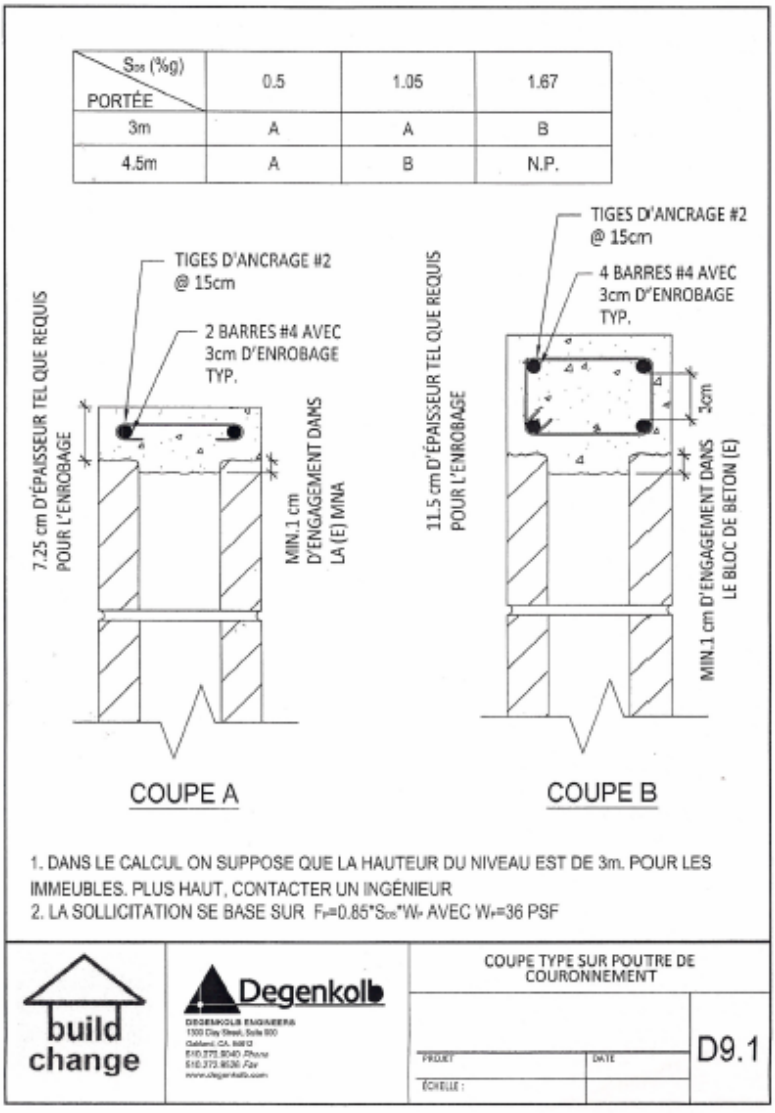
APPENDIX III: SAMPLE RETROFIT CONSTRUCTION QC CHECKLISTS (HAITI)

**Detail and checklist images shown here are also available as .pdf at www.buildchange.org/USAIDPrimers.html

DETAIL DRAWING FOR A NEW ADDED RING BEAM:



S_{DS} (%g) / PORTÉE	0.5	1.05	1.67
3m	A	A	B
4.5m	A	B	N.P.

1. DANS LE CALCUL ON SUPPOSE QUE LA HAUTEUR DU NIVEAU EST DE 3m. POUR LES IMMEUBLES. PLUS HAUT, CONTACTER UN INGÉNIEUR
2. LA SOLLICITATION SE BASE SUR F_P=0.85*S_{DS}*W AVEC W_P=36 PSF

build change

Degenkolb ENGINEERS

COUPE TYPE SUR POUTRE DE COURONNEMENT

PROJET | DATE | ÉCHELLE : | D9.1

QC CHECKLIST FOR A NEW ADDED RING BEAM:

Cordaid No.: _____ Homeowner: _____ Homeowner telephone: _____

BC Engineer: _____ Boss: _____ Boss Telephone: _____

D9.1 (A & B)
Addition of a ring beam

Method

Ensure that removing existing roof will not adversly effect the stability any existing walls
Adequately prop any existing walls whose stability cannot be guaranteed
Remove existing lightweight roof, retaining all material that can be reused on site
Ensure good bond between top of existing masonry wall and the new ring beam by:
    If the blocks have been laid upside down, break-out tops of cells to create shear key
    Clean top of existing wall and remove all loose debris
Lay reinforcement for ring beam (either 2 or 4 #4 bars depending on the distance between cross walls)
Add hurricane straps as shown in Detail D9.2
Erect shuttering
Pour concrete, taking care to vibrate the concrete adequately (use steel rod from above and hammer on formwork)
Remove formwork only after 48 hours
Ensure adequate curing of concrete

