Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
OFFICE OF THE SECRETARY
Bonifacio Drive, Port Area, Manila

BAGONG PILIPINAS

MAY 28 2025

MEMORANDUM

FOR : MANUEL M. BONOAN
Secretary
This Department

SUBJECT : Request for Modification of Project under FY 2025 GAA

This refers to the Memorandum dated April 15, 2025 of **DPWH NCR Regional Director LORETA M. MALALUAN, CESO IV,** endorsing the request for the approval of **Modification** of **District Engineer Manny B. Bulusan**, DPWH South Manila DEO of the project under FY 2025 General Appropriation Act (GAA), to wit;

As per GAA/Original			***As Modified***		
Project Description					
UACS No. 310303102045000 **Project ID: P00900759LZ** OO1: Ensure Safe and Reliable National Road System Bridge - Retrofitting/Strengthening of Permanent Bridges Liwasang Bonifacio West Overpass (Flyover) (**B03377LZ**), Manila City			OO1: Ensure Safe and Reliable National Road System Bridge - Retrofitting/Strengthening of Permanent Bridges Liwasang Bonifacio West Overpass (Flyover) (**B01348LZ**), Manila City		
Physical Target	**Unit Cost (P'000)**	**Allocation**	**Physical Target**	**Unit Cost (P'000)**	**Allocation**
CW1 – Retrofitting/ Strengthening of Permanent Bridges **1 Bridge**	P147,000,00/ bridge	P 147,000,000.00	CW1 – Retrofitting/ Strengthening of Permanent Bridges **1 Bridge**	P147,000,00/ bridge	P 147,000,000.00
EAO	-	P3,000,000.00	EAO	-	P3,000,000.00
	Total :	**P150,000,000.00**		**Total :**	**P150,000,000.00**

Justifications:

- To rectify the bridge ID error in project title from "Liwasang Bonifacio West Overpass (Flyover) (B03377LZ), Manila City" to "Liwasang Bonifacio West Overpass (Flyover) (B01348LZ), Manila City".
- The Bridge ID of Liwasang Bonifacio West Overpass is B01348LZ

Attached are the following supporting documents:
- FY 2025 DPWH Infrastructure Program (Based on GAA), Project Modification Request Form, BP 202, Geo-tagged photos, GIS Map, Certificate of Availability of Funds/Allotment, Program of Works with Detailed Unit Price Analysis, and DED Plans.

Having complied with all the documentary requirements under Department Order No. 23, Series of 2023 and other supplemental guidelines, we are respectfully requesting that the abovementioned project under FY 2025 GAA be modified.

For the Secretary's favorable consideration.

LORETA M. MALALUAN, CESO IV
Assistant Secretary for Regional Operations in CAR,
Regions I, II, IX, X, XI, XII, XIII and NCR

Recommending Approval:

MARIA CATALINA E. CABRAL, Ph.D., CESO I
Undersecretary for Planning and
Public-Private Partnership Services

ROBERTO R. BERNARDO, CESO I
Undersecretary for Regional Operations in NCR,
NIR, Regions III, IV-A, IV-B, V, VI, VII and VIII

APPROVED/~~DISAPPROVED~~:

MANUEL M. BONOAN
Secretary

Department of Public Works and Highways
Office of the Secretary
WIN5F08572

Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
OFFICE OF THE SECRETARY
Bonifacio Drive, Port Area, Manila

BAGONG PILIPINAS

MAY 2 8 2025

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As per GAA/Original			***As Modified***		
Project Description					
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Physical Target	**Unit Cost (P'000)**	**Allocation**	**Physical Target**	**Unit Cost (P'000)**	**Allocation**
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	Total :	**P150,000,000.00**		**Total :**	**P150,000,000.00**

Justifications:

- To rectify the bridge ID error in project title from "Liwasang Bonifacio West Overpass (Flyover) (B03377LZ), Manila City" to "Liwasang Bonifacio West Overpass (Flyover) (B01348LZ), Manila City".
- The Bridge ID of Liwasang Bonifacio West Overpass is B01348LZ

Attached are the following supporting documents:
- FY 2025 DPWH Infrastructure Program (Based on GAA), Project Modification Request Form, BP 202, Geo-tagged photos, GIS Map, Certificate of Availability of Funds/Allotment, Program of Works with Detailed Unit Price Analysis, and DED Plans.

Having complied with all the documentary requirements under Department Order No. 23, Series of 2023 and other supplemental guidelines, we are respectfully requesting that the abovementioned project under FY 2025 GAA be modified.

For the Secretary's favorable consideration.

LORETA M. MALALUAN, CESO IV
Assistant Secretary for Regional Operations in CAR,
Regions I, II, IX, X, XI, XII, XIII and NCR

Recommending Approval:

MARIA CATALINA E. CABRAL, Ph.D., CESO I
Undersecretary for Planning and
Public-Private Partnership Services

ROBERTO R. BERNARDO, CESO I
Undersecretary for Regional Operations in NCR,
NIR, Regions III, IV-A, IV-B, V, VI, VII and VIII

APPROVED/~~DISAPPROVED~~:

MANUEL M. BONOAN
Secretary

05/16/25

2.6 AJGM/BCL/RRB
Project ID: P00900759LZ

Project Modification Evaluation Form

Date of Evaluation: _____

UACS:	310303102045000	Project ID:	P00900759LZ	Fund Source:	FY 2025 GAA, R.A. 12116	
Region:	NCR	Implementing Office:	South Manila District Engineering Office		Appropriations (Php):	₱150,000,000
Programs/ Activities / Projects (P/A/P):		OO1: Ensure Safe and Reliable National Road System				
Name of Project (as per GAA) :	FROM	Liwasang Bonifacio West Overpass (Flyover) (B03377lz), Manila City				
Name of Project (as Modified) :	TO	Liwasang Bonifacio West Overpass (Flyover) (**B01348LZ**), Manila City				

A. Implementing Office Justification for Modification: To correct the bridge ID that appears in the project description. The **correct Bridge ID** for the Liwasang Bonifacio West Overpass **is B01348LZ.**

A.1 [ ] Certificate of Reasonableness of Cost Estimate by _____ dated: _____

B. PER PLANNING SERVICE EVALUATION

B.1 [✓] **PROJECT MODIFICATION ON PROJECT DESCRIPTION**

- B.1.1 [✓] Typographical Error/s
- B.1.2 [ ] Change in Location (for non-existent locations only)
- B.1.3 [ ] Change in Station Limits
- B.1.4 [ ] Addition/ Deletion of Word/s

B.2 [ ] **PROJECT MODIFICATION/ADJUSTMENTS ON PROJECT COMPONENTS**

- B.2.1 [ ] Change in Targets
- B.2.2 [ ] Change in Scope of Work
- B.2.3 [ ] Change in Component Amount
  - B.2.3.1 [ ] Addition of Component (including excess amount)
  - B.2.3.2 [ ] Deletion of Component
  - B.2.3.2 [ ] Movement of Funds between Components

C. RELEASE OF FUNDS CLASSIFICATION

C.1 [ ] GAAAO C.2 [✓] For Issuance of SARO (FISARO)

- C.2.1 [ ] DPWH Initiatives (D.I.)
- C.2.2 [✓] Non-DPWH Initiatives (C.I.)
- C.2.3 [ ] Others (such as TRIP, etc)

[✓] **Certificate of Availability of Funds/ Allotment**

signed by: **JUANITA S. SIAZAR**

date: **March 27, 2025**

D. RESULTANT AFTER MODIFICATION

D.1 [ ] Additional Project Component/s

D.2 Component/s:

COMP	Type Of Work (TOW)	Unit Cost	TARGET	Unit of Measure	Increase / Decrease (%)		
					Unit Cost (FROM/TO)	Unit Cost (BOC/TO)	Target
CW1							
CW2							
CW3							

see attached Project Modification Component Detail Matrix (PMCDM)

E. AS EVALUATED

E.1 [✓] ALLOWED as per the GAA Provisions

E.2 [ ] NOT ALLOWED as per the GAA Provisions

E.3 Remarks (to be filled out by Planning Service):

Evaluated By:

ALEX G. BOTE
Director, Planning Service

Noted By: 05/15/25

CONSTANTE A. LLANES, JR., CESO III
Assistant Secretary, Planning Service and the Legislative Liaison Office

F. Approving Authority as per latest Approved Guidelines on Modification of Allotment under the GAA

F.1 [✓] Secretary

F.2 [ ] Undersecretary for Operations

DPWH - OSEC RECEIVED MAY 22 2025 Time: By: Control No. 25-07170 IDTS No. 06719

[ ] Recommended for Approval

[ ] Remarks:

MARIA CATALINA E. CABRAL, PhD, CESO I
Undersecretary for Planning and PPP Services

Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
NATIONAL CAPITAL REGION
2nd Street, Port Area, Manila

BAGONG PILIPINAS

DPWH - NCR RMS
DATE: 25 APR 2025
FILE: 403
BY: RECORDS MGT. DIV.

April 15, 2025

MEMORANDUM

FOR : **Secretary MANUEL M. BONOAN**
This Department

THRU : **Undersecretary ROBERTO R. BERNARDO, CESO I**
For Regional Operations in NCR, NIR,
Regions III, IV-A, IV-B, V, VI, VII and VIII

SUBJECT : **Request for Modification of Project under FY 2025 GAA**

We are respectfully forwarding the memorandum dated March 27p, 2025 of **District Engineer MANNY B. BULUSAN**, South Manila District Engineering Office, this Region, requesting the modification of the project included in the FY 2025 General Appropriations Act (GAA), R.A. 12116, to wit:

As per GAA/Original			***As Modified***		
Project Description					
UACS No. 310303102045000 **Project ID: P00900759LZ** OO1: Ensure Safe and Reliable National Road System Bridge - Retrofitting/Strengthening of Permanent Bridges Liwasang Bonifacio West Overpass (Flyover) (**B03377LZ**), Manila City			 OO1: Ensure Safe and Reliable National Road System Bridge - Retrofitting/Strengthening of Permanent Bridges Liwasang Bonifacio West Overpass (Flyover) (**B01348LZ**), Manila City		
Physical Target	**Unit Cost (P'000)**	**Allocation**	**Physical Target**	**Unit Cost (P'000)**	**Allocation**
CW1 – Retrofitting/ Strengthening of Permanent Bridges **1 Bridge**	**P147,000,00/** bridge	P 150,000,000.00	CW1 – Retrofitting/ Strengthening of Permanent Bridges **1 Bridge**	**P147,000,00/** bridge	P 150,000,000.00
EAO	-	P3,000,000.00	EAO	-	P3,000,000.00
	Total :	**P150,000,000.00**		**Total :**	**P150,000,000.00**
Justifications: • To rectify the bridge ID error in project title from "Liwasang Bonifacio West Overpass (Flyover) (B03377LZ), Manila City" to "Liwasang Bonifacio West Overpass (Flyover) (B01348LZ), Manila City". • The Bridge ID of Liwasang Bonifacio West Overpass is B01348LZ					

The following documents are attached for ready reference:

1. FY 2025 DPWH Infrastructure Program (Based on GAA)
2. Project Modification Request Form
3. BP 202
4. Geo-tagged photos
5. GIS Map
6. Certificate of Availability of Funds/Allotment
7. Program of Works with Detailed Unit Price Analysis
8. DED Plans

Early favorable response to expedite project implementation is highly appreciated.

LORETA M. MALALUAN, CESO IV
Regional Director

NCR.1 LED/RMM

P00900759LZ

CHECKLIST FOR EVALUATION OF PROJECTS FOR MODIFICATION OF DPWH-NCR

	REQUIRED DOCUMENTS AND OTHER ATTACHMENTS			COMMENTS/REMARKS
	1. Endorsement Letter			160,000,000
✓	2. FY 2025 Annual Infrastructure Program (Based on GAA)			✓ 150.000,000
N/A	3. Certification from LGU (only for non-existing or change of location)			
	4. Modification Request Form version 01-2024 (including Annexes)			
		✓	Project ID and UACS	
		✓	OU and IO	
		✓	Project Categories	
		✓	Type of Work	
		✓	Technical Justification (Minimum od 2 Bullet Points)	✓
		✓	Physical Target	
		✓	Target Unit Cost	
			Difference of Unit Cost (%)	
		✓	Civil Works	
		✓	EAO	
		N/A	Annex A (For National Road)	
✓	5. BP Form 202			
✓	6. Certificate of Availability of Fund/Allotment			✓ 148,500,000
	7. Certificate of Reasonableness of Cost Estimate (If there is increase in unit cost) **Concurred by Regional Director*			
	8. Straight Line Diagram (SLD): For National Road **Evaluated and Signed by te Planning and Design Chief and validated by the Regional RBIA Coordinator*			
✓	9. Approved Program of Work (POW)			
	2.00 %	✓	EAO	
✓	10. Approved Budget for the Contract (ABC)			
✓	11. Detailed Unit Price Analysis (DUPA)			
✓	12. Copy of Approved Plans			
		✓	Cover Page	
		✓	Summary of Quantities	
		N/A	Cross Section Showing Changes	
✓	13. Geo-tagged Photos			
✓	14. GIS Map			✓
N/A	15. Project Impact Analysis (only for flood control projects)			

Guidelines:
- D.O. 23, series of 2023 AMENDED GUIDELINES ON MODIFICATION OF ALLOTMENT UNDER THE GENERAL APPROPRIATIONS ACT
- D.O. 07, series of 2025 Breakdown of the Allocation of the Authorized Deductions from Project Related Expenses to be used for Engineering and Administrative Overhead (EAO) and MOOE under FY 2025 GAA, DPWH Budget
- Memo 097.7_040424_Supplemental Guidance Project Modifications
- Memo 097.7_071924_Supplemental Guidelines on Project Modification
- Memo 097.7_102924_Limitation on Inclusion of Right-of-Way Acquisition as a Component in Project Modifications for 001 and 002 Project

Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
SOUTH MANILA
DISTRICT ENGINEERING OFFICE
NATIONAL CAPITAL REGION
8TH Street corner Bonifacio Drive, Port Area, Manila

BAGONG PILIPINAS

March 27, 2025

MEMORANDUM

FOR : **Regional Director LORETA M. MALALUAN, CESO IV**
This Region

ATTENTION : **Engineer LIBERATO R. MERCADO**
OIC - Planning and Design Division

Please find attached documents needed for the request for modification of Project Title for the GAA FY 2025 Infrastructure Program under the 5th Congressional District of Manila, to wit:

FROM	TO
Liwasang Bonifacio West Overpass (Flyover) (**B03377LZ**), Manila City	Liwasang Bonifacio West Overpass (Flyover) (**B01348LZ**), Manila City
Limit : P. Burgos St. – Jones Bridge	Limit : P. Burgos St. – Jones Bridge
Location : Ermita, Manila	Location : Ermita, Manila
Allocation : P 150,000,000.00	Allocation : P 150,000,000.00
Physical Target : 1 Bridge	Physical Target : 1 Bridge
Scope of Work : Retrofitting/Strengthening of Permanent Bridges	Scope of Work : Retrofitting/Strengthening of Permanent Bridges

This is for the Regional Director's information and consideration.

MANNY B. BULUSAN
District Engineer

NCR.9.1 JACM/LFG

Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
SOUTH MANILA DISTRICT ENGINEERING OFFICE
8th St. cor. Bonifacio Drive, Port Area, Manila

BAGONG PILIPINAS

March 27, 2025

CERTIFICATION OF AVAILABILITY OF ALLOTMENT

This is to certify that the amount of **ONE HUNDRED FORTY EIGHT MILLION, FIVE HUNDRED THOUSAND PESOS (P148,500,000.00)**, intended for the **Liwasang Bonifacio West Overpass (Flyover) (BO3377lz), Manila City** which is covered by SR2025-03-011164 dated 03/27/2025 under the following details, is still available for obligation as of even date, to wit:

PPA	-	310303102045000
Authorized Appropriation	-	P148,500,000.00

GAA 2025 RA 12116 General Appropriations (Fund 01101101)

This certification is issued for whatever legal purpose it may serve.

JUANITA S. SIAZAR
Chief, Finance Section

Noted:

MANNY B. BULUSAN
District Engineer

NCR 9.4 JSS/lbr
@Reports2025.CAF modification

SOCOTEC ISO 9001

Republic Of The Philippines

DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

Bonifacio Drive, Port Area, Manila

SUB-ALLOTMENT ADVICE

CY 2025

The District Engineer

Regional Office NCR - South Manila DEO

8th Street, corner Bonifacio Drive, Port Area, Manila

Sub-Allotment No. : SR2025-03-011164 **Date :** March 27, 2025

Fund : 01101101 - Regular Agency Fund - General Fund - New General Appropriations - Specific Budgets of National Government Agencies

Legal Basis : FY 2025 RA 12116 Regular 2025 CURRENT

You are hereby authorized to incur obligations not exceeding the amount indicated in accordance with SARO issued by the DBM. Obligation & disbursement must be in accordance w/ generally accepted accounting & auditing rules & regulations & the sole responsibility of the Implementing Office. The allotment herein released shall be valid for obligation until December 31, 2026

P.P.A. Code	Expense Class	Expense Object Code	Particulars	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
310303102045000.EAO	CO	50604030-01	18-001-01-00000-PREXC-03.3 103 BRIDGE PROGRAM	1,500,000.00	0.00	0.00	0.00	1,500,000.00
310303102045000.PC	CO	50604030-01	18-001-01-00000-PREXC-03.3 103 BRIDGE PROGRAM	147,000,000.00	0.00	0.00	0.00	147,000,000.00
Special Allotment: SARO-BMB-A-25-0009037.				**148,500,000.00**	**0.00**	**0.00**	**0.00**	**148,500,000.00**

***** ONE HUNDRED FORTY EIGHT MILLION FIVE HUNDRED THOUSAND PESO/S *****

Capital Outlay - Bridge Program - Retrofitting/ Strengthening of Permanent Bridges
Release of funds for Liwasang Bonifacio West Overpass (Flyover) (B03377lz), Manila City - P150M. Per memorandum of Undersecretary Maria Catalina E. Cabral, Ph.D., CESO I duly approved by Secretary Manuel M. Bonoan dated March 27, 2025.

Prepared by:	Certified as to Availability of Funds	Recommending Approval	APPROVED:
PAUL JOHN V. PEÑAFLORIDA	DOROTHY S. DELIZO	DEBORAH B. STA. MARIA, CHIEF BUDGET DIVISION	GENEVIEVE E. CUARESMA DIRECTOR IV, FS

Date/Time Printed : April 05, 2025 03:49:51 PM

No. 394461

Modification Request Form

A. GENERAL

1. REGION	2. DEO	3. LEGISLATIVE DISTRICT
National Capital Region	South Manila District Engineering Office	5th Legislative District

B. ORIGINAL PROJECT

4. UACS (Unified Account Code Structure as defined in GAA)

310303102045000

5. Project Id

P00900759LZ

6. Project Category

001: Ensure Safe and Reliable National Road System

7. Sub-Program (P/A/P)

Bridge - Retrofitting/ Strengthening of Permanent Bridges

8. Operating Unit

South Manila District Engineering Office

9. Type of Work (Enter Details for all Components below)

Component ID	Type of Work
CW1	Retrofitting / Strengthening of Bridge
Click here to enter text.	Choose an item.
Click here to enter text.	Choose an item.
Click here to enter text.	Choose an item.

10. PROJECT DESCRIPTION (as recorded in GAA)

Liwasang Bonifacio West Overpass (Flyover) (B03377LZ), Manila City

11. ALLOTMENT (P'000) (as recorded in GAA)

150,000

12. PHYSICAL TARGET (Enter Details for all Components below)

Component ID	Target	Target Unit
CW1	1	Number of Bridges
Click here to enter text.	Click here to enter text.	Choose an item.
Click here to enter text.	Click here to enter text.	Choose an item.
Click here to enter text.	Click here to enter text.	Choose an item.

13. UNIT COST (Enter Details for all Components below)

Component ID	Component Cost (P'000)	Target Unit Cost (P'000/Target Unit)
CW1	147,000	147,000/Bridge
EAO	3,000	Click here to enter text.
Click here to enter text.	Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Click here to enter text.

C. PROPOSED REVISED PROJECT

18. Operating Unit (Change subject to DBM approval)

South Manila District Engineering Office

19. Type of Work (Enter Details for all Components below)

Component ID	Type of Work
CW1	Retrofitting / Strengthening of Bridge
Click here to enter text.	Choose an item.
Click here to enter text.	Choose an item.
Click here to enter text.	Choose an item.

20. PROJECT DESCRIPTION (of the revised project)

Liwasang Bonifacio West Overpass (Flyover) (B01348LZ), Manila City

21. REVISED ESTIMATED COST (P'000) (Equal to, or lower than GAA allotment)

150,000

22. CAF (To be obtained from Financial Management office)

☒YES

23. PHYSICAL TARGET (Enter Details for all Components below)

Component ID	Target	Target Unit
CW1	1	Number of Bridges
Click here to enter text.	Click here to enter text.	Choose an item.
Click here to enter text.	Click here to enter text.	Choose an item.
Click here to enter text.	Click here to enter text.	Choose an item.

24. UNIT COST (Enter Details for all Components below)

Component ID	Component Cost (P'000)	Target Unit Cost (P'000/Target Unit)
CW1	147,000	147,000/Bridge
EAO	3,000	Click here to enter text.
Click here to enter text.	Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Click here to enter text.

Modification Request Form

14. PROJECT WORK LOCATION (Must be defined in strict accordance with DO 65 Series 2014)				25. PROJECT WORK LOCATION (Must be defined in strict accordance with DO 65 Series 2014. Also complete "ANNEX A" for National Road projects under OO-1)			
Ermita, Manila				Ermita, Manila			
Start X	120.9808971	End X	120.9840389	Start X	120.9808971	End X	120.9840389
Start Y	14.5948991	End Y	14.5972333	Start Y	14.5948991	End Y	14.5972333
15. ROAD CLASSIFICATION (if applicable)				26. ROAD CLASSIFICATION (if applicable)			
Tertiary				Tertiary			
16. IMPLEMENTING OFFICE (Record the Implementing Office of the original project)				27. IMPLEMENTING OFFICE (Record the Implementing Office of the proposed revised project)			
South Manila District Engineering Office				South Manila District Engineering Office			
17. PROJECT IMPLEMENTATION PLAN (PIP)				28. PROJECT IMPLEMENTATION PLAN (PIP)			
Planned Start Date		Planned End Date		Planned Start Date		Planned End Date	
04/28/2025		10/24/2025		04/28/2025		10/24/2025	
				29. OVERLAP?		30. UNDER WARRANTY?	
				☒ NO	☐ YES	☒ NO	☐ YES

D. ATTACHMENTS & JUSTIFICATIONS

31. PROJECT IMPACT ANALYSIS ATTACHED? (For Flood Control Projects)

☐ NO ☐ YES ☒ N/A

32. TECHNICAL JUSTIFICATION (Explain in detail in Bullet point format; minimum of 2 points)

- To rectify the bridge ID error in project title from "Liwasang Bonifacio West Overpass (Flyover) (B03377LZ), Manila City" to "Liwasang Bonifacio West Overpass (Flyover) (B01348LZ), Manila City".
- The Bridge ID of Liwasang Bonifacio West Overpass is B01348LZ.

33. PHOTOS SUBMITTED

☐NO ☒YES

34. A MAP OF THE PROPOSED PROJECT WORK LOCATION SUBMITTED

☐NO ☒YES

35. PREPARED BY:			
Name:	JOSE ARVIN C. MANAHAN	Position:	Engineer II
Office:	South Manila District Engineering Office	Date:	3/27/2025

36. REVIEWED BY DISTRICT OFFICE (If Required)		38. REVIEWED BY REGIONAL OFFICE	
Name:	LEONARD F. DE GUZMAN	Name:	LIBERATO R. MERCADO
Position:	OIC - Planning & Design Section	Position:	OIC - Planning & Design Division
Date:	3/27/2025	Date:	3/27/2025
37. RECOMMENDED BY DISTRICT OFFICE (If Required)		**39. RECOMMENDED BY REGIONAL OFFICE**	
Name:	MANNY D. BUGUSAN	Name:	LORETA M. MALABUAN, CESO IV
Position:	District Engineer	Position:	Regional Director
Date:	3/27/2025	Date:	3/27/2025

Modification Request Form

UACS (Unified Account Code Structure as defined in GAA)
310303102045000

Project Id
P00900759LZ

40. DPWH OFFICE OF THE UNDERSECRETARIES FOR OPERATIONS

Primary Reason for Request (based on Category of Modification): (choose one)

Category A	Category B	Category C	Category D	Impact
☒ Typographical error on Project Description	☐ Overlapping Sections ☐ Change in Station Limits ☐ Change in Physical Target	☐ No such Barangay ☐ No such City or Municipality	☐ Change in (IO), requiring a change in the (OU)	☑ No change or decrease in unit cost ☐ 20% or less increase in unit cost ☐ > 20% increase in unit cost

Reviewed by Office of the Undersecretary for Operations

Name: BENIGNA C. LAFORTEZA

Signature

Position: Project Manager - I

Date:

41. DPWH PLANNING SERVICE

Category of Modification
(please check the appropriate)

☒ Category A – Typographical Error
☐ Category B – Change in Station Limits
☐ Category C – Change in Location, due to non-existing location
☐ Category D – Change in Operating Unit (requires DBM approval)
☐ Modification does not comply with DBM Categories

Reviewed by Planning Service

Name: AVIGAIL MENDIOLA

Signature

Position: Engineer II

Date: May 9, 2025

Name: PETER PAUL R. CORTEZ

Signature:

Position: Chief of Programming Division

Date:

PROPOSAL FOR NEW OR EXPANDED LOCALLY-FUNDED PROJECT

1. Proposal/Project Name	Retrofitting/ Strengthening of Permanent Bridges -Liwasang Bonifacio West Overpass (Flyover) (B03377lz), Manila City
2. Implementing Department/ Agency	SOUTH MANILA DEO
3. Priority Ranking No.	
4. Categorization	New ☒ / Expanded/Revised ☐ ; Infrastructure ☒ / Non-Infrastructrure ☐
5. NEDA Project ID:	
6. Total Proposal Cost:	150M
7. Description	Retrofitting of Bridge
8. Purpose:	
9. Benificiaries	
10. Implementation Period:	Original: UPON APPROVAL; Start Date: UPON APPROVAL; Finish Date: UPON APPROVAL; REVISED: UPON APPROVAL; Start Date: UPON APPROVAL; Finish Date: UPON APPROVAL

11. Pre-Requisites

Approving Authorities	Reviewed/Approved: Yes	No	Not Applicable	Remarks
NEDA Board	☐	☐	☐	
NEDA Board-ICC	☐	☐	☐	
DPWH Certification	☐	☐	☐	
DPWH MOA	☐	☐	☐	
DPWH Costing	☐	☐	☐	
DENR Clearance	☐	☐	☐	
RDC Consultation	☐	☐	☐	
CSO Consultation	☐	☐	☐	
List of Locations	☐	☐	☐	
List of Beneficiaries	☐	☐	☐	
Others (Pls. Specify)				

12. Financial (In P'000) and Physical Details — 150M

12.1 PAP ATTRIBUTION BY EXPENSE CLASS

PAP (A)	TIER2 (B)	2024 (C)	2025 (D)
310303102045000			
			150M

12.2 PHYSICAL ACCOMPLISHMENT & TARGETS

Physical Accomplishments (A)	TIER2 (B)	2024 (C)	2025 (D)
CONSTRUCTION			
Grand Total			150M

12.3 REQUIREMENTS FOR OPERATING COST INFRASTRUCTURE PROJECT

For infrastructure projects, show the estimated ongoing operating costs to be included in forward estimates

PAP (A)	2024 (B)	2025 (C)
310303102045000		
Grand Total		150M

12.4 COSTING BY COMPONENTS

Components (A)	PS (B)	MOOE (C)	CO (D)	FINEX (E)	Total (F)
Grand Total			150M		

12.5 LOCATION OF IMPLEMENTATION

Location (A)	PS (B)	MOOE (C)	CO (D)	FINEX (E)	Total (F)
Manila City					
Grand Total			150M		

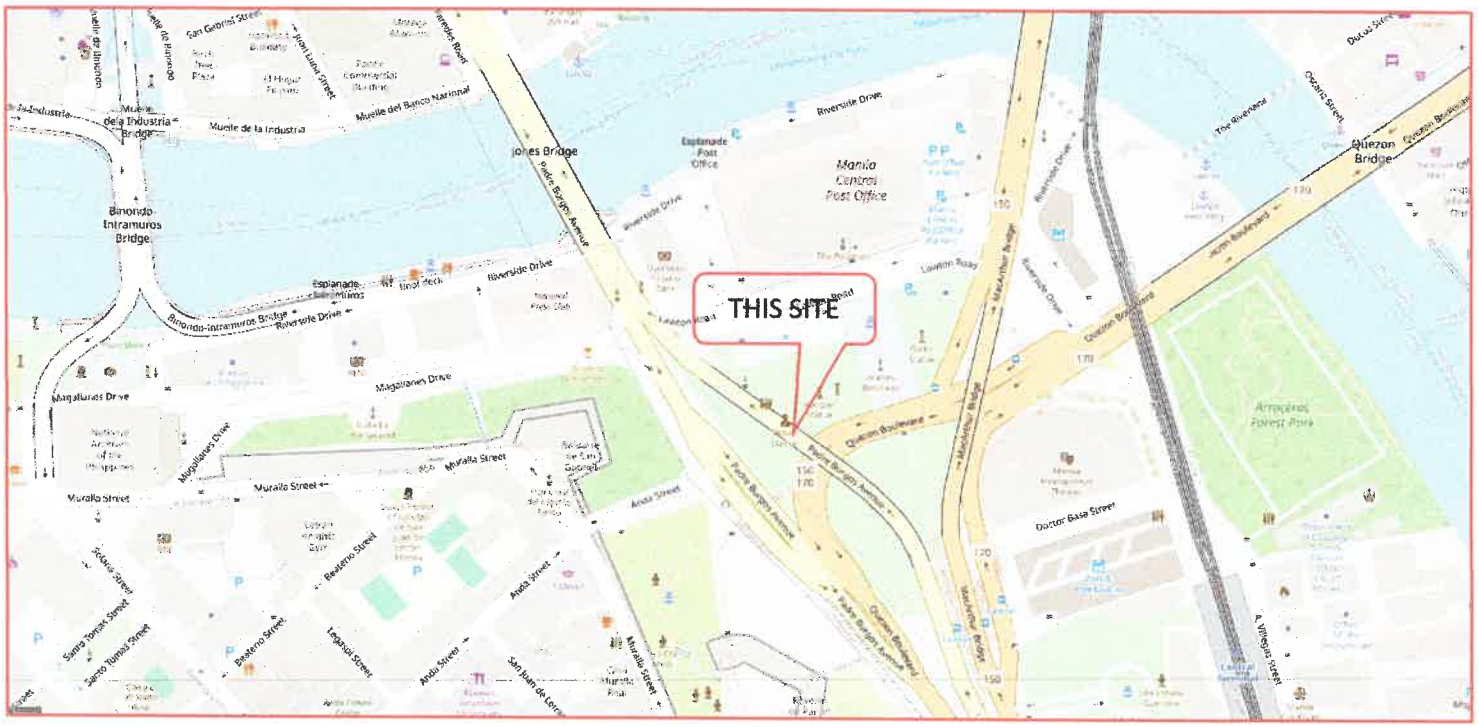
Prepared By:		Certified Correct	Approved:	Date:
LEONILA B. REYES	LEONARD F. DE GUZMAN	JUANITA S. SIAZAR	MANNY B. BULUSAN	
Budget Officer	OIC-Planning Officer	Chief, Accountant	OIC, Office of the District Engineer	

FY 2025 ANNUAL INFRASTRUCTURE PROGRAM

Based on General Appropriations Act

UACS / Sub Program Project Component ID	Project Component Description	Type of Work	Target Unit	Physical Target	Amount (PHP)	Operating Unit / Implementing Office
P00900758LZ-CW1					49,000,000	South Manila District Engineering Office / South Manila District Engineering Office
P00900758LZ-EAO					1,000,000	South Manila District Engineering Office / South Manila District Engineering Office
35. P00900759LZ	310303102045000				150,000,000	
Liwasang Bonifacio West Overpass (Flyover) (B03377lz), Manila City						
P00900759LZ-CW1					147,000,000	South Manila District Engineering Office / South Manila District Engineering Office
P00900759LZ-EAO					3,000,000	South Manila District Engineering Office / South Manila District Engineering Office
36. P00900760LZ	310303102046000				50,000,000	
San Andres Br. along Sn Andres St.						
P00900760LZ-CW1					49,000,000	South Manila District Engineering Office / South Manila District Engineering Office
P00900760LZ-EAO					1,000,000	South Manila District Engineering Office / South Manila District Engineering Office
	Bridge - Rehabilitation/ Major Repair of Permanent Bridges				7,000,000	
37. P00916699LZ	310304101384000				7,000,000	
Lambingan Br. (B02295LZ) along New Panaderos St						

South Manila District Engineering Office



Location Map

Liwasang Bonifacio West Overpass (Flyover) (B01348LZ), Manila City

Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
SOUTH MANILA
DISTRICT ENGINEERING OFFICE
NATIONAL CAPITAL REGION
8TH Street corner Bonifacio Drive, Port Area, Manila

BAGONG PILIPINAS

JUSTIFICATION

The project "Liwasang Bonifacio West Overpass (Flyover) (B03377LZ), Manila City" from General Appropriation Act (GAA) FY 2025 informing that the project with an allocation of One Hundred Fifty Million Pesos (P 150,000,000.00) containing the Bridge ID "B03377LZ" is an error, the right Bridge ID # is B01348LZ.

