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DACW/2871

20th November 2012

Susan Amaku,
Woodhall Planning,
56 Woodhall Lane,
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LS28 5NY

Dear Susan,

Bailey Hall Barn, Hurst Green
TRIAL PITS & CRUCK RESTRAINTS

Following our visit to inspect the trial pits and rafters and consider the need for underpinning and the options for restraining the cruck frames on 6th November, and our subsequent telephone conversations, I have now considered my findings and write to report as follows:

13 trial pits were dug at the locations shown on the plan and the findings are recorded on the logs sheets 1-3 enclosed with this letter. The trial pits revealed that the walls of the barn have mostly no projecting footing and are founded at between 130 and 450mm below the adjacent ground level. Ground conditions below the footings were consistent across all the pits comprising a firm light-brown sandy-silty clay. The only exception was trial pit 11 on the northwest corner of the storehouse where a layer of cobbles was found below the footing, bedded in the sandy-silty clay.

Ground conditions are good and the clay undoubtedly has adequate bearing capacity to carry the walls of the building without being overstressed. Underpinning on purely structural grounds is not therefore essential but on the basis of the trial pit findings it would appear that underpinning is required under some of the walls, to avoid undermining the walls when the ground floor is excavated. This will of course be subject to final confirmation on site when the works are underway.

Unit 2, Kitchen – Existing Calf House

Trial pits 9 & 10 show the walls founded 430 and 300mm below the ground floor level. The floor next to TP10 is lower than by TP9 so if the final ground floor level is kept as high as possible, underpinning may not be necessary. Underpinning of retaining walls is always tricky so this will be beneficial.

Unit 2, Bedrooms 1, 2 & 3 – Existing Shippon

The west wall is founded only 130mm below ground floor level (TP12) whilst the north wall is 450mm below ground level. In bedroom 3 at the west wall will have to be underpinned, but it may be possible to avoid underpinning the north wall. Bedrooms 1 & 2 are three steps up and underpinning of the remainder of the west wall and the south wall can probably be avoided.

Unit 2, Bedroom 4 - Existing Stalls

The north and east walls are founded between 400 and 450mm below ground level (TPs 1,2 & 3). Providing the finished floor level is at present ground level or better still slightly above, then underpinning can probably be avoided.

Unit 1, West and East Walls

The footings found in TPs 5-8 & 13 are founded between 200 and 360mm below ground level. This is too shallow and the walls will be undermined by the excavation for the new ground floor. Underpinning will therefore be required along both the east and west walls and probably the south wall of Unit 1.

In my report no.434 of April 2012, I suggested that the ties in the cruck frames should be reinstated or that modern steel ties could be installed at first floor level, to limit the outwards horizontal forces that the existing crucks exerts at plinth level. Cruck 2 can be treated this way as it is within the first floor but obviously the ties would be visible in crucks 3 & 4. I have given some further thought to this and suggest as an alternative that the feet of the crucks could be restrained with tie rods bored down through the plinths at an angle and anchored in a reinforced concrete ground beam cast below the ground floor construction as shown in the enclosed drawing 2871sk01. Cruck 4 is shown but the detail would be similar for cruck 3. This detail will help anchor the cruck blade to the plinth whilst stabilising the plinth as well. The horizontal ties back to the wall would be resin grouted into the wall and timber with a matching timber pellet set in the hole.

