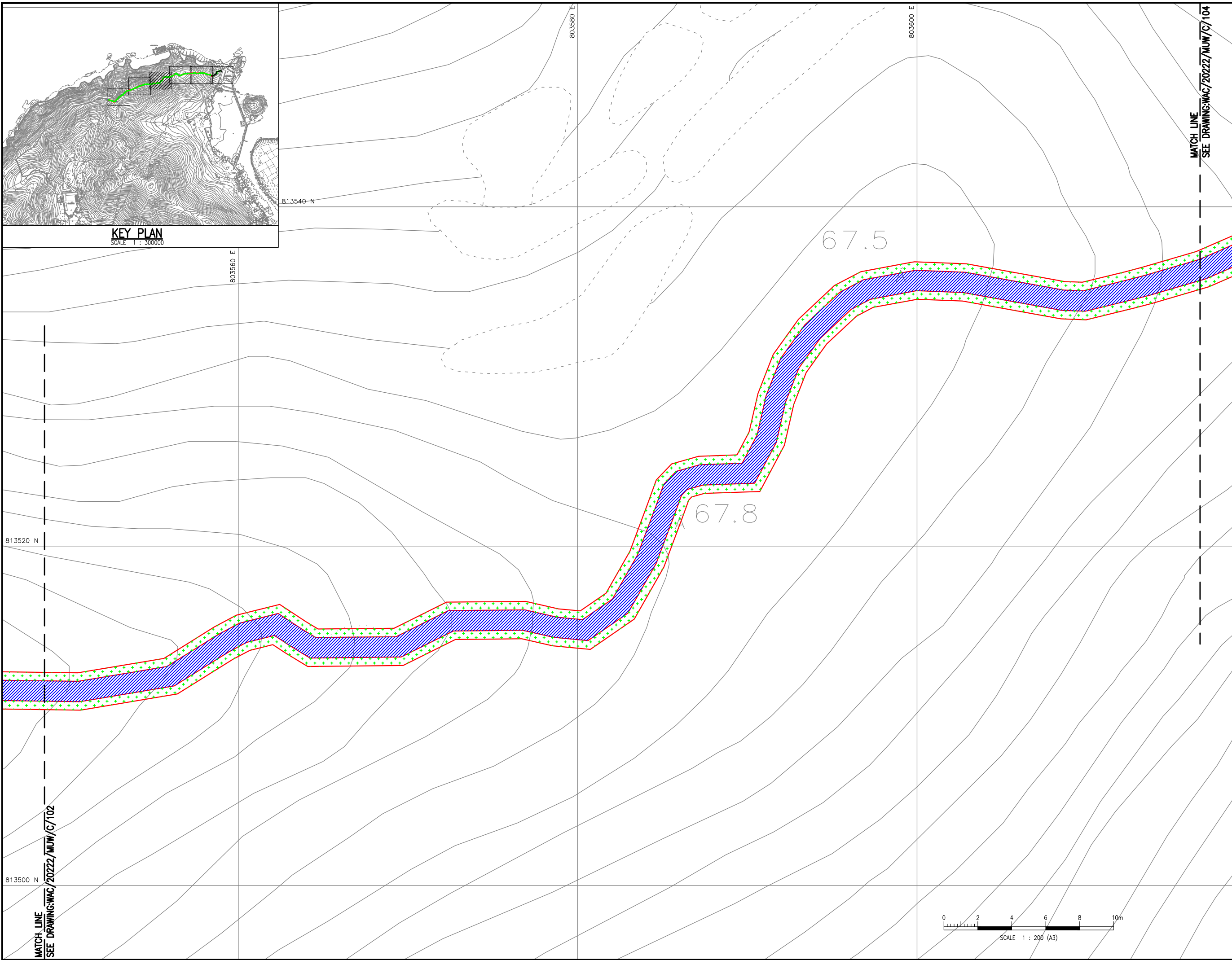
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SCOPE OF TREE PRUNING AT  
TAI O FU SHAN  
(SHEET 2 OF 6)

DRAWING NO:	WAC/20222/TS/C/102	REV:	-
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**KEY PLAN**  
SCALE 1 : 300000



B.D. REF.	/	/
F.S.D. REF.	/	/

- LEGEND:**
- TREE PRUNING AREA
  - HYDROSEEDING AND MAKE GOOD OF THE SOIL PROFILE TO MATCH WITH THE EXISTING GROUND LEVEL

**AS-BUILT**

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
<small>ALL MEASUREMENTS MUST BE CHECKED AT THE SITE - DO NOT SCALE DRAWING            ALL DRAWING SPECIFICATIONS AND THEIR COPY RIGHT ARE THE PROPERTY OF            ENGINEERS, ARCHITECTS, DESIGNERS AND SHALL BE RETURNED AT THE            COMPLETION OF THE WORK - THIS DRAWING IS NOT VALID FOR CONSTRUCTION            PURPOSES UNLESS EXPRESSLY CERTIFIED.</small>					

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

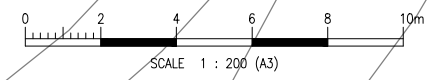
L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	DF TC
APPROVED BY:	VT
SCALE:	A3 1:2500
CAD FILE:	WAC_20222_TS_C_003

PROJECT:  
SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)

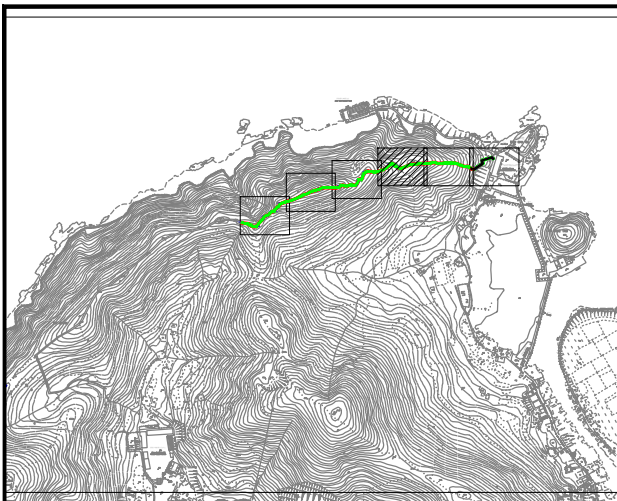
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SCOPE OF TREE PRUNING AT  
TAI O FU SHAN  
(SHEET 3 OF 6)

DRAWING NO:	WAC/20222/TS/C/103
REV:	-

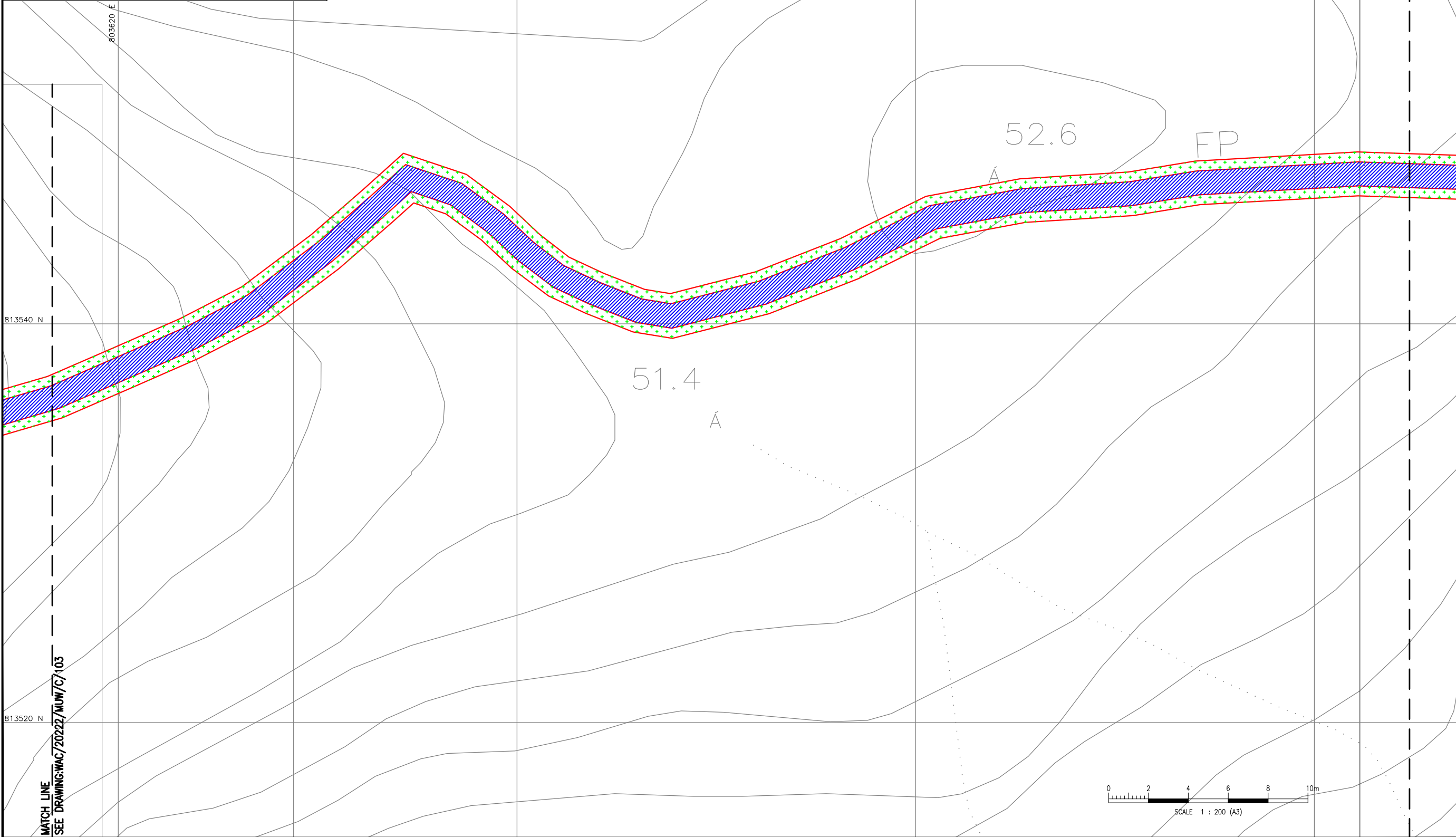


MATCH LINE  
SEE DRAWING: WAC/20222/MUW/C/102

MATCH LINE  
SEE DRAWING: WAC/20222/MUW/C/104



**KEY PLAN**  
SCALE 1 : 300000



B.D. REF.	/	/
F.S.D. REF.	/	/

- LEGEND:**
- TREE PRUNING AREA
  - HYDROSEEDING AND MAKE GOOD OF THE SOIL PROFILE TO MATCH WITH THE EXISTING GROUND LEVEL

MATCH LINE  
SEE DRAWING: WAC/20222/MUW/C/105

803620 E

813540 N

813520 N

803640 E

803660 E

803680 E

**AS-BUILT**

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

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L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	DF TC
APPROVED BY:	VT
SCALE:	A3 1:2500
CAD FILE:	WAC_20222_TS_C_003

PROJECT:  
SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)

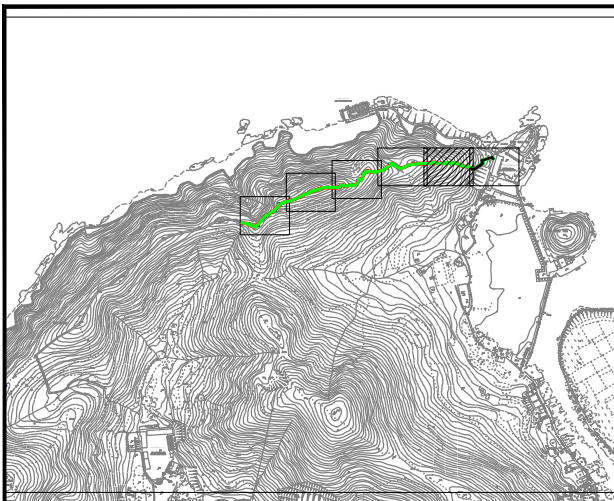
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SCOPE OF TREE PRUNING AT  
TAI O FU SHAN  
(SHEET 4 OF 6)

DRAWING NO:	WAC/20222/TS/C/104
REV:	-

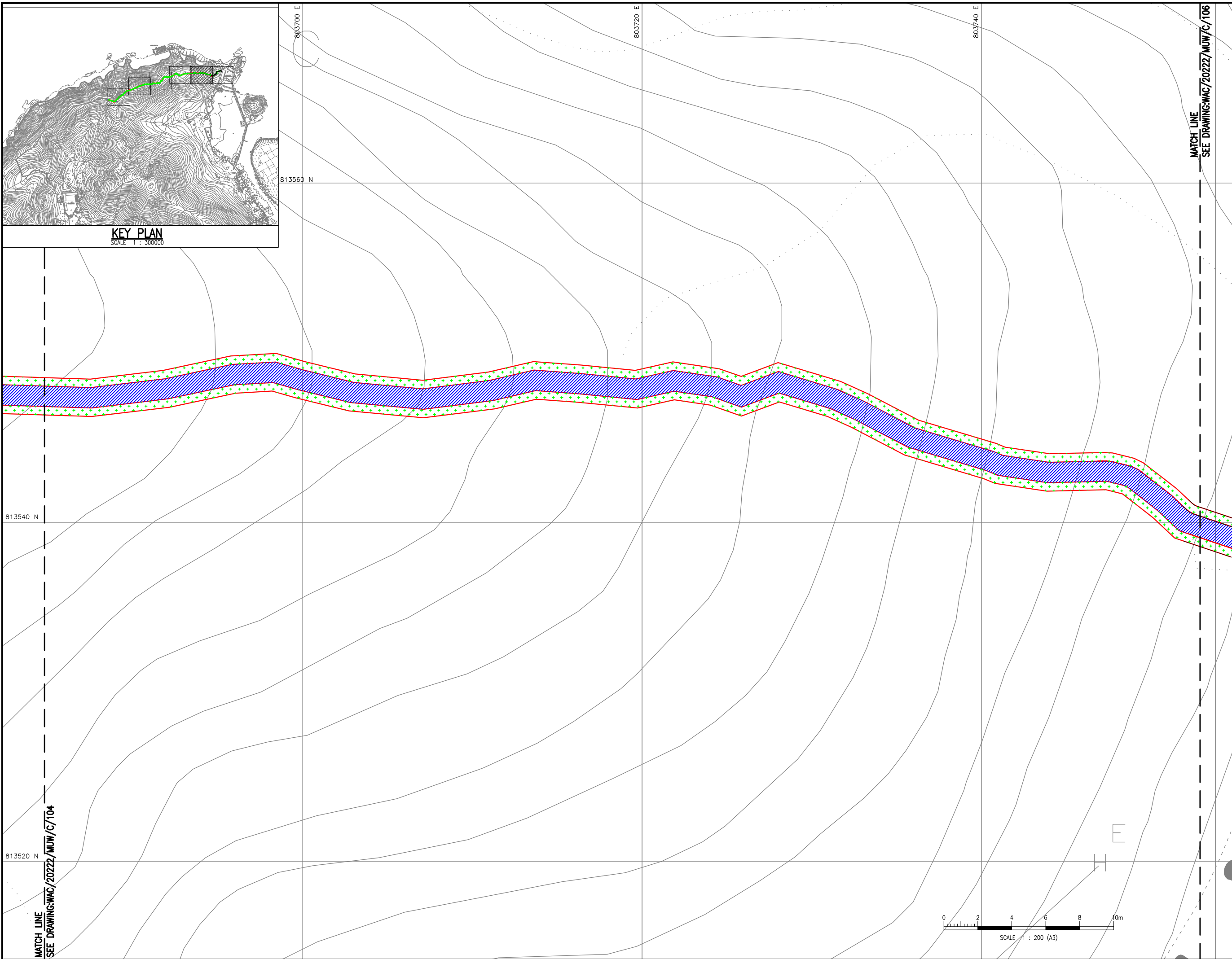


MATCH LINE  
SEE DRAWING: WAC/20222/MUW/C/103







**KEY PLAN**  
SCALE 1 : 300000



B.D. REF. / /  
F.S.D. REF. / /

- LEGEND:
-  TREE PRUNING AREA
  -  HYDROSEEDING AND MAKE GOOD OF THE SOIL PROFILE TO MATCH WITH THE EXISTING GROUND LEVEL

MATCH LINE  
SEE DRAWING: WAC/20222/MUW/C/106

**AS-BUILT**

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SIGNATURE FOR SUBMISSION/ CONSTRUCTION  
  
L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

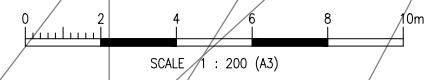
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DESIGNED BY:	JC		
CHECKED BY:	DF	TC	
APPROVED BY:	VT		
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CAD FILE:	WAC_20222_TS_C_003		

PROJECT:  
SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)

DRAWING TITLE:  
SCOPE OF TREE PRUNING AT  
TAI O FU SHAN  
(SHEET 5 OF 6)

DRAWING NO:  
WAC/20222/TS/C/105

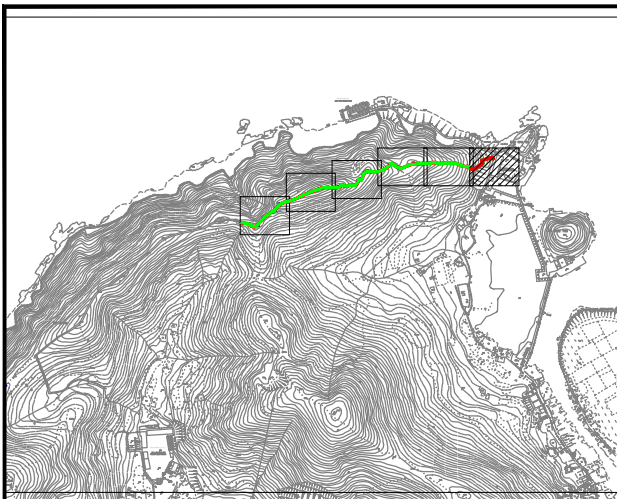
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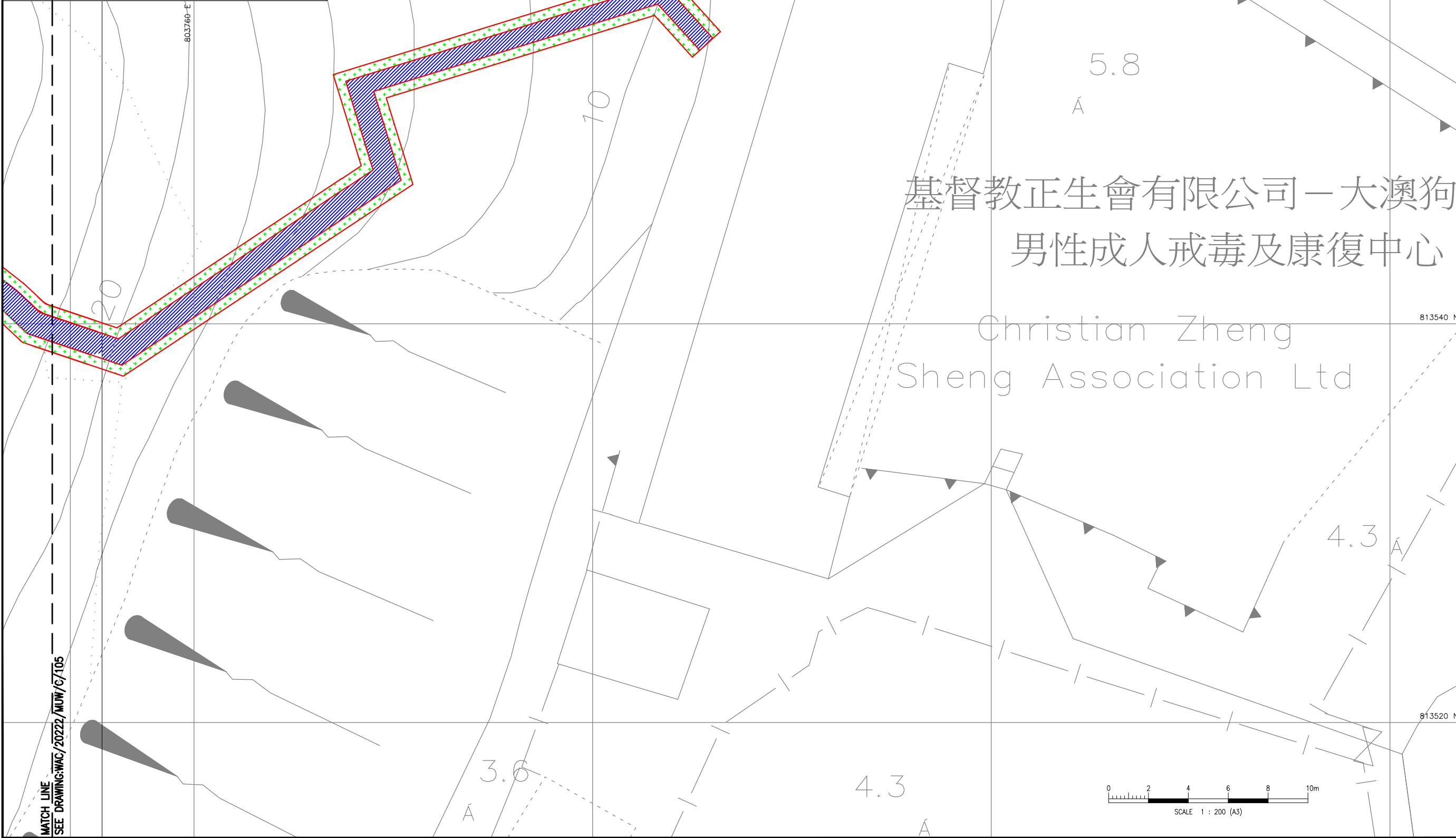
MATCH LINE  
SEE DRAWING: WAC/20222/MUW/C/104







**KEY PLAN**  
SCALE 1 : 300000



B.D. REF.	/	/
F.S.D. REF.	/	/

- LEGEND:
- TREE PRUNING AREA
  - HYDROSEEDING AND MAKE GOOD OF THE SOIL PROFILE TO MATCH WITH THE EXISTING GROUND LEVEL

基督教正生會有限公司—大澳狗  
男性成人戒毒及康復中心

Christian Zheng  
Sheng Association Ltd

**AS-BUILT**

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
<small>ALL MEASUREMENTS MUST BE CHECKED AT THE SITE - DO NOT SCALE DRAWING            ALL DRAWING SPECIFICATIONS AND THEIR COPY RIGHT ARE THE PROPERTY OF            ENGINEERS, ARCHITECTS, DESIGNERS AND SHALL BE RETURNED AT THE            COMPLETION OF THE WORK - THIS DRAWING IS NOT VALID FOR CONSTRUCTION            PURPOSES UNLESS EXPRESSLY CERTIFIED.</small>					

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

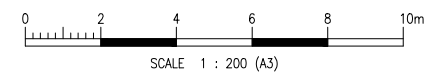
L.T. HUNG  
HOP TAI CONSTRUCTION CO. L.T.D.

