

SECTION 2

2 PROJECT DESCRIPTION

2.1 Introduction

2.1.1 The primary objective of the Assignment is to identify and evaluate the feasibility of four alignment options for providing a new major trunk road connection between Tseung Kwan O (TKO) New Town and South East Kowloon (SEK). The current TKO population of 220,000 is planned to increase to 445,000 with a possible further increase to 520,000. The Western Coast Road (WCR) would provide access from East Kowloon for the increased population at TKO and provide a safe route for Dangerous Goods Vehicles (DGV) to and from Area 137, TKO. The WCR would also provide access between Eastern Kowloon and other port developments in TKO (such as Area 131).

2.1.2 Without the Project, it is expected that road infrastructure would not be able to accommodate future population demand in the area and alternative routing would be required for the transport of DGV. The planning of the Project has been undertaken so as to meet the required traffic carrying capacity and cause the least adverse impact to the local community, environment, road and marine transport activities.

2.2 Alignment Option Selection

2.2.1 As part of the alignment option assessment, a total of thirty-four alternative alignment schemes were developed based on four WCR coastal options (Options 1 to 4) and three WCR inland options (Options 5 to 7). These options were initially screened in terms of a combination of factors including: environmental, engineering, traffic and cost considerations. Based on these factors, four alignment options (Options 2D2, 2E1, 2E2 and 6) were selected and endorsed in the 3rd Project Steering Group Meeting held on 26 May 1997.

2.2.2 The four options were further assessed based on rating methods accepted at the Project Working Group Meeting held on 3rd September 1997 for which the following factors were considered: (i) Traffic (including: *primary traffic function*, which is the basic requirement to provide a road to link TKO and East Kowloon, with its eastern end connecting to TKO Road P2 and western end connecting to East Kowloon Road T2, and with slip road connections to Yau Tong and TKO Area 131 and *secondary traffic function*, which includes the effectiveness of the secondary road linkages and the effects on the existing road system); (ii) Environmental Considerations (including: *noise impacts, air quality impacts, water quality impacts, construction impacts, waste, ecology impact and cultural heritage impacts*); (iii) Marine Impacts (including: *impacts to marine facilities and traffic and risk of structure against ship collision*); (iv) Landuse and Visual Impacts; (v) Drainage Impacts; (vi) Utilities Impacts; and (vii) Cost.

- 2.2.3 During the evaluation of the selected alignment options, it was found that Option 6 would result in significant environmental impacts to air quality from the enclosures associated with this Option and risks associated with the use of the tunnel for DGV. Therefore, this Option was not included for further consideration as part of the Study.
- 2.2.4 For Option 2E1, the proposed Option would require high level bridges over the mouth of Yau Tong Bay and Sam Ka Tsuen Typhoon Shelter and would not have the slip road connection to Cha Kwo Ling Road near Eastern Harbour Crossing. This Option was found unfavourable based on issues relating to traffic functions, land use impacts, utilities impact, and visual and landscape impacts and had similar effects on noise, air quality, water quality, construction, waste and ecology as option 2D2.
- 2.2.5 The remaining alignment Options, 2D2 and 2E2, were found to be very similar with the exception of their respective slip road connections to Lei Yue Mun Road and Cha Kwo Ling Road:
- Option 2D2 would have slip roads running along the hillside of Lei Yue Mun Headland behind Sam Ka Tsuen, with a major portion of the slip roads formed by cut and fill slopes and a minor portion formed by bridges; and
 - Option 2E2 would have slip roads running along the seawall of Sam Ka Tsuen Typhoon Shelter near Shung Shun Street in the form of high level bridges.
- 2.2.6 Due to the high level slip road bridges running along the seawall of Sam Ka Tsuen Typhoon Shelter, with some of the bridge columns sitting within the typhoon shelter, Option 2E2 was found to be less favourable than Option 2D2 in terms of marine impact, land use impact, visual and landscape impacts, utilities impact and cost; while other factors including noise impact, air quality impacts, water quality impacts, construction impacts and ecology impact were found to be similar for both Options.
- 2.2.7 As a result, Option 2D2, which has slip roads running along the hillside of Lei Yue Mun Headland behind Sam Ka Tsuen, was found to be the preferred Option and was therefore recommended as the preferred alignment for WCR. The Option was subsequently endorsed, in principle, at the 4th Project Steering Group Meeting held on 17 November 1997 for further assessment, including the undertaking of the EIA for this Option. The preferred alignment option is shown in *Figure 2.2a* and *Figure 2.2b*.
- 2.2.8 The vertical alignment of WCR along Yau Tong Coastal Section cannot be depressed either in the form of underpass or tunnel due to the following reasons:
- The WCR is required to take DGV and a tunnel alignment is considered not suitable for the DGV.

- The proposed reclamation at Yau Tong waterfront has to be carried out in two phases so that the marine access to the existing waterfront facilities including Sam Ka Tsuen Ferry Pier, WSD Yau Tong Salt Water Pumping Station and F.M.O. Kwun Tong Wholesale Fish Market can be maintained until the corresponding reprovisioning facilities are completed along the new seawall of the reclamation. If the WCR is in the form of an underpass, the construction of the section of WCR along the reclamation strip at Yau Tong waterfront, unlike the elevated road option, would have to commence after completion of the reclamation and the reprovisioning facilities since the underpass will block off the marine access to the existing waterfront facilities. As a result of this, the target date of road opening of WCR by year 2006 would be delayed to about year 2009, which is unacceptable from traffic point of view.
- Due to the presence of a 1400 mm diameter submarine fresh water pipeline, a twin 600 mm diameter submarine gas pipeline and the tunnels of the Eastern Harbour Crossing at the mouth of Yau Tong Bay, the section of WCR needs to be elevated to allow marine access below the WCR for the future maintenance of the existing pipelines and tunnels. The alternative option of constructing WCR as a tunnel underneath the pipelines and the Eastern Harbour Crossing tunnels will have a high risk of damage to the pipelines or tunnels and would not be acceptable. The other alternative option of diverting the existing pipelines and the Eastern Harbour Crossing to give way for a depressed alignment of WCR is considered not practical in terms of cost and time.

2.3 Construction Phase

2.3.1 A preliminary Project programme is shown in *Figure 2.3a*.

2.3.2 The construction of the WCR is divided into sections (*Figure 2.3b*), namely:

- TKO Section;
- Lei Yue Mun Headland Section;
- Lei Yue Mun Slip Road Section; and
- Yau Tong Coastal Section.

TKO Section

2.3.3 The TKO Section of WCR is proposed to be built on a narrow strip of reclamation along the TKO coastline towards the Lei Yue Mun Headland as shown in *Figure 2.3c*. The area of reclamation required for WCR in the TKO Section would be about 75,200 m² (7.5 ha), approximately 80 m wide and 940 m in length. The estimated volume of dredging and fill material that would be required for the reclamation are presented in *Table 2.3a*.

Table 2.3a Estimated Volumes of Dredging and Fill Materials for TKO Section Reclamation

Activity	Volume of Dredging (m ³) ⁽¹⁾	Volume of Fill Materials (m ³) ⁽²⁾
Sloping Seawall	299,150	594,440
General Reclamation	0	536,145
Total	299,150	1,130,585
Notes :		
(1) Assumed seabed level at 10.0 mPD with the bottom of Marine Deposit at 15.0 mPD		
(2) General fill to replace dredged material. Top of reclamation level to be at +4.5 mPD		

Lei Yue Mun Headland Section

- 2.3.4 This Section would comprise cut and cover tunnel works for a short tunnel of approximately 175 m involving: site clearance, excavation, tunnel construction, slope works and drainage/utility works.

Lei Yue Mun Slip Roads Section

- 2.3.5 Construction for the slip roads would involve site clearance, cut and fill works, piling work, roadworks and drainage utility works. It is expected that access to this Section of the alignment will be through the Yau Tong area. However, it is expected that the number of vehicles travelling along haul routes will be minimal, as most of the excavated material will be used on site for the slope works. Any surplus material identified would be used for the small reclamation section at Yau Tong and thus minimise haul traffic requirements.

Yau Tong Coastal Section

- 2.3.6 This Section would comprise reclamation works and subsequent road infrastructure works. The works will involve the dredging and construction activities required for the seawall, reclamation and the proposed submerged reef and protective dolphins at Yau Tong Bay; reprovisioning of the existing fish market and CED Maintenance Depot, new pumping station and ferry pier; and construction of the remaining roadway and demolition of the old ferry pier and pumping station. The source of fill material would likely be a combination of public fill and contracted fill material. The quantities of which are to be established during the detailed design stage of the Project. *Figure 2.3 d-f* show the sequence of the construction of the proposed reclamation and submerged reef.

Stage 1

- 2.3.7 Stage 1 involves the initial dredging activities required for the construction of the reclamation seawall and the proposed submerged reef at Yau Tong Bay. Due to the small volumes of material to be dredged, it is expected that the dredging will involve one grab dredger. Stage 1 comprise the following activities:

- dredging for the submerged reef and protective dolphins at Yau Tong Bay; and
- dredging of the seawall for the thin reclamation strip between Yau Tong Bay and Sam Ka Tsuen Typhoon Shelter.

Stage 2

2.3.8 Stage 2 involves the construction of the submerged reef and protective dolphins, the seawall construction and initial filling of the reclamation behind constructed seawalls. This stage will also include the reprovisioning of the new pumping station and ferry pier. Stage 2 comprise the following activities:

- construction of the submerged reef and protective dolphins at Yau Tong Bay;
- construction of the seawall for the thin reclamation strip between Yau Tong Bay and Sam Ka Tsuen Typhoon Shelter;
- Phase 1 of the thin reclamation strip between Yau Tong Bay and Sam Ka Tsuen Typhoon Shelter;
- construction for the reprovisioning of the fish market and CED Maintenance Depot;
- construction of the new ferry pier; and
- construction of the pumping station.

Stage 3

2.3.9 Stage 3 involves the final stage of the reclamation requiring the construction of the remaining seawall, completion of the reclamation and demolition of the old ferry pier and pumping station. Stage 3 comprise the following activities:

- construction of the remaining seawall for the thin reclamation strip between Yau Tong Bay and Sam Ka Tsuen Typhoon Shelter;
- Phase 2 of the thin reclamation strip between Yau Tong Bay and Sam Ka Tsuen Typhoon Shelter;
- reprovisioning of the Fish Market and CED Maintenance Depot;
- demolition of the old ferry pier; and
- demolition of the old pumping station.

2.3.10 The estimated volumes of the reclamation are presented in *Table 2.3b*.

Table 2.3b Estimated Volumes of Dredging and Fill Materials for Yau Tong Reclamation

Activity	Volume of Dredging (m ³)	Volume of General Fill Materials (m ³)
Submerged Reef	60,000	60,000
Dredging of Sloping Seawall	58,650	75,210
Dredging of Vertical Seawall	24,800	26,800
General Reclamation	83,600	418,000
Total	227,050	580,010

2.3.11 It is expected that the construction programme will be subject to ongoing change and refinement due to design development and Government review, as well as during the progress of the design. Any subsequent significant changes to the programme or design will necessitate a review to confirm that adverse impacts, including cumulative impacts, are no greater than those predicted in this EIA. It should also be noted that under Section 7 (Public Inspection of Reports) and 8 (Approval of EIA Report) of the EIAO, additional information may be required as a result of comments from the public consultation or from the Advisory Council on the Environment (ACE).

