CPD AWARDED BY:
BEM APPROVED CPD: 26 HOURS
[REF. NO. ACEM/250326/040]

BRIDGE ENGINEERING COURSE - 6 MODULES

4 Days
"Bridge Design Course"

PROGRAMME OUTLINE -

Module 1

- Use spreadsheet to calculate lane loading factors for particular widths of bridge decks.
- Determine HA udl for span length.
- Design a reinforced concrete bridge with maximum span length of 15m that can be cast on site or precast on site for HA loading.
- Check design for limited HB loading.
- Check for crack widths.
- Check for Additional Shear reinforcement.
- Design Deck slab and check for crack width.
- Design abutment as integral with bridge deck.
- Design of piled foundations.

BRIDGE ENGINEERING COURSE - 6 MODULES

Module 2- Assessable Skills

- Using tools and skills developed from Module 1, the course continues with
- Design of per-stressed pre-tensioned beams with spans up to 25m.
- Composite behaviour.
- Appreciation of strand layout and positioning.
- The art of debonding (blanketing) strands at supports.
- Additional shear reinforcement and strands in excess of that needed for ultimate bending capacity.
- Design of deck.
- Ultimate design check.
- Selection of elastomeric bearings.
- Design abutment as semi-integral with bridge deck.

The participants will be able to design a variety of per-stressed pre-tensioned beams bridges with spans under 25m.

BRIDGE ENGINEERING COURSE - 6 MODULES

Module 3- Assessable Skills

- Using tools and skills developed from Modules 2 & 3, the course continues with
- Design of per-stressed post-tensioned beam with spans up to 30m.
- Appreciation of cable layout and positioning.
- The art of end block design.
- Shear resistance from inclined tendons and additional reinforcement and strands in excess of that needed for ultimate bending capacity.
- Design of deck.
- Selection of elastomeric bearings.
- Lateral stability of long span beams.
- Ultimate design check.
- Design abutment as semi-integral with bridge deck.

The participants will be able to design a variety of per-stressed post-tensioned beams bridges with spans under 30m.

BRIDGE ENGINEERING COURSE - 6 MODULES

Module 4- Assessable Skills

- Using tools and skills developed from Modules 1,2,& 3, the course continues with
- Design of steel concrete composite bridges up to 20m with standard UB serial size.
- Appreciation of corrosion protection.
- The art of bracing.
- Shear resistance at steel concrete interface.
- Design of deck.
- Selection of elastomeric bearings when bearing shoes are used.
- Lateral stability of long span beams.
- Ultimate design check.
- Design abutment as semi-integral with bridge deck.

BRIDGE ENGINEERING COURSE - 6 MODULES

Module 5

- Pile group analysis by hand methods
- Earth pressure coefficients Ka ~ Ko, when pile groups are vertical or raked
- Shear and Bending of piles in pile group
- Geo-technical capacity of piles determined by SPT

The participants will be able to design a variety of piled foundations by hand before proceeding to use software such as PIGLET, ALLPile, etc. The participants after the 5th day training should proceed to continuosly enhance their capability by using standard industry software such as PROKON, SBD in all aspects of bridge and foundation design.

Module 6

- Introduction to Railway Engineering
- KTMB History
- Railway Gauges used around the world
- Characteristics of High Speed Railway
- Development of UW Girder for Railway and Long Span Girders
- The various types of Railway Bridge Decks

The participants will be able to evaluate suitable bridge sections for the fit for

Speaker's Biodata

Ir. PATRICK CYRIL AUGUSTIN					
NATIONALITY	Malaysian DATE OF BIRTH 16th May 1954				
PRIMARY and SECONDARY	La Salle Petaling Jaya 1961-1971				
FORM 6	Further Education Class 1972-1973, Bukit Bintang Boys School, Petaling Jaya				
TERTIARY	1	B.Sc. (Upper 2nd Class Honours Engineering Lancaster University			1977
	2	DIC, M.Sc. (Concrete Structures) Imperial College London University			1981
ROFESSIONAL QUALIFICATIONS	1	Member of the Institution of Engineer, Malaysia (MIEM) Fellow of the Institution of Engineer, Malaysia (FIEM)	25 17	April January	1983 2000
	2	Registered Professional Engineer (P. Eng.)	19	March	1984
	3	Member of the Institution of Civil Engineers (MICE) Fellow of the Institution of Civil Engineers (FICE)	2 17	December December	1984 2003
	4	Chartered Engineer, U.K. (C.Eng.)	17	December	2003
	5	Member of Institution of Structural Engineers (MIStructE) Fellow of Institution of Structural Engineers (FIStructE) Chartered Structural Engineer	23 23 23	November January January	1989 2003 2003
	6	Member Association of Consulting Engineers Malaysia (MACEM)			1994
	7	Council Member, ACEM 2002-2003,2003-2004,2004-2005			
	8	Council Member, IEM 2005-2006, 2006-2007,2007-2008,2009-2010			
	9	BEM Accredited Checker A10023S	9	May	2020

