

**Drainage Services Department**

**Contract No. DC/2022/03  
Yuen Long Barrage and Nullah  
Improvement Schemes**

**Translocation Plan of  
Aquatic Species of Conservation Importance**

**v.1.5**

Certified By	 (Environmental Team Leader: Mr. KS Lee)
Prepared By	 (Qualified Ecologist: Dr. Mark Shea / China Hong Kong Ecology Consultants Ltd)

**REMARKS:**

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties.

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**Environmental Impact Assessment Ordinance Register Office**  
**Environmental Protection Department**  
27th floor, Southorn Centre,  
130 Hennessy Road, Wan Chai, Hong Kong.

By Courier

18 January 2024

Dear Sir / Madam,

**Contract No. DC/2022/03**  
**Yuen Long Barrage and Nullah Improvement Schemes**  
**(Environmental Permit (EP) No. EP-604/2022)**

**Submission of Translocation Plan of Aquatic Species of Conservation Importance v.1.5**

We refer to our Submission of Translocation Plan of Aquatic Species of Conservation Importance v.1.5 on 18 January 2024.

This certification is to supplement the captioned submission in accordance with Condition 2.14 under Environmental Permit No.: EP-604/2022. This Translocation Plan of Aquatic Species of Conservation Importance v.1.5 has been certified by Environmental Team Leader as referred to EP No.: EP-604/2022 Condition 2.14.

Should you require further information, please do not hesitate to contact our Ms. Betty Choi at 2151 2072 or the undersigned at 2151 2091.

Yours faithfully,  
Cinotech Consultants Limited



Mr. KS Lee  
Environmental Team Leader

Encl.

c.c.

DSD

Binnies

Meinhardt

Mr. LEE Chak Cho, Joe (1 hard copy)

Mr. Alvin Yu (1 hard copy)

Mr. Adi Lee (1 soft copy)

By Mail

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By E-Mail

Our Ref: CHKEC 2206/20240506

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Should you require further information, please do not hesitate to contact the undersigned at 9207 2997, or 2529 9593.

Yours faithfully,  
China Hong Kong Ecology Consultants Limited



Dr. Mark SHEA  
Qualified Ecologist

Encl.

c.c.

DSD

Binnies

Meinhardt

Mr. LEE Chak Cho, Joe (1 hard copy)

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Mr. Adi Lee (1 soft copy)

By Mail

By Mail

By E-Mail

Our Ref.: CL/YML/ST/60280/91955/mw  
Date: 18 January 2024

**By Email**

Drainage Services Department  
Project Management Division  
42/F, Revenue Tower  
5 Gloucester Road  
Wan Chai, Hong Kong

Attn.: Mr. Lee Chak-cho, Joe

**Meinhardt Infrastructure and  
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Dear Sir

Re: Contract No. DC/2022/03  
Yuen Long Barrage and Nullah Improvement Schemes  
Submission of Translocation Plan of  
Aquatic Species of Conservation Importance

I refer to Condition 2.14 under Environmental Permit No. EP-604/2021, regarding the submission of Translocation Plan of Aquatic Species of Conservation Importance. I hereby verify the captioned "Translocation Plan of Aquatic Species of Conservation Importance (v1.5)" dated 18 January 2024.

Should you have any queries, please do not hesitate to contact the undersigned at 2859 5443.

Yours faithfully  
MEINHARDT INFRASTRUCTURE AND ENVIRONMENT LTD



Adi Lee

Independent Environmental Checker

## **1. Objective**

1.1.1 To comply with the Contract Specification of Contract No. DC/2022/03- Yuen Long Barrage and Nullah Improvement Scheme and the Environmental Permit No. EP-604/2022 specified in Condition 2.14 for Translocation Plan of Aquatic Species of Conservation Importance (TPASCI). This Translocation Plan included details of the pre-construction survey methodology and results at the Project site, identification of potential receptor site(s), translocation methodology, measures to prevent recolonization of aquatic fauna in the works area of the tidal barrier, as well as a contingency plan in case of failure of the translocation. Any aquatic species of conservation importance, including but not limited to *Gobiopterus macrolepis*, identified during the pre-construction survey at the Project site and during the course of translocation will be translocated. All mitigation measures recommended and requirements specified in the TPASCI shall be fully implemented.

1.1.2 A silt curtain and rock berm/inflatable dam will be installed at the end of the collection site area to facilitate cofferdam construction work in the dry season. The silt curtain can also prevent the aquatic fauna from entering the collection area. Translocation of aquatic fauna of species of conservation importance will be carried out. Upon completion of the cofferdam, the silt curtain and rock berm/inflatable dam will be removed in the wet season. The watertight cofferdam can prevent fauna recolonization into the works area of the proposed barrage. After the translocation, regular checking of the integrity of silt curtain and cofferdam is recommended to ensure no aquatic fauna can recolonize into the work area.

## 2. Staffing

2.1.1 The translocation works and monitoring surveys will be conducted by experienced ecologist, Dr. Mark Shea, who is the Ph.D. holders of Ecology/ Environmental Science and he has the practical experience related to freshwater fish/ communities. He possess over 20-year experience in translocation of aquatic fauna. His CV is provided in **Appendix 1**. He will lead a well-trained team to conduct the translocation operation. All personnel involved in the works must attend safety and brief environmental training before the commencement of work and use appropriate PPE including safety helmets, anti-slippery safety boots or rain boots, and reflective vests. The Contractor and RSS will witness and provide necessary assistance to the fish collection and translocation exercises.

## 3. Scope of fauna translocation

3.1.1 Fish capture and translocation will be conducted in Section 4 of Yuen Long Nullah (between an existing inflatable dam and Shan Pui River) (**Photo 1** in **Appendix 2**) as indicated in **Figure 1** in **Appendix 3**.

3.1.2 All native fish encountered in the capture exercise will be collected and translocated. Particular attention would be given to the fish species *Gobiopterus macrolepis* (大鱗鱔虎魚) (**Photo 2** in **Appendix 2**) and other species of conservation importance (hereafter collectively called “target species”).

3.1.3 According to Figure A4b of Appendix 7.1 of the EIA Report, *Gobiopterus macrolepis* was recorded at the mouth of Yuen Long Nullah and other parts of the same waterbody (Shan Pui River, Kam Tin River and Nam San Wai). Therefore, two receptor sites along Yuen Long Nullah are proposed: one of them is located lower stream section of the Shan Pui River outside the collection area and silt curtain, where the goby species was previously recorded in the EIA Stage. The other receptor site is near the water gate that connects the reed-pond in Nam San Wai, where most of the goby species was previously recorded in the EIA Stage.

3.1.4 The captured species with conservation importance will be relocated to two receptor sites (**Figure 2** in **Appendix 3**) and all other fish collected will be relocated to the lower stream of the Shan Pui River outside the collection area and silt curtain (**Figure 2** in **Appendix 3**). As the proposed receptor sites are near the project site and they belongs to the same river system, and all of the collected species is considered adapted to the habitats, this can increase the survival rate of the translocation species. Short transportation distance can also minimize stress

to the captured individuals.

#### **4. Construction Sequence & Translocation Arrangement**

4.1.1 According to the Project Engineer, a dry environment is required for cofferdam construction as it cannot withstand the water pressure of daily tidal flow. Therefore, a rock berm and an inflatable dam are proposed at the proposed barrage for controlling the water level in Section 4 of Yuen Long Nullah. The enclosed area is proposed as the collection area for the target species. According to hydrographic survey, marine sediment was detected at various locations in Yuen Long Nullah. Due to safety concern, the ecological survey team cannot walk within the nullah to search for the target goby. Therefore, netting using boats is proposed.

4.1.2 Referring to **Appendix 4** and an indicative drawing **Figure 1** (in **Appendix 3**), a silt curtain will be placed at the Yuen Long Nullah channel mouth at the lowest predictable tide when most aquatic wildlife should have followed the tide into further downstream of Shan Pui River. The method statement of the silt curtain is provided in **Appendix 5**. During flood tide, water will enter Section 4 but the rising silt curtain will block the entry of aquatic wildlife.

4.1.3 After installing the silt curtain, a rock berm will be constructed at the channel mouth. Around 25m length of rock berm will be thinner to cater for an inflatable dam, and filled with water, air or both. This arrangement can reduce the tearing force on the inflatable dam due to tidal action. Instead of a full length rock berm, this setting allows quick removal of the dam and rock berm to allow upstream discharge in case of extreme rainfall. The method statement of the inflatable dam installation is provided in **Appendix 6**.

