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Report No.: 0165/15/ED/0653

QUARTERLY ENVIRONMENTAL MONITORING & AUDIT REPORT (Rev. 1)

September 2016 to November 2016

Client:

China Harbour Engineering Co., Ltd.

Project:

Contract No. HY/2013/03

Hong Kong-Zhuhai-Macao Bridge

Hong Kong Boundary Crossing Facilities -

Vehicle Clearance Plazas and Ancillary Buildings and Facilities

Report No.:

0165/15/ED/0653

Prepared by: Scarlet Cheng

Reviewed by: Bong Yu

Certified by:

Arthur Cheng

Environmental Team Leader



Ref.: HYDHZMBEEM00_0_5020L.17

6 February 2017

By Fax (3468 2076) and By Post

AECOM Asia Co. Ltd. The PRE's Office 5 Ying Hei Road, Tung Chung, Lantau Hong Kong

Attention: Mr. Michael Tovey

Dear Sir,

Re: Agreement No. CE 48/2011 (EP)

Environmental Project Office for the

HZMB Hong Kong Link Road, HZMB Hong Kong Boundary Crossing Facilities,

and Tuen Mun-Chek Lap Kok Link - Investigation

Contract No. HY/2013/03 - HZMB HKBCF - Vehicle Clearance Plazas and

Ancillary Buildings and Facilities

Quarterly EM&A Report No.5 for September 2016 to November 2016

Reference is made to the Environmental Team's submission of Quarterly Environmental Monitoring & Audit Report No.5 for September 2016 to November 2016 (Rev. 1) certified by the ET Leader (ET's ref.: "MCL/ED/0077/2016/C" dated 2 February 2017) and provided to us via e-mail on 3 February 2017.

We are pleased to inform you that we have no adverse comment on the captioned report. We write to verify the captioned submission in accordance with Section 16.4.1 of the Updated EM&A Manual (2011).

Thank you very much for your attention and please feel free to contact the undersigned should you require further information.

Yours faithfully, For and on behalf of Ramboll Environ Hong Kong Limited

Raymond Dai

Independent Environmental Checker

c.c. HyD Mr. Vico Cheung (By Fax: 3188 6614) HyD Mr. Ken Woo (By Fax: 3188 6614) MCL Mr. Arthur Cheng (By Fax: 2450 8032) CHEC Mr. Johnason Ko (By Fax: 2887 3014)

Internal: DY, YH, ENPO Site

anguit



02 February 2017

MCL/ED/0077/2016/C

Date

Our Ref.

Room 723 & 725, 7/F, Block B,

Profit Industrial Building,

1-15 Kwai Fung Crescent, Kwai Fong,

Hong Kong

Tel : +852-2450 8238 Fax : +852-2450 8032 E-mail : mcl@fugro.com.hk

Website: www.materialab-consultant.com

Ramboll Environ Hong Kong Limited (formerly ENVIRON Hong Kong Limited) 21/F, BEA Harbour View Centre 56 Gloucester Road, Wan Chai Hong Kong

Attn.: Mr. Raymond Dai, IEC

BY HAND

Dear Sir,

Quarterly EM&A Report for September 2016 to November 2016 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Vehicle Clearance Plazas and Ancillary Buildings and Facilities (Contract No. HY/2013/03)

Pursuant to Section 16.4 of the updated EM&A Manual for Hong Kong Boundary Crossing Facilities (Version 1.0) covering the captioned contract, we are pleased to submit the certified Quarterly EM&A Report for September 2016 to November 2016 (Rev.1) for your verification.

Should you require further information, please do not hesitate to contact our Miss Scarlet Cheng at 3565 4156 or the undersigned at 3565 4115.

Yours faithfully, for and on behalf of MATERIALAB CONSULTANTS LIMITED

Arthur Cheng

Environmental Team Leader

AC/sc

Encl.

c.c. AECOM – Mr. P.K. Lee, Mr. W.S. Ng, Mr. Patrick Ko

RAMBOLL ENVIRON - Mr. Ray Yan, Mr. Andy Wong

CHEC - Mr. Marko Chan

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Report No.: 0165/15/ED/0653

CONTENTS

EXECUTIVE SUMMARY

1. INTRODUCTION

- 1.1 Basic Project Information
- 1.2 Project Organisation
- 1.3 Construction Programme
- 1.4 Construction Works undertaken during the Reporting Period

2 **EM&A REQUIREMENTS**

- 2.1 Summary of EM&A Requirements
- 2.2 Monitoring Requirements
- 2.3 Action and Limit Levels
- 2.4 Event and Action Plans
- 2.5 Mitigation Measures

ENVIRONMENTAL MONITORING AND AUDIT 3.

- 3.1 Air Quality Monitoring Results
- 3.2 Noise Monitoring Results
- 3.3 Water Quality Monitoring Results
- 3.4 Ecology Monitoring Results
- 3.5 Implementation of Environmental Measures
- 3.6 Advice on the Solid and Liquid Waste Management Status
- 3.7 Environmental Licenses and Permits

SUMMARY OF EXCEEDANCES, COMPLAINTS, NOTIFICATION OF SUMMONS AND 4. SUCCESSFUL PROSECUTION

- 4.1 Summary of Exceedance of the Environmental Quality Performance Limit
- 4.2 Summary of Complaints, Notification of Summons and Successful Prosecution

5. COMMENTS, RECOMMENDATIONS AND CONCLUSIONS

- 5.1 Comments
- 5.2 Recommendations
- 5.3 Conclusions

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Report No.: 0165/15/ED/0653

APPENDICES

- Α Location of Works Areas
- В Project Organization for Environmental Works
- С **Construction Program**
- D Event / Action Plan
- Ε Implementation Schedule for Environmental Mitigation Measures (EMIS)
- F Site Audit Findings and Corrective Actions
- G Waste Flow Table
- **Environmental Licenses and Permits** Н
- Statistics on Environmental Complaints, Notification of Summons and Successful Prosecutions ı

FIGURES

Figure 1 Air Quality Monitoring Stations

Figure 2 Noise Monitoring Stations

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MateriaLab

Report No.: 0165/15/ED/0653

EXECUTIVE SUMMARY

This Quarterly Environmental Monitoring and Audit (EM&A) Report is prepared for Contract No. HY/2013/03 "Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Vehicle Clearance Plazas and Ancillary Buildings and Facilities" (includes the construction works of Contract No. HY/2013/06 "Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Automatic Vehicle Clearance Support System" within Contract No. HY/2013/03 works area) (hereafter referred to as "the Contract") for the Highways Department of Hong Kong Special Administrative Region (HKSAR). The Contract was awarded to China Harbour Engineering Co. Limited (construction works of Contract No. HY/2013/06 was awarded to ATAL Technologies Limited within Contract No. HY/2013/03 works area) (hereafter referred to as "the Contractor") and MateriaLab Consultants Limited (MCL) was appointed as the Environmental Team (ET) by the Contractor.

Contract No. HY/2013/03 (includes the construction works of Contract No. HY/2013/06 within Contract No. HY/2013/03 works area) is part of the "Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities" (HZMB HKBCF) Project which is a "Designated Project" under Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance (Cap. 499) and for which an EIA Report (Register No. AEIAR-145/2009) was prepared and approved. The current Environmental Permit (EP) for HKBCF, namely No. EP-353/2009/K, was issued on 11 April 2016. These documents are available through the EIA Ordinance Register. Commencement of Contract No. HY/2013/03 took place on 10 April 2015 while the construction works and the EM&A programme of Contract No. HY/2013/03 commenced on 29 August 2015 (commencement of Contract No. HY/2013/06 took place on 14 August 2015 while the construction works and the EM&A programme of Contract No. HY/2013/06 within Contract No. HY/2013/03 works area commenced on 13 September 2016).

MateriaLab Consultants Limited (MCL) has been appointed by the Contractor to implement the Environmental Monitoring & Audit (EM&A) programme for the Contract in accordance with the Updated EM&A Manual for HKBCF (Version 1.0) and will be providing environmental team services for the Contract. This is the 5th Quarterly EM&A Report for the Contract which summaries findings of the EM&A works during the reporting period from 01 September 2016 to 30 November 2016 (includes the findings of the EM&A programme of Contract No. HY/2013/06 within Contract No. HY/2013/03 works area during the reporting period from 13 September 2016 to 30 November 2016) (the "reporting period").

Environmental Monitoring and Audit Progress

The EM&A programme was undertaken in accordance with the Updated EM&A Manual for HKBCF (Version 1.0). It should be noted that the air quality and noise monitoring works for the Contract are covered by Contract No. HY/2010/02 "Hong Kong-Zhuhai-Macao Bridge HKBCF – Reclamation Works" and Contract No. HY/2011/03 "Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between Scenic Hill and HKBCF". The ET of the Contract or another ET of the HZMB project is required to conduct impact air quality monitoring at AMS6 and AMS7 and noise monitoring at NMS2 and NMS3B as part of EM&A programme if these monitoring stations are no longer covered under Contract Nos. HY/2010/02 and HY/2011/03. However, this is subject to ENPO's final decision on which ET should carry out the monitoring work at these stations.

The dates of site inspection for Contract No. HY/2013/03 (includes Contract No. HY/2013/06 within Contract No. HY/2013/03 works area) during the reporting period are listed below:

Environmental Site Inspection:

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Report No.: 0165/15/ED/0653

- 01, 08, 15, 22 and 28 September 2016 (15, 22 and 28 September 2016 includes Contract No. HY/2013/06 within Contract No. HY/2013/03 works area)
- 06, 13, 27 and 28 October 2016 (Environmental site inspection of 21 October 2016 was cancelled due to hoisting of typhoon signal no. 8 on 21 October 2016 and re-scheduled to 28 October 2016)
- 03, 10, 17 and 25 November 2016

Breaches of Action and Limit Levels

Summary of Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level at AMS6 is reported in the monthly EM&A report prepared by Contract No. HY/2011/03.

There was no Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level recorded at station AMS7 by the Environmental Team of Contract No. HY/2010/02 during the reporting period.

There was no Action and Limit Level exceedance for noise recorded at station NMS2 and station NMS3B by the Environmental Team of Contract No. HY/2010/02 during the reporting period.

There was no marine works conducted during the reporting period and therefore, no water quality impact monitoring result is reported.

There was no marine works conducted during the reporting period and therefore, no ecology monitoring result is reported.

Complaint Log

There were two complaints received in relation to the environmental impact during the reporting period.

Log No.	Environmental Complaint Ref. No.	Date of Complaint Receipt	Description
002	ENPO-C0100	22 September 2016	Water
003	ENPO-C0102	10 November 2016	Water

After investigation, it was concluded that these two complaints were not related to Contract No. HY/2013/03.

Notifications of Summons and Successful Prosecutions

There were no notifications of summons or prosecutions received during this reporting period.

Reporting Changes

There was no reporting change during the reporting period.

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Report No.: 0165/15/ED/0653

1. INTRODUCTION

1.1 Basic Project Information

- 1.1.1 This Quarterly Environmental Monitoring and Audit (EM&A) Report is prepared for Contract No. HY/2013/03 "Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities Vehicle Clearance Plazas and Ancillary Buildings and Facilities" (includes the construction works of Contract No. HY/2013/06 "Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities Automatic Vehicle Clearance Support System" within Contract No. HY/2013/03 works area) (hereafter referred to as "the Contract") for the Highways Department of Hong Kong Special Administrative Region (HKSAR). The Contract was awarded to China Harbour Engineering Co. Limited (construction works of Contract No. HY/2013/06 was awarded to ATAL Technologies Limited within Contract No. HY/2013/03 works area) (hereafter referred to as "the Contractor") and MateriaLab Consultants Limited (MCL) was appointed as the Environmental Team (ET) by the Contractor.
- 1.1.2 Contract No. HY/2013/03 (includes the construction works of Contract No. HY/2013/06 within Contract No. HY/2013/03 works area) is part of the "Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities" (HZMB HKBCF) Project which is a "Designated Project" under Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance (Cap. 499) and for which an EIA Report (Register No. AEIAR-145/2009) was prepared and approved. The current Environmental Permit (EP) for HKBCF, namely No. EP-353/2009/K, was issued on 11 April 2016. These documents are available through the EIA Ordinance Register. Commencement of Contract No. HY/2013/03 took place on 10 April 2015 while the construction works and the EM&A programme of Contract No. HY/2013/03 commenced on 29 August 2015 (commencement of Contract No. HY/2013/06 took place on 14 August 2015 while the construction works and the EM&A programme of Contract No. HY/2013/06 within Contract No. HY/2013/03 works area commenced on 13 September 2016). The works areas of the contract are shown in Appendix A.
- 1.1.3 This is the 5th Quarterly EM&A Report summarising the findings of EM&A activities conducted under Contract No. HY/2013/03 from 01 September 2016 to 30 November 2016 (from 13 September 2016 to 30 November 2016 for the construction works of Contract No. HY/2013/06 within Contract No. HY/2013/03 works area) (the "reporting period") and is submitted to fulfil Condition 16.4 of the Updated EM&A Manual for HKBCF.

1.2 Project Organisation

1.2.1 The organisation chart and lines of communication with respect to the on-site environmental management structure together with the contact information of the key personnel are shown in **Appendix B**. The key personnel contact names and numbers are summarized in **Table 1.1** and **Table 1.2**.

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Report No.: 0165/15/ED/0653

Table 1.1 Contact Information of Key Personnel (for Contract No. HY/2013/03)

Party	Position	Contact Person	Telephone No.	Fax No.
Engineer or Engineer's Representative (AECOM Asia Co. Ltd.)	Chief Resident Engineer	Mr. Michael Tovey	3985 7470	3902 8800
Environmental Project Office /	Environmental Project Office Leader	Mr. Y. H. Hui	3547 2133	3465 2899
Independent Environmental Checker	Independent Environmental Checker (IEC)	Mr. Raymond Dai	3465 2888	3465 2899
(Ramboll Environ Hong Kong Limited)	Environmental Site Supervisor	Mr. Ray Yan	5181 8165	3465 2899
Contractor (China Harbour	Site Agent	Mr. Paul Pui	9125 0700	2512 0427
Engineering Co. Ltd)	Environmental Officer	Mr. Marko Chan	9427 2879	2512 0427
Environmental Team (MateriaLab Consultants Limited)	Environmental Team Leader (ETL)	Mr. Arthur Cheng	3565 4115	2450 8032
24-hr Complaint Hotline			5236 7111	

Table 1.2 Contact Information of Key Personnel (for Contract No. HY/2013/06 within Contract No. HY/2013/03 works area)

Party	Position	Contact Person	Telephone No.	Fax No.
Engineer or Engineer's Representative (AECOM Asia Co. Ltd.)	Chief Resident Engineer	Mr. Michael Tovey	3985 7470	3902 8800
Environmental Project Office /	Environmental Project Office Leader	Mr. Y. H. Hui	3547 2133	3465 2899
Independent Environmental Checker	Independent Environmental Checker (IEC)	Mr. Raymond Dai	3465 2888	3465 2899
(Ramboll Environ Hong Kong Limited)	Environmental Site Supervisor	Mr. Ray Yan	5181 8165	3465 2899
Contractor	Site Agent	Mr. Eric Yim	2565 3355	3162 5217
(ATAL Technologies Limited)	Environmental Officer	Mr. W. Li	2565 3137	3162 5217
Environmental Team (MateriaLab Consultants Limited)	Environmental Team Leader (ETL)	Mr. Arthur Cheng	3565 4115	2450 8032
24-hr Complaint Hotline			6509 0375	

1.3 Construction Programme

1.3.1 The construction programme for Contract No. HY/2013/03 (includes the construction works of HY/2013/06 within Contract No. HY/2013/03 works area) are provided in **Appendix C**.

1.4 Construction Works undertaken during the Reporting Period

1.4.1 A summary of the construction activities undertaken during this reporting period is shown below:

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Report No.: 0165/15/ED/0653

For Contract No. HY/2013/03

September 2016

- 1. Site Investigation at Portion G;
- 2. Piling at Portion C, STP, Area G (Bridge A1 A5, A7b, A8 & A9), Box Culvert B & C;
- 3. Building at Portion A1, B, G, STP & Pumping Stations;
- 4. CUE Construction at Portion B, C & J;
- 5. Drainage & Sewerage Work at Portion B, H1, H2, G & A1;
- 6. Radiation Screen Wall and Sign Gantry Footing at Portion B;
- 7. Sewerage Pumping Station, High Mast Lighting Foundation & Box Culvert C at Portion G;
- 8. Bridge Works at A1 to A6;
- 9. Site Foundation Works at Portion K;
- 10. Cover Walkway at Portion H1 & H2; and
- 11. Marine sediment excavation activities from the land-based works and corresponding disposal at the designated disposal sites within Hong Kong as allocated by the Marine Fill Committee.

October 2016

- 1. Site Investigation at Portion G & N;
- 2. Building at Portion A1, B, G, N, J, STP & Pumping Stations;
- 3. Piling at Portion C, STP, Area G (Bridge A1 & A9), Box Culvert B & C;
- 4. CUE Construction at Portion B, C & J;
- 5. Drainage & Sewerage Work at Portion B, H1, H2, J, P, G & A1;
- 6. Radiation Screen Wall and Sign Gantry Footing at Portion B;
- 7. Sewerage Pumping Station, High Mast Lighting Foundation & Box Culvert C at Portion G;
- 8. Bridge Works at A1 to A9;
- 9. Site Foundation Works at Portion K;
- 10. Cover Walkway at Portion H1 & H2;
- 11. Box Culvert D at Portion A1; Shuttle kiosk & Subway at Portion E; and
- 12. Marine sediment excavation activities from the land-based works and corresponding disposal at the designated disposal sites within Hong Kong as allocated by the Marine Fill Committee.

November 2016

- 1. Site Investigation at Portion G & N;
- 2. Building at Portion A1, B, G, N, J, STP & Pumping Stations;
- 3. Piling at Portion C, STP, Area G (Bridge A1 & A9), Box Culvert B & C;
- 4. CUE Construction at Portion B, C & J:
- 5. Drainage & Sewerage Work at Portion B, H1, H2, J, P, G & A1;
- 6. Radiation Screen Wall and Sign Gantry Footing at Portion B;
- 7. Sewerage Pumping Station, High Mast Lighting Foundation & Box Culvert C at Portion G;
- 8. Bridge Works at A1 to A9;
- 9. Site Foundation Works at Portion K;
- 10. Cover Walkway at Portion H1 & H2; and
- 11. Box Culvert D at Portion A1; Shuttle kiosk & Subway at Portion E.

For Contract No. HY/2013/06 within Contract No. HY/2013/03 works area

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Report No.: 0165/15/ED/0653

September 2016

1. Conduit duct laying at CUE Kiosk.

October 2016

1. Conduit duct laying at CUE Kiosk.

November 2016

1. Concealed Conduit works at CUE Vehicle Kiosk.

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Report No.: 0165/15/ED/0653

2. EM&A REQUIREMENTS

2.1 Summary of EM&A Requirements

- 2.1.1 The EM&A programme was undertaken in accordance with the Updated EM&A Manual for HKBCF (Version 1.0). It should be noted that the air quality and noise monitoring works for the Contract are covered by Contract No. HY/2010/02 "Hong Kong-Zhuhai-Macao Bridge HKBCF Reclamation Works" and Contract No. HY/2011/03 "Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road Section between Scenic Hill and HKBCF". The ET of the Contract or another ET of the HZMB project is required to conduct impact air quality monitoring at AMS6 and AMS7 and noise monitoring at NMS2 and NMS3B as part of EM&A programme if these monitoring stations are no longer covered under Contract Nos. HY/2010/02 and HY/2011/03. However, this is subject to ENPO's final decision on which ET should carry out the monitoring work at these stations.
- 2.1.2 A summary of air and noise monitoring locations are presented in **Table 2.1**. The location of air quality and noise monitoring stations are shown as in **Figure 1** and **Figure 2**, respectively.

Table 2.1 Air Quality and Noise Monitoring Locations

Environmental Monitoring	Identification No.	Location Description	
	AMS6(1)	Dragonair/CNAC (Group) Building (A80)	
Air Quality	AMS7(1)	Hong Kong SkyCity Marriott Hotel	
Noise	NMS2(2)	Seaview Crescent	
Noise	NMS3B(2) (3)	Site Boundary of Site Office Area at WA2	

Remarks:

2.2 Monitoring Requirements

2.2.1 The monitoring requirements, monitoring equipment, monitoring parameters, frequency and duration, monitoring methodology, monitoring schedule, meteorological information are detailed in the monthly EM&A Reports prepared for Contract Nos. HY/2010/02 and HY/2011/03.

2.3 Action and Limit Levels

2.3.1 The Action and Limit Levels for 1-hr TSP and 24-hr TSP are provided in **Table 2.2** and **Table 2.3** respectively.

Table 2.2 Action and Limit Levels for 1-hour TSP

Monitoring Station	Action Level (µg/m³)	Limit Level (µg/m³)
AMS6	360	500
AMS7	370	500

Table 2.3 Action and Limit Levels for 24-hour TSP

Monitoring Station	Action Level (µg/m³)	Limit Level (µg/m³)	
AMS6	173	260	
AMS7	183	260	

⁽¹⁾ The ET of this Contract should conduct impact air quality monitoring at the AMS listed in the table as part of EM&A programme according to latest notification from ENPO when the monitoring station(s) is/are no longer covered by another ET of the HZMB project.

⁽²⁾ The ET of this Contract should conduct impact noise monitoring at the NMS listed in the table as part of EM&A programme according to the latest notification from ENPO when the monitoring station(s) is/are no longer covered by another ET of the HZMB project.

⁽³⁾ The Action and Limit Levels for schools will be applied for this alternative monitoring location.

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Report No.: 0165/15/ED/0653

If exceedance(s) at these stations is/are recorded by the ET of the Contract or referred by the other ET under the HZMB project to the Contract, the ET of the Contract will carry out an investigation and findings will be reported in the quarterly EM&A Report.

The Action and Limit Levels for construction noise are defined in Table 2.4. 2.3.3

Table 2.4 Action and Limit Level for Construction Noise

Monitoring Station	Action Level	Limit Level		
For the Time Period 0700-1900 hrs. on Normal Weekdays				
NMS2	When one documented	75.0 dB (A) Leq (30 min.)		
NMS3B	complaint is received	70.0 dB (A) Leq (30 min.)*		

Notes:

If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.

If exceedance(s) at these stations is/are recorded by the ET of the Contract or referred by the other ET under the HZMB project to the Contract, the ET of the Contract will carry out an investigation and findings will be reported in the quarterly EM&A Report.

Event and Action Plans 2.4

The event and action plans for air quality and noise are provided in **Appendix D**. 2.4.1

2.5 **Mitigation Measures**

2.5.1 Environmental mitigation measures for the contract were recommended in the approved EIA Report. Appendix E lists the recommended mitigation measures and the implementation status.

^{*} Reduce to 70 dB(A) for schools and 65 dB(A) during school examination period.

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Report No.: 0165/15/ED/0653

3. ENVIRONMENTAL MONITORING AND AUDIT

: (852)-24508238

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: mcl@fuaro.com

3.1 Air Quality Monitoring Results

- 3.1.1 The monitoring results for AMS6 and AMS7 are reported in the monthly EM&A Reports (for September 2016, October 2016 and November 2016) prepared for Contract Nos. HY/2011/03 and HY/2010/02 respectively.
- 3.1.2 Summary of Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level at AMS6 is reported in the monthly EM&A Reports (for September 2016, October 2016 and November 2016) prepared by Contract No. HY/2011/03.
- 3.1.3 There was no Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level recorded at station AMS7 by the Environmental Team of Contract No. HY/2010/02 during the reporting period.

3.2 Noise Monitoring Results

- 3.2.1 The monitoring results for NMS2 and NMS3B are reported in the monthly EM&A Reports (for September 2016, October 2016 and November 2016) prepared for Contract No. HY/2010/02.
- 3.2.2 No noise exceedances were recorded at stations NMS2 and NMS3B by the ET of Contract No. HY/2010/02 during the reporting period.

3.3 Water Quality Monitoring Results

- 3.3.1 There was no marine works conducted during the reporting period and therefore, no relevant monitoring result is reported. However, ET of the Contract shall closely monitor on the status of marine works, which shall conduct monitoring when marine works commence in the future.
- 3.3.2 The ET of the Contract is required to conduct impact water quality monitoring as part of EM&A programme if water quality monitoring is no longer covered by another ET of the HZMB project. The ETL shall review and obtain IEC, ENPO and EPD agreement on the contract specific water quality monitoring works at least a month before the commencement of any marine works.

3.4 Ecology Monitoring Results

- 3.4.1 There was no marine works conducted, which impacted to the ecology during the reporting period and therefore, no relevant monitoring result is reported. However, ET of the Contract shall closely monitor on the status of marine works, which shall conduct monitoring when marine works commence in the future.
- 3.4.2 The ET of the Contract is required to conduct ecology monitoring as part of EM&A programme if ecology monitoring is no longer covered by another ET of the HZMB project. The ETL shall review and obtain IEC, ENPO, AFCD and EPD agreement on the contract specific marine ecology monitoring works at least a month before the commencement of any marine works.

3.5 Implementation of Environmental Measures

3.5.1 In response to the site audit findings, the Contractor carried out corrective actions. Details of site audit findings and the corrective actions during the reporting period are presented in **Appendix F**.

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Report No.: 0165/15/ED/0653

- 3.5.2 A summary of the Implementation Schedule of Environmental Mitigation Measures (EMIS) is presented in Appendix E. All necessary mitigation measures at this stage of works were implemented properly.
- Implementation status of Regular Marine Travel Route Plan (RMTRP) was checked by ET. 3.5.3 Training of marine travel route for marine vessels operator was given to relevant staff and relevant records were kept properly. Marine traffic records which indicated the number of trips data for pelican barge, hopper barge, tug boat and floating concrete batching plant on the implementation of RMTRP from September 2016 to November 2016 were checked by ET. Marine traffic records of September 2016, October 2016 and November 2016 were provided by Contractor to ER, IEC/ENPO for checking within the month of October 2016, November 2016 and December 2016 respectively. The implementation of marine traffic follows the Regular Marine Travel Route Plan with respect to ET's checking on the marine traffic records for the reporting period.
- With respect to condition 3.26A of EP-353/2009/K approved by EPD on 11 April 2016, the 3.5.4 numbers and operating periods of floating grout production facilities and floating concrete batching plants on-site to review on the compliance to this EP condition were checked. Under Contract No. HY/2013/03, one floating concrete batching plant was operated on-site during the reporting period.

3.6 Advice on the Solid and Liquid Waste Management Status

- 3.6.1 The Contractor of Contract No. HY/2013/03 registered as a chemical waste producer for the Contract. Sufficient numbers of receptacles were available for general refuse collection and sorting.
- 3.6.2 No extracted marine sediment was treated using cement solidification/stabilisation (Cement S/S) techniques under Contract No. HY/2013/03 during this reporting period. The marine sediment extracted from this Contract was disposed to the Marine Fill Committee (MFC) allocated disposal sites directly without treatment during this reporting period. As a practical means, the disposal operation is managed by one contractor who is also responsible for applying dumping permit and its subsequent extension applications from EPD. Contract No. HY/2013/03 has been assigned to coordinate and arrange for disposal of extracted marine sediment from all three Contracts (Contract Nos. HY/2013/02, HY/2013/03 and HY/2013/04).
- The barge for disposal of marine sediment was morn at the temporary loading and unloading at the east shore of the HKBCF Island, which has been being used by reclamation contractor (Contract No. HY/2010/02) for reclamation activities. In terms of safety consideration and to avoid mixing of sediment between contracts, each dumping date was allocated to one Contract. The quantity of marine sediment disposed on each date was from one Contract.
- 3.6.4 During dumping, Contractor of Contract No. HY/2013/03 is responsible for transporting the marine sediment from the site area of Contract No. HY/2013/03 to the barge. The estimated quantity of marine sediment in each truck is confirmed by Resident Site Staff of Contract Nos. HY/2013/02, HY/2013/03 and HY/2013/04. The trip tickets for transportation and disposal of marine sediment are collected and checked. Contract No. HY/2013/03 as the dumping permit holder is responsible for reporting to EPD the quantity disposed of as the condition stipulated in the dumping permit. The disposal site allocated to this Project is the Mud Pit CMP Vd of the Confined Marine Sediment Disposal Facility to the East of Sha Chau (ESC) during this reporting period.

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Report No.: 0165/15/ED/0653

3.6.5 Marine sediment extracted from bored piling from this Contract was disposed to allocated dumping site during this reporting period. The summary of marine sediment disposed during this reporting period is shown in the following table:

Table 3.1 Summary of Marine Sediment Disposed to Dumping Site

Month/Year	Quantity dispos	Quantity disposed (in'000m ³)			
	HY/2013/02	HY/2013/03	HY/2013/04	Total	
Sep 2016	2.328	6.816	3.888	13.032	
Oct 2016	1.096	2.376	5.286	8.758	
Nov 2016	0.000	0.000	0.000	0.000	
Total	3.424	9.192	9.174	21.790	

- The summary of waste flow table for Contract No. HY/2013/03 (includes Contract No. HY/2013/06 within Contract No. HY/2013/03 works area) is detailed in **Appendix G**.
- Contractor of Contract No. HY/2013/03's site arrangement for disposal of bentonite slurry to Tseung Kwan O Area 137 Fill Bank was checked by ET and formal consent has been obtained from Tseung Kwan O Area 137 Fill Bank for receiving used bentonite slurry generated from Contract No. HY/2013/03.

3.7 **Environmental Licences and Permits**

3.7.1 The valid environmental licences and permits for Contract No. HY/2013/03 (includes Contract No. HY/2013/06 within Contract No. HY/2013/03 works area) during the reporting period are summarized in Appendix H. The Contractor of Contract No. HY/2013/06 was advised to register as a chemical waste producer when chemical waste is expected to generate for the foreseeable future from the operations (For Registration as Waste Producer Pursuant to Waste Disposal (Chemical Waste) (General) Regulation).

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Report No.: 0165/15/ED/0653

4. SUMMARY OF EXCEEDANCES, COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTION

4.1 Summary of Exceedance of the Environmental Quality Performance Limit

- 4.1.1 Summary of Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level at AMS6 is reported in the monthly EM&A Reports (for September 2016, October 2016 and November 2016) prepared by Contract No. HY/2011/03.
- 4.1.2 There was no Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level recorded at station AMS7 by the Environmental Team of Contract No. HY/2010/02 during the reporting period.
- 4.1.3 There was no Action and Limit Level exceedance for noise recorded at station NMS2 and station NMS3B by the Environmental Team of Contract No. HY/2010/02 during the reporting period.
- 4.1.4 There was no marine works conducted during the reporting period and therefore, no relevant monitoring result is reported.
- 4.1.5 There was no marine works conducted during the reporting period and therefore, no ecology monitoring result is reported.

4.2 Summary of Complaints, Notification of Summons and Successful Prosecution

4.2.1 There were two complaints received in relation to the environmental impact during the reporting period. The summary of environmental complaints is presented in **Table 4.1**. The details of cumulative statistics of Environmental Complaints are provided in **Appendix I**.

Table 4.1 Summary of Environmental Complaints for the Reporting Period

Log No.	Environmental Complaint Ref. No.	Date of Complaint Receipt	Description
002	ENPO-C0100	22 September 2016	Water
003	ENPO-C0102	10 November 2016	Water

(a) 22 September 2016 (Log No. 002)

The complaint was received by EPD from a member of the public on 22 September 2016 complained about two site flat top barges came from Tuen Mun everyday and observed that whitish effluent discharged into the sea from 1800 to 0400 near Cell No. 54 to 55 of HZMB construction site which creates pollution during the reporting period. After investigation, it was concluded that the complaint was not related to the construction site activities of Contract No. HY/2013/03. Nevertheless, the contractor had been reminded to comply with the requirements stipulated in the Environmental Mitigation Implementation Schedule (EMIS) of the EM&A Manual, in particular:

Water Quality: W1 -

- 1. barges and hopper dredgers shall have tight fitting seals to their bottom openings to prevent leakage of material;
- any pipe leakages shall be repaired quickly. Plant should not be operated with leaking pipes;

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Report No.: 0165/15/ED/0653

- 3. loading of barges and hoppers shall be controlled to prevent splashing of dredged material to the surrounding water. Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation:
- 4. excess material shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved:
- 5. adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action:
- all vessels shall be sized such that adequate clearance is maintained between vessels and 6. the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; and
- 7. the works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site.
- (b) 10 November 2016 (Log No. 003)

The complaint was received by EPD from a member of the public on 09 November 2016 complained about water quality pollution was observed behind a barge on 07 November 2016 at 09:26 am from the footbridge near Tung Chung Pier. A barge travelled from Hong Kong Zhuhai Macao Bridge near Scenic Hill site boundary to Tung Chung Pier's front sea area, turbid water was observed behind a barge which creates water quality pollution during the reporting period. After investigation, it was concluded that the complaint was not related to the construction site activities of Contract No. HY/2013/03. Nevertheless, the contractor had been reminded to comply with the requirements stipulated in the Environmental Mitigation Implementation Schedule (EMIS) of the EM&A Manual, in particular:

Water Quality: W1 -

- 1. barges and hopper dredgers shall have tight fitting seals to their bottom openings to prevent leakage of material:
- 2. any pipe leakages shall be repaired quickly. Plant should not be operated with leaking
- 3. loading of barges and hoppers shall be controlled to prevent splashing of dredged material to the surrounding water. Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation;
- 4. excess material shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved:
- 5. adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action;
- all vessels shall be sized such that adequate clearance is maintained between vessels and 6. the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; and
- 7. the works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site.
- 4.2.2 No notification of summons or prosecutions was received during the reporting period.
- 4.2.3 Statistics on notifications of summons and successful prosecutions are summarized in Appendix I.

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Report No.: 0165/15/ED/0653

5. COMMENTS, RECOMMENDATIONS AND CONCLUSIONS

5.1 Comments

5.1.1 According to the environmental site inspections undertaken during the reporting period, the following recommendations were provided:

For Contract No. HY/2013/03

- CHEC was reminded to provide drip tray for chemicals at CUE & Box Culvert.
- CHEC was reminded to remove stagnant water on site.
- CHEC was reminded to ensure no oil leakage from the generator at Box Culvert.
- CHEC was reminded to clear the stagnant water accumulated at CUE works area.
- CHEC was reminded to clear the stagnant water accumulated at Building 037.
- CHEC was reminded to remove the general refuse accumulated at Building 037.
- CHEC was reminded to provide drip tray for chemical containers at Bridge A7 Area.
- CHEC was reminded to increase watering for dust suppression on site.
- CHEC was reminded to maintain good housekeeping on site (Building 041).
- CHEC was reminded to remove the stagnant water accumulated at the lifting holes of the precast concretes on site.
- CHEC was reminded to maintain proper housekeeping on site (CUE works area).
- CHEC was reminded to remove stagnant water on site (CUE works area).
- CHEC was reminded to properly maintain housekeeping on site (CUE).
- CHEC was reminded to properly maintain equipment (generator) on site (Box Culvert D).
- CHEC was reminded to maintain proper housekeeping on site (Building 043).
- CHEC was reminded to provide drip tray for chemical containers at CUE works area.
- CHEC was reminded to remove stagnant water accumulated at Building 037 and Bridge A7 area.
- CHEC was reminded to enhance watering for dusty operation at Bridge A7 area.

For Contract No. HY/2013/06 within Contract No. HY/2013/03 works area

- No recommendation.
- 5.1.2 A summary of the Implementation Schedule of Environmental Mitigation Measures (EMIS) is presented in **Appendix E**. All necessary mitigation measures at this stage of works were implemented properly.

5.2 Recommendations

- 5.2.1 With implementation of the recommended environmental mitigation measures, the contract's environmental impacts were considered environmentally acceptable. The weekly environmental site inspections ensured that all the environmental mitigation measures recommended were effectively implemented.
- 5.2.2 The recommended environmental mitigation measures, as included in the EM&A programme, effectively minimize the potential environmental impacts from the contract. Also, the EM&A programme effectively monitored the environmental impacts from the construction activities and ensure the proper implementation of mitigation measures. No particular recommendation was advised for the improvement of the programme.

5.3 Conclusions

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Report No.: 0165/15/ED/0653

- 5.3.1 Commencement of Contract No. HY/2013/03 took place on 10 April 2015 and the construction works of Contract No. HY/2013/03 commenced on 29 August 2015 (commencement of Contract No. HY/2013/06 took place on 14 August 2015 and the construction works of Contract No. HY/2013/06 commenced on 13 September 2016 within Contract No. HY/2013/03 works area). This is the 5th Quarterly EM&A Report summarising the findings of EM&A activities conducted under Contract No. HY/2013/03 from 01 September 2016 to 30 November 2016 (includes the findings of EM&A activities conducted under Contract No. HY/2013/03 works area from 13 September 2016 to 30 November 2016).
- 5.3.2 Summary of Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level at AMS6 shall be referred to the monthly EM&A Reports (for September 2016, October 2016 and November 2016) prepared by Contract No. HY/2011/03.
- 5.3.3 There was no Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level recorded at station AMS7 by the Environmental Team of Contract No. HY/2010/02 during the reporting period.
- 5.3.4 There was no Action and Limit Level exceedance for noise recorded at station NMS2 and station NMS3B by the Environmental Team of Contract No. HY/2010/02 during the reporting period.
- 5.3.5 There was no marine works conducted during the reporting period and therefore, no water quality impact monitoring result is reported.
- 5.3.6 There was no marine works conducted during the reporting period and therefore, no ecology monitoring result is reported.
- 5.3.7 Environmental site inspection was carried out on 01, 08, 15, 22 and 28 September 2016 (15, 22 and 28 September 2016 includes Contract No. HY/2013/06 within Contract No. HY/2013/03 works area), 06, 13, 27 and 28 October 2016 (site inspection of 21 October 2016 was cancelled due to hoisting of typhoon signal no. 8 on 21 October 2016 and re-scheduled to 28 October 2016), and 03, 10, 17 and 25 November 2016. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site inspections.
- 5.3.8 There were two complaints received in relation to the environmental impact during the reporting period. After investigation, it was found that these two complaints were not related to the Contract.
- 5.3.9 There were no notifications of summons or prosecutions received during the reporting period.

