#### FORM - I

Sr. No.	ltem		
1.	Name of the Project/s	:	Extension of runway with blast pad, RESA, taxiway, Apron, GSE area, isolation bay, construction of new domestic terminal building, ATC tower cum Technical block cum fire station and other Miscellaneous works at Kolhapur Airport (Maharashtra).
2.	S. No. in the schedule	:	7(a)
3.	Proposed capacity / area/length/ tonnage to be handled / command area/ lease area/ number of wells to be drilled.		<ul> <li>i. Extension of Runway by 930 m x 45 m towards North-East (25 Runway Orientation) to have total runway dimension of 2300 m x 45 m to cater for the strength of Code 'C' critical aircraft B737-900W / A-320-200.</li> <li>ii. Strengthening of the existing runway 1370 m x 45 m to cater for the strength of Code 'C' critical aircraft A-320-200.</li> <li>iii. Provision of 2.5 m wide Shoulder on both sides of 2300 M Runway pavement for operation of code -"C" critical aircraft A-320-200.</li> <li>iv. Provision of 60 m x 60 m Blast Pad at Runway 07 &amp; 25.</li> <li>v. Construction of 240 m x 90 m RESA at both ends of Runway strip of Runway 07 / 25.</li> <li>vi. Provision of 213 m x 23 m Link taxi track with 2.5m shoulder on both sides to cater for code – 'C' aircraft (B-737-900W) for new Apron.</li> <li>vii. Construction of new Apron of size 148.5m x 93.5m for parking aircraft 3 nos. Cat- "C" aircraft (1 No. AB-320/ B737- 900W and 2 Nos. ATR-72) or (2 Nos. AB-320/ B737- 900W) in power-in and power out configuration with 75 x 20 M wide GSE Area after adequate clearances.</li> <li>viii. Provision of new Isolation Bay 91 m X 76 m and 217.5 m x 23m link</li> </ul>

			taxiway with 2.5 m wide shoulder
			suitable to cater for Code - "C" type
			of aircraft.
			ix. Provision of centrally air-conditioned
			New Domestic Passenger Terminal
			building to handle 300 Peak Hour
			passengers (150 Arrival & 150
			Departure) with covered area 3900
			sqm. as per IMG norms.
			x. New ATC tower cum Technical block
			(Category-2) cum fire station
			(Category - 6) similar to as per
			drawings enclosed.
4.	New/ Expansion/ Modernization	:	Extension of runway with blast pad,
	•		RESA. taxiway. Apron. GSE area.
			isolation bay, construction of new
			domestic terminal building. ATC tower
			cum Technical block cum fire station and
			other Miscellaneous works at Kolhapur
			Airport (Maharashtra)
5	Existing Capacity/ Area atc		a Existing passanger terminal building
5.	Existing Capacity/ Area etc.	•	area is 174.67 som
			b. Runway 07/25 having dimension
			1370 m X 45 m is suitable for the
			operation of ATR-72 type of aircraft.
6.	Category of Project i.e. 'A' or 'B'.	:	A
1.	lf ves please specify	:	
8.	Does it attract the specific condition?	:	No
	If yes, please specify.		
9.	Location	:	Kolhapur Airport is located at a distance
			of 9 km from the City Centre.
			Latitude and Longitude of the Kelhapur
			Airport
			16° 39' 55" N,
			74° 17' 29" E
	Plot/ Survey/ Khasra No.	:	Total land available (Acres) with existing
			Kolhapur Airport: 750.53 Acres.
			Additional 64 Acres land is required from
			development
	Village	:	Ujalaiwadi
	, , , , , , , , , , , , , , , , , , ,		•
	Tehsil	:	Kolhapur
	District	:	Kolhapur
	State	:	Maharashtra
1		1	Location map on google Earth image and

			on Toposheet is enclosed as Annexure 1.
10	Nearest railway station/ airport along with distance in kms.	:	Nearest major railway station is Chatrapati Sahoo Maharaj Railway Station (Kolhapur), which is located at aerial distance of 6.8 km.
11.	Nearest town, city, district Headquarters along with distance in kms.	:	Kolhapur is district headquarter, which is located at distance of 9 km.
12.	Village Panchayat, Zilla Parishad, Municipal Corporation, Local body (complete postal addresses with telephone nos. to be given).	:	Ujalaiwadi, Kolhapur
13.	Name of the Applicant	:	Airport Director
14.	Registered address	:	Airports Authority of India, Kolhapur Airport, Kolhapur
15.	Address for Correspondence:		
	Name	:	Ms. Puja K Mul
	Designation (Owner/ Partner/ CEO)	:	Airport Director
	Address	:	Airports Authority of India
			Kolnapur Airport, Manarashtra
	Pin Code	:	416 004
	E-mail	:	aerodromeinc_vakp@aai.aero
	Telephone No.	:	0231-2677 701/ 2677 352
	Fax No.	:	NA
16.	Details of alternate sites examined, if	:	The proposed development work will be
	any. Location of these sites should be		located within existing land available
	shown on a topo sheet.		within the Kolhapur Airport.
17.	Interlinked Projects.	:	No
18.	Whether separate application of interlinked project has been submitted?	:	No
19.	If ves, date of submission.	:	NA
20.	If no. reason	:	NA
21.	Whether the proposal involves	:	Not Applicable
	approval/clearance under: if yes, details of the same and their status to be given. (a) The Forest Conservation Act, 1980?	-	
	(b) The Wildlife (Protection) Act, 1972?		
	(c) The C.R.Z. Notification, 1991?		
22.	Whether there is any Government order/policy relevant/relating to the site?	:	No
23.	Forest land involved (hectares)	:	Yes, Forest patch is located adjacent to Kolhapur airport. State Govt is in process of diversion of 27.01 Acres forest land to handed over to Airport Authority of India to proposed

			development at Kolhapur airport.
24.	<ul> <li>Whether there is any litigation pending against the project and/or land in which the project is propose to be set up?</li> <li>(a) Name of the court.</li> <li>(b) Case No.</li> <li>(c) Orders/directions of the court, if any and its relevance with the proposed project.</li> </ul>	:	No

 Capacity corresponding to sectoral activity (such as production capacity for manufacturing, mining lease area and production capacity for mineral production, area for mineral exploration, length for linear transport infrastructure, generation capacity for power generation etc.,)

#### (II) Activity

1. Construction, operation or decommissioning of the project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)

Sn.	Information/ Checklist	Yes/No	Details thereof (with approximate
	confirmation		quantities/ rates, wherever
			possible) with source of
			information
1.1	Permanent or temporary	No	The proposed development work will
	change in land use, land cover		be located on existing 750.53 Acres
	or topography including		land available within the Kolhapur
	increase in intensity of land use		Airport. Additional 64 Acres land is
	(with respect to local land use		required from State Govt for the
	plan)		proposed development.
1.2	Clearance of existing land,	No	The site of proposed development
	vegetation and buildings?		work at Kolhapur Airport is free from
			vegetation and buildings.
1.3	Creation of new land uses?	Yes	The proposed development work will
			be located on existing 750.53 Acres
			land available within the Kolhapur
			Airport. Additional 64 Acres land is
			required from State Govt for the
			proposed development.
1.4	Pre-construction investigations	No	Pre-construction investigations e.g.
	e.g. bore house, soil testing?		bore house, soil testing will be
			carried out before construction.
1.5	Construction works?	No	No construction has been started.
			Construction work for proposed
			development at Kolhapur Airport will
			be started only after obtaining
			Environmental Clearance.
1.6	Demolition Works?	No	No major structure will be
			demolished, therefore, no demolition
			work is required.
1.7	Temporary sites used for	Yes	Temporary site for labour, project
	construction works or housing		site office will be required during
	of Construction workers?		construction by the contractors and
			same will be located within the site at
			the Airport.
1.8	Above ground buildings,	Yes	Under proposed development work,
	structures or earthworks		taxiway, apron, terminal building, air
	including linear structures, cut		traffic control tower etc, will be
	and fill or excavations		constructed. Excavated materials will

Sn.	Information/ Checklist	Yes/No	Details thereof (with approximate
	confirmation		quantities/ rates, wherever
			possible) with source of
			information
			be used for filling at the site.
1.9	Under ground works including	No	No underground works including
	mining or tunneling		mining or tunneling will be required
			for the proposed development work
			at the Kolhapur Airport.
1.10	Reclamation Works?	No	For the proposed development work
			at the Kolhapur Airport.
1.11	Dredging?	No	No dredging will be required at the
			proposed development work at the
			Kolhapur Airport.
1.12	Offshore structures?	No	Not applicable
1.13	Production and manufacturing	No	Not applicable
	processes?		
1.14	Facilities for Storages of goods	Yes	Storage facilities will be provided for
	or materials?		aggregate, sand, cement, steel,
			paints and other construction
			materials as per requirement during
			construction of proposed
			development work at the Kolhapur
			Airport.
1.15	Facilities for treatment or	Yes	During construction phase of
	disposal of solid waste or liquid		proposed development work at the
	effluents?		Kolhapur Airport, sewage treatment
			facilities of adequate capacity will be
			provided for disposal of sewage at
			construction labour camp.
			Construction debris will be disposed
			suitably in the environmental sound
			manner.
			During operation shape. CTD will be
			During operation phase, STP Will be
			installed for treatment of sewage
			development work at the Keller
			Airport
1 4 0	Facilities for loss tarms have	NI-	
1.16	racilities for long term housing	INO	Not applicable as project is proposed
	oi operational workers?		Airport
4 47	New read and an or the fill	NI-	Airport.
1.17	inew road, rail or sea traffic	NO	During construction phase, very

Sn.	Information/ Checklist	Yes/No	Details thereof (with approximate
	confirmation		quantities/ rates, wherever
			possible) with source of
			information
	during construction or		minor increase in road and rail traffic
	operation?		is anticipated due to transportation of
			construction materials to the site.
1.18	New road, rail, air waterborne	No	Only existing transport facilities will
	or other transport infrastructure		be used to transport the construction
	including new or altered routes		materials to the proposed
	and stations, ports, airports		development work at the Kolhapur
	etc?		Airport.
1.19	Closure or diversion of existing	No	Only existing transport facilities will
	transport routes or		be used to transport the construction
	infrastructure leading to		materials to the proposed
	changes in traffic movements?		development work at the Kolhapur
			Airport.
1.20	New or diverted transmission	No	There is no transmission line or
	lines or pipelines?		pipeline at the proposed
			development work site at the
			Kolhapur Airport.
1.21	Impoundment, damming,	No	No such changes are anticipated
	culverting, realignment or other		due to proposed development work
	changes to the hydrology of		at the Kolhapur Airport.
	watercourses or aquifers?		
	-		
1.22	Stream crossings?	No	Panchganga River is flowing at a
			distance of 5 km in north direction
			from the Komapur Airport.
1.23	Abstraction or transfers of	Yes	On an average 30 cum/day water will
1.20	water form ground or surface	100	be required for construction, which
	waters?		will be met from ground water
			resource through bore well at the
			project site.
			During operation phase,
			approximately 95 kl/d water will be
			required which will be met from
			borewells at the airport
1.24	Changes in water bodies or the	No	At the Kolhapur Airport storm water
	land surface affecting drainage		management will be adopted to
	or run-off?		avoid any impact on natural drainage
			pattern.
1.25	Transport of personnel or	Yes	For construction of the project 120 to

Sn.	Information/ Checklist confirmation	Yes/No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information
	materials for construction, operation or decommissioning?		<ul><li>150 persons will be deployed depending upon quantum of work at one point of time.</li><li>Transport of personnel or materials for construction will be from local area.</li></ul>
1.26	Long-term dismantling or decommissioning or restoration works?	No	No such activity is required at the proposed site for construction of the proposed development work at the Kolhapur Airport.
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	No	No decommissioning activity is going on the proposed development work at the Kolhapur Airport.
1.28	Influx of people to an area in either temporarily or permanently?	No	About 120 to 150 construction workers will be deployed during the construction phase temporarily.
1.29	Introduction of alien species?	No	No such possibility is envisaged due to construction and operation phase of the proposed development work at the Kolhapur Airport.
1.30	Loss of native species or genetic diversity?	No	No such possibility is envisaged due to construction and operation phase of the proposed development work at the Kolhapur Airport.
1.31	Any other actions?	No	

2. Use of Natural resources for Construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply):

S.No	Information /Checklist	Yes/No	Details thereof (with approximate
	confirmation		quantities / rates wherever
			possible) with source of
			information data
2.1	Land especially undeveloped or agricultural land (ha)	Yes	The proposed development work will be located on existing 750.53 Acres land available within the Kolhapur Airport. Additional 64 Acres land is required from State Govt for the
0.0	Mater (avecated course 9	Vaa	proposed development.
2.2	competing users) unit : KLD	Yes	About 95 kl/day average water requirement will be for domestic purpose, CFT and cooling, which will be met from ground sources.
2.3	Minerals (MT)	Yes	Cement, bricks, aggregate and sand will be required for construction of the proposed development of Kolhapur Airport.
2.4	Construction material- stone,	Yes	Construction materials such as stone,
	aggregates, and /soil		aggregates, sand and soil are locally
	(expected source- MT)		available in plenty for the project.
2.5	Forests and Timber (source- MT)	No	For construction of proposed development of Kolhapur Airport, no forest and timber will be required.
2.6	Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)	Yes	During operation phase, DG set of two 250 kVA capacity and one standby fitted with acoustic enclosure will be installed for emergency power generation during grid power failure. Quantity of HSD will depend on the operation of DG Sets and construction equipment. At one point of time, only 800 liters HSD will be stored in barrels.
2.7	Any other natural resources (Use appropriate standard units)	Yes	Aggregate and sand will be required for construction purpose.

3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.

S.No	Information /Checklist	Yes/No	Details thereof (with
	confirmation		approximate quantities / rates.
			Wherever possible) with source
			of information data
3.1	Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and water supplies)	Yes	No hazardous substances or material (as per MSIHC rules) will be used at the proposed development work at the Kolhapur Airport during construction and operation phase. Small quantity of paints and HSD for DG sets operation will be used at the Kolhapur Airport, however, quantity of these materials will be much less
			than the threshold quantity mentioned in MSIHC Rule.
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	No	No such possibility is anticipated during construction and operation phase of proposed development work at the Kolhapur Airport.
3.3	Affect the welfare of people e.g. by changing living conditions?	Yes	The proposed development work at the Kolhapur Airport will provide improved facilities to the tourist and visitors. The proposed development work at the Kolhapur Airport will create direct and indirect employment opportunities significantly during construction and operation phases.
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.	No	The proposed development work will be located within land available at Kolhapur Airport. Therefore, no person will be displaced for the construction of proposed development of Kolhapur Airport.
3.5	Any other cause	No	

4. Production of solid was	es during construction or	operation or	decommissioning
(MT/ month)			

S.No	Information /Checklist	Yes/No	Details thereof (with approximate
	confirmation		quantities / rates. Wherever
			possible) with source of
			information data
4.1	Spoil, overburden or mine	No	No such waste will be generated
	wastes		from the construction of the
			proposed development work at the
			Kolhapur Airport.
4.2	Municipal waste (domestic and	Yes	During Construction Phase: 15
	or commercial wastes)		kg/day
			Metal scrap and empty metal
			materials; and
			Paper and packing wood
			scrap.
			During Operation Phase: 70 kg/day
			Kitchen Waste;
			Paper and stationary scrap; and
			Empty plastic containers of non-
			hazardous materials.
4.3	Hazardous waste (as per	Yes	Containers containing paint
	Hazardous Waste Management		residue mainly during
	Rules)		construction phase; and
			• Waste oil generated from DG
			sets. twice in year. which is
			collected in drum and handed
			over to Central Pollution Control
			Board (CPCB)/ Maharashtra
			approved waste oil recyclers
4.4	Other industrial process wastes	No	No industrial process wastes will be
			generated from construction
			activities of the proposed civil
			enclave.
4.5	Surplus product	No	No surplus product will be
			generated from construction of the
			proposed civil enclave.

S.No	Information /Checklist	Yes/No	Details thereof (with approximate
	confirmation		quantities / rates. Wherever
			possible) with source of
			information data
4.6	Sewage sludge or other sludge	Yes	During operation phase, approx 15
	from effluent treatment		kg sludge will be generated from
			the Sewage Treatment Plant (STP).
4.7	Construction or demolition	No	Demolition wastes will not be
	wastes		generated from the proposed
			development work at the Kolhapur
			Airport. Construction wastes
			generated time to time during
			construction activity will be used in
			filling at the site.
4.8	Redundant machinery or	No	No redundant machinery or
	equipment		equipment will be left at the
			Kolhapur Airport.
4.9	Contaminated soils or other	No	No contaminated soil or material is
	materials		anticipated to be generated at the
			proposed development work at the
			Kolhapur Airport.
4.10	Agricultural wastes	No	No agricultural waste is anticipated
			at the proposed development work
			at the Kolhapur Airport.
4.11	Other solid wastes	Yes	Only 20-25 kg municipal waste will
			be generated from the construction
			labour camps, which will be
			disposed suitably after segregation.

S.	Information /Checklist	Yes/No	Details thereof (with approximate
No	confirmation		quantities / rates. Wherever
			possible) with source of
			information data
5.1	Emissions from combustion of	Yes	Vehicles transporting construction
	fossil fuels from stationery or		materials, construction equipment
	mobile sources		and machinery will be another source
			of emissions.
			Stack emissions are anticipated from
			the operation of DG sets, which will be
			operated only to meet the power
			requirement during grid power failure.
			Vehicles approaching to the airport
			will also be another source of
			emissions.
5.2	Emissions from production	No	Not applicable as no production
	processes		process will be carried out at the
			Kolhapur Airport.
5.3	Emissions from materials	No	Not applicable as no material
	handling including storage or		handling will be carried out at the
	transport		Kolhapur Airport.
5.4	Emissions from construction	Yes	Small quantity of dust emissions may
	activities including plant and		be observed during excavation and
	equipment		Airport
5.5	Dust or odours from handling or	Yes	During excavation and earth work
0.0	materials including construction	100	dust emissions are anticipated.
	materials, sewage and waste		however, this dust comprising coarse
			particles will be settled at short
			distance.
			No odour problem is anticipated from
			construction materials, sewage and
			waste as same will be handled as per
			standard practice.
5.6	Emissions form incineration of	No	No incineration of waste will be held
57	Waste	No	at the Kolnapur Airport.
D./		INO	out at the Kelbanur Airpart
	construction debrie		
5.8	Emissions from any other	Yes	Air emissions due to aircraft take off
0.0	sources	103	landing taxiing and from aprop
			and norm apron

#### 5. Release of pollutants or any hazardous, toxic or noxious substances to air (Kg/hr)

S. No	Information /Checklist confirmation	Yes/No	Details thereof (with approximate quantities / rates. Wherever possible) with source of information data
			parking are other existing sources of air emissions.
			Emissions from vehicular movement during construction and operation phases.

#### 6. Generation of Noise and Vibration, and Emissions of Light and Heat :

S.No	Information /Checklist	Yes/No	Details thereof (with approximate
	confirmation		quantities / rates. Wherever
			possible) with source of
			information data
6.1	From operation of equipment	Yes	From construction equipment and
	e.g. engines, ventilation plant,		DG set, 70 to 80 dB (A) noise
	crushes		levels may be generated. However,
			acoustic enclosures will be fitted
			with DG sets to control the noise
			levels.
6.2	From industrial or similar	No	No industrial process will be
	processes		involved during construction/
			operation phase of Kolhapur
			Airport.
6.3	From construction or demolition	Yes	Noise will be generated from
			construction machinery during
			construction process.
			During construction activities
			During construction activities,
			be generated temporarily
6.4	From blasting or piling	No	No blasting will be carried out at the
0.4		INO	proposed civil enclave
6.5	From construction or operational	Yes	Approximately 65 to 70 dB(A) noise
0.0	traffic		may be generated from the
			vehicles approaching the site.
6.6	From lighting or cooling systems	No	Not applicable
6.7	From any other sources	No	Noise will be generated during take
			off and landing and taxing of
			aircraft at the Kolhapur Airport.

### 7. Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, ground water, coastal waters or the sea :

S.No	Information /Checklist	Yes/No	Details thereof (with approximate
	confirmation		quantities / rates. Wherever
			possible) with source of
			information data
7.1	From handling, storage, use or	Yes	Approx. 5000 litres HSD will be
	spillage of hazardous materials.		stored at the airport for operation of
			DG set.
7.2	From discharge of sewage or	Yes	During operation phases of the
	other effluents to water or the		Kolhapur Airport, sewage
	land (expected mode and place		generated will be treated in
	of discharge)		Sewage Treatment Plant (STP).
			I reated water will be utilized for
			flushing and horticulture purposes
			at the Kolnapur Airport.
7.3	By deposition of pollutants	Yes	The dust generation may take
	emitted to air into the land or		place due to material handling and
	into water		These emissions are neutral in
			nature and will be settled in the
			immediate vicinity hence no impact
			is anticipated During operation DG
			set emissions stack will be provided
			as per CPCB guideline Sewage
			will be treated in sewage treatment
			plant (STP).
7.4	From any other sources	No	
7.5	Is there a risk of long term build	No	No such impact is anticipated.
	up of pollutants in the		
	environment from these		
	sources?		

8.	Risk	of	accidents	during	construction	or	operation	of th	е	Project,	which	could
af	fect h	um	an health	or the er	nvironment.							

S.No	Information /Checklist	Yes/No	Details thereof (with approximate
	Commation		quantities 7 fates. Wherever
			information data
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous substances.	Yes	At the Kolhapur Airport, HSD will be handled through barrels, which is flammable and hazardous substance if getting ignited.
			Adequate safety measures will be taken during the handling and storage of HSD.
8.2	From any other causes?	Yes	<ul> <li>Emergency during Aircraft landing and takeoff</li> <li>Traffic movement inside Airport, and</li> <li>Short circuit at terminal building.</li> </ul>
8.3	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquake, landslides, cloudburst etc)?	No	There is no possibility of affecting the project by natural disaster, e.g. floods, earthquakes, cloudburst etc.

9. Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality.

S.No	Information /Checklist confirmation	Yes/No	Detailsthereof(withapproximatequantities/ rates.Whereverpossible)withsourceofinformationdata
9.1	Lead to development of supporting, utilities, ancillary development or development stimulated by the project, which could have impact on the environment e.g.		
	<ul> <li>Supporting infrastructure (roads, power supply, waste or waste water treatment, etc)</li> </ul>	Yes	The proposed development of Kolhapur Airport is aimed to provide better facilities for tourist, business and local passengers.

S.No	Information /Checklist confirmation	Yes/No	Details thereof (with approximate quantities / rates. Wherever possible) with source of information data
	Housing development	No	Any development activity around the airport will be discouraged or it will be as per applicable siting
	Extractive industries	No	criterion.
	Supply industries	No	
	Other	No	
9.2	Lead to after – use of the site, which could have an impact on the environment.	No	
9.3	Set a precedent for later developments.	No	
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects.	No	No cumulative effect is anticipated due to proposed civil enclave.

#### (III) Environmental Sensitivity

S.	Areas	Name/	Aerial distance (within 15 Km.)
No		Identity	proposed project location
			Boundary
1.	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	No	No any areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value within 15 km area from the Kolhapur Airport
2.	Areas which are important or sensitive for ecological reasons- Wetlands, watercourse or other water bodies, coastal zone, biosphere, mountains, forests	Yes	<ul><li>Panchganga is flowing at a distance of 5 km in north direction from Kolhapur Airport.</li><li>(Forest patch is located adjacent to airport. State Govt will be divert 27.01 Acres forest land and handed over to Airport Authority of India)</li></ul>

S.	Areas	Name/	Aerial distance (within 15 Km.)
No		Identity	proposed project location
			Boundary
3.	Areas used by protected,		
	important or sensitive species of		No protected important or consitive
	flora or fauna for breeding,		no protected, important of sensitive
	nesting, foraging, resting, over	No	species located within 15 km radius
	wintering, migration		
4.	Inland, coastal, marine or	No	No such sensitive feature is located
	underground waters		within the 15 km radius study area.
5.	State, National boundaries	Yes	Maharashtra and Karnataka State
			Boundary is located within 15 km
			radius area at a distance of 12.5
			km.
6.	Routes or facilities used by the		No routes or facilities used by the
	public for access to recreation or	No	public for access to recreation or
	other tourist, pilgrim area		other tourist, pilgrim area is located
			within 15 km radius.
7.	Defence Installations	No	No defence installation is located
			within the 15 km distance.
8.	Densely populated or built-up	Yes	Kolhapur city is major populated or
	area		built up area at a distance of 9 Km.
9.	Areas occupied by sensitive		Major hospitals schools places of
	man-made land uses (hospitals,		worship community facilities are
	schools, places of worship,	Yes	located at Kolhanur City
	community facilities)		
10.	Areas containing important, high		
	quality or scarce resources		No any important, high quality or
	(ground water resources, surface	No	scarce resources areas are located
	resources, forestry, agriculture,		within 15km
	fisheries, tourism, minerals)		
11.	Areas already subjected to		<u> </u>
	pollution or environmental		There is no any area within 15 km
	damage (those where existing	No	which is already subjected to
	legal environmental standards		pollution or environmental damage.
10	are exceeded)		
12.	Areas susceptible to natural		
	nazard which could cause the		
	project to present environmental		
	problems	No	The Kolhapur is located in Seismic
	(earthquake, subsidence,		∠one III.
	landslides, erosion, flooding or		
	extreme or adverse climatic		
	conditions)		

#### (IV). Proposed Terms of Reference for EIA/EMP Studies

#### A. Project (Proposed Development of Kolhapur Airport) Description

Design details of the taxiway, apron, proposed terminal buildings, HVAC systems details, power requirements, parking facilities, water requirement and sources, drainage and sewage disposal system, storm water drainage system, horticulture and landscaping, energy conservation measures, intelligent fire detection and alarm system, etc.

#### B. Description of the Environment

The Study Area: The study area will cover 10 km area around the Kolhapur airport.

**Topography:** Topography, ground conditions, slope, etc.

**Soil and Geology:** Soil type and it characteristics, geology of the area.

**Ground & Surface Water Hydrology:** Ground water table, rainfall, surface water bodies in the area.

Drainage Patterns: Drainage pattern, runoff flow direction

Water Quality: Quality of ground water recourses.

**Meteorology and Climatology:** Meteorology and climatological conditions including temperature, relative humidity, wind direction and wind speed, etc.

Ambient Air Quality: Ambient air quality monitoring at and around the airport.

Noise Environment: Noise level measurements at and around the airport.

Flora and Fauna: Common trees, shrubs, other vegetation, common fauna, rare and endangered flora and fauna species, sensitive locations, wildlife animals and avifauna.

**Socio-economic Details:** The demographic details including population, schedule cast, schedule tribe, literacy, occupational pattern, economic and social conditions, employment and skills in the settlement within the 10 km radius area around the Kolhapur airport.

#### C. Anticipated Environmental Impacts and Mitigation Measures

The environmental impact assessment will be carried out in accordance with the requirement of MOEF&CC norms and guidelines. Impact assessment will be carried out after establishing the baseline status of the study and analysis of the project data/activities. Wherever practicable, a quantitative analysis would be performed. Suitable computer models, if applicable, would be used; otherwise, the impact assessment would be quantified through mathematical computations. The projects activities will be linked with the existing baseline environmental conditions in order to short list the affected environmental parameters and assess the likely impacts on such parameters. Compliance of the proposed project with national standards will be duly checked.

During construction and operation phase of proposed development of Kolhapur Airport, environmental impacts on various environmental parameters will be identified and evaluated as given below:

- Impact on water resources
- Impact on ambient air quality
- Impact on noise baseline levels
- Impact on soil characteristics
- Nature, quantity and disposal of construction spoils and solid waste
- Sewage generation and disposal
- Solid Waste Management Plan
- Parking and traffic management
- Impact on flora and fauna
- Socio-economic impacts on the area and region

#### D. Environmental Monitoring Programme

Environmental monitoring plan for construction and post construction phases of the project will be formulated to ensure effectiveness of implemented environmental mitigation measures.

#### E. Environment Management Plan

Environmental Management Plan (EMP) is the key to ensure a safe and clean environment during construction and operation phase. The EMP envisages the plans for the proper implementation of mitigation measures to reduce the adverse environmental impacts arising out of the project activities during construction and operation phase. The following issues will be addressed in the EMP:

• Details of the Sewage Treatment Plant (STP) for treatment of sewage and recycling and reuse of treated waste water.

- Environmental management measures for ambient air quality
- Details of noise mitigative measures to be taken to minimize noise at the nearby areas.
- Details of waste segregation and disposal of waste, including vermi composting
- Details of energy saving system to be installed and incorporated in the plan and design.
- Parking facilities for vehicles
- Details of the construction materials and its transportation to site
- Details of greenbelt development along with the area/cost earmarked for the project.
- Rainwater Harvesting System
- Details of fuel storage and safety measures.
- Details of Environment Cell and EMP.
- Expenditures & budget for environmental protection measures and implementation of the EMP.
- Details of the emergency response plan

#### Annexure 1



Location of Kolhapur Airport on Google Map

## **Pre-feasibility Project Report**

for

Extension of Runway with Blast Pad, RESA, Taxiway, Apron, GSE Area, Isolation Bay, Construction of New Domestic Terminal Building, ATC tower cum Technical Block cum Fire Station and Other Miscellaneous Works at Kolhapur Airport (Maharashtra)

## **AIRPORTS AUTHORITY OF INDIA**

**Chapter 1** 

# **Kolhapur Airport**

### Chapter 1

### Kolhapur Airport

#### 1.1 Background

Kolhapur is an important city in Maharashtra and is known as Dakshin Kashi from ancient time. It is a famous religious place due to Mahalakshmi & Jotiba temples. Kolhapur is seat of Goddess Mahalaxmi and is one of the Shaktipeeths mentioned in India. Kolhapur is world famous for Kolhapuri Chappals as well. The city is situated at a height of 1790 feet above mean sea level and 16-42 North latitude and 74 - 14 East longitude. The city stands on the bank of river Panchaganga, a tributary of the river Krishna. By road, Kolhapur is 228 km south of Pune, 615 km north-west of Bangalore and 530 km west of Hyderabad. The coastal line (western) is only 75 km away from Kolhapur & hence is known as 'Door of Konkan'. The national highway no.4 (Poona-Bangalore Highway) passes through Kolhapur. Kolhapur is having a railway terminal station named "Chhatrapati Shahu Tarminus".

#### 1.1.1 Economy

Kolhapur is one of the important economic regions of Maharashtra with its Strong and Historic Heritage, most attractive tourist destinations, well established economic infrastructure, is one of the richest agricultural belt of the country. The main economic drivers are Manufacturing, Tourism, Agriculture and Services.

It is also second highest per capita income city, called the "sugar bowl of India", having the maximum amount of Mercedes cars, spinning mills, education center. The city has a textile manufacturing sector, particularly known for the Kolhapuri chappal, a hand-crafted buffalo leather slipper that is locally tanned using vegetable dyes. Other handicrafts include: hand block printing of textiles, silver, bead and paste jewelry crafting, pottery, wood carving and lacquer ware, brass sheet work and oxidized silver art workand lace and embroidery making.

#### 1.1.2 Industry

Sugar and jaggery of Kolhapur is very famous in all over India and more than 20 sugar factories present in kolhapur district. Cotton mills also very popular and reached at top most position. Ichalkaranji is biggest city in kolhapur which is mostly known as 'Manchester of Maharashtra'. There is so many spinning mills in Kolhapur district and most of them are placed in Ichalkaranji. kolhapuris going to become a very successful in milk bussiness. So many milk products come into market and day by day the popularity of these increases rapidly.

Kolhapur is also popular for Machinary production. Different kinds of machineries are produced in Kolhapur which is oil engines, printing machines, lathe machines, Electronic motors, spare parts of machinary, Tractor Engines, watches, furniture's etc.

Kolhapur has well known historical background and also has good potential in Foundry Industries. There are approximately 300 foundry units located in the Kolhapur and Sangli districts of the region. A majority of the foundry units in the cluster cater to the automotive sector along with other sectors such pumps / valves, sugar, textiles, etc. The cluster has experienced growth in turnover, employment and exports over the past few years. Almost 30% of production is being exported to several countries and catering to numerous industries.

There is 4 major industries in Kolhapur City:

- 1. Shivaji Udyam Nagar Industry
- 2. Gokul Shirgaon MIDC
- 3. Shiroli MIDC
- 4. Five Star MIDC

#### 1.1.3 Tourism Potential

Kolhapur is situated in the southwest corner of Maharashtra, India. It is the land of magnificent temples, and the religious pride of Maharashtra. Nested in the tranquil laps of the Sahyadri mountain ranges, it is situated on the banks of the river Panchganga. Also termed as a city of palaces and gardens, it is a historic Maratha city, with the Mahalakshmi temple forming the focus. Arts,

aristocracy and graciousness combined with culture stepped in spiritualism, education and modernization.

Kolhapur, known as 'Dakshin Kashi' is one of the most prosperous and joyous city of India. Kolhapur, the town of goddess Mahalakshmi is gifted with an incredible archeological & cultural heritage, magnificent temples, monuments, forts, lakes and gardens. Kolhapur is an ancient city, famous for its food, headwear, footwear, jewelry, wrestling and religious connections. Also it is world famous for Kolhapuri Chappals & Jaggery.

The city has numerous attractions in the form of Heritage Structures, Lakes and Palaces, Forts and Hill Station, Parks and River Banks Catering to Religious Tourists, Leisure, Nature and Adventure segment, Business segment etc.

An important religious destination due to the presence of

- Mahalaxmi Temple: 35 lacs visitors annually
- Jothiba Temple : 10 lacs visitors annually
- Narsobawadi : 7-8 lacs visitors annually

#### 1.1.4 Kolhapur Airport

Kolhapur Airport is located at a distance of 9 km from the City Centre. It is an operational airport having total land area of 748.78 acres. At present, there are no schedule flights. Non-scheduled Charters operate their flights for business, ceremonies and other several important occasions.

#### 1.2 Existing Infrastructure at Kolhapur Airport

The details of existing infrastructure available at the Kolhapur Airport are given below:

- (i) Terminal Building The existing Passenger Terminal building area 174.67 sqm capable to handle 25 peak hour passengers (25 Arriving or 30 Departing)
- (ii) **Runway** Runway 07/25 having dimension 1370 m X 45 m is suitable for the operation of ATR-72 type of aircraft.

- (iii) Apron Apron size is 82 m x 52 m suitable for parking 3 nos. (2nos. ATR-72 & 1 no. B-200) type of aircraft with power-in and power-out configuration.
- (iv) **Fire Station** Presently being provided by City Fire Services during flight operation

#### ICAO/ IATA Code: VAKP / KLH

Operation: Non scheduled.

#### **Reference Point:**

Latitude	: 16°39'55"N
Longitude	: 74°17'29"E
Elevation	: 606 m.
Aerodrome Reference Code (ARC)	: 3C

Total Land Available (Acres) with Kolhapur Airport: 748.83 Acres

#### Runway

Orientation	Dimension	Bearing Strength		of
		pavement-	LCN/PCN	
7/25	1370 m×45 m	16/F/D/Y/T		

#### Runway Detail

Runway	TORA	TODA	LDA	ASDA
07	1370	1549.83	1370	1370
25	1370	1549.83	1370	1370

#### 1.3 Scope of Work for Proposed Development at Kolhapur Airport

Scope of work for extension of runway with blast pad, RESA, taxiway, Apron, GSE area, Isolation bay, construction of new domestic terminal building, ATC tower cum Technical block cum fire station and other Miscellaneous works at Kolhapur Airport (Maharashtra) is given below:

#### (A) Civil Works

#### (i) Runway Extension:

- i) Obstacle Survey to be undertaken before extension of runway to ensure full utilization of full length of runway.
- Extension of Runway by 930 m x 45 m towards North-East (25 Runway Orientation) to have total runway dimension of 2300 m x 45 m to cater for the strength of Code 'C' critical aircraft B737-900W / A-320-200 as shown in the enclosed drawing. Both longitudinal and transverse slopes are to be maintained as specified in Annex-14.
- iii) Strengthening of the existing runway 1370 m x 45 m to cater for the strength of Code 'C' critical aircraft A-320-200.
- iv) Provision of 2.5 M wide Shoulder on both sides of 2300 M Runway pavement for operation of code -"C" critical aircraft A-320-200.
- v) Construction of Turn pad for code 'C' critical aircraft A-320-200 at both ends of Runway 07 & 25.
- vi) Provision of 60 m x 60 m Blast Pad at Runway 07 & 25.
- vii) Construction of 240 m x 90 m RESA at both ends of Runway strip of Runway 07 / 25.
- viii) Grading of Runway strip (300 m x 2420 m) as specified in DGCA CAR, Taxiway strip and entire operational area to meet the ICAO slope criteria, wherever required.
- ix) Development of drainage system for the pavements in the operational area after 300 m basic strip, wherever required.
- x) Technical evaluation system for the pavement strength after completion of work an prior to commissioning
- xi) Provision of runway, taxiway & apron marking, mandatory instruction marking, wherever required as per Annexure -14 and Aerodrome design Manual Part IV (Visual Aids)
- xii) Paved surfaces of adequate dimensions should be provided in front of PAPI to prevent growth of grass and vegetation.

#### (2) New Taxiway

- i) Provision of 213 m x 23 m Link taxi track with 2.5m shoulder on both sides to cater for code 'C' aircraft (B-737- 900W) for new Apron.
- ii) Both Longitudinal and transverse slopes on Taxiway to be maintained as specified in DGCA CAR.

#### (3) New Apron

- i) Construction of new Apron of size 148.5m x 93.5m for parking aircraft 3 nos. Cat- "C" aircraft (1 No. AB-320/ B737- 900W and 2 Nos. ATR-72) or (2 Nos. AB-320/ B737- 900W) in power-in and power out configuration with 75 x 20 M wide GSE Area after adequate clearances as shown in the apron layout drawing (Annexure II).
- ii) Provision of 2.5 M wide shoulder in desired strength on all sides as shown in the apron layout Drawing (Annexure II).
- iii) Provision of fillets at taxiway intersection with Runway and apron for AB 320-200 aircraft.
- iv) The slope to be provided as specified in DGCA CAR.
- v) Taxiway strip of width 52 m *i.e.* symmetrically for a distance of 26 m on either side of the centre line shall be made obstruction free considering the operations of A320- 200 type of aircraft which is designated as code -"C" aircraft.
- vi) Technical evaluation and declaration of pavement strength after completion of work and prior to commissioning.
- vii) Provision of drainage system for the apron connecting to the main storm water drains and required culverts.
- viii) Provision of new Isolation Bay 91 m X 76 M and 217.5 m x 23m Link Taxiway with 2.5 m wide shoulder suitable to cater for code-"C" type of aircraft.

#### (4) New Domestic Terminal Building:

 Provision of centrally air-conditioned New Domestic Passenger Terminal building to handle 300 Peak Hour passengers (150 Arrival & 150 Departure) with covered area 3900 sqm. as per IMG norms with a provision for modular expansion on both the sides as per location shown in the enclosed Master plan drawing (Annexure-I) and Drawings enclosed.

- ii) The new terminal building should have provision of all modern amenities, 10 no of check in counters and 9 nos. of airlines ticketing, facilitation and concessionaires etc. on the city side.
- Provision of 2 nos. arrival conveyor belt/carousal system, CCTV, Plasma/LED TV for flight display system, furnishing of VIP lounges adequate no of chairs, baggage trolleys, furniture, furnishing, etc.
- iv) Provision of canopy covering 2-lane road and Kerb in front of terminal building.
- v) City side car parking for 100 cars, VIP parking for 10 cars, taxi parking, coach parking, approach road and utility buildings *i.e.* A.C plant sub-station, sewage treatment plant, etc., public toilet & snacks counter in car park area.
- vi) Horticulture-landscaping, drainage system, water supply in the city side area.
- vii) Providing city side compound wall with gates etc, as per site requirements
- vii) Provision of 2 lane service road between apron and terminal building.
- (ix) Retro reflective road signage in the car park and approach road.

#### (5) New ATC Tower cum Technical Block cum Fire Station

 New ATC tower cum Technical block (Category-2) cum Fire Station (Category - 6) similar to as per drawings enclosed.

#### (6) Miscellaneous Work

- i) Provision of 4.5 m wide Perimeter road all around the acquired land.
- ii) Provision of property/ operational boundary wall and Security hut/ tower.

#### **B. Electrical Works:**

#### Runway Extension, New Apron, New Taxiway, Isolation bay

- i) Provision / Relocation of Runway edge lights, Threshold / End Lights, Turn Pad lights and Runway Marking /Marker,
- ii) Installation of simple approach lighting system on runway 07 and 25

- iii) Trans installation /Relocation of PAPI at RWY 25 and RWY 07 ends.
- iv) Provision of Apron edge lights and taxiway edge lights, lighted mandatory information/ information signs etc. including cabling works.
- v) Provision of high mast Apron and car park flood lights at appropriate locations to meet the desired illumination standards.
- vi) Provision of illuminated signage/pictographs, cubes etc, inside and illuminated fascia signage outside the terminal building
- vii) Provision of perimeter road lightings within operational area.
- viii) Provision of edge light, flood lights for isolation bay.

## (B) New Domestic Terminal Building, New ATC Tower cum Technical Block cum Fire Station

- Augmentation of Power supply if any, Substation equipment, DG sets for secondary power supply, A.C Plant equipment, Internal and external electrification of Terminal building, car park, approach roads and other ancillary buildings, provision of CCR equipment if any.
- ii) Central Air conditioning of new terminal building
- iii) Fire detection, alarm and protection system with fire control road
- iv) Provision of Check-in conveyer belts without in line X-ray inspection system and suitable arrival carousal system
- v) Building Management System
- vi) Re-routing of existing cables and necessary items for relocations of services as requirement during work progress
- vii) Fire Fighting Hydrant Sprinkler System & Fire Extinguishers for terminal Building and fire hydrant & Extinguishers for control tower
- viii) Provision of air curtains
- ix) Provision of elevators for new ATC Tower
- x) Provision of water pumping system
- xi) Advance Lighting Arrestor System for terminal building and technical block
- xii) CCTP equipment for airport security
- xiii) Sub-station should have sufficient space for accommodating 10 to 15 CCR.

- xiv) Provision of air conditioning for first floor of technical block
- xv) Roof top solar power plant on earmarked location as per drawing

#### C. CNS Works

i) Provision of DVOR in Runway-25 approach area

#### **D. Airport System Works**

- i) Public address system and car calling system
- Surveillance close circuit TV system (SCCTV) and provision of close circuit TV monitors, in the Security Control Room, Terminal Management Room, APD Office, etc.
- iii) Provision of flight information system (FIDS) with display Devices in the departure, arrival and security hold for passenger facilitation.
- iv) Provision of X-ray machines for scanning cargo, registered baggage (RB)/Hand Baggage (HB), including provision of required numbers of ETD, DFMDs, HHMDs as per BCAS Norms.
- v) Provision of adequate nos. of VHF FM Sets (Walkie-Talkie, base stations and mobile Stations)
- vi) Provision of Telephone exchange/digital EPABX system for Terminal Building including Telephone/intercom instruments, wiring, etc.