4.1.4 The enclosed area will be maintained at around 1.5m to allow translocation work using a vessel. The fish and other aquatic fauna will be captured within collection area by active searching by seines, nets, traps, and standard field sampling techniques as appropriate. After translocation work is completed, the water inside Section 4 will be lowered to facilitate an internal rock berm construction. A PE pipe placed underneath the rock berm/ dam will be opened to

allow flushing of brackish water into Section 4. The water level inside Section 4 will be controlled at a level that will not collapse the internal rock berm around the cofferdam works area. Upon completion of the cofferdam in dry season, the internal rock berm, silt curtain and rock berm/dam will be removed to return the natural water flow in wet season.

## **5. Overall method and sequence of *Gobiopterus macrolepis* translocation**

### **5.1 Preliminary site survey**

5.1.1 A preliminary survey was conducted on 4 September 2023 to identify the general physical/environmental conditions of the collection and receptor sites prior to any works to ascertain whether any site preparation works, e.g. clearance of invasive vegetation, re-profiling, etc., is/are needed.

5.1.2 No major habitat change was identified when compared to the descriptions in the EIA Report. Shan Pui River remained as a semi-natural watercourse influenced by tidal flow from Deep Bay, with sediment covering the riverbed, wetland herbs growing near the bankside and weeds emerging the concrete bank. As the goby was recorded in this environment in the EIA Stage, no site preparation work for changing the environment is required before the translocation work.

### **5.2 Pre-Translocation site check at collection area and receptor site**

5.2.1 In order to collect current specific data on the biodiversity of fish and other aquatic fauna in the river channel section, a pre-translocation survey was conducted on 20 October 2023 covering the collection area and the receptor site along Yuen Long Nullah. An additional pre-relocation survey was performed at Yuen Long Nullah and at Nam San Wai reed pond on the 14<sup>th</sup> December 2023. These pre-relocation surveys are considered important for figuring out the detailed methodology for fish relocation operations.

5.2.2 The same methods described in EIA report were used to survey the fish, i.e., by direct observation and active searching by hand netting, pot trap and seining.



5.2.3 All captured fauna species, including the target species, will be identified and their abundance will be recorded. Captured fauna will be released in situ immediately.

### **5.3 Pre-Translocation survey and results**

5.3.1 A pre-translocation survey was conducted within collection area and receptor sites on 20 October 2023 from 1:00 p.m. to 5:00 p.m. under flooding tide when the tidal level fluctuated between 1.4m and 1.7m. Vegetation were found at the bank only. No *Gobiopterus macrolepis* or species of conservation importance were captured but a shrimp during the pre-translocation survey (Photos 3-6 in **Appendix 2**).

5.3.2 An additional pre-relocation survey was performed at Yuen Long Nullah (Photos 7-10 in **Appendix 2**) and the Nam San Wai reed pond was performed on the morning of 14<sup>th</sup> December 2023, also under flooding tide between 1.4m and 1.7m. Approximately 30 goby fish *Gobiopterus macrolepis* were collected plus a few Geiwei shrimp (基圍蝦) *Metapenaeus ensis* in Nam San Wai only (Photos 11-20 in **Appendix 2**).

5.3.3 The survey results align with the distribution trend of the goby in the EIA (11 - 50 individuals were reported at Y5, 51 - 100 individuals at Y3 & Y4 and >1,000 at AD1 & AD2). The absence of the goby at the Nullah during the surveys may be due to low abundance. As mentioned in **Section 5.1.2**, no significant change in habitat is identified when compared to that in the EIA, and the reedbed in Nam San Wai is hydrologically linked to Shan Pui River. Therefore, Yuen Long Nullah remains as a suitable receptor site in case the goby is found in Section 4 of Yuen Long Nullah during the translocation search.

### **5.4 Collection and translocation works**

#### **5.4.1 Aquatic fauna collection and preparation works**

5.4.1.1 During aquatic fauna including the *Gobiopterus macrolepis* collection, only manual effort, instead of machinery other than a rubber boat, will be deployed in order to minimize disturbance. The silt curtain and rock berm/inflatable dam will be installed before the translocation works as described in **Section 4.1.2**.

5.4.1.2 The translocation works would be carried out within the collection area for 3 days or when no target species is found. Fish and other aquatic fauna will be captured within collection area manually with the pot traps, netting and hand-net fishing with small mesh size i.e. <3mm. The fish netting will be performed systematically in row from one side of the river to the other side.

#### ***Setting of pot traps***

5.4.1.3 Pot traps (mesh size <3mm diameter) (**Photo 7 in Appendix 2**) with bread baits will be used to capture *Gobiopterus macrolepis*. At least ten pot traps with baits will be evenly placed in the deeper water at each collection area. The fish traps will be deployed at the beginning of the translocation exercise and checked and animals will be collected after setting for one to two hours. More pot traps would be placed depending on the on-site situation.

#### ***Net fishing***

5.4.1.4 Plankton net fishing (mesh size <1mm diameter, 1m in length and 0.3m in depth) (**Photo 22 in Appendix 2**) with two rubber boats (**Photo 23 in Appendix 2**) will be used to capture aquatic fauna including *Gobiopterus macrolepis*. The net fishing will be kept operated in the morning and afternoon.

#### ***Hand-net fishing***

5.4.1.5 Hand-net fishing (mesh size <3mm diameter) will be carried out along the riverside (**Photo 24**).

5.4.1.6 The trapped/ captured animals including *Gobiopterus macrolepis* will be temporarily placed in aquatic containers (no less than 300mm Width\* 200mm Length\* 200mm Height) and separated from other species. An example of aquatic container is shown in **Photo 25 in Appendix 2**. Powered air pumps will be adopted in the containers to keep the water aerated. The water used will be collected from the collection area in order to minimize physiological shock. To avoid overcrowding, the number of individuals per container should be no more than 30.

5.4.1.7 Attention will be paid to the fish species that are collected to ensure only *Gobiopterus macrolepis*, other species of conservation importance and other

native species will be translocated. The exotic/introduced species will be collected from the collection area.

5.4.1.8 The conditions of the captured target fauna will be checked at 30-minute intervals or less. Water level check in containers will be conducted every hour or at any interval deemed necessary.

#### **5.4.2 Transportation and release**

5.4.2.1 The trapped and captured fish will be temporarily placed in fish containers. Powered air pumps will be adopted in the containers to keep the water aerated. Each container will only serve one species of native. The water used will be collected from the collection area in order to minimize physiological shock.

5.4.2.2 One vehicle will be on standby at the site for the translocation exercise. The collected fish will be relocated to the recipient sites within two hours to increase the survive rate of the captured species.

#### **5.4.3 Proposed collection and translocation exercise schedule**

5.4.3.1 The first choice of fish translocation date will be proposed the date after the silt curtain, rock berm and inflatable dam set up, supposed to be done in mid of January 2024.

5.4.3.2 Fish collection exercises will be commenced in the daytime during late January 2024. The species collected with the number of individuals will be recorded. These capture and relocation exercises will be completed when no more target species and other species of conservation importance could be collected within the collection area in three collection dates.

## **6. Post-translocation Monitoring**

6.1.1 *Gobiopertus macrolepis* is a kind of the planktonic species and follows the tidal water along Yuen Long Nullah and Shan Pui River. Since the goby is very small (20mm – 30mm), it is impossible to tag the captured individual(s) and check their survival after release. It is also impossible to set up an enclosed area at the receptor site (Shan Pui River) for observing the released goby due to high daily water level fluctuation. Most part of Shan Pui River will be drained under low

tide and the remaining water channel is occasionally utilized by the locals for water transportation. As the goby will be returned to the same waterbody where it originates and reported in the EIA Report, post-translocation monitoring at the receptor site is not proposed.

## **7. Measures to prevent recolonization of aquatic fauna**

- 7.1.1 In the dry season, recolonization of aquatic fauna is prevented by a silt curtain across the channel mouth. It has sufficient length down to the riverbed level and very small mesh size that allows water but goby to pass through. The rock berm/dam also provides additional blockage.
- 7.1.2 In the wet season, the silt curtain, rock berm/dam and internal rock berm are removed. The cofferdam retained will act a barrier to prevent recolonization of aquatic fauna within the works area of the barrage.
- 7.1.3 The frontline staff should report to the contractor if any leakage or damage of the silt curtain, rock berm/dam (dry season) or the cofferdam (wet season) is observed and maintain it immediately. If holes / damage is found, repairment arrangement shall be carried out.