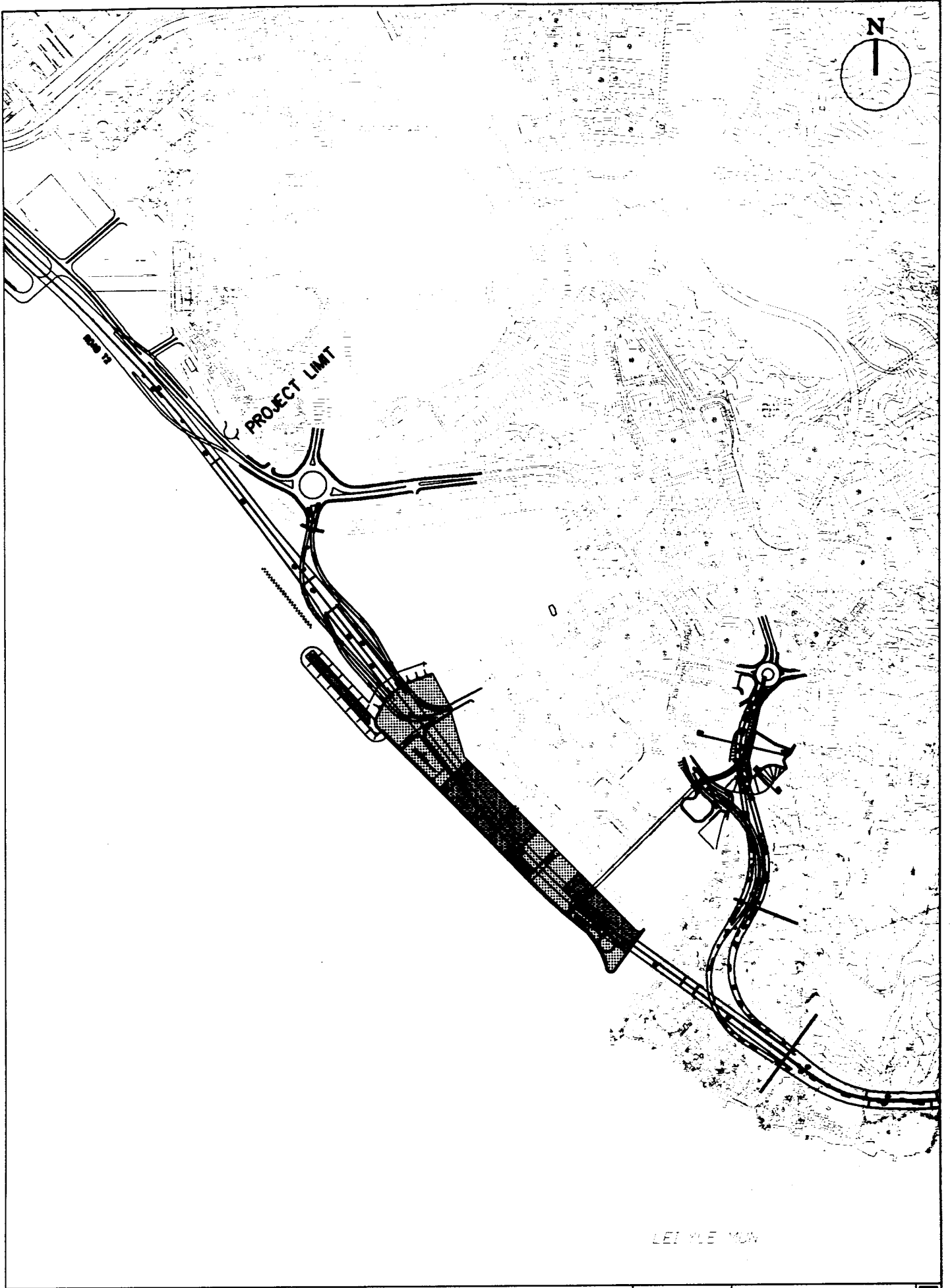
2.4 Operation Phase

2.4.1 The WCR would be a dual 4-lane roadway along the TKO section due to the increased traffic expected from the TKO Cross Bay Bridge. WCR would then be reduced to a dual 3-lane roadway, as it reaches the Lei Yue Mun Headland and traverses into the Yau Tong area where it connects to the South East Kowloon area. The slip roads in the Yau Tong area will be 1 or 2-lane single carriageways.

2.4.2 For the purpose of this EIA Report, traffic forecasts have been produced for the worst case year (Year 2021) 15 years after the commencement of operation of WCR and are provided in *Figure 2.4a*. The worst case scenario is based on an agreed growth rate (2%) applied for 10 years to 2011 traffic data.

2.5 Designated Projects

2.5.1 The WCR Project is classified under the Schedule 2, Part I, A "Roads, Railways and Depots" category of projects. Under Schedule 2, Part I, A.1, these projects are described as "A road which is an expressway, trunk road, primary distributor or district distributor road including new roads, and major extensions or improvements to existing road".

