

Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Contract No. HY/2012/08



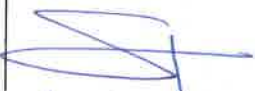

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Environmental Assessment
Changes in Dredging Extent of Northern Landfall

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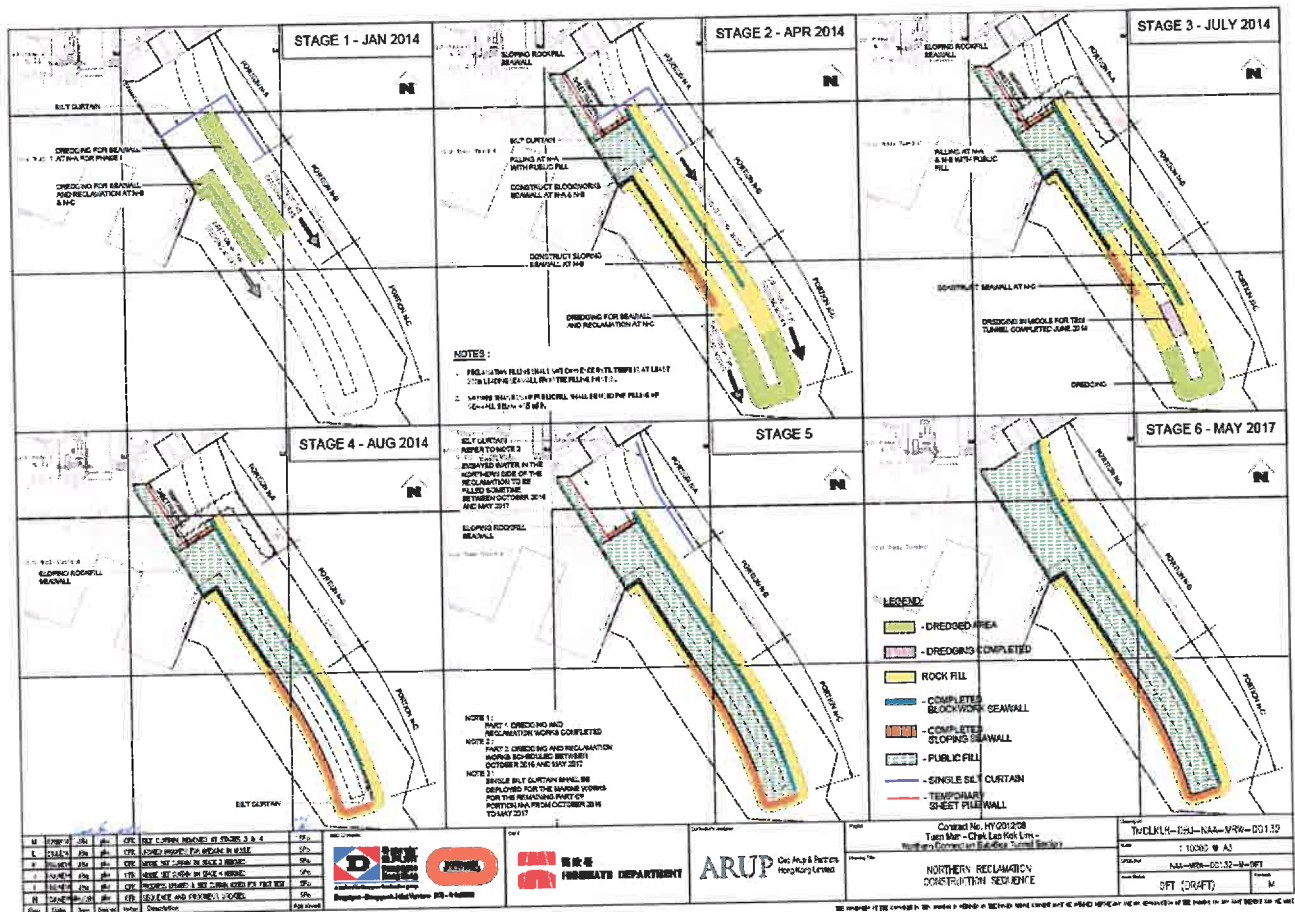
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1.0 Proposed Changes

Pursuant to Condition 3.5 of the Environmental Permit EP-354/2009/B, we hereby give written notice that, due to changes in progress and methodology, “dredging in the middle” at Portions N-A and N-B, as specified under Condition 3.7(d) and Figure 3 of the EP-354/2009/B is no longer necessary. The latest construction sequence is illustrated in Figure 1 and Appendix A.