Ir. Patrick Augustin graduated with a B.Sc.(Upper 2nd Class Honours Engineering) from Lancaster University and a DIC, M.Sc.(Concrete Structures) from Imperial College London University. He is a registered Professional Engineer, a Chartered Engineer, a Fellow of IEM, ICE & IStructE and a member of ACEM. He has also served as a Council Member for both ACEM and IEM. Ir. Patrick is also a BEM Accredited Checker and a HRD Accredited Trainer.

Ir. Patrick Augustin has written and published several articles related to the design and construction of bridges. He also conduct courses and presents paper at seminars and conferences on the subject.

Target Audience

- This course is intended for Graduate Engineers who have started a career in bridge design, with 1 to 3 years of exposure.
- Target Group → CIVIL AND STRUCTURAL ENGINEERS
- Methology → IN PERSON : FACE TO FACE
- Target Industry → CONSULTING ENGINEERS AND BRIDGE CONTRACTORS

Course Outline and Subject Matter
Module 1

- MODULE 1 M1.1A INTRODUCTION TO BRIDGE DESIGN.pdf
- MODULE 1 M1.1B HISTORY OF BRIDGE LOADINGS TABLE 1.1 COMPLETE.pdf
- MODULE 1 M1.2 LOADS FOR HIGHWAY BRIDGES BD3701.pdf
- MODULE 1 M1.3 HA LOADING.pdf
- MODULE 1 M1.3 Table 1.pdf
- MODULE 1 M1.4 I5 BRIDGE DECK.pdf
- MODULE 1 M1.5 HA loading on Bridge Decks I5.pdf
- MODULE 1 M1.6 BS5400 PART 1978 & BD37-88 MAJOR DEPARTURE.pdf
- MODULE 1 M1.7 I5 BRIDGE DECK.pdf
- MODULE 1 M1.7A I5-14 BEAM SECTION PROPERTIES.pdf
- MODULE 1 M1.8 I5 BRIDGE DECK DESIGN AS RC - LOADINGS.pdf
- MODULE 1 M1.9 DESIGN OF I5 AS RC.pdf
- MODULE 1 M1.10 I5 BARE GIRDER WITH DECK LOAD.pdf
- MODULE 1 M1.11 I5 COMPOSITE DECK WITH LL.pdf
- MODULE 1 M1.12 EFFECT OH HB LOADING CRACK WIDTHS.pdf
- MODULE 1 M1.13 LOCAL WHEEL EFFECT.pdf
- MODULE 1 M1.14 GRILLAGE HB LOADING CENTRE OF DECK.pdf
- MODULE 1 M1.15 SHEAR vs REINFORCEMENT.pdf
- MODULE 1 M1.16 ADDITIONAL SHEAR REINFORCEMENT.pdf
- MODULE 1 M1.17 Crack Width BS5400 Correction X on 13th April 2016.pdf
- MODULE 1 M1.18 FINITE ELEMENT LOCAL WHEEL EFFECT.pdf
- MODULE 1 M1.19 Pucher Chart Extracts.pdf
- MODULE 1 M1.20 FORCES ON ABUTMENTS.pdf
- MODULE 1 M1.21 PILE GROUP.pdf