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Checklist

1	Preparatory works	Implemented correctly ?	Date	Photo #	If step not correctly implemented, following advice given:	Advice followed?	Date	Photo #	Action taken if advice not followed:
a	Ensure stability of existing walls - if necessary add props	Yes/No				Yes/No			
b	Retain reusable material (timber and metal sheets) on site	Yes/No				Yes/No			
c	Create shear key by breaking open tops of cells in existing wall	Yes/No				Yes/No			
d	Clean top of existing wall removing all loose debris	Yes/No				Yes/No			
2	**Ring beam**	Planned?	Date	Photo #	Recommendation Made	Done?	Date	Photo #	Recommendation Implemented
a	15 cm wide, 8 or 15cm high	Yes/ No				Yes/ No			
b	**Longitudinal Bars**								
1	Two or four #4 (1/2") longitudinal bars	Yes/ No				Yes/ No			
2	Minimum Strength = Grade 60	Yes/ No							
5	Type of longitudinal bars RIBBED	Yes/ No				Yes/ No			
c	**Stirrups**								
1	#2 stirrups	Yes/ No				Yes/ No			
2	Stirrup hooks bent at 135 degrees	Yes/ No				Yes/ No			
3	Hook length for stirrup minimum 4 cm	Yes/ No				Yes/ No			
4	Cover over steel minimum 2.5 cm	Yes/ No				Yes/ No			
4	**Bar Assembly**	Implemented correctly ?	Date	Photo #	If step not correctly implemented, following advice given:	Advice followed?	Date	Photo #	Action taken if advice not followed:
a	**Ring beam**								
1	Stirrup spacing maximum 20cm	Yes/ No				Yes/ No			
2	Stirrups closely spaced (10cm) near all beam-column joints	Yes/ No				Yes/ No			
3	Stirrup hooks rotated	Yes/ No				Yes/ No			
4	Stirrups tied to longitudinal bars with binding wire	Yes/ No				Yes/ No			
b	**Joint detailing**								
1	Minimum lap length = 50Ø (50cm for #3 bars, 60cm for #4 bars)	Yes/ No				Yes/ No			
2	Apply one of overlap detailing options (see D9.5)	Yes/ No				Yes/ No			
3	Use extra L or T bars only if bars not cut properly	Yes/ No				Yes/ No			
4	All bent bars at corners and T-junctions bent at 90 degrees	Yes/ No				Yes/ No			
5	Laps tied with binding wire	Yes/ No				Yes/ No			
5	Formwork and concrete spacer	Implemented correctly ?	Date	Photo #	If step not correctly implemented, following advice given:	Advice followed?	Date	Photo #	Action taken if advice not followed:
a	Formwork is good quality (not warped)	Yes/ No				Yes/ No			
c	Space between steel and formwork minimum 2.5 cm	Yes/ No				Yes/ No			
d	Use concrete spacers every 3-4 stirrups or as req to maintain cover	Yes/ No				Yes/ No			
e	Maximum size for concrete spacer is 3 cm x 3 cm x 5 cm	Yes/ No				Yes/ No			
f	Use binding wire in concrete spacer	Yes/ No				Yes/ No			

6	Concrete mixing	Implemented correctly ?	Date	Photo #	If step not correctly implemented, following advice given:	Advice followed?	Date	Photo #	Action taken if advice not followed:
a	Use Mix 1:2:4	Yes/ No				Yes/ No			
b	Use crushed, angular gravel	Yes/ No				Yes/ No			
c	Use gravel with size less than 2 cm	Yes/ No				Yes/ No			
d	Use clean, washed river sand	Yes/ No				Yes/ No			
e	Use clean water (not salty or muddy)	Yes/ No				Yes/ No			
f	Use Type 1 Cement	Yes/ No				Yes/ No			
g	Mix a clean, concrete or asphalt surface, not on dirt	Yes/ No				Yes/ No			
h	Using a mechanical mixer is best	Yes/ No				Yes/ No			
i	Batch out gravel, then sand, then cement	Yes/ No				Yes/ No			
j	Turn over 3 times or until color is uniform	Yes/ No				Yes/ No			
k	Do not use too much water! Add water slowly	Yes/ No				Yes/ No			
l	Use slump test or hand test for water content	Yes/ No				Yes/ No			
7	Concrete pouring and curing	Implemented correctly ?	Date	Photo #	If step not correctly implemented, following advice given:	Advice followed?	Date	Photo #	Action taken if advice not followed:
a	Wet formwork and steel before pouring concrete	Yes/ No				Yes/ No			
b	Use concrete within 90 minutes of mixing with water if from factory	Yes/ No				Yes/ No			
c	If manually use in less than 30 minutes	Yes/ No				Yes/ No			
e	Use rod to consolidate concrete around reinforcement	Yes/ No				Yes/ No			
f	Complete entire beam everywhere indicated within one day	Yes/ No				Yes/ No			
g	If concrete pouring must stop, use a diagonal joint with stones	Yes/ No				Yes/ No			
h	Have plastic on standby, cover if it rains	Yes/ No				Oui / No			
j	Cure for minimum 3 days by sprinkling clean water;	Yes/ No				Oui / No			
k	Cure 5 times perday : MORNING: At 8 , 10	Yes/ No				Oui / No			
l	AFTERNOON: 12, 14, 16, pour water slowly	Yes/ No				Oui / No			
8	Concrete inspection	Implemented correctly ?	Date	Photo #	If step not correctly implemented, following advice given:	Advice followed?	Date	Photo #	Action taken if advice not followed:
a	For beams, remove formwork after 48 hours	Yes/ No				Oui / No			
b	If steel showing, demolish and rebuild	Yes/ No				Oui / No			
c	Any cracks larger than 3 mm	Yes/ No				Oui / No			
d	Many cracks in one location	Yes/ No				Oui / No			
e	Diagonal or vertical cracks anywhere in the beam	Yes/ No				Oui / No			
f	If any of the above exist, demolish concrete and repour	Yes/ No				Oui / No			

Homeowner Signature: _____ Date: _____

BC Engineer Signature: _____ Date: _____

BC Team Leader Signature: _____ Date: _____

BC Manager Signature: _____ Date: _____

Overall Assessment: Meets Minimum Standard?
Yes / No
Comments: