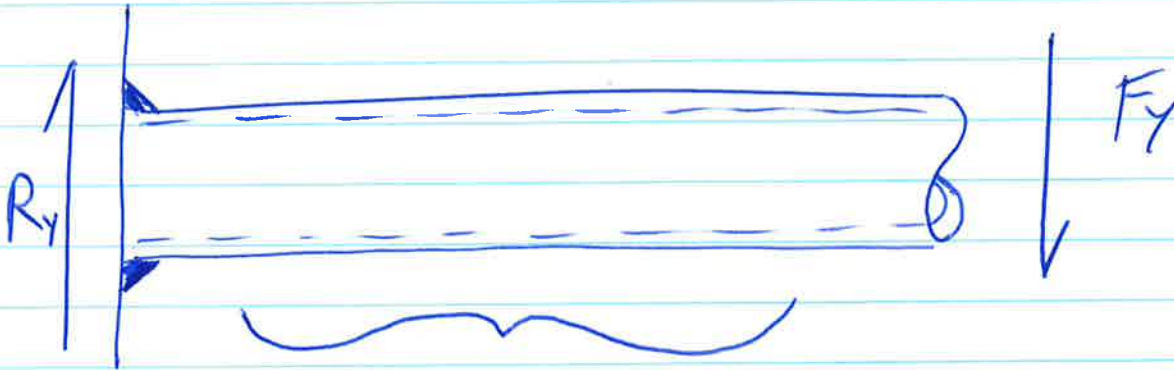
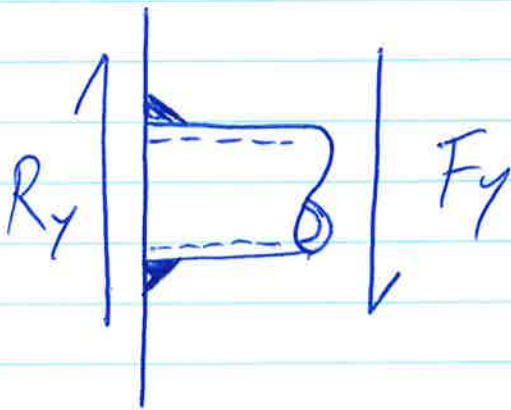


LOCAL VS. GLOBAL EFFECTS

→ Where is the stress?



