



SAMPLE NO. 12

d = 51 mm

L = 0 mm

MODE OF FAILURE

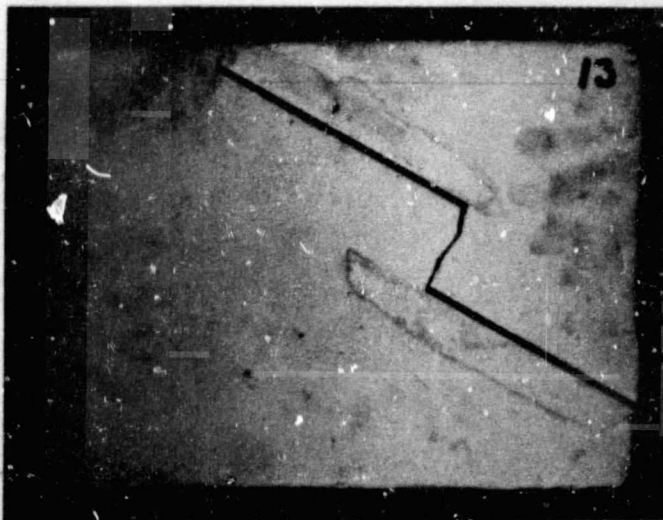
Shear occurred along both joints but not along the entire length of the upper joint. This resulted from the fact that the tension fracture through the intact material was neither straight nor perpendicular to the joint direction.

FAILURF LOAD

The 2,7 kN reaction was lowered onto the sample. A blast from a nearby excavation shook the building and the sample fractured.

MODE OF FAILURE

This sample was failed by dropping the arm of the apparatus onto the sample from successively increasing heights. Shear movement occurred along both joints and the intact material between the joints fractured in tension at approximately right angles to the joint direction.

SAMPLE NO. 13

MODE OF FAILURE

Shear movement took place on both joint surfaces and two clean tension fractures occurred through the intact material between the joints.



SAMPLE NO. 14

d = 51 mm

L = 0 mm

W = unreliable

SAMPLE NO. 15

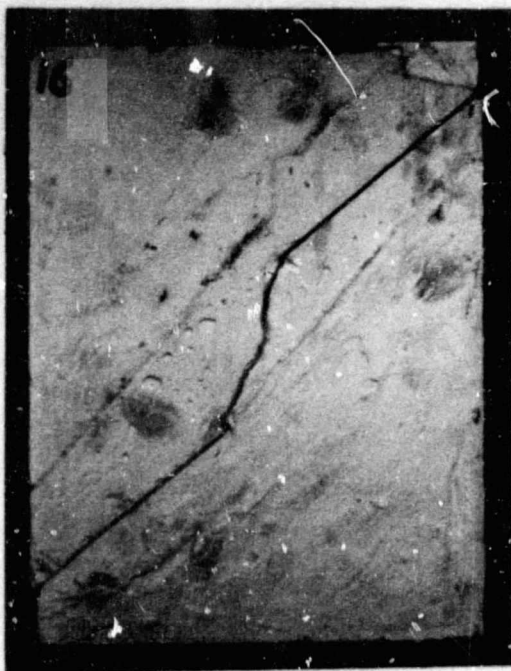
d = 51 mm

L = 81 mm

W = 38,0 kN

MODE OF FAILURE

Shear movement took place on both joint surfaces. The failure surface through the intact material took the shortest path between the joint ends and shows signs of both striations and tension fractures i.e. the step failure mechanism on a small scale.

SAMPLE NO. 16 $d = 51 \text{ mm}$ $L = 81 \text{ mm}$ $W = 19,3 \text{ kN}$ MODE OF FAILURE

Shear movement took place along both joint surfaces. The failure surface through the intact material oscillated about the path of shortest distance between the two joint ends and showed signs of both tension and shear failures.

MODE OF FAILURE

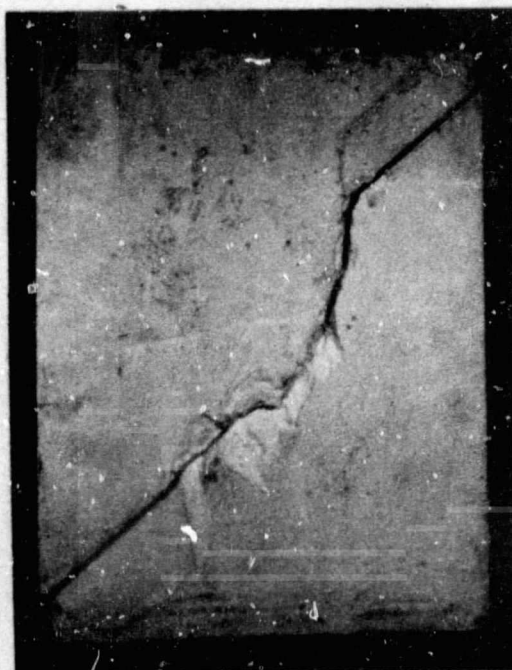
Shear took place along both joint surfaces. The failure surface through the intact material bore striations parallel to the expected direction of movement and suggested a step failure mechanism on a small scale.

SAMPLE NO. 17

d = 51 mm

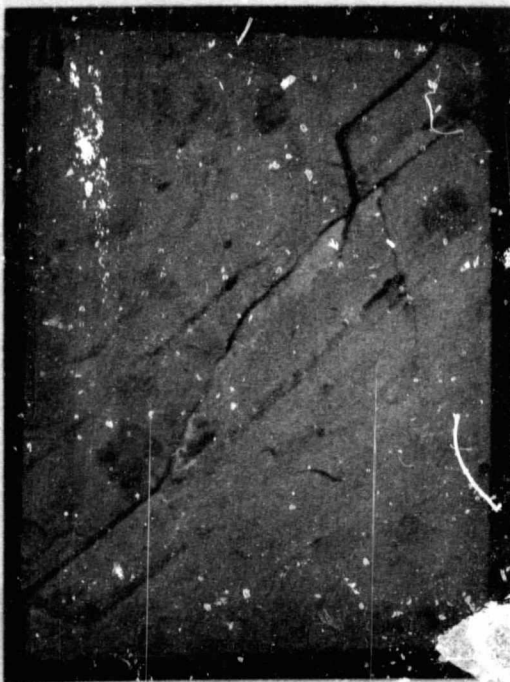
L = 158 mm

W = 35,8 kN



MODE OF FAILURE

Branch cracks grew from near the joint ends. Shear movement took place along the joint surfaces. The failure through the intact material had both tension and shear components. (The fracture around the back of the top joint piece took place later).

SAMPLE NO. 18

d = 51 mm

L = 158 mm

W = 35,6 kN

SAMPLE NO. 19

d = 51 mm

L = 158 mm

W = 34,3 kN

MODE OF FAILURE

The load was increased to its maximum value. A branch crack started to form from the top of the bottom joint. The load decreased slightly and then fracture occurred suddenly. Shear took place on both joint surfaces. Material spalled off near the middle of the sample and the failure surface through the intact material, which had both striations and signs of tension fracture, followed approximately the shortest path between the joint ends.



SAMPLE NO. 20

Joint pieces moved during casting. L and d insufficient to describe geometry.
 $W = 28,4 \text{ kN}$

MODE OF FAILURE

Creep of the sample was noticed before peak load was reached. After peak load had been reached, the load decreased and a branch crack was observed near the top of the bottom joint. Then fracture occurred suddenly. Shear occurred on both joint surfaces. The failure surface between the joint ends took a path close to a straight line and had striations as well as evidence of tension failure. A piece spalled off near the middle of one side.

MODE OF FAILURE

A branch crack developed downwards from the bottom of the top joint. Pieces B and C separated in tension. Shear occurred along both joints (between pieces C and F and between B and D). Piece E broke off piece B due to insufficient bond with the joint piece. There was little evidence of striations on the failure surface through the intact material, which took a fairly straight path between the joint ends.

SAMPLE NO. 21

d = 51 mm

L = 158 mm

W = 52,4 kN



MODE OF FAILURE

A branch crack started downwards from the bottom of the top joint. This led to a clean tension break. Shear occurred along both joints. The failure surface through the intact material showed striations and evidence of tension fracture. Pieces spalled off near the middle of both sides of the model.

SAMPLE NO. 22

d = 51 mm

L = 158 mm

W = 34,3 kN

SAMPLE NO. 23

Joint pieces
slipped
during casting



MODE OF FAILURE

Shear occurred along both joints. A tension fracture occurred through the intact material between the joints.

SAMPLE NO. 24 $d = 51 \text{ mm}$ $I. = 0 \text{ mm}$ $W = 29,8 \text{ kN}$ MODE OF FAILURE

Shear movement took place on both joint surfaces. A tension fracture occurred through the intact material between the joints.

MODE OF FAILURE

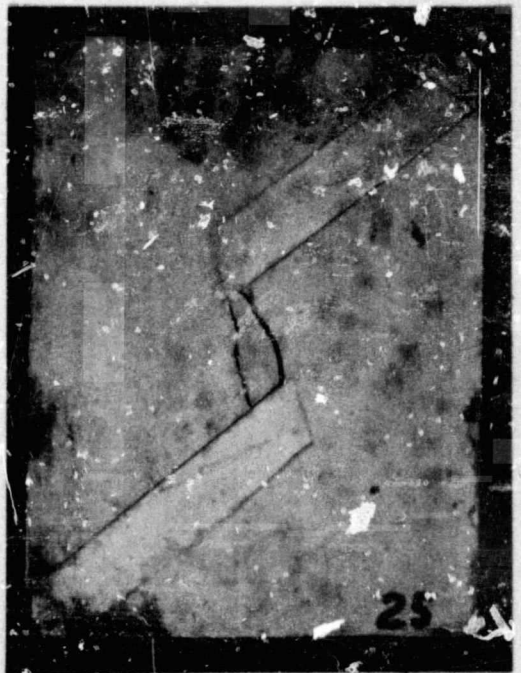
Shear movement took place along both joint surfaces. Two tension breaks occurred in the intact material between the joints.

SAMPLE NO. 25

d = 51 mm

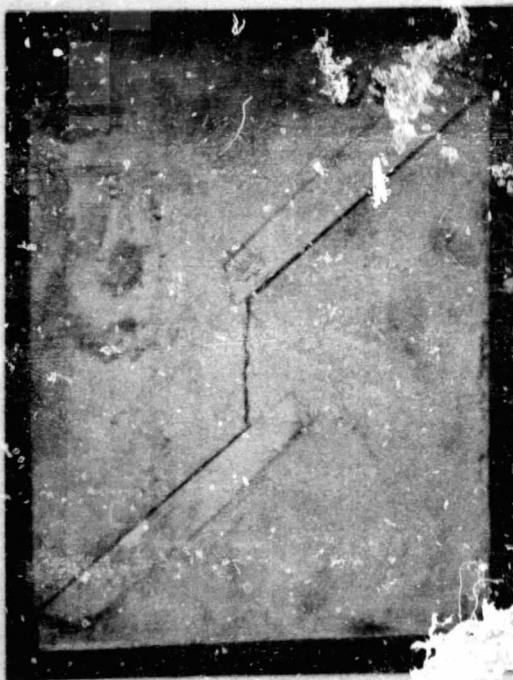
L = 0 mm

W = 11,1 kN



MODE OF FAILURE

Shear took place along both joints; but not along their entire lengths because the tension fracture through the intact material was not perpendicular to the joint planes.

SAMPLE NO. 26

d = 51 mm

L = 0 mm

W = 18,2 kN

SAMPLE NO. 27

d = 51 mm

L = 81 mm

W = 15,0 kN

MODE OF FAILURE

Shear movement took place along both joint surfaces. The failure surface through the intact material, which took a fairly direct path between the two joint ends, showed signs of both shear and tension fracture.

SAMPLE NO. 28

d = 51 mm

L = 81 mm

W = 37,6 kN

MODE OF FAILURE

Shear movement took place along both joint surfaces. Branch cracks developed from the joint ends. The tension failures have occurred along these planes, whereas the shear components of failure through the intact material have occurred on distinctly different planes (i.e. the step failure mechanism on a macroscopic scale between joints).

MODE OF FAILURE

Shear movement took place along both joint surfaces. The fracture surface through the intact material goes directly, in small steps, from the one joint end to the other. This fracture surface shows signs of both shear and tension fracture.

SAMPLE NO. 29

d = 51 mm

L = 81 mm

W = 10,9 kN



MODE OF FAILURE

Shear took place along both joints. A tension fracture took place through the intact material between the joints.

SAMPLE NO. 30

d = 51 mm

L = - 20 mm

W = 9,9 kN

SAMPLE NO. 71

d = 31 mm

L = 20 mm

W = 7,9 kN



TYPE OF FAILURE

Shear movement took place along both joint surfaces. A tension fracture occurred through the intact material between the joints.

SAMPLE NO. 32 $d = 51 \text{ mm}$ $L = 20 \text{ mm}$ $W = 24,2 \text{ kN}$ MODE OF FAILURE

Shear took place along both joint surfaces. A tension fracture occurred through the intact material.



SAMPLE NO. 33

d = 25 mm

L = - 41 mm

W = 10.0 kN

MODE OF FAILURE

Shear movement took place along both joint surfaces and a tension fracture occurred through the intact material.

SAMPLE NO. 34

d = 25 mm

L = - 41 mm

W = 25,6 kN



MODE OF FAILURE

Shear movement took place along both joint surfaces. Two almost parallel tension fractures took place through the intact material between the joints.

MODE OF FAILURE

As the load increased, a crack formed from the bottom of the upper joint down to the lower joint. The load was increased further until failure suddenly occurred. Shear took place along the joints and a combined shear and tension failure occurred through the intact material.

SAMPLE NO. 35

d = 25 mm

L = - 41 mm

W = 23,8 kN

Author Goodman Hubert John

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