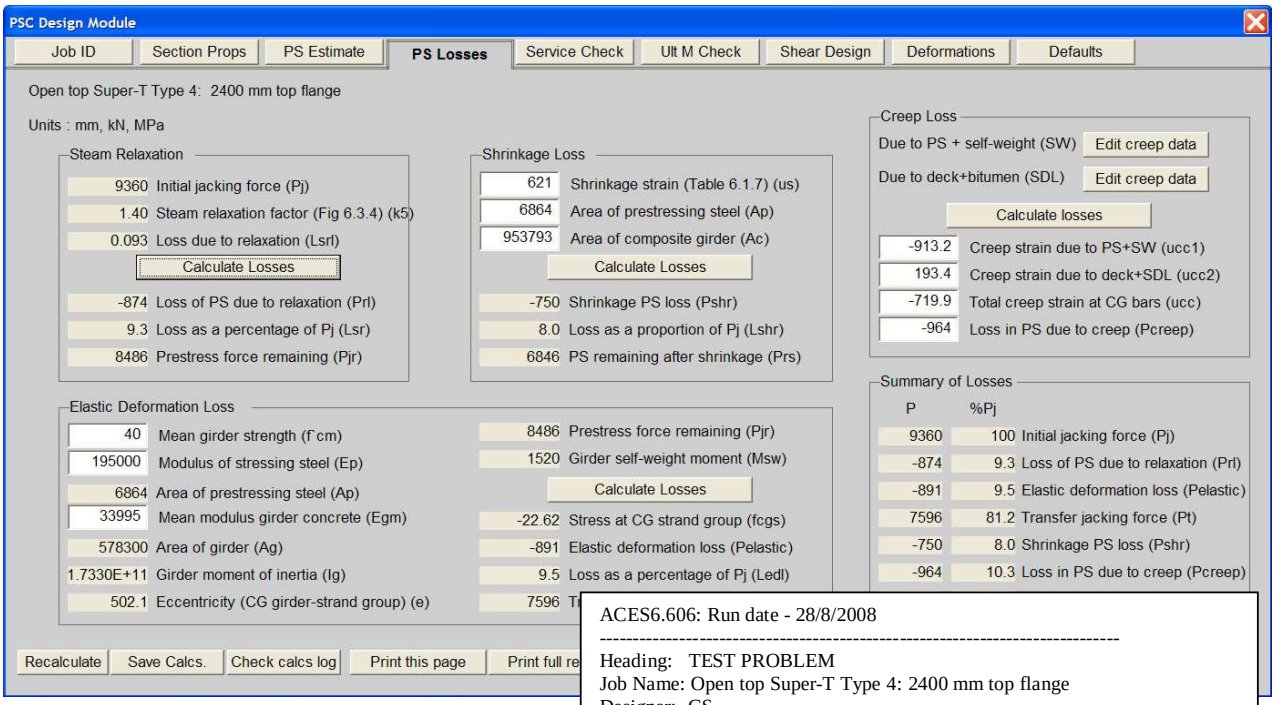
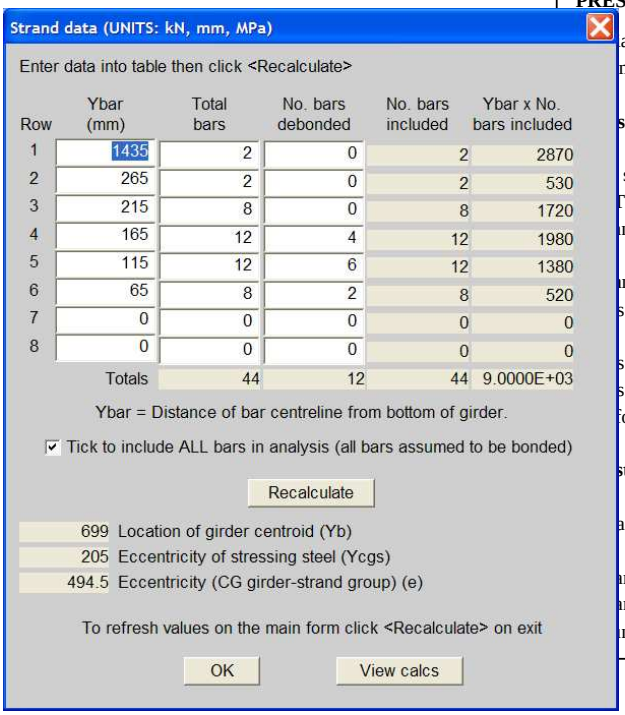
ACES-PSC

Prestress Concrete Design Module

ACES-PSC performs the design of pretensioned concrete Super-T and related beams in accordance with the general design approach given in the Australian Standards bridge design code (AS5100.5). The module can either be accessed directly from within the main ACES program or run in stand-alone mode. It can also be readily customized to handle other section shapes and design codes. An EXCEL-style analysis process is used – change a parameter anywhere in the module then click the recalculate button to redo the entire design.



