



Inorbit Malls India Pvt. Ltd

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Description of Mall

Description of Mall

Inorbit Mall is a result of passion of Inorbit Malls (India) Private Ltd, a subsidiary of K Raheja Corp. Mumbai, to not just create a retail structure but also to influence the lifestyles. Committed to set benchmarks in the Indian Retail Industry, its success is due to its unique positioning as a true one-stop lifestyle destination. Inorbit's core lies in understanding that shopping is a multifaceted experience.

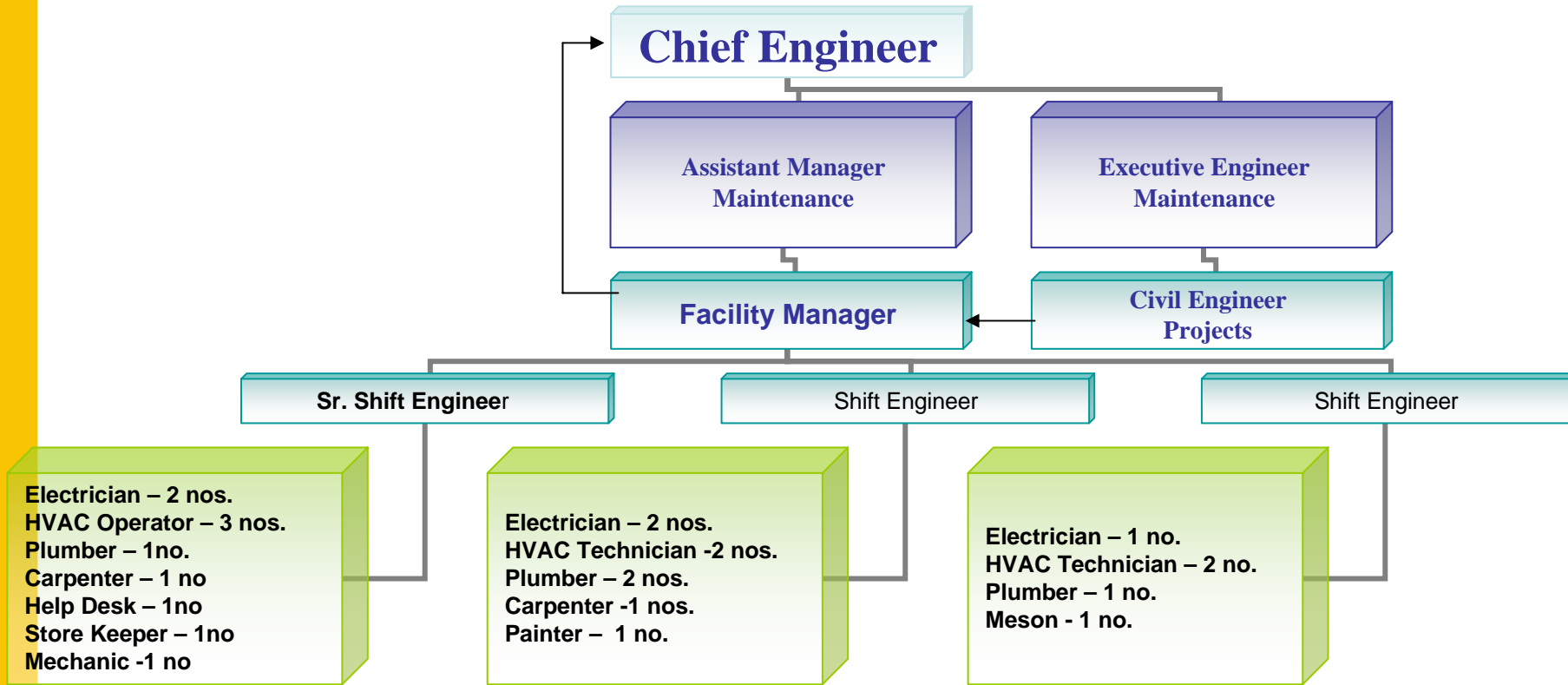
Inorbit mall is located at Malad (West), the western suburb of country's commercial capital, Mumbai and next to the Mindspace, a posh office and residential locality developed by real estate division of K Raheja Corp. Mindspace is a hub of call centres and service industry. Some major organization operating from the Mindspace are Converges, 3G, JP Morgan, E- Serve, etc.

It is a 100% new development project came out of 50 years of immense experience of real estate development. K Raheja Corp. is one of the leading and prestigious real estate developers in India. From pioneering the concept of self contained townships, futuristic business park, to developing retail infrastructure, the company has always concentrated on meeting the needs of discerning consumers. We have constantly endeavoured to create a holistic atmosphere in all our projects - commercial, residential, retail and hotels



Engineering Dept. Structure and Roles & Responsibility

Organization Structure



Total Strength:31

Roles & Responsibilities

- A. Heading Engineering department, Forming Strategy & Departmental Goal Setting, Established Engineering operations, System up gradation, Team Building, Training Etc.

- B. Project Planning, Estimation, Contracting, Budgeting, Man & Material Planning, Cash Flow, Liaisoning with Clients, Consultants, Architects, Vendors & Inter Departmental Heads and Statutory local authorities.

Resource Management and Distributions

- Electrical power
- HVAC
- Water Supply and Sewage treatment
- Projects, Fit outs and Building upkeep
- Safety
- Engineering Related Statutory Compliance

Cost Efficiency

- Energy Conservation
- Water Conservations
- Continuous Monitoring of HLP
- Controlling HLP and R&M Cost
- Taking care of Equipments & Machineries
- Continuous Monitoring & Control of the Machine Performances.

Operation & Maintenance

- Preventive Maintenance
- Preparing Preventive Maintenance Schedules
- Breakdown analysis and corrective actions
- Upkeep of the Property.
- Civil Maintenance
- MIS & MMR reports.
- Standard Operating Procedures
- Purchase for Engineering.
- Inventory control of engineering Items
- Billing & Payments.

Critical Equipments

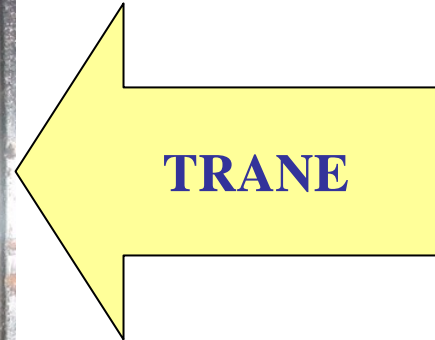
Electrical Power Distribution System

- ✓ Substation at Basement
- ✓ Incoming from Reliance Energy
- ✓ Incomers 11KV x 04 nos.
- ✓ Five Transformers : Total Capacity 10.5MVA
- ✓ Sophisticated H.T.Switchgears for Switching Operations and Protection of Electrical Installations.
- ✓ Power Consumption / Day : 23000kwh (average)
- ✓ Average Monthly Billing: Rs. 74 Lacs/ Month

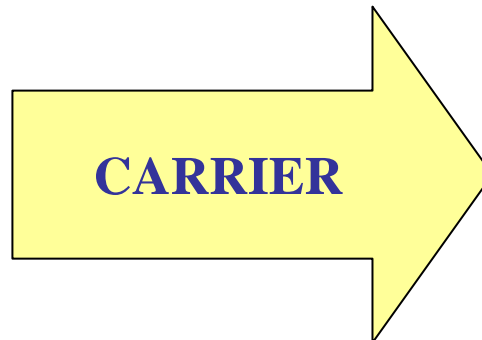
HVAC Systems

- ✓ Total Installed Capacity: 2304 TR
- ✓ Total TR Load: 1500 TR (Approx)
- ✓ Chiller Plant
 - ✓ Trane Chiller: 700 TR (Water Cooled, 545 KWH)
 - ✓ Carrier Chiller: 326 TR x 4 Nos. (Air Cooled, 640 KWH)
 - ✓ Clevit Chiller: 300 TR (Water Cooled, 245 KWH)
- ✓ Pumps:-
 - ✓ Primary Pumps: 15 hp x 9 nos. (6w + 3s)
 - ✓ Secondary Pumps: 60 hp x 3 nos. (2w + 1s)
 - ✓ Condenser Pumps: 30 hp x 3 nos. & 15 hp x 2 nos
- ✓ Cooling Tower Fan Motor: 15 hp x 2 nos.

