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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

08.08.2024

STRUCTURAL STABILITY CERTIFICATE

It is certified that the Proposed Residential Building at Old Door No.12,New Door No.08,Appa Garden Road (Formerly Sivasankaran Mudailyar Road),Kilpauk,Chennai-600010 Comprised In T. S. Nos. 138/27 & 138/28 In Block No.10 Of Egmore Village, Egmore Taluk 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 PLOT OLD DOOR NO.12, NEW DOOR NO.08,APPA GARDEN ROAD (FORMERLY SIVASANKARAN MUDAILYAR ROAD),KILPAUK,CHENNAI-600010, COMPRISED IN T. S. NOS. NOS. 138/27 & 138/28 IN BLOCK NO.10 OF EGMORE VILLAGE, EGMORE TALUK 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	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  8, 2024                *
*           Time=    13:47:13                    *
*                                                *
*  Licensed to: C.Kannan                         *
**************************************************
```

```
     1. STAAD SPACE
INPUT FILE: D:\LOGESH\STABILITY CERTIFICATE\AMARA\APPA GARDEN\AMARA-APP.. .STD
     2. START JOB INFORMATION
     3. ENGINEER DATE 8/8/2024
     4. ENGINEER NAME KANNAN
     5. CHECKER NAME KANNAN
     6. APPROVED NAME KANNAN
     7. JOB NAME PROPOSED RESIDENTIAL BUILDING AT OLD DOOR NO.12, NEW DOOR NO.08, -
     8. APPA GARDEN ROAD (FORMERLY SIVASANKARAN MUDAILYAR ROAD), KILPAUK, -
     9. CHENNAI-600010 COMPRISED IN T.S.NO.138/27 & 138/28 IN BLOCK NO.10 OF EGMORE -
    10. VILLAGE, EGMORE TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.
    11. CHECKER DATE 8/8/2024
    12. APPROVED DATE 8/8/2024
    13. END JOB INFORMATION
    14. INPUT WIDTH 79
    15. SET NL 250
    16. UNIT MMS KN
    17. JOINT COORDINATES
    18. 32 -0.14782 0 -2600.69; 40 -15953.8 0 -2600.32; 127 -0.14782 3000 -2600.69
    19. 134 -15953.8 3000 -2600.32; 207 -0.14782 6000 -2600.69
    20. 214 -15953.8 6000 -2600.32; 287 -0.14782 9000 -2600.69
    21. 294 -15953.8 9000 -2600.32; 367 -0.14782 12000 -2600.69
    22. 374 -15953.8 12000 -2600.32; 432 -0.14782 15000 -2600.69
    23. 436 -15953.8 15000 -2600.32; 464 -0.14782 18000 -2600.69
    24. 468 -15953.8 18000 -2600.32; 469 -12373.4 18000 -2600.74
    25. 496 -0.14782 -2000 -2600.69; 500 -15953.8 -2000 -2600.32
    26. 501 -12373.4 -2000 -2600.74; 791 -4643.01 -2000 -2600.19
    27. 792 -12373.4 0 -2600.4; 793 -12373.4 3000 -2600.4; 794 -12373.4 6000 -2600.4
    28. 795 -12373.4 9000 -2600.4; 796 -12373.4 12000 -2600.4
    29. 797 -12373.4 15000 -2600.74; 798 -4643.01 0 -2600.19
    30. 799 -4643.01 3000 -2600.58; 800 -4643.01 6000 -2600.58
    31. 801 -4643.01 9000 -2600.58; 802 -4643.01 12000 -2600.58
    32. 803 -4643.01 15000 -2600.71; 804 -4643.01 18000 -2600.71
    33. MEMBER INCIDENCES
    34. 22 32 798; 144 127 799; 259 207 800; 374 287 801; 489 367 802; 595 496 32
    35. 599 500 40; 600 501 792; 888 432 803; 1225 464 804; 1472 792 40; 1473 793 134
    36. 1474 794 214; 1475 795 294; 1476 796 374; 1478 432 464; 1479 367 432
    37. 1480 287 367; 1481 207 287; 1482 127 207; 1483 32 127; 1484 436 468
    38. 1485 374 436; 1486 294 374; 1487 214 294; 1488 134 214; 1489 40 134
```

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STAAD SPACE -- PAGE NO. 2

```
39. 1490 797 469; 1491 796 797; 1492 795 796; 1493 794 795; 1494 793 794
40. 1495 792 793; 1496 797 436; 1497 469 468; 1498 798 791; 1502 798 792
41. 1503 799 793; 1504 800 794; 1505 801 795; 1506 802 796; 1507 803 797
42. 1508 804 469; 1509 799 798; 1510 800 799; 1511 801 800; 1512 802 801
43. 1513 803 802; 1514 804 803
44. START GROUP DEFINITION
45. FLOOR
46. END GROUP DEFINITION

** WARNING: NO VALID GROUPS IN GROUP DEFINITION DATA **
47. UNIT METER KN
48. DEFINE MATERIAL START
49. ISOTROPIC CONCRETE
50. E 2.17185E+07
51. POISSON 0.17
52. DENSITY 23.5616
53. ALPHA 1E-05
54. DAMP 0.05
55. G 9.28139E+06
56. TYPE CONCRETE
57. STRENGTH FCU 27579
58. END DEFINE MATERIAL
59. MEMBER PROPERTY
60. 595 599 600 1478 TO 1495 1498 1509 TO 1514 PRIS YD 0.6 ZD 0.2
61. 22 144 259 374 489 888 1225 1472 TO 1476 1496 1497 1502 TO 1507 -
62. 1508 PRIS YD 0.6 ZD 0.2
63. CONSTANTS
64. MATERIAL CONCRETE ALL
65. UNIT MMS KN
66. SUPPORTS
67. 496 500 501 791 FIXED
68. UNIT METER KN
69. DEFINE IS1893 2016 LOAD
70. ZONE 0.16 RF 5 I 1.2 SS 1 ST 1 DM 0.05 DT 2
71. MEMBER WEIGHT
72. 22 144 259 374 489 888 1225 1472 TO 1476 1496 1497 1502 TO 1508 UNI 45 0 0
73. 22 144 259 374 489 888 1225 1472 TO 1476 1496 1497 1502 TO 1508 UNI 15 0 0
74. 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.

75. TYPE 1 WIND 1
76. <! STAAD PRO GENERATED DATA DO NOT MODIFY !!!
77. CUSTOM:PARAMS
78. !> END GENERATED DATA BLOCK
79. INT 1.35 1.48 1.65 HEIG  10  15  18
80. EXP 1 JOINT 32 40 127 134 207 214 287 294 367 374 432 436 464 468 469 496 -
81. 500 501 791 TO 804
82. LOAD 1 LOADTYPE SEISMIC-H  TITLE EQ +X
83. 1893 LOAD X 1
84. LOAD 2 LOADTYPE SEISMIC-H  TITLE EQ -X
```

STAAD SPACE -- PAGE NO. 3

```
 85. 1893 LOAD X -1.
 86. LOAD 3 LOADTYPE SEISMIC-H  TITLE EQ +Z
 87. 1893 LOAD Z 1
 88. LOAD 4 LOADTYPE SEISMIC-H  TITLE EQ -Z
 89. 1893 LOAD Z -1.
 90. LOAD 5 LOADTYPE WIND  TITLE WIND +X
 91. WIND LOAD X 1 TYPE 1
 92. LOAD 6 LOADTYPE WIND  TITLE WIND -X
 93. WIND LOAD -X 1 TYPE 1
 94. LOAD 7 LOADTYPE WIND  TITLE WIND +Z
 95. WIND LOAD Z 1 TYPE 1
 96. LOAD 8 LOADTYPE WIND  TITLE WIND -Z
 97. WIND LOAD -Z 1 TYPE 1
 98. LOAD 9 LOADTYPE LIVE  TITLE LIVE
 99. MEMBER LOAD
100. 22 144 259 374 489 888 1225 1472 TO 1476 1496 1497 1502 TO 1508 UNI GY -15
101. LOAD 10 LOADTYPE DEAD  TITLE DEAD LOAD
102. SELFWEIGHT Y -1
103. MEMBER LOAD
104. 22 144 259 374 489 888 1225 1472 TO 1476 1496 1497 1502 TO 1508 UNI GY -45
105. LOAD COMB 11 1.5(DL+IL)
106. 9 1.5 10 1.5
107. LOAD COMB 12 1.2(DL+IL+ELX)
108. 9 1.5 10 1.2 1 1.2
109. LOAD COMB 13 1.2(DL+IL-ELX)
110. 9 1.2 10 1.2 2 1.2
111. LOAD COMB 14 1.2(DL+IL+ELZ)
112. 9 1.2 10 1.2 3 1.2
113. LOAD COMB 15 1.2(DL+IL-ELZ)
114. 9 1.2 10 1.2 4 1.2
115. LOAD COMB 16 1.2(DL+IL+WLX)
116. 9 1.2 10 1.2 5 1.2
117. LOAD COMB 17 1.2(DL+IL-WLX)
118. 10 1.2 6 1.2
119. LOAD COMB 18 1.2(DL+IL+WLZ)
```

```
120. 9 1.2 10 1.2 7 1.2
121. LOAD COMB 19 1.2(DL+IL-WLZ)
122. 9 1.2 10 1.2 8 1.2
123. LOAD COMB 20 1.5(DL+ELX)
124. 9 1.5 10 1.5 1 1.5
125. LOAD COMB 21 1.5(DL-ELX)
126. 9 1.5 10 1.5 2 1.5
127. LOAD COMB 22 1.5(DL+ELZ)
128. 9 1.5 10 1.5 3 1.5
129. LOAD COMB 23 1.5(DL-ELZ)
130. 10 1.5 4 1.5
131. LOAD COMB 24 1.5(DL+WLX)
132. 10 1.5 5 1.5
133. LOAD COMB 25 1.5(DL-WLX)
134. 10 1.5 6 1.5
135. LOAD COMB 26 1.5(DL+WLZ)
136. 10 1.5 7 1.5
137. LOAD COMB 27 1.5(DL-WLZ)
138. 10 1.5 8 1.5
139. LOAD COMB 28 0.9 DL+ELX
140. 10 0.9 1 1.5
141. LOAD COMB 29 0.9 DL-ELX
142. 10 0.9 2 1.5
143. LOAD COMB 30 0.9 DL+ELZ
144. 10 0.9 3 1.5
145. LOAD COMB 31 0.9 DL-ELZ
146. 10 0.9 4 1.5
147. LOAD COMB 32 0.9 DL+WLX
148. 10 0.9 5 1.5
149. LOAD COMB 33 0.9 DL-WLX
150. 10 0.9 6 1.5
151. LOAD COMB 34 0.9 DL+WLZ
152. 10 0.9 7 1.5
153. LOAD COMB 35 0.9 DL-WLZ
154. 10 0.9 8 1.5
155. PERFORM ANALYSIS PRINT ALL


