Comprehensive background information on the status of the WHO South-East Asia Regional Office Building in New Delhi, India, was presented to the Sixty-ninth session of the WHO Regional Committee for South-East Asia held in Colombo, Sri Lanka, in September 2016. This was a follow-up review exercise of the preliminary building report submitted at the previous session held in Dili, Timor Leste, in September 2015.

Regional Committee Decision SEA/RC69(3) noted the urgent need for the Regional Office to move to temporary premises pending the establishment and implementation of a sustainably funded reconstruction strategy.

Suitable premises for the temporary move of the Regional Office have been secured and work is on to shift operations before the end of 2017. WHO has agreed to cover the costs of this move for a duration of up to five years.

The comprehensive specialized study providing a detailed business case for a recommended solution has been completed, validating earlier findings and setting a total estimated budget of US$ 55.89 million for the combined reconstruction and temporary move of premises.

The Government of India has communicated an in-principle agreement to fund and manage the reconstruction project (US$ 35.4 million) and discussions are ongoing to ensure the shortest possible timelines.

More than US$ 1 million has been been pledged by Member States other than India thus far towards the Regional Office Building project.

The attached working paper was presented to the High-Level Preparatory (HLP) Meeting for its review and recommendations. The HLP Meeting reviewed the paper and made the following recommendations for consideration by the Seventieth Session of the Regional Committee:
Action by WHO

(1) Provide updates on the SEA Regional Office Building reconstruction project to the Seventieth Session of the Regional Committee.

This Working Paper and the HLP Meeting recommendations are submitted to the Seventieth Session of the WHO Regional Committee for South-East Asia for its consideration and decision.
Background

1. Preliminary review of the status of the buildings housing the WHO Regional Office for South-East Asia (SEARO) in New Delhi, India, was conducted by the WHO Regional Committee at its Sixty-eighth session in Dili, Timor-Leste, in 2015. A further review in greater detail was conducted by the Sixty-ninth session in Colombo, Sri Lanka, in 2016, during which the Committee expressed concern over the safety of the current Regional Office Building and agreed that the condition of the building warranted an immediate decision on temporary relocation of staff members and construction of new premises.

2. In its Decision SEA/RC69(3), the Regional Committee requested the Secretariat to:

   (i) proceed as soon as possible with the relocation to temporary accommodation in New Delhi, duly considering the appropriateness of the premises in relation to the Regional Office’s convening mandate; and

   (ii) finalize a sustainably funded reconstruction strategy for the new Regional Office Building, considering all available funding mechanisms, including but not limited to: real estate funds, other potential reserves, and contributions from the Host Member State. In this regard, the Committee also desired that negotiations with WHO headquarters may also be held to secure additional Budget Space and Budget for the proposed construction and related costs involved.

Progress made

(A) Move to temporary premises

3. As per standard practice for WHO in the case of such largescale rental projects, a professional and internationally reputed real estate consulting company was engaged, following the established procedures, to assist SEARO in identifying temporary premises.

4. The consulting company conducted a market research process using SEARO requirements and their professional expertise, and proposed 25 swing space properties for WHO’s consideration. Following comprehensive reviews, site visits and investigations, and in consultation with the constituted Building Committee in SEARO, the following two adjacent swing space properties were identified as the future temporary office for WHO SEARO, with a total combined area of 76 789 square feet:

   (1) Metropolitan Hotel (26 100 sq. ft)

   (2) Red Fort Capital Parsvnath Tower 1 (RFCPT 1) (50 686 sq. ft)

5. The above properties were selected based on their acceptable security provisions, including meeting the earthquake resistance codes, and their ideal location in central Delhi with proximity to basic amenities, public transportation and numerous hotels for accommodation and meeting requirements. Selection of these temporary premises to relocate SEARO staff on time reduces unacceptable risks: to staff safety since they are currently housed in a seismically vulnerable building structure; to potential strategic business interruptions; to organizational liability risks; and to reputational risks to the entire Organization.
6. The United Nations Department of Safety and Security (UNDSS), New Delhi, has completed the security assessment of both premises and endorsed the suitability of these premises for relocation of the WHO SEA Regional Office.

7. After careful review and close examination of the WHO Contract Review Committee, due diligence performed by a contracted lawyer, and clearance by the Legal team at WHO headquarters, WHO signed the lease agreements for the two properties on 1 May 2017 for an initial period of three years renewable for another three years.

8. The design of the temporary offices is currently being finalized by the contracted architect in consultation with the Project Management Team and the newly constituted SEARO Building Relocation Committee, for the planned office move by December 2017.

(B) Finalize sustainably funded reconstruction strategy

(i) In-depth analysis of options completed

9. At the Sixty-ninth session of the Regional Committee, initial findings were presented from the international real estate consultancy company engaged by the Secretariat to conduct a comprehensive study of the options available for the Regional Office Building. The final report: “Business Case Report World Health Organization – SEARO” was completed in 2017 and is appended as Annex 1, providing a detailed study of the costs and benefits of the following three options:

**Option 1: Refurbishment of the existing campus:** This entailed the retrofitting of the Main Building and Conference Hall to render them compliant with current building standards, and demolition of the three Annex Buildings. During the refurbishment period, all staff would be required to be relocated to a temporary premise. Upon completion of refurbishment of the Main Building and Conference Hall, two thirds of the staff members would be relocated back to the refurbished SEARO building with one third of staff continuing to reside in an alternate rented facility on account of space limitations. This option would extend the life of the building by 15–20 years only after which reconstruction would be required.

**Option 2: Redevelopment of the whole campus:** This required relocating the present staff to temporary premises during the dismantling of all building structures on the current site and new construction in accordance with all safety and structural building codes. This option would cater to the current as well as long-term operational staffing requirements.

**Option 3: Part redevelopment and part refurbishment:** The third option was a hybrid of Options 1 and 2. It entailed a similar procedure as Option 2, whereas the entire Main Building and annexes would be demolished and redeveloped, while the Conference Hall Block would only be retrofitted to current building codes, increasing the lifespan of that part of the campus by 15–20 years only after which reconstruction would need to be considered.

10. The business case explored several indicators of strategic importance, including: security, health and safety, financial consequences, environmental concerns, compliance with applicable legislation, long-term operational costs and organizational flexibility. The conclusion of the report validated the recommendation of previous studies which led to the Regional Committee Decision
SEA/RC69(3) requesting the Secretariat to move to alternate premises and find means to finance a redevelopment of the whole campus. The report provides financial and practical evidence for the recommendation to proceed with Option 2: Redevelopment of the whole campus.

11. This same consultancy company assisted SEARO in exploring the market in Delhi to source suitable facilities in central New Delhi to temporarily house the Regional Office during the period of the reconstruction project. Accordingly, the Business Case Report presented comprehensive and detailed financial estimates for the complete costs of the reconstruction project, including the temporary move of office premises. The total costs of the overall project is determined as US$ 55.89 million, of which US$ 35.4 million is for the reconstruction and US$ 20.49 million for the rental and fit-out of the temporary premises for a period of five years.

(ii) Funding solutions

12. In recognition of the practical, administrative and logistical challenges associated with this major project, the role of the World Health Organization in carrying out its mandate to provide leadership in health in the Region, and the important central role of the Government of India as host country to the South-East Asia Regional Office, a Joint Standing Committee of WHO SEARO and the Ministry of Health and Family Welfare, Government of India, was established to provide strategic direction, coordination and facilitation of any relocation and reconstruction project.

13. The Joint Standing Committee continued to be engaged and in its meeting on 1 March 2017, the Ministry of Health and Welfare confirmed the approval, in principle, of the contribution of the Government of India of Indian Rupee 2280 million (US$ 35.4 million) for the construction of the new Regional Office Building. It was further confirmed that the construction project will be managed by the Government of India in collaboration with WHO. Further confirmation of this through an in-principle approval was provided by the Ministry of Health and Family Welfare (MoHFW) of India in their letter addressed to the Regional Director dated 3 March 2017.

14. The Government of India’s in-principle agreement of funding two thirds of the overall combined project follows the cost-share principle that was used when the SEARO Building in Delhi was first constructed by the Government of India in 1962 and sold for one third of the value to WHO.

15. WHO has agreed to cover the remaining one third of the overall reconstruction and temporary move project, thereby the US$ 20.49 million estimated for the temporary move for a period of up to five years. At least US$ 3 million of this is expected to be covered by efficiencies gained through lower maintenance and management costs in the modern serviced building that will be occupied and the balance will be available to SEARO from the real estate fund and other central sources without any effect on the overall Programme Budget ceilings and allocations.

16. In addition, following the Regional Committee’s Decision SEA/RC69(3), pledges of financial support for the project were received from Maldives, Thailand, Timor-Leste and Sri Lanka amounting to more than US$ 1 million. These funds will be critical to enable specific elements of the projects, including meeting room fit-outs, and ensuring that the projects are reflective of WHO’s representative and convening mandate.
Next steps

17. The Joint Standing Committee of WHO SEARO and the Ministry of Health and Family Welfare, Government of India, will continue meeting regularly to ensure efficient progress of the reconstruction project. During the most recent meeting of 29 June 2017, the means to ensure that the project could be completed within the shortest possible timelines were discussed. The MoHFW assured that they are taking all possible steps within their financial regulations to ensure the most efficient clearance and construction processes.

18. WHO SEARO, in preparation for the re-construction project and to comply with current zoning regulations, has initiated the formal process of conversion of the WHO land from sociocultural to office building classification. This will secure higher FAR (floor area ratio) of 2.0 from the current 1.20 for the new office building, thereby allowing for the full anticipated office requirements of WHO in New Delhi.

19. The Ministry of Health and Family Welfare is now working to formalize the approval of the budget through the Ministry of Finance of the Government of India. WHO is assisting in the process by providing the required information as per the prescribed format shared by the MoHFW.

20. The Regional Committee will be invited to decide that, in the event all the necessary administrative and budget approvals from the Government of India are confirmed, the redevelopment project for the SEARO compound may commence according to Option 2 presented in this report, i.e. redevelopment of the whole compound. As WHO will not be responsible for funding and contracting the construction project, approval by the World Health Assembly will not be required.
ANNEX–1
# Table of Contents

1. Executive Summary .................................................................................................................. 5

2. Project Background .................................................................................................................. 7

3. Introduction and Overview of the Current Status ......................................................................... 9

   3.1. Review of the Existing Development .................................................................................. 9

   3.1.1. Building Details .............................................................................................................. 9

   3.1.2. Existing Car Parking Provisions .................................................................................... 11

   3.2. The Current Real Estate Challenges at SEARO ................................................................. 11

   3.2.1. Safety .......................................................................................................................... 11

   3.2.2. Environmental Performance ......................................................................................... 12

   3.2.3. Health ......................................................................................................................... 13

   3.2.4. Fire Safety ................................................................................................................ 13

   3.2.5. Flexibility of Operations .............................................................................................. 14

   3.2.6. Operational Cost of Facility Management ..................................................................... 14

4. Strategic Context and Business Need ...................................................................................... 16

5. Temporary Swing Space Requirement ..................................................................................... 18

6. Scenario and Financial Analysis ............................................................................................... 19

   6.1. Overview of the 3 Options ................................................................................................. 19

   6.1.1. Option 1: Refurbishment of the Existing Campus ......................................................... 20

   6.1.2. Option 2: Redevelopment of the Whole Campus ......................................................... 20
6.1.3. Option 3: Part Redevelopment and Part Refurbishment ........................................... 20

6.2. Risk Assessment of the 3 Options .................................................................................. 21

6.2.1. Option 1: Refurbishment of the Existing Campus ...................................................... 21
6.2.2. Option 2: Redevelopment of the Whole Campus ....................................................... 21
6.2.3. Option 3: Part Redevelopment and Part Refurbishment ........................................... 21

6.3. Car Parking Provision .................................................................................................. 22

6.4. Comparison of Options Basis WHO’s 6 Objectively Measured Indicators ....................... 23

6.4.1. Security .................................................................................................................. 23

6.4.2. Health & Safety ..................................................................................................... 23

6.4.3. Approach and Methodology for Cost Estimates in Financial Analysis ....................... 24

6.4.4. Financial Consequences ........................................................................................ 25

6.4.5. Environment Concerns ........................................................................................ 26

6.4.6. Compliance with Local Applicable Legislation ....................................................... 26

6.4.7. Reduction in Long Term Operational Costs ............................................................ 27

6.4.8. Enhancement in Flexibility of Operations ............................................................... 27

7. Conclusion and Recommendation ................................................................................ 28

8. Annexures ...................................................................................................................... 31

8.1. Site Layout Plan ......................................................................................................... 31

8.2. Timelines .................................................................................................................. 32

8.3. Building Indicative Specifications (for Option 2) ........................................................ 33
8.4. Disclaimer – Operational Cost Computation

8.5. Disclaimer – Capital Expenditure Computation

8.6. Disclaimer

List of Tables

Table 3-1: Existing Bye-laws

Table 3-2: Existing Building Infrastructure

Table 3-3: Existing Buildings Present Condition

Table 3-4: Main Building and Conference Hall Space Efficiency (excluding Annexe’s)

Table 5-1: Summary of Swing Space Requirement

Table 6-1: Overview of the 3 Options

Table 6-2: Health & Safety Comparison

Table 6-3: Financial Consequences Comparison

Table 6-4: Environment Concerns Comparison

Table 6-5: Enhancement in Flexibility of Operations Comparison

Table 7-1: Comparison of 3 Options
1. Executive Summary

The World Health Organization (WHO) Regional Office for South East Asia (SEARO) is located at New Delhi, India on a land parcel admeasuring approximately 7,203 sqm. The land was leased to WHO by the Government of India on a long lease basis at a concessional rate. While, the Main Building and the Conference Hall at the campus was constructed by Central Public Works Department (CPWD), Government of India.

Since the SEARO campus is more than 50 years old, WHO is facing a number of real estate challenges in terms of safety, health, environment, locally applicable regulations, operational costs and future expansion. Most importantly, recent structural surveys carried out by CPWD and other external agencies have revealed that the current buildings within the office campus are highly vulnerable to seismic events, which consequently is a high risk to business continuity and employee safety.

Thus, it was agreed amongst the key stakeholders including Government of India, SEA Regional Director, WHO Director – General and government representatives to relocate business operations temporarily (tentatively by May 2017) till such time the current office is either renovated or reconstructed in order to avoid any unfortunate incident and mitigate risks that could result in institutional, personal, financial liability and reputational risk for the entire UN system. In this regard, SEARO has identified suitable temporary ‘swing space’ options in the central part of Delhi, for relocation of its 362 staff members, with the help of an international real estate consultant namely CBRE South Asia Private Limited.

Further, CBRE has also undertaken a comparison of the three available options at the existing office campus from a long term strategy perspective and evaluated the best possible option considering WHO’s six objectively measured indicators.

A detailed assessment of the possible options basis WHO’s six objectively measured indicators reveals, that the optimal option would be the ‘Re-development of the whole SEARO campus’. The same encompasses dismantling of the complete existing infrastructure, plan of a new
building and other facilities according to the present bye-laws and codes. This option shall also entail conversion of land use resulting in a higher development potential at the site to cater to present as well as medium term future / expansion requirement.
2. Project Background

The WHO Regional Office for South East Asia is located at Indraprastha Estate, Mahatma Gandhi Marg, New Delhi, India. The office campus is spread over a land area admeasuring approximately 7,203 sqm and the land was leased by the Government of India at a concessional price of USD 0.015 per annum on a perpetuity basis.

The office campus comprises of a Main Building, a Conference Hall and three Annexe Buildings. Main Building and the Conference Hall were constructed by CPWD over 50 years ago and sold to WHO immediately post construction completion at 1/3rd of the construction cost (then approximately USD 350,000). The three annexe buildings were constructed by WHO itself. The sketch attached as Annexure 1 details the general layout of the buildings in the campus.

Delhi lies in the critical Zone IV of the Seismic Zoning Map of India and hence, there is a high risk of earthquakes in the region. All buildings within the campus are found to be inadequate with reference to the current building code provisions to withstand significant seismic activity. Reason being the Main Building and Conference Hall were constructed more than 50 years ago and at the time, building code provisions were non-existent. Based on recent structural surveys carried out, it has been observed that the Main Building and Conference Hall are reaching the end of their useful life and the three Annexe Buildings are unsafe to operate from.

Furthermore, the campus is built on the flood plains of River Yamuna and next to a drain and already faces major challenges during the monsoon season, when the ground water table is high.

Hence, there is a high risk of serious damage, imminent settling, tilting or collapse in the event of a strong earthquake and / or sustained saturation due to floods in the area. The business operations and employees are being exposed to a very high risk that could result in institutional, personal, financial liability and reputational risk for the entire UN system. To summarize, SEARO is facing a number of real estate challenges in terms of safety, health, environment, locally applicable regulations, operational costs and future expansion.
Hence, it was agreed amongst the key stakeholders including Government of India, SEA Regional Director, WHO Director – General and government representatives to relocate business operations temporarily till such time the current office is either renovated or reconstructed in order to avoid any unfortunate incident and mitigate risks. In this regard, SEARO with the help of CBRE (an international real estate consultant) has identified suitable temporary ‘swing space’ options in the central part of Delhi, for relocation of the 362 staff members.

Further, SEARO with the help of CBRE has also undertaken a comparison of the three available options at the existing office campus from a long term strategy perspective and the aim of this paper is to highlight the best possible option considering WHO’s six objectively measured indicators.
3. Introduction and Overview of the Current Status

3.1. Review of the Existing Development

3.1.1. Building Details

The campus housing the WHO Regional Office for South East Asia in New Delhi, India is built on a plot area admeasuring 7,203 sqm. As per the current Master Plan of Delhi (MPD) 2021, the land parcel lies in Zone B and is zoned for ‘Socio Cultural Activities’. According to the present local bye-laws, the following development potential is permitted:

<table>
<thead>
<tr>
<th>Table 3-1: Existing Bye-laws</th>
</tr>
</thead>
<tbody>
<tr>
<td>**Floor Area Ratio (FAR)**¹</td>
</tr>
<tr>
<td><strong>Plinth Area (sqm)</strong></td>
</tr>
<tr>
<td><strong>Ground Coverage</strong></td>
</tr>
</tbody>
</table>

*Source: WHO SEARO*

The infrastructure existing on the plot is detailed below:

<table>
<thead>
<tr>
<th>Table 3-2: Existing Building Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Building</strong></td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td><strong>Main Building</strong></td>
</tr>
<tr>
<td>(comprises Main Building, Conference Hall, Old Annexe Building, New Annexe Building and STC Annexe Building)</td>
</tr>
<tr>
<td><strong>Other Construction – Additional</strong></td>
</tr>
<tr>
<td>(Stores, Staff Lounge, VC Room, Guard Room, TT Room, New Fire Escape, etc.)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

*Source: WHO SEARO*

¹ As per the Notification No K-2003/1/DS-DDIB dated 16th Oct 1997 of the Delhi Division, Department of Urban Development, Ministry of Urban Affairs & Employment
The buildings existing at the site fully utilize the development potential permitted at the site, considering the current zoning and local bye-laws. Hence, in order to achieve a higher development potential at the site, WHO has already applied to the local regulatory bodies for conversion of zoning of the land parcel to ‘Office Building’, in order to obtain a higher FAR of 2.00.

The following table highlights the present condition of the existing buildings at the site:

<table>
<thead>
<tr>
<th>Building</th>
<th>Component</th>
<th>Year of Construction</th>
<th>Construction Party</th>
<th>Present Condition</th>
<th>No. of Floors</th>
<th>Covered Area (sqm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Building</strong></td>
<td>Main Building</td>
<td>1962</td>
<td>CPWD, GoI</td>
<td>Nearing end of usable life; Unsafe according to prevalent earthquake code</td>
<td>G+5</td>
<td>4,948</td>
</tr>
<tr>
<td></td>
<td>Conference Hall</td>
<td>1962</td>
<td></td>
<td></td>
<td>G+1</td>
<td>1,134 (capacity - 400 pax)</td>
</tr>
<tr>
<td></td>
<td>STC Annexe Building</td>
<td>1962</td>
<td></td>
<td></td>
<td>G+5</td>
<td>3,403</td>
</tr>
<tr>
<td></td>
<td>Old Annexe Building</td>
<td>1972</td>
<td></td>
<td>Wholly Unsafe; To be dismantled immediately</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>New Annexe Building</td>
<td>1983</td>
<td>WHO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other Construction – Additional</strong></td>
<td>Stores, Staff Lounge, VC Room, Guard Room, TT Room, New Fire Escape, etc.</td>
<td>1999 onwards</td>
<td></td>
<td></td>
<td>-</td>
<td>1,041</td>
</tr>
</tbody>
</table>

**Total**                                             |                                   |                     |                                                       |               | 10,526             |

*Source: WHO SEARO*
3.1.2. Existing Car Parking Provisions

In the current scenario, provision of surface car parking for employees is provided within the existing campus of WHO-SEARO. Whereas, the facility for visitors’ car parking is provided outside the campus on the service lane.

3.2. The Current Real Estate Challenges at SEARO

In context to the Regional Office at New Delhi, several technical and diagnostic studies were commissioned between year 2000 and 2016 to measure the status of SEARO. The studies exhibit that SEARO currently faces a number of real estate challenges. The same have been highlighted below:

3.2.1. Safety

New Delhi lies in the critical Zone IV of the Seismic Zoning Map of India and hence, there is a high risk of earthquakes in the region. Basis surveys and studies carried out, all buildings within the campus are found to be inadequate with reference to the current building code provisions to withstand significant seismic activity. Reason being the Main Building and Conference Hall were constructed more than 50 years ago and at the time, building code pertaining to criteria for earthquake resistant design & ductile detailing of reinforcement were non-existent. The Main Building and Conference Hall are reaching the end of their useful life and the three Annexe Buildings have been declared as unsafe to operate from.

Furthermore, the campus is built on the flood plains of River Yamuna and next to a drain and already faces major challenges during the monsoon season, when the ground water table is high (potential risk of flooding inside the SEARO campus, since the campus is at a relatively lower level).

Basis the above, there is a high risk of serious damage, imminent settling, tilting or collapse in the event of a strong earthquake and / or sustained saturation due to floods in the area. The
business operations and employees are being exposed to a very high risk that could result in institutional, personal, financial liability and reputational risk for the entire UN system.

3.2.2. Environmental Performance

Large buildings require computerized management system to optimize their heating and cooling performance. As the various buildings are very old and have been added over different time periods and hence, holistic control of the building systems has not been possible. Thus, resulting in higher energy consumption, which also has a negative impact on the environment.

An Environmental and Power Quality Analysis Assessment Report conducted for the Data Center, Hub Rooms and EPBAX rooms in 2012 have also indicated that there are multiple cooling issues at the data center. This has in turn led to equipment failures and poses a huge risk of ‘system collapse’.

Another risk to the existing premises is the effect of ‘hydrogen sulphide gas’ within the Data Center and the Hub rooms from the drain adjoining the site. There are higher than acceptable levels of hydrogen sulphide, a corrosive gas in nature, in all areas of the facility. Currently, there is no form of air purification / scrubbing unit that has been engaged in the Data Center, hence, the same continues to pose a threat of further degradation to the systems.

With newer technology and systems that are required in today’s context for the effective working of any modern office complex, it is unlikely that the existing SEARO campus will be able to accommodate / upgrade to the same and yield optimal results. With the complexity of the workplace and keeping updated with technology, newer and efficient building management systems should be evaluated that will enable the efficient functioning of the premises along with the desired rationale of optimising energy loads, lighting systems, security systems, air-conditioning systems, efficient sewage disposal systems, rain water harvesting systems, recycling methodologies and more. These would not be possible with the obsolete equipment installed at SEARO campus and may lead to system failure / collapse with modifications made
beyond a designated capacity. Maintenance of the system and skillsets identification for the same will become challenging as well with passage of time.

With modifications that have been made over the years to cater to the business needs, varied alterations have already been made to the ‘backbone systems’ to cater to new requirements. As such, the original design intent and performance criteria have been altered and it is likely that the overall system performance is sub-optimal.

3.2.3. Health

Although, there have been periodic upgradations of the building management systems, the extent of upgradation is limited to a certain capacity, beyond which the building will cease to function effectively with respect to any of the supporting services such as the air conditioning system which in turn will affect the Indoor Air Quality (IAQ) and thus, the health of the occupants or the electrical system which would imply that additional loads for any augmentation will not be possible beyond a certain ‘load taking ability’.

Since, the campus is built on the flood plains of River Yamuna and next to a drain, it already faces major challenges during the monsoon season, when the ground water table is high. There is a potential risk of flooding inside the SEARO campus, as the campus is at a relatively lower level. The same could potentially result in high health risks for the employees working at the SEARO campus.

3.2.4. Fire Safety

Basis our understanding, the current systems installed are ageing and are not in tune with the latest technology. This poses challenges with respect to the operational efficiencies as well as safety. Out of date systems installed for electrical installations pose a major risk towards fire hazards as it cannot be determined if their current carrying capacity is as per the original configuration when they were installed.
Further, the buildings were constructed as per fire safety norms prevailing at the time of construction. However, improved systems constantly evolve and older ones get obsolete as maintenance becomes a problem for older systems. Retrofitting these becomes a challenge in a working office environment.

3.2.5. Flexibility of Operations

Although, all the building structures are ‘permanent’ in type, it is spread across multiple buildings that prevent the organization from adapting the work space to accommodate open plan team working. Office space utilization is less efficient, leading ultimately to increased operational costs. The same is exhibited below:

<table>
<thead>
<tr>
<th>Table 3-4: Main Building and Conference Hall Space Efficiency (excluding Annexe’s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Useable Area</td>
</tr>
<tr>
<td>Covered Area</td>
</tr>
<tr>
<td>Efficiency</td>
</tr>
</tbody>
</table>

*Source: WHO SEARO*

As exhibited above, the efficiency being achieved in the SEARO campus is approximately 66%, while, as per general market benchmarks (considering a campus setting), an organization is able to achieve approximately 75 – 80% efficiency.

Further, since the Annexe Buildings shall have to be dismantled immediately, there would be no possibility of accommodating more seating / employees in the existing Main Building for lack of space. The existing set up is also insufficient to cater to future / expansion requirement.

3.2.6. Operational Cost of Facility Management

Basis our understanding, the current systems installed are ageing and are not in tune with the latest technology. This leads to unnecessary losses in the system that contributes towards the wasteful expenditure of energy and inflated electricity bills.
Efficiencies of heavy equipment like Diesel Generator (DG) and Heating Ventilation and Air-Conditioning (HVAC) systems are time bound. Older systems tend to be more inefficient in providing the output versus the input. For instance a 10 year old Air-Conditioning (AC) system will use more electrical units to produce lesser cooling than modern systems and similarly a DG set would produce lesser electrical units per litre of fuel consumed as opposed to newer ones. All concealed conduits and pipes are prone to erosion after the completion of their designed life cycles. Eroded pipes would lead to instabilities in the plumbing systems leading to leaks and bursts that will lead to wastage of water. Domestic water pipes (if not Polyvinyl Chloride (PVC)) would also pose a health risk as erosion would contaminate the water they carry to washrooms / water systems.

The age of the building also translates to ageing interiors like floors and fixtures. Maintaining older stone or carpeted floors require more manpower to produce the desirable hygiene levels. This translates to further inefficiencies in the manpower deployed.
4. Strategic Context and Business Need

The Ministry of Health and Family Welfare, Government of India invited CPWD to perform a comprehensive analysis of the existing facilities at SEARO campus. CPWD issued a report in January, 2016 stating that the current buildings are not safe for use; particularly the three annexe buildings, the Main Building and Conference Hall are approaching the end of their useful life.

As part of its assessment, CPWD made two recommendations. First, to re-inforce / retrofit the Main Building and Conference Hall. However, given the design, it was not found to be economically or structurally viable for the three Annexe Buildings and hence, the same would have to be demolished. The second recommendation was to demolish all buildings and construct a new, green and seismically safe signature / iconic building.

The second option was preferred, as the expected useful life of a newly constructed building is approximately 75 to 100 years as opposed to 5 to 10 to 15 years of useful life if only retrofitted. Although, the capital expenditure expected to be incurred in the first option would be lower, but the same would only be useful for a period of 5 to 15 years and the campus would require major capital expenditure at regular time intervals.

In addition, basis preliminary assessment, it would be unviable to construct additional space over the retrofitted Main Building and Conference Hall from a structural safety and cost point of view. Hence, the employees currently seated in the annexe buildings would have to be accommodated in an alternate location resulting in split office operations, lower operational efficiency and higher cost.

A comprehensive site wide plan offers a number of benefits, which includes:

- Address the long term maintenance and refurbishment needs of all buildings in the SEARO campus – provides the opportunity to carry out business operations smoothly
- Reduce the total life cycle cost of refurbishment as compared with piecemeal refurbishment of existing buildings
- Provide an opportunity to rationalize and reduce the operational expenditure through an effective building management system, low maintenance facilities and modern equipment
- Allow compliance with local legislation, notably in relation to building byelaws and structural stability
- Allow compliance with fire safety and green building norms

Due to the above factors, CBRE proposes to consider a comprehensive approach to the SEARO campus and temporarily relocate business operations till such time the current office is either renovated or reconstructed in order to avoid any unfortunate incident and mitigate risks.
5. Temporary Swing Space Requirement

In view of the construction process for retrofitting or redevelopment of SEARO campus at New Delhi, staff would have to be relocated into ‘swing space’ for the duration of redevelopment / refurbishment. The construction work of this magnitude would usually take approximately 2 years to complete, besides time required to secure approvals from local regulatory bodies.

In this regard, SEARO management has engaged the services of an international real estate consultant company to meet the swing space requirement. Available options in prescribed geography (i.e. in proximity to existing office development) were examined and shortlisted on the basis of business suitability and employee commute standpoint.

Following table provides the summary of swing space finalized by WHO SEARO:

<table>
<thead>
<tr>
<th>Table 5-1: Summary of Swing Space Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of the Building</td>
</tr>
<tr>
<td>Saleable Area (sft)</td>
</tr>
<tr>
<td>Total Monthly Rental (USD / sft)</td>
</tr>
<tr>
<td>Number of Car Parks</td>
</tr>
</tbody>
</table>

*Source: WHO SEARO*

The swing space requirement for WHO SEARO office has been serviced; SEARO is in the final stages of signing the lease agreement and shall tentatively relocate during 2017 till such time the current office is either renovated or reconstructed. Total rental outflow for a period of 5 years is estimated to be approximately USD 20.49 million in case reconstruction options are explored. However, the organization will have to spend approximately USD 114.21 mn in case refurbishment is undertaken for the facility to support the number of employees along with increasing number of employees on account of new hiring.
6. Scenario and Financial Analysis

6.1. Overview of the 3 Options

<table>
<thead>
<tr>
<th>Table 6-1: Overview of the 3 Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parameter</strong></td>
</tr>
<tr>
<td><strong>Solution Description</strong></td>
</tr>
<tr>
<td><strong>Land Use Zoning</strong></td>
</tr>
<tr>
<td>Floor Area Ratio (FAR)</td>
</tr>
<tr>
<td>Plinth Area (sqm)</td>
</tr>
<tr>
<td>Ground Coverage (%)</td>
</tr>
<tr>
<td>Ground Coverage (sqm)</td>
</tr>
<tr>
<td>Car Parking Provision</td>
</tr>
</tbody>
</table>

Comparison of Envisaged Strategy for the Various Components

| **Main Building** | Status Quo | To be Retrofitted | To be Redeveloped | To be Redeveloped |
| **Conference Hall** | Status Quo | To be Retrofitted | To be Redeveloped | To be Retrofitted |
| **3 Annexe Buildings** | Status Quo | To be Dismantled and redeveloped | To be Dismantled | To be Dismantled |

---

2 As per the Notification No K-2003/1/DS-DDIB dated 16th Oct 1997 of the Delhi Division, Department of Urban Development, Ministry of Urban Affairs & Employment
6.1.1. **Option 1: Refurbishment of the Existing Campus**

The first option available to WHO is to refurbish the Main Building and Conference Hall, while, the 3 Annexe Buildings would have to be demolished and redeveloped. During the interim refurbishment period, employees would have to be relocated to the swing space. Upon completion of refurbishment of the Main Building and Conference Hall, majority of the employees would be shifted back to the SEARO campus from the swing space, while, the balance employees would be accommodated in an alternate rented facility on account of lack of ample space in SEARO campus. The alternate rented facility shall also cater to the future expansion requirement.

6.1.2. **Option 2: Redevelopment of the Whole Campus**

The ‘Re-development of the whole SEARO campus’ encompasses relocating the present staff strength to the identified swing space. Thereafter, applying to the local regulatory authorities for conversion of land zoning from ‘Socio Cultural Activities’ to ‘Office Building’. The same shall allow a higher FAR of 2.00 at the site. Upon obtaining of all approvals, the organization can proceed ahead with dismantling of the complete existing infrastructure; plan a new building and other facilities according to the present bye-laws and codes. This option shall cater to present as well as medium term future / expansion requirement, as all projected staff members could be housed in 1 facility, resulting in ease of business operations.

6.1.3. **Option 3: Part Redevelopment and Part Refurbishment**

The third option is a hybrid between Option 1 and 2. It shall entail a similar procedure as Option 2, wherein the entire Main Building would be demolished and redevelopment, however, the Conference Hall would only be refurbished.
6.2. Risk Assessment of the 3 Options

6.2.1. Option 1: Refurbishment of the Existing Campus

- Possibility of Refurbishment – The existing buildings have reached the end of their useful life and hence, WHO shall have to engage specialists / experts to carry out a survey of the existing structures to determine whether the structures can be refurbished and the extent to which the useful life can be extended. In our opinion (basis survey reports provided by WHO), the useful life would get extended only by a few years, while, the refurbishment cost would be substantial. The possibility of refurbishment is a major risk.

- Safety & Security Risk – WHO shall have to engage specialists / experts to carry out a testing survey of the existing structures to determine whether the structures can be refurbished to make the structures conform with the current codes from an earthquake resistance perspective. In case the structures do not conform to the codes after refurbishment, it poses a major risk to the occupants of the building.

6.2.2. Option 2: Redevelopment of the Whole Campus

- Approval Risk – WHO shall have to seek approvals from the government authorities such as change of land use, building plan approvals, etc. A delay in obtaining the approvals would pose as a risk to the project. However, the same is expected to be overcome with the support of the government authorities.

6.2.3. Option 3: Part Redevelopment and Part Refurbishment

- Impact on Building Strength – Dismantling one building can impact the stability of adjacent structure. Further, design and construction of a new building would be complicated and can impact the current meeting hall structure.

- Possibility of Refurbishment – The existing buildings have reached the end of their useful life and hence, WHO shall have to engage specialists / experts to carry out a survey of the existing structures to determine whether the structures can be
refurbished and the extent to which the useful life can be extended. In our opinion (basis survey reports provided by WHO), the useful life would get extended only by a few years, while, the refurbishment cost would be substantial. The possibility of refurbishment is a major risk.

- **Safety & Security Risk** – WHO shall have to engage specialists / experts to carry out a testing survey of the existing structures to determine whether the structures can be refurbished to make the structures conform with the current codes from an earthquake resistance perspective. In case the structures do not conform to the codes after refurbishment, it poses a major risk to the occupants of the building.

**Note:** Annexure 8.3 highlights the proposed timeline for the above mentioned options.

6.3. **Car Parking Provision**

As part of option – 1, car parking provision shall remain as per the status quo, i.e. surface car parking within the campus for WHO employees and facility of car parking outside the campus for the visitors.

In option – 2 & 3, as per the development control norms, it is compulsory to provide parking within the land parcel. The norm is as follows:

1.8 E.C.S. (Equivalent Car Space) per 100 sqm of plinth area

Hence, a provision for the same needs to be made. As per the above norm, car parking provision would have to be provided for 259 vehicles. Following options could be explored:

- **Basement Parking** – Facility of car parking in the basement has been considered outside the building footprint. Further, as per the development control norms the area for basement would not impact the plinth area of the office space.

---

3 Source: CPWD Letter (ref.: 24(47)/WHO SEARO Bld/NDZ-II/2037 ) dated 31.05.2016 to WHO Regional Office for South – East Asia for Retrofitting/Redevelopment of WHO Campus at Indraprastha Estate, Mahatma Gandhi Marg, New Delhi
Automated / Mechanical Parking – Automated / mechanical car parking facility can be provided within the campus to accommodate the above mentioned required car parks.

Additional cost requirement for above mentioned options have been taken into account in financial analysis.

Various alternatives can be explored to provide car parking within option 2 & 3, same can be finalised in the designing stage of the project.

6.4. **Comparison of Options Basis WHO’s 6 Objectively Measured Indicators**

6.4.1. **Security**

While, the present campus is equipped with the necessary security measures, however, with passage of time and current global scenario, for any organization security has become paramount. In Option 1, implementation of stringent security guidelines would be difficult. Whereas implementing the required security measures would be most feasible in Option 2.

6.4.2. **Health & Safety**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>2016 Status Quo</th>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution Description</td>
<td>Current Situation</td>
<td>Refurbishment of the Existing Campus</td>
<td>Redevelopment of the Whole Campus</td>
<td>Part Redevelopment and Part Refurbishment</td>
</tr>
<tr>
<td>Main Building</td>
<td>Approaching the end of useful life</td>
<td>5 to 15 years</td>
<td>75 to 100 years</td>
<td>75 to 100 years</td>
</tr>
<tr>
<td>Conference Hall</td>
<td>Approaching the end of useful life</td>
<td>5 to 15 years</td>
<td>75 to 100 years</td>
<td>5 to 15 years</td>
</tr>
<tr>
<td>3 Annexe Buildings</td>
<td>To be demolished</td>
<td>To be demolished &amp; redeveloped</td>
<td>To be demolished</td>
<td>To be demolished</td>
</tr>
<tr>
<td>Seismic Risk Mitigation</td>
<td>Unsatisfactory</td>
<td>Neutral</td>
<td>Good</td>
<td>Satisfactory</td>
</tr>
</tbody>
</table>

Expected Life Comparison

Performance Comparison
Constructing a new campus (i.e. Option 2) makes it possible to ensure compliance with the prescribed health and safety norms. WHO shall be able to construct the new campus taking into consideration all the ground conditions. While, Option 1 and 3 would only be a temporary solution to the problem.

CPWD report as on January, 2016 suggest that both the Main Building and Conference Hall can be strengthened and more detailed analysis and modelling could be done with greater in-depth study. However, due to unavailability of old structural drawings, recreating / re-building the old drawings would be a challenge. It is to be noted that the strengthening work would only augment the useful life of the building by another 5 to 15 years.

In case of Option 2 and 3, typical risks with respect to approvals and construction would be applicable. However, the same can be overcome with the help of government support and proper planning. During construction stage, soil collapse / protection to adjacent infrastructure for new development at the location would need to be considered. Risks during execution of soil stabilisation techniques considering the nature of soil should be evaluated carefully.

### 6.4.3. Approach and Methodology for Cost Estimates in Financial Analysis

CBRE has evaluated the cost estimates for each of the above 3 options pertaining to WHO SEARO building, basis the published CPWD PAR (Plinth Area Rates) – 2012 along with CBRE’s in-house understanding & over-the-years expertise in domains of property valuations & project management consultancy.
6.4.4.  Financial Consequences

<table>
<thead>
<tr>
<th>Parameter</th>
<th>2016 Status Quo</th>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution Description</td>
<td>Current Situation</td>
<td>Refurbishment of the Existing Campus</td>
<td>Redevelopment of the Whole Campus</td>
<td>Part Redevelopment and Part Refurbishment</td>
</tr>
<tr>
<td>Capital Expenditure Comparison</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment (USD Mn)</td>
<td>-</td>
<td>18.64</td>
<td>35.40</td>
<td>30.82</td>
</tr>
<tr>
<td>Rental including Fit out and Operations Expenditure Comparison</td>
<td>114.21</td>
<td>20.49</td>
<td>20.49</td>
<td></td>
</tr>
<tr>
<td>Subsequent Capital Expenditure (after 15 years)</td>
<td></td>
<td>92.47</td>
<td>-</td>
<td>26.59</td>
</tr>
<tr>
<td>Operating Expenses (USD Mn) over a 40 year duration</td>
<td>-</td>
<td>183.2</td>
<td>159.43</td>
<td>186.74</td>
</tr>
<tr>
<td>Cash Outflow Comparison</td>
<td></td>
<td>409.94</td>
<td>218.19</td>
<td>267.42</td>
</tr>
</tbody>
</table>

In option 1 & 3 the cost incurred would augment the useful life of the building by another 5 to 15 years only and the organization would need to incur capital expenditure at regular intervals. In this way, the cost of redeveloping the whole campus is only being deferred by a few years, while, there are no major cost savings (capital expenditure as well as operating expenditure).

Option 3 is also not a financially viable option, as the capital expenditure expected to be incurred in this case is approximately 90% of the cost in Option 2 (i.e. not reflective of major cost savings) and the same is not a long term solution. Option 2 shall result in the highest capital expenditure. However, the overall useful life (approximately 75 to 100 years) of the building will be much more than other alternates.
Further, the operating expenditure is expected to be the lowest in case of Option 2, as the campus would comprise of modern equipment, a new building management system, etc. and would be developed as per Green Building norms. A Platinum LEED Rating can be targeted in Option 2, while, in case of Option 1 and 3, the maximum that can be targeted is a Gold rating.

### 6.4.5. Environment Concerns

<table>
<thead>
<tr>
<th>Parameter</th>
<th>2016 Status Quo</th>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution Description</td>
<td>Current Situation</td>
<td>Refurbishment of the Existing Campus</td>
<td>Redevelopment of the Whole Campus</td>
<td>Part Redevelopment and Part Refurbishment</td>
</tr>
<tr>
<td>Achievable Rating</td>
<td>No Rating</td>
<td>Gold - USGBC</td>
<td>Platinum - USGBC</td>
<td>Gold - USGBC</td>
</tr>
</tbody>
</table>

The redevelopment of the whole campus will allow WHO to incorporate more efficient and modern systems as opposed to the current setup. This would enable the building to run efficiently with the best available current standards and also be environmentally friendlier. In Option 2 and 3, high water table and associated dewatering costs – disposal / utility of ground water table during construction stage would need to be factored in. Associated permissions for excavation as applicable (mining authorities, etc.) would need to be factored in. Additionally, the utility / disposal of the excavated soil / Yamuna River soil will also need to be planned for.

### 6.4.6. Compliance with Local Applicable Legislation

Time spent in seeking approvals for Option 1 would be the least, while, in Option 2 and 3, it would be approximately equal. Reason being that WHO would first have to apply for a conversion of land use from ‘Socio Cultural Activities’ to ‘Office Building’ and thereafter, seek permission for building construction.
6.4.7. **Reduction in Long Term Operational Costs**

Long Term Operational Costs are expected to be lowest in case of Option 2 on a per square foot basis, while, operational costs would be the highest in case of Option 1 on a per square foot basis, till such time the entire structure is demolished and re-constructed.

6.4.8. **Enhancement in Flexibility of Operations**

<table>
<thead>
<tr>
<th>Table 6-5: Enhancement in Flexibility of Operations Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parameter</strong></td>
</tr>
<tr>
<td>Solution Description</td>
</tr>
<tr>
<td>Improved Flexibility in Design of Office Space</td>
</tr>
<tr>
<td>Reduced Operating Risk</td>
</tr>
</tbody>
</table>

The change of land zoning would be essential to meet the space requirement to accommodate the future staff strength at the building. In case of Option 1, the office campus would not be able to accommodate the projected staff; hence, this option will result in split office operations, thus resulting in lower operational efficiency and higher operational costs. Further, there would not be any possibility to increase / decrease the area of the conference hall, in case required. Space efficiency is also expected to decline marginally due to the refurbishment exercise.

However, in Option 1 and 3, the painting by renowned artist M. F. Hussain on the walls of the Conference Hall could be retained. Whereas, in Option 2 the same would require substantial effort and cost.
7. Conclusion and Recommendation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>2016 Status Quo</th>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution Description</td>
<td>Current Situation</td>
<td>Refurbishment of the Existing Campus</td>
<td>Redevelopment of the Whole Campus</td>
<td>Part Redevelopment and Part Refurbishment</td>
</tr>
<tr>
<td>Security</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Very Satisfactory</td>
<td>Neutral</td>
</tr>
<tr>
<td>Health &amp; Safety</td>
<td>Unsatisfactory</td>
<td>Neutral</td>
<td>Very Satisfactory</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>Financial Consequences</td>
<td>-</td>
<td>Unsatisfactory</td>
<td>Very Satisfactory</td>
<td>Neutral</td>
</tr>
<tr>
<td>Environment Concerns</td>
<td>-</td>
<td>Satisfactory</td>
<td>Very Satisfactory</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>Compliance with Local Applicable Legislation (In terms of time spent in seeking approvals)</td>
<td>-</td>
<td>Very Satisfactory</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>Reduction in Long Term Operational Costs</td>
<td>Unsatisfactory</td>
<td>Unsatisfactory</td>
<td>Very Satisfactory</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>Enhancement in Flexibility of Operations</td>
<td>Unsatisfactory</td>
<td>Neutral</td>
<td>Very Satisfactory</td>
<td>Satisfactory</td>
</tr>
</tbody>
</table>

Taking into account above exhibited WHO’s six objectively defined indicators, it is clear that Option – 2 (i.e. Redevelopment of the Whole Campus) is the most preferred.

**Advantages of Redevelopment of the Whole Campus:**

- **Security:** Currently, the campus is fitted out with necessary security measures. Redevelopment of campus would enable implementation of prescribed security guidelines effectively.
• **Health & Safety:** The structural studies and surveys undertaken suggest that Main Building and Conference Hall are reaching the end of their useful life and the three Annexe Buildings have been declared unsafe to operate from. The main building and conference hall were constructed before seismic earthquake codes were enforced in India and are, therefore, not designed for seismically vulnerable area such as New Delhi. Furthermore, the campus is built on the flood plains of River Yamuna and next to a drain, hence it becomes perilous by the unsuitable ground conditions at the site, particularly during the monsoon season when the water table is high. Basis the above, there is a high risk of serious damage, imminent settling, tilting or collapse in the event of strong earthquake and/or sustained saturation due to floods in the area, that could result in institutional, personal, financial and reputational risk for WHO. Redevelopment of the whole campus as part of option – 2 shall completely mitigate any such risk.

• **Financial Consequences:** In the present conditions, Main Building and Conference Hall are reaching the end of their useful life and the three Annexe Buildings have been declared unsafe to operate from. Redevelopment of the campus is expected to extend useful life of both the main building and the conference hall by around 75 – 100 years. Further, the operating expenditure is expected to be the lowest in case if option – 2, as the campus would comprise of modern equipment, a new building management system, etc. and would be developed as per Green Building norms. A Platinum LEED Rating can be targeted in option – 2.

• **Environment Concern:** The redevelopment of the whole campus (option – 2) will allow WHO to incorporate more efficient and modern systems as opposed to the current setup. This would enable the building to run efficiently with the best available current standards and also be environmentally friendlier. As discussed above, Platinum LEED Rating can be targeted in option – 2, which would help in addressing environmental concerns.
• **Reduction in Long Term Operational Costs:** Outcome of option – 2 are expected to help WHO SEARO campus reduce operational costs to the minimum by way of installation of efficient equipment.

• **Enhancement in Flexibility of Operations:** So as to accommodate future staff strength at the building it is essential to change land zoning and reconstruct the whole campus.

**Disadvantages of Partial / Complete Refurbishment of the Campus:**

• **Security:** Partial / complete refurbishment of the campus as part of option – 1 or option – 3 security conditions within WHO SEARO campus is expected to remain as it is currently.

• **Health & Safety:** With partial / complete refurbishment of the campus, health & safety risk arising due to the age of the building cannot be completely mitigated.

• **Financial Consequences:** As the Main Building and Conference Hall are reaching the end of their useful life and the three Annexe Buildings have been declared unsafe to operate from, partial / complete refurbishment of the campus is expected to only extend useful life of the building by 15 years and the campus would require reconstruction thereafter. Hence, exercising option – 1 or option – 3 will only defer the construction cost and would not reduce the cost.
8. Annexures

8.1. Site Layout Plan

Figure 8-1: Site Layout Plan – WHO SEARO

Source: WHO SEARO
## Timelines

<table>
<thead>
<tr>
<th>Week</th>
<th>Task Description</th>
<th>Duration</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Option (A) Refurbishment of the existing building</td>
<td>91 days</td>
<td>29 Jun '17</td>
<td>28 Oct '17</td>
</tr>
<tr>
<td>2</td>
<td>Kick-off project approval</td>
<td>0 days</td>
<td>29 Jun '17</td>
<td>30 Jun '17</td>
</tr>
<tr>
<td>3</td>
<td>STS project selection</td>
<td>123 days</td>
<td>01 Jul '17</td>
<td>01 Oct '17</td>
</tr>
<tr>
<td>4</td>
<td>Design consultant selection</td>
<td>123 days</td>
<td>01 Jul '17</td>
<td>01 Oct '17</td>
</tr>
<tr>
<td>5</td>
<td>Geospatial survey</td>
<td>695 days</td>
<td>01 Mar '17</td>
<td>30 Dec '17</td>
</tr>
<tr>
<td>6</td>
<td>Strengthening design</td>
<td>113 days</td>
<td>01 Nov '17</td>
<td>31 Mar '18</td>
</tr>
<tr>
<td>7</td>
<td>Fit-out design development</td>
<td>143 days</td>
<td>01 Apr '18</td>
<td>30 Sep '18</td>
</tr>
<tr>
<td>8</td>
<td>Procurement</td>
<td>274 days</td>
<td>01 Apr '18</td>
<td>30 Oct '18</td>
</tr>
<tr>
<td>9</td>
<td>Strengthening contractor</td>
<td>21 days</td>
<td>01 Apr '18</td>
<td>30 Apr '18</td>
</tr>
<tr>
<td>10</td>
<td>Project and tender documentation</td>
<td>91 days</td>
<td>01 Oct '18</td>
<td>30 Oct '18</td>
</tr>
<tr>
<td>11</td>
<td>Construction</td>
<td>69 days</td>
<td>31 Mar '18</td>
<td>26 Dec '18</td>
</tr>
<tr>
<td>12</td>
<td>Demolishing</td>
<td>93 days</td>
<td>31 Mar '18</td>
<td>31 Jul '18</td>
</tr>
<tr>
<td>13</td>
<td>Strengthening</td>
<td>143 days</td>
<td>01 Apr '18</td>
<td>30 Sep '18</td>
</tr>
<tr>
<td>14</td>
<td>Fit-out and Fit-up</td>
<td>143 days</td>
<td>01 Apr '18</td>
<td>30 Sep '18</td>
</tr>
<tr>
<td>15</td>
<td>Testing and commissioning</td>
<td>10 days</td>
<td>29 Nov '18</td>
<td>28 Dec '18</td>
</tr>
</tbody>
</table>

### Option (B) Redevelopment of the Whole Campus

<table>
<thead>
<tr>
<th>Week</th>
<th>Task Description</th>
<th>Duration</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Kick-off project approval</td>
<td>0 days</td>
<td>30 Jun '17</td>
<td>30 Jun '17</td>
</tr>
<tr>
<td>13</td>
<td>Site selection</td>
<td>0 days</td>
<td>30 Oct '17</td>
<td>30 Oct '17</td>
</tr>
<tr>
<td>14</td>
<td>Design consultant selection</td>
<td>123 days</td>
<td>01 Apr '18</td>
<td>30 Apr '18</td>
</tr>
<tr>
<td>15</td>
<td>Geospatial survey</td>
<td>695 days</td>
<td>01 Mar '17</td>
<td>30 Dec '17</td>
</tr>
<tr>
<td>16</td>
<td>Concept design and approvals</td>
<td>93 days</td>
<td>31 Mar '18</td>
<td>31 Mar '18</td>
</tr>
<tr>
<td>17</td>
<td>Building construction development and fit-out</td>
<td>143 days</td>
<td>01 Apr '18</td>
<td>30 Sep '18</td>
</tr>
<tr>
<td>18</td>
<td>Design development and fit-out</td>
<td>143 days</td>
<td>01 Apr '18</td>
<td>30 Sep '18</td>
</tr>
<tr>
<td>19</td>
<td>Procurement</td>
<td>274 days</td>
<td>01 Apr '18</td>
<td>30 Oct '18</td>
</tr>
<tr>
<td>20</td>
<td>Strengthening contractor</td>
<td>21 days</td>
<td>01 Apr '18</td>
<td>30 Apr '18</td>
</tr>
<tr>
<td>21</td>
<td>Fit-out and Fit-up</td>
<td>143 days</td>
<td>01 Apr '18</td>
<td>30 Sep '18</td>
</tr>
<tr>
<td>22</td>
<td>Testing and commissioning</td>
<td>10 days</td>
<td>29 Nov '18</td>
<td>28 Dec '18</td>
</tr>
</tbody>
</table>

### Option (C) Partial Redevelopment and Partial Refurbishment

<table>
<thead>
<tr>
<th>Week</th>
<th>Task Description</th>
<th>Duration</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>Kick-off project approval</td>
<td>0 days</td>
<td>30 Jun '17</td>
<td>30 Jun '17</td>
</tr>
<tr>
<td>24</td>
<td>Site selection</td>
<td>0 days</td>
<td>30 Oct '17</td>
<td>30 Oct '17</td>
</tr>
<tr>
<td>25</td>
<td>Design consultant selection</td>
<td>123 days</td>
<td>01 Apr '18</td>
<td>30 Apr '18</td>
</tr>
<tr>
<td>26</td>
<td>Geospatial survey</td>
<td>695 days</td>
<td>01 Mar '17</td>
<td>30 Dec '17</td>
</tr>
<tr>
<td>27</td>
<td>Concept design and approvals</td>
<td>93 days</td>
<td>31 Mar '18</td>
<td>31 Mar '18</td>
</tr>
<tr>
<td>28</td>
<td>Building construction development and fit-out</td>
<td>143 days</td>
<td>01 Apr '18</td>
<td>30 Sep '18</td>
</tr>
<tr>
<td>29</td>
<td>Design development and fit-out</td>
<td>143 days</td>
<td>01 Apr '18</td>
<td>30 Sep '18</td>
</tr>
<tr>
<td>30</td>
<td>Procurement</td>
<td>274 days</td>
<td>01 Apr '18</td>
<td>30 Oct '18</td>
</tr>
<tr>
<td>31</td>
<td>Strengthening contractor</td>
<td>21 days</td>
<td>01 Apr '18</td>
<td>30 Apr '18</td>
</tr>
<tr>
<td>32</td>
<td>Fit-out and Fit-up</td>
<td>143 days</td>
<td>01 Apr '18</td>
<td>30 Sep '18</td>
</tr>
<tr>
<td>33</td>
<td>Testing and commissioning</td>
<td>10 days</td>
<td>29 Nov '18</td>
<td>28 Dec '18</td>
</tr>
</tbody>
</table>

### Option (D) Complete Redevelopment

<table>
<thead>
<tr>
<th>Week</th>
<th>Task Description</th>
<th>Duration</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>Kick-off project approval</td>
<td>0 days</td>
<td>30 Jun '17</td>
<td>30 Jun '17</td>
</tr>
<tr>
<td>35</td>
<td>Site selection</td>
<td>0 days</td>
<td>30 Oct '17</td>
<td>30 Oct '17</td>
</tr>
<tr>
<td>36</td>
<td>Design consultant selection</td>
<td>123 days</td>
<td>01 Apr '18</td>
<td>30 Apr '18</td>
</tr>
<tr>
<td>37</td>
<td>Geospatial survey</td>
<td>695 days</td>
<td>01 Mar '17</td>
<td>30 Dec '17</td>
</tr>
<tr>
<td>38</td>
<td>Concept design and approvals</td>
<td>93 days</td>
<td>31 Mar '18</td>
<td>31 Mar '18</td>
</tr>
<tr>
<td>39</td>
<td>Building construction development and fit-out</td>
<td>143 days</td>
<td>01 Apr '18</td>
<td>30 Sep '18</td>
</tr>
<tr>
<td>40</td>
<td>Design development and fit-out</td>
<td>143 days</td>
<td>01 Apr '18</td>
<td>30 Sep '18</td>
</tr>
<tr>
<td>41</td>
<td>Procurement</td>
<td>274 days</td>
<td>01 Apr '18</td>
<td>30 Oct '18</td>
</tr>
<tr>
<td>42</td>
<td>Strengthening contractor</td>
<td>21 days</td>
<td>01 Apr '18</td>
<td>30 Apr '18</td>
</tr>
<tr>
<td>43</td>
<td>Fit-out and Fit-up</td>
<td>143 days</td>
<td>01 Apr '18</td>
<td>30 Sep '18</td>
</tr>
<tr>
<td>44</td>
<td>Testing and commissioning</td>
<td>10 days</td>
<td>29 Nov '18</td>
<td>28 Dec '18</td>
</tr>
</tbody>
</table>

### Option (E) Complete Refurbishment

<table>
<thead>
<tr>
<th>Week</th>
<th>Task Description</th>
<th>Duration</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>Kick-off project approval</td>
<td>0 days</td>
<td>30 Jun '17</td>
<td>30 Jun '17</td>
</tr>
<tr>
<td>46</td>
<td>Site selection</td>
<td>0 days</td>
<td>30 Oct '17</td>
<td>30 Oct '17</td>
</tr>
<tr>
<td>47</td>
<td>Design consultant selection</td>
<td>123 days</td>
<td>01 Apr '18</td>
<td>30 Apr '18</td>
</tr>
<tr>
<td>48</td>
<td>Geospatial survey</td>
<td>695 days</td>
<td>01 Mar '17</td>
<td>30 Dec '17</td>
</tr>
<tr>
<td>49</td>
<td>Concept design and approvals</td>
<td>93 days</td>
<td>31 Mar '18</td>
<td>31 Mar '18</td>
</tr>
<tr>
<td>50</td>
<td>Building construction development and fit-out</td>
<td>143 days</td>
<td>01 Apr '18</td>
<td>30 Sep '18</td>
</tr>
<tr>
<td>51</td>
<td>Design development and fit-out</td>
<td>143 days</td>
<td>01 Apr '18</td>
<td>30 Sep '18</td>
</tr>
<tr>
<td>52</td>
<td>Procurement</td>
<td>274 days</td>
<td>01 Apr '18</td>
<td>30 Oct '18</td>
</tr>
<tr>
<td>53</td>
<td>Strengthening contractor</td>
<td>21 days</td>
<td>01 Apr '18</td>
<td>30 Apr '18</td>
</tr>
<tr>
<td>54</td>
<td>Fit-out and Fit-up</td>
<td>143 days</td>
<td>01 Apr '18</td>
<td>30 Sep '18</td>
</tr>
<tr>
<td>55</td>
<td>Testing and commissioning</td>
<td>10 days</td>
<td>29 Nov '18</td>
<td>28 Dec '18</td>
</tr>
</tbody>
</table>

---

[World Health Organization logo]
8.3. Building Indicative Specifications (for Option 2)

1. **STRUCTURAL**

   A. **Structural Configuration**

   RCC frame structure with beams and slabs as per structural design. The building may have special structural elements in steel / glass / other special material

   B. **Design Standards**

   The design of the above structure is in accordance with the following design codes or their most recent revisions:

   IS : 875 Part I - Unit weight of materials

   IS : 875 Part II - Live loads

   IS : 875 Part III - Wind loads

   IS : 1893 (Part – 1) - 2002 - Seismic Loads

   IS : 456 - 2000 - The concrete design

   IS : 800 - Steel design

   C. **Loads**

   Following live loads are considered while designing the structural elements apart from the dead loads as per code norms

   **Live Loads**

   1. Office area: 400 kg / sqm

   2. Terraces: 400 kg / sqm
3. Staircase: 400kg / sqm

4. Lift Machine rooms: 1000kg/sqm or as per actuals

5. Additional UPS / Server strengthening: Not considered. To be in Fit out scope if required

6. Floor finish: 150 kg / sqm

7. False Ceiling + Ducting: 50 kg / sqm

8. Fire truck on podium slabs 45 MT

**Wind load**

Basic wind speed: 33m/sec or as applicable for the location

**Seismic load**

Zone : IV

or as applicable as per latest guidelines

**D. Materials**

**Concrete**

- All structural concrete shall have cube crushing strength varying from M25 to M45 N / sqmm at 28 days.

- Plain cement concrete shall have cube strength of 10 N / sqmm (M10) at 28 days

**Reinforcement Steel**

All reinforcement shall conform to IS : 1786 - 1985 having minimum yield strength of 415/500 N / sqmm
E. Water proofing Methods:

- Acrylic modified / polymer modified cementitious waterproofing on the roof with concrete screed on top of it as protective layer.

- Acrylic modified / polymer modified cementitious waterproofing with 12 mm thick plastering in CM 1:3 mixed with waterproofing admixtures for inside UG Tanks walls.

2. EXTERNAL FINISHES

Facade

Combination of local / Imported reflective glass in double glazed units (6mm outer heat strengthened + 12 mm air gap + 6 mm clear annealed internal glass) for office areas,

Structural glazing in special steel / aluminum sections and glass designed to required loads and as per relevant codes

Any other special material as required for compliance to the architectural design

External Landscaping

Hardscape and softscape done elaborately with special architectural lighting and features.

3. PLUMBING

A. Source

Municipal water supply supplemented with ground water (in compliance to local laws).

B. Water Requirement

The water requirement for the campus will be worked out as per SP-35 and National Building Code (NBC), the average per capita water consumption will be assumed as 45 litre per capita per day based on the assumption that 10 square meter of area is required per person.
C. Water Storage

Based on norms, water storage for domestic and fire fighting is provided. The water to be initially stored in a sump at basement level having capacity of two days of domestic water requirement of the entire complex and fire fighting static requirement. The sump is suitably partitioned by RCC wall to store raw, domestic, and fire water separately. The water first taken into the fire water sump and then overflows to raw water sump, the water from the raw water sump is pumped through a water treatment plant and stored in the treated water sump. The treated water is then pumped through a set of pumps to Overhead Tanks located on the terrace which has half day storage capacity of domestic water. Overhead tanks shall also be provided with a partition to store water for fire, the capacity as based on NBC norms.

D. Water Treatment

The sumps at basement level, as mentioned in the above distribution scheme, shall be designed in two compartments to accommodate raw water and treated water. A basic treatment scheme with a pressure sand filter, softener and chlorine dosing system is envisaged.

E. Water Distribution System

Raw water from bore-wells and other sources shall be collected in sump at basement level and after necessary treatment; the water shall be pumped to treated water storage sump as mentioned above.

The distribution of water supply to the various fixtures, toilet and utilities would be by gravity system. The domestic water from the underground sump would be pumped by a set of pumps. One pump will be working and one will remain as 100% standby. The pumps will work automatically with the help of level switches installed both in ground level and at
terrace level tanks. The pipe sizes are worked out to equalize the pressure on all floors and would be provided with pressure reducing station (if needed) to reduce the excessive pressure at the lower floors.

Each toilet would be provided with shut-off valve (master control valve) for easy repair and maintenance of the water supply system in each toilet. The building proposed being a LEED certified Gold rated, hence low water consuming fixtures needs to be fixed/adopted as per the LEED specifications.

Water supply system will be designed as per IS – 1239 Part I and SP-35.

F. Plumbing Materials

The network will be designed considering CPVC pipes for internal & shaft piping and GI pipes for external area. All the concealed pipes shall be insulated with PVC tapes and protected with approved paint for exposed pipes.

Fitting and flanges shall be malleable iron galvanized fittings to IS specifications. Valves 50mm dia and below shall be gunmetal screwed type ball valves. Valves 65mm dia and above shall be of double flanged type butterfly valve. The hot water distribution pipe inside the toilets or pantry will be provided..

G. Sewage System and Treatment

Sewage System

The sewage system shall be designed as two pipe system based on IS specifications. Vent pipe shall be provided for soil stack (Stack Venting) which shall be taken up to terrace level as vent through roof.

The sewage from the soil stack will be connected to an Inspection chamber located near to the periphery of the building. The waste pipe will be connected to the inspection chamber through a gully trap to avoid odor nuisance.
The sewage will be conveyed through a network of pipes to the Sewage Treatment Plant. The treated water from the Sewage Treatment Plant, after completing necessary treatment, will be used for either landscaping, water distribution to water closets on floor toilets, or to the central chilled water plant as per recommendation from the Plumbing & HVAC Consultant.

**Basis of Design**

Minimum diameter of pipe adopted for vertical stack is 110mm. All fixtures and appliances (if applicable) would be fully trapped for prevention of back flow of foul gases and odour into the toilet blocks. Vent pipe would be provided to soil stack for free flow of foul gases upto the terrace level.

**Materials**

- Vertical soil, waste, vent and rain water pipes: uPVC pipes
- Waste pipes from floor traps, and uPVC pipes w.b
- Floor traps, gratings – PVC molded traps with stainless steel frame and grating.

**H. Rain Water Disposal**

All vertical down takes will be designed for an intensity of 100 mm/hr of rainfall. (for 15mm Storm) Minimum dia of vertical down take shall be 160mm. This requirement will be duly checked for local conditions and suitability and compliance to local regulation. These vertical rain water pipes from terrace floor will discharge the rainwater to rain water storage tank in basement. Overflow will be diverted to external storm water drain at ground floor level.

Rainwater from balconies at various floors will be conveyed through separate stacks and connected to the external storm water network.

**Materials**
Vertical pipes - U PVC pipes conforming to IS Specifications (SWR Type – A)

Horizontal pipes in False Ceiling etc. - U PVC pipes conforming to IS Specifications (SWR Type – A)

I. Storm Water Disposal

The entire storm water from the project site should be disposed by suitable covered storm water drainage system to the existing storm water drain outside the building premises.

J. Rain Water Harvesting System

Rainwater collection sump is to be provided in the basement to collect & reuse the rainwater.

4. FIRE PROTECTION SYSTEMS

The following provisions are to be made as per National Building Code:

(i) Wet riser-cum-down comers near each staircase as per NBC. Each riser shall be of 150mm internal diameter and of G.I. C class pipe. Hose Reel will be provided from each fire hydrant riser outlets at each landing.

(ii) Adequate BIS marked reinforced rubber lined delivery hoses of 63 mm size to reach the farthest point of the floor from each system, shall be provided through branch pipe (Gunmetal) near each hydrant outlet in a proper box.

(iii) A Static Storage Sump at basement level with Terrace Storage Tank of capacity as per NBC to be provided. A terrace level Over Head Tank shall be connected to the wet riser with non-return valve and pump for compensating the pressure losses.

(iv) All the pumps will be provided as per NBC norms.
(v) At every 50M perimeter of the building there will be one number of yard hydrant double headed type (external) around the building and one number of Four way Fire Brigade Inlet connection along with two way Fire brigade inlet connection will be provided.

(vi) The basement shall be provided with Automatic Sprinkler System. The sprinkler system has been designed in accordance with NBC norms.

(vii) In addition to the above, public address system with talk back facility will be provided on all floors with the control console placed at the ground floor reception / security.

(viii) Automatic fire detection and alarm system of Addressable Analog type is provided in all the floors of the building as per NBC. Detection system shall consist of smoke detectors.

(ix) Manually operated electrical fire alarm system is installed with call boxes located near each staircase landing. The call boxes shall be of break glass type, where the call is transmitted automatically to the control room when the glass of the system is broken. This system shall also be connected to an alternative source of power supply (Diesel generator). The call boxes shall be so installed that their location can easily be noticed from either direction and shall be at a height of one meter from the floor level.

(x) Fire extinguishers will be placed at strategic locations in the common areas as per the requirement. All extinguishers should be with BIS mark and located at an easily accessible position without obstructing the normal passage.

5. **ELECTRICAL**

   **Supply and Distribution Scheme**
The Project should receive 11 kV power supply from preferably two different grid substations at a single ring main unit to ensure continuous power supply scenario.

All buildings are to be served by a combination of oil filled type (ONAN) step down transformers (11/0.433 kV).

LT power from transformer to the LT panel will be transmitted through conventional type fabricated bus ducts or copper cables of adequate capacity.

The building is to be designed with overall 5.5VA/ sqft of power requirement for office spaces and actual for chilled water plant system and other common loads. Power is to be supplied to the respective floors by tapping off from the rising main. Provision of bus duct will provide massive flexibility for distribution of loads among various floors. The main panels in the Electrical room are to be of extendable type which will allow separate feeders required for UPS / server PAC or any other related load.

All electrical panels are to be located at an Electrical room to enable centralized and proper monitoring.

Inverter is to be provided for emergency lighting in common areas.

**Metering Policy**

A suitable metering scheme is to be implemented to monitor power consumption in a systematic manner.

6. **DG SETS**

- DG set rooms are to be provided at a common point in close proximity to the electrical panel room for better interfacing.

- Effective 100% DG backup to be provided with 990 litre diesel tanks are provided per DG
• The DG engines are to be provided with air-cooled radiators to impart necessary cooling of the engines. There should be sufficient and designed fresh air supply for the DG room and also dedicated DG exhaust shaft for the DG room.

• The entire DG room walls are to be clad with sufficiently thick acoustic lining for dampening the noise within DG room.

• Synchronization panel is to be provided.

7. **AIRCONDITIONING SYSTEM (HIGH SIDE)**

**Scope & Design Objective**

The aim should be to provide a centralized and high side air-conditioning system for the premises with the objective that the system built is efficient, environment friendly as well as simple and conducive to effective operation and maintenance. The system shall conform to applicable local and National Codes. System shall be designed and constructed to meet NBC and ASHRAE standards.

**HVAC Design Brief**

The capacity of the chillers and the AHUs are based on the consideration that the space is designed as an Office area with the following Design parameters.

(a) The Outside Design Conditions for New Delhi are to be considered for summer, monsoon, and winter seasons

Inside design conditions will be :

**Air Conditioning Areas:**

DB $23 \pm 1 \, \text{deg C} \, \text{RH around 60 \%}.$

**System Description**
The Water chilling machines & Pumps are to be installed in the Plant room. The chilled water produced in the chiller will be pumped to various Air handling units through insulated chilled water pipes laid in the shaft.

2-way valves are to be provided for the chilled water coil of the AHU. Based on the load, the chilled water flow rate in the coil will be regulated through 2-way valve. Differential Pressure Sensor (DPS) located in the farthest most point will sense the variation in flow rate in the chilled water system. The output from the DPS will bypass excess chilled water in the system through Bypass valve provided near the plant. This will also switch ON/OFF the required number of pump-sets automatically through stand-alone type microprocessor controller. Air handling units are located in each floor in dedicated AHU room. Fresh air openings are provided in the AHU room to draw the fresh air through the AHU either through fresh air duct or from outside of the building as per the specific AHU room designed/ location.

**High Side Equipment**

This shall comprise of the following:

- Central Chilled water Plant will comprise of hybrid system of combination of air-cooled and water-cooled chillers. Pump sets, AHUs, Microprocessor controls, connected Electrical work, will be provided.

- Chilled water controls including Modulating valves, Sensors, etc. for maintaining required chilled water temperature & flow rate at the AHU cooling coil shall be provided.

- Air Handling Units will be Double skin construction and comprising of MERV 5 filters, High delta T Cooling coil, fan-motor unit. The fans provided will be backward curved type which will be compatible to VFDs.
- The AHU room shall have provision of adequate maintenance space around AHU, chilled water piping shaft, outside air (fresh air) intake, space for supply & return air duct entries, space for Fixing Fire Dampers.

- Low side equipment like supply and return air plenum, ducting, grilles, diffusers, fire & volume control dampers, duct insulation, air side controls, VAVs, under-deck insulation etc. shall be installed as per system requirements.

- Additional AHUs, FCUs including necessary drainage shall be installed as required.

- Common toilet exhaust duct riser with adequate capacity fan at terrace will be provided. The Internal ducting with dampers will be provided.

8. **BASEMENT VENTILATION SYSTEM**

- Ventilation requirement for basement floor (if designed) as per NBC (6.5.3 Car Park Ventilation) will be minimum of 2.5 to 5% external wall / slab opening of the Car Park area.

- Since the External wall /slab opening is provided as per NBC, Mechanical Ventilation System is not envisaged.

9. **VERTICAL TRANSPORTATION SYSTEM – LIFTS**

- Passenger lift at main entrance lobby, and service lifts will be provided as per lift traffic analysis

- Passenger lifts run from basement to all floor.

- Service lift will run from basement till terrace.

- Capacity: 20 passengers each or as required as per occupancy and traffic analysis

- Minimum Speed: min 1.75m/sec
• All lifts are to be provided with variable voltage variable frequency drives that allow efficient energy management.

• All lifts are to be microprocessor based group controlled (octaplex), selective/collective control without attendant. This means that all passenger lifts are synergized to function together.

• Type of elevators: Geared.

• Various safety features are:
  o Fireman drive switch.
  o Overload warning indicator.
  o Automatic Rescue Device in passenger elevators
  o Inverter operated emergency light and alarm including battery.
  o Alarm bell and hooter at the main lobby
  o Electrical locking for car gate
  o Mechanical locking for landing gate.
  o Final limit and terminal switches.

• In the event of power failure / emergency, all lifts are programmed to reach the nearest landing level or the ground floor and open to enable easy evacuation.

• All lifts are provided with two way communication system between the car and the machine room.

• International architectural finish of passenger lifts are as follows:
  o Walls: stainless steel Hairline finish.
Floor: Granite as per architectural design

Ceiling: False ceiling with lights matching to wall panels.

- Ventilation: Fans are provided in false ceiling.

- All cars are equipped with a full height operating panel which is a specialty for these high speed elevators.

- Service lift will be of capacity of 1360 kgs and of speed of 1 m/sec. Service lift will cater to the terrace level

10. **INTERNAL FINISHES**

- Atrium: Natural stone flooring, wall cladding with combination stone, metal and wall paper and false ceiling in material as per design

- Lift lobby: Natural stone flooring and cladding, Gypsum False ceiling.

- Staircases: 19 mm thick Sadarhalli finish with OBD paint on walls and MS handrail.

- Screed: M20 grade ready mixed controlled concrete for Sub flooring of average 60 mm thickness.

- Internal wall plastering: 12 mm thickness.

11. **OTHERS**

- Earthing is to be provided as required by design for all equipment to ensure safety and compliance to regulation.

- CCTV monitoring systems to be designed as per specific requirements.

- A comprehensive Building Monitoring System to be installed.
8.4. Disclaimer – Operational Cost Computation

- Technical manpower considered basis current set up, list of utilities, practical operational hours requirements
- AMC values for equipment’s as per current market rates with the help of our existing benchmarks
- Capital expenditure replacement considered basis an approx. value of current equipment’s and a life cycle assumption
- Soft services, manpower, consumables basis our current benchmarks from running similar square footage space

8.5. Disclaimer – Capital Expenditure Computation

- The estimates are exclusive of any taxes that may be applicable for executing the said works.
- Refurbishment works have been envisaged with the building vacant and members shifted to other premises. Floor by Floor refurbishment will pose a serious risk to business continuity and operations and is therefore not advisable.
- The Main Building and Conference Building are nearing the end of their 'planned designed life' and require extensive refurbishment. Their architectural, infrastructure and operational limitations call into question the cost benefit of the substantial capital investment that would be required to meet the real estate challenges and upgrade to meet current / future demands.
- The current costings are with the assumptions that the building is in Zone 4. Should the Zone change to Zone 5 and newer regulations are introduced, the costing will change.
- Utilities should be planned above Ground level to reduce the risks associated due to flooding.
- Scrap value from demolishing of the existing structures has not been factored in the cash flow assessment

8.6. Disclaimer

- This document is confidential in nature and is for the sole usage of the Client (WHO). The material contained in this document is the copyright of CBRE and may not be reproduced or disseminated in whole or in part without CBRE’s written consent. Any
other parties relying on the CBRE’s report may do so on their own accord without any liability on CBRE to such parties.

- CBRE had not been engaged to carry out all possible investigations in relation to the subject property. Where in our report we identify certain limitations to our investigations, this is to enable the reliant party to instruct further investigations where considered appropriate or where we recommend as necessary prior to reliance. CBRE is not liable for any loss occasioned by a decision not to conduct further investigations.

- Assumptions are a necessary part of undertaking such exercises. CBRE adopts assumptions for the purpose of providing a NPV estimation advice because some matters are not capable of accurate calculation or fall outside the scope of our expertise, or our instructions. The reliant party accepts that the NPV estimation contains certain specific assumptions and acknowledges and accepts the risk that if any of the assumptions adopted in the price estimation are incorrect, then this may have an effect on the same.

- This exercise is based on the information provided for by the Client. The same has been assumed to be correct and has been used for NPV assessment exercise. Where it is stated that another party has supplied information to CBRE, this information is believed to be reliable but CBRE can accept no responsibility if this should prove not to be so. Where information is given without being attributed directly to another party, this information has been obtained by our search of the records and examination of documents or by inquiry from the Government or other appropriate departments.

- To the extent that the price estimation includes any statement as to a future matter, that statement is provided as an estimate and/or opinion based on the information known to CBRE at the date of this document. CBRE does not warrant that such statements are accurate or correct.

- Inout with respect to current & future zoning of the subject property has been provided by the Client. We have not been provided with any documentation identifying the same. Further, it has been assumed that the proposed development on the subject property would adhere to building regulations as prescribed by the relevant authorities. CBRE has not made any enquiries with the relevant development authorities to validate the legality of the same.

- Based on our discussion with the Client, it is understood that the land area of the subject property admeasures approx. 7,203 sqm. A site plan showing the extents of the land for the same have been provided. However, the information has not been cross-verified with the actual records.

- In the absence of any information to the contrary, we have assumed that there are no abnormal ground conditions, nor archaeological remains present which might adversely affect the current or future occupation, development for the property; the property is free from rot, infestation, structural or latent defect; no currently known deleterious or hazardous materials or suspect techniques will be used in the construction of or subsequent alterations or additions to the property and comments made in the property details do not purport to express an opinion about, or advice upon, the
condition of uninspected parts and should not be taken as making an implied representation or statement about such parts

- CBRE has utilized the Discounted Cash Flow Methodology and is based upon an estimation of future results. The methodology begins with a set of assumptions as to the projected income and expenses of the property. The income and expense figures are mathematically extended with adjustments for estimated changes in economic conditions. The result is the best estimate of price CBRE can produce, but it is an estimate and not a guarantee and it is fully dependent upon the accuracy of the assumptions as to income, expense and market conditions. This methodology use market derived assumptions, including discount rates, obtained from analyzed transactions. Where reliance has been placed upon external sources of information in applying the methodologies, unless otherwise specifically instructed by the Client and/or stated in the assessment, CBRE has not independently verified that information and CBRE does not advice nor accept it as reliable. The person or entity to whom the report is addressed acknowledges and accepts the risk that if any of the unverified information in the valuation is incorrect, then this may have an effect on the assessment.

- We have not made any allowances with respect to any existing or proposed local legislation relating to taxation on realization of the sale value of the subject property. CBRE is not required to give testimony or to appear in court by reason of this price estimation report, with reference to the property in question, unless arrangement has been made thereof.

- All opinions and estimates included in this report constitute our judgment as of May, 2017. They are subject to change without notice and transactions should not be entered into in reliance upon the information, opinions and estimates set out herein. CBRE specifically excludes any responsibility or liability whatsoever in connection with any purchases, disputes, developments or loss of profits arising from reliance on this report.

- Building Specification provided as part of Annexure – 8.4 are only indicative of a standard Grade – A office building. Further, the exact specification may vary slightly depending upon exact building design.

- Exchange Rate assumed is 1 USD = INR 64.40
THANK YOU