Figure 1 Latest Construction Sequence



2.0 Rationale for the Proposed Changes

It is proposed that the dredging in the middle of Portion N-A and Portion N-B to be deleted. The additional dredging in the middle of Portions N-A and N-B, as stated under VEP application (VEP-426/2014) and subsequently approved in the EP-354/2009/B, was intended to resolve buoyancy pressure of marine mud acting upon the TBM assembly, as well as other geotechnical and structural limitations.

An alternative solution of ground treatment will be implemented to speed up consolidation of the Northern Landfall, so that the TBM may safely drill through it. This solution involves the use of vibrocores. This method employs large vibrating rod, which vibrates into the ground to compact the wet soil. In the process, additional sand is pulled down to the ground, filling voids and forming compacted land. Once the land is compacted, drilling rigs will plow/drill into the ground at strategic locations to inject and mix cement grout into the soil. This will further bind the fill material and solidify the grounds to provide a stabilized substrate for the TBM to drill through, avoiding buoyant pressure acting upwards on the TBM unit.

The ground treatment works is land-based. It replaces the marine dredging works in the middle of Portions N-A and N-B and is carried out on top of the completed parts of the Northern Landfall reclamation. Therefore, it is considered that the reclamation method, as considered under the EIA assumption, will not change as a consequence of the proposed changes.

Like bored piling and other land-based foundation works, the ground treatment works will be wet-works and will not cause dust impact. Water recycling and treatment facilities will be provided as a normal practice and in compliance with discharge licenses to treat the water before discharge.

In the course of the ground treatment works, no open excavation for this work is envisaged. There will be no additional C&D materials to be excavated and the work is considered to remain within the scope of EP-354/2009/B and EIA Report requirements for normal land based civil works.

3.0 Potential Environmental Implication of the Proposed Changes

With the cancellation of dredging in the middle of Portions N-A and N-B, the overall dredging extent will reduce from that depicted in Figure 3 of EP-354/2009/B. The potential environmental impacts, due to the reduction of dredging, should be equal to or less than that expected under EP-354/2009/B. It follows that the impact should be no greater than that envisaged under the approved EIA Report. For the purpose of assessing potential environmental impacts against individual aspects under the approved EIA Report, the following environmental aspects are deemed to be relevant.

- Water quality;
- Marine ecology;
- Fisheries;
- Waste Management; and
- Landscape and visual.

Environmental aspects that are considered irrelevant to the present assessment are presented in Table 3.1, with justification of their exclusion from the assessment.

Table 3.1 Environmental Aspects Excluded from the Assessment

Environmental Aspect Excluded	Justifications
Air Quality	<ol style="list-style-type: none"> 1. The works are predominantly marine-based. No significant dust nuisance is expected. 2. The ground treatment works that replaces some of the dredging works will be wet-works. 3. No additional open excavation works is envisaged as a result of the change.
Noise	<ol style="list-style-type: none"> 1. No Noise Sensitive Receivers (NSR) is identified within the necessary proximity to works in the EIA Report. As such, the noise assessment is not relevant to the works.
Terrestrial Ecology	<ol style="list-style-type: none"> 1. The works are predominantly marine-based. 2. The location of works is adjoined to a developed area and at least 200 m from any potentially sensitive habitats, e.g. plantation, stream and tall shrubs.
Cultural Heritage	<ol style="list-style-type: none"> 1. The marine works and the work area was not identified as having marine archaeological potential in the approved EIA Report. 2. The nearest built heritage resources (Grave G1) is located near the toll plaza and will not be affected by the works.
Land Contamination	<ol style="list-style-type: none"> 1. The marine works do not overlap with any potentially contaminated land.
Landfill Gas Hazard	<ol style="list-style-type: none"> 1. The marine works are far away from any landfill sites.

