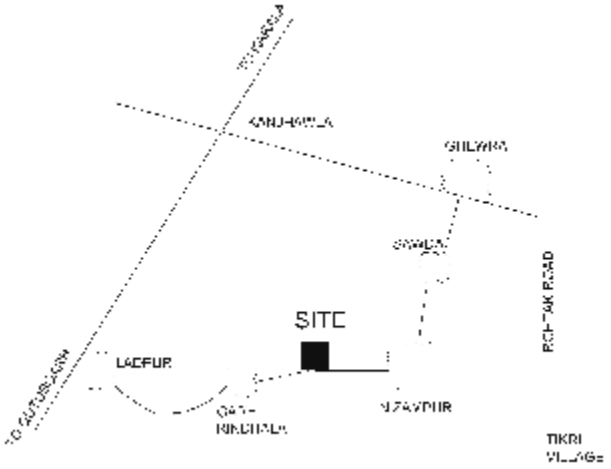
CODE NO: 121314

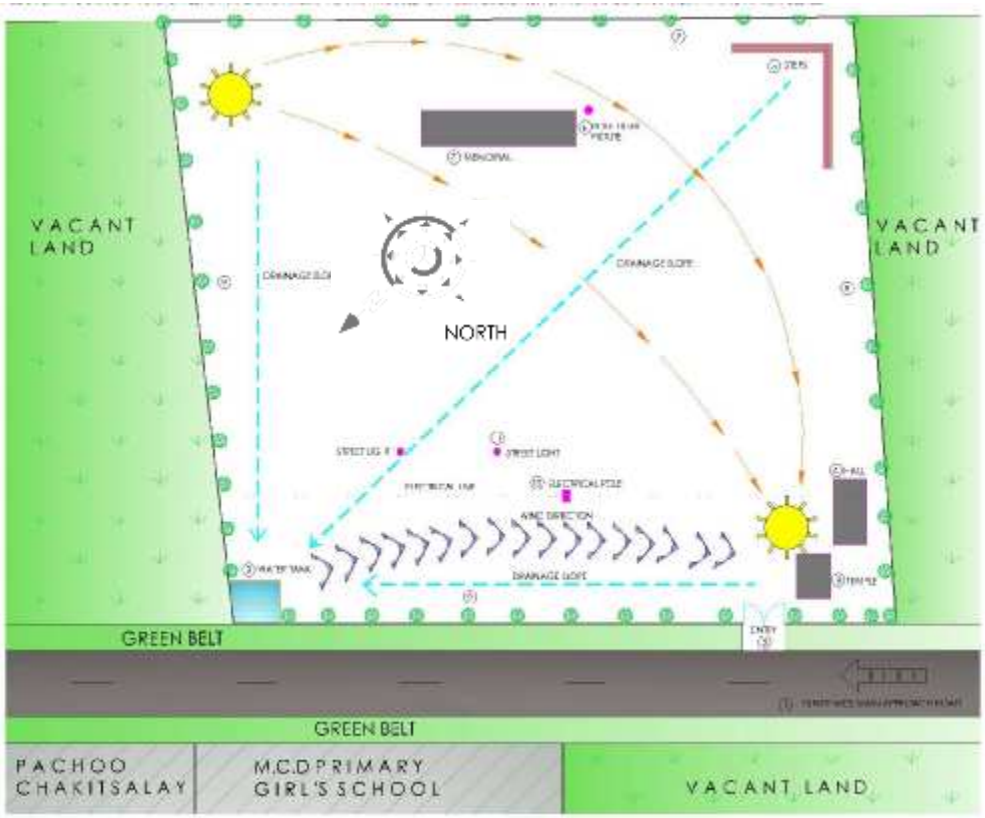
DESIGN PROPOSAL FOR MULTIPURPOSE INDOOR STADIUM AT NAGAFGARH

Site Analysis



Location & approach : The location of the of the proposed site is on theconnecting road between nizampur and garhi rindhala. It is also approachable from the main rohtak road & qutubgarh road.The main access to the site is from a 15mtr wide road from the nizampur village side towards the garhirindhala ladpur side.

Climate : The site has composite climate with max temp as 45%%d c and a minimum of 26%%d c in summers . also the maximum temp for winters is 21%%dc and minimum of 6.0%%d c.The monsoon are generally from july to september with the annual rainfall as 666.5 mm.



Orientation: The site is oriented in the north west direction as the front of the side is facing the N-W side.

Site slope/water movement: The site has a general slope towards the north side as evident from the location of the existing water tank on site in the left hand side crner of the site.

Utilities : The site has electrical lines running on the periphery of the site also another electrical line is crossing through the site in the NE-SW direction of the site. The site also has water connection on the north left corner as well as the south right corner of the site.

Existing trees/plants: The site has full grown eucalyptus trees along the boundary wall.Also there are few small palm ,banana,& asoka trees near the temple area.