LEONARD F. DE GUZMAN
OIC - Planning & Design Section

Noted:

MANNY B. BULUSAN
District Engineer

NCR.9.1 JACM/LFG

Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
SOUTH MANILA
DISTRICT ENGINEERING OFFICE
NATIONAL CAPITAL REGION
8th Street corner Bonifacio Drive, Port Area, Manila

BAGONG PILIPINAS

JUSTIFICATION

The project "Liwasang Bonifacio West Overpass (Flyover) (B03377LZ), Manila City" from General Appropriation Act (GAA) FY 2025 informing that the project with an allocation of One Hundred Fifty Million Pesos (P 150,000,000.00) containing the Bridge ID "B03377LZ" is an error, the right Bridge ID # is B01348LZ.

LEONARD F. DE GUZMAN
OIC - Planning & Design Section

Noted:

MANNY B. BULUSAN
District Engineer

NCR.9.1 JACM/LFG

ARTMENT OF PUBLIC WORKS AND HIGH YS
Document Tracking System
Civil Works
Date: JANUARY 15, 2025

The attached **DED PLANS BY ADMIN PER 1 SPAN** is included in the Document Tracking System (DoTS). Use DoTS in sending and receiving this document.

DETAILS

			TL	Office	Initial
Transaction Code	:	CW-OJ-202501-00008 I	1	DC	
Implementing Office	:	PDS	18	PDS	
Subject	:	Prep., review, check, evaluate & approval of DED Plan:	1	ADE	
		Retrofitting/Strengthening of Permanent Bridges- Liwasang Bonifacio West Overpass (Flyover) (B01348LZ), Manila City.	1	DE	

*TL = Time Line

DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
Document Tracking System
Civil Works
Date: JANUARY 16, 2025

The attached **PROGRAM OF WORK (POW)** is included in the Document Tracking System (DoTS). Use DoTS in sending and receiving this document.

DETAILS

			TL	Office	Initial
Transaction Code	:	CW-OJ-202501-00011 I	1	DC	
Implementing Office	:	PDS	3	PDS	
Subject	:	Prep,review,check,eval&approval of POW: Retrofitting/Strengthening of Permanent Bridges- Liwasang Bonifacio West Overpass (Flyover) (B01348LZ), Manila City.	1	ADE	
			1	DE	

*TL = Time Line

D ARTMENT OF PUBLIC WORKS AND HIGH YS

Document Tracking System

Civil Works

Date: JANUARY 17, 2025

The attached **APPROVED BUDGET FOR CONTRACT (ABC)** is included in the Document Tracking System (DoTS). Use DoTS in sending and receiving this document.

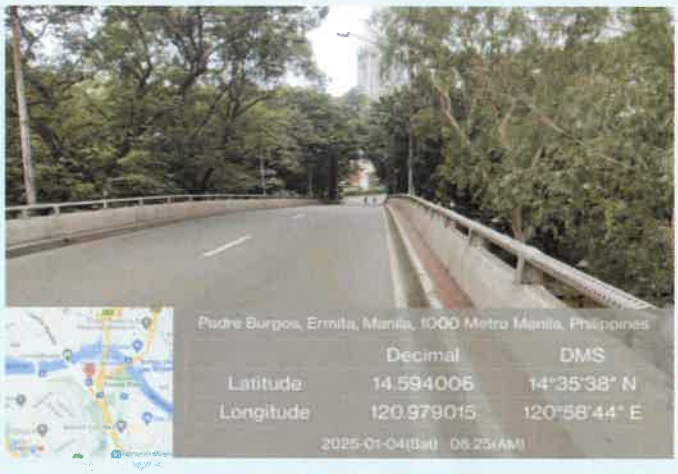
DETAILS

			TL	Office	Initial
Transaction Code	:	CW-OJ-202501-00012 F	1	DC	
Implementing Office	:	PDS	3	PDS	
Subject	:	Prep,review,check,eval&approval of ABC: Retrofitting/Strengthening of Permanent Bridges- Liwasang Bonifacio West Overpass (Flyover) (B01348LZ), Manila City.	1	ADE	
			1	DE	

*TL = Time Line

PROJECT PROFILE

PROJECT CATEGORY	
PROGRAM	
THRUST	
PROJECT NAME	Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City
LOCATION	
Region:	National Capital Region
District Engineering Office:	South Manila District Engineering Office
Legislative District:	District 5
Province:	Metro Manila
Municipality/City:	Manila City
Barangay:	Brgy. 654, 658 Zone 70, 69
TOTAL PROJECT COST	150,000,000.00
TYPE OF WORK	Retroffiting/Strengthening of Permanent Bridges
DETAILED SCOPE OF WORK	Retroffiting/Strengthening of Permanent Bridges using Carbon Fiber Sheet



GEOTAGGED PHOTOS

WILLIAM N. GABATINO
Chief, Planning and Design Section
Date _____

MANNY B. BULUSAN
Officer-in-Charge, Office of the District Engineer
Date _____

CALCULATION OF CYCLE TIME FOR HAULING EQUIPMENT

ESTIMATED TRAVEL SPEED, LOADING / UNLOADING & ALLOWANCE FOR DELAY

TERRAIN CONDITION	ROAD SURFACE CONDITION	DUMP TRUCK TRAVEL SPEED (km/h)	
		LOADED	EMPTY
FLAT	PAVED	35	55
	UNPAVED	30	45
ROLLING	PAVED	30	40
	UNPAVED	25	35
MOUNTAINOUS	PAVED	20	30
	UNPAVED	15	25
LOADING TIME (min)		3	
UNLOADING TIME (min)		2	
ALLOWANCE FOR DELAY (min)		10% OF CYCLE TIME	

FORMULA FOR THE CALCULATION OF DUMP TRUCK TRAVEL TIME

FORMULA : $T = D \div R$

WHRE : T = TIME, TIME OF TRAVEL (h)

D = DISTANCE, HAULING DISTANCE (km)

R = RATE, TRAVEL SPEED (km/h)

COMPUTATION OF CYCLE TIME, T

AVERAGE HAULING DISTANCE		=	21.70 km.
TERRAIN CONDITION		=	FLAT
ROAD SURFACE CONDITION		=	PAVED
LOADING TIME		=	3.00 min
LOADED TRAVEL TIME			
FIRST 200 @	23.33 kph	=	0.51 min
SUCEEDING 21300 m @	35 kph	=	36.51 min
NEXT 200 @	23.33 kph	=	0.51 min
UNLOAD AND MANEUVER		=	2.00 min
FIRST 200 @	36.67 kph	=	0.33 min
SUCEEDING 21300 m @	55 kph	=	23.24 min
NEXT 200 @	36.67 kph	=	0.33 min
CYCLE TIME , T		=	**66.43** min
ALLOWANCE FOR DELAY		=	6.64 min
TOTAL CYCLE TIME , T		=	**73.07** min
say		=	**1.22** hr.

NOTE:

The assumed travel time for loaded and unloaded dump trucks for each type of road surface and terrain condition are for normal conditions. It may vary depending on traffic and road surface conditions and other factors provided that a detailed justification/explanation to be supported with corresponding data and relevant information should be presented.

Project Title:

Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Location : **MANILA CITY**

DERIVATION OF PROJECT DURATION

$$C.D. = \frac{(\ Dh - Dl\ ) \times (\ Ap - Al\ )}{(\ Ah - Al\ )} + Dl$$

Where:

Dh	=	Reference Duration (Higher)	=	318.000
Dl	=	Reference Duration (Lower)	=	266.00
Ah	=	Reference Amount (Higher)	=	150,000,000.00
Al	=	Reference Amount (Lower)	=	100,000,000.00
Ap	=	Appropriation, amount to be programmed	=	150,000,000.00

$$C.D. = \frac{(\ 52.00\ ) \times (\ 50,000,000.00\ )}{(\ 50,000,000.00\ )} + 266.00$$

C.D.	**=**	**318.00**	Calculated Calendar Days for Construction
C.D.	**=**	**40.00**	Additional CD for MMDA/LGU permit
SAY	**=**	**360.00**	Total Computed Calendar Days

note: the design are ***Based on do_044_s2012_ Retrofitting/ Rehabilitation/ Strengthening on Bridge***

Prepared by:

ABDURAHEM I. CANDOTAN
Engineer II
Construction Section

Project Title:

Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location: MANILA CITY

ITEM NO.	DESCRIPTION	QTY	UNIT
PART A	**FACILITIES FOR THE ENGINEER**		
A.1.1(3)	Construction of Field Office for the Engineer	1.00	l.s.
PART B	**OTHER GENERAL REQUIREMENTS**		
B.5(1)	DPWH Project Billboard/Signboard	2.00	each
B.5(2)	COA Billboard/Signboard	1.00	each
B.7(2)	Occupational Safety and Health Program	1.00	l.s.
B.9	Mobilization / Demobilization	1.00	l.s.
PART C	**EARTHWORKS**		
101(3)c1	Removal of Actual structures and obstruction -ACP, 0.050m thick	2,864.89	sq.m.
PART E	**SURFACE COURSES**		
302(2)	Emulsified Asphalt	2,864.89	sq.m.
310(1)c	Bituminous Concrete Wearing Surface Course, Hot-Laid (50mm thk)	2,864.89	sq.m.
PART F	**BRIDGE CONSTRUCTION**		
413(4)b1	Expansion Joint, Steel Finger Type (30mm gap)	93.60	l.m.
414(1)	Forms and Falsework	1.00	l.s.
416(1)b	Carbon Fiber Sheet (2 Layers)	2,330.23	sq.m.
425(1)	Waterproofing on Deck Slab, Liquid Applied	1,941.00	sq.m
425(3)	Epoxy Injection on Crack	6,394.00	l.m.
425(10)	Protective Coating for Concrete Structures	2,330.23	sq.m.
PART H	**MISCELLANEOUS STRUCTURES**		
612(1)	Reflectorized Thermoplastic Pavement Markings (White)	110.00	sq.m.

Prepared by:

ABDURAHEM I. CANDOTAN
Engineer II
Construction Section

Checked by:

JOSE ARVIN C. MANAHAN
Engineer I
Planning and Design Section

Submitted by:

WILLIAM N. GABATINO
Chief, Planning and Design Section

Recommending Approval:

BRIAN B. BRIONES
Officer-in-Charge
Office of the Assistant District Engineer

Approved:

MANNY B. BULUSAN
Officer-in-Charge
Office of the District Engineer

FORM ABC-2015-02-00

SOUTH MANILA DISTRICT ENGINEERING OFFICE

Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

MANILA CITY

APPROVED BUDGET FOR THE CONTRACT

Stations:
Length: Contract Duration: 360

ITEM	DESCRIPTION		ESTIMATED DIRECT COST	TOTAL MARK-UP %	TOTAL MARK-UP VALUE	VAT	TOTAL INDIRECT COST	TOTAL COST
PART A	**FACILITIES FOR THE ENGINEER**	As Evaluated						
		As Submitted	159,515.00		28,712.70	9,411.39	38,124.09	197,639.09
PART B	**OTHER GENERAL REQUIREMENTS**	As Evaluated						
		As Submitted	2,278,979.82		150,125.24	121,455.26	271,580.50	2,550,560.32
PART C	**EARTHWORK**	As Evaluated						
		As Submitted	223,498.43		40,229.72	13,186.41	53,416.13	276,914.56
PART E	**SURFACE COURSES**	As Evaluated						
		As Submitted	5,510,662.21		991,919.19	325,129.08	1,317,048.27	6,827,710.48
PART F	**BRIDGE CONSTRUCTION**	As Evaluated						
		As Submitted	110,625,378.54		19,912,568.15	6,526,897.34	26,439,465.49	137,064,844.03
PART H	**MISCELLANEOUS STRUCTURES**	As Evaluated						
		As Submitted	66,435.20		11,958.34	3,919.68	15,878.02	82,313.22
GRAND TOTAL		As Evaluated						
		As Submitted	**118,864,469.20**			**6,999,999.16**		**146,999,981.70**

Preparation & Submission:

Prepared by:

ABDURAHEM I. CANDOTAN
Engineer II
Construction Section

Checked/Submitted by:

JOSE ARVIN C. MANAHAN
Engineer II
Planning and Design Section

Evaluation:

Reviewed as to Unit Cost

WILLIAM N. GABATINO
Chief, Planning and Design Section

Approval:

Recommending Approval:

BRIAN B. BRIONES
Officer in Charge
Office of the Assistant District Engineer

Approved:

MANNY B. BULUSAN
Officer in Charge
Office of the District Engineer

FORM ABC-2015-02a-00

SOU A DISTRICT ENGINEERING OFFICE

Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

MANILA CITY

APPROVED BUDGET FOR THE CONTRACT

Length: Contract Duration: 360 C.D.

ITEM	DESCRIPTION		QTY	UNIT	ESTIMATED DIRECT COST	MARK-UP IN %		TOTAL MARK-UP		VAT	TOTAL INDIRECT COST	TOTAL COST ESTIMATED	UNIT COST
						OCM	PROFIT	%	VALUE				
(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8) (6)+(7)	(9) (5)(8)	(10) 5%[(5)+(9)]	'(11) (10)+(9)	'(12) (5)+(11)	(13) (12)/(3)
PART A	**FACILITIES FOR THE ENGINEER**												
A.1.1(3)	Construction of Field Office for the Engineer	As Evaluated											
		As Submitted	1.00	l.s.	159,515.00	10.00%	8.00%	18.00%	28,712.70	9,411.39	38,124.09	197,639.09	197,639.09
	TOTAL OF PART A	As Evaluated											
		As Submitted			***159,515.00***				***28,712.70***	***9,411.39***	***38,124.09***	***197,639.09***	
PART B	**OTHER GENERAL REQUIREMENTS**												
B.5(1)	DPWH Project Billboard/Signboard	As Evaluated											
		As Submitted	2.00	each	6,807.02	10.00%	8.00%	18.00%	1,225.26	401.61	1,626.87	8,433.89	4,216.95
B.5(2)	COA Billboard/Signboard	As Evaluated											
		As Submitted	1.00	each	6,878.79	10.00%	8.00%	18.00%	1,238.18	405.85	1,644.03	8,522.82	8,522.82
B.7(2)	Occupational Safety and Health Program	As Evaluated											
		As Submitted	1.00	l.s.	488,184.91	0.00%	8.00%	8.00%	39,054.79	26,361.99	65,416.78	553,601.69	553,601.69
B.8(2)	Traffic Management	As Evaluated											
		As Submitted	1.00	l.s.	1,357,587.60	0.00%	8.00%	8.00%	108,607.01	73,309.73	181,916.74	1,539,504.34	1,539,504.34
B.9	Mobilization / Demobilization	As Evaluated											
		As Submitted	1.00	l.s.	419,521.50	0.00%	0.00%	0.00%	0.00	20,976.08	20,976.08	440,497.58	440,497.58
	TOTAL OF PART B	As Evaluated											
		As Submitted			**2,278,979.82**				**150,125.24**	**121,455.26**	**271,580.50**	**2,550,560.32**	
PART C	**EARTHWORK**												
101(3)c1	Removal of Actual structures and obstruction -ACP, 0.050m thick	As Evaluated											
		As Submitted	2,864.89	sq.m.	223,498.43	10.00%	8.00%	18.00%	40,229.72	13,186.41	53,416.13	276,914.56	96.66
	TOTAL OF PART C	As Evaluated											
		As Submitted			**223,498.43**				**40,229.72**	**13,186.41**	**53,416.13**	**276,914.56**	
PART E	**SURFACE COURSES**												
302(2)	Emulsified Asphalt	As Evaluated											
		As Submitted	2,864.89	sq.m.	81,555.85	10.00%	8.00%	18.00%	14,680.05	4,811.80	19,491.85	101,047.70	35.27
310(1)c	Bituminous Concrete Wearing Surface Course, Hot-Laid (50mm thi	As Evaluated											
		As Submitted	2,864.89	sq.m.	5,429,106.36	10.00%	8.00%	18.00%	977,239.14	320,317.28	1,297,556.42	6,726,662.78	2,347.97
	TOTAL OF PART E	As Evaluated											
		As Submitted			**5,510,662.21**				**991,919.19**	**325,129.08**	**1,317,048.27**	**6,827,710.48**	
PART F	**BRIDGE CONSTRUCTION**												
413(4)b1	Expansion Joint, Steel Finger Type (30mm gap)	As Evaluated											
		As Submitted	93.60	l.m	23,605,875.43	10.00%	8.00%	18.00%	4,249,057.58	1,392,746.65	5,641,804.23	29,247,679.66	312,475.21
414(1)	Forms and Falsework	As Evaluated											
		As Submitted	1.00	l.s.	600,000.00	10.00%	8.00%	18.00%	108,000.00	35,400.00	143,400.00	743,400.00	743,400.00
416(1)b	Carbon Fiber Sheet (2 Layers)	As Evaluated											
		As Submitted	2,330.23	sq.m.	54,743,130.71	10.00%	8.00%	18.00%	9,853,763.53	3,229,844.71	13,083,608.24	67,826,738.95	29,107.32
425(1)	Waterproofing on Deck Slab, Liquid Applied	As Evaluated											
		As Submitted	1,941.00	sq.m	1,566,531.14	10.00%	8.00%	18.00%	281,975.61	92,425.34	374,400.95	1,940,932.09	999.97
425(3)	Epoxy Injection on Crack	As Evaluated											
		As Submitted	6,394.00	l.m.	21,524,803.66	10.00%	8.00%	18.00%	3,874,464.66	1,269,963.42	5,144,428.08	26,669,231.74	4,170.98
425(10)	Protective Coating for Concrete Structures	As Evaluated											
		As Submitted	2,330.23	sq.m.	8,585,037.60	10.00%	8.00%	18.00%	1,545,306.77	506,517.22	2,051,823.99	10,636,861.59	4,564.73
	TOTAL OF PART F	As Evaluated											
		As Submitted			**110,625,378.54**				**19,912,568.15**	**6,526,897.34**	**26,439,465.49**	**137,064,844.03**	
PART H	**MISCELLANEOUS STRUCTURES**												
612(1)	Reflectorized Thermoplastic Pavement Markings (White)	As Evaluated											
		As Submitted	110.00	sq.m.	66,436.20	10.00%	8.00%	18.00%	11,958.34	3,919.68	15,878.02	82,313.22	748.30
	TOTAL OF PART H	As Evaluated											
		As Submitted			**66,436.20**				**11,958.34**	**3,919.68**	**15,878.02**	**82,313.22**	
		As Evaluated											
	GRAND TOTAL	As Submitted			**118,864,469.20**					**6,999,999.16**		**146,999,981.70**	

Preparation and Submission

Prepared by:

ABDURASHEM I. CANDOTAN
Engineer II
Construction Section

Checked/Submitted by:

JOSE ARVIN C. MANAHAN
Engineer III
Chief, Planning and Design Section

Evaluation

Reviewed as to Unit Cost:

WILLIAM N. GABATINO
Engineer III
Chief, Planning and Design Section

SOUTH MANILA DISTRICT ENGINEERING OFFICE

PROGRAM OF WORKS/ BUDGET COST

ANNEX A

FORM POW-2015-01-00

Project : Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Net Length : a. Road
b. Bridge
c. Others

Project ID :
Location : MANILA CITY
Station Limits :
Appropriation : ₱ 150,000,000.00
Source of Fund : GAA-2025

Target Start Date :
Total Project Duration : 360 C.D.
No. of Pre-determined :
Unworkable Days :

DESCRIPTION OF WORKS TO BE DONE		QUANTITY	UNIT	AS SUBMITTED		AS EVALUATED	
				% TOTAL	TOTAL DIRECT COST	% TOTAL	TOTAL DIRECT COST
	VOLUME II						
PART A	FACILITIES FOR THE ENGINEER			0.13%	159,515.00		
PART B	OTHER GENERAL REQUIREMENTS			1.92%	2,278,979.82		
	PROJECT COMPONENT DESCRIPTION						
PART C	EARTHWORKS	(PLS. SEE FORM POW-2015-01A-00)		0.19%	223,498.43		
PART E	SURFACE COURSES			4.64%	5,510,662.21		
PART F	BRIDGE CONSTRUCTION			93.07%	110,625,378.54		
PART H	MISCELLANEOUS STRUCTURES			0.06%	66,435.20		
	Total			**100.00%**	**118,864,469.20**		

EQUIPMENT:

DESCRIPTION	REQUIRED
(PLS. SEE FORM POW-2015-01B-00)	

BREAKDOWN OF EXPENDITURES:

	AS SUBMITTED	AS EVALUATED
1. Labor	3,998,296.58	
2. Materials	111,572,128.95	
3. Rental of Equipment	3,294,043.67	
4. Provisional Sum/ Daywork		
5. OCM and Profit	21,135,513.34	
6. Value Added Tax	6,999,999.16	
7. EAO (2.0%)	3,000,000.00	
8. RROW Acquisition		
9. Physical Reseved (Contigency)		
10. TOTAL ESTIMATED COST	**149,999,981.70**	
Say	**150,000,000.00**	

	AS SUBMITTED	AS EVALUATED
A. Total Direct Cost	118,864,469.20	
B. OCM and Profit	21,135,513.34	
C. Value Added Tax	6,999,999.16	
D. Total Const. Cost	146,999,981.70	
E. EAO (2.0%)	3,000,000.00	
F. RROW Acquisition		
G. Physical Reseved (Contigency)		
H. TOTAL ESTIMATED COST	**149,999,981.70**	
H. TOTAL ESTIMATED COST	**150,000,000.00**	

Preparation & Submission:

Prepared by:
ABDURAHEM I. CANDOTAN
Engineer II
Construction Section

Checked by:
JOSE ARVIN C. MANAHAN
Engineer II
Planning and Design Section

Submitted by:
WILLIAM N. GABATINO
Engineer III
Chief, Planning and Design Section

Evaluation:

Recommending Approval:
BRIAN B. BRIONES
Officer-in-Charge
Office of the Assistant District Engineer

Approved:
MANNY B. BULUSAN
Officer-in-Charge
Office of the District Engineer

Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

MANILA CITY

FORM POW-2015-01A-00

ITEMIZED BREAKDOWN

ITEM NO.	DESCRIPTION	QTY		UNIT	DIRECT COST				TOTAL COST (DIRECT+INDIRECT)		% DIRECT COST
					TOTAL		UNIT COST				
		As-Submitted	As-Evaluated		As-Submitted	As-Evaluated	As-Submitted	As-Evaluated	As-Submitted	As-Evaluated	As-Submitted
PART A	FACILITIES FOR THE ENGINEER										
A.1.1(3)	Construction of Field Office for the Engineer	1.00		l.s.	159,515.00		159,515.00		197,639.09		0.13%
	TOTAL OF PART A				**159,515.00**				**197,639.09**		**0.13%**
PART B	OTHER GENERAL REQUIREMENTS										
B.5(1)	DPWH Project Billboard/Signboard	2.00		each	6,807.02		3,403.51		8,433.89		0.01%
B.5(2)	COA Billboard/Signboard	1.00		each	6,878.79		6,878.79		8,522.82		0.01%
B.7(2)	Occupational Safety and Health Program	1.00		l.s.	488,184.91		488,184.91		553,601.69		0.41%
B.8(2)	Traffic Management	1.00		l.s.	1,357,587.60		1,357,587.60		1,539,504.34		1.14%
B.9	Mobilization / Demobilization	1.00		l.s.	419,521.50		419,521.50		440,497.58		0.35%
	TOTAL OF PART B				**2,278,979.82**				**2,550,560.32**		**1.92%**
PART C	EARTHWORKS										
101(3)c1	Removal of Actual structures and obstruction -ACP, 0.050m thick	2864.89		sq.m.	223,498.43		78.01		276,914.56		0.19%
	TOTAL OF PART C				**223,498.43**				**276,914.56**		**0.19%**
PART E	SURFACE COURSES										
302(2)	Emulsified Asphalt	2864.89		sq.m.	81,555.85		28.47		101,047.70		0.07%
310(1)c	Bituminous Concrete Wearing Surface Course, Hot-Laid (50mm thk)	2864.89		sq.m.	5,429,106.36		1,895.05		6,726,662.78		4.57%
	TOTAL OF PART E				**5,510,662.21**				**6,827,710.48**		**4.64%**
PART F	BRIDGE CONSTRUCTION										
413(4)b1	Expansion Joint, Steel Finger Type (30mm gap)	93.60		l.m.	23,605,875.43		252,199.52		29,247,679.66		19.86%
414(1)	Forms and Falsework	1.00		l.s.	600,000.00		600,000.00		743,400.00		0.50%
416(1)b	Carbon Fiber Sheet (2 Layers)	2330.23		sq.m.	54,743,130.71		23,492.59		67,826,738.95		46.06%
425(1)	Waterproofing on Deck Slab, Liquid Applied	1941.00		sq.m	1,566,531.14		807.07		1,940,932.09		1.32%
425(3)	Epoxy Injection on Crack	6394.00		l.m.	21,524,803.66		3,366.41		26,669,231.74		18.11%
425(10)	Protective Coating for Concrete Structures	2330.23		sq.m.	8,585,037.60		3,684.20		10,636,861.59		7.22%
	TOTAL OF PART F				**110,625,378.54**				**137,064,844.03**		**93.07%**
PART H	MISCELLANEOUS STRUCTURES										
612(1)	Reflectorized Thermoplastic Pavement Markings (White)	110.00		sq.m.	66,435.20		603.96		82,313.22		0.06%
	TOTAL OF PART H				**66,435.20**				**82,313.22**		**0.06%**
	GRAND TOTAL				**118,864,469.20**				**146,999,981.79**		**100.00%**

Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

MANILA CITY

FORM POW-2015-01B-00

MINIMUM EQUIPMENT REQUIREMENT

No.	EQUIPMENT DESCRIPTION	CAPACITY	NUMBER OF EQUIPMENT		No.	EQUIPMENT DESCRIPTION	CAPACITY	NUMBER OF EQUIPMENT
1	Backhoe (0.80 cu.m.)		10.00		33			
2	Dump Truck (12 cu.yd.), All Models		4.00		34			
3	Water Pump, 100 mm suction Ø (2,667 lpm, 16 hp)		1.00		35			
4	Concrete Pump Diesel Driven, Trailer-Mounted Less		1.00		36			
5	Motorized Road Grader with Scarifier, G710A		1.00		37			
6	Payloader (110 hp, 1.50 cu.m.), LX80-2C		2.00		38			
7	Concrete Vibrator		2.00		39			
8	Concrete Screeder (5.5 hp)		1.00		40			
9	Concrete Saw (7.5 hp), 14" Blade Ø		1.00		41			
10	Bar Cutter, Single Phase		1.00		42			
11	Concrete Joint Sealing Machine		1.00		43			
12	Boom Truck (2-5mt)		1.00		44			
13	Cargo Truck (2-5 m.t.), All Models		1.00		45			
14	Concrete Vibrator		2.00		46			
15	Concrete Screeder (5.5 hp)		1.00		47			
16	Concrete Saw (7.5 hp), 14" Blade Ø		1.00		48			
17	Cargo Truck (9-10 mt)		1.00		49			
18	Applicator Machine		1.00		50			
19	Kneading Machine		1.00		51			
20	Backhoe (3.00 m^3), PC450-7		1.00		52			
21	Bulldozer, DX175		1.00		53			
22	Vibratory Roller (10 m.t.), SD100DC		1.00		54			
23	Water Truck/Pump (16000 L), All Makes		1.00		55			
24	Truck Mounted Crane (41 - 45 mt)		1.00		56			
25	Vibro Hammer (272.22 hp)		1.00		57			
26	Generator Set (700 kW)		1.00		58			
27	Welding Machine (500 A), Electric Driven		1.00		59			
28	Cutting Outfit		1.00		60			
29	Plate Compactor (5 hp)		1.00		61			
30	Cargo Truck (9-10 T, 270 hp), All Makes		1.00		62			
31	Bar Bender		1.00		63			
32	One Bagger Mixer		1.00		61			
	SUB-TOTAL					**SUB-TOTAL**		
						TOTAL		

Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

MANILA CITY

FORM POW-2015-01C-00

DETAILED BREAKDOWN OF COMPONENT COST FOR EACH ITEM

ITEM NO.	DESCRIPTION	%	QTY	UNIT	DIRECT COST				TOTAL MARK-UP		5% VAT	TOTAL COST
					MATERIAL	LABOR	EQUIPMENT	TOTAL	%	VALUE		
PART A	FACILITIES FOR THE ENGINEER											
A.1.1(3)	Construction of Field Office for the Engineer	AS EVALUATED		l.s.								
		AS SUBMITTED	1.00		113,248.56	42,060.40	4,206.04	159,515.00	18.00%	28,712.70	9,411.39	197,639.09
	TOTAL OF PART A	AS EVALUATED										
		AS SUBMITTED			**113,248.56**	**42,060.40**	**4,206.04**	**159,515.00**		**28,712.70**	**9,411.39**	**197,639.09**
PART B	OTHER GENERAL REQUIREMENTS											
B.5(1)	DPWH Project Billboard/Signboard	AS EVALUATED		each								
		AS SUBMITTED	2.00		5,300.00	1,435.26	71.76	6,807.02	18.00%	1,225.26	401.61	8,433.89
B.5(2)	COA Billboard/Signboard	AS EVALUATED		each								
		AS SUBMITTED	1.00		5,300.00	1,435.26	143.53	6,878.79	18.00%	1,238.18	405.85	8,522.82
B.7(2)	Occupational Safety and Health Program	AS EVALUATED		l.s.								
		AS SUBMITTED	1.00		75,256.27	412,928.64	-	488,184.91	8.00%	39,054.79	26,361.99	553,601.69
B.8(2)	Traffic Management	AS EVALUATED		l.s.								
		AS SUBMITTED	1.00		40,966.80	1,166,860.80	149,760.00	1,357,587.60	8.00%	108,607.01	73,309.73	1,539,504.34
B.9	Mobilization / Demobilization	AS EVALUATED		l.s.								
		AS SUBMITTED	1.00		-	-	419,521.50	419,521.50	0.00%	-	20,976.08	440,497.58
	TOTAL OF PART B	AS EVALUATED										
		AS SUBMITTED			**126,823.07**	**1,582,659.96**	**569,496.79**	**2,278,979.82**		**150,125.24**	**121,455.26**	**2,550,560.32**
PART C	EARTHWORKS											
101(3)c1	Removal of Actual structures and obstruction -ACP, 0.050m thick	AS EVALUATED		sq.m.								
		AS SUBMITTED	2,864.89		-	12,888.66	210,609.77	223,498.43	18.00%	40,229.72	13,186.41	276,914.56
	TOTAL OF PART C	AS EVALUATED										
		AS SUBMITTED			**-**	**12,888.66**	**210,609.77**	**223,498.43**		**40,229.72**	**13,186.41**	**276,914.56**
PART E	SURFACE COURSES											
302(2)	Emulsified Asphalt	AS EVALUATED		sq.m.								
		AS SUBMITTED	2,864.89		74,888.22	2,084.37	4,583.26	81,555.85	18.00%	14,680.05	4,811.80	101,047.70
310(1)c	Bituminous Concrete Wearing Surface Course, Hot-Laid (50mm thk)	AS EVALUATED		sq.m.								
		AS SUBMITTED	2,864.89		5,285,722.05	25,365.73	118,018.58	5,429,106.36	18.00%	977,239.14	320,317.28	6,726,662.78
	TOTAL OF PART E	AS EVALUATED										
		AS SUBMITTED			**5,360,610.27**	**27,450.10**	**122,601.84**	**5,510,662.21**		**991,919.19**	**325,129.08**	**6,827,710.48**
PART F	BRIDGE CONSTRUCTION											
413(4)b1	Expansion Joint, Steel Finger Type (30mm gap)	AS EVALUATED		l.m.								
		AS SUBMITTED	93.60		22,147,292.23	516,693.60	941,889.60	23,605,875.43	18.00%	4,249,057.58	1,392,746.65	29,247,679.66
414(1)	Forms and Falsework	AS EVALUATED		l.s.								
		AS SUBMITTED	1.00		-	-	600,000.00	600,000.00	18.00%	108,000.00	35,400.00	743,400.00
416(1)b	Carbon Fiber Sheet (2 Layers)	AS EVALUATED		sq.m.								
		AS SUBMITTED	2,330.23		53,996,998.35	618,188.17	127,944.19	54,743,130.71	18.00%	9,853,763.53	3,229,844.71	67,826,738.95
426(1)	Waterproofing on Deck Slab, Liquid Applied	AS EVALUATED		sq.m								
		AS SUBMITTED	1,941.00		1,323,432.03	205,666.45	37,432.66	1,566,531.14	18.00%	281,975.61	92,425.34	1,940,932.09
425(3)	Epoxy Injection on Crack	AS EVALUATED		l.m.								
		AS SUBMITTED	6,394.00		20,300,950.00	714,218.21	509,635.45	21,524,803.66	18.00%	3,874,464.66	1,269,963.42	26,669,231.74
425(10)	Protective Coating for Concrete Structures	AS EVALUATED		sq.m.								
		AS SUBMITTED	2,330.23		8,146,111.24	273,844.39	165,081.97	8,585,037.60	18.00%	1,545,306.77	506,517.22	10,636,861.59
	TOTAL OF PART F	AS EVALUATED										
		AS SUBMITTED			**105,914,783.85**	**2,328,610.82**	**2,381,983.87**	**110,625,378.54**		**19,912,568.15**	**6,526,897.34**	**137,064,844.03**
PART H	MISCELLANEOUS STRUCTURES											
612(1)	Reflectorized Thermoplastic Pavement Markings (White)	AS EVALUATED		sq.m.								
		AS SUBMITTED	110.00		56,663.20	4,626.64	5,145.36	66,435.20	18.00%	11,958.34	3,919.68	82,313.22
	TOTAL OF PART H	AS EVALUATED										
		AS SUBMITTED			**56,663.20**	**4,626.64**	**5,145.36**	**66,435.20**		**11,958.34**	**3,919.68**	**82,313.22**
	GRAND TOTAL	AS EVALUATED										
		AS SUBMITTED			**111,672,128.95**	**3,996,296.68**	**3,294,043.67**	**118,864,469.20**		**21,136,513.34**	**6,999,999.16**	**146,999,981.70**