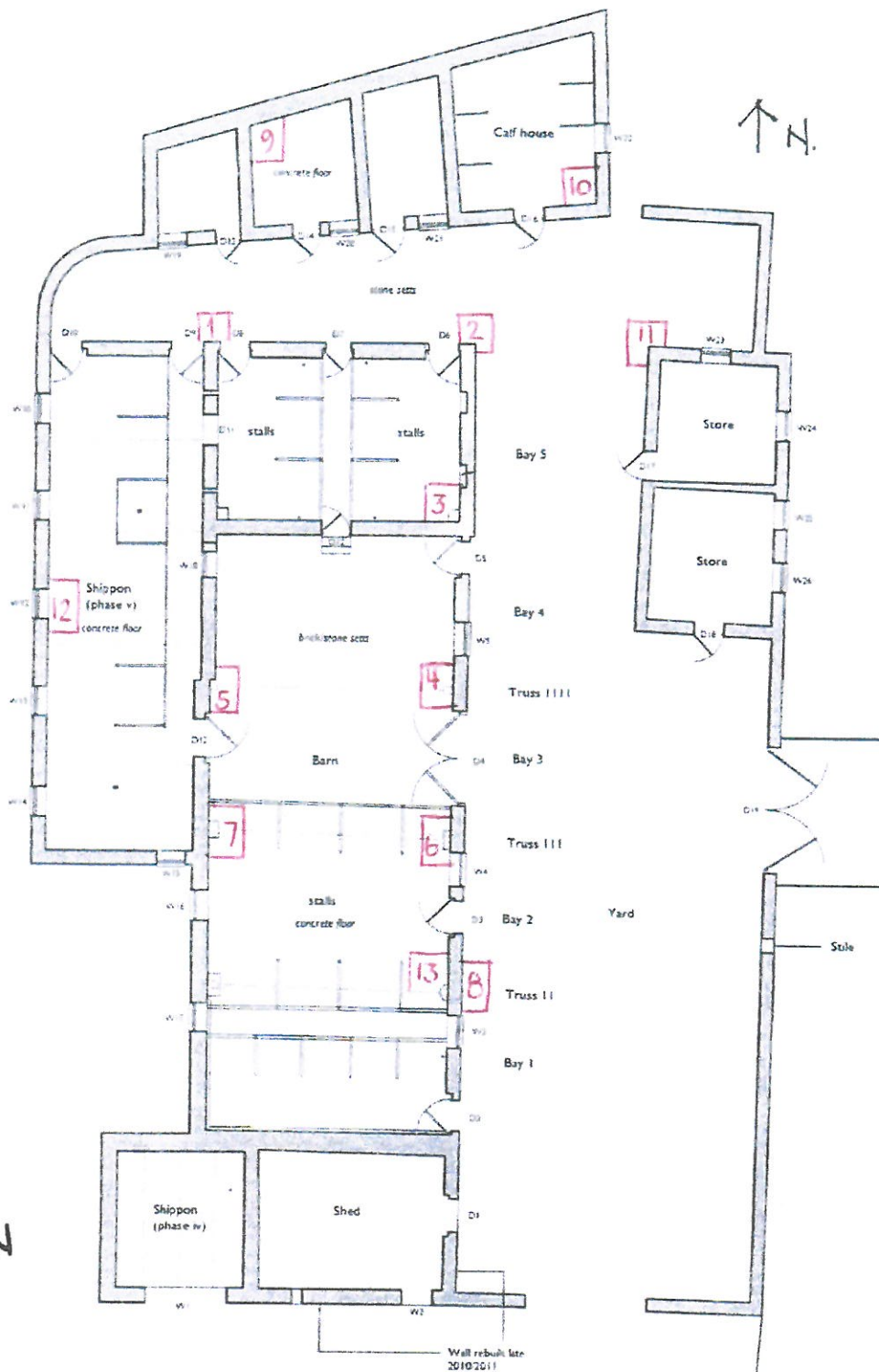
I am very concerned that once the building is heated there will be movement as the masonry and timber react to the drier atmosphere, and in the circumstances it might be appropriate if cruck 2 was also treated this way. I used this detail but with new concrete plinths cast within the wall, in a very similar cruck, where the ties had been removed, in an old barn near Barnsley two years ago and it has performed satisfactorily since then.

I trust that this helps to move the project forward but please contact me if I can be of any further assistance.