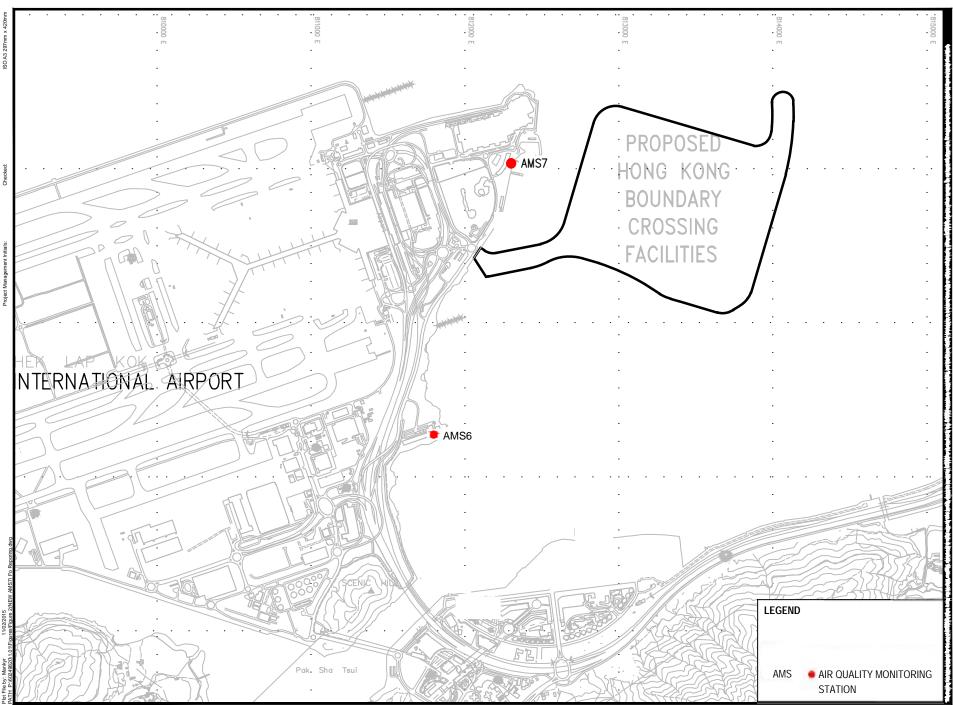
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Report No.: 0165/15/ED/0653

Figure 1

Air Quality Monitoring Stations



AIR QUALITY AND NOISE MONITORING STATIONS FOR HKBCF

HONG KONG - ZHUHAI - MACAO BRIDGE HONG KONG BOUNDARY CROSSING FACILITIES - RECLAMATION WORKS

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Report No.: 0165/15/ED/0653

Figure 2

Noise Monitoring Stations

AIR QUALITY AND NOISE MONITORING STATIONS FOR HKBCF

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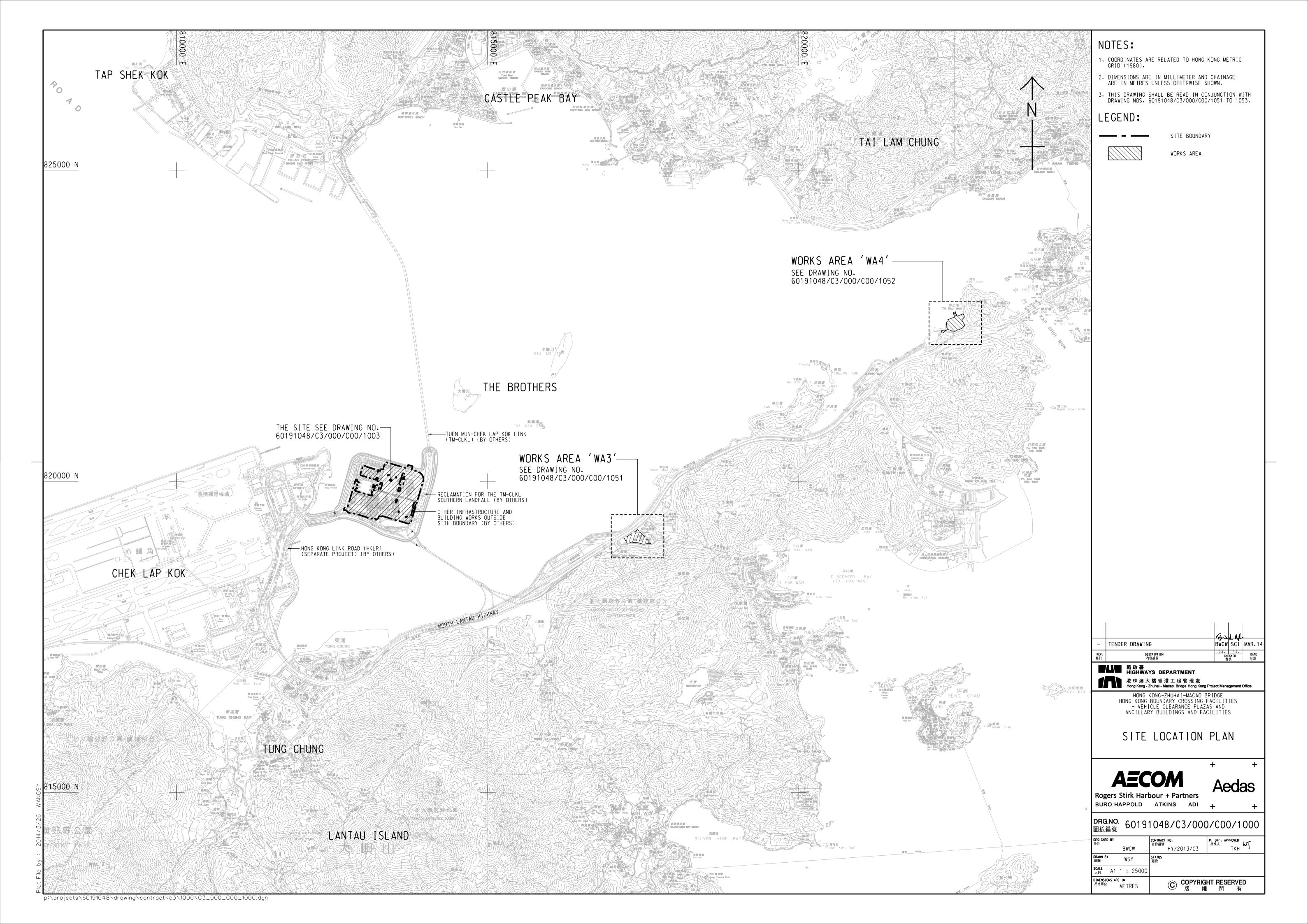
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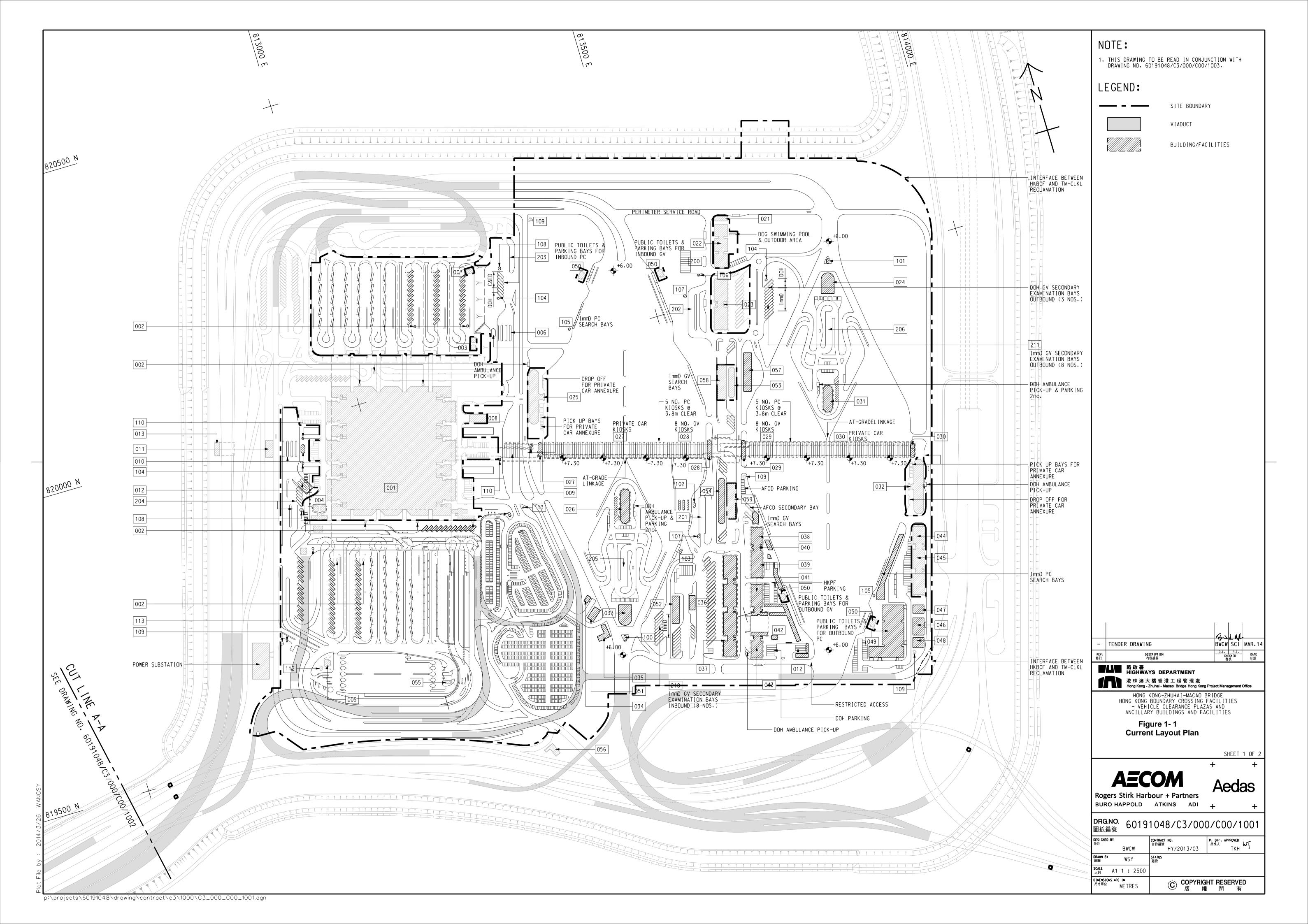


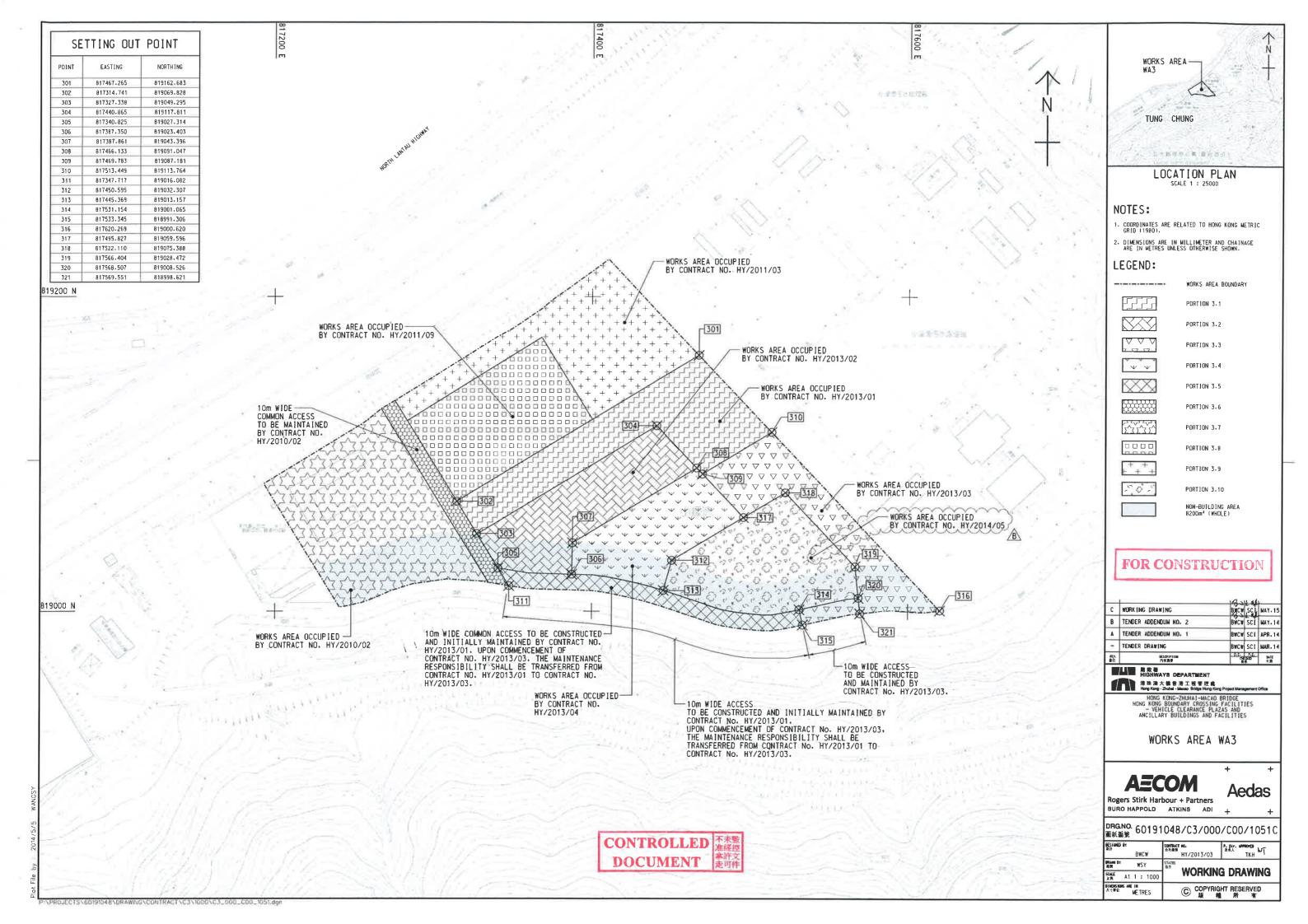
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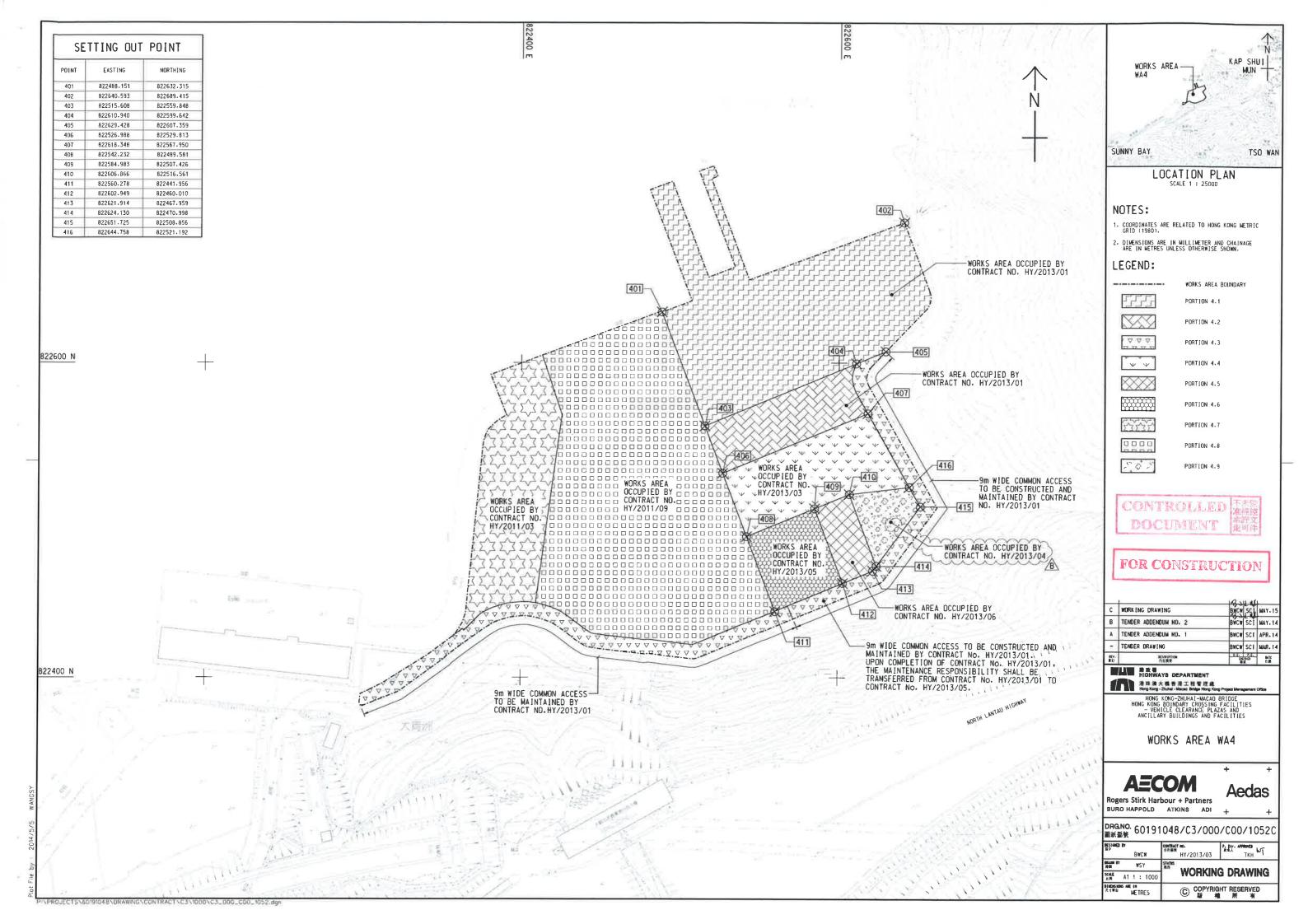
Appendix A

Location of Works Areas









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Report No.: 0165/15/ED/0653

Appendix B

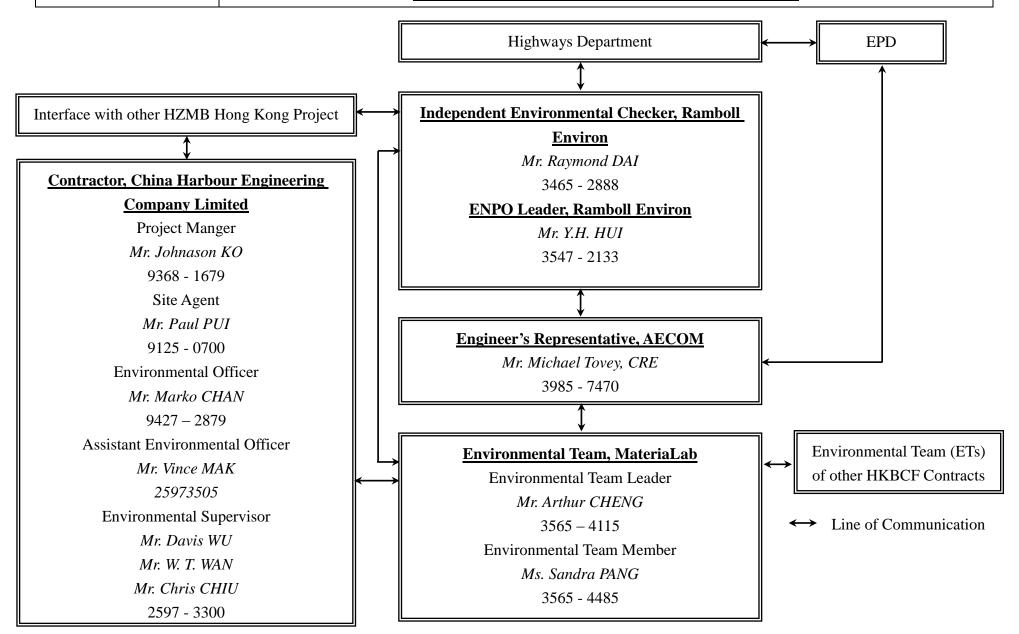
Project Organization for Environmental Works

CHINA HARBOUR ENGINEERING COMPANY LIMITED



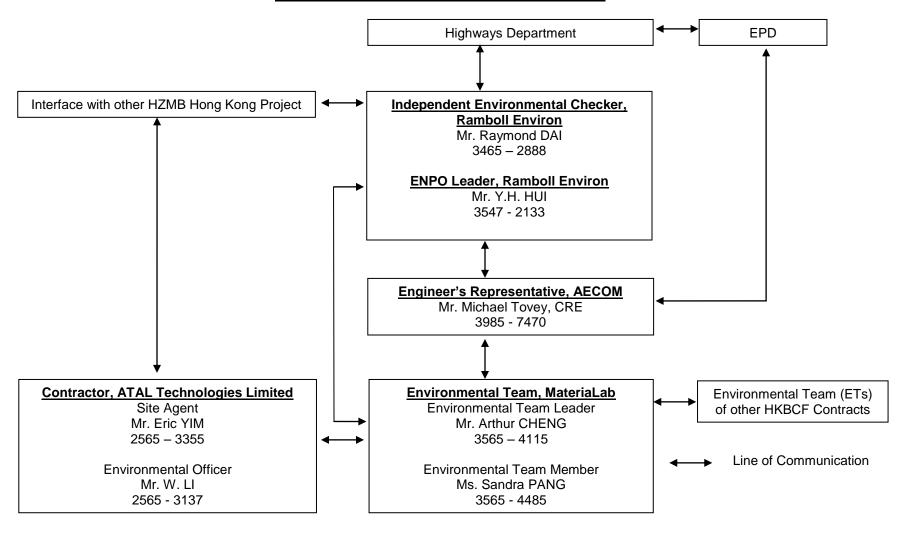
Contract No. HY/2013/03 Hong Kong-Zhuhai-Macao Bridge, Hong Kong Boundary Crossing Facilities – Vehicle Clearance Plazas and Ancillary Buildings and Facilities

Projects Organization for Environmental Works



Contract No. HY/2013/06 (within Contract No. HY/2013/03 works area) Hong Kong-Zhuhai-Macao Bridge, Hong Kong Boundary Crossing Facilities – Automatic Vehicle Clearance Support System

Projects Organization for Environmental Works



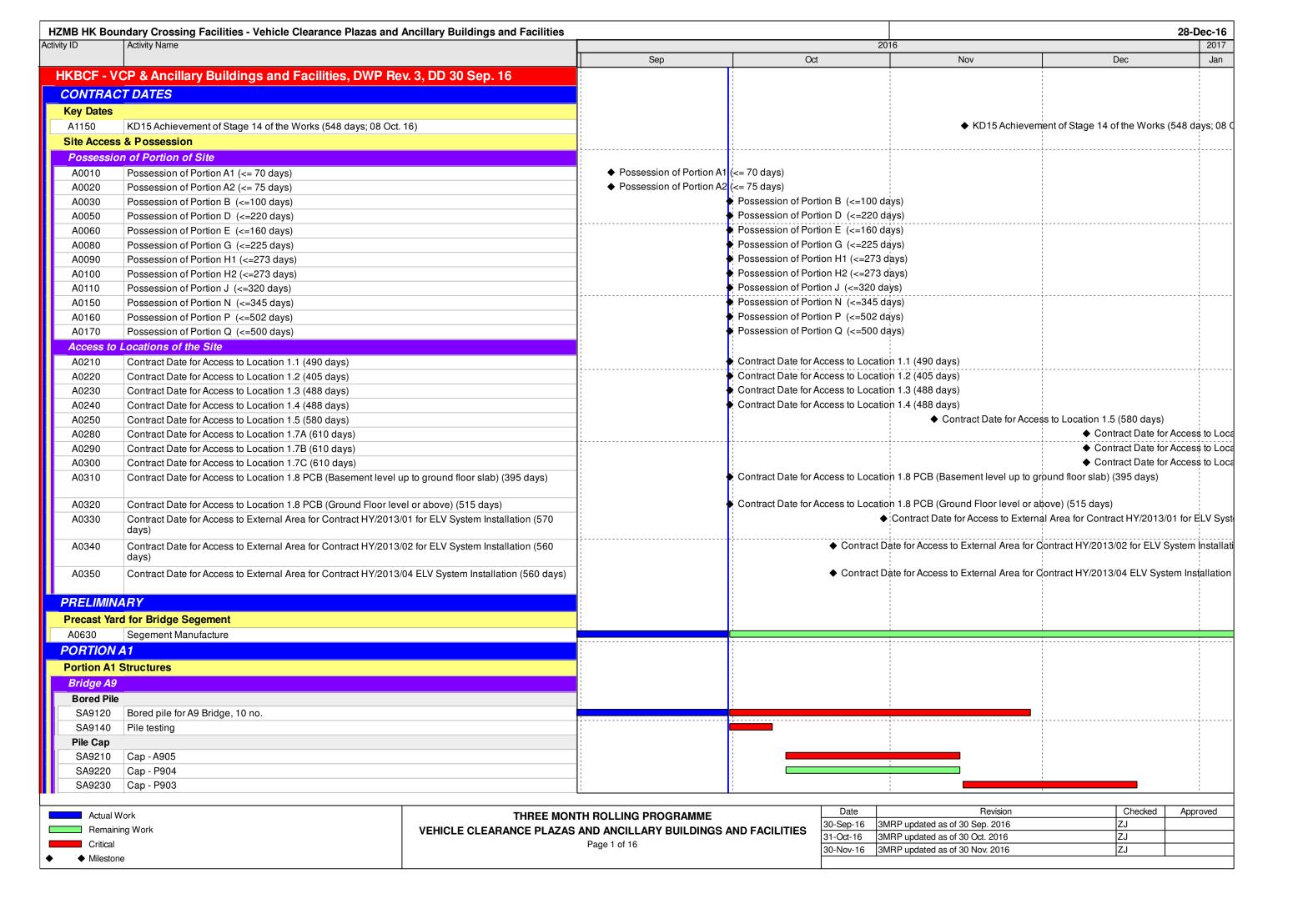
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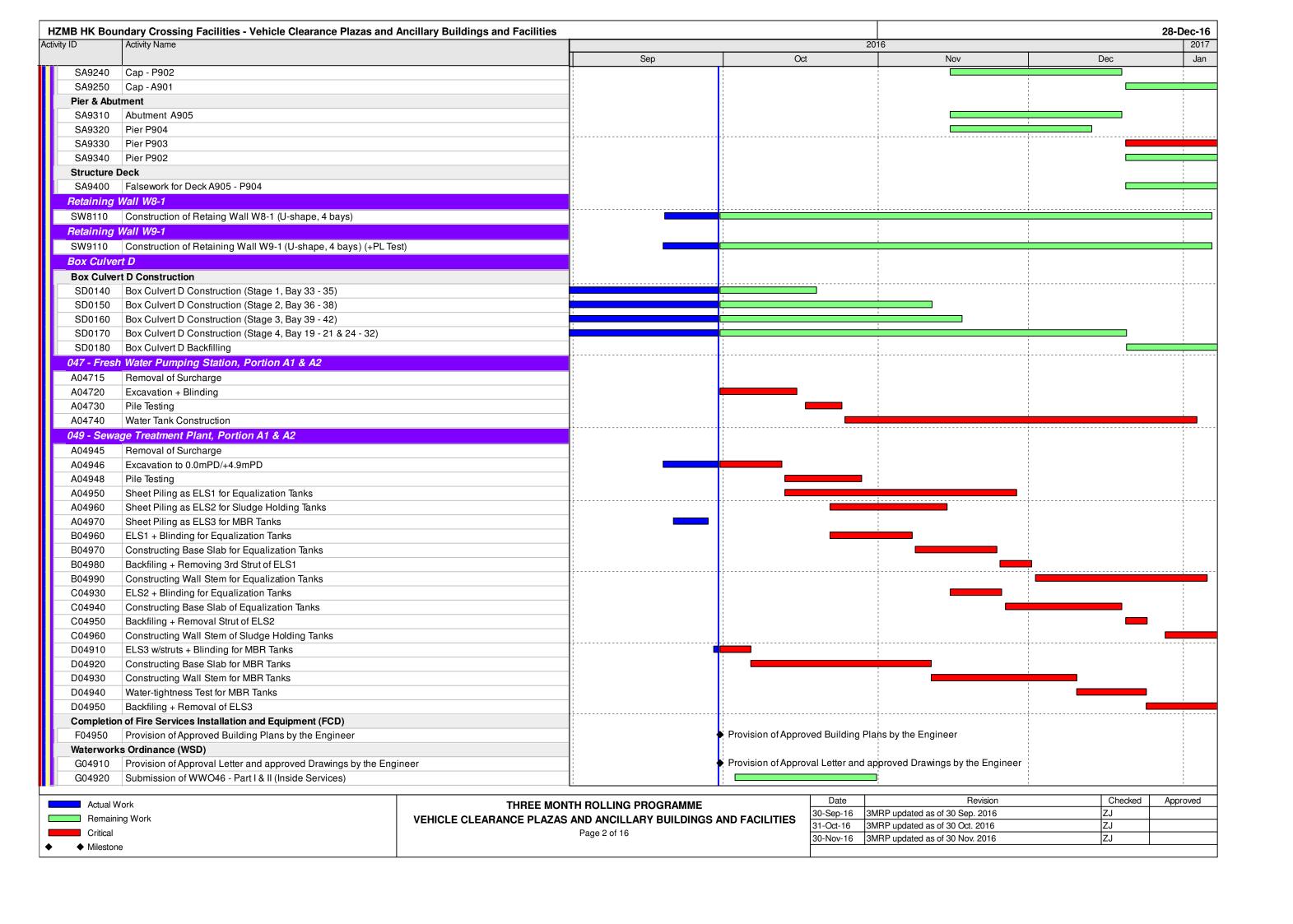


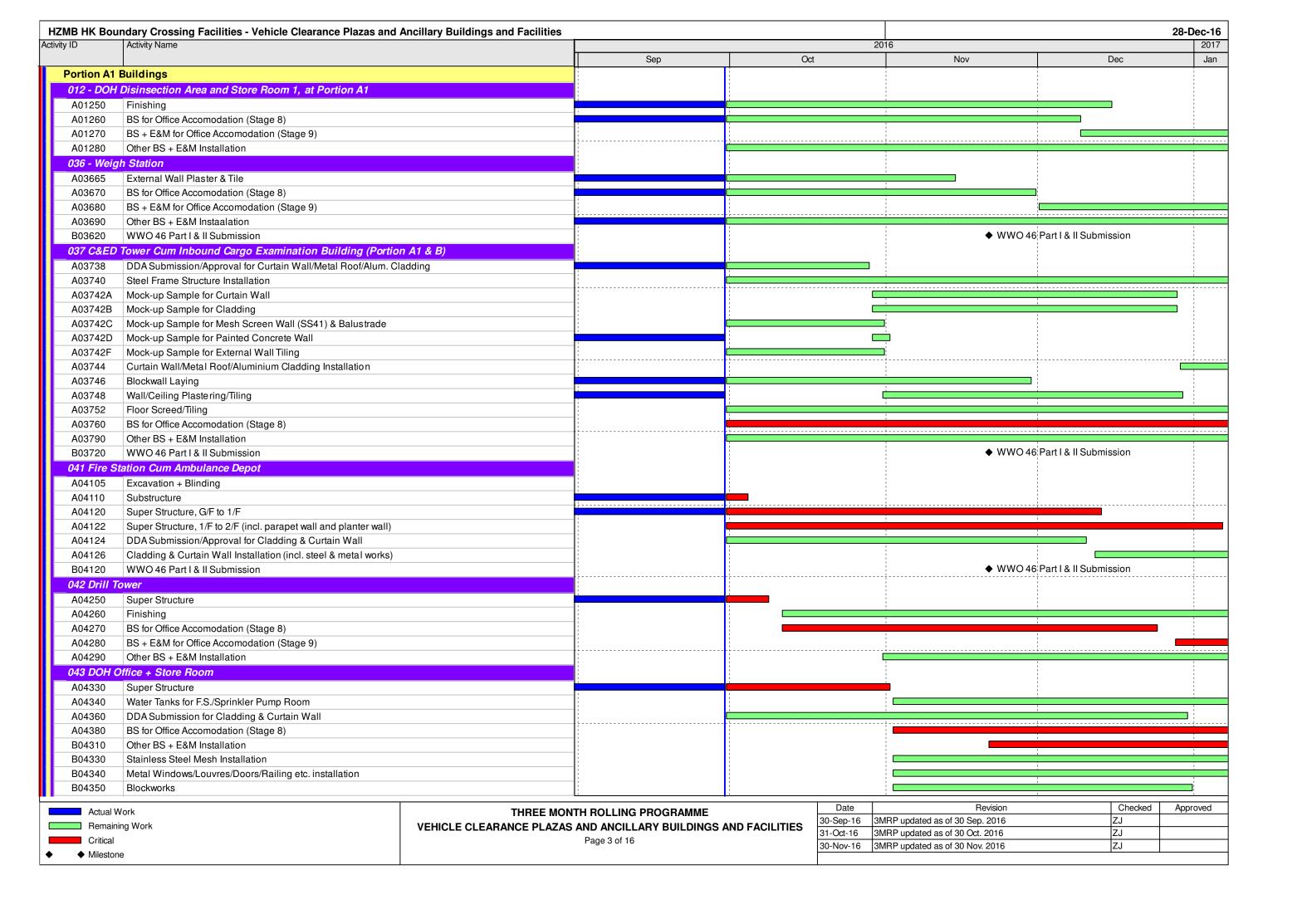
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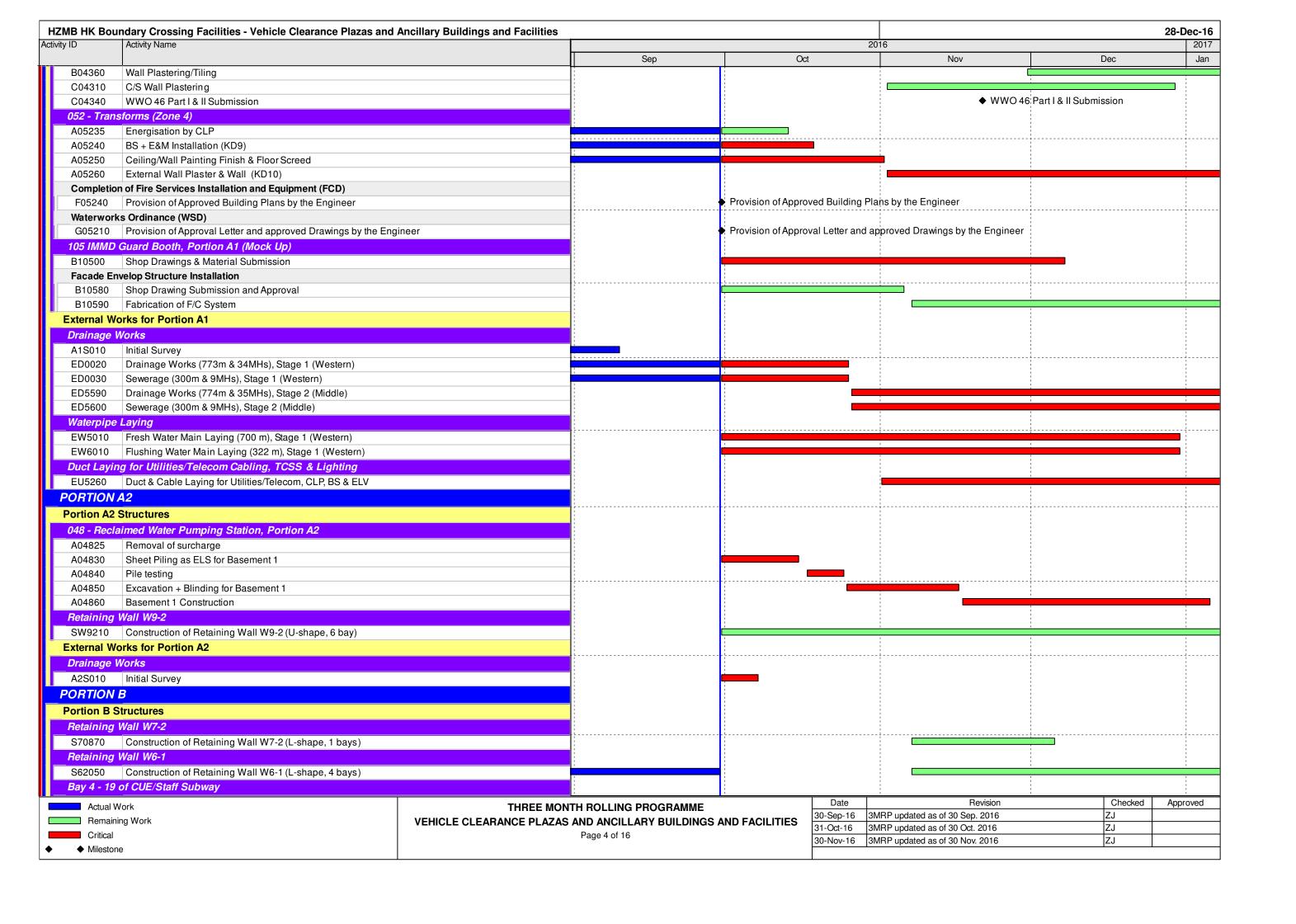
Appendix C

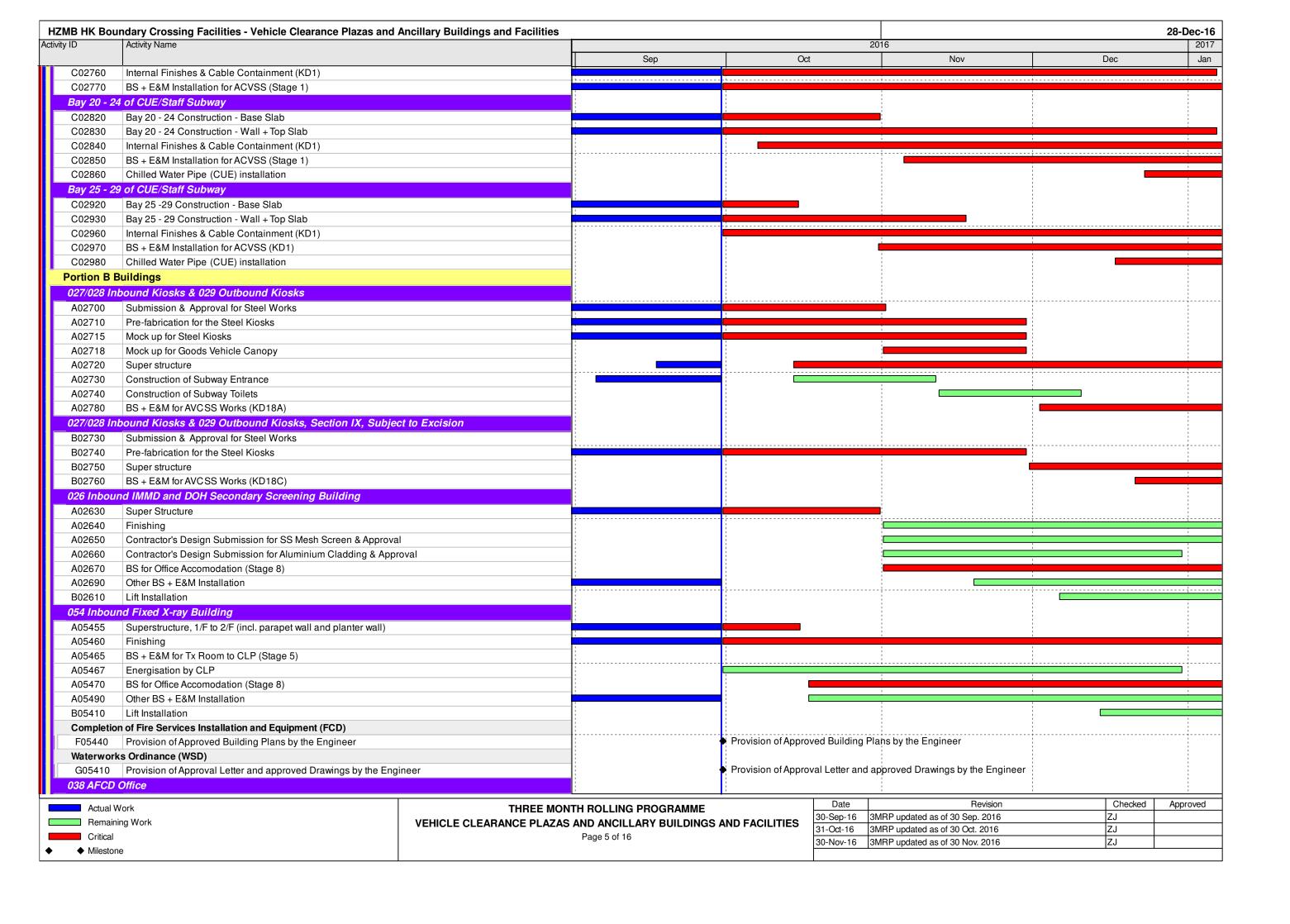
Construction Programme

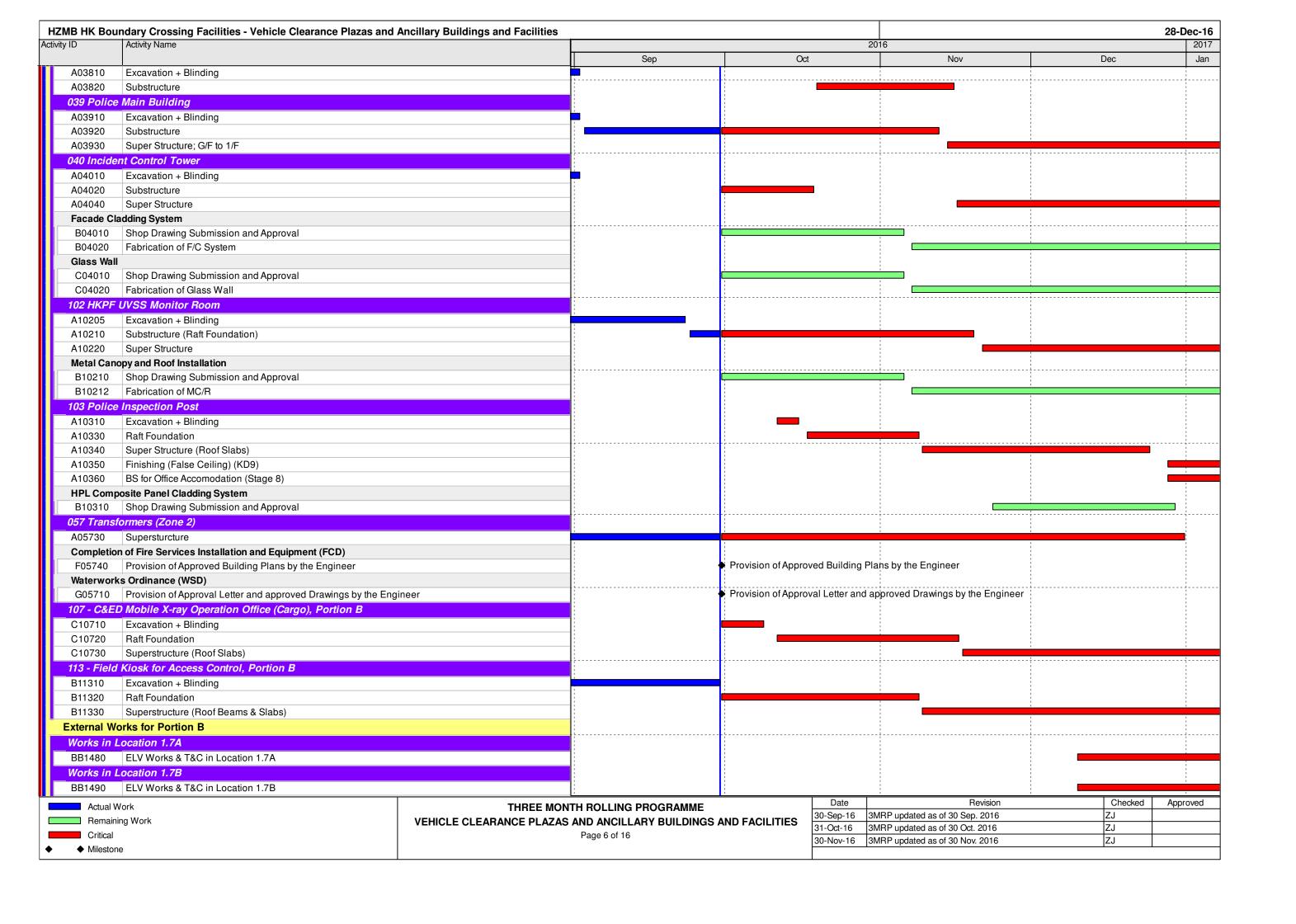


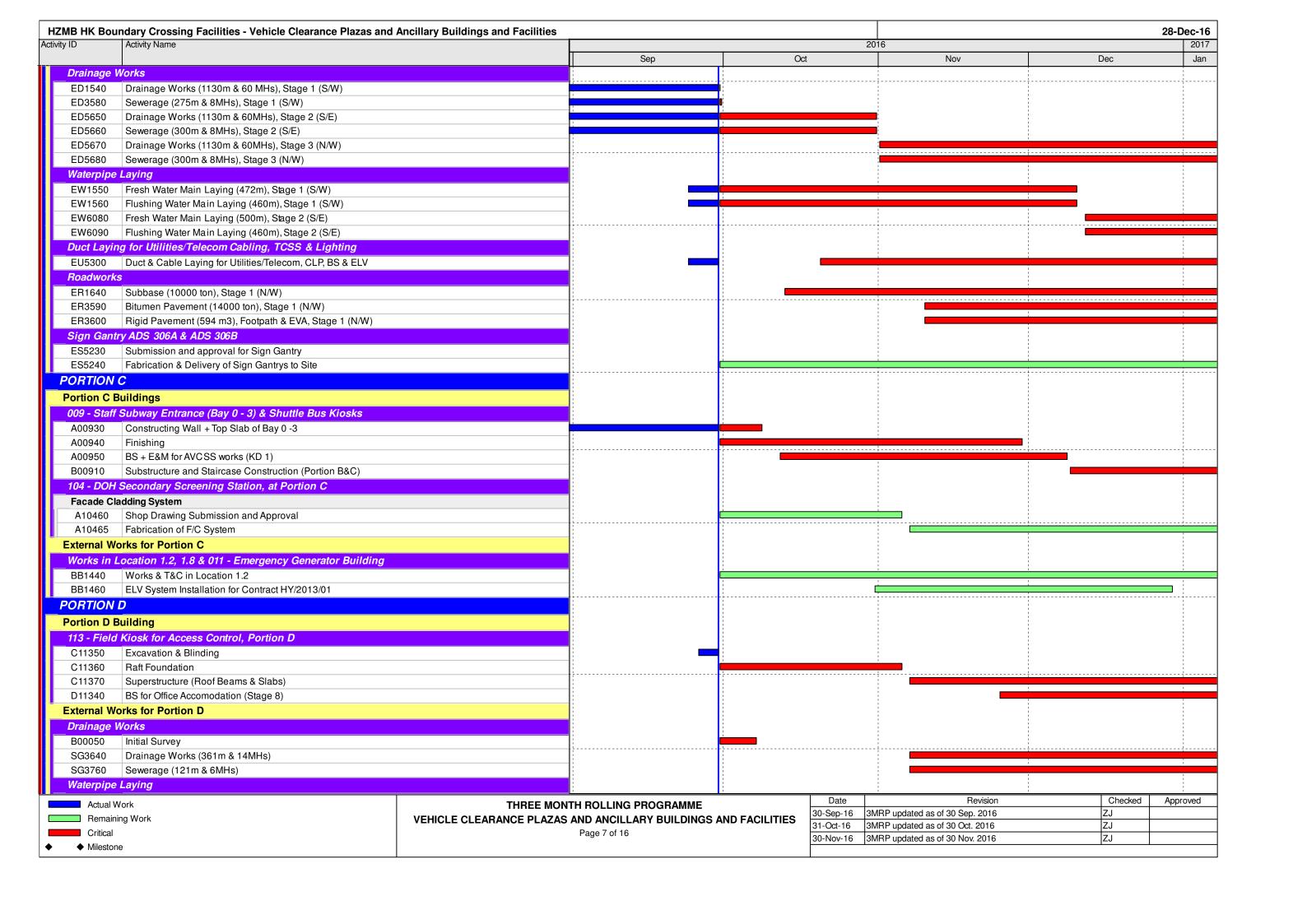


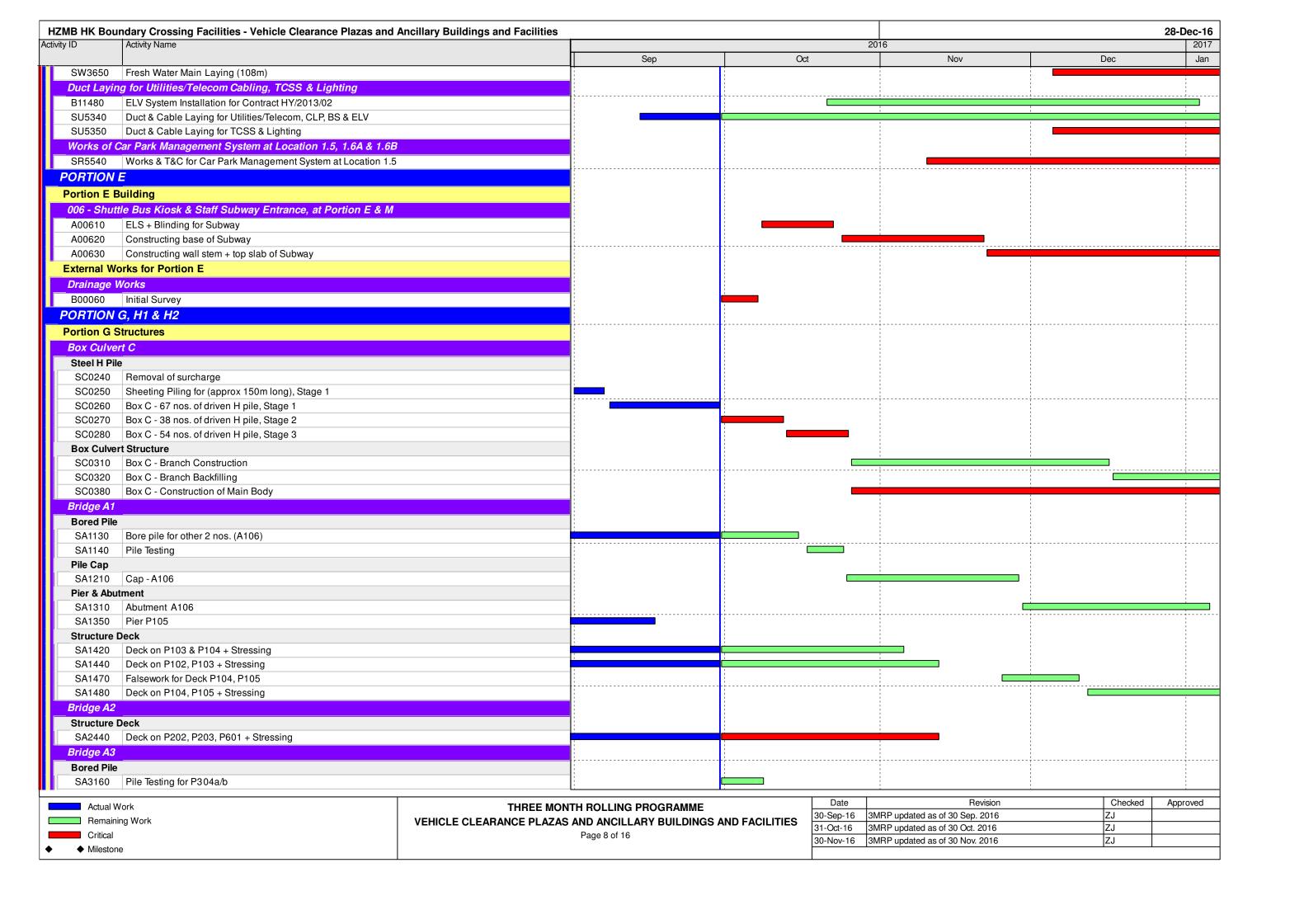


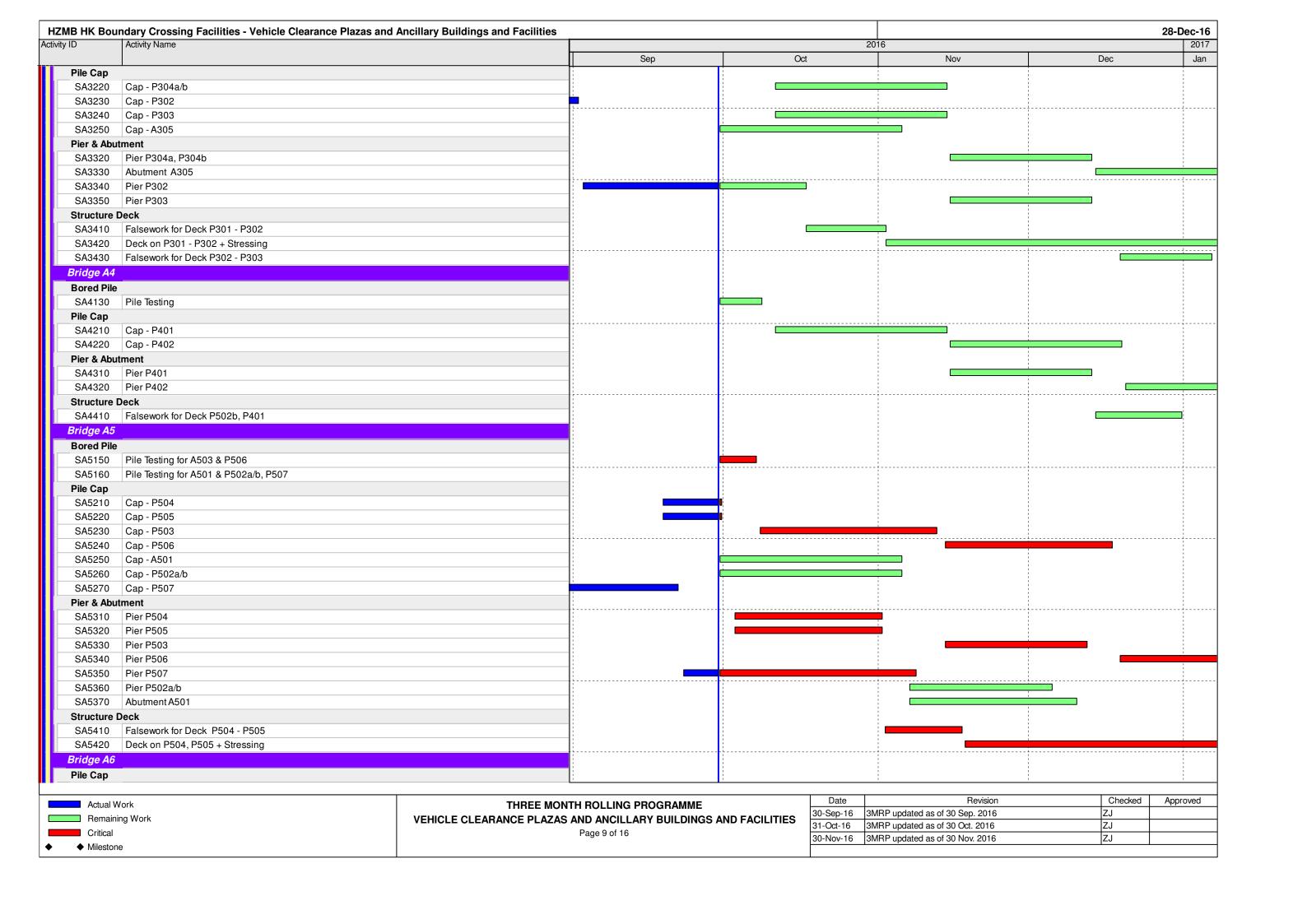


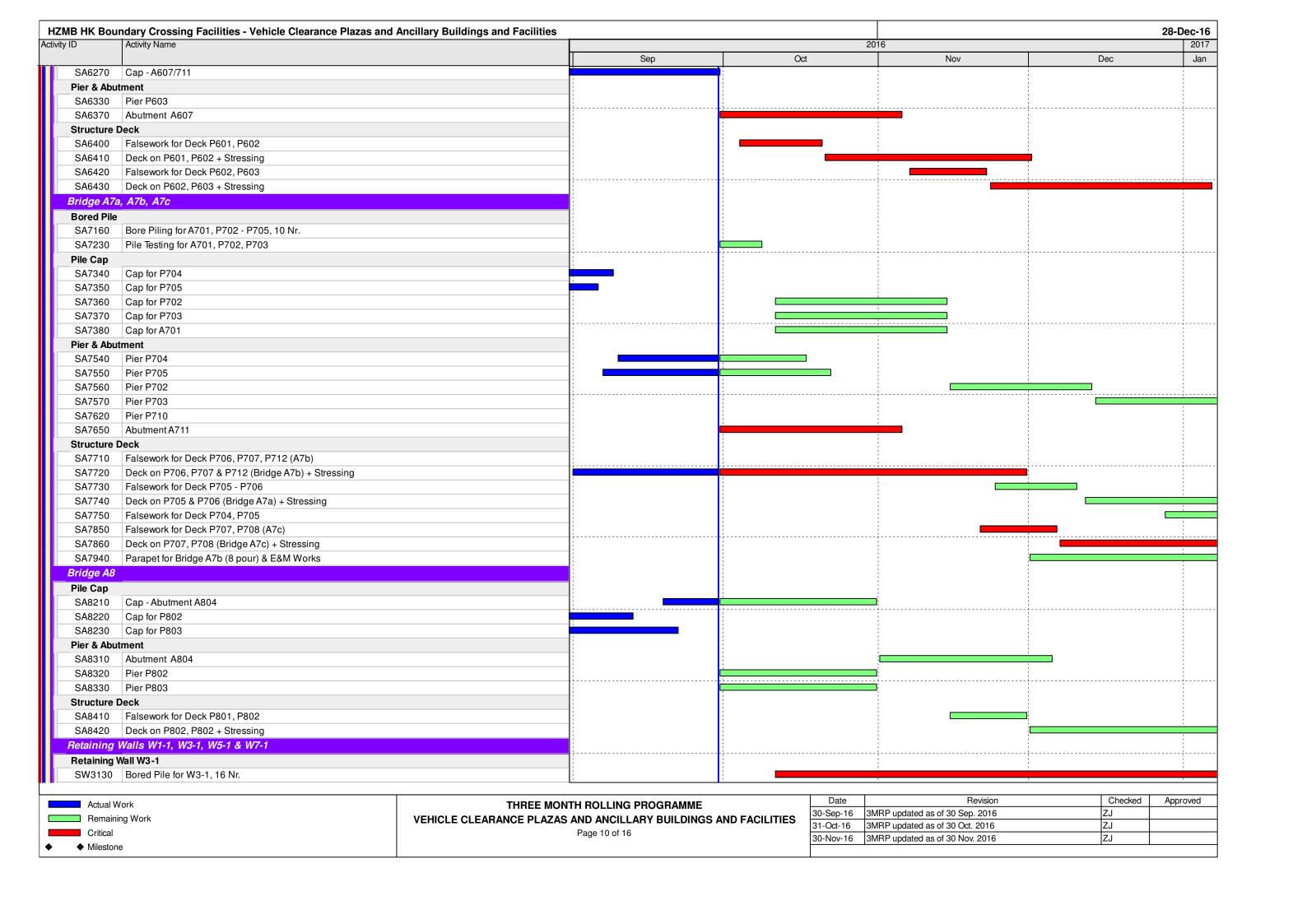


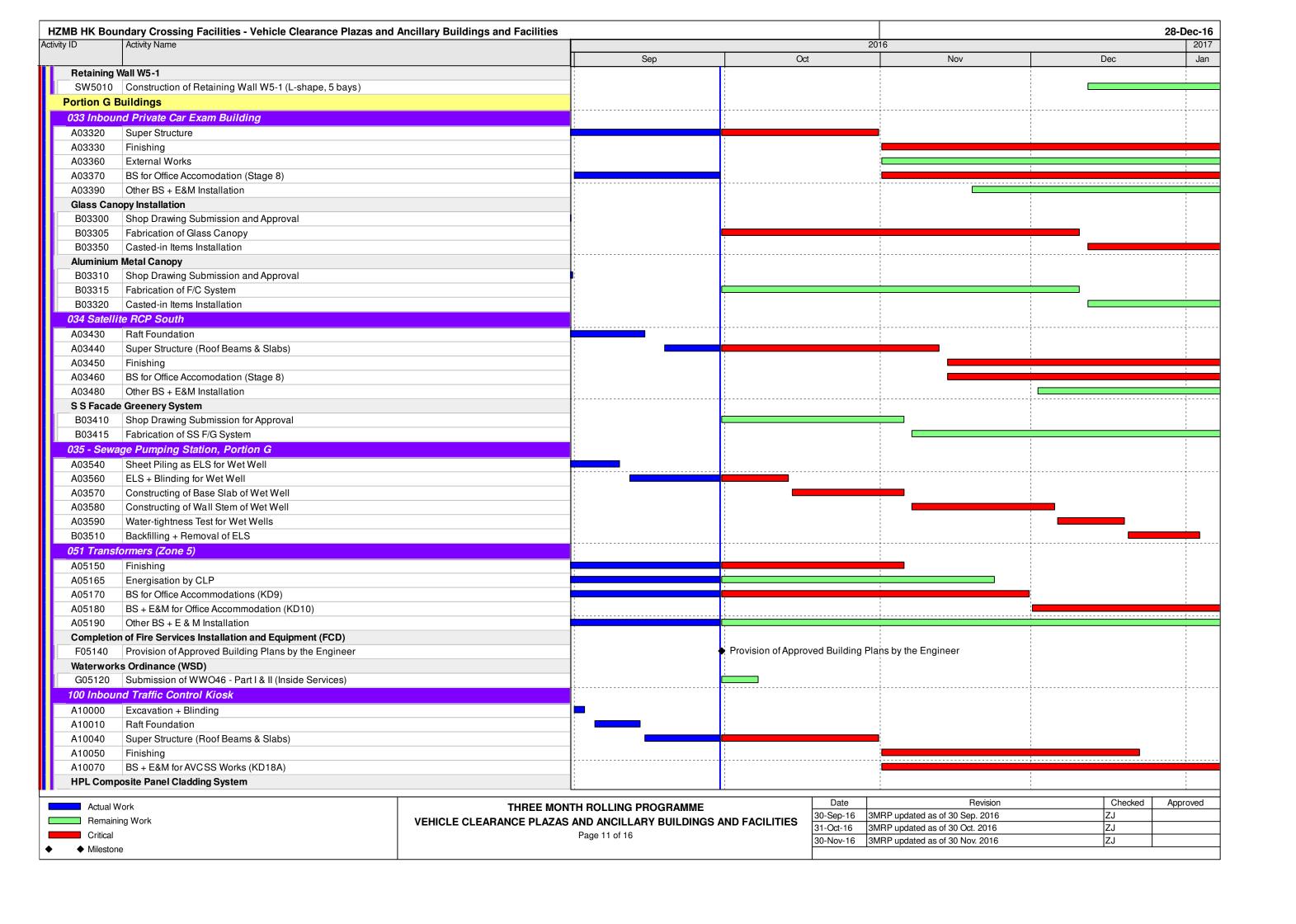


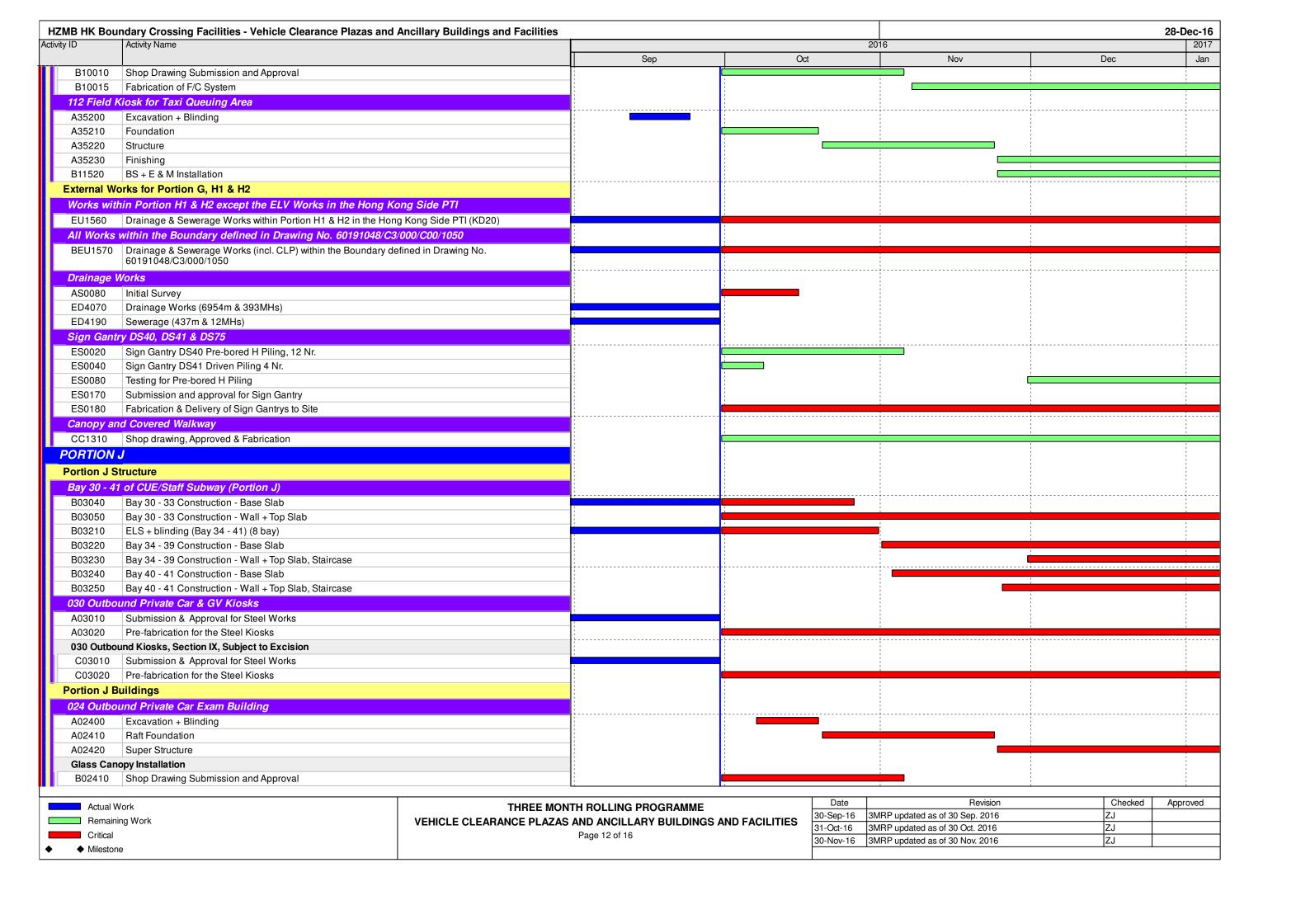


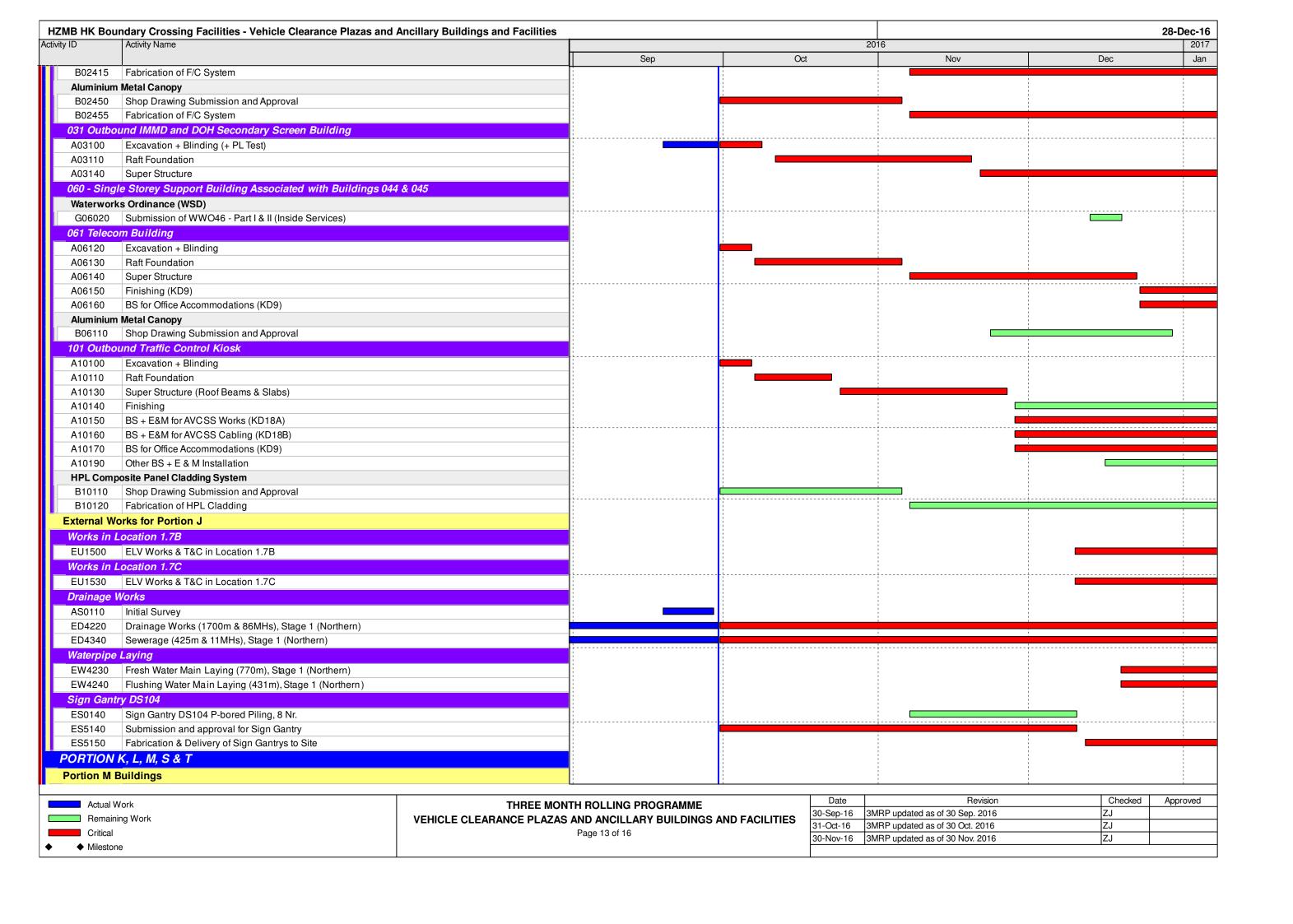


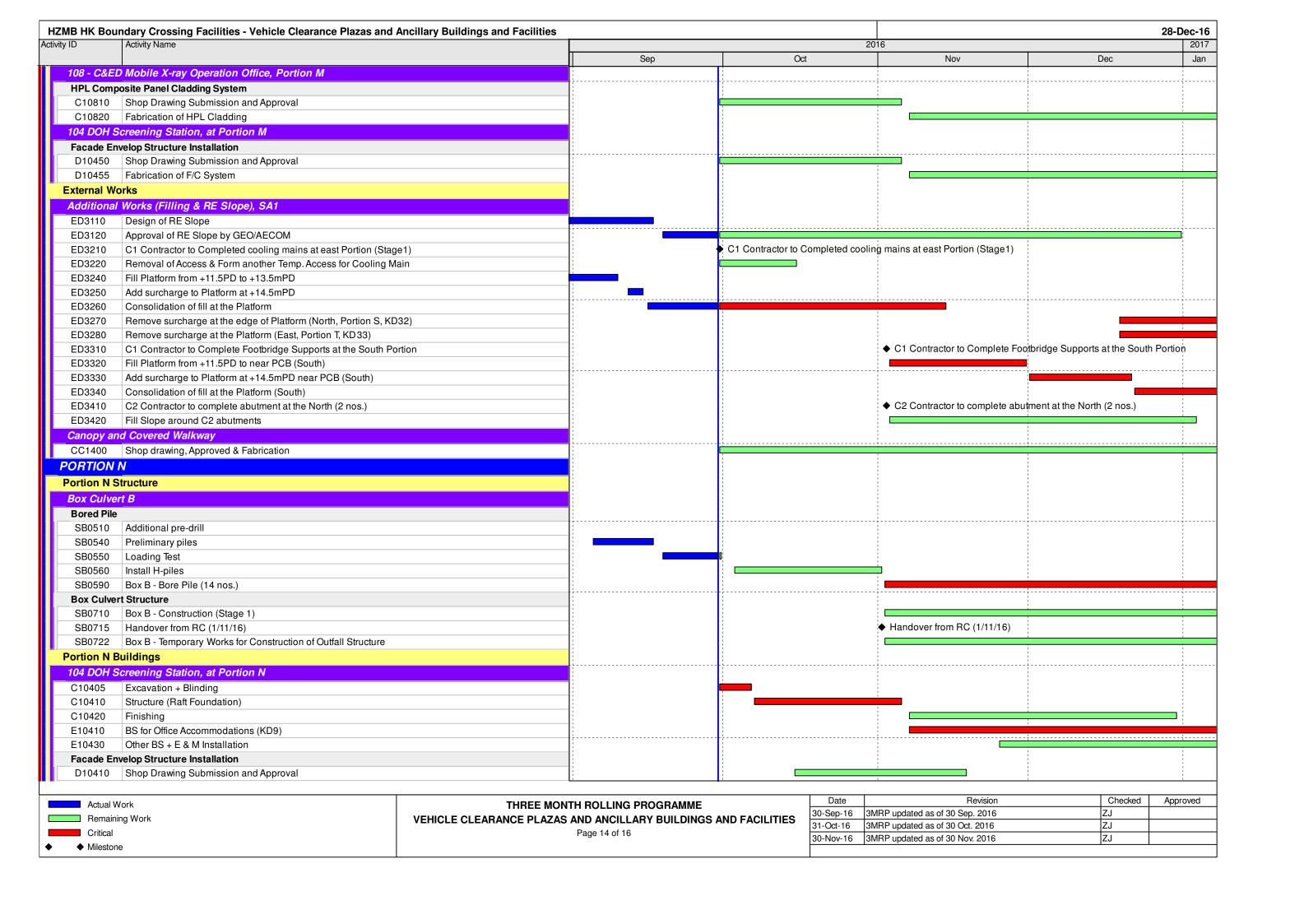


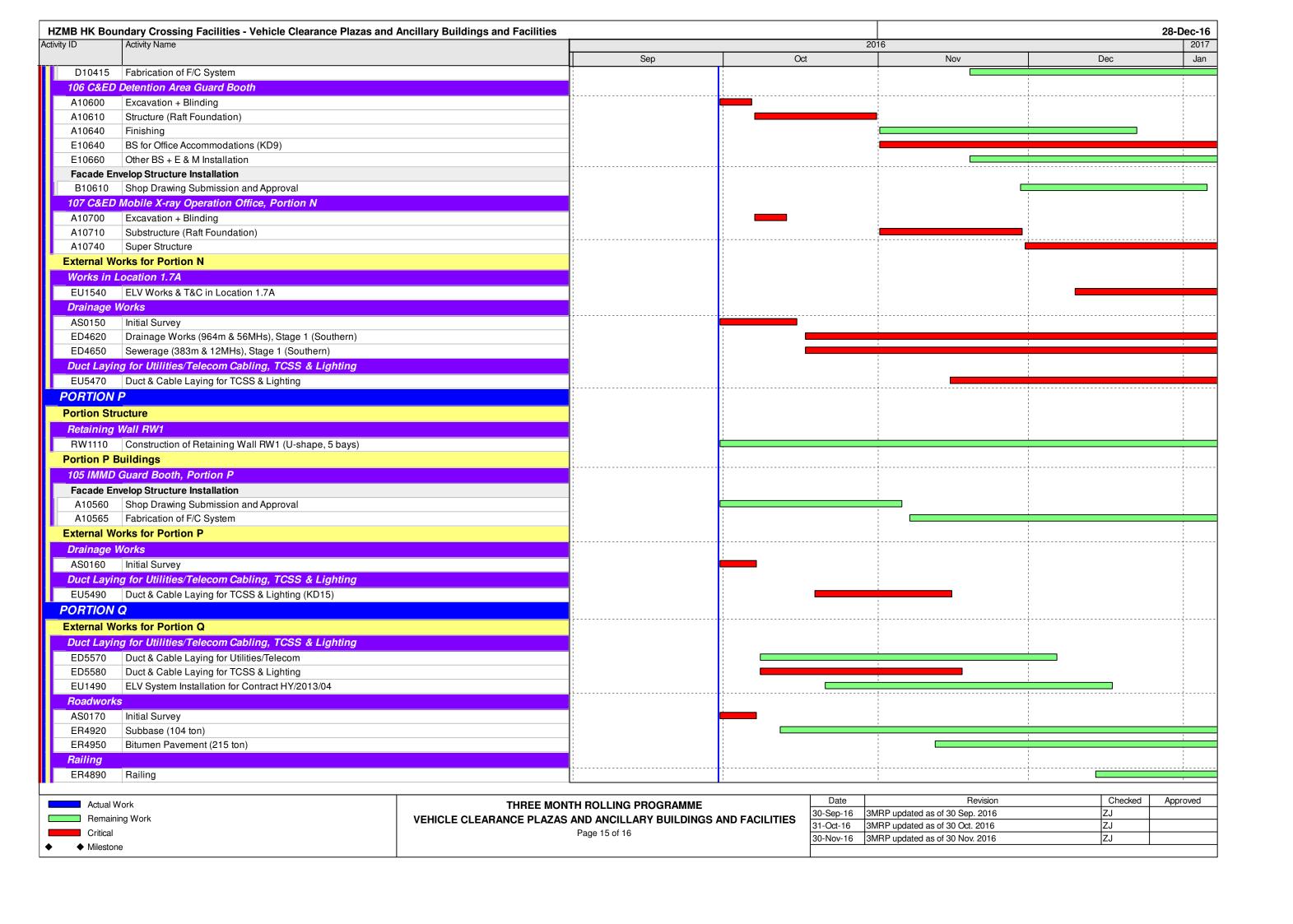












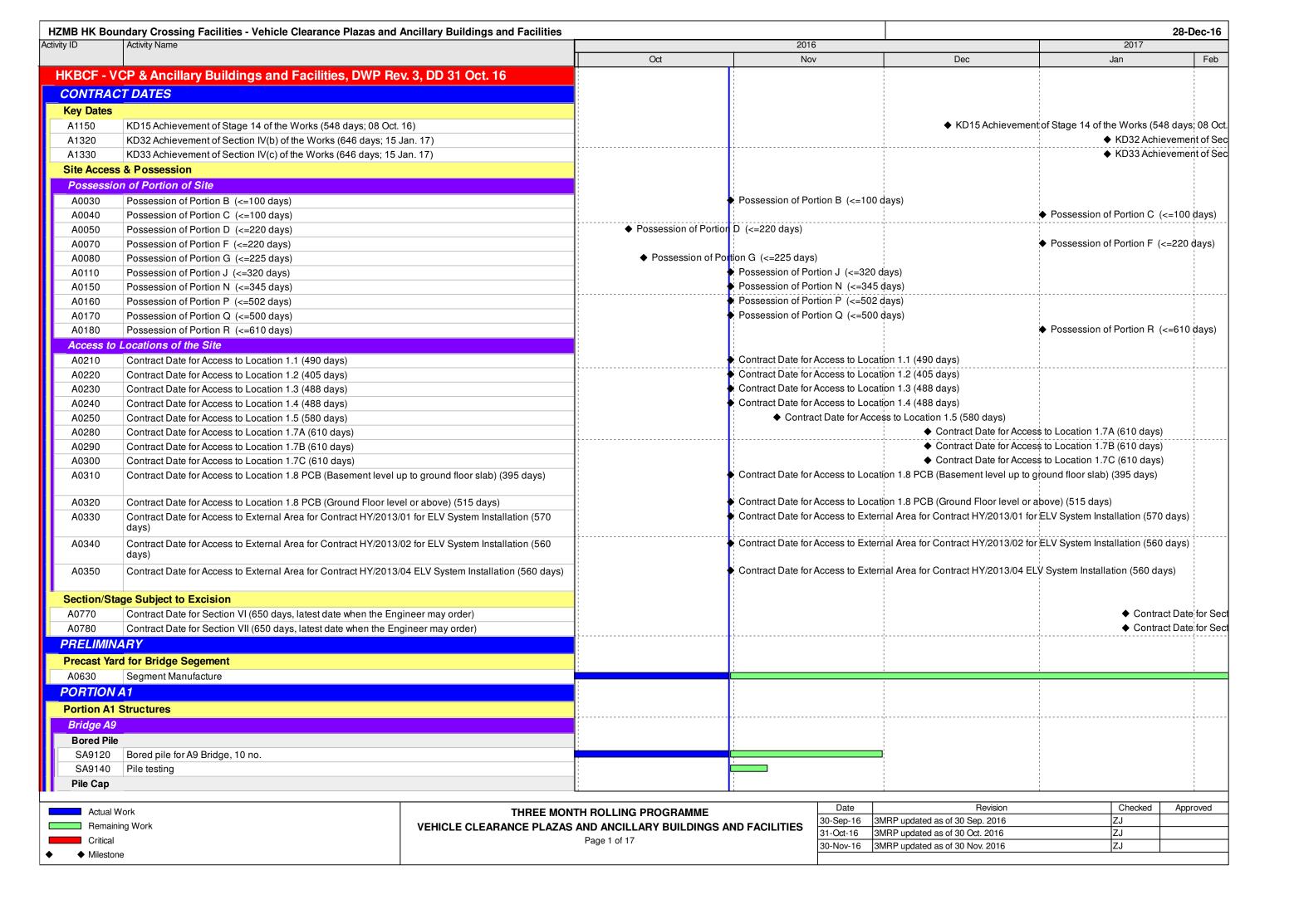
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		Sep	Oct	Nov	Dec	Jan
Road Furniture						
ER4900	Road Furniture					
Landscape	Works					
A5170	Design and Procurement for Irrigation System					

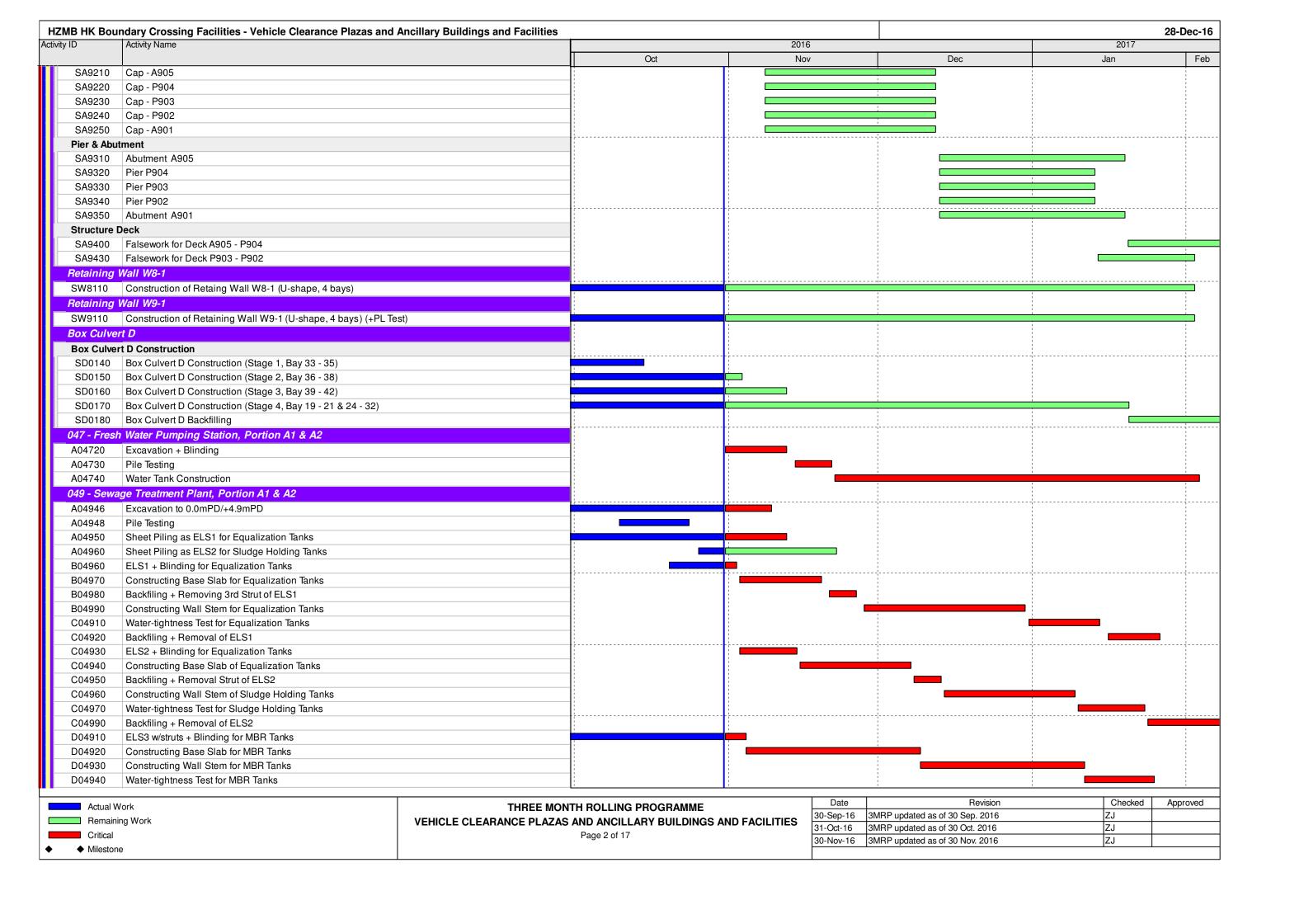
Actual Work
Remaining Work
Critical

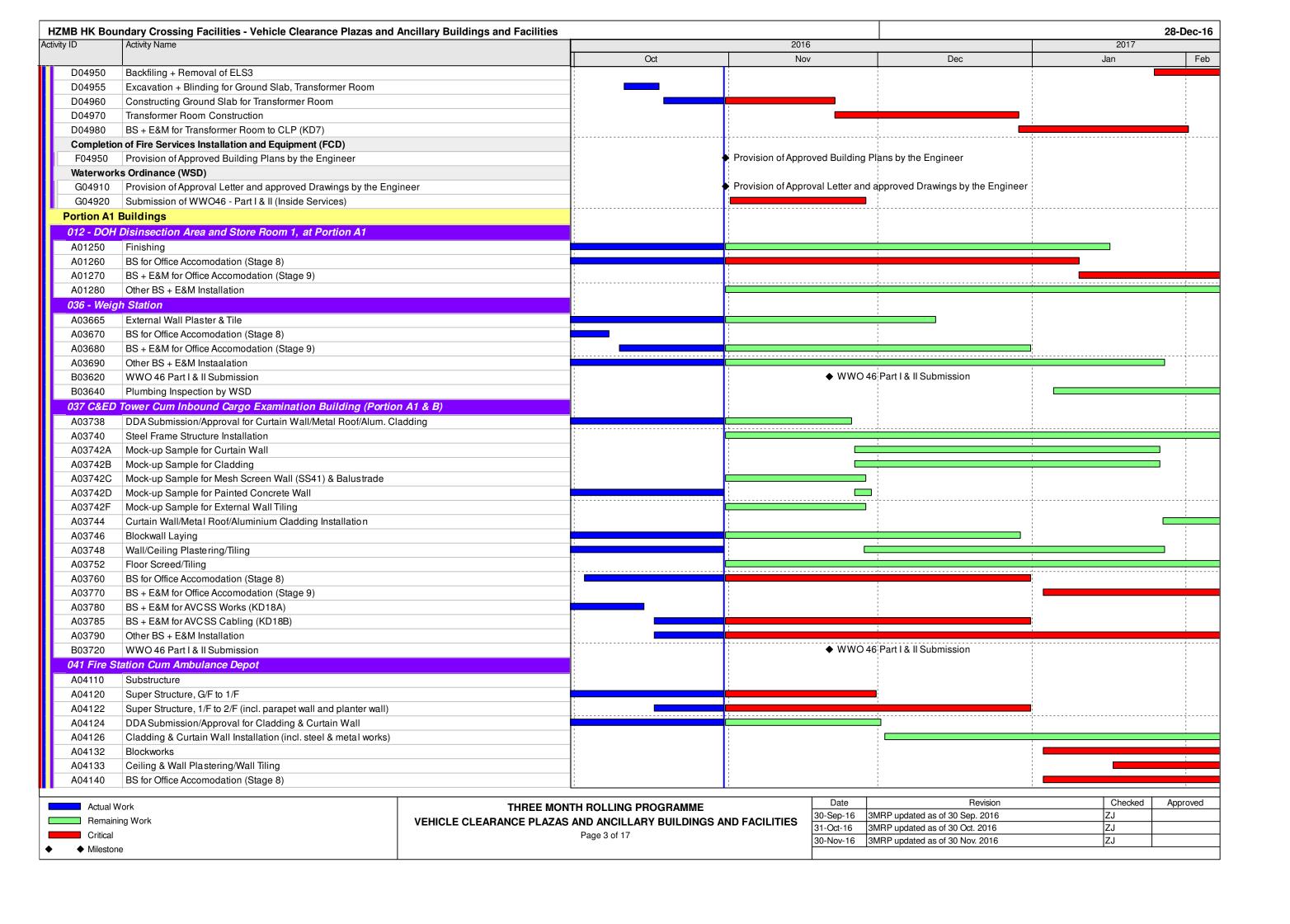
Milestone

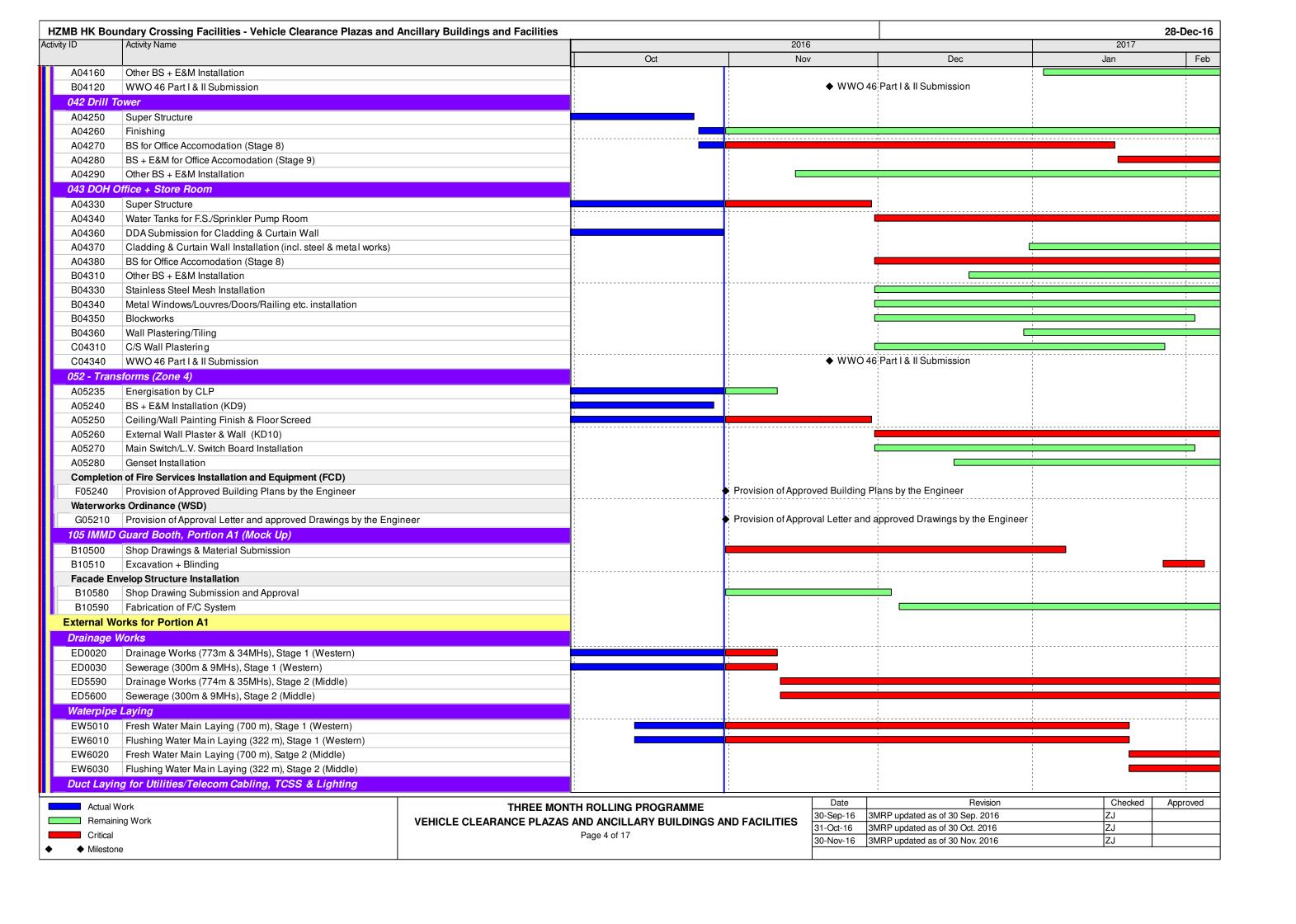
THREE MONTH ROLLING PROGRAMME
VEHICLE CLEARANCE PLAZAS AND ANCILLARY BUILDINGS AND FACILITIES
Page 16 of 16