Course Outline and Subject Matter Module 2

- MODULE 2 M2.1 SPAN LIMITATIONS PRESTRESSED CONCRETE BRIDGE DESIGN IN ACCORDANCE WITH BS5400 Rev 3.pdf
- MODULE 2 M2.2 WHY HIGH TENSILE STRENGTH FOR PRESTRESSED CONCRETE.pdf
- MODULE 2 M2.3 HA loading on Bridge Decks I14 SARAWAK.pdf
- MODULE 2 M2.4 BEAM PROPERTIES - SOFT.pdf
- MODULE 2 M2.5 COMPOSITE BEAM ANALYSIS.pdf
- MODULE 2 M2.6 PRESTRESSED DESIGN SELECTION BY TRIAL AND ERROR.pdf
- MODULE 2 M2.7 Section7.1 & TRANSMISSION LENGTH.pdf
- MODULE 2 M2.8 Debonding for 114 25M.pdf
- MODULE 2 M2.9 CODE OF DEBONDING.pdf
- MODULE 2 M2.10 Effect of Strand Blanketing on JL-65-DECEMBER-2.pdf
- MODULE 2 M2.11 CRACKS IN PRE-TENSIONED BEAMS.pdf
- MODULE 2 M2.12 SHEAR CAPACITY ENHANCED BY PRESTRESS.pdf
- MODULE 2 M2.13 DERIVATION OF UNCRACKED FORMUALE.pdf
- MODULE 2 M2.14 DESIGN OF PRESTRESSED MEMBER FOR SHEAR.pdf
- MODULE 2 M2.15 Shear Resistance Uncracked Section BS5400 6.3.4.2.pdf
- MODULE 2 M2.16 SHEAR RESISTANCE CRACKED SECTION IN FLEXURE BS5400 6.3.4.3.pdf
- MODULE 2 M2.17 CALCULATION OF ULTIMATE MOMEMNT OF RESISTANCE OF A SECTION LA CLARK PG62.pdf
- MODULE 2 M2.17 CALCULATION OF ULTIMATE MOMEMNT OF RESISTANCE OF A SECTION LA CLARK PG62.pdf
- MODULE 2 M2.18 Pier 1 Bearings.pdf
- MODULE 2 M2.19 DESIGN PARAMETERS LAMINATED ELASTOMERIC BEARINGS.pdf
- MODULE 2 M2.20 LAMINATED ELASTOMERIC RUBBER BEARINGS FOR BRIDGES.pdf
- MODULE 2 M2.21 BEARING CALC 231122_VERIFICATION RECHECK.pdf
- MODULE 2 M2.22 PERFORMANCE OF DIAMOND SHAPE ELASTOMERIC BEARING PADS IN KUALA LIPIS BRIDGE.pdf
- MODULE 2 M2.23 Investigation of Elastomeric Bearing Pad Failures in Louisiana Bridges.pdf
- MODULE 2 M2.24 Laminated Elastomeric Bearing – Suggested Casting Tolerance of Bearing Plinth, A Technical Note.pdf

Course Outline and Subject Matter
Module 3

- MODULE 3 M3.1 SPAN LIMITATIONS PRESTRESSED CONCRETE BRIDGE DESIGN IN ACCORDANCE WITH BS5400 Rev 3.pdf
- MODULE 3 M3.2 I18 BRIDGE DECK 12.5m x 30 M SPAN UDL.pdf
- MODULE 3 M3.3 I18 WITH EXTENDED TOP FLANGE.pdf
- MODULE 3 M3.4 I18 WITH DECK SLAB.pdf
- MODULE 3 M3.5 COMPOSITE BEAMS I18X EffFlange- ANALYSIS.pdf
- MODULE 3 M3.6 GRILLAGE MODEL WITH SPRING SUPPORTS.pdf
- MODULE 3 M3.7 TYPICAL DETAILING DECK SLAB AND BEAM.pdf
- MODULE 3 M3.8 MAGNEL DIAGRAM I18X AT 1.8M C_C.pdf
- MODULE 3 M3.9 PRESTRESSED I8X DESIGN SELECTION BY TRIAL AND ERROR.pdf
- MODULE 3 M3.10 CONCRETE FROM SANDSTONE AGGREGATE EFFECTS.pdf
- MODULE 3 M3.11 Anchor-Block-Design CIRIA GUIDE 1.pdf
- MODULE 3 M3.12 50 LEVELS EQUILIBRIUM STEEL CIRIA Guide 1_R2.pdf
- MODULE 3 M3.13 Bursting and Spalling Reinforcement.pdf
- MODULE 3 M3.14 Stability design of long precast.pdf
- MODULE 3 M3.15 Lateral stability of long precast BEAMS.pdf
- MODULE 3 M3.16 JL-89-January-February_Lateral_Stability_of_Long_Prestressed_Concrete_Beams-
- Part_1.pdf
- MODULE 3 M3.17 JL-93-January-February_Lateral_Stability_of_Long_Prestressed_Concrete_Beams-
- Part_2.pdf
- MODULE 3 M3.18 LATERAL OF LONG PRESTRESSED BEAMS.pdf
- MODULE 3 M3.19 I1-10 ABUTMENTS EXTERNAL of RS VOLUME.pdf
- MODULE 3 M3.20 I18 BRIDGE DECK for SEMI INTEGRAL ABUTMENT.pdf

Course Outline and Subject Matter
Module 4

- MODULE 4 M4.1 THE HIGHWAYS AGENCY BA 19_85 design example of 20m UB Girder Bridge-1-9.pdf
- MODULE 4 M4.2 DECK CASTING NO LATERAL BRACING.pdf
- MODULE 4 M4.3 DECK CASTING WITH INTERMEDIATE BRACING.pdf
- MODULE 4 M4.4 LOCAL WHEEL EFFECTS.pdf
- MODULE 4 M4.5 22M PLATE GIRDER BRIDGE.pdf
- MODULE 4 M4.6 DESIGN OF INTEGRAL BRIDGES BA 42-96 AMENDMENT NO. 1 ba4296.pdf
- MODULE 4 M4.7 16.5-22-16.5m BEARING DESIGN_210720.pdf
- MODULE 4 M4.8 BASIC PAINTING SPECIFICATIONS.pdf
- MODULE 4 M4.9 PACKAGE 3A_ BATU MAUNG INTERCHANGE CONCRETE FOR BEAMS May 2012.pdf
- MODULE 4 M4.10 SUKE HALVING JOINT - DESIGN REPORT Executive Summary.pdf
- MODULE 4 M4.11 TURNPIKE-SUKE-C-B-ML-CBI-017 Coring Works of T-Beams Due to Lifting Hole Not in Position.pdf

Course Outline and Subject Matter
Module 5 & 6

- MODULE 5M5.1 ACTIVE AND AT-REST PRESSURES 6.1 BRIDGE FOUNDATIONS AND SUBSTRUCTURES Building Research Establishment by Dr Edmund C Hambly, Consulting Engineer under the direction of Dr J B Burland, Head of Geotechnics Division, BRS.pdf
- MODULE 5M5.2 LATERL SOIL PRESSURE INDUCED FAILURES 2_SEA-01.pdf
- MODULE 5M5.3 CYBREJAYA BRIDGE COLLAPSE.pdf
- MODULE 5M5.4 ASSESSMENT OF GROUND BEARING CAPACITY.pdf
- MODULE 5M5.5 HAND ANALYSIS OF A PILE GROUP.pdf
- MODULE 5M5.6 PILE CAPACITY FOR BENDING SHALL ALWAYS BE SATISFIED.pdf
- MODULE 5M5.7 Pile-Design-Using-SPT.pdf
- MODULE 5M5.8 CHIN FK INVERSE SLOPE GEJ_1978_v9n2_December.pdf
- MODULE 5M5.9 SETTLEMENT MEASURING DEVICE.pdf
- MODULE 5M5.10 END OF SETTLEMENT – ASOKA PLOT.pdf
- MODULE 5M5.11 Set TAKING.pdf MODULE 5M5.12 INTRODUCTION TO REINFORCED SOIL.pdf
- MODULE 5M5.13 BATANG KALI LANDSLIDE.pdf
- AN INTRODUCTION TO RAILWAY BRIDGE ENGINEERING
- MODULE 6 M6.1 RAILWAY BRIDGE LIVE LOAD.pdf
- MODULE 6 M6.2 LURCHING AND NOSING LOAD.pdf
- MODULE 6 M6.3 LOAD MODEL 71.pdf MODULE 6 M6.4 DEFORMATION LIMITS FOR VERY GOOD PASSENGE COMFORT.pdf
- MODULE 6 M6.5.1 PRCAST BEAM AND SLAB.pdf
- MODULE 6 M6.5.2 W-GIRDER.pdf MODULE 6 M6.5.3 U-girder L.W.FLOOD HEADROOM.pdf
- MODULE 6 M6.5.4 BALANCED CANTILEVER.pdf

Training Programme

- **Training Programme No : 10001447235**
- **Course Title : BRIDGE ENGINEERING COURSE**
- **- 6 MODULES**
- **Date : 06th & 07th May 2026 &**
- **13th & 14th May2026**
- **Expiry Date : 31/12/2026**
- **Total Training Hours : 28.0 (4 DAYS COURSE)**
- **Trainer : PATRICK CYRIL AUGUSTIN**

Contact Person:
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thru WhatsApp

SCAN TO
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PROGRAMME ITINERARY

Perunding FAISAL, ABRAHAM dan AUGUSTIN sdn. bhd.
HRD CORP CLAIMABLE COURSES
FACE TO FACE – PUBLIC TRAINING

BRIDGE ENGINEERING COURSE - 6 MODULES
(PROGRAMME ITINERARY)

SESSION 1
Wednesday & Thursday
08th & 09th April 2026
Module 1, 2 & 3

SESSION 2
Wednesday & Thursday
15th & 16th April 2026
Module 4, 5 & 6

PROGRAMME ITINERARY

Day 1 – 06th May 2026

8.30am to 9.00am

Registration & Light breakfast

9.00am to 12.30pm

Module 1

- Use spreadsheet to calculate lane loading factors for widths of bridge decks.
- Determine HA udl for span length.
- Design a reinforced concrete bridge with maximum span length of 15m that can be cast on site or precast on site for HA loading.
- Check design for limited HB loading.
- Check for crack widths.

