APPENDICES

APPENDIX A PRECEDENT RESEARCH

Appendix A: PRECEDENT RESEARCH

1.1 Nano Lab

Survey of Similar Facilities-1

Name of BuildingUniversity of Tokyo Nano Tech LabLocation:Professor Arakwawa Lab, Komaba Campus, University of Tokyo

Building Details

The University of Tokyo's Nano-Tech lab consists of 10 controlled environment research labs ("clean rooms"). Clean rooms are laboratory rooms where the amount of air particles in its environment is strictly controlled. The classes of clean room are measured with the amount of air particles in one cubic meter. Standard clean room classifications are; Class 100, 1000 and 10,000 allow 100, 1000 and 10,000 air particles per cubic meters respectively. The amount of air particles in a regular office environment ranges from 500,000 to 1,000,000.

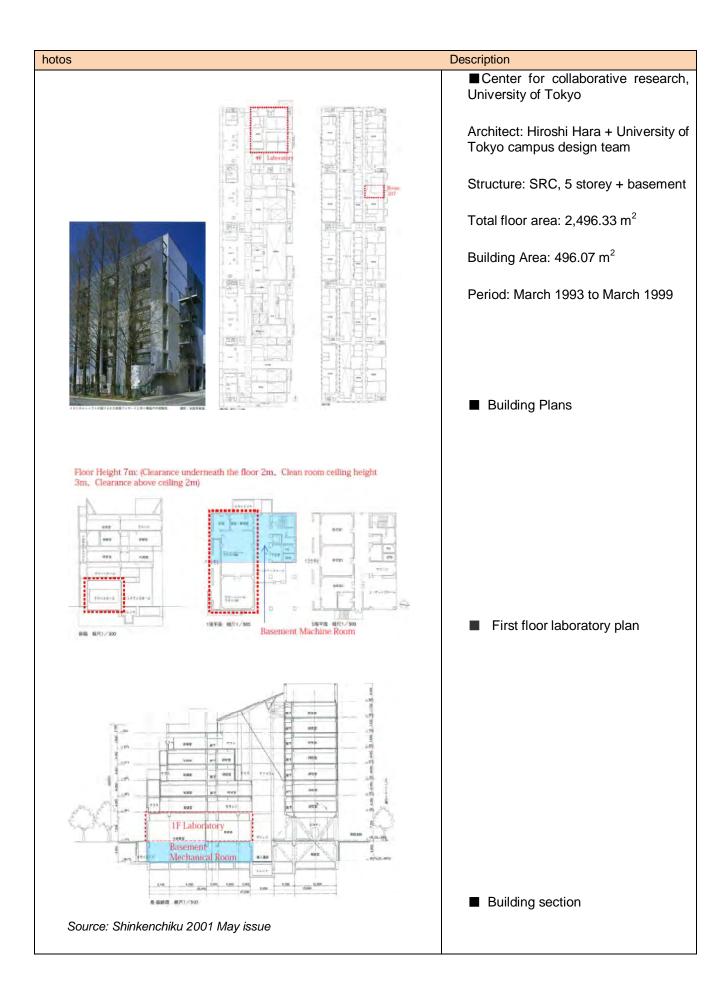
		粒径0.1µn	nの粒子数	粒径0.2µn	nの粒子数	粒径0.3µr	nの粒子数	粒径0.5µn	∩の粒子数	粒径5µmの粒子数	
JIS B9920	USA Fed.Std.209E	/m³	/f ³	/m³	/f ³	/m³	/f ³	/m³	/f³	/m³	/f ³
クラス1	-	10	-	2	-	-	-	-	-	-	-
クラス2	-	102	-	24	-	10	-	4	-	-	-
クラス3	クラス1	103	35	237	8	102	3	35	1	-	-
クラス4	クラス10	104	350	2,370	75	1,020	30	352	10	-	-
クラス5	クラス100	105	-	23,700	750	10,200	300	3,520	100	29	-
クラス6	クラス1,000	106	-	237,000	-	102,000	-	35,200	1,000	293	7
クラス7	クラス10,000	-	-	-	-	-	-	352,000	10,000	2,930	70
クラス8	クラス100,000	-	-	-	-	-	-	3,520,000	100,000	29,300	700
クラス9	-	-	-	-	-	-	-	35,200,000	-	293,000	-

http://www.itsuki-sangyo.co.jp/

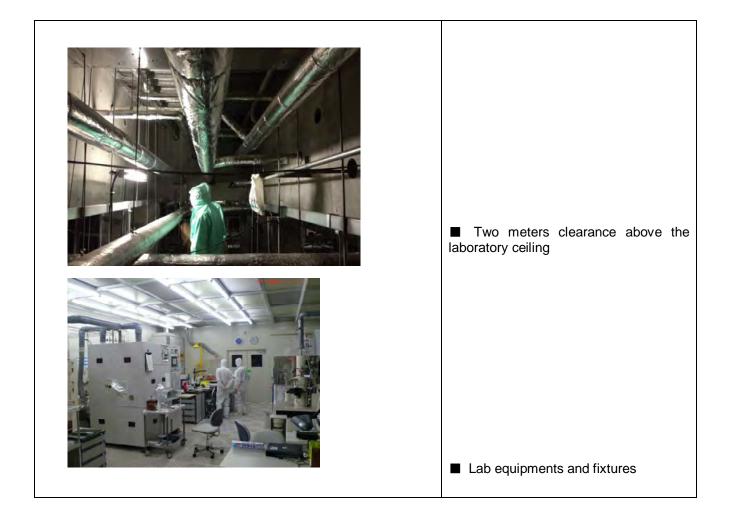
The facility at UoT consists of 10 controlled environment research labs ($2x \sim 100$ ppm, $3x \sim 1000$ ppm and $5x \sim 10000$ ppm). The total area is around $60m^2$. When moving between labs of different classification, it is necessary to go through an air shower to prevent contamination. Nano-technology involves manipulating matter at 1×10^{-9} meter scale so equipments and machines that operate for nano-technology are very sensitive. It is essential to have a clean environment for equipments and lab experiments.

An extensive HVAC system and special air filters (HEPA-High Efficiency Particulate Air Filter) are necessary. These filters can remove particles as small as 0.3 microns with a 99.97% minimum particle-collective efficiency. With HEPA, air flow rates and direction, pressurization, temperature, humidity and specialized filtration are regulated. Other filtration mechanisms are used to remove gases and liquids to prevent contamination.

All this mechanical equipment requires extensive dedicated ducting space. Prof. Arakawa lab provided a large area above the ceiling and under the floor of the nano-labs to facilitate HVAC and gas cylinder ducting. In the IITH- Research Centre Complex building, we provided about 0.8 meter clearance under the raised floor and 4 meters above the ceiling to accommodate ducting for HVAC and gas cylinders.

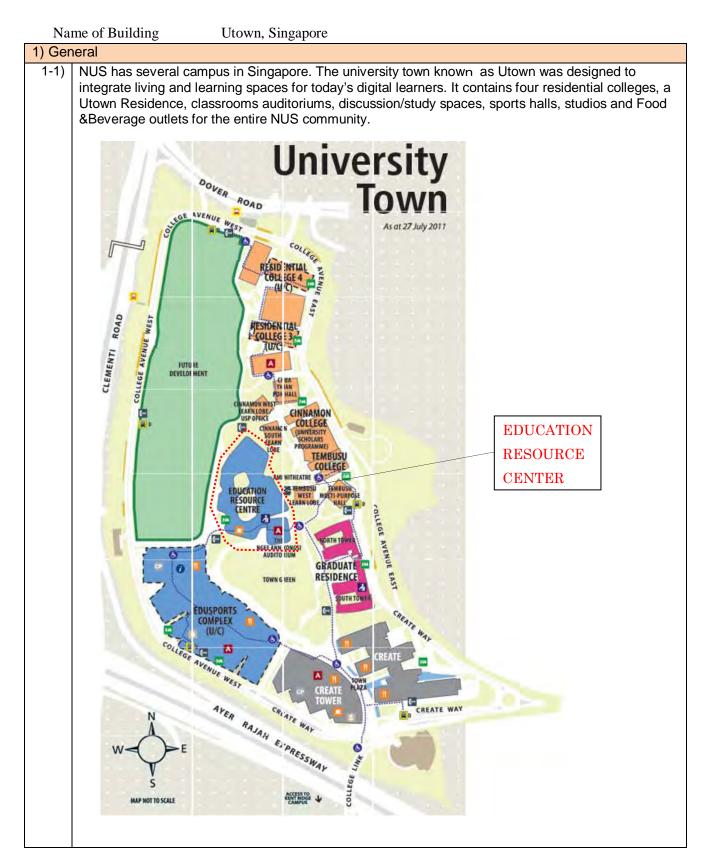






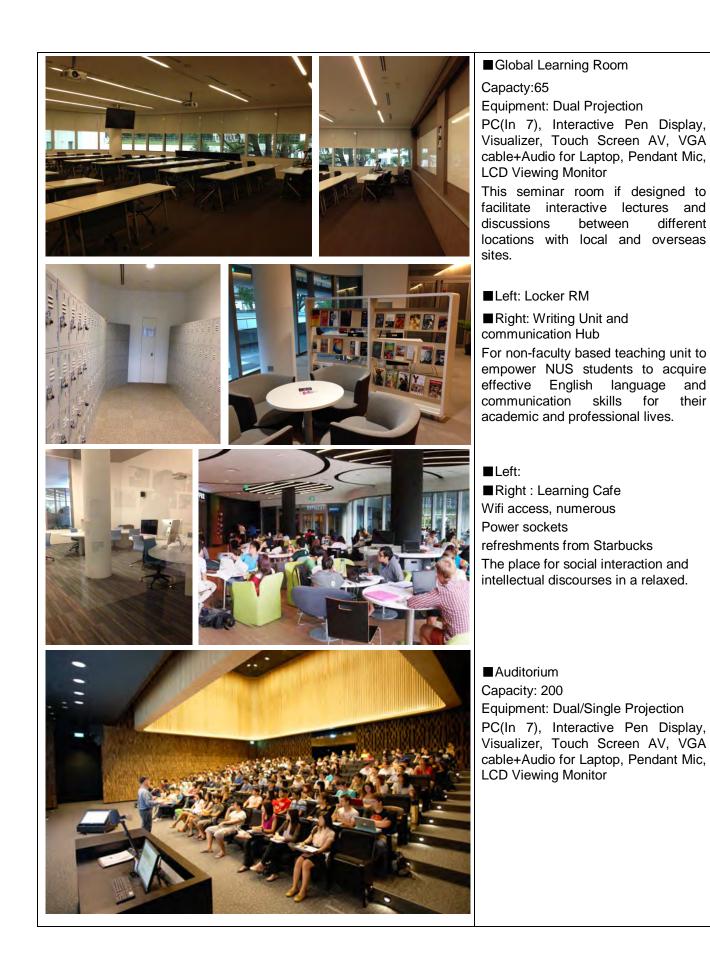
1.2 The National University of Singapore (NUS)

Survey of Similar Facilities-1



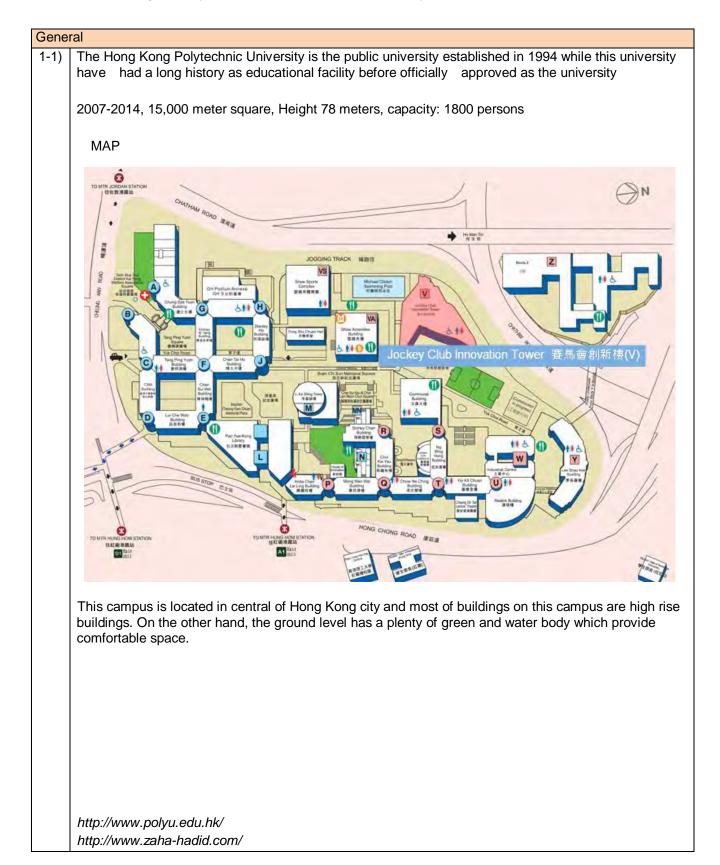
2) Campus (Overall)	
Photos	Descriptions
	■ Town Green and Stephen Riady Center.
	The campus has an open green area called Town Green and an open public space called Town Plaza. Most of the main facilities are located around these two main open area.
	■ CREATE (Campus for Research Excellence And Technological Enterprise Incubation Center)





1-3. The Hong Kong Polytechnic University

School of Design Jockey Club Innovation Tower and Library







1-4. The Tama Art University Library

iniversities in Japan. Currently, it has two campuses; one in Setagaya and the other in Hachioji	
Province Provin	RAME REPORT
	CIERARY BUILDING CIERARY BUILDING CIERARY BUILDING CIERARY BUILDING CIERARY BUILDING CIERARY BUILDING CIERARY CIERARY BUILDING CIERARY BUILDING CIE
	ig.1. Campus map

Tama Art University Library



Fig.2. Main facade

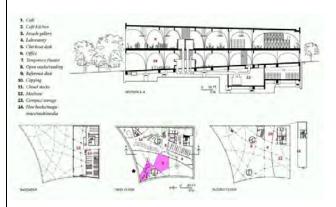


Fig.3. Building plans and section



Fig.4. Structural system

General Information

Building: Tama Art University Library, Hachioji, Tokyo, Japan Architect: Toyo Ito & Associates Architects Associate Architect & Mechanical Engineering: Kajima Design Structural Engineers: Sasaki Structural Consultants Function: Library Construction Material: Steel & Concrete Storey: 2 stories Floor Area: 5,639.46 sqm Construction Period: April 2004 to Feb 2007

The IITH KNC project resembles Tama Art University library in many ways. For instance, both buildings serve as a main library on campus, use exposed concrete as their finish material as well as spaces under arches.

