

**DIRECTORATE GENERAL
FIRE SERVICE, HOME GUARDS AND CIVIL DEFENCE, ODISHA
NUAPATNA, CUTTACK-753001**

FORM-II

[See rule-12 (5)]

Fire Safety Recommendation

File No. C-307-2017

1. Address of the proposed building/premises:- Over Plot No-4364 and others, Khata No.1988/9, Mouza - Ghatikhia, Bhubaneswar, Dist-Khurda.
2. Name and Address of the Applicant: - Sri. Kumud Ranjan Mishra, Director M/s Altrade Construction Pvt. Ltd., A/143, 2nd Floor, Saheed Nagar, Bhubaneswar-7
3. Date of Receipt of Application: - Dt.27.03.2017.
4. Proposed occupancy (Type of building): - 02 Blocks of G+6 floors apartment house with integrated basement
Occupancy: - "Residential as per Bhubaneswar Development Authority (Planning and Building Standards) Regulations, 2008 and "Residential-A" Subdivision A-4 (apartment houses) as per NBCI-2016.
5. Area with plot no and. khata no: - Plot area - 7286.98 m², Over Plot No-4364 and others, Khata No.1988/9, Mouza - Ghatikhia, Bhubaneswar, Dist-Khurda.
6. Date of Inspection: - Dt.14.02.2018
7. Recommendation: -

The plot abuts on a public road of width 18.03 mtrs. Two blocks of G+6 floors apartment houses with integrated basement have been proposed over the said plot. Block-1 is the main building, a part of which up to 2nd floor has been proposed as Club with incidental facilities like multi-purpose hall, gymnasium, squash, kids zone, billiards, indoor game/ library, pool etc. Block-2 (EWS block) is meant for economically weaker section people.

The area of individual floor in both the blocks and proposed occupancy are as follows:-

Block-1

- ✓ Ground- Area 2478.89 m²-Multipurpose hall, squash and apartments
- ✓ 1st Floor - Area 2387.70 m²-Squash, kids zone, billiards, indoor games/library and apartments
- ✓ 2nd Floor- Area 2303.42 m²-Gymnasium, pool and apartments
- ✓ 3rd Floor - Area 2176.78 m²-Apartments
- ✓ 4th Floor- Area 2166.24 m²- Apartments
- ✓ 5th Floor- Area 2201.25 m²-Apartments
- ✓ 6th Floor- Area 2172.25 m²-Apartments

Block-2 (EWS)

- ✓ Ground- Area 290.85 m²-Parking
- ✓ 1st to 6th Floor - Area 287.43 m² on each floor-apartments

ALLTRADE CONSTRUCTION PRIVATE LIMITED

Authorised Signature

Basement

Basement is common for both the blocks-5665.15 m² -Parking

As per National building code of India, proposed use of both the blocks are coming under residential category of occupancy (A) Subdivision A-4 (apartment houses).

A. OPEN SPACE, EXITS AND MEANS OF ESCAPE:-

Two boundary gates of width 6.5 mtrs each have been shown in the plan. If the boundary gates are built over, the minimum clearance shall be 4.5 mtrs. The height of both the blocks is 20.95 mtrs from the ground level for which open space of width 07 mtrs is required all around the buildings as per the provision of Bhubaneswar Development Authority (Planning and building standards) Regulations-2008 and the same have been shown in the plan. However, BDA, Bhubaneswar may verify the plan as regards provision of open space shown therein and setbacks applicable for the said buildings.

The compulsory open space around the buildings up to 06 mtrs shall not be used for parking purpose and shall be free from obstruction at all time. Drive way of width 06 mtrs, having turning radius of 09 mtrs shall be planned all around the buildings. As shown in the plan, the roof of the basement extends beyond the plinth line into the driveway, hence roof of the basement shall have also load bearing capacity upto 45 ton and load bearing capacity certificate from the competent authority shall be obtained to that effect.

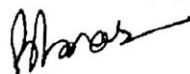
Adequate number of exits/staircases and protected escape routes as per provisions of Bhubaneswar Development Authority Planning & Building Standards Regulations-2008 shall be provided in the buildings on all floors to enable its occupants to reach place of safety in case of emergency and in no case there shall be less than two exits to provide direct access in separate directions from any point in the area served on every floor. The exits/staircases shall be placed as remote from each other as possible and also comply to other provisions i.e. permissible travel distance, dead end corridor length in exit access etc, as per the provisions of Bhubaneswar Development Authority, Planning and Building Standards Regulations, 2008. All the exits shall be accessible from the entire floor area at all floor levels. The exit doorways of the hotel rooms shall be of clear width not less than 01 mtrs each and have height minimum of 2.1mtrs. Similarly, provision of adequate exits shall be made for gymnasium, games zone, library, Kids zone and other areas of assembly in the buildings in accordance with Bhubaneswar Development Authority, Planning and Building Standards Regulations, 2008 and the width of the exit doorways of such areas shall not be less than 02 mtrs each. All the corridors & passageways in the buildings shall be of width not less than the calculated aggregate width of exit doorways leading from them in the direction of travel to the exit, but in no case less than 1.25 mtrs. The minimum number of exits required on every floor of the buildings and their dimensions shall be determined as per clause-4.2.1 to 4.4.2.4.2 of Part-IV, NBCI-2016 & BDA Regulations.

The use of glass shall not be permitted in enclosures for exits & exit passage way. The glazing and glass façade if provided shall be done in accordance with Clause-3.4.10 of Part-4, NBCI-2016. The finishing materials used for various surfaces & décor shall be such that it shall not generate toxic smoke/fumes.

The escape routes should be well ventilated and provided with safety lighting and free from obstructions. Exits shall be clearly visible and the routes to reach the exit shall be clearly marked and sign posted to guide the population of the floor concerned. Signs shall be illuminated and wired to an independent electrical circuit on an alternative source of supply. Exit signs shall be provided such that no point in an exit access is more than 30mtrs from a visible exit directional sign. Provision of escape lighting and exit signage shall be made in accordance to Clause-3.4.7.1 to 3.4.7.4 of Part-4, NBCI-2016 & relevant BIS. Floor exit plan shall be provided in each floor to determine the movements of traffic by most expeditious route.

B. CONSTRUCTION: - Non-combustible materials with appropriate fire resistance rating shall be used for construction of the building. Load bearing steel beams & columns of building having total covered area of 500m² & above shall be protected against failure / collapse of structure in case of fire. A door way or opening in a fire resistance wall on any floor shall be limited to 5.6 m² in area with a maximum height / width of 2.75 mtrs. Every wall opening shall be protected with fire resisting doors, having the fire rating of not less than 120 min. The openings in the floors shall be protected by vertical enclosures extending above and below such openings, such enclosures having a fire resistance of not less than 120 min. & all openings therein being protected with a fire resisting assembly. Further it shall be ensured that a clear height of such assembly in the exit access shall not be less than 2100 mm.

Except basement floor, all other floors shall be compartmented / zoned with area of each compartment not more than 750 m². The maximum size of the Compartment in the basement shall be 3000



ALLTRADE CONSTRUCTION PRIVATE LIMITED



Authorised Signature

m². The fire barrier of such compartments shall have fire resistance rating of 120 min. Compartmentation of floors in the building shall be done as per the provisions given in clause 4.5, part-4, NBCI-2016.

Compartmentation of basement car parking shall be done with fire barrier or with water curtain nozzle (K-23) or with combination thereof. Automatic deluge system comprising deluge valve, piping nozzles, etc shall be used to zone the compartment in case of water curtain system. In case of water curtain, required additional provision of water with dedicated electric pump of adequate capacity shall be made. Car parking facilities in basement or at upper levels shall comply with Annexure-H of Part-IV, NBCI-2016.

There shall be provision of at least one firefighting shaft in each building. But provision of the same has not been shown in the plan. So the building plan needs to be redesigned accordingly. The protected area of the firefighting shaft shall have 120 min. fire resistance rating & comprising of protected lobby, staircase & fireman's lift. It shall have connectivity directly to exit discharge or through exit passageway with 120 min fire resistance walls at the level of exit discharge to exit discharge. The respective floors shall be approachable from it. It shall have provision of 120 min. fire doors. Besides, it shall have provision of fireman talk back, wet riser & landing valve in its lobby. Staircase & fire lift lobby of firefighting shaft shall be smoke controlled. Provision of Horizontal exits shall be planned in the building by way of separation of adjoining compartment through 120 min. fire barrier. Provision of firefighting shaft and horizontal exits shall be made in accordance to Clause-2.24 and Annexure- E, Part-4, NBCI-2016.

Refuse chutes, if any provided in the building, shall have opening at least 1 m above roof level for venting purpose and they shall have an enclosure wall of non-combustible material with fire resistance of not less than 120 min. They shall not be located within the staircase enclosure or service shafts, or air conditioning shafts. Inspection panel and doors of refuse chutes shall be tight fitting with 60 min fire resistance. Sprinkler protection system shall be provided for the refuse chutes. Refuse chutes shall be at least 6 m away from exits.