Yours faithfully

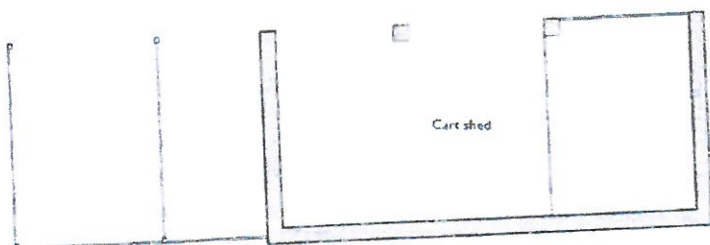


DAC Wood



BAILEY HALL BARN
HURST GREEN

TRIAL PITS log 6.11.12
LOCATION PLAN

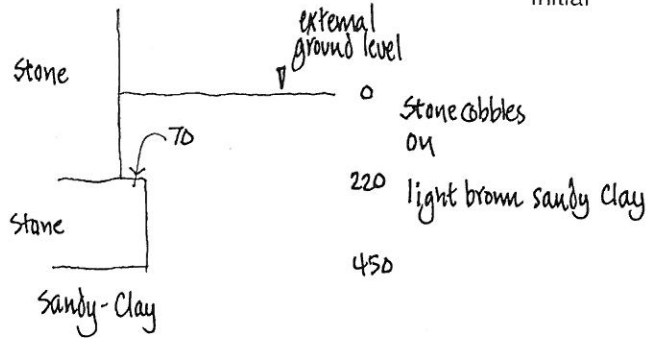


Subject

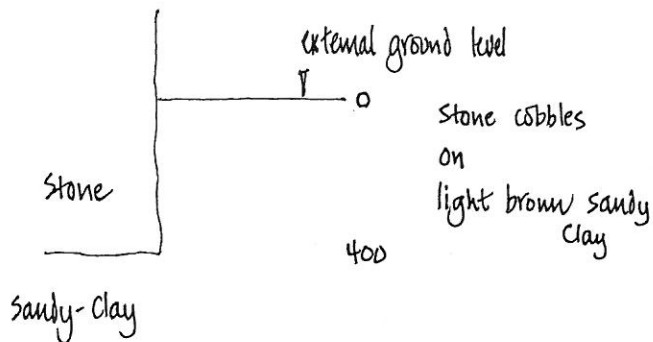
Initial

BAILEY HALL BARN
HURST GREEN

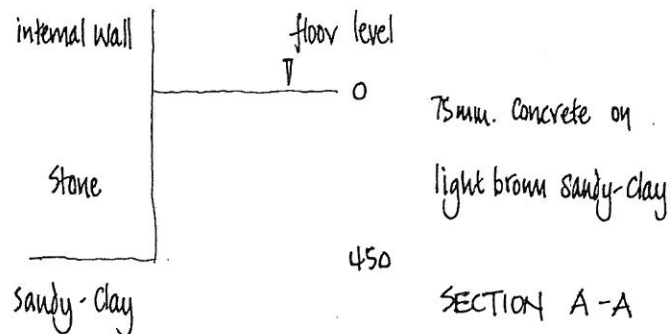
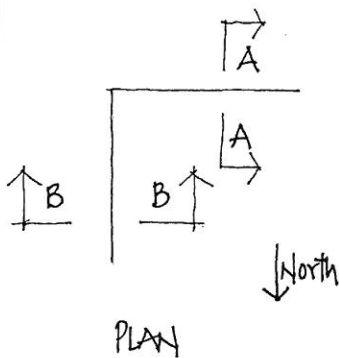
TRIAL PIT LOGS