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

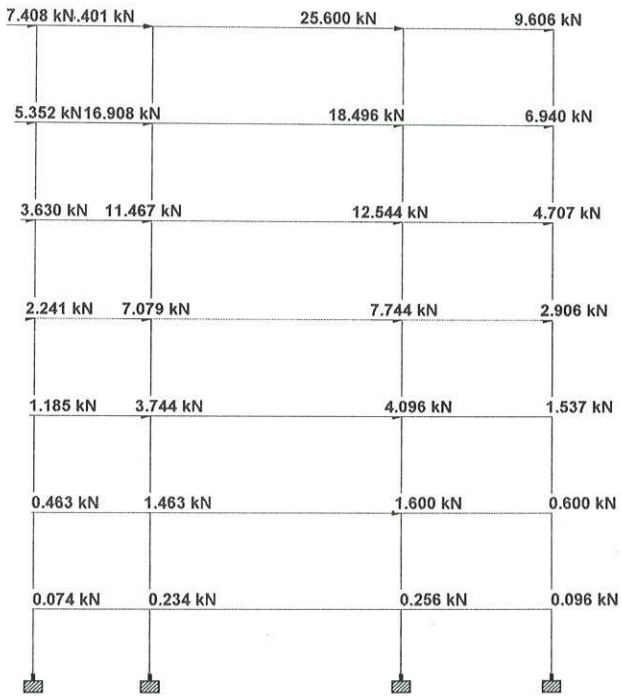
  NUMBER OF JOINTS         32  NUMBER OF MEMBERS      49
  NUMBER OF PLATES          0  NUMBER OF SOLIDS        0
  NUMBER OF SURFACES        0  NUMBER OF SUPPORTS      4

        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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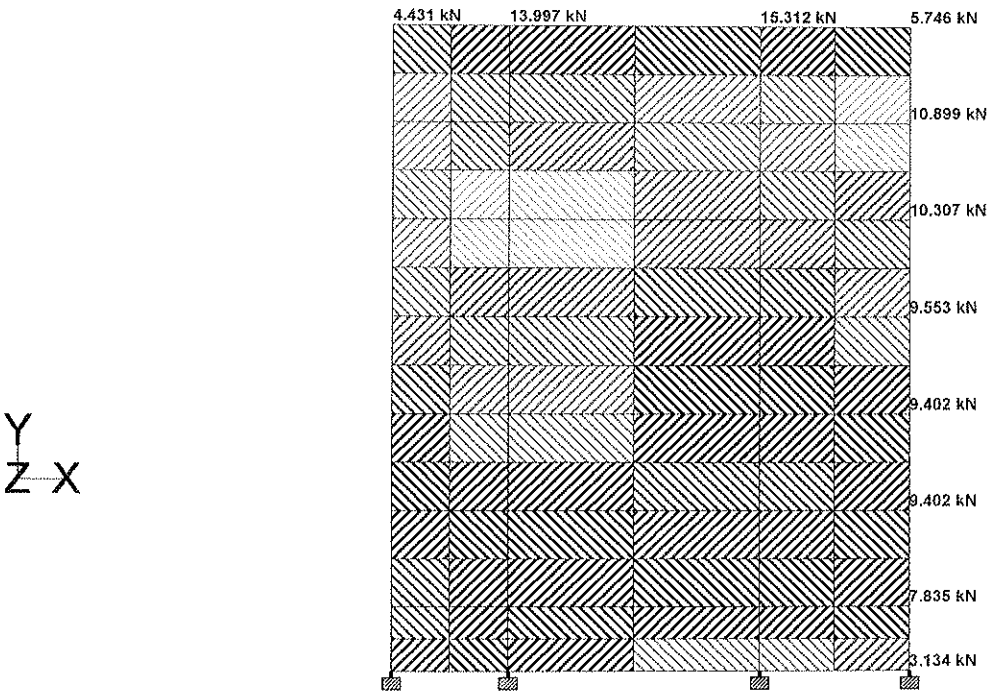
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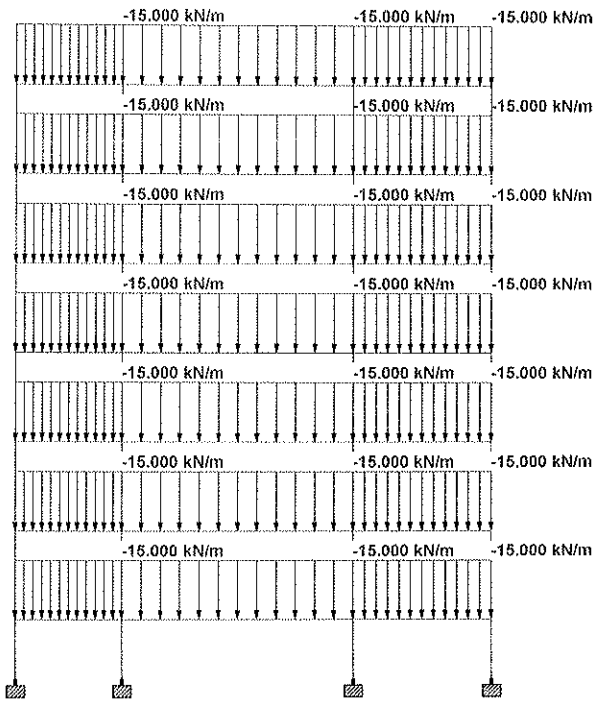
Y
Z X

