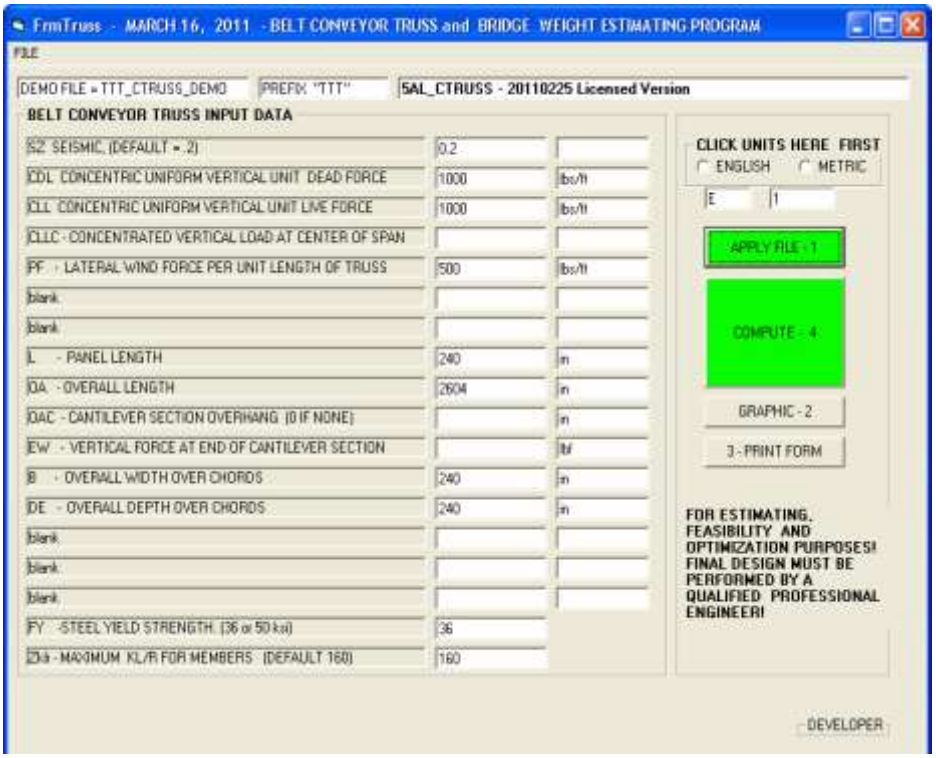
K3A

BELT CONVEYOR TRUSSES

5A_CTRUSS.EXE ITEM L

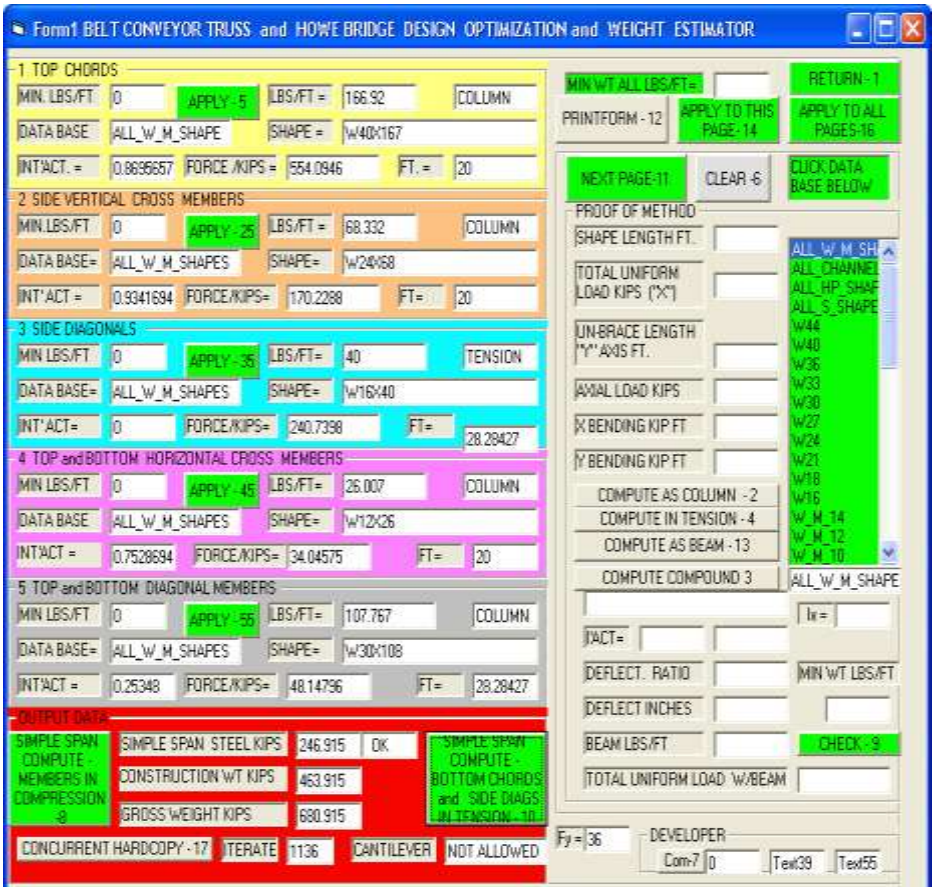
PARAMETRIC BELT CONVEYOR TRUSS and BRIDGE DESIGN OPTIMIZATION PROGRAM ENABLES RAPID FEASIBILITY STUDIES AND ESTIMATES.