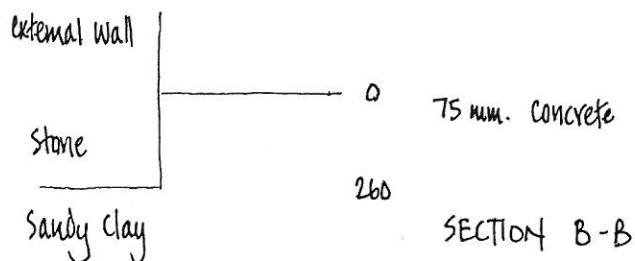
TRIAL PIT 1



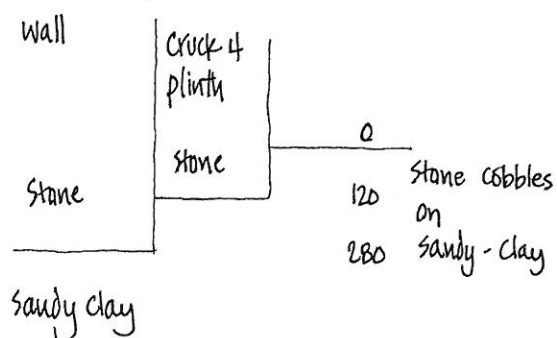
TRIAL PIT 2



TRIAL PIT 3



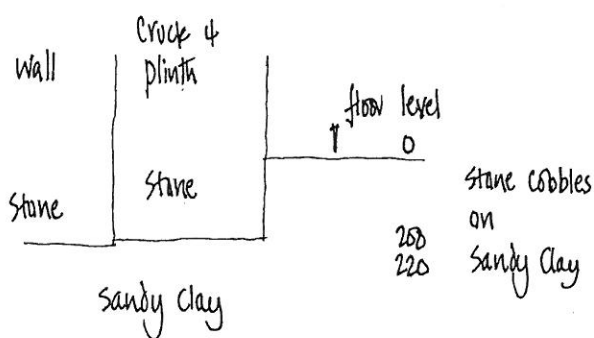
TRIAL PIT 4



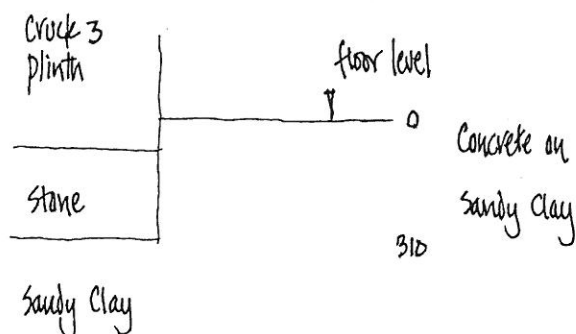
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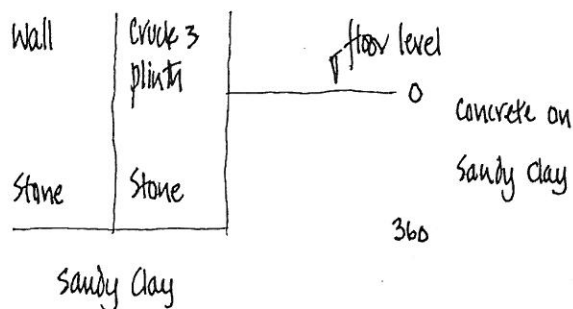
BAILEY HALL BARN HURST GREEN TRIAL PIT LOGS