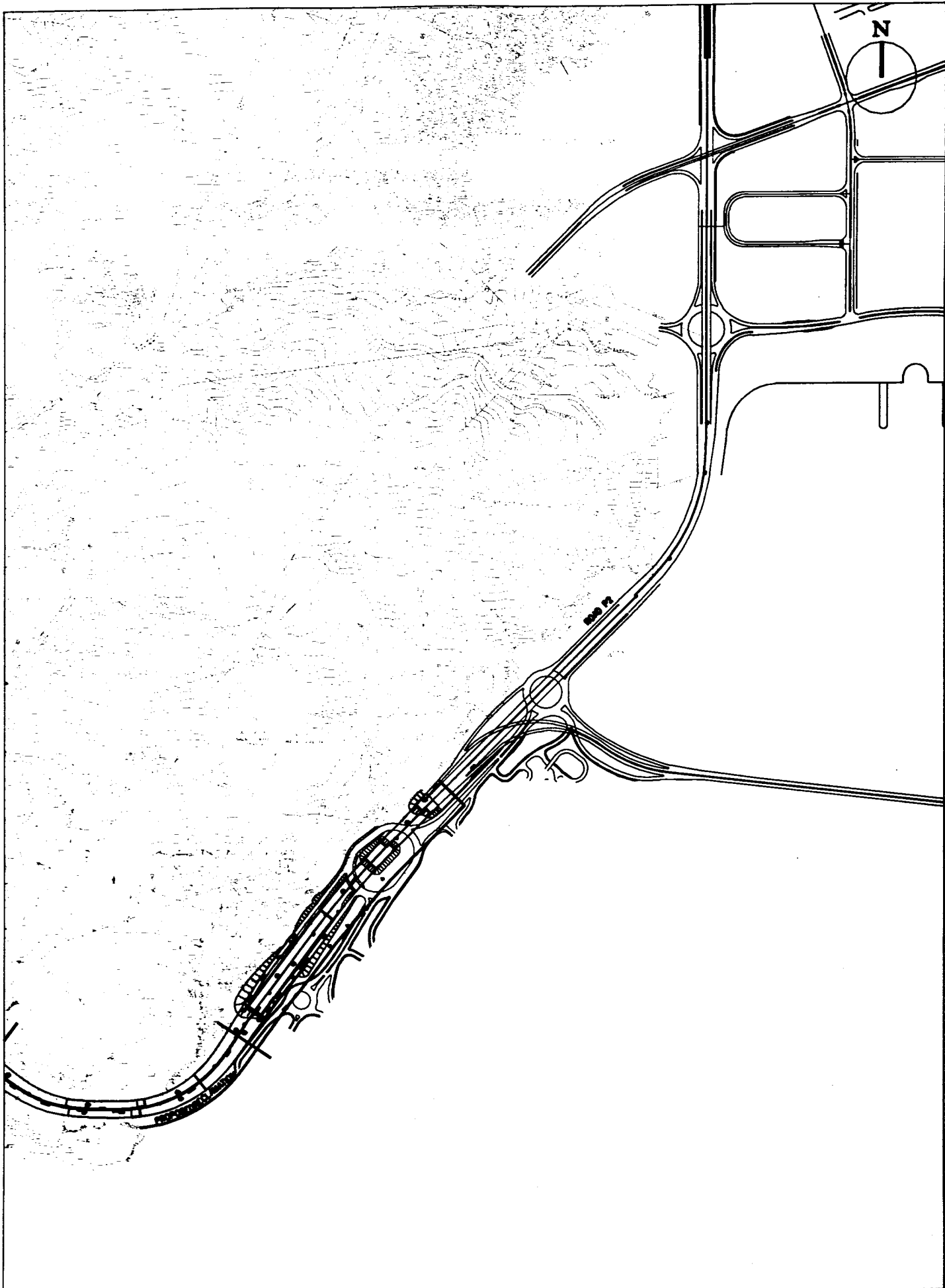


LEI YUE MUN

PREFERRED ALIGNMENT OPTION FOR YAU TONG

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	及盛工程顧問有限公司	
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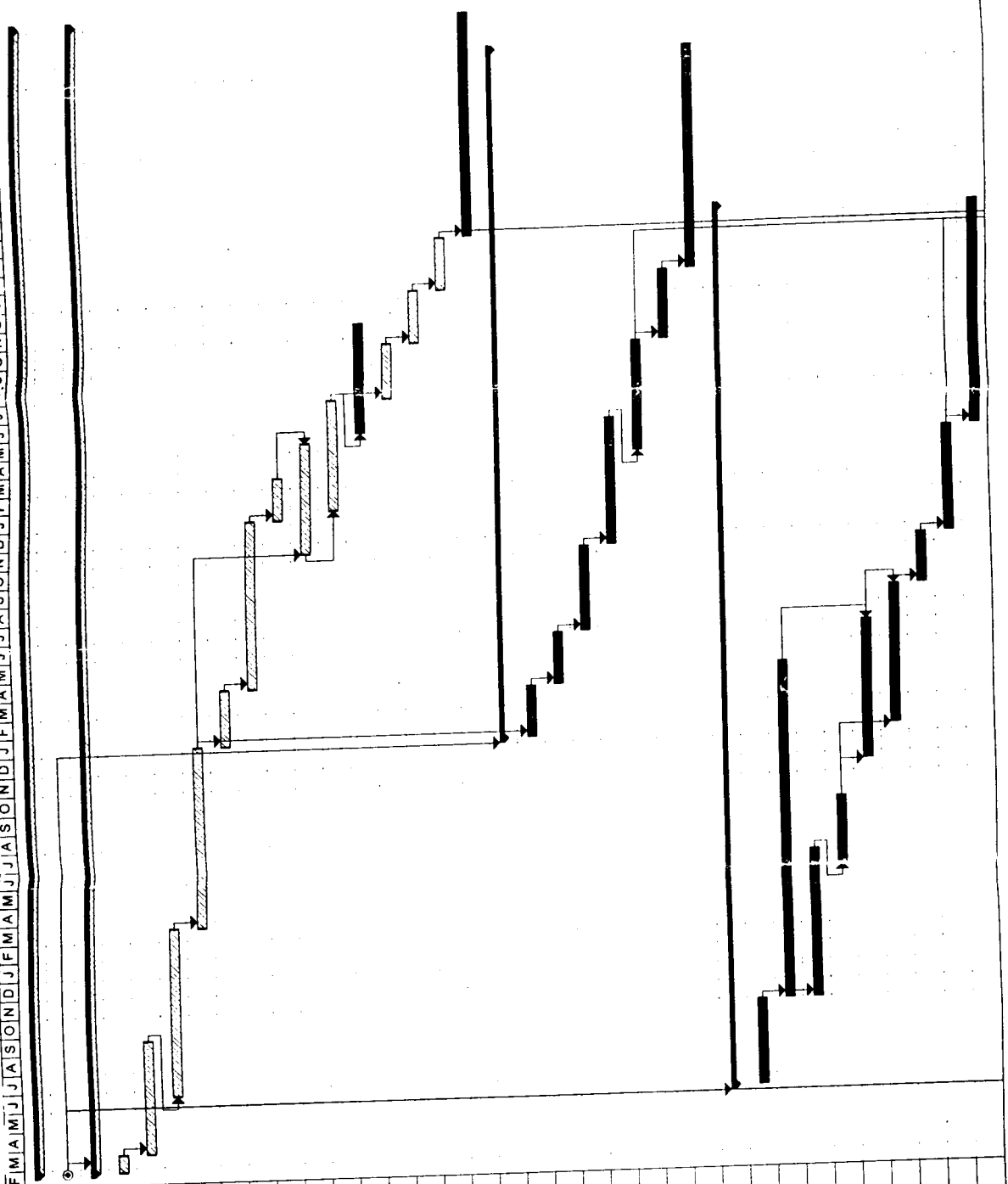
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PREFERRED ALIGNMENT OPTION FOR TKO SECTION

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	SCALE: 1:11000	2.2b		

2007
 2006
 2005
 2004
 2003



ID	Task Name
87	Construction commencement
88	TKO section
89	Mobilization
90	Dredging for seawall trenches
91	Seawall construction
92	Reclamation
93	Preloading mounds for roads
94	Preloading period (assume 9 months)
95	Removal of preloading mounds
96	Piling works
97	Pile caps, columns, abutments construction
98	Bridge deck construction
99	Utilities and drainage works
100	Roadworks
101	Landscape softworks
102	Landscape establishment works (12-month)
103	Cut-and-cover Tunnel Works
104	Site clearance, tree felling or transplanting
105	Excavation works
106	Tunnel construction (including roadworks)
107	Backfill and slope works
108	Utilities and drainage works
109	Landscape softworks
110	Landscape establishment works (12-month)
111	Lei Yue Mun slip roads
112	Site clearance, tree felling or transplanting
113	Cut-and-fill slopeworks, retaining walls
114	Piling works
115	Pile caps, columns, abutments construction
116	Bridge deck construction
117	Utilities, drainage and sewer works
118	Roadworks
119	Landscape softworks
120	Landscape establishment works (12-month)
121	Landscape establishment works (12-month)