PERT-CPM COMPUTATION

A.1.1(3) Construction of Field Office for the Engineer

Total Quantity = 1.00 l.s.
Assumed Output = 0.00035 l.s. /hr

$$\text{No. of Days} = \frac{1.00}{(\ 0.0004\ )} \times \frac{1\ \text{day}}{8\ \text{hr.}} = 357.14 \text{ day(s)}$$

= 360 day(s)

B.5(1) DPWH Project Billboard/Signboard
B.5(2) COA Billboard/Signboard

Total Quantity = 3.00 each
Assumed Output = 0.38 each /hr

$$\text{No. of Days} = \frac{3.00}{(\ 0.380\ )} \times \frac{1\ \text{day}}{8\ \text{hr.}} = 0.99 \text{ day(s)}$$

= 1 day(s)

B.7(2) Occupational Safety and Health Program

Total Quantity = 1.00 l.s.
Assumed Output = 0.00035 l.s. /hr

$$\text{No. of Days} = \frac{1.00}{(\ 0.000350\ )} \times \frac{1\ \text{day}}{8\ \text{hr.}} = 357.14 \text{ day(s)}$$

= 360 day(s)

B.8(2) Traffic Management

Total Quantity = 1.00 l.s.
Assumed Output = 0.007 l.s. /hr

$$\text{No. of Days} = \frac{1.00}{(\ 0.0070\ )} \times \frac{1\ \text{day}}{8\ \text{hr.}} = 17.86 \text{ day(s)}$$

= 18 day(s)

B.9 Mobilization / Demobilization

Total Quantity = 1.00 l.s.
Assumed Output = 0.00040193 l.s. /hr

$$\text{No. of Days} = \frac{1.00}{(\ 0.000402\ )} \times \frac{1\ \text{day}}{8\ \text{hr.}} = 311.00 \text{ day(s)}$$

= 311 day(s)

101(3)c1 **Removal of Actual structures and obstruction -ACP, 0.050m thick**

Total Quantity = 2864.89 l.s.
Assumed Output = 1.79056 l.s. /hr

$$\text{No. of Days} = \frac{2864.89}{(\ 1.790560\ )} \times \frac{1\ \text{day}}{8\ \text{hr.}} = 200.00 \text{ day(s)}$$

= 200 day(s)

302(2) **Emulsified Asphalt**

Total Quantity = 2864.89 sq.m.
Assumed Output = 6.51111 sq.m. /hr

$$\text{No. of Days} = \frac{2864.89}{(\ 6.511110\ )} \times \frac{1\ \text{day}}{8\ \text{hr.}} = 55.00 \text{ day(s)}$$

= 55 day(s)

310(1)c **Bituminous Concrete Wearing Surface Course, Hot-Laid (50mm thk)**

Total Quantity = 2,864.89 sq.m.
Assumed Output = 5.97 sq.m. /hr

$$\text{No. of Days} = \frac{2864.89}{(\ 5.97\ )} \times \frac{1\ \text{day}}{8\ \text{hr.}} = 59.99 \text{ day(s)}$$

= 60 day(s)

413(4)b1 **Expansion Joint, Steel Finger Type (30mm gap)**

Total Quantity = 93.60 kg
Assumed Output = 0.17 kg/hr

$$\text{No. of Days} = \frac{93.60}{(\ 0.17\ )} \times \frac{1\ \text{day}}{8\ \text{hr.}} = 68.82 \text{ day(s)}$$

= 70 day(s)

414(1) **Forms and Falsework**

Total Quantity = 1.00 cu.m.
Assumed Output = 0.00 cu.m./hr

$$\text{No. of Days} = \frac{1.00}{(\ 0.00\ )} \times \frac{1\ \text{day}}{8\ \text{hr.}} = \#\text{DIV/0!} \text{ day(s)}$$

= 60 day(s)

416(1)b **Carbon Fiber Sheet (2 Layers)**

Total Quantity = 2,330.23 cu.m.
Assumed Output = 6.47 cu.m./hr

$$\text{No. of Days} = \frac{2330.23}{(\ 6.47\ )} \times \frac{1\ \text{day}}{8\ \text{hr.}} = 45.02 \text{ day(s)}$$

= 45 day(s)

425(1) **Waterproofing on Deck Slab, Liquid Applied**

Total Quantity = 1941.00 l.s.
Assumed Output = 1.21313 l.s. /hr

$$\text{No. of Days} = \frac{1941.00}{(\ 1.213130\ )} \times \frac{1\ \text{day}}{8\ \text{hr.}} = 200.00 \text{ day(s)}$$

= 200 day(s)

425(3) **Epoxy Injection on Crack**

Total Quantity = 6,394.00 piece
Assumed Output = 29.6 piece/hr

$$\text{No. of Days} = \frac{6394.00}{(\ 29.60\ )} \times \frac{1\ \text{day}}{8\ \text{hr.}} = 27.00 \text{ day(s)}$$

= 27 day(s)

425(10) **Protective Coating for Concrete Structures**

Total Quantity = 2,330.23 sq.m.
Assumed Output = 9.71 sq.m./hr

$$\text{No. of Days} = \frac{2330.23}{(\ 9.71\ )} \times \frac{1\ \text{day}}{8\ \text{hr.}} = 30.00 \text{ day(s)}$$

= 30 day(s)

612(1) **Reflectorized Thermoplastic Pavement Markings (White)**

Total Quantity = 110.00 cu.m.
Assumed Output = 0.23 cu.m./hr

$$\text{No. of Days} = \frac{110.00}{(\ 0.23\ )} \times \frac{1\ \text{day}}{8\ \text{hr.}} = 59.78 \text{ day(s)}$$

= 61 day(s)

Prepared by:

ABDURAHEM I. CANDOTAN
Engineer II
Construction Section

Project Name : Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location : MANILA CITY

BILL OF QUANTITIES

Part No: _____ **Part Description :** _____

Pay Item No.	DESCRIPTION	UNIT	QTY	UNIT PRICE (PESOS)	AMOUNT (PESOS)
(1)	(2)	(3)	(4)	(5)	(6)
PART A	**FACILITIES FOR THE ENGINEER**				
A.1.1(3)	Construction of Field Office for the Engineer	l.s.	1.00	In words: Pesos _____ In Figures: Php	In Figures: Php
TOTAL OF PART A					In words: Pesos _____ In Figures: Php
PART B	**OTHER GENERAL REQUIREMENTS**				
B.5(1)	DPWH Project Billboard/Signboard	each	2.00	In words: Pesos _____ In Figures: Php	In Figures: Php
B.5(2)	COA Billboard/Signboard	each	1.00	In words: Pesos _____ In Figures: Php	In Figures: Php
B.7(2)	Occupational Safety and Health Program	l.s.	1.00	In words: Pesos _____ In Figures: Php	In Figures: Php
B.9	Mobilization / Demobilization	l.s.	1.00	In words: Pesos _____ In Figures: Php	In Figures: Php
B.9	Mobilization / Demobilization	l.s.	1.00	In words: Pesos _____ In Figures: Php	In Figures: Php
TOTAL OF PART B					In words: Pesos _____ In Figures: Php

Project Name : Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location : MANILA CITY

BILL OF QUANTITIES

Part No: _____ **Part Description :** _____

Pay Item No.	DESCRIPTION	UNIT	QTY	UNIT PRICE (PESOS)	AMOUNT (PESOS)
(1)	(2)	(3)	(4)	(5)	(6)
PART C	**EARTHWORKS**				
101(3)c1	Removal of Actual structures and obstruction -ACP, 0.050m thick	sq.m.	2864.89	In words: Pesos _____ In Figures: Php _____	In Figures: Php _____
TOTAL OF PART C					In words: Pesos _____ In Figures: Php _____
PART E	**SURFACE COURSES**				
302(2)	Emulsified Asphalt	sq.m.	2864.89	In words: Pesos _____ In Figures: Php _____	In Figures: Php _____
310(1)c	Bituminous Concrete Wearing Surface Course, Hot-Laid (50mm thk)	sq.m.	2864.89	In words: Pesos _____ In Figures: Php _____	In Figures: Php _____
TOTAL OF PART E					In words: Pesos _____ In Figures: Php _____

Project Name : Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location : MANILA CITY

BILL OF QUANTITIES

Part No: _____ **Part Description :** _____

Pay Item No.	DESCRIPTION	UNIT	QTY	UNIT PRICE (PESOS)	AMOUNT (PESOS)
(1)	(2)	(3)	(4)	(5)	(6)
PART F	**BRIDGE CONSTRUCTION**				
413(4)b1	Expansion Joint, Steel Finger Type (30mm gap)	l.m.	93.60	In words: Pesos _____ In Figures: Php _____	In Figures: Php _____
414(1)	Forms and Falsework	l.s.	1.00	In words: Pesos _____ In Figures: Php _____	In Figures: Php _____
416(1)b	Carbon Fiber Sheet (2 Layers)	sq.m.	2330.23	In words: Pesos _____ In Figures: Php _____	In Figures: Php _____
425(1)	Waterproofing on Deck Slab, Liquid Applied	sq.m	1941.00	In words: Pesos _____ In Figures: Php _____	In Figures: Php _____
425(3)	Epoxy Injection on Crack	l.m.	6394.00	In words: Pesos _____ In Figures: Php _____	In Figures: Php _____
425(10)	Protective Coating for Concrete Structures	sq.m.	2330.23	In words: Pesos _____ In Figures: Php _____	In Figures: Php _____
	TOTAL OF PART F				In words: Pesos _____ In Figures: Php _____
PART H	**MISCELLANEOUS STRUCTURES**				
612(1)	Reflectorized Thermoplastic Pavement Markings (White)	sq.m.	110.00	In words: Pesos _____ In Figures: Php _____	In Figures: Php _____

Project Name : Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location : MANILA CITY

BILL OF QUANTITIES

Part No: _____ **Part Description :** _____

Pay Item No.	DESCRIPTION	UNIT	QTY	UNIT PRICE (PESOS)	AMOUNT (PESOS)
(1)	(2)	(3)	(4)	(5)	(6)
	TOTAL OF PART H				In words: Pesos _____ In Figures: Php
	GRAND TOTAL				In words: Pesos _____ In Figures: Php

Submitted by:

Name of the Representative of the Bidder

Position: _____

Name of the Bidder _____

Date :

Project Title: Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location: MANILA CITY

DETAILED ESTIMATE

PART A FACILITIES FOR THE ENGINEER

A.1.1(3) Construction of Field Office for the Engineer

Qty = 1.00 l.s.

PART B OTHER GENERAL REQUIREMENTS

B.5(1) DPWH Project Billboard/Signboard

Qty = 2.00 each

B.5(2) COA Billboard/Signboard

Qty = 1.00 each

B.7(2) Occupational Safety and Health Program

Qty = 1.00 l.s.

B.8(2) Traffic Management

Qty = 1.00 l.s.

B.9 Mobilization / Demobilization

Qty = 1.00 l.s.

PART C EARTHWORKS

101(3)c1 Removal of Actual structures and obstruction -ACP, 0.050m thick

APPROACH	LENGTH	AVE. WIDTH	AREA (sq.m.)
1	115.30	12.10	1395.13
2	64.00	7.80	499.20
SLAB	134.80	7.20	970.56
		TOTAL	2864.89
		GRAND TOTAL	2864.89 sq.m

PART E SURFACE COURSES

302(2) Emulsified Asphalt

APPROACH	LENGTH	AVE. WIDTH	AREA (sq.m.)
1	115.30	12.10	1395.13
2	64.00	7.80	499.20
SLAB	134.80	7.20	970.56
		TOTAL	2864.89
		GRAND TOTAL	2864.89 sq.m

310(1)c Bituminous Concrete Wearing Surface Course, Hot-Laid (50mm thk)

APPROACH	LENGTH	AVE. WIDTH	AREA (sq.m.)
1	115.30	12.10	1395.13
2	64.00	7.80	499.20
SLAB	134.80	7.20	970.56
		TOTAL	2864.89
		GRAND TOTAL	2864.89 sq.m

PART F **BRIDGE CONSTRUCTION**

413(4)b1 **Expansion Joint, Steel Finger Type (30mm gap)**

BR. COMPONENTS	# OF COMPONENTS	LENGTH	TOTAL
ABUTMENT	2.00	7.20	14.40
PIER	11.00	7.20	79.20
		GRAND TOTAL	93.60

l.m.

414(1) **Forms and Falsework**

QTY = 1.00 l.s.

416(1)b **Carbon Fiber Sheet (2 Layers)**

BR. COMPONENTS	# OF COMPONENTS	DIMENSION	LENGTH	TOTAL
GIRDER	7.00	1.44	134.80	1358.78
INT. DIAPHRAGM	72.00	1.41	0.98	99.49
SLAB	1.00	6.64	131.32	871.96
			GRAND TOTAL	2330.23

sq.m.

425(1) **Waterproofing on Deck Slab, Liquid Applied**

BR. COMPONENTS	LENGTH	AVE. WIDTH	AREA (sq.m.)
DECK SLAB	134.80	7.20	970.56
		TOTAL	1941.12
		GRAND TOTAL	1,941.00

sq.m. 2 coat

425(3) **Epoxy Injection on Crack**

Coverage Area =	6.64	x	131.32	=	871.96	sq.m.
Approximate Coverage Crack =	871.96	x	2.20%	=	19.18	sq.m.
Approximate Width Crack =	3.00	mm				
Output/Rate =	7.60	m/gal				
Qty =	19.18	/	0.003	=	**6,394.00**	**l.m.**

425(10) **Protective Coating for Concrete Structures**

BR. COMPONENTS	# OF COMPONENTS	DIMENSION	LENGTH	TOTAL
GIRDER	7.00	1.44	134.80	1358.78
INT. DIAPHRAGM	72.00	1.41	0.98	99.49
SLAB	1.00	6.64	131.32	871.96
			GRAND TOTAL	2330.23

sq.m.

PART H **MISCELLANEOUS STRUCTURES**

612(1) **Reflectorized Thermoplastic Pavement Markings (White)**

COMPONENTS	LENGTH	THICK	# OF LINES	AREA (sq.m.)
EDGE LINE	314.10	0.15	2.00	94.23
BROKEN LINE	107.70	0.15	1.00	16.16
			TOTAL	110.00
			GRAND TOTAL	110.00

sq.m.

Prepared by:

ABDURAHEM I. CANDOTAN
Engineer II
Construction Section

Checked by:

JOSE ARVIN C. MANAHAN
Engineer II
Planning and Design Section

Submitted by:

WILLIAM N. GABATINO
Chief, Planning and Design Section

Recommending Approval:

BRIAN B. BRIONES
Office of the Assistant District Engineer

Approved:

MANNY B. BULUSAN
Officer-in-Charge
Office of the District Engineer

Project Title: Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location: MANILA CITY

DETAILED UNIT PRICE ANALYSIS (DUPA)

FORM POW-2015-01D-00

Item No./ Description : A.1.1(3) Construction of Field Office for the Engineer
Unit of Measurement : l.s.
Output per month - As Submitted : 1.00
Output per month - As Evaluated :

	Designation	No. of Person/s	No. of Month/s	Monthly Rate	Amount (Php)
A.1	**Labor**				
	Construction Foreman	1.00	40.00	181.17	7,246.80
	Skilled Laborer	2.00	40.00	131.30	10,504.00
	Unskilled Laborer	6.00	40.00	101.29	24,309.60
	Sub - Total for A.1 - As Submitted				**42,060.40**
A.2	**Labor**				
	Sub - Total for A.2 - As Evaluated				
	Name and Capacity	No. of Unit/s	No. of Month/s	Monthly Rate	Amount (Php)
B.1	**Equipment**				
	Minor Tools (10% of Labor Cost)				4,206.04
	Sub - Total for B.1 - As Submitted				**4,206.04**
B.2	**Equipment**				
	Sub - Total for B.2 - As Evaluated				
C.1	**Total (A.1 + B.1) As-Submitted**				**46,266.44**
C.2	Total (A.2 + B.2) As-Evaluated				
D.1	**Output per Month As-Submitted**				**1.00**
D.2	Output per Month As-Evaluated				
E.1	**Direct Unit Cost (C.1 / D.1) As-Submitted**				**46,266.44**
E.2	Direct Unit Cost (C.2 / D.2) As-Evaluated				
	Name and Specification	Unit	Quantity	Unit Cost	Amount (Php)
F.1	**Materials**				
	a. Coco Lumber 2" x 12" x 12' (beam)	bd.ft.	16.00	32.00	512.00
	b. Coco Lumber 5" x 5" x 12' (post)	bd.ft.	100.00	32.00	3,200.00
	c. Coco Lumber 5" x 5" x 10' (post)	bd.ft.	83.33	32.00	2,666.56
	d. Coco Lumber 2" x 6" x 12' (flooring)	bd.ft.	120.00	32.00	3,840.00
	e. Coco Lumber 2" x 5" x 18' (flooring)	bd.ft.	120.00	32.00	3,840.00
	f. Coco Lumber 2" x 3" x 14' (purlins)	bd.ft.	210.00	32.00	6,720.00
	g. Coco Lumber 2" x 2" x 8' (purlins)	bd.ft.	24.00	32.00	768.00
	h. Coco Lumber 2" x 8" x 14' (flooring)	bd.ft.	114.00	32.00	3,648.00
	i. Coco Lumber 2" x 4" x 12' (sliding)	bd.ft.	480.00	32.00	15,360.00
	j. Coco Lumber 2" x 4" x 14' (sliding)	bd.ft.	58.00	32.00	1,856.00
	k. Coco Lumber 2" x 3" x 10' (purlins)	bd.ft.	310.00	32.00	9,920.00
	l. Coco Lumber 2" x 3" x 12' (purlins)	bd.ft.	180.00	32.00	5,760.00
	m. Coco Lumber 2" x 3" x 14' (purlins)	bd.ft.	140.00	32.00	4,480.00
	n. Marine Plywood 1/2" x 4" x 8' (sliding)	pc.	12.00	900.00	10,800.00
	o. Marine Plywood 1/4" x 4" x 8' (sliding)	pc.	22.00	624.00	13,728.00
	p. Gauge 26 x 8 Plain GI Sheet	pc.	36.00	650.00	23,400.00
	q. C.W. Nails	kg.	20.00	100.00	2,000.00
	r. Roofing Nails	kg.	5.00	150.00	750.00
	Sub - Total for B.1 - As Submitted				**113,248.56**
F.2	**Materials**				
	Sub - Total for B.2 - As Evaluated				
G.1	**Direct Unit Cost (E.1 + F.1) As-Submitted**				**159,515.00**
G.2	Direct Unit Cost (E.2 + F.2) As-Evaluated				
H.1	**Overhead, Contigencies & Miscelleneous (OCM) As Submitted**			**10% of G.1**	**15,951.50**
H.2	Overhead, Contigencies & Miscelleneous (OCM) As Evaluated			10%of G.2	
I.1	**Contractor's Profit As-Submitted**			**8% of G.1**	**12,761.20**
I.2	Contractor's Profit As-Evaluated			8% of G.2	
J.1	**Value Added Tax As-Submitted**			**5% of (G.1 + H.1 + I.1)**	**9,411.39**
J.2	Value Added Tax As-Evaluated			5% of (G.2 + H.2 + I.2)	
K.1	**Total Unit Cost As-Submitted**			**(G.1 + H.1 + I.1 + J.1)**	**197,639.09**
K.2	Total Unit Cost As-Evaluated			(G.2 + H.2 + I.2 + J.2)	

Prepared by:

ABDURAHEM I. CANDOTAN
Engineer II
Construction Section

Submitted by:

WILLIAM N. GABATINO
Engineer III
Chief, Planning and Design Section

Project Title: Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location: MANILA CITY

DETAILED UNIT PRICE ANALYSIS (DUPA)

FORM POW-2015-01D-00

Item No./ Description : B.5(1) DPWH Project Billboard/Signboard
Unit of Measurement : each
Output per hour - As Submitted : 1.00
Output per hour - As Evaluated :

	Designation	No. of Person/s	No. of Hour/s	Hourly Rate	Amount (Php)
A.1	**Labor**				
	Construction Foreman	1.00	1.00	181.17	181.17
	Skilled Laborer	1.00	1.00	131.30	131.30
	Unskilled Laborer	4.00	1.00	101.29	405.16
	Sub - Total for A.1 - As Submitted				**717.63**
A.2	**Labor**				
	Sub - Total for A.2 - As Evaluated				
	Name and Capacity	No. of Unit/s	No. of Hour/s	Hourly Rate	Amount (Php)
B.1	**Equipment**				
	Minor Tools (5% of Labor Cost)				35.88
	Sub - Total for B.1 - As Submitted				**35.88**
B.2	**Equipment**				
	Sub - Total for B.2 - As Evaluated				
C.1	**Total (A.1 + B.1) As-Submitted**				**753.51**
C.2	Total (A.2 + B.2) As-Evaluated				
D.1	**Output per Hour As-Submitted**				**1.00**
D.2	Output per Hour As-Evaluated				
E.1	**Direct Unit Cost (C.1 / D.1) As-Submitted**				**753.51**
E.2	Direct Unit Cost (C.2 / D.2) As-Evaluated				
	Name and Specification	Unit	Quantity	Unit Cost	Amount (Php)
F.1	**Materials**				
	Tarpaulin (4' x 8')	sq.ft.	32.00	20.00	640.00
	Coco Lumber	bd.ft.	42.00	32.00	1,344.00
	Marine Plywood (1/4" x 4' x 8')	pc.	1.00	624.00	624.00
	Assorted Common Wire Nails	kg.	0.42	100.00	42.00
	Sub - Total for B.1 - As Submitted				**2,650.00**
F.2	**Materials**				
	Sub - Total for B.2 - As Evaluated				
G.1	**Direct Unit Cost (E.1 + F.1) As-Submitted**				**3,403.51**
G.2	Direct Unit Cost (E.2 + F.2) As-Evaluated				
H.1	**Overhead, Contigencies & Miscelleneous (OCM) As Submitted**			**10% of G.1**	**340.35**
H.2	Overhead, Contigencies & Miscelleneous (OCM) As Evaluated			10% of G.2	
I.1	**Contractor's Profit As-Submitted**			**8% of G.1**	**272.28**
I.2	Contractor's Profit As-Evaluated			8% of G.2	
J.1	**Value Added Tax As-Submitted**			**5% of (G.1 + H.1 + I.1)**	**200.81**
J.2	Value Added Tax As-Evaluated			5% of (G.2 + H.2 + I.2)	
K.1	**Total Unit Cost As-Submitted**			**(G.1 + H.1 + I.1 + J.1)**	**4,216.95**
K.2	Total Unit Cost As-Evaluated			(G.2 + H.2 + I.2 + J.2)	

Prepared by:

ABDURAHEM I. CANDOTAN
Engineer II
Construction Section

Submitted by:

WILLIAM N. CABATINO
Engineer III
Chief, Planning and Design Section

Project Title: Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location: MANILA CITY

DETAILED UNIT PRICE ANALYSIS (DUPA)

FORM POW-2015-01D-00

Item No./ Description : B.5(2) COA Billboard/Signboard
Unit of Measurement : each
Output per hour - As Submitted : 1.00
Output per hour - As Evaluated :

	Designation	No. of Person/s	No. of Hour/s	Hourly Rate	Amount (Php)
	Labor				
A.1	Construction Foreman	1.00	2.00	181.17	362.34
	Skilled Laborer	1.00	2.00	131.30	262.60
	Unskilled Laborer	4.00	2.00	101.29	810.32
	Sub - Total for A.1 - As Submitted				**1,435.26**
	Labor				
A.2					
	Sub - Total for A.2 - As Evaluated				
	Name and Capacity	No. of Unit/s	No. of Hour/s	Hourly Rate	Amount (Php)
	Equipment				
B.1	Minor Tools (10% of Labor Cost)				143.53
	Sub - Total for B.1 - As Submitted				**143.53**
	Equipment				
B.2					
	Sub - Total for B.2 - As Evaluated				
C.1	**Total (A.1 + B.1) As-Submitted**				**1,578.79**
C.2	Total (A.2 + B.2) As-Evaluated				
D.1	**Output per Hour As-Submitted**				**1.00**
D.2	Output per Hour As-Evaluated				
E.1	**Direct Unit Cost (C.1 / D.1) As-Submitted**				**1,578.79**
E.2	Direct Unit Cost (C.2 / D.2) As-Evaluated				
	Name and Specification	Unit	Quantity	Unit Cost	Amount (Php)
	Materials				
F.1	Tarpaulin (8' x 8')	sq.ft.	64.00	20.00	1,280.00
	Coco Lumber	bd.ft.	84.00	32.00	2,688.00
	Marine Plywood (1/4" x 4' x 8')	pc.	2.00	624.00	1,248.00
	Assorted Common Wire Nails	kg.	0.84	100.00	84.00
	Sub - Total for B.1 - As Submitted				**5,300.00**
	Materials				
F.2					
	Sub - Total for B.2 - As Evaluated				
G.1	**Direct Unit Cost (E.1 + F.1) As-Submitted**				**6,878.79**
G.2	Direct Unit Cost (E.2 + F.2) As-Evaluated				
H.1	**Overhead, Contigencies & Miscelleneous (OCM) As Submitted**			**10% of G.1**	**687.88**
H.2	Overhead, Contigencies & Miscelleneous (OCM) As Evaluated			10% of G.2	
I.1	**Contractor's Profit As-Submitted**			**8% of G.1**	**550.30**
I.2	Contractor's Profit As-Evaluated			8% of G.2	
J.1	**Value Added Tax As-Submitted**			**5% of (G.1 + H.1 + I.1)**	**405.85**
J.2	Value Added Tax As-Evaluated			5% of (G.2 + H.2 + I.2)	
K.1	**Total Unit Cost As-Submitted**			**(G.1 + H.1 + I.1 + J.1)**	**8,522.82**
K.2	Total Unit Cost As-Evaluated			(G.2 + H.2 + I.2 + J.2)	

Prepared by:

ABDURAHEM I. CANDOTAN
Engineer II
Construction Section

Submitted by:

WILLIAM N. GABATINO
Engineer III
Chief, Planning and Design Section

Project Title: Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location: MANILA CITY

DETAILED UNIT PRICE ANALYSIS (DUPA)

FORM POW-2015-01D-00

Item No./ Description : B.7(2) Occupational Safety and Health Program
Unit of Measurement : l.s.
Output per hour - As Submitted : 1.00
Output per hour - As Evaluated :

	Designation	No. of Person/s	No. of Hour/s	Hourly Rate	Amount (Php)
A.1	**Labor**				
	a. Safety Practitioner/Officer (Part Time), 4hr/week	1.00	192.00	181.17	34,784.64
	b. Health Personnel (Full Time)	1.00	2880.00	131.30	378,144.00
	Sub - Total for A.1 - As Submitted				**412,928.64**
A.2	**Labor**				
	Sub - Total for A.2 - As Evaluated				
	Name and Capacity	No. of Unit/s	No. of Hour/s	Hourly Rate	Amount (Php)
B.1	**Equipment**				
	Sub - Total for B.1 - As Submitted				
B.2	**Equipment**				
	Sub - Total for B.2 - As Evaluated				
C.1	**Total (A.1 + B.1) As-Submitted**				**412,928.64**
C.2	Total (A.2 + B.2) As-Evaluated				
D.1	**Output per Hour As-Submitted**				**1.00**
D.2	Output per Hour As-Evaluated				
E.1	**Direct Unit Cost (C.1 / D.1) As-Submitted**				**412,928.64**
E.2	Direct Unit Cost (C.2 / D.2) As-Evaluated				
	Name and Specification	Unit	Quantity	Unit Cost	Amount (Php)
F.1	**Materials**				
	Personal Protective Equipment (PPE)				
	Safety Helmet	man-days	2964.24	0.77	2,282.46
	Safety Shoes	man-days	2959.29	6.85	20,271.14
	Safety Vest	man-days	2964.24	1.30	3,853.51
	Working Gloves	man-days	2964.24	15.33	45,441.80
	Rubber Boots	man-days	1839.07	1.64	3,016.07
	Optional (if Necessary)				
	Raincoats	man-days	889.27	0.44	391.28
	Sub - Total for B.1 - As Submitted				**75,256.27**
F.2	**Materials**				
	Sub - Total for B.2 - As Evaluated				
G.1	**Direct Unit Cost (E.1 + F.1) As-Submitted**				**488,184.91**
G.2	Direct Unit Cost (E.2 + F.2) As-Evaluated				
H.1	**Overhead, Contigencies & Miscelleneous (OCM) As Submitted**			**10% of G.1**	
H.2	Overhead, Contigencies & Miscelleneous (OCM) As Evaluated			10% of G.2	
I.1	**Contractor's Profit As-Submitted**			**8% of G.1**	**39,054.79**
I.2	Contractor's Profit As-Evaluated			8% of G.2	
J.1	**Value Added Tax As-Submitted**			**5% of (G.1 + H.1 + I.1)**	**26,361.99**
J.2	Value Added Tax As-Evaluated			5% of (G.2 + H.2 + I.2)	
K.1	**Total Unit Cost As-Submitted**			**(G.1 + H.1 + I.1 + J.1)**	**553,601.69**
K.2	Total Unit Cost As-Evaluated			(G.2 + H.2 + I.2 + J.2)	

Prepared by:

ABDURAHEM I. CANDOTAN
Engineer II
Construction Section

Submitted by:

WILLIAM N. GABATINO
Engineer III
Chief, Planning and Design Section

DETAILED CALCULATIONS ON COST OF CONSTRUCTION SAFETY AND HEALTH

ITEM NO. / DESCRIPTION	QUANTITY	OUTPUT PER HOUR	WORKERS	NO. OF PERSONNEL	DAYS	MAN-DAYS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAINCOATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LARNYARD	RUBBER BOOTS	EYE GOOGLES	
101(3)c1Removal of Actual structures and obstruction ;ACP, 0.050m thick	2,864.89	137.00	Foreman	1	2.61	2.61	2.61	2.61	2.61	2.61	0.783	0	0	0	0	0	0	
			Skilled Laborer	1	2.61	2.61	2.61	2.61	2.61	2.61	0.783	0	0	0	0	0	0	
			Unskilled Laborer	3	2.61	7.83	7.83	7.83	7.83	7.83	2.349	0	0	0	0	0	0	
302(2)Emulsified Asphalt	2,864.89	666.67	Foreman	1	0.54	0.54	0.54	0.54	0.54	0.54	0.162	0	0	0	0	0.54	0	
			Skilled Laborer	0	0.54	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	3	0.54	1.62	1.62	1.62	1.62	1.62	0.486	0	0	0	0	1.62	0	
310(1)cBituminous Concrete Wearing Surface Course, Hot-Laid (50mm thk)	2,864.89	171.30	Foreman	1	2.09	2.09	2.09	2.09	2.09	2.09	0.627	0	0	0	0	0	0	
			Skilled Laborer	4	2.09	8.36	8.36	8.36	8.36	8.36	2.508	0	0	0	0	0	0	
			Unskilled Laborer	8	2.09	16.72	16.72	16.72	16.72	16.72	5.016	0	0	0	0	0	0	
413(4)b1Expansion Joint, Steel Finger Type (30mm gap)	93.60	0.13	Foreman	2	90	180	180	180	180	180	54	0	0	0	0	0	0	
			Skilled Laborer	2	90	180	180	180	180	180	54	0	0	0	0	0	0	
			Unskilled Laborer	8	90	720	720	720	720	720	216	0	0	0	0	0	0	
414(1)Forms and Falsework	1.00	1.00	Foreman	0	0.13	0	0	0	0	0	0	0	0	0	0	0	0	
			Skilled Laborer	0	0.13	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	0	0.13	0	0	0	0	0	0	0	0	0	0	0	0	
416(1)bCarbon Fiber Sheet (2 Layers)	2,330.23	3.20	Foreman	1	91.02	91.02	91.02	91.02	91.02	91.02	27.306	0	0	0	0	91.02	0	
			Skilled Laborer	2	91.02	182.04	182.04	182.04	182.04	182.04	54.612	0	0	0	0	182.04	0	
			Unskilled Laborer	4	91.02	364.08	364.08	364.08	364.08	364.08	109.224	0	0	0	0	364.08	0	
425(1)Waterproofing on Deck Slab, Liquid Applied	1,941.00	6.10	Foreman	1	39.77	39.77	39.77	39.77	39.77	39.77	11.931	0	0	0	0	39.77	0	
			Skilled Laborer	2	39.77	79.54	79.54	79.54	79.54	79.54	23.862	0	0	0	0	79.54	0	
			Unskilled Laborer	2	39.77	79.54	79.54	79.54	79.54	79.54	23.862	0	0	0	0	79.54	0	
425(3)Epoxy Injection on Crack	6,394.00	7.60	Foreman	1	105.16	105.16	105.16	105.16	105.16	105.16	31.548	0	0	0	0	105.16	0	
			Skilled Laborer	2	105.16	210.32	210.32	210.32	210.32	210.32	63.096	0	0	0	0	210.32	0	
			Unskilled Laborer	4	105.16	420.64	420.64	420.64	420.64	420.64	126.192	0	0	0	0	420.64	0	
425(10)Protective Coating for Concrete Structures	2,330.23	5.50	Foreman	1	52.96	52.96	52.96	52.96	52.96	52.96	15.888	0	0	0	0	52.96	0	
			Skilled Laborer	2	52.96	105.92	105.92	105.92	105.92	105.92	31.776	0	0	0	0	105.92	0	
			Unskilled Laborer	2	52.96	105.92	105.92	105.92	105.92	105.92	31.776	0	0	0	0	105.92	0	
612(1)Reflectorized Thermoplastic Pavement Markings (White)	110.00	25.00	Foreman	1	0.55	0.55	0.55	0	0.55	0.55	0.165	0	0	0	0	0	0	
			Skilled Laborer	2	0.55	1.1	1.1	0	1.1	1.1	0.33	0	0	0	0	0	0	
			Unskilled Laborer	6	0.55	3.3	3.3	0	3.3	3.3	0.99	0	0	0	0	0	0	
			A. Total Personnel/Man-Days	67		2964.24	2964.24	2959.29	2964.24	2964.24	889.27	0	0	0	0	1839.07	0	
			B. Service Lifes, Days				730	365	180	3	730	1	730	730	730	365	60	
			C. Purchase Cost, Php				562	2500	234	46	318.5	303	494	2265	2166.6	600	516	
			D. Unit Cost/Man-Day (C÷B)				0.77	6.85	1.3	15.33	0.44	303	0.68	3.1	2.97	1.64	8.6	
			E. Direct Cost for PPE's (D x A (Man-Days))				2282.46	20271.14	3853.51	45441.8	391.28	0	0	0	0	3016.07	0	75,256.25
			F. Safety Officer/Practitioner (Part Time) @ P131.30/hr (consider at 4 hours per week) (4 weeks duration)															34,784.64
			G. Health Personnel (Full Time) 121.15/hr															378,144.00
																		488,184.89

Project Title: Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location: MANILA CITY

DETAILED UNIT PRICE ANALYSIS (DUPA)

FORM POW-2015-01D-00

Item No./ Description : B.8(2) Traffic Management
Unit of Measurement : l.s.
Output per hour - As Submitted : 1.00
Output per hour - As Evaluated :

	Designation	No. of Person/s	No. of Hour/s	Hourly Rate	Amount (Php)
A.1	**Labor**				
	Traffic Controller (Flagman)	4.00	2880.00	101.29	1,166,860.80
	Sub - Total for A.1 - As Submitted				**1,166,860.80**
A.2	**Labor**				
	Sub - Total for A.2 - As Evaluated				
	Name and Capacity	No. of Unit/s	No. of Hour/s	Hourly Rate	Amount (Php)
B.1	**Equipment**				
	Two-way Radio (w/ lifespan consideration of 2 yrs)	4.00	2880.00	2.60	29,952.00
	Barricade Flasher Light (3 volts, baterry operated				
	amber color, w/ lifespan consideration of 6 months)	64.00	2880.00	0.65	119,808.00
	Sub - Total for B.1 - As Submitted				**149,760.00**
B.2	**Equipment**				
	Sub - Total for B.2 - As Evaluated				
C.1	**Total (A.1 + B.1) As-Submitted**				**1,316,620.80**
C.2	Total (A.2 + B.2) As-Evaluated				
D.1	**Output per Hour As-Submitted**				**1.00**
D.2	Output per Hour As-Evaluated				
E.1	**Direct Unit Cost (C.1 / D.1) As-Submitted**				**1,316,620.80**
E.2	Direct Unit Cost (C.2 / D.2) As-Evaluated				
	Name and Specification	Unit	Quantity	Unit Cost	Amount (Php)
F.1	**Materials**				
	Speed Restriction (R4-1)	each	2.00	141.90	283.80
	Roadwork 1 km Ahead (T1-1)	each	2.00	328.50	657.00
	End Roadwork (T2-16)	each	2.00	328.50	657.00
	Lane status (T2-6-2)	each	24.00	388.50	9,324.00
	Workmen Ahead (T1-5)	each	2.00	169.20	338.40
	Prepare to Stop (T1-18)	each	2.00	169.20	338.40
	Temporary Hazard Marker (Chevron, T5-5)	each	1.00	172.80	172.80
	Temporary Hazard marker (Chevron, T5-4)	each	6.00	150.30	901.80
	Temporary Bollards (@ 5m apart)	each	31.00	49.20	1,525.20
	Plastic Safety Barriers	each	318.00	82.20	26,139.60
	Safety Vest	each	4.00	66.60	266.40
	Hard Hat	each	4.00	7.50	30.00
	Safety Shoes	each	4.00	83.10	332.40
	Sub - Total for B.1 - As Submitted				**40,966.80**
F.2	**Materials**				
	Sub - Total for B.2 - As Evaluated				
G.1	**Direct Unit Cost (E.1 + F.1) As-Submitted**				**1,357,587.60**
G.2	Direct Unit Cost (E.2 + F.2) As-Evaluated				
H.1	**Overhead, Contigencies & Miscelleneous (OCM) As Submitted**			**10% of G.1**	
H.2	Overhead, Contigencies & Miscelleneous (OCM) As Evaluated			10% of G.2	
I.1	**Contractor's Profit As-Submitted**			**8% of G.1**	**108,607.01**
I.2	Contractor's Profit As-Evaluated			8% of G.2	
J.1	**Value Added Tax As-Submitted**			**5% of (G.1 + H.1 + I.1)**	**73,309.73**
J.2	Value Added Tax As-Evaluated			5% of (G.2 + H.2 + I.2)	
K.1	**Total Unit Cost As-Submitted**			**(G.1 + H.1 + I.1 + J.1)**	**1,539,504.34**
K.2	Total Unit Cost As-Evaluated			(G.2 + H.2 + I.2 + J.2)	

Prepared by:

ABDURAHEM I. CANDOTAN
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Construction Section

Submitted by:

WILLIAM N. GABATINO
Engineer III
Chief, Planning and Design Section

Project Title: Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location: MANILA CITY

DETAILED UNIT PRICE ANALYSIS (DUPA)

FORM POW-2015-01D-00

Item No./ Description : B.9 Mobilization / Demobilization
Unit of Measurement : l.s.
Output per hour - As Submitted : 1.00
Output per hour - As Evaluated :

	Designation	No. of Person/s	No. of Hour/s	Hourly Rate	Amount (Php)
A.1	**Labor**				
	Construction Foreman				-
	Skilled Laborer				-
	Unskilled Laborer				-
	Sub - Total for A.1 - As Submitted				**-**
A.2	**Labor**				
	Sub - Total for A.2 - As Evaluated				
	Name and Capacity	No. of Unit/s	No. of Hour/s	Hourly Rate	Amount (Php)
B.1	**Equipment**				
	Dump Truck, Model: all models Capacity: 12yd³	2.00	87.95	1,420.00	249,778.00
	Boom Truck, Model: NXG1160D3ZAL1X Capacity:	1.00	87.95	1,930.00	169,743.50
	Sub - Total for B.1 - As Submitted				**419,521.50**
B.2	**Equipment**				
	Sub - Total for B.2 - As Evaluated				
C.1	**Total (A.1 + B.1) As-Submitted**				**419,521.50**
C.2	Total (A.2 + B.2) As-Evaluated				
D.1	**Output per Hour As-Submitted**				**1.00**
D.2	Output per Hour As-Evaluated				
E.1	**Direct Unit Cost (C.1 / D.1) As-Submitted**				**419,521.50**
E.2	Direct Unit Cost (C.2 / D.2) As-Evaluated				
	Name and Specification	Unit	Quantity	Unit Cost	Amount (Php)
F.1	**Materials**				
	Sub - Total for B.1 - As Submitted				**-**
F.2	**Materials**				
	Sub - Total for B.2 - As Evaluated				
G.1	**Direct Unit Cost (E.1 + F.1) As-Submitted**				**419,521.50**
G.2	Direct Unit Cost (E.2 + F.2) As-Evaluated				
H.1	**Overhead, Contigencies & Miscelleneous (OCM) As Submitted**			**10% of G.1**	
H.2	Overhead, Contigencies & Miscelleneous (OCM) As Evaluated			10% of G.2	
I.1	**Contractor's Profit As-Submitted**			**8% of G.1**	
I.2	Contractor's Profit As-Evaluated			8% of G.2	
J.1	**Value Added Tax As-Submitted**			**5% of (G.1 + H.1 + I.1)**	**20,976.08**
J.2	Value Added Tax As-Evaluated			5% of (G.2 + H.2 + I.2)	
K.1	**Total Unit Cost As-Submitted**			**(G.1 + H.1 + I.1 + J.1)**	**440,497.58**
K.2	Total Unit Cost As-Evaluated			(G.2 + H.2 + I.2 + J.2)	

Prepared by:

ABDURAHEM I. CANDOTAN
Engineer II
Construction Section

Submitted by:

WILLIAM N. GABATINO
Engineer III
Chief, Planning and Design Section

Project Title: Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location: MANILA CITY

DETAILED UNIT PRICE ANALYSIS (DUPA)

FORM POW-2015-01D-00

Item No./ Description : 101(3)c1 Removal of Actual structures and obstruction -ACP, 0.050m thick
Unit of Measurement : sq.m.
Output per hour - As Submitted : 137.00
Output per hour - As Evaluated :

	Designation	No. of Person/s	No. of Hour/s	Hourly Rate	Amount (Php)
A.1	**Labor**				
	Construction Foreman	1.00	1.00	181.17	181.17
	Skilled Laborer	1.00	1.00	131.30	131.30
	Unskilled Laborer	3.00	1.00	101.29	303.87
	Sub - Total for A.1 - As Submitted				**616.34**
A.2	**Labor**				
	Sub - Total for A.2 - As Evaluated				
	Name and Capacity	No. of Unit/s	No. of Hour/s	Hourly Rate	Amount (Php)
B.1	**Equipment**				
	Cold Milling Asphalt Pavement machine (1.00m millinh width, 300 mm max depth	1.00	0.70	6,900.00	4,830.00
	Dump Truck, Model: all models Capacity: 12yd³	2.00	1.22	1,420.00	3,464.80
	Water Truck/pump, Model: all makes Capacity: 16000l	1.00	0.70	2,450.00	1,715.00
	Minor Tools (10% of Labor Cost)				61.63
	Sub - Total for B.1 - As Submitted				**10,071.43**
B.2	**Equipment**				
	Sub - Total for B.2 - As Evaluated				
C.1	**Total (A.1 + B.1) As-Submitted**				**10,687.77**
C.2	Total (A.2 + B.2) As-Evaluated				
D.1	**Output per Hour As-Submitted**				**137.00**
D.2	Output per Hour As-Evaluated				
E.1	**Direct Unit Cost (C.1 / D.1) As-Submitted**				**78.01**
E.2	Direct Unit Cost (C.2 / D.2) As-Evaluated				
	Name and Specification	Unit	Quantity	Unit Cost	Amount (Php)
F.1	**Materials**				
	Sub - Total for B.1 - As Submitted				-
F.2	**Materials**				
	Sub - Total for B.2 - As Evaluated				
G.1	**Direct Unit Cost (E.1 + F.1) As-Submitted**				**78.01**
G.2	Direct Unit Cost (E.2 + F.2) As-Evaluated				
H.1	**Overhead, Contigencies & Miscelleneous (OCM) As Submitted**			**10% of G.1**	**7.80**
H.2	Overhead, Contigencies & Miscelleneous (OCM) As Evaluated			10% of G.2	
I.1	**Contractor's Profit As-Submitted**			**8% of G.1**	**6.24**
I.2	Contractor's Profit As-Evaluated			8% of G.2	
J.1	**Value Added Tax As-Submitted**			**5% of (G.1 + H.1 + I.1)**	**4.60**
J.2	Value Added Tax As-Evaluated			5% of (G.2 + H.2 + I.2)	
K.1	**Total Unit Cost As-Submitted**			**(G.1 + H.1 + I.1 + J.1)**	**96.66**
K.2	Total Unit Cost As-Evaluated			(G.2 + H.2 + I.2 + J.2)	

Prepared by:

ABDURAHEM I. CANDOTAN
Engineer II
Construction Section

Submitted by:

WILLIAM N. GABATINO
Engineer III
Chief, Planning and Design Section

Project Title: Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location: MANILA CITY

DETAILED UNIT PRICE ANALYSIS (DUPA)

FORM POW-2015-01D-00

Item No./ Description : 302(2) Emulsified Asphalt
Unit of Measurement : sq.m.
Output per hour - As Submitted : 666.67
Output per hour - As Evaluated :

	Designation	No. of Person/s	No. of Hour/s	Hourly Rate	Amount (Php)
A.1	**Labor**				
	Construction Foreman	1.00	1.00	181.17	181.17
	Unskilled Laborer	3.00	1.00	101.29	303.87
	Sub - Total for A.1 - As Submitted				**485.04**
A.2	**Labor**				
	Sub - Total for A.2 - As Evaluated				
	Name and Capacity	No. of Unit/s	No. of Hour/s	Hourly Rate	Amount (Php)
B.1	**Equipment**				
	Asphalt Distributor, ROSCO/5ton 3000 USG	1.00	1.00	936.00	936.00
	Power Boom, Towed Type with Engine 2m wide 6-30km/hr sweeping capacity	1.00	1.00	130.54	130.54
	Sub - Total for B.1 - As Submitted				**1,066.54**
B.2	**Equipment**				
	Sub - Total for B.2 - As Evaluated				
C.1	**Total (A.1 + B.1) As-Submitted**				**1,551.58**
C.2	Total (A.2 + B.2) As-Evaluated				
D.1	**Output per Hour As-Submitted**				**666.67**
D.2	Output per Hour As-Evaluated				
E.1	**Direct Unit Cost (C.1 / D.1) As-Submitted**				**2.33**
E.2	Direct Unit Cost (C.2 / D.2) As-Evaluated				
	Name and Specification	Unit	Quantity	Unit Cost	Amount (Php)
F.1	**Materials**				
	Emulsified Asphalt SS1 (with 5% wastage)	mt	0.000472	55,385.00	26.14
	Sub - Total for B.1 - As Submitted				**26.14**
F.2	**Materials**				
	Sub - Total for B.2 - As Evaluated				
G.1	**Direct Unit Cost (E.1 + F.1) As-Submitted**				**28.47**
G.2	Direct Unit Cost (E.2 + F.2) As-Evaluated				
H.1	**Overhead, Contigencies & Miscelleneous (OCM) As Submitted**			**10% of G.1**	**2.85**
H.2	Overhead, Contigencies & Miscelleneous (OCM) As Evaluated			10% of G.2	
I.1	**Contractor's Profit As-Submitted**			**8% of G.1**	**2.28**
I.2	Contractor's Profit As-Evaluated			8% of G.2	
J.1	**Value Added Tax As-Submitted**			**5% of (G.1 + H.1 + I.1)**	**1.68**
J.2	Value Added Tax As-Evaluated			5% of (G.2 + H.2 + I.2)	
K.1	**Total Unit Cost As-Submitted**			**(G.1 + H.1 + I.1 + J.1)**	**35.27**
K.2	Total Unit Cost As-Evaluated			(G.2 + H.2 + I.2 + J.2)	

Prepared by:

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Submitted by:

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Project Title: Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location: MANILA CITY

DETAILED UNIT PRICE ANALYSIS (DUPA)

FORM POW-2015-01D-00

Item No./ Description	:	310(1)c	Bituminous Concrete Wearing Surface Course, Hot-Laid (50mm thk)
Unit of Measurement	:	sq.m.	
Output per hour - As Submitted	:	171.30	
Output per hour - As Evaluated	:		

	Designation	No. of Person/s	No. of Hour/s	Hourly Rate	Amount (Php)
A.1	**Labor**				
	Construction Foreman	1.00	1.00	181.17	181.17
	Skilled Laborer	4.00	1.00	131.30	525.20
	Unskilled Laborer	8.00	1.00	101.29	810.32
	Sub - Total for A.1 - As Submitted				**1,516.69**
A.2	**Labor**				
	Sub - Total for A.2 - As Evaluated				
	Name and Capacity	No. of Unit/s	No. of Hour/s	Hourly Rate	Amount (Php)
B.1	**Equipment**				
	Asphalt Paver, Model: NF220 BIIVDM	1.00	1.00	1,833.00	1,833.00
	Pneumatic Tire Roller, Model: 9-WHL, 9.00x20, 4PR Capacity: 10 mt	1.00	1.00	561.00	561.00
	Tandem Steel Roller, Model: HD110 Capacity: 11 mt	1.00	1.00	2,061.00	2,061.00
	Water Truck/Pump, Model: all makes Capacity: 16000L	1.00	1.00	2,450.00	2,450.00
	Minor Tools (10% of Labor Cost)				151.67
	Sub - Total for B.1 - As Submitted				**7,056.67**
B.2	**Equipment**				
	Sub - Total for B.2 - As Evaluated				
C.1	**Total (A.1 + B.1) As-Submitted**				**8,573.36**
C.2	Total (A.2 + B.2) As-Evaluated				
D.1	**Output per Hour As-Submitted**				**171.30**
D.2	Output per Hour As-Evaluated				
E.1	**Direct Unit Cost (C.1 / D.1) As-Submitted**				**50.05**
E.2	Direct Unit Cost (C.2 / D.2) As-Evaluated				
	Name and Specification	Unit	Quantity	Unit Cost	Amount (Php)
F.1	**Materials**				
	Bituminous Concrete Surface Course(Asphalt Plant	mt	0.123	15,000.00	1,845.00
	Mix Hot) Thickness: 50mm (with 5% wastage)				
	Sub - Total for B.1 - As Submitted				**1,845.00**
F.2	**Materials**				
	Sub - Total for B.2 - As Evaluated				
G.1	**Direct Unit Cost (E.1 + F.1) As-Submitted**				**1,895.05**
G.2	Direct Unit Cost (E.2 + F.2) As-Evaluated				
H.1	**Overhead, Contigencies & Miscelleneous (OCM) As Submitted**			**10% of G.1**	**189.51**
H.2	Overhead, Contigencies & Miscelleneous (OCM) As Evaluated			10% of G.2	
I.1	**Contractor's Profit As-Submitted**			**8% of G.1**	**151.60**
I.2	Contractor's Profit As-Evaluated			8% of G.2	
J.1	**Value Added Tax As-Submitted**			**5% of (G.1 + H.1 + I.1)**	**111.81**
J.2	Value Added Tax As-Evaluated			5% of (G.2 + H.2 + I.2)	
K.1	**Total Unit Cost As-Submitted**			**(G.1 + H.1 + I.1 + J.1)**	**2,347.97**
K.2	Total Unit Cost As-Evaluated			(G.2 + H.2 + I.2 + J.2)	

Prepared by:

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Project Title: Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location: MANILA CITY

DETAILED UNIT PRICE ANALYSIS (DUPA)

FORM POW-2015-01D-00

Item No./ Description : 413(4)b1 Expansion Joint, Steel Finger Type (30mm gap)
Unit of Measurement : l.m.
Output per hour - As Submitted : 0.13
Output per hour - As Evaluated :

	Designation	No. of Person/s	No. of Hour/s	Hourly Rate	Amount (Php)
A.1	**Labor**				
	Removal of Existing Expansion Joint:				
	Construction Foreman	1.00	0.60	181.17	108.70
	Skilled Laborer	1.00	0.60	131.30	78.78
	Unskilled Laborer	4.00	0.60	101.29	243.10
	Installation of New Expansion Joint:				
	Construction Foreman	1.00	0.40	181.17	72.47
	Skilled Laborer	1.00	0.40	131.30	52.52
	Unskilled Laborer	4.00	0.40	101.29	162.06
	Sub - Total for A.1 - As Submitted				**717.63**
A.2	**Labor**				
	Sub - Total for A.2 - As Evaluated				
	Name and Capacity	No. of Unit/s	No. of Hour/s	Hourly Rate	Amount (Php)
B.1	**Equipment**				
	Removal of Existing Expansion Joint:				
	Concrete saw	1.00	0.40	32.64	13.06
	Cutting Outfit	1.00	0.25	45.45	11.36
	Portable Breaker, BHF30S/Chipping Hammer	1.00	0.60	123.20	73.92
	Air Compressor (15-35cfm)	1.00	0.60	205.00	123.00
	Cargo/Service Truck (2-5 mt)	1.00	0.10	783.00	78.30
	Generator Set (5kw)	1.00	0.60	325.00	195.00
	Installation of New Expansion Joint:				
	Bar Cutter, Single Phase	1.00	0.15	105.47	15.82
	Bar Bender	1.00	0.15	168.75	25.31
	Air Compressor (15-35cfm)	1.00	0.15	205.00	30.75
	Hammer Drilling Machine	1.00	0.15	371.00	55.65
	Welding Machine (300 A) Electric Driven	1.00	0.35	872.87	305.50
	Grout Mixer	1.00	0.25	965.00	241.25
	Generator Set (5kw)	1.00	0.45	150.00	67.50
	Minor Tools (10% of Labor Cost)				71.76
	Sub - Total for B.1 - As Submitted				**1,308.18**
B.2	**Equipment**				
	Sub - Total for B.2 - As Evaluated				
C.1	**Total (A.1 + B.1) As-Submitted**				**2,025.81**
C.2	Total (A.2 + B.2) As-Evaluated				
D.1	**Output per Hour As-Submitted**				**0.13**
D.2	Output per Hour As-Evaluated				
E.1	**Direct Unit Cost (C.1 / D.1) As-Submitted**				**15,583.15**
E.2	Direct Unit Cost (C.2 / D.2) As-Evaluated				
	Name and Specification	Unit	Quantity	Unit Cost	Amount (Php)
F.1	**Materials**				
	Steel finger type Expansion Joint set	l.m.	1.00	216,962.23	216,962.23
	(including anchor bars, screws,bolts,water barrier, etc)				
	Epoxy Grout (w/ 5% w.s)	ltr	1.05	1,050.00	1,102.50
	Epoxy Bonding agent (w/ 5% w.s)	ltr	0.26	1,850.00	481.00
	Cementitious Grout (w/ 5% w.s)	bag	10.00	1,500.00	15,000.00
	Reinforcing Steel Bar (w/ 5% w.s)	kg	50.60	56.00	2,833.60
	Welding rod (1kg/2000kg of rsb)	kg	0.025	180.00	4.50
	Oxygen/Acetylene (1 set/5000kg of RSB)	set	0.010	3,794.00	37.94
	Miscellaneous (1% of Materials Cost)				194.60
	Sub - Total for B.1 - As Submitted				**236,616.37**
F.2	**Materials**				
	Sub - Total for B.2 - As Evaluated				
G.1	**Direct Unit Cost (E.1 + F.1) As-Submitted**				**252,199.52**
G.2	Direct Unit Cost (E.2 + F.2) As-Evaluated				
H.1	**Overhead, Contigencies & Miscelleneous (OCM) As Submitted**			**10% of G.1**	**25,219.95**
H.2	Overhead, Contigencies & Miscelleneous (OCM) As Evaluated			10% of G.2	
I.1	**Contractor's Profit As-Submitted**			**8% of G.1**	**20,175.96**
I.2	Contractor's Profit As-Evaluated			8% of G.2	
J.1	**Value Added Tax As-Submitted**			**5% of (G.1 + H.1 + I.1)**	**14,879.77**
J.2	Value Added Tax As-Evaluated			5% of (G.2 + H.2 + I.2)	
K.1	**Total Unit Cost As-Submitted**			**(G.1 + H.1 + I.1 + J.1)**	**312,475.21**
K.2	Total Unit Cost As-Evaluated			(G.2 + H.2 + I.2 + J.2)	

Prepared by:

ABDURAHEM I. CANDOTAN
Engineer II
Construction Section

Submitted by:

WILLIAM N. SABATINO
Engineer III
Chief, Planning and Design Section

Project Title: Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location: MANILA CITY

DETAILED UNIT PRICE ANALYSIS (DUPA)

FORM POW-2015-01D-00

Item No./ Description : 414(1) Forms and Falsework
Unit of Measurement : l.s.
Output per hour - As Submitted : 1.00
Output per hour - As Evaluated :

	Designation	No. of Person/s	No. of Hour/s	Hourly Rate	Amount (Php)
A.1	**Labor**				
	Sub - Total for A.1 - As Submitted				-
A.2	**Labor**				
	Sub - Total for A.2 - As Evaluated				
	Name and Capacity	No. of Unit/s	No. of Hour/s	Hourly Rate	Amount (Php)
B.1	**Equipment**				
	H-Frame (1.80x1.80x0.90 = 1 set) w/ catwalk	100.00	1200.00	5.00	600,000.00
	Sub - Total for B.1 - As Submitted				**600,000.00**
B.2	**Equipment**				
	Sub - Total for B.2 - As Evaluated				
C.1	**Total (A.1 + B.1) As-Submitted**				**600,000.00**
C.2	Total (A.2 + B.2) As-Evaluated				
D.1	**Output per Hour As-Submitted**				**1.00**
D.2	Output per Hour As-Evaluated				
E.1	**Direct Unit Cost (C.1 / D.1) As-Submitted**				**600,000.00**
E.2	Direct Unit Cost (C.2 / D.2) As-Evaluated				
	Name and Specification	Unit	Quantity	Unit Cost	Amount (Php)
F.1	**Materials**				
	Sub - Total for B.1 - As Submitted				-
F.2	**Materials**				
	Sub - Total for B.2 - As Evaluated				
G.1	**Direct Unit Cost (E.1 + F.1) As-Submitted**				**600,000.00**
G.2	Direct Unit Cost (E.2 + F.2) As-Evaluated				
H.1	**Overhead, Contigencies & Miscelleneous (OCM) As Submitted**			**10% of G.1**	**60,000.00**
H.2	Overhead, Contigencies & Miscelleneous (OCM) As Evaluated			10% of G.2	
I.1	**Contractor's Profit As-Submitted**			**8% of G.1**	**48,000.00**
I.2	Contractor's Profit As-Evaluated			8% of G.2	
J.1	**Value Added Tax As-Submitted**			**5% of (G.1 + H.1 + I.1)**	**35,400.00**
J.2	Value Added Tax As-Evaluated			5% of (G.2 + H.2 + I.2)	
K.1	**Total Unit Cost As-Submitted**			**(G.1 + H.1 + I.1 + J.1)**	**743,400.00**
K.2	Total Unit Cost As-Evaluated			(G.2 + H.2 + I.2 + J.2)	

Prepared by:

ABDURAHEM I. CANDOTAN
Engineer II
Construction Section

Submitted by:

WILLIAM N. GABATINO
Engineer III
Chief, Planning and Design Section

Project Title: Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location: MANILA CITY

DETAILED UNIT PRICE ANALYSIS (DUPA)

FORM POW-2015-01D-00

Item No./ Description : 416(1)b Carbon Fiber Sheet (2 Layers)
Unit of Measurement : sq.m.
Output per hour - As Submitted : 3.20
Output per hour - As Evaluated :

	Designation	No. of Person/s	No. of Hour/s	Hourly Rate	Amount (Php)
A.1	**Labor**				
	Construction Foreman	1.00	1.00	181.17	181.17
	Skilled Laborer	2.00	1.00	131.30	262.60
	Unskilled Laborer	4.00	1.00	101.29	405.16
	Sub - Total for A.1 - As Submitted				**848.93**
A.2	**Labor**				
	Sub - Total for A.2 - As Evaluated				
	Name and Capacity	No. of Unit/s	No. of Hour/s	Hourly Rate	Amount (Php)
B.1	**Equipment**				
	Grinding Machine And Accessories	1.00	0.15	75.38	11.31
	Air Compressor (15-35 cfm)	1.00	0.15	205.00	30.75
	Generator Set (5kw/ 10kva)	1.00	0.15	325.00	48.75
	Minor Tools (10% of Labor Cost)				84.89
	Sub - Total for B.1 - As Submitted				**175.70**
B.2	**Equipment**				
	Sub - Total for B.2 - As Evaluated				
C.1	**Total (A.1 + B.1) As-Submitted**				**1,024.63**
C.2	Total (A.2 + B.2) As-Evaluated				
D.1	**Output per Hour As-Submitted**				**3.200**
D.2	Output per Hour As-Evaluated				
E.1	**Direct Unit Cost (C.1 / D.1) As-Submitted**				**320.20**
E.2	Direct Unit Cost (C.2 / D.2) As-Evaluated				
	Name and Specification	Unit	Quantity	Unit Cost	Amount (Php)
F.1	**Materials**				
	Carbon Fiber Sheet w/ 5% w.s	sq.m.	2.10	10,024.50	21,051.45
	Epoxy resin Adhesive (undercoat) w/ 2% w.s	gal	0.33	2,865.93	945.76
	Epoxy resin Adhesive (Topcoat) w/ 2% w.s	gal	0.33	2,865.93	945.76
	Miscellaneous (1% of Materials Cost)				229.43
	Sub - Total for B.1 - As Submitted				**23,172.39**
F.2	**Materials**				
	Sub - Total for B.2 - As Evaluated				
G.1	**Direct Unit Cost (E.1 + F.1) As-Submitted**				**23,492.59**
G.2	Direct Unit Cost (E.2 + F.2) As-Evaluated				
H.1	**Overhead, Contigencies & Miscelleneous (OCM) As Submitted**			**10% of G.1**	**2,349.26**
H.2	Overhead, Contigencies & Miscelleneous (OCM) As Evaluated			10% of G.2	
I.1	**Contractor's Profit As-Submitted**			**8% of G.1**	**1,879.41**
I.2	Contractor's Profit As-Evaluated			8% of G.2	
J.1	**Value Added Tax As-Submitted**			**5% of (G.1 + H.1 + I.1)**	**1,386.06**
J.2	Value Added Tax As-Evaluated			5% of (G.2 + H.2 + I.2)	
K.1	**Total Unit Cost As-Submitted**			**(G.1 + H.1 + I.1 + J.1)**	**29,107.32**
K.2	Total Unit Cost As-Evaluated			(G.2 + H.2 + I.2 + J.2)	

Prepared by:

ABDURAHEM I. CANDOTAN
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Submitted by:

WILLIAM N. GABATINO
Engineer III
Chief, Planning and Design Section

Project Title: Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location: MANILA CITY

DETAILED UNIT PRICE ANALYSIS (DUPA)

FORM POW-2015-01D-00

Item No./ Description : 425(1) Waterproofing on Deck Slab, Liquid Applied
Unit of Measurement : sq.m
Output per hour - As Submitted : 6.10
Output per hour - As Evaluated :

	Designation	No. of Person/s	No. of Hour/s	Hourly Rate	Amount (Php)
A.1	**Labor**				
	Construction Foreman	1.00	1.00	181.17	181.17
	Skilled Laborer	2.00	1.00	131.30	262.60
	Unskilled Laborer	2.00	1.00	101.29	202.58
	Sub - Total for A.1 - As Submitted				**646.35**
A.2	**Labor**				
	Sub - Total for A.2 - As Evaluated				
	Name and Capacity	No. of Unit/s	No. of Hour/s	Hourly Rate	Amount (Php)
B.1	**Equipment**				
	Generator Set (5 kW/10 kva)	1.00	0.10	325.00	32.50
	Compressor, 331-350 CFM	1.00	0.10	205.00	20.50
	Minor Tools (10% of Labor Cost)				64.64
	Sub - Total for B.1 - As Submitted				**117.64**
B.2	**Equipment**				
	Sub - Total for B.2 - As Evaluated				
C.1	**Total (A.1 + B.1) As-Submitted**				**763.99**
C.2	Total (A.2 + B.2) As-Evaluated				
D.1	**Output per Hour As-Submitted**				**6.10**
D.2	Output per Hour As-Evaluated				
E.1	**Direct Unit Cost (C.1 / D.1) As-Submitted**				**125.24**
E.2	Direct Unit Cost (C.2 / D.2) As-Evaluated				
	Name and Specification	Unit	Quantity	Unit Cost	Amount (Php)
F.1	**Materials**				
	Epoxy Primer	sq.m.	1.05	440.00	462.00
	Waterproofing Membrane, 3mm thk, Torch Applied	sq.m.	1.11	170.00	188.70
	LPG (11kg)	kg.	0.30	81.27	24.38
	Miscellaneous (1% of Materials Cost)				6.75
	Sub - Total for B.1 - As Submitted				**681.83**
F.2	**Materials**				
	Sub - Total for B.2 - As Evaluated				
G.1	**Direct Unit Cost (E.1 + F.1) As-Submitted**				**807.07**
G.2	Direct Unit Cost (E.2 + F.2) As-Evaluated				
H.1	**Overhead, Contigencies & Miscelleneous (OCM) As Submitted**			**10% of G.1**	**80.71**
H.2	Overhead, Contigencies & Miscelleneous (OCM) As Evaluated			10% of G.2	
I.1	**Contractor's Profit As-Submitted**			**8% of G.1**	**64.57**
I.2	Contractor's Profit As-Evaluated			8% of G.2	
J.1	**Value Added Tax As-Submitted**			**5% of (G.1 + H.1 + I.1)**	**47.62**
J.2	Value Added Tax As-Evaluated			5% of (G.2 + H.2 + I.2)	
K.1	**Total Unit Cost As-Submitted**			**(G.1 + H.1 + I.1 + J.1)**	**999.97**
K.2	Total Unit Cost As-Evaluated			(G.2 + H.2 + I.2 + J.2)	

Note: Modified dupa due to change of formworks

Prepared by:

ABDURAHEM I. CANDOTAN
Engineer II
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Submitted by:

WILLIAM N. GABATINO
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Chief, Planning and Design Section

Project Title: Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location: MANILA CITY

DETAILED UNIT PRICE ANALYSIS (DUPA)

FORM POW-2015-01D-00

Item No./ Description : 425(3) Epoxy Injection on Crack
Unit of Measurement : l.m.
Output per hour - As Submitted : 7.60
Output per hour - As Evaluated :

