STRUCTURAL ENGINEERING PACKAGE

BY

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BRIEF COMPUTER PROGRAM DESCRIPTION
FOR OLIVETTI

1.   <u>RIGID PILE ANALYSIS</u>

   Program computes soil pressure and moment capacity of pile. Also
   locates maximum moment on pile giving stress at that location.
                                              Price $ 25.00

3.   <u>DOUBLE TEE SECTION PROPERTIES</u>

   This program computes the precast and composite section properties
   for double tees and single tees with or without sloping webs. Flanges
   must be uniform in thickness. Transformed section properties can
   also be computed if steel is to be considered. (MLU)
                                              Price $ 65.00

5.   <u>SECTION PROPERTIES FOR A LEDGER BEAM</u>

   Input data modification allows versatile usage from this program.
   Inverted tee sections and normal tee section can be handled in most
   cases.   Price $ 25.00

6.   <u>DEFLECTION OF CANTILEVER BEAM WITH POINT LOADS AND A PARTIALLY
   UNIFORM LOAD</u>

   Deflection due to any number of point loads and a partially distributed
   uniform load are computed independently and then summed.
                                              Price $ 25.00

7.   <u>FIXED END MOMENTS AND REACTIONS</u>

   This program computes fixed end moments and reaction for beams
   with any number and/or combination of loads such as point loads,
   triangular loads, uniform loads, and applied moments. Triangular
   and uniform loads may be partially of fully distributed on the beam.
   End joints can be pinned or fixed on either end or on both ends. (MLU)
                                              Price $ 60.00

8.   <u>SECTION PROPERTIES FOR A LIN TEE</u>

   Area, centroid, inertia and both section moduli are computed for
   a double tee or single tee with or without sloping webs. Flanges
   can be sloping on single tee if desired.
                                              Price $ 25.00

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10. <u>DEFLECTION AT ANY POINT IN A SIMPLE SPAN DUE TO UNIFORM LOAD,</u>
     <u>POINT LOADS, AND END MOMENTS</u>

   This program computes the deflection at any point X along the span
   due to applied end moments, uniform load, and any number of point
   loads. Deflection due to each load type plus total deflection is
   output.   Price $ 65.00

12. <u>DESIGN OF VERTICAL, BLOCK, SPREAD, AND CAISSON FOUNDATIONS</u>

   Moment capacity is computed for spread, vertical, block, and
   caisson footings. This moment is compared with moment at bottom
   for footing(output). Soil pressure and safety factor along with
   loads on footing are input.   Price $ 35.00

14. <u>STRESSES IN A PRESTRESSED BEAM AT RELEASE</u>

   Program computes the stresses in the top and bottom of a prestressed
   beam at the ends and midspan at release.
                                                     Price $25.00

15. <u>INTERACTION DIAGRAM FOR COLUMN DESIGN BASED ON ULTIMATE</u>

   Program computes P_b and then enters a loop which allows the user
   to enter the area of steel to be used and P_o, M_b, and M_o are
   computed and printed out for this amount of steel. Another area of
   steel may be entered with P_o, M_b, and M_o computed repeatedly
   until all desirable areas of steel have been inspected.
                                                     Price $ 60.00

16. <u>STIRRUP SPACING FOR CONVENTIONAL BEAM BASED ON WORKING</u>
     <u>STRESS (UNIFORMLY LOADED BEAM, ONE SPAN)</u>

   The value of the beam shear at a distance "d" from the support is
   entered as a beginning value for computations. Program continues
   giving required stirrups in one foot increments until the actual
   beam shear can be carried by the beam.
                                                     Price $ 25.00

17. <u>STIRRUP SPACING FOR ONE SPAN BEAM BASED ON ULTIMATE STRENGTH</u>

   Required stirrup spacing is given in one foot increments across the
   span. Program is written to solve for stirrup spacing for beam with
   or without external moments and uniform loading condition.
                                                     Price $ 25.00

22. SECTION PROPERTIES

This program computes the section properties for any shape that can be represented by rectangles, triangles, circles, and rolled sections. Circles may be added or subtracted from shape. Shapes considered for example are tee sections, ASSHO girders, hollowcore slabs, rolled sections with plates added, and sections built up out of plates. The price for the MLU version just described is $75.00. A more simplified version is available to users without MLU for $60.00.