3.1 Marine Water Quality

Dredging in the middle of Portions N-A and N-B are deleted from Figure 3 of EP-354/2009/B, with no concurrent changes to the dredging extent of Portion N-C. Accordingly, the overall dredging extent is reduced.

extent. As such, indirect impact to marine ecological resources due to the proposed change in the dredging scheme is anticipated to remain the same as that envisaged under the approved EIA Report.

- Acoustic disturbance to marine life – Since the overall dredging extent is reduced, it means that there will be less dredging works and associated dredging plant used in the concerned area of Portion N-A and N-B will not increase. The number and types of plant involved for dredging works is not expected to increase or decrease as these plant assets would be distributed to various other works within the site. It is considered that acoustic disturbances to marine life would be no worse than those deemed to be acceptable in the approved EIA Report.
- Injury/mortality or disturbance from construction phase marine traffic to marine life, specifically the Chinese White Dolphins (CWDs) – Since dredging between the 200m leading seawalls at Portions N-A and N-B has been cancelled, with no concurrent changes to the dredging extent of Portion N-C, it is considered that any impacts arising from the dredging activities and from the associated marine traffic, will be reduced. Therefore, disturbance to marine life would not be worse than those deemed to be acceptable in the approved EIA Report.
- As the dredging extent is reduced and the affected reclamation area remains within the site boundary under this Contract, potential impact to fisheries resources and operations is not expected to be unacceptable.

Overall marine ecological and fisheries impacts due to the proposed change in the dredging extent are not considered as unacceptable.

3.3 Waste Management

Under this notification, dredging in the middle of Portions N-A and N-B is cancelled. The dredging quantity at Portion N-C remains unchanged from that depicted under Figure 3 of EP-354/2009/B. As such, it is expected that the amount of dredged sediment generated will be no larger than that assumed in the EP-354/2009/B and the approved EIA Report.

In the course of the ground treatment works, no open excavation for this work is envisaged. There will be no additional C&D materials to be excavated and the work is considered to remain within the scope of EP-354/2009/B and approved EIA Report requirements.

3.4 Landscape and Visual

Since the concerned dredging works are within the site boundary under this Contract, it is envisaged that the related landscape impact would be no greater or any worse than that predicted in the approved EIA Report.

Referring to the approved EIA Report, impacts to marine water quality are attributable to sediment plumes, which are caused by the suspension of sediment during the process of dredging. A reduction in the overall dredging extent should result in a corresponding reduction in marine water quality impact.

Reclamation filling activities are proceeding concurrently at Portion N-B. However, no changes to reclamation filling extent are proposed under this notification. As all associated mitigations for reclamation filling (e.g. 200m leading seawall) are implemented in accordance with EP-354/2009/B requirements, it is considered that the impact of marine water quality due to the reclamation filling activities would be no greater or any worse than those predicted in the approved EIA Report.

Therefore, the net impact is considered to be solely due to the change in dredging extent. The associated water quality impact, due to the cancellation of dredging in the middle of Portions N-A and N-B, is considered to be no worse than that assumed in the approved EIA Report.

For the dredging in the middle of Portions N-A and N-B, the following additional mitigation measures were proposed under VEP application (VEP-426/2014) and subsequently specified under Condition 3.7(d) and Figure 3 of the EP-354/2009/B:

“Dredging in the middle of Portion N-A and Portion N-B shall only be carried out upon the formation of 50m leading seawall from the dredging location within Portion N-A / Portion N-B and a single layer of silt curtain shall also be deployed between the ends of the two leading seawalls to form an enclosed area as shown in Figure 3 of this Permit.”

Since no dredging will be undertaken in the middle of Portions N-A and N-B, the aforementioned mitigation measures in Condition 3.7(d) and Figure 3 of the EP-354/2009/B are no longer deemed necessary.