## **8. Contingency plan**

- 8.1.1 The contractor shall ensure that the silt curtain, inflatable dam and cofferdam are under good operation conditions to prevent the target species and other species of conservation recolonization in the collection area. In case the target goby is continuously captured with no indication of reducing abundance after 3 days, this may indicate that the silt curtain fails to prevent re-entry of the goby or the abundance inside the collection area is too high that the capture survey shall be prolonged. The translocation exercise will be repeated after the review to find out the reason(s) of the failure of the translocation within one week, 4 days for find out the reason(s) and fix the problem; 3 days for translocation exercise.

## **9. Safety measures**

- 9.1.1 The staffs must wear a life jacket during the translocation exercise. The work gloves shall be wearing to prevent from slashed by the fish and rocks. Footwear with slip-resistant soles should be worn.
- 9.1.2 The staffs must not undertake the survey alone.
- 9.1.3 The staffs shall not access the location with the water level >500mm.
- 9.1.4 No fish collections and translocation works will be performed when/ after flooding, heavy rainfall and Typhoon Signal No.3 or above or any Rainstorm Warning.
- 9.1.5 Take care when walking into the water. Rocks can be very slippery.
- 9.1.6 The staffs shall aware of the surroundings, including changing water levels and floating debris.
- 9.1.7 The staffs shall not access into the riverbed when low tide due to the safety deep of the mud.

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**Appendix 1**  
**CV of the Qualified Ecologist**

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**CURRICULUM VITAE****Personal Details**

Name : SHEA She-sang, Mark 余書生  
National : HKSAR  
Current Position: Principal Ecology Consultant - China Hong Kong Ecology Consultants Ltd.

**Education, Professional Qualifications and Memberships**

B.Sc. Biology, Hunan Normal College, PRC, 1981  
M.Sc. Zoology, Nanjing Normal University, PRC, 1987  
Ph.D. Ecology/Environmental Science, The University of Hong Kong, 1995

**Key Qualifications**

Dr. Mark Shea is an ecology consultant with over 30 years of experience in the field of biology, ecology and environmental impact assessment in Hong Kong, China and the region. He has undertaken over 300 projects with ecological component dealing with terrestrial ecology, wetland ecology, insect taxonomy, pollution biology, mangrove, heperto-fauna, avi-fauna, terrestrial vertebrates, fishery, benthic community ecology in Hong Kong's stream, river, coast, marine and terrestrial environments. In addition, he has experience for ecology related projects in Mainland China, Taiwan and Macau.

**In last 20 years, Dr. Shea conducted a number of fauna and flora relocation/transplantation projects including capture and relocation of Hong Kong Newts and goby fish in Lam Tsuen River (2008-2014); capture and relocate common rat snake and a reletive large scale of relocation of variety of inter-tidal fauna for Lung Mei Beach project (2017-2019); fish relocation for Kau Lung Hung stream (2009-2012). Relocation of Short-legged toad for Chai Wan Columbarium project in 2018, and relocation fish and shell in 2020. Relocation of Romer's Tree Frog for Tung Chung New Town Development project 2021-2022. Relocation of various plants with conservation interest or with protection status for Ngong Ping Cable Car project during 2006-2009. Plants transplantation of protected plants for Ocean Park Extention project, Wo Ha Shek, Lai Chi Yuen cemetery, and etc. More recently, Dr. Shea lead a team pormed frog capture survey and relocation for Tung Chung New Town Extension project in 2021.**

**Project Experience Records (*Selected projects with fauna & flora translocation*):**

**Contract No. NL/2020/06 Tung Chung New Town Extension (West) Environmental Permit (EP) (No. EP-519/2016) Condition 2.20 - Habitat Enhancement and Translocation Plan for Amphibian Species of Conservation Importance. Perform pre-construction survey, relocation plan and capture-translocation proposal, and subsequent relocation operation and monitoring. Amphibian species to be relocated include Romer's Tree Frog and Chinese Bullfrog. Client: China Railway Group Ltd., 2021-2022.**

**Contract No. ND/2019/03- Development of Long Valley Nature Park (古洞北及粉嶺北新發展區第一階段—發展塋原自然生態公園。 Supporting contract Sang Hing - Kuly Joint Venture. Provision of ecologists, wetland specialist, ecological conservation and compensation; and construction of treatment wetland and associated birdhide; and preparing method statements for translocation of a rare fish, Rose Bitterling, Mussels and responsible for fauna relocation; and subsequent fauna translocation operation. Client: Sang Hing – Kuly Joint Venture, 2019-2022.**

**Contract No. SS G511 Construction of Columbarium at Cape Collinson Road in Chai Wan; Provide surveys and special treatment to existing Short-legged Toads (translocation the species to a hosting location nearby) and Red Fire Ants and reporting, Client: Build King, 2018.**

**Architectural Services Department Quotation Contract No. CPM301\_13/18: Mui Wo Lai Chi Yuen Extension. Ecological survey, plant transplantation proposal and other related ET tasks. Translocation incense tree *Aquilaria sinensis*; Client: AEC, 2018-2020.**

**Contract No.: CV/2012/05. Bathing Beach at Lung Mei, Tai Po, Rule of qualified ecologist responsible for ecological baseline surveys, rat snake capture survey, marine benthic, fish and intertidal fauna monitoring, mangrove plantation, fauna relocation. Faunal relocation include rat snake and various marine organisms. Client: Welcome Construction / CEDD, HKSAR, 2016-2019.**

**Contract No. DC/2007/06 River Improvement Works in Upper Lam Tsuen River, She Shan River and Upper Tai Po River. Employed by Contractor (Chiu Hing Construction & Transportation Co. Ltd.) as ecology specialist responsible for conducting ecological baseline survey (flora and fauna), impact monitoring, mitigation, part of post-construction monitoring and as well as capture surveys. The project required to capture and relocate some rare fish and all Hong Kong Newts (amphibian species) within construction sites to unaffected river sections to reduce adverse impact by the river works construction period. 2007 - 2014.**

**Contract No. DC/2006/09: Drainage Improvement Works in Kau Lung Hang, Yuen Leng, Nam Wa Po and Tai Hang Areas and Construction of Ping Kong Drainage Channels. Employed by Contractor (Chiu Hing Construction & Transportation Co. Ltd.) as ecology specialist responsible for conducting ecological baseline survey, impact monitoring, fish relocation operation and mitigation/post monitoring. The project also required to capture and relocate some rare fish species with conservation value to temporal constructed fish aquarium and to unaffected river sections to reduce adverse impact by the river works during construction period. The fish will be released back to new river channel after completion of river works. Main task include design temporal fish holding tanks, capture/relocation operation, maintenance, monitoring of a local rare fish species of *Acrossocheilus parallens* 側條光唇魚; Duration: 2007-2013.**

**Lantau Cable Car Project (Ngong Ping 360): Tree surveys, EM & A – responsible for tree surveys, ecological baseline surveys, impact monitoring and ecological mitigation during stage of construction period, and as well as fauna and flora relocation and transplantation. Task performed include translocation various plants with protection status and conservation interests. Client: MTR Corporation, sub-contractor of MottConnell, 2002 - 2007.**

**Lantau Cable Car Project (Ngong Ping 360): Stream diversion – responsible for ecological restoration of newly constructed stream channel with ecologically friendly design; involved stream bank vegetation restoration by transplanting natural vegetation from old stream bank (to be demolished) and monitoring of plant and fauna establishment and pest control (red ants). Task performed include translocation various native plants and stream faun. Client: MTR Corporation, sub-contractor of MottConnell, 2004 - 2006.**

**Repositioning and Long Term Operation Plan of Ocean Park. Conduct tree surveys, vegetation survey to identify and locate some protected plants for transplantation. Proposal of plant transplantation plan. Task performed include design a plants hosting nursery, translocation various plants with protection status and conservation interests, maintenance of nursery, monitoring and reporting. Client: Ocean Park Corporation; and sub-contractor of Dragages, 2006-2008.**



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**Appendix 2**  
**Photos**

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Appendix 2 Photos

Site Photo & Target Species	
	
<b>Photo 1.</b> Site Photo	<b>Photo 2.</b> <i>Gobiopterus macrolepis</i>

Pre-relocation survey at Yuen Long Nullah (20 October 2023)	
	