23. TWO SPAN BEAM ANALYSIS AND DESIGN

Program is based on USD. Uniform load is assumed acting on the beam. Fixed end moments, negative moment, reactions, maximum positive moments and their locations are computed and printed. Area of steel required at midspan and the middle support is output. Price $25.00

25. BEAM ANALYSIS

This program computes the reactions and then the shear and moment at any number of locations along the beam due to point loads, uniform load and end moments. Maximum positive moments and points of inflection are easily obtained. (Opt.)   Price $60.00

27. COMPOSITE BEAM DESIGN

This program designs composite steel beams in accordance with the AISC specifications as outlined in the AISC Seventh Edition of Manual of Steel Construction. A trial member with or without cover plates must be selected before executing program. Program will compute stress -es deflection and all design parameter required in composite design.
          Price $60.00

29. GROUP PILE ANALYSIS

Program solves for the forces in each pile of the group when the pile cap is loaded with an axial load and applied moments. Moments may be in one or two direction (biaxial bending). Forces due to axial load, bending in X direction and bending in the Y direction are all output individually and then the summation is output. (MLU)
          Price $75.00

30. INDETERMINATE TWO SPAN BEAM WITH CANTILEVER

Fixed end moments and cantilever moment are required for input. Also length of regular spans (excluding cantilever) are entered. Moment distribution is the method of analysis used by the program to solve for the negative moment.
          Price $25.00

33. <u>BOND STRESS BASED ON WORKING STRESS</u>

Program computes the bond stress for a group of bars, mixed or identical. Working stress analysis as outlined in the <u>ACI Building Code</u> is followed. Allowable bond stress for top and bottom bars is computed and printed.

Price $25.00

34. <u>INDETERMINATE TWO SPAN BEAM SOLUTION</u>

Moment distribution is used by program to compute negative moment at support. Fixed end moments can be computed by program # 7 for use in this program. Span lengths are required input.

Price $25.00

35. <u>INDETERMINATE THREE SPAN BEAM SOLUTION</u>

Moment distribution is used by program to compute negative moment at supports. Fixed end moments can be computed by program # 7 for use in this program. Span lengths are required input.

Price $25.00

36. <u>INDETERMINATE FOUR SPAN SOLUTION</u>

Moment distribution is used by program to compute negative moment at supports. Fixed end moments can be computed by program # 7 for use in this program. Span lengths are required input.

Price $25.00

41. <u>DEFLECTION OF A PRESTRESSED BEAM</u>

Deflection due to member's weight, prestress, superimposed load, and live load is computed. Camber is calculated assuming a 1.5 growth factor. This value can be modified to any value desired.

Price $35.00

44. <u>EFFECTIVE INERTIA OF CONCRETE BEAM</u>

Program is written in accordance with chapter nine of the <u>ACI Building Code</u> (318-71). Section properties for uncracked section and cracked section are computed. Tension steel and compression steel, if present, are considered in the cracked section properties. Cracking moment and effective inertia are output for support and midspan with a final average effective inertia output. Tee section and rectangular section are considered in the program. (MLU)

Price $50.00

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50. **DEFLECTIONS FOR UNIFORMLY LOADED SIMPLE BEAM WITH CANTILEVER END**

Deflection at cantilever end is computed and printed. Program computes
the deflection at any desired point between the supports. After the
location where deflection is desired is entered, the machine computes
the deflection and prints it out. As many locations as desired may be
inspected with only one execution due to the cycle built into the
program. Program will also work for uniformly loaded beams without
the cantilever end.

Price $25.00

51. **DEFLECTION AT THE END OF A CANTILEVER BEAM WITH THREE INERTIA
CHANGES**

Uniform load is assumed to be acting on the first two segments of
different inertia. The extreme segment representing the third inertia
must also have a uniform load, although it can be a different magnitude
from the initial two segments.