PROJECT NO:	20222		
DRAWN BY:	KL		
DESIGNED BY:	JC		
CHECKED BY:	DF	TC	
APPROVED BY:	VT		
SCALE:	A3 1:2500		
CAD FILE:	WAC_20222_TS_C_003		

PROJECT:  
SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)

DRAWING TITLE:  
SCOPE OF TREE PRUNING AT  
TAI O FU SHAN  
(SHEET 6 OF 6)

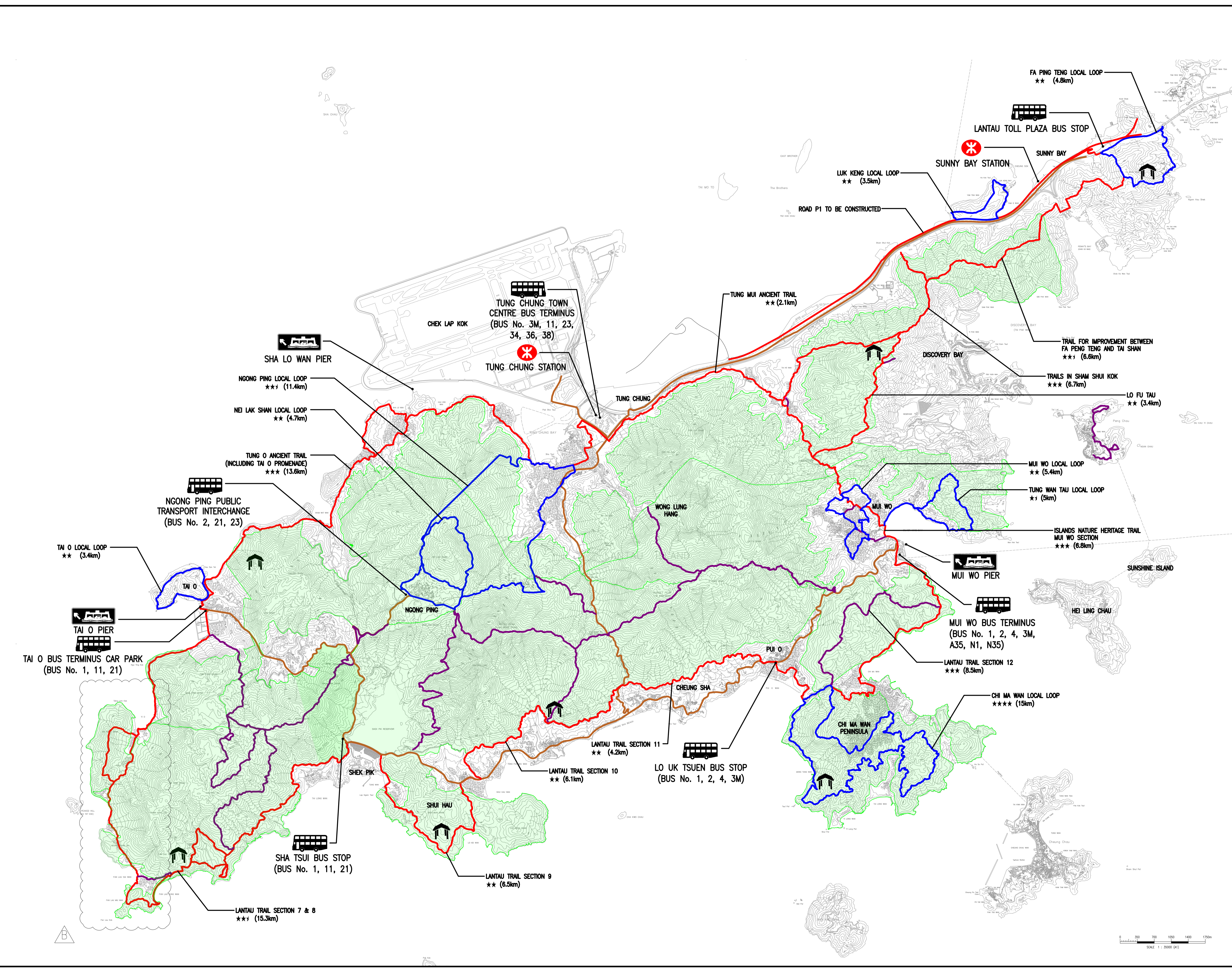
DRAWING NO:	WAC/20222/TS/C/106	REV:	-
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MATCH LINE  
SEE DRAWING: WAC/2022/MUW/C/105

## **APPENDIX B**

### **Map Of Round-The-Lantau Route**



B.D. REF. / /  
 F.S.D. REF. / /

- LEGENDS:
- PROPOSED ROUND THE LAUTAU TRAIL
  - PROPOSED LOCAL LOOP
  - EXISTING CARRIAGEWAY
  - EXISTING HIKING TRAILS
  - AREA OF COUNTRY PARK
  - PROPOSED LOCATION OF HUBS

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
B	04/23	2ND AMENDMENT	KC	TC	DF
A	05/22	1ST AMENDMENT	KC	TC	DF

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 PURPOSES UNLESS EXPRESSLY CERTIFIED.

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	TC DF
APPROVED BY:	VT
SCALE:	1:35000 (A1)
CAD FILE:	WAC_20222_RTLT_C_001_B

PROJECT:  
 SLO 03/2020  
 STUDY FOR ENHANCEMENT OF  
 TRAILS AND CONNECTIVITY IN LAUTAU

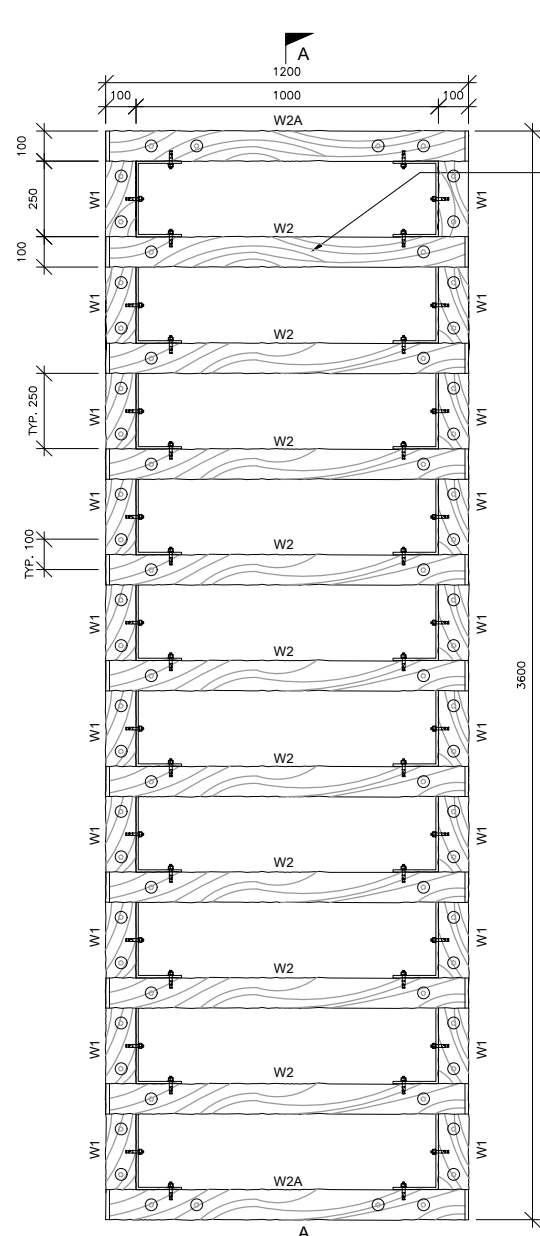
DRAWING TITLE:  
 MASTER PLAN OF "ROUND THE  
 LAUTAU" TRAIL

DRAWING NO:	WAC/20222/RTL/C/001	REV:	B
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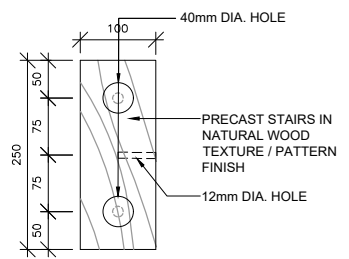


## **APPENDIX C**

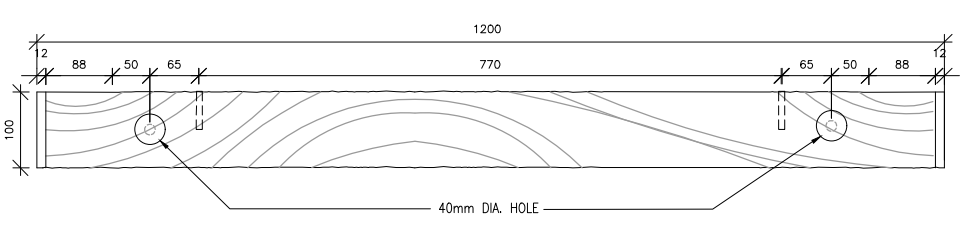
### **Drawing Of Optimized Design Of PPM Step, Stair, Railing, Water Bar And Boardwalk**



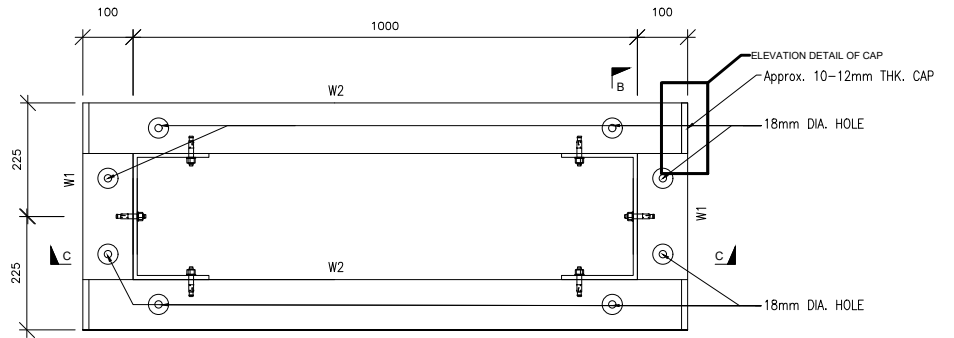
**PLAN OF PRECAST MODULES - STAIRS**  
SCALE 1:25 (A3)



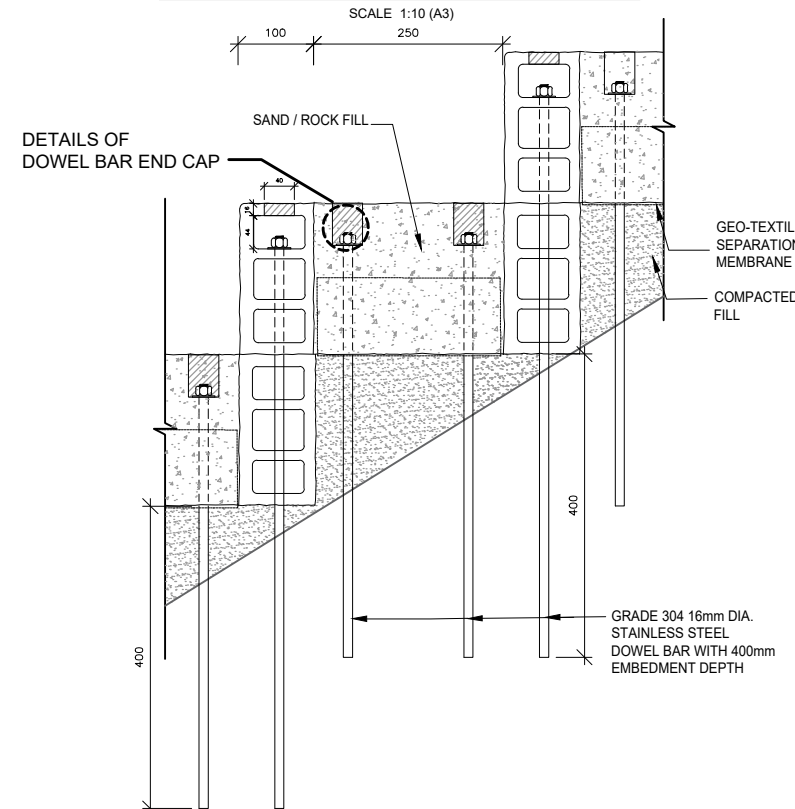
**PLAN OF W1**  
SCALE 1:10 (A3)



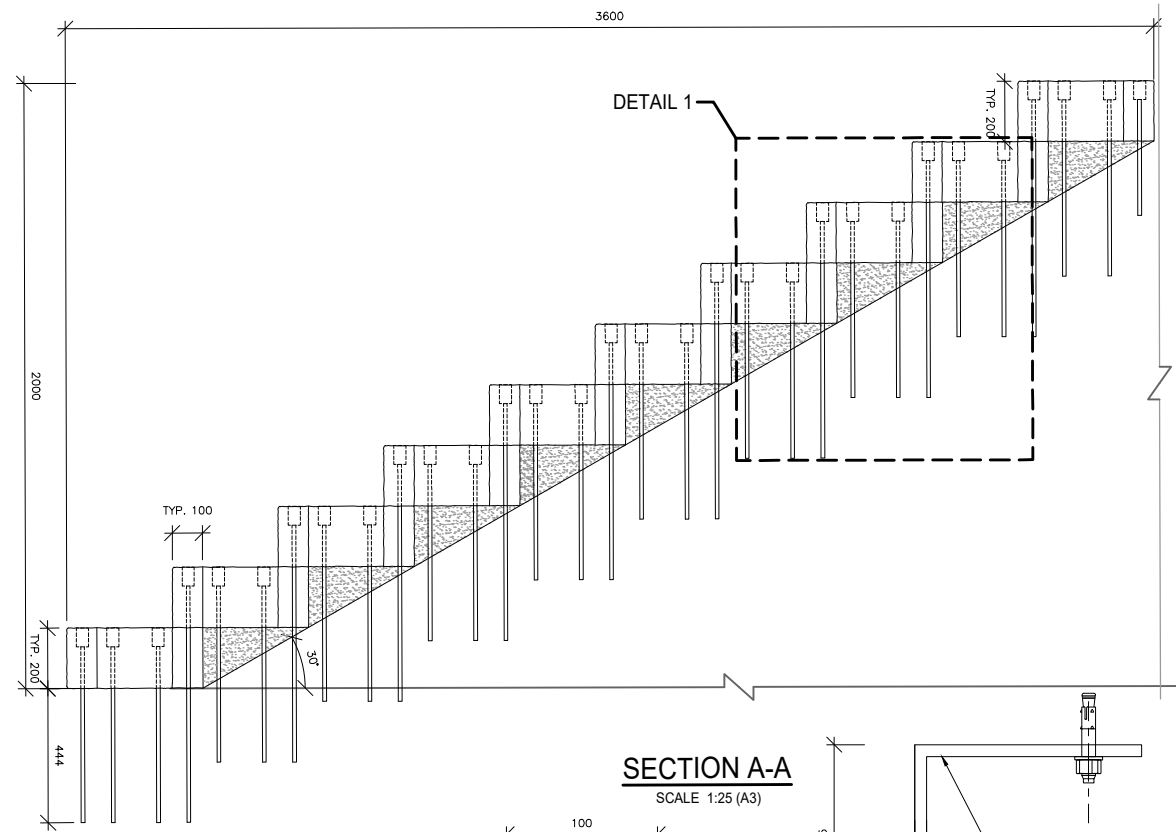
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SCALE 1:10 (A3)



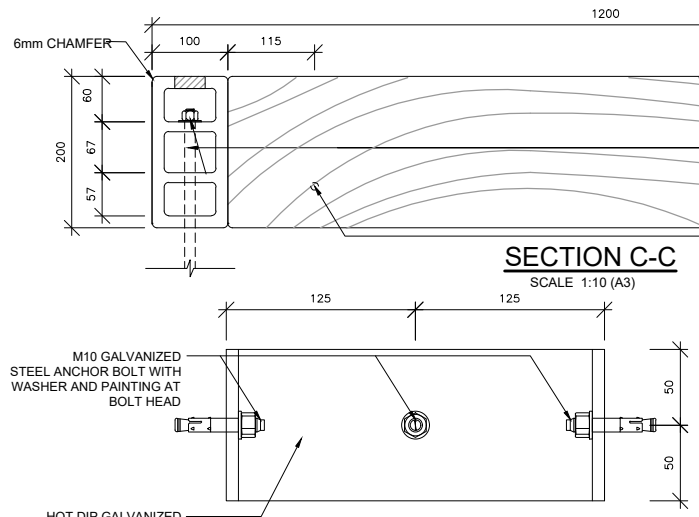
**PRECAST MODULES - STAIRS DETAIL**  
SCALE 1:10 (A3)



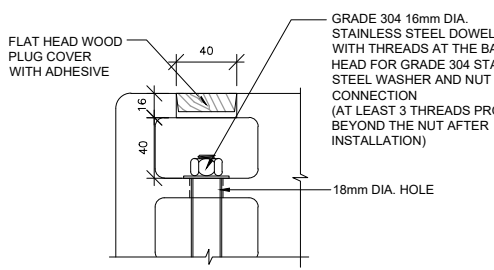
**DETAIL 1**  
SCALE 1:10 (A3)



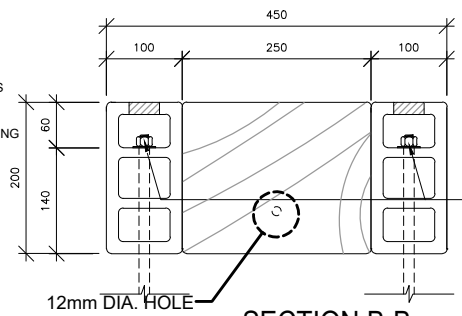
**SECTION A-A**  
SCALE 1:25 (A3)



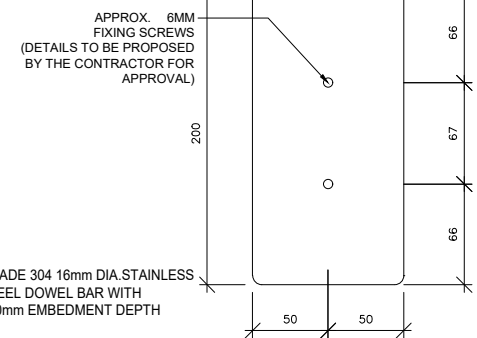
**SECTION C-C**  
SCALE 1:10 (A3)



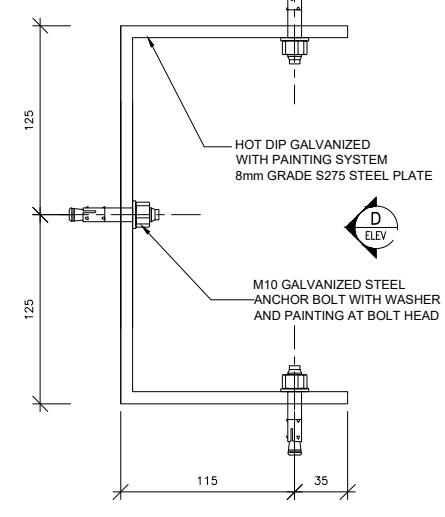
**DETAILS OF DOWEL BAR END CAP**  
SCALE 1:5 (A3)



**SECTION B-B**  
SCALE 1:10 (A3)



**ELEVATION DETAIL OF CAP**  
SCALE 1:5 (A3)



**DETAILS OF CORNER CONNECTING PLATE**  
SCALE 1:5 (A3)



**IMAGE REFERENCE**  
SCALE NTS

B.D. REF.	/	/
F.S.D. REF.	/	/

- NOTES:**
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  - ALL LEVEL ARE IN METRES WITH REFERENCE TO HONG KONG PRINCIPAL DATUM (mPD).
  - FOR GENERAL NOTES, REFER TO DRAWING NO. WAC/20222/MUW/GN/001 AND SPECIFICATION FOR THE WPC MATERIAL'S PROPERTIES.
  - PRE-ASSEMBLY TRIAL OF THE PRECAST MODULES SHALL BE CARRIED OUT AT MANUFACTURING FACTORY BEFORE DELIVERING TO THE SITE.
  - EACH PRECAST STEP SHALL NOT BE OVERLAPPING WHEN CONSTRUCTED IN SERIES.
  - COLOR AND PATTERN OF PPMs SHALL REFER TO DRAWING NO. WAC/20222/PPM/C/012.
  - FOR ALL RECTANGULAR PPMs, 6mm CHAMFER SHALL BE PLACED ON THE EDGE.
  - ON-SITE MODIFICATION, SUCH AS TRIMMING, INSITU CONCRETE MIXING, HOLE DRILLING AND ADJUSTING ANGLE, SHALL BE CARRIED OUT BY THE CONTRACTOR. SO THAT THE PPMs WILL FIT INTO THE ACTUAL SITE CONDITION.
  - FORMATION FOR STAIRS & STEP, SUCH AS CUT AND FILL OF THE GROUND SURFACE IN MINIMAL EXTENT, SHALL BE CARRIED OUT BY THE CONTRACTOR.