The construction and use of the basement shall be strictly in accordance to provision of Bhubaneswar Development Authority, Planning and Building Standards Regulations, 2008. Adequate provision of exits and ramps shall be made in the basements as per Bhubaneswar Development Authority (Planning and Building Standards) Regulations, 2008 (Amended 2013) and NBCI-2016. The ramp providing access to basement shall be constructed leaving required open space around the building. Door openings leading from upper floors to basement shall need to be protected with fire doors with 120 min. fire rating except for exit discharge doors from the basements.

Smoke exhaust system having make-up air and exhaust air system shall be planned for large lobbies and which have exit through staircase leading to exit discharge. All exit passageways (from exit to exit discharge) shall be pressurized or naturally ventilated. The mechanical pressurization system shall be automatic in action with manual controls in addition. Doors provided in such exit passageway shall be fire rated doors of 2 hrs. rating. Each basement shall be separately ventilated. Vents with cross-sectional area (aggregate) not less than 2.5 percent of the floor area spread evenly round the perimeter of the basement shall be provided in the form of grills or breakable stall board lights or pavement lights or by way of shafts. Alternatively, a system of mechanical ventilation shall be provided so as to permit 12 air changes per hour in case of fire or distress call. Ventilation system shall start automatically on actuation of detector provided in the basement area. Smoke exhaust and pressurization of areas shall be done as per the provisions given in clause- 4.6 of part-4, NBCI-2016.

C. STAIRCASE: - Provision of eight numbers of staircases having connectivity from basement to terrace have been proposed in block-1. Besides, four more numbers of staircases have been planned from 5th floor to top most of floor of block-1. Similarly two numbers of staircases have been planned in block-2, out of which one is continuous from basement floor.

The staircases shall be placed as remote from each other as possible and shall be arranged to provide direct access in separate directions from any point in the area served and also comply to other provisions i.e. dimension, permissible travel distance, dead end corridor length in exit access etc. as per the provisions of Bhubaneswar Development Authority (Planning and Building Standards) Regulations, 2008 (Amended 2013) and NBCI-2016. Further, additional staircases if necessary shall be provided to comply with required provisions of exit as mentioned above.

As per the provisions of Bhubaneswar Development Authority (Planning and Building Standards) Regulations, 2008 (Amended 2013) and NBCI-2016 the access to the basement shall be separate from the main and alternative staircase providing access & exit from higher floors. However, as shown in the plan most

ALLTRADE CONSTRUCTION PRIVATE LIMITED

Authorized Signature

of the staircases are continuous from basement floor. Hence, the authority BDA, Bhubaneswar may take appropriate decision on the matter. Door openings leading to the basement shall need to be protected with fire doors with 120 min fire rating, except for exit discharge doors from the basements. Where the staircase is continuous in the case of buildings served by more than one staircase the same shall be of enclosed type serving as fire separation from the basement floor and higher floors.

The clear width of each staircase shall not be less than 01.25 mtrs each. The minimum width of treads without nosing shall be 25 cm for an internal staircase. The treads shall be constructed and maintained in a manner to prevent slipping. The maximum height of riser shall be 15 cm. Construction of staircases & their dimension shall be as per Bhubaneswar Development Authority (Planning and Building Standards) Regulations, 2008 (Amended 2013) and NBCI-2016.

The internal staircases not constructed with external wall shall be pressurized. The internal staircases constructed with external wall shall be naturally ventilated or pressurized. The natural ventilation requirement of the staircase shall achieved thorough opening at each landing of an area 0.5 m² in the external wall. Pressurization of the staircase shall be done as per Clause-4.4.2.5, 4.6, 6.1.1.3 & Annexure-E of Part-4, NBCI-2016.

D. LIFT: - As shown in the plan there is provision of eight numbers of lifts in block-1 and one in block-2.

The Lifts shall not open in staircase landing. Grounding switch (es) at ground floor level shall be provided to enable the fire service to ground the lifts. Besides, telephone / talk back communication facilities shall be provided.

The lobbies and wells of the lifts shall be pressurized those are proposed to communicate to basements or located in the core of the building. Lift lobbies of other lifts shall be pressurized or naturally ventilated. Pressurization of the lifts shall be done as per the provisions given in Clause-4.4.2.5 of Part-4, NBCI-2016.

Construction and provisions of fire and life safety measures of lifts shall be in accordance with Bhubaneswar Development Authority Planning and Building Standards Regulations, 2008 (amended 2013) and Clause 4.4.2.5 of part-4 and 'Building Services, Section 5 Installation of Lifts, Escalators and Moving Walks, Sub-Section 5 A Lifts of Part-8 of National Building Code of India, 2016.