Our Chiller Plants



**TOTAL CAPACITY
2304 TR**



Preventive Maintenance



Approx
Energy Saving
600KWH/Day



Preventive Maintenance

Fire Fighting System

- ✓ Fire Tank capacity 240 m³ .
- ✓ Fire Hydrant System
 - ✓ Main pump: 50 H.P, 187 m³ /h
 - ✓ Jockey Pump: 10 H.P,17 m³ /h
- ✓ Sprinklers.
 - ✓ Main Pump: 30 H.P, 106 m³ /h
 - ✓ Jockey Pump: 7.5 H.P, 17 m³ /h
- ✓ Fire detection System
 - ✓ No. of Smoke detectors: **192 nos.**
- ✓ Fire Extinguishers
 - ✓ ABC Type: **112 nos.**
 - ✓ CO2 **Type: 30 nos.**

Energy & Water Conservation

- ✓ APFC Panel
 - 225 KVAR – 04 nos.
 - 315 KVAR – 1 no.
 - 115 KVAR – 1 no.
 - 225 KVAR – 2 nos.
- ✓ BMS Systems
- ✓ Energy Saver For Lighting DBs
- ✓ VFD Drives for Pumps
- ✓ PL Lamps
- ✓ Scheduled operations
- ✓ STP treated water recycled to Cooling Towers
- ✓ Preventive Maintenance



Energy Conservation Drive

ENERGY CONSERVATION TO REDUCE POWER CONSUMPTION AND WASTAGE

- Installation of APFC (Auto power factor correction) Panels.
- Proposed replacement of Air cooled Chiller to Water cooled Chiller
- Revamping of Floor A/C for better efficiency.
- Maintaining Power factor above 0.98
- Installed Energy Saver in the Lighting Panel
- Replaced all the induction choke to electronic ballast
- Implementation of CFL For mall lighting.
- Established daily monitoring schedule of engineering parameters to keep close watch on the operation of the m/c.
- Optimization of Chiller Running Hrs without affecting the temperature.
- Proposed installation of Central chiller Plant Manager
- SAVE POWER HAVE POWER campaign to reduce power consumption.

Energy Conservation Drive

- To switch off front facade and north facade garden light (Metal halide lamps) at 9pm instead of 12MN.
- To switch of west facade signage's at 9pm instead of 12MN
- To switch of all coffer lights in mall corridor
- To switch off all PL lights in mall corridor at 9.40pm
- To switch of front façade signage's at 11pm
- To switch all basement lights except emergency lights from Monday to Friday.
- To increase chilled water header temperature by 2deg