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

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SIGNATURE FOR SUBMISSION/ CONSTRUCTION

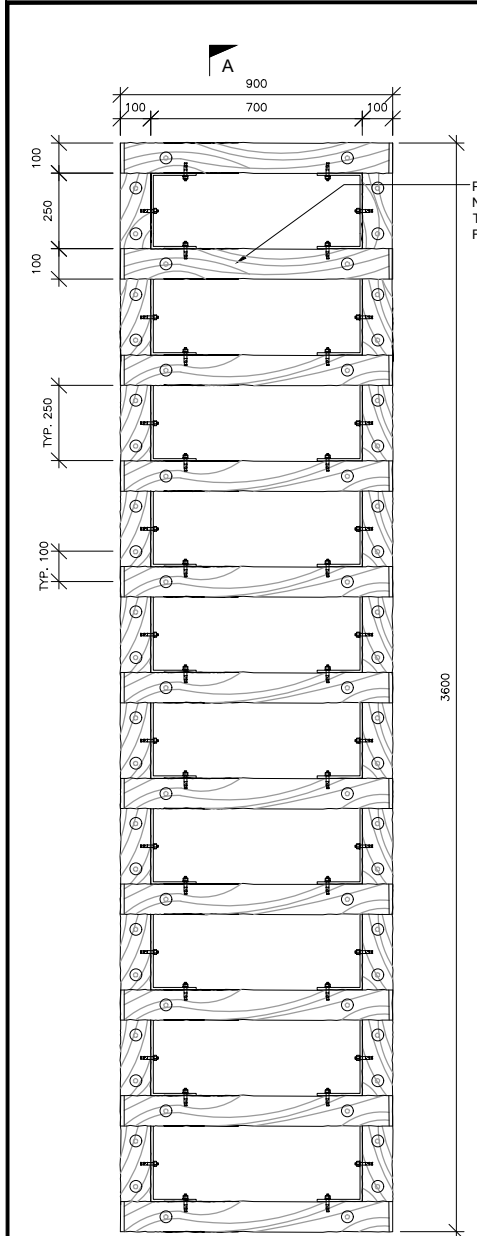
PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	DF TC
APPROVED BY:	VT
SCALE:	AS SHOWN
CAD FILE:	WAC_20222_C_PPM_002B_TYPE1

PROJECT:  
**SLO 03/2020**  
**STUDY FOR ENHANCEMENT OF TRAILS AND CONNECTIVITY IN LANTAU**

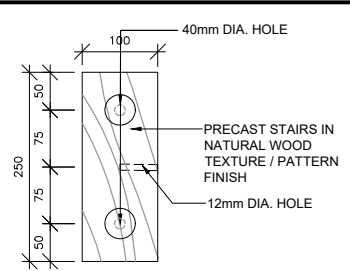
DRAWING TITLE:  
**TYPICAL DETAILS OF PRECAST MODULES - OPTIMIZED DESIGN OF STAIRS (TYPE 1)**

DRAWING NO:	WAC/20222/C/PPM/002a
REV:	-

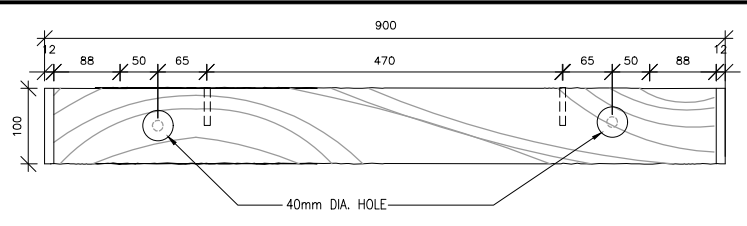




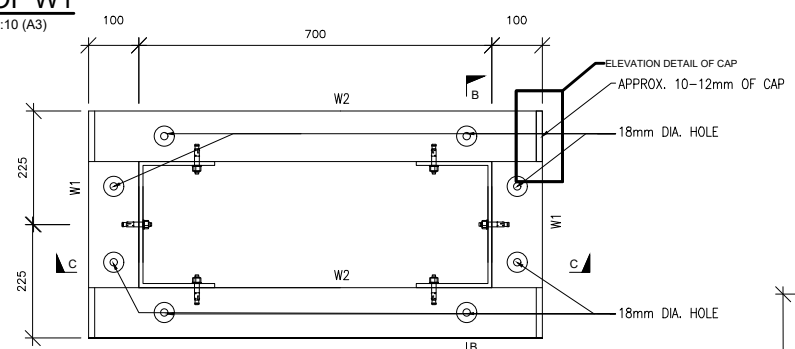
**PLAN OF PRECAST MODULES - STAIRS**  
SCALE 1:25 (A3)



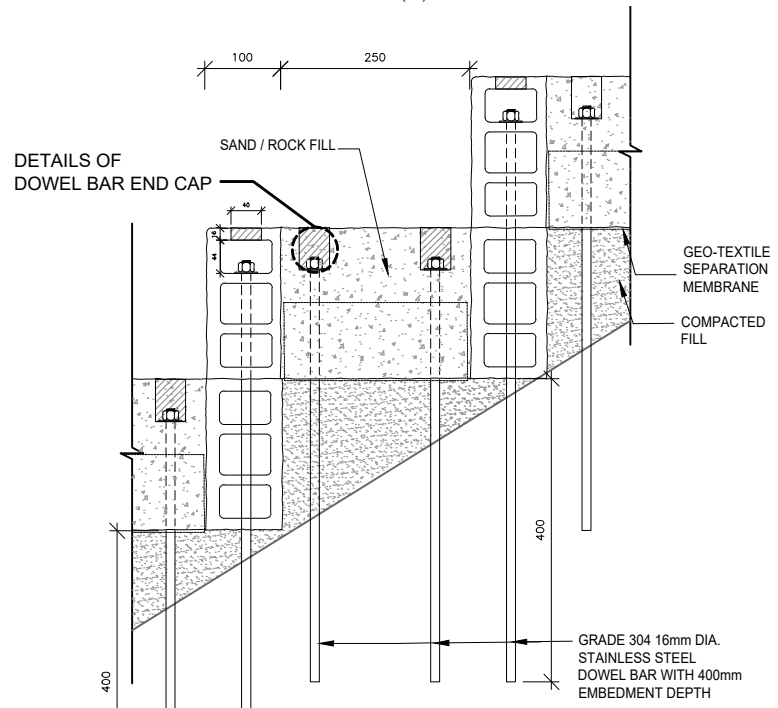
**PLAN OF W1**  
SCALE 1:10 (A3)



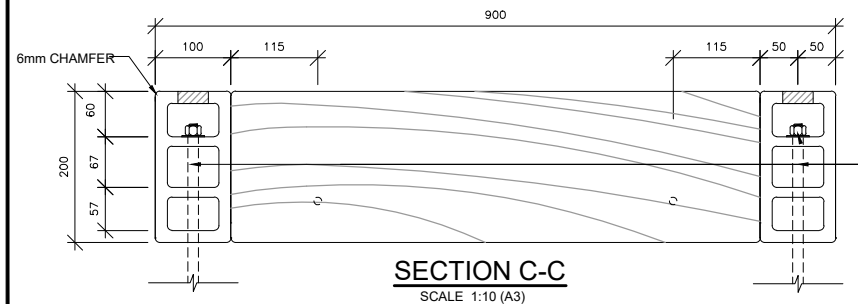
**PLAN OF W2**  
SCALE 1:10 (A3)



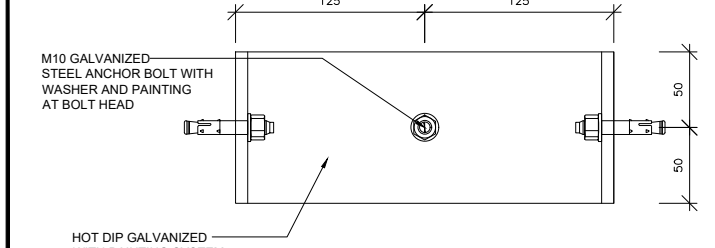
**PRECAST MODULES - STAIRS DETAIL**  
SCALE 1:10 (A3)



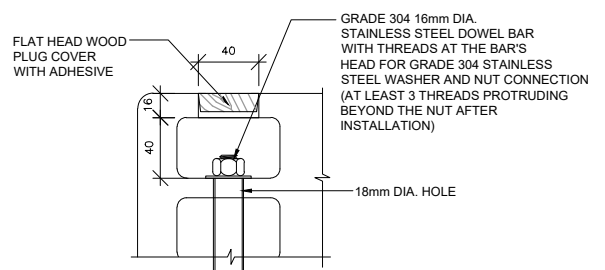
**DETAIL 1**  
SCALE 1:10 (A3)



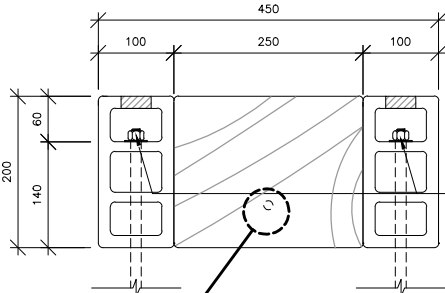
**SECTION C-C**  
SCALE 1:10 (A3)



**ELEVATION D**  
SCALE 1:5 (A3)

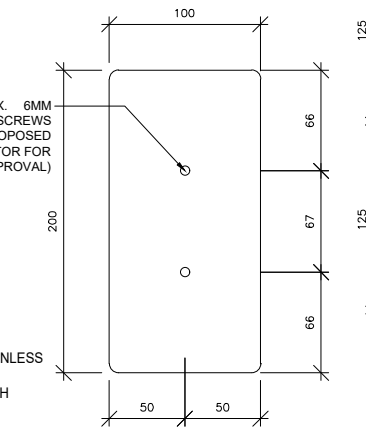


**DETAILS OF DOWEL BAR END CAP**  
SCALE 1:5 (A3)

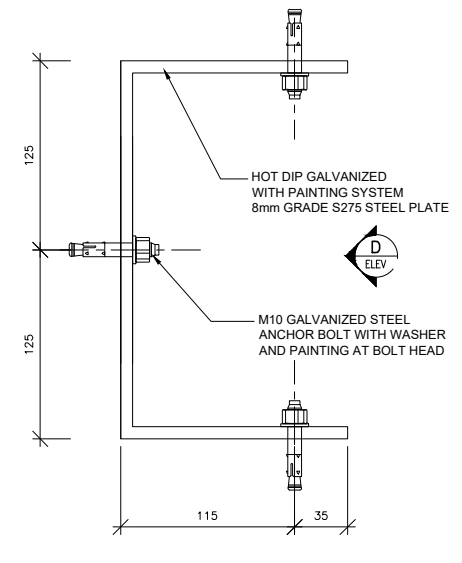


**SECTION B-B**  
SCALE 1:10 (A3)

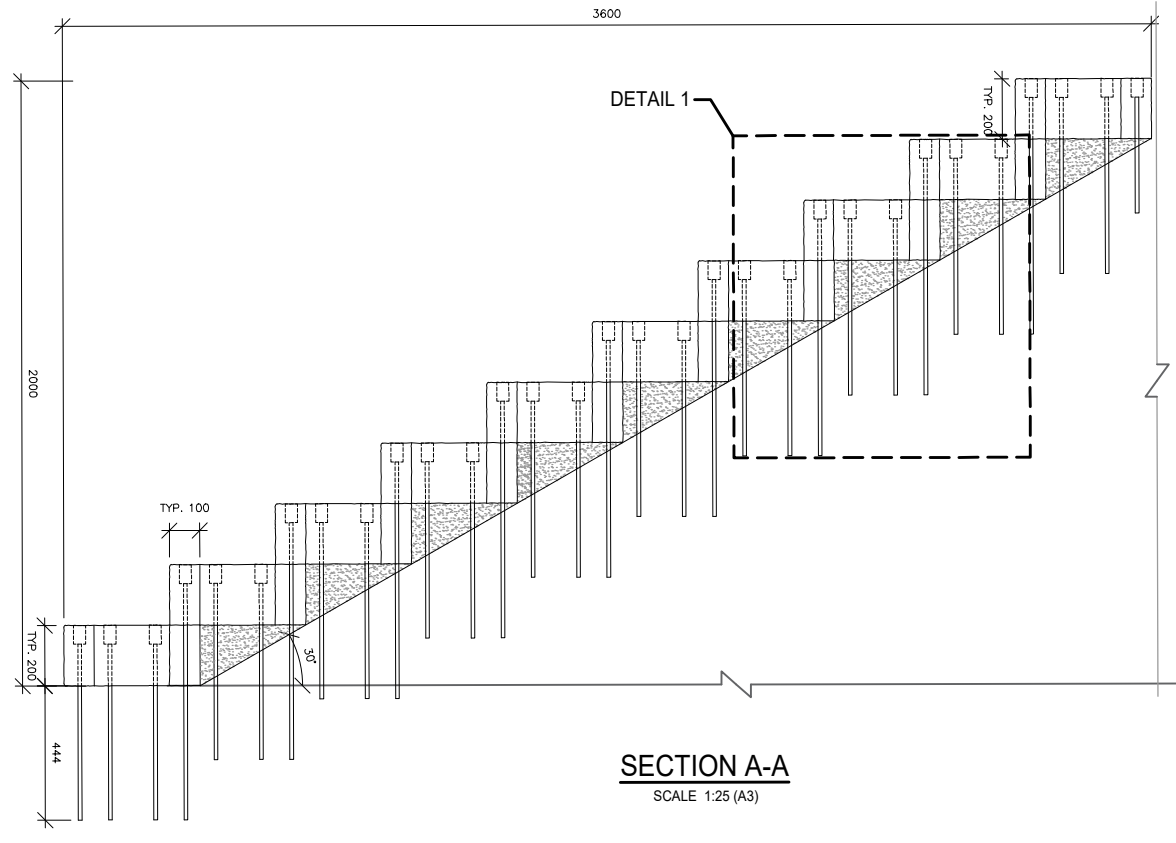
APPROX. 6MM FIXING SCREWS (DETAILS TO BE PROPOSED BY THE CONTRACTOR FOR APPROVAL)



**ELEVATION DETAIL OF CAP**  
SCALE 1:5 (A3)



**DETAILS OF CORNER CONNECTING PLATE**  
SCALE 1:5 (A3)



**SECTION A-A**  
SCALE 1:25 (A3)



**IMAGE REFERENCE**  
SCALE NTS

B.D. REF.	/	/
F.S.D. REF.	/	/

- NOTES:**
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REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

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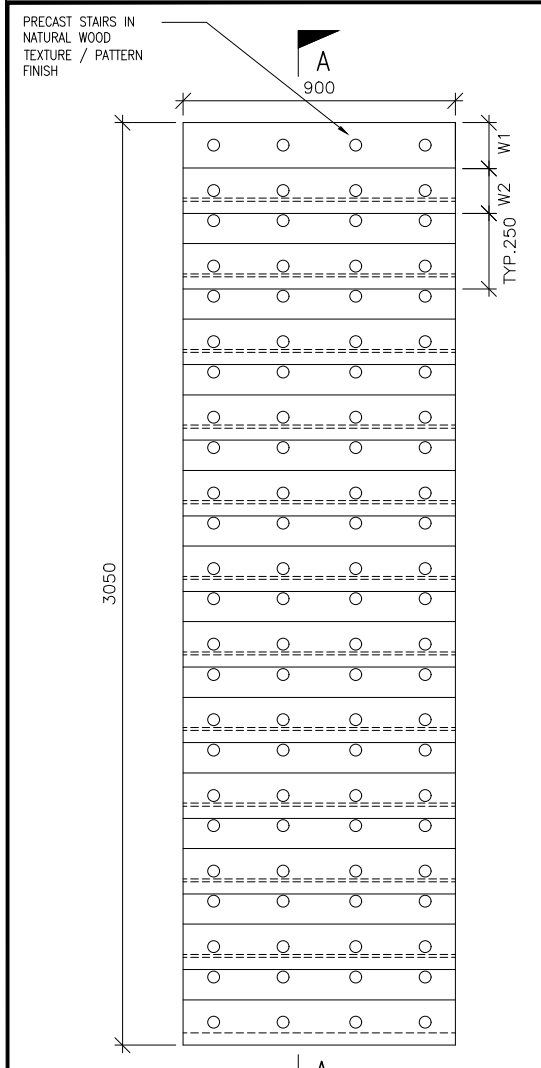
SIGNATURE FOR SUBMISSION/ CONSTRUCTION

PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	DF TC
APPROVED BY:	VT
SCALE:	AS SHOWN
CAD FILE:	WAC_20222_C_PPM_002-1_TYPE2A

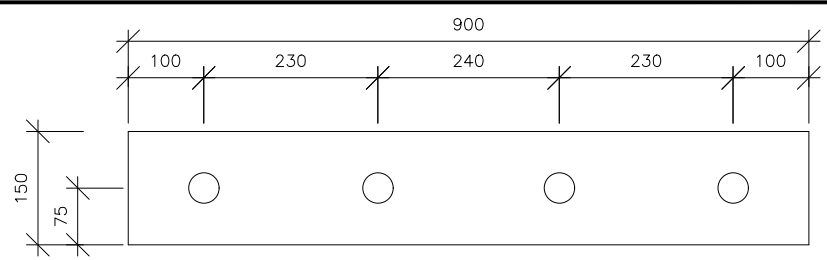
PROJECT:  
**SLO 03/2020**  
STUDY FOR ENHANCEMENT OF TRAILS AND CONNECTIVITY IN LANTAU

DRAWING TITLE:  
**TYPICAL DETAILS OF PRECAST MODULES - OPTIMIZED DESIGN OF STAIRS (TYPE 2A)**

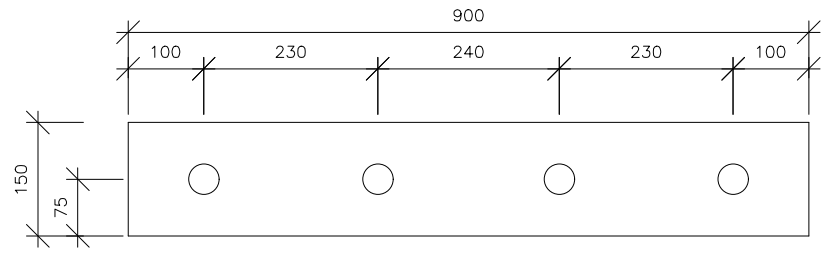
DRAWING NO:	WAC/20222/C/PPM/002-1a
REV:	-



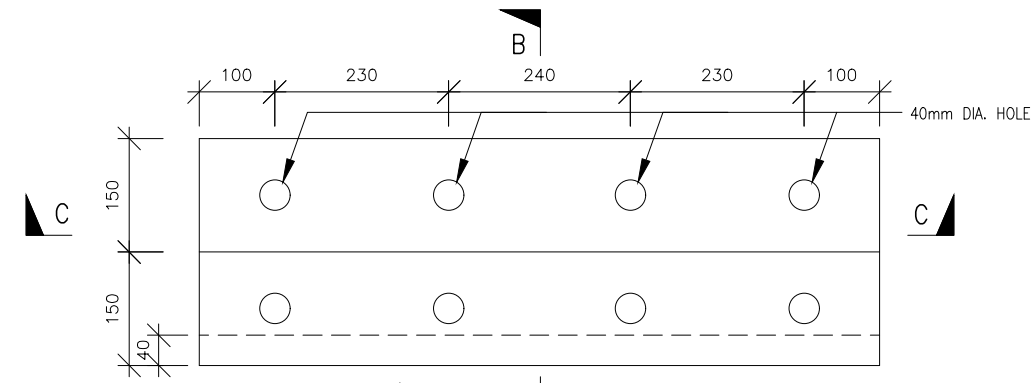
**PLAN OF PRECAST MODULES - STAIRS**  
SCALE 1:25 (A3)



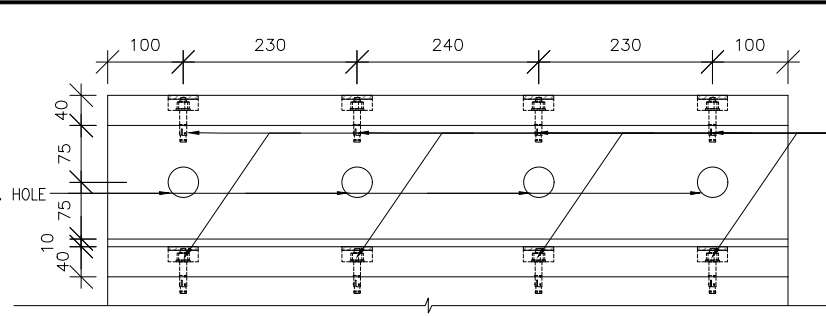
**PLAN OF W1**  
SCALE 1:10 (A3)