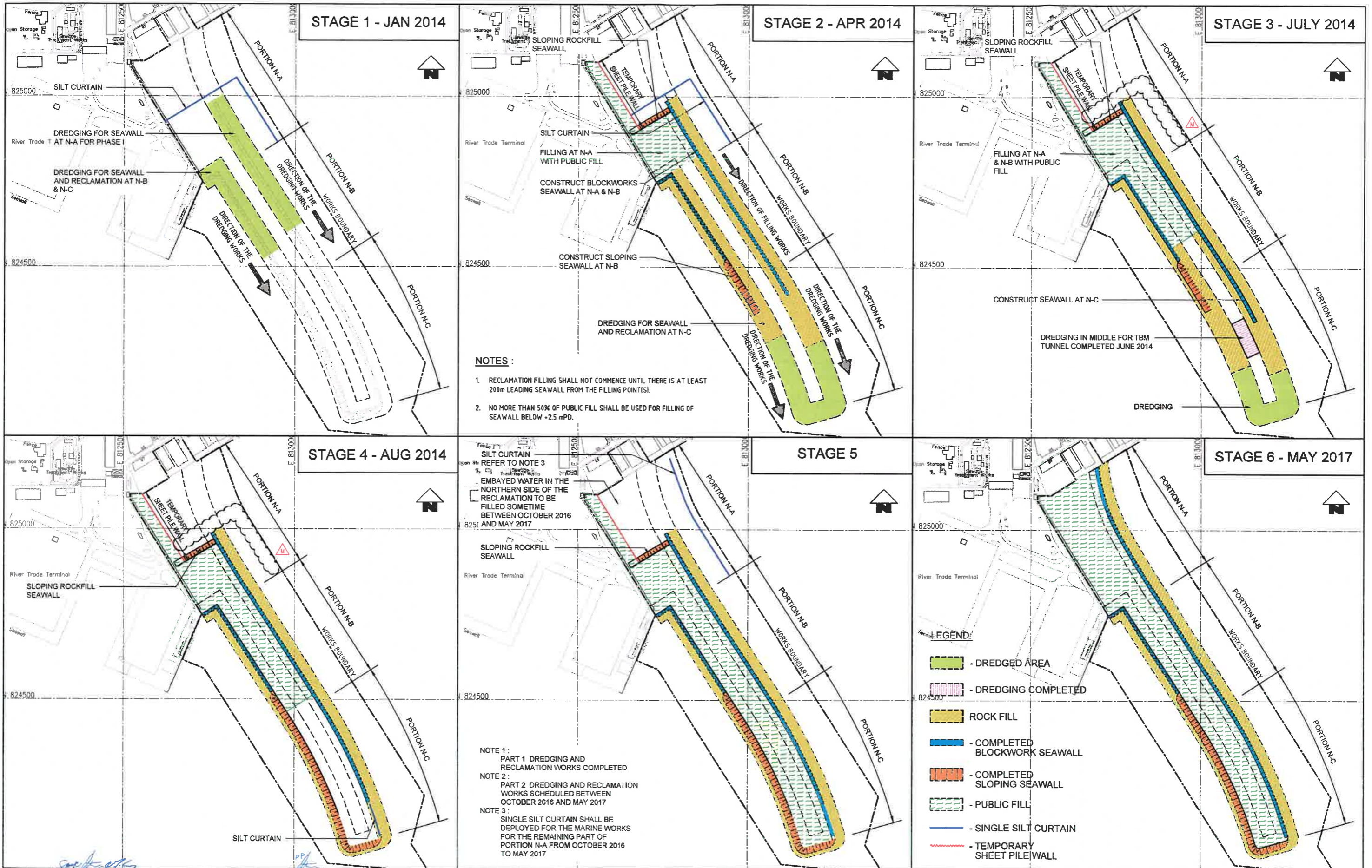
3.2 Marine Ecology and Fisheries

The potential impacts to marine ecology and fisheries are assessed as follow:

- Permanent loss of habitat – The reclamation footprint of the northern landfall will not be changed as a result of the proposed reduction in dredging extent. As such, the size and type of habitat loss would remain the same as those predicted in the approved EIA Report, as well as in both EP-354/2009/A and EP-354/2009/B. Corals at the concerned area, that were considered feasible for translocation, have already been translocated prior to the construction commenced on 1 November 2013. As such, unacceptable impacts to corals or other marine habitats are not expected to occur due to the change of dredging extent.
- Indirect impacts due to the change in water quality – As discussed in Section 3.1 above, unacceptable water quality impact is not expected as a result of the reduction of the dredging

4.0 Conclusion

- In EP-354/2009/A, full dredging was permitted beneath the seawall construction and in Portion N-C.
- A variation to EP-354/2009/A was applied in December 2013 to permit the dredging in the middle of Portions N-A and N-B. EP-354/2009/B was issued on 28 January 2014.
- The additional dredging in the middle of Portions N-A and N-B, as stated in the EP-354/2009/B, was intended to resolve buoyancy pressure of marine mud acting upon the TBM assembly, as well as other structural limitations.
- Due to the ongoing progress and methodology changes, this notification addresses the cancellation of dredging in the middle of Portions N-A and N-B, as described in Clause 3.7(d) and illustrated in Figure 3 of EP-354/2009/B.
- An alternative solution of ground treatment will be implemented to speed up ground compaction and weight down the soil for TBM excavation. The ground treatment works will be solely land-based, carried out on top of the reclaimed land of the Northern Landfall. It will replace the marine dredging works in the middle of Portions N-A and N-B and will not affect the reclamation method, as considered under the EIA assumptions.
- The ground treatment method employed will involve wet-works and will not cause dust impact. Water recycling and treatment facilities will be provided as a normal practice and in compliance with discharge licenses to treat the water before discharge. This is considered to be in compliance with EP-354/2009/B and EIA Report requirements. In the course of the ground treatment works, no open excavation for this work is envisaged. There will thus be no additional C&D materials to be excavated and the work is considered to remain within the scope of EP-354/2009/B and approved EIA Report requirements.
- The dredging quantities estimated for the newly proposed dredging scope are all within the preliminary design of the Project assumed in the approved EIA Report and the EP-354/2009/B, given that no dredging will be undertaken in the middle of Portions N-A and N-B and the dredging extent of Portion N-C is the same as that assumed in the EP-354/2009/B.
- Comparison of potential environmental impacts between the proposed change in the dredging extent and the conditions in EP-354/2009/B indicated that the associated environmental impacts under the proposed change would be no greater or any worse than those predicted in the approved EIA Report.
- Overall, it is recommended that the cancellation of dredging at Portions N-A and N-B to be considered as conforming to the information and requirements contained in the EIA Report.



M	02SEP14	JBU	pkv	CFK	SILT CURTAIN REMOVED AT STAGES 3 & 4	SPo
L	09JUL14	JBU	pkv	CFK	UPDATED PROGRESS FOR DREDGING IN MIDDLE	SPo
K	26JUNE14	JBU	pkv	CFK	MIDDLE SILT CURTAIN ON STAGE 3 REMOVED	SPo
J	23JUNE14	JBU	pkv	CFK	MIDDLE SILT CURTAIN ON STAGE 4 REMOVED	SPo
I	19JUNE14	JBU	pkv	CFK	PROGRESS UPDATED & SILT CURTAIN ADDED FOR PILOT TEST	SPo
H	10JUNE14	pkv/JBU	pkv	CFK	SEQUENCE AND PROGRESS UPDATED	SPo
Rev.	Date	Drawn	Designed	Verified	Description	Approved

Main Contractor

Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

Client

路政署 HIGHWAYS DEPARTMENT

ARUP Ove Arup & Partners Hong Kong Limited

Contractor's Designer

Project

Contract No. HY/2012/08
Tuen Mun - Chek Lap Kok Link -
Northern Connection Sub-Sea Tunnel Section

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CONSTRUCTION SEQUENCE

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