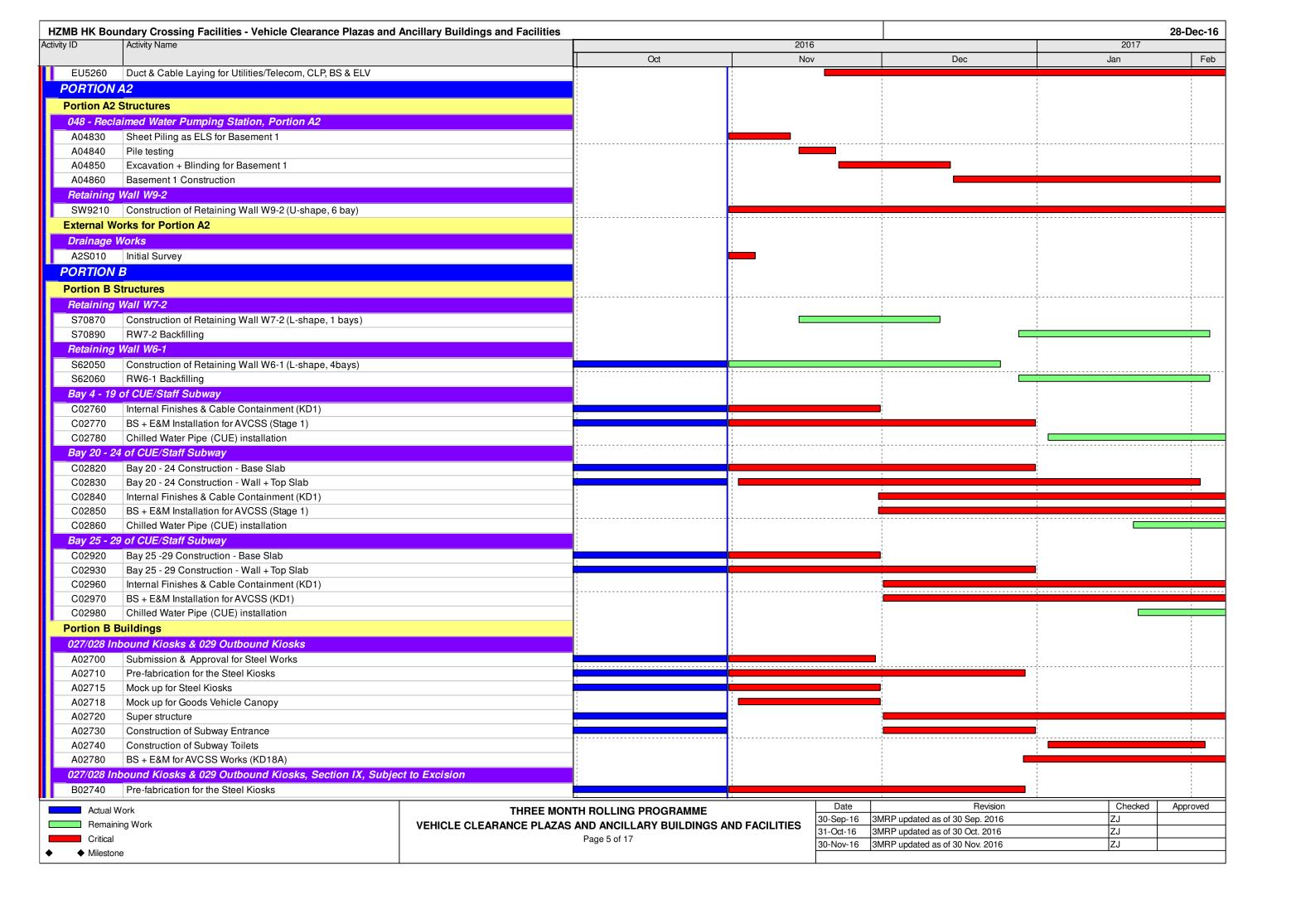
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31-Oct-16	3MRP updated as of 30 Oct. 2016	ZJ	
30-Nov-16	3MRP updated as of 30 Nov. 2016	ZJ	