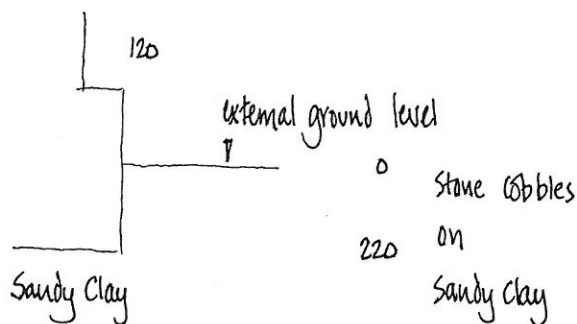
TRIAL PIT 5



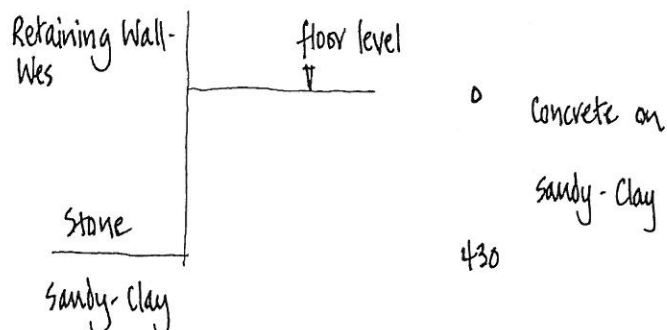
TRIAL PIT 6



TRIAL PIT 7



TRIAL PIT 8



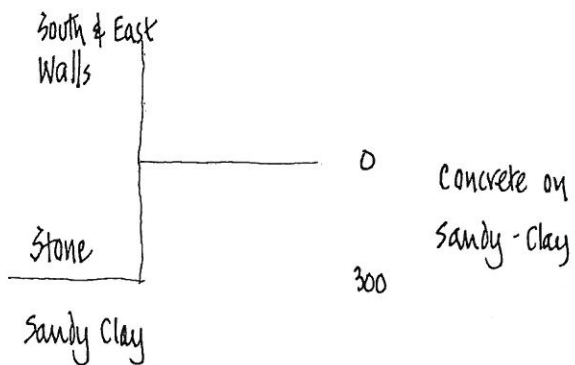
TRIAL PIT 9

Subject

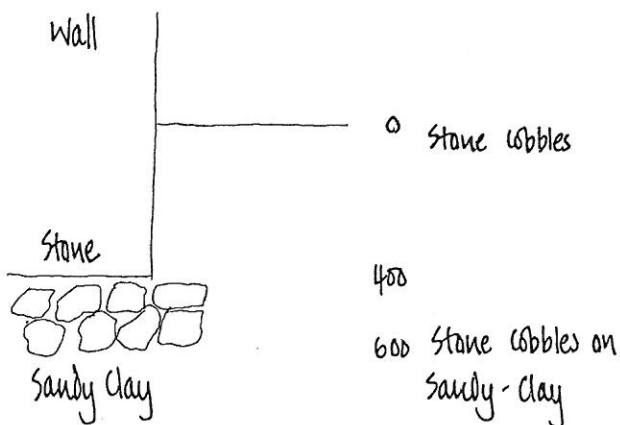
Initial

BAILEY HALL BARN
HURST GREEN

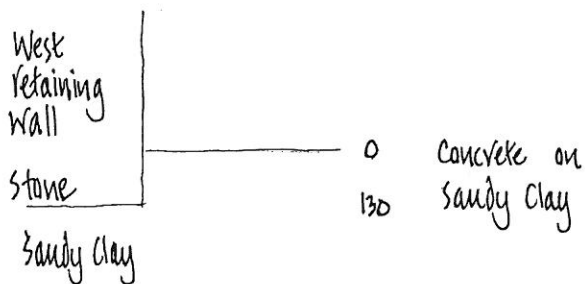
TRIAL PIT LOGS



