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C.KANNAN, M.E. (Structure)
STRUCTURAL ENGINEER

Door .21, plot No. 257- W, Flat No. 2B
"Utopia Apartments" 2nd Floor,
4th Main Road, Indira Nagar,
Chennai- 600 020
Mobile: 9841249815
Email: kannankds2007@gmail.com

STRUCTURAL STABILITY CERTIFICATE

It is certified that the Proposed Residential Building at Plot No. 68, Block No. H, East Avenue Road, Korattur, Chennai- 600 080. Comprised in Old Survey No. 1189/ Part, 1191/1A1 Part, T. S. No. 32/1/2, Block No. 81, Ward No. 7 (E), Korattur Village, within limits of Greater Chennai Corporation. Having Stilt plus Five upper floors is designed to resist earthquake. Check has been made and found safe and I hereby certify that

1. The minimum column width is 300 in stilt floor areas
2. The minimum grade of concrete is M25.
3. The design analysis using the code of practice for loading Standards as per IS-875 Part I to III and seismic force as per one code IS 1893, is carried out.

The Structure is safe and sound when used for the purpose for which it is designed.

C. KANNAN, B.E., M.E., (Structure),
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CMDA Reg. No: SE/GR-I/19/02/002.
Door No: 21, 4th Main Road,
Indira Nagar, Chennai-600 020.

PROPOSED RESIDENTIAL BUILDING AT PLOT NO. 68, BLOCK NO. H, EAST AVENUE ROAD, KORATTUR, CHENNAI- 600 080. COMPRISED IN OLD SURVEY NO. 1189/ PART, 1191/1A1 PART, T. S. NO. 32/1/2, BLOCK NO. 81, WARD NO. 7 (E), KORATTUR VILLAGE, WITHIN LIMITS OF GREATER CHENNAI CORPORATION

GENERAL NOTE ON STRUCTURAL DESIGN.

1.0 GENERAL.

1.1 DESIGN BASIS

The proposed residential building consists of Stilt plus Five upper floors.

The design of this building is carried out based on frame analysis using STAAD CONNECT.

1.2 CODES AND STANDARDS

All structural design is carried out conforming to the provisions of National Building Code of India and other relevant Indian Codes and Standards.

1. I.S. 456 - 2000
2. I.S. 875 - Part I to III
3. I.S.1893 - 2016

2.0 BASIC CIVIL DESIGN LOADS

2.1 DEAD LOADS & LIVE LOADS

Typical slab dead load is calculated as follows

Self weight of slab	=	3.25kN/m²
Floor finish	=	2.0kN/m²
Live load	=	2.0kN/m²
		7.25kN/m²

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3.0 SOIL DETAILS

Based on soil test report Pile Foundation is adopted.

DESIGN METHODS

General design and detailing of concrete members/elements are done conforming to the provisions of I.S: 456 and other relevant I.S codes. Limit State method is followed for the design.

Seismic Zone III load is taken into account for the analysis. The predominant direction of vibration is horizontal. Relevant combination of forces has been taken into account.

4.1

Load Combination	Ultimate Limit Load	Serviceability Limit State
DL+LL+WL	1.2DL+1.2LL+1.2WL	DL+LL+WL
Or	Or	or
DL+LL+EL	1.2DL+1.2LL+1.2EL	DL+LL+EL

4.3 **MINIMUM COVER**

Slab	15 mm
Beam	25 mm
Columns	40 mm
Foundations	50 mm

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```
*****************************************************
*                                                   *
*           STAAD.Pro CONNECT Edition               *
*           Version  22.12.00.142                   *
*           Proprietary Program of                  *
*           Bentley Systems, Inc.                   *
*           Date=    AUG 23, 2023                   *
*           Time=    17:16:41                       *
*                                                   *
*  Licensed to: C.Kannan                            *
*****************************************************
```