Program computes from parametric input data an estimated weight of Howe like box trusses such as those used for belt conveyors and small bridges.

NOTE 1: For belt conveyor trusses live and dead loads may be taken from Title 19.5 of WINBELT.

1) Enter parametric descriptive data into FrmTruss as seen at left. Follow unit requirements.



2) Click APPLY FILE_1 to ensure data is properly entered.

3) Licensees Click "FILE" in upper left corner to initiate Microsoft style file saving.

4) Click COMPUTE-4 to display Form1 seen at left.

NOTE 2: Program methodology auto selects shape meeting AISC ASD criteria from within the data base you select. Multiple iterations "smoothes" output.

6) Data bases are listed in the green text box at the far right. With your mouse move the slider bar at the right up and down to view the entire list. These correspond closely to AISC shape availability. Excluded are rectangular tubing shapes and unequal leg angles.

7) For a first approximation CLICK onto ALL_W_M_SHAPES at the very top of the list. (This data base has the widest range of properties.)

8) Click onto green command box entitled APPLY TO ALL PAGES-16 near upper right. This applies the same data base to all members.

9) In each yellow, brown, blue, purple, grey or yellow box (Click NEXT PAGE-11) to the right of label "DATA BASE" will appear "ALL_W_M_SHAPES". This becomes the data base for a first computation.

In red area at bottom left:

10) Click "SIMPLE SPAN COMPUTE MEMBERS IN COMPRESSION-8

and/or:

11) Click "SIMPLE SPAN COMPUTE – BOTTOM CHORDS and SIDE DIAGS IN TENSION – 10" This choice does not permit a cantilever extension.

12) View in text box to right of "SIMPLE SPAN STEEL KIPS" a computed weight of steel in kips (1 kip = 1,000 lbs). In text box to immediate right will appear OK, WEAK ?, NO or SELECT ? Only OK is permissible. If other than OK appears visually search "SHAPE = "in each colored box to determine which member(s) do not qualify.

If ALL_W_M_SHAPES has been selected and OK does not appear then the Program will not find a solution based in the entered INPUT parameters. Options are to adjust input data.

If 10) above has been clicked and the input OAC CANTILEVER causes a bending moment requirement exceeding that available from the design of the simple span then "TOO LONG" will appear in the text box in the lower right of the red area. Cantilever spans are NOT ALLOWED for 11) above regardless.

REAL TIME OPTIMIZATION

Reducing weight of trusses is essential not only for cost reasons but to reduce the weight that goes into just supporting itself.

13) For each member to the right of "INT'ACT" appears a number representing the INTERACTION or COMBINED STRESS RESULT. Multiplying this by 100 and think of in terms of "efficiency of use." 1 (or 100% efficiency) is ideal. This will seldom appear but numbers such as .9 are quite frequent. If the number is less you have the option of trying different data bases to raise the "INT'ACT" result. In doing this use the separate "APPLY" command in each colored box for each member or the APPLY TO THIS PAGE ONLY near upper right. Member 6 appears by Clicking NEXT PAGE – 11.

Data bases preceded by ALL, HSS_SQUARE (TUBING) or W14 cover a range of sizes. Using one of these first will provide guidance or first approximation to a more size specific data base. Size designated data bases (W24 etc) include all shapes of that size (depth) that are also metric. Clicking a size designated data base enables a "fine tuning" of results. Near size data bases should also be clicked. The writer finds W14 an attractive data base for heavier bridges. Concurrent use of "MIN WT" command enables specifying shapes that are actually available or preferred for purchase reasons .

14) Standardizing member sizes is customary fabrication practice. In the upper right corner of Form1 is a text box for entering MIN WT ALL LBS/FT. A minimum weight entered here and clicked at APPLY TO ALL PAGES – 16 or applied to an individual MEMBER sets a minimum weight in conjunction with the entered shape data base. For example: The writer sometimes likes to check the weight summary. I enter W16 as the data base and 99 as the minimum weight. This forces display of W16X100.

15) To see BOTTOM CHORDS click NEXT PAGE – 11 near upper right Form1

16) PRICE: Multiply SIMPLE SPAN STEEL KIPS BY your price per 1000 lbs. Program is for estimating only. Weights do not include connections:

PURPOSE

For both vendors and planners proposals and feasibility studies are both time consuming and costly. The time taken is the worst of these concerns because taking time prevents the real-time optimization needed to achieve the best result.

POTENTIAL USERS MAY INCLUDE"

Consulting Engineers, Contractors, Steel Fabricators, Mining Companies, State Highway Departments, Belt Conveyor Vendors.

PROOF OF METHOD –

In grey area immediately to left of data base listing enter data for individual beams and columns taken from AISC Manuals and compare.

End of Subject