E. AIR CONDITIONING: - Air-conditioning system if installed need to be maintained so as to minimize the danger of spread of fire, smoke or fumes from one floor to other or from outside to any occupied building or structure. Separate air handling units (AHU) for each floor shall be provided so as to avoid the hazards arising from spread of fire and smoke through the air conditioning ducts. The air ducts shall be separate from each AHU to its floor and in no way shall interconnect with the duct of any other floor. Within a floor it would be desirable to have separate air handling unit provided for each compartment. Air conditioning systems circulating air to more than one floor area should be provided with dampers designed to close automatically in case of fire and thereby prevent spread of fire or smoke. Such a system should also be provided with automatic controls to stop fans in case of fire, unless arrange to remove smoke from a fire, in which case these should be designed to remain in operation. Besides, provision of dampers shall be made where ducts / passages enter the vertical shaft & at the inlet of supply air duct as well as the return air duct of each compartment on every floor. Dampers shall be integrated with fire alarm panel. Manual operation facilities for damper operation shall also be provided. Air ducts serving main floor areas, corridors, etc. shall not pass through the exits / exit passage way / exit enclosure. Exits and lift lobbies, etc. shall not be used as return air passage. The openings around the ducts pass through fire walls or floors shall be sealed with materials having fire resistance rating of the compartment.

Air Conditioning & mechanical ventilation requirements of different rooms or areas of the building shall be as per the provisions given in Part-8, NBCI-2016.

F. ELECTRICAL INSTALLATION: - It is desirable that the wiring and cabling are with flame retardant property. Medium and low voltage wiring running in shafts, and within false ceiling shall run in metal conduit. Any 230 V wiring for lighting or other services, above false ceiling, shall have 660V grade insulation.

The electric distribution cables/wiring shall be laid in a separate shaft. The shaft shall be sealed at every floor with fire stop materials having the same fire resistance as that of the floor. High, medium and low voltage wiring running in shaft and in false ceiling shall run in separate shaft/conduits. Any other service line

ALLTRADE CONSTRUCTION PRIVATE LIMITED

Authorised Signature

shall not be laid in the duct used for electrical cables. An independent, ventilated or air conditioned MV panel room shall be provided on the ground level. This room shall be provided with access from outside. The MV panel room shall be provided with fire resistant walls and doors of fire resistance of not less than 120 min. Electrical MV main distribution panel and lift panels shall be provided with CO₂/inert gas flooding system for all panel compartments with a cylinder located beside the panel. A substation or a switch station with oil filled equipment shall not be allowed to be functional inside the building. All transformers of capacity more than 10 MVA shall be protected by high velocity water spray systems or nitrogen injection system. Transformers if located inside a building shall be of dry type & all sub-station / switch room walls, ceiling, floor, opening, including doors shall have a fire resistance rating of 120 min. Access to the sub-station shall be provided from the nearest fire exit/exit staircase for the purpose of electrical isolation. Diesel generator set (s) shall not be installed at any floor other than ground floor. If same are installed indoors, proper ventilation and exhaust shall be planned. The D.G. Set room shall be separated by 120 min fire resistance rated walls & doors. Provision for lightning protection shall be made in the building. Routing of down conductors of lightning protection shall not be made through electrical or other service shafts.

The specific requirements for electrical installations from fire safety point of view shall be in accordance to Part-8 of NBCI-2016, National Electrical Code-2011 and relevant BIS Specifications.

G. SERVICE DUCTS & SHAFTS: - Openings in walls or floors which are necessary to be provided to allow passages of all building services like cables, electrical wirings, telephone cables, plumbing pipes, etc. shall be protected by enclosure in the form of ducts / shafts having a fire resistance not less than 120 min. The inspection door for electrical shafts / ducts shall be not less than 120 min rating and that in case of plumbing shafts that shall be not less than 30 min. rating. Further, medium & low voltage wiring running in shafts / ducts shall either be armoured type or run through metal conduits. The space between the electrical cables / conduits and the walls / slabs shall be filled in by a fire stop material having fire resistance rating of not less than 120 min. Provision of Service ducts & shafts in the buildings shall be made in accordance with Clause-3.4.5.4 of Part-4, NBCI-2016.

H. STANDBY SOURCE OF POWER SUPPLY: - There shall be provision for dedicated emergency power supply to fire pumps, lifts, fire alarm system, pressurization system, emergency lighting, escape route lighting, exit signage, public address system, lighting in fire command center, magnetic door hold open devices, etc. The power supply to the panel / distribution board of these fire and life safety systems shall be through fire proof enclosures or circuit integrity cables or through alternate route in the adjoining fire compartment to ensure supply of power is reliable to these systems and equipment. Cables for fire alarm and PA system shall be laid in metal conduits or armoured to provide physical segregation from the power cables.

