



Infrastructure Innovators Since 1994

QuakeWrap, Inc.

6840 S. Tucson Blvd., Tucson, AZ 85756

(520) 791-7000, FAX (520) 791-0600

Toll Free (866) QuakeWrap (782-5397)

www.quakewrap.com

PROJECT PROFILE

American Battle Monuments Commission – Water Storage Tanks, Manila, Philippines

Repair System: Wet Layup with GFRP

Owner: ABMC

Project Management: Gary Kaye Design, Phoenix, Arizona

Installer: Well-Built, Quezon City, Philippines

FRP Design and Materials: QuakeWrap, Inc.

Location: Manila, Philippines

Project Synopsis:

- The American Cemetery in Manila, Philippines is administered by the American Battle Monuments Commission. The cemetery harbors fallen soldiers from World War II and is of high historic value.
- The irrigation water for the lawn is supplied from two 400,000 gal reinforced concrete storage tanks.
- The storage tanks were deteriorated, and therefore, the owner of the project entertained replacing the tanks in kind.
- Upon discovering QuakeWrap's FRP solutions, they have realized they could save 75% over replacement.
- QuakeWrap provided a structural, corrosion resistant GFRP lining system, which was also installed in a fraction of time it would take for replacement.
- An international team of design, project management, and installation completed the project on schedule and within budget with no significant issues.

Project highlights:

- ABMC saved 75% by going with QuakeWrap's solution.
- A detailed 3D design, strong collaboration, coordination, and training were the key to success.
- The dual layer (with a chopped and woven mat) GFRP laminate is NSF 61 certified and impermeable in addition to its high strength.

**Contact an engineer today at
info@quakewrap.com**



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ONE LAYER B2610G FOR SIDE WALL, BEAMS, COLUMNS, FLOOR AND ROOF

ISOMETRIC VIEW OF TANKS
SCALE: 4/16

ONE LAYER 1270 mm WIDE B2610G
4370 mm LONG COLUMN
150 mm OVERLAP

COLUMN DETAIL
SCALE: 4/16

Install one layer of FRP on floor and roof.

19812 mm

PLAN VIEW OF FLOOR AND ROOF
SCALE: 4/16

Install one layer of FRP along hoop direction on side wall. Overlap 150 mm between strips.

4845 mm

19812 mm

Roof

Floor

Side Wall

SECTION A-A
SCALE: 4/16

TYPE 1 BEAM

TYPE 2 BEAM

ISOMETRIC VIEW OF BEAMS
SCALE: 4/16

450 mm

450 mm

TYPICAL COLUMN CROSS SECTION
SCALE: 4/16

ROOF

FRP LAYERS

150 mm OVERLAP BETWEEN ROOF AND SIDE WALL FRP LAYERS

THICKENED EPOXY TAPER OFF

SIDE WALL

1-1

SIDE WALL

1270 mm WIDE FRP ON SIDE WALL IN HOOP DIRECTION

150 mm OVERLAP BETWEEN FLOOR AND SIDE WALL FRP LAYERS

FLOOR

TYPICAL SECTION 2-2
SCALE: 4/16

150 mm OVERLAP

ONE LAYER 1270 mm WIDE B2610G

19300 mm LONG TYPE 1 BEAM (16100 mm LONG TYPE 2 BEAM)

BEAM DETAIL
SCALE: 4/16

300 mm

475 mm

TYPICAL BEAM CROSS SECTION
SCALE: 4/16

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PROJECT:
WATER STORAGE TANK
REHABILITATION AT
AMERICAN CEMETERY,
MANILA, PHILIPPINES

CLIENT:
AMERICAN BATTLE
MONUMENTS COMMISSION
(ABMC)

FRP LINING DETAILS

100% DESIGN

NOTES:

1. INJECT EPOXY INTO CRACKS PRIOR TO INSTALLATION OF B2610G (TYP.) ON WALL, BEAMS, COLUMNS AND CEILINGS.
2. USE QUAKEBOND™ 300SR FOR SURFACE PRIMING AND SATURATING FRP FABRIC.
3. USE QUAKEBOND™ 220QR AS EPOXY ADHESIVE OVER CONCRETE SURFACE.
4. INSTALL ONE LAYER OF 1270 mm WIDE B2610G WITH 150 mm OVERLAP ON FLOOR (AND ROOF).
5. INSTALL ONE LAYER OF 1270 mm WIDE B2610G ALONG HOOP DIRECTION WITH 150 mm OVERLAP BETWEEN SIDE WALL AND FLOOR/ROOF.
6. INSTALL ONE LAYER OF 1270 mm WIDE B2610G WITH 150 mm OVERLAP ON COLUMNS AND BEAMS.
7. APPLY 0.5 mm THICK TOP COAT 300SR RESIN ON SURFACE OF VB2610G FABRIC LAYER.

NO.	DESCRIPTION	REVISIONS		CHECKED	DATE
		DRAWN	DATE		
P1	100% DESIGN	DT		VPS	12/15/2020

S - 01

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