■ Structure

The structural system of Tama art university library is 12mm structural steel plate's arches encased in in-situ concrete. Concrete is cast over the steel plat arches to prevent them from bulking. This combined system also allows having thinner profile arch walls of 200 mm thickness and keep the overall structure crisp and slim.

The bottom of arches intersections, below the floor finish level, is encased with concrete about 3 meters depth and form cross-shaped dwarf concrete columns at every arch's intersections. These embedded column units are supported with seismic isolators which prevent the building from moving less than 50 cm horizontally during severe earthquake. (Fig.5) Besides isolators, the entire building is separated from its site by seismic isolation pit for further earthquake damages.(Fig.6)



Fig.5.Seismic isolators



Fig.6. Isolator pit



Fig.7. Noise reduction boards` locations

Noise Reduction

The library functions as a quiet space, therefore, human noise is not much of a design issue. Soundproofing boards are installed at some limited areas (above café, library entrance, arcade gallery and theater area) at the ceiling. In fig 1 and 5, the purple highlighted areas show the locations where the noise reduction boards are installed.

■Sun Shading

Providing shading devices to arch windows of different sizes and shapes can be tricky. In Tama Art University Library, the curtain tracks are installed in a straight line above the arch openings by eliminating different size of curtains, thus, reducing installation and maintenance expenses (Fig. 8)

■HVAC System

In Tama Art University library, heat, ventilation and air-conditioning machinery and equipments are located at the basement floor. (Fig.3) The air –circulation (return and supply) is possible by floor (mainly) and wall openings. The bulky HVAC ceiling pluming arrangement is omitted and increases the space volume and spatial fluidity.



Fig.8. Curtain



Fig.9. Building corner

■References:

http://faculty-legacy.arch.tamu.edu/anichols/index_files/ courses/arch631/case/2013/TAMAArtUniversityLibrary. pdf

http://www.arcspace.com/features/toyo-ito--associates/t ama-art-university-library/

http://www.dezeen.com/2007/09/11/tama-art-universitylibrary-by-toyo-ito/

http://coolboom.net/architecture/tama-art-university-libr ary-by-toyo-ito/

http://en.wikipedia.org/wiki/Tama_Art_University

APPENDIX B MEETING MINUTES

MEETING MINUTES

DATE: Mar. 11. 2014

PLACE: IITH NEW CAMPUS SITE OFFICE

SUBJECT: IITH PHASE III DD

PROJECT: IITH Campus Development Project

ATTENDEES	
Names	Affiliation
Prof. Subramaniam, Mr.Babu	IITH
Y. Tobe(PM), T.Endo(A), M.Oshima(A),	Nihon Sekkei (NSI)
H. Eguchi	APL

NO.	ТОРІС	ACTION
1.	Work Plan	
	 NSI explained the work plan. IITH accepted the work flow and schedule. <u>Scope of Work</u> 	
	IITH requested NSI to include the sunlight and shading analysis, energy analysis and any related sustainable architecture design report into the scope of work in	NSI
	order to meet GRIHA's requirements. The analysis could be done by a local consultant such as Teri.	1101
	<u>Selection of DD3 local consultants</u>	
	IITH requested the selection of local consultants to be made among three architects currently on site. They are ARCOP, ASTUTE, and Raj Associates.	NSI
	• <u>Request of Project Condition from IITH (based on UoT's presentation)</u>	
	Overall : Increasing of total floor area to be within 3 % from the MD report	UoT
	RCC: Two of the wet labs to be planned/designed as a model lab with the raised floor system.	NSI
	The place of the toxic gas equipments needs to be reviewed.	UoT/NSI
	Showcase window for project/research achievements to be planed	UoT/NSI
	Loading chamber to be added at loading dock	UoT/NSI
	KNC: Exposed concrete finish to be reviewed	UoT
2.	Overall Schedule and Packaging of Japanese Project	
	• NSI and IITH discussed the overall construction schedule.	
	• The Japanese Project constructions shall be divided into two following packages.	
	<u>Package 1</u> – IGH, SC : These two will be tendered together.	
	Package 2 – CONV, TIP, RCC, KNC : These four project will be tendered	
	together.	
	• As for Package 1, the TOR Draft shall be completed by the end of March	
	2014. IITH shall start the selection of the local consultant accordingly. It	
	will take about three months. By the end of 2014, IITH plans to complete its	
	tendering package.	
	• The schedule of the package 2 has not confirmed yet.	

3.	Project Process of JAPANESE PROJECTS after DD	
	• IITH explained that the International consultant fees for both continuing	
	service of NSI and the technical service of AGW were excluded from the	
	total campus development budget.	
	For Package one, IITH will select the following consultants within three	IITH
	months. The PMC consultant and the Contractor will be selected accordingly.	
	Consultant#1: Consultant of UoT's direction areas, Reservoir of IGH and	
	Sport field of SC. The consultant scope includes SD*, DD, CD/Tender and CA.	
	Consultant#2: Consultant of CD/Tender and CA for IGH&SC	
	*SD = Schematic Design, DD = Design Development, CD = Construction	
	<i>Documents</i> , CA = Construction Administration	
	• IITH is preparing the TOR for Package 1.	
	• IITH will select #1 and #2 Consultants among three architects from India	
	and two architects from Japan recommended by JICA.	
	• IITH concerns the original project concept and design will not be fully	
	carried out in the case that NSI is appointed. For this reason, NSI will be	
	excluded from these architects.	
	• The selections for Package 2 are not scheduled yet.	
4.	Involvement of International Consultants for Japanese Projects	
	• The local consultant fee for after DD Japanese projects CD/Tender and CA	
	will be around 2% of the total construction cost for each building.	
	• IITH explained that NSI's CD/Tender/CA assistance fee for six Japanese	
	projects was taken out from the total campus development budget.	
5.	Involvement of International Consultants - Truss Wall System	
	• IITH has taken out the Truss Wall System consulting fee (Asahi	
	Building-Wall Co., LTD., AGB) from the campus development project	
	budget.	
	• IITH considers the selected contractor shall have a contract with AGB for	IITH
	their technical assistance. The TOR of the contractor selection shall note that	
	a contractor must contact and include the AGB technical service in their	
	scope and fee.	
6.	Site visit and Discussion of construction process	
	• The next meeting and site visit is scheduled on March 13. Mr. Babu will	IITH/NSI
	explain the construction process including work permit requirements and	
	work flow.	

MEETING MINUTES

DATE: Mar. 13. 2014

PLACE: IITH NEW CAMPUS SITE OFFICE

SUBJECT: IITH PHASE III DD

PROJECT: IITH Campus Development Project

ATTENDEES	
Names	Affiliation
Mr.Babu	IITH
Y. Tobe(PM), T.Endo(A), M.Oshima(A),	Nihon Sekkei (NSI)
H. Eguchi	APL

NO.	ТОРІС	ACTION
1.	Phase 1A Construction Progress	
	Seven hostels out of ten and the dining hall will be completed by July 2014 as well as	
	the ground floor plus another four floors of the chemical engineering building. In	
	august 2014 IITH will move to the new campus accordingly. The mechanical	
	engineering building and the civil engineering building are scheduled to be completed	
	by in March 2015.	
2.	Conflicted Plot	
	The plot number 369 and the other two small pieces of land on the edge of the campus are still not obtained and under negotiation with the owners. The heavy lab and the service station which were planned on the #369 plot has been relocated to the other plot of the campus. The service station was shifted in the plot below.	
3.	Project Process after DD, before construction	
	 Followings to be prepared by BAC (bidding assistance consultant) and approved by IITH and PMC. 1. CD (construction documents) as well as General specification and Particular specification 2. BOQ (bill of quantity) after the CD completes. 3. Good for Construction drawings (GFC) after the tender : GFC will be used for construction. 4. During the CD stage, cost estimating and value engineering if necessary are also performed. 5. After the CD documents are completed, all the CD documents of all the projects in each package will be merged into one in order to reduce the total construction budget, known as "the merging period". 	
	 Following to be created by a contractor and approved by IITH, the PMC and the BAC. Shop drawings including Metal work, Door and window work, Pre-casted concrete Work, Electrical Panel work, etc. 	

4.	Responsibility during Construction	
	• The roles of PMC are:	
	1. Regular inspection and on-site management: Day to day basis construction	
	checking activities as well as construction drawing check, also keeping IITH	
	informed of the project's progress	
	2. Execution monitoring : including measurement check and construction	
	material and sample check such as tiles, concrete, and steel	
	3. Quality assurance including schedule monitoring	
	• The roles of Architect are:	
	1. Review and approval of shop drawings	
	2. Approval and observance on site to ensure if the project is being built	
	according to the plans and specifications	
	3. Provision of missing information and GFC drawings	

MEETING MINUTES

DATE: Mar. 18. 2014

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PLACE: ASTUTE OFFICE, Pune/INDIA

SUBJECT: IITH PHASE III DD

PROJECT: IITH Campus Development Project

ATTENDEES	
Names	Affiliation
Anindya Joshi, Sonali Malvankar	ASTUTE
T.Endo(A), M.Oshima(A),	Nihon Sekkei (NSI)

NO.	ТОРІС	ACTION
1.	Missing information request	
	Senior architect	
	Based on the TOR condition, NSI has requested AST the additional information of the	AST
	senior licensed architect in India besides as well as the experienced project manager,	
	Ms. Sonali. The senior architect shall be a full-time employee with over twenty years	
	of experience in charge of both KNC and RCC projects as written in the TOR. AST	
	suggested Mr. Deo with less years experience to be fully in charge of the KNC and	
	RCC projects from the beginning to the end of the DD of phase 3. He was a former	
	quantity surveyor for TIP and CONV and familiar with the background of the project.	
	He will be AST agreed to replace him immediately with a well experienced licensed	
	architect if NSI finds his lack of ability.	
	• Code consultant	
	Based on the TOR, NSI has requested the third party building code consulting firm.	AST
	AST to provide NSI the third party code consultant background information. AST	
	agreed that this third party consultant to review the drawings and provide listed	
	documents including the egress analysis and calculations, the fire code related	
	requirements and any building code related suggestions and analysis. This exercise to	
	be completed at the beginning of the DD stage and towards the end of the DD. The	
	documents shall be a part of the interim report and the final report for JICA as well as	
	a part of the DD drawing set.	
	KICK OFF	
2.	Code Review	
	AST to review the projects regarding the building code and any related local building	NSI/AST
	regulations in early April and in early September. The third party code consultant to	
	list and document the requirements and suggestions with the referred regulation	
	numbers in two week after receiving the drawings.	
3.	STRUCTURE	
	By the end of April, NSI shall provide the basic structure information. AST to review	NSI/AST

	the structure members and beam and column schedule. AST to provide the revised	
	drawings in two weeks after receiving NSI's drawings as well as the beam and column	
	schedule. The meetings to be scheduled three times, the end of May, the end of July	
	and early September. The detailed schedule to be discussed.	
4.	MEP	
	NSI shall provide the concept sketch drawings for MEP in the end of May followed by	NSI/AST
	the meetings in Pune. The complete drawings shall be submitted by the MEP	
	consultants on August 31st. After NSI reviews the completed drawings, AST's	
	revisions might be required considering the phase 1 and 2 experiences. The meetings	
	to be scheduled three times, the end of May, the end of July and early September	
	before the submission to IITH and JICA. The detailed schedule to be discussed.	
5.	Energy Analysis	
	Energy analysis needs to be performed by the end of June. NSI to notify AST the	NSI/AST
	detailed schedule. The report is requested by IITH for their GRIHA requirements.	
	The complete analysis and report to be attached to the final set of the DD drawings as	
	well as JICA's interim report and the final report.	
6.	Important date	
	AST understood that the contract with JICA will terminate by the end of October. The	AST/NSI
	submission of drawings to IITH and JICA India is scheduled around mid October.	
	AST agreed that all the drawings to be completed by early October.	
7.	Next	
	The next meeting is scheduled around the end of May. The detailed schedule to be	NSI
	discussed.	

MINUTES OF MEETING

DATE: June 2nd-4th. 2014

PLACE: JW CONSULTANTS

SUBJECT: IITH PHASE III DD

PROJECT: IITH Campus Development Project

ATTENDEES	
Names	Affiliation
U. Joshi, S. Gramopadhye, M. Bansode,	JW CONSULTANTS(JW)
S. Malvankar	ASTUTE
Y.Tobe(PM), M.Oshima(A), K. Nishikawa(S), A.Nashimoto(S)	Nihon Sekkei Inc, Nihon
	Sekkei International - NSI

NO.	ТОРІС	ACTION
GENE	ERAL about structure	
1.	Structural condition	
	 NSI stated that the structural condition is the same as the IITH phase I & II. JW accepted. 	
2.	Geotechnical report	
	 Geotechnical report of the project site by the NAGADI CONSULTANTS is confusing that NSI cannot read even the N value of each layer. JW also cannot understand this report. JW will clarify it with IITH and report to NSI. 	JW
3.	Others	
	 Imposed load JW explained that the imposed load by NBC is the minimum requirement. It should be increased if necessary. For example, 2.5 kN/m2 of imposed load for office in educational buildings might not be enough. It is better to refer the imposed load for office category in the other function building. 3.0 ~ 4.0kN/m² is usually used for the imposed load for office. NSI accepted. 	
Resea	ach Center Complex - RCC	
1.	RCC : Overall Structure Concept	
	 NSI explained the overall architecture and structure concept of RCC. JW suggested not to use the term "rigid" frame with "shear walls" in the design basis report. It shall be called just a moment frame as it is very flexible with a few shear walls. NSI accepted. 	
2.	RCC : Mega lab (NANO-TECH Lab)	
	NSI explained the NANO-TECH lab: Steel grating floors are raised by the steel posts from the concrete slab to allow the tenants to run ducting free	