I. FIXED FIRE FIGHTING INSTALLATIONS: - The following fixed firefighting installations are required to be provided in the building..

i. **DOWN COMER:** - Down-Comer system shall be provided on each floor of the buildings with landing valves. The Down-Comer pipe shall be connected to terrace tank through terrace pump. Installation of Down-Comer shall be done in accordance to relevant BIS specification. Sufficient length of rubber lined fire hoses subject to minimum two lengths of 15 mtrs length fitted with coupling together with branch pipe and nozzle conforming to IS:903:1984 should be provided and kept adjacent to the hydrant in hose boxes.

ii. **FIRST-AID HOSE REEL:** - First-aid hose reel shall be provided on each floor of the building in accordance to relevant BIS specification.

iii. **TERRACE TANK:** - Terrace tank of 25,000 ltrs. capacity shall be provided at the top of the each building for firefighting purpose. It should be ensured that water in the tank is not utilized for any other purpose other than firefighting. The terrace tank should be connected to Down comers. In case of water curtain if used for compartmentation of basement car parking required additional provision of water with independent electric pump of adequate capacity shall be made to supplement water demand for water curtain nozzles for 60 minutes considering the largest compartment's perimeter out of all compartments. Both the terrace tanks shall be interconnected at ground level for maximum utilization of available water source in case of emergency.

Mares

ALLTRADE CONSTRUCTION PRIVATE LIMITED

NA

Chief Engineer

iv. **TERRACE PUMPS**:-One Terrace pump of capacity 900 LPM shall be provided at top of the each building for firefighting purpose. The pump is to be operated automatically or manually either from the usual supply of Electricity or from the stand by power supply (Generator) in case of failure of usual electrical supply. The terrace pump shall be provided as per relevant BIS specification.

v. **FIRE EXTINGUISHER**:-The exact requirement/types of fire extinguishers will be suggested after completion of construction of the building before occupation.

vi. **AUTOMATIC SPRINKLER SYSTEM**:- Automatic water sprinkler system with sprinkler heads shall be provided in the basement. Installation of sprinklers shall be in accordance to relevant BIS specification.

vii. **MANUAL OPERATED ELECTRONIC FIRE ALARM SYSTEM**:-Manually operated electronic fire alarm system at conspicuous places in each floor of the buildings shall be provided in accordance to NBCI-2016 and relevant BIS specification.


J. **FIRE COMMAND CENTER (FCC)**:-There shall be a Fire Command Center on entrance floor of the building having direct access. The control room shall have the main fire alarm panel with communication system (suitable public address system). The entire building shall be provided with public address system with main control at Fire Command Center. Fire Command Center shall have provisions as given in Clause-3.4.12 of Part-IV, NBCI-2016.

The owner / occupier shall provide any additional fire safety requirements in future if the recommendation is issued by this office.

After completion of the construction work including installation of fixed firefighting measures as suggested, the owner/occupier shall be required to apply for Fire Safety Certificate as per Rule 13 (1) of Odisha Fire Prevention and Fire Safety Rules, 2017, along with following documents:-

- i. The owner / occupier shall produce a certificate to be issued by the person concerned to the effect that all the provisions of Bye-Laws / Regulations of Bhubaneswar Development Authority have been incorporated in the building.
- ii. The owner / occupier shall produce a certificate of the Competent Authority concerned to the effect that electrical installations have been done as recommended and as per provisions given in Part-8 "Building Services, Section-2 Electrical and allied installations" of NBCI-2016 and Section-7 of National Electrical Code, 2011.
- iii. The owner / occupier shall produce a certificate of the agency concerned to the effect that installation of firefighting measures have been done as recommended and as per provisions given in Part-4 of National Building Code of India - 2016 and relevant BIS specifications.

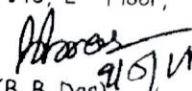
By order of the Director of Fire Service


(B. B. Das)
Chief Fire Officer,
Fire Prevention Wing

Memo No. 8335/FPW

Copy to Sri. Kumud Ranjan Mishra, Director M/s Altrade Construction Pvt. Ltd., A/143, 2nd Floor, Saheed Nagar, Bhubaneswar-7 for information and necessary action.


Date. 9-05-2018


(B. B. Das)
Chief Fire Officer,
Fire Prevention Wing

Memo No. _____/FPW

Copy to Fire Officer, Central Range, Cuttack for information.

Date. -05-2018


(B. B. Das)
Chief Fire Officer,
Fire Prevention Wing

ALLTRADE CONSTRUCTION PRIVATE LIMITED


Authorised Signature