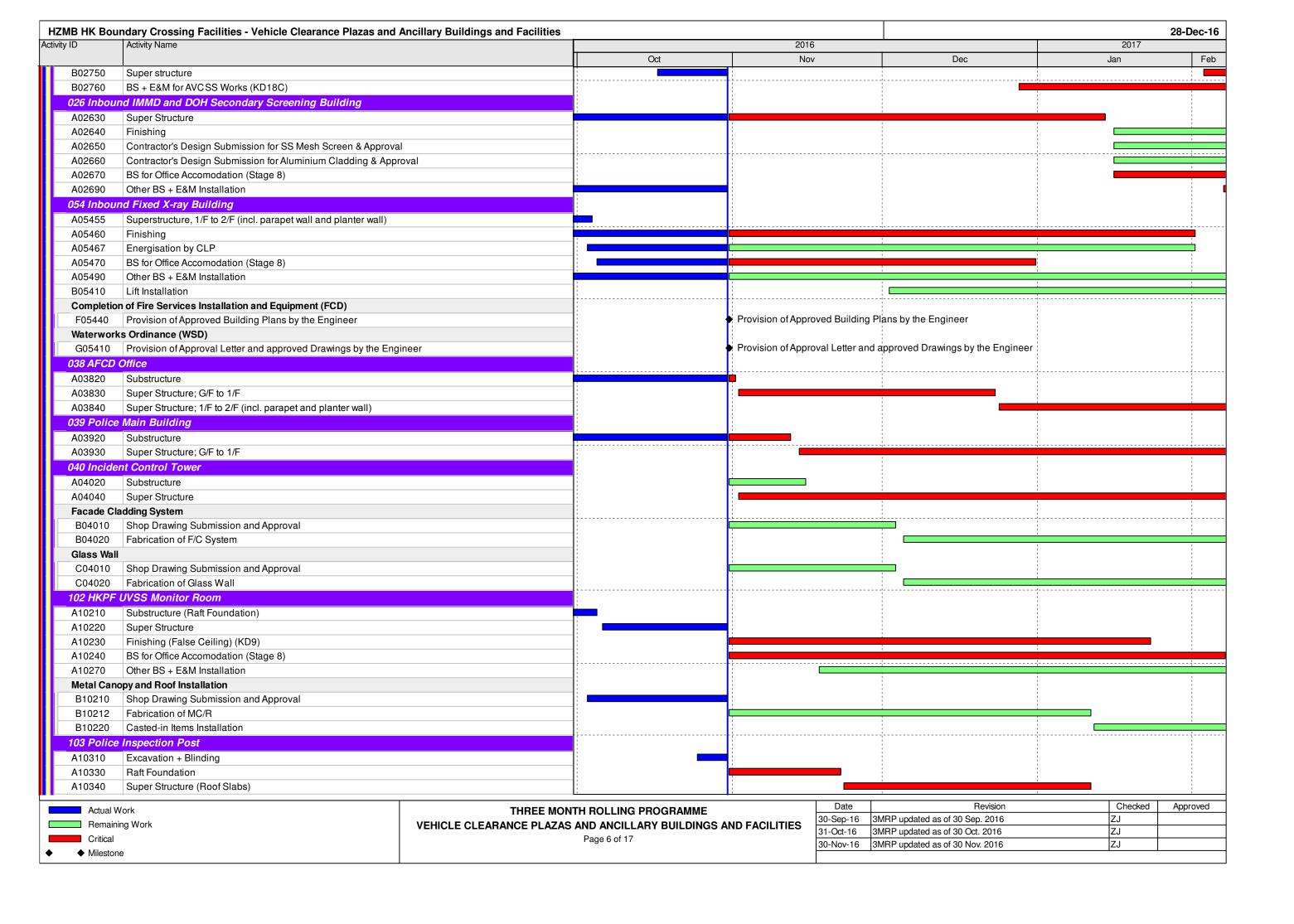


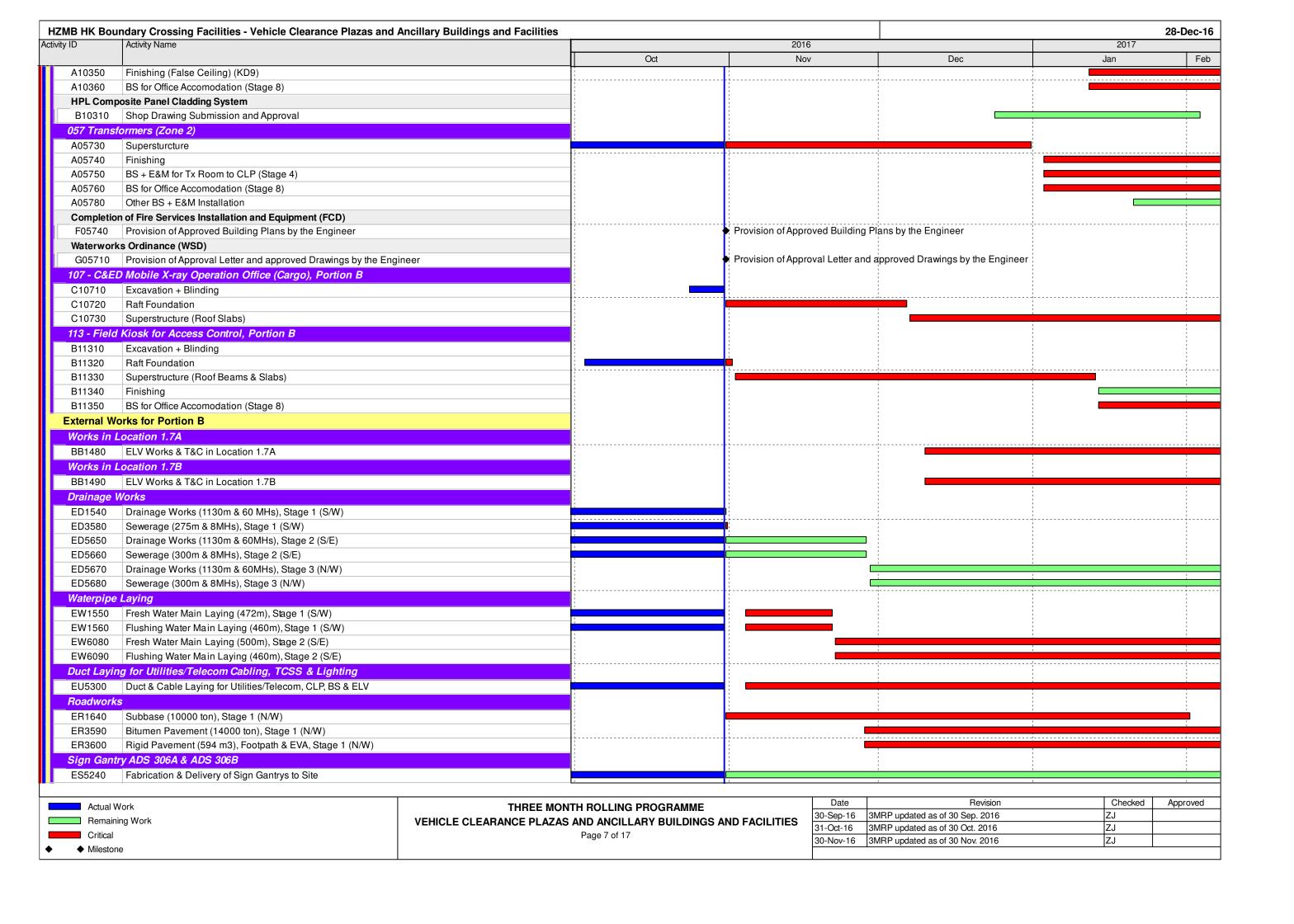


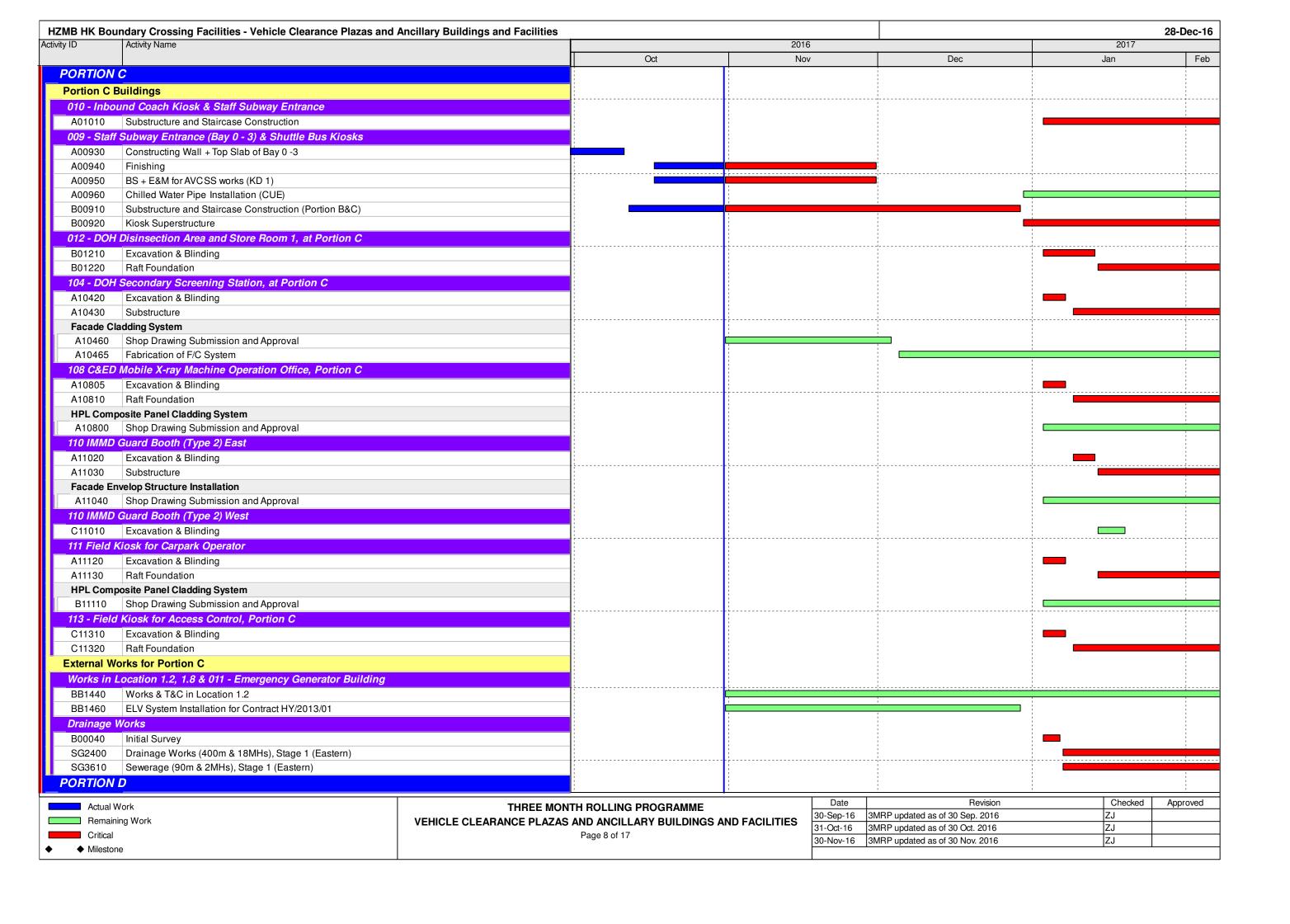


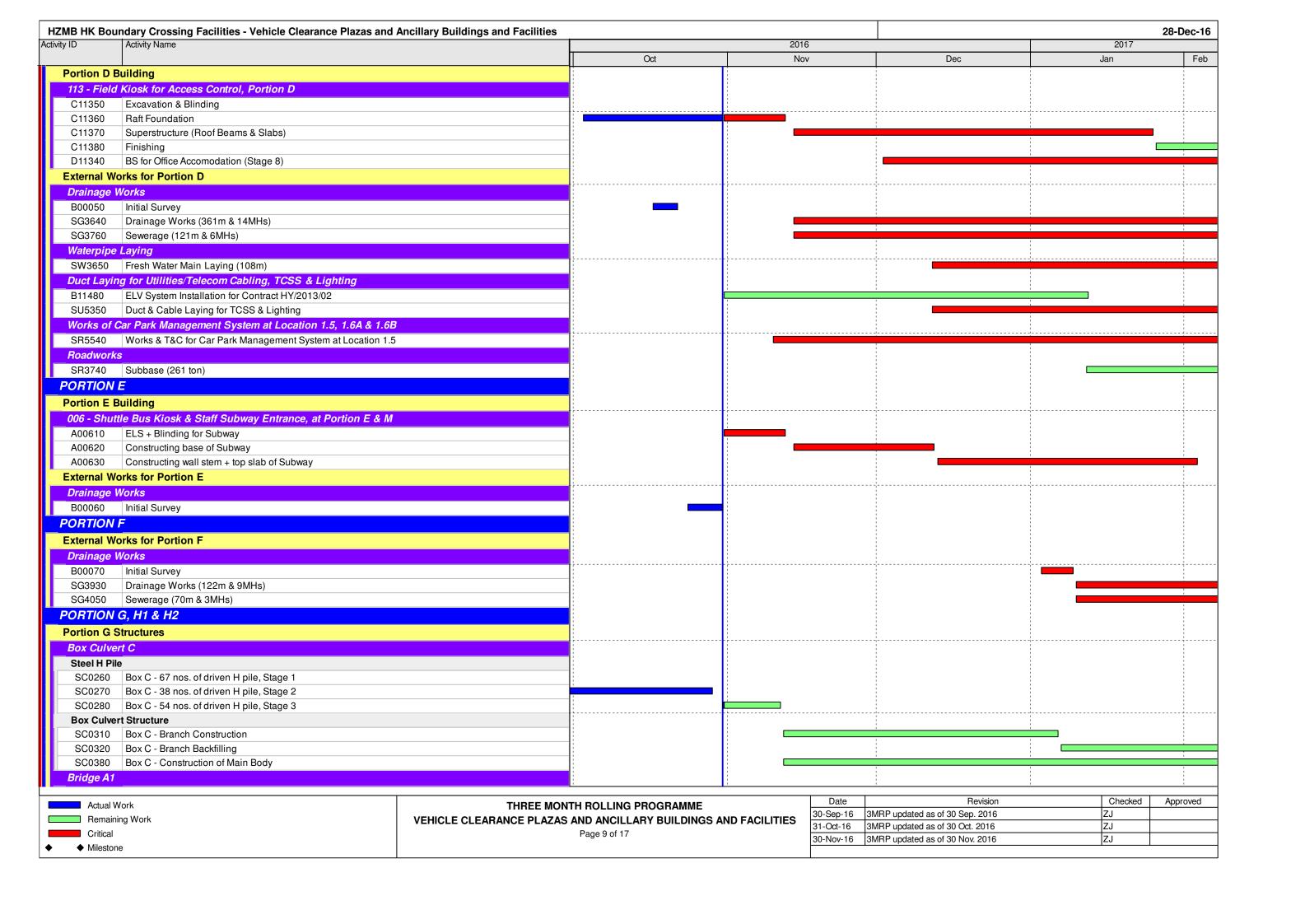


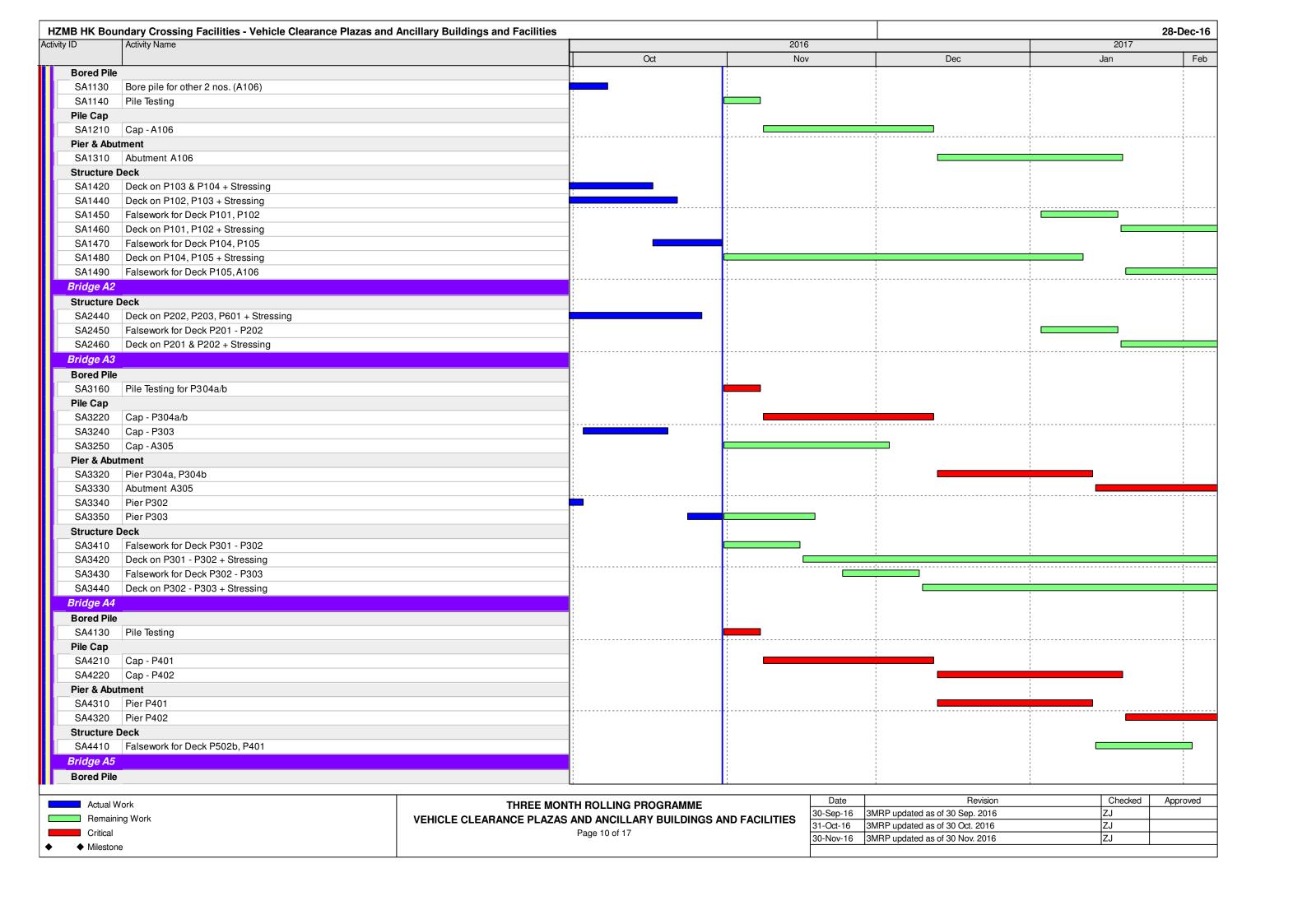


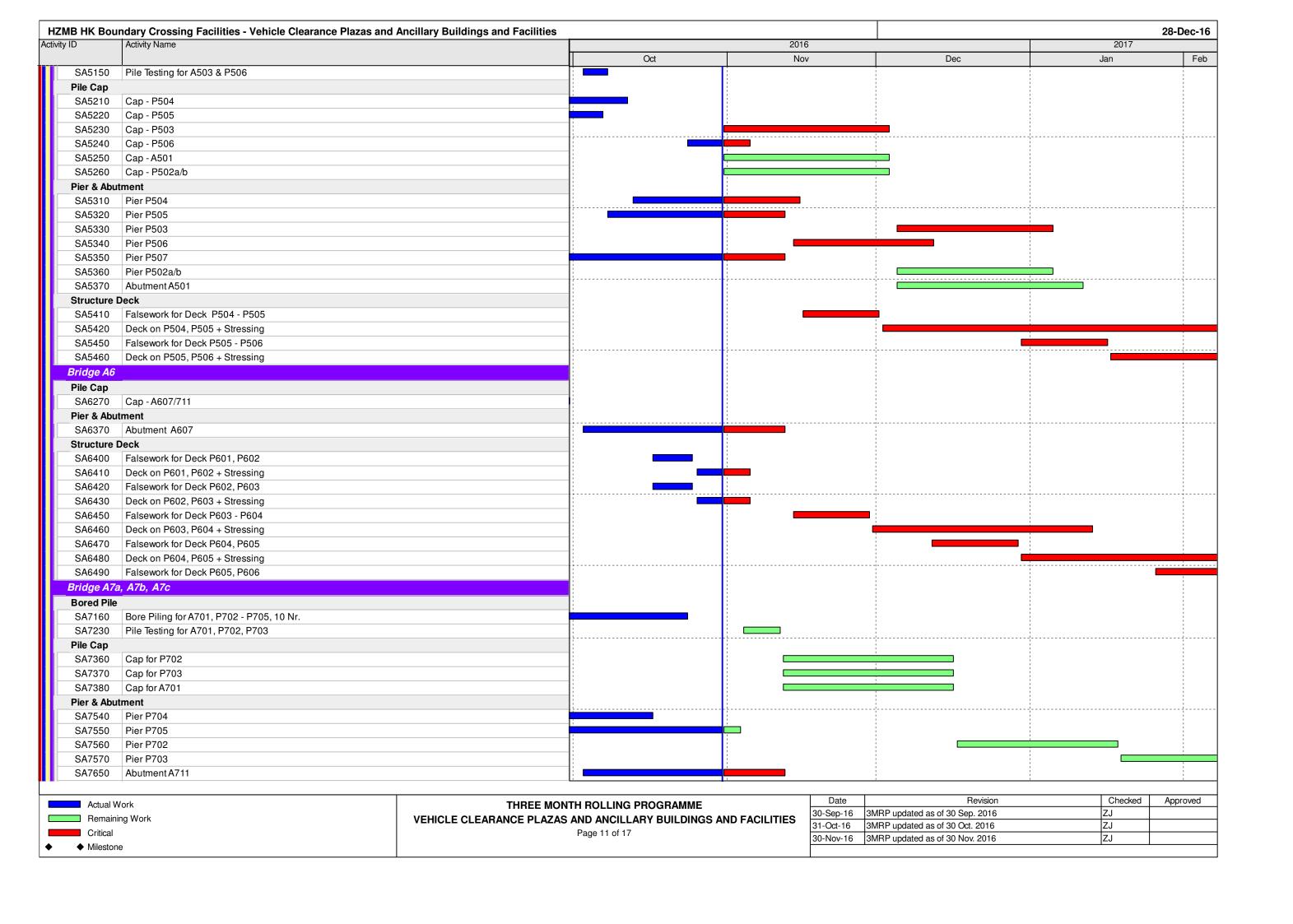


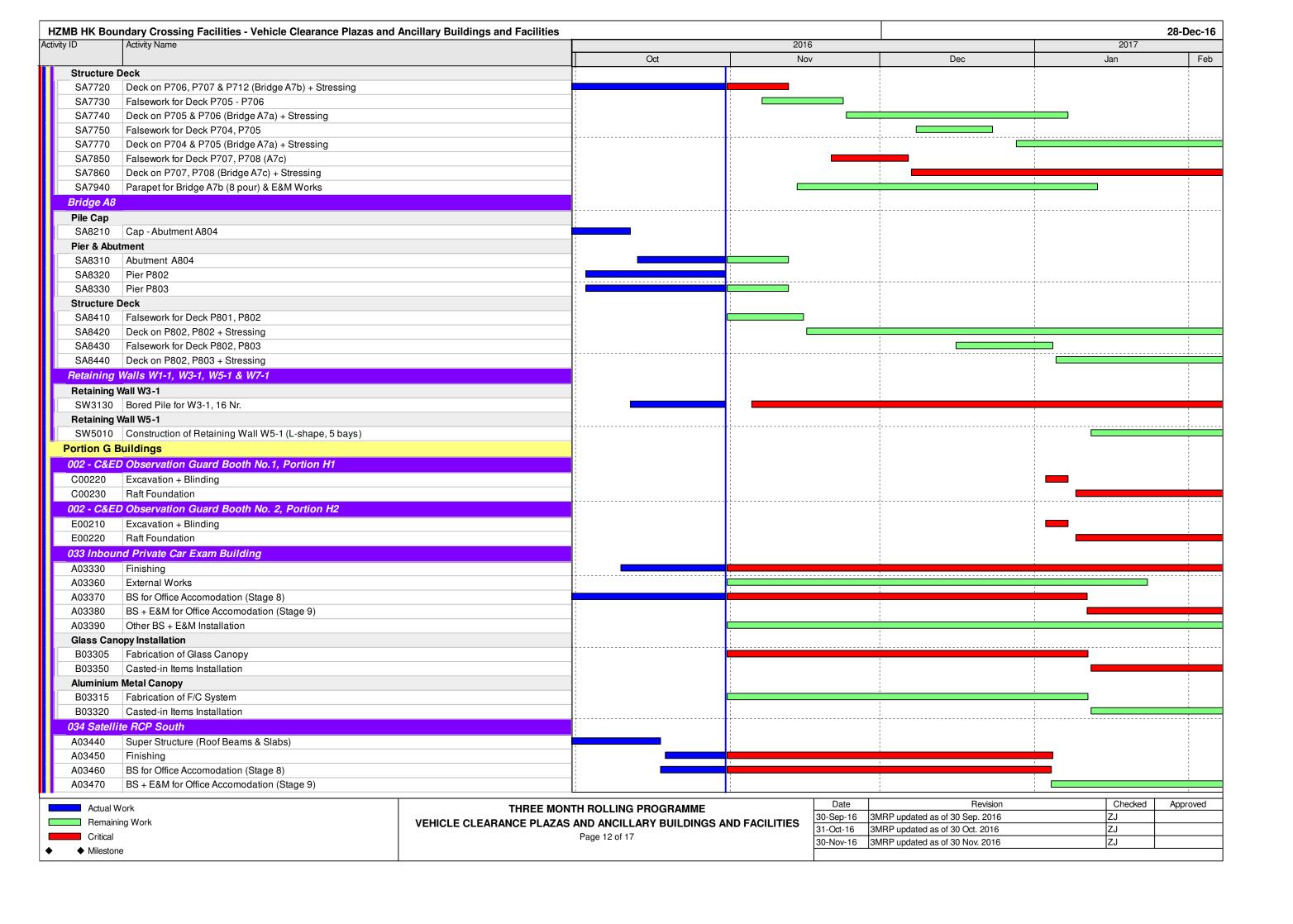


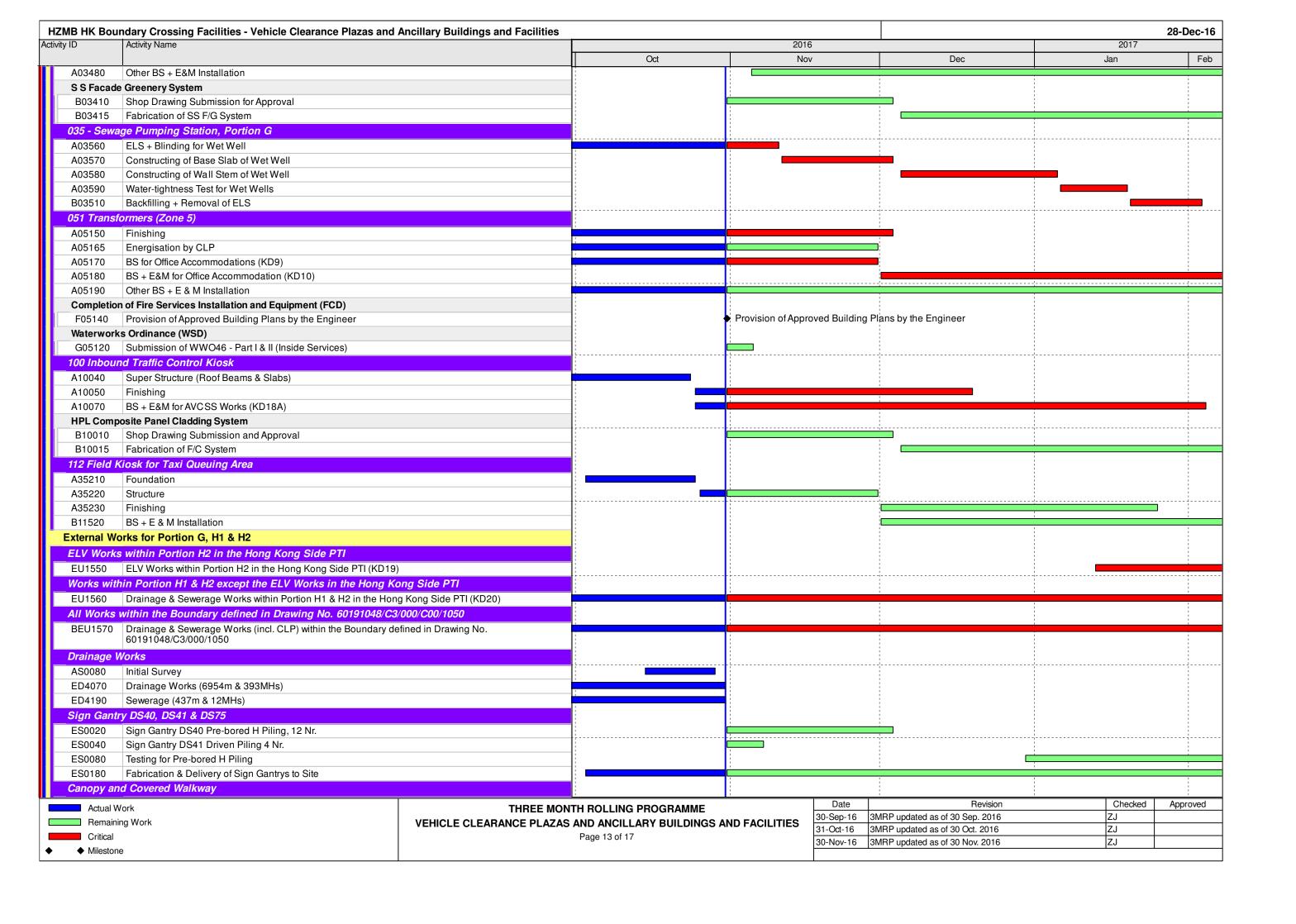


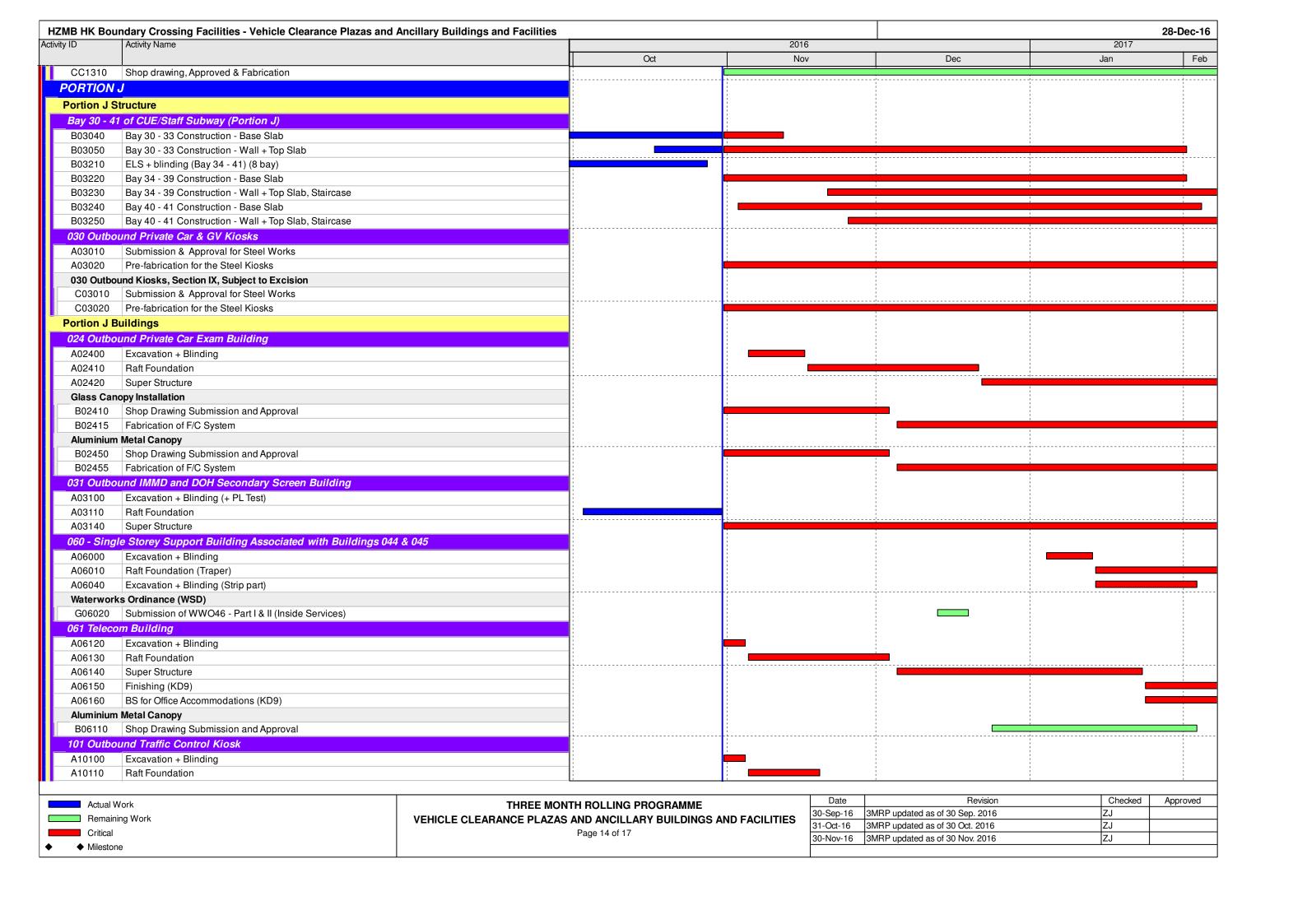


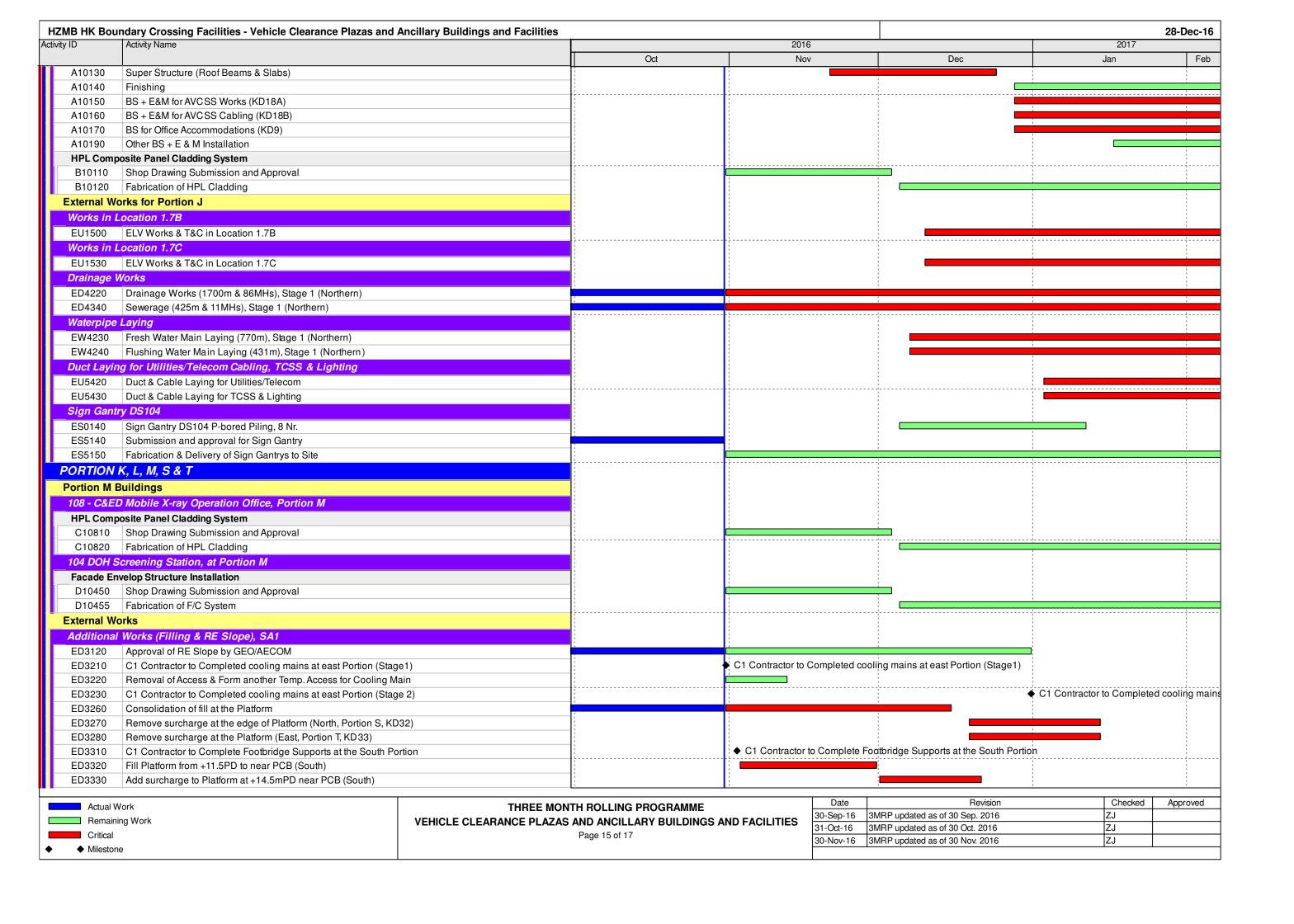


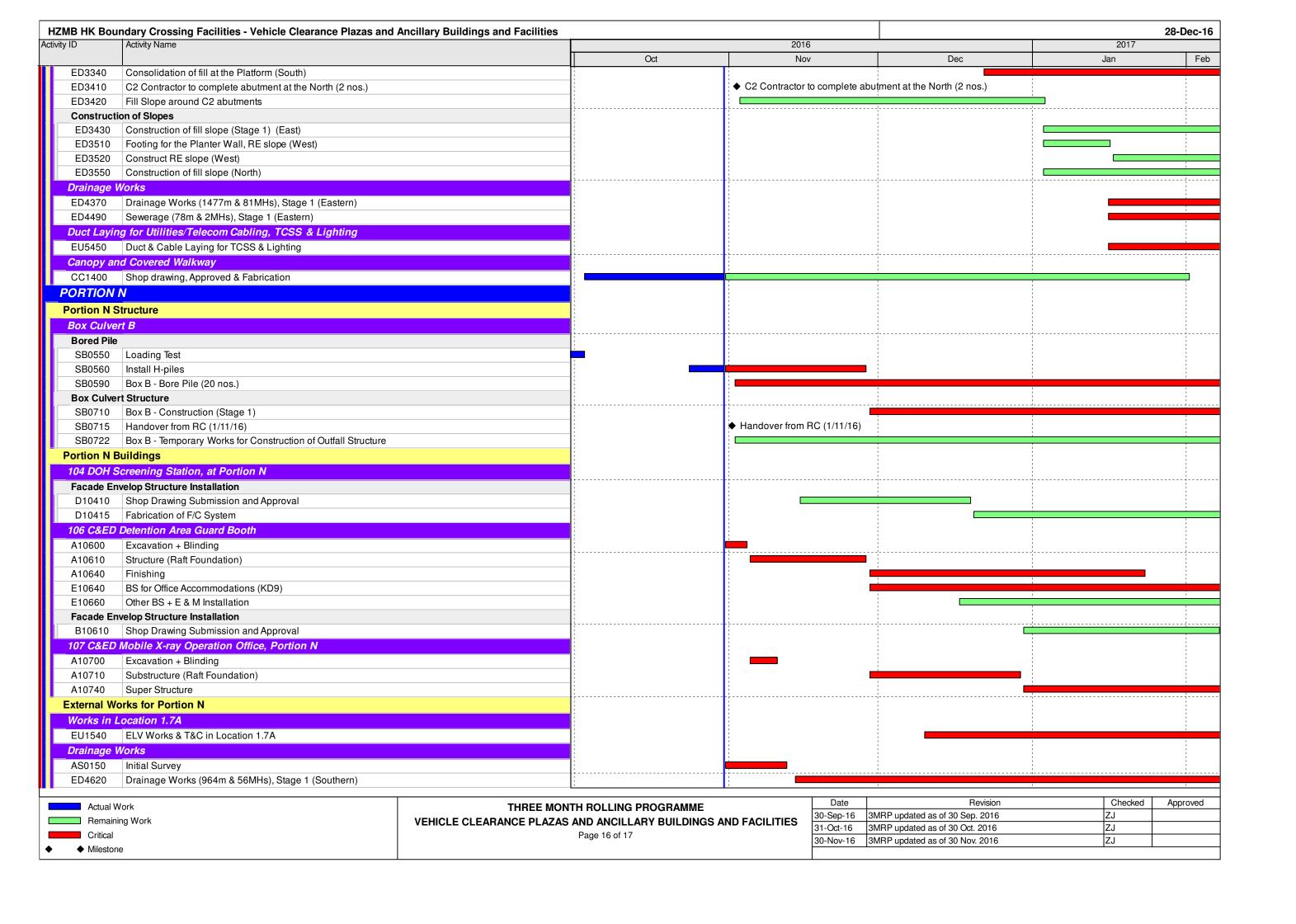


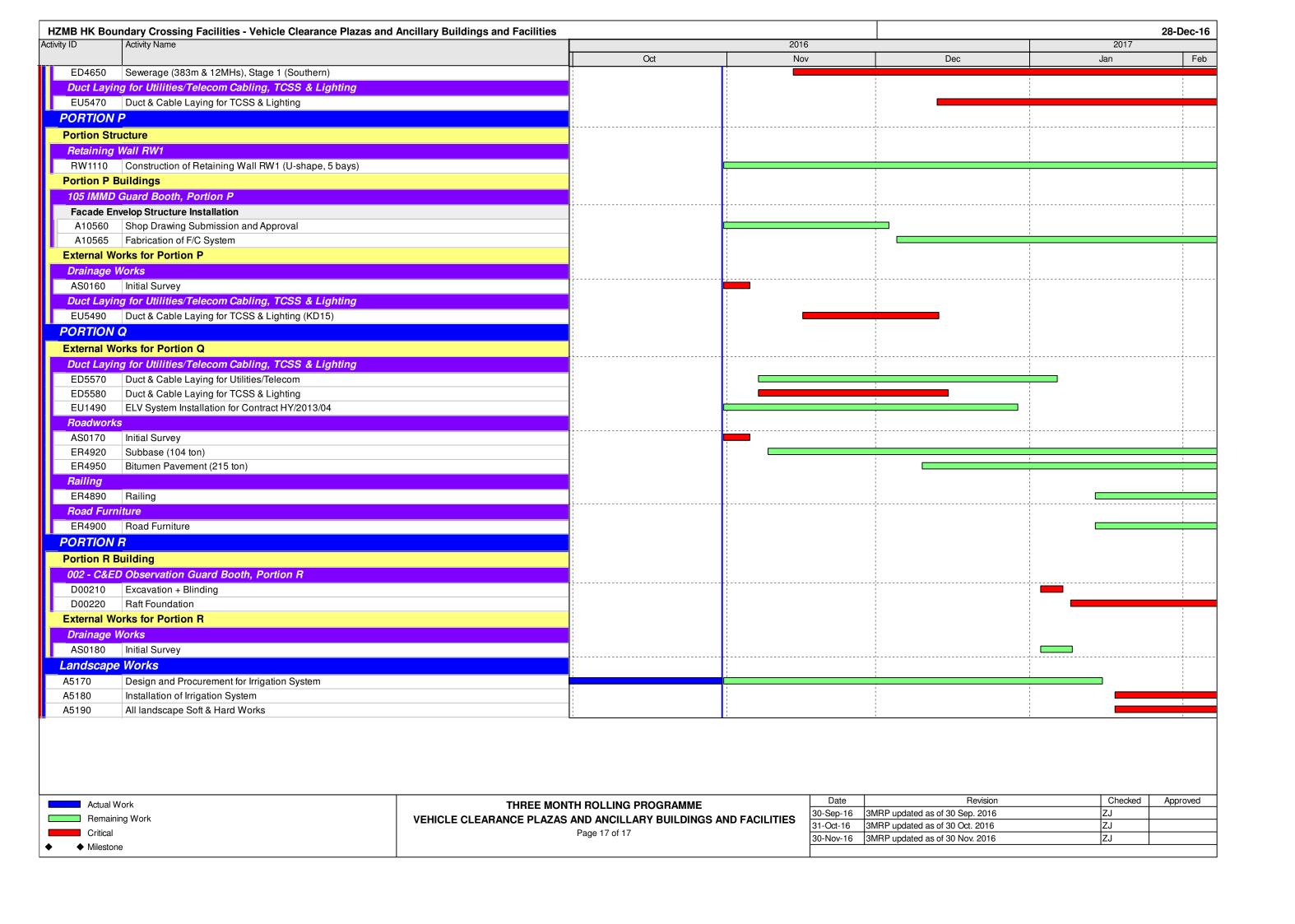


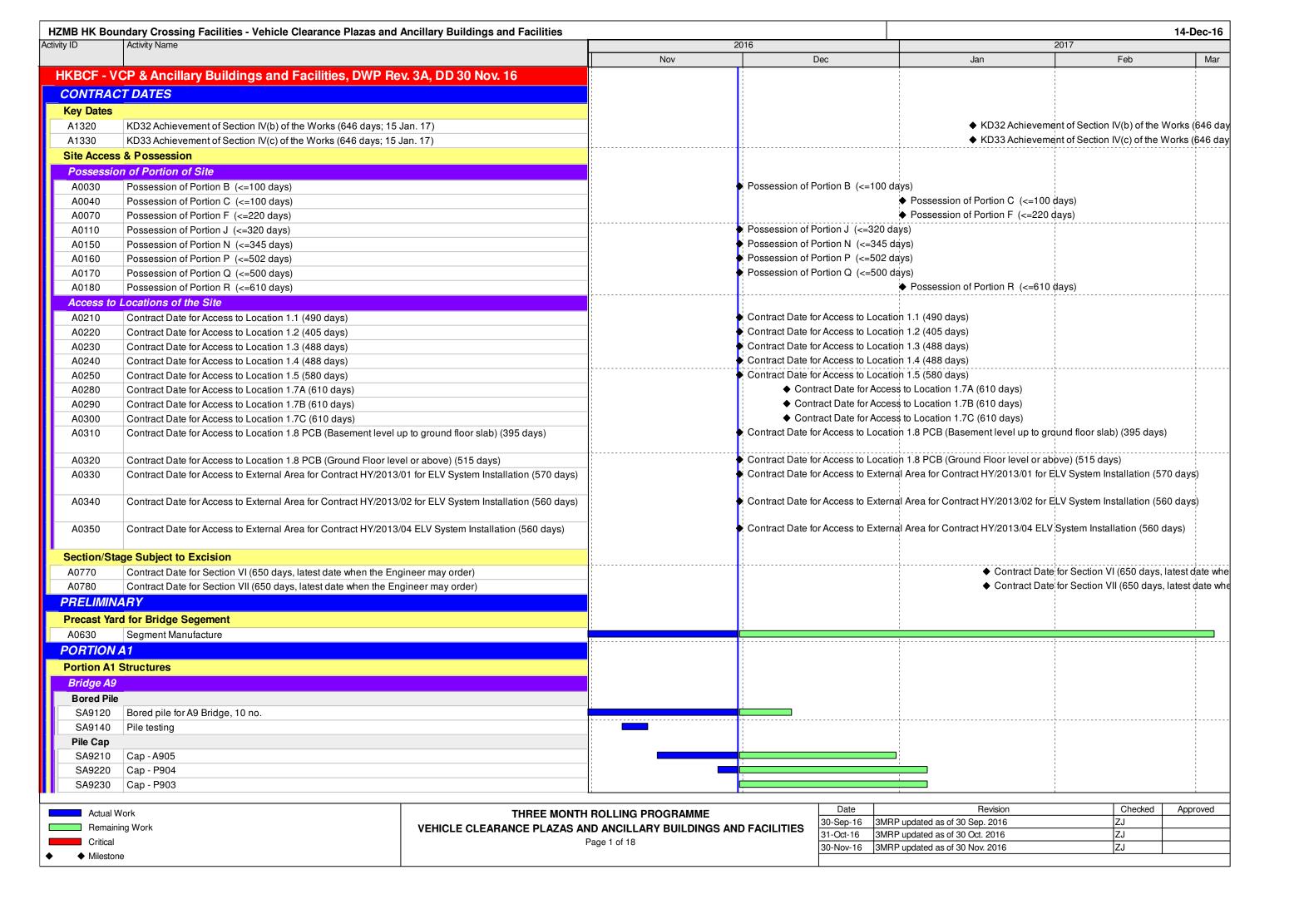


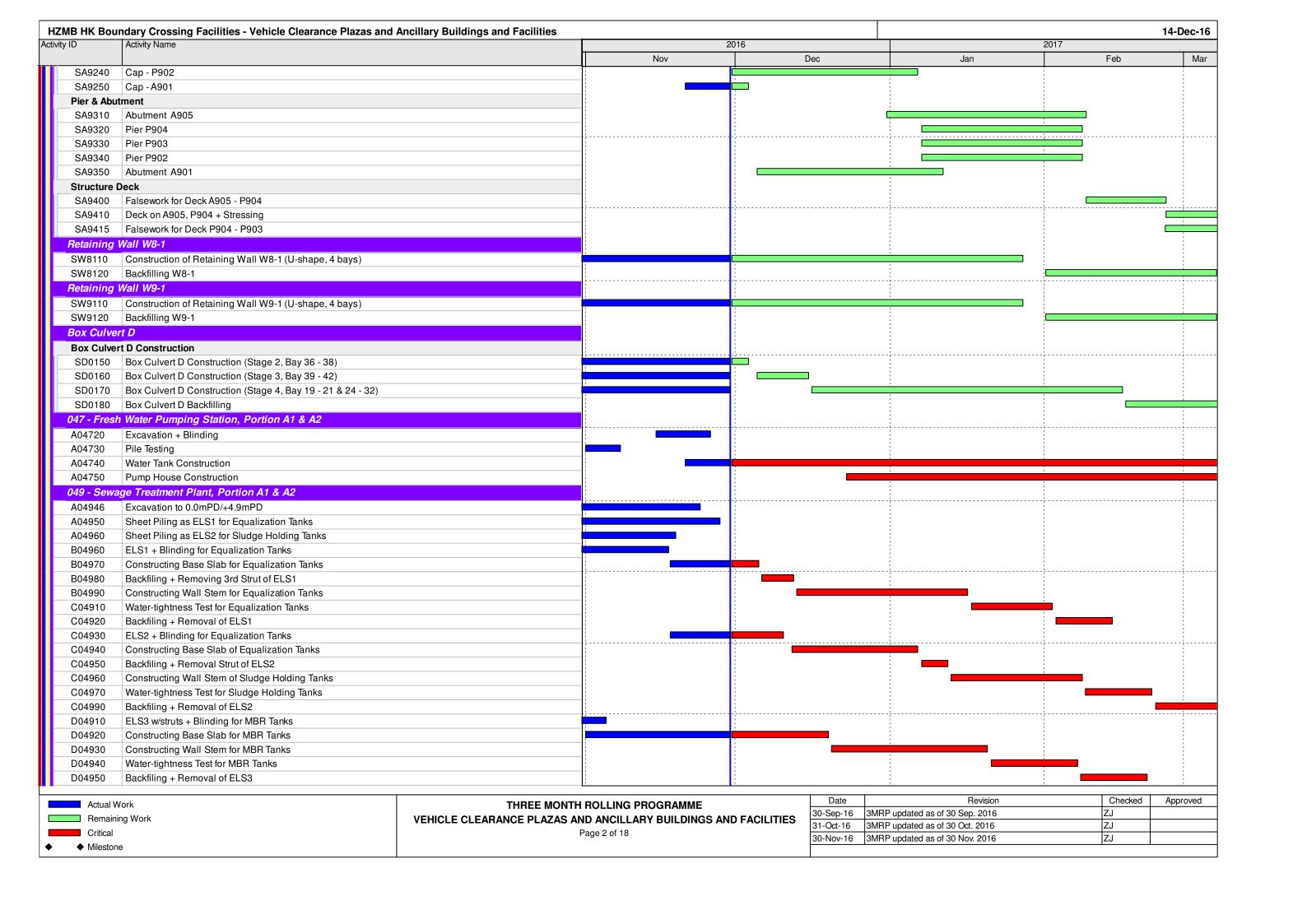


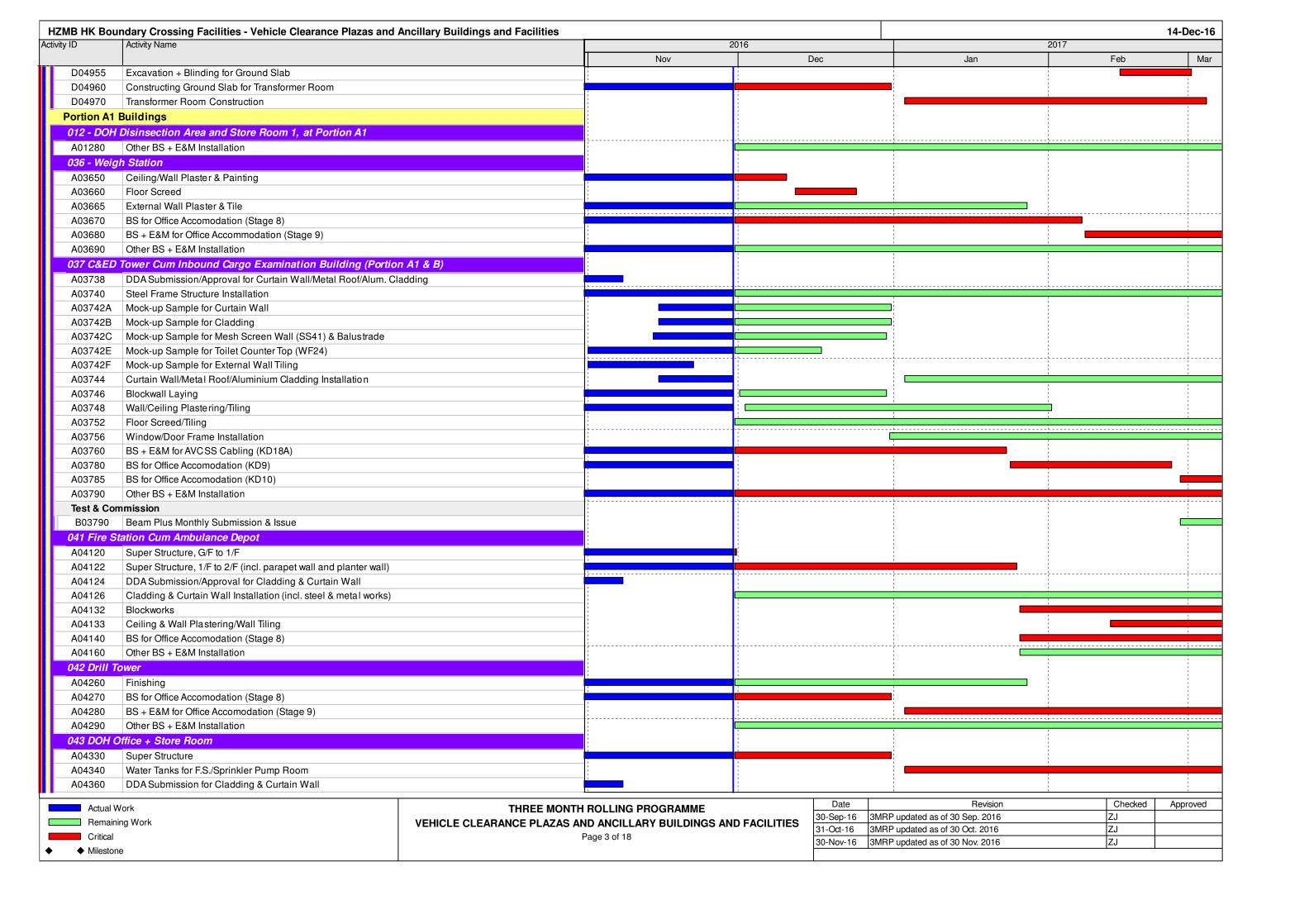


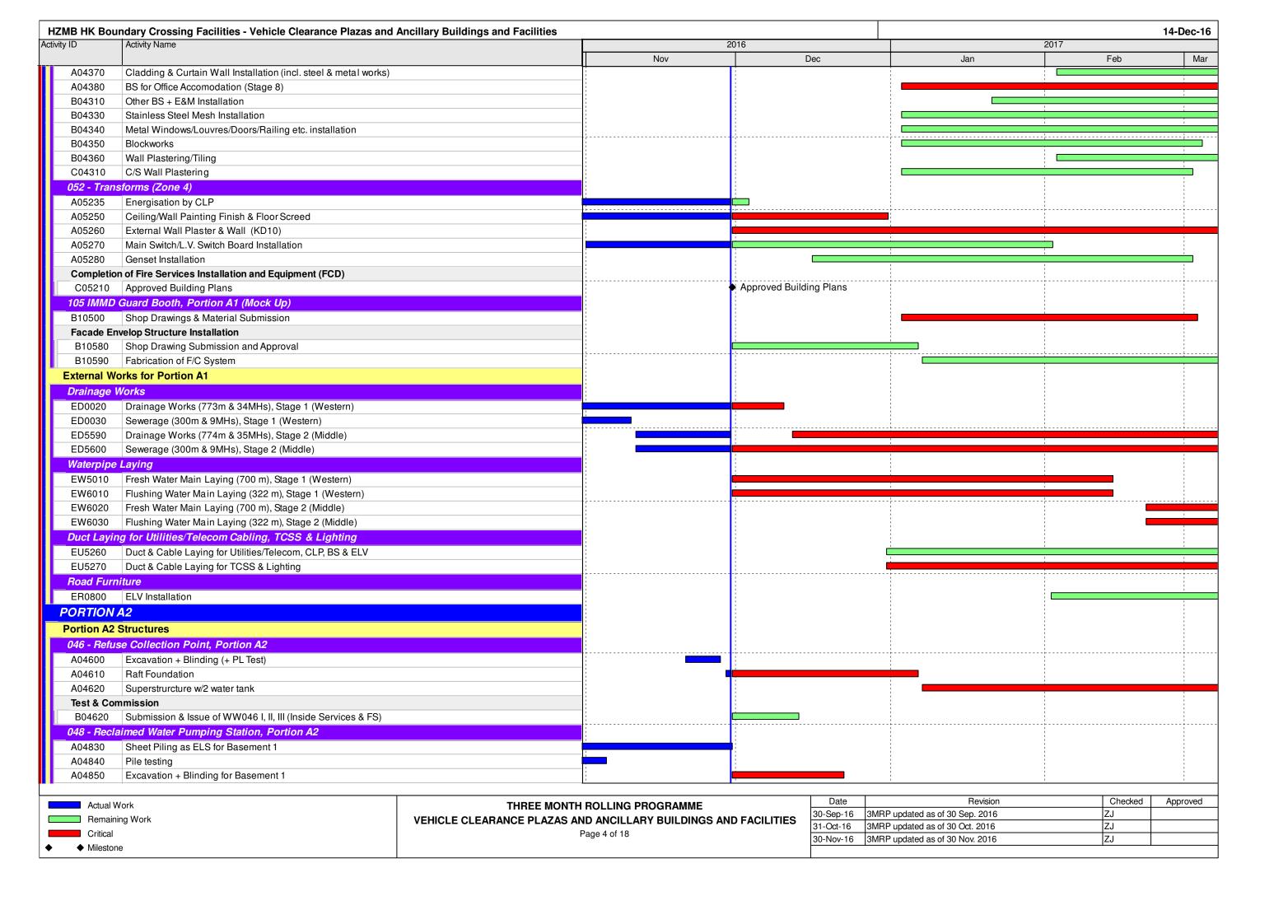


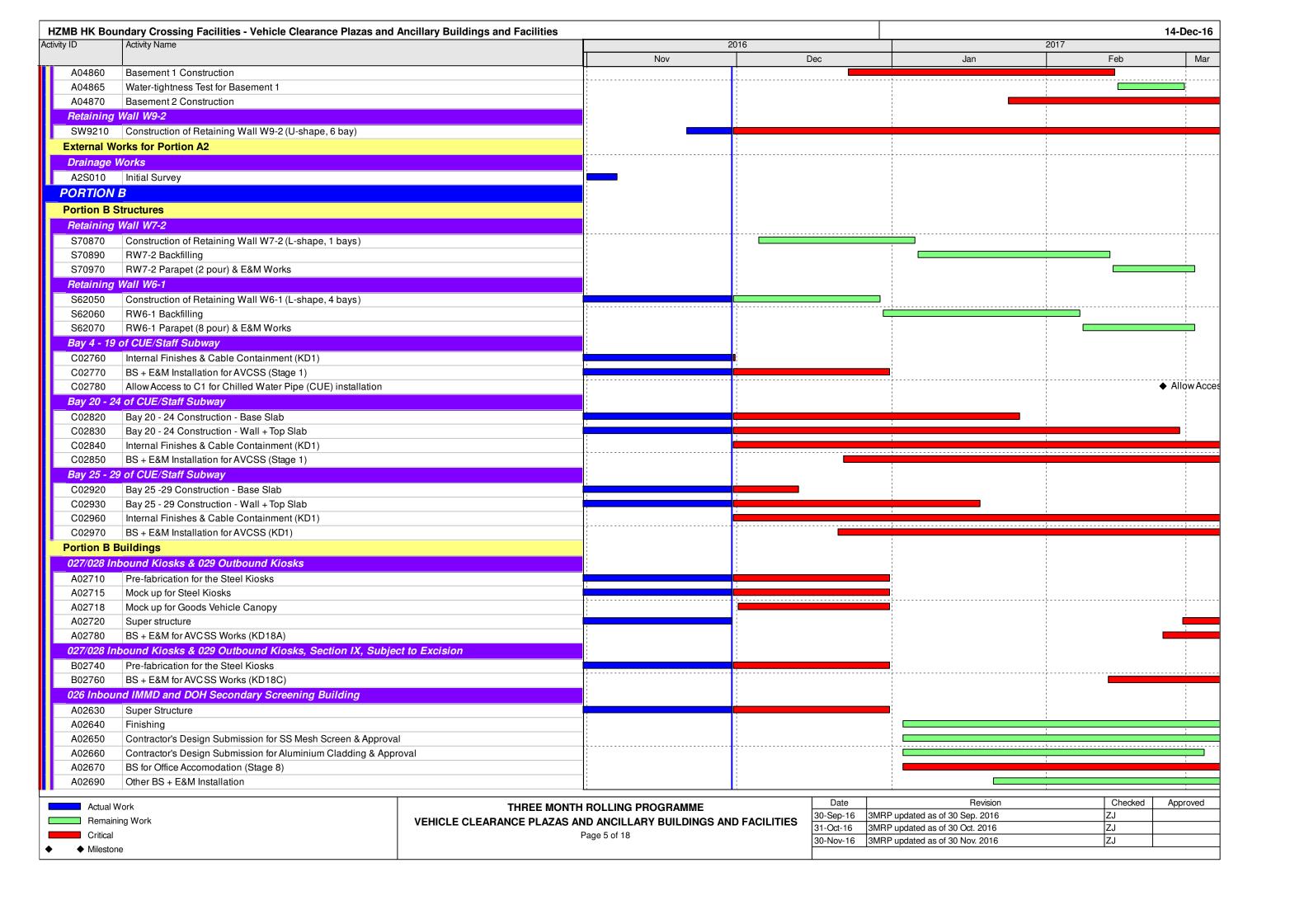


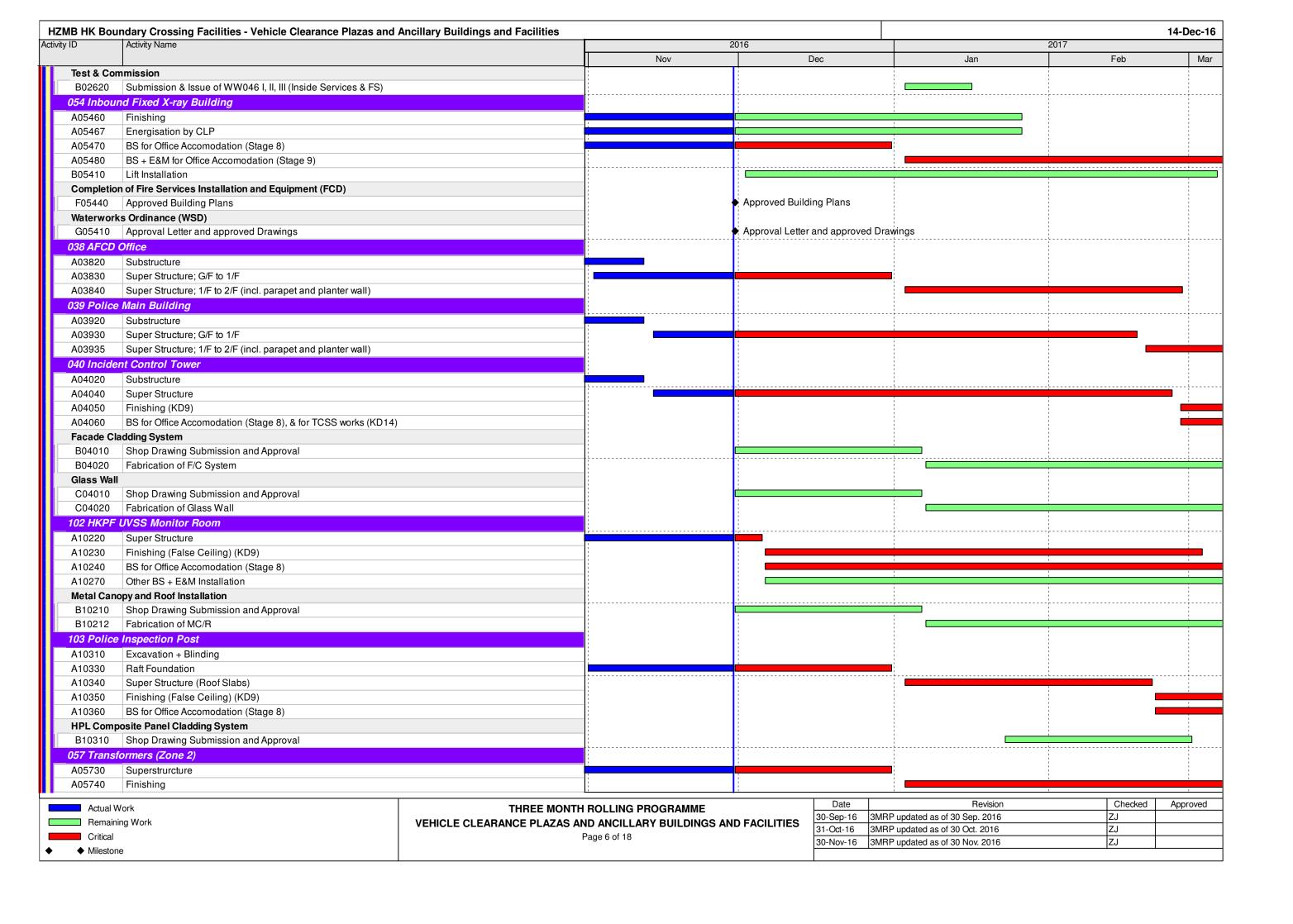


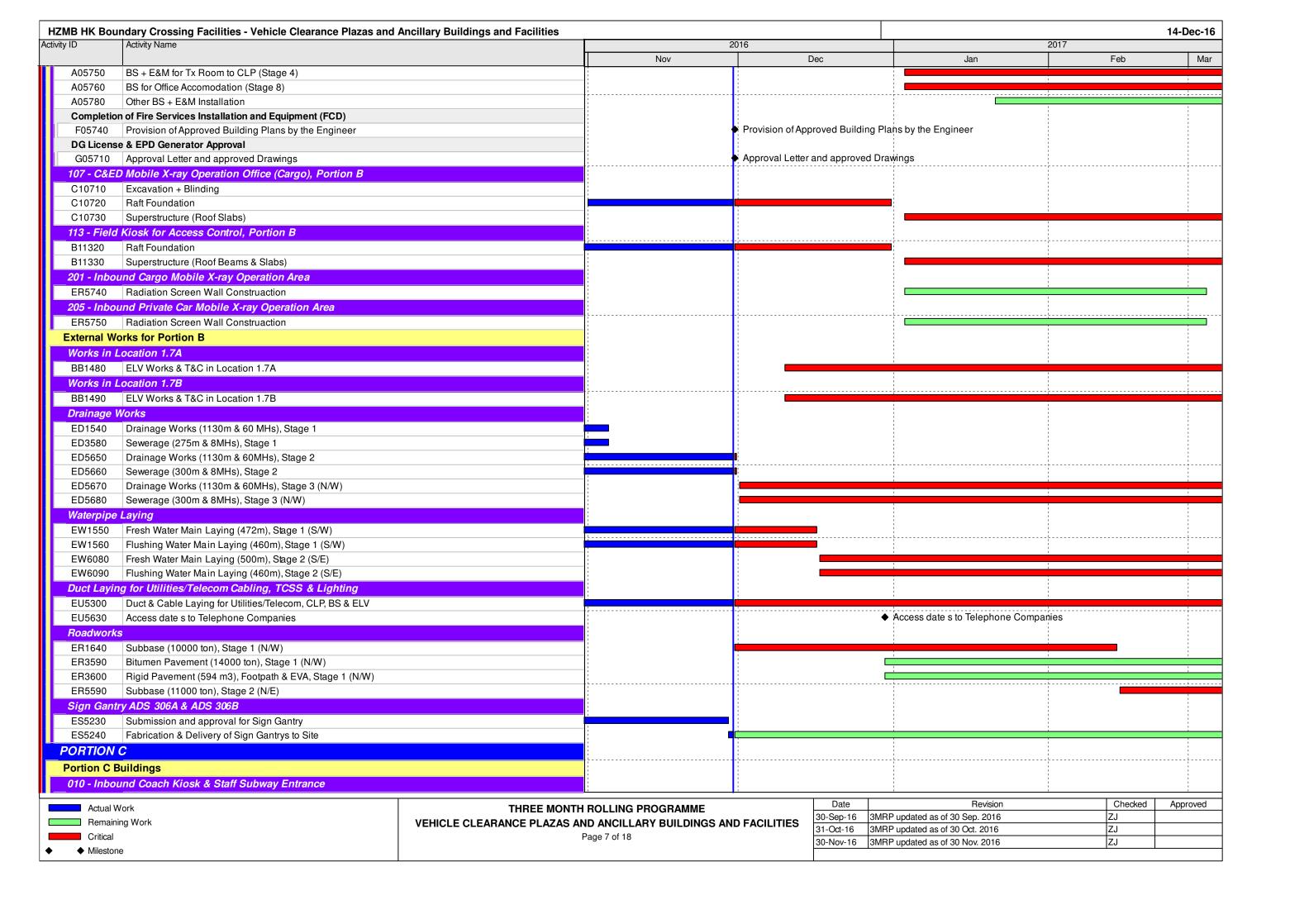


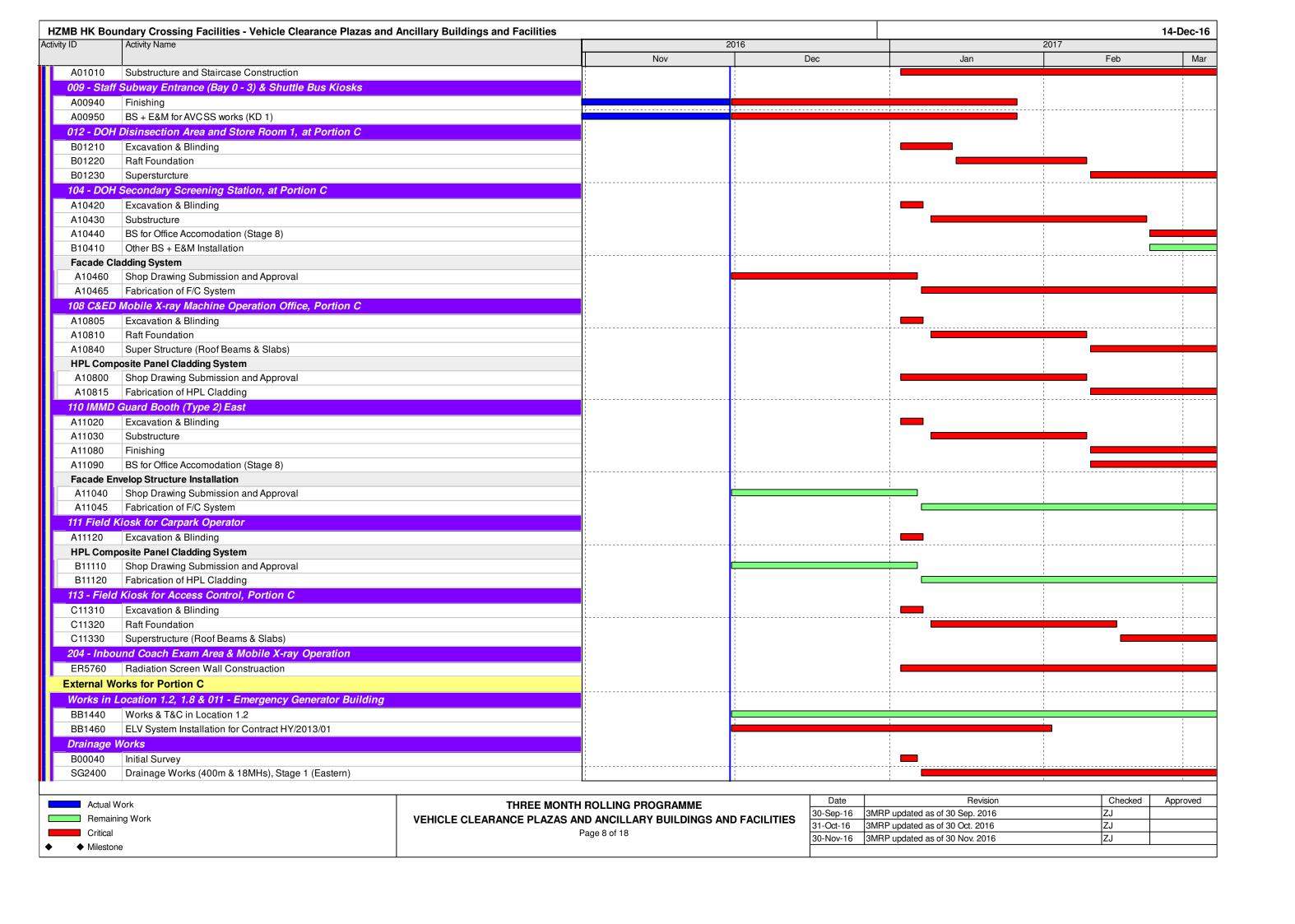