PIPE DISTRIBUTES THE LOADS THROUGH BEAM ACTION; SHEAR CARRIED IN THE SIDES IN WEB-LIKE BEHAVIOUR

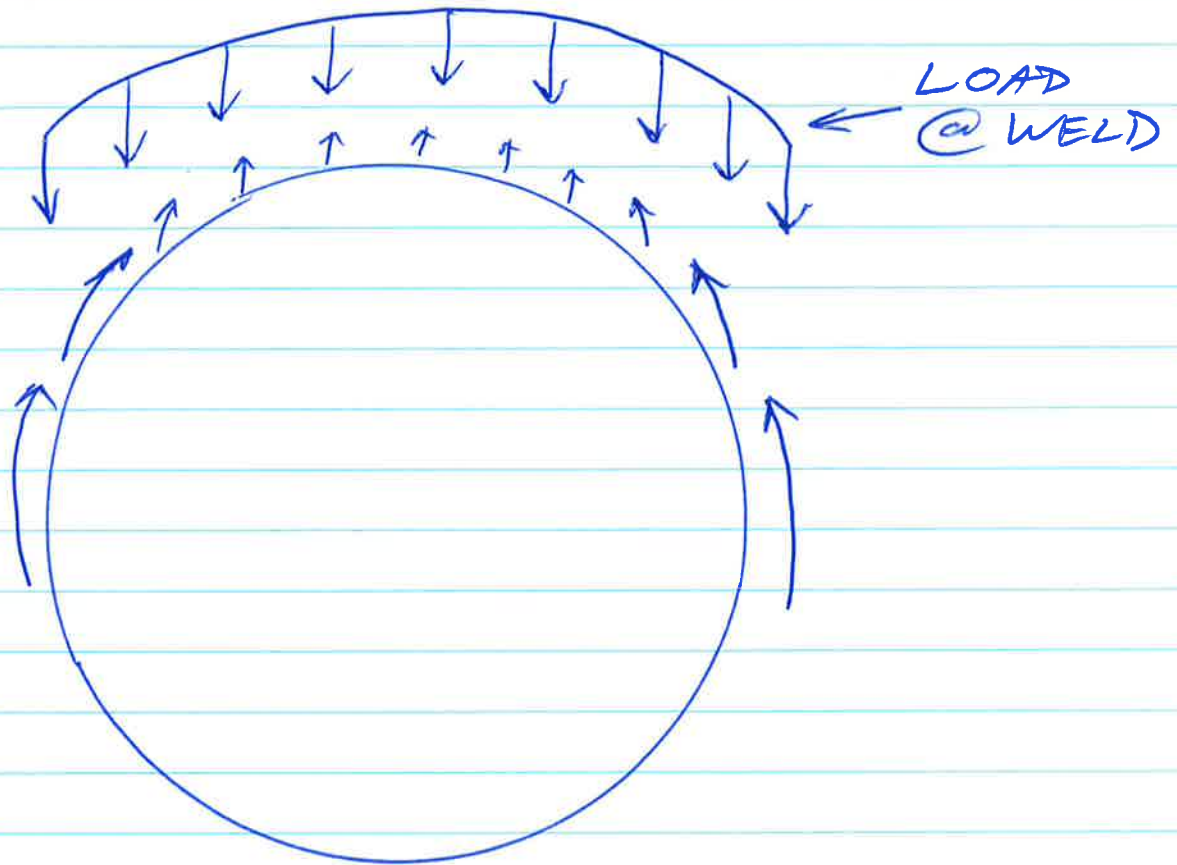


IN THIS CASE, THE POINT OF LOADING IS SO CLOSE TO THE RESISTING WELDMENT THAT THE LOAD CANNOT DISTRIBUTE INTO THE SECTION & IS RESISTED DIRECTLY.

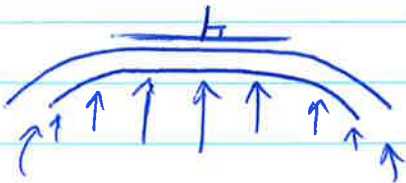
THOUGHT EXPERIMENT

1 of 2

FAILURE OF A CIRCULAR WELD LOADED @ WELD



1) FLATTENING



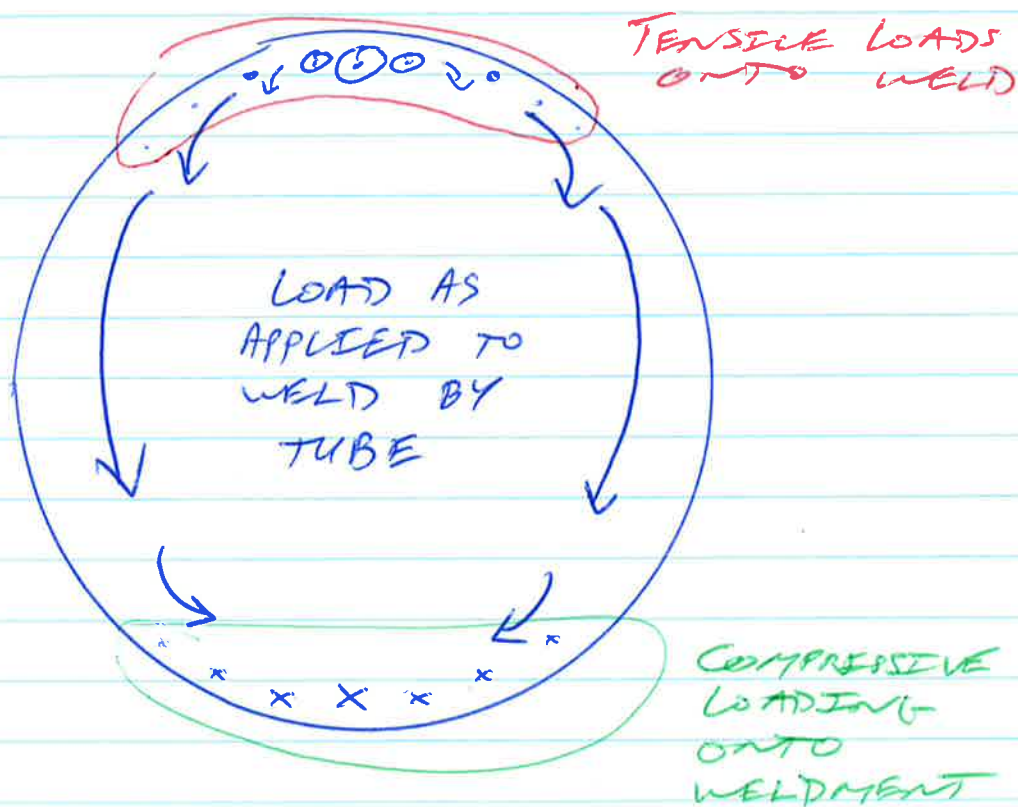
2) TEARING



3) PROGRESSIVE FAILURE / UNZIPPING FROM TOP TEAR

FAILURE OF A CIRCULAR WELD (TUBE MOUNT CASE)

FAILURE NOW
COULD OCCUR
MULTIPLE WAYS
BASED ON RATIO
OF BENDING
STRESSES VS.
SHEARING
STRESSES.



IN THIS CASE IT WOULD BE REASONABLE TO ASSUME A "ZONE" APPROACH TO THE WELDMENT DESIGN BASED ON LOAD DISTRIBUTION; IE: SHEAR ON SIDES & TENSION / COMPRESSION COUPLE.

NOTE : COMBINING THE FULL FACE SHEAR & FULL FACE BENDING AS
$$\phi V \geq \sqrt{P/A + \frac{M_c}{I}}$$

IS THE SAME IN EFFECT AS IT REQUIRES THE COMBINED TOTAL CAPACITY.