<b>Photo 3.</b> Hand-net fishing	<b>Photo 4.</b> Fish netting
	
<b>Photo 5.</b> Plankton net	<b>Photo 6.</b> Captured shrimp

**Appendix 2      Photos**

**An additional pre-relocation survey at Yuen Long Nullah (14 December 2023)**



**Photo 7.** A view of Yuen Long Nullah



**Photo 8.** Survey trap



**Photo 9.** Survey by netting



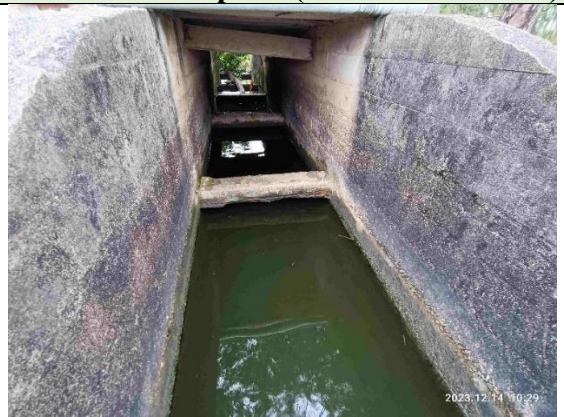
**Photo 10.** Survey by netting

Appendix 2      Photos

An additional pre-relocation survey at Nam San Wai reed pond (14 December 2023)



**Photo 11.**  
A view of survey pond at Nam Sang Wei



**Photo 12.**  
Water gate between Nam Sang Wei pond and Yuen Long Nullah



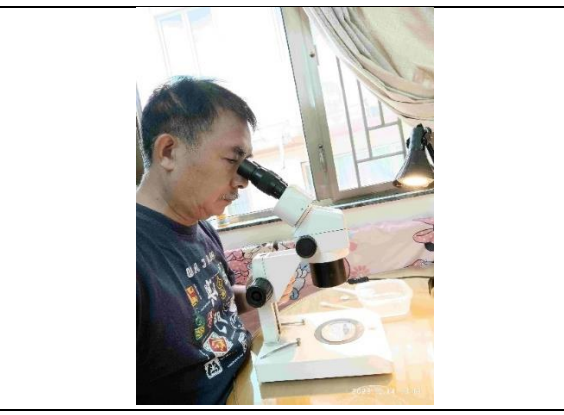
**Photo 13.** Water gate outflow point



**Photo 14.** Nan Sang Wei tidal pond


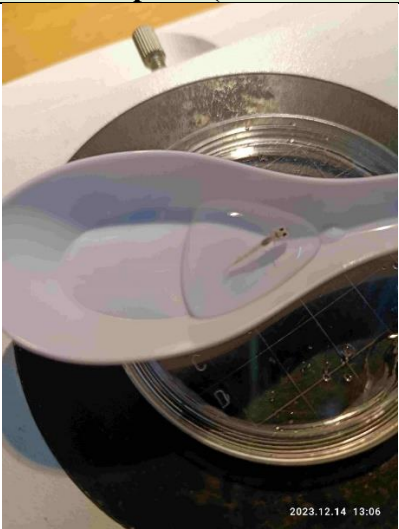




**Photo 15.** Live trap survey



**Photo 16.** Fish identification

Appendix 2      Photos

An additional pre-relocation survey at Nam San Wai reed pond (14 December 2023)	
	
<p><b>Photo 17.</b> Fish identification <i>Gobiopterus macrolepis</i></p>	<p><b>Photo 18.</b> Fish identification <i>Gobiopterus macrolepis</i></p>
	
<p><b>Photo 19.</b> Fish identification <i>Gobiopterus macrolepis</i></p>	<p><b>Photo 20.</b> Fish identification <i>Gobiopterus macrolepis</i></p>

**Appendix 2      Photos**

<b>Equipment</b>	
	
<p><b>Photo 21.</b> Sample of pot trap</p>	<p><b>Photo 22.</b> Sample of fish netting</p>
	
<p><b>Photo 23.</b> Sample of rubber boats</p>	<p><b>Photo 24.</b> Sample of hand netting</p>
	
<p><b>Photo 25.</b> Example of the sterilized container for temporary storage</p>	

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**Appendix 3**  
**Figures**

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**Figure 1.** The fish collection area and receptor sites





**Figure 2.** Freshwater Sampling Points in EIA Study (Purple Dots)

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**Appendix 4**  
**Construction Setup**

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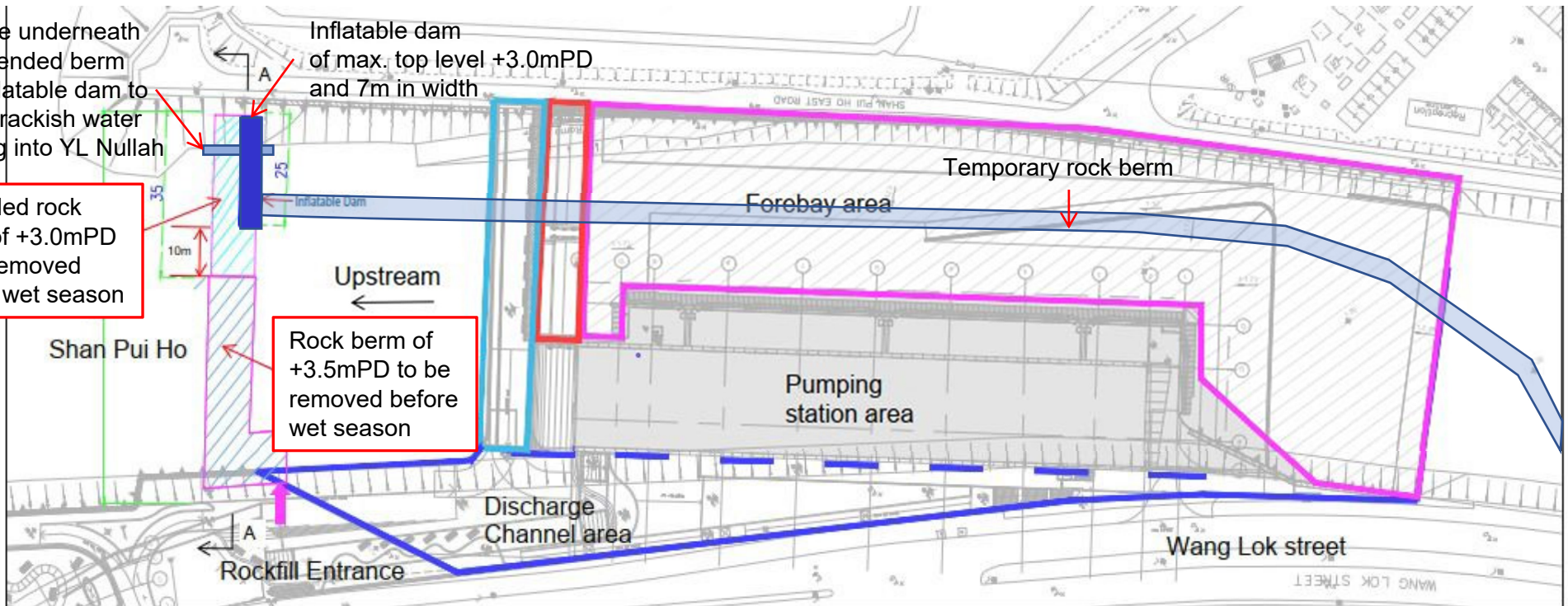
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PE Pipe underneath the extended berm and inflatable dam to allow brackish water flushing into YL Nullah

Inflatable dam of max. top level +3.0mPD and 7m in width

Extended rock berm of +3.0mPD to be removed before wet season

Rock berm of +3.5mPD to be removed before wet season



PE Pipe underneath the extended berm and inflatable dam to allow brackish water flushing into YL Nullah

**Sequence of works**

- 1) Extend 10m rockfill platform
- 2) If no wet weather is shown in 9 days forecast, Then will further extend the remaining 25m rockfill platform
- 3) Install the inflatable dam
- 4) Backhoe crane will remove the 25m rock dam before 6th of February 24

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**Appendix 5  
Method Statement of Silt Curtain  
Installation**

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# Contract No. DC/2022/03 Yuen Long Barrage and Nullah Improvement Schemes

*Submission No.:*  
METHOD STATEMENT FOR SETTING UP SILT  
CURTAIN

*Document No.:* YLBN-MES-A000-CGE00012-01



Submitted to: Drainage Services Department  
Submitted by: China State - Alchmex Joint Venture  
Date: 10 October 2023





## Contract No. DC/2022/03

## Yuen Long Barrage and Nullah Improvement Schemes

## Method Statement for Setting Up Silt Curtain

### REVISION NOTE

Rev	Date	Summary of Key Revised Items
0	10 Oct 2023	First Submission

Prepared by Henry Pang \_\_\_\_\_  
Technical Manager Signature Date

Reviewed By Tony Cheung \_\_\_\_\_  
Site Agent Signature Date

Approved By Jason Chung \_\_\_\_\_  
Construction Manager Signature Date



## **1 Introduction**

This method statement describes the details of setting up silt curtain for Yuen Long Nullah. The works will mainly comprise installation of anchor bolt for silt curtain and setting up the silt curtain at Yuen Long Nullah.