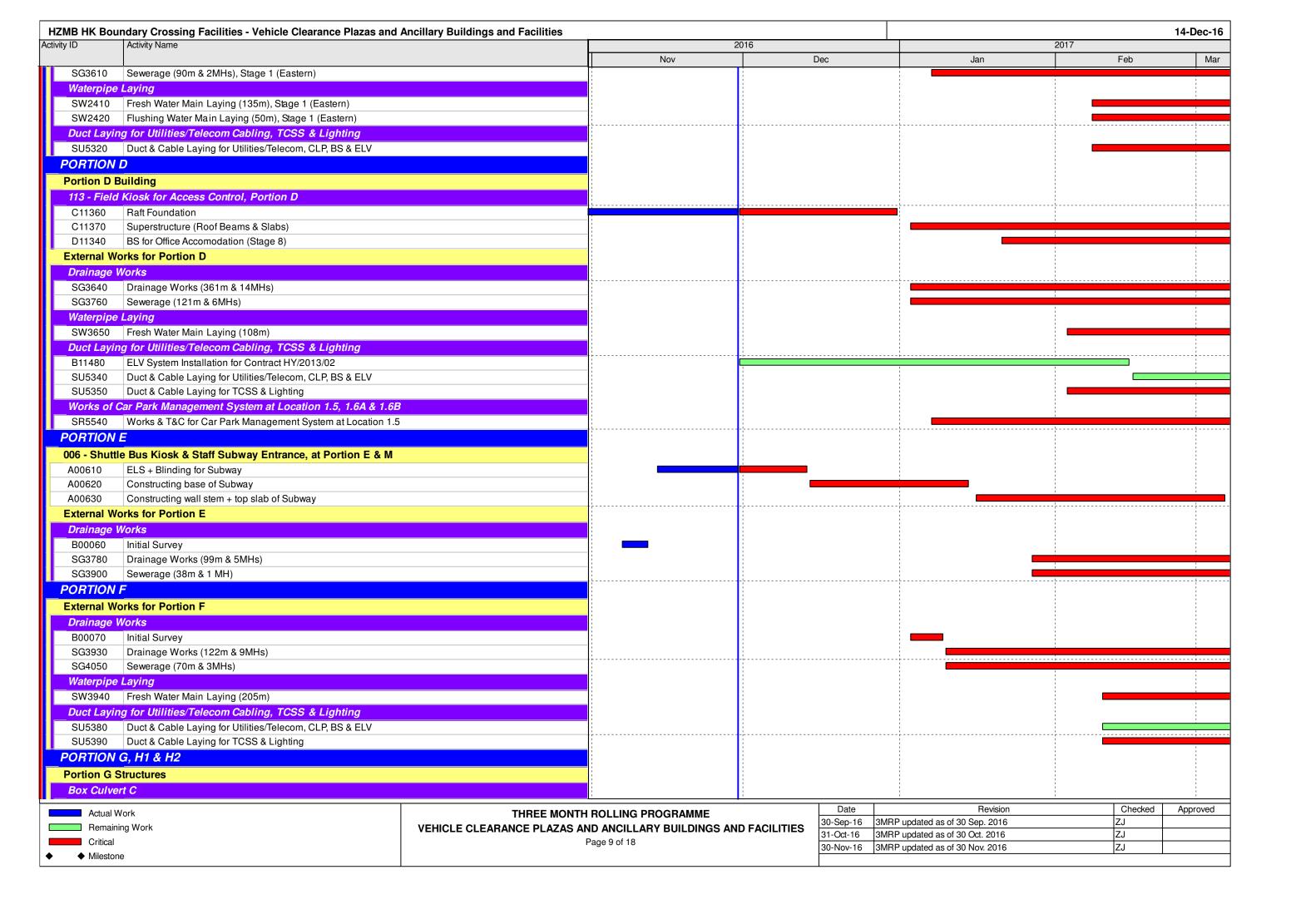


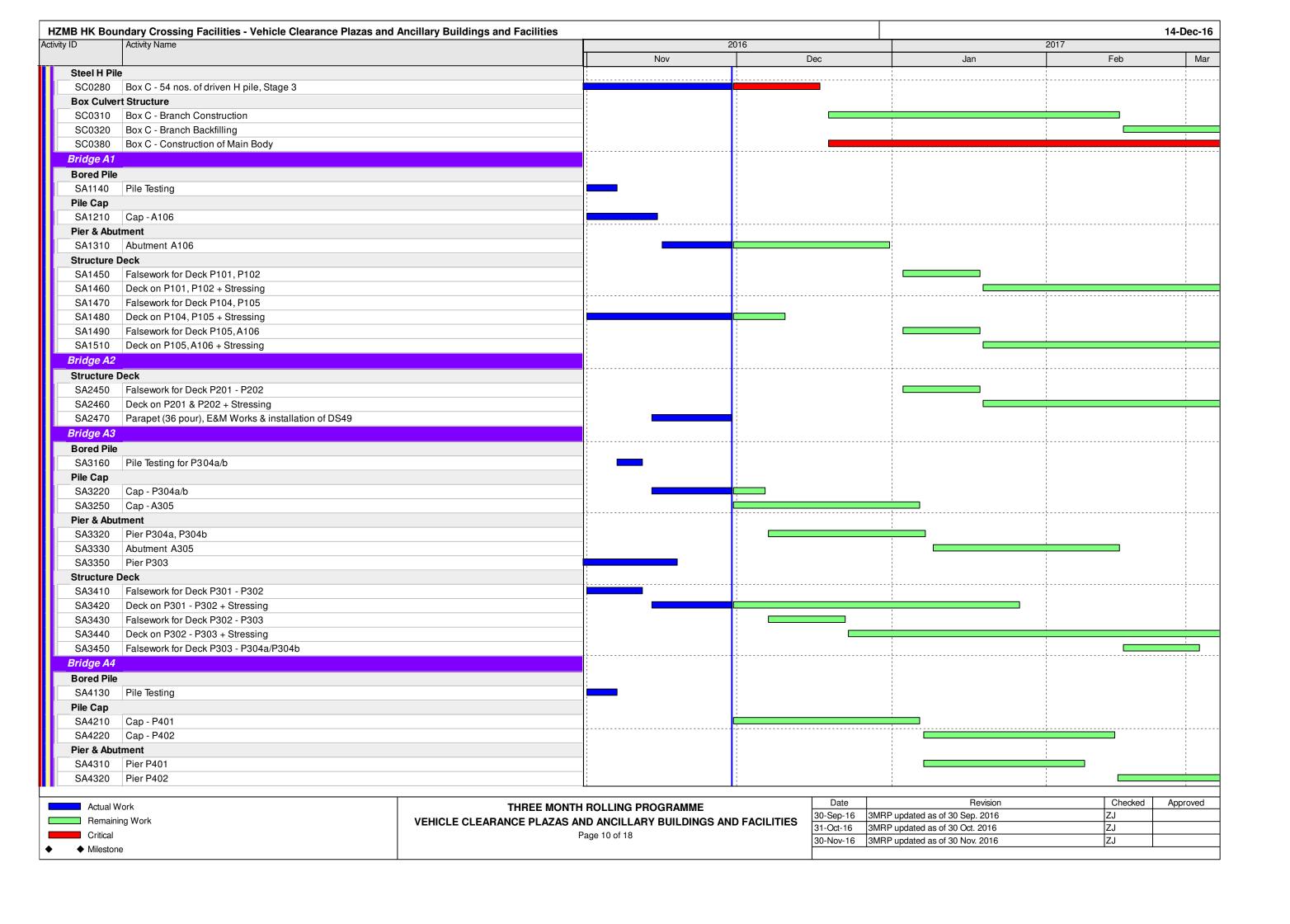


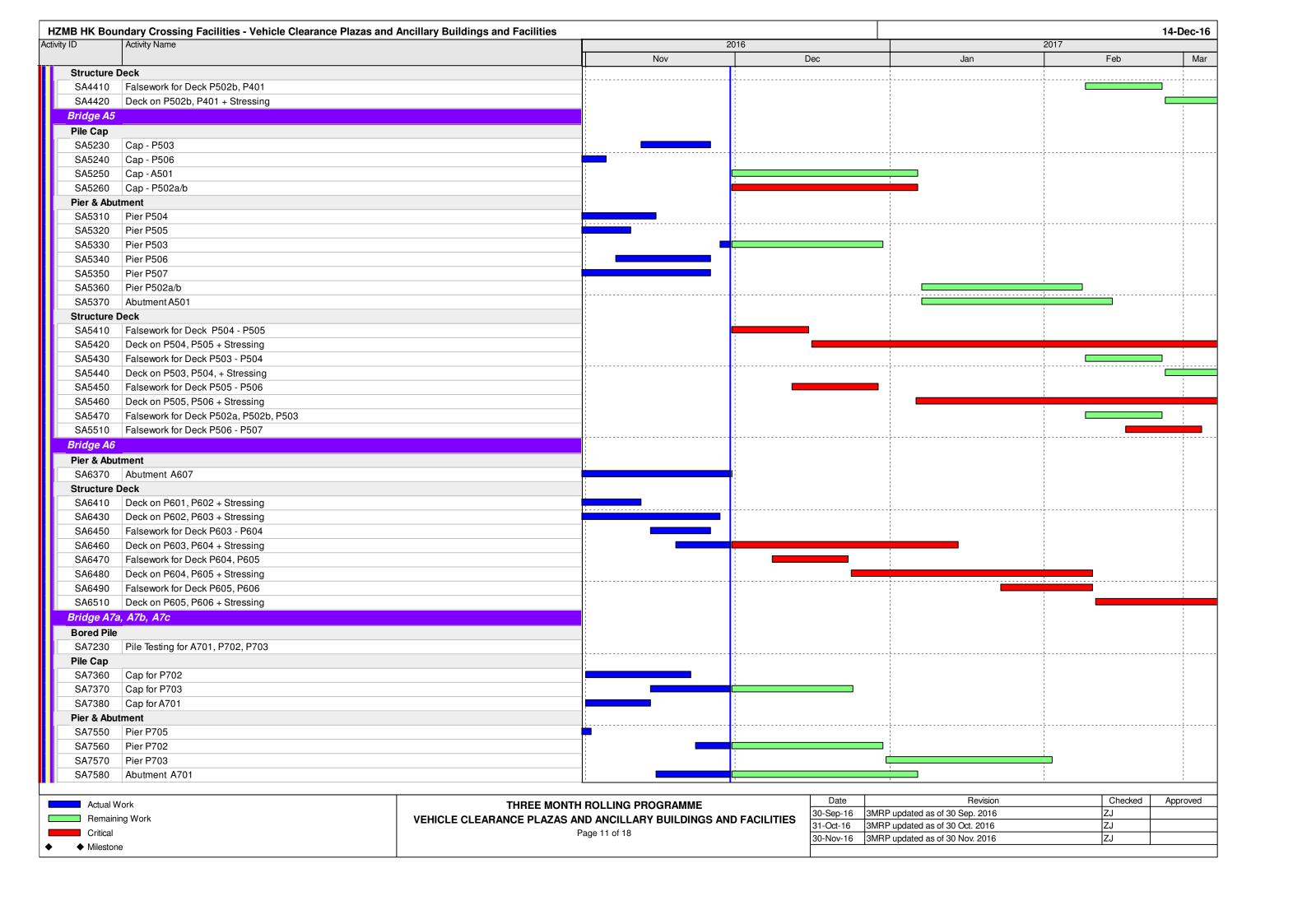


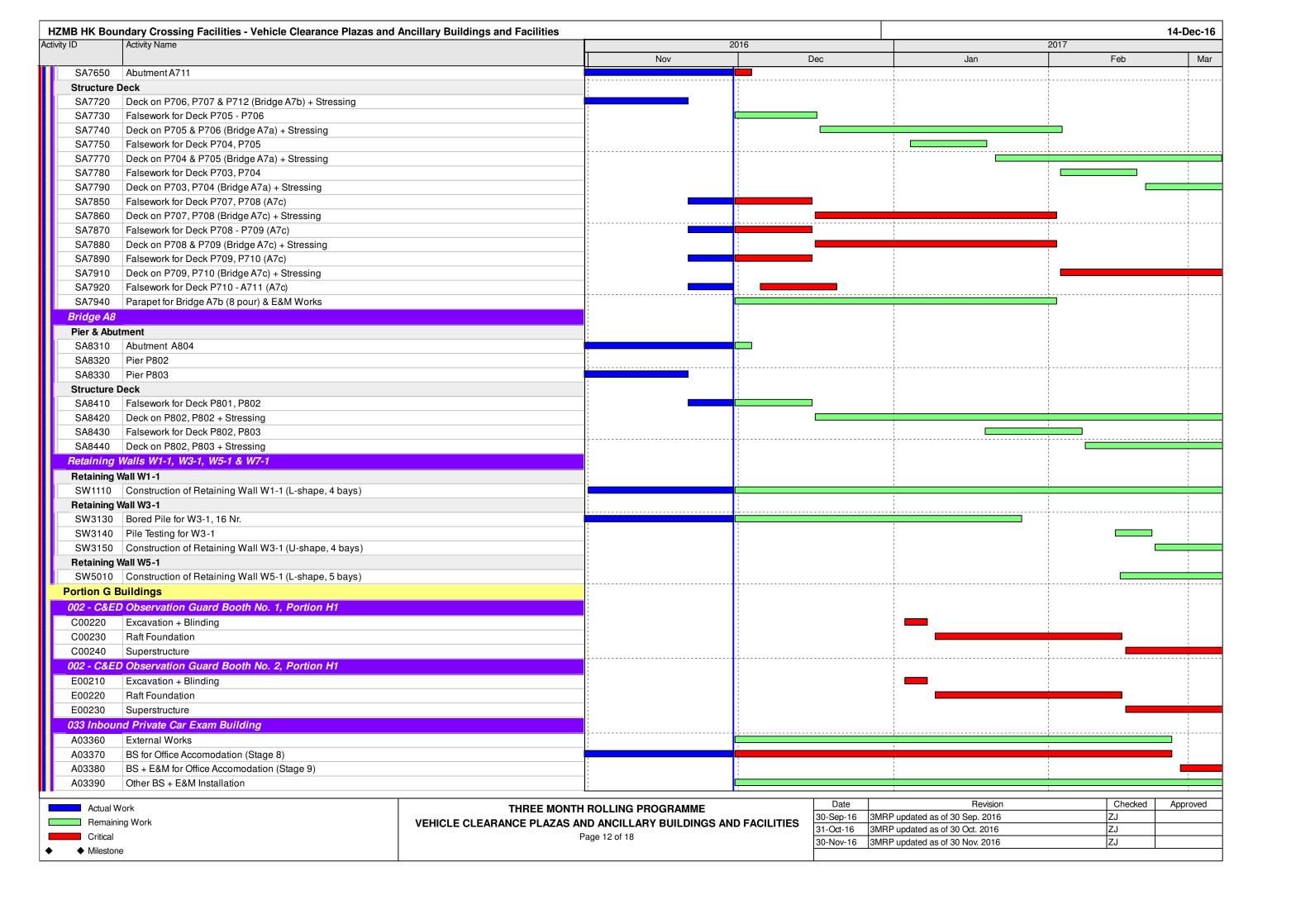


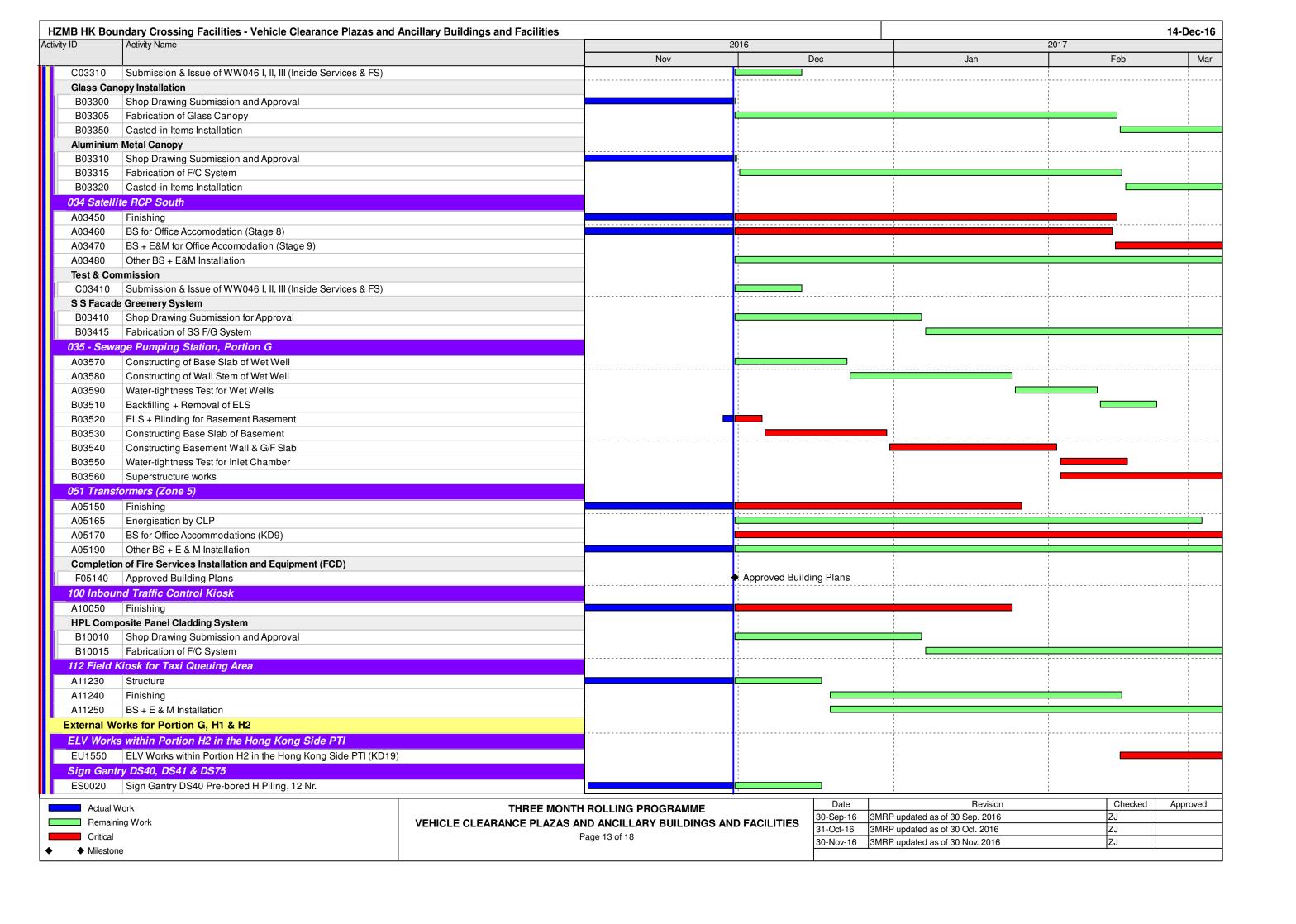


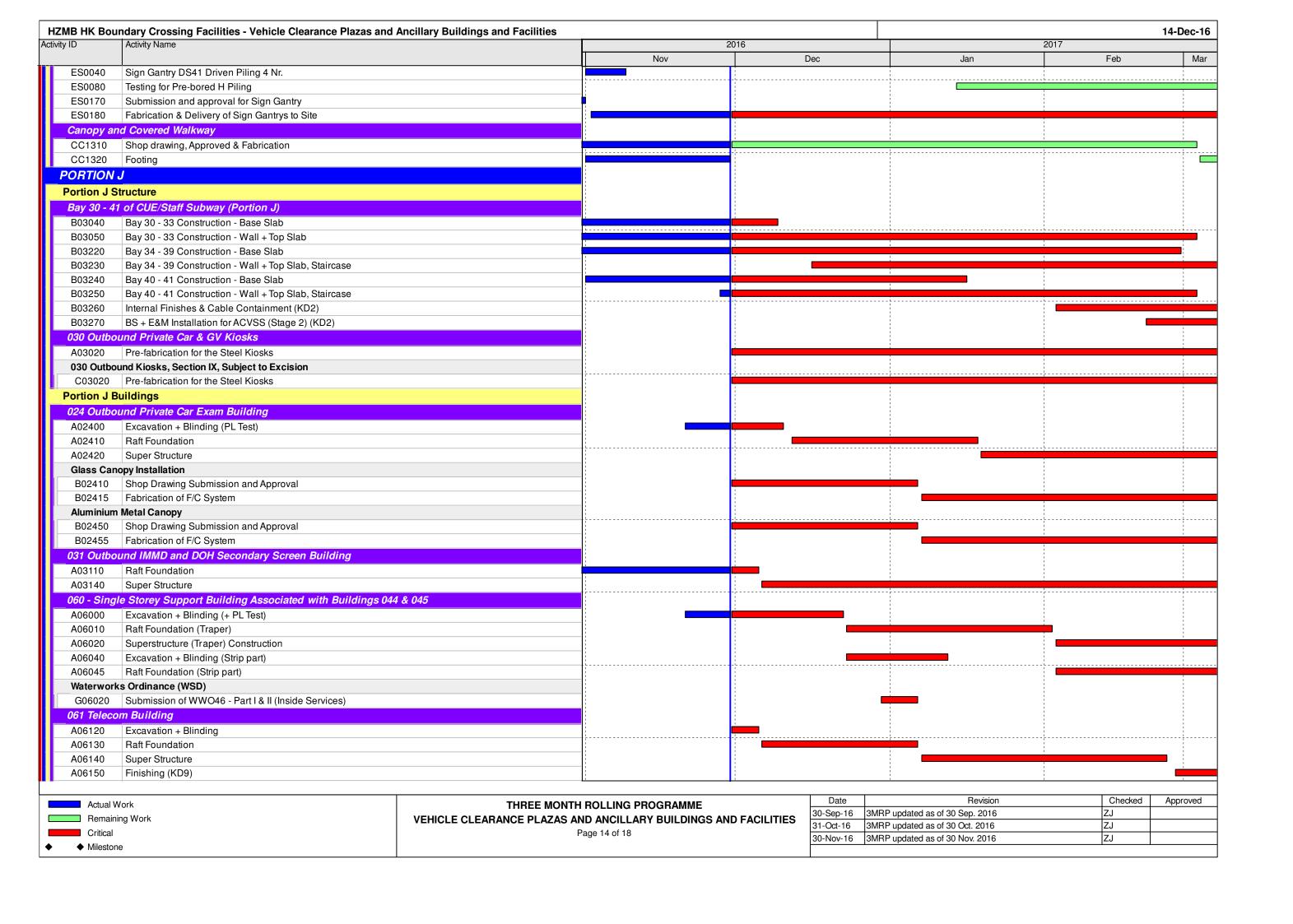


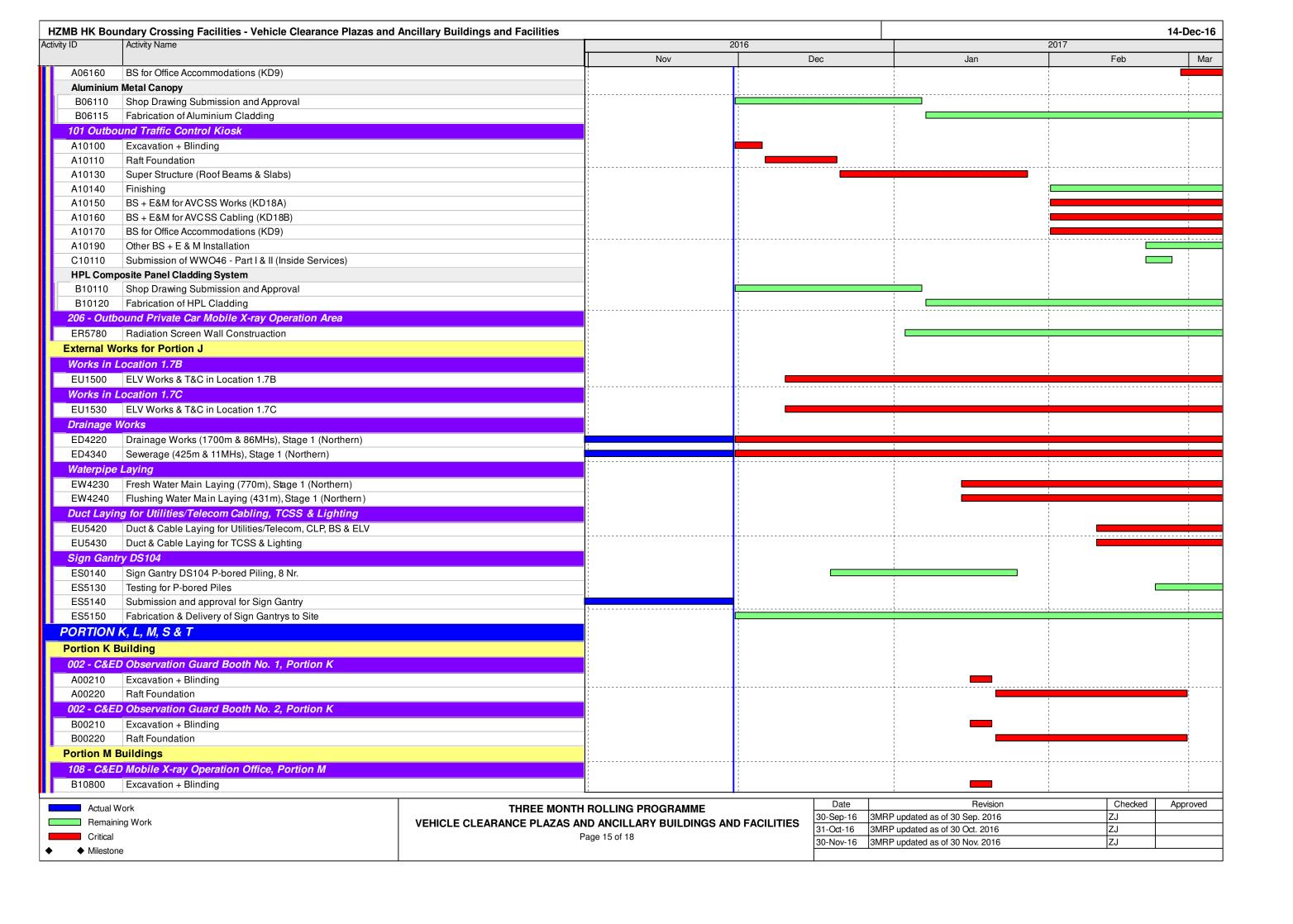


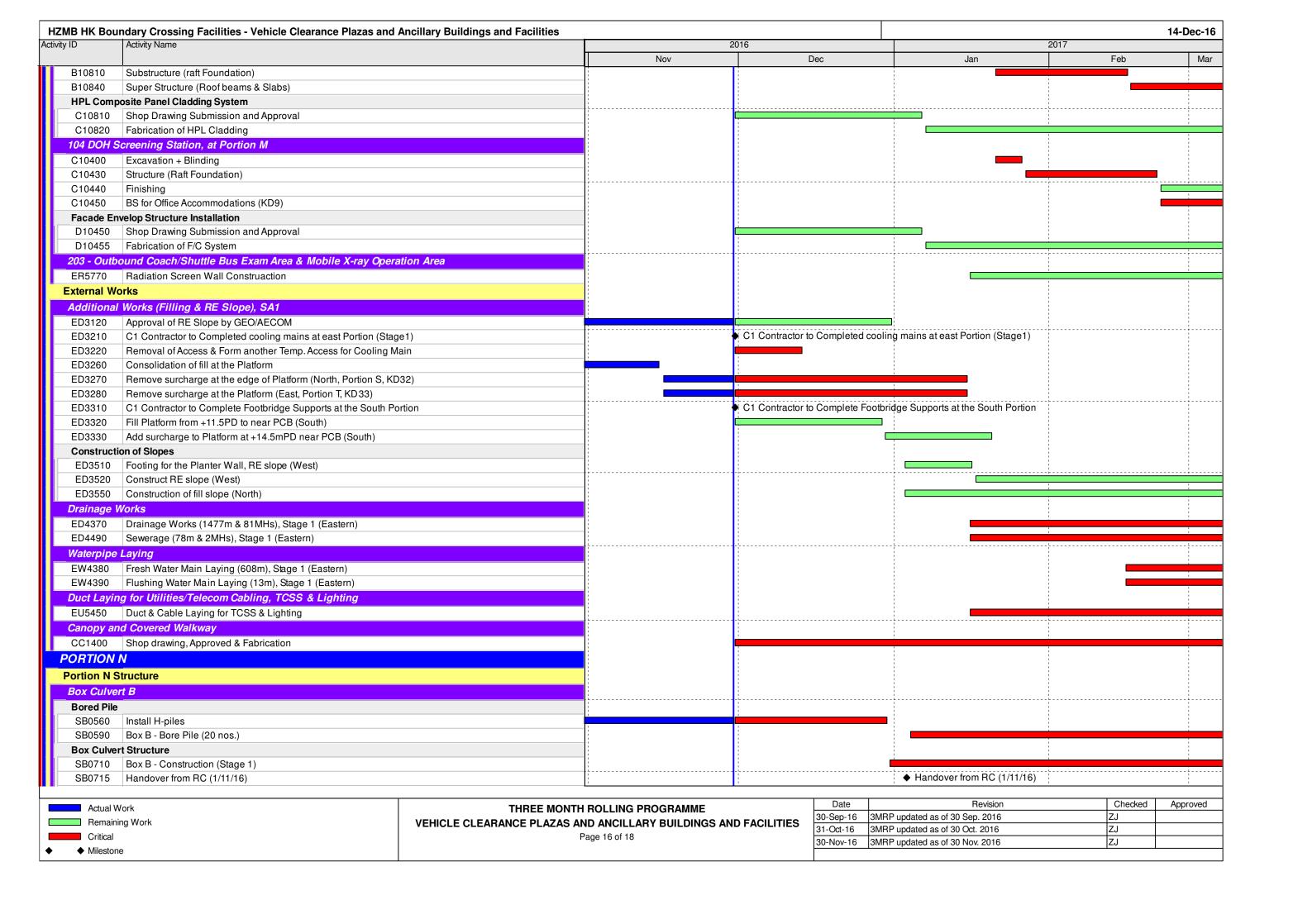


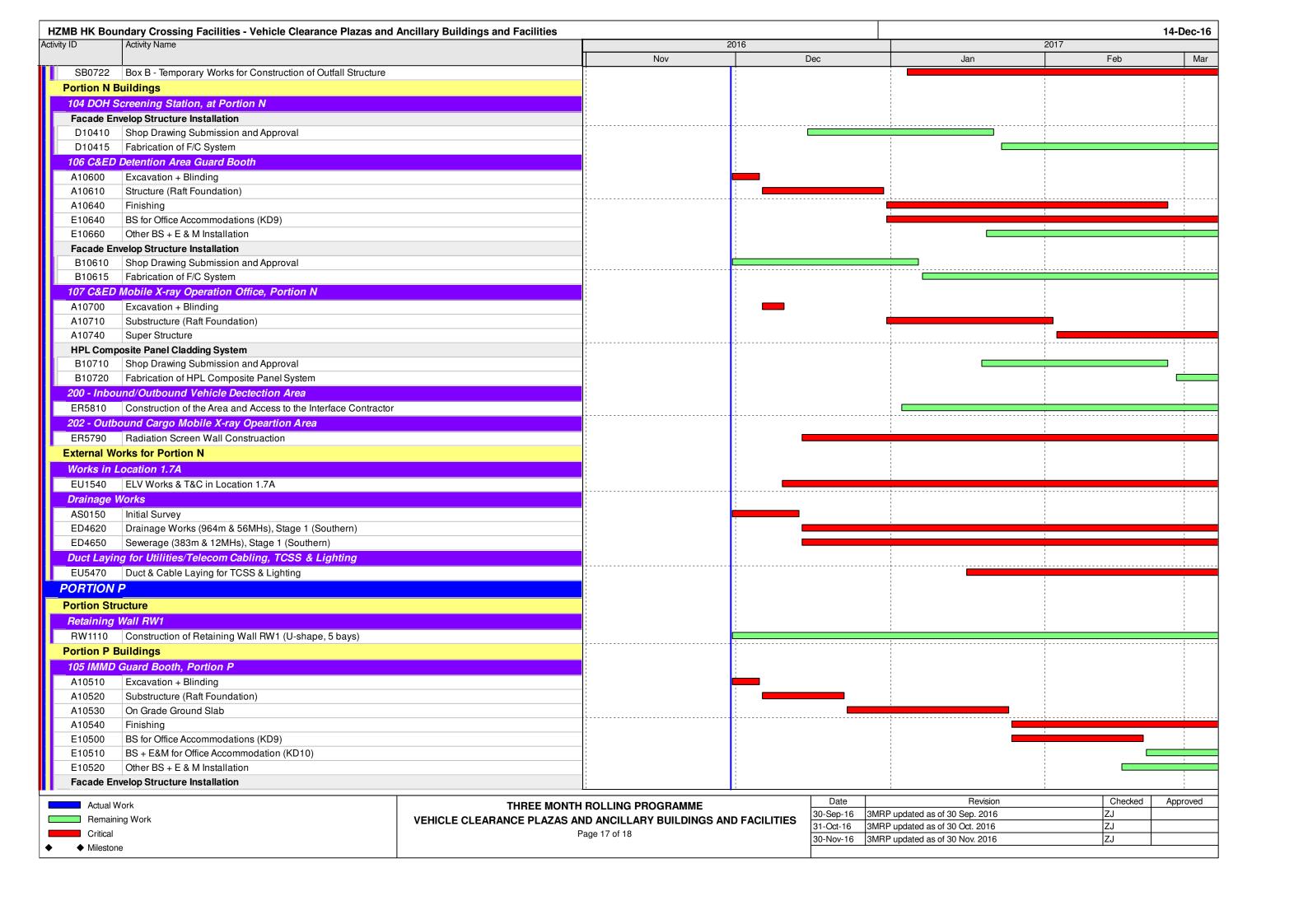


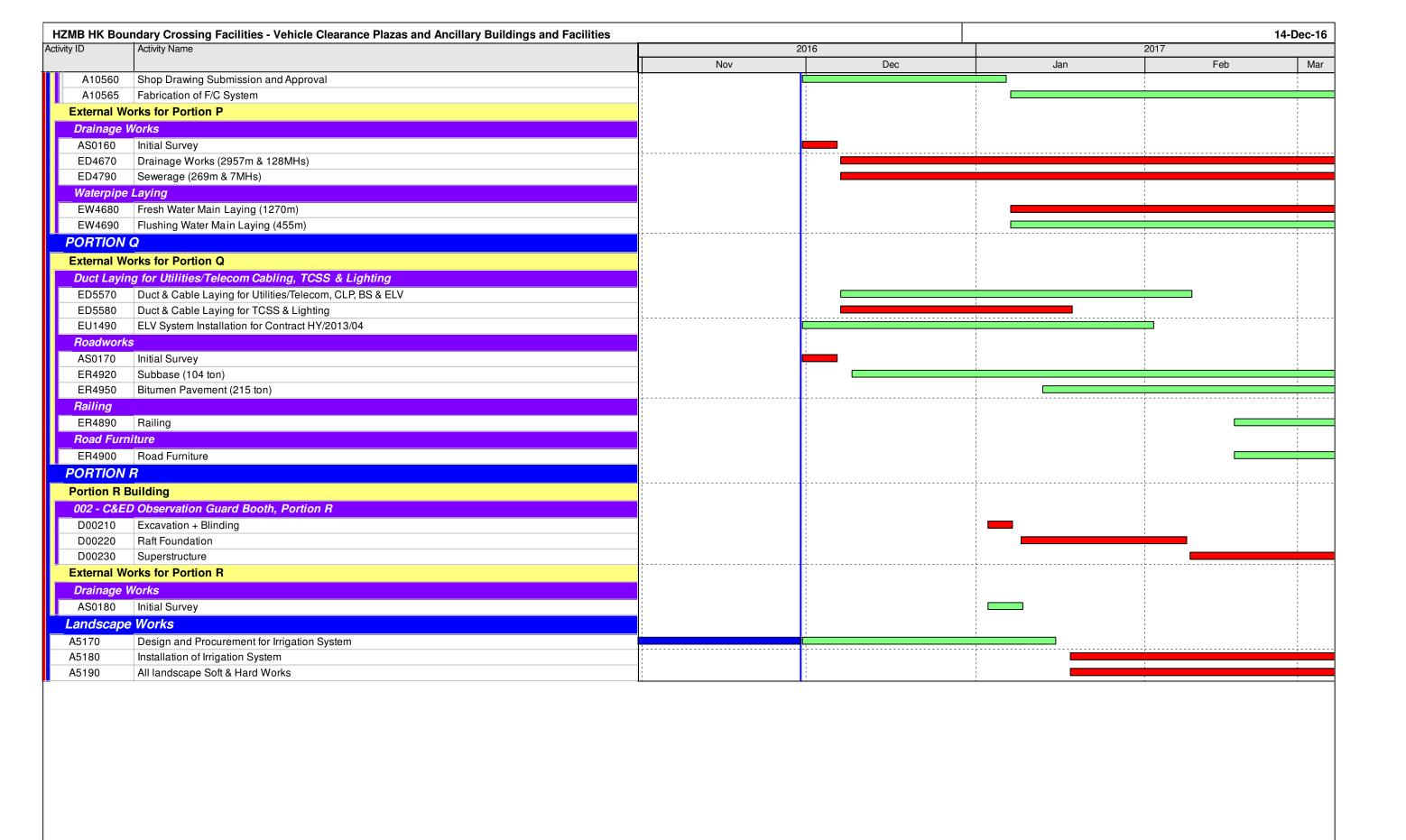






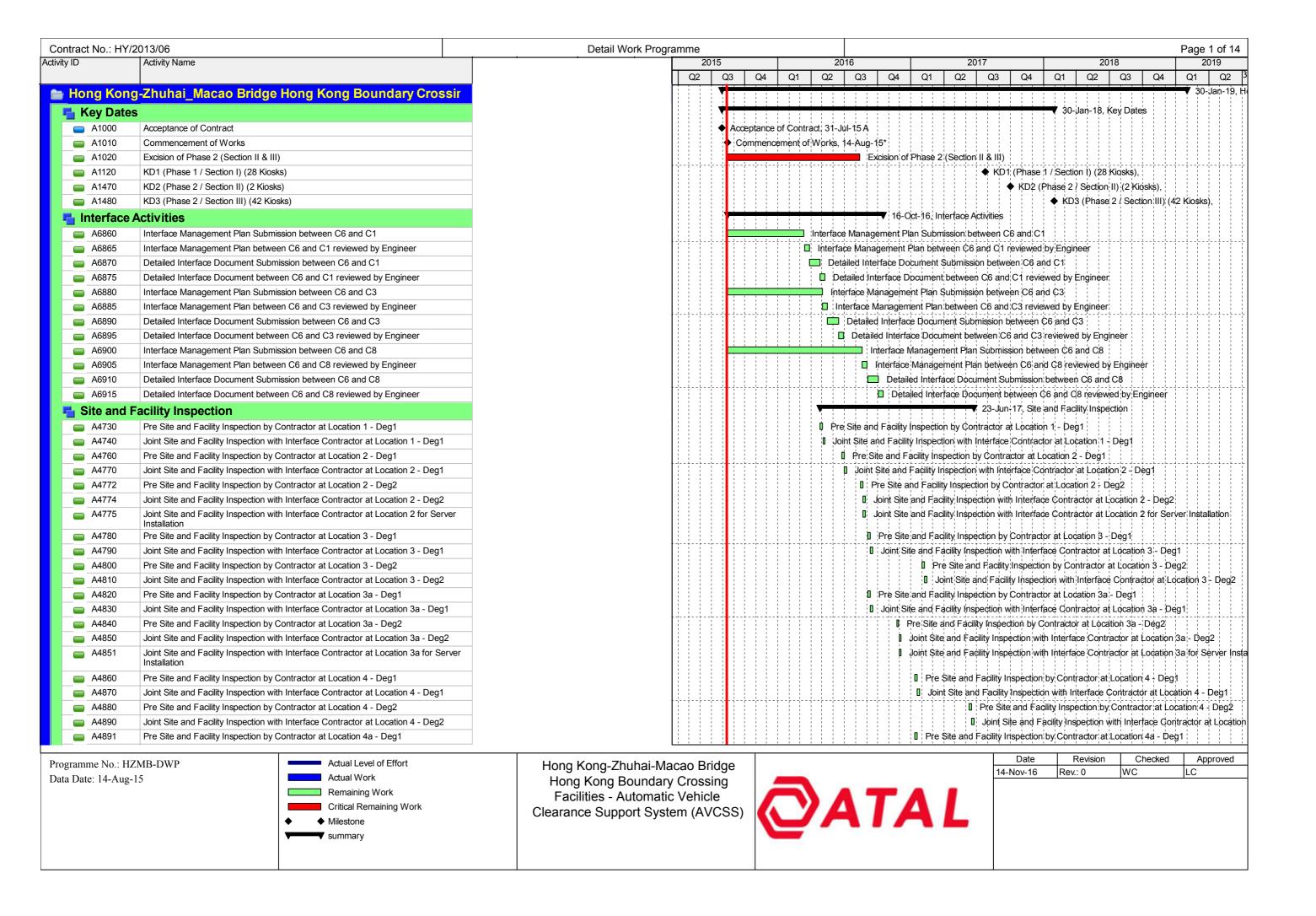






	Actual Work	THREE MONTH ROLLING PROGRAMME	Date
	Remaining Work	VEHICLE CLEARANCE PLAZAS AND ANCILLARY BUILDINGS AND FACILITIES	30-Sep-10 31-Oct-16
	Critical	Page 18 of 18	30-Nov-1
◆	Milestone		

Date	Revision	Checked	Approved
30-Sep-16	3MRP updated as of 30 Sep. 2016	ZJ	
31-Oct-16	3MRP updated as of 30 Oct. 2016	ZJ	
30-Nov-16	3MRP updated as of 30 Nov. 2016	ZJ	