**PLAN OF W2**  
SCALE 1:10 (A3)



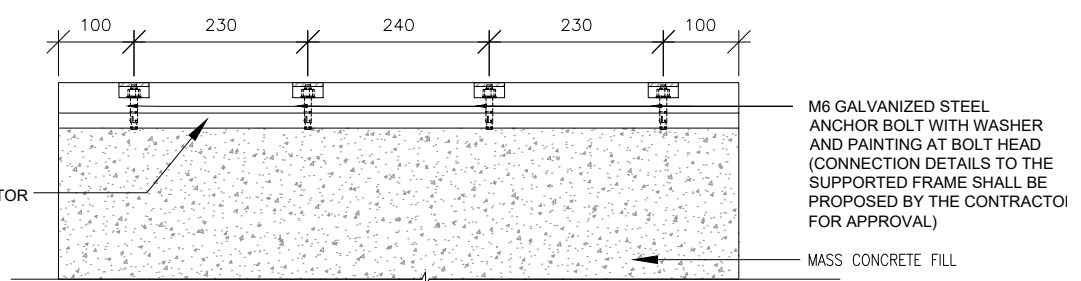
**PLAN OF STAIRS DETAIL**  
SCALE 1:10 (A3)



**ELEVATION A**  
SCALE 1:10 (A3)

M6 GALVANIZED STEEL ANCHOR BOLT WITH WASHER AND PAINTING AT BOLT HEAD (CONNECTION DETAILS TO THE SUPPORTED FRAME SHALL BE PROPOSED BY THE CONTRACTOR FOR APPROVAL)

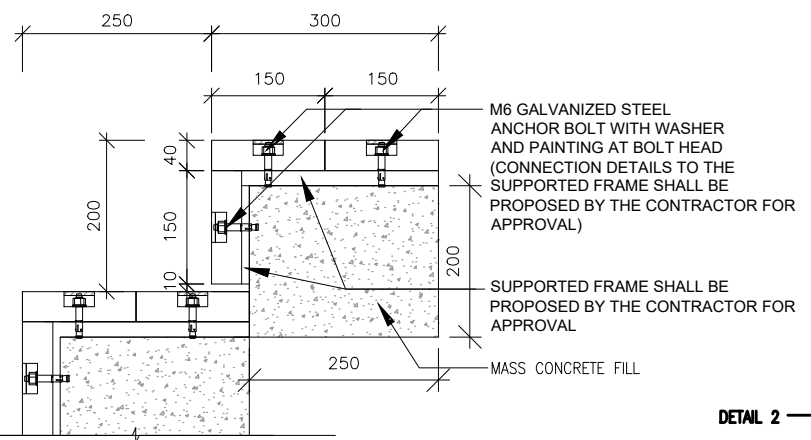
SUPPORTED FRAME SHALL BE PROPOSED BY THE CONTRACTOR FOR APPROVAL



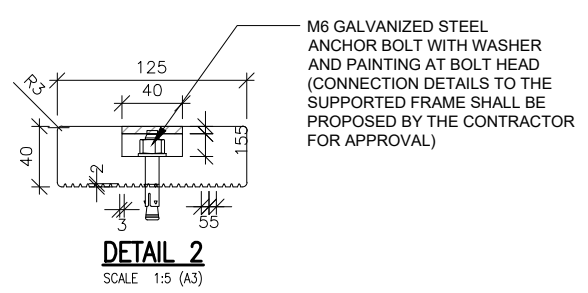
**SECTION C-C**  
SCALE 1:10 (A3)

M6 GALVANIZED STEEL ANCHOR BOLT WITH WASHER AND PAINTING AT BOLT HEAD (CONNECTION DETAILS TO THE SUPPORTED FRAME SHALL BE PROPOSED BY THE CONTRACTOR FOR APPROVAL)

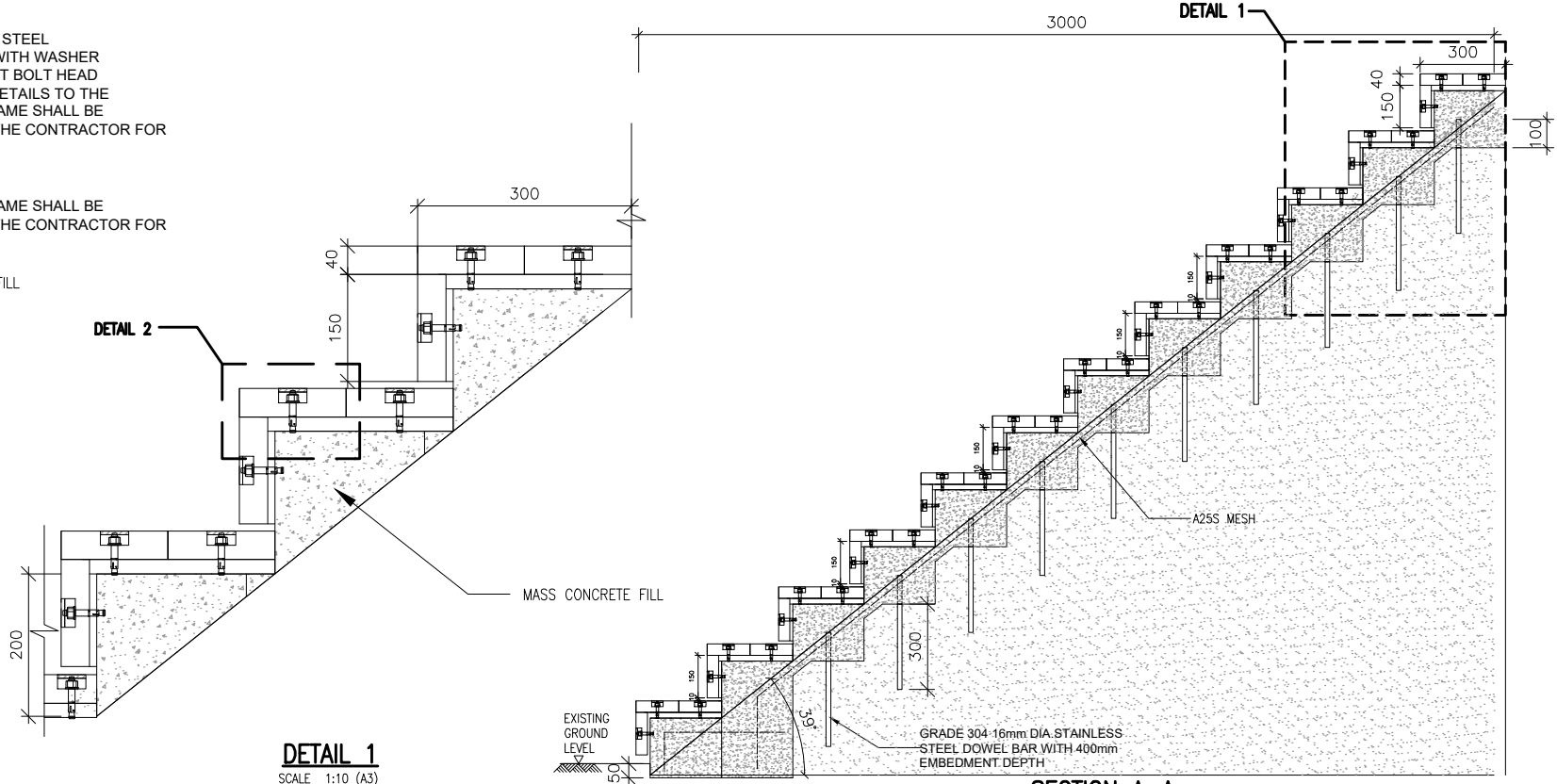
MASS CONCRETE FILL



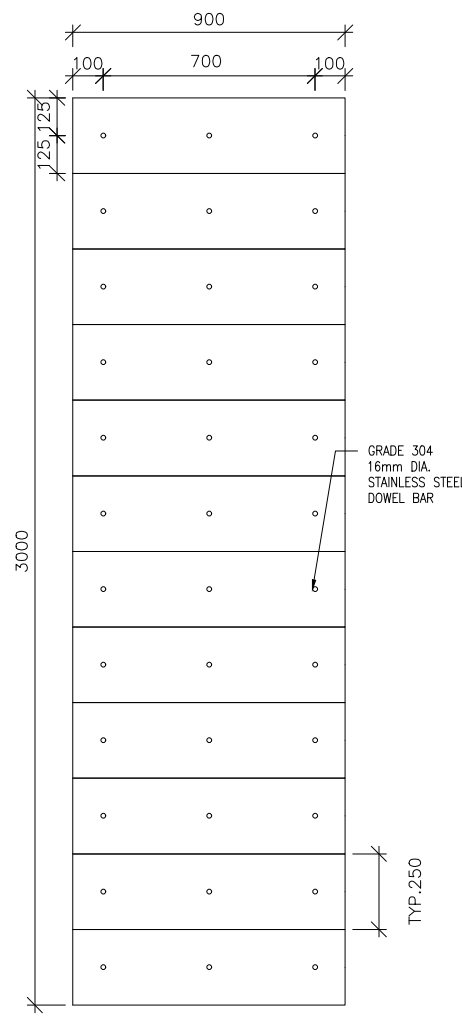
**SECTION B-B**  
SCALE 1:10 (A3)



**DETAIL 2**  
SCALE 1:5 (A3)



**SECTION A-A**  
SCALE 1:25 (A3)



**PLAN OF DOWEL BAR ARRANGEMENT**  
SCALE 1:25 (A3)

B.D. REF.	/	/
F.S.D. REF.	/	/

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REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

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SIGNATURE FOR SUBMISSION/ CONSTRUCTION

PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	DF TC
APPROVED BY:	VT
SCALE:	AS SHOWN
CAD FILE:	WAC_20222_C_PPM_002-3_Type3

**PROJECT:**  
 SLO 03/2020  
 STUDY FOR ENHANCEMENT OF TRAILS AND CONNECTIVITY IN LANTAU

**DRAWING TITLE:**  
 TYPICAL DETAILS OF PRECAST MODULES - OPTIMIZED DESIGN OF STAIRS (TYPE 3)

DRAWING NO:	WAC / 20222 / C / PPM / 002 - 3a	REV:	-
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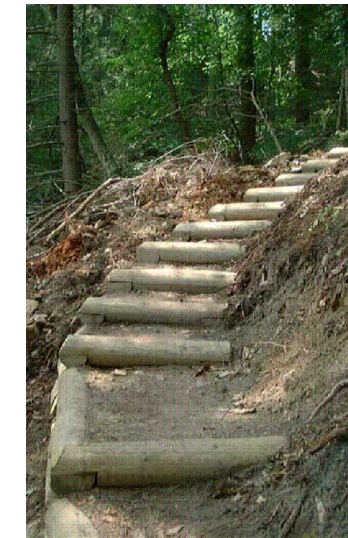
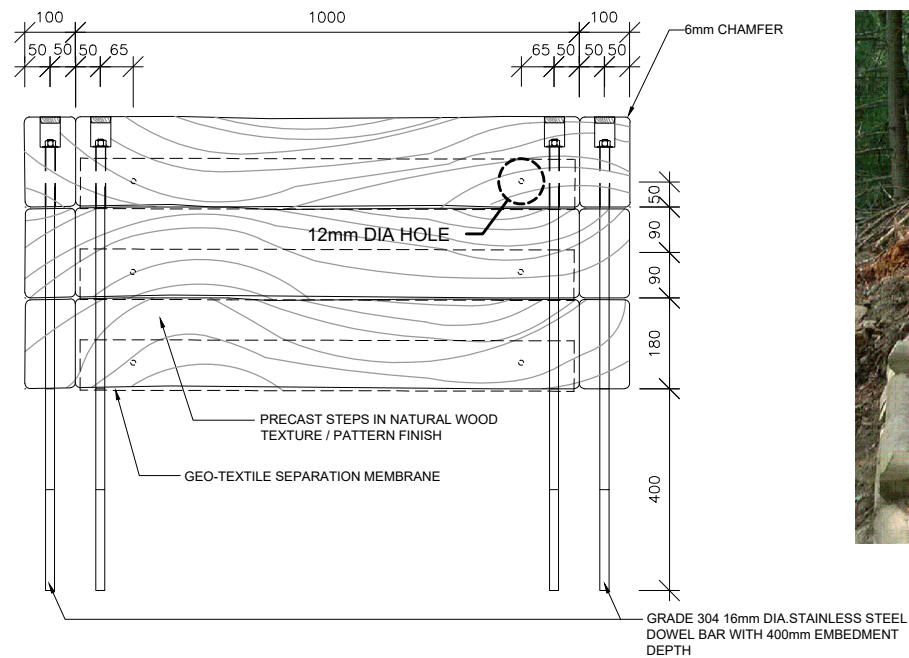
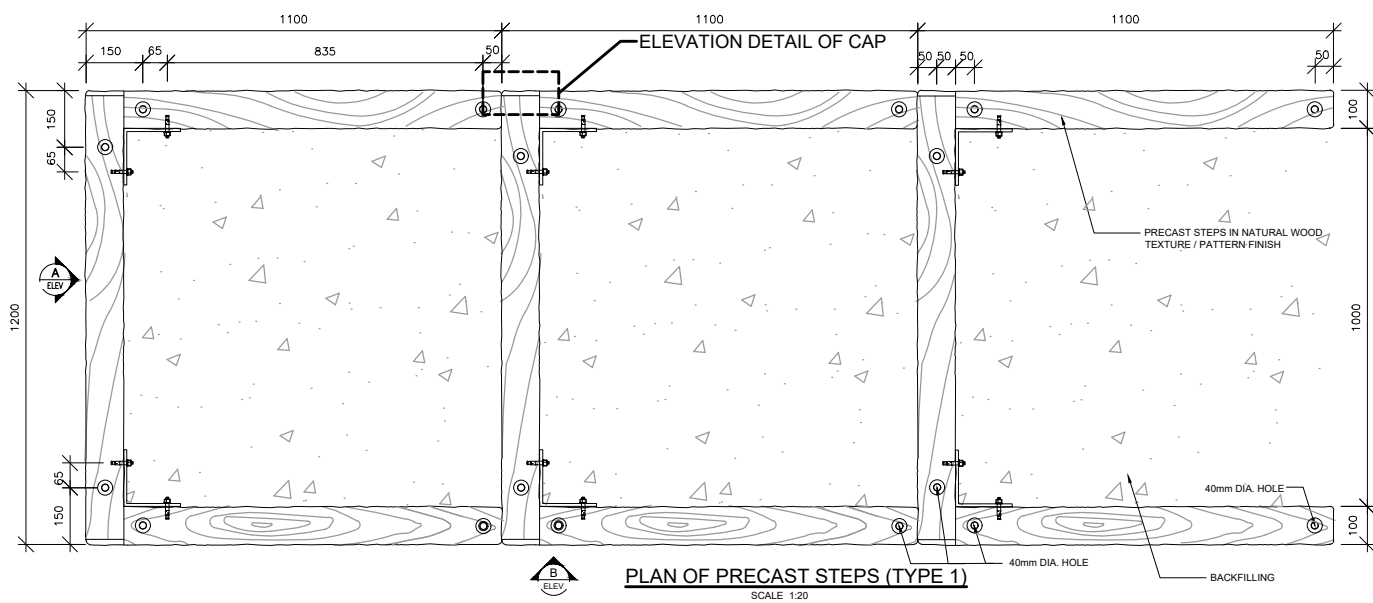
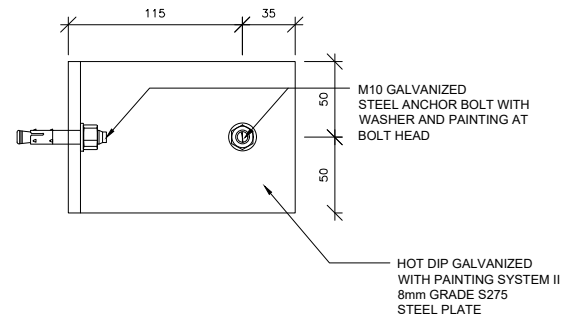
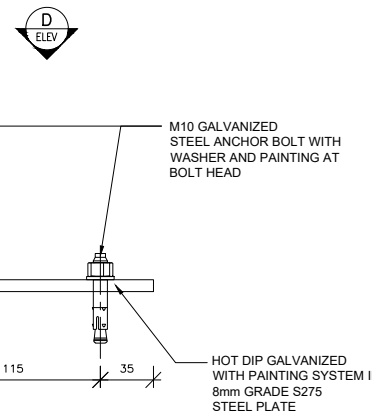


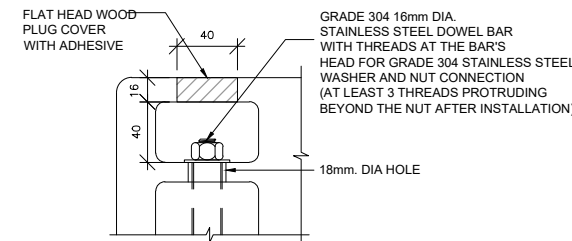
IMAGE REFERENCE  
SCALE NTS

ELEVATION A OF PRECAST STEPS  
SCALE 1:20

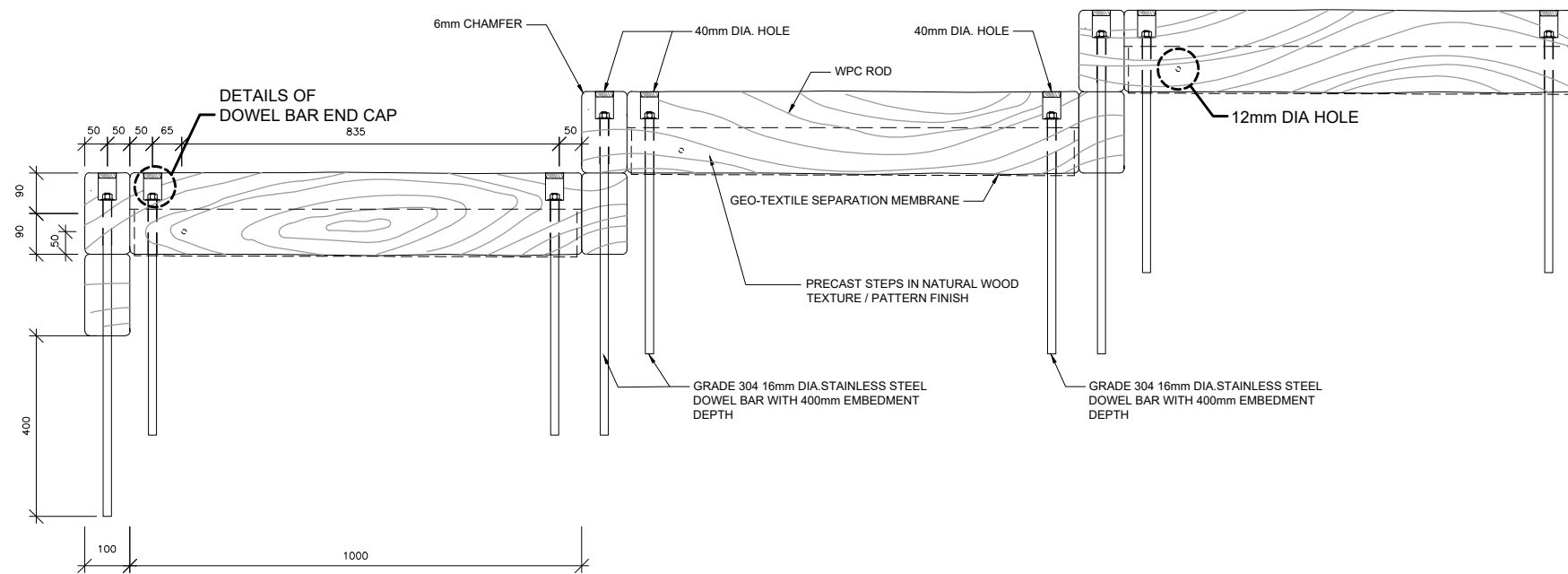


DETAILS OF CORNER  
CONNECTING PLATE  
SCALE 1:5 (A3)

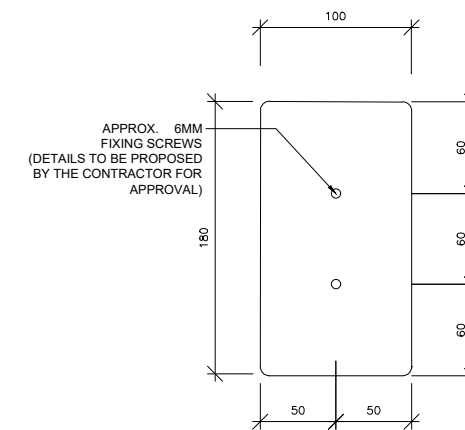
ELEVATION D OF CORNER  
CONNECTING PLATE  
SCALE 1:5 (A3)



DETAILS OF DOWEL BAR END CAP  
SCALE 1:5 (A3)



ELEVATION B OF PRECAST STEPS  
SCALE 1:20



ELEVATION DETAIL OF CAP  
SCALE 1:5 (A3)

B.D. REF.	/	/
F.S.D. REF.	/	/

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REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

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SIGNATURE FOR SUBMISSION/ CONSTRUCTION