Load 1

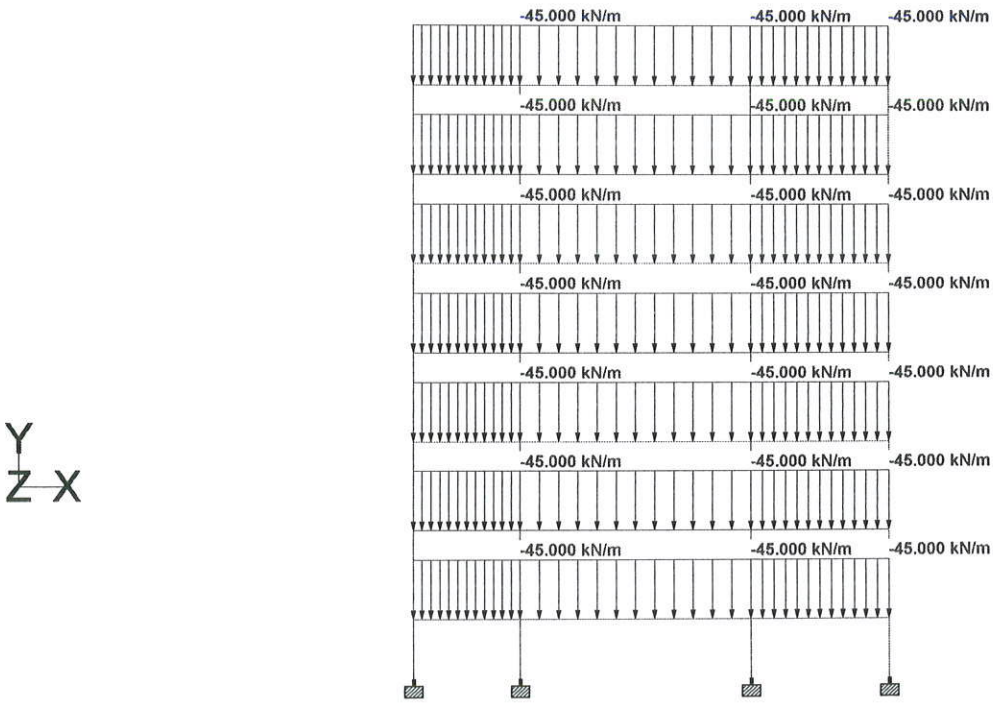
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4.431 kN
13.997 kN
16.312 kN
5.746 kN
10.899 kN
10.307 kN
9.553 kN
9.402 kN
9.402 kN
7.835 kN
3.134 kN
Y
Z
X

Load 7


-15.000 kN/m
-15.000 kN/m
-15.000 kN/m
-15.000 kN/m
-15.000 kN/m
-15.000 kN/m
-15.000 kN/m
-15.000 kN/m
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-15.000 kN/m
-15.000 kN/m
-15.000 kN/m
-15.000 kN/m
Y
Z
X

Load 9



Load 10

C. KANNAN, B.E., M.E, (Structure)
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3/350/2 Mettukuppam,
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Chennai, India

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+91 9996 12 9996
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