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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

03-05-2024

STRUCTURAL STABILITY CERTIFICATE

It is certified that the Proposed Residential Building at Door No. 15, Zakariya Colony 1st Street, Varadarajanpet, Choolaimedu, Chennai- 600 094. Comprised in Old T. S. No. 62, As Per Patta T. S. No. 63/2, Block No. 29, Of Puliyur Village, Within the 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)
Structural Engineer,
CMDA Reg. No: SE/I/2024/2/0047
Door No: 21, 4th Main Road,
Indira Nagar, Chennai-600 020.

PROPOSED RESIDENTIAL BUILDING AT DOOR NO. 15, ZAKARIYA COLONY 1ST STREET, VARADARAJANPET, CHOOLAIMEDU, CHENNAI- 600 094. COMPRISED IN OLD T. S. NO. 62, AS PER PATTA T. S. NO. 63/2, BLOCK NO. 29, OF PULIYUR VILLAGE, WITHIN THE 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 Shallow 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 Or DL+LL+EL	1.2DL+1.2LL+1.2WL Or 1.2DL+1.2LL+1.2EL	DL+LL+WL or 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=    MAY  3, 2024                 *
*          Time=    14:15:38                     *
*                                                *
*  Licensed to: C.Kannan                         *
**************************************************
```

```
     1. STAAD SPACE
INPUT FILE: D:\AGAN\3.STABILITY\Tuya homes-Kodambakkam\Staad\Tuya Homes.. .STD
     2. START JOB INFORMATION
     3. ENGINEER DATE 03-MAY-24
     4. JOB NAME PROPOSED RESIDENTIAL BUILDING AT DOOR NO. 15, ZAKARIYA COLONY 1ST -
     5. STREET, VARADARAJANPET, CHOOLAIMEDU, CHENNAI- 600 094. COMPRISED IN OLD T. -
     6. S. NO. 62, AS PER PATTA T. S. NO. 63/2, BLOCK NO. 29, OF PULIYUR VILLAGE, -
     7. WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION
     8. ENGINEER NAME KANNAN
     9. CHECKER NAME KANNAN
    10. APPROVED NAME KANNAN
    11. CHECKER DATE 5/3/2024
    12. APPROVED DATE 5/3/2024
    13. END JOB INFORMATION
    14. INPUT WIDTH 79
    15. SET NL 250
    16. UNIT MMS KN
    17. JOINT COORDINATES
    18. 1 0 0 0; 2 1399.97 0 0; 4 7299.97 0 0; 5 8899.97 0 0; 6 10249.6 0 0
    19. 7 0 3000 0; 8 1399.97 3000 0; 9 3599.97 3000 0; 10 7299.97 3000 0
    20. 11 8899.97 3000 0; 12 10249.6 3000 0; 13 0 6000 0; 14 1399.97 6000 0
    21. 15 3599.97 6000 0; 16 7299.97 6000 0; 17 8899.97 6000 0; 18 10249.6 6000 0
    22. 19 0 9000 0; 20 1399.97 9000 0; 21 3599.97 9000 0; 22 7299.97 9000 0
    23. 23 8899.97 9000 0; 24 10249.6 9000 0; 25 0 12000 0; 26 1399.97 12000 0
    24. 27 3599.97 12000 0; 28 7299.97 12000 0; 29 8899.97 12000 0; 30 10249.6 12000 0
    25. 31 0 15000 0; 32 1399.97 15000 0; 33 3599.97 15000 0; 34 7299.97 15000 0
    26. 35 8899.97 15000 0; 36 10249.6 15000 0; 37 0 18000 0; 38 1399.97 18000 0
    27. 39 3599.97 18000 0; 40 7299.97 18000 0; 41 8899.97 18000 0; 42 10249.6 18000 0
    28. 43 1399.97 -2000 0; 44 7299.97 -2000 0; 45 8899.97 -2000 0
    29. MEMBER INCIDENCES
    30. 1 1 2; 2 2 4; 4 4 5; 5 5 6; 6 7 8; 7 8 9; 8 9 10; 9 10 11; 10 11 12; 11 13 14
    31. 12 14 15; 13 15 16; 14 16 17; 15 17 18; 16 19 20; 17 20 21; 18 21 22; 19 22 23
    32. 20 23 24; 21 25 26; 22 26 27; 23 27 28; 24 28 29; 25 29 30; 26 31 32; 27 32 33
    33. 28 33 34; 29 34 35; 30 35 36; 31 37 38; 32 38 39; 33 39 40; 34 40 41; 35 41 42
    34. 36 43 2; 37 2 8; 38 8 14; 39 14 20; 40 20 26; 41 26 32; 42 32 38; 44 9 15
    35. 45 15 21; 46 21 27; 47 27 33; 48 33 39; 49 44 4; 50 4 10; 51 10 16; 52 16 22
    36. 53 22 28; 54 28 34; 55 34 40; 56 45 5; 57 5 11; 58 11 17; 59 17 23; 60 23 29
    37. 61 29 35; 62 35 41
    38. UNIT METER KN
```

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STAAD SPACE -- PAGE NO. 2