Figure 2.3a : 1

IMPLEMENTATION PROGRAMME

2007
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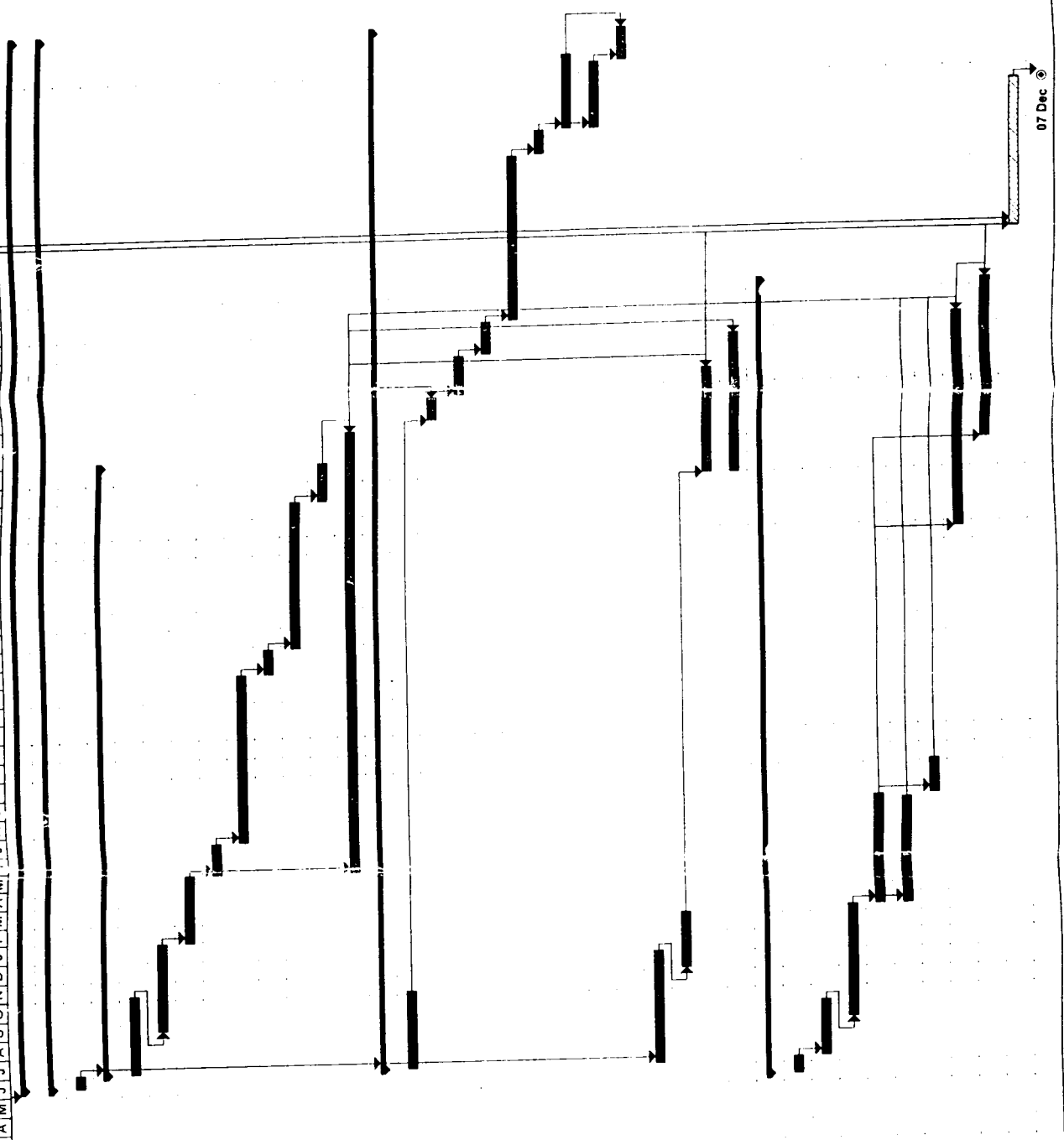
2006
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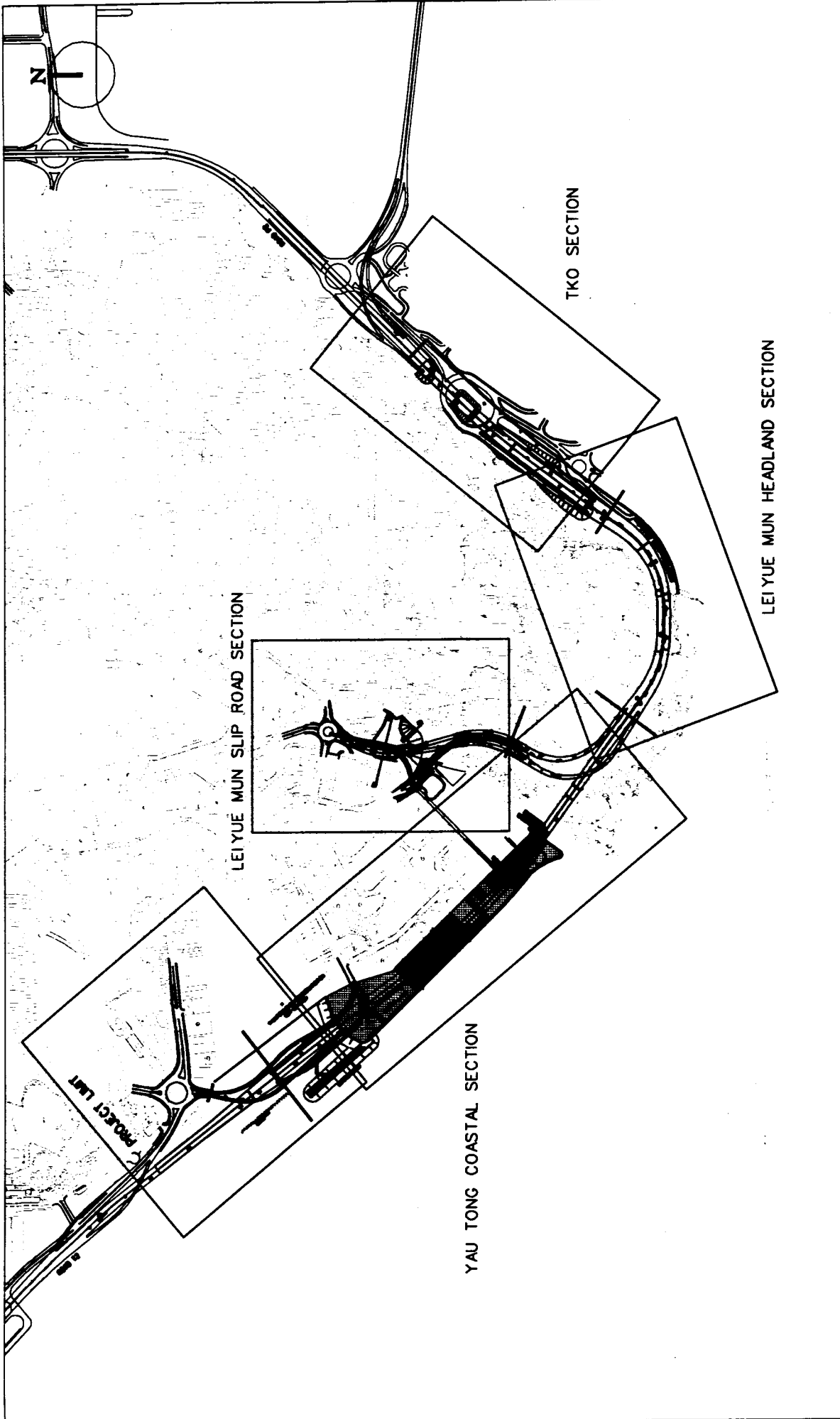
2005
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2004
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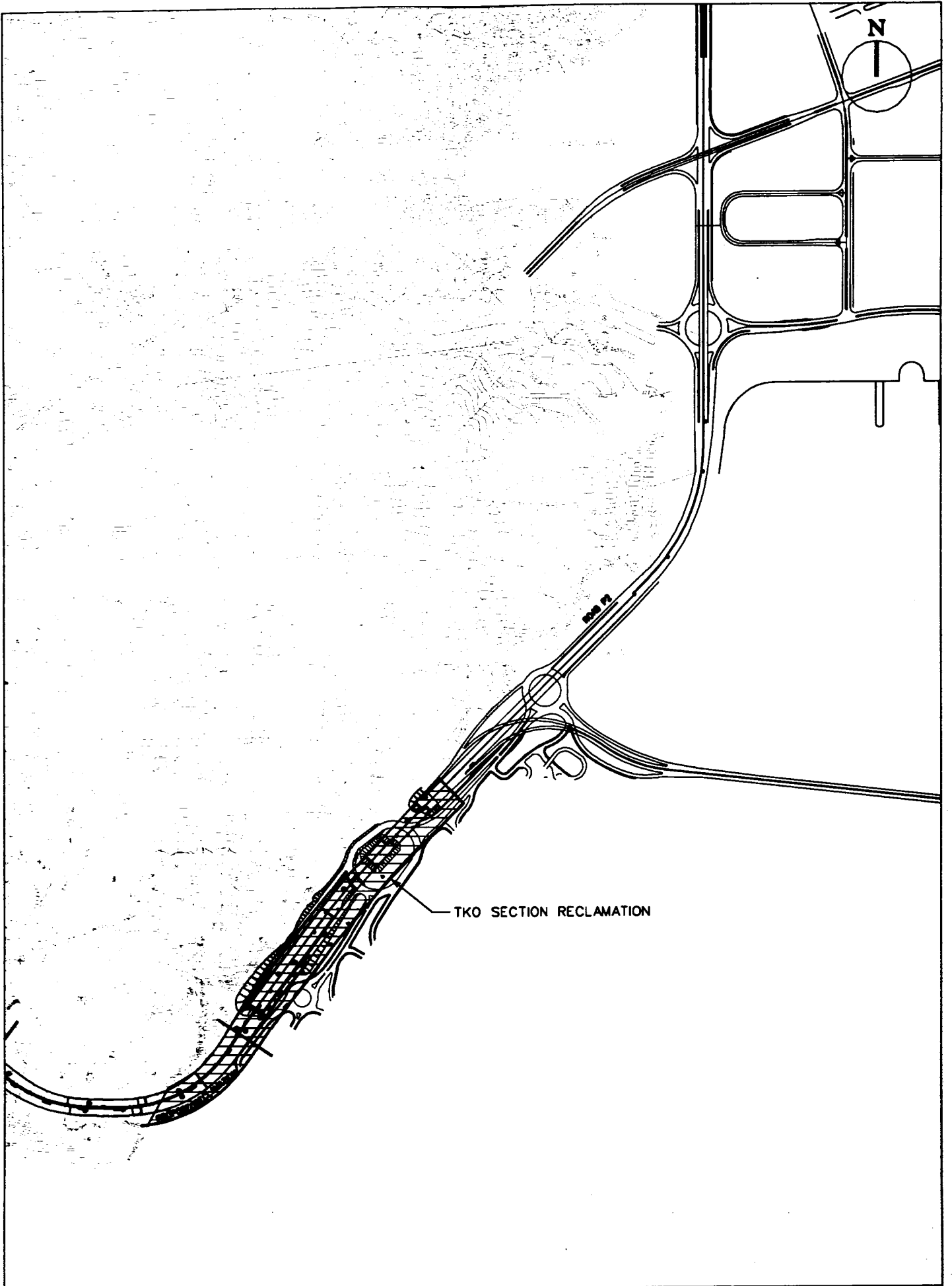
2003
 J F M A M J J A S O N D J F M A M