```
    1. STAAD SPACE
INPUT FILE: D:\LOGESH - 2\LOGESH\STABILITY CERTIFICATE\pushkar - aj blo.. .STD
    2. START JOB INFORMATION
    3. ENGINEER DATE 8/23/2023
    4. ENGINEER NAME KANNAN
    5. CHECKER NAME KANNAN
    6. APPROVED NAME KANNAN
    7. CHECKER DATE 8/23/2023
    8. APPROVED DATE 8/23/2023
    9. JOB NAME PROPOSED RESIDENTIAL BUILDING AT PLOT NO. 2477, OLD DOOR NO. AJ- -
   10. 20, NEW DOOR NO. 2, 9TH MAIN ROAD/ 5TH STREET, ANNA NAGAR, CHENNAI- 600 040
   11. END JOB INFORMATION
   12. INPUT WIDTH 79
   13. UNIT MMS KN
   14. JOINT COORDINATES
   15. 2 0 0 0; 9 3800.5 0 1.16415E-10; 10 9300.5 0 0; 11 11000.5 0 1.16415E-10
   16. 12 0 3000 0; 13 3800.5 3000 1.16415E-10; 14 9300.5 3000 0
   17. 15 11000.5 3000 1.16415E-10; 16 0 6000 0; 17 3800.5 6000 1.16415E-10
   18. 18 9300.5 6000 0; 19 11000.5 6000 1.16415E-10; 20 0 9000 0
   19. 21 3800.5 9000 1.16415E-10; 22 9300.5 9000 0; 23 11000.5 9000 1.16415E-10
   20. 24 0 -2000 0; 25 3800.5 -2000 1.16415E-10; 26 9300.5 -2000 0
   21. 27 11000.5 -2000 1.16415E-10; 28 0 12000 0; 29 3800.5 12000 1.16415E-10
   22. 30 9300.5 12000 0; 31 11000.5 12000 1.16415E-10; 32 0 15000 0
   23. 33 3800.5 15000 1.16415E-10; 34 9300.5 15000 0; 35 11000.5 15000 1.16415E-10
   24. 36 0 18000 0; 37 3800.5 18000 1.16415E-10; 38 9300.5 18000 0
   25. 39 11000.5 18000 1.16415E-10
   26. MEMBER INCIDENCES
   27. 1 9 2; 7 9 10; 8 10 11; 9 2 12; 10 9 13; 11 10 14; 12 11 15; 13 13 12
   28. 14 13 14; 15 14 15; 16 12 16; 17 13 17; 18 14 18; 19 15 19; 20 17 16; 21 17 18
   29. 22 18 19; 23 16 20; 24 17 21; 25 18 22; 26 19 23; 27 21 20; 28 21 22; 29 22 23
   30. 30 2 24; 31 9 25; 32 10 26; 33 11 27; 34 20 28; 35 21 29; 36 22 30; 37 23 31
   31. 38 29 28; 39 29 30; 40 30 31; 41 28 32; 42 29 33; 43 30 34; 44 31 35; 45 33 32
   32. 46 33 34; 47 34 35; 48 32 36; 49 33 37; 50 34 38; 51 35 39; 52 37 36; 53 37 38
   33. 54 38 39
   34. DEFINE MATERIAL START
   35. ISOTROPIC CONCRETE
   36. E 21.7185
   37. POISSON 0.17
   38. DENSITY 2.35616E-08
```

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STAAD SPACE -- PAGE NO. 2

```
39. ALPHA 1E-05
40. DAMP 0.05
41. G 9.28139
42. TYPE CONCRETE
43. STRENGTH FCU 0.027579
44. END DEFINE MATERIAL
45. MEMBER PROPERTY
46. 9 TO 12 16 TO 19 23 TO 26 30 TO 37 41 TO 44 48 TO 51 PRIS YD 500 ZD 200
47. 1 7 8 13 TO 15 20 TO 22 27 TO 29 38 TO 40 45 TO 47 52 TO 54 PRIS YD 500 ZD 200
48. CONSTANTS
49. MATERIAL CONCRETE ALL
50. SUPPORTS
51. 24 TO 27 FIXED
52. DEFINE IS1893 2016 LOAD
53. ZONE 0.16 RF 5 I 1.2 SS 1 ST 1 DM 0.05 DT 2
54. SELFWEIGHT 1
55. MEMBER WEIGHT
56. 1 7 8 13 TO 15 20 TO 22 27 TO 29 38 TO 40 45 TO 47 52 TO 54 UNI 0.012 0 0
57. 1 7 8 13 TO 15 20 TO 22 27 TO 29 38 TO 40 45 TO 47 52 TO 54 UNI 0.035 0 0
58. DEFINE WIND LOAD

*** NOTE: If any floor diaphragm is present in the model Wind Load definition
          should be defined after Floor Diaphragm definition. Otherwise wind
          load generation may be unsuccessful during analysis.