Price $25.00

53. **TRUSS MEMBER DESIGN**

This program designs truss members, wood or steel, tension or com-
pression in accordance with the 1969 AISC Specifications. Program
has provision built in to accept input data from a time sharing terminal
by means of the LN20 paper tape reader. Input data can be entered
manually for designers without LN20. (MLU)

Price $95.00

57. **ANALYSIS OF A TRIANGULARLY LOADED SIMPLE BEAM**

Reactions and maximum moment are printed out. Location of maximum
moment is also printed.

Price $25.00

59. **SPREAD FOOTING DESIGN**

Complete design is performed for footing with axial load and moment.
Three different sets of equations are built in the program so that any
type soil pressure distribution can be handled. Moment capacities
based on allowable soil pressure and safety factor against over-
turning are output along with actual moment at bottom of footing.
Beam and punching shearing stresses are output with allowable
stresses from ACI Code 318-71. Finally, flexural stresses, moments
and area of steel required for top and bottom are output. (MLU)

Price $85.00

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63. <u>SHORT STEEL COLUMN AND CONNECTION PLATE DESIGN</u>

Stresses in column due to axial load and moment are computed and output. Tension in connectiong bolts and plate thickness are also computed.   Price $40.00

64. <u>CONCRETE BEAM DESIGN</u>

This program designs rectangular or tee shaped reinforced concrete beams in accordance with the <u>1971 ACI Building Code</u>. Ultimate strength criteria is used by the program. The maximum and minimum steel requirements are computed and output. The ultimate moment capacity and area of steel required for each moment are output. (Opt.)
            Price $60.00

66. <u>ROTATION AND DEFLECTION ANALYSIS</u>

Rotation and deflection is computed at load point due to applied moment and point load on a simple span.
            Price $ 25.00

67. <u>SOCKET DEPTH DESIGN</u>

Required socket depth is computed for section with applied moment and shear. Added plate thickness is also computed. Moment capacity of socket is computed and printed out.   Price $ 35.00

75. <u>SECTION PROPERTIES OF BOX SECTION ABOUT BOTH AXIS</u>

Inertia and section modulus about X and Y axis are computed. Also polar moment of inertia is calculated.   Price $ 25.00

81. <u>PRESTRESSED BEAM DESIGN</u>

Program solves for stresses due to member weight, topping weight, live load, initial prestress and final prestress. Required number of strands based on ultimate and allowable stress conditions are computed.   Price $ 35.00

83. <u>PRESTRESS MEMBER DESIGN PART A</u>

Dead , superimposed and live loads are entered. Member can have cantilever on both ends. Moments are computed and stored for use in #86. Option is built in program to allow user the ability to handle point loads in design. (MLU)   Price $ 85.00

86.   **PRESTRESS MEMBER DESIGN - PART B**

Initial and final stresses are output for top and bottom of member.
Tendon profile can be straight, have one point depression, or two
point depression. (MLU)

                                        Price $85.00

89.   <u>PRESTRESS STIRRUP DESIGN</u>

Stirrup requirements for prestressed beams based on short method of
ACI 318-71 Code.

                                        Price $50.00

95.   <u>POST-TENSIONED BEAM STRESS ANALYSIS</u>

Stresses are computed at ends of member and at any desired interior
point due to DL + Post-tensioning and due to DL + LL + Post-tensioning.
(MLU)   Price $125.00

98.   <u>POST-TENSIONED BEAM STRAND LOCATION - PART A</u>

Post-tension cable location is computed for each value of X that is
entered. Part A is for end spans, ie., where cable representation is
based on three parabola patterns. Location computed is in terms of
cable eccentricity. (MLU)

                                        Price $50.00

100.   <u>POST-TENSIONED BEAM STRAND LOCATION - PART B</u>

Post-tension cable eccentricity is computed for each value X that is
input. Part B is for interior spans, ie., where cable representation
is based on four parabola patterns. (MLU)

                                        Price $50.00

102.   <u>FIXED END MOMENTS DUE TO POST-TENSION CABLE DRAPE - PART A</u>

Fixed end moments are computed for a post-tensioned, non-corcordant
drape exterior span. Program gives equivalent uniform load that would
produce this moment for pinned, fixed beam.