## **2 Specification Reference**

The works shall be carried out in compliance with the requirement of DSD, General Specification for Civil Engineering Works, 2020 Edition and Particular Specification and latest legislation of Labour Department.

## **3 Plant and Equipment**

- a) Crawler crane

## **4 Sequence of Works**

- 4.1 Installing eyebolts as the anchor for fixing the proposed silt curtain. Location of eyebolt should refer to figure 1.
- 4.2 Fixing the silt curtain in according to the specification of silt curtain in appendix A.
- 4.3 Shifting the silt curtain to designated location by crawler crane.
- 4.4 Placing two concrete blocks to support the silt curtain. Location of the concrete blocks is illustrated in figure 1.

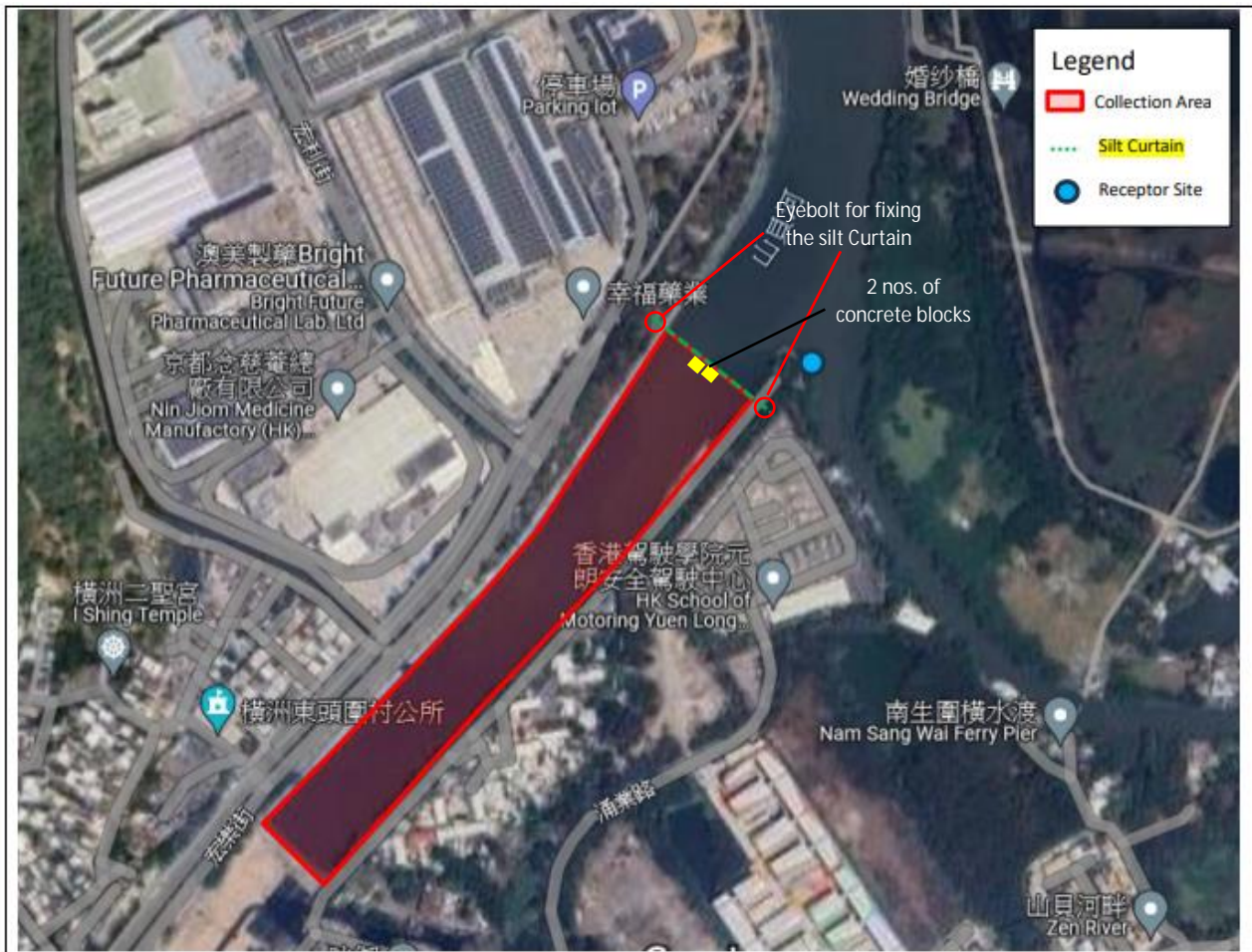


Figure 1. The fish collection area and receptor site

## 5 Appendix

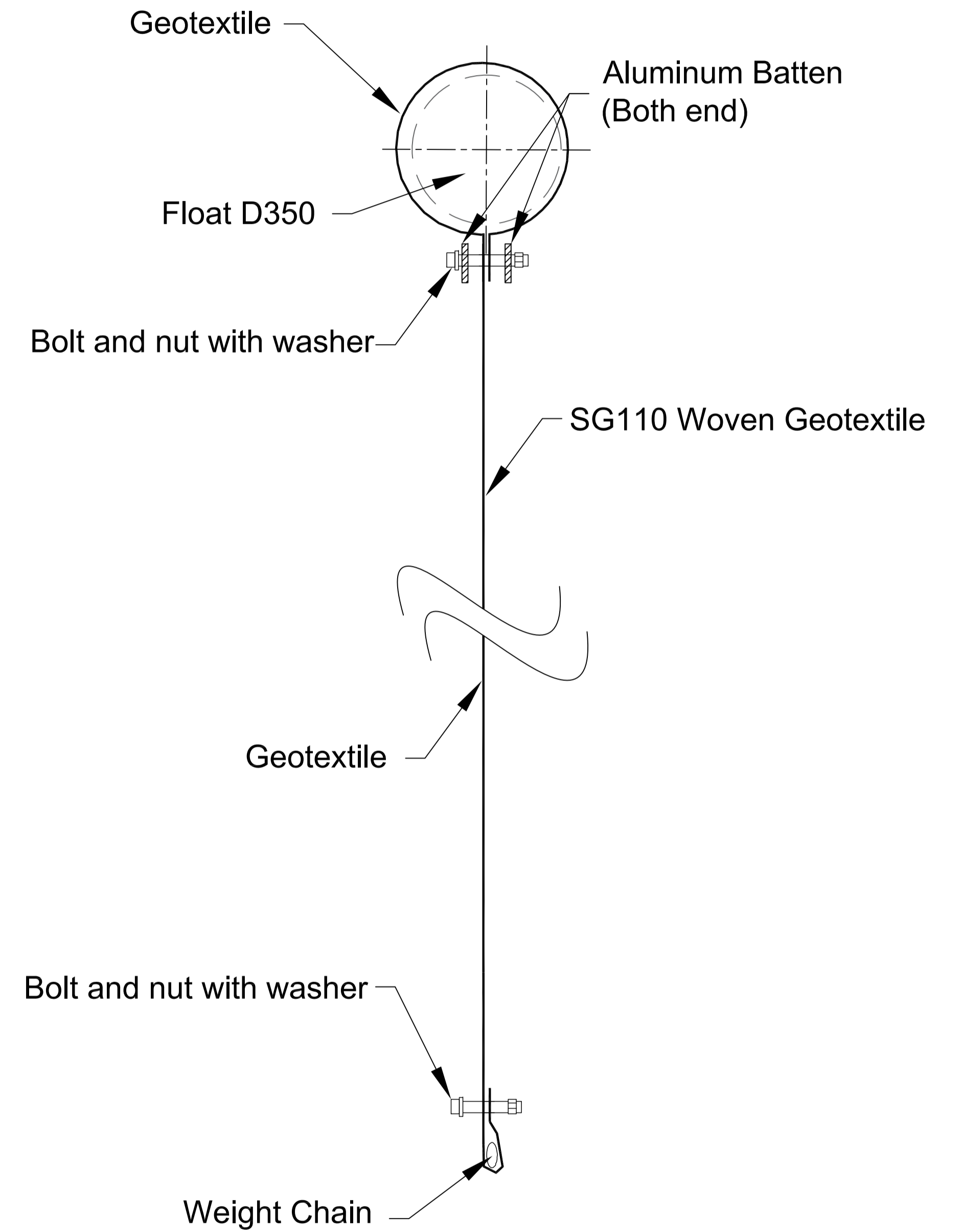
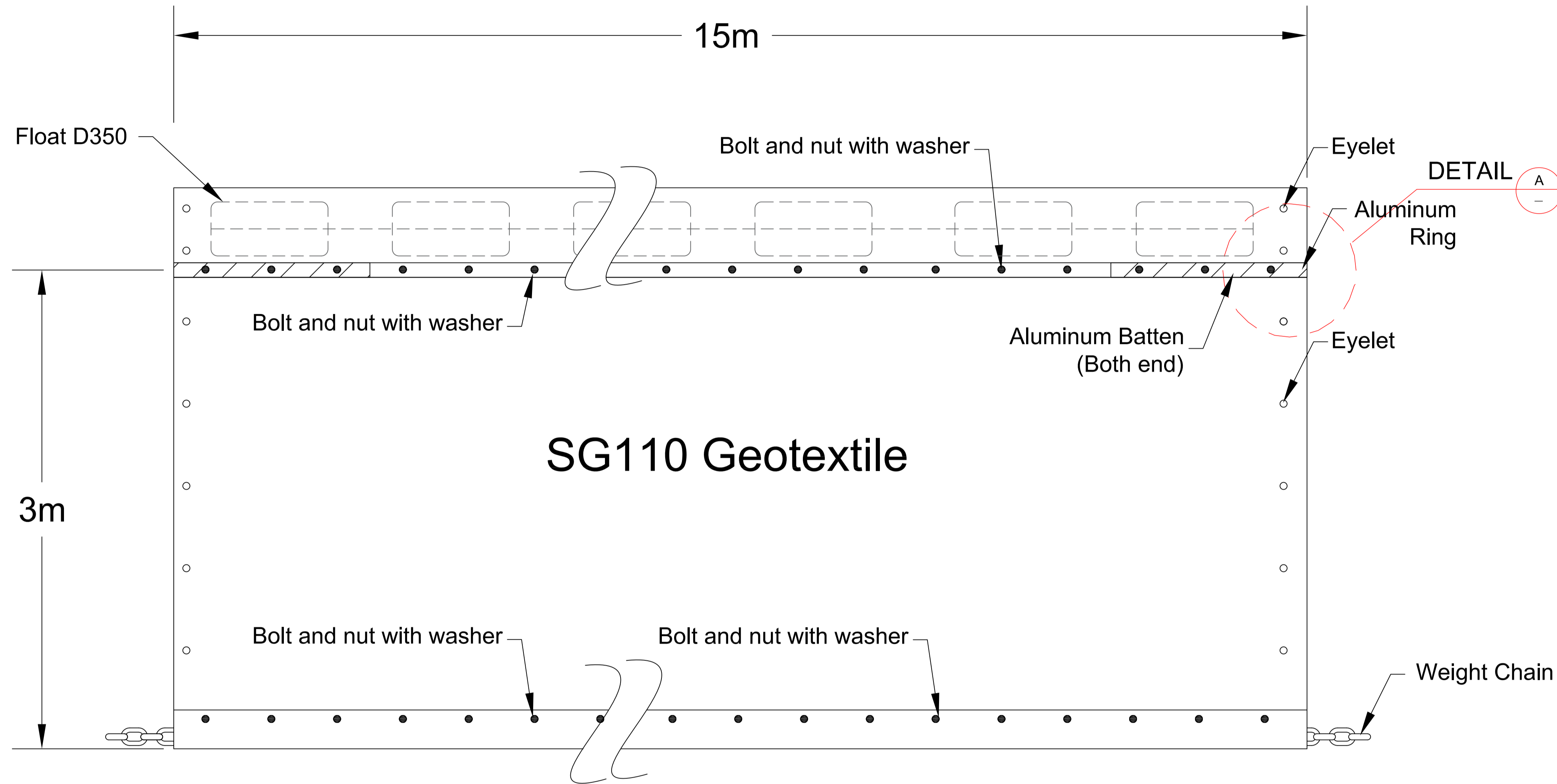
Appendix A – Site Layout Plan and GI location plan