59. TYPE 1 WIND 1
60. INT 1.35E-06 1.56E-06 1.68E-06 HEIG  10000  15000  18000
61. EXP 1 JOINT 2 9 TO 39
62. LOAD 1 LOADTYPE SEISMIC-H  TITLE EQ +X
63. 1893 LOAD X 1
64. LOAD 2 LOADTYPE SEISMIC-H  TITLE EQ -X
65. 1893 LOAD X -1.
66. LOAD 3 LOADTYPE SEISMIC-H  TITLE EQ +Z
67. 1893 LOAD Z 1
68. LOAD 4 LOADTYPE SEISMIC-H  TITLE EQ -Z
69. 1893 LOAD Z -1.
70. LOAD 5 LOADTYPE WIND  TITLE WIND +X
71. WIND LOAD X 1 TYPE 1
*WARNING- NO MEMBERS LOADED FOR A WIND LOAD GENERATION.
72. LOAD 6 LOADTYPE WIND  TITLE WIND -X
73. WIND LOAD -X 1 TYPE 1
```

STAAD SPACE -- PAGE NO. 3

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*WARNING- NO MEMBERS LOADED FOR A WIND LOAD GENERATION.
  74. LOAD 7 LOADTYPE WIND  TITLE WIND +Z
  75. WIND LOAD Z 1 TYPE 1
  76. LOAD 8 LOADTYPE WIND  TITLE WIND -Z
  77. WIND LOAD -Z 1 TYPE 1
  78. LOAD 9 LOADTYPE LIVE  TITLE LIVE LOAD
  79. MEMBER LOAD
  80. 1 7 8 13 TO 15 20 TO 22 27 TO 29 38 TO 40 45 TO 47 52 TO 54 UNI GY -0.012
  81. LOAD 10 LOADTYPE DEAD  TITLE DEAD LOAD
  82. SELFWEIGHT Y -1
  83. MEMBER LOAD
  84. 1 7 8 13 TO 15 20 TO 22 27 TO 29 38 TO 40 45 TO 47 52 TO 54 UNI GY -0.035
  85. LOAD COMB 11 1.5(DL+IL)
  86. 9 1.5 10 1.5
  87. LOAD COMB 12 1.2(DL+IL+ELX)