Clear, well annotated dialog boxes and reports that are customisable



ACES6.606: Run date - 28/8/2008

Heading: TEST PROBLEM
Job Name: Open top Super-T Type 4: 2400 mm top flange
Designer: GS
Comments: Test comment to check module
Units: mm, microstrain, kN, kN.m, MPa

DESIGN CODE: AS5100.5

PRESTRESS LOSSES

al jacking force (Pj) = 9360 kN
mate jacking force factor (Jf) = 0.780

s due to Steam Relaxation

steam relaxation factor (k5) is the larger of 0.0 or:
The maximum of: 1 + (Jf-0.7)*0.5/0.1 = 1.400 (Fig 6.
nd: (Jf-0.4)/0.3 = 1.267

m relaxation factor (k5) = 1.400
s due to relaxation (Lsrl = 0.1*k5/1.5) = 0.093

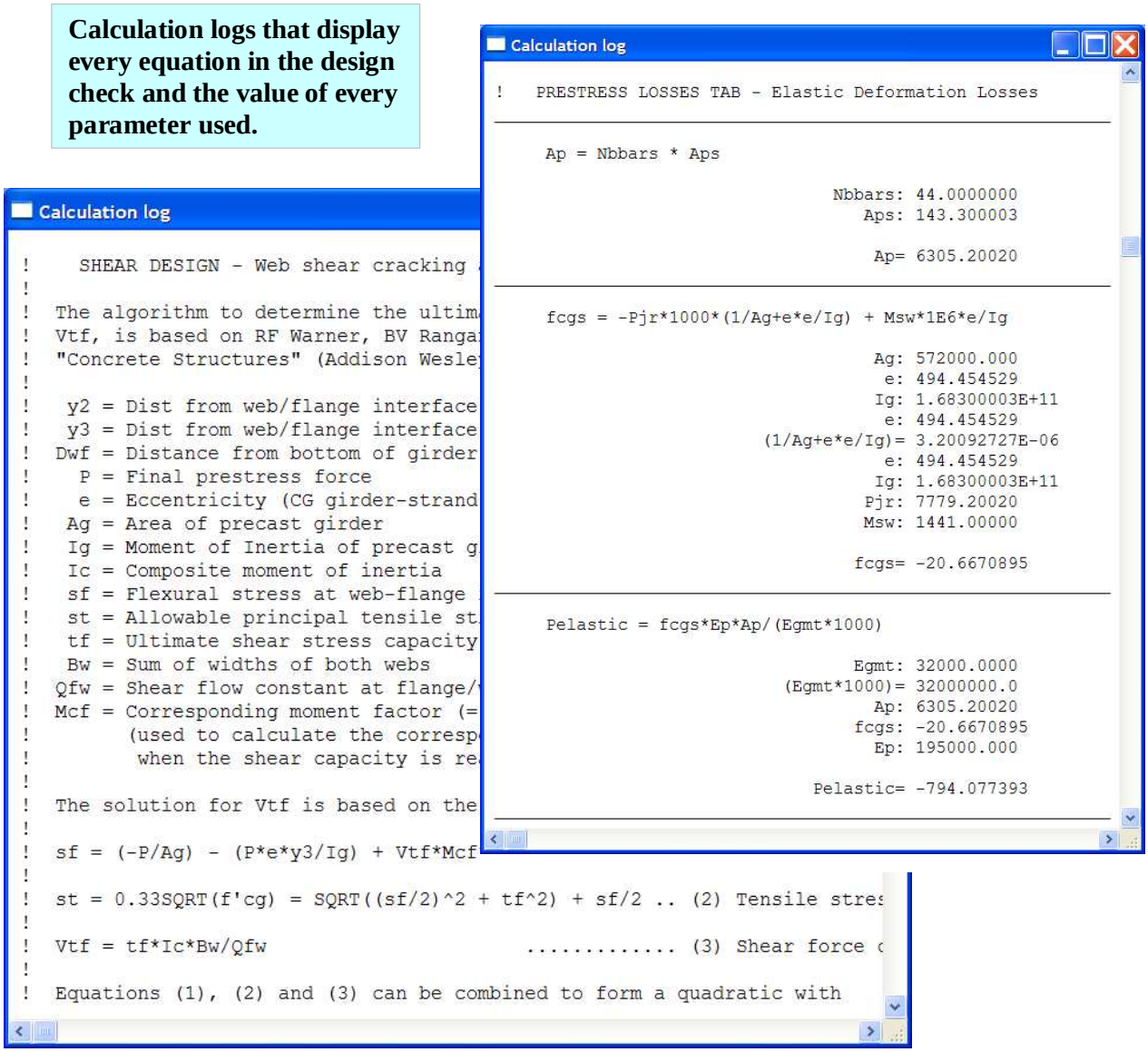
s in PS due to relaxation (Prl = - Lsrl*Pj) = -873.6 kN
s as a proportion of Pj (Lsr = - Prl*100/Pj) = 9.3 %
orce remaining (Pjr = Pj + Prl) = 8486.4 kN

stic Deformation Loss

a of PS steel (Ap = Nbbars*Pi*Ds^2/4) = 6864.0 mm2

n girder concrete strength (f'cm) = 40.0 MPa
n Young's Modulus of girder concrete (Egm) = 33995.0 MPa
ng's Modulus of stressing steel (Ep) = 195000.0 MPa

Calculation logs that display every equation in the design check and the value of every parameter used.



FEATURES

- Design of PSC Super-T beams to AS5100.5 Clause 8.1.5. Torsion and cracking are not included in the design check. However, the effect of passive (non-prestressed) reinforcement is taken into consideration in the Ultimate Limit State check.
- Calculation logs give detailed descriptions of every equation used in the analysis as well as the immediate value of every parameter and variable set during the calculation.
- All equations and algorithms used in the design can be changed and customised.
- Parameter definitions used in the dialog boxes and equations can be changed to suit local conventions.
- A large number of parameters can be preset and saved to a defaults file. They will be auto-loaded when a new design is initiated. Default parameters can be customised.
- Output reports are in HTML form. The full design logic, all equations and all associated parameter values are shown.
- All reports can be customised using standard HTML editors.

ACES Analysis Systems
PO Box 107
Stepney SA 5069
Phone/Fax: +(618) 8362 3177
Email: aces@internode.on.net