# Appendix A

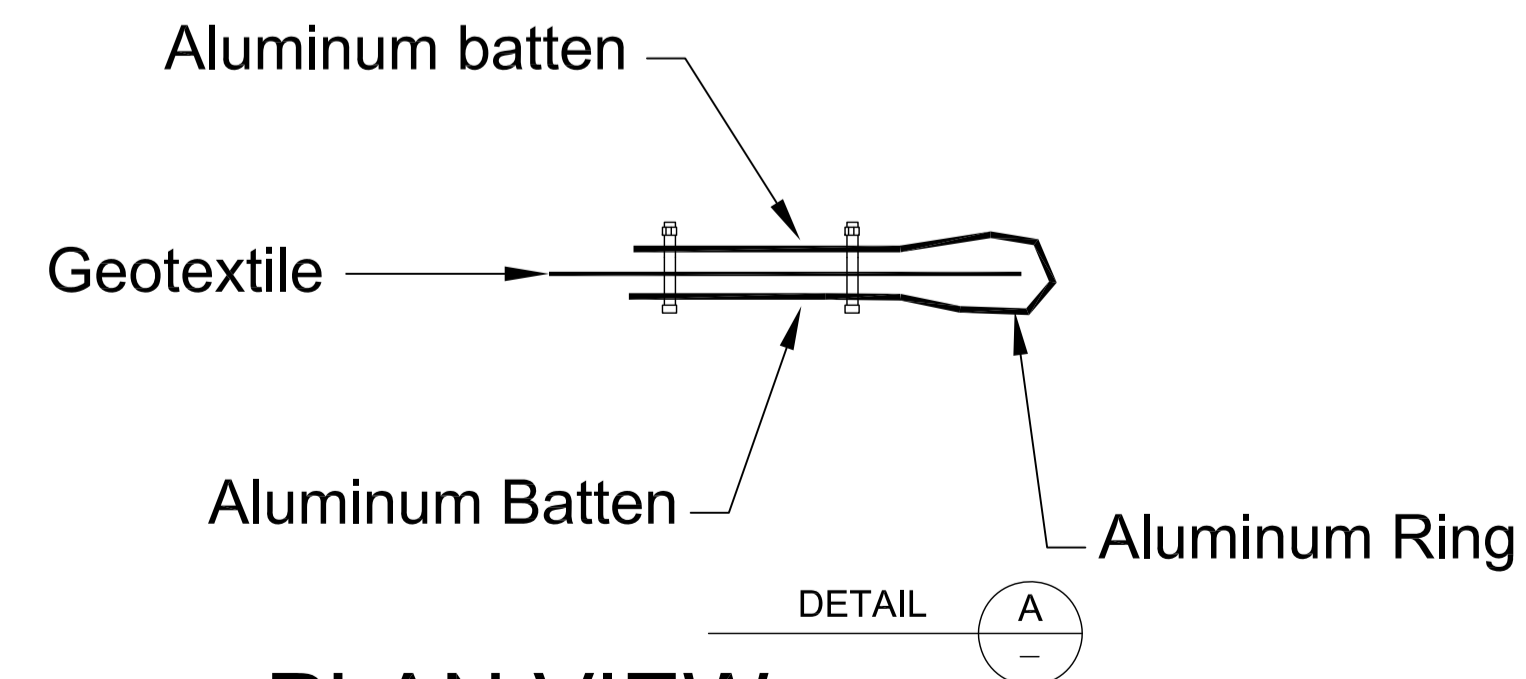
# GESCH-SG110 Silt Curtain Hanging Type



**SIDE VIEW**



**PROTOTYPE**



**PLAN VIEW**

PROJECT NO.	--	DRAWN	TCY
DRAWING NO.	GESCH/SG/05	DATE	23 July 2023

DRAWING TITLE:  
**HANGING TYPE GT100 FABRICATION DETAILS**

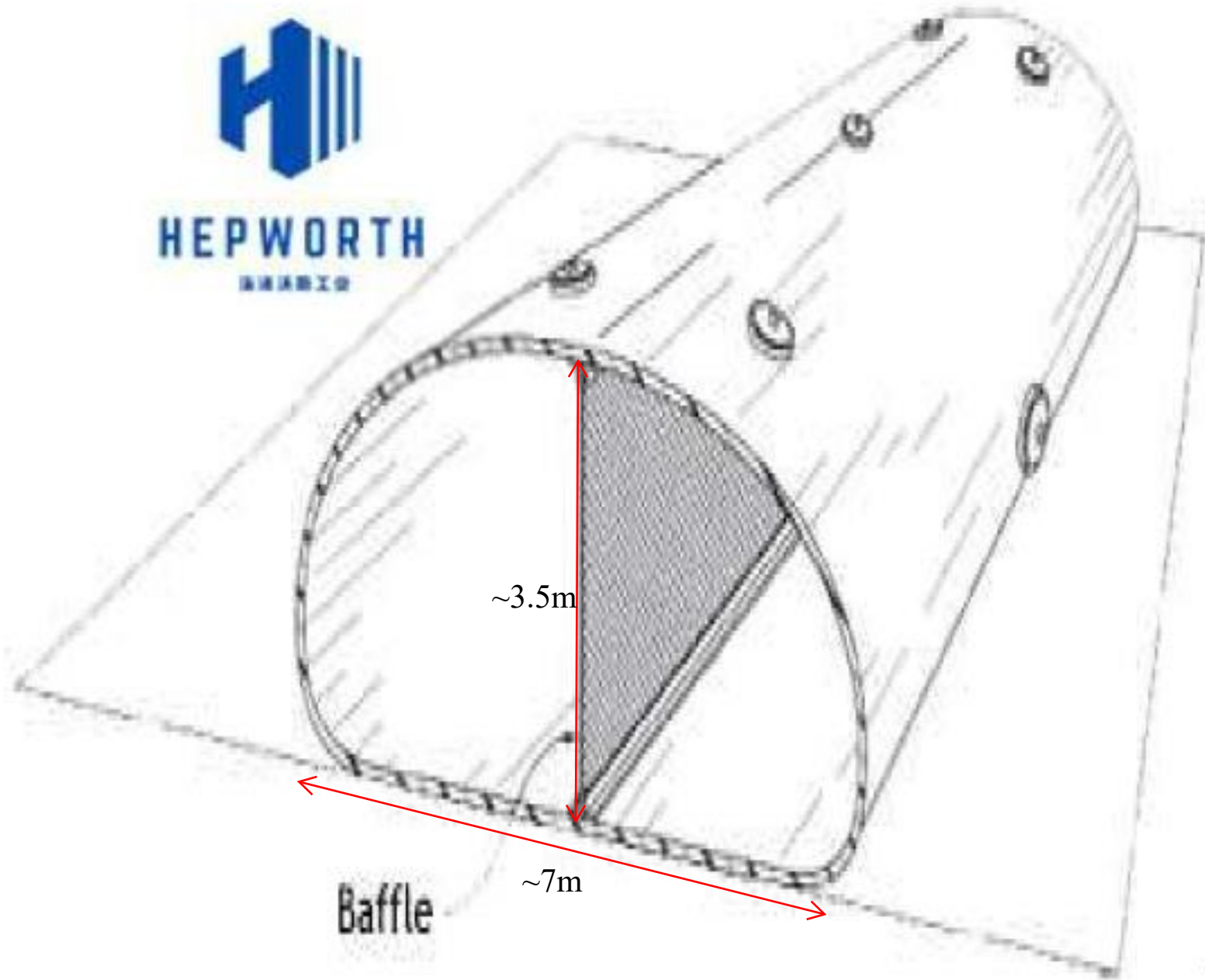
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**Appendix 6  
Method Statement of Rubber Dam  
Installation**

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**HEP WORTH**  
BRAND



## 水霸软体拦水坝部署方案

### 一、产品简介

水霸软体围堰拦水坝是一个充满水的柔性临时围堰，内部集成的稳定性透网挡板形成两个内室，以提供项目临时围堰所需的坚固性。正确安装后，水霸软体围堰拦水坝可以控制高达 90% 高度的水深和外部泥浆。该产品一旦装满水就不会滚动，可作为临时水坝用于各种需要围堰应用的工程。

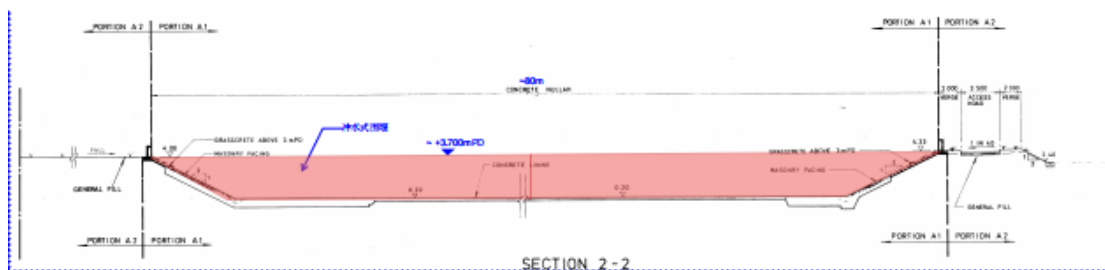
水霸软体围堰拦水坝的安装过程比传统方法更具成本效益，并且比其他方法需要更少的精力。水霸软体围堰拦水坝还可以通过限制其他水坝类型经常伴随的污染物，更大限度地减少对环境的影响。水霸软体围堰拦水坝内部并排管设计比其他充水围堰具有更高的稳定性，其灵活性使产品能够满足任何工况路径要求。

水霸软体拦水坝材质选用高强度 PVC 涂层布，厚度 1.2MM，具有耐腐蚀、阻燃、抗撕裂的特性。



## 二、工况说明

该项目河道长度 50M，梯形河道，坡比 1:1，建议软体拦水坝的长度 60M 共两条同时铺设，单条拦水坝高度 3.5M，充水后宽度 7M。





### 三、安装说明:

A、现场需要准备的物料如下:

- 1、每条拦水坝准备长度 10M 直径 50 以上的钢管 2 根
- 2、水泵 30 方以以上 2 台，带 20 米水管
- 3、直径 2CM 绳子 200 米
- 4、配电箱接水泵电缆
- 5、50 米吊机或者挖机两台（根据现场工况配备）