3.	 for their own labs. This system is used in the nanotech labs of UOT (University of Tokyo). JW suggested to use RC posts instead due to the necessity of the footings as well as fire safety separation. NSI explained it is under the scope of tenants. IITH and tenants will install the lab after the building completion. NSI considers that the footings are unnecessary since the load on the grating floors is not very large. JW accepted the concept. NSI explained the nanotech labs are double height space with the mechanical spaces above the ceiling and below the grating floor supported with 10 meter tall columns. JW accepted. 	
	NSI explained pre-stressed beams are used for 12 meter long spanned	
	 and heavy loaded girders. It is efficient to reduce cracks and keep the girder size to be 650MM wide by 900MM deep. JW explained the width of pre-stressed beam shall be larger than 1,200 MM in India. It is common that the width of a pre-stressed beam becomes larger than the width of the column. The pre-stressing codes can be tied on the sides of a column. JW suggested making these pre-stressed girders to the conventional RC girders with the same size. It is accepted to make 12 meter long beams with a conventional type in India. NSI accepted 	
4.	RCC : Others	
	 JW pointed out the dead loads of some rooms seemed to be incorrect. NSI to revise dead loads. 	NSI
	 <u>NOTE</u>: The additional RC slab to be added in the pit of mega lab. NSI to send revised framing plans and architectural plan and sections to JW. 	NSI
Know	ledge Center - KNC	
1.	KNC : Overall	
	 NSI explained the overall architecture and structure concept of KNC. The building is very complicated. There are three major structural challenges. Stepped open shelf area RC arch walls Roof. 	
2.	KNC : STEPPED OPEN SHELF area	
	NSI explained the architectural and structural concept including inclined girders as to the STEPPED OPEN SHELF, placing secondary beams	
1	1	

 horizontal, and slabs supported by the upward lump concretes. JW suggested an alternative structural concept by using flat framing on the bottom level considering its execution method on site. NSI and JW discussed the stepped floors area above taller arches where the flat framing concept does not work. (Grid 8 to 11 between Grid D and G) 	
 the bottom level considering its execution method on site. NSI and JW discussed the stepped floors area above taller arches where the flat framing concept does not work. (Grid 8 to 11 between Grid D and 	
NSI and JW discussed the stepped floors area above taller arches where the flat framing concept does not work. (Grid 8 to 11 between Grid D and	
the flat framing concept does not work. (Grid 8 to 11 between Grid D and	
 JW agreed to proceed the original structural concept NSI suggested. 	
	JW
 JW to execute the design development drawings of the STEPPED OPEN SHELF area. 	
3. KNC : RCC ARCH WALL	
· NSI explained the UoT's original design of 500mm-thick RCC ARCH	
WALL. NSI considered to evaluate its stiffness for the whole structural	
calculation based on the calculation method in Japan.	
• Since it doesn't work as structural arch, JW suggested suspending each	
RCC ARCH WALL from the beam above and just considering its weight	
as the additional load on the beam above. In case of a horizontal load	
added, cracks are allowed along the edges of the walls on both sides.	
• The "stitched re-bars" shall be necessary for reinforcement between	
walls and cross shaped columns. The walls do not restrain the frame	
movement and evaluating the stiffness of the walls is unnecessary. NSI	
accepted the concept.	JW
JW to develop the RCC ARCH WALL part drawings for DD submission.	3.00
4. KNC : Roof	
• NSI explained the concept of roof shape. The UoT team considered	
Precast concrete method in order to maintain the smoothness and	
sharpness. However, after several studies, NSI had just found out	
additional concretes would be massive because the size of the PCa	
piece is not small enough to achieve the smoothly curved roof.	
• JW considered PCa is not suitable for this case. In India, in-situ concrete	
can be executed smooth and sharp, and much cheaper than PCa.	
Constructing with in-situ concrete shall reduce additional concretes. NSI	
accepted the concept.	
NSI and JW discussed the reasonable depth and pitch of secondary	
beams for constructing it by in-situ and concluded as the following: The size shall be 250MM by 1700MM to 350MM by 1200MM at every	
size shall be 250MM by 1700MM to 350MM by 1200MM at every 2400MM	
	NSI
beams and confirm to JW by June 21 st by e-mail.	
5. KNC : Long column	
5. KNC : Long column · NSI and JW discussed the size of the columns. According to Indian	

	 compression member when both the slenderness ratios L_{ex}/D and L_{ey}/b are not less than 12. Six of the main columns are long and shall be considered as slender compression members. According to Indian Standard (IS), a RC slender compression member shall be designed by considering an additional moment. In the case of KNC, this moment will be 120 times of its original moments. The original size of the columns is too small. 	
	<u>NOTE:</u> NSI reviewed the calculations. Refer the email sent on June 16 th 2014 by NSI. JW to reply.	JW
	 In order to keep the original size, JW suggested steel tube columns with the same cross section shape. The steel tube column is filled with concrete. It is designed as if it is only steel tube column. The strength of concrete shall not be counted. The thickness of steel plate for the tube column shall be 20MM to 60MM. NSI concerned its finish: The finishing of these columns shall be exposed concrete in order to achieve the seamless connections between the arches and the columns. →JW suggested to plaster on the surfaces of columns. The thickness of plastering shall be 30 MM. 	
	 NSI to discuss with UOT and confirm. 	NSI
6.	KNC : Others	
	 Pit NSI to finalize the pit design. NSI to submit the drawings of the pit framing plan to AST/JW by June 21st 2014. Stair 1~5 	NSI
	 NSI to update the stair 1 to 5. NSI to submit the drawings to AST/JW by June 21st 2014. Stair 6 	NSI
	NSI to update the stair 6 design as a free standing stair . Stair 6 to be discussed during NSI's next visit.	NSI
Sched	ule and Scope	
	NSI and AST/JW agreed the schedule and scope. Refer the attachment	NSI/JW

RCC: Research Center Complex , KNC: Knowledge Center

4

■STRUCTURE DD Schedule for IITH Phase III

11th Jun. 2014

RCC				Jun.	2014	•		July.	2014			Aug.	2014			Sep.	2014	ł	Remarks
				1st N	lonth	1		2nd M	Month			3rd M	/ onth			4th M	Nonth	I	
TOPIC	ACTION	DETAILS	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
ARCHITECTURAL DRAWING	NS→JW	Plan, Section, Elevation	0 visit																
		Other details								O visit						O visit			
STRUCTURAL DRAWING	NS→JW	Concept drawing of Framing plan, Framing elevation, Column & Beam schedule	0 visit																
Main Structure :																			
OVERALL	JW	Drawing Framing plan, Framing elevation, Column & Beam schedule, etc		_				•		(_			-	•	*			
PIT	NS	Designing pit floor plan			E	e mail										5000	1351014		
	JW	Drawing pit framing plan								(•	*			
Details :																508	VISSION		
OTHERS	NS									O visit									
	JW	Reviewing and adding information to the drawing								(•	* SUBN	ISSION		

KNC				Jun.	2014	L		July.	2014	ļ		Aug. 2014				Sep.	Remarks		
			1st Month		2nd Month				3rd Month				4th Month						
TOPIC	ACTION	DETAILS	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
ARCHITECTURAL DRAWING	NS→JW	Plan, Section, Elevation	visit																
		Other details								O visit						O visit			
STRUCTURAL DRAWING	NS→JW	Concept drawing of Framing plan, Framing elevation, Column & Beam schedule	O visit																
Main Structure :																			
STEPPED OPEN SHELF area	JW	Drawing Framing plan, Framing elevation, Column & Beam schedule, etc						•						-	•	*			
RCC ARCH WALL area	JW	Drawing Framing plan, Framing elevation, Column & Beam schedule, etc						•							•	*	1133101		
ROOF	NS	Confirming design of roof (PCa or insite, pitch and size of the ribs)			E	o mail										508	MISSION		
	JW	Drawing Framing plan, Framing elevation, Column & Beam schedule, etc				-		•							•	*			
LONG COLUMNS	NS	Discussing and deciding the concept of these long columns with UOT			E	omail										SUB	MISSIO		
	JW	Adding information to the drawing				-		-		(*			
PIT	NS	Designing pit floor plan			E	-mail										508	MISSIO	N	
	JW	Drawing pit framing plan				-		•						-	•	* SUBN			
Details:																			
STAIR 1~STAIR 5	NS	Modifying			E	e -mail													
	JW	Adding information to the drawing				-		•							•	*			
STAIR 6	NS	Designing STAIR 6(Trussed stair)								O visit						SUBM	ISSION		
	JW	Reviewing and adding information to the drawing													•	*			
OTHERS	NS									O visit						SUBM	SSION		
	JW	Reviewing and adding information to the drawing								(•	*			

MEETING MINUTES OF ELECTRICAL SYSTEM

DATE: 5th Jun. 2014

PLACE: ASTUTE

SUBJECT: IITH PHASE III DD

PROJECT: IITH Campus Development Project

1

ATTENDEES	
Names	Affiliation
Sonali mal vankar, and 2 staffs	Astute - AST
Vinayak A. Vaidya, Ashitosh Monap	Abhiyanta(ELE)-ABH
	APL
M. Ohshima, Y. Ohtani	Nihon Sekkei - NSI

NO.	ТОРІС	ACTION
1.	COMMONS	
	 NSI and AST confirmed "MEP DD Schedule for PHASE II DD". →AST to refer <i>to the table 1 in Attachment</i>. NSI and AST confirmed "Architectural drawings for RCC and KNC" 	AST
2.	INFRASTRUCTURE	
	 NSI and AST confirmed "Infrastructure plan by ARCOP for RCC and KNC". As for RCC, the tapoff for electrical L.T line is located at the southwest corner of the site according to the latest ARCOP plan. And, the tapoff for ELV line is located at the northeast corner of the site. As for KNC, the tapoff for electrical L.T line is located at the northeast corner of the site of the site. And, ELV line is located at the southeast corner of the site. 	
3.	ELECTRICAL POWER DEMAND	
	 NSI and AST discussed about "Calculation Sheet of electrical power demand". →Same as Phase II NSI and AST discussed about "PPD of Distribution Panel for LAB" →NSI assumed the capacity of LAB DB by PPD. The PPD of DRY and WET LAB is 150VA/m2. 150VA/m2 is the same as TIP LAB. And, the PPD of MEGA LAB is 300VA/m2. NSI will study the capacity of chillers by tenant. →NSI assumed it is by 150W/m2 it is because the heat load is assumed as 300W/m2 and COP of chillers is 2.0. 	
	PPD: Power Socket Power Density COP=Heat Load ⁄ Electrical Load	
4.	DRAWING LIST	
	 NSI and AST confirmed "Drawing List of Electrical Work". →Same as Phase II 	

5.	POWER SUPPLY SYSTEM	
	• NSI and AST discussed about "the concept of power supply system" as	
	the figure 1 in Attachment.	
	<i>→Same as Phase II</i>	
	• RCC is similar to TIP. And, KNC is similar to CONV.	
	1. Between Substation and MDB in EMR	
	 Electrical L.T line between Substation and MDB shall be two 	
	following lines each for both RCC and KNC.	
	- Normal line	
	- Emergency line connected to generators on campus	
	 "Piller Box" shall be located at the site boundary on electrical L.T line. 	
	 The cabling goes underground and goes into the pit. Then, it goes up 	
	from the bottom of EPS to MDB in EMR.	
	2. Between Normal MDB and Emergency MDB	
	 Normal MDB and emergency MDB are connected by ATS. 	
	3. Between MDB and Local distribution boards	
	• EPS shall be planed in each area in the buildings. And, local DB shall	
	be located in EPS and MR.	
	• As to RCC, each LAB has distribution board one by one. And, LAB DB	
	is connected with local DB through the meter.	
	4. The discrimination between normal and emergency loads	
	 The distribution between normal and emergency loads The following loads are discriminated to emergency loads. 	
	-Emergency lighting	
	-Server rack	
	-CCTV equipments	
	-Amplifier	
	-Fire alarm panel	
	-PBX	
	-Lift	
	-Plumbing system	
	-Fire fighting system	
	r ne ngnung system	
	5. The loads of UPS	
	 2 kinds of UPS shall be planed. One is for emergency lighting. And, 	
	• 2 kinds of OFS shall be planed. One is for emergency lighting. And, the other is for ELV equipments.	
	• AST to review the layout of EMR.	AST
	EMR; Electrical Machine Room	
	MDB; Main Distribution Board	
	Local DB; Local Distribution Board	
	EPS; Electrical Pipe Shaft	
	DISTRIBUTION AND CABLE TRAY SYSTEM	
	• NSI indicated local distribution board layout and DB supply boundary	
	by "NS drawings".	

7.	• The meter for LAB DB shall be located in EPS.	
7.		
	DISTRIBUTION PANEL AND POWER CONTROL PANEL DIAGRAM	
	 Power control panel means distribution panel for the 3 phase electrical roads; pump, air handling unit etc. by HVAC or Plumping system. NSI and AST discussed about the scope of Work between electrical and mechanical works. Distribution panel is by electrical work. While, control panel is by mechanical work. Panel diagram shall be as ABH style. →Same as Phase II 	
8.	Lighting System	
	 NSI indicated the lighting fixture layout, illuminance level and switching way for each room and lighting fixture layout by "NS drawings". AST advised that the illuminance level for LAB room is 300lx and for pantry is 200lx generally in India. NSI agreed. In DRY and WET LAB, the ceiling is exposed concrete and the height is 3.8m. So, lighting fixture shall be planed as suspended type at FL+3.0m. 	
9.	POWER SOCKET SYSTEM	
	 NSI indicated power socket layout by "NS drawings". RCC has 3 kind s of LAB as below; DRY LAB and MEGA LAB Office WET LAB MEGA LAB 	
10.	TELEPHONE SYSTEM	
	 NSI and AST discussed about "the concept of communication system" as the figure 2 in Attachment. NSI and AST plan unified communication system with telephone, LAN by optical cable. Television system is separated from this system. MDF and server lack are located in ELV room. The cabling route from MDF in ELV room to local patch panels is the same as power cabling. →Same as Phase II NSI indicated multimedia outlet layout by "NS drawings". ELV: Extra Low Voltage 	
11.	LAN SYSTEM	
	 LAN system shall be unified with telephone. NSI indicated multimedia outlet layout by "NS drawings". 	

12.	TELEVISION SYSTEM	
	• NSI indicated television outlet layout by "NS drawings".	
13.	CCTV SYSTEM	
	• NSI indicated CCTV Camera layout by "NS drawings".	
	• The main rack including recorder, monitor is located in fire control	
	room.	
	• CCTV cameras shall be IP type.	
	• The capacity of recorder shall be able to store the video for 1 month. → <i>Same as Phase II</i>	
14.	PUBLIC ADDRESS SYSTEM	
	 NSI and AST confirmed the local legal installation standards. 	
	 The main rack including amplifier is located in fire control room. 	
	\rightarrow Same as Phase II	
15.	AUTOMATIC FIRE ALARM SYSTEM	
	• NSI and AST confirmed the local legal installation standards.	
	• The fire alarm panel is located in fire control room.	
	 Fire alarm panel shall be analog address type. Detactory shall be available analog address type. 	
	• Detectors shall be mainly smoke type. Heat detectors shall be equipped with pantry, kitchen.	
	 Beam detectors hall be equipped with the room of over 5m height. In 	
	RCC, MEGA LAB shall be applicable.	
	 In open air room, detectors are not necessary. In RCC, mechanical 	
	shaft shall be applicable.	
	• In the room with false ceiling, if the height of the space is over	
	800mm, detectors are necessary at both above and below the ceiling.	
	\rightarrow Same as Phase II	
	• <i>A</i> ST to review the layout of fire control room.	AST
16.	LIGHTNING PROTECTION SYSTEM	
	• NSI and AST confirmed the local legal installation standards.	
	• NSI expects that lightning protection system shall be mainly tape	
	type. AST will study.	AST
	• Grounding electrode is composed of the loop conductor around the	
	 building. The conductor from the top of roof to grounding electrode is displaced 	
	by the metal as the building structure.	
	\rightarrow Same as Phase II	
17.	EARTHING System	
	• Grounding electrode shall be separated from the one for lightning	
	protection system.	
	<i>→Same as Phase II</i>	

-		1
18.	I. B. M.S. – Intelligent Building Management System	
	 NSI and AST discussed about I. B. M. S. combines the below systems. HVAC system Plumbing system Fire fighting system including fire alarm and sprinkler system Electrical system CCTV system The management items of electrical system are as below; Lighting control DB alarm and measurement data Power meter →Same as Phase II 	
19.	RCC Scope of Work for Electrical System	
	 NSI and AST confirmed the scope of work about the below system for RCC LAB. Lighting and Power Socket Telephone LAN Television Fire Alarm/Public Address 	

RCC: Research Center Complex

KNC: Knowledge Center Complex

Table 1: MEP DD Schedule for IITH Phase III

MEP D	D Schedule for IITH Ph	ase III																		5th Jun. 201
					Jun.	2014	 		July.	2014	 		Aug.	2014			Sep.	2014		Remarks
			0		1st I	Month			2nd M	Nonth			3rd N	lonth			4th M	/ onth		
ACTOR	ACTION			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
NS →AS	NS Architectural Plan		-	•																
	NS MEP Basic Design		-	•																
AS	ASTUTE Drawing			-																
AS	ASTUTE Making of Drawing List					•														
AS →NS	ASTUTE Submit of Drawings	FLOOR PLAN							(•										
		DIAGRAM							(þ										
		DETAILS							•	>										Machine RM., Toilets
NS	NS Confirmation of Drawings								•	_	•									
AS	ASTUTE Modificaiton of Drawings																			
AS→NS	ASTUTE Submit of Final Drawings												(>						
NS	NS Preparation of Submit to IITH												•		_					
NS →IITH	NS Submit to IITH of Drawings														(•				
NS →AS	NS business Trip to India				•					•					•		•			

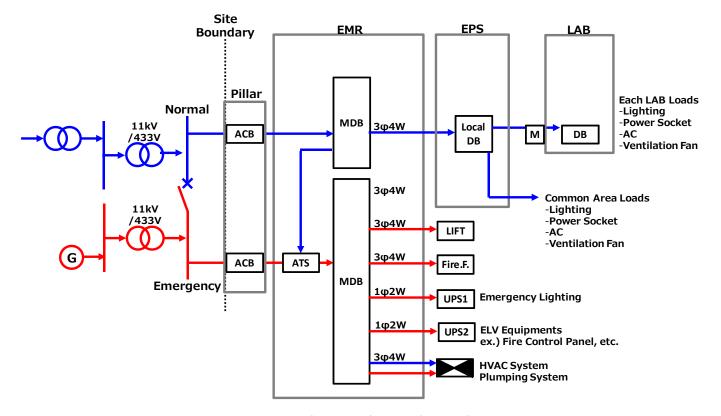


Fig.1: The Concept of Power Supply System

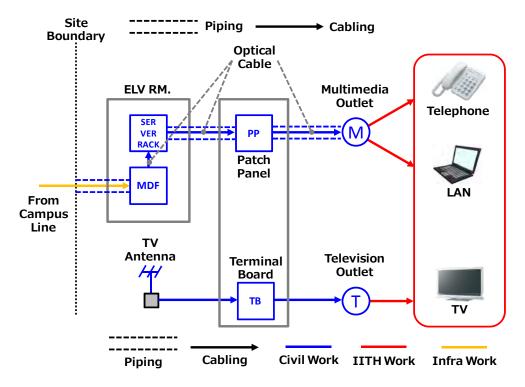


Fig.2: The Concept of Communication System



ELECTRICAL CONSULATANTS & ENGINEERS

SHREE SWAMI KRUPA, PLOT NO. 6, NEELKAMAL HOUSING SOCIETY,

2ND FLOOR, KARVENAGAR, PUNE - 411 052

TEL. : 25462173, FAX : 25410691. E-MAIL - abhiyanta@vsnl.com

MINUTES OF MEETING / VISIT REPORT

		PEX / 402 / Rev - 0
CLIENT :	PRESENT	
ASTUTE ENGG SERVICES		
	ARCHITECTS :	NIHON SEKKEI INTERNATION INC. JAPAN
PROJECT: IIT-H RCC & KNC PHASE-		ASTUTE ENGINEERING SERVICES
3		
	CONSULTANTS :	NIHON SEKKEI INTERNATION INC. JAPAN
DATE : 29.07.2014	00110021/11101	ABHIYANTA ELECTRICAL CONSULTANTS & ENGG.
30.07.2014		ABHITANTA ELEOTNICAE CONCOLTANTO & ENCO.
30.07.2014		
Following points were discussed during Des	sian Review Meeting-	
RCC	Agri i torioti i ilocting.	
1) DG Power requirement is for common loa	ad only 8 not for total load	Load list to be revised accordingly
2) PHE panel shall be added in main SLD a		
		der provision shall be made from typical mega lab DB.
Cable laying & further scope of work will be		
4) Some Revision in external lighting is suge		
5) Equipment layout to be shown in electrica		
6) for Dry Labs- No. of socket (20a Ind.) to I		
7) Motion sensors along with manual switch		
	Chiller cabling from Mega	a Lab to Chiller area, cabling scope by tenant.
Cable tray shall be added in Pit Floor Plan.		
Corridors shall have plane ceiling & not g		
10) Legend shall be separated for Normal L		
11) Lighting fixture at Porch & peripheral lig	hting is with normal T5 sir	mple fixture & no decorative fixture.
12) Lighting fixture orientation to be cross cl	necked for mega lab office	e, also check HVAC indoor units locations.
13) Revised earthing scheme to be shared v	with NSI.	
14) Addition of Up/Down & bracket lights as	marked on layouts.	
15) Load managers shall be shown at MLTF		eters to be shown at other panels.
16) Layouts shall be revised & resend oncor		
	·	
KNC		
1) Locations of HVAC panel to be shown in	mechanical room.	
2) PHE panel to be shown in Pump room.		
3) Main SLD is OK.		
4) Equipment layout shall be shown in electric	rical room area at ground	floor
5) NSI asked to avoid the tray routes throug		
6) Naming shall be done for DB's in each E		
7) The cable route shown from EPS-1 to EF		
8) At 3rd Floor, 5A socket requirement for H		& romoved if not required
9) External earthing pits shall be relocated in		
	nged with proper distance	es & addition of fixture shall be considered & expanison
areas.		
	om snall nave grid celling,	fixtures shall be arranged acordingly. Astute to resend
the layouts with false ceiling.		
	udio-Visual room with grid	d ceiling, Astute to resend the layouts incorporating the
same.		
<u>, , , , , , , , , , , , , , , , , , , </u>	nall be considered with 4r	ows x 4col. As lux required is 400lx. Dialux considering
above combination shall be shared to NSI.		
14) In mechanical room, wall mounted light	fixtures to be shown & ave	oid ceiling mounted lights wherever not possible.
FIRST FLOOR		
15) Grid-5-10:N-R, will have grid ceiling- Lig	hting fixtures shal be real	lighned with respect to grid.
16) NSI will share the details of lighting fixtu		
17) 5A Socket point shall be shown for Des		
SECOND FLOOR	<u>,</u>	
l		

18) 5A Socket point shall be shown for Desk Light for tables. For two tables consider one Desk Light Fixture as discussed.
19) Lighting Fixture in Corridors at Library areas shall be bi-directional & having one sided reflector.
20) Dialux for vertical plane shall be checked for book shelf areas & to be share with NSI.
20) Diality for ventical plane shall be checked for book shell areas & to be share with NSI. 21) Area at grid no-A-D:11-13, keep 600x600mm lighting fixture as shown earlier.
22) NSI will reconfirm the mounting height for Foot Lights at Grid-D-G:3-4. The same fixtures are used for staircase.
THIRD FLOOR
23) Desk lighting shall be added at additional reading spaces.
24) At desk areas, lighting fixture shall be placed side-by-side as marked on layouts.
25) Square light shall be added in Reading room -1, grid-11-13:A-B.
LIGHTNING PROTECTION LAYOUT
26) Kindly show only Arch. Layouts & no structural Layouts.
27) Add lightning conductor grid at the top of water tank & staircase.
LOAD LIST
28) Consider additional watt per sqft. i.e. 10w/sqft load for printing areas. Assume loads like Photo Copy machine, Scanners.
29) Add smoke exhaust load provision in load list.(approx-20kw).
COMMON POINTS
30) For dropping of LA strip, it is suggested to run strip through RCC columns, Astute to take a note of this & take concent of
RCC consultant.
31) Astute to share the revised layouts with Grid Ceiling, Plane Ceiling etc wherever required.
32) Incoming tap-off points shall be shown in External Site Plan for Electrical & ELV System for RCC & KNC.
ELV SYSTEM
KNC – PA System
1) Column Mounted Box type Speaker need to be considered for Bridge area on Third floor instead of ceiling mounted speaker.
2) Schematic diagram need to be revised accordingly.
KNC – FAS System
3) Beam Detectors need to be considered for Bridge area on Third floor instead of normal smoke detectors.
4) Schematic diagram need to be revised accordingly.
RCC – PA System
5) Consider separate zone for common area & separate zone for Lab areas for Ground Floor and make changes in schematic
diagram accordingly.
RCC – FAS System
6) Make correction in schematic diagram of FAS system (i.e. loop number correction)

MINUTES OF MEETING

DATE: August 4th – 5th , 2014

SUBJECT: IITH PHASE III DD

PLACE: JW CONSULTANTS

PROJECT: IITH Campus Development Project

ATTENDEES	
Names	Affiliation
U. Joshi, M. Bansode,	JW CONSULTANTS (JW)
S. Malvankar	ASTUTE(AST)
Y. Tobe(PM), M. Oshima(A), K. Nishikawa(S), Y. Imatomi(S)	Nihon Sekkei Inc, Nihon
	Sekkei International (NSI)

NO.	ТОРІС	ACTION
Know	vledge Center - KNC	
1.	KNC : Free-standing Stairs	
	 NSI explained the result of calculation analysis about free-standing stairs (Stair 6). The analysis is done by Finite Element Analysis. →JW insisted NSI to show a diagram indicating principle shear strain of stair slabs. 	NSI
2.	KNC : Glass Façade	
	• NSI explained about the sash system for glass façade of arch openings.	
	According to UoT's design proposal, glass façade is to be composed of	
	horizontal mullions, which is spanning 10 meter long maximum.	
	· NSI proposed the mullions to be steel I-girder. JW stated that steel	
	I-girder mullion is feasible enough in India.	
Struc	tural Drawing	
1.	KNC	
	NSI mentioned that the structural drawings of KNC submitted by JW on	
	July 31 st do not include all the floor framing plans and elevation framing	
	plans.	
	\rightarrow AST/JW shall submit revised final DD structural drawing by Sep. 23 rd .	AST/JW
DD R	eport and Schedule	A31/3W
	· JW to carry out rough calculation of typical members and create whole	AST/JW
	structural analysis model, and submit DD report including following items.	
	1. Diagram of 3D analysis model	
	2. List of load combinations	
	3. Diagram showing the load is applied for each floor (DL and LL)	
	4. List of additional load especially for KNC inclined beam and upward	
	lumped concrete	
	5. Diagram showing forces of frames for each basic load cases	
	6. Diagram showing ground reaction	

7. Calculation of some typical columns (at least for slenderness	
column and typical columns)	
8. Calculation of some typical main beams (at least for longest,	
shortest and typical span)	
9. Beam and column schedule	
\rightarrow AST/JW agreed. NSI to send Load Sheet, for indicating loads for floor	NSI
framing, before starting structural calculation.	
<u>NOTE:</u> NSI sent	
· NSI, AST and JW discussed DD report submission schedule to be	AST/JW
following:	
1. Load Sheet to be submitted from NSI to AST/JW by Aug. 8 th	
NOTE: NSI sent the Load sheet.	
2. DBR shall be submitted from AST/JW to NSI by Aug. 15 th . NSI shall	
review DBR by Aug. 22th	
NOTE: NSI received and approved RCC and KNC DBR.	
4. Draft of DD report shall be submitted from AST/JW to NSI by Sep.	
2 nd for RCC, and Sep. 9 th for KNC	
5. Final DD report for RCC and KNC shall be submitted from AST/JW	
to NSI by Sep. 15 th	
• Structure Framing Plans for DD set to be submitted by Sept 23rd 2014	AST/JW
accord Contor Complex	

RCC: Research Center Complex

KNC: Knowledge Center

2

MEETING MINUTES

DATE: Sept. 08. 2014

PLACE: IITH NEW CAMPUS SITE OFFICE

SUBJECT: IITH PHASE III DD

PROJECT: IITH Campus Development Project

ATTENDEES	
Names	Affiliation
Prof. Subramaniam, Mr.Babu	IITH
Y. Tobe(PM), M.Oshima(A), K.Nishikawa(S), S.Hario(MEP),	Nihon Sekkei (NSI)
R.Nishimoto(A)	