  88. 9 1.5 10 1.2 1 1.2
  89. LOAD COMB 13 1.2(DL+IL-ELX)
  90. 9 1.2 10 1.2 2 1.2
  91. LOAD COMB 14 1.2(DL+IL+ELZ)
  92. 9 1.2 10 1.2 3 1.2
  93. LOAD COMB 15 1.2(DL+IL-ELZ)
  94. 9 1.2 10 1.2 4 1.2
  95. LOAD COMB 16 1.2(DL+IL+WLX)
  96. 9 1.2 10 1.2 5 1.2
  97. LOAD COMB 17 1.2(DL+IL-WLX)
  98. 10 1.2 6 1.2
  99. LOAD COMB 18 1.2(DL+IL+WLZ)
 100. 9 1.2 10 1.2 7 1.2
 101. LOAD COMB 19 1.2(DL+IL-WLZ)
 102. 9 1.2 10 1.2 8 1.2
 103. LOAD COMB 20 1.5(DL+ELX)
 104. 9 1.5 10 1.5 1 1.5
 105. LOAD COMB 21 1.5(DL-ELX)
 106. 9 1.5 10 1.5 2 1.5
 107. LOAD COMB 22 1.5(DL+ELZ)
 108. 9 1.5 10 1.5 3 1.5
 109. LOAD COMB 23 1.5(DL-ELZ)
 110. 10 1.5 4 1.5
 111. LOAD COMB 24 1.5(DL+WLX)
 112. 10 1.5 5 1.5
 113. LOAD COMB 25 1.5(DL-WLX)
 114. 10 1.5 6 1.5
 115. LOAD COMB 26 1.5(DL+WLZ)
 116. 10 1.5 7 1.5
 117. LOAD COMB 27 1.5(DL-WLZ)
 118. 10 1.5 8 1.5
 119. LOAD COMB 28 0.9 DL+ELX
```

```
120. 10 0.9 1 1.5
121. LOAD COMB 29 0.9 DL-ELX
122. 10 0.9 2 1.5
123. LOAD COMB 30 0.9 DL+ELZ
124. 10 0.9 3 1.5
125. LOAD COMB 31 0.9 DL-ELZ
126. 10 0.9 4 1.5
127. LOAD COMB 32 0.9 DL+WLX
128. 10 0.9 5 1.5
129. LOAD COMB 33 0.9 DL-WLX
130. 10 0.9 6 1.5
131. LOAD COMB 34 0.9 DL+WLZ
132. 10 0.9 7 1.5
133. LOAD COMB 35 0.9 DL-WLZ
134. 10 0.9 8 1.5