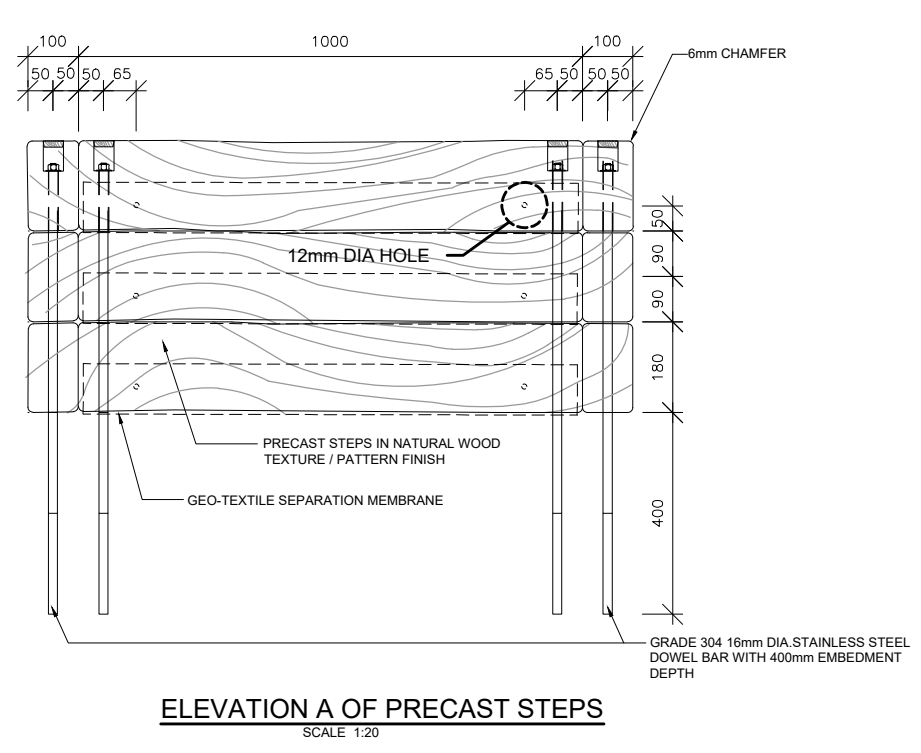
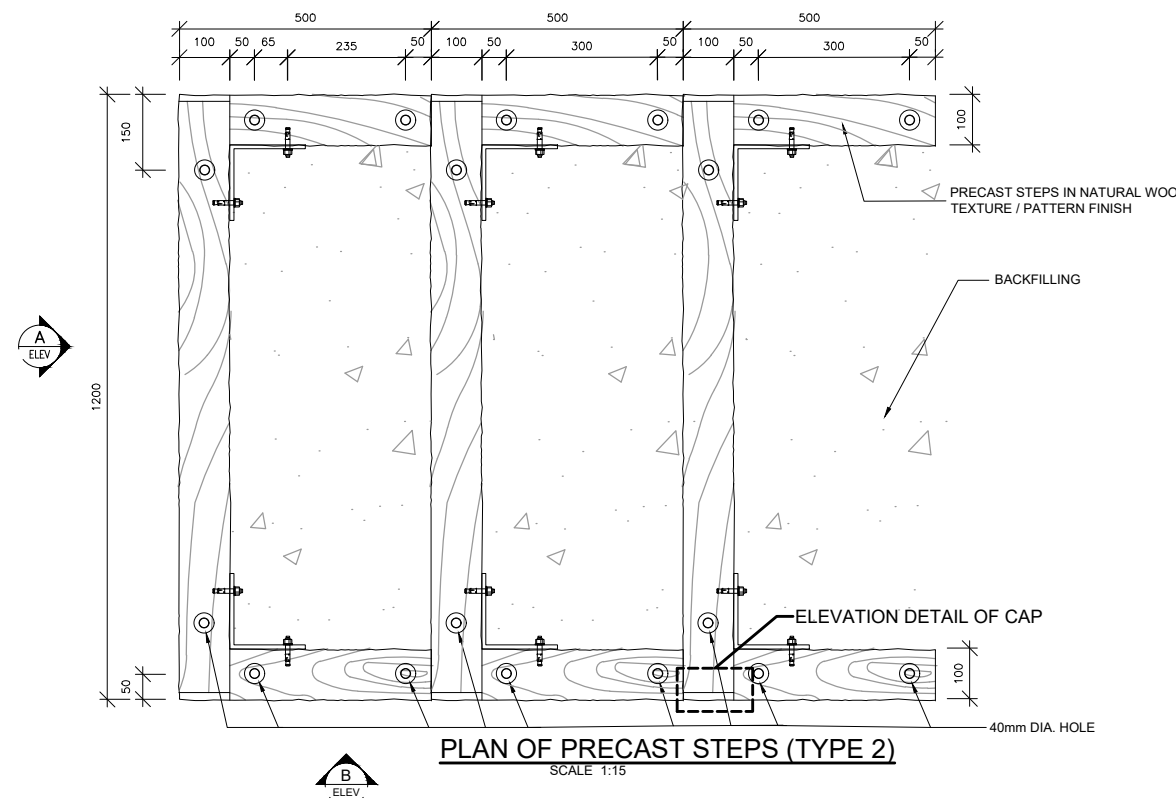
PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	TC DF
APPROVED BY:	VT
SCALE:	AS SHOWN
CAD FILE:	WAC_20222_C_PPM_003B

PROJECT:  
SLO 03/2020  
STUDY FOR ENHANCEMENT OF TRAIL AND CONNECTIVITY IN LANTAU

DRAWING TITLE:  
TYPICAL DETAILS OF PRECAST MODULES - OPTIMIZED DESIGN OF STEPS (TYPE 1)

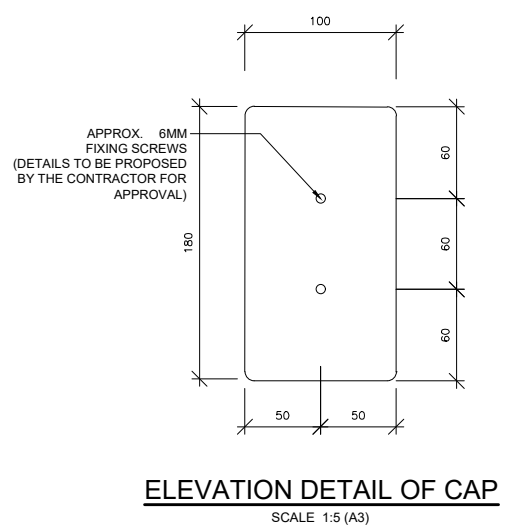
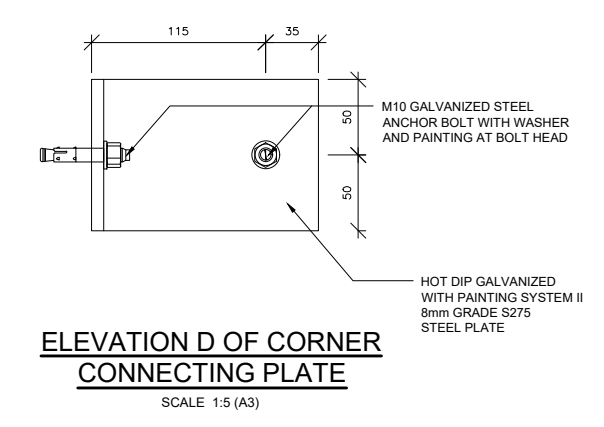
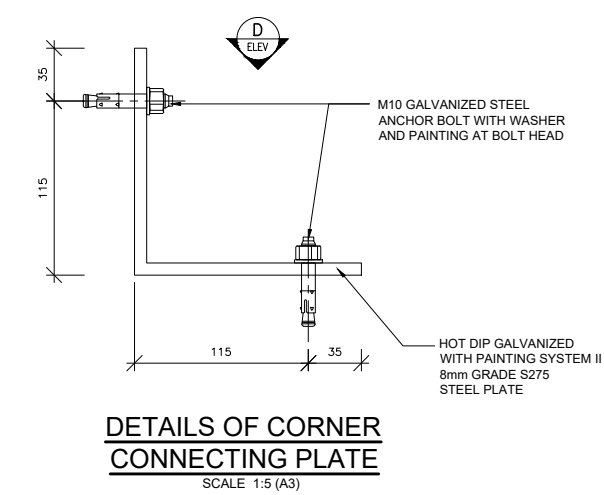
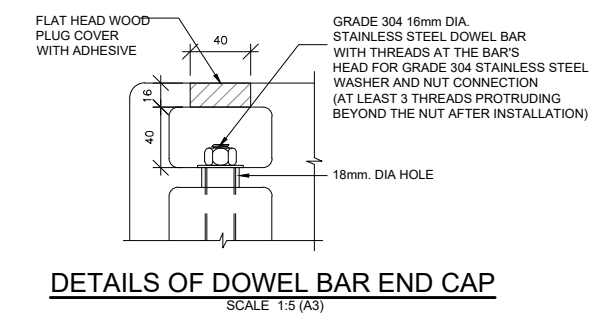
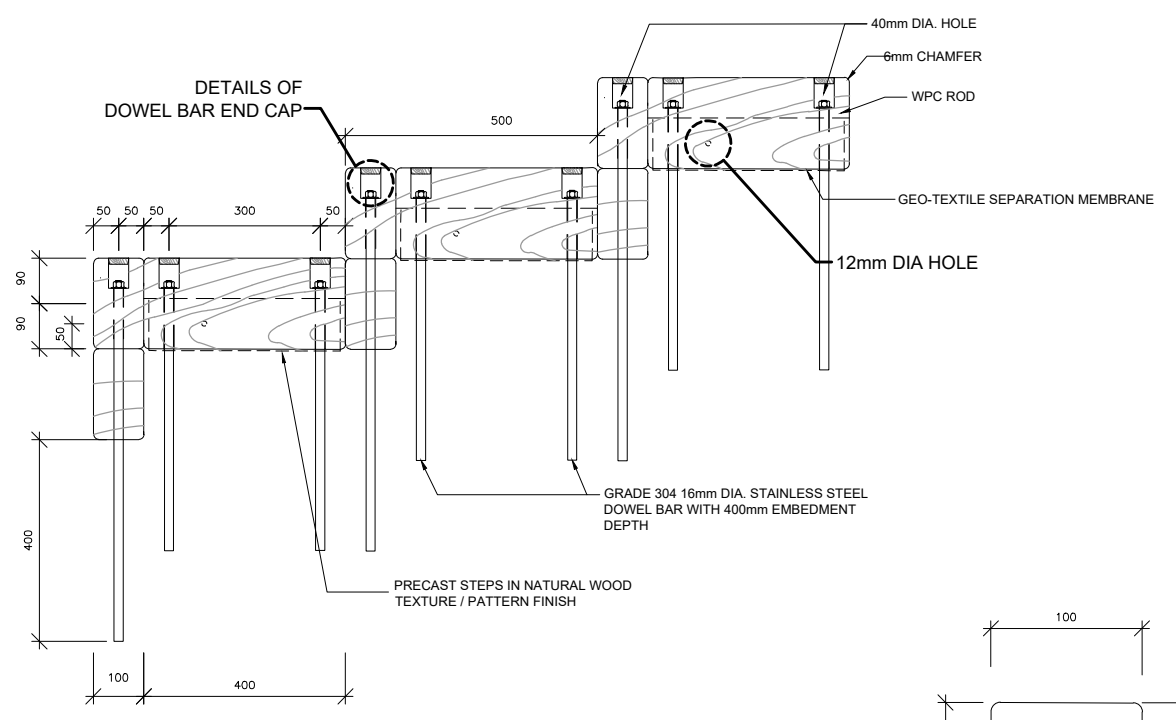
DRAWING NO:	WAC/20222/C/PPM/003a
REV:	-





B.D. REF.	/	/
F.S.D. REF.	/	/

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REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
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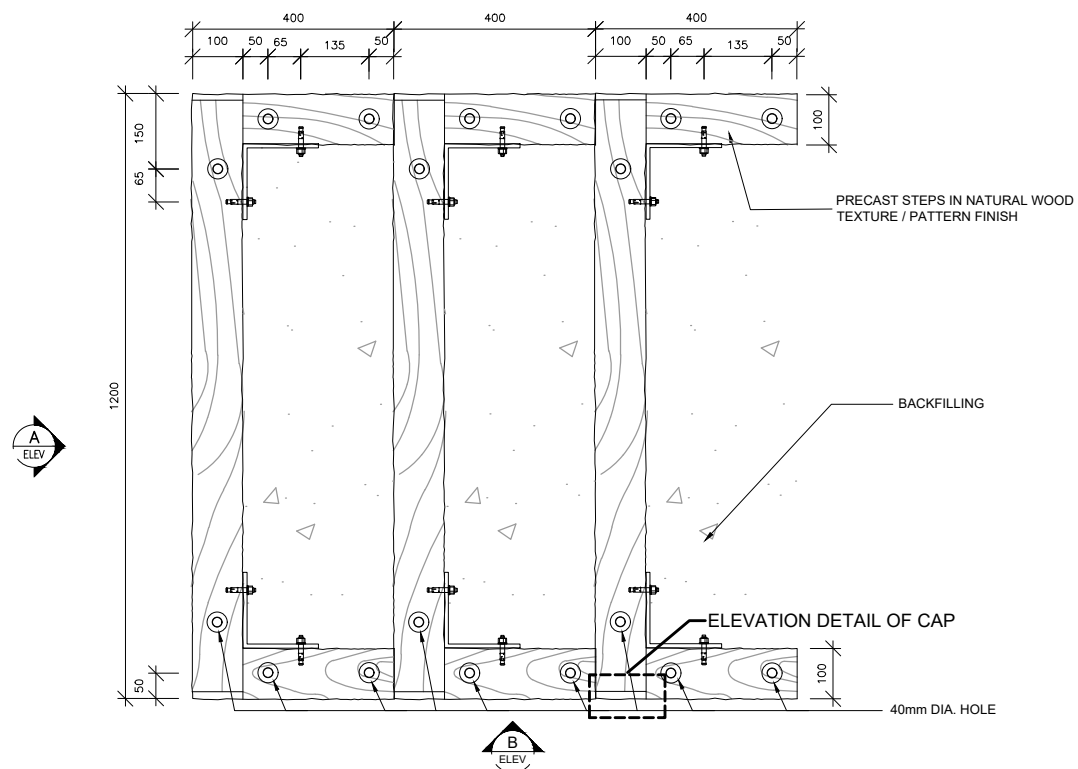
SIGNATURE FOR SUBMISSION/ CONSTRUCTION

PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	TC DF
APPROVED BY:	VT
SCALE:	AS SHOWN
CAD FILE:	WAC_20222_C_PPM_004B

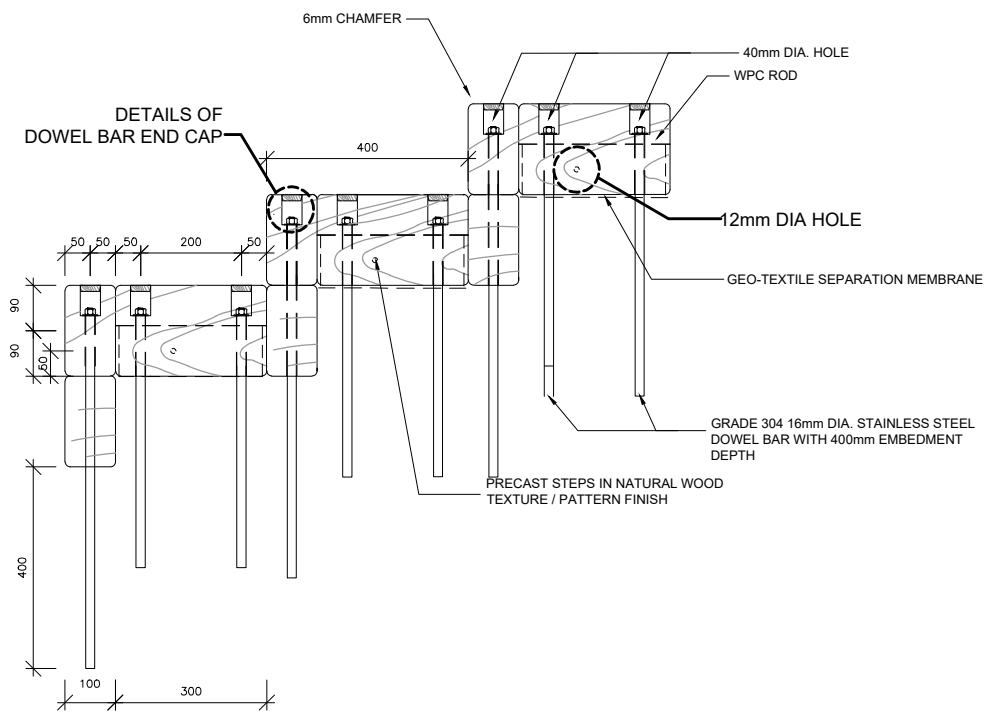
PROJECT:  
**SLO 03/2020**  
**STUDY FOR ENHANCEMENT OF TRAIL AND CONNECTIVITY IN LANTAU**

DRAWING TITLE:  
**TYPICAL DETAILS OF PRECAST MODULES - OPTIMIZED DESIGN OF STEPS (TYPE 2)**

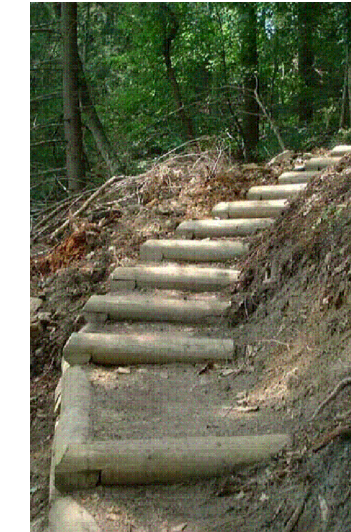
DRAWING NO:	WAC/20222/C/PPM/004a	REV:	-
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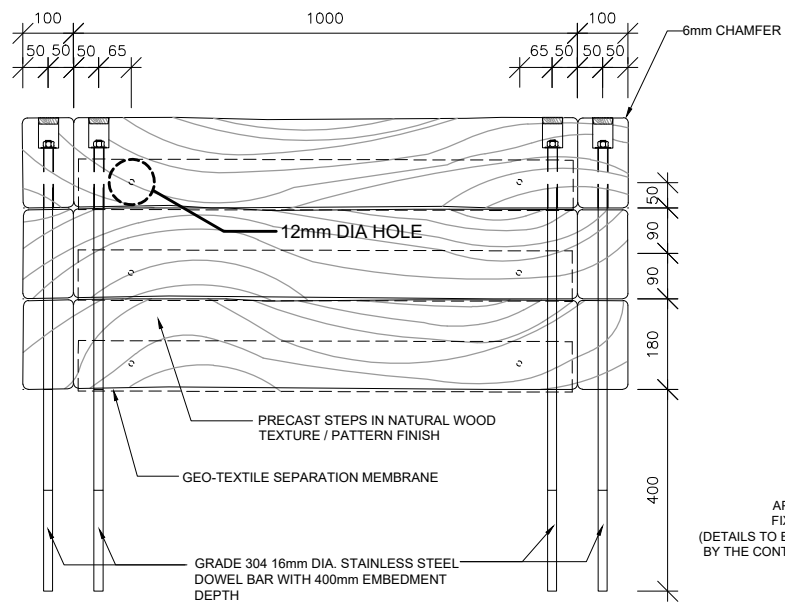
**PLAN OF PRECAST STEPS (TYPE 3)**  
SCALE 1:15



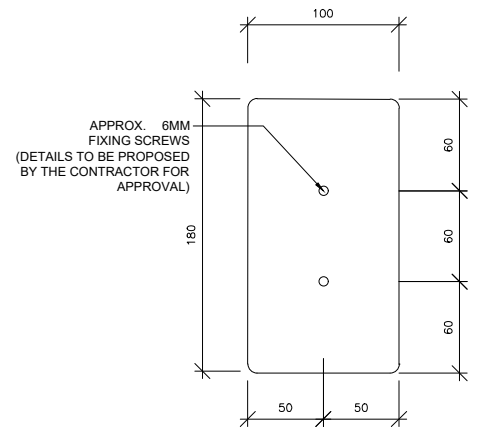
**ELEVATION B OF PRECAST STEPS**  
SCALE 1:20



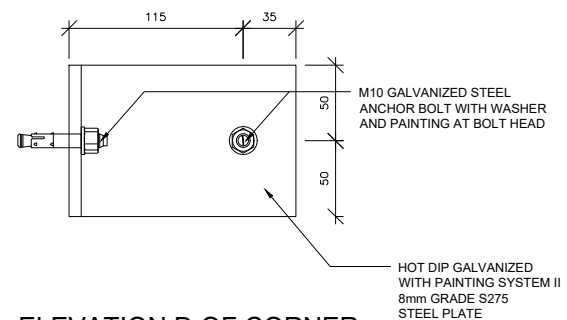
**IMAGE REFERENCE**  
SCALE NTS



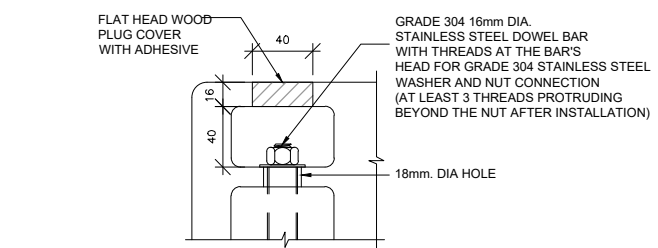
**ELEVATION A OF PRECAST STEPS**  
SCALE 1:20



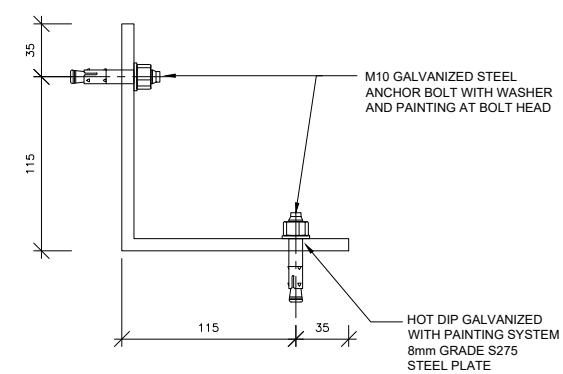
**ELEVATION DETAIL OF CAP**  
SCALE 1:5 (A3)



**ELEVATION D OF CORNER CONNECTING PLATE**  
SCALE 1:5 (A3)



**DETAILS OF DOWEL BAR END CAP**  
SCALE 1:5 (A3)



**DETAILS OF CORNER CONNECTING PLATE**  
SCALE 1:5 (A3)

B.D. REF.	/	/
F.S.D. REF.	/	/

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
  - ALL LEVEL ARE IN METRES WITH REFERENCE TO HONG KONG PRINCIPAL DATUM (mPD).
  - FOR GENERAL NOTES, REFER TO DRAWING NO. WAC/20222/MUW/GN/001 AND SPECIFICATION FOR THE WPC MATERIAL'S PROPERTIES.
  - PRE-ASSEMBLY TRIAL OF THE PRECAST MODULES SHALL BE CARRIED OUT AT MANUFACTURING FACTORY BEFORE DELIVERING TO THE SITE.
  - EACH PRECAST STEP SHALL NOT BE OVERLAPPING WHEN CONSTRUCTED IN SERIES.
  - COLOR AND PATTERN OF PPMs SHALL REFER TO DRAWING NO. WAC/20222/PPM/C/012.
  - FOR ALL RECTANGULAR PPMs, 6mm CHAMFER SHALL BE PLACED ON THE EDGE.
  - ON-SITE MODIFICATION, SUCH AS TRIMMING, INSITU CONCRETE MIXING, HOLE DRILLING AND ADJUSTING ANGLE, SHALL BE CARRIED OUT BY THE CONTRACTOR. SO THAT THE PPMs WILL FIT INTO THE ACTUAL SITE CONDITION.
  - FORMATION FOR STAIRS & STEP, SUCH AS CUT AND FILL OF THE GROUND SURFACE IN MINIMAL EXTENT, SHALL BE CARRIED OUT BY THE CONTRACTOR.

