

Bent Portion Tensile Test

#3 GFRP rebars | Ultimate tensile force of bent portion of bar under ASTM D7914.

GUARANTEED TENSILE FORCE

37.7 kN

% OF GUARANTEED FORCE

63.90%

SPECIFICATION LIMIT

PASS

TEST SUMMARY

Reference Standard

ASTM D7914 / D7914M

Objective

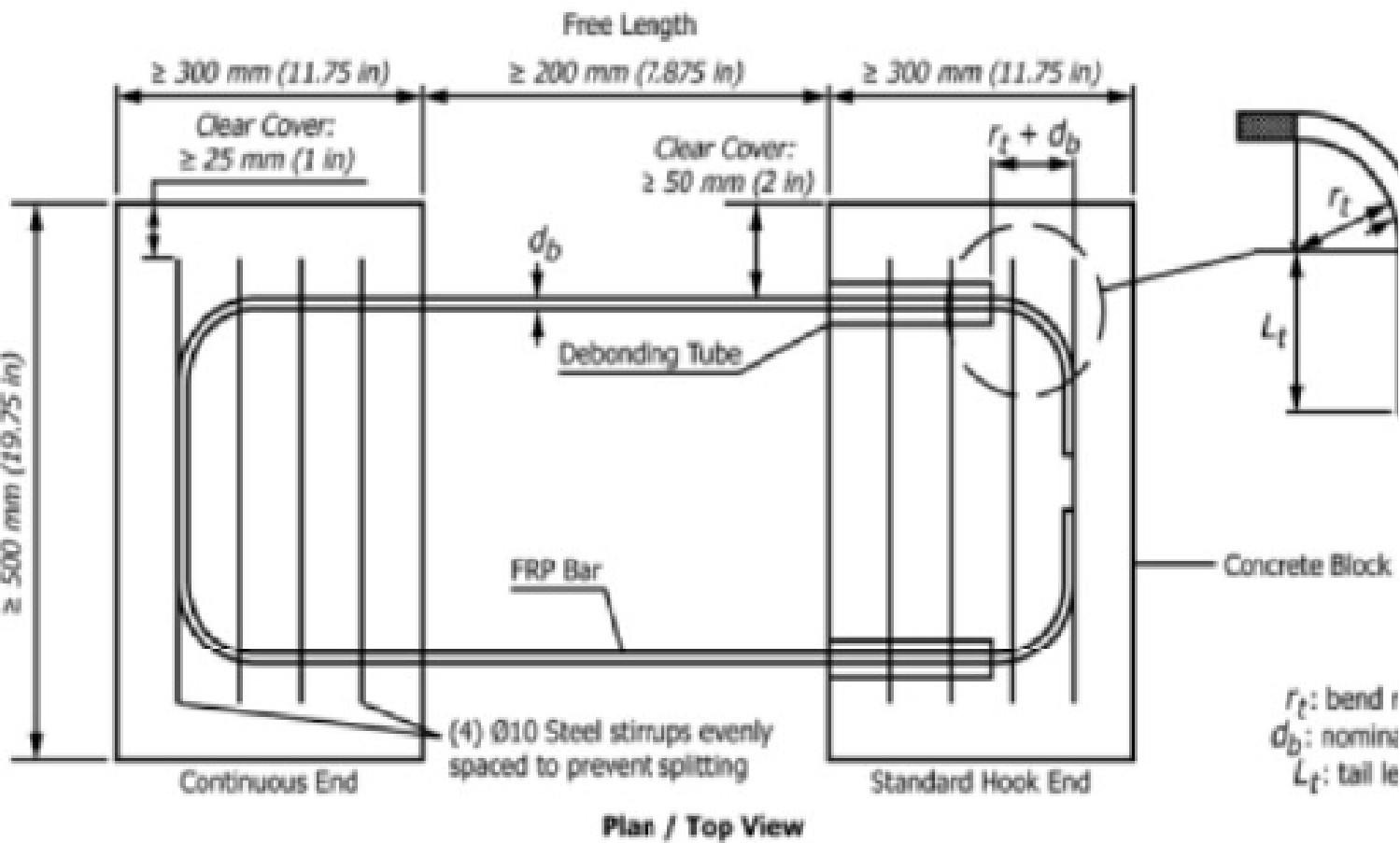
Determine relative strength of bent FRP bars under tensile stress when embedded in concrete