Site images

1 15 MTR WIDE MAIN APPROACH ROAD FROM THE NAGAFGARH VILLAGE SIDE

2 EXISTING ENTRY FOR SITE TO BE SHIFTED AS PER SITE PLANNING

3 EXISTING TEMPLE ON SITE TO BE RELOCATED

4 EXISTING HALL TO BE DEMOLISHED

5 EXISTING STEPS TO BE DEMOLISHED

Site images

6 EXISTING LIGHT POLE FIXTURE TO BE RELOCATED

7 EXISTING STATUE / MEMORIAL TO BE DEMOLISHED

8 EXISTING OPEN WATER TANK TO BE REMOVED & RELOCATED

9 EXISTING EUCALYPTUS TREES ON THE PERIPHERY OF SITE TO BE RETAINED

10 EXISTING ELECTRICAL LINE & POLE TO BE RELOCATED

11 EXISTING STREET LIGHTS TO BE REMOVED

Site views

North-West side view

North- East side view

South- East side view

South- West side view

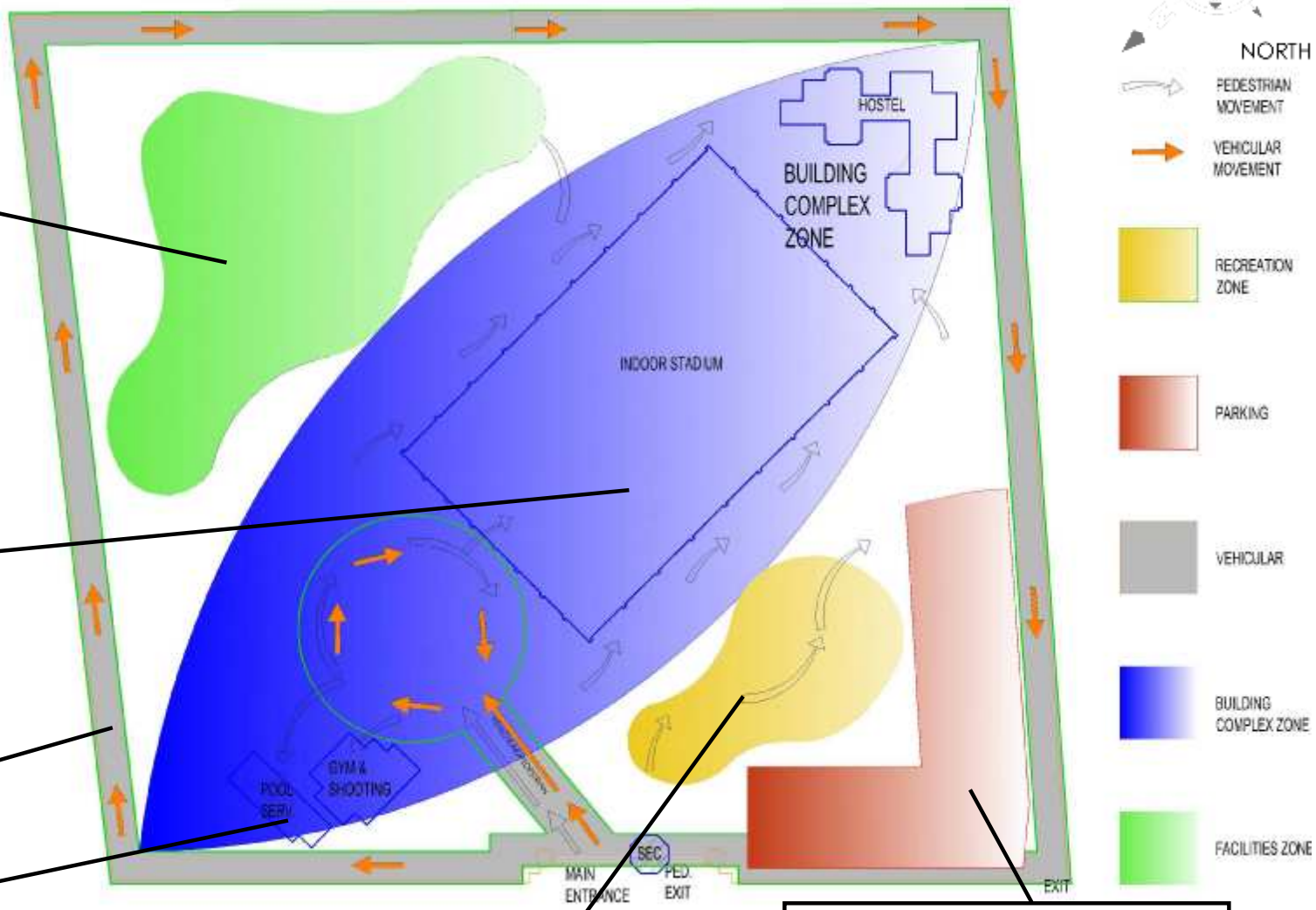
Zoning of various Activities

▪The Faciliy zone is kept is kept in the East facing so a to allow the athletes have full advantage of the morning sun.Also it would be a zone away from the public areas so that the players gt a more private space.

▪The orientations of main arenas is north-south so that the maximum number of spectators have the sun at their back.

▪Loop vehicular system ensures no bottle necks and proper fire services

▪Pool services kept in the noth corner of the site as per the slope of the site in the north direction.Also the orientation of the pools are North –south so as to avoid the sun glare



▪All the recreational facily are kept closer to the main entrance & parking to allow better movement,It also acts as a buffer space between the parking are & the main stadium.Its a space which would be active throughout the day

▪The parking is kept closest to the main entry so as to allow better movement & be easily accessible to the visitors. It will also facilitate the spectators to reach at walking distance

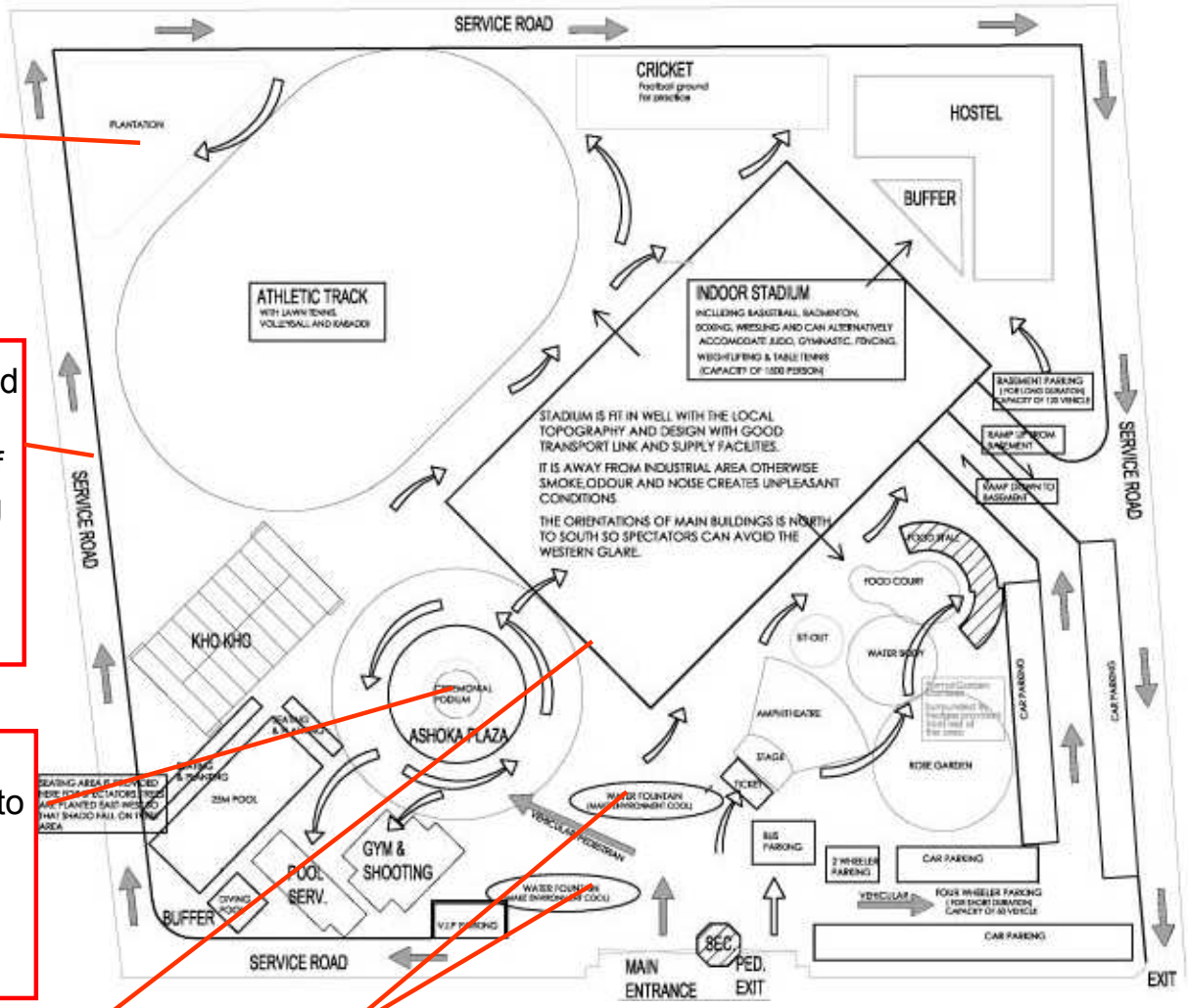
Site Planning

The joggers park & yoga area is kept at the far east corner to provide the morning walkers with the first rays of the sun.