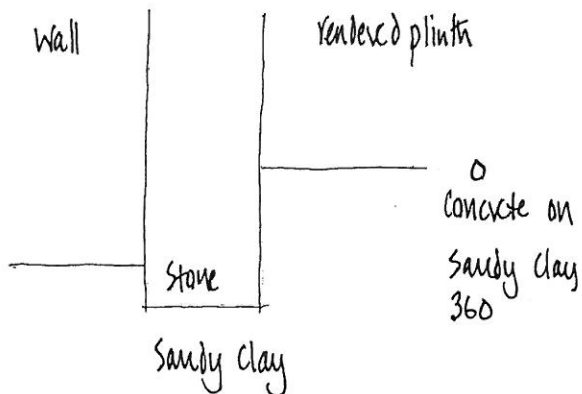
TRIAL PIT 10



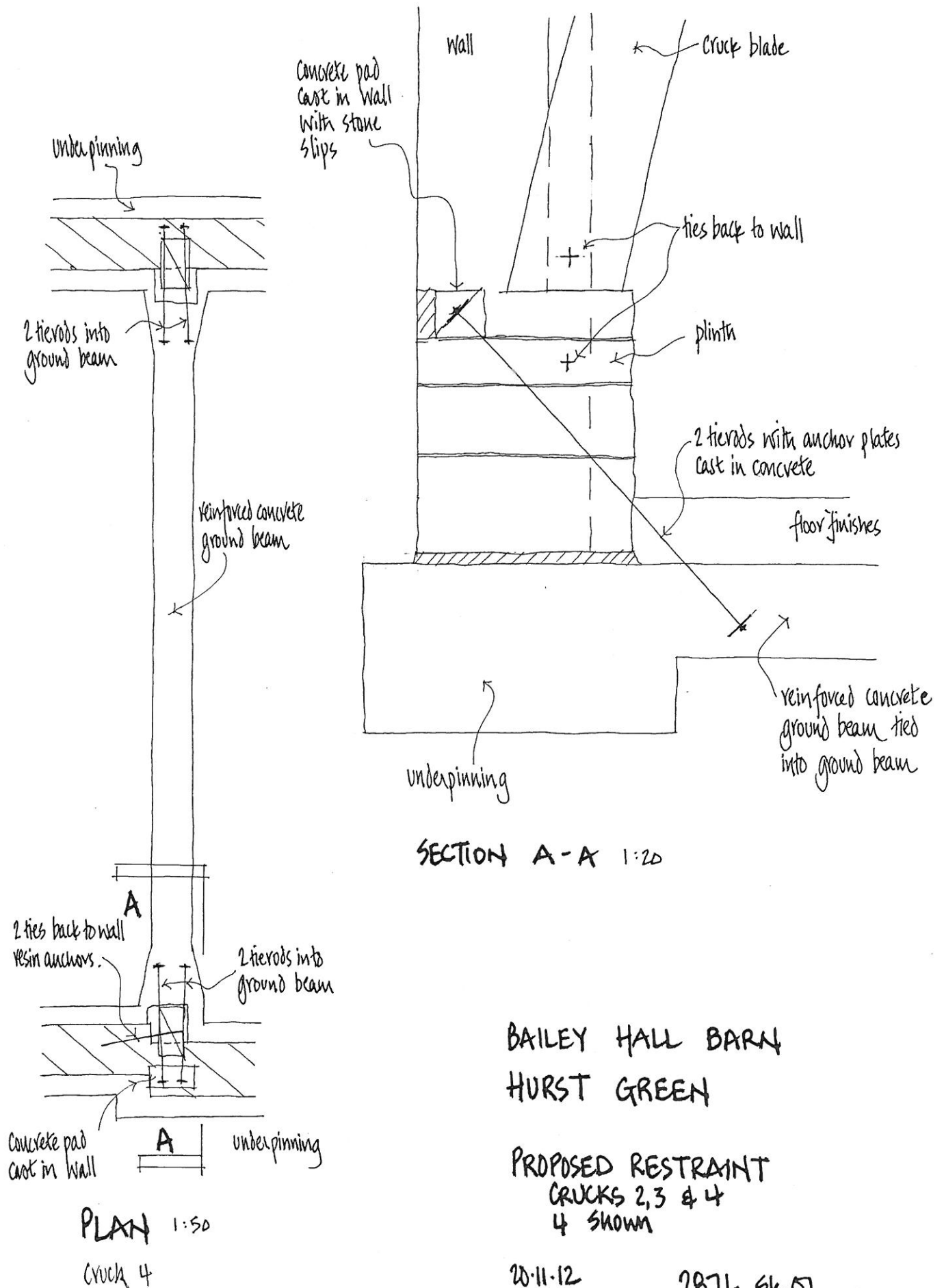
TRIAL PIT 11



TRIAL PIT 12



TRIAL PIT 13



Addendum to DAC Wood Trial Pits and Cruck Restraints for Bailey Hall Barn, Hurst Green, Lancashire.

Document ref: DACW/2871

Page 2, line 1:

“Unit 2, Bedroom 4 – Existing Stalls” should read:

“Unit 2, Kitchen / Dining – Existing stalls”