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
A	12/21	1ST AMENDMENT	KL	TC	DF

ALL MEASUREMENTS MUST BE CHECKED AT THE SITE - DO NOT SCALE DRAWING  
ALL DRAWING SPECIFICATIONS AND THEIR COPY RIGHT ARE THE PROPERTY OF ENGINEERS, ARCHITECTS, DESIGNERS AND SHALL BE RETURNED AT THE COMPLETION OF THE WORK - THIS DRAWING IS NOT VALID FOR CONSTRUCTION PURPOSES UNLESS EXPRESSLY CERTIFIED.

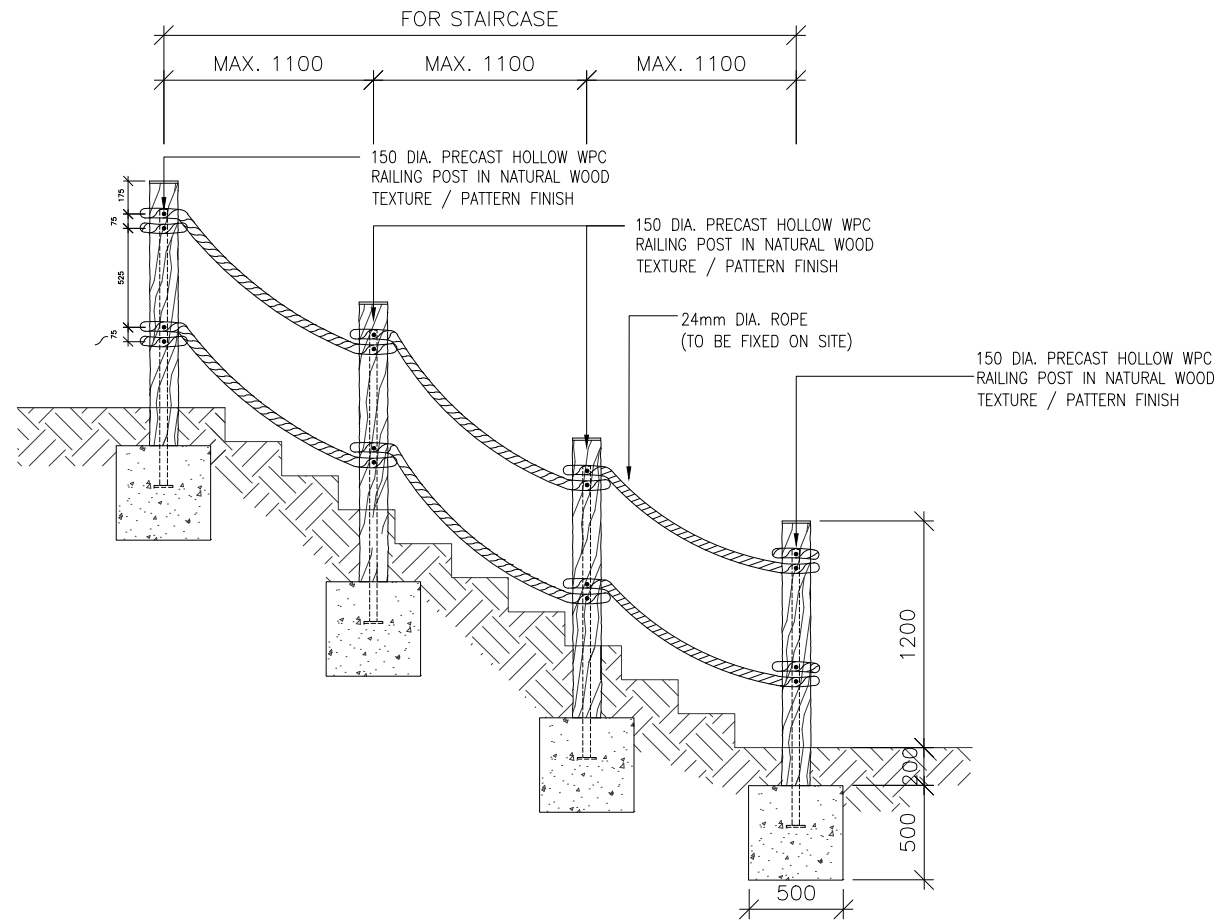
SIGNATURE FOR SUBMISSION/ CONSTRUCTION

PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	TC DF
APPROVED BY:	VT
SCALE:	AS SHOWN
CAD FILE:	WAC_20222_C_PPM_0056

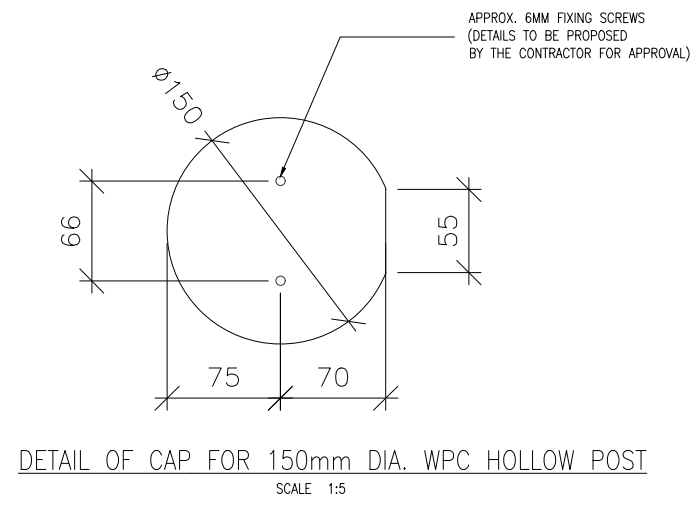
PROJECT:  
**SLO 03/2020**  
**STUDY FOR ENHANCEMENT OF TRAIL AND CONNECTIVITY IN LANTAU**

DRAWING TITLE:  
**TYPICAL DETAILS OF PRECAST MODULES - OPTIMIZED DESIGN OF STEPS (TYPE 3)**

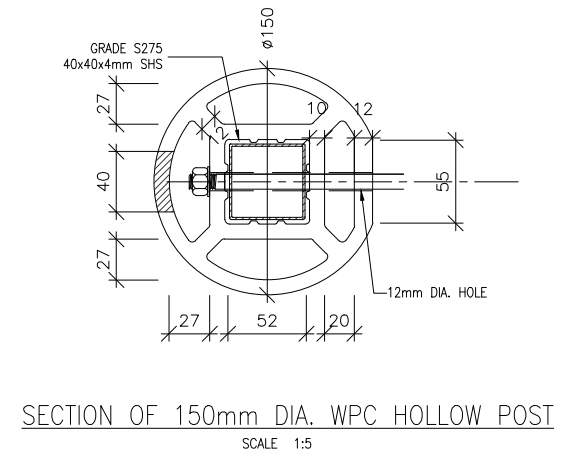
DRAWING NO:	WAC / 20222 / C / PPM / 005a
REV:	-



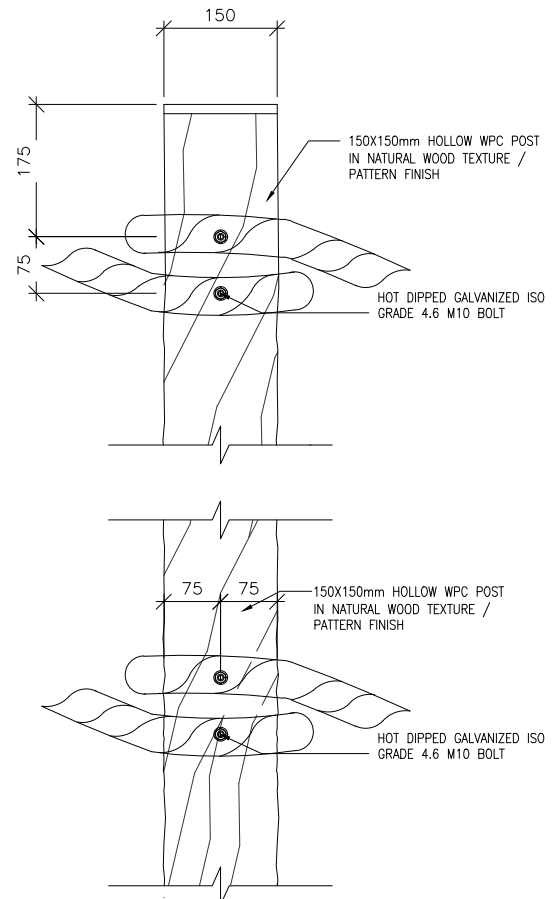
TYPICAL ELEVATION OF RAILING FOR STAIRCASE  
SCALE 1:40



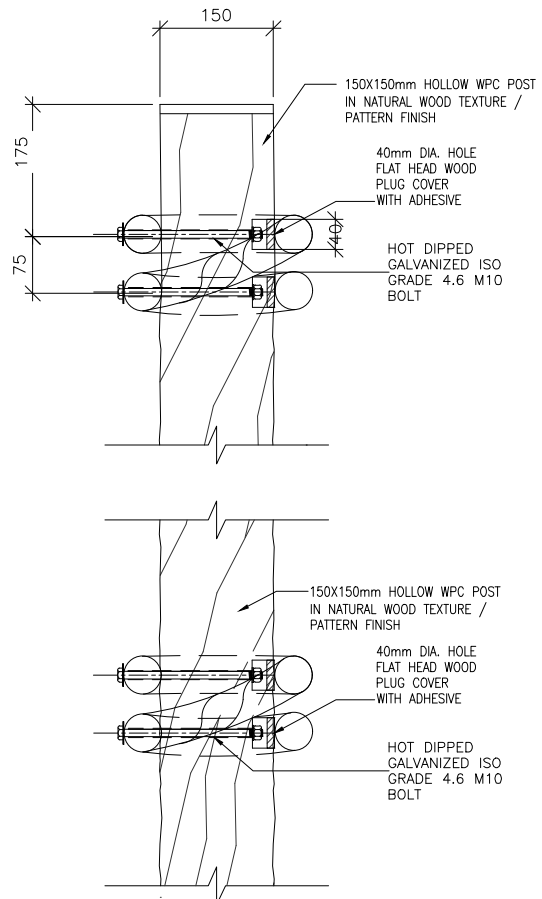
DETAIL OF CAP FOR 150mm DIA. WPC HOLLOW POST  
SCALE 1:5



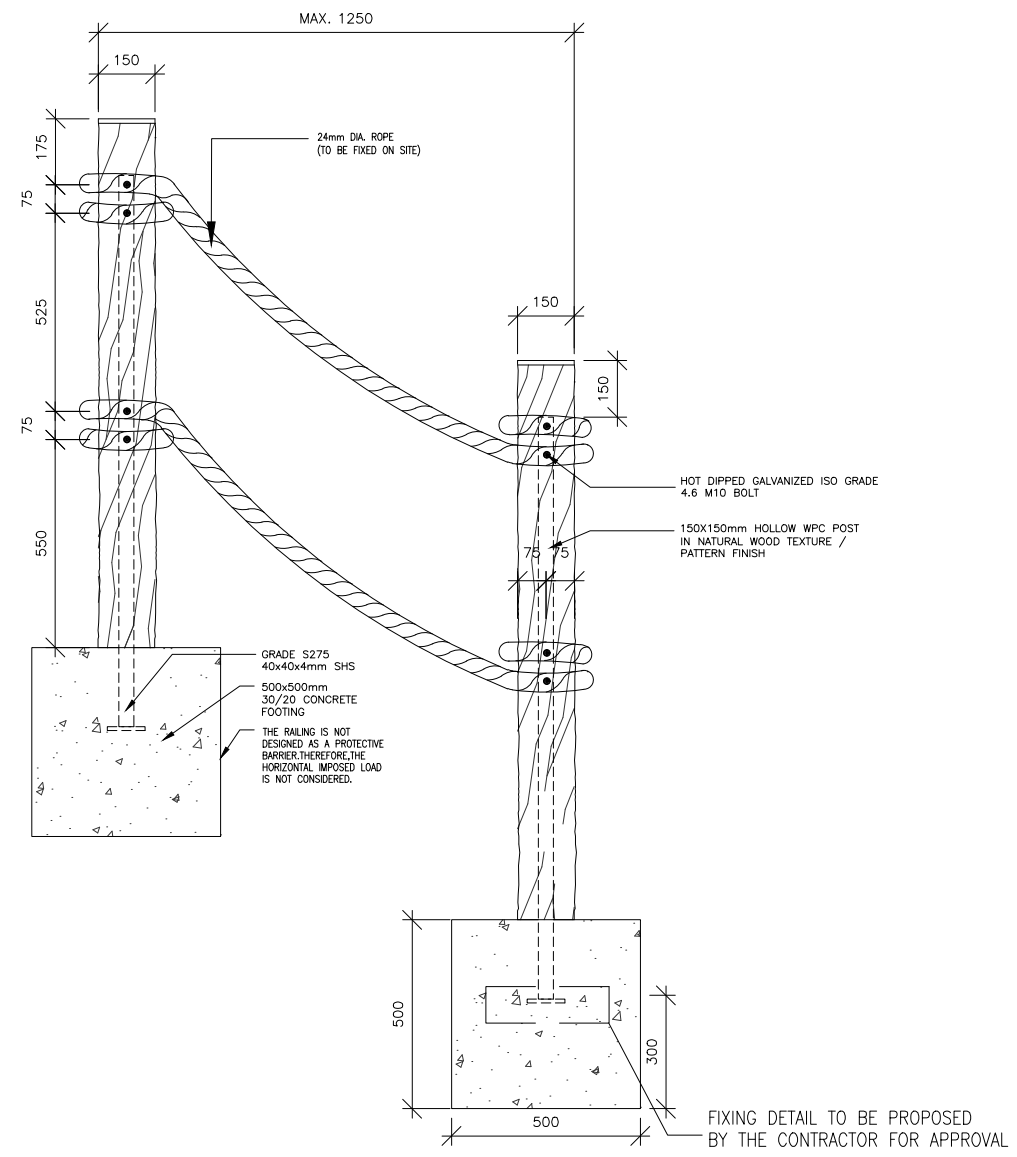
SECTION OF 150mm DIA. WPC HOLLOW POST  
SCALE 1:5



DETAILS OF 50mm DIA. HOLE SIDE A  
SCALE 1:10



DETAILS OF 50mm DIA. HOLE SIDE B  
SCALE 1:10



DETAILS OF PRECAST RAILING  
SCALE 1:20

B.D. REF.	/	/
F.S.D. REF.	/	/

- NOTES:
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
  - ALL LEVEL ARE IN METRES WITH REFERENCE TO HONG KONG PRINCIPAL DATUM (mPD).
  - FOR GENERAL NOTES, REFER TO DRAWING NO. WAC/20222/MUM/001 AND SPECIFICATION FOR THE WPC MATERIAL'S PROPERTIES.
  - PRE-ASSEMBLY TRIAL OF THE PRECAST MODULES SHALL BE CARRIED OUT AT MANUFACTURING FACTORY BEFORE DELIVERING TO THE SITE.
  - EACH PRECAST STEP SHALL NOT BE OVERLAPPING WHEN CONSTRUCTED IN SERIES.
  - COLOR AND PATTERN OF PPMs SHALL REFER TO DRAWING NO. WAC/20222/PPM/C/012.
  - FOR ALL RECTANGULAR PPMs, 6mm CHAMFER SHALL BE PLACED ON THE EDGE.
  - ON-SITE MODIFICATION, SUCH AS TRIMMING, INSITU CONCRETE MIXING, HOLE DRILLING AND ADJUSTING ANGLE, SHALL BE CARRIED OUT BY THE CONTRACTOR. SO THAT THE PPMs WILL FIT INTO THE ACTUAL SITE CONDITION.
  - FORMATION FOR STAIRS & STEP, SUCH AS CUT AND FILL OF THE GROUND SURFACE IN MINIMAL EXTENT, SHALL BE CARRIED OUT BY THE CONTRACTOR.
  - THE RAILING IS NOT DESIGNED AS A PROTECTIVE BARRIER. THEREFORE, THE HORIZONTAL IMPOSED LOAD IS NOT CONSIDERED.

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

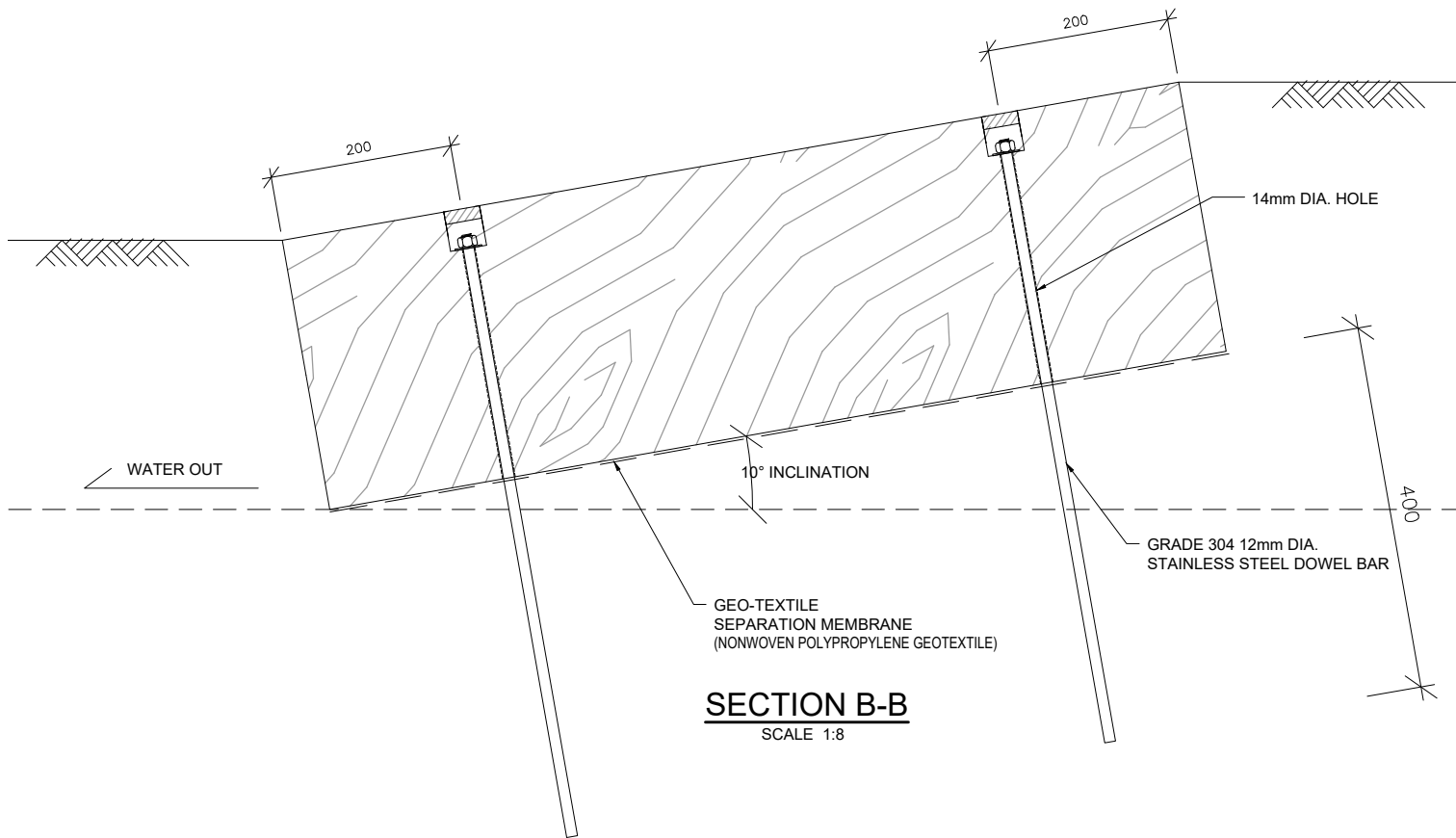
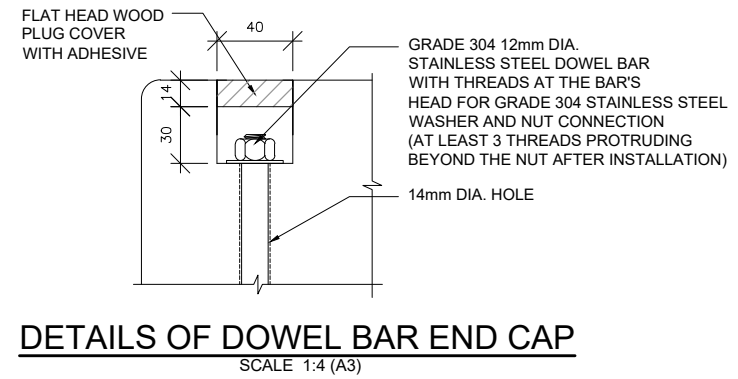
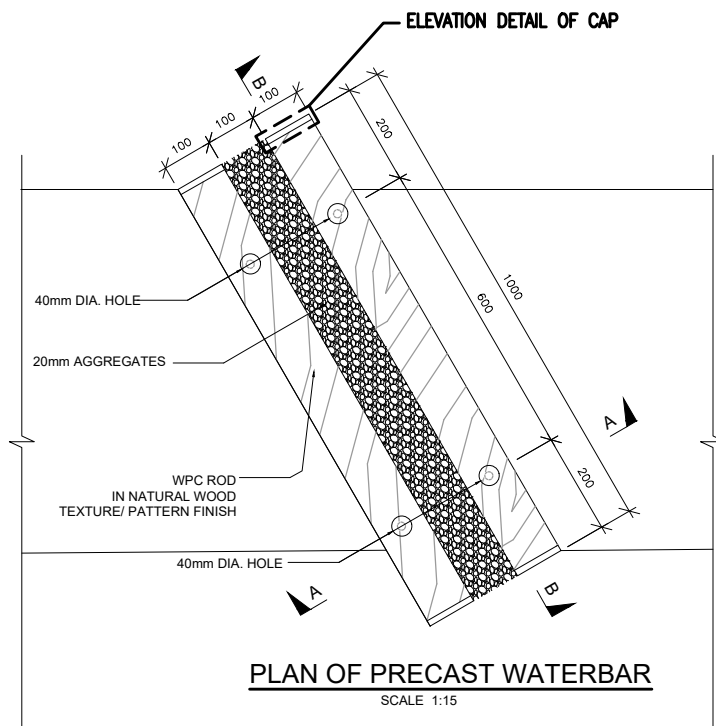
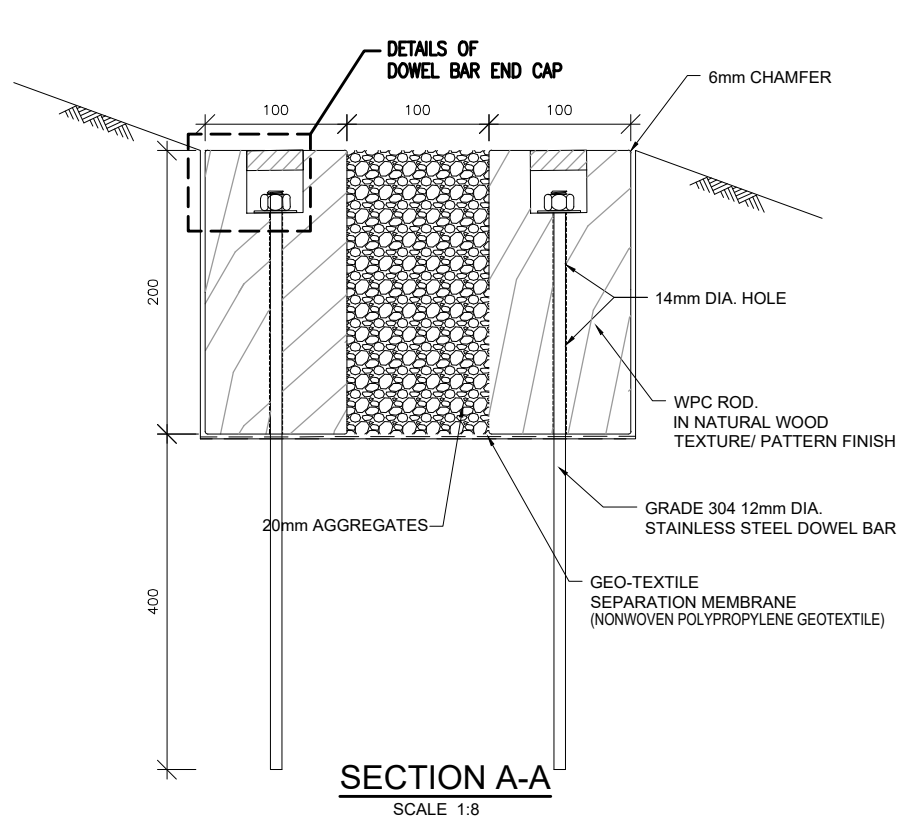
PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	DF TC
APPROVED BY:	VT
SCALE:	AS SHOWN
CAD FILE:	WAC_20222_C_PPM_008C

PROJECT:  
SLO 15/2020  
TRAIL IMPROVEMENT WORKS IN TAI O  
(FU SHAN TO PO CHUE TAM)

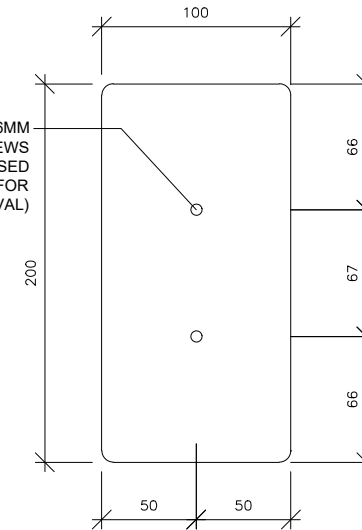
DRAWING TITLE:  
TYPICAL DETAILS OF  
PRECAST MODULES -  
OPTIMIZED DESIGN OF RAILING  
(TYPE 3)

DRAWING NO:	WAC/20222/C/PPM/008c
REV:	-





APPROX. 6MM  
FIXING SCREWS  
(DETAILS TO BE PROPOSED  
BY THE CONTRACTOR FOR  
APPROVAL)



B.D. REF.	/	/
F.S.D. REF.	/	/

**NOTES:**

- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
- ALL LEVEL ARE IN METRES WITH REFERENCE TO HONG KONG PRINCIPAL DATUM (mPD).
- FOR GENERAL NOTES, REFER TO DRAWING NO. WAC/2022/MJW/GN/001 AND SPECIFICATION FOR THE WPC MATERIAL'S PROPERTIES.
- PRE-ASSEMBLY TRIAL OF THE PRECAST MODULES SHALL BE CARRIED OUT AT MANUFACTURING FACTORY BEFORE DELIVERING TO THE SITE.
- EACH PRECAST STEP SHALL NOT BE OVERLAPPING WHEN CONSTRUCTED IN SERIES.
- COLOR AND PATTERN OF PPMs SHALL REFER TO DRAWING NO. WAC/2022/PPM/C/012.
- FOR ALL RECTANGULAR PPMs, 6mm CHAMFER SHALL BE PLACED ON THE EDGE.
- ON-SITE MODIFICATION, SUCH AS TRIMMING, INSITU CONCRETE MIXING, HOLE DRILLING AND ADJUSTING ANGLE, SHALL BE CARRIED OUT BY THE CONTRACTOR. SO THAT THE PPMs WILL FIT INTO THE ACTUAL SITE CONDITION.
- FORMATION FOR STAIRS & STEP, SUCH AS CUT AND FILL OF THE GROUND SURFACE IN MINIMAL EXTENT, SHALL BE CARRIED OUT BY THE CONTRACTOR.
- THE LENGTH OF WATERBAR SHALL BE ADJUSTED BASED ON SITE CONDITION.

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
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ALL MEASUREMENTS MUST BE CHECKED AT THE SITE - DO NOT SCALE DRAWING - ALL DRAWING SPECIFICATIONS AND THEIR COPY RIGHT ARE THE PROPERTY OF ENGINEERS, ARCHITECTS, DESIGNERS AND SHALL BE RETURNED AT THE COMPLETION OF THE WORK - THIS DRAWING IS NOT VALID FOR CONSTRUCTION PURPOSES UNLESS EXPRESSLY CERTIFIED.

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

PROJECT NO:	20222		
DRAWN BY:	KL		
DESIGNED BY:	JC		
CHECKED BY:	TC	DF	
APPROVED BY:	VT		
SCALE:	AS SHOWN		
CAD FILE:	WAC_20222_C_PPM_009B		

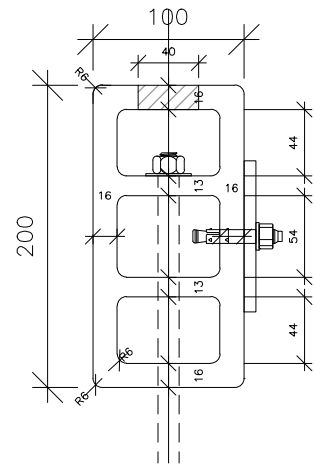
PROJECT:  
**SLO 03/2020**  
STUDY FOR ENHANCEMENT OF TRAILS AND CONNECTIVITY IN LANTAU

DRAWING TITLE:  
**TYPICAL DETAILS OF PRECAST MODULES - OPTIMIZED DESIGN OF WATERBAR**

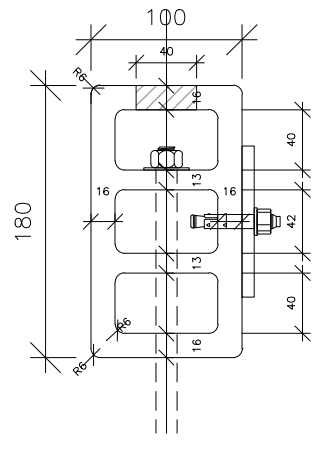
DRAWING NO:	WAC/20222/C/PPM/009a	REV:	-
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**DIMENSIONS OF MOULDS**

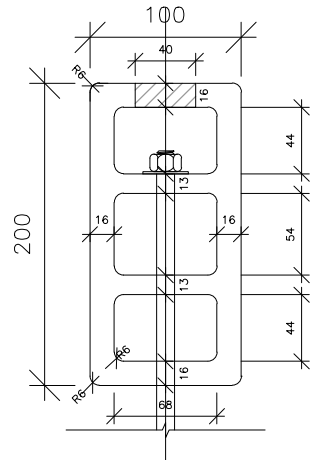
NOTES: TRIAL PANEL OF WPC MATERIAL FOR OPTIMIZING THE SOLIDITY RATIO AND LABORATORY TESTING FOR MATERIAL PROPERTIES AND SLIP RESISTANCE ON MATERIAL SURFACE.



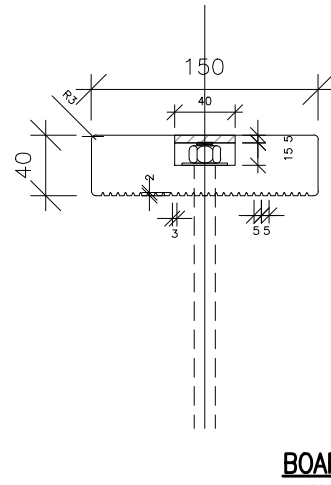
**STAIR**  
SCALE 1:5



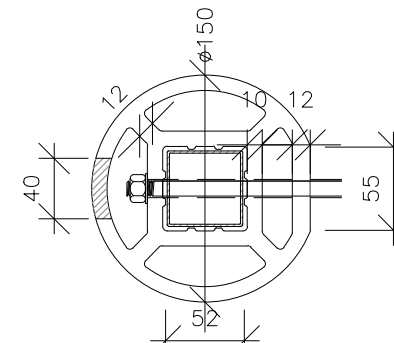
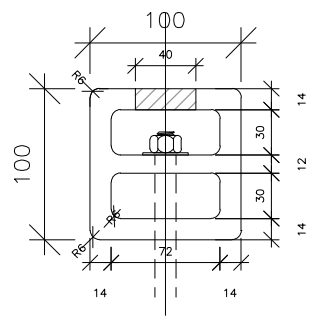
**STEP**  
SCALE 1:5



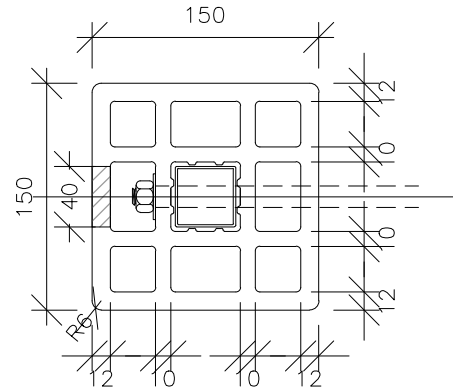
**WATER BAR**  
SCALE 1:5



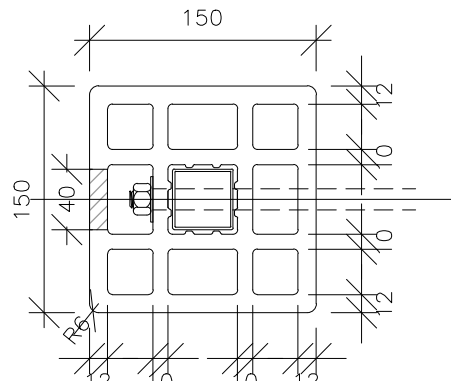
**BOARDWALK**  
SCALE 1:5



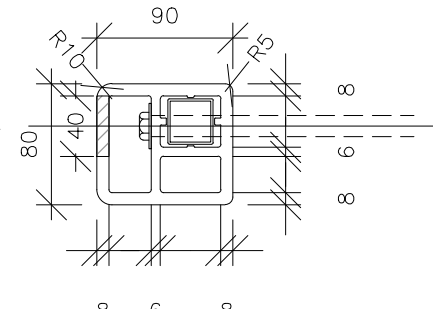
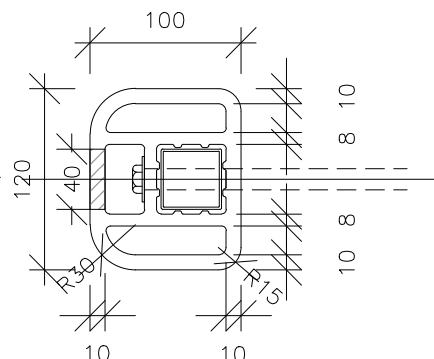
**RAILING TYPE 3**  
SCALE 1:5



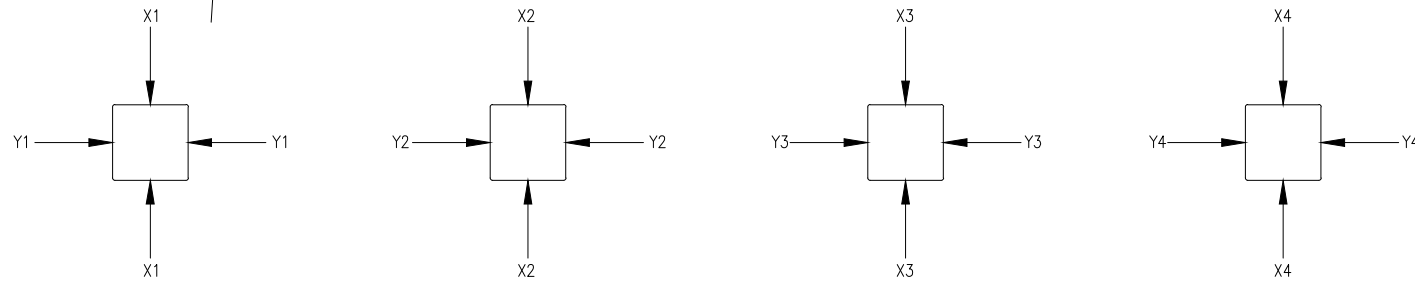
**RAILING TYPE 2**  
SCALE 1:5



**RAILING TYPE 1**  
SCALE 1:5



**COMBINATIONS OF COLOR & PATTERN**



**COLOR 1 MAHOGANY**  
SCALE NTS



**COLOR 2 RED OAK**  
SCALE NTS



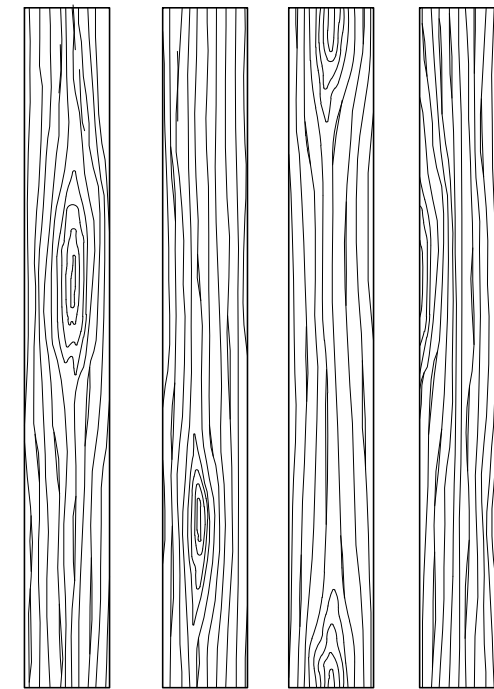
**COLOR 3 PROVINCIAL**  
SCALE NTS

(EXACT COLOR CODE SHALL BE AGREED WITH THE ENGINEER AND ARCHITECT)

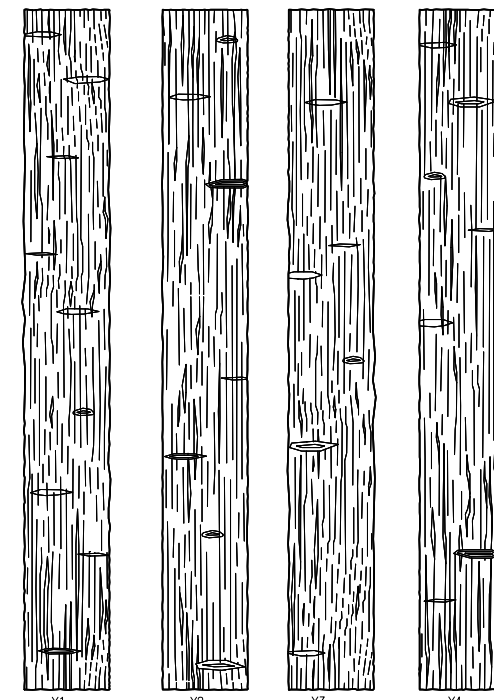
**STEEL MOULD TO BE HANDED OVER TO CEDD:**

PPM-TYPE	PPM MOULD ID NO.	SIZE (mm)	REMARKS
PPM-STAIR	A	100x180	SAME SIZE AS ORIGINAL CONTRACT DRAWING
PPM-STEP TYPE 1-3	B	100x200	SAME SIZE AS ORIGINAL CONTRACT DRAWING
PPM-WATER BAR	C	100x100	SAME SIZE AS ORIGINAL CONTRACT DRAWING
PPM-BOARDWALK	C	100x100	SAME SIZE AS ORIGINAL CONTRACT DRAWING
	D	150x40	CHANGED FROM 200x180mm TO 150x40mm (DUE TO THE DESIGN CHANGE OF BOARDWALK)
PPM-RAILING TYPE 1	E	150x150	SAME SIZE AS ORIGINAL CONTRACT DRAWING
	F	100x120	CHANGED FROM Ø75mm TO 100x120mm (DUE TO THE DESIGN CHANGE OF RAILING TYPE1)
	G	80x90	CHANGED FROM Ø50mm TO 80x90mm (DUE TO THE DESIGN CHANGE OF RAILING TYPE1)
PPM-RAILING TYPE 2	E	150x150	SAME SIZE AS ORIGINAL CONTRACT DRAWING
PPM-RAILING TYPE 3	G	80x90	CHANGED FROM Ø50mm TO 80x90mm (DUE TO THE DESIGN CHANGE OF RAILING TYPE3)
	H	Ø150	SAME SIZE AS ORIGINAL CONTRACT DRAWING

\*THERE ARE 8 TYPES OF STEEL MOULD IN TOTAL  
(THE TOTAL NUMBER OF STEEL MOULD REMAIN UNCHANGED)



**PATTERN X ROUGH CEDAR**  
SCALE NTS



**PATTERN Y HAND HEWN**  
SCALE NTS

B.D. REF.	/	/
F.S.D. REF.	/	/

- NOTES:**
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  - ALL LEVEL ARE IN METRES WITH REFERENCE TO HONG KONG PRINCIPAL DATUM (mPD).
  - FOR GENERAL NOTES, REFER TO DRAWING NO. WAC/20222/MUM/CN/001 AND SPECIFICATION FOR THE WPC MATERIAL'S PROPERTIES.
  - PRE-ASSEMBLY TRIAL OF THE PRECAST MODULES SHALL BE CARRIED OUT AT MANUFACTURING FACTORY BEFORE DELIVERING TO THE SITE.
  - EACH PRECAST STEP SHALL NOT BE OVERLAPPING WHEN CONSTRUCTED IN SERIES.
  - COLOR AND PATTERN OF PPMs SHALL REFER TO DRAWING NO. WAC/20222/PPM/C/012.
  - FOR ALL RECTANGULAR PPMs, 6mm CHAMFER SHALL BE PLACED ON THE EDGE.
  - ON-SITE MODIFICATION, SUCH AS TRIMMING, INSITU CONCRETE MIXING, HOLE DRILLING AND ADJUSTING ANGLE, SHALL BE CARRIED OUT BY THE CONTRACTOR. SO THAT THE PPMs WILL FIT INTO THE ACTUAL SITE CONDITION.
  - FORMATION FOR STAIRS & STEP, SUCH AS CUT AND FILL OF THE GROUND SURFACE IN MINIMAL EXTENT, SHALL BE CARRIED OUT BY THE CONTRACTOR.
  - THE CAPPING DETAIL SHALL BE PROVIDED BY THE CONTRACTOR FOR THE ENGINEER'S APPROVAL.
  - THE BOLT CONNECTIONS AND STRUCTURAL STEEL SECTIONS ARE INDICATIVE ONLY.

**LEGEND:**  

 FLAT HEAD WOOD PLUG COVER WITH ADHESIVE

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
ALL MEASUREMENTS MUST BE CHECKED AT THE SITE - DO NOT SCALE DRAWING = ALL DRAWING SPECIFICATIONS AND THEIR COPY RIGHT ARE THE PROPERTY OF ENGINEERS, ARCHITECTS, DESIGNERS AND SHALL BE RETURNED AT THE COMPLETION OF THE WORK - THIS DRAWING IS NOT VALID FOR CONSTRUCTION PURPOSES UNLESS EXPRESSLY CERTIFIED.					

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

PROJECT NO:	20222
DRAWN BY:	KL
DESIGNED BY:	JC
CHECKED BY:	TC DF
APPROVED BY:	VT
SCALE:	AS SHOWN
CAD FILE:	WAC_20222_C_PPM_012c

PROJECT:  
**SLO 15/2020**  
**TRAIL IMPROVEMENT WORKS IN TAI O**  
**(FU SHAN TO PO CHUE TAM)**

DRAWING TITLE:  
**COLOR CODE & WOOD GRAIN**  
**PATTERN DRAWING FOR PPM**  
**OPTIMIZED DESIGN**

DRAWING NO:	WAC/20222/C/PPM/012a	REV:	-
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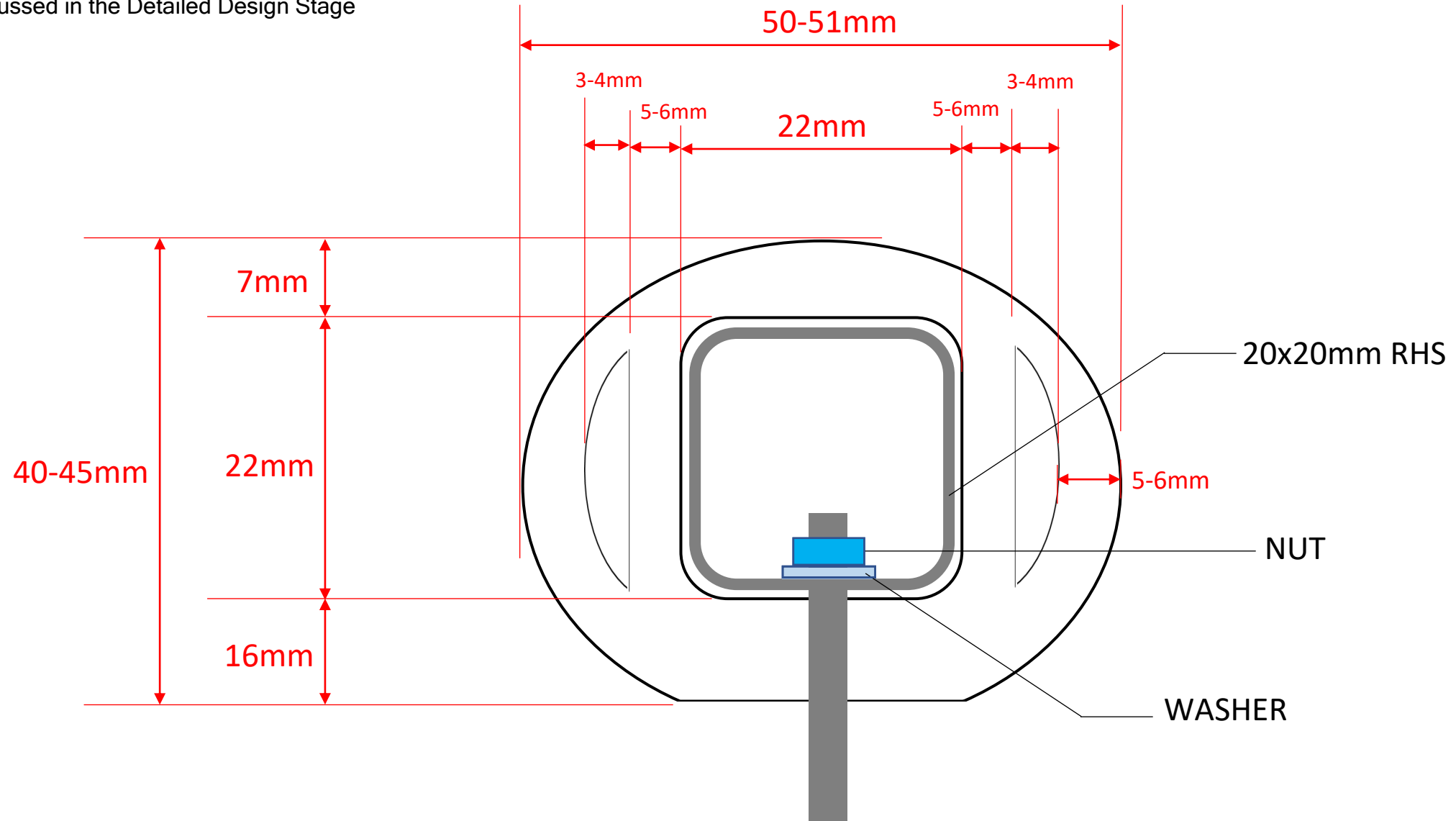
## **Appendix D**

### **Graphical Sketch of Optimized Design of PPM Railing Type 1,2 and 3**

# Suggestion for the Optimization of PPM for Railing

## Railing Type 1 - Rod

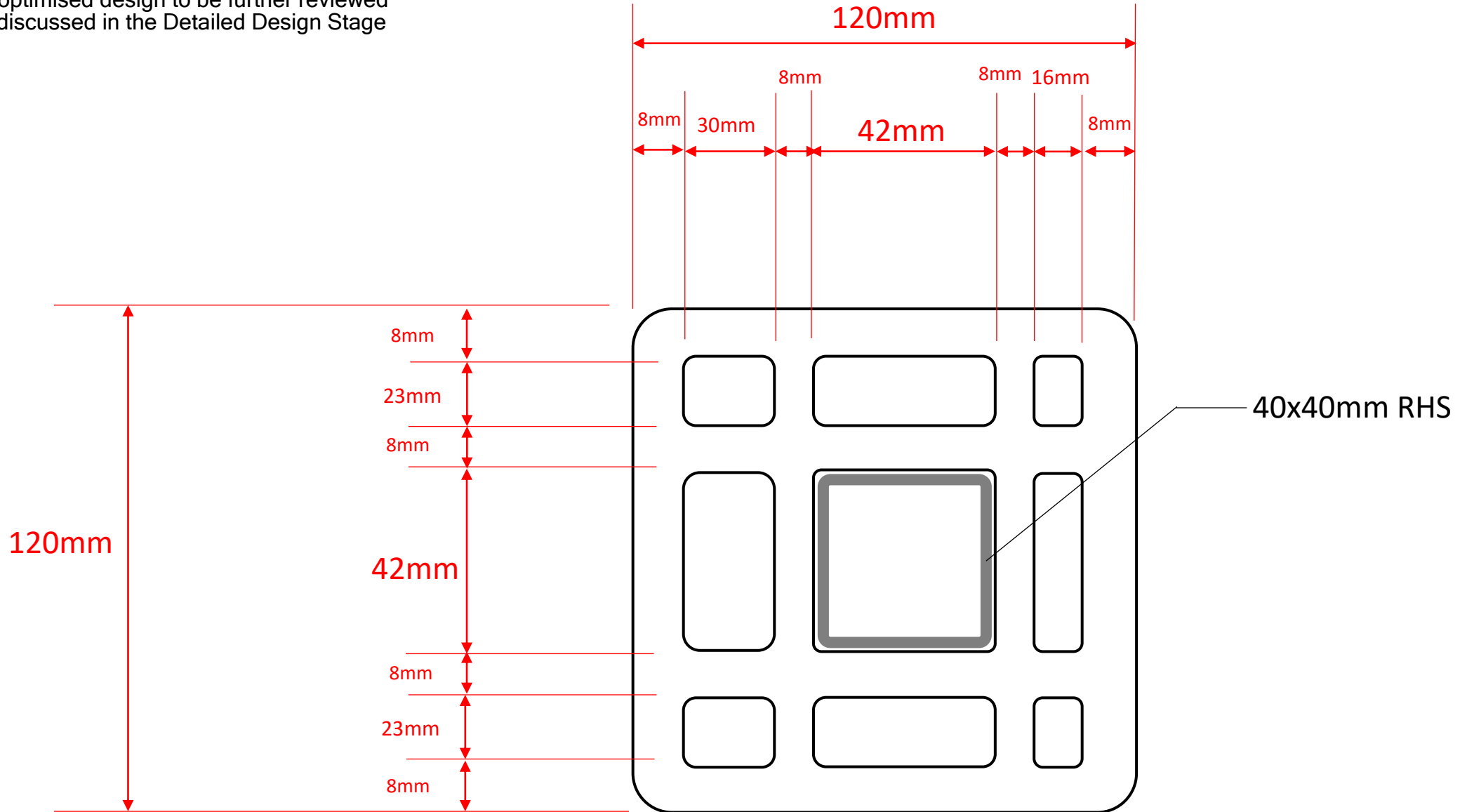
The optimised design to be further reviewed and discussed in the Detailed Design Stage



# Suggestion for the Optimization of PPM for Railing

## Railing Type 1 - Post

The optimised design to be further reviewed and discussed in the Detailed Design Stage

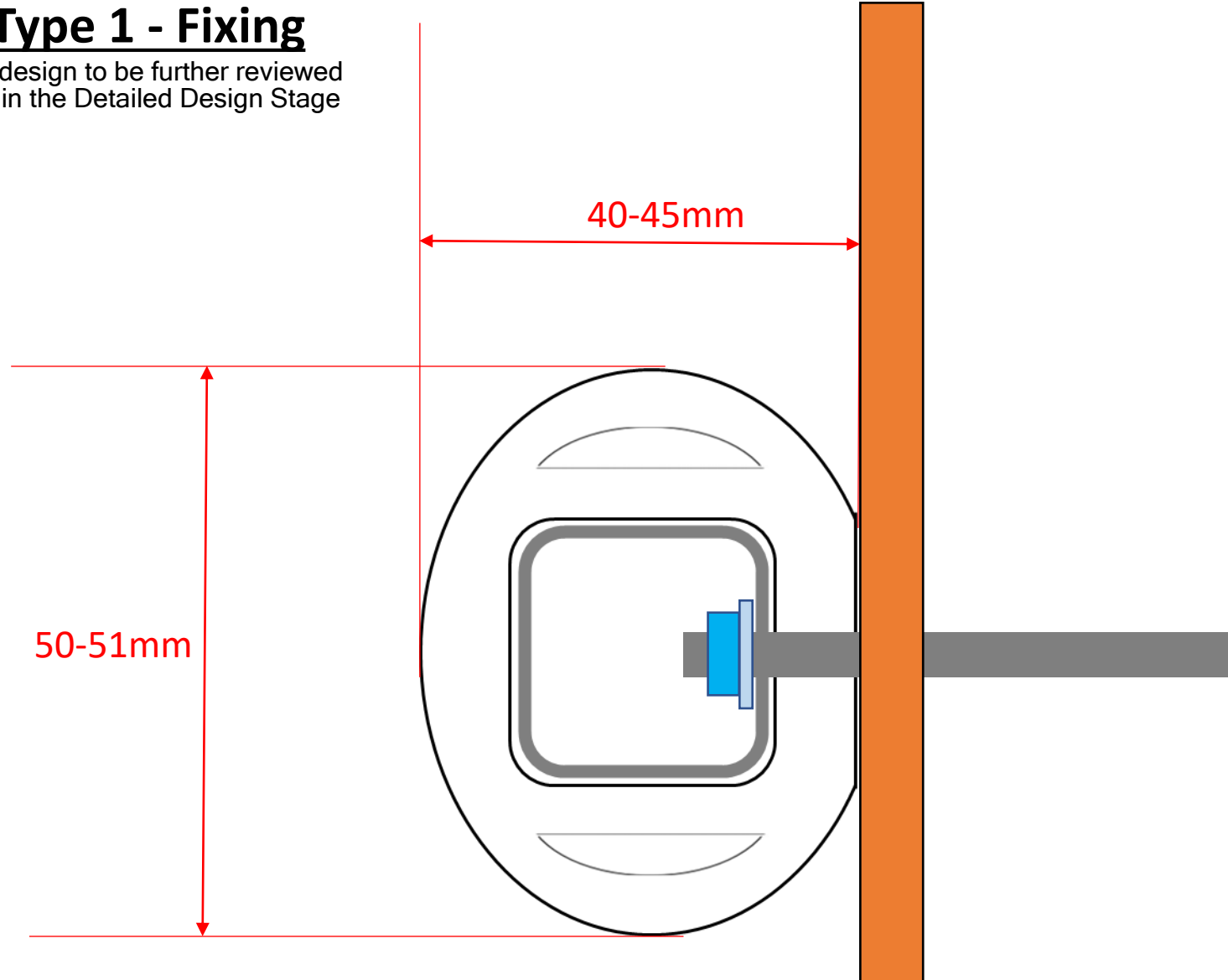




# Suggestion for the Optimization of PPM for Railing

## Railing Type 1 - Fixing

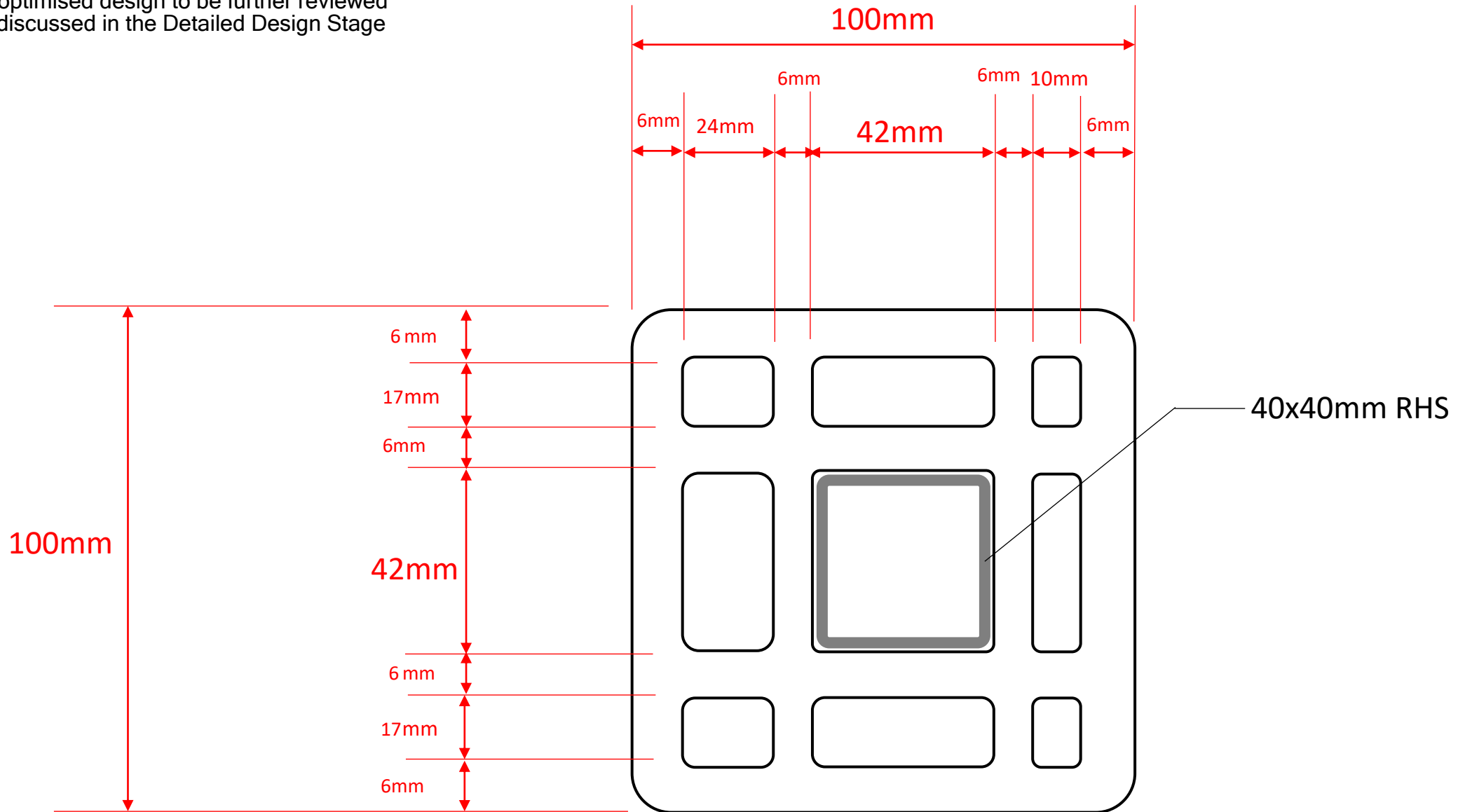
The optimised design to be further reviewed and discussed in the Detailed Design Stage



# Suggestion for the Optimization of PPM for Railing

## Railing Type 2 - Post

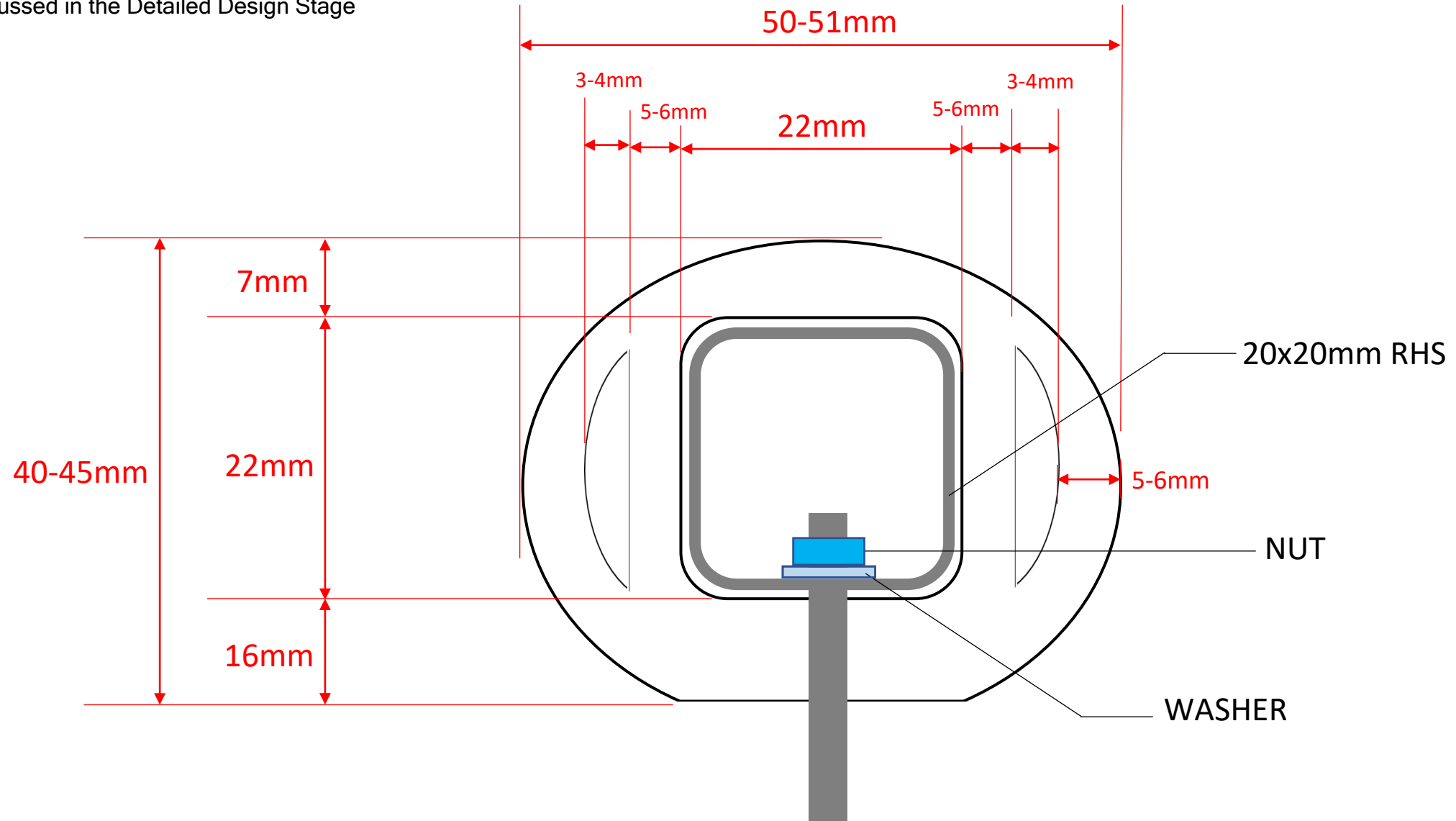
The optimised design to be further reviewed and discussed in the Detailed Design Stage



# Suggestion for the Optimization of PPM for Railing

## Railing Type 3 - Rod

The optimised design to be further reviewed and discussed in the Detailed Design Stage



# Suggestion for the Optimization of PPM for Railing

## Railing Type 3 - Fixing

The optimised design to be further reviewed and discussed in the Detailed Design Stage