#### E. IT Systems

- Passive and active networking components such as OFC, UTP, cabling, Routers, Core & Access Switches and Accessories. Provisions of Raceways, cable trays and conducting and cabling.
- ii) One room of 400 sq. ft. area with provision of 3 pin power supply for IT UPS.
- iii) 2.4 mx3.0 m switching room for IT networks with UPS supply where all the IT gadgets should be within 90 meters of cable length
- iv) Server room and adequate space for keeping network switches along with electrical power points and UPS.
- v) Access Control System as per BCAS requirement
- vi) Provision of internet, VPN bandwidth, Wi-Fi system along with Raceways/ conduiting and cable trays

vii) All the works are to be carried out as per DGCA CAR/ICAO documents and BCAS Norms

#### 1.6 **Project Site Details**

The total area of Kolhapur Airport is 748.83 Acres. It is located at Longitude 74°17'29"E and Latitude 16°39'55"N with elevation of 606 m at MSL. The map showing master plan of the proposed development of Kolhapur Airport is shown as **Figure 1.1.** The layout plan of the ground floor plan for new terminal building at Kolhapur Airport is shown in **Figure 1.2.** The section of new terminal building at Kolhapur Airport is given in **Figure 1.3.** The layout plan for new apron at Kolhapur Airport are shown as **Figure 1.4.** The proposed ATC cum fire station are given in **Figure 1.5.** 



Figure 1.1: Master Plan for Kolhapur Airport



Figure 1.2: Ground Floor Plan for New Terminal Building at Kolhapur Airport



Figure 1.3: Section of New Terminal Building at Kolhapur Airport



Figure 1.4: Layout Plan for New Apron at Kolhapur Airport



Figure 1.5: Proposed ATC cum Fire Station

Chapter 2

## Water Supply, Sewerage, Drainage And Fire Fighting

### **Chapter 2**

### Water Supply, Sewerage, Drainage And Fire Fighting

#### 2.1 Introduction

At Kolhapur Airport, terminal building is proposed covering an area of approx. 3900 sqm for 300 peak passengers (150 Arrival and 150 Departure passenger).

#### 2.2 Expected Population per Day at Airport

The expected population per day at the terminal building is given below:

Arriving and Departing Passengers	-	1500
Airport Staff (day time)	-	40
Airport Staff (24 hourly)	-	35
Drivers/Visitors	-	200

Water required as per National Building Code 2005 Part IX Table 2 is given below:

Terminal Staff (day time)	-	70 Litres/Head/Day
Terminal Staff (24 hourly time)	-	135 Litres/Head/Day
Air Passenger	-	15 Litres/Head
Floating population	-	15 Litres/Head

#### 2.3 Total Water Required

Water requirement for the proposed development of Kolhapur Airport is estimated as given below:

#### For Domestic Water Use

Air Passengers (1500 x70) - 105000 Litres

Staff day time (40 x70)	-	28	800 Litres
Staff (30 x135)		-	4050 Litres
VISILOIS (200X15)		-	3000 Litres
Total		-	114.850 Litres
	Say	-	115 kld
For Crush Fire Tender Water Use		-	10 kl
For HVAC Use		-	20 kl

Total water requirement is estimated as 145 Kl per day. The water balance diagram is shown in **Figure 2.1**. The water requirement for flushing and landscaping will be met through reuse of treated waste water from STP.



Figure 2.1: Water Balance Diagram for Kolhapur Airport

#### 2.4 Sources of Water

Water requirement will be met through tube wells.

#### 2.5 Sanitary Fixtures And Toilet Accessories

**Water Closet:** All water closets will be wall hung with concealed dual flushing cistern and in lodders and staff toilets WC will be provided with dual flushing cistern. Under counter/ circular above counter wash basins with battery operated auto sensor pillar taps will be provided.

- Flat back wash basins with CP brass self closing pillar tap will be provided in lodders and staff toilets.
- Semi stall urinal with battery operating auto sensor flush valves.
- Frosted Glass urinal portion with metal clips.
- CP adjustable shower with Diverter and spout in rest room's and VIP toilet.
- Vitreous china recess toilet paper holder.
- Automatic soap dispenser on wash basins (Stainless steel).
- Automatic air purifier (Stainless steel).
- Toilet tissue paper holder (Stainless steel).
- Automatic electrically operated hand drier (Stainless steel).

#### 2.6 Water Distributions Pipe and Fittings

G.I. / composite Pipe and fitting for hot and cold water. Heavy class G.I. pipe and fitting in shaft and under floor. All external under ground water pipe will be cast iron Class LA conforming to IS:1536 with specials and lead joints.

#### 2.7 Sewerage Treatment and Disposal

As per water balance diagram, 110 kl/d sewage will be generated after the operation of new terminal building which will be treated in STP of 125 kl/day capacity.

#### 2.8 Sewage Treatment Plant

Sewage generated from the airport will be treated in well designed Sewage Treatment Plant (STP). It is proposed to installed Moving Bed Biofilm Reactor (MBBR) type sewage treatment plant of 125 kl capacity.

#### **Design of STP**

Approximately 110 kl per day sewage/waste water will be generated from the proposed airport. Sewage will be collected and treated in well-designed sewage treatment plant. After meeting stipulated standards, treated waste water will be utilized for flushing purpose, irrigation of greenery and landscaping.

#### **Details of Sewage Treatment Process**

The sewage from the proposed airport shall be collected by gravity into the collection tank/equalization tank of Sewage Treatment Plant (STP) via perforated screens to prevent the large particles into system. In equalization tank, pH and temperature of incoming sewage will be equalized. The sewage from equalization tank will be pumped to Moving Bed Biofilm Reactor (MBBR) reactor for biological treatment, where required quantity of air in presence of MBBR system will be supplied to meet the oxygen requirements by mean of blower and fine bubbles air diffusers. After MBBR reactor, sewage will flow by gravity to settler (tube type) where sludge will be settled at the bottom due to gravity. This settled sludge will be recycled through sludge pump to MBBR reactor to meet the mixed liquor suspended solids (MLSS) requirement, excess sludge will be discharged through filter press for final disposal. Final discharge of waste water from settler will be collected in chlorine contact tank. where some chlorine will be dosed for disinfections of treated waste water. Then, treated sewage will be pumped for tertiary treatment through duel media filter or it will be passed through or it will be passed through Ultraviolet (UV) disinfection system. Treated sewage will meet the norms prescribed by State Pollution Control Board and will be utilized for flushing, HVAC and for irrigation of greenery & landscaping purpose. Treated wasted water will not be discharged out side the boundary of proposed airport.

#### **Design Parameters**

	5 1 1	1 0	
SI.	Parameters	Inlet	Outlet
1.	BOD	300 mg/l	Less than 20 mg/l
2.	COD	400 mg/l	Less than 150 mg/l
3.	Oil & Grease	50 mg/l	Less than 10 mg/l
4.	TSS	200 mg/l	Less than 50 mg/l
5.	PH	6.5-8.5 mg/l	6.5-8.5 mg/l

Design parameters for the proposed STP are given below:

No treated waste water will be discharged outside the airport. Unit wise description of the proposed STP is given below and shown in **Figure 2.2**:

#### Screen Chamber

Prior to the actual treatment of the wastewater, a screen chamber will be provided. In this chamber removable type mechanical bar screens will be provided for removal of various large size elements, such as paper, cloth, plastic etc, etc, which may hamper the satisfactory functioning of subsequent units of the STP, if not removed at early stages.

#### Oil & Grease Trap

The oil & grease trap will be provided to collect oil and grease trace coming with sewage. Collected oil & grease will be stored in a drum and disposed of in environmental sound manner.

#### **Equalization Tank**

As the quantity of the flow is non-uniform in nature, an equalization tank will have to be provided. By the provision of an equalization tank, wastewater characteristics will become homogeneous in nature and, therefore, better treatment can be achieved in the subsequent units of the STP. Diffused aeration will be provided in this tank to stir the contents of the tank completely.