NO.	ТОРІС	ACTION
1.	Master Plan and Infrastructure	
	• For RCC and KNC, it is schedule to start the construction in Jan, 2016, and end in 2018.	
	• IITH requested NSI to double check with ARCOP regarding the electrical demand and locations of substations.	NSI
	NOTE: NSI confirmed with ARCOP.	1101
	The electrical demand by ARCOP estimated significantly lower than	
	the required demand which shows in NSI's DD drawings. It is	
	necessary to coordinate it with ARCOP.	
	The location of substations is correct.	
	• The emergency generators are located in the main substation (SV1).	
	They shall be connected with the main cable (Single Line) to each	NSI
	electrical room from the substations. NSI to revise the electrical concept	
	diagram.	
	NOTE: According to ARCOP, each building shall be connected with two	
	electrical LT cables from the substations. One is for the normal line and the other is for the emergency line.	
	 Each building shall have UPS by itself according to the requirements. 	
2.	RCC	
	i. <u>Architecture</u>	
	• The raise floor system shall be applied at this point as IITH has not	
	determined the lab layouts yet. NSI also suggested that it is the best method	
	not only for installation and maintenance purposes but also considering	
	future renovations. The trench system or the slung system using the space	
	above ceiling of the floor below can be considered during the tender stage if	
	IITH decides the layout and prefers to lower the initial building cost.	IITH
	This item to be noted on the DD drawing.	
	• IITH and NSI discussed the types of stones. Granite stones tend to have	
	darker colors. IITH suggested using the larger size stone in vertical direction	
	up to 6 feet with the dry type system instead of 300mm x 300mm stone	

panel on the wall of RCC in order to reduce the cost of steel back supports.	
	U.T
The stone types and their details to be reviewed with UoT.	UoT
ii. <u>Structure</u>	NGI
Additional soil survey locations were discussed. NSI to send the locations	NSI
for each building to IITH	
NOTE: NSI shared information with IITH.	
Structure systems as well as use of PT beams were discussed. NSI to discuss	NSI/JW
with JW. IITH suggested using PT beams where the column span is more	
than 7 to 8 meter long.	
iii. <u>HVAC, Plumbing and Electrical</u>	
The gravity method is applied for the water supply system. NSI to double	NSI
check the water pressure and necessity of pressure reducing valve for lower	
level.	
NOTE: According to water pressure calculation, the pressure reducing valve	
is not required for RCC water supply.	
If UPS room shall be provided, the ventilation to be required for UPS room.	NSI
NSI to check the location of UPS room.	
NOTE: There is not a UPS room in both buildings.	
In the case of black out, the UPS system shall be used for emergency	
lighting and ELV equipments. DG (Diesel Generator) system shall back up	
all of UPS covered area, the elevators including fire lift and plumbing	
equipments.	
The use of LED fixture to be considered instead of fluorescent light as the	
market is catching up. Fluorescent lighting fixture can be used for not	
frequently used rooms such as mechanical room and storage.	
NOTE: NSI added the remark in the drawing "Equivalent LED fixture shall	
be used against T5 fluorescent lighting fixture".	
CAT6E shall be applied for LAN. NSI to check CCTV.	NSI
NOTE: CAT6E shall be applied for CCTV as well.	
IITH requested the provision of the special earthing system. Considering the	
soil type of the site, the same type of earthing system as three academic	
buildings currently under construction to be applied for both RCC and KNC.	
NSI to discuss with AST and ARCOP and revise it.	NSI
NOTE: NSI revised the drawing.	
iv. Scope of work	
Wet Lab	
1. Floor finish: The only two model rooms to have the floor finish.	
 Ceiling finish: The ceiling shall be installed for all the wetlabs. 	

Г

	• <u>Dry Lab</u>	
	1. Floor Finish: Floor finishing shall be installed for all Dry Labs.	
	2. Ceiling finish: The ceiling shall be installed for all the Dry labs.	
	• Mega Lab	
	No ceiling, No floor finish no partition/wall to be installed.	
3.	KNC	
_	i. Architecture	
	 NSI to review the stone types with UoT. 	UoT
	ii. <u>Structure</u>	001
	 Additional soil survey locations were discussed. NSI to send the locations 	NSI
	for each building to IITH	
	NOTE: NSI shared information with IITH.	
	iii. <u>HVAC, Plumbing, and Electrical</u>	
	 Mainly the under floor air distribution system shall be applied for the stepped open shelf hall along with wall/ceiling mounted air conditioning system. 	
	• Fire fighting system for archive room was discussed. Considering the pros and cons for three systems, FM200, Water mist, and Double interlock pre action, IITH chose the water mist system. NSI to update the system.	NSI
	NOTE: NSI revised the drawing on Sept 12, 2014.	1151
	• The internal electrical load will be higher than conventional libraries. NSI to make sure consider the future electrical load.	NSI
4.	Other	
	• <u>Budget</u> IITH to send the total budget detail information of RCC and KNC for NSI's cost estimation review.	ІІТН
	• <u>Sustainability Report</u> Sustainability analysis shall include such as material analysis, heat simulation, sun analysis, and lighting condition based on the GRIHA's	NSI
	 criteria. NSI to submit the report. <u>The DD submission date</u> It shall be on Oct 8th, 2014 Wednesday at 14:00. JICA India (Mr. Sanjeev, 	
	Mr. Yasumoto) will join it. NSI to check with JICA who to attend.	IITH/NSI/JICA

MEETING MINUTES

DATE: Oct. 08. 2014

PLACE: IITH NEW CAMPUS SITE OFFICE

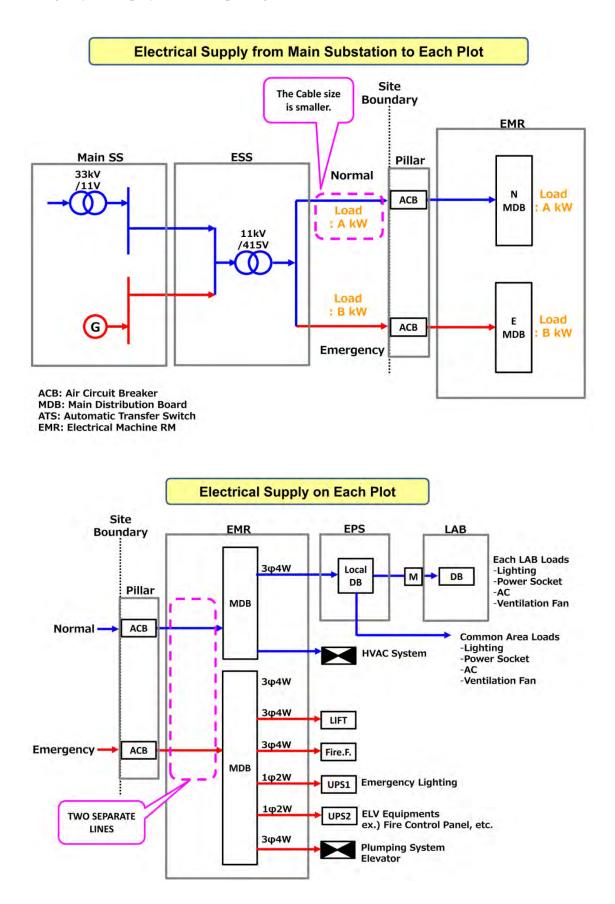
SUBJECT: IITH PHASE III DD

PROJECT: IITH Campus Development Project

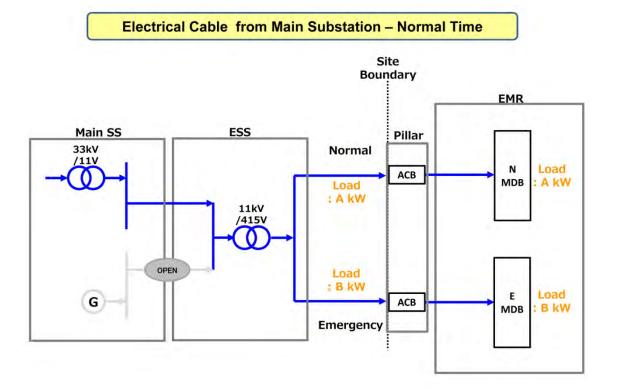
ATTENDEES				
Names	Affiliation			
Mr. Sanjeev Moholkar	JICA India			
Prof. Subramaniam, Mr.Babu	IITH			
Y. Tobe(PM), T.Endo(A), M.Oshima(A), H.Nakashima(Cost), K.Htoo(A)	Nihon Sekkei (NSI)			

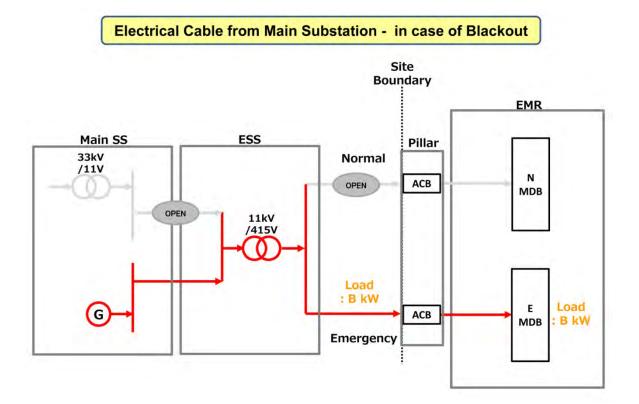
NO.	TOPIC	ACTION
1.	Phase 3, KNC and RCC 100% DD Drawings Submission	
	NSI submitted hard and soft copies of KNC and RCC 100% Design	
	Development drawing set as well as GRIHA report to IITH.	
2.	МЕР	
	NSI reported MEP related information to IITH and the topics are as followed;	
	<u>Electrical Capacity</u>	
	1) The electrical demand by ARCOP estimated significantly lower than	
	the required demands of each facility. It needs to be noted and coordinated	
	with ARCOP during tender stage. NSI to submit the finalized electrical	NSI
	load information to IITH.	1101
	 The electrical capacity of the FF System seems to be quite high. NSI to review the capacity. 	NSI
	Emergency Backup System	
	NSI confirmed with ARCOP regarding the emergency backup system	
	concept. There will be two lines.	
	<u>KNC future Electrical Demand</u>	IITH
	At this point IITH has not figured out its demand. IITH shall coordinate the	
	expected future electrical demands during tendering stage.	
3.	Soil Survey	
	NSI reminded to take action on the requested additional soil surveys before the	
	CD stage starts. IITH has preceded the process of the additional soil survey with	
	ARCOP.	
4.	Cost Estimation	
	NSI submitted the cost estimation report of KNC and RCC to IITH.	
5.	Project Schedule	
	The construction is scheduled in Jan, 2016 for 30 months.	

Emergency Backup System Concept Diagram



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APPENDIX C GRIHA CHECK LIST

	GRIHA self-evaluation to	ool			
	ability checks have been provided for various criterions in the table, to check for co ⁷ in the Applicability checks, the conditions specified are false for the given project,		-		on non-
Criterion	Appraisal	Maximum Points	Points being attempted *	Remarks -RCC	Remarks -KNC
			*Points will be	evaluated by GRIHA con.	sultant appointed by II
Criterion 1	Site Selection				
	The site plan must be in conformity with the development plan/master plan/UDPFI guidelines (mandatory). This should comply with the provisions of eco-sensitive zone regulations, coastal zone regulations, heritage areas (identified in the master plan or issued separately as specific guidelines), water body zones (in such zones, no construction is permitted in the water-spread and buffer belt of 30 meter minimum around the FTL), various hazard prone area regulations, and others if the site falls under any such area (mandatory with no point allocation).	0		clients scope	clients scope
	The site should be located within ½ km radius of an existing bus stop, commuter rail, light rail or metro station and/or the proposed site must be a Brownfield site (to rehabilitate damaged sites where development is hindered by environmental contamination, thereby reducing pressure on undeveloped land)	1		clients scope	clients scope
		1			
Criterion 2	Preserve and protect landscape during construction/compensatory depository forestation.				
	Applicability Check 1 There are existing several mature trees on site that can be preserved	yes			
	Construction has been planned in a way that excavation/basement work, up to plinth level is not coinciding with rainy season and the site disruption is restricted to pre-designated areas	1		contractors scope	general contractors scop in- applicable in construction stage

	Proper staging, spill prevention plan , sedimentation and erosion control systems in place.	1	general general contractors scope contractors scope in- applicable in in- applicable in construction construction stage stage
	Trees are preserved and protected properly Note: Applicable if answer is yes in Applicability Check 1 above	1	
	Compensatory forestation is applied on site Note: Applicable if answer is yes in Applicability Check 1 above	1	masterplanners masterplanners scope scope
		4	
Criterion 3	Soil conservation (post construction)		
	Applicability Check 2 Top soil quality meets the quality standard of top preservation criteria as per criteria 3	yes	
	Top soil is fertile and properly laid for vegetative growth Note: Applicable if answer is yes in Applicability Check 2 above	1	general general contractors scope contractors scope in- applicable in in- applicable in construction construction stage stage
	Measures taken for proper stabilization so soil Note: Applicable if answer is yes in Applicability Check 2 above	1	generalgeneralcontractors scopecontractors scopein- applicable inin- applicable inconstructionconstructionstagestage
		2	

Criterion 4	Design to include existing site features			
	Building and site planning to minimize the disruption of natural ecosystems and to maximize benefits from prevailing micro-climate	4	can attempt for these points as the micro climate is not disterbed	can attempt for these points as the micro climate is not disterbed
		4		
Criterion 5	Reduce hard paving on site			
	Net Paved area on site under parking, roads etc. to exceed 25% of the site area (minus the building footprint) or the net imperviousness factor of the site should not exceed the net imperviousness factors prescribed in the NBC 2005, whichever is more stringent.	1	achieved	achieved
	Total surface parking not to exceed as permitted by the local building by-laws	0		
	More than 50% of the total paved area to have pervious paving or open grid pavements or grass pavers or shading through the use of vegetated pergolas or covered with coating of SRI>0.5 OR More than 50% of the total paved area to have a combination of the above.	1	more than 50% pervious cover planned	more than 50% pervious cover planned
		2		
Criterion 6	Enhance outdoor lighting system efficiency			
	Luminous efficacy of 100% of lamps used in outdoor lighting to meet the corresponding lamp luminous efficacy as mentioned in Table 6.1, as per GRIHA	1	planned as per GRIHA guideline	planned as per GRIHA guideline
	Automatic controls to be installed for 100% of outdoor lights	0		
	Ť	1		

Criterion 7	Plan utilities efficiently and optimize on-site circulation efficiency			
	Various transportation and service corridors shall be minimized and consolidated and the pedestrian walkways to be shaded.	1	single building	single buildng
	Aggregate utility corridors shall be used	1		
	Utility corridors shall be consolidated along the previously disturbed areas or along new roads in order to minimize unnecessary cutting and trenching and ensure easy maintenance	1	masterplanners scope	masterplanners scope
		3		
Criterion 8	Provide minimum level of sanitation/safety facilities for construction			
	Ensure compliance with the NBC (2005) safety norms for providing the necessary safety equipment and measures for construction workers	1	general contractors scope in- applicable in construction stage	general contractors scope in- applicable in construction stage
	Provisions for drinking water, healthy and clean living conditions and sanitation facilities shall be provided for the workers	1	general contractors scope in- applicable in construction stage	general contractors scope in- applicable in construction stage
		2		
Criterion 9	Reduce air pollution during construction			
	Necessary measures to be taken on site to reduce air pollution for example providing site barricading to a height of 3 m on the site perimeter, carry out wheel washing of vehicles entering/exiting the site, sprinkle water on roads with loose dust etc.	2	general contractors scope in- applicable in construction stage	general contractors scope in- applicable in construction stage
		2		