A 5m wide service road is provided all around the facility to allow smooth flow of all kind of vehicular traffic and fire services. Vip droff-off and parking, bus parking and surface parking clearly demarkated. The basement parking is well connected to the egress of the trafic through a seperated exit.

Entire sports complex is planned around the main central **Ashoka plaza** with promenade to facilitate pedestrain movement all around the site. There is vehicular-free pedestrian movement for recreation, sports &other facilities.

The facade of building is facing towards north so that it keeps the building cool and give soft daylight for the internal part of building. So it is benificial to provide the large number of openings on facade. It gives access way for cold winds coming from north, n-e during month of nov. To feb-march.



Water body or fountain is provided along both side of promenade also in the plaza and in the recreation area to keep the temperature cool and comfortable

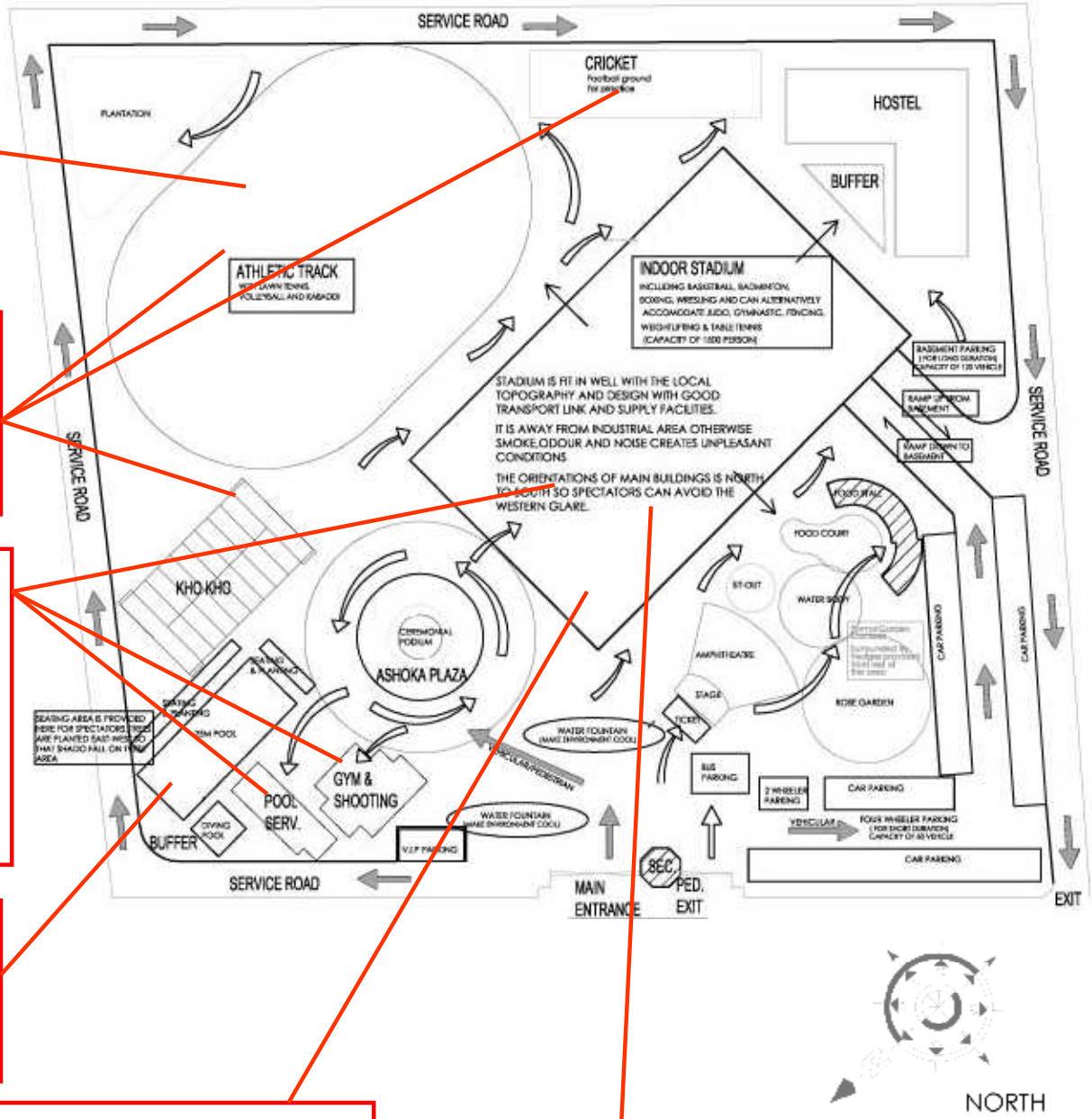
Site Planning

The orientations of atheletic tracks is north - south so that the maximum number of spectators have the sun at their back.

Additional sports such as kho kho, kabaddi are provide for along with the general sports requirement. Team sports are placed strategically. Also Cricket practice net is provided promoting sportmanship.

The site is almost rectangular in shape and has a gradual slope towards main road.The longer side of the site is parallel to the main approach road. That is why the most of the buildings are angled to the main road.Also that both long and short elevations of the buldings and its three-dimentional form is visible from the road.

The pool is kept near the front of the site to provide easy access but is still designed for privacy but seating is also provided for tournaments.



Based on planning capacity seating is provided within the stadium either on all sides of the plan to take the advantage of shortest viewing distance.