	Designation	No. of Person/s	No. of Hour/s	Hourly Rate	Amount (Php)
A.1	**Labor**				
	Construction Foreman	1.00	1.00	181.17	181.17
	Skilled Laborer	2.00	1.00	131.30	262.60
	Unskilled Laborer	4.00	1.00	101.29	405.16
	Sub - Total for A.1 - As Submitted				**848.93**
A.2	**Labor**				
	Sub - Total for A.2 - As Evaluated				
	Name and Capacity	No. of Unit/s	No. of Hour/s	Hourly Rate	Amount (Php)
B.1	**Equipment**				
	Pressured Epoxy Injector	1.00	1.00	250.00	250.00
	Compressor, 15-35cfm	1.00	1.00	205.00	205.00
	Grinding Machine And Accessories	2.00	1.00	75.38	150.76
	Sub - Total for B.1 - As Submitted				**605.76**
B.2	**Equipment**				
	Sub - Total for B.2 - As Evaluated				
C.1	**Total (A.1 + B.1) As-Submitted**				**1,454.69**
C.2	Total (A.2 + B.2) As-Evaluated				
D.1	**Output per Hour As-Submitted**				**7.60**
D.2	Output per Hour As-Evaluated				
E.1	**Direct Unit Cost (C.1 / D.1) As-Submitted**				**191.41**
E.2	Direct Unit Cost (C.2 / D.2) As-Evaluated				
	Name and Specification	Unit	Quantity	Unit Cost	Amount (Php)
F.1	**Materials**				
	Epoxy for Injection of Cracks	gal	1.00	2,880.00	2,880.00
	Thinner	lit	1.00	50.00	50.00
	Copper Tube/ Nipple 6mm dia. < 100mm	pcs	7.00	35.00	245.00
	Sub - Total for B.1 - As Submitted				**3,175.00**
F.2	**Materials**				
	Sub - Total for B.2 - As Evaluated				
G.1	**Direct Unit Cost (E.1 + F.1) As-Submitted**				**3,366.41**
G.2	Direct Unit Cost (E.2 + F.2) As-Evaluated				
H.1	**Overhead, Contigencies & Miscelleneous (OCM) As Submitted**			**10% of G.1**	**336.64**
H.2	Overhead, Contigencies & Miscelleneous (OCM) As Evaluated			10% of G.2	
I.1	**Contractor's Profit As-Submitted**			**8% of G.1**	**269.31**
I.2	Contractor's Profit As-Evaluated			8% of G.2	
J.1	**Value Added Tax As-Submitted**			**5% of (G.1 + H.1 + I.1)**	**198.62**
J.2	Value Added Tax As-Evaluated			5% of (G.2 + H.2 + I.2)	
K.1	**Total Unit Cost As-Submitted**			**(G.1 + H.1 + I.1 + J.1)**	**4,170.98**
K.2	Total Unit Cost As-Evaluated			(G.2 + H.2 + I.2 + J.2)	

Prepared by:

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Construction Section

Submitted by:

WILLIAM N. SABATINO
Engineer III
Chief, Planning and Design Section

Project Title: Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location: MANILA CITY

DETAILED UNIT PRICE ANALYSIS (DUPA)

FORM POW-2015-01D-00

Item No./ Description : 425(10) Protective Coating for Concrete Structures
Unit of Measurement : sq.m.
Output per hour - As Submitted : 5.50
Output per hour - As Evaluated :

	Designation	No. of Person/s	No. of Hour/s	Hourly Rate	Amount (Php)
A.1	**Labor**				
	Construction Foreman	1.00	1.00	181.17	181.17
	Skilled Laborer	2.00	1.00	131.30	262.60
	Unskilled Laborer	2.00	1.00	101.29	202.58
	Sub - Total for A.1 - As Submitted				**646.35**
A.2	**Labor**				
	Sub - Total for A.2 - As Evaluated				
	Name and Capacity	No. of Unit/s	No. of Hour/s	Hourly Rate	Amount (Php)
B.1	**Equipment**				
	Generator set (5kw/10kva)	1.00	1.00	325.00	325.00
	Minor Tools (10% of Labor Cost)				64.64
	Sub - Total for B.1 - As Submitted				**389.64**
B.2	**Equipment**				
	Sub - Total for B.2 - As Evaluated				
C.1	**Total (A.1 + B.1) As-Submitted**				**1,035.99**
C.2	Total (A.2 + B.2) As-Evaluated				
D.1	**Output per Hour As-Submitted**				**5.50**
D.2	Output per Hour As-Evaluated				
E.1	**Direct Unit Cost (C.1 / D.1) As-Submitted**				**188.36**
E.2	Direct Unit Cost (C.2 / D.2) As-Evaluated				
	Name and Specification	Unit	Quantity	Unit Cost	Amount (Php)
F.1	**Materials**				
	Acy-urethane painting system (2 coat)	ltr	1.00	2,050.00	2,050.00
	epoxy plutty	ltr	0.35	1,166.66	408.33
	epoxy prinner for steel and concrete	ltr	0.68	1,525.75	1,037.51
	Sub - Total for B.1 - As Submitted				**3,495.84**
F.2	**Materials**				
	Sub - Total for B.2 - As Evaluated				
G.1	**Direct Unit Cost (E.1 + F.1) As-Submitted**				**3,684.20**
G.2	Direct Unit Cost (E.2 + F.2) As-Evaluated				
H.1	**Overhead, Contigencies & Miscelleneous (OCM) As Submitted**			**10% of G.1**	**368.42**
H.2	Overhead, Contigencies & Miscelleneous (OCM) As Evaluated			10% of G.2	
I.1	**Contractor's Profit As-Submitted**			**8% of G.1**	**294.74**
I.2	Contractor's Profit As-Evaluated			8% of G.2	
J.1	**Value Added Tax As-Submitted**			**5% of (G.1 + H.1 + I.1)**	**217.37**
J.2	Value Added Tax As-Evaluated			5% of (G.2 + H.2 + I.2)	
K.1	**Total Unit Cost As-Submitted**			**(G.1 + H.1 + I.1 + J.1)**	**4,564.73**
K.2	Total Unit Cost As-Evaluated			(G.2 + H.2 + I.2 + J.2)	

Prepared by:

ABDURAHEM I. CANDOTAN
Engineer II
Construction Section

Submitted by:

WILLIAM N. GABATINO
Engineer III
Chief, Planning and Design Section

Project Title: Retrofitting / Strengthening of Permanent Bridges - Liwasang Bonifacio west Overpass (Flyover) (B01348LZ), Manila City

Project Location: MANILA CITY

DETAILED UNIT PRICE ANALYSIS (DUPA)

FORM POW-2015-01D-00

Item No./ Description	:	612(1)	Reflectorized Thermoplastic Pavement Markings (White)
Unit of Measurement	:	sq.m.	
Output per hour - As Submitted	:	25.00	
Output per hour - As Evaluated	:		

	Designation	No. of Person/s	No. of Hour/s	Hourly Rate	Amount (Php)
A.1	**Labor**				
	Construction Foreman	1.00	1.00	181.17	181.17
	Skilled Laborer	2.00	1.00	131.30	262.60
	Unskilled Laborer	6.00	1.00	101.29	607.74
	Sub - Total for A.1 - As Submitted				**1,051.51**
A.2	**Labor**				
	Sub - Total for A.2 - As Evaluated				
	Name and Capacity	No. of Unit/s	No. of Hour/s	Hourly Rate	Amount (Php)
B.1	**Equipment**				
	Cargo/Service Truck, Model: All Models Capacity: 2-5mt	1.00	1.00	783.00	783.00
	Applicator Machine	1.00	1.00	93.75	93.75
	Kneading Machine	1.00	1.00	187.50	187.50
	Minor Tools (10% of Labor Cost)				105.15
	Sub - Total for B.1 - As Submitted				**1,169.40**
B.2	**Equipment**				
	Sub - Total for B.2 - As Evaluated				
C.1	**Total (A.1 + B.1) As-Submitted**				**2,220.91**
C.2	Total (A.2 + B.2) As-Evaluated				
D.1	**Output per Hour As-Submitted**				**25.00**
D.2	Output per Hour As-Evaluated				
E.1	**Direct Unit Cost (C.1 / D.1) As-Submitted**				**88.84**
E.2	Direct Unit Cost (C.2 / D.2) As-Evaluated				
	Name and Specification	Unit	Quantity	Unit Cost	Amount (Php)
F.1	**Materials**				
	Thermoplastic Paint (White)	bag	0.325	1,250.00	406.25
	Glass Beads	bag	0.033	895.00	29.54
	Primer	lit	0.120	180.00	21.60
	LPG (50 kg.)	kg	0.004	4,063.50	16.25
	LPG (12 kg.)	kg	0.002	975.24	1.95
	Calsumine	kg	0.125	120.00	15.00
	Miscellaneous (5% of Materials Cost)				24.53
	Sub - Total for B.1 - As Submitted				**515.12**
F.2	**Materials**				
	Sub - Total for B.2 - As Evaluated				
G.1	**Direct Unit Cost (E.1 + F.1) As-Submitted**				**603.96**
G.2	Direct Unit Cost (E.2 + F.2) As-Evaluated				
H.1	**Overhead, Contigencies & Miscelleneous (OCM) As Submitted**			**10% of G.1**	**60.40**
H.2	Overhead, Contigencies & Miscelleneous (OCM) As Evaluated			10% of G.2	
I.1	**Contractor's Profit As-Submitted**			**8% of G.1**	**48.32**
I.2	Contractor's Profit As-Evaluated			8% of G.2	
J.1	**Value Added Tax As-Submitted**			**5% of (G.1 + H.1 + I.1)**	**35.63**
J.2	Value Added Tax As-Evaluated			5% of (G.2 + H.2 + I.2)	
K.1	**Total Unit Cost As-Submitted**			**(G.1 + H.1 + I.1 + J.1)**	**748.30**
K.2	Total Unit Cost As-Evaluated			(G.2 + H.2 + I.2 + J.2)	

Prepared by:

ABDURAHEM I. CANDOTAN
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Construction Section

Submitted by:

WILLIAM N. GABATINO
Engineer III
Chief, Planning and Design Section

REPUBLIC OF THE PHILIPPINES

DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

NATIONAL CAPITAL REGION

SOUTH MANILA DISTRICT ENGINEERING OFFICE

BONIFACIO DRIVE CORNER 8th STREET, PORT AREA, MANILA

C.Y. 2025 PROJECT

DETAILED ENGINEERING DESIGN PLAN FOR

RETROFITTING/STRENGTHENING OF PERMANENT BRIDGES - LIWASANG BONIFACIO WEST OVERPASS (FLYOVER) (B01348LZ), MANILA CITY

SECTION:	N/A
LOCATION:	LIWASANG BONIFACIO., MANILA CITY
STATION LIMITS:	STA. 0.+000 TO STA. 0+314.10
NET LENGTH:	314.10 l.m.
ROAD SECTION/BRIDGE ID:	B01348LZ

SUBMITTED:

WILLIAM N. GABATINO
CHIEF, PLANNING AND DESIGN SECTION

DATE :

RECOMMENDED:

BRIAN B. BRIONES
OFFICER-IN-CHARGE
OFFICE OF THE ASSISTANT DISTRICT ENGINEER

DATE :

APPROVED:

MANNY B. BULUSAN
OFFICER-IN-CHARGE
OFFICE OF THE DISTRICT ENGINEER

DATE :

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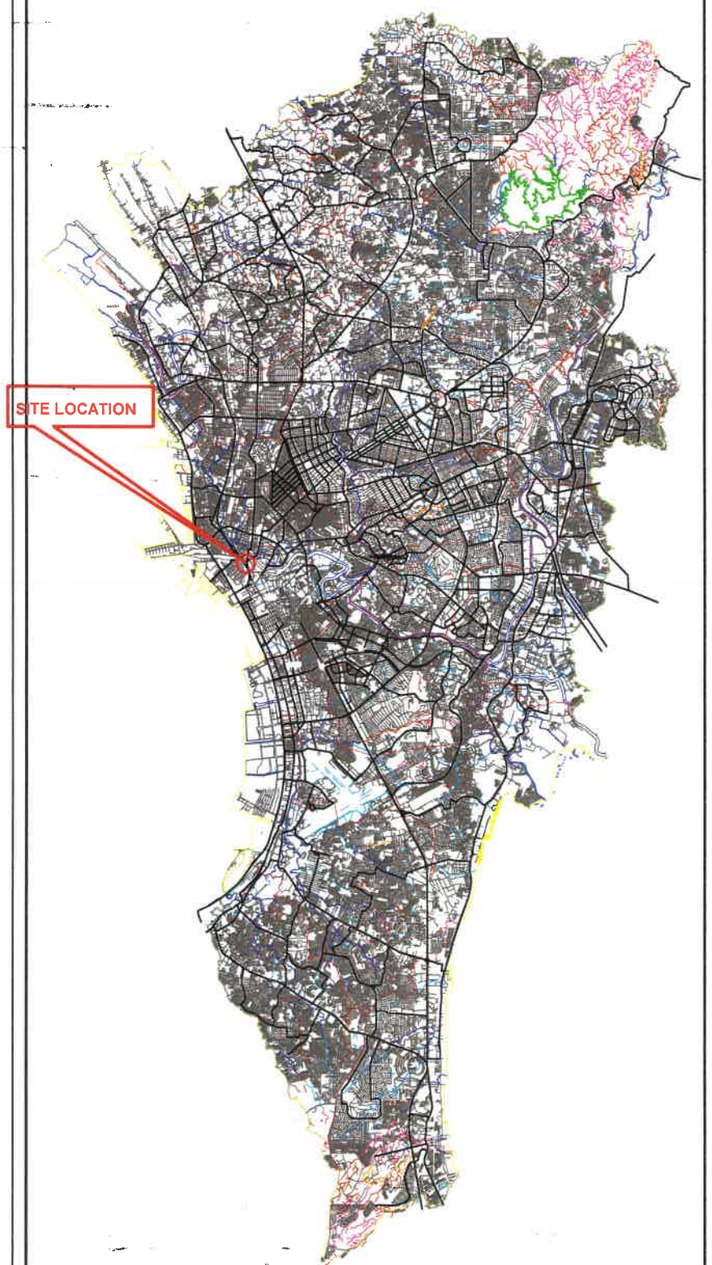
REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS NATIONAL CAPITAL REGION SOUTH MANILA DISTRICT ENGINEERING OFFICE BONIFACIO DRIVE CORNER 8th STREET, PORT AREA, MANILA	PROJECT NAME AND LOCATION: RETROFITTING/STRENGTHENING OF PERMANENT BRIDGES - LIWASANG BONIFACIO WEST OVERPASS (FLYOVER) (B01348LZ), MANILA CITY	SHEET CONTENTS: INDEX OF DRAWINGS	DRAFTED: MOHAMMAD RAMJIE P. ARANGAD ENGINEER I DATE: PREPARED: ABDURAHEM I. CANDOTAN ENGINEER II DATE:	REVIEWED: JOSE ARVIN C. MANAHAN ENGINEER I DATE:	SUBMITTED: WILLIAM N. CABATINO CHIEF, PLANNING AND DESIGN SECTION DATE:	RECOMMENDED: ERICK B. ESCOTA OFFICER-IN-CHARGE OFFICE OF THE ASSISTANT DISTRICT ENGINEER DATE:	APPROVED: MANNY D. BULUSAN OFFICER-IN-CHARGE OFFICE OF THE DISTRICT ENGINEER DATE:	SET NO. G 1	SHEET NO. 02 18

MAP OF NATIONAL CAPITAL REGION



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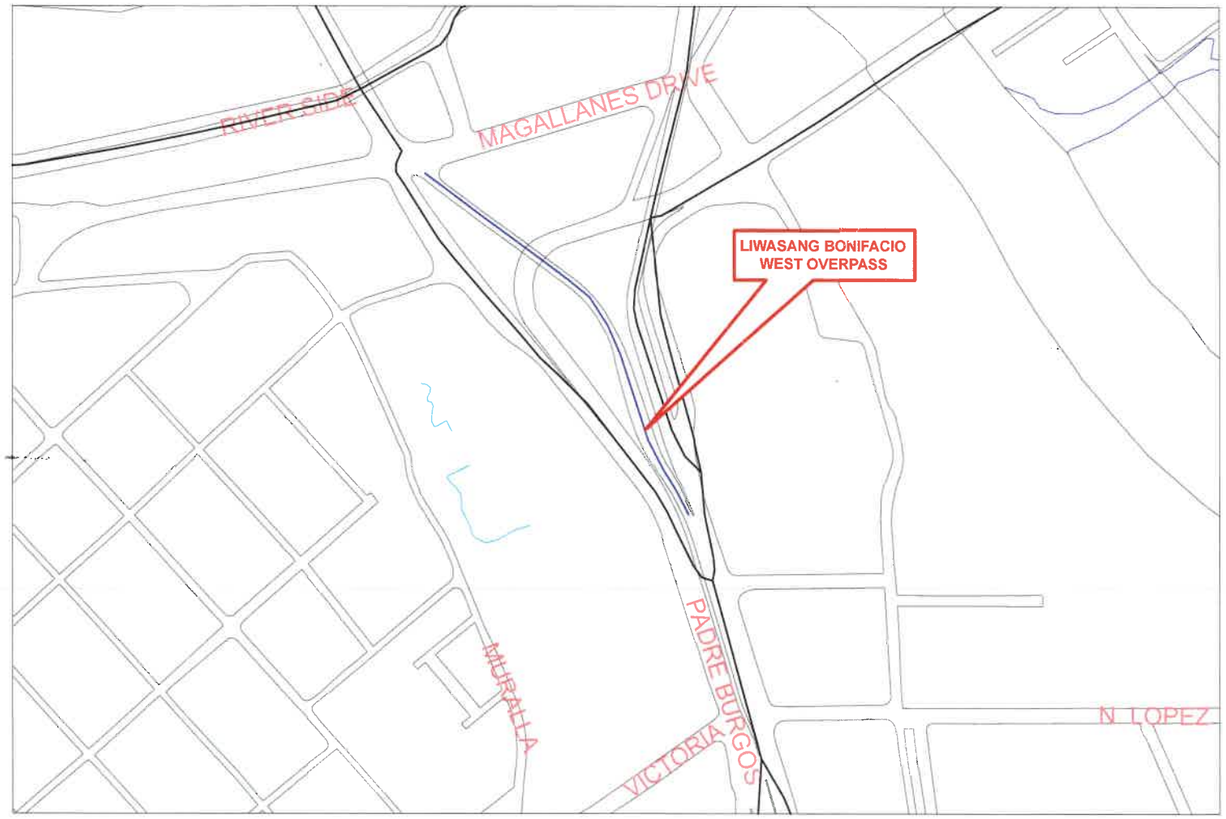
LOCATION MAP
SCALE N T S



VICINITY MAP
SCALE N T S

MMA - 3816

THE STATION IS LOCATED AT THE NW EDGE OF BONIFACIO SHRINE PLAZA ABOUT 1 METER NE OF PADRE BURGOS STREET AND 10 METERS SE OF MANILA CITY HALL

STATION MARK IS THE HEAD OF 4" STAINLESS BOLT FLUSHED IN A 20CM. X 20CM. CEMENT PUTTY WITH INSCRIPTION 'MMA-3816; 2011; LMS-NCR, FLS."

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
NATIONAL CAPITAL REGION
SOUTH MANILA DISTRICT
ENGINEERING OFFICE
BONIFACIO DRIVE CORNER 8th STREET, PORT AREA, MANILA

PROJECT NAME AND LOCATION:
RETROFITTING/STRENGTHENING OF PERMANENT BRIDGES - LIWASANG BONIFACIO WEST OVERPASS (FLYOVER) (B01348LZ), MANILA CITY

SHEET CONTENTS:
LOCATION MAP
VICINITY MAP

DRAFTED:
MOHAMMAD HAMJE PARANGAD
ENGINEER I
DATE:

PREPARED:
ABDULHAKIM I. CANDOTAN
ENGINEER II
DATE:

REVIEWED:
JOSE KEVIN C. MANAHAN
ENGINEER II
DATE:

SUBMITTED:
WILHAM N. ADDATINO
CHIEF, PLANNING AND DESIGN SECTION
DATE:

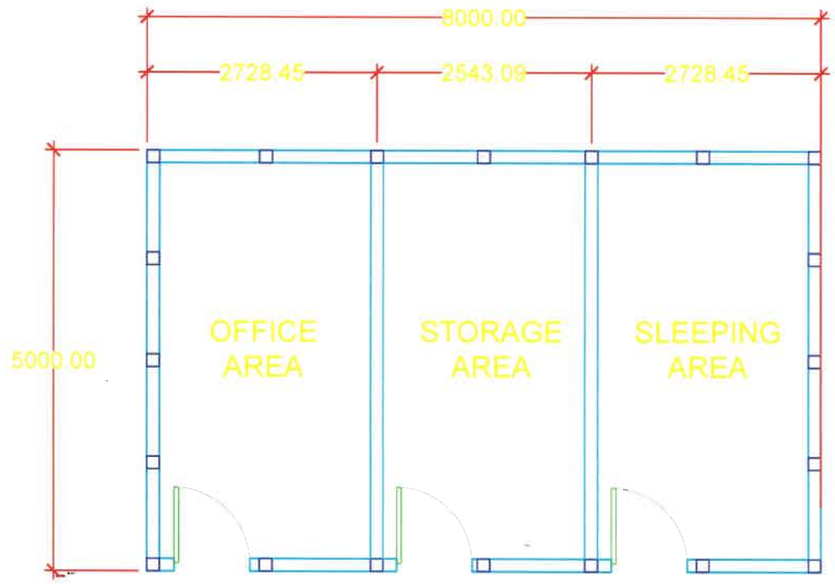
RECOMMENDED:
ERNIE T. RIONES
OFFICER-IN-CHARGE
OFFICE OF THE ASSISTANT DISTRICT ENGINEER
DATE:

APPROVED:
MANNY S. BULUSAN
OFFICER-IN-CHARGE
OFFICE OF THE DISTRICT ENGINEER
DATE:

SET NO. G 2
SHEET NO. 03 18

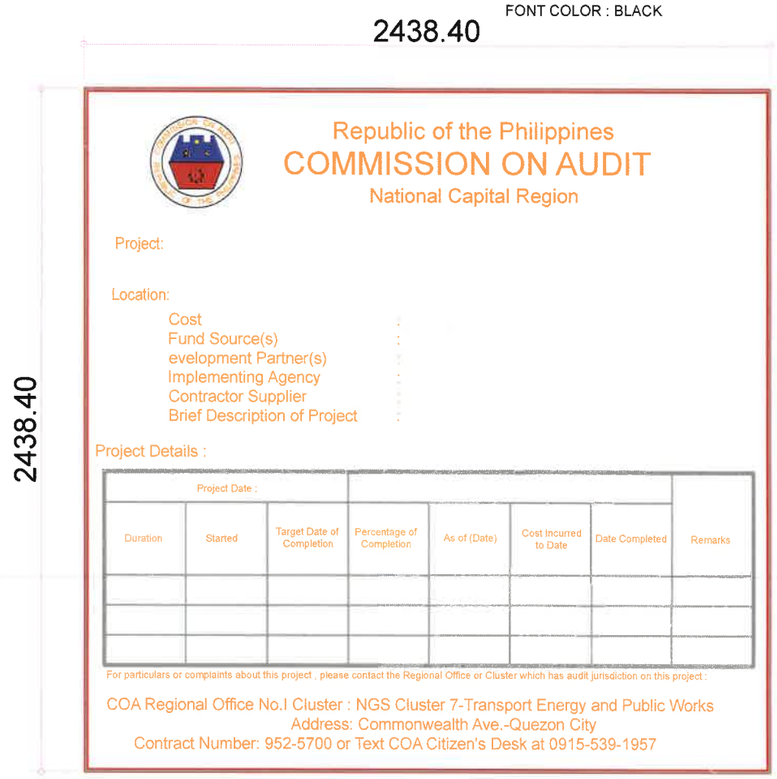
SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	QTY	UNIT
PART A	FACILITIES FOR THE ENGINEER		
A.1.1(3)	Construction of Field Office for the Engineer	1.00	l.s.
PART B	OTHER GENERAL REQUIREMENTS		
B.5(1)	DPWH Project Billboard/Signboard	2.00	each
B.5(2)	COA Billboard/Signboard	1.00	each
B.7(2)	Occupational Safety and Health Program	1.00	l.s.
B.8	Mobilization / Demobilization	1.00	l.s.
PART C	EARTHWORKS		
101(3)c1	Removal of Actual structures and obstruction -ACP, 0.050m thick	2,864.89	sq.m.
PART E	SURFACE COURSES		
302(2)	Emulsified Asphalt	2,864.89	sq.m.
310(1)c	Bituminous Concrete Wearing Surface Course, Hot-Laid (50mm thk)	2,864.89	sq.m.
PART F	BRIDGE CONSTRUCTION		
413(4)b1	Expansion Joint, Steel Finger Type (30mm gap)	93.60	l.m.
414(1)	Forms and Falsework	1.00	l.s.
416(1)b	Carbon Fiber Sheet (2 Layers)	2,330.23	sq.m.
425(1)	Waterproofing on Deck Slab, Liquid Applied	1,941.00	sq.m
425(3)	Epoxy Injection on Crack	6,394.00	l.m.
425(10)	Protective Coating for Concrete Structures	2,330.23	sq.m.
PART H	MISCELLANEOUS STRUCTURES		
512(1)	Reflectorized Thermoplastic Pavement Markings (White)	110.00	sq.m.

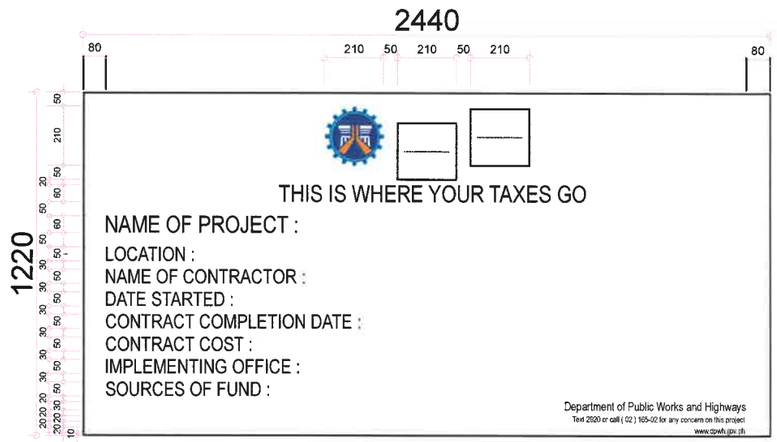


FIELD OFFICE FLOOR PLAN
SCALE 1:50

TARPAULINE , WHITE , 8FT X 8 FT
RESOLUTION : 70 dpi
FONT: NELVETICA
FONT SIZE : MAIN INFORMATION : 3"
SUB-INFORMATION : 1"
FONT COLOR : BLACK



DPWH PROJECT BILLBOARD
SCALE 1:15



NOTE: THE NEW BILLBOARD DESIGN LAYOUT AND DIMENSION (SEE ATTACHED DRAWING)
USING 6.25mm (1/4 INCH) THICK MARINE PLYWOOD OR TARPAULIN POSTED ON 5MM ($\frac{3}{16}$ INCH) MARINE PLYWOOD.
COLOR SHADE COMBINATION FOR THE YELLOW BACKGROUND

COA BILLBOARD
SCALE 1:15

REPUBLIC OF THE PHILIPPINES
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PROJECT NAME AND LOCATION:
RETROFITTING/STRENGTHENING OF PERMANENT BRIDGES - LIWASANG BONIFACIO WEST OVERPASS (FLYOVER) (B01348LZ), MANILA CITY

SHEET CONTENTS:
SUMMARY OF QUANTITIES
FIELD OFFICE FLOOR PLAN
DPWH PROJECT BILLBOARD
COA BILLBOARD

DRAFTED: MOHAMMAD RAHJIE P. BABAGAD, ENGINEER I, DATE:
PREPARED: ABDUKAHEM I. CANDOTAN, ENGINEER II, DATE:
REVIEWED: JOSE ARVIN C. MARAYAN, ENGINEER II, DATE:
SUBMITTED: WILLIAM N. ZAGATINO, CHIEF, PLANNING AND DESIGN SECTION, DATE:
RECOMMENDED: BRIAN B. BRIONES, OFFICER-IN-CHARGE, OFFICE OF THE ASSISTANT DISTRICT ENGINEER, DATE:
APPROVED: MARVIN B. SULUAN, OFFICER-IN-CHARGE, OFFICE OF THE DISTRICT ENGINEER, DATE:

SET NO. G 3
SHEET NO. 04 18

GENERAL CONSTRUCTION NOTES

I. GENERAL

1. IN THE INTERPRETATION OF THESE DRAWINGS, INDICATED DIMENSIONS SHALL GOVERN AND DISTANCES OR SIZES SHALL NOT BE SCALED FOR CONSTRUCTION PURPOSES.

2. UNLESS OTHERWISE SPECIFIED ON PLANS, ALL DIMENSIONS ARE IN MILLIMETERS, ELEVATIONS ARE IN METERS AND STATIONS ARE IN KILOMETERS PLUS METER.

3. ALL DIMENSIONS, ELEVATIONS AND STATIONING SHALL BE VERIFIED PRIOR TO ACTUAL CONSTRUCTION/REPAIR.

4. CARBON FIBER REINFORCED POLYMER (CFRP) SHALL SUBJECTED FOR TESTING PRIOR TO APPLICATION BASED ON THE PROPERTY SPECIFIED ON THE PLAN.

5. QUALIFIED CONTRACTOR/APPLICATOR SHALL SUBMIT CORRESPONDING DESIGN BASED ON THE SCHEME.

6. FOR THE INTEREST OF THE GOVERNMENT AND CONSIDERING THAT THE SCHEME OF STRENGTHENING OF EXISTING STRUCTURE IN A NEW TECHNOLOGY, THE CONTRACTOR /APPLICATOR SHALL NOT BE RELIEVED WITH RESPONSIBILITY AND CORRESPONDING WARRANTY OF NOT LESS THAN 5 YEARS SHALL BE ISSUED PRIOR TO APPLICATION.

7. MATERIALS AND WORKMANSHIP SHALL CONFORM WITH THE DPWH STANDARD AND SPECIFICATIONS FOR HIGHWAYS, BRIDGES, AND AIRPORTS 2013.

8. METHODS AND PROCEDURES SHALL CONFORM DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS BRIDGE REPAIR MANUAL 2ND EDITION.

II. APPLICATION CRITERIA

1. PATCHING OF DECK SLAB

USE PATCHING TYPE-B FOR SURFACE WITH EXPOSED REBAR, WITH DEFECTIVE WIDTHS BETWEEN 300 MM AND 600 MM, AND UP TO 100 MM DEPTHS. USE POLYMER CEMENT MORTAR FOR TYPE-B PATCHING.

2. CARBON FIBER SHEET BONDING TO DECK SLAB

THE RELATED STRENGTHENING SYSTEM FOR THE CONCRETE DECK SLAB SHALL GENERALLY CONSISTS OF WOVEN CARBON FIBER SHEET (CFS) REINFORCING LAYERS, BONDED TO THE CONCRETE SURFACE WITH EPOXY ADHESIVE.

3. WATERPROOFING ON DECK SLAB

CONCRETE IS NATURALLY ALKALINE AND THEREFORE PROTECTS THE STEEL. THE EFFECT OF ITS CONTACT WITH WATER AND CORROSIVE MATERIALS REDUCES THE ALKALINE ENVIRONMENT AND ALLOWS AN ELECTROLYTIC PROCESS TO START REBAR CORROSION. THE RESULT OF THE CORROSION AND RUSTING IS TO EXPAND THE REBAR WHICH THEN DAMAGES AND EVENTUALLY DESTROYS THE SURROUNDING CONCRETE OF THE DECK. THE PRIMARY PROTECTION AGAINST THIS DESTRUCTIVE DAMAGE IS THROUGH INSTALLATION OF WATERPROOFING MEMBRANE ON THE DECK SLAB.

4. EPOXY INJECTION ON CONCRETE GIRDERS

CRACKS WITH MORE THAN 0.3MM UP TO 3.0MM WIDTHS CAN BE BONDED AND SEALED BY INJECTING LOW VISCOSITY EPOXY.

5. RECASTING CONCRETE/GROUT ON GIRDERS

RECASTING METHOD INVOLVES CASTIN OF THE DAMAGED AREA BY PLACING CONCRETE OR GROUTING MORTAR ON THE FORMWORK AND IS USUALLY MOST SUITABLE FOR SEVERELY DAMAGED CONCRETE, OR FOR LARGELY DAMAGED AREAS WITH DENSELY SPACED REBAR. IF CONCRETE PLACING BY VIBRATION IS OFTEN A PROBLEM, GROUT AND FREE FLOWING SELF-COMPACTING CONCRETE SHOULD BE USED TO MINIMIZED THE VIBRATION REQUIRED.

6. CARBON FIBER SHEET/PLATE BONDING TO CONCRETE GIRDER

THE RELATED STRENGTHENING SYSTEM FOR THE CONCRETE GIRDER SHALL GENERALLY CONSISTS OF WOVEN CARBON FIBER SHEET (CFS) REINFORCING LAYERS, BONDED TO THE CONCRETE SURFACE WITH EPOXY ADHESIVE. THE APPLICATION OF CFS IN SPAN FROM BOTH ENDS WILL SERVES AS PROTECTION AGAINST SHEAR CRACKS WHILE THE CENTER SECTION OF SPAN IS APPLIED WITH CARBON FIBER PLATE (CFP) FOR PROTECTION AGAINST FLEXURAL CRACKS.

7. PROTECTIVE COATING

PROTECTIVE COATING SHALL BE APPLIED TO SURFACE OF CONCRETE MEMBER FOR PREVENTIVE MAINTENANCE, AFTER REPAIRING DAMAGE. THE MATERIAL IS MADE OF AN ACRYL URETHANE CHARACTERIZED BY WEATHER/UV RESISTANCE, CHEMICAL AND OIL RESISTANCE NEEDED FOR THE PROTECTION OF CONCRETE. COATING IS NORMALLY APPLIED FOR 1 TO 3 COATS.

8. ASPHALTIC PLUG JOINT

ASPHALTIC PLUG JOINTS ARE MAINLY APPLIED ON RCDG BRIDGES AND STEEL BRIDGES ON FIXED BEARINGS. IT SHOULD BE ENSURED THAT EXPANSION JOINTS ARE WATERPROOFED AS WELL AS RESISTANT TO LEAKAGE. THE MOST SUITABLE REPAIR MEASURE FOR DAMAGED ASPHALT SEALANT IS THE INSTALLATION OF ASPHALTIC PLUG JOINT.

III. MATERIAL REQUIREMENT

1. PATCHING OF DECK SLAB
   1.1 POLYMER CEMENT MORTAR

SPECIFICATIONS OF POLYMER CEMENT PATCHING MATERIAL			
PROPERTY	TEST METHOD	UNIT	SPECIFICATION
COMPRESSIVE STRENGTH	JHS 416/ASTM C39	N/mm²	AT 28 DAYS: >/=25
BOND STRENGTH TO CONCRETE	JHS 416/ASTM D7234	N/mm²	>/=1.5
BLEEDING RATE	JHS 416/ASTM C39	%	0

THE MATERIAL SHALL BE APPROVED BY THE ENGINEER THROUGH MILL CERTIFICATE OF THE SUPPLIER.