```
39. DEFINE MATERIAL START
40. ISOTROPIC CONCRETE
41. E 2.17185E+07
42. POISSON 0.17
43. DENSITY 23.5616
44. ALPHA 1E-05
45. DAMP 0.05
46. G 9.28139E+06
47. TYPE CONCRETE
48. STRENGTH FCU 27579
49. END DEFINE MATERIAL
50. MEMBER PROPERTY
51. 1 2 4 TO 35 PRIS YD 0.45 ZD 0.2
52. 36 TO 42 44 TO 62 PRIS YD 0.45 ZD 0.2
53. CONSTANTS
54. MATERIAL CONCRETE ALL
55. UNIT MMS KN
56. SUPPORTS
57. 43 TO 45 FIXED
58. UNIT METER KN
59. 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.

60. TYPE 1 WIND 1
61. <! STAAD PRO GENERATED DATA DO NOT MODIFY !!!
62. CUSTOM:PARAMS
63. !> END GENERATED DATA BLOCK
64. INT 1.22 1.35 1.48 HEIG  10  15  18
65. EXP 1 JOINT 1 2 4 TO 45
66. DEFINE IS1893 2016 LOAD
67. ZONE 0.16 RF 5 I 1.2 SS 1 ST 1 DM 0.05 DT 0
68. SELFWEIGHT 1
69. MEMBER WEIGHT
70. 1 2 4 TO 35 UNI 12 0 0
71. 1 2 4 TO 35 UNI 25 0 0
72. LOAD 1 LOADTYPE SEISMIC-H  TITLE EQX
73. 1893 LOAD X 1
74. LOAD 2 LOADTYPE SEISMIC-H  TITLE EQX
75. 1893 LOAD X -1.
76. LOAD 3 LOADTYPE SEISMIC-V  TITLE EQZ
77. 1893 LOAD Z 1
78. LOAD 4 LOADTYPE SEISMIC-V  TITLE EQZ
79. 1893 LOAD Z -1.
```

STAAD SPACE -- PAGE NO. 3