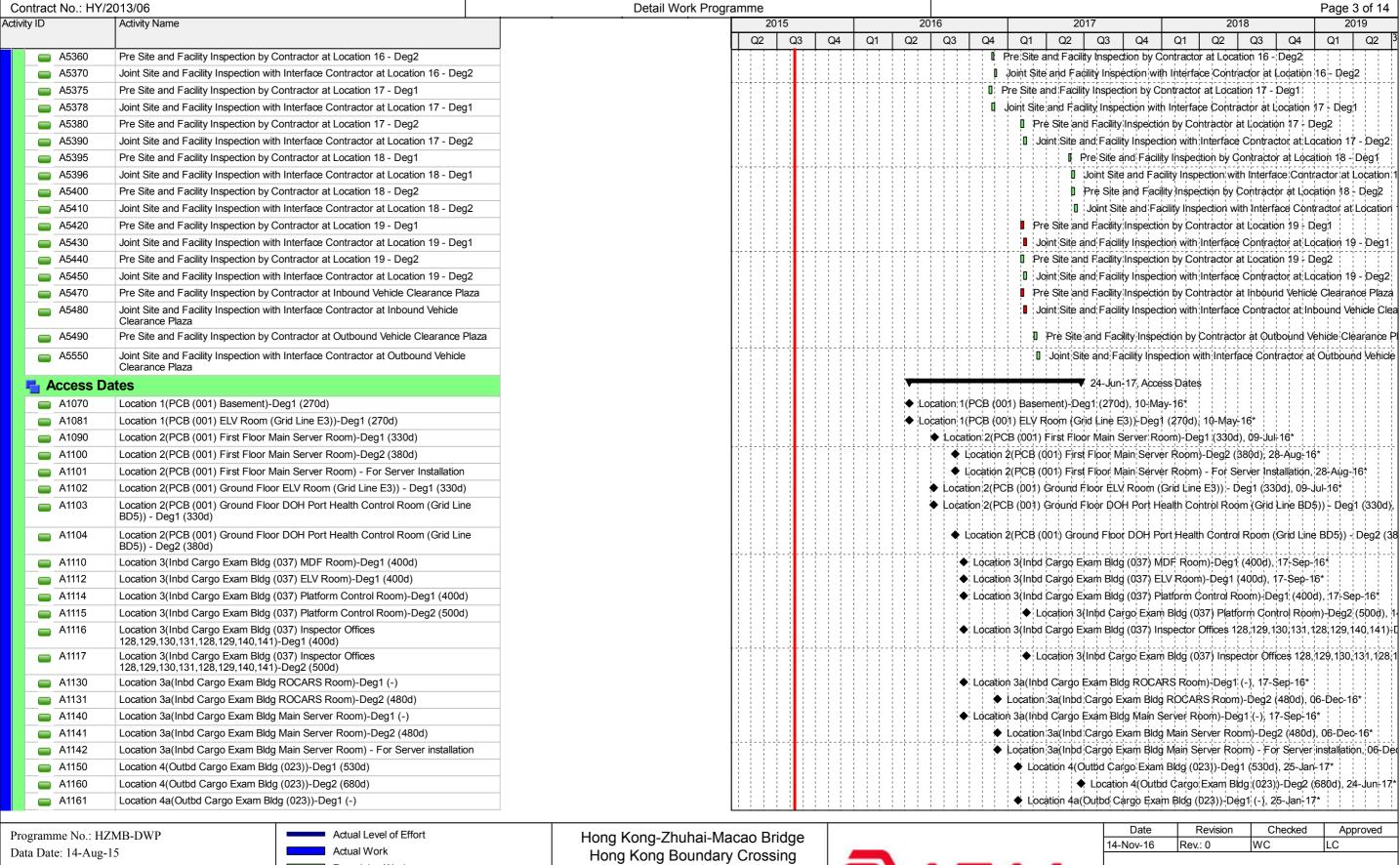
Contract No.: HY/	2013/06	Detail Work Programme									Pag	je 2 of 14
Activity ID	Activity Name	20	15			2016		2017		2018		2019
		Q2	Q3	Q4	Q1	Q2 Q3 Q4	Q1 Q2	Q3	Q4 Q1	Q2 Q3	Q4 Q1	Q2 3
A4892	Joint Site and Facility Inspection with Interface Contractor at Location 4a - Deg						Joint Site a	nd Facility Ins	spection with Ir	nterface Contracto	r at Location 4	la - Deg1
A4900	Pre Site and Facility Inspection by Contractor at Location 4a - Deg2						Pr	e Site and Fa	cility Inspectio	n by Contractor at	t Location 4a -	Deg2
A 4910	Joint Site and Facility Inspection with Interface Contractor at Location 4a - Deg2	2						oint Site and I	Facility Inspect	ion with Interface	Contractor at L	Location 4a -
■ A4920	Pre Site and Facility Inspection by Contractor at Location 5 - Deg1					Pre Site and Fa	acility Inspection	by Contractor	at Location 5	- Deg1		
■ A4930	Joint Site and Facility Inspection with Interface Contractor at Location 5 - Deg1					I Join't Site and I	Facility Inspection	n with Interfac	e Contractor	at Location 5 - De	g1	
A 4940	Pre Site and Facility Inspection by Contractor at Location 5 - Deg2					1 Pr	re Site and Facili	ty Inspection	by Contractor	at Location 5 - De	g2	
A 4950	Joint Site and Facility Inspection with Interface Contractor at Location 5 - Deg2					J	oint Site and Fac	cility Inspectio	n with Interfac	e Contractor at Lo	cation 5 - Deg	2
A4960	Pre Site and Facility Inspection by Contractor at Location 6 - Deg1					1 Pre Site	and Facility Ins	pection by Co	ntractor at Lo	cation 6 - Deg1	, , , , , , , , , , , , , , , , , , ,	
A 4970	Joint Site and Facility Inspection with Interface Contractor at Location 6 - Deg1					☐ Joint S	ite and Facility In	spection with	Interface Con	tractor at Location	6 - Deg1	
A 4980	Pre Site and Facility Inspection by Contractor at Location 6 - Deg2					□ Pre	e Site and Facilit	y Inspection b	y Contractor a	t Location 6 - Dec	92	
■ A4990	Joint Site and Facility Inspection with Interface Contractor at Location 6 - Deg2		-			jo	int Site and Faci	lity Inspection	with Interface	Contractor at Loc	ation 6 - Deg2	
■ A5000	Pre Site and Facility Inspection by Contractor at Location 7 - Deg1					Pre Site and Facility	Inspection by C	ontractor at L	ocation 7 - De	g1		
A 5010	Joint Site and Facility Inspection with Interface Contractor at Location 7 - Deg1			[]		 Joint Site and Facili 	ty Inspection with	n Interface Co	ontractor at Lo	cation 7 - Deg1		
■ A5020	Pre Site and Facility Inspection by Contractor at Location 8 - Deg1					☐ Pre S	Site and Facility I	nspection by	Contractor at	Location 8 - Deg1		
A 5030	Joint Site and Facility Inspection with Interface Contractor at Location 8 - Deg1					☐ Join	t Site and Facility	/ Inspection w	ith Interface C	ontractor at Local	tion 8 - Deg1	
■ A5040	Pre Site and Facility Inspection by Contractor at Location 8 - Deg2						1 1 1 1 1 1	Pre Site and F	acility Inspecti	on by Contractor	at Location 8 -	Deg2
■ A5050	Joint Site and Facility Inspection with Interface Contractor at Location 8 - Deg2							Joint Site and	Facility Inspec	tion with Interface	Contractor at	Location 8 -
■ A5060	Pre Site and Facility Inspection by Contractor at Location 9 - Deg1						Pre Site and	Facility Inspe	ction by Contr	actor at Location 9	9 - Deg1	
■ A5070	Joint Site and Facility Inspection with Interface Contractor at Location 9 - Deg1						I Joint Site an	nd Facility Insp	ection with Int	erface Contractor	at Location 9	- Deg1
■ A5080	Pre Site and Facility Inspection by Contractor at Location 9 - Deg2							Pre Site and	Facility Inspec	tion by Contracto	r at Location 9	- Deg2
■ A5090	Joint Site and Facility Inspection with Interface Contractor at Location 9 - Deg2						11111	Joint Site an	nd Facility Insp	ection with Interfac	ce Contractor	at Location 9
■ A5100	Pre Site and Facility Inspection by Contractor at Location 10 - Deg1					G 1	Pre Site and Fac	cility Inspectio	n by Contracto	r at Location 10 -	Deg1	
A 5110	Joint Site and Facility Inspection with Interface Contractor at Location 10 - Deg						Joint Site and F	acility Inspect	ion with Interfa	ce Contractor at I	Location 10 - D	Deg1
■ A5120	Pre Site and Facility Inspection by Contractor at Location 10 - Deg2						Pre Site a	and Facility Ins	spection by Co	ntractor at Location	n 10 - Deg2	
■ A5130	Joint Site and Facility Inspection with Interface Contractor at Location 10 - Deg2	2					Joint Site	and Facility I	nspection with	Interface Contrac	tor at Location	10 - Deg2
A 5140	Pre Site and Facility Inspection by Contractor at Location 11 - Deg1					1 Pre Site	and Facility Ins	pection by Co	ntractor at Lo	cation 11 - Deg1		
A5150	Joint Site and Facility Inspection with Interface Contractor at Location 11 - Deg1					☐ Joint S	ite and Facility In	spection with	Interface Con	tractor at Location	11 - Deg1	
A5160	Pre Site and Facility Inspection by Contractor at Location 11 - Deg2			fii	;; <u>;</u>		Pre Site and Fac	cility Inspectio	n by Contracto	r at Location 11 -	Deg2	
A5170	Joint Site and Facility Inspection with Interface Contractor at Location 11 - Deg2						Joint Site and F	acility Inspect	ion with Interfa	ce Contractor at l	Location 11 - D	eg2
A5180	Pre Site and Facility Inspection by Contractor at Location 12 - Deg1						1 1 1 1 1 1	1 1 1 1		cation 12 - Deg1		
■ A5190	Joint Site and Facility Inspection with Interface Contractor at Location 12 - Deg								: : : : :	tractor at Location	12 - Deg1	
A5200	Pre Site and Facility Inspection by Contractor at Location 12 - Deg2							1 1 1 1		or at Location 12 -		
A5210	Joint Site and Facility Inspection with Interface Contractor at Location 12 - Deg2	1								ice Contractor at I		Deg2
■ A5220	Pre Site and Facility Inspection by Contractor at Location 13 - Deg1							1 1 1 1		or at Location 13 -		
A5230	Joint Site and Facility Inspection with Interface Contractor at Location 13 - Deg						1 1 1 1 1 1	i i i i	1 7 1 1 1	ce Contractor at I		Deg1
■ A5240	Pre Site and Facility Inspection by Contractor at Location 13 - Deg2							1 1 1 1		ntractor at Location		
A5250	Joint Site and Facility Inspection with Interface Contractor at Location 13 - Deg2						1 1 1 1 1 1	1 1 1 1 1		Interface Contrac		13 - Deg2
A5260	Pre Site and Facility Inspection by Contractor at Location 14 - Deg1							- +	i r ii r	by Contractor at L	i i i i i i	
■ A5270	Joint Site and Facility Inspection with Interface Contractor at Location 14 - Deg							1 1 1 1	1 1 1 1 1	n with Interface Co		
■ A5300	Pre Site and Facility Inspection by Contractor at Location 15 - Deg1					1 Pre Site	1 1 1 1 1 1	i i i i		cation 15 - Deg1		
■ A5310	Joint Site and Facility Inspection with Interface Contractor at Location 15 - Deg								: : : : :	tractor at Location	15 - Dea1	
■ A5320	Pre Site and Facility Inspection by Contractor at Location 15 - Deg2						1 1 1 1 1 1	1 1 1 1		or at Location 15 -		
■ A5330	Joint Site and Facility Inspection with Interface Contractor at Location 15 - Deg2	2				- i i i i i i i i <u>i</u>	- 6 - 56 - 65 - 6 - 66 - 65		iiiii	ice Contractor at I		eg2
A5340	Pre Site and Facility Inspection by Contractor at Location 16 - Deg1							1 7 1 1		cation 16 - Deg1		3
A5350	Joint Site and Facility Inspection with Interface Contractor at Location 16 - Degr							1 1 1 1		tractor at Location	16 - Dea1	
7,0000		<u>. </u>	i i	<u>. i i </u>	<u>. i i</u>		and doing			The state of the s	ייפיי יי	<u> </u>
Programme No.: HZ	ZMB-DWP Actual Level of Effort	Llong Mana 7hishai Masas De	das						Date I	Revision CI	hecked /	Approved
_		Hong Kong-Zhuhai-Macao Bri	•					14-No	v-16 Rev	:: 0 WC	LC	
Data Date: 14-Aug-	-13 Adda Work	Hong Kong Boundary Cross	ına	_ [//								

Data Date: 14-Aug-15

Remaining Work Critical Remaining Work summary



Date	Revision	Checked	Approved
14-Nov-16	Rev.: 0	WC	LC



Actual Work

Remaining Work

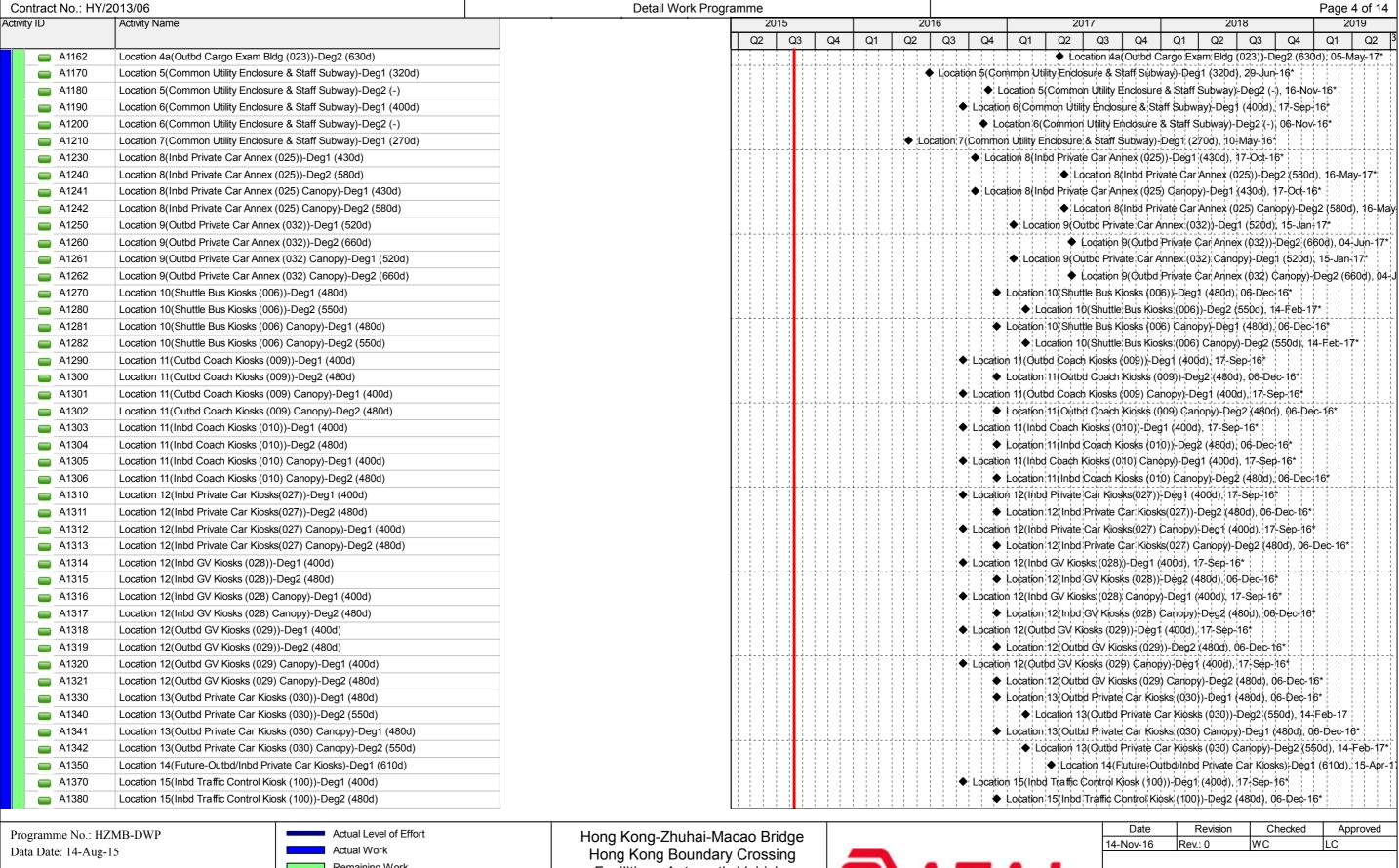
Critical Remaining Work

Milestone

summary

Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities - Automatic Vehicle Clearance Support System (AVCSS)

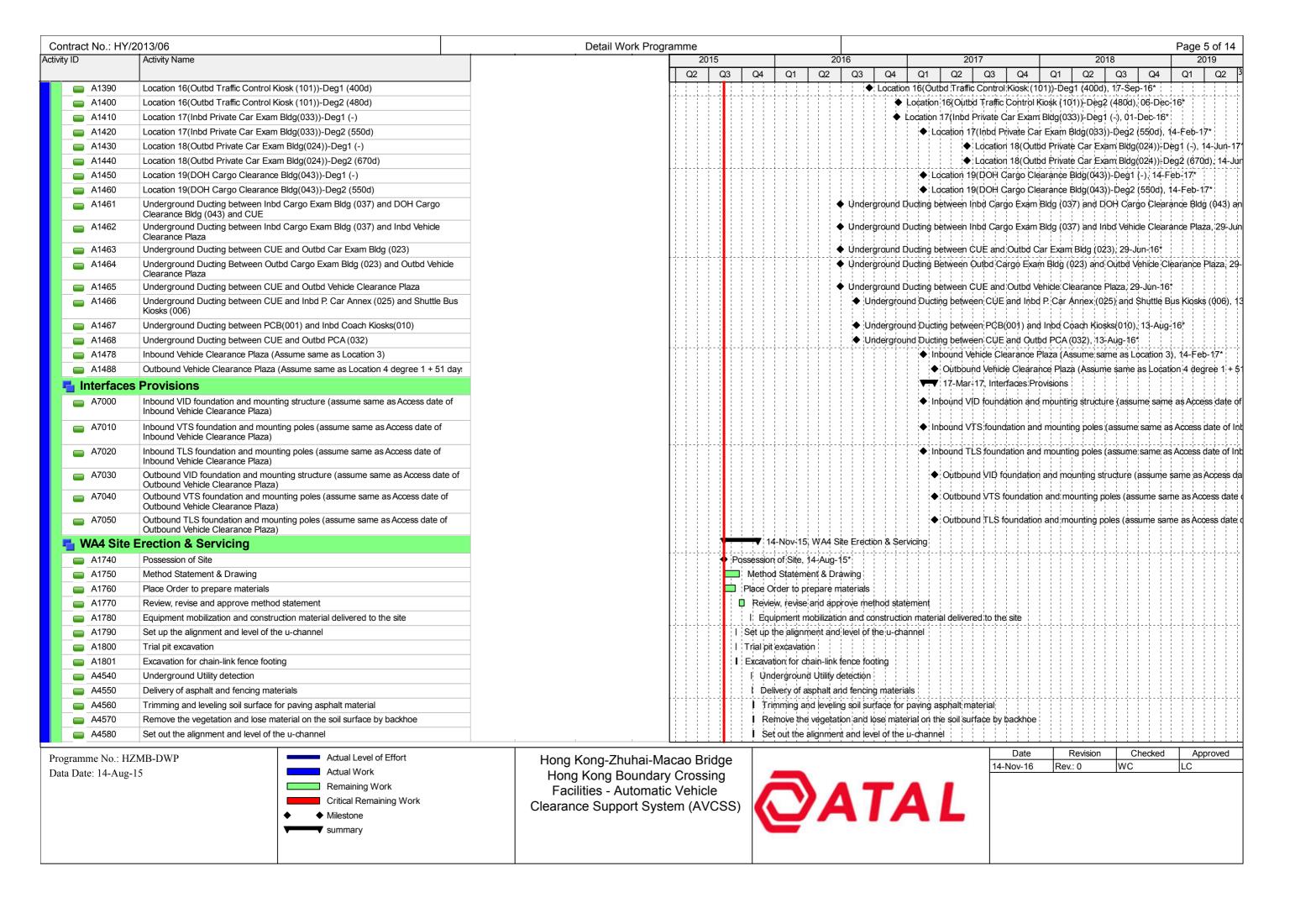


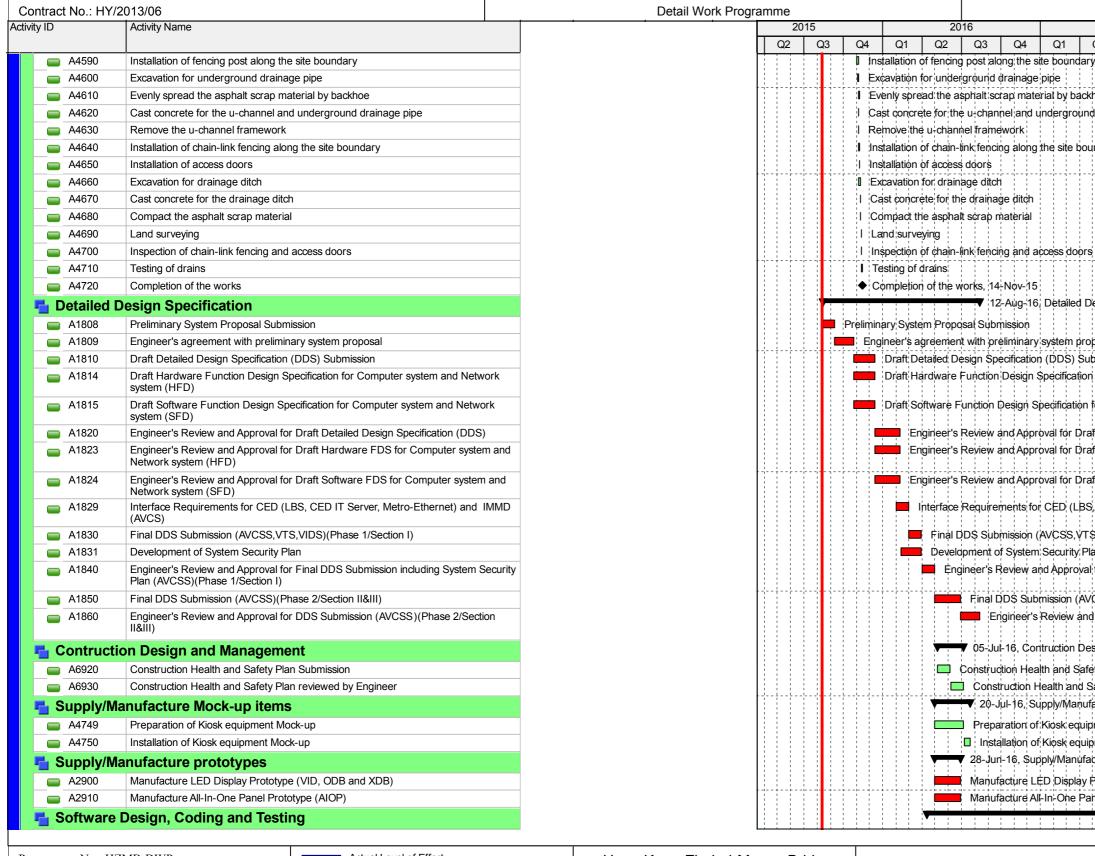


Remaining Work Critical Remaining Work ◆ Milestone summary

Facilities - Automatic Vehicle Clearance Support System (AVCSS)







I Excavation for underground drainage pipe I Evenly spread the asphalt scrap material by backhoe Cast concrete for the u-channel and underground drainage pipe Remove the u-channel framework Installation of chain-link fencing along the site boundary Installation of access doors Excavation for drainage ditch I Cast concrete for the drainage ditch I Compact the asphalt scrap material I Land surveying I Inspection of chain-link fencing and access doors I Testing of drains Completion of the works, 14-Nov-15 ■ 12-Aug-16, Detailed Design Specification Preliminary System Proposal Submission Engineer's agreement with preliminary system proposal Draft Detailed Design Specification (DDS) Submission Draft Hardware Function Design Specification for Computer system and Network system (HFD) Draft Software Function Design Specification for Computer system and Network system (SFD) Engineer's Review and Approval for Draft Detailed Design Specification (DDS) Engineer's Review and Approval for Draft Handware FDS for Computer system and Network system (HFD) Engineer's Review and Approval for Draft Software FDS for Computer system and Network system (SFD): Interface Requirements for CED (LBS, CED IT Server, Metro-Ethernet) and IMMD (AVC\$) Final DD\$ Submission (AVCSS,VT\$,VID\$)(Phase 1/Section I) Development of System Security Plan Engineer's Review and Approval for Final DDS Submission including System Security Plan (AVCSS) (Phase Final DD\$ Submission (AVCSS)(Phase 2/Section II&III) Engineer's Review and Approval for DDS Submission (AVCSS)(Phase 2/Section [I&II]) 05-Jul-16, Contruction Design and Management Construction Health and Safety Plan Submission Construction Health and Safety Plan reviewed by Engineer 20-Jul-16, Supply/Manufacture Mock-up items Preparation of Kiosk equipment Mock-up Installation of Kiosk equipment Mock-up ▼ 28-Jun-16, Supply/Manufacture prototypes Manufacture LED Display Prototype (VID, ODB and XDB) Manufacture All-In-One Panel Prototype (AIOP) ▼ 22-May-17, Software Design, Coding and Testing

2017

Q3

Q2

2016

Q3

Q4

Q2

Programme No.: HZMB-DWP Data Date: 14-Aug-15

 Actual Level of Effort Actual Work Remaining Work Critical Remaining Work Milestone summary

Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities - Automatic Vehicle Clearance Support System (AVCSS)



14-Nov-16 Rev.: 0 WC LC	Date	Revision	Checked	Approved
	14-Nov-16	Rev.: 0	WC	LC

Page 6 of 14

2019

Q2

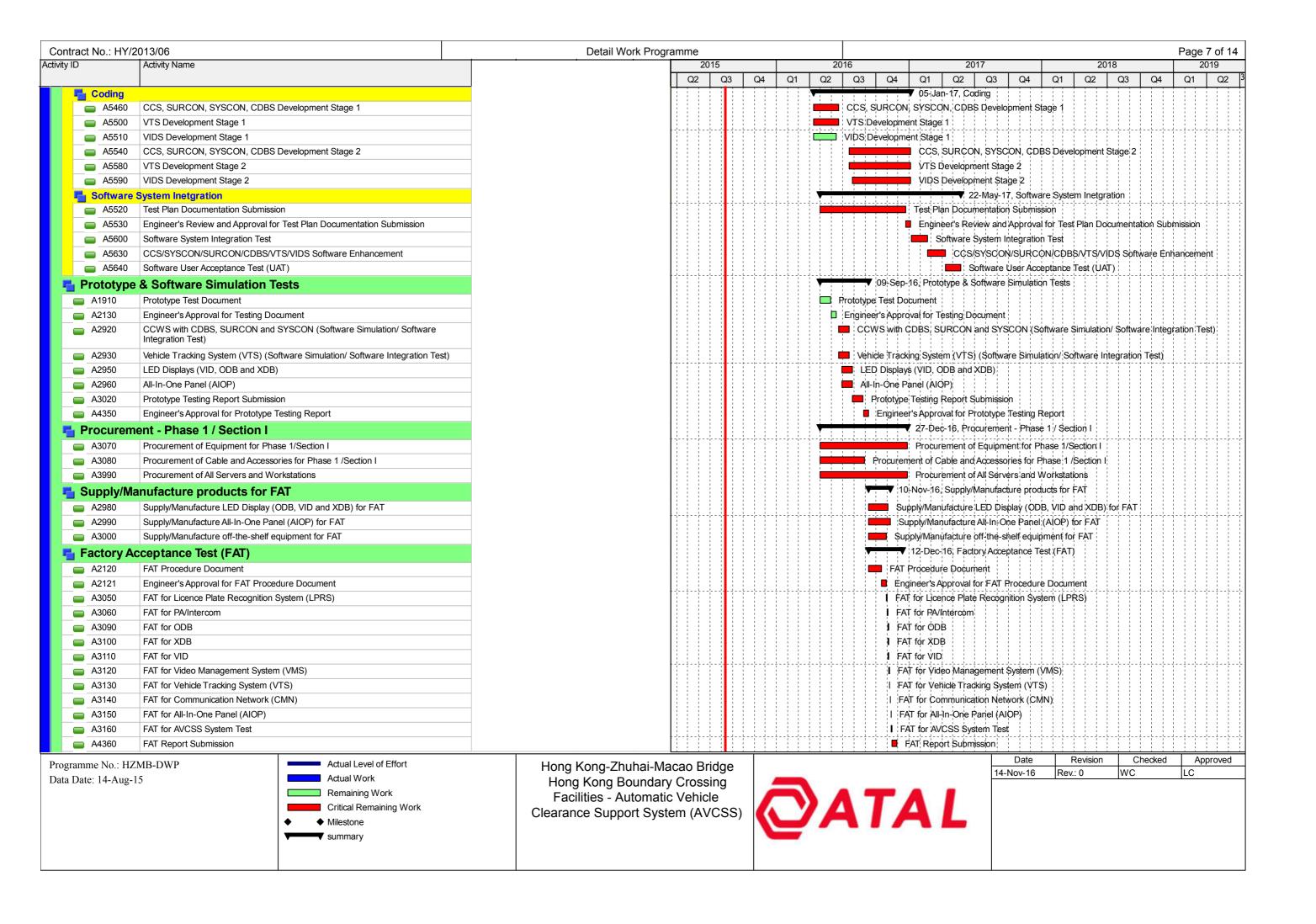
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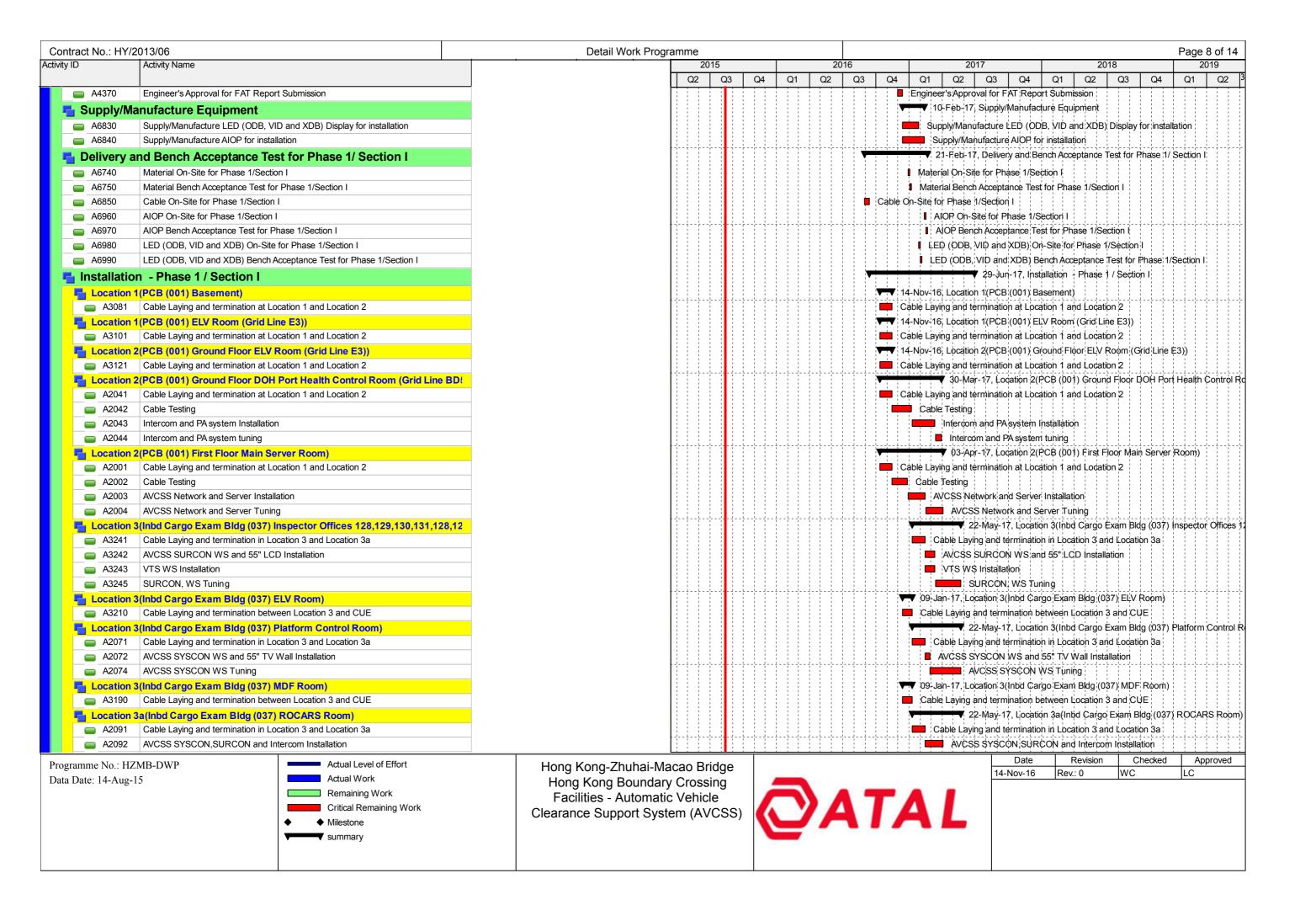
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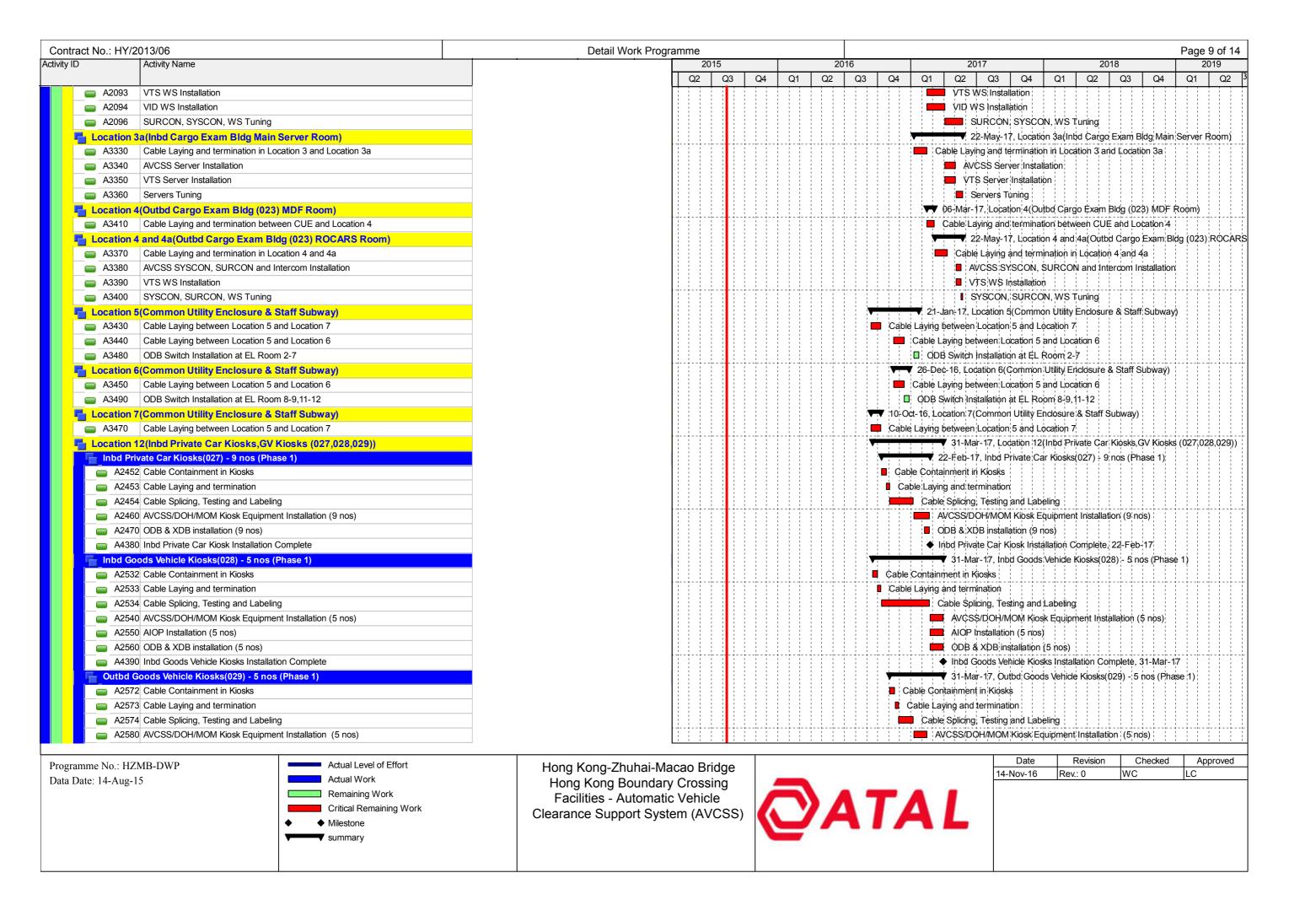
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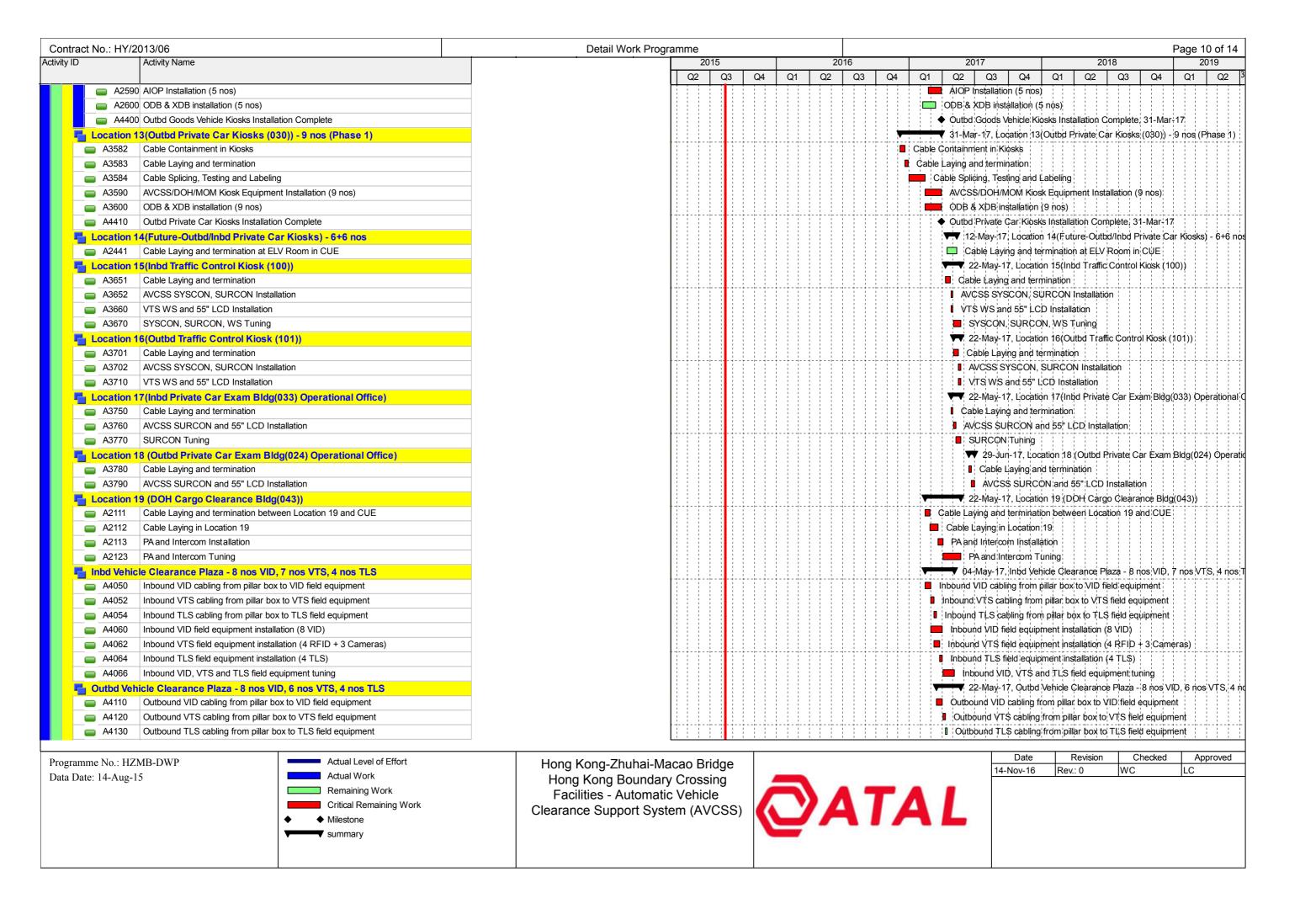
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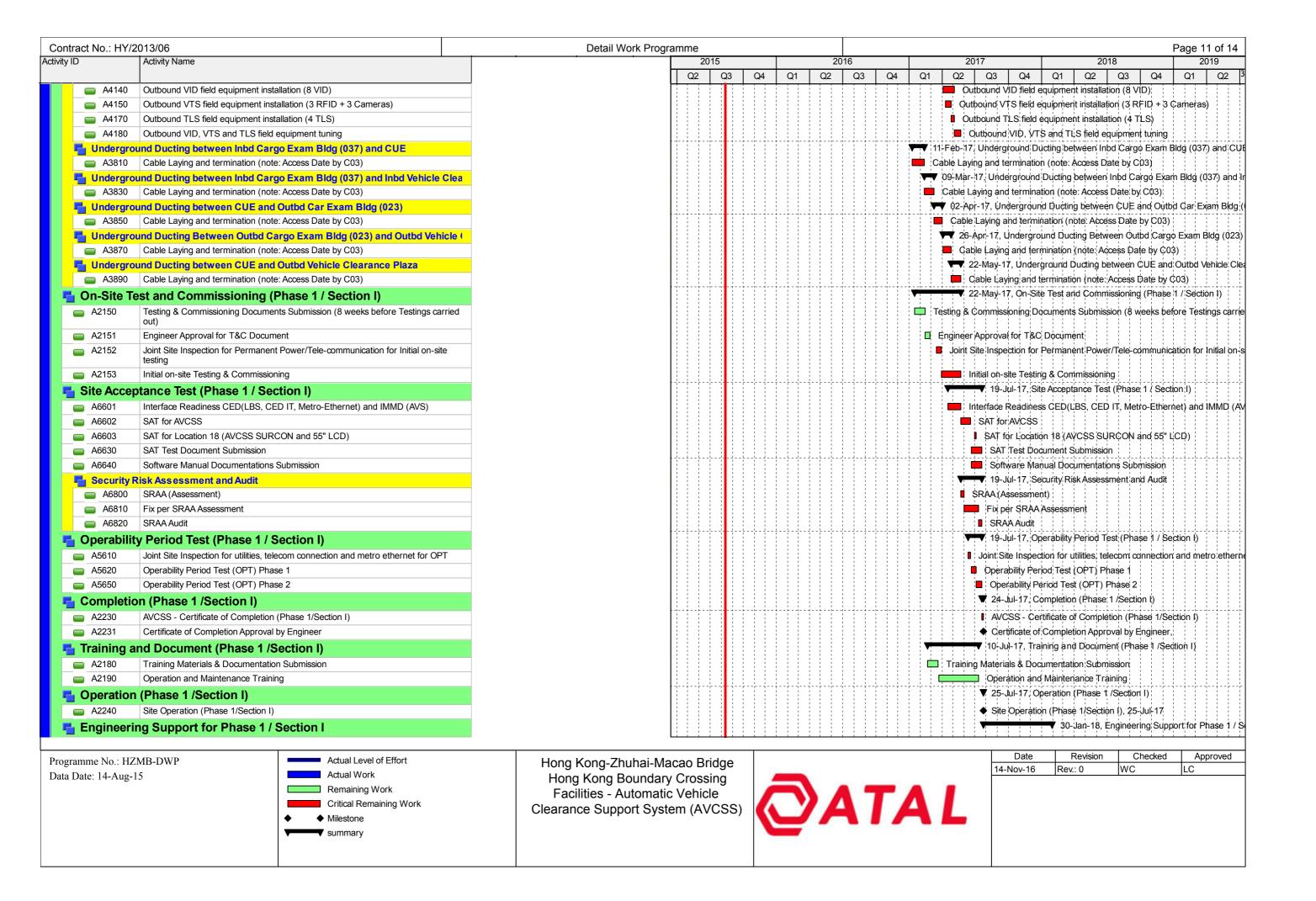
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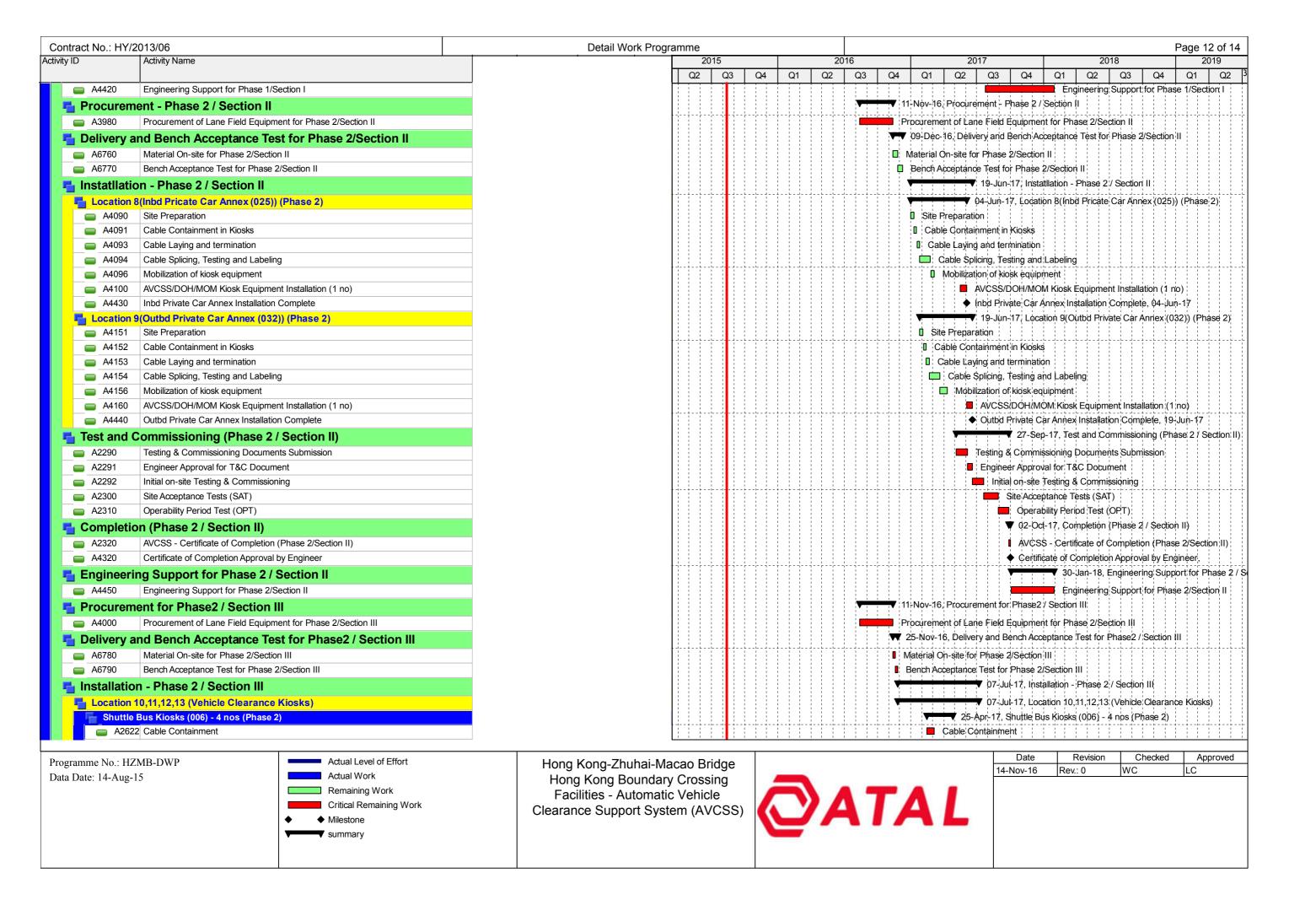