1.2 BONDING PRIMER

SPECIFICATIONS OF BONDING PRIMER TO CONCRETE PATCHING			
PROPERTY	TEST METHOD	UNIT	SPECIFICATION
COMPRESSIVE STRENGTH	JIS K 7208/ASTM D695M	N/mm²	75
FLEXURAL STRENGTH	JIS K 6911/ASTM D790M	N/mm²	40
TENSILE STRENGTH	JIS K 7113/ASTM D638M	N/mm²	30
TENSILE SHEAR BOND STRENGTH	JIS K 6850/ASTM D1002	N/mm²	10
SLANT SHEAR BOND TO MORTAR	JIS K 6852/ASTM C882	N/mm²	15

THE MATERIAL SHALL BE APPROVED BY THE ENGINEER THROUGH MILL CERTIFICATE OF THE SUPPLIER.

1.3 ZINC-RICH PRIMER

SPECIFICATIONS OF ZINC-RICH PRIMER TO BE APPLIED TO REBAR			
PROPERTY	TEST METHOD	UNIT	SPECIFICATION
GLOSS @ 60° ANGLE	ASTM D523	-	FLAT
ADHESION	ASTM D3359	-	MINIMUM 3A
SALT SPRAY RESISTANCE	ASTM D117	-	EXCELLENT
%ZINC BY WEIGHT IN DRIED FILM TEST	-	%	87.5±2

THE MATERIAL SHALL BE APPROVED BY THE ENGINEER THROUGH MILL CERTIFICATE OF THE SUPPLIER.

2. CARBON FIBER SHEET BONDING TO DECK SLAB
   2.1 CARBON FIBER SHEET

SPECIFICATION PROPERTIES DATA SHEET
Carbon PAN-Carbon T-300a

TYPICAL OF CARBON FIBER PROPERTIES	SI / Units (US Design)
TYPICAL DIAMETER	7x10 ^-6 (7)
SPECIFIC GRAVITY	1.76
TENSILE MODULUS (Gpa)	231
TENSILE STRENGTH (Gpa)	3.65
STRAIN TO FAILURE, PERCENT	1.40
COEF. OF THERMAL EXPANSION 10^-6 /C	-0.10 to -0.50 (longitudinal), 7-12 (radial)
POISSON'S RATIO	-0.20

SPECIFICATION PROPERTIES DATA SHEET
Carbon PITCH-Carbon P-555a

TYPICAL OF CARBON FIBER PROPERTIES	SI / Units (US Design)
TYPICAL DIAMETER	10 ^-7 (10)
SPECIFIC GRAVITY	2.00
TENSILE MODULUS (Gpa)	380
TENSILE STRENGTH (Gpa)	1.9
STRAIN TO FAILURE, PERCENT	.50
COEF. OF THERMAL EXPANSION 10^-6 /C	-0.90 (longitudinal)
POISSON'S RATIO	-

2.2 EPOXY ADHESIVE

SPECIFICATION OF EPOXY RESIN ADHESIVE FOR CFS					
PROPERTY	TEST METHOD	UNIT	PRIMER	EPOXY PUTTY	PENETRATING EPOXY RESIN
VISCOSITY	JIS K 6833/ ASTM D2393	mPa-s	</=1000	PASTE-LIKE	15,000±5,000
MODULUS OF ELASTICITY	JIS K 7208/ ASTM D695M	N/mm²	>/=1500	>/=1500	>/=1500
SLANT SHEAR BOND TO CONCRETE	ASTM C882	N/mm²	>/=15	>/=15	>/=15
BOND STRENGTH TO CONCRETE (DRY/WET)	JIS K 5400/ ASTM D7234	N/mm²	>/=1.54	>/=1.54	>/=1.54

THE MATERIAL SHALL BE APPROVED BY THE ENGINEER THROUGH MILL CERTIFICATE OF THE SUPPLIER.

3. WATERPROOFING ON DECK SLAB

SPECIFICATION OF ASPHALT COMPOUND FOR WATERPROOFING			
PROPERTY	TEST METHOD	UNIT	SPECIFICATION
PENETRATION WITH CONIC NEEDLE	JIS K 5400/ASTM D217	mm	2~5
MELTING TEMPERATURE	JIS K 6839/ASTM D3461	°C	80
ELONGATION	JIS K 6021/ASTM D638	%	3.5
TENSILE STRENGTH	JIS K 6021/ASTM D638	Kgf/cm²	300

THE MATERIAL SHALL BE APPROVED BY THE ENGINEER THROUGH MILL CERTIFICATE OF THE SUPPLIER. PRIMER, TACK COAT AND SILICA SAND SHALL BE IN ACCORDANCE WITH DPWH STANDARD SPECIFICATIONS.

4. EPOXY INJECTION ON CONCRETE GIRDERS
   4.1 EPOXY RESIN

SPECIFICATION OF EPOXY RESIN FOR INJECTION TO GIRDER			
PROPERTY	TEST METHOD	UNIT	SPECIFICATION
VISCOSITY	JIS K 6833/ASTM D2393	mPa-s	</=1000
POTLIFE	-	minute	60
SPECIFIC GRAVITY	JIS K 7112/ASTM D792	-	1.15±0.1
COMPRESSIVE STRENGTH	JIS K 7208/ASTM D695	N/mm²	>/=50
FLEXURAL STRENGTH	JIS K 7203/ASTM D790M	N/mm²	>/=40
TENSILE SHEAR BOND	JIS K 6850/ASTM D1002	N/mm²	>/=10
SLANT SHEAR BOND STRENGTH TO CONCRETE	JIS K 6852/ASTM C882	N/mm²	15/above
BOND STRENGTH TO CONCRETE DRY/WET	JIS K 5400/ASTM D7234	N/mm²	>/=1.5 CF

THE MATERIAL SHALL BE APPROVED BY THE ENGINEER THROUGH MILL CERTIFICATE OF THE SUPPLIER.
CF - CONCRETE FAILURE

4.2 SEALANT (PUTTY)

SPECIFICATION OF SEALANT (PUTTY) FOR EPOXY INJECTION TO GIRDER			
PROPERTY	TEST METHOD	UNIT	SPECIFICATION
SPECIFIC GRAVITY	JIS K 7112/ASTM D792	-	1.50±0.30
COMPRESSIVE STRENGTH	JIS K 7208/ASTM D695	N/mm²	>/=50
FLEXURAL STRENGTH	JIS K 7203/ASTM D790M	N/mm²	>/=15
TENSILE SHEAR BOND	JIS K 6850/ASTM D1002	N/mm²	>/=10
BOND STRENGTH TO CONCRETE DRY/WET	JIS K 5400/ASTM D7234	N/mm²	>/=1.5 CF

THE MATERIAL SHALL BE APPROVED BY THE ENGINEER THROUGH MILL CERTIFICATE OF THE SUPPLIER.
CF - CONCRETE FAILURE

5. CARBON FIBER SHEET BONDING TO CONCRETE GIRDER
   5.1 CARBON FIBER SHEET (SAME AS TABLE 2.1)
   5.2 EPOXY RESIN ADHESIVE

SPECIFICATION OF EPOXY ADHESIVE FOR BONDING CFS					
PROPERTY	TEST METHOD	UNIT	PRIMER	EPOXY PUTTY	PENETRATING EPOXY RESIN
VISCOSITY	JIS K 6833/ ASTM D2393	mPa-s	</=1000	PASTE-LIKE	15,000±5,000
TENSILE STRENGTH	JIS K 7113/ ASTM D638M	N/mm²	>/=15	-	>/=30
FLEXURAL STRENGTH	JIS K 7203/ ASTM D790M	N/mm²	>/=20	>/=15	>/=40
COMPRESSIVE STRENGTH	JIS K 7208/ ASTM D695M	N/mm²	>/=20	>/=40	>/=50
MODULUS OF ELASTICITY	JIS K 7208/ ASTM D695M	N/mm²	>/=1500	>/=1500	>/=1500
SLANT SHEAR BOND TO CONCRETE	ASTM C882	N/mm²	>/=15	>/=15	>/=15
ADHESIVE STRENGTH (DRY/WET)	JIS K 5400/ ASTM D7234	N/mm²	>/=1.5	>/=1.5	>/=1.54

THE MATERIAL SHALL BE APPROVED BY THE ENGINEER THROUGH MILL CERTIFICATE OF THE SUPPLIER.

REPUBLIC OF THE PHILIPPINES
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PROJECT NAME AND LOCATION:
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SHEET CONTENTS:
GENERAL NOTES

DRAFTED: MOHAMMAD RAMJIE P. BISANGAD, ENGINEER I — DATE:
PREPARED: ARJUNAH C. MANDOTAN, ENGINEER II — DATE:
REVIEWED: JOSE ERWIN C. MANAHAN, ENGINEER III — DATE:
SUBMITTED: WILLIAM R. CABATINO, CHIEF, PLANNING AND DESIGN SECTION — DATE:
RECOMMENDED: BRIAN P. TABOSES, OFFICER-IN-CHARGE, OFFICE OF THE ASSISTANT DISTRICT ENGINEER — DATE:
APPROVED: MANNY S. BULULAN, OFFICER-IN-CHARGE, OFFICE OF THE DISTRICT ENGINEER — DATE:

SET NO. G 4
SHEET NO. 05 18

GENERAL CONSTRUCTION NOTES

6. PROTECTIVE COATING

SPECIFICATION OF PROTECTIVE COATING			
PROPERTY	TEST METHOD	UNIT	SPECIFICATION
BOND STRENGTH	ASTM D3359 or ASTM D7234	N/mm²	>/=1.5
TAP WATER RESISTANCE	ASTM D6943	-	No Change
ACID RESISTANCE (5%H_2SO_4)	ASTM D6943	-	No Change
ALKALI RESISTANCE (5%NaOH)	ASTM D6943	-	No Change

THE MATERIAL SHALL UNDERGO QUALITY TESTS AND CONFIRM TO THE ABOVE SPECIFICATIONS.

7. FLEXIBLE ASPHALT

SPECIFICATION OF FLEXIBLE ASPHALT			
PROPERTY	TEST METHOD	UNIT	SPECIFICATION
DENSITY	ASTM D1188	g/cm³	2.26±0.05
SPLITTING STRENGTH	ASTM D4123-82	N/mm²	1.57±0.29
DEFORMATION (FLOW VALUE)	JIS K 2207/ASTM D1559	1/100cm	140±20

THE MATERIAL SHALL BE APPROVED BY THE ENGINEER THROUGH MILL CERTIFICATE OF THE SUPPLIER.

IV. CONSTRUCTION REQUIREMENTS

A. CARBON FIBER SHEET BONDING TO DECK SLAB

1. SURFACE PREPARATION

ALL CONCRETE SURFACES SHALL BE CLEAN, SOUND AND FREE FROM SURFACE MOISTURE. CRACK SEALING OR WATER PROOFING SHALL BE PROVIDED PRIOR TO CONCRETE SURFACE RESTORATION. IF WATER LEAKS THROUGH CRACKS ON CONCRETE SURFACE TO BE COVERED WITH CARBON FIBER SHEET (CFS), SURFACE PREPARATION AND APPLICATION OF THE CFS SHALL BE IN ACCORDANCE WITH THE APPROVED MANUFACTURER'S SPECIFICATIONS. BOTH THE CONTRACTOR AND THE MANUFACTURER'S TECHNICAL REPRESENTATIVE MUST VERIFY SUITABILITY OF ANY CHANGES TO THE APPLICATION METHODS PROPOSED BY THE ENGINEER. CRACKS LARGER THAN 0.3 MM SHALL BE INJECTED WITH EPOXY USING A SYSTEM/METHOD APPROVED BY THE ENGINEER.

2. MATERIAL HANDLING

THE CARBON FIBER COMPONENTS SHALL BE DELIVERED IN AN ORIGINAL, UNOPENED (EXCEPT CARBON FIBER OR STRIPS) CONTAINERS CLEARLY MARKED WITH THE MANUFACTURER'S NAME, PRODUCT IDENTIFICATION, AND BATCH NUMBERS. STORAGE AND HANDLING OF THE VARIOUS RELATED PRODUCTS SHALL BE IN CONFORMANCE WITH MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.

3. PRIME COAT

CONTACT SURFACE SHALL BE DRY BEFORE COATING WITH PRIMER. THE PRIMER SHOULD BE FORMULATED AND COMPATIBLE TO THE CARBON FIBER MATERIAL AND SHOULD NOT BE APPLIED WHEN RAINING, STORMING OR AIR IS MISTY OR WHEN CONDITION REMAINS UNSATISFACTORY IN THE OPINION OF THE ENGINEER.

APPLICATION RATE SHALL BE SUCH AS TO ENSURE COMPLETE SATURATION OF THE CONTACT SURFACE. PRIMER SHOULD BE CURED BETWEEN 2~3 HOURS BEFORE PROCEEDING TO THE NEXT STEP.

4. PUTTY APPLICATION

THIS WORK INVOLVES APPLICATION OF EPOXY PUTTY ONTO THE PRIMER COATED CONCRETE SURFACE, USING TROWEL OR SPATULA, TO SMOOTHEN THE SURFACE. THE PUTTY IS APPLIED WHEN THE PRIMER IS ALREADY TACK-FREE. THE APPLICATION METHOD IS AS FOLLOWS:

- MIX 2 PARTS OF EPOXY PUTTY UNTIL THE MIXTURE IS HOMOGENIZED.
- APPLY THE PUTTY TO SMOOTHEN THE SURFACE. ALLOWABLE UNEVENNESS AFTER PUTTY APPLICATION IS 1 MM/M.

5. APPLICATION OF EPOXY RESIN FOR UNDERCOAT

PRIOR TO UNDERCOATING EPOXY RESIN ADHESIVE, AMBIENT TEMPERATURE AT THE WORK SITE SHALL BE CHECKED TO CONFIRM THE CURING CONDITIONS FOR APPLYING THE RESIN. THE CONTRACTOR SHALL CHECK AND CONFIRM THAT THE PRIMER AND PUTTY HAVE BECOME TACK-FREE AND THAT NO CLAY AND DUST EXIST ON THE CONCRETE SURFACE PRIOR TO ENGINEER'S INSPECTION. IF THERE IS A TIME INTERVAL OF LONGER THAN 3 DAYS AFTER PRIMER AND PUTTY APPLICATION, THE COATED SURFACE SHOULD BE ROUGHENED WITH SANDPAPER AND CLEANED BEFORE THE RESIN APPLICATION.

6. CFS APPLICATION (LONGITUDINAL DIRECTION)

THE STANDARD LENGTH OF CARBON SHEET WILL BE CUT TO 4 TO 6 M. IF THE STANDARD CUT LENGTH IS EXCEEDED, WRINKLES WILL APPEAR AND INSTALLATION BECOMES MORE DIFFICULT. THE CFS SHALL BE APPLIED AS PER THE FOLLOWING:

- STICK THE CFS IN THE LONGITUDINAL DIRECTION WITH A REASONABLE LAPSE OF 20~30 MINUTES AFTER THE EPOXY RESIN APPLICATION.
- PRESS THE CFS USING A ROLLER (PLASTIC ROLLER IS PREFERRED) STARTING FROM THE CENTER TOWARDS THE EDGE TO SQUEEZE OUT AIR BEFORE THE EPOXY RESIN SETS.
- WHEN LAPPING OF TWO CFS IS REQUIRED, A LAP LENGTH OF NOT LESS THAN 20 CM SHALL BE PROVIDED.

THE SPECIFIED NORMAL CURING TIME IS ONLY FOR REFERENCE PURPOSES. THE ACTUAL CURING PERIOD SHOULD BE DETERMINED IN CONSIDERATION OF THE AMBIENT TEMPERATURE AND MANUFACTURER'S RECOMMENDATION IN THE WORK SITE, SUBJECT TO ENGINEER'S APPROVAL.

7. OVER COATING RESIN APPLICATION

MIXING AND APPLICATION PROCEDURE FOR THE OVER COAT SHALL BE SIMILAR TO THAT OF THE UNDER-COATING RESIN. THE STANDARD QUANTITY OF OVER-COATING RESIN IS 0.2 KG/M². THE ACTUAL QUANTITY SHOULD BE DETERMINED IN CONSIDERATION WITH AMBIENT TEMPERATURE AND MANFACTURER'S RECOMMENDATION IN THE WORK SITE, SUBJECT TO ENGINEER'S APPROVAL.

8. CFS APPLICATION (TRANSVERSE DIRECTION)

AFTER ALL LONGITUDINAL LAYER CFS APPLICATION, THE TRANSVERSAL LAYER CFS IS APPLIED AT RIGHT ANGLES TO EACH OTHER IN SAME MANNER AS THE LONGITUDINAL DIRECTION.

SIGN CRITERIA

1. SURVEY SPECIFICATION
CONSIST OF FURNISHING THE NECESSARY EQUIPMENT AND MATERIAL TO SURVEY, STAKE, CALCULATE, AND RECORD DATA FOR THE CONTROL OF WORK IN ACCORDANCE WITH THIS SPECIFICATION AND IN CONFORMITY WITH THE LINES, GRADES AND DIMENSION SHOWN ON THE PLANS OR AS ESTABLISHED BY THE ENGINEER.

THIS SPECIFICATION DEPARTMENT ORDER NO. 54 SERIES OF 2007 WITH THE SUBJECT: DPWH Standard Specifications for Construction Survey and Staking, Part B, Section B.4

NATIONAL STRUCTURAL CODE OF THE PHILIPPINES (NCSP), VOLUME 2, bridges, 2010 THE AMERICAN ASSOCIATION OF THE STATE HIGHWAY AND TRANSPORTATION OFFICIAL (AASHTO) STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES 17TH EDITION, 2002 DPWH Design Guidelines, Criteria and Standards (DGCS) Engineering Survey, Volume 2B, 2015 Edition
AASHTO Guide on Pavement Design, 1993 Edition

2. DESIGN SPECIFICATION
NATIONAL STRUCTURAL CODE OF THE PHILIPPINES (NCSP), VOLUME 2, bridges, 2010 THE AMERICAN ASSOCIATION OF THE STATE HIGHWAY AND TRANSPORTATION OFFICIAL (AASHTO)
STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES 17TH EDITION, 2002
DPWH Design Guidelines, Criteria and Standards (DGCS) Highway Design, Volume 4, 2015 Edition AASHTO Guide on Pavement Design, 1993 Edition

3. SEISMIC DESIGN
IN ACCORDANCE TO AASHTO DIVISION 1 AND 1A, NATIONAL STRUCTURAL CODE OF THE PHILIPPINES (NSCP), VOLUME 2, BRIDGES, 2010, ACCELERATION COEFFICIENT OF 0.40

4. LOADINGS
HIGHWAY TRAFFIC LOADINGS : MS - 18

5. TRAFFIC SAFETY
Highway Safety Design Standards : Part 1 - Road Safety Design, and Part 2 - Road Signs and Pavement Markings, 2012 Edition

6. TRAFFIC MANAGEMENT
TRAFFIC MANAGEMENT AND SAFETY & HEALTH REQUIREMENTS FOR THE CONSTRUCTION AND MAINTENANCE OF ROADS, BRIDGES AND SAFETY & HEALTH REQUIREMENTS FOR SCHOOL BUILDINGS - D.O. NO. 13 SERIES OF 2018

ITEMS SPECIFICATION

ITEM 101(3)c1 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS
This item shall consist of the removal wholly in part, and satisfactory disposal of all buildings, fences, structures, old pavements, abandoned pipe lines and any other obstructions which are not designated or permitted to remain, except for the obstructions to be removed and disposed off under other items contract. It shall also include the salvaging of designated materials, and backfilling the resulting trenches, holes and pits.

ITEM 302(2) - EMULSIFIED ASPHALT
This item shall consist of preparing and treating and existing bituminous or cement concrete surface with bituminous material in accordance with the Plans and Specifications, preparatory to the construction of a bituminous surface course.

ITEM 310(2)c - BITUMINOUS TACT CONCRETE SURFACE COURSE, HOT-LAID
This item shall consist of contructing a Bituminous Concrete Surface Course composed of aggregates, mineral filler and bituminous material mixed in a central plant, constructed and laid hot on the prepared base in accordance with this specification and in comformity with lines, grades, thickness and typical cross sectionshown on the plans.

ITEM 413(4)b1 - EXPANSION JOINT, Steel Finger Type (30mm gap)
This Item of work shall consist of furnishing materials, labor, tools, equipment and incidentals necessary to design, fabrication, inspection, testing and installation the expansion joint system in conformity with the thickness and typical cross-section shown and specified on the Plans, to provide continuity between two parts of the structure which are in relative movements because of thermal deformations, creep, shrinkage and displacement/ deflection of the structure under traffic load.

ITEM 414(1) - FORMS AND FALSEWORKS
This item shall consist of designing, constructing and removing forms and falsework to temporarily support concrete, griders and other structural elements until the structure is completed to the point it can support itself

ITEM 416(1)b - CARBON FIBER sheet (2 layer)
This item covers carbon fibers for use to reinforced concrete structures as shown on the plans or as directed by the Engineer

ITEM 425(3) - Epoxy Injection on Crack
The quantities to be paid for epoxy coating and injection on crack shall be based on the total length of crack in linear meters as identified by the Engineer

ITEM 425(1) - Waterproofihg oh Deck slab
The quantities to be paid for waterproofing on deck slab shall be measured based on the actual area in square meters (m2) of bridge deck material applied and accepted by the Engineer. Application on curb faces and overlaps shall not be included.

ITEM 425(10) - Protective Coating for Concrete Structure
This item shall consist of furnishing and placing protective coating for bridge decks, curbs,sidewalks, concrete portions of bridge railing and other concrete structures, in order to protect them from physical damage and against chemical attack on its surfaces by acids, alkalis, salt solutions or variety of organic chemical in accordance with this specification and in conformity with types, grades and classes specified in the plans, or as directed by the Engineer

ITEM 612 (1) - REFLECTIVE THERMOPLASTIC STRIPPING MATERIALS (SOLID FORM)
This standard specifies the requirements for reflectorized thermoplastic pavement stripping material to AASHTO M 249 that is applied to the road surface in a molten state by mechanical means with surface application of glass beads at a rate of not less than 350g/L of glass beads having a size range of drop-in type and will produce an adherent reflectorized stripe of specified thickness and width capable of resisting deformation by traffic .

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS NATIONAL CAPITAL REGION SOUTH MANILA DISTRICT ENGINEERING OFFICE BONIFACIO DRIVE CORNER 8th STREET, PORT AREA, MANILA	PROJECT NAME AND LOCATION: RETROFITTING/STRENGTHENING OF PERMANENT BRIDGES - LIWASANG BONIFACIO WEST OVERPASS (FLYOVER) (B01348LZ), MANILA CITY	SHEET CONTENTS: GENERAL NOTES	DRAFTED: MOHAIMAD KAMRIE P. AMANGAD ENGINEER I DATE: PREPARED: ABDURAHEM C. CANDOTAN ENGINEER II DATE:	REVIEWED: JOSE ARVIN C. MANAHAN ENGINEER II DATE:	SUBMITTED: WILLIAM N. GABATINO CHIEF, PLANNING AND DESIGN SECTION DATE:	RECOMMENDED: BRIAN B. BRIONES OFFICER-IN-CHARGE OFFICE OF THE ASSISTANT DISTRICT ENGINEER DATE:	APPROVED: MANNY V. BULUSAN OFFICER-IN-CHARGE OFFICE OF THE DISTRICT ENGINEER DATE:	SET NO. G 5	SHEET NO. 06 18

HAULING DISPOSAL MAP

SCALE N.T.S

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS NATIONAL CAPITAL REGION SOUTH MANILA DISTRICT ENGINEERING OFFICE BONIFACIO DRIVE CORNER 8th STREET, PORT AREA, MANILA	PROJECT NAME AND LOCATION: RETROFITTING/STRENGTHENING OF PERMANENT BRIDGES - LIWASANG BONIFACIO WEST OVERPASS (FLYOVER) (B01348LZ), MANILA CITY	SHEET CONTENTS: **HAULING DISPOSAL MAP**	DRAFTED: MOHAMMAD RAHJIE P. ABANGAD ENGINEER I DATE: PREPARED: ABDUHAKIM T. CANDOTAN ENGINEER II DATE:	REVIEWED: JOSE ERVIN C. MANAHAN ENGINEER II DATE:	SUBMITTED: WILLIAM N. CASTAÑO CHIEF, PLANNING AND DESIGN SECTION DATE:	RECOMMENDED: EMILIA T. BUCOY OFFICER-IN-CHARGE OFFICE OF THE ASSISTANT DISTRICT ENGINEER DATE:	APPROVED: MANNY E. BULOSAN OFFICER-IN-CHARGE OFFICE OF THE DISTRICT ENGINEER DATE:	SET NO. G 7	SHEET NO. 08 18

SYMBOLS AND ABBREVIATIONS

1. SYMBOLS

1.1 EXISTING TOPOGRAPHIC FEATURES

1. PAVED ROAD	13. PLANT BOX/FLOWER BOX	25. NORTH ARROW	
2. UNPAVED ROAD OR TRACK	14. ACASIA TREE	26. ELEVATED WATER TANK	EWT
3. HOUSE/STRUCTURE	15. BAMBOO TREE	28. TRANSMISSION TOWER	
4. FENCE	16. COCONUT TREE	29. CONCRETE ELECTRICAL POST	
5. MASONRY WALL/FENCE	17. IPIL-IPIL TREE	30. WOODEN ELECTRICAL POST	
6. RAILROAD	18. FRUIT TREE	31. STEEL ELECTRICAL POST	
7. CONTOUR LINES (ELEV. AS SHOWN)	19. VARIOUS TREE	32. MANHOLE	
8. CONTOUR LINES FOR INUNDATED AREA	20.NARRA TREE	33. KILOMETER POST	
9. GROUND SPOT ELEVATION	21. MAHOGANY/GEMELINA TREE	34. SIGN POST	
10. WATERWAYS (RIVERS,CREEKS, ETC.)	22. MANGO TREE	35. POLE MOUNTED DISTRIBUTION TRANSFORMER	T
11. DEEP WELL	23. RICE FIELD		
12. LAMP POST	24. DIRECTION OF WATER FLOW		

1.2 NEW DESIGN FEATURES

PLAN			
1. EXPRESSWAY ROADWAY	SHLDR. SUB LANES SHLDR./CURB AND GUTTER ℄ SHLDR. SUB LANES SHLDR./CURB AND GUTTER	20. TEST PIT	TP
2. CENTERLINE		21. SECTION TARGET	
3. RIGHT-OF-WAY LIMIT WITH CHAIN LINK FENCE		22. ELEVATION TARGET	
4. RIGHT-OF-WAY LIMIT FOR PRCAST CONRETE PLANKS		23. SYMMETRICAL	
5. BARBED WIRE FENCE		24. GUARDRAIL	
6. CUT AND FILL SLOPES	FILL CUT	25. BERM DICTH	
7. CULVERT (PIPE OR BOX)	a – HEADWALL W/O FLARE b – HEADWALL W/ FLARE DRAINAGE UNLESS OTHERWISE INDICATED	26. STONE MASONRY	
8. BRIDGE	a – ABUTMENT b – PIER/COLUMN	27. CURB OUTFALL	
9. AREA TO BE FILLED/POCKET FILL		28. BERM OUTFALL	
10. GROUTED RIPRAP SLOPE PROTECTION	CLASS AS INDICATED ON PLANS	29. ASPHALT CURB	
11. MEDIAN DRAIN		**LONGITUDINAL PROFILE**	
12. DROP INLET		1. PROFILE GRADE	
13. PAVEMENT CROWN SLOPE	a – ABOVE LEVEL LINE b – BELOW LEVEL LINE	2. EXISTING GROUND LINE	
14. REFERENCE TO NOTE		3. BRIDGE	
15. REFERENCE POINT MONUMENT	(HOR. AND/OR VERT. CONTROLS)	4. BRIDGE OR OVERPASS (CROSS ROAD)	
16. BORE HOLE	BH	5. PIPE CULVERT	
17. AUGER HOLE	AH	6. BOX CULVERT	
18. BENCH MARK	BM	7. GUARDRAIL	LEFT SIDE, RIGHT SIDE, BOTH SIDE
19. GPS STA.	GPS	8. LINED DITCH	
20. GRID COORDINATES	N	9. WATER LEVEL	
		10. PROFILE GRADE (SECTION)	

2. ABBREVIATIONS

A	PARAMETER OF CLOTHOID	g	GRADE	R	RADIUS
ABUT	ABUTMENT	GEN	GENERAL	Ro	OUTER RADIUS
AH	AHEAD/AUGER HOLE	GPS	GLOBAL POSITIONING SYSTEM	RI	INNER RADIUS
APPROX.	APPROXIMATE	GRD	GROUND	RT	TRANSITION RADIUS
AC	ASPHALT CONCRETE	HDWL	HEADWALL	REF	REFERENCE
AZIM	AZIMUTH	HA.	HECTARE	RP	REFERENCE POINT
@	AT	HP	HIGH POINT	REINF	REINFORCED/REINFORCEMENT
APP	APPROACH	HOR	HORIZONTAL	RCBC	REINFORCED CONC. BOX CULVERT
				RCPC	REINFORCED CONC. PIPE CULVERT
BR	BRIGDE	I	INTERSECTION ANGLE	REQD	REQUIRED
BW	BOTHWAYS	Ic	CENTRAL ANGLE OF CIRCULAR CURVE	RET. WALL	RETAINING WALL
BOT	BOTTOM	IE	INLET INVERT ELEVATION	RT	RIGHT
BS	BEGINNING OF SUPERELEVATION	∞	INFINITY	ROW	RIGHT-OF-WAY
BK	BACK	JT	JOINT	RDWY	ROADWAY
℄	BASELINE			RCDG	REINFORCED CONCRETE DECK GIRDER
BRG	BEARING	KG	KILOGRAM	RD	ROAD
BEG	BEGINNING	KM	KILOMETER	ΔR	THROW OF SPIRAL
BCC,SC	BEGINNING OF CIRCULAR CURVE,/SPIRAL CURVE	KPH	KILOMETER PER HOUR		
BTC,TS	BEGINNING OF TRANSITION CURVE,/TRANSITION SPIRAL	L1	SHORT SIDE OF VERTICAL CURVE LENGTH	SHT	SHEET
BM	BENCH MARK	L2	LONG SIDE OF VERTICAL CURVE LENGTH	SLDR	SHOULDER
BIT	BITUMINOUS	LT	LEFT	SS	SIDE SLOPE
BH	BOREHOLE	L	TOTAL LENGTH	SL	SLOPE
BLDG.	BUILDING	Lc	LENGTH OF CIRCULAR CURVE	SPL	SPECIAL
BGY	BARANGAY	LM	LINEAR METRE	SB	SOUTHBOUND
		LP	LOW POINT	S	SOUTH / SIDE DITCH GRADE
CB	CATCH BASIN	LWL	LOW WATER LEVEL	STD	STANDARD
℄	CENTERLINE	LS	LUMP SUM	STA	STATION
cm	CENTIMETRE	LSP	LIMIT OF SLOPE PROTECTION	STR	STRAIGHT
CLR	CLEAR	LVC	LENGTH OF VERTICAL CURVE	SC	SPIRAL TO CURVE
COMB	COMBINATION	Lk	CLOTHOID LENGTH	STIRR	STIRRUPS
CONST	CONSTRUCT/CONSTRUCTION			ST	STREET
CULV.	CULVERT	MAX	MAXIMUM	STRUC	STRUCTURE
m^3	CUBIC METRE	MFL	MAXIMUM FLOOD LEVEL	SYMM	SYMMETRY
CL	CLASS	MSL	MINIMUM SEA LEVEL	SEP	STEEL ELECTRICAL POST
CS	CURVE TO SPIRAL	MT,	METRIC TON		
CTR	CENTER	m	METER	T	TANGENT
COL	COLUMN	MIN.	MINIMUM	T_L	LONG TANGENT OF SPIRAL
CONC	CONCRETE	mm	MILLIMETRE	T_K	SHORT TANGENT OF SPIRAL
CHB	CONC. HOLLOW BLOCK	MON	MONUMENT	T_S	TOTAL TANGENT DISTANCE
CONC. MON.	CONCRETE MONUMENT	Mo	MIDDLE ORDINATE	TP	TEST PIT
CONST	CONSTRUCTION			THK	THICK
CONT	CONTINOUS	N	NORTHING(S)	TYP	TYPICAL
		NB	NORTHBOUND		
D	DEGREE OF CURVE	NC	NORMAL CROWN SLOPE	VAR	VARIABLE
DL	DISTANCE OF LP FROM CURVE END	NA	NOT APPLICABLE	VERT	VERTICAL
DH	DISTANCE OF HP FROM CURVE END	NTS	NOT TO SCALE	v	VELOCITY/SPEED
DFL	DESIGN FLOOD LEVEL	NO.	NUMBER		
DET	DETAIL	&	AND	W	WEST/ WELL
DIA, Ø	DIAMETER	OWL	OBSERVED FLOOD LEVEL	w_n	LANE WIDTH (NORMAL)
DIAPH	DIAPHRAGM	OIE	OUTLET INVERT ELEVATION	w_e	LANE WIDTH (TURNING)
DIST	DISTANCE	Øa	DEFLECTION ANGLE	w	WIDENING
DWG	DRAWING	OGL	ORIGINAL GROUND LEVEL	W_c	PAVEMENT WIDTH ON CURVE
DIV.	DIVERSION	OC	ON CENTER	W_{tc}	PAVEMENT WIDTH ON TANGENT
DPWH	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	PG	PROFILE GRADE	w/	WITH
		PVMT	PAVEMENT	WEP	WOODEN ELECTRICAL POST
E	EAST/EXTERNAL DISTANCE	PI	POINT OF INTERSECTION		
EA	EACH	PC	POINT OF CURVATURE	X,Y	COORDINATES OF POINTS BCC AND ECC WITH RESPECT TO TANGENT (HORIZONTAL CURVE WITH TRANSITION)
EG	EXISTING GRADE	PVI	POINT OF VERTICAL INTERSECTION		
ELEV./EL	ELEVATION	PVC	POINT OF VERTICAL CURVATURE	Xm	LENGTHENING OF TANGENT DUE TO INTERSECTION OF SPIRAL
ECC,/CS	END OF CIRCULAR CURVE,/SPIRAL CURVE	PVT	POINT OF VERTICAL TANGENCY		
ETC,/ST	END OF TRANSITION CURVE,/ TRANSITION SPIRAL	PCC	PORTLAND CEMENT CONCRETE		
EQ	EQUAL,/EQUATION	PHIL	PHILIPPINES		
EXTG.	EXISTING	PSC	PRESTRESSED CONCRETE		
EXPWY	EXPRESSWAY	PNR	PHILIPPINE NATIONAL RAILWAYS		
EXT	EXTENSION	%	PERCENT		
Ef	FULL SUPERELEVATION	PT	POINT OF TANGENCY		
e	SUPERELEVATION	PRC	POINT OF REVERSE CURVATURE		
ES	END OF SUPERELEVATION	PCC	POINT OF COMPOUND CURVE		
FG	FINISHED GRADE	QTY	QUANTITY		
L	FLOWLINE				
FTG	FOOTING				
FIN	FINISHED				
FWL	FLOOD WATER LEVEL				