Product Under Evaluation

#3 GFRP rebars

Test Machine

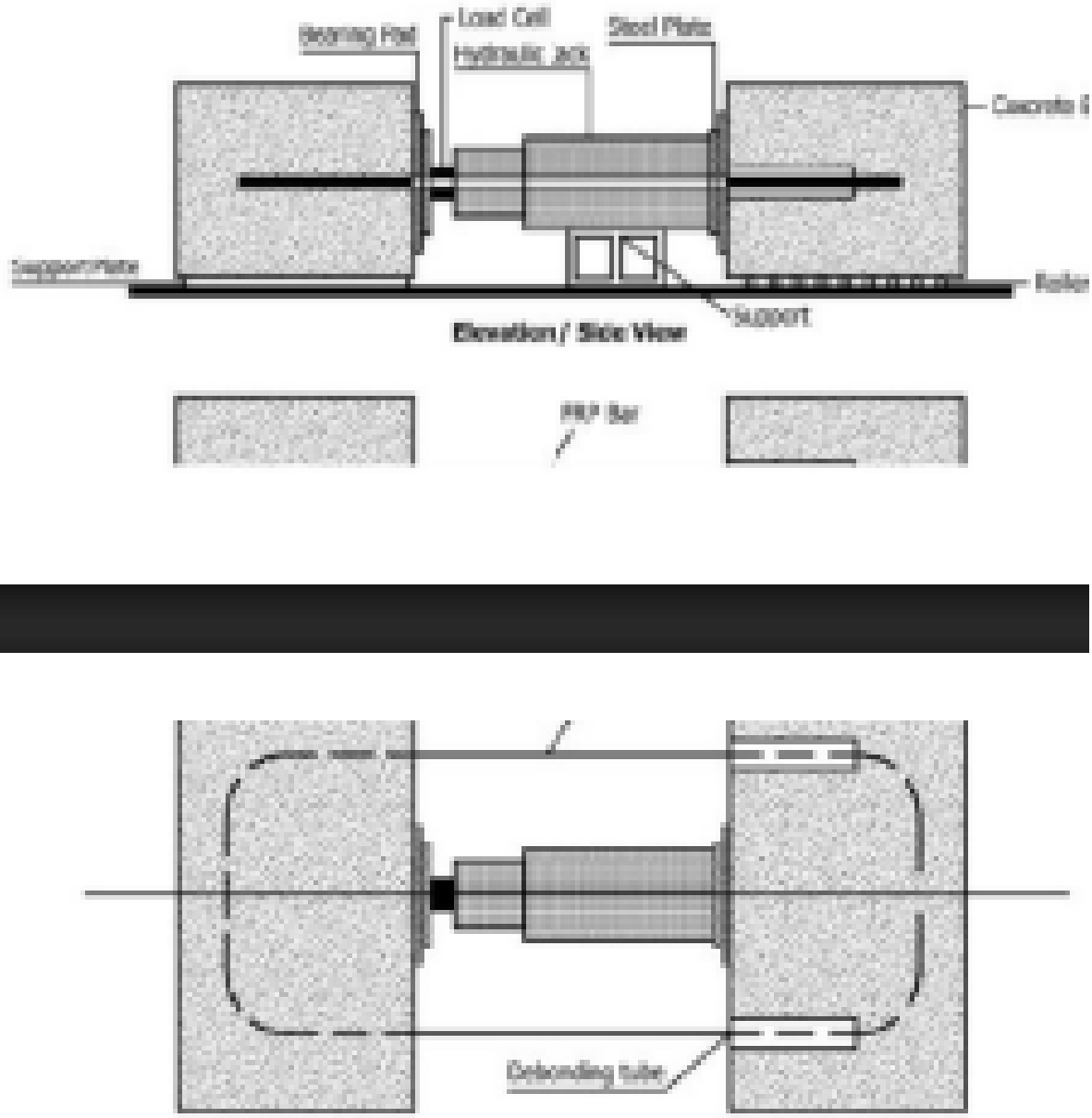
ZJJ HC-50T Hydraulic Cylinder / HZC-H1-30T Load Cell



Bend bar test specimen layout



Specimen prior casting



Test set-up schematic



Test set-up photo

Ultimate Tensile Force Results

Based on the report, the guaranteed ultimate tensile force of the bent portion meets the ASTM D7957 requirement of at least 60% of minimum guaranteed ultimate tensile force.

AVERAGE PEAK LOAD

85.70 kN

AVG TENSILE FORCE

42.85 kN

AVERAGE RATIO

72.63%

RESULT SUMMARY

Specimen ID	Guaranteed Tensile Force	% of Guaranteed Force	Specification Limit
PN#3B series	37.7 kN	63.90%	PASS
ASTM D7914	Minimum required ratio	At least 60%	Meets requirement

OBSERVED FAILURE MODE

Two main modes were observed: failure in the concrete most likely at the bend, and failure in tension at the FRP leg in the free length between blocks. No concrete splitting was observed.



Representative failure mode



FRP leg / concrete block view

DETAILED TEST DATA SUMMARY

Metric	Peak Load (kN)	Tensile Force (kN)	Guaranteed Force (kN)	% of Guaranteed
Average	85.70	42.85	59.00	72.63%
Standard Deviation	3.437	1.717	-	2.91%
Coefficient of Variance	4.01%	4.01%	-	4.01%
Guaranteed Tensile Force	75.40	37.70	59.00	63.90%