ID	Task Name
122	Yau Tong coastal section
123	Reclamation section
124	Mobilization
125	Reclamation Phase 1
126	Dredging for seawall trenches
127	Seawall construction
128	Reclamation
129	Preloading mounds for roads
130	Preloading period (assume 9 months)
131	Removal of preloading mounds
132	Utilities, drainage and sewer works
133	Ground level roadworks
134	Re-provisioning works for waterfront sites (assume 24 months)
135	Reclamation Phase 2
136	Dredging for seawall trenches
137	Seawall construction
138	Reclamation
139	Preloading mounds for roads
140	Preloading period (assume 9 months)
141	Removal of preloading mounds
142	Shung Shun Street Box Culvert extension
143	Utilities, drainage and sewer works
144	Ground level roadworks
145	Piling works
146	Pile caps, columns construction
147	Land bridge deck construction
148	Construction of roundabout at Cha Kwo Ling Road near EHC portal
149	Marine sections
150	Mobilization
151	Submerged reef construction
152	Marine piling works
153	Pile caps, columns construction
154	Construction of protection dolphins
155	Constn of ship collision protection fender
156	Marine bridge deck construction
157	Utilities and drainage works
158	Allow 8 months for extension of time due to inclement weather
159	Opening of Western Coast Road





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CONSTRUCTION AREAS		SCALE: 1:10000	

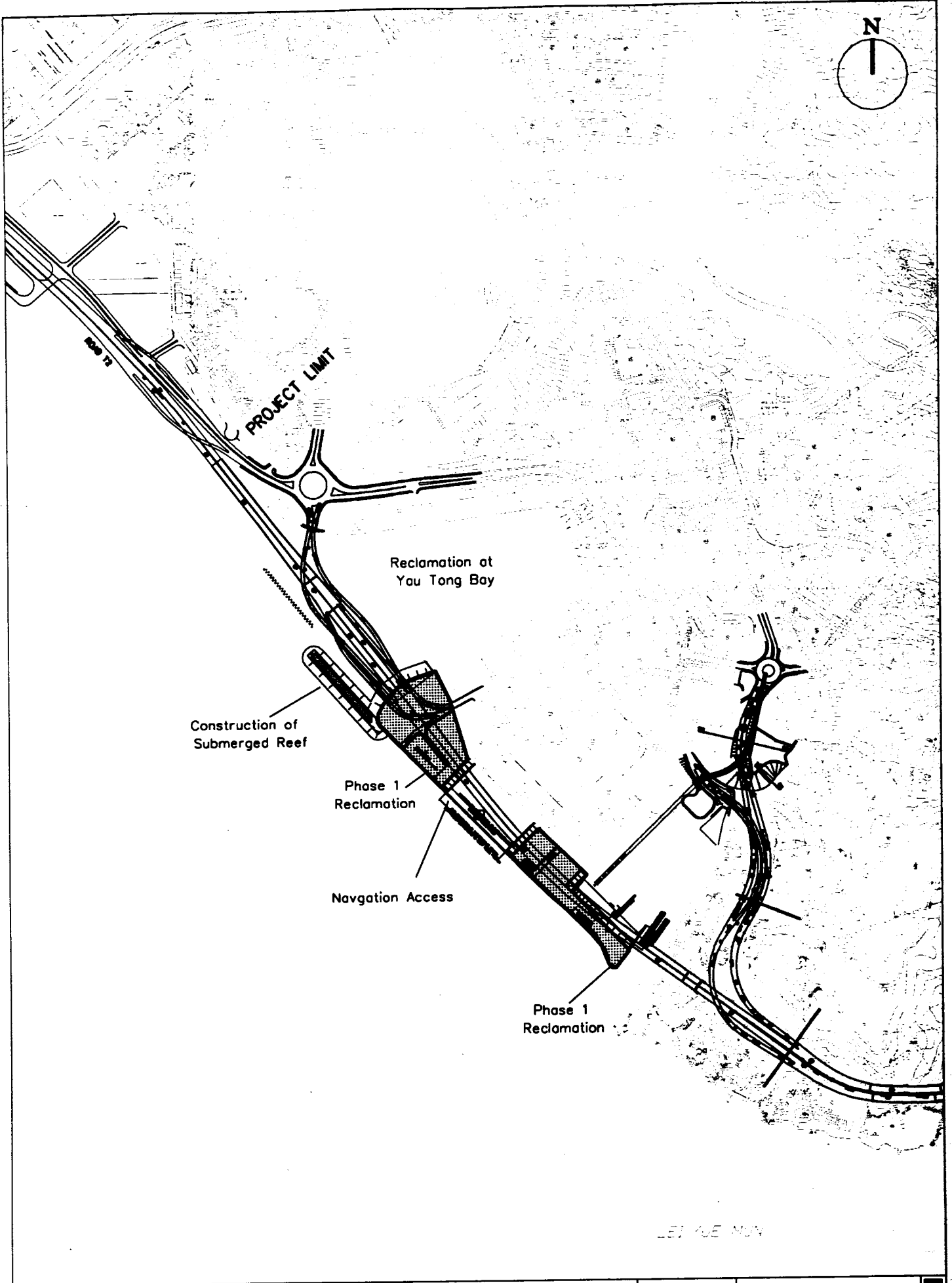
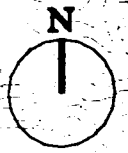