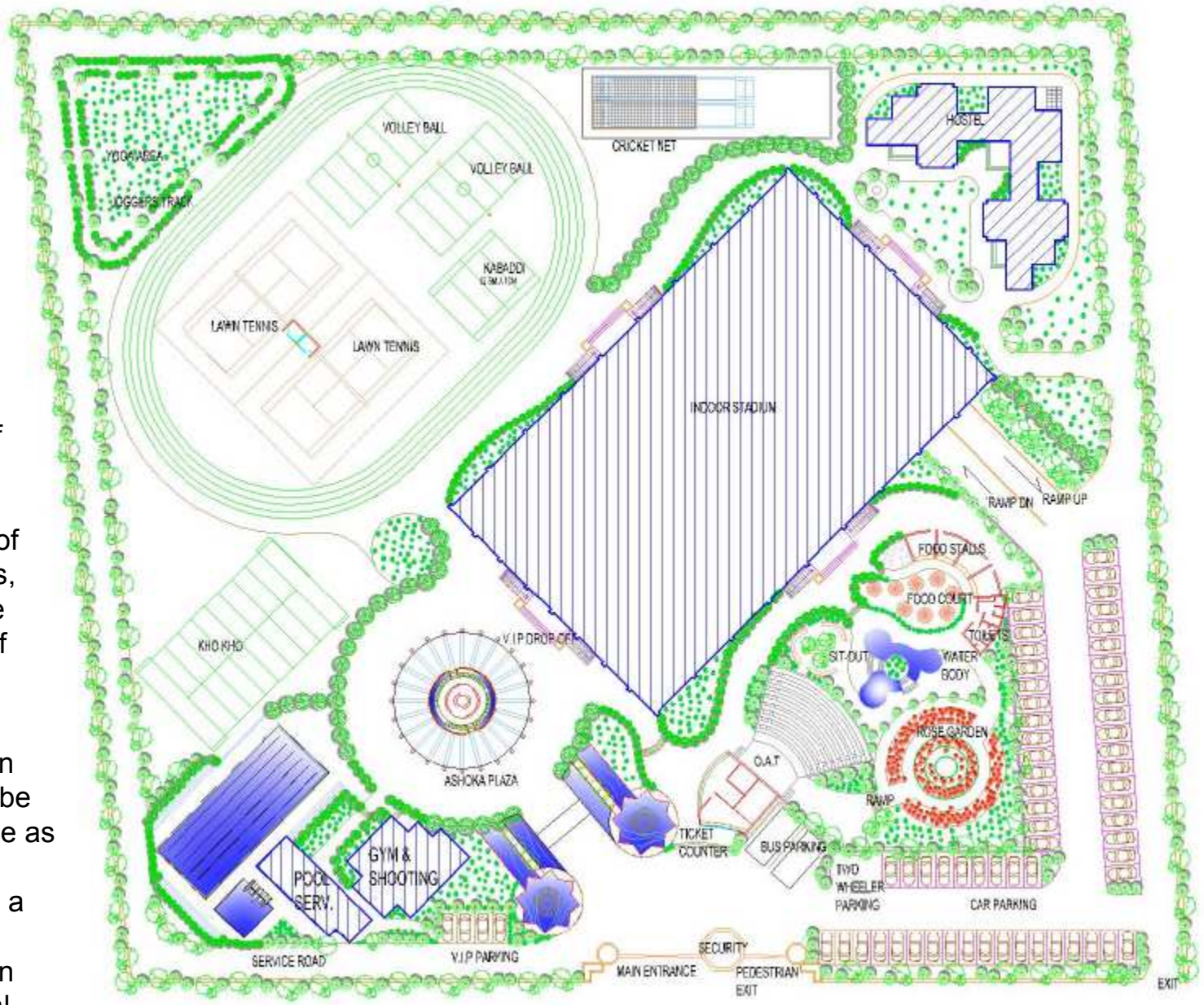
Building block generate shadows over the front lanscaped areas

Design Concept

The indoor stadium and sports complex is conceived as an **iconic integrated facility** in itself which also identifies with the images of historic delhi **'arches', gates, fountains and plazas.**

The **Stadium building** itself would be a **memorable landmark** like many of the architectural achievements of previous eras. Its intention is, therefore, to create a unique venue to reflect the image of India .

The built mass is designed in such a way that it seems to be emerging from the landscape as **monolithic forms** arranged radially around a plaza, with a north-south orientation for maximum glare-free northern lightighting, and ideal natural ventilation.



The Building character

The **stadium complex** will sport a contemporary look with large glass sections and steel columns jutting out, and a modernist canopy that will contain led.

The overall impact of the **roof design** creates a dramatic skyline element. The steel columns and suspension elements are visible from a distance. The soaring elements of the columns and the suspension systems enhance, and mirror the excitement level and anticipation of events.

In contrast, the **hostel , gym & pool building** will be plaster, stone cladding and glazing collegiate style with arched roofs recalling those of the indoor stadium.

The Architectural Design

The **Entrance** for the indoor stadium complex has been designed as a tall 60 ft height entrance gateway resembling the fort like character of the historical monuments.

The entrance gate leads us to the '**Asoka avenue**' flanked with tall Asoka trees amid the linear still water feature with huge circular water fountains welcoming the visitors much in character like the one at the India Gate.

This avenue leads us to a large open space " **Main Asoka plaza**".The main plaza is flanked with 24 'Ashokan pillars' symbolising the 'Asoka chakra' with 24 spokes. This central plaza has a radial entry for Gym & pool facilities ,the Athletic arena, the main stadium building & the recreation zone with the amphitheatre & the foodcourt.

The Architectural Design

The main **Indoor stadium building** has been designed as a light weight steel structure with curtain glazing to have 1500 spectator seating .The North south orientation ensures glare free northern light maximizing the spectators comfort level & also helps in conserving energy by reducing the Air conditioning load .The longer edge of the stadium faces east & west ensuring that the sun is always on the spectators backside. The columns jutting out from the façade make a bold architectural statement while also support the roof structure.

The **Stadium building** has a curved roof not only making it structurally light & stable but also draw on the image of the arches that have become the identity of the city. The oval-shaped skylight in the roof can be open able to provide natural light & ventilation when required.

The Architectural Design

The **Indoor stadium Building** has access from all four sides to ensure segregation of spectators during entry & safe passage of egress incase of any emergency. The entry on all sides also ensures connectivity to the various other facilities around the main stadium.

Among the facilities the **Gym and pool** building is located in the front northern side of the site .The location of the water body on the Northern side of a site is also considered as traditionally good site planning. The Gym and the pool building being close to the main entrance will also facilitate the pedestrian traffic of locals. The Gym and pool building also have curved roof design similar to the main indoor stadium building. The swimming pools have stepped seating around for the spectators during tournaments and competitions. Also the area has been landscaped in a way so as to maintain the privacy of the people using the pool services.

The Architectural Design

The **Recreational areas** include the **Amphitheatre, the Rose garden, the Food court , the Sit-out & the Water body feature**. The recreational areas have been designed in a way so that all the activities are inter-connected and merge well with the surrounding landscaped areas. An attempt has been made to design these area as a series of visual experience for visitors. This experience would include the Amphitheatre as an ‘active zone of events ’which is also kept close to main ticket counter and can work as the spill over area for the spectators from the stadium. This space is linked to the food court area through a walkway from the rose garden area as well as a lotus pond and landscaped sit-out area. The recreational area is envisaged as a series of different levels so as to bring about a place of interest in the much flat topography of the existing site as well as the requirements of various sports activities.

The **Hostel block** is placed in the southern corner so as to isolate it from the road side traffic area. The hostel has access through a 6mt road and has a separate drop-off point. The block is also linked to the stadium through a buffer landscape court. The Girl’s and the boys hostel are separated from each other through a common dining facility. this block has good connectivity to all sports & athletic facility by virtue of several pathways.

