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Program for Research Vierendeel Trusses

1. Search of Literature
2. Purpose and Scope
 - a. To determine experimentally the stresses in Vierendeel Trusses and to compare these with calculated values.
 - b. To determine effect of varying end restraint, specifically by varying size of fillets.
 - c. To obtain some indication of the most economical design, and to compare this with ordinary trusses.
3. Method of Approach
 1. To Compute theoretical stresses for model trusses furnished.
 2. To determine the actual stresses for loads decided upon on basis of computation.
 - a. Photoelastically ~~by~~ for ^{celluloid} bakelite model.
 - b. With strain gages for steel model.
 3. To recompute stresses for revised model (i.e. with fillets reduced).
 4. Redetermine actual stresses.
 5. Prepare large scale models of joints for more accurate determination of stress distribution in them.
 6. On basis of theory as modified by experiment, compute ^{material and} costs of trusses of various styles and materials.
 7. Compare these costs with those of ordinary trusses.
4. Method of Experimentation
 1. Determine strain-stress diagram ^{and strength} for

bakelite ^{celluloid} used.

2. Prepare a calibration beam to obtain photoelastic constant.

3. Observe fringes and isoclinics for at least two joints, preferably more, with more than one set of loadings. Obtain drawings or photographs of these fringes and isoclinics.

4. Similarly load the steel model; determine stresses from strain measurements.

5. (Possibly) devise a rig for subjecting a model of a joint to thrust, shear and moment.

5. Control of Methods and Materials

anneal model before use; also anneal tension specimen and calibration beam in same manner.