TKO SECTION RECLAMATION

TKO SECTION RECLAMATION

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YAU TONG COASTAL RECLAMATION - PHASE 1

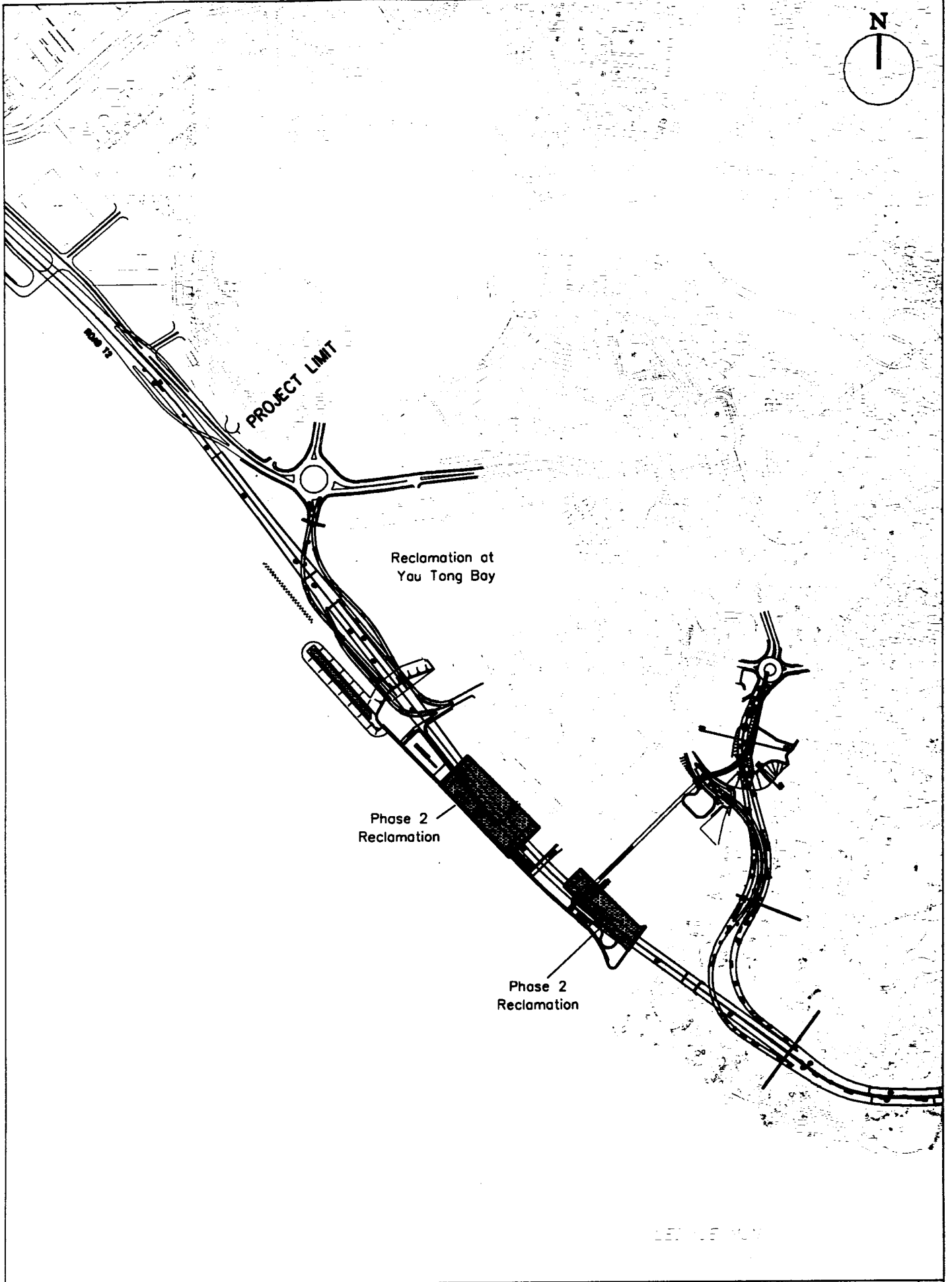
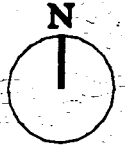
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FIGURE No.
2.3d

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YAU TONG COASTAL RECLAMATION - PHASE 2