The Architectural Design

The **Athletics area** & the outdoor sports courts are buffered from the road side activity by the zone of buildings so as to provide a sports conducive environment.

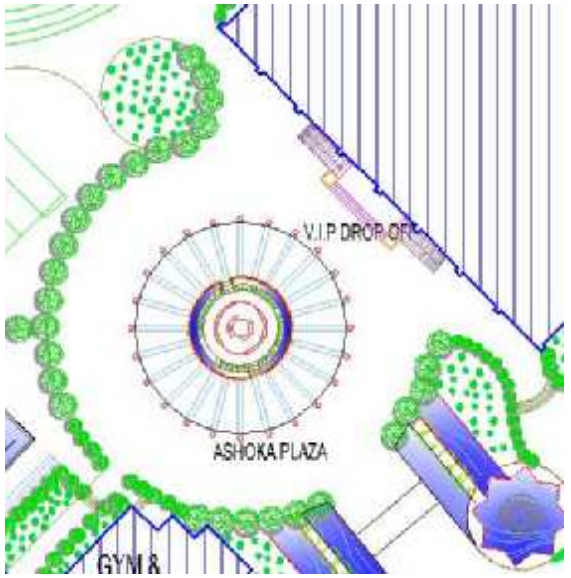
The **Joggers & yoga park** are kept in the eastern corner as such activities are traditionally preferred by the participants during early morning hours. The practice of yoga also includes postures that salute the morning sun. The Indian local sports are incorporated to encourage local talent & to build national pride in our traditional sports.

The **parking area** is separated into V.I.P, bus, two-wheeler & four wheeler parking to segregate the kind of traffic entering the site as well as to assist security requirements for V.I.P. spectators. A V.I.P entering the site can drive up to the entrance lobby without having to cross any public areas.
The Bus parking is given priority in parking nearest to the ticket counter. The surface parking would be mostly used by short term visitors while the basement parking would be for longer use of the facility. The basement ramp is hidden behind the block of food stalls so as to give it cover and shade.

Design Elements

THE ASHOKA PLAZA

The **Ashoka plaza**, inspired by the **Ashoka chakra** symbolizes the wheels of progress, motion and energy. Such a nationalist image was chosen to emphasize the role of sports as a class less, caste-less and religion-less binding force that is nation-wide.



The **Ashoka chakra** in elevation manifests into free standing columns creating a dramatic focal point to the centre of all activity. This plaza would create a civic space that is very urban in nature.

An attempt has been made to reflect the historic landscape of Delhi with the use of a grand gate, promenade, fountains and the **Ashoka plaza.**

Design Elements

AMPHITHEATRE

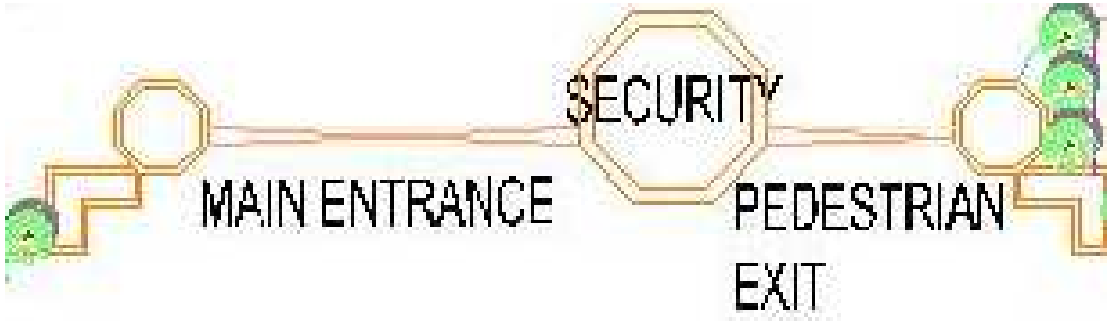
The Amphitheatre has been integrated as a part of the des scheme so as to have recreational activities throughout the year in the stadium complex. It not on acts as a buffer spac between the landscaped enclosure & the main entrance bu also an arena for several activities. It is located close to entrance and the ticketing so as to ease the vehicular as w as pedestrian spectators in purchase tickets, and using the amphitheatre for special events/ceremonies/trainings etc. can also be used as a waiting/sit-out area or a spill over ar to the stadium.

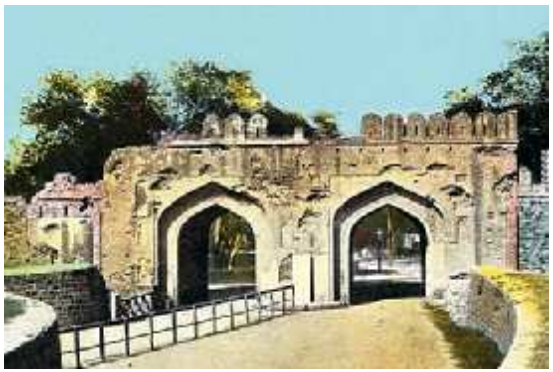
Design Elements

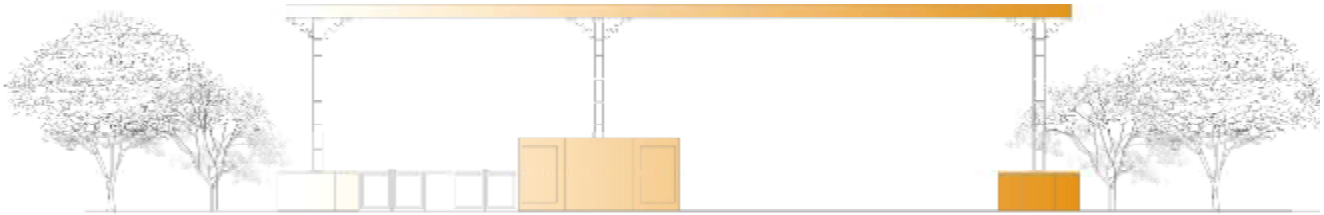
THE GATEWAY

The Grand gateway assumes the role of greeting Sportsmen and spectators alike to unite them on a common ground of national integrity.

As in historical times this 60 feet grand gate marks the entrance to the indoor stadium complex.







Landscape Concept

The Landscape design of the entire scheme is inspired by the historical landscapes found specially in the city of Delhi and also all over India. However it has been designed keeping in mind the requirements of a modern sports facility.

VIEW: The scheme emphasizing its recreational landscape area which can be experienced both visually as well as other senses like smell touch etc by virtue of its rose garden & lotus/duck pond. From the approach road the grand gate, the symmetrical fountains the recreational areas the bold Ashoka plaza would invite facility users as well as general visitor alike and create an impact on the entire community. The outdoor sports field are hidden from view of approach road by the stadium and other facility buildings.