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
NATIONAL CAPITAL REGION
SOUTH MANILA DISTRICT ENGINEERING OFFICE
BONIFACIO DRIVE CORNER 8th STREET, PORT AREA, MANILA

PROJECT NAME AND LOCATION:
RETROFITTING/STRENGTHENING OF PERMANENT BRIDGES - LIWASANG BONIFACIO WEST OVERPASS (FLYOVER) (B01348LZ), MANILA CITY

SHEET CONTENTS:
SYMBOLS AND ABBREVIATIONS

DRAFTED:
MOHAMMAD RAMNE P. AMANGAD
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PREPARED:
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SUBMITTED:
WILLIAM S. CABATINO
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RECOMMENDED:
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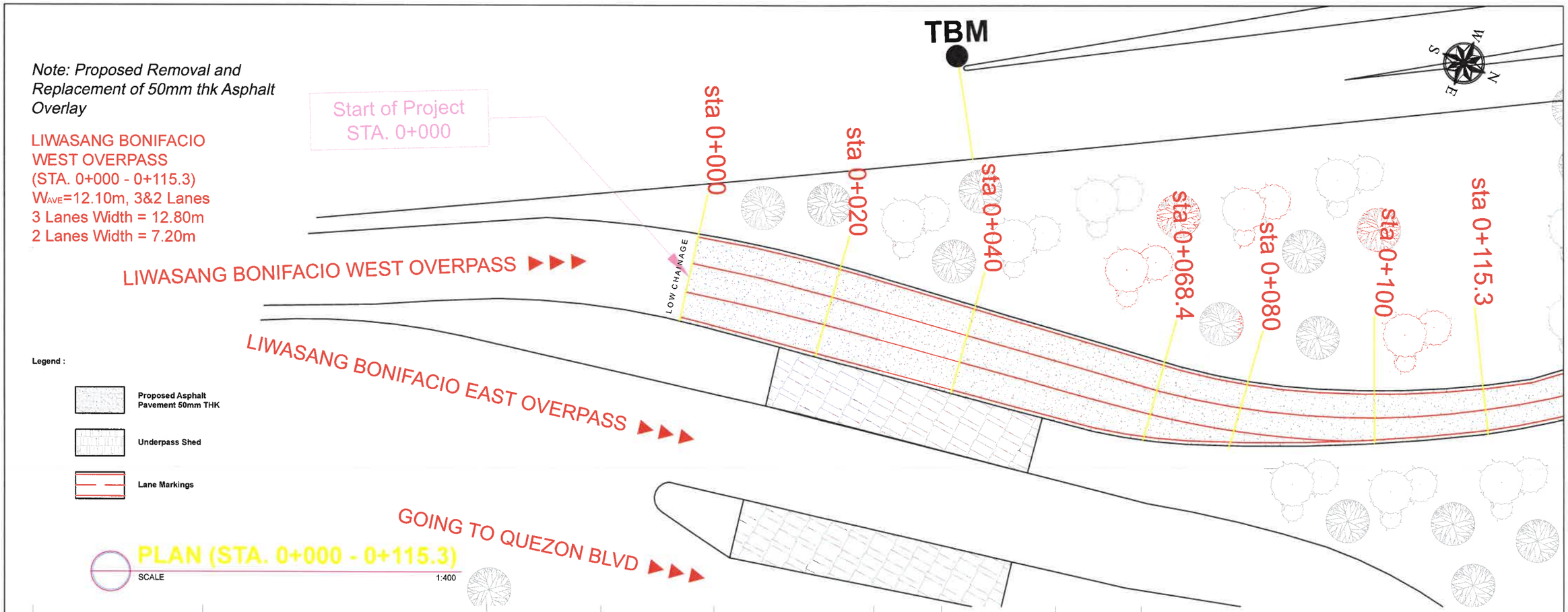
OFFICER-IN-CHARGE
OFFICE OF THE DISTRICT ENGINEER
DATE:

SET NO. G 6
SHEET NO. 07 18

Note: Proposed Removal and Replacement of 50mm thk Asphalt Overlay

LIWASANG BONIFACIO WEST OVERPASS
(STA. 0+000 - 0+115.3)
W_{AVE}=12.10m, 3&2 Lanes
3 Lanes Width = 12.80m
2 Lanes Width = 7.20m

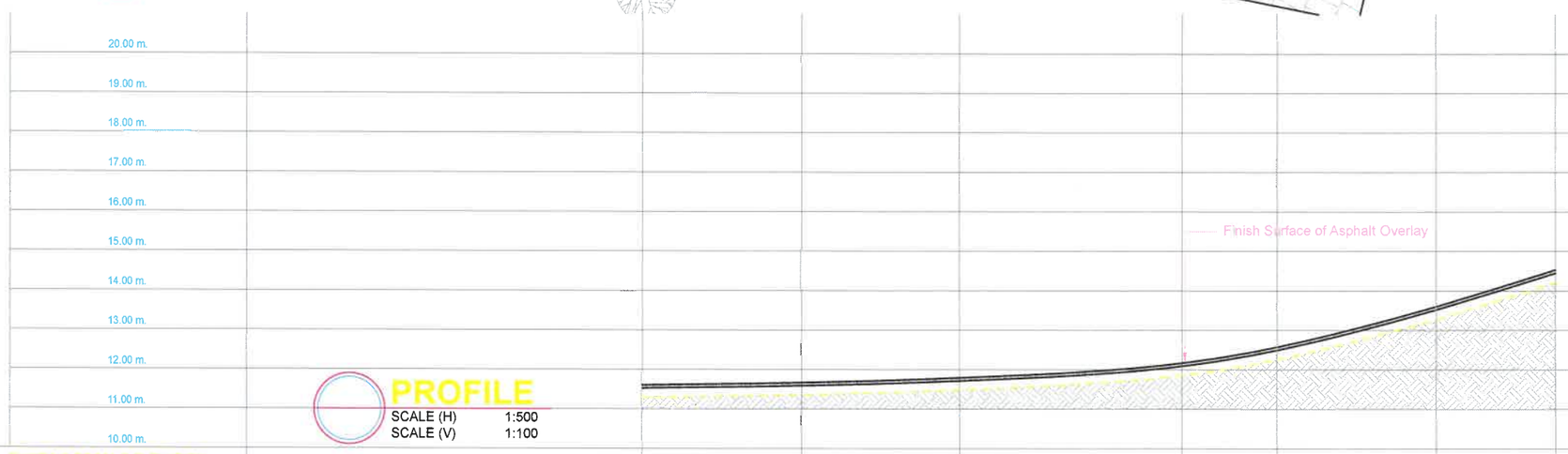


Legend :

- Proposed Asphalt Pavement 50mm THK
- Underpass Shed
- Lane Markings

PLAN (STA. 0+000 - 0+115.3)

SCALE 1:400



PROFILE

SCALE (H) 1:500
SCALE (V) 1:100

EXISTING PROFILE ELEVATION (ALONGCENTERLINE OF ROAD)	11.61	11.67	11.875	12.18	12.18	12.18	14.535
FINISHED PROFILE ELEVATION (ALONGCENTERLINE OF ROAD)	11.706	11.766	11.971	12.276	12.276	12.276	14.588
INVERT ELEVATION	0	0	0	0	0	0	0
STATION	Sta.0+000	Sta.0+020	Sta.0+040	Sta.0+068.4	Sta.0+080	Sta.0+100	Sta.0+115.3

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
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SOUTH MANILA DISTRICT ENGINEERING OFFICE
BONIFACIO DRIVE CORNER 8th STREET, PORT AREA, MANILA

PROJECT NAME AND LOCATION:
RETROFITTING/STRENGTHENING OF PERMANENT BRIDGES - LIWASANG BONIFACIO WEST OVERPASS (FLYOVER) (B01348LZ), MANILA CITY

SHEET CONTENTS:
PLAN (0+000 - 0+116.30)
PROFILE

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DATE:

SET NO. B 1
SHEET NO. 09 18

LIWASANG BONIFACIO
WEST OVERPASS
(STA. 0+115.3 - 0+250.1)
W_{AVE}=7.20m, 2Lanes

Legend :

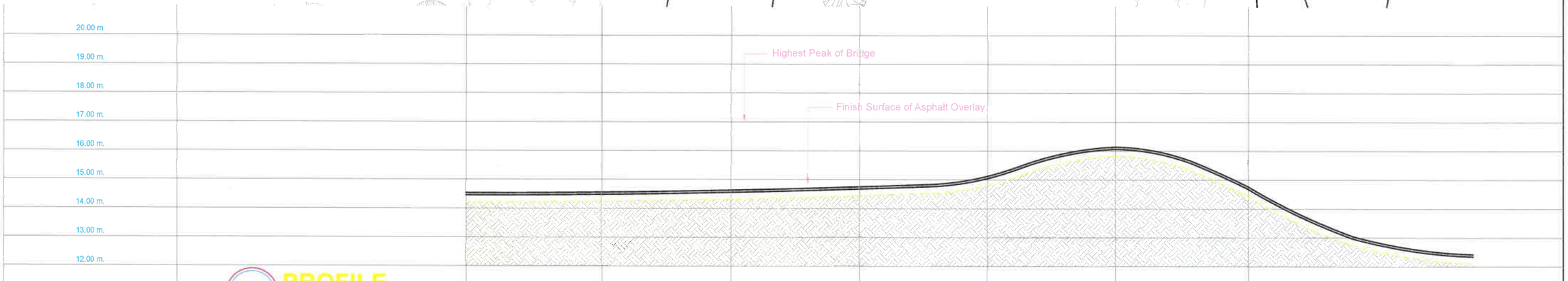
Proposed Asphalt Pavement 50mm THK

Lane Markings

sta 0+080
sta 0+100
sta 0+115.3
sta 0+138.6
sta 0+161
sta 0+183.2
sta 0+205.3
sta 0+227.3
sta 0+250.1
sta 0+270.1
sta 0+289.1

PLAN (STA. 0+115.3 - 0+250.1)

SCALE 1:400



PROFILE

SCALE (H) 1:500
SCALE (V) 1:100

EXISTING PROFILE ELEVATION (ALONG EDGE OF THE ROAD)	14.535	14.535	14.535	14.535	14.835	16.145	14.77
FINISHED PROFILE ELEVATION (ALONG CENTERLINE OF ROAD)	14.588	14.588	14.588	14.588	14.888	16.198	14.823
INVERT ELEVATION	0	0	0	0	0	0	0
STATION	Sta.0+115.3	Sta.0+138.6	Sta.0+161	Sta.0+183.2	Sta.0+205.3	Sta.0+227.3	Sta.0+250.1

REPUBLIC OF THE PHILIPPINES
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ENGINEERING OFFICE
BONIFACIO DRIVE CORNER 8th STREET, PORT AREA, MANILA

PROJECT NAME AND LOCATION:
. RETROFITTING/STRENGTHENING OF PERMANENT BRIDGES - LIWASANG BONIFACIO WEST OVERPASS (FLYOVER) (B01348LZ), MANILA CITY

SHEET CONTENTS:
PLAN (0+115.30 - 0+260.10)
PROFILE

DRAFTED:
MOHAMMAD RAHJIE P. ALIMBAGAD
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MANNY E. BULUSAN
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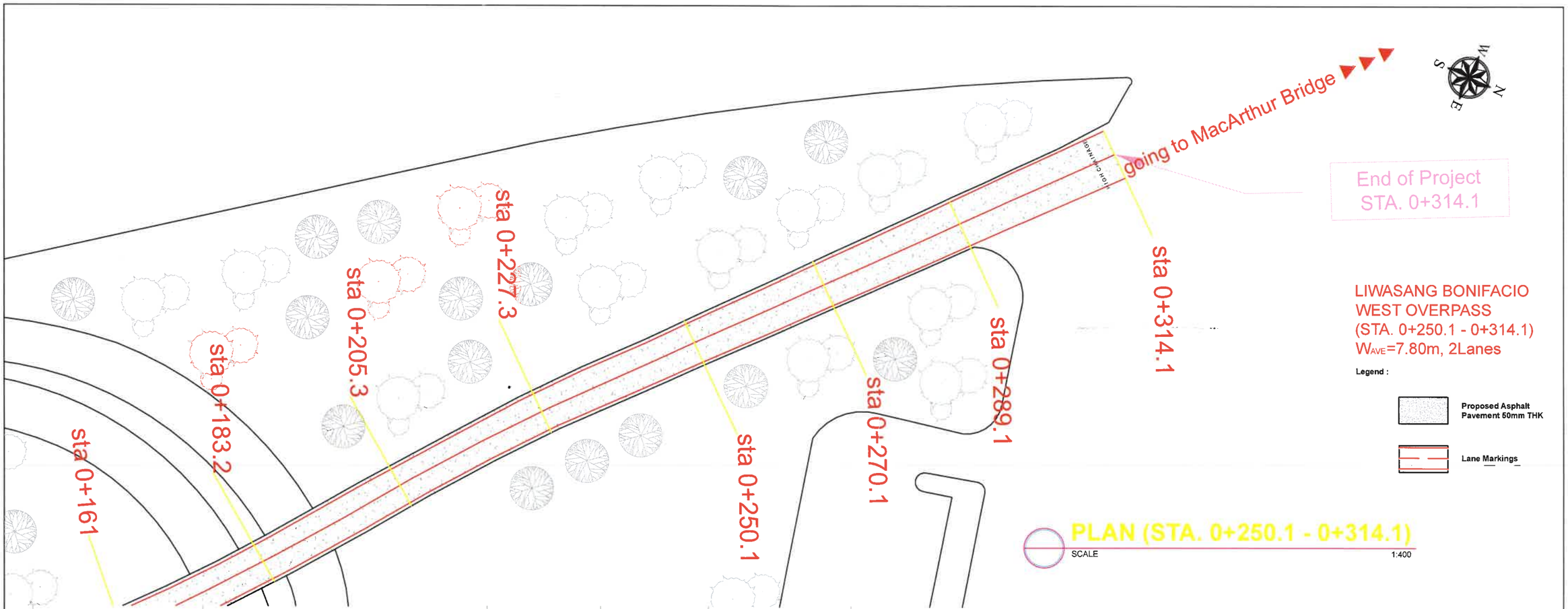
DATE:

SET NO. B 2

SHEET NO. 10 18



EXISTING PROFILE ELEVATION (CONSTRUCTION OF THE ROAD)	14.77	14.77	12.43	14.77
FINISHED PROFILE ELEVATION (CONSTRUCTION OF ROAD)	14.823	14.823	12.483	14.823
INVERT ELEVATION	0	0	0	0
STATION	Sta.0+250.1	Sta.0+270.1	Sta.0+289.1	Sta.0+314.1

REPUBLIC OF THE PHILIPPINES
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PROJECT NAME AND LOCATION:
RETROFITTING/STRENGTHENING OF PERMANENT BRIDGES - LIWASANG BONIFACIO WEST OVERPASS (FLYOVER) (B01348LZ), MANILA CITY

SHEET CONTENTS:
PLAN (0+250.10 - 0+314.10)
PROFILE

DRAFTED: MOHAMMAD RAHJE P. AMANGAD, ENGINEER I — DATE:
PREPARED: ABDURAHEM H. CANDOTAN, ENGINEER II — DATE:
REVIEWED: JOSE ARVIN C. MANAHAN, ENGINEER II — DATE:
SUBMITTED: WILLIAM V. GABATINO, CHIEF, PLANNING AND DESIGN SECTION — DATE:
RECOMMENDED: ENGR. E. BRIONES, OFFICER-IN-CHARGE, OFFICE OF THE ASSISTANT DISTRICT ENGINEER — DATE:
APPROVED: MANNY I. BULUSAN, OFFICER-IN-CHARGE, OFFICE OF THE DISTRICT ENGINEER — DATE:

SET NO. B 3
SHEET NO. 11 18

Note: Proposed Removal and Replacement of 50mm thk Asphalt Overlay

LIWASANG BONIFACIO
WEST OVERPASS
(STA. 0+000 - 0+115.3)
W_{AVE} = 12.10m, 3 & 2 Lanes

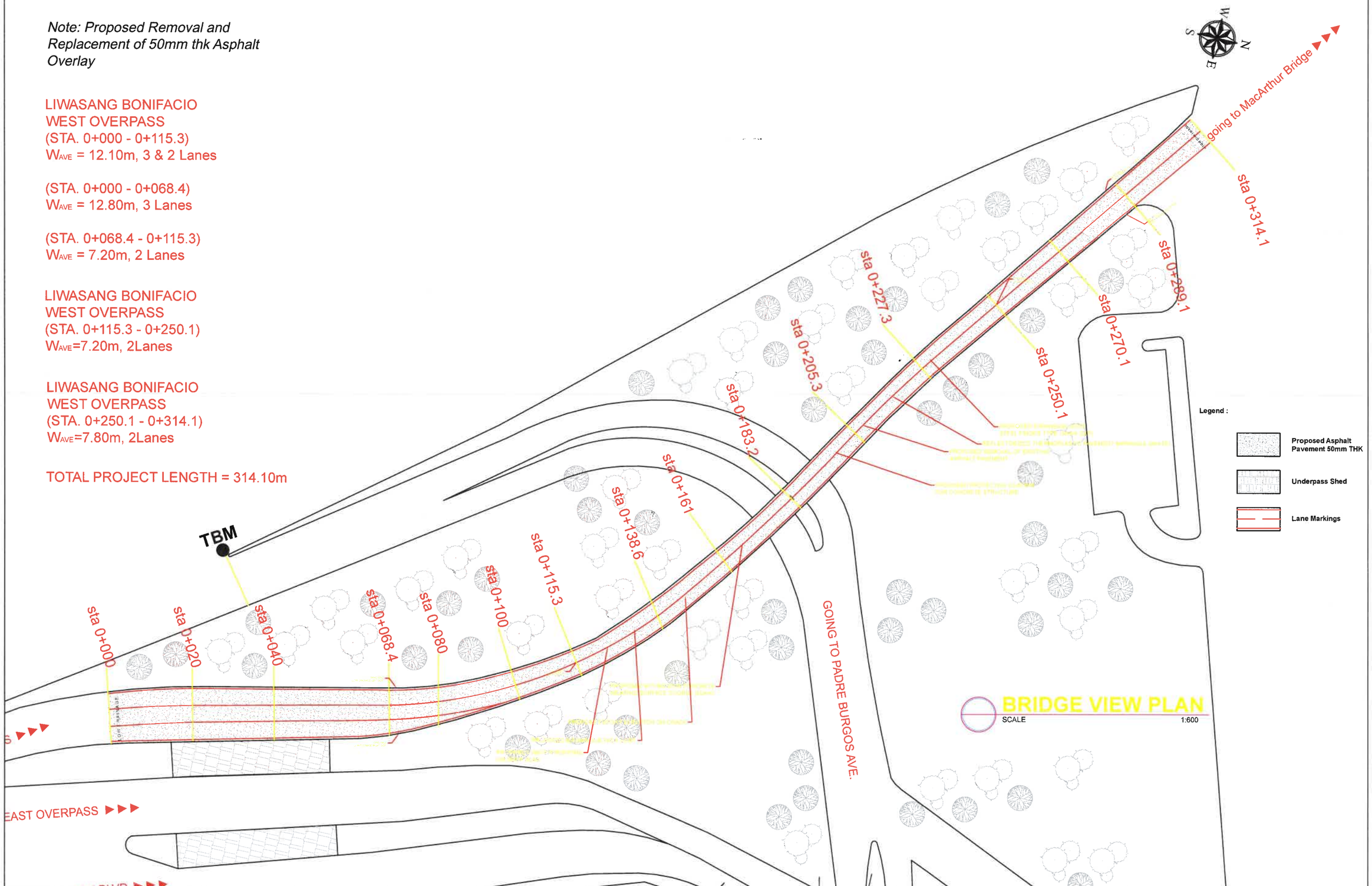
(STA. 0+000 - 0+068.4)
W_{AVE} = 12.80m, 3 Lanes

(STA. 0+068.4 - 0+115.3)
W_{AVE} = 7.20m, 2 Lanes

LIWASANG BONIFACIO
WEST OVERPASS
(STA. 0+115.3 - 0+250.1)
W_{AVE}=7.20m, 2Lanes

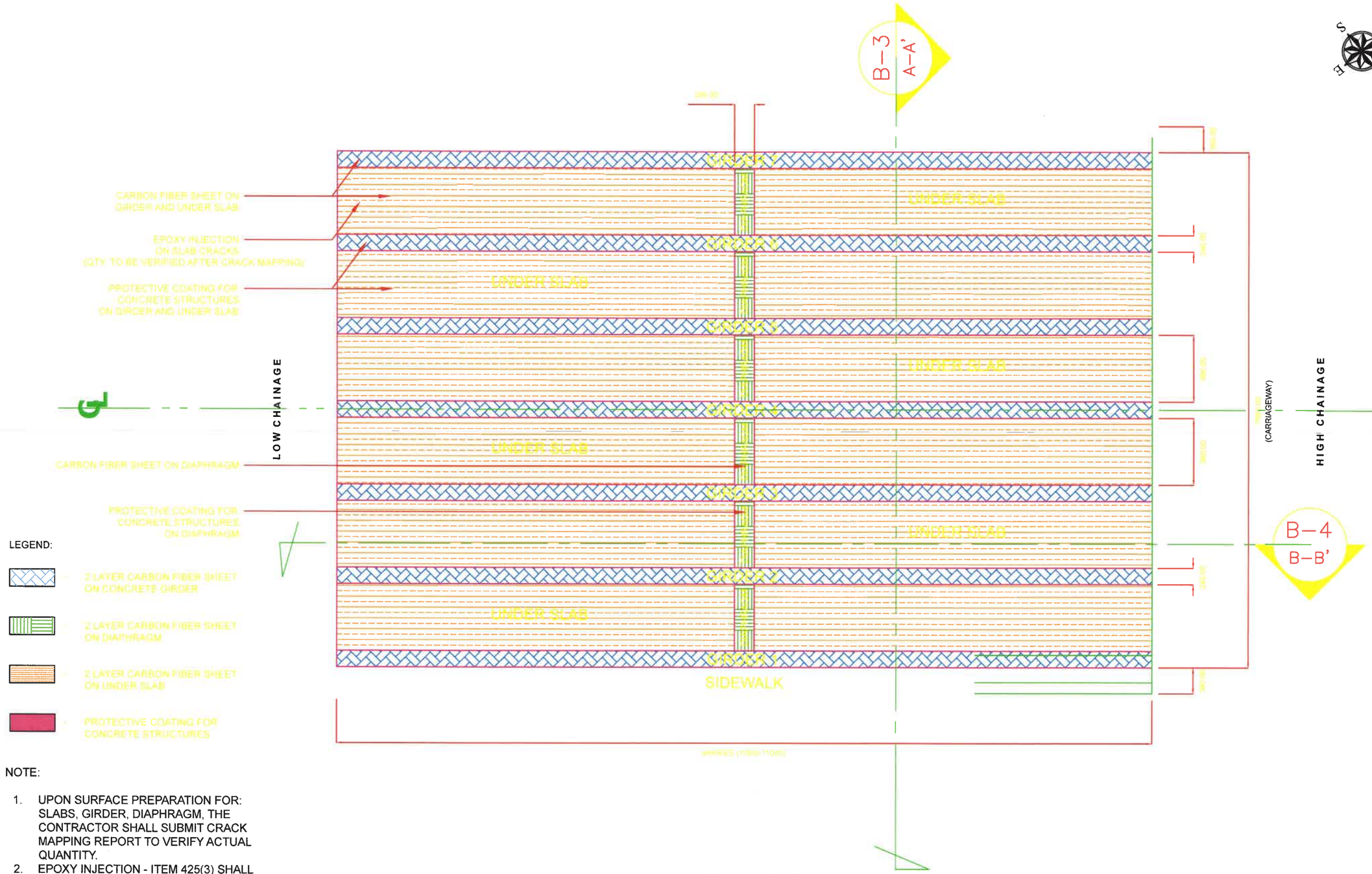
LIWASANG BONIFACIO
WEST OVERPASS
(STA. 0+250.1 - 0+314.1)
W_{AVE}=7.80m, 2Lanes

TOTAL PROJECT LENGTH = 314.10m



BRIDGE VIEW PLAN
SCALE 1:600

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS NATIONAL CAPITAL REGION SOUTH MANILA DISTRICT ENGINEERING OFFICE BONIFACIO DRIVE CORNER 8th STREET, PORT AREA, MANILA	PROJECT NAME AND LOCATION: RETROFITTING/STRENGTHENING OF PERMANENT BRIDGES - LIWASANG BONIFACIO WEST OVERPASS (FLYOVER) (B01348LZ), MANILA CITY	SHEET CONTENTS: **BRIDGE VIEW PLAN**	DRAFTED: MOHAMMAD RAMLE P. BAHAD ENGINEER I DATE: PREPARED: ABDURAHEM D. CANDOTAN ENGINEER II DATE:	REVIEWED: JOSE ARVIN C. MANAHAN ENGINEER II DATE:	SUBMITTED: WILLIAM N. MAGNATINO CHIEF, PLANNING AND DESIGN SECTION DATE:	RECOMMENDED: ENGR. E. ARIONES OFFICER-IN-CHARGE OFFICE OF THE ASSISTANT DISTRICT ENGINEER DATE:	APPROVED: NANNY E. BULUSAN OFFICER-IN-CHARGE OFFICE OF THE DISTRICT ENGINEER DATE:	SET NO. B 4	SHEET NO. 12 18



NOTE:

1. UPON SURFACE PREPARATION FOR: SLABS, GIRDER, DIAPHRAGM, THE CONTRACTOR SHALL SUBMIT CRACK MAPPING REPORT TO VERIFY ACTUAL QUANTITY.
2. EPOXY INJECTION - ITEM 425(3) SHALL BE APPLIED ONTO CONCRETE SURFACE PRIOR TO CARBON FIBER APPLICATION.
3. APPLY PROTECTIVE COATING TO ALL CONCRETE SURFACE WITH CARBON FIBER APPLIED - ITEM 416(1)b.

PLAN (UNDERSIDE VIEW)

SCALE 1:50M

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
NATIONAL CAPITAL REGION
SOUTH MANILA DISTRICT ENGINEERING OFFICE
BONIFACIO DRIVE CORNER 8th STREET, PORT AREA, MANILA

PROJECT NAME AND LOCATION: RETROFITTING/STRENGTHENING OF PERMANENT BRIDGES - LIWASANG BONIFACIO WEST OVERPASS (FLYOVER) (B01348LZ), MANILA CITY

SHEET CONTENTS: PLAN (UNDERSIDE VIEW)

DRAFTED: MOHAMMAD RAMJEP ABANGAD, ENGINEER I — DATE:

PREPARED: ABDURAHMAN ANDOTAN, ENGINEER II — DATE:

REVIEWED: JOSE ARVIN C. MANAHAN, ENGINEER II — DATE:

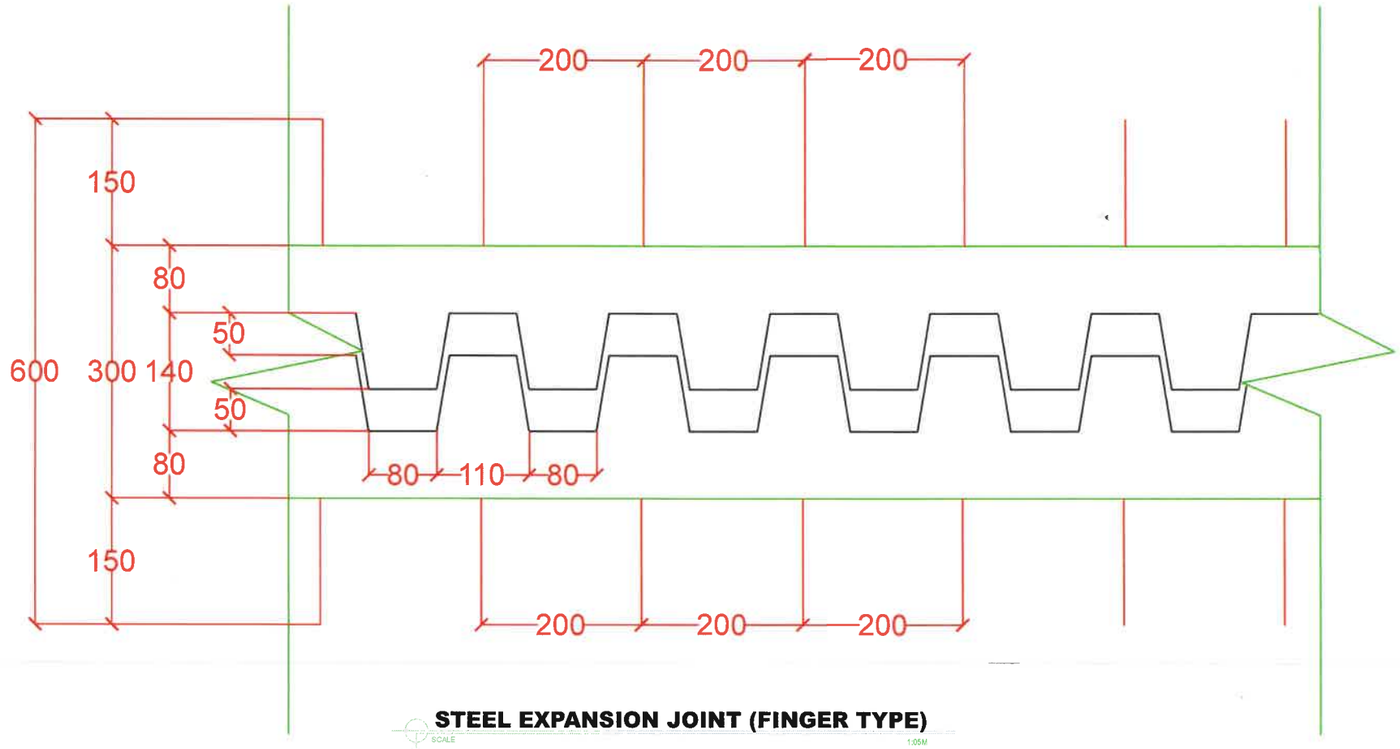
SUBMITTED: WILLIAM A. ABATINO, CHIEF, PLANNING AND DESIGN SECTION — DATE:

RECOMMENDED: ENGR. [illegible], OFFICER-IN-CHARGE, OFFICE OF THE ASSISTANT DISTRICT ENGINEER — DATE:

APPROVED: MANNY A. BULUSAN, OFFICER-IN-CHARGE, OFFICE OF THE DISTRICT ENGINEER — DATE:

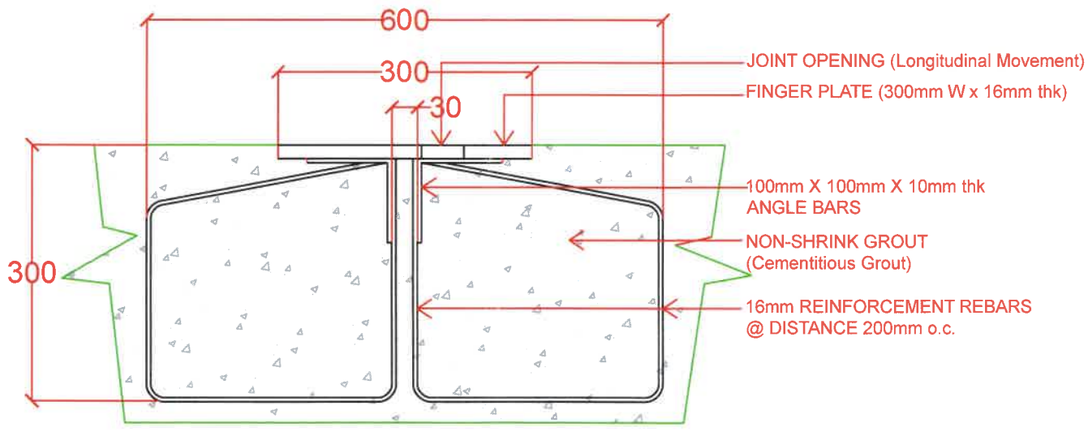
SET NO. B 5

SHEET NO. 13 18



STEEL EXPANSION JOINT (FINGER TYPE)