Criterion 10	Reduce landscape water demand			
	If landscape water demand is reduced by up to 30%	1	landscape designers scope	landscape designers scope
	If landscape water demand is reduced by up to 40%	2	landscape designers scope	landscape designers scope
	If landscape water demand is reduced by up to 50%	3	landscape designers scope	landscape designers scope
		3	landscape designers scope	landscape designers scope
Criterion 11	Reduce building water use			
	Non Applicability condition: All faucets, which are installed in spaces with water head heights less than 15 feet (4.6 m), in a gravity fed systems, can be exempt for calculations in Criterion 11.			
	If building water demand is reduced by up to 25%	1	attempted for 25% reduction. Domestic & flushing duel plumbing sys for water supply. Low flow fixtures, Low flow fixtures used	attempted for 25% reduction. Domestic & flushing duel plumbing sys for water supply. Low flow fixtures, Low flow fixtures used
	If building water demand is reduced by up to 50%	1	not achieved	not achieved
		2		

Criterion 12	Efficient water use during construction			
	Efforts to be taken to reduce the use of potable water during construction for example use waste jute bags to cover columns and beams during curing, add admixtures to concrete which cause a reduction in the water required for curing etc.	1	general contractors scope in- applicable in construction stage	general contractors scope in- applicable in construction stage
		1		
Criterion 13	Optimize building design to reduce conventional energy demand			
	The WWR and/or SSR shall be limited to the prescribed levels as per Table13.1 (GRIHA Manual Introduction Volume-I) and all fenestration shall meet either the SHGC requirements of ECBC 2007OR shading requirements as suggested in 13.1.4 OR 13.1.5, as per clause 13.2.3 to 13.2.5	2	refer to drawing IITH_RCC?KNC_A 1_GRIHA_criteria N13	
	Minimum 25% of the living area shall be daylighted and shall meet the level of daylight prescribed in NBC 2005 (reference Table 13.2 GRIHA Manual Introduction Volume-I)	2	Majority of spaces being labs , and can be excluded, other areas can fulfill the criterion	Majority of spaces being Library / book schelves , and can be excluded, other areas can fulfill the criterion
	If the total daylighted area>50% of the total living area and meets the prescribed level of daylight	1	Not achieved	Not achieved
	If the total daylighted area>75% of the total living area and meets the prescribed level of daylight	1		
	Over-design of artificial lighting system shall be avoided and the lighting levels in indoor spaces shall be maintained as recommended in NBC 2005.	2	designed as per NBC 2005	designed as per NBC 2006
		8		

Criterion 14	Optimize energy performance of building within specified comfort limits			
	All mandatory compliance measures (for all applicable buildings) as recommended in the Energy Conservation Building Code 2007 of BEE shall be complied with.	6	the HVAC (distribution side	the HVAC (distribution side)system is designed as per ECBC 2007, however the chilled water generation and equipments and efficiancy to be compared along with master planners for a . cumulative result.
	The thermal comfort conditions and at least 10% reduction from the benchmark EPI, specified in GRIHA, shall be met.	2	· ·	
	If the reduction in energy consumption is \geq 20% of the benchmarked figure and the thermal comfort criteria are fully met	2	however the chilled water	
	If the reduction in energy consumption is \geq 30% of the benchmarked figure and the thermal comfort criteria are fully met	4	equipments and efficiancy to be	
	If the reduction in energy consumption is \geq 40% of the benchmarked figure and the thermal comfort criteria are fully met	6	compared along with master planners for a	
	If the reduction in energy consumption is \geq 50% of the benchmarked figure and the thermal comfort criteria are fully met	8	cumulative result.	
		16		
Criterion 15	Utilization of fly-ash or equivalent industrial/agricultural waste as recommended by BIS in building structures			
	Replace 15-25 % of OPC by weight with fly-ash or equivalent industrial/agricultural waste as recommended by BIS in structural concrete	1	can be achieved	can be achieved
	Replace more than 25% of OPC by weight with fly-ash or equivalent industrial/agricultural waste as recommended by BIS in structural concrete	1	can be achieved	can be achieved
	100% of the building blocks shall have at least 40% fly ash or equivalent industrial/agricultural waste as recommended by BIS (by volume)	2	can be achieved	can be achieved

	Replace 15-25 % of OPC by weight with fly-ash or equivalent industrial/agricultural waste as recommended by BIS in masonry and plaster mortar	1		
	Replace more than 25% of OPC by weight with fly-ash or equivalent industrial/agricultural waste as recommended by BIS in masonry and plaster mortar	1		
		6	4-5 points could be attempted.	4-5 points could be attempted.
Criterion 16	Reduce embodied energy of construction is reduced by adopting material efficient technologies and/or low-energy materials			
	The embodied energy of the structural systems of the building shall be reduced by at least 2.5% for 100% of the structural system in the building.	1	TERI to calcuate as per after scrutinizing the BOQ	TERI to calcuate as per after scrutinizing the BOQ
	The embodied energy of the structural systems of the building shall be reduced by at least 5% for 100% of the structural system in the building.	2	TERI to calcuate as per after scrutinizing the BOQ	TERI to calcuate as per after scrutinizing the BOQ
	The embodied energy of the non-structural systems of the building shall be reduced by at least 5% for 100% of the structural system in the building block work.	1	TERI to calcuate as per after scrutinizing the BOQ	TERI to calcuate as per after scrutinizing the BOQ
	The embodied energy of the non-structural systems of the building shall be reduced by at least 10% for 100% of the structural system in the building block work.	2	TERI to calcuate as per after scrutinizing the BOQ	TERI to calcuate as per after scrutinizing the BOQ
		4		

Criterion 17	Use low-energy materials in Interiors			
	Minimum 70% of the total quantity of materials used for sub- assembly/internal partitions/paneling/false-ceiling/in-built furniture shall be low-energy materials	2	TERI to calculate as paer BOQ	TERI to calculate as paer BOQ
	Minimum 70% of the total quantity of materials used for flooring shall be low- energy materials	1	TERI to calculate as paer BOQ	TERI to calculate as paer BOQ
	Minimum 70% of the total quantity of materials used for door, windows and frames shall be low-energy materials	1	TERI to calculate as paer BOQ	TERI to calculate as paer BOQ
		4		refer to drawing IITH_RCC?KNC_A 1_GRIHA_criteria N18
Criterion 18	Renewable energy utilization			
	Non Madatory condition If more than 80% of total built-up area (FSI and non-FSI) falls under residential use, then the Appraisal 18.3.1(first appraisal clause - as mentioned below) is non-mandatory.			
	The minimum size of the renewable energy system, installed on site, should be equal to 1% of the total connected load for artificial lighting (internal and external) and space conditioning loads	2	Solar farms planned by Masterplanners for campus	Solar farms planned by Masterplanners for campus
	If the total energy generated by the renewable energy system is equivalent to 5% or more of the total annual energy consumption for artificial lighting	1	provision for solar panels on the roof	
	If the total energy generated by the renewable energy system is equivalent to 10% or more of the total annual energy consumption for artificial lighting	2		

	If the total energy generated by the renewable energy system is equivalent to 20% or more of the total annual energy consumption for artificial lighting	3		
	If the total energy generated by the renewable energy system is equivalent to 30% or more of the total annual energy consumption for artificial lighting	4		
	If the total energy generated by the On-site or Off-site, renewable energy system is equivalent to 100% or more of the total annual energy consumption for artificial lighting	2		
		8		
Criterion 19	Renewable energy based hot water system			
	Applicability Check 3 The total hot water requirement is more than 500 liters per day	NO	refer to drawing IITH_RCC?KNC_A 1_GRIHA_criteria N19	refer to drawing IITH_RCC?KNC_A 1_GRIHA_criteria N20
	If the renewable hot water system saves 20-50% of the annual energy required for hot water Note: Applicable if answer is yes in Applicability Check 3 above	0		
	If the renewable hot water system saves 50-70% of the annual energy required for hot water Note: Applicable if answer is yes in Applicability Check 3 above	0		
	If the renewable hot water system saves more than 70% of the annual energy required for hot water Note: Applicable if answer is yes in Applicability Check 3 above	0		
		0		

Criterion 20	Waste water treatment			
	Applicability Check 4 The total waste water generation on site is more than 10kL per day.	Yes	scope of Masterplanner	scope of Masterplanner
	The treated waste water shall meet the BIS recommended disposal standards, as per table 20.3, GRIHA Note: Applicable is answer is yes to Applicability Check 4 above	2		
		2		
Criterion 21	Water recycle and reuse (including rainwater)			
	Applicability Check 5 Ground water table is low and ground water recharge is advisable as per Central Ground Water Board norms.	yes	scope of Masterplanner	scope of Masterplanner
	If the project demonstrates 25% annual water reuse Note: Applicable is answer is yes to Applicability Check 4 above	1		
	If the project demonstrates 50% annual water reuse Note: Applicable is answer is yes to Applicability Check 4 above	2		
	If the project demonstrates 75% annual water reuse Note: Applicable is answer is yes to Applicability Check 4 above	3		
	The surplus rainwater is recharged in to the ground after necessary filtration Note: Applicable if answer is yes to Applicability Check 5	2		
		5		

Criterion 22	Reduction in waste during construction			
	Hazardous and inert waste shall be segregated during construction	1	general contractors scope in- applicable in construction stage	general contractors scope in- applicable in construction stage
	The segregated waste shall be recycled and/or safely disposed			
		1		
Criterion 23	Efficient Waste segregation			
	Multi-coloured bins shall be provided to segregate waste at source	1	clients/masterpla nners scope	clients/masterpla nners scope
		1		
Criterion 24	Storage and disposal of wastes			
	Separate space shall be allocated for collection of waste before transfer for recycling	1	clients/masterpla nners scope	clients/masterpla nners scope
		1		
Criterion 25	Resource recovery from waste			
	Applicability Check 6 Organic solid waste generation on site is more than 100 kg/day	yes		
	Appropriate measures to be taken for zero-waste generation from site Note: Applicable if answer is yes to Applicability Check 6	2	could be achievable at CD stage	could be achievable at CD stage
			Stuge	

Criterion 26	Use of low-VOC paints/adhesives/sealants			
	100% of all paints used in building interior shall be low/zero-VOC, as per Table 26.1, GRIHA Manual	1	could be achievable at CD stage	could be achievable at CD stage
	100% of all adhesives and sealants used shall be low/zero-VOC, as per Table 26.1, GRIHA	1		
	100% of all composite wood products shall not use urea-formaldehyde	1		
		3		
Criterion 27	Minimize ozone depleting substances			
	All insulation to be used in the building shall be CFC and HCFC free		achieved	achieved
	All HVAC and refrigeration equipment shall be CFC free	1		
	The fire-suppression systems and fire extinguishers shall be halon free			
		1		
Criterion 28	Ensure water quality			
	Water used for various purposes like drinking, irrigation etc. shall conform to the BIS standards (Table 28.3, GRIHA Manual)	2	clients/masterpla nners scope	clients/masterpla nners scope
		2		
Criterion 29	Acceptable outdoor and indoor noise levels			
	The measured outdoor noise levels on site conform to the standard set by the CPCB, Table 29.1, GRIHA	1	report can be prepared when the buildings are ocupied	report can be prepared when the buildings are ocupied
	The measured indoor noise levels inside the building meet the noise levels recommended by NBC 2005 (Table 29.2, GRIHA Manual)	1	achieved	achieved
		2		
Criterion 30	Tobacco and smoke control			
	Smoking is prohibited on site OR Necessary provisions shall be provided in the mechanical ventilation system by the HVAC consultant	1	IITH is a no- smoking campus	IITH is a no- smoking campus
		1		
Criterion 31	Provide at least the minimum level of accessibility for persons with			

			-		
	Buildings shall be designed in compliance with the NBC code in order to be disabled friendly	1		provisions made refer to drawing IITH_RCC?KNC_A 1_GRIHA_criteria N31	provisions made refer to drawing IITH_RCC?KNC_A 1_GRIHA_criteria N32
		1			
Criterion 32	Energy audit and validation				
	A mandatory energy audit shall be conducted by a BEE certified energy auditor	0		report can be prepared when the buildings are ocupied	report can be prepared when the buildings are ocupied
Criterion 33	Operation and Maintenance				
	Metering and sub-metering of energy as well as water will be carried out as per GRIHA clause	1		report can be prepared when the buildings are ocupied	report can be prepared when the buildings are ocupied
	An O & M protocol to be specified for operation and maintenance of the various systems in the building. Additionally,	1			
		2			
		97			
Criterion 34	Innovation Points			None	None
	Point for innovation				
	Point for innovation				
	Point for innovation				
	Point for innovation				
Total					
Score					
Percentile					

APPENDIX D IMPOSED LOAD DIAGRAM

APPENDIX D : Imposed Load Diagram

a) KNC

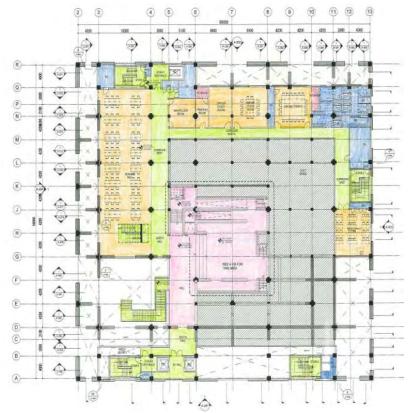
KIND OF ROOM	IMPOSED UNIFORM LOAD (N/m ²)	REMARKS			
OPEN SHELF	6,000	NBC			
ARCHIVE	9,600	NBC			
READING ROOM	4,000	NBC (with separate storage)			
GROUP STUDY ROOM	4,000	NBC			
MEDIALITERACY	4,000	NBC			
AUDIOVISUAL ROOM	5,000	NBC			
CAFETERIA	4,000	NBC			
ENTRANCE HALL	4,000	NBC			
ADMINISTRATION OFFICE	4,000	NBC			
CORRIDOR, STAIR 4,000		NBC			
WC	2,000	NBC			
KITCHEN	3,000	NBC			
STORAGE	5,000 NBC				
MECHANICAL ROOM	10,000 NBC				
ROOF	750 1,500	NBC (inaccessible,as to 0°≦Gradient≦10°			

Floor Imposed Load of Floor (N/m²)

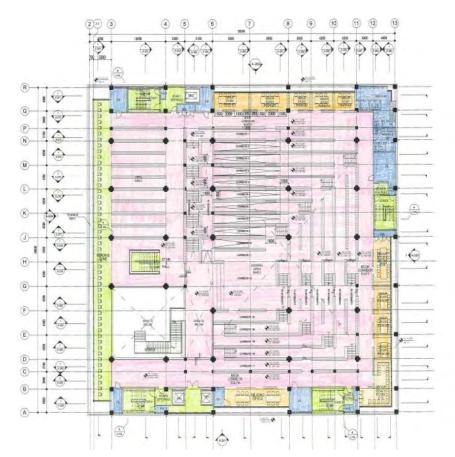
i. GROUND FLOOR LEVEL

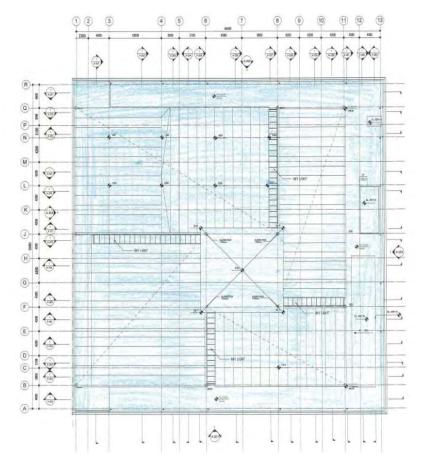


ii. 1ST FLOOR LEVEL

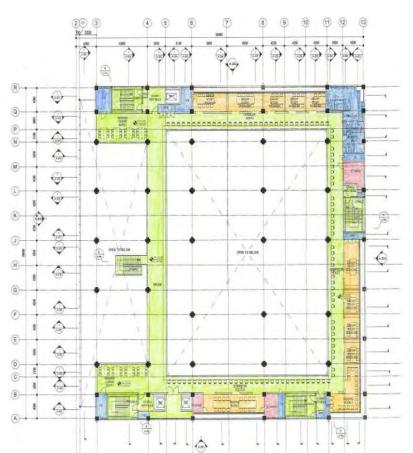


iii) 2nd FLOOR LEVEL





v) ROOF LEVEL

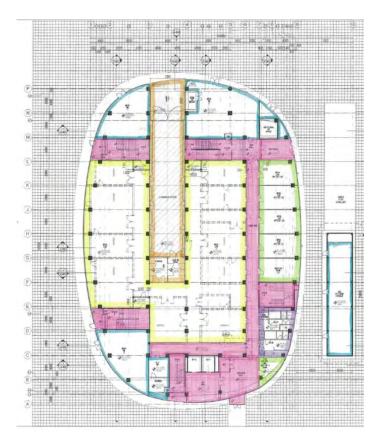


iv) 3rd FLOOR LEVEL

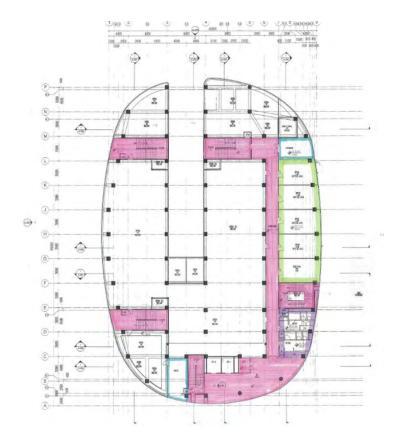
ii) RCC

	Imposed loa	d for rooms			
Kind of room		Imposed uniform load (N/m ¹)	Remarks		
RESEARCH CENTER COMPLEX	MEGA LAB	15,000	Shall be determined by concernin		
	WET LAB	10,000	machine weight, floor finishing		
	DRY LAB	7,000	such as raise floor system and future possible usage changes.		
	SLOPE TO RECEIVING DOCK	7,500	Concerning trucks and cargo weight		
	OFFICE, LOUNGE	4,000	NBC		
	MEETING ROOM	4,000	NBC		
	CORRIDOR, STAIRCASE	4,000	NBC		
	BALCONY	4,000	NBC		
	FLAT ROOF (accessible)	1,500	NBC (0°≦Gradient≦10°)		

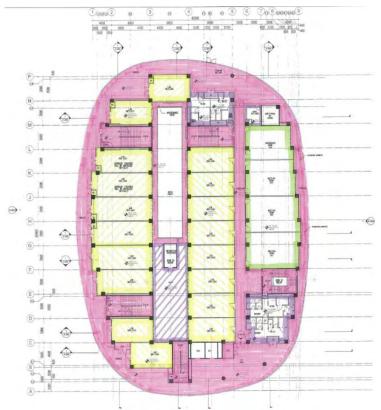
i) GROUND FLOOR LEVEL

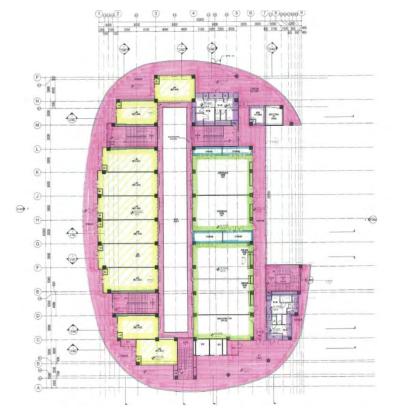


ii) 1st FLOOR LEVEL

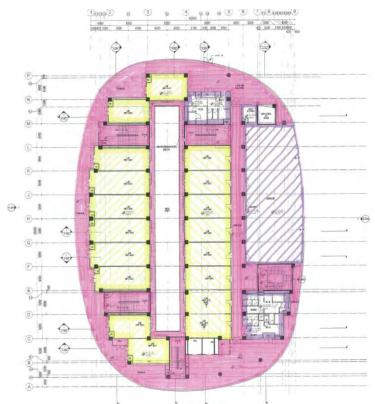


iii) 2nd FLOOR LEVEL





v) 4th FLOOR LEVEL



iv) 3rd FLOOR LEVEL

<u>APPENDIX E</u>

KNC & RCC DRAWINGS

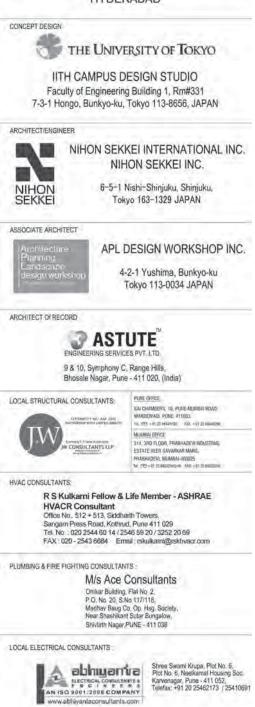


KNOWLEDGE CENTRE AT INDIAN INSTITUTE OF TECHNOLOGY HYDERABAD

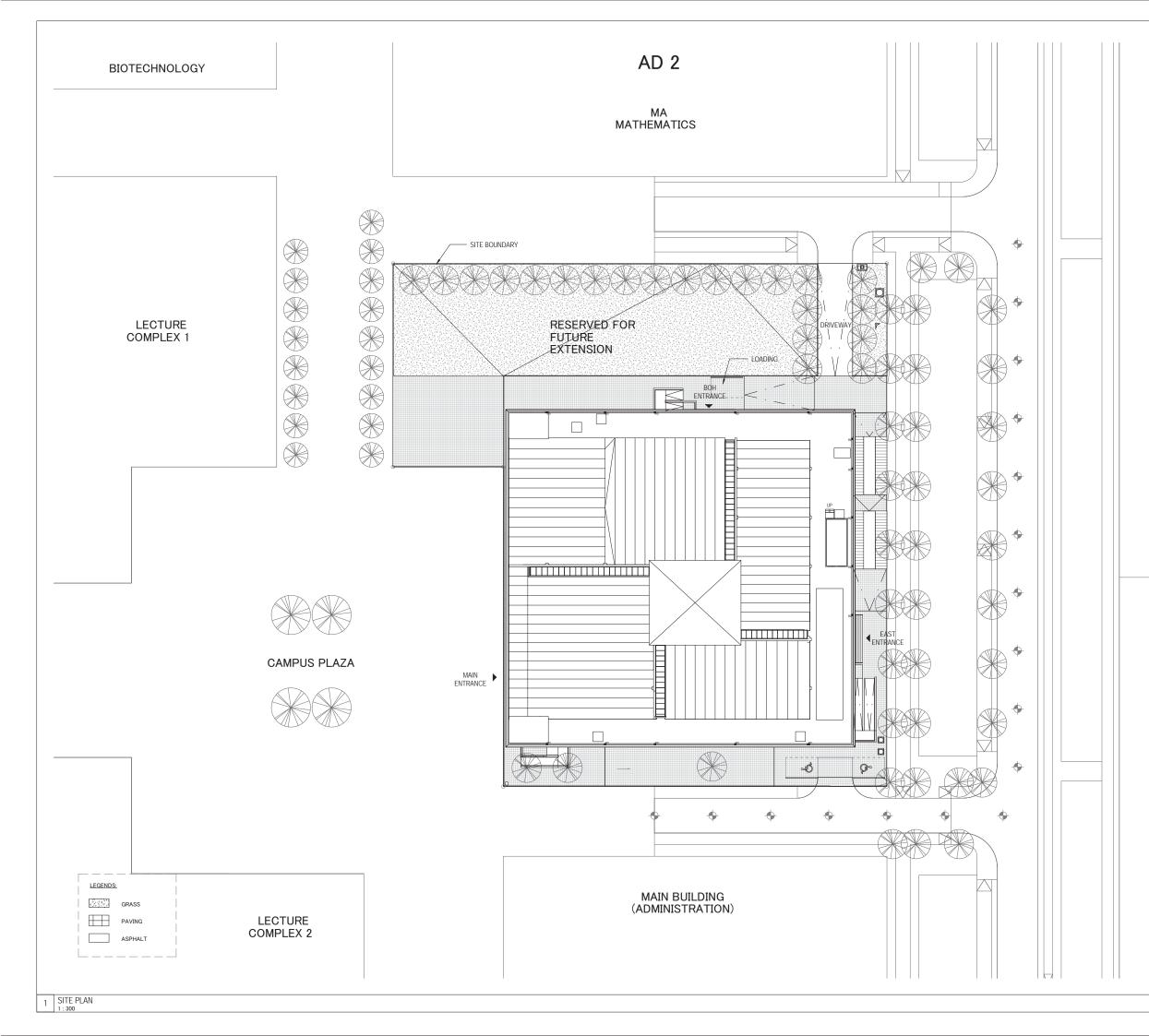
ARCHITECTURE



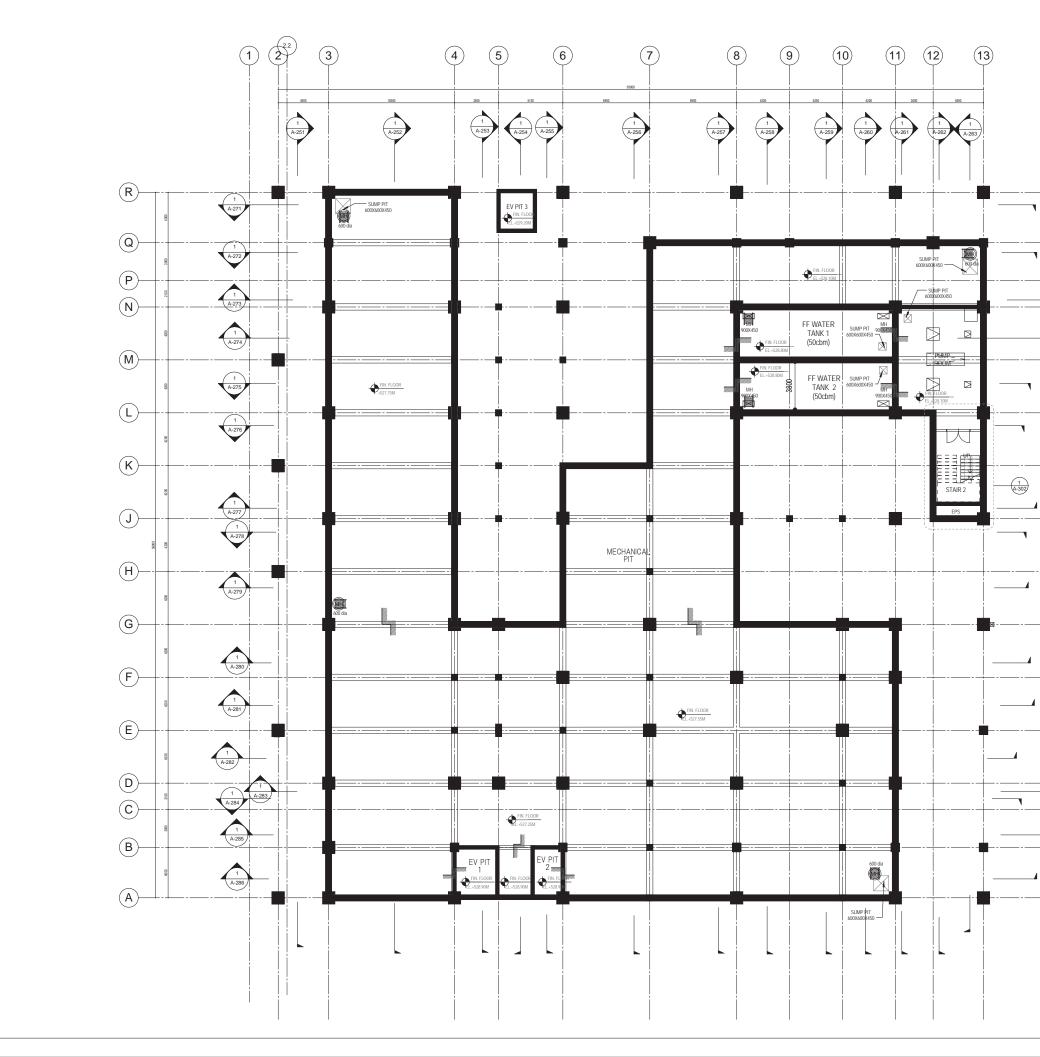
INDIAN INSTITUTE OF TECHNOLOGY HYDERABAD



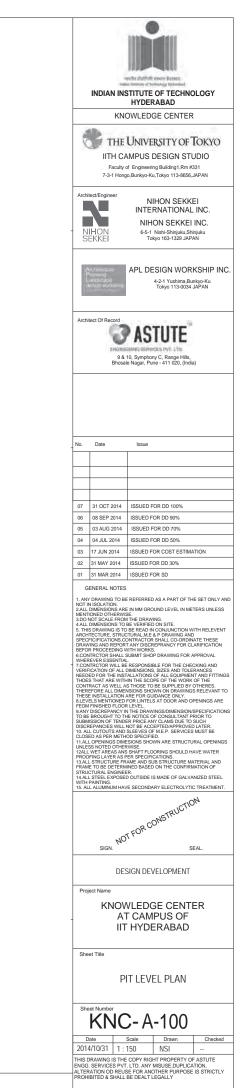
ISSUED FOR DESIGN DEVELOPMENT 100% OCTOBER 31ST, 2014

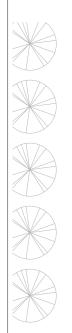


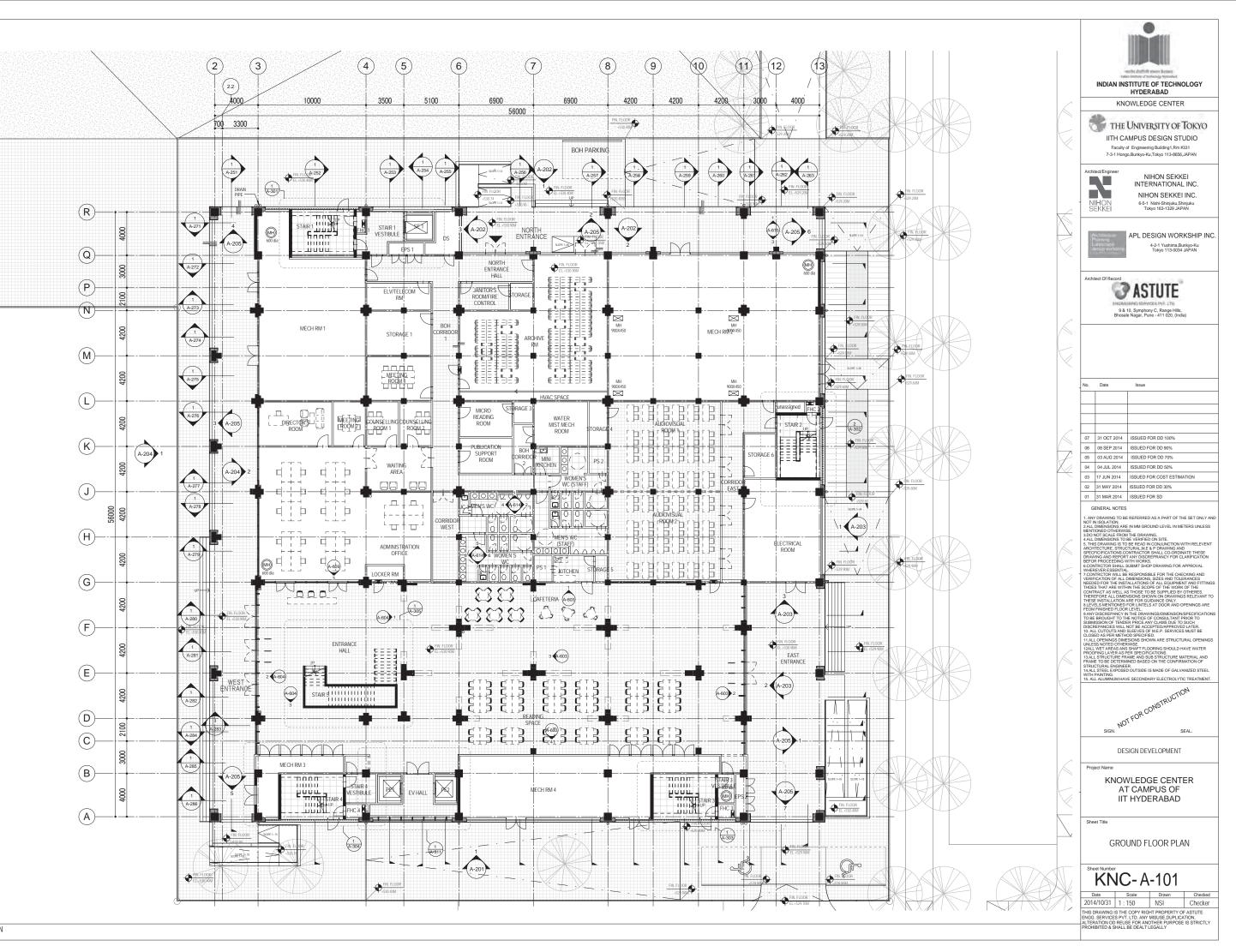
		INDIAN INS	STITUTE OF TECHNOLOGY HYDERABAD DWLEDGE CENTER			
	IITH CAMPUS DESIGN STUDIO Faculty of Engineering Building1,Rm #331 7-34 Honore Burkurykur Tokun 113,8656, IAPAN					
	7:3-1 Hongo,Bunkyo-Ku,Tokyo 113-8656,JAPAN Architect/Engineer NIHON SEKKEI INTERNATIONAL INC. NIHON SEKKEI INC. 6:5-1. Niah-Shinjuku Tokyo 163-1329 JAPAN					
	Contraction of the second	Victationtano Transmin unictanapol testan workstrap	APL DESIGN WORKSHIP INC. 4-2-1 Yushima, Bunkyo-Ku Tokyo 113-0034 JAPAN			
	Arch	itect Of Record				
PGH 1+2	9 & 10, Symphony C, Range Hills, Bhosale Nagar, Pune - 411 020, (India)					
	No.	Date	Issue			
	-					
	07	31 OCT 2014 08 SEP 2014	ISSUED FOR DD 100% ISSUED FOR DD 90%			
	05	03 AUG 2014	ISSUED FOR DD 90%			
	04	04 JUL 2014	ISSUED FOR DD 50%			
	03	17 JUN 2014	ISSUED FOR COST ESTIMATION			
	02	31 MAY 2014 31 MAR 2014	ISSUED FOR DD 30%			
	NOT TI 2.ALLL MENTN 3.DO 4.ALLL BRAIC BEFCC VERIES 6.COIO 6.COIO 8.COIO 8.COIO VERIES THOE CONT THEE THOE CONT THEE SUBB SUBB SUBB SUBB SUBB SUBB SUBB SU	IN ISOLATION. IN	THE DRAWNO. SE VERFIED ON STEL SE VERFIEL ON STEL SE VERFIEL ON STEL SE VERFIEL SE VERFIEL SE VERFIEL SE VERFIEL SE VERFIEL SE VERFIEL SE VERFIEL SE VERFIEL ST POSE DE SUPPLED BY OTHERE ST POSE DE S			
		SIGN.	SEAL.			
	DESIGN DEVELOPMENT					
	Project Name KNOWLEDGE CENTER AT CAMPUS OF IIT HYDERABAD					
PGH 3+4		et Title	SITE PLAN			
	Sheet Number KNC-A-051 Date Scale Drawn Checked 2014/10/31 As indicated NSI This DRAWING is THE COPY RIGHT PROPERTY OF ASTUTE					
	ENGG ALTER	. SERVICES PVT RATION OD REUS	LTD. ANY MISUSE, DUPLICATION, SE FOR ANOTHER PURPOSE IS STRICTLY BE DEALT LEGALLY			

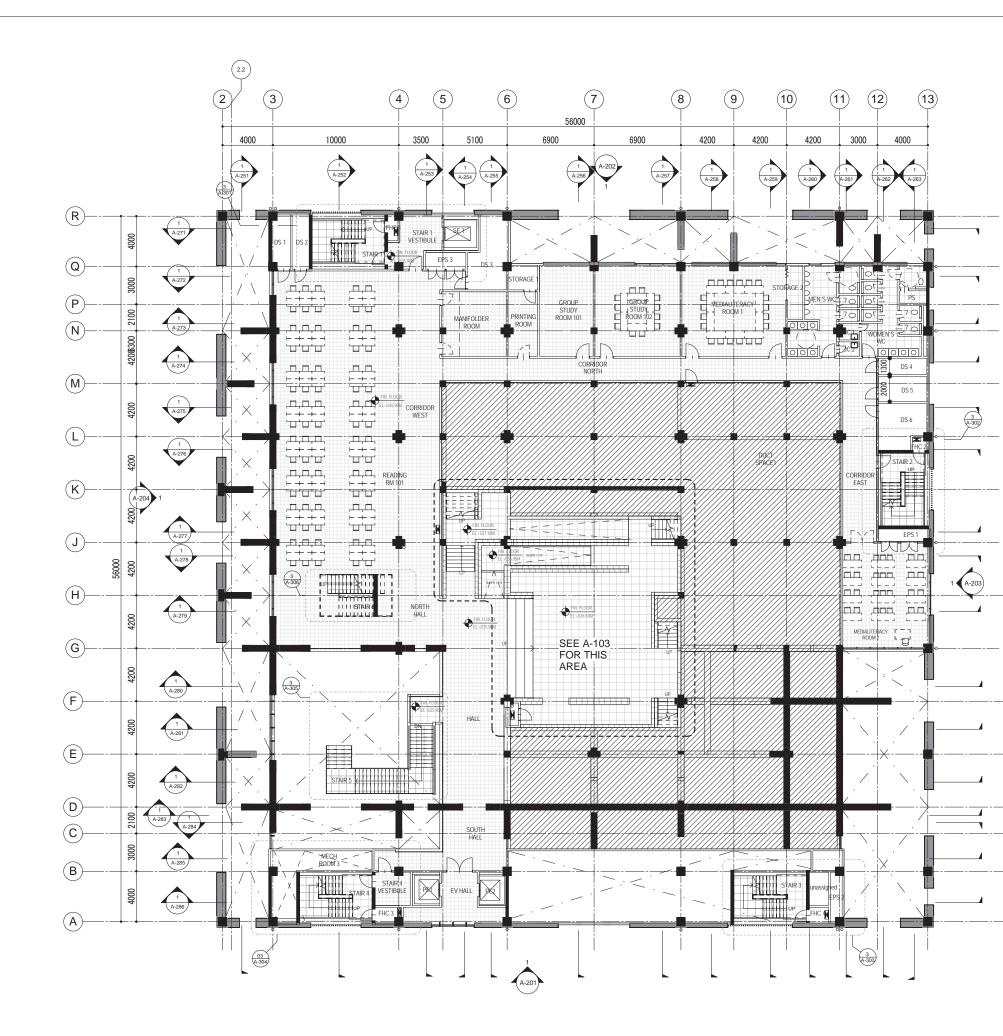


1 PIT LEVEL PLAN 1 : 150

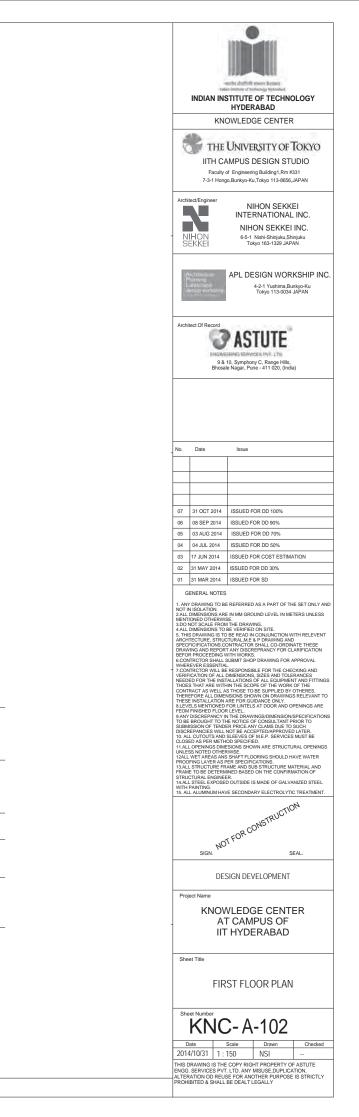


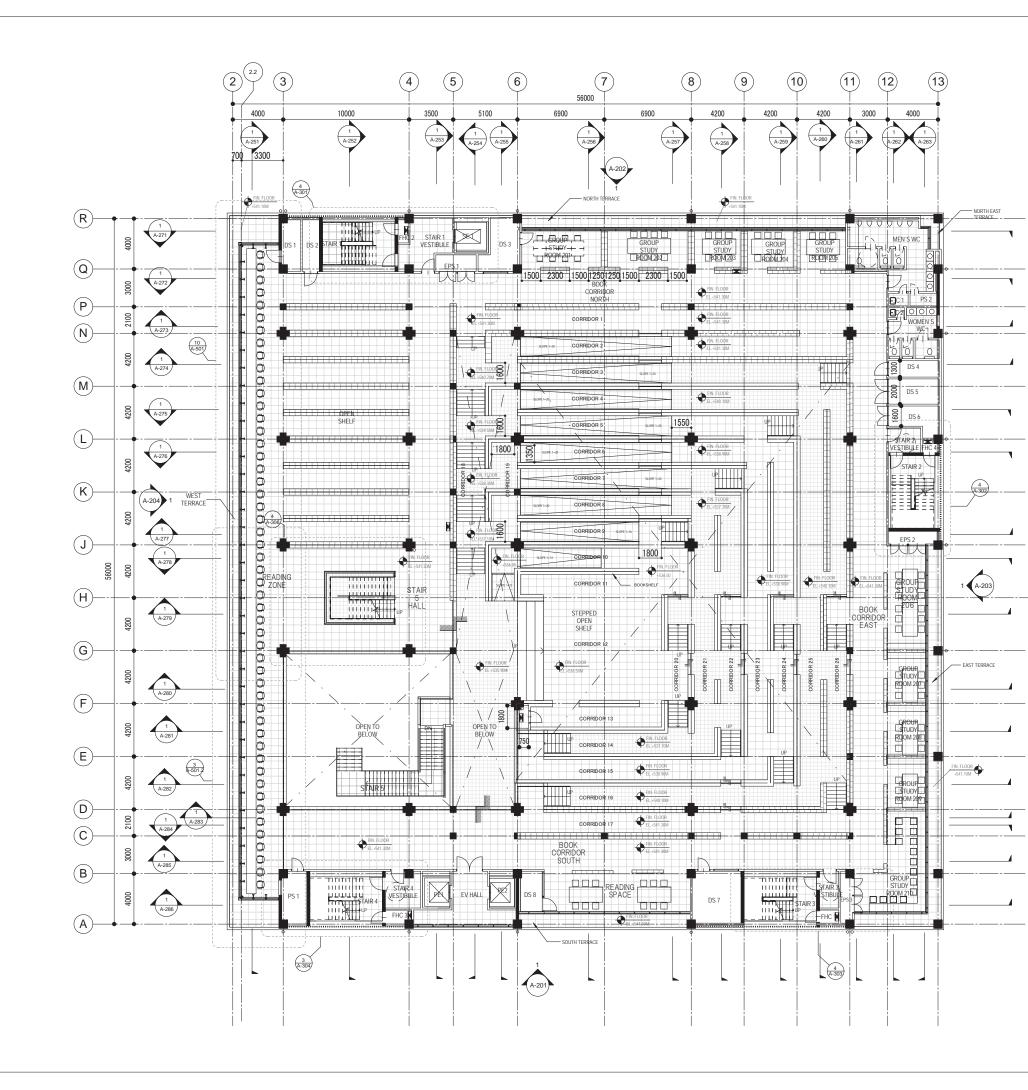




