

BELT CONVEYOR SUPPORT TOWERS

7A_CTOWER.EXE

PARAMETRIC TOWER DESIGN PROGRAM ENABLES RAPID DESIGN OPTIMIZATION, WEIGHT and PRICE ESTIMATES.



Industrial plants are replete with towers supporting conveyors, tanks, screens, crushers etc. Some have provision for trucks or trains to pass under.

Program 7A_CTOWER is operatively similar to Program CTRUSS.

NOTE: “Form” names referred to are in the upper left corner.

INSTRUCTIONS:

PROGRAM VERSION = 7A_CTOWER 20110906 - License Version CTOWER Program

CTOWER INPUT FORM

DEMO FILE = TOW_DEMO | PREFIX FILES WITH TOW | FILE = C:\WINBELT\TOWER_TRUCK_LOAD_OUT_STATION.THT

UNITS: ENGLISH (selected) METRIC

COMMANDS: APPLY, COMPUTE - 4, GRAPHIC - 3, CLEAR - 5, PRINTFORM - 2

FOR ESTIMATING AND OPTIMIZATION ONLY! FINAL DESIGN MUST BE PERFORMED BY A QUALIFIED PROFESSIONAL ENGINEER!

PRINTFORM - 1 | GO BACK - 6

- 1) Enter your parametric descriptive data into FormTower form seen at right.
- 2) If there are intermediate details such as bins or a truck pass through enter additional data into Form5 immediately below. This is accessed by clicking command button labeled NEXT PAGE – 6 near the bottom of FormTower.
- 3) Click command button labeled GO BACK – 6 near bottom of Form5 to return to FrmTower.
- 4) Licensed users Click “FILE” near upper left corner to initiate “Microsoft” style file saving.

NOTE 1: In opening a file always Click 1 APPLY on FrmTower to make sure file is in memory.

5) On FrmTower Click COMPUTE-4. This causes the display of Form1 seen to left.

NOTE 2: Program auto selects shape(s) meeting AISC ASD criteria from within the data base(s) you select. Multiple iterations resolves design. From this the entire structural weight is determined and the sizes of the 13 key members. These are detailed in the multi-colored boxes on the left side of the 3 forms to the left.

Available data bases are listed in the green text box at the far right of these 3 forms. With mouse move the slider bar immediately to the right of each list box up and down to view the entire list of data bases. 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 FORM1 data base 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 of Form1. This applies the same data base to all members including those on Form6 and Form7.

9) In each multi colored box, on all 3 forms, to the right of label "DATA BASE" will appear "ALL_W_M_SHAPES". This becomes the data base for a first computation.

The red area at bottom left of Form1 is enlarged below

OUTPUT DATA		MAX BENDING	200
COMPUTE -8	FAB. STEEL INCLUDING BIN KIPS	818.9933	OK
	MAX FOUNDATION LOAD (EACH) KIPS	359.0027	ITERATE
	MIN FOUNDATION LOAD (EACH) KIPS	50.494	1200

PRINT HARDCOPY-11 SHOW -10 DEVELOPER

10) Click green command button “COMPUTE -8 in red area of Form1

11) View in text box to right of “FAB STEEL INCLUDING BIN 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 on the entered INPUT parameters. Options are to adjust input data or accept output as “close enough” (not advised)

REAL TIME OPTIMIZATION

Reducing weight is essential for cost and competitive reasons.

13) For each member to the right of “INTACT” appears a number representing the INTERACTION or COMBINED STRESS RESULT. Multiply this by 100 and think of it 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 “INTACT” result towards 1. 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 for individual Form6 and Form7.

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 work. Concurrent use of “MIN WT” command enables specifying shapes that are actually available or preferred for purchase or connection 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 FAB STEEL INCLUDING BIN 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. Process plant builders.

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.

Below the red box are commands

PRINT HARDCOPY – 11
SHOW-10

Clicking **HARDCOPY-11** before clicking **COMPUTE-8** will cause Program to concurrently produce hardcopy of intermediate computational results. (If you have a printer connected)

Clicking **SHOW-10** after Clicking **COMPUTE – 8** will enable a review of the same data on monitor.

End of Subject