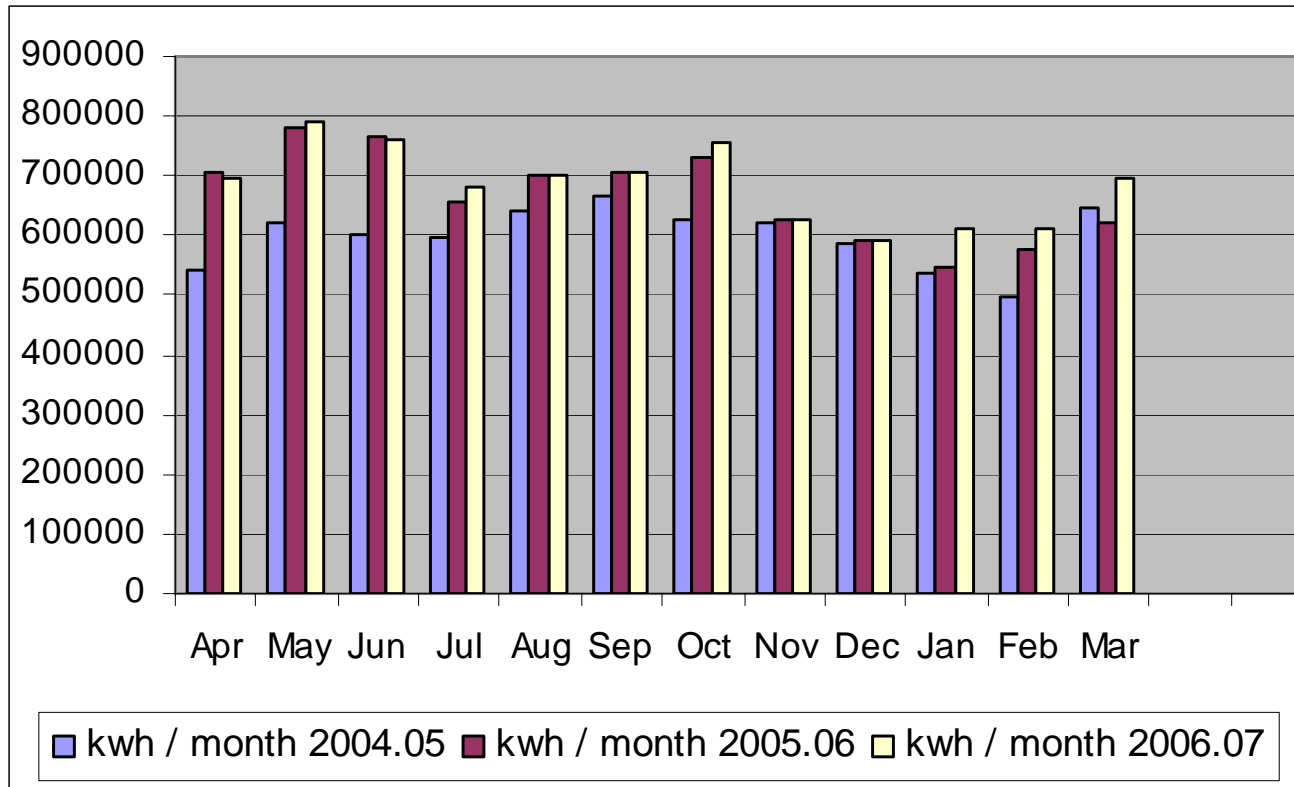
COMPARATIVE ELECTRICAL CONSUMPTION FOR LAST 3 YEARS

Electrical Consumption in kWh for last 3 years			
Months	Year 2004-05	Year 2005-06	Year 2006-07
Apr	540000	707580	693954
May	619721	779154	792000
Jun	600570	764550	761160
Jul	596280	657690	679613
Aug	642103	701166	701158
Sep	667560	704316	704310
Oct	626913	731490	757050
Nov	621150	624060	624060
Dec	588256	591883	594060
Jan	537912	547200	609810
Feb	495292	577170	611130
Mar	644056	619680	696390
Total	7179813	8005939	8224695
Increase in consumption	-	-11.51%	-2.73%

Notes: -

- 1) Total consumption rise in the year 2006-07 is just 2% comparative to the consumption of year 2005-06
- 2) There is reduction in consumption by 8.77%

COMPARATIVE ELECTRICAL CONSUMPTION FOR LAST 3 YEARS



Comments: Increase in electrical consumption in years 06-07 over 05-06 is due to additional HVAC load added. Details given in box below

Consumption of HVAC in March'07 : 13761 Kwh/day
 Total generation in March : 1650 TR (700TR + 2x325TR + 300TR)
 $= 13761 / 1650$
 $= 8.34 \text{ Kwh}$

Additional load : 470 TR x 8.34 kwh
 Increase in load due to additional load = 3920 kwh/day
 Actual increase in consumption = 2474 KWH/day
 % Saving = $3920 - 2472 / 3920 = 36.88 \%$

ENERGY CONSUMPTION (KWH/MONTH)

MONTH	FY: 2005 - 06			FY: 2006 - 07		
	KWH	TARIFF	AMOUNT Rs.Lacs	KWH	TARIFF	AMOUNT Rs.Lacs
MAR	619680	4.42	25.53	696390	4.85	33.76
FEB	577170	4.42	25.53	611130	5.43	33.20
JAN	547200	6.92	37.89	609810	5.40	32.87
DEC	591883	5.30	31.37	594060	5.56	33.02