COLOUR : The colour of the buildings as well as the outdoor spaces are kept natural & soothing.Water bodies along the Asoka avenue, inside Asoka plaza as well as the recreational area act as elements to cool the environment as well as to the soothing environment. Interest and dynamism is brought to environment because of the rose garden as well the patio seating & alfresco dining which would add splashes of colors to this otherwise soothing palette.

Landscape Concept

SHADE: The parking areas would be shaded as would the jogging track be. The cricket practice net & athletic track-sports field would be shaded by the stadium building from the harsh western sun while the recreational area would be shaded during the morning time. by the stadium building.

PRIVACY: Landscape is effectively used in the scheme in the form of stepped seating, hedges and trees. The Hostel has its own landscaped area that buffers it from the public realm of the stadium.

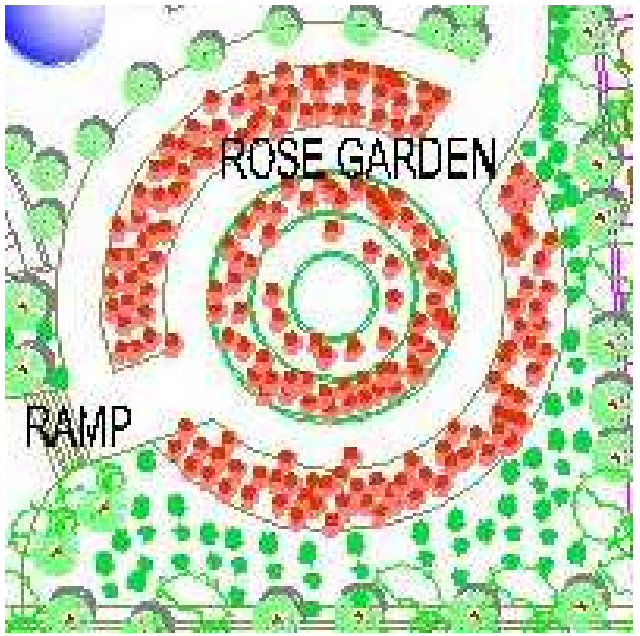
LEVELS: A sports facility by virtue of its nature demands two kinds of level, a flat topography or its sports activity and a dynamic streetscape for its recreational activity. A balance of both has been created in the scheme by the building zone.

Landscape Elements

THE ROSE GARDEN

The Rose garden draws its inspiration from the Rose garden at Rashtrapati bhawan. The form in sync with the Ashoka plaza takes the spectator through a winding path to an outdoor food court area.

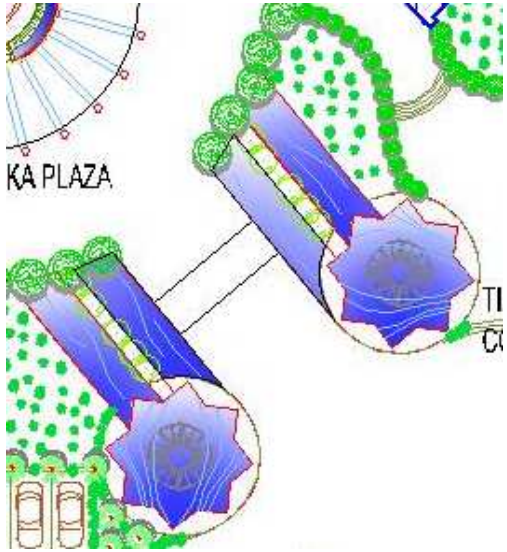
This recreational space keeps the area vibrant even in the night and will become an important place in the public realm of this area.



Landscape Elements

THE WATER FOUNTAIN

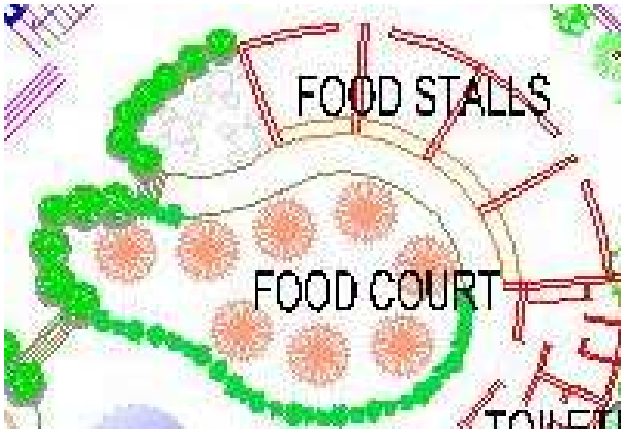
This monumental water feature draws its inspiration from beautiful water feature at the India gate. This feature will not be a pleasant welcome to the visitors but also will help in improving the environment around the Ashok plaza.



Landscape Elements

THE PATIO SEATING

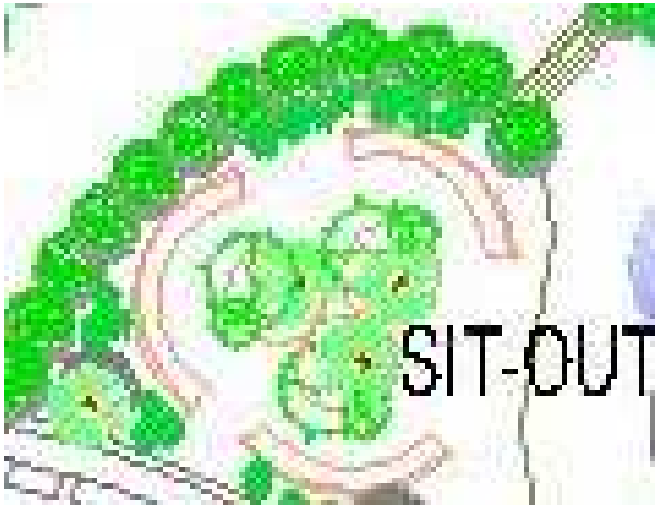
Small covered sit-outs for the food plaza add a recreational feel to the entire design scheme.
Interest and dynamism is brought to environment with the patio seating & alfresco dining which would add splashes of colors to this otherwise soothing palette.



Landscape Elements

THE CURVED SIT-OUT

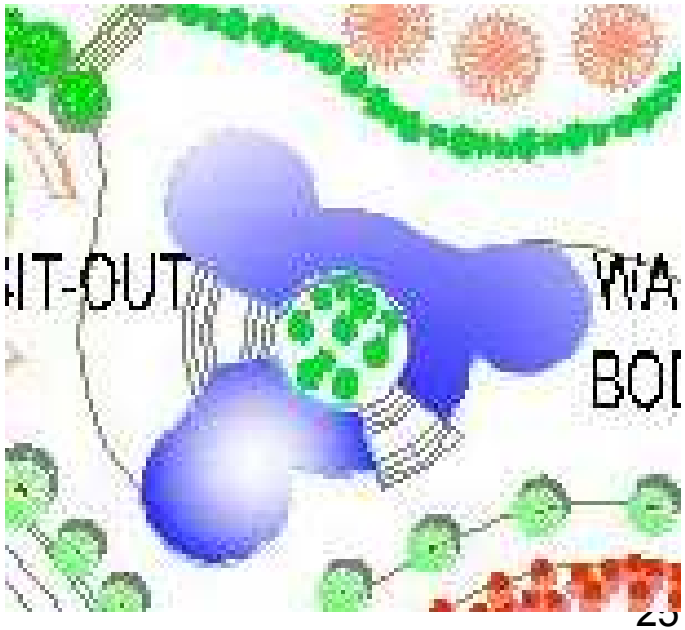
A well landscaped green sit-out space for the visitors/athletes to take a break from the main activity zones.



Landscape Elements

THE WATER BODY

Water bodies in the recreational area act as elements to cool & sooth the environment around. Also it can be used have lotus pond or a duck pond to make the space more lively & interesting.



Other Landscape Elements

SPORTS SCULPTURES/LIGHTS /MURALS

Lighting fixtures, sculptures and murals would be a part of the sports facility theme so act as interesting focal points.

Green design/ sustainable design concept

The concept of Green design has been used to effectively make the scheme responds to its surrounding environment.

Sustainable design for the scheme will be for both, the indoor comfort and the global climate.

Site orientation : the relationship of the site planning to the sun and wind is paramount in maximizing thermal efficiency

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Situating the building (and the functions, spaces, doors and windows) in a way that makes maximum use of sun-paths and wind patterns is achieved by the North-south orientation of the Buildings and the outdoor sports.

Such planning improves ventilation, it's more comfortable than living with constant heating and air-conditioning, it significantly reduces electricity bills, and it reduces greenhouse gas emissions from heating, cooling, mechanical ventilation and lighting.

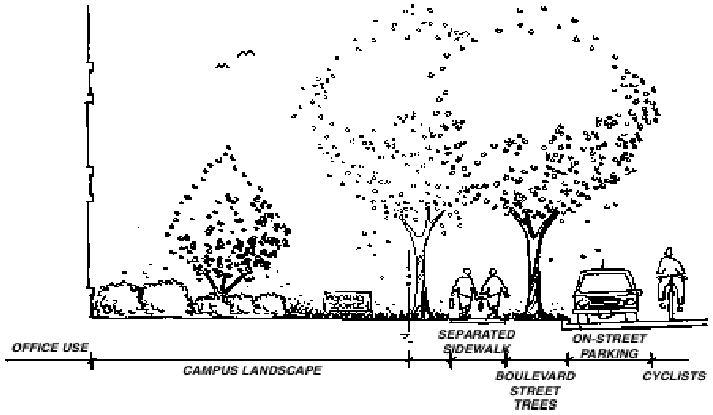
Design element for – sustainable architecture

Landscaping –The scheme's landscaping reduces direct sun heating on building surfaces. The Landscape used creates different air flow patterns and helps to direct or divert the wind advantageously by causing a pressure difference. Additionally the shade created by trees and the effect of grass and shrubs reduce air temperatures in the building. The climatic requirements govern the type trees to be planted to match the existing eucalyptus tree.

Building envelope– the sustainability of the facility is established by the performance of its building envelope. The primary elements affecting the performance of the building envelope are

Material and construction techniques –Strain on conventional energy will be reduced by use of low energy material, efficient structural design and reduction in transportation energy. The choice of materials will also help to maximize indoor comfort for the facility.

Roofs: The roof receives significant solar radiation pad lays an important role in heat gain / losses, day lighting and ventilation. Skylights are hence incorporated in the roof design.

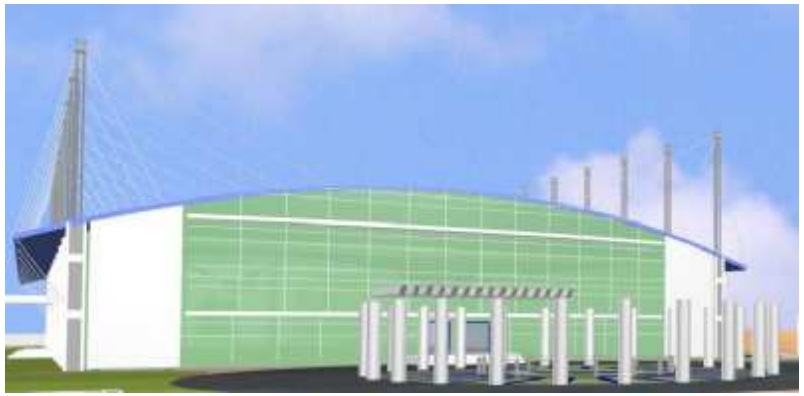


• **Photovoltaic panels:** Most of external light located outside the building blocks i.e. along the road, round about etc, will be powered by independent Solar Panels Battery System. The corridor of Hostels will be controlled through solar panels installed on their respective terraces. (For solar street lighting refer Lighting Design).

Green design/ sustainable design concept

- **Glazing:** The windows and glazing will use insulated glass where two panes of glass sandwich an airspace, which serves as an insulator against heat gain.

- **Energy efficient lighting :** Daylight integration with artificial lighting can be achieved based on, Site characteristics, Orientation and Mechanisms to implement Efficient control systems for switching the lights off when not required.



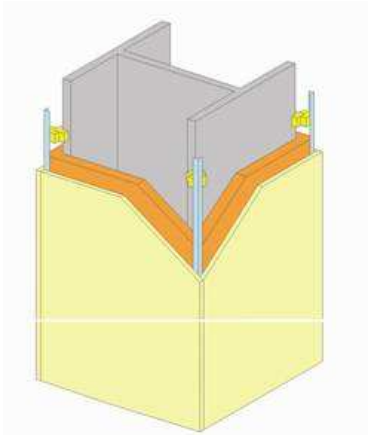
ENERGY-EFFICIENT SYSTEMS

Absorption chillers*:* A set of eco-friendly chillers which run on LPG and require minimum electricity, provide extra cooling when needed to the stadium.

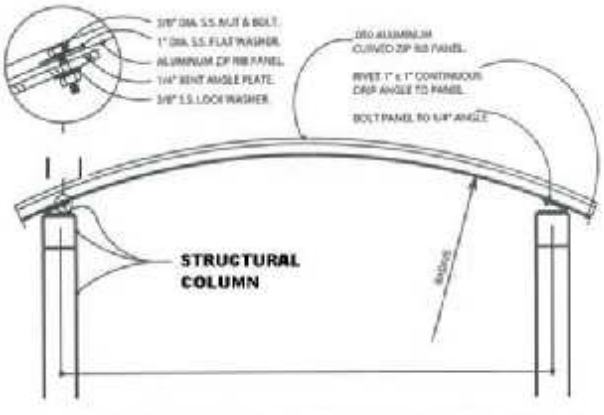
Waste water recycling : Waste water from the scheme will be recycled using the root zone technique. It is a natural waste water treatment process based on aerobic and anaerobic decomposition of the contents in the roots of the reeds (phragmytes) and microbial organisms. The process is natural, economical, and efficient and gives quality treated water. The entire area is proposed to have water harvesting and watershed management.

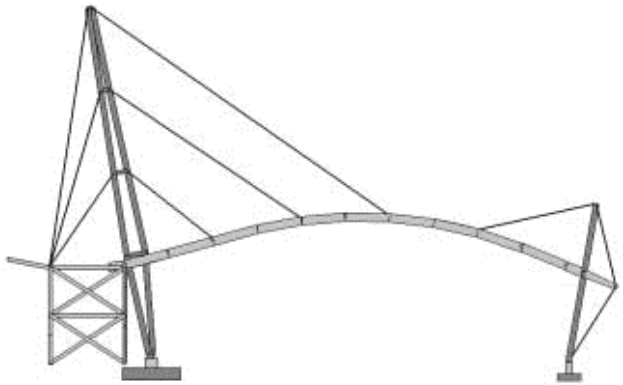
Structural design concept

- A steel structural system is opted for the design of the main Indoor Stadium building. The structure would hence be constructed much faster; the costs would be lower compared to traditional building methods; it would be lighter weight; and easier to maintain; and also carry a reduced risk of fire. Moreover, steel is 66% recyclable, which makes it an especially cost-effective and environmentally sound alternative to any other construction material. Above all, strength is a major plus for steel. Steel structures can withstand unfavorable weather conditions like, earthquakes especially in this zone 4 location of delhi . They are also resistant to termites, creeping, cracks, splitting and rotting, thus increasing durability.
- The steel columns of the main stadium supports the light weight roof via a steel truss as well as by using cables. Such a roof form entails a Uniformly Distributed loading , supported by cable stays and also limit bending in the mast.
- As a supporting structure Cables have a low modulus of elasticity, so stretch can be 4x rods or tubes
- The design uses fewer structural steel members. All of the roof panels are planar since all four corners are in one plane. They are fixed at their four corners by clamping plates standing off the longitudinal columns. The roof panels do not transfer structural loads.
- This structural design can provide column free space increasing internal flexibility as it can be easily extended and can lead to reduced structural weight.



Steel Structure Fire Protection





Structural design concept

- The structural design is technology-driven steel fabrication that provides cost effective solutions and better quality.
- Roofing materials plays an important part in creating an attractive yet green building.
- Point supported type roof with glass skylights that can be retracted to allow natural light and ventilation is used. This glazing is located between the regular truss intervals of the structure.

- This unique design utilized a double-layered free-span system eliminating intermediate framing while also providing an insulated system for a climate controlled canopy.
- The structural design allows for a bold edge to the eaves of the design or break up the look of a long roof with skylights

Lighting design concept

- **Outdoor lights** are chosen that will accent and magnify the sports environment for the various sports as it affects the performance of the sportsman or team. Hence careful attention is paid to a number of very important factors that to develop a system of outdoor lights and lighting controls in order to strike the right balance between functional lighting and ambient lighting, the lighting design must consider, landscaping, and exterior architecture.

- **Theme and Style**:The theme and style of lighting reflects, the physical style of the facility, and the geography in which you are located.

- **Green lighting** : Use only environmentally-friendly outdoor lights and installs them using special techniques that protect trees from scarring and ensure their future growth. Use Sustainable Landscape Lighting Systems like Solar-powered outdoor lighting system

- Use of Low-voltage instead of Line-voltage Landscape Lighting - provide the same light output in the space and use remarkably less energy

- Solar low-pressure sodium light is an independent renewable lighting system, which has the characteristics of energy saving, and environment protection. The main system is the solar generating system, the solar module collect sunlight and converts sunlight into electricity, which charges the maintenance-free sealed lead-acid batteries in the day time. At night the light turns on automatically, using the electricity stored in the batteries during the day.

To achieve energy-efficient outdoor lighting:

- Security and utility lighting does not need to be bright to be effective.

- Consider incandescent flood lights with combined photo sensors and motion sensors in the place of other security lighting options.

- Use photosensors with fluorescent, high-intensity discharge, or low-pressure sodium lights.

- Make sure outdoor light fixtures have reflectors, deflectors, or covers to make more efficient use of the light source and help reduce light pollution.

- Use timers and other controls to turn decorative lighting on and off.

- Use outdoor solar lighting where and if applicable.

Lighting design concept

Types of lighting:

- **Sports field lighting** -integrated sports lighting using environmental lights designed to put all the light on the court evenly to meet Tennis, volleyball etc. standards. Good luminance uniformity in both the horizontal and vertical planes is important

ILLUMINANCE

•The illuminated field serves for the players, spectators and cameras as a visual background, an adequate horizontal illuminance on the pitch is important. To ensure safety of movement for the spectators when entering and leaving the stands or surrounds , adequate horizontal illuminance in these areas is also required.

GLARE

- Glare has a disturbing effect on the visual comfort and disability glare can be minimized by playing careful attention to the string aiming and selection of floodlights relative to the main directions of view.

- Decks and patios can be lit with minimal power costs by using a combination of led lights and lighting controls, making it possible to have cool-burning lights left on throughout the night into the wee hours of the morning.

Lighting design concept

- Outdoor lighting systems frequently use wall sconces, rope lights, step lights, and path lights around the perimeter of the Landscaped areas.





- Landscape lighting is done to compliment the design yet to overwhelm it. This applies for both the landscaped areas as well as the building envelope.



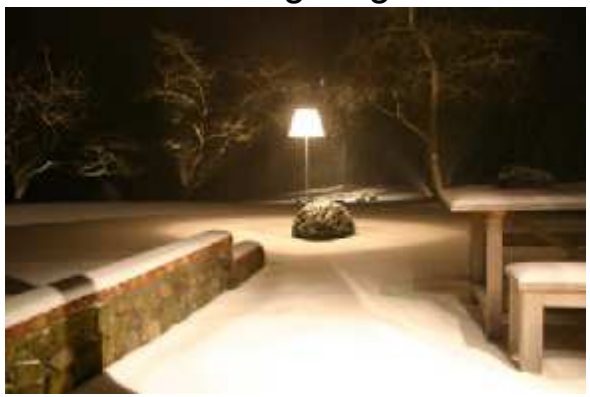

Lighting design concept

- **Security Lights and Alarm System Integration**: High Intensity Discharge security lights can be made cost effective by linking them to lighting controls and motion sensors that only turn the main flood lights on if human body movements are detected.

- Perimeter lighting can be done by using a variety of low voltage lighting fixtures that keep shadows away from the corners of the facility. Also connect security lights to the existing alarm system, and install manual controls that will enable controller to instantly turn on every indoor and outdoor light in the event of suspicious activity or emergency.

- Ease in mounting – It is considered economical and can be a design feature to mount the lights of the trees itself

- Sit-Out Lighting



- Fountain Lighting

- Light fixture sculpture

- Indoor Sports lighting