- 6、工人 10 名
- 7、特别提示：因拦水坝长度 60mx2，高度 3.5M，考虑到侧向水压，建议铺设拦水坝时在背水面打桩或者用沙墩稳固，以防漂移，打桩间隔 50CM 一个，高度 6-9 米。或者布设 1 方的沙墩 3 层。



8、吊车吊装拦水屏障或人工移动拦水屏障时必须注意避免与地面的摩擦，以免损坏。

#### **B、安装前：**

- 1、认真检查坝袋，确保完好无损。
- 2、确保河道无尖锐物品，谨防扎破坝袋。
- 3、确定河道无塌陷、无管涌、无暗流空洞。
- 4、实际最深水位符合产品规格所适应的限度。
- 5、水泵、电源（380V）到位。
- 6、拆装期间避免于地面的磨损和损伤。

#### **C、现场准备工作：**



在任何类型工况环境下安装水霸拦水坝，都需要进行充分的准备工作。以下是安装水霸时需要遵守的几项常规要求：

1、安装时，应避免所有可能刺穿水霸拦水坝的地面物（如尖锐的岩石、破碎的玻璃），或对其进行仔细清除。如在静止或流动水环境中进行安装，现场巡视检查或使用拖网将确保该区域得到适当清理。当不能完全清除安装现场问题物体时，则安装前需要在现场安装防护材料（即无纺布土工织物或其他形式的耐磨防刺穿材料）。

2、在水霸拦水坝围堰和防洪应用时，建议对屏障进行 24 小时监测，这将有助于防止设备发生损坏。同时，当屏障拦洪失效时，也有助于提供相关信息。

3、避免在任何电源（例如，接地变压器、电杆和线路、接线盒和开关装置）附近安装水霸。在升吊水霸时，请遵守所有架空电力线安全法规要求。高压接触事故可能导致严重的人身伤害或死亡。当工地或工地附近有电源线时，设备运行的安全由工地负责人负责。在任何项目上安装或操作设备之前：**请评估工地是否存在电气危险**（包括高空和地下的），如存在风险，**操作须极其谨慎**。

4、在评估安装水霸拦水坝的最佳区域时，对斜坡和地形的评估非常重要。如所需地区为丘陵山谷，则可能只需在山谷中布放拦水屏障。拦水屏障只会以其所处的最低点为起始基准充水至其预期充水高度。如遇极端地形，请在安装前向水霸拦水坝技术人员

进行咨询以寻求帮助。请确定用于为屏障充水的水源，并保持其畅通。请在注水口靠近水源的地方布放屏障。首选使用最短软管对水霸进行注水，因为管道越短，传输水量越多。

#### **D、安装注意事项：**

**1、动水环境：**当使用临时拦水坝系统对流动水体进行部分或完全堵拦时，水体流动方式会有所改变。常规水道尺寸减小会导致水深和流速增加。降雨、水道流量、不规则地表情况、土壤组成和其他相关水文信息可能会影响拦水坝系统的整体效能。为应对这些未知因素，可能需要对最初的围堰设计进行更改。