#### MBBR Reactor (Biological Treatment)

Moving Bed Biofilm Reactor (MBBR) technology employs thousands of polyethylene biofilm carriers operating in mixed motion within an aerated wastewater treatment basin. Each individual bio carrier increases productivity through providing protected surface area to support the growth of heterotrophic and autotrophic bacteria within its cells. It is this high-density population of bacteria that achieves high-rate biodegradation within the system, while also offering process reliability and ease of operation.

This technology provides cost-effective treatment with minimal maintenance since MBBR processes self-maintain an optimum level of productive biofilm. Additionally, the biofilm attached to the mobile biocarriers within the system automatically responds to load fluctuations.

The bacteria/activated sludge grow on the internal surface of the carriers. The bacteria break down the organic matter from the waste water. The aeration system keeps the carriers with activated sludge in motion. Only the extra amount of bacteria growth, the excess sludge will come separate from the carriers and will flow with the treated water towards the final separator. The system can consist of a one stage or more stage system (see underneath schedule), depending on the specific demands. The specific bacteria remain in their own duty tank because of the fact that the carriers remain in only 1 tank, protected by screens.

A bio-film develops on the media, which move along the effluent sewage in the reactors. The movement within the reactors is generated by providing aeration with the help of diffusers placed at the bottom of reactors. This thin film on the media enables bacteria to act up on the bio-degradable matter in the effluent sewage and thus reduce the BOD/COD content in presence of oxygen from the air used for fluidization. Aeration will be done with the help of twin lobe blowers. The MBBR reactors will increase the oxygen content of the sewage and thus, will help in the growth of the micro-organisms required to reduce the BOD. These micro-organisms will consume the organic matter and will convert it into active biomass, better known as sludge. The waste water, laden with sludge, will be transferred to tube settler for sludge separation.

#### Secondary Settling Tank Followed by Pre filtration Tank

The sludge formed will settle in the secondary settling tank followed by pre filtration tank. The settled sludge will be discharged in the Sludge Collection Tank and would be dewatered using sludge press. The clear supernatant from the outlet of the tube settler will be discharged as treated waste water and will be passed on to further treatment for final polishing. HDPE/PVC low maintenance tubes will be provided for trouble free operation of the tube settler.

#### Sludge Filter Press

The sludge from the settling tank of the STP will be collected in the tank and will be treated in the sludge press. This will be 24 plates CI sludge press completes with its pump and accessories. In sludge press, the sludge in the form of liquid slurry is fed into the press and dry solid cake of sludge is taken out from it. These dry cakes are used as manure for green belt and landscaping.

#### **Pressure Sand Filter**

For final polishing of the treated waste water, a Pressure Sand Filter (PSF) will be provided. The PSF comprises of a MS Vessel having filtering media sand topping for filtration of supernatant treated sewage water and thus ensuring clarity of water.

#### **Activated Carbon Filter**

For tertiary treatment, an Activated Carbon Filter (ACF) will be provided. This will be MS constructed tank in which activated charcoal/carbon will be filled as adsorbing media. This will not only adsorb impurities but will also act as the polishing tank for the final treated waste water. The resultant water shall be clear, odourless and will be reused for horticulture purpose.

#### Ultraviolet (UV) Disinfection System

Ultraviolet (UV) disinfection will use a UV light source. UV-rays are energyrich electromagnetic rays that are found in the natural spectrum of the sunlight. They are in the range of the invisible short wave light having a wavelength ranging from 100 to 400 nm.

can pass through a flow chamber, and UV rays are admitted and absorbed into the stream. When ultraviolet energy is absorbed by the reproductive mechanisms of bacteria and viruses, the genetic material is rearranged and they can no longer reproduce. They are therefore considered dead and the risk of disease has been eliminated.

UV plant will have following features:

- Stainless steel construction
- Single lamp
- Long life of the UV Lamp



Figure 2.2: Schematic Diagram for MBBR Based STP

#### 2.9 Rain Water Harvesting

Rainwater harvesting system for proposed terminal building will be developed based in Central Ground Water Board (CGWB) Guidelines and Construction Manual of Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India. Design details of rainwater harvesting system are given below :

Total Terminal Building Area	-	3900 sqm
Peak hourly rainfall	-	45 mm
Runoff Coefficient for Terrace	-	0.85
Peak Flow for Terrace	-	3900 x 0.85 x 0.045 149.175 m <sup>3</sup> /hr
with flow velocity of 0.15 m/sec.	-	38.15 m <sup>3</sup> /hr 38 m <sup>3</sup> /hr
No of pits based on 38 m <sup>3</sup> /hr	-	3.92 Nos, say 4 Pits

In the open areas of Kolhapur Airport land, 50 rainwater harvesting pits will be constructed to recharge the ground water resources through rain water.

The cross section of rainwater harvesting pit is given in Figure 2.3.



Figure 2.3: Typical Cross Section of Rain Water Harvesting Pit

### Chapter 3

### Solid Waste Management

#### 3.1 Solid Waste Generation

It is estimated that approx. 70 kg/d solid waste will be generated from the airport. From the new terminal building, waste will be generated in the form of paper, plastics, polyethylene bags, and food waste, etc.

#### 3.2 Solid Waste Management

The following measures will be taken for management of solid wastes during operation phase of proposed airport.

- Solid wastes management will be carried out as per Solid Waste Management Rule, 2016.
- Wastes shall be collected in designated waste bins based on their types, placed at the strategic locations.

The solid waste handling and disposal services will be outsourced to authorized agency to ensure disposal of solid waste generated from the proposed airport. Solid waste generated in the aircrafts will also disposed off at the designated waste collection points from where the agency will pick up the garbage bags.

The agency will collect the garbage from designated bins, which will be spread over the area of proposed airport. The wet garbage of the aircrafts comprising of left over food in the tray from the security gates of flight kitchens will be disposed off at the specified places.

The collected garbage will be transported in covered container and will be arranged to dispose off after segregation of recyclable wastes as per provisions of Solid Waste Management Rule, 2016. After collection of garbage, garbage bins will be disinfected every day by sprinkling disinfectant powder by the agency. Weekly washing of garbage bins will also be carried out by this agency.

After collection of waste, solid waste management plan to be followed by authorized agency is as given below:

- Segregation of recyclable and non recyclable wastes.
- Disposal of recyclable wastes for recycling.
- Composting of biodegradable organic of wastes for captive use
- Disposal of segregated wastes to common municipal waste landfill Site

### Chapter 4

### **Energy Conservation**

#### 4.1 Energy Conservation Measures

During design and construction of new terminal building at the proposed development of Kolhapur Airport necessary measures will be taken for conservation of energy in line with "Energy Conservation Building Code – 2016" and "National Building Code 2016". The important energy conservation measures proposed for new terminal building are described below:

- Airport Terminal building will be designed and constructed for GRIHA Rating 4 star,
- Use of Energy Efficient building material & glass,
- Use of LED lamps instead of GLS lamps,
- Use of Solar Backed up Light Emitting Diode Lamps instead of par lamps,
- Energy efficient HVAC system,
- Solar passive techniques for terminal building,
- Use of 5 star BEE energy efficiency rating electrical equipments,
- Microprocessor-based Building Management System (BMS) will be installed for minimization of energy consumption,
- Automatic lighting on/ off control system will be provided in the airport area for optimum utilization of energy.

It is proposed that 100 KW solar power generation plant will be established at the airport to produce clean energy.

By adopting above measures about 40% energy will be saved.