```
  80. LOAD 5 LOADTYPE WIND  TITLE WIND +X
  81. WIND LOAD X 1 TYPE 1
*WARNING- NO MEMBERS LOADED FOR A WIND LOAD GENERATION.
  82. LOAD 6 LOADTYPE WIND  TITLE WIND -X
  83. WIND LOAD -X 1 TYPE 1
*WARNING- NO MEMBERS LOADED FOR A WIND LOAD GENERATION.
  84. LOAD 7 LOADTYPE WIND  TITLE WIND +Z
  85. WIND LOAD Z 1 TYPE 1
  86. LOAD 8 LOADTYPE WIND  TITLE WIND -Z
  87. WIND LOAD -Z 1 TYPE 1
  88. LOAD 9 LOADTYPE LIVE  TITLE L.L
  89. MEMBER LOAD
  90. 1 2 4 TO 35 UNI GY -12
  91. LOAD 10 LOADTYPE DEAD  TITLE D.L
  92. SELFWEIGHT Y -1 LIST ALL
  93. MEMBER LOAD
  94. 1 2 4 TO 35 UNI GY -25
  95. LOAD COMB 11 1.5(DL+IL)
  96. 9 1.5 10 1.5
  97. LOAD COMB 12 1.2(DL+IL+ELX)
  98. 9 1.5 10 1.2 1 1.2
  99. LOAD COMB 13 1.2(DL+IL-ELX)
 100. 9 1.2 10 1.2 2 1.2
 101. LOAD COMB 14 1.2(DL+IL+ELZ)
 102. 9 1.2 10 1.2 3 1.2
 103. LOAD COMB 15 1.2(DL+IL-ELZ)
 104. 9 1.2 10 1.2 4 1.2
 105. LOAD COMB 16 1.2(DL+IL+WLX)
 106. 9 1.2 10 1.2 5 1.2
 107. LOAD COMB 17 1.2(DL+IL-WLX)
 108. 10 1.2 6 1.2
 109. LOAD COMB 18 1.2(DL+IL+WLZ)
 110. 9 1.2 10 1.2 7 1.2
 111. LOAD COMB 19 1.2(DL+IL-WLZ)
 112. 9 1.2 10 1.2 8 1.2
 113. LOAD COMB 20 1.5(DL+ELX)
 114. 9 1.5 10 1.5 1 1.5
 115. LOAD COMB 21 1.5(DL-ELX)
 116. 9 1.5 10 1.5 2 1.5
 117. LOAD COMB 22 1.5(DL+ELZ)
 118. 9 1.5 10 1.5 3 1.5
```

```
119. LOAD COMB 23 1.5(DL-ELZ)
120. 10 1.5 4 1.5
121. LOAD COMB 24 1.5(DL+WLX)
122. 10 1.5 5 1.5
123. LOAD COMB 25 1.5(DL-WLX)
124. 10 1.5 6 1.5
125. LOAD COMB 26 1.5(DL+WLZ)
126. 10 1.5 7 1.5
127. LOAD COMB 27 1.5(DL-WLZ)
128. 10 1.5 8 1.5
129. LOAD COMB 28 0.9 DL+ELX
130. 10 0.9 1 1.5
131. LOAD COMB 29 0.9 DL-ELX
132. 10 0.9 2 1.5
133. LOAD COMB 30 0.9 DL+ELZ
134. 10 0.9 3 1.5
135. LOAD COMB 31 0.9 DL-ELZ
136. 10 0.9 4 1.5
137. LOAD COMB 32 0.9 DL+WLX
138. 10 0.9 5 1.5
139. LOAD COMB 33 0.9 DL-WLX
140. 10 0.9 6 1.5
141. LOAD COMB 34 0.9 DL+WLZ
142. 10 0.9 7 1.5
143. LOAD COMB 35 0.9 DL-WLZ
144. 10 0.9 8 1.5
145. PERFORM ANALYSIS PRINT ALL


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

  NUMBER OF JOINTS          44  NUMBER OF MEMBERS       60
  NUMBER OF PLATES           0  NUMBER OF SOLIDS         0
  NUMBER OF SURFACES         0  NUMBER OF SUPPORTS       3

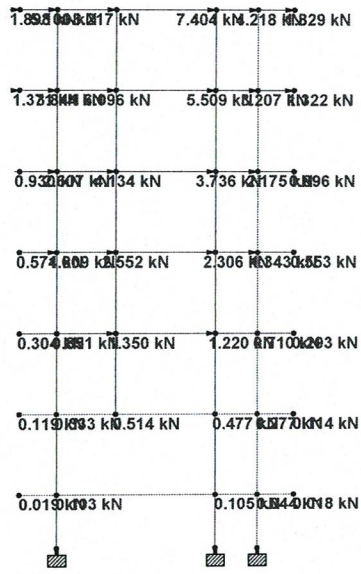
        Using 64-bit analysis engine.