12.30pm to 01.30pm - Lunch Break

01.30pm to 03.30pm - Continue Module 1

- Check for Additional Shear reinforcement.
- Design Deck slab and check for crack width.
- Design abutment as integral with bridge deck.
- Design of piled foundations.

PROGRAMME ITINERARY

Day 1 – 06th May 2026 (Cont'd)

03.30pm to 03.45pm

Tea Break

03.45pm to 05.30pm

Module 2 – Assessable Sites

- Using tools and skills developed from Day 1, the course continues with Design of pre-stressed pre-tensioned beams with spans up to 25m.
- Composite behaviour.
- Appreciation of strand layout and positioning.
- The art of debonding (blanketing) strands at supports.
- Additional shear reinforcement and strands in excess of that needed for ultimate bending capacity.

05.30pm to 06.00pm

Question & Answer – Workshop end

PROGRAMME ITINERARY

Day 2 – 07th May 2026

8.30am – 9.00am
Registration & Breakfast

9.00am – 12.30pm
Continue Module 2 – Assessable Sites

- Design of deck.
- Ultimate design check.
- Selection of elastomeric bearings.
- Design abutment as semi-integral with bridge deck.

12.30pm - 01.30pm Lunch Break

01.30pm – 03.30pm
Module 3 – Assessable Sites

- Design abutment as semi-integral with bridge deck.
- Using tools and skills developed from day 1 & 2, the course continues with Design of pre-stressed post tentioned beam with spans up to 30m.
- Appreciation of cable layout and positioning.
- The art of end block design

03.30pm – 03.45pm Tea Break

PROGRAMME ITINERARY

Day 2 – 07th May 2026 (Cont'd)

03.45pm – 05.30pm

Continue Module 3 – Assessable Sites

- Shear resistance from inclined tendons and additional reinforcement and strands in excess of that needed for ultimate bending capacity.
- Design of deck.
- Selection of elastomeric bearings.
- Lateral stability of long span beams.
- Ultimate design check.
- Design abutment as semi-integral with bridge deck.

05.30pm – 06.00pm

Question & Answer – Workshop end

PROGRAMME ITINERARY

Day 3 – 13th May 2026

8.30am – 9.00am

Registration & Light breakfast

9.00am – 12.30pm

Module 4 – In –Assessable Sites

- Using tools and skills developed from day 1, 2 & 3, the course continues with
- Design of steel concrete composite bridges up to 20m with standard UB serial size.
- Appreciation of corrosion protection.

12.30pm - 01.30pm Lunch Break

01.30pm – 03.30pm

- The art of bracing
- Shear resistance at steel concrete interface.

03.30pm – 03.45pm Tea Break

03.45pm - 05.30pm

- Design of Deck
- Selection of elastomeric bearings when bearing shoes are used.
- Lateral stability of long span beams
- Design abutment as semi-integral with bridge deck.

05.30pm – 06.00pm Question & Answer – Workshop end

PROGRAMME ITINERARY

Day 4 – 14th May 2026

8.30am – 9.00am

Registration & Light breakfast

9.00am – 12.30pm

Module 5 – Assessable Sites

- Pile group analysis by hand methods.
- Earth pressure co-efficient Ka Ko, when pile groups are vertical or raked.
- Lateral soil pressure Induced failures
- Hand Analysis of Pile Group
- Pile Capacity for Bending Shall always be satisfied

12.30pm – 1.30pm Lunch Break

1.30pm – 3.30pm

Module 6 – Assessable Sites

- Railway Bridge Live load.pdf
- Lurching and nosing load.pdf
- Precast Beam and Slab.pdf

3.30pm – 3.45pm - Tea Break

3.45pm – 5.30pm

- Shear and Bending of piles in pile group.
- Geo-technical capacity of piles determined by SPT

5.30pm – 6.00pm

Question & Answer - Workshop end