135. PERFORM ANALYSIS PRINT ALL


         P R O B L E M   S T A T I S T I C S
         -----------------------------------

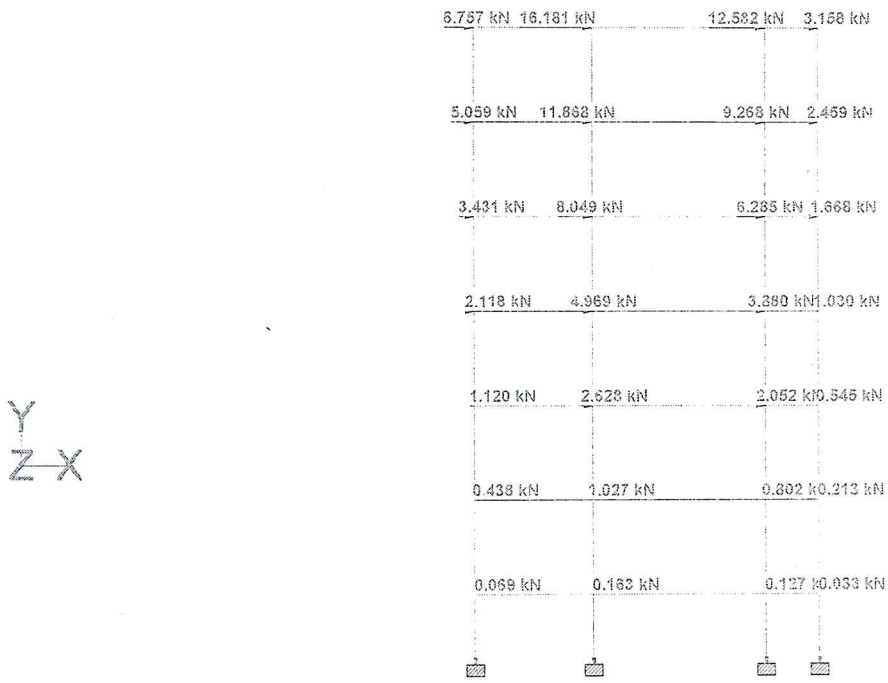
  NUMBER OF JOINTS         32  NUMBER OF MEMBERS      49
  NUMBER OF PLATES          0  NUMBER OF SOLIDS        0
  NUMBER OF SURFACES        0  NUMBER OF SUPPORTS      4

        Using 64-bit analysis engine.

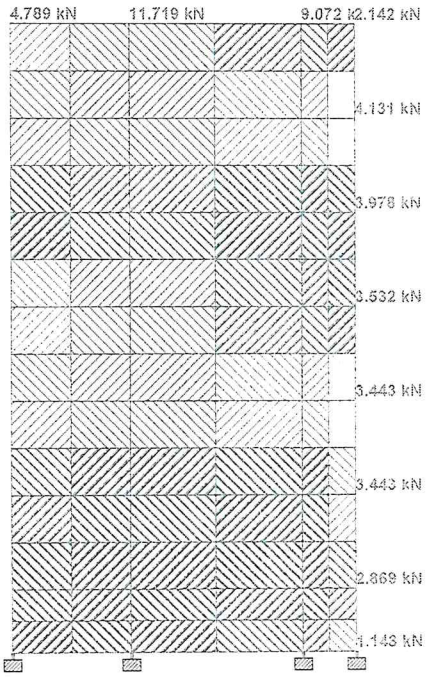
        SOLVER USED IS THE IN-CORE ADVANCED MATH SOLVER

TOTAL      PRIMARY LOAD CASES =    10, TOTAL DEGREES OF FREEDOM =     168
TOTAL LOAD COMBINATION  CASES =    25  SO FAR.
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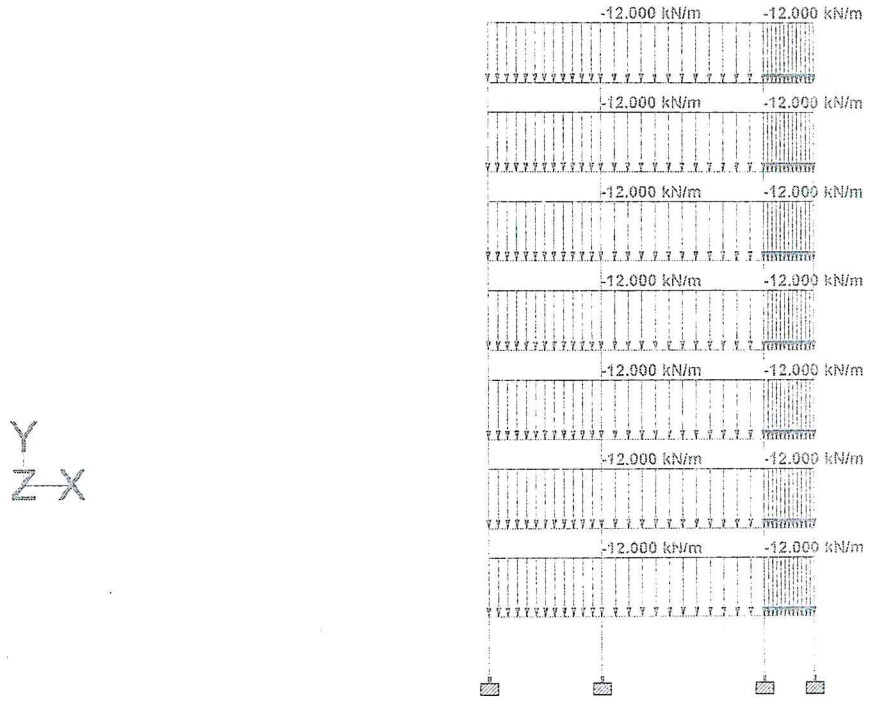
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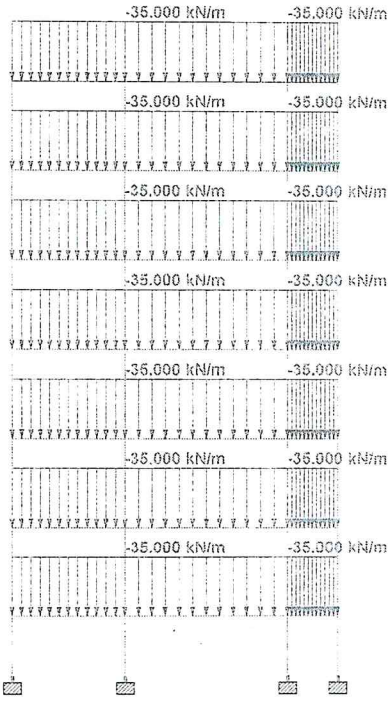
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4.789 kN
11.719 kN
9.072 kN
2.142 kN
4.131 kN
3.978 kN
3.532 kN
3.443 kN
3.443 kN
2.869 kN
1.143 kN


Y
Z
X


-12.000 kN/m
-12.000 kN/m
-12.000 kN/m
-12.000 kN/m
-12.000 kN/m
-12.000 kN/m
-12.000 kN/m
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-12.000 kN/m
-12.000 kN/m
-12.000 kN/m
Y
Z
X

Load 9





Load 10

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