Savings

Particulars/ Years	2004 - 05	2005 - 06	2006 - 07
Total Connected Load (in kW)	3,800.00	3,800.00	4,200.00
Electricity Purchased (Lakh kWh)	71.49	80.44	82.31

Increase in Load from 2005 to 2006: -

$$\frac{3800 - 4200}{3800} \times 100 = 10.50 \%$$

Increase in Consumption from 2005 to 2006: -

$$\frac{80.44 - 82.31}{80.44} \times 100 = 2.30\%$$

1) Savings = 10.50% - 2.30% = 8.2%

2) Saving in 2006-07 is 82.31Kwh X 8.2% which is equal to 6.75Kwh

3) Saving in 2006-07 is 6.75Kwh X Rs. 5.40/Kwh is equal to Rs. 36.45 Lakhs

Savings

Particulars/ Years	2004 – 05	2005 – 06	2006 – 07
Total Connected Load (in kW)	3,800.00	3,800.00	4,200.00
Electricity Purchased (Lakh kWh)	71.49	80.44	82.31
Total Built-up Area (Sq. mts.)	46468.00	46468.00	46468.00
Electrical SEC kWh/m2	1,538.48	1,731.08	1,771.33
% Elect. SEC reduction over last year		(12.52)	(2.32)
Electrical SEC 2005-06 kWh//kW of connected load	18,813.16	21,168.42	19,597.62
% Elect. SEC reduction over last year		(12.52)	7.42

INCREASED LOAD IN HVAC

TR Generation in Feb' 2006: 1350TR (1x700TR + 2x 325TR)

Consumption for HVAC in Feb '2006: 15081 KWH/Day (As per Energy Bill)

Therefore, Per TR per Day load in Feb'06 = $15081/1350 = 11.17\text{KWH}$

TR Generation in Feb' 2007: 1650 TR (1x700TR + 2x 325TR + 1 x 300TR)

Consumption for HVAC in Feb '2007: 13590 KWH/Day (As per Energy Bill)

Therefore, Per TR per Day load = $13590/1650 = 8.23\text{KWH}$

SAVINGS Due To APFC Panel & Clevit Integration = $\frac{11.17 - 8.23}{11.17}$ i.e 26%

Energy Consumption

- KWH Consumed as compared to last year load : 464133 KWH
- KWH consumed due to additional 470TR load : 146997 KWH
(Cross Word 170 TR & Home Stop 300 TR)

TOTAL KWH CONSUMPTION : 611130 KWH

Saving 24 %

NOTE:

- Only 149 KWH LT load is sectioned from PWD against 481 KWH demand
- Needs Planning for one more 149 KWH LT connection in future.



Awards & Achievements

Awards

- Won a **Silver Maxi award** for the 'Save power, Have power' campaign (please refer to page 25 of the file Maxi Awards - 2007.pdf)



Major Achievements

- New BMC Water Line Completed –Saving Rs 2.00 Lakhs per month.
- Power Consumption reduced by 10 to 15 % on Present Load Condition – Savings Rs 3.00 to 4.00 Lakhs per month.
- Power Factor Improved from 0.89 to 0.97 – Saving Rs. 50 thousand Per month in electricity bill & also getting power factor incentive of Rs. 1.5 Lacs to 2.5 Lacs / month from Reliance.
- Clevit Chiller Integration With The Central Plant
- Installation & commissioning of 1000 KVA D.G set.
- Reliance Power Supply For home Stop
- BMS Systems are fully Operational.
- STP enhancement completed.

Plans Ahead

- Trane Chiller commissioning(In Process)
- Mall's A/C Revamping (WIP)
- Smoke Detector Revamping (WIP)
- Installation of R.O. plant for limiting TDS
- LPG Gas Leak Detection Panel
- Realignment of Gas Bank
- Timer Panel For Lighting Switches.
- Commissioning of Diesel Generator

Thank you