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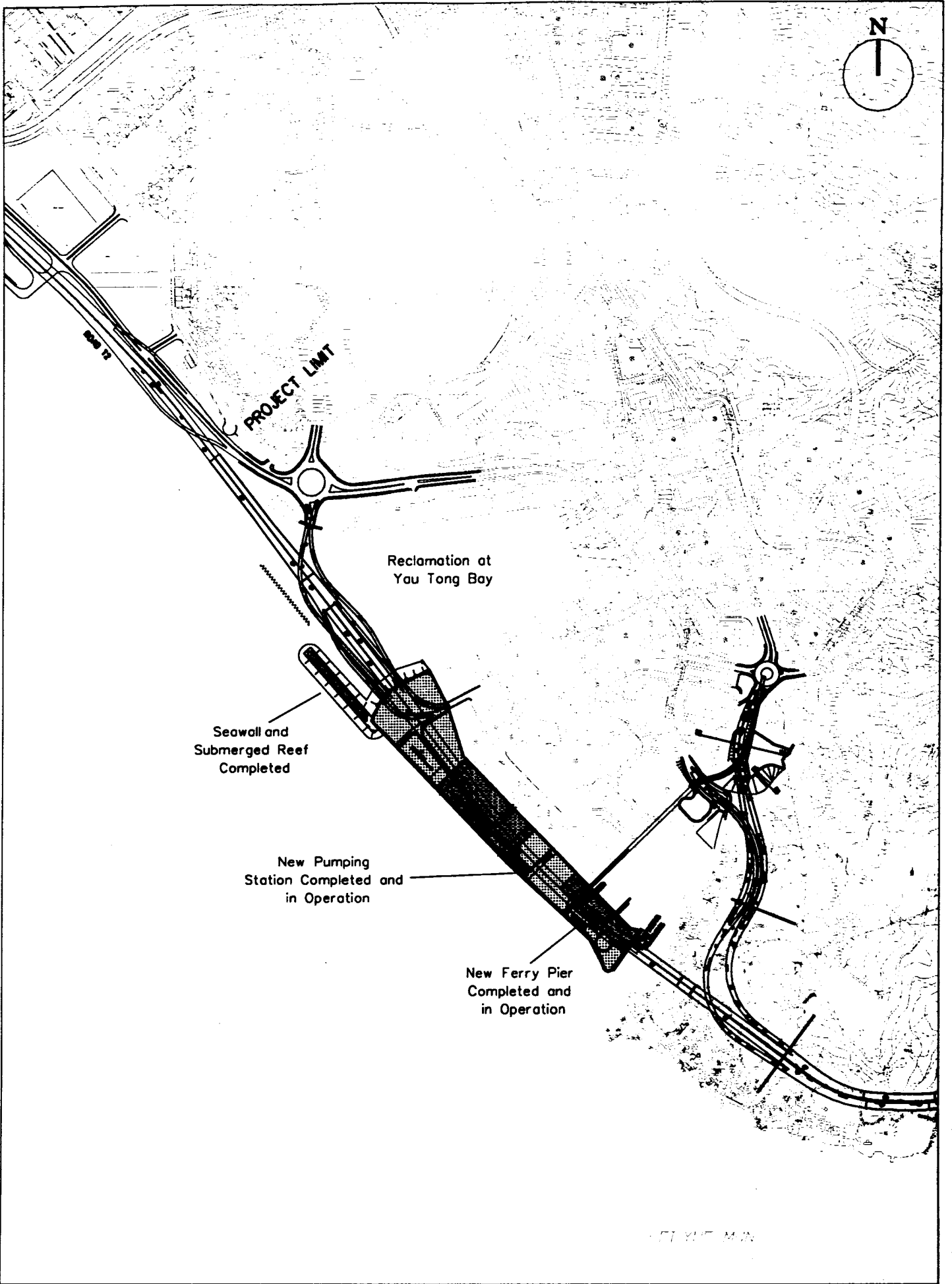
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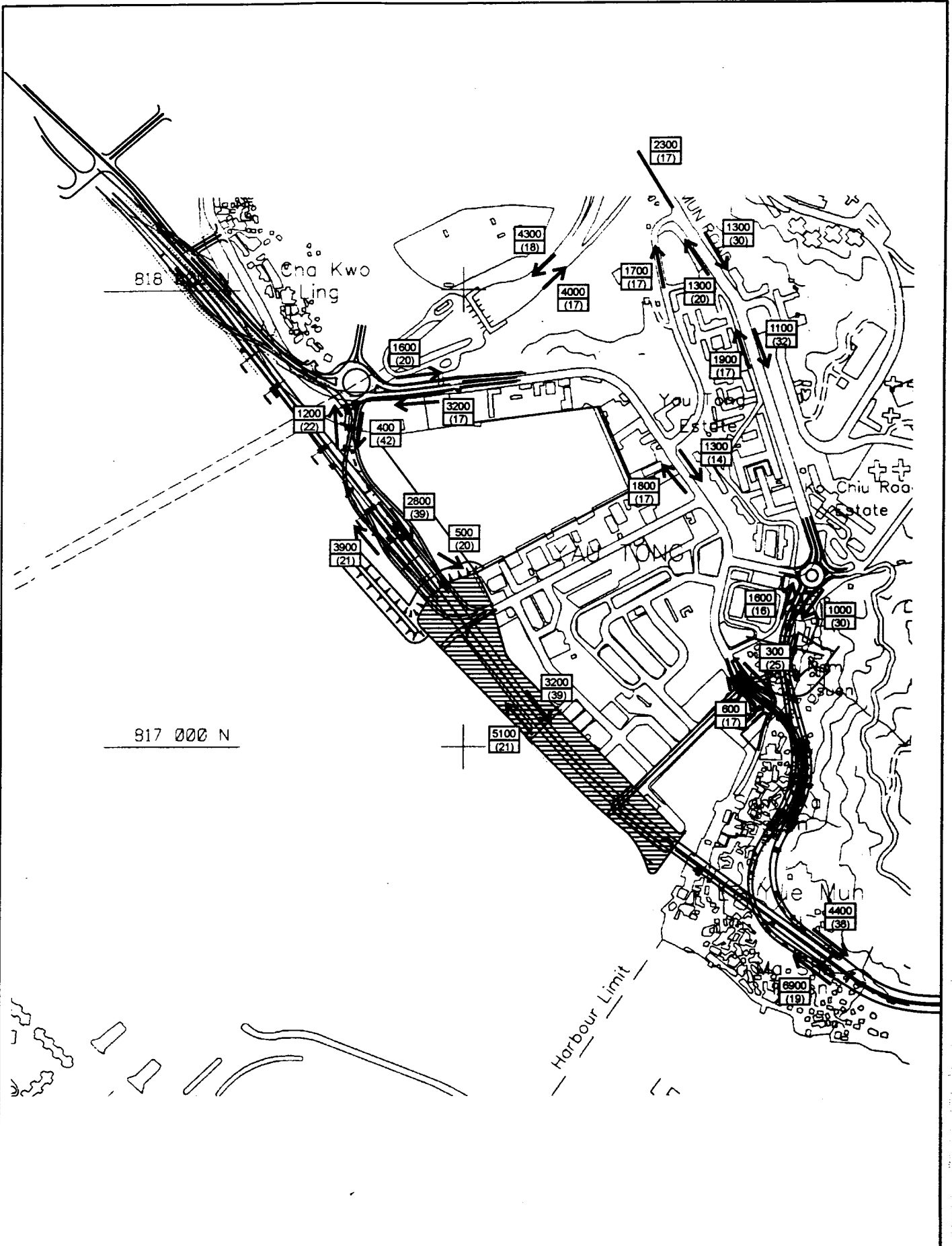
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YAU TONG COASTAL RECLAMATION - PHASE 3

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KEY
 6900 - 2021 AM PEAK TRAFFIC FLOWS (IN VEH)
 (19) - % OF HGV

FIGURE 2.4a

TRAFFIC FIGURES FOR THE YEAR 2021

FILE: C1609g
 DATE: 08/03/99

Environmental
 Resources
 Management