        SOLVER USED IS THE IN-CORE ADVANCED MATH SOLVER

 TOTAL       PRIMARY LOAD CASES =     10, TOTAL DEGREES OF FREEDOM =      246
 TOTAL LOAD COMBINATION  CASES =     25  SO FAR.
```

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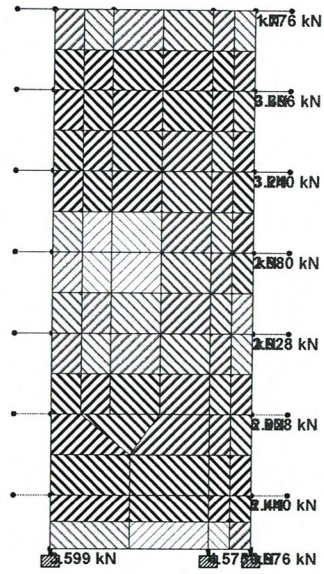




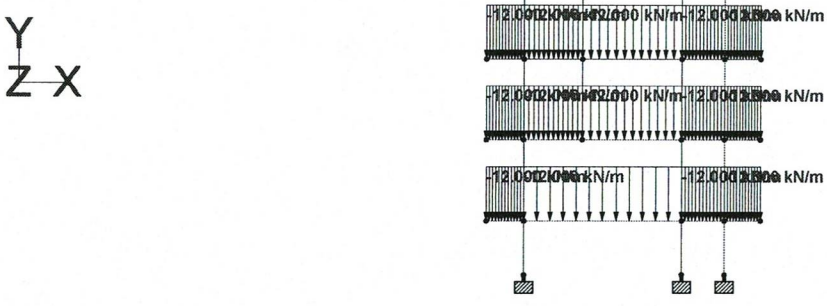
Load 1

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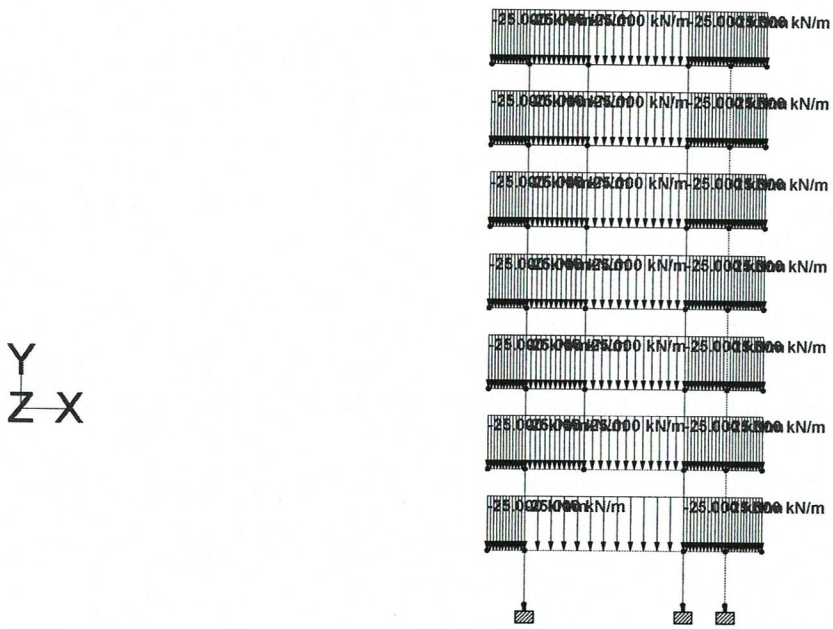




Load 7



Load 9



Load 10

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