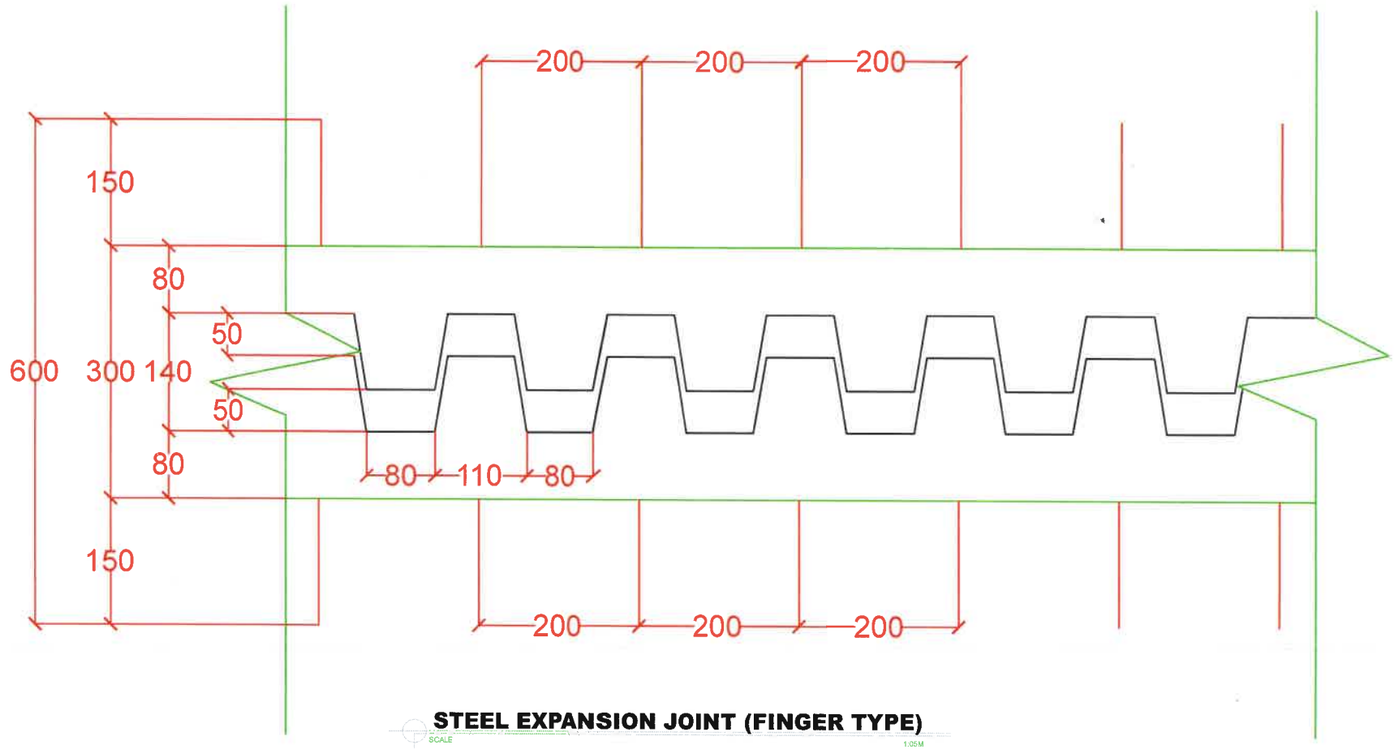
SCALE 1:05M



DETAIL OF STEEL EXPANSION JOINT (FINGER TYPE)

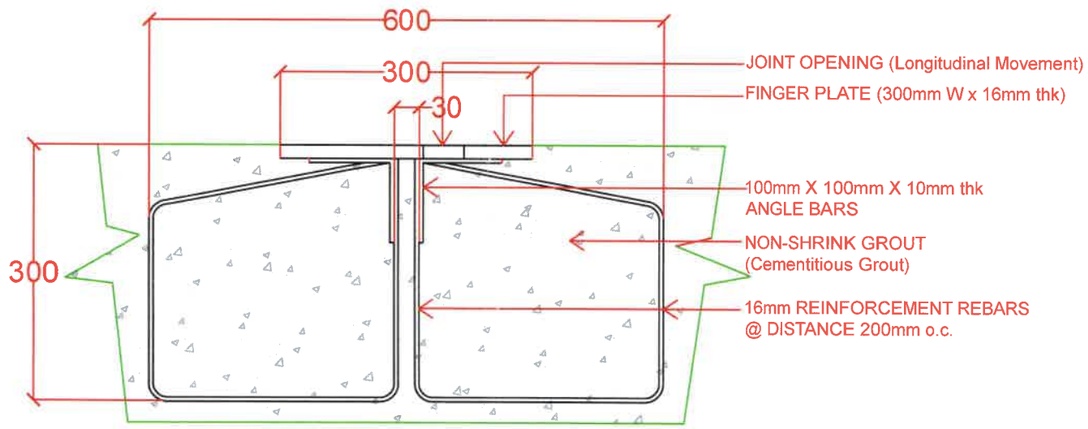
SCALE 1:05M

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS NATIONAL CAPITAL REGION SOUTH MANILA DISTRICT ENGINEERING OFFICE BONIFACIO DRIVE CORNER 8th STREET, PORT AREA, MANILA	PROJECT NAME AND LOCATION: RETROFITTING/STRENGTHENING OF PERMANENT BRIDGES - LIWASANG BONIFACIO WEST OVERPASS (FLYOVER) (B01348LZ), MANILA CITY	SHEET CONTENTS: STEEL EXPANSION JOINT (FINGER TYPE) DETAIL OF STEEL EXPANSION JOINT (FINGER TYPE)	DRAFTED: MOHAMMAD RAMAE P. ABANGAD ENGINEER I DATE: PREPARED: ABDURAHIM I. CANDOTAN ENGINEER II DATE:	REVIEWED: JOSE ARVIN C. MANAHAN ENGINEER II DATE:	SUBMITTED: WILLIAM V. CABATINO CHIEF, PLANNING AND DESIGN SECTION DATE:	RECOMMENDED: ROLEX P. BRIONES OFFICER-IN-CHARGE OFFICE OF THE ASSISTANT DISTRICT ENGINEER DATE:	APPROVED: NONN B. BULLICAN OFFICER-IN-CHARGE OFFICE OF THE DISTRICT ENGINEER DATE:	SET NO. B 6	SHEET NO. 14 18



STEEL EXPANSION JOINT (FINGER TYPE)

SCALE 1:05M



DETAIL OF STEEL EXPANSION JOINT (FINGER TYPE)

SCALE 1:05M

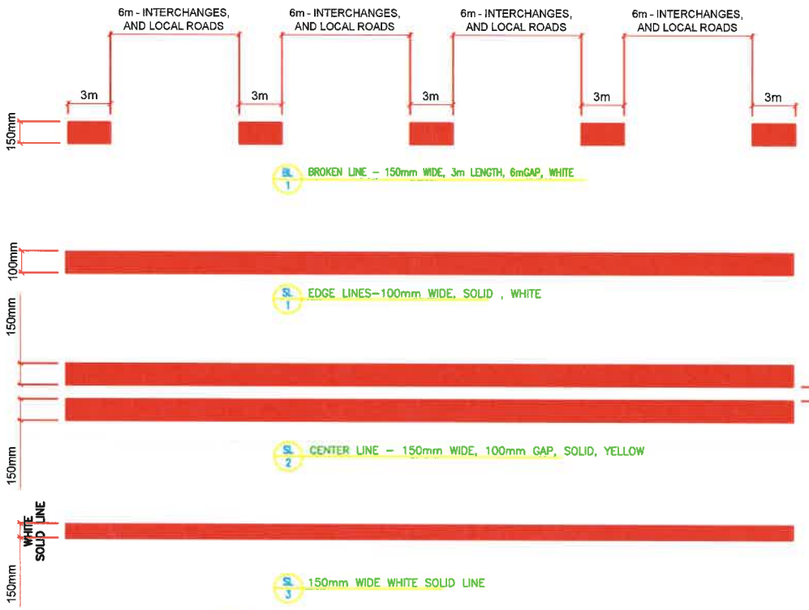
REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
NATIONAL CAPITAL REGION
SOUTH MANILA DISTRICT
ENGINEERING OFFICE
BONIFACIO DRIVE CORNER 8th STREET, PORT AREA, MANILA

PROJECT NAME AND LOCATION:
RETROFITTING/STRENGTHENING OF PERMANENT BRIDGES - LIWASANG BONIFACIO WEST OVERPASS (FLYOVER) (B01348LZ), MANILA CITY

SHEET CONTENTS:
STEEL EXPANSION JOINT (FINGER TYPE)
DETAIL OF STEEL EXPANSION JOINT (FINGER TYPE)

DRAFTED: MOHAMMAD RAMJIE P. ABA HOAD, ENGINEER I, DATE:
PREPARED: ABDULKARIM L. CANDOTAN, ENGINEER II, DATE:
REVIEWED: JOSE ARVIN C. MANAHAN, ENGINEER II, DATE:
SUBMITTED: WILLIAM M. CABATINO, CHIEF, PLANNING AND DESIGN SECTION, DATE:
RECOMMENDED: RICKY P. BRIONES, OFFICER-IN-CHARGE, OFFICE OF THE ASSISTANT DISTRICT ENGINEER, DATE:
APPROVED: MONNIE D. BELLICAN, OFFICER-IN-CHARGE, OFFICE OF THE DISTRICT ENGINEER, DATE:

SET NO. B 6
SHEET NO. 14 18

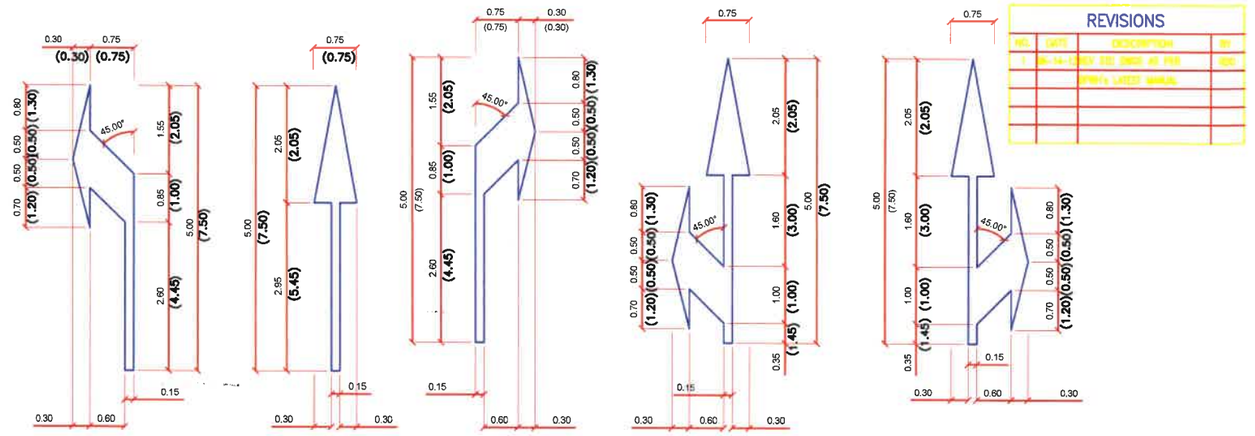


1 F-12a STANDARD PAVEMENT MARKINGS
SCALE: NTS

NOTE:
PURSUANT TO SECTION 4 ANNEX "A" OF THE REVISED IMPLEMENTING RULES AND REGULATIONS OF R.A. 9184, APPROVAL BY THE AUTHORIZED DPWH OFFICIALS OF DETAILED ENGINEERING SURVEYS AND DESIGNS UNDERTAKEN BY CONSULTANTS NEITHER DIMINISHES OF RESPONSIBILITY OF THE LATTER FOR THE TECHNICAL INTEGRITY OF THE SURVEYS AND DESIGNS NOR TRANSFER ANY PART OF THAT RESPONSIBILITY TO THE APPROVING OFFICIALS.

THE DESIGN CONSULTANT SHALL BE HELD FULLY RESPONSIBLE FOR THE FAILURE OF THE FACILITIES/STRUCTURES DUE TO FAULTY DESIGN EXCEPT FOR THE CHANGES MADE WITHOUT THE CONFORMITY OF THE CONSULTANT.

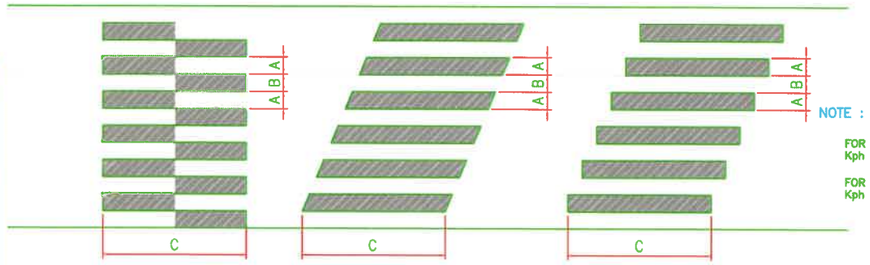
VIRGILIO G. DE ASIS
PROJECT MANAGER, FDC



3 F-12a STANDARD PAVEMENT ARROWS
SCALE: NTS

NOTE:
VALUES IN PARENTHESIS ( ) ARE FOR SPEED LIMIT OVER 60 KPH.

MATERIALS, DIMENSIONS AND COLOR OF STANDARD PAVEMENT ARROWS SHALL CONFORM IN ACCORDANCE WITH THE SPECIFICATION DEFINED IN THE MUTCD 2009 EDITION (MANUAL ON UNIFORM TRAFFIC AND CONTROL DEVICES) AND DPWH HIGHWAY SAFETY DESIGN STANDARDS, 2012.



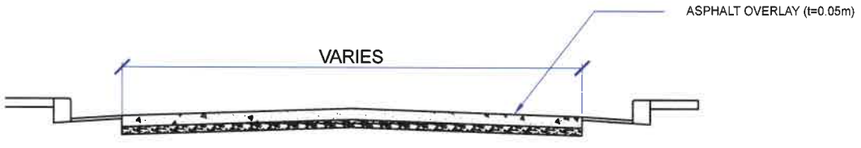
NOTE :
FOR 85%ile SPEED < 60 Kph
A=B=300mm C=2.5–4.0m
FOR 85%ile SPEED > 60 Kph
A=B=600mm C>4.0m

4 F-12a PEDESTRIAN CROSSING (ZEBRA TYPE)

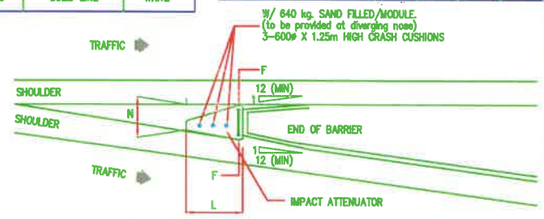
REVISIONS			
NO.	DATE	DESCRIPTION	BY
1	06-14-13	PER DPWH AO #193	RDR
		DPWH's LATEST MANUAL	

PAVEMENT MARKINGS			
SYMBOLS	WIDTH	SPACING SEGMENT / GAP	COLOR
SL 1	150	3000/9000	WHITE
SL 2	150	3000/3000	WHITE
SL 1	150	SOLID LINE	WHITE
SL 2	150	SOLID LINE	YELLOW
SL 3	200	SOLID LINE	WHITE

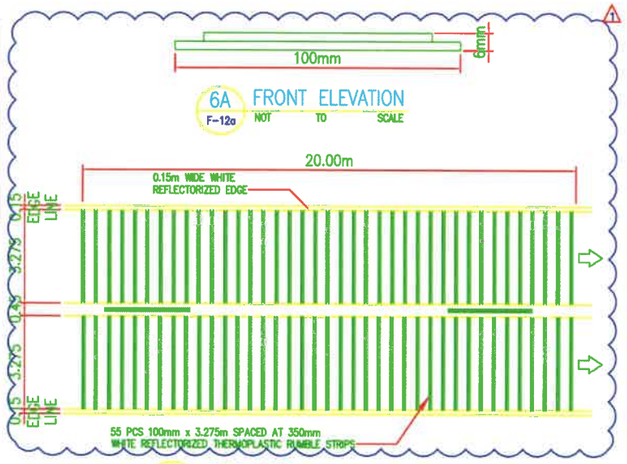
SPACE REQUIREMENTS FOR PLASTIC DRUM ATTENUATORS						
DESIGN SPEED (Km/h)	SPACE REQUIREMENTS (m)					
	MINIMUM			PREFERRED		
	N*	L*	F*	N*	L*	F*
70	1.8	4.3	0.6	3.6	8.5	1.2
80	1.8	5.2	0.6	3.6	10.0	1.2
90	1.8	6.2	0.6	3.6	12.0	1.2
100	1.8	7.2	0.6	3.6	14.0	1.2
110	1.8	8.3	0.6	3.6	16.0	1.2



TYPICAL ROADWAY SECTION



5 F-12a SAND–FILLED PLASTIC BARREL IMPACT ATTENUATORS
SCALE: NTS

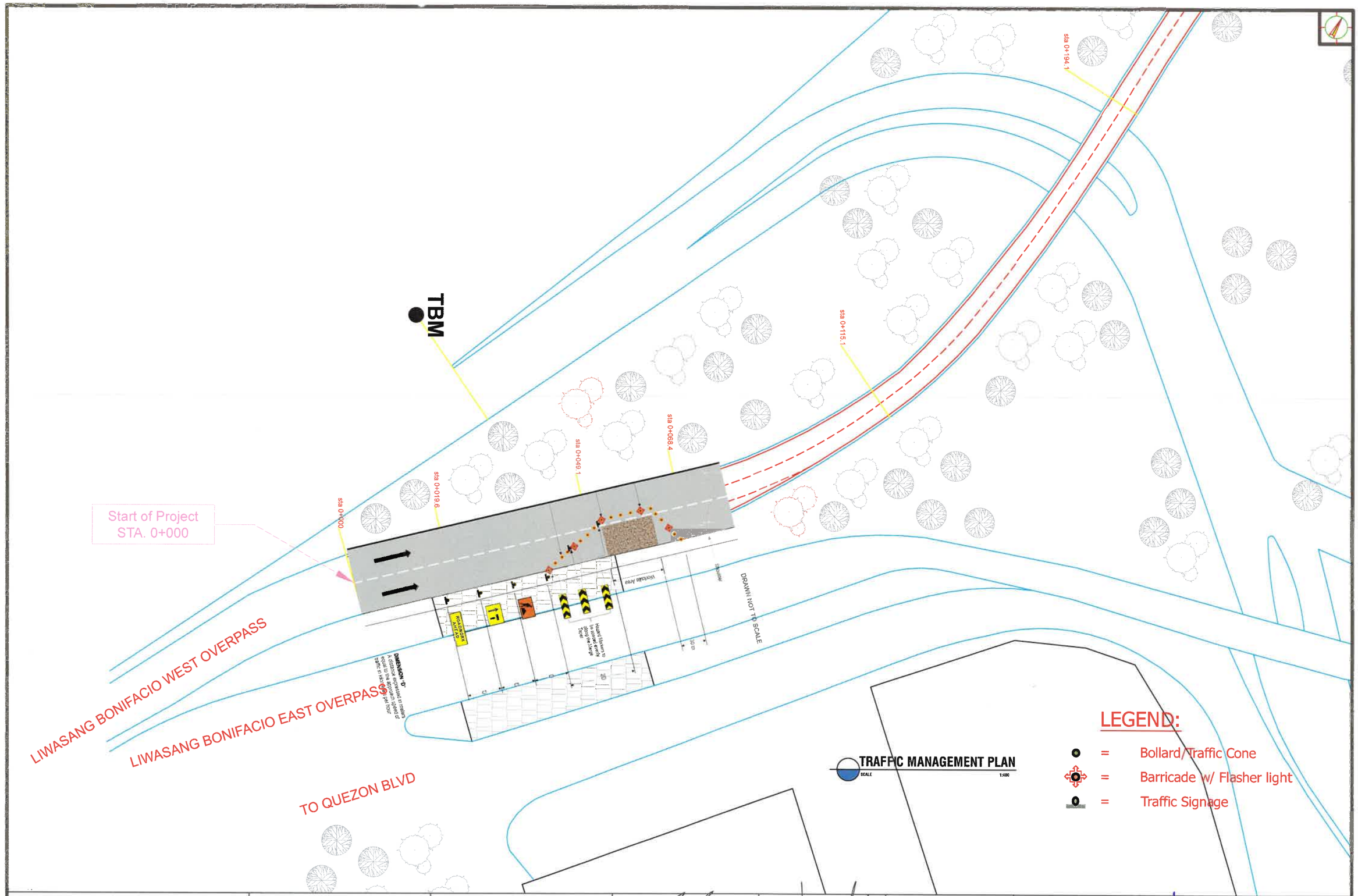


6A F-12a FRONT ELEVATION
NOT TO SCALE

6 F-12a RUMBLE STRIPS DETAIL
NOT TO SCALE

NOTE: THIS DRAWING SUPERSEDES SHEET No. F-12

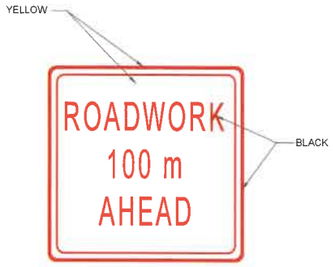
REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS NATIONAL CAPITAL REGION SOUTH MANILA DISTRICT ENGINEERING OFFICE BONIFACIO DRIVE CORNER 8th STREET, PORT AREA, MANILA	PROJECT NAME AND LOCATION: RETROFITTING/STRENGTHENING OF PERMANENT BRIDGES - LIWASANG BONIFACIO WEST OVERPASS (FLYOVER) (B01348LZ), MANILA CITY	SHEET CONTENTS: STANDARD PAVEMENT MARKINGS	DRAFTED: MOHAMMAD RANJIE P. ABAMGAD ENGINEER I DATE: PREPARED: ARCHIBALD V. SANDOTAN ENGINEER II DATE:	REVIEWED: JOSEFARVIN C. MANAHAN ENGINEER II DATE:	SUBMITTED: WILLEM K. BATINO CHIEF, PLANNING AND DESIGN SECTION DATE:	RECOMMENDED: BRIAN B. BRIONES OFFICER-IN-CHARGE OFFICE OF THE ASSISTANT DISTRICT ENGINEER DATE:	APPROVED: MANNY I. BULUSAN OFFICER-IN-CHARGE OFFICE OF THE DISTRICT ENGINEER DATE:	SET NO. RS 1	SHEET NO. 15 18



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
NATIONAL CAPITAL REGION
SOUTH MANILA DISTRICT
ENGINEERING OFFICE
BONIFACIO DRIVE CORNER 8th STREET, PORT AREA, MANILA

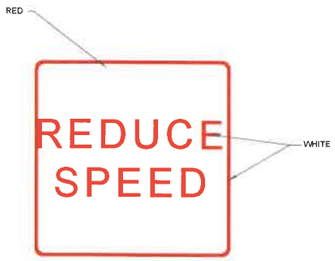
PROJECT NAME AND LOCATION:	SHEET CONTENTS:
RETROFITTING/STRENGTHENING OF PERMANENT BRIDGES - LIWASANG BONIFACIO WEST OVERPASS (FLYOVER) (B01348LZ), MANILA CITY	TRAFFIC MANAGEMENT PLAN

DRAFTED:	REVIEWED:	SUBMITTED:	RECOMMENDED:	APPROVED:	SET NO.	SHEET NO.
MOHAMMAD RAHJIE P. ABANGAD ENGINEERING I PREPARED: **ABDURAHEM I. CANDOTAN** ENGINEER II	**JOSE ARVIN C. MANAHAN** ENGINEER II DATE:	**WILLIAM N. SABATINO** CHIEF - PLANNING AND DESIGN SECTION DATE:	**BRIAN B. BRIONES** OFFICER IN CHARGE OFFICE OF THE ASSISTANT DISTRICT ENGINEER DATE:	**MANNY B. BULUSAN** OFFICER IN CHARGE OFFICE OF THE DISTRICT ENGINEER DATE:	RS 02	16 18

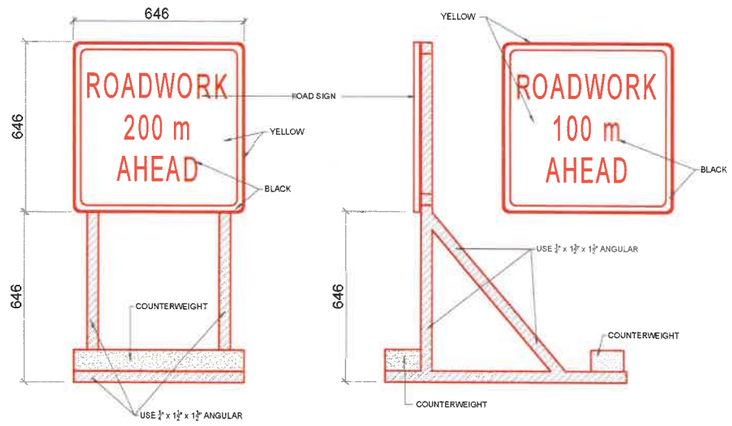


1200mm X 1200mm PORTABLE TEMPORARY

1200mm X 1200mm PORTABLE TEMPORARY



1200mm X 1200mm PORTABLE TEMPORARY

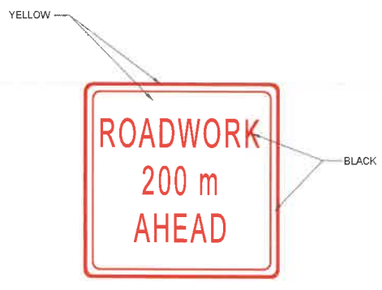


FRONT ELEVATION

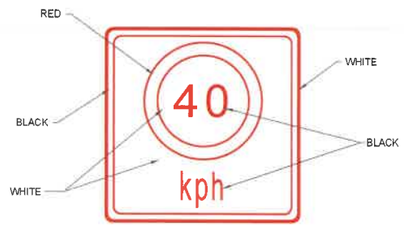
SIDE ELEVATION

TYPICAL MOUNTING DETAILS

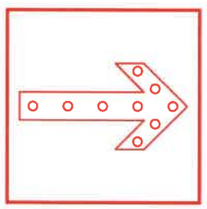
SCALE 1:20 mts



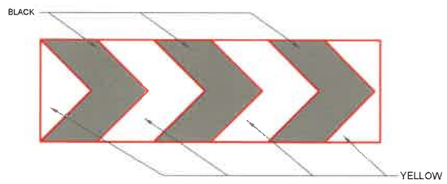
1200mm X 1200mm PORTABLE TEMPORARY



1200mm X 1200mm PORTABLE TEMPORARY



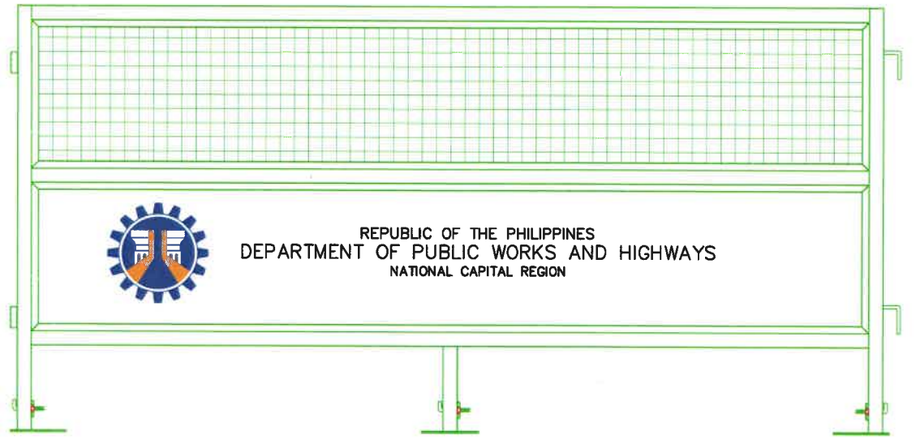
1200mm X 1200mm ILLUMINATED ARROW SIGN



450mm X 1200mm HAZARD MARKER

RECOMMENDED TEMPORARY TRAFFIC DEVICES

SCALE NTS

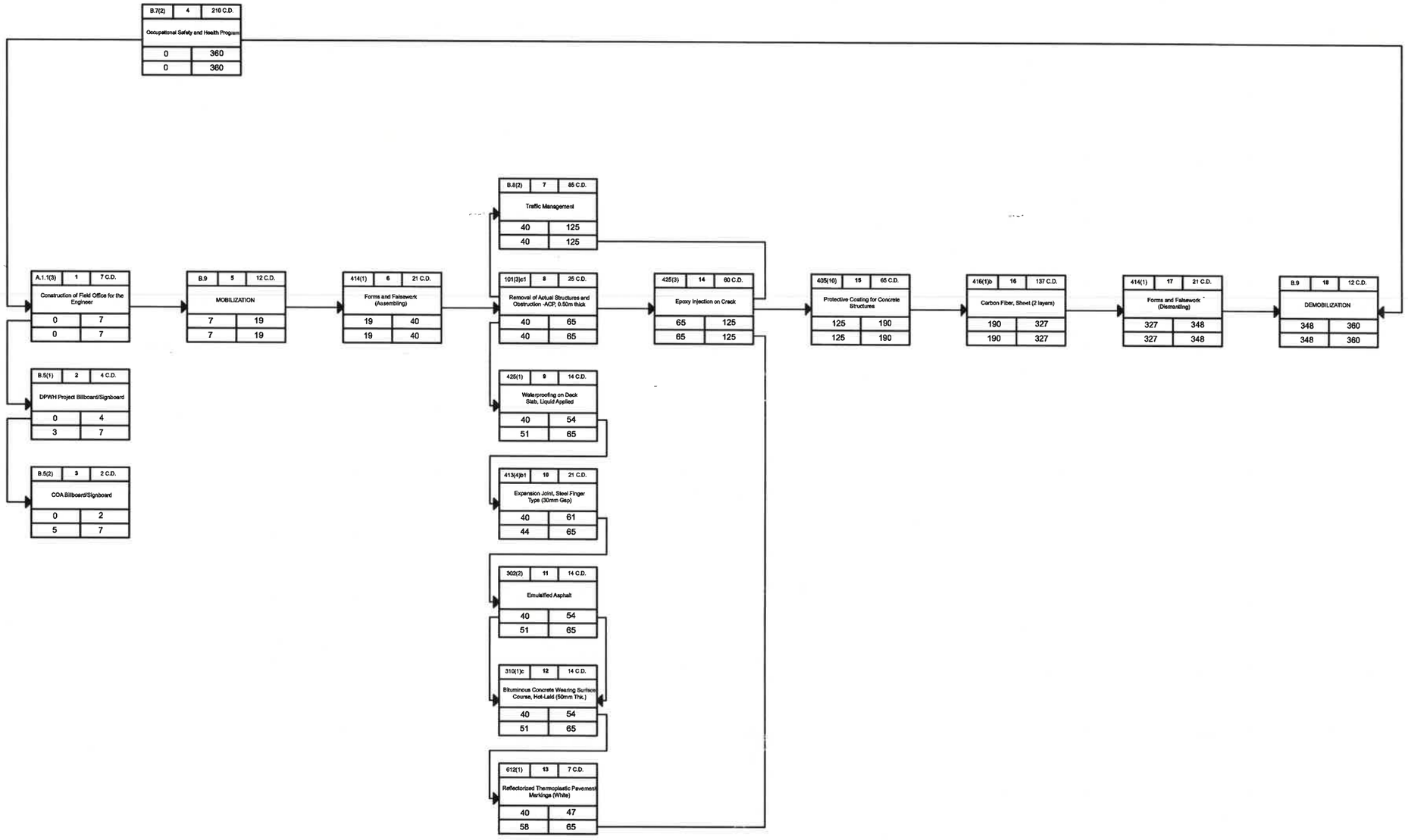


STEEL BARRIER WITH WIRE MESH (SEE APPROVED DETAILS)

SCALE NTS

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS NATIONAL CAPITAL REGION SOUTH MANILA DISTRICT ENGINEERING OFFICE BONIFACIO DRIVE CORNER 8th STREET, PORT AREA, MANILA	PROJECT NAME AND LOCATION: RETROFITTING/STRENGTHENING OF PERMANENT BRIDGES - LIWASANG BONIFACIO WEST OVERPASS (FLYOVER) (B01348LZ), MANILA CITY	SHEET CONTENTS: TEMPORARY TRAFFIC DEVICES AND SIGNAGES	DRAFTED: MOHAMMAD RAMJET P. ABAMGAD ENGINEER I DATE: PREPARED: ABDURAHEEM L. CANDOTAN ENGINEER II DATE:	REVIEWED: JOSE ARVIN C. MANARAN ENGINEER II DATE:	SUBMITTED: WILLIAM A. AGBATINO CHIEF, PLANNING AND DESIGN SECTION DATE:	RECOMMENDED: DANILO T. TINOJES OFFICER-IN-CHARGE OFFICE OF THE ASSISTANT DISTRICT ENGINEER DATE:	APPROVED: MANNY B. BULUSAN OFFICER-IN-CHARGE OFFICE OF THE DISTRICT ENGINEER DATE:	SET NO. RS 3	SHEET NO. 17 18

PRECEDENCE DIAGRAM METHOD



REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS NATIONAL CAPITAL REGION SOUTH MANILA DISTRICT ENGINEERING OFFICE BONIFACIO DRIVE CORNER 8th STREET, PORT AREA, MANILA	PROJECT NAME AND LOCATION: RETROFITTING/STRENGTHENING OF PERMANENT BRIDGES - LIWASANG BONIFACIO WEST OVERPASS (FLYOVER) (B01348LZ), MANILA CITY	SHEET CONTENTS: **PRECEDENCE DIAGRAM METHOD**	DRAFTED: MOHAMMAD RANJIE P. ARANGAD ENGINEER I DATE: PREPARED: ABDURAHMAN CANDOTAN ENGINEER II DATE:	REVIEWED: JOBCARVIN C. MANAHAN ENGINEER II DATE:	SUBMITTED: WILLIAM N. GABATINO CHIEF, PLANNING AND DESIGN SECTION DATE:	RECOMMENDED: ERNESTO RIBONES OFFICER-IN-CHARGE OFFICE OF THE ASSISTANT DISTRICT ENGINEER DATE:	APPROVED: MANNY B. BUBUSAN OFFICER-IN-CHARGE OFFICE OF THE DISTRICT ENGINEER DATE:	SET NO. RS 4	SHEET NO. 18 18