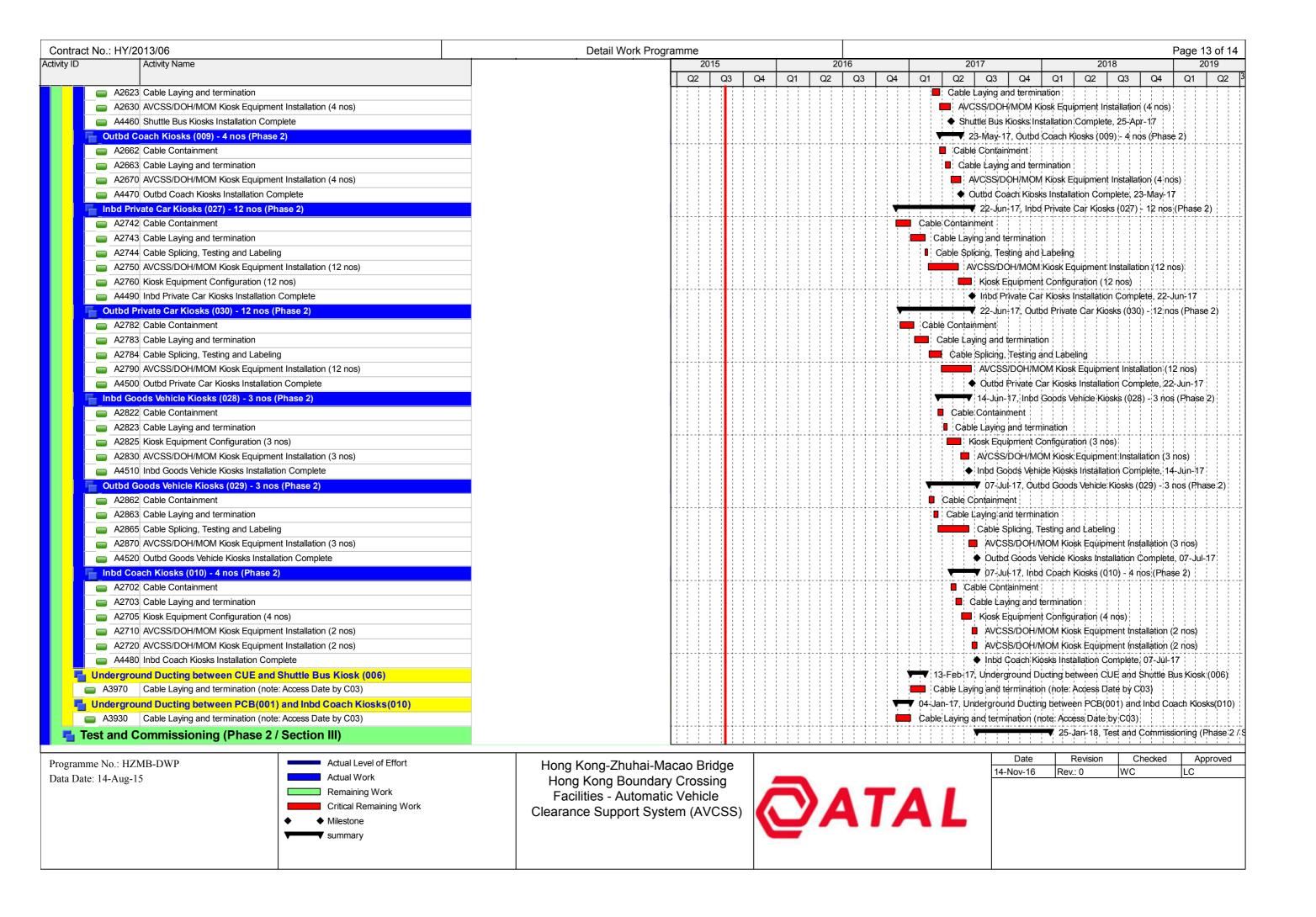


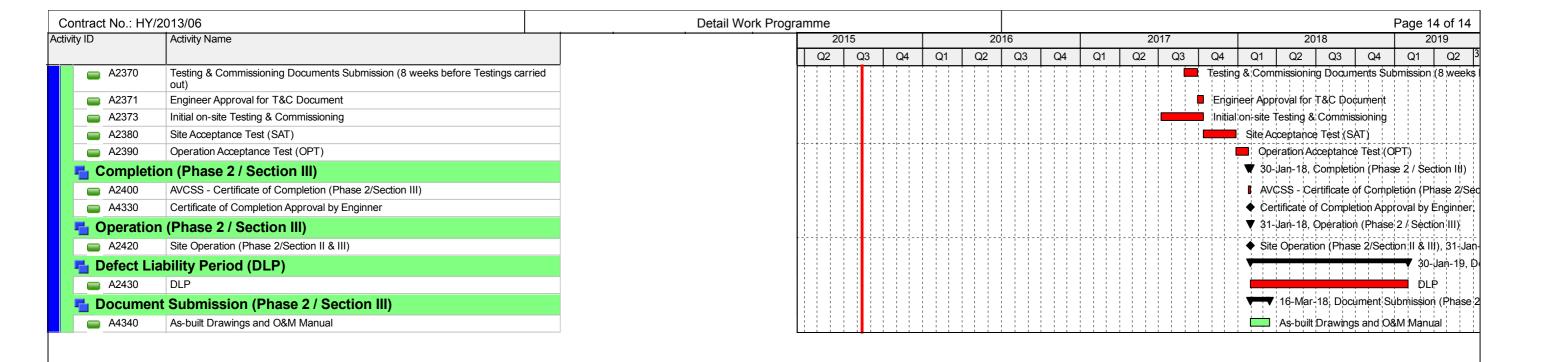












Programme No.: HZMB-DWP Data Date: 14-Aug-15

Actual Level of Effort

Actual Work

Remaining Work

Critical Remaining Work

Milestone

summary

Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities - Automatic Vehicle Clearance Support System (AVCSS)



Date	Revision	Checked	Approved
14-Nov-16	Rev.: 0	wc	LC

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Report No.: 0165/15/ED/0653

Appendix D

Event / Action Plan

Appendix D -

Event / Action Plan for Air Quality and Noise Monitoring

Event / Action Plan for Air Quality

Event	Action						
	ET	IEC	ER	Contractor			
Action Level							
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measureme nt to confirm finding; 4. Increase monitoring frequency to daily.	 Check monitoring data submitted by ET; Check Contractor's working method. 	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.			

Event	Action				
	ET	IEC	ER	Contractor	
Exceedance for two or more consecutive samples	 Identify source; Inform IEC and ER; Advise the ER on the effectiveness of the proposed remedial measures; Repeat measurement s to confirm findings; Increase monitoring frequency to daily; Discuss with IEC and Contractor on remedial actions required; If exceedanc e continues, arrange meeting with IEC and ER; If exceedanc e stops, cease additional monitoring. 	 Check monitoring data submitted by ET; Check Contractor's working method; Discuss with ET and Contractor on possible remedial measures; Advise the ER on the effectiveness of the proposed remedial measures; Supervise Implementatio n of remedial measures. 	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.	

Event	Action						
	ET	IEC	ER	Contractor			
Limit Level							
1. Exceedance for one sample	 Identify source, investigate the causes of exceedance a nd propose remedial measures; Inform ER, Contractor and EPD; Repeat measurement to confirm finding; Increase monitoring frequency to daily; Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 	 Check monitoring data submitted by ET; Check Contractor's working method; Discuss with ET and Contractor on possible remedial measures; Advise the ER on the effectiveness of the proposed remedial measures; Supervise implementatio n of remedial measures. 	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	 Take immediate action to avoid further exceedance; Submit proposals for remedial actions to IEC within 3 working days of notification; Implement the agreed proposals; Amend proposal if appropriate. 			

Event		Act	ion	
Event	ET	IEC	ER	Contractor
2. Exceedance for two or more consecutive samples	 Notify IEC, ER, Contractor and EPD; Identify source; Repeat measurement to confirm findings; Increase monitoring frequency to daily; Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; Arrange meeting with IEC and ER to discuss the remedial actions to be taken; Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; If exceedance stops, cease additional monitoring. 	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	 Confirm receipt of notification of failure in writing; Notify Contractor; In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; Ensure remedial measures properly implemented; If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	 Take immediate action to avoid further exceedance; Submit proposals for remedial actions to IEC within 3 working days of notification; Implement the agreed proposals; Resubmit proposals if problem still not under control; Stop the relevant portion of works as determined by the ER until the exceedances abated.

Event / Action Plan for Construction Noise Monitoring

Event	Action						
	ET	IEC	ER	Contractor			
Action Level	1. Notify IEC and Contractor; 2. Identify source, investigate the causes of exceedance and propose remedial measures; 3. Report the results of investigation to the IEC,ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented.	1.Submit noise mitigation proposals to IEC; 2.Implement noise mitigation proposals.			

Event	Action						
	ET	IEC	ER	Contractor			
Limit Level	1.Inform IEC, ER, EPD and Contractor; 2.Identify source; 3.Repeat measurements to confirm findings; 4.Increase monitoring frequency; 5.Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6.Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7.Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8.If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1.Confirm receipt of notification of failure in writing; 2.Notify Contractor; 3.Require Contractor to propose remedial measures for the analysed noise problem; 4.Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.			

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Report No.: 0165/15/ED/0653

Appendix E

Implementation Schedule for Environmental Mitigation Measures (EMIS)

Appendix E – Implementation Schedule of Environmental Mitigation Measures (EMIS)

EIA Ref.	EM&A Log	Recommended Mitigation Measures	Location of the	Implementation Status
	Ref.		measures	
Air Quality		T.,	1	
S5.5.6.1	A1	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	All construction sites	V
\$5.5.6.2	A2	 2) Proper watering of exposed spoil should be undertaken throughout the construction phase: Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; A stockpile of dusty material should not be extend beyond the pedestrian barriers, fencing or traffic cones. The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with 	All construction sites	V
\$5.5.6.2	A2	 concrete, bituminous materials or hardcores; When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials, Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; Any skip hoist for material transport should be totally enclosed by impervious sheeting; Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the 	All construction sites	V
\$5.5.6.2	A2	 Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; Loading, unloading, transfer, handling or storage of bulk 	All construction sites	N/A

EIA Ref.	EM&A	Recommended Mitigation Measures	Location of	Implementation
	Log Ref.		the measures	Status
		enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction,		
		turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site r part of the construction site where the exposed earth lies		
S5.5.6.3	A3	The Contractor should undertake proper watering on all exposed spoil (with at least 8 times per day) throughout the construction phase.	All construction sites	V
\$5.5.6.4	A4	Engineer to incorporate the controlled measures into the Particular Specification (PS) for the civil work. The PS should also draw the contractor's attention to the relevant latest Practice Notes issued by EPD.	All construction sites	V
S5.5.6.4	A5	Implement regular dust monitoring under EM&A programme during the construction stage.	Selected Represent- ative dust monitoring station	V
S5.5.7.1	A6	The following mitigation measures should be adopted to prevent fugitive dust emissions for concrete batching plant; Loading, unloading, handling, transfer or storage of any dusty materials should be carried out in totally enclosed system; All dust-laden air or waste gas generated by the process operations should be properly extracted and vented to fabric filtering system to meet the emission limits for TSP; Vents for all silos and cement/pulverised fuel ash (PFA) weighing scale should be fitted with fabric filtering system; The materials which may generate airborne dusty emissions should be wetted by water spray system; All receiving hoppers should be enclosed on three sides up to 3m above unloading point; All conveyor transfer points should be totally enclosed;	Selected Represent- ative dust monitoring station	N/A
		 All access and route roads within the premises should be paved and wetted; and Vehicle cleaning facilities should be provided and used by all concrete trucks before leaving the premises to wash off any dust on the wheels and/or body 		
S5.5.2.7	A7	The following mitigation measures should be adopted to prevent fugitive dust emissions at barging point: All road surface within the barging facilities will be paved; Dust enclosures will be provided for the loading ramp; Vehicles will be required to pass through designated wheels wash facilities; and Continuous water spray at the loading points	All construction sites	V
Construction		ir borne) 1) Use of good site practices to limit noise emissions by	All	V
S6.4.10	N1	considering the following: only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works;	All construction sites	v

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
		 mobile plant should be sited as far away from NSRs as possible and practicable; material stockpiles, mobile container site officer and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities. 		
S6.4.11	N2	 Install temporary hoarding located on the site boundaries between noisy construction activities and NSRs. The conditions of the hoardings shall be properly maintained throughout the construction period. 	All construction sites	V
S6.4.12	N3	Install movable noise barriers (typically density@14kg/m acoustic mat or full enclosure close to noisy plants including compressor, generators, saw.	For plant items listed in Appendix 6D of the EIA report at all construction sites	N/A
S6.4.13	N4	Select "Quiet plants" which comply with the BS 5228 Part 1 or TM standards.	For plant items listed in Appendix 6D of the EIA report at all construction site	V
S6.4.14	N5	5) Sequencing operation of construction plants where practicable	All construction sites where practicable	V
S5.1	N6	6) Implement a noise monitoring under EM&A programme.	Selected representative noise monitoring station	V
S7.3	S1	1) The requirements as recommended in ETWB TC 34/2002	All	٧
		Management of Dredged/Excavated Sediment shall be included in the Particular Specification as appropriate.	construction sites	
S8.3.8	igement (C WM1	construction Waste) Construction and Demolition Material	All	V
		 The following mitigation measures should be implemented in handling the waste: Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement; Carry out on-site sorting; Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified; and Implement an enhanced Waste Management Plan similar to E7WBTC (Works) No. 19/2005 - "Environmental Management on Construction Sites" to encourage on-site sorting of C&D materials and to minimize their generation during the course of construction. In addition, disposal of the C&D materials onto any sensitive locations such as agricultural lands, etc. should be avoided. The Contractor shall propose the final 	construction sites	

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
	IXCI.	disposal sites to the Project Proponent and get its	measures	
S8.3.9-	WM2	approval before implementation C&D Waste	All	V
S8.3.91 S8.3.11	VVIVIZ	Standard formwork or pre-fabrication should be used as far as practicable in order to minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works should be considered. Use of wooden hoardings should not be used, as in other projects. Metal hoarding should be used to enhance the possibility of recycling. The purchasing of construction materials will be carefully planned in order to avoid over ordering and wastage. The Contractor should recycle as much of the C&D materials as possible on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Where practicable, concrete and masonry can be crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different areas of the sites should be considered for such	construction sites	V
00.0.40	14/140	segregation and storage.	AII	V
\$8.2.12- \$8.3.15	WM3	 Chemical Waste Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Containers used for the storage of chemical wastes should be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450 liters unless the specification has been approved by the EPD; and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the regulation. The storage area for chemical wastes should be clearly labeled and used solely for the storage of chemical waste; enclosed on at least 3 sides; have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20 % of the total volume of waste stored in that area, whichever is the greatest; have adequate ventilation; covered to prevent rainfall entering; and arranged so that incompatible materials are adequately separated. Disposal of chemical waste should be via a licensed waste collector; be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre which also offers chemical waste collection service and can supply the necessary storage containers; or be to a reuser of the waste, under approval from the EPD. 	All construction sites	V
S8.3.16	WM4	Sewage Adequate numbers of portable toilets should be provided for the workers. The portable toilets should be maintained in a state which will not deter the workers from utilizing these portable toilets. Night soil should be collected by licensed collectors regularly.	All construction sites	V
S8.3.17	WM5	General Refuse General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes. A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by	All construction sites	V

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the	Implementation Status
	кет.	la	measures	
		law. • Aluminium cans are often recovered from the waste		
		stream by individual collectors if they are segregated and		
		made easily accessible. Separate labelled bins for their		
		deposit should be provided if feasible.		
		Office wastes can be reduced through the recycling of		
		paper if volumes are large enough to warrant collection.		
		Participation in a local collection scheme should be		
		considered by the Contractor.		
		Training should be provided to workers about the		
		concepts of site cleanliness and appropriate waste		
		management procedure, including reduction, reuse and		
		recycling of wastes.		
Water Qual	lity (Consti	ruction Phase)		
S9.11.1.7	W2	Land Works	Land-based	V
		General construction activities on land should also be	works area	
		governed by standard good working practice. Specific		
		measures to be written into the works contracts should		
		include:		
		wastewater from temporary site facilities should be controlled to provent direct displayers to surface or marine.		
		controlled to prevent direct discharge to surface or marine waters:		
		 sewage effluent and discharges from on-site kitchen 		
		facilities shall be directed to Government sewer in		
		accordance with the requirements of the WPCO or		
		collected for disposal offsite. The use of soakaways shall		
		be avoided:		
		storm drainage shall be directed to storm drains via		
		adequately designed sand/silt removal facilities such as		
		sand traps, silt traps and sediment basins. Channels,		
		earth bunds or sand bag barriers should be provided on		
		site to properly direct stormwater to such silt removal		
		facilities. Catchpits and perimeter channels should be		
		constructed in advance of site formation works and		
		earthworks;		
		• silt removal facilities, channels and manholes shall be		
		maintained and any deposited silt and grit shall be		
		removed regularly, including specifically at the onset of and after each rainstorm:		
		temporary access roads should be surfaced with crushed		
		' '		
		stone or gravel; - rainwater pumped out from trenches or foundation		
		excavations should be discharged into storm drains via		
		silt removal facilities;		
		• measures should be taken to prevent the washout of		
		construction materials, soil, silt or debris into any drainage		
		system;		
		open stockpiles of construction materials (e.g. aggregates)		
		and sand) on site should be covered with tarpaulin or		
		similar fabric during rainstorms;		
		· manholes (including any newly constructed ones) should		
		always be adequately covered and temporarily sealed so		
		as to prevent silt, construction materials or debris from		
		getting into the drainage system, and to prevent storm		
		run-off from getting into foul sewers;		
		discharges of surface run-off into foul sewers must always		
		be prevented in order not to unduly overload the foul		
00.44.4=	14/0	sewerage system;		\
S9.11.1.7	W2	all vehicles and plant should be cleaned before they leave	Land-based	V
		the construction site to ensure that no earth, mud or	works area	
		debris is deposited by them on roads. A wheel washing		
		bay should be provided at every site exit;		
		wheel wash overflow shall be directed to silt removal facilities before being discharged to the storm design.		
		facilities before being discharged to the storm drain;		
	1	the section of construction road between the wheel		

EIA Ref.	EM&A	Recommended Mitigation Measures	Location of	Implementation
	Log Ref.		the measures	Status
	11011	washing bay and the public road should be surfaced with	mousures	
		crushed stone or coarse gravel;		
		 wastewater generated from concreting, plastering, Internal decoration, cleaning work and other similar 		
		activities, shall be screened to remove large objects;		
		 vehicle and plant servicing areas, vehicle wash bays and 		
		lubrication facilities shall be located under roofed areas.		
		The drainage in these covered areas shall be connected		
		to foul sewers via a petrol interceptor in accordance with the requirements of the WPCO or collected for off site		
		disposal; • the contractors shall prepare an oil / chemical cleanup		
		plan and ensure that leakages or spillages are contained and cleaned up immediately;		
		 waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal 		
		Ordinance;		
		all fuel tanks and chemical storage areas should be		
		provided with locks and be sited on sealed areas. The storage areas should be surrounded by bunds with a		
		capacity equal to 110% of the storage capacity of the		
		largest tank; and		
		• surface run-off from bunded areas should pass through		
		oil/grease traps prior to discharge to the stormwater system.		
Ecology (Co	nstruction		I	
S10.7	E4	Watering to reduce dust generation; prevention of siltation	Land-based	V
		of freshwater habitats; Site runoff should be desilted, to	works areas	
		reduce the potential for suspended sediments, organics and other contaminants to enter streams and standing		
		freshwater		
S10.7	E5	Good site practices, including strictly following the	Land-based	V
		permitted works hours, using quieter machines where practicable, and avoiding excessive lightings during night	works areas	
		time		
S10.7	E8	Control vessel speed	Marine	V
		Skipper training	Traffic	
		Predefined and regular routes for working vessels; avoid		
Fisheries		Brother Islands.		
S11.7	F4	Maritime Oil Spill Response Plan (MOSRP);	HKBCF	V
		Contingency plan.		
		Detailed Design Phase)	LIKDOE	
S14.3.3.1	LV1	General design measures include: Roadside planting and planting along the edge of the	HKBCF	V
		HKBCF Island is proposed; Transplanting of mature trees in good health and amenity		
		value where appropriate and reinstatement of areas		
		disturbed during construction by compensatory hydro-		
		seeding and planting;		
		 Protection measures for the trees to be retained during construction activities; 		
		 Optimizing the sizes and spacing of the bridge columns; 		
		• Fine-tuning the location of the bridge columns to avoid		
		visually-sensitive locations;		
		Providing planting area around peripheral of HKBCF for tree planting expansion effects.		
		tree planting screening effect; Providing salt-tolerant native trees along the planter strip		
		at affected seawall and newly reclaimed coastline;		
		For HKBCF, providing aesthetic architectural design on		
		the related buildings (e.g. similar materials for PCB		
		building facade to Airport buildings, roof planting and subtle materials for other facilities buildings and so on),		
	1	and the related infrastructure (e.g. parapet planting and		

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
		transparent cover for elevated footbridges) to provide harmonious atmosphere of the HKBCF; and • Fine-tuning the sizes of the structural members to minimize the bulkiness of buildings and adjustment of building arrangement to minimise disturbance to surrounding vegetation in the HKBCF.		
Landscape	& Visual (C	Construction Phase)		
S14.3.3.3	LV2	Mitigate both Landscape and Visual Impacts G1. Grass-hydroseed bare soil surface and stock pile areas. G2. Add planting strip and automatic irrigation system if appropriate at some portions of bridge footbridge to screen bridge and traffic. G3. Not applicable as this is for HKLR. G4. For HKBCF, providing aesthetic architectural design on the related buildings (e.g. similar materials for PCB building facade to Airport buildings, roof planting and subtle materials for other facilities buildings and so on), and the related infrastructure (e.g. parapet planting and transparent cover for elevated footbridges) to provide harmonious atmosphere of the HKBCF G5. Vegetation reinstatement and upgrading to disturbed areas G6. Maximizing new tree shrub and other vegetation planting to compensate tree felled and vegetation removed G7. Providing planting area around peripheral of HKBCF for tree planting screening effect; G8. Plant salt-tolerant native and shrubs etc along the planter strip at affected seawall. G9. Reserve of loose natural granite rocks for re-use, Provide new coastline to adopt "natural-look" by means of using armour rocks in the form of natural rock materials and planting strip area accommodating screen buffer to enhance "natural-look" of the new coastline.	HKBCF	N/A
S14.3.3.3	LV3	Mitigate Visual Impacts V1. Minimize time for construction activities during construction period. V2. Provide screen hoarding at the portion of the project site / works areas / storage areas near VSRs who have close low-level views to the Project during HKBCF construction.	HKBCF	N/A
EM&A	l		ı	I
S15.2.2	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual	All construction sites	V
S15.5 – S15.6	EM2	An Environmental Team needs to be employed as per the EM&A Manual. Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	All construction sites	V

Legend: V = implemented;

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Report No.: 0165/15/ED/0653

Appendix F

Site Audit Findings and Corrective Actions

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Report No.: 0165/15/ED/0653

Appendix F – Site Audit Findings and Corrective Actions

Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project (site audit of 21 October 2016 was cancelled due to hoisting of typhoon signal no. 8 on 21 October 2016 and re-scheduled to 28 October 2016). During the reporting period, 13 site inspections were carried out on 01, 08, 15, 22 and 28 September 2016 (includes Contract No. HY/2013/06 within Contract No. HY/2013/03 works area on 15, 22 and 28 September 2016), 06, 13, 27 and 28 October 2016, and 03, 10, 17 and 25 November 2016.

Particular observations during the site inspections are described below.

For Contract No. HY/2013/03

26 Aug 2016

- CHEC was reminded to increase watering for dust suppression on site. Subsequently, watering was increased for dust suppression on site. The observation was closed on 01 September 2016.
- 2. CHEC was reminded to remove general refuse accumulated at A2 Bridge area. Subsequently, general refuse was removed at A2 Bridge area. The observation was closed on 08 September 2016.

01 Sept 2016

- CHEC is reminded to provide drip tray for chemicals at CUE & Box Culvert. Subsequently, chemicals were removed at CUE & Box Culvert. The observation was closed on 08 September 2016.
- 2. CHEC is reminded to remove stagnant water on site. Subsequently, stagnant water was removed on site. The observation was closed on 08 September 2016.
- 3. CHEC is reminded to ensure no oil leakage from the generator at Box Culvert. Subsequently, no oil leakage from the generator at Box Culvert. The observation was closed on 08 September 2016.

08 Sept 2016

1. CHEC was reminded to clear the stagnant water accumulated at CUE works area. Subsequently, stagnant water was cleared at CUE works area. The observation was closed on 15 September 2016.

15 Sept 2016

- CHEC was reminded to clear the stagnant water accumulated at Building 037. Subsequently, stagnant water was cleared at Building 037. The observation was closed on 28 September 2016.
- 2. CHEC was reminded to remove the general refuse accumulated at Building 037. Subsequently, general refuse was removed at Building 037. The observation was closed on 28 September 2016.

22 Sept 2016

1. CHEC was reminded to provide drip tray for chemical containers at Bridge A7 Area. Subsequently, additional drip tray was provided for chemical container at Bridge A7 Area. The observation was closed on 28 September 2016.

28 Sept 2016

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Report No.: 0165/15/ED/0653

 CHEC was reminded to increase watering for dust suppression on site. Subsequently, watering was increased for dust suppression on site. The observation was closed on 06 October 2016.

06 Oct 2016

1. CHEC is reminded to maintain good housekeeping on site (Building 041). Subsequently, good housekeeping was maintained on site (Building 041). The observation was closed on 13 October 2016.

13 Oct 2016

1. CHEC was reminded to remove the stagnant water accumulated at the lifting holes of the precast concretes on site. Subsequently, stagnant water was removed at the lifting holes of the precast concretes on site. The observation was closed on 27 October 2016.

21 Oct 2016

1. Site inspection was cancelled due to hoisting of typhoon signal no. 8 on 21 Oct 2016 and re-scheduled to 28 Oct 2016.

27 Oct 2016

- CHEC is reminded to maintain proper housekeeping on site (CUE works area). Subsequently, proper housekeeping was maintained on site. The observation was closed on 03 November 2016.
- 2. CHEC is reminded to remove stagnant water on site (CUE works area). Subsequently, stagnant water was removed on site. The observation was closed on 03 November 2016.

28 Oct 2016

- 1. CHEC was reminded to increase watering for dust suppression on site. Subsequently, watering was increased on site. The observation was closed on 03 November 2016.
- 2. CHEC was reminded to clear the stagnant water accumulated at Building 037. Subsequently, stagnant water was cleared at Building 037. The observation was closed on 03 November 2016.
- 3. CHEC was reminded to remove the general refuse accumulated at Building 037. Subsequently, general refuse was removed at Building 037. The observation was closed on 03 November 2016.

03 Nov 2016

- CHEC is reminded to properly maintain housekeeping on site (CUE). Subsequently, housekeeping was maintained properly on site. The observation was closed on 10 November 2016.
- 2. CHEC is reminded to properly maintain equipment (generator) on site (Box Culvert D). Subsequently, the equipment was properly maintained on site. The observation was closed on 10 November 2016.

10 Nov 2016

1. CHEC was reminded to maintain housekeeping practice at CUE works area. Subsequently, housekeeping practice was maintained at CUE works area. The observation was closed on 17 November 2016.

17 Nov 2016

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Report No.: 0165/15/ED/0653

1. CHEC is reminded to maintain proper housekeeping on site (Building 043). Subsequently. proper housekeeping was maintained on site. The observation was closed on 25 November 2016.

25 Nov 2016

- 1. CHEC was reminded to provide drip tray for chemical containers at CUE works area. Follow-up actions for outstanding observation will be checked in the upcoming site inspections and reported in the coming reporting period.
- 2. CHEC was reminded to remove stagnant water accumulated at Building 037 and Bridge A7 area. Follow-up actions for outstanding observation will be checked in the upcoming site inspections and reported in the coming reporting period.
- 3. CHEC was reminded to enhance watering for dusty operation at Bridge A7 area. Follow-up actions for outstanding observation will be checked in the upcoming site inspections and reported in the coming reporting period.

For Contract No. HY/2013/06 within Contract No. HY/2013/03 works area

15 Sept 2016

1. Nil findings.

22 Sept 2016

1. Nil findings.

28 Sept 2016

1. Nil findings.

06 Oct 2016

1. Nil findings.

13 Oct 2016

1. Nil findings.

21 Oct 2016

1. Site inspection was cancelled due to hoisting of typhoon signal no. 8 on 21 Oct 2016 and re-scheduled to 28 Oct 2016.

27 Oct 2016

1. Nil findings.

28 Oct 2016

1. Nil findings.

03 Nov 2016

1. Nil findings.

10 Nov 2016

1. Nil findings.

17 Nov 2016

1. Nil findings.

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Report No.: 0165/15/ED/0653

25 Nov 2016 1. Nil findings.

The Contractor has rectified most of the observations as identified during environmental site inspections during the reporting period. Follow-up actions for outstanding observations will be inspected during the next site inspections.

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Report No.: 0165/15/ED/0653

Appendix G

Waste Flow Table



Contract No. HY/2013/03
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities
- Vehicle Clearance Plazas and Ancillary Buildings and Facilities

Monthly Summary of Waste Flow Table for 2016 (year)

Name of Person completing the Record: Marko Chan

	Actual Qu	antities of Ine	ert C&D Mater	ials Generate	d Monthly	Actual Quantities of Non-inert C&D Wastes Generated Monthly					
Month	Total Quantity Generated	nerated the Contract Projects Public Fill Metals		Paper/ Metals cardboard packaging		cardboard		Others, e.g. general refuse			
	(in (000-3)	(see Note 1)	(in '000m ³)	•	(:- (0003)	(in '000 Kg)	(in '000 Kg)	(see Note 2) (in '000 Kg)	(in '000 Kg)		
lon	(in '000m³)	(in '000m ³)		(in '000m ³)	(in '000m³)	`				(in '000m ³)	
Jan	0.000	0	0	0	0.000	0	0.992	0	0	0.073	
Feb	0.000	0	0	0	0.000	0	0	0	0	0.093	
Mar	0.087	0	0	0	0.087	0	0.392	0	0	0.200	
Apr	0.184	0	0	0	0.184	0	0.411	0	0	0.224	
May	0.203	0	0	0	0.203	0	0	0	0	0.293	
Jun	0.244	0	0	0	0.244	0	0.413	0	0	0.322	
Jul	2.429	0	0	0	2.429	0	0.419	0	0	0.312	
Aug	0.057	0	0	0	0.057	0	0.340	0	0	0.288	
Sept	0.000	0	0	0	0.000	0	0	0	0	0.327	
Oct	0.379	0	0	0	0.379	0	0.400	0	0	0.332	
Nov	0.229	0	0	0	0.229	0	0.389	0	0	0.644	
Dec											
Total	3.812	0.000	0.000	0.000	3.812	0.000	3.756	0.000	0.000	3.108	

Notes: (1) Broken concrete for recycling into aggregates.

(2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

Monthly Summary of Excavated Marine Sediment for 2016 (year)

Month	Total Quantity of Excavated Marine Sediment Generated	Reused in this contract	Reused in other Projects	Disposed of at CMP
	in '000m ³	in '000m ³	in '000m ³	in '000m ³
Jan	1.950	0	0	1.950
Feb	2.328	0	0	2.328
Mar	2.464	0	0	2.464
Apr	5.602	0	0	5.602
May	0	0	0	0
Jun	4.584	0	0	4.584
Jul	10.728	0	0	10.728
Aug	1.544	0	0	1.544
Sep	6.816	0	0	6.816
Oct	2.376	0	0	2.376
Nov	0	0	0	0
Dec				
Total	38.392	0.000	0.000	38.392



Monthly Summary Waste Flow Table



Project name 工程項目名稱 : Contract No. HY/2013/06 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities-Automatic Vehicle Clearance Support System

Location 工程地點: Artifical Island of HKIAP

Year: 2016

	Inert C&D Waste disposal 墮性廢物(in tonnes) (see Note 1)					Non-inert (dispo 非墮t (in to	osal / 生廢物		Waste to	be recycled	d and return	ed / 可再循	環利用或回	收的廢物				
Month	Reused in Packag backfi 再用於工種	ge (e.g. Iling) /	Reused Proje 再用於封	ects /	broken o rubble, fil	I material 廢物(如泥,	refuse, formwork	.g. general broken etc) / 其他 廢板枋等)	Metals	/ 金屬	Plastic	: / 塑膠	packa	ardboard aging / .裝紙類	Chemica 化學			Quantity 八總生產量
	(k	o)	((c)	(((b	(1	e)	(in to	nnes)	(in to	nnes)	(in to	(in tonnes) (in litr		itre)	(a)= (b-	+c+d+e)
	Est./ 估計數量)	Act./ (實際數量)	Est./ 估計數量)	Act./ (實際數量)	Est./ 估計數量)	Act./ (實際數量)	Est./ 估計數量)	Act./ (實際數量)	Est./ 估計數量)	Act./ (實際數量)	Est./ 估計數量)	Act./ (實際數量)	Est./ 估計數量)	Act./ (實際數量)	Est./ 估計數量)	Act./ (實際數量)	Est./ 估計數量)	Act./ (實際數量)
January																		
February																		
March																		
April																		
May																		
June																		
July																		
August																		
September	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.002	0.002	N/A	N/A	0.002	0.002
October	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.002	0.002	N/A	N/A	0.002	0.002
November	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.002	0.002	N/A	N/A	0.002	0.002
December																		
Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.006	0.000	0.000	0.006	0.006

Notes: (1) The quantitles of C&D Materials, in tonne, was calculated by multiply the estimated volume, in m3, with the density of the soil, which is 1.5 gcm⁻³.

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Report No.: 0165/15/ED/0653

Appendix H

Environmental Licenses and Permits

Appendix H - Environmental Permit / Licences Summary for Contract No. HY/2013/03

Item	Permit/Licence Registration	Permit No.	Work Area	Application Date	Issue Date	Valid From	Date	Status	Remark
1	Environmental Permit Pursuant to Environmental Impact Assessment Ordinance	EP-353/2009/K	НКВСГ	24-Mar-16	11-Apr-16	11-Apr-16	Nil	Valid	
2	Notification Pursuant to Section 3(1) of The Air Pollution Control (Construction Dust) Regulation	Ref No. 387703	Main Site Area	15-Apr-15	15-Apr-15	15-Apr-15	Nil	Valid	
3	Notification Pursuant to Section 3(1) of The Air Pollution Control (Construction Dust) Regulation	Ref No. 387735	Works Area WA3	15-Apr-15	15-Apr-15	15-Apr-15	Nil	Valid	
4	Billing A/C for Construction Waste Disposal Pursuant to Section 6 & 9 of the Waste Disposal (Charges for Disposal of Construction waste) Regulation	A/C No. 7022228	Main Site Area, WA3 & 4	15-Apr-15	06-May-15	06-May-15	Nil	Valid	
5	Registration as Waste Producer Pursuant to Waste Disposal (Chemical Waste) (General) Regulation	5213-951-C1186-28	Main Site Area	28-Apr-15	01-Jun-15	01-Jun-15	Nil	Valid	
6	Registration as Waste Producer Pursuant to Waste Disposal (Chemical Waste) (General) Regulation	5213-974-C3597-03	Works Area WA4	28-Apr-15	01-Jun-15	01-Jun-15	Nil	Valid	
7	Water Discharge License Pursuant to Water Pollution Control Ordinance (Cap 358)	WT00022180-2015	Works Area WA3	29-Apr-15	04-Aug-15	03-Aug-15	31-Aug-20	Valid	
8	Water Discharge License Pursuant to Water Pollution Control Ordinance (Cap 358)	WT00022391-2015	Main Site Area	06-May-15	04-Sep-15	04-Sep-15	30-Sep-20	Superseded	
9	Water Discharge License Pursuant to Water Pollution Control Ordinance (Cap 358)	WT00025384-2016	Main Site Area	09-Mar-16	10-Nov-16	10-Nov-16	30-Sep-20	Valid	
10	Construction Noise Permit Pursuant to Section 8(6) of the Noise Control Ordinance	GW-RS0607-16	Main Site Area	02-Jun-16	16-Jun-16	19-Jun-16	18-Sep-16	Superseded	
11	Construction Noise Permit Pursuant to Section 8(6) of the Noise Control Ordinance	PP-RS0020-16	Portion A, G & H	13-Jul-16	27-Jul-16	28-Jul-16	24-Jan-17	Superseded	
12	Construction Noise Permit Pursuant to Section 8(6) of the Noise Control Ordinance	GW-RS0933-16	Main Site Area	18-Aug-16	01-Sep-16	05-Sep-16	31-Dec-16	Valid	
13	Construction Noise Permit Pursuant to Section 8(6) of the Noise Control Ordinance	GW-RS0960-16	Main Site Area	06-Sep-16	15-Sep-16	19-Sep-16	18-Dec-16	Valid	
14	Construction Noise Permit Pursuant to Section 8(6) of the Noise Control Ordinance	PP-RS0028-16	Portion A, G, H & N	15-Sep-16	29-Sep-16	03-Oct-16	02-Apr-17	Valid	

15	Permit issued Under the Dumping at Sea Ordinance	EP/MD/17-088	East of Sha Chau (CMP Vd)	16-Aug-16	26-Aug-16	01-Sep-16	30-Sep-16	Valid until 30-Sep-16
16	Permit issued Under the Dumping at Sea Ordinance	EP/MD/17-105	East of Sha Chau (CMP Vd)	15-Sep-16	27-Sep-16	01-Oct-16	31-Oct-16	Valid until 31-Oct-16
17	Permit issued Under the Dumping at Sea Ordinance	EP/MD/17-132	East of Sha Chau (CMP Vd)	03-Nov-16	30-Nov-16	05-Dec-16	04-Jan-17	To be Valid from 05-Dec-16
18	Permit issued Under the Dumping at Sea Ordinance	EP/MD/17-140	East of Sha Chau (CMP Va) or South of Brothers (CMP2)	14-Nov-16	30-Nov-16	30-Nov-16	29-Dec-16	Valid

Environmental Permit / Licences Summary for Contract No. HY/2013/06 within the HY/2013/03 site works area

Item	Downit/Licence Designation	Downit No.	Work Area	Application Data	Issue Date	Valid Date		Ctatus	Remark
Item	Permit/Licence Registration	Permit No.	Work Area	Application Date	Issue Date	From	То	Status	
1	Environmental Permit	EP-353/2009/K	HKBCF	24-Mar-16	11-Apr-16	11-Apr-16	Nil	Valid	
1	Pursuant to Environmental Impact Assessment Ordinance	EF-333/2009/K	TIKBCI	24-Wai-10	11-Api-10	11-Api-10	INII	vanu	
	Billing A/C for Construction Waste Disposal								
2	Pursuant to Section 6 & 9 of the Waste Disposal (Charges for	A/C No. 7023015	Main Site Area	07-Aug-15	20-Aug-15	20-Aug-15	Nil	Valid	
	Disposal of Construction waste) Regulation								
3	Registration as Waste Producer	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	#
3	Pursuant to Waste Disposal (Chemical Waste) (General) Regulation	IV.A.	IV.A.	IV.A.	IV.A.	IV.A.	IN.A.	IV.A.	

[#] The Contractor of Contract No. HY/2013/06 was advised to register as a chemical waste producer when chemical waste is expected to generate for the foreseeable future from the operations.

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Report No.: 0165/15/ED/0653

Appendix I

Statistics on Environmental Complaints, Notification of Summons and Successful Prosecutions

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Report No.: 0165/15/ED/0653

Appendix I -

Statistics on Environmental Complaints, Notifications of Summons and Successful **Prosecutions**

For Contract No. HY/2013/03

	Cumulative Statistics							
Reporting Period	Complaints	Notifications of Summons	Successful Prosecutions					
This reporting period	2	0	0					
From commencement date of construction to end of reporting period	3	0	0					

For Contract No. HY/2013/06 within Contract No. HY/2013/03 works area

	Cumulative Statistics		
Reporting Period	Complaints	Notifications of	Successful
		Summons	Prosecutions
This reporting period	0	0	0
From commencement	0	0	0
date of construction to			
end of reporting month			