**2、光滑土壤条件：**在表面摩擦有限的环境中；可能需要调整出水高度（充水式屏障高于周围水面的部分）或临时打桩用沙墩支架等以稳定屏障。在如湖泊，池塘，或其他静水环境中易产生长期泥沙淤积。这种软质淤泥介质的表面摩擦力很小。

斜面、坡度和其他相关水文数据会影响充水式屏障在这些环境中的拦水效果。在没有足够的土壤摩擦力来稳定拦水坝系统的情况下，可以使用打桩、沙墩、钢管系统等结构支撑来实现稳定并防止滑动。

#### **E、安装方法：**

1、在地面铺开坝袋，正面朝上，复核规格，明确排水口、注水口位置，确定好充水端，关紧排水口。

2、两端穿入钢管（木杠），在钢管中央系好引导绳。



3、铺设方法采用两条 H3.5M、W7m，长度 60M 并排同时部署铺设，以增加地面摩擦力，首先在陆地上人工全部平整的打开拦水坝管袋，人工或者吊车用两端的钢管套引导绳索把管袋吊至河道两岸，确定好需要拦水的位置，然后在河岸护坡固定好拦水坝两端并开始充水。直至坝袋上表面高出水面 10-20CM，充水至满载高度的 90%需停止注水。固定拦水坝的河道两岸护坡需要平整处理，检查是否有尖锐的物体，以防刺破拦水坝。

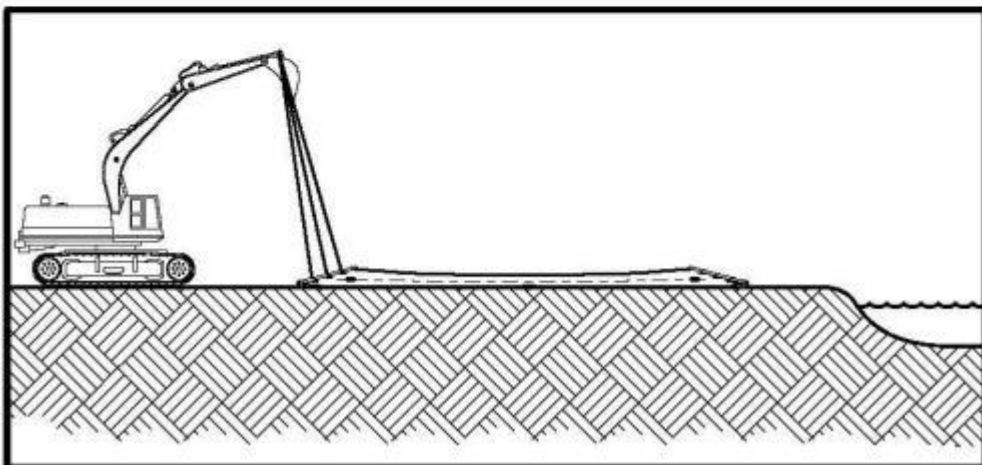
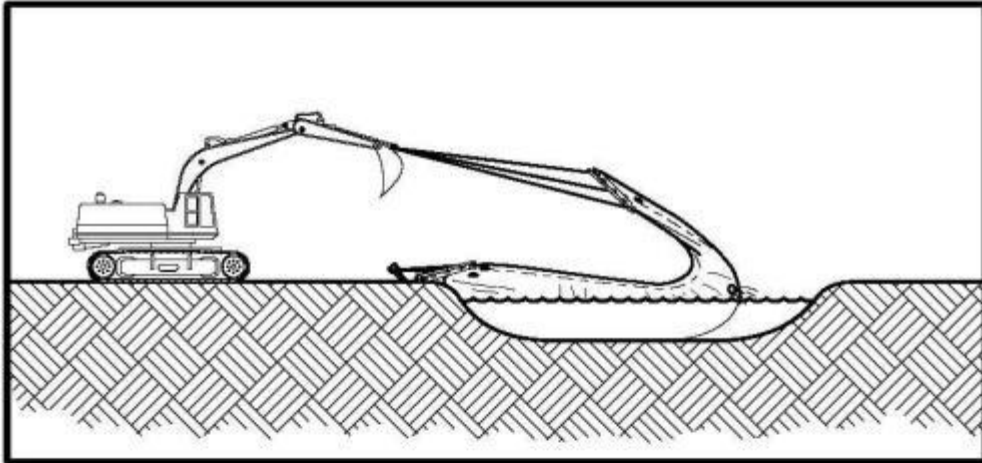
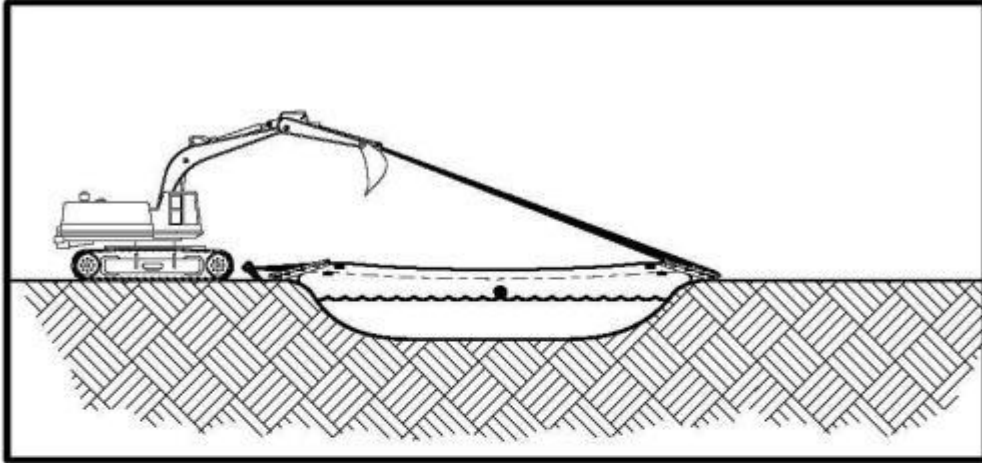


4、建议：拦水坝充水至约 50%时需检查背水面（需要脱水施工的一面）是否存在鼓包、漂移、弯曲等现象，若有则需放置墩袋稳固拦水坝，然后继续充水至需求高度并补充墩袋的高度。



#### 四、拆卸步骤：

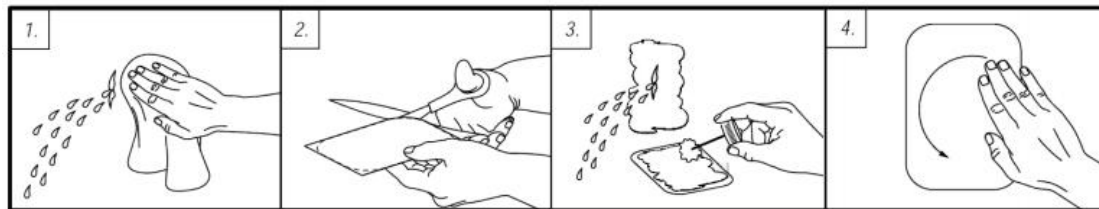
首先将拦水屏障一端连接到挖机或吊机臂上。在将水霸拦水坝从水中拆卸之前，须使屏障两侧的水达到平衡。先打开拦水屏障干燥一侧的排水口堵头。当大部分水从屏障中排出后，就可打开屏障另一侧的堵头。等水排到 3 分之 2 以后可以把屏障的一端拉过顶端，然后沿着屏障向下拉。通过拦水坝两端预留的排水口排干剩余的水，这一过程防止拆除时对拦水屏障底部造成划伤和磨损。折叠并收卷屏障，使之大小贴合于运输托盘，并确保没有部分悬挂于托盘外。



## 五、维修说明

### 1、胶补：

找到屏障表面上的穿孔、切口、撕裂或磨损处。并根据问题区域面积裁剪出适当大小的补片。补片面积应超出屏障表面受损区域面积至少 5 厘米。在使用补片前，将补片材料的边角修圆。用水对屏障表面和补片材料表面进行清洁。在补片和屏障表面厚涂一层乙烯基接触胶合剂（万能胶）。等待几分钟让粘合剂变干。当粘合剂呈现出霜白色且触感粘稠时则已充分晾干，方可用于修补。将贴片贴覆于屏障表面，来回搓揉约一分钟即可。当在低于 40 华氏度的温度下使用时，乙烯涂层粘合剂将失去粘接性能。建议将粘合剂存储在温度不低于 40 华氏度的区域。



### 2、热熔焊接：

找到拦水坝需要修补的位置，裁剪好大小适合修补的材料，铺平需要修补的漏洞处，用热熔枪高温热熔材料，同时用滚轮来回滚压修补的材料。使之紧密的焊接在一起。