                                        Price $75.00

103.   <u>FIXED END MOMENTS DUE TO POST-TENSION CABLE DRAPE - PART B</u>

Fixed end moments are computed for a post-tensioned, non-corcordant
drape interior span. Program gives value of point load and location
that would produce same moments.

                                        Price $75.00

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104. <u>EFFECTIVE POST-TENSIONING FORCE AFTER LOSSES</u>

The effective post-tensioning force at each support is computed for
any number of spans. Loss computations are according to ACI 318-71.
Wobble factor and friction coefficient are part of input.   Price $75.00

106. <u>STEEL BEAM COLUMN DESIGN</u>

This program aids in the design of steel beam columns subject to axial
compression and biaxial bending. Equations 1.6-1a and 1.6-1b or 1.6-2
of the seventh edition of the AISC Code are used. (MLU)   Price $150.00

109. <u>COLUMN LOAD ANALYSIS</u>

Dead and live loads are computed and accumulated at each floor level for
the column. Live load reduction and continuity effects are considered in
the program. (MLU)   Price $60.00

112. <u>INDETERMINATE FOUR SPAN ANALYSIS</u>

Program computes the fixed end moments and then distributes them and
prints out negative moments. Input consists of uniform loads, inertias,
span lengths, and point load descriptions. (MLU)   Price $50.00

120. <u>STEEL BASE PLATE DESIGN</u>

This program designs rectangular steel base plates supporting eccen-
trically loaded steel columns in accordance with the seventh edition of
AISC Specification (1969) and <u>ACI Building Code.</u> (MLU)   Price $60.00

124. <u>TRAPEZOIDAL LOADED INTERIOR BEAM ANALYSIS</u>

Program computes reactions and internal moments for beam with end
moments and trapezoidal loading. Internal moments are computed for
any number of locations entered.   Price $25.00

125. <u>SHEARWALL ANALYSIS</u>

Program analyzes shear walls for wind and gravity loads. The cumulative
shear and moment at the base of the level in question are output along with
the axial, flexural and shear stresses and total deflection. (MLU)
                                                             Price $150.00

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127. CONTINUOUS BEAM ANALYSIS

This program computes the negative moments for a continuous beam with
or without columns. Any number of spans up to ten can be solved by the
program. Any number of point loads on each span may be entered along
with the uniform load. Program has option that enables user to enter carry
over factors and distribution factors. Shear and moment diagram ordinates
at support and at quarter points are output for each beam. (MLU) Price $125.00

136. TRUSS ANALYSIS

Program analyzes a statically determinate, simple span truss. Member
forces and reactions are output. Method of joints is used to solve for
member forces. Any number of joint loads may be applied to truss. (MLU)
Price $90.00

143. RETAINING WALL DESIGN

This program performs stability analysis along with flextural steel design
for a cantilever retaining wall. The analysis includes sloping backfill,
uniform surcharge, line load, water pressure and passive pressure. The
righting and overturning moments, along with safety factors against sliding
and overturning and maximum and minimum soil pressures are output. The
flexural steel requirements are calculated for the toe and heel and any
point along the stem by the ultimate strength design in accordance with
the 1971 ACI Code. (MLU)   Price $150.00

155. FIXED END MOMENTS

Program computes fixed end moments for a fixed-fixed beam and for a
fixed-pinned beam with uniform load and any number of point loads.
Price $25.00

156. MULTISTORY FRAME ANALYSIS

This program solves a plane rectangular frame subjected to wind loading at
each floor by the cantilever method. Axial forces, moments and shears are
computed for the columns, and moment and shear for the beams. Any number
of stories and a maximum of 20 bays may be analyzed. (MLU)   Price $100.00

161. MOMENT MAGNIFICATION METHOD - ACI 318-71

Program determines if concrete column is short of long column. For long
columns, the slenderness effect is considered which yields a magnifier for
the ultimate moment according to Chapter 10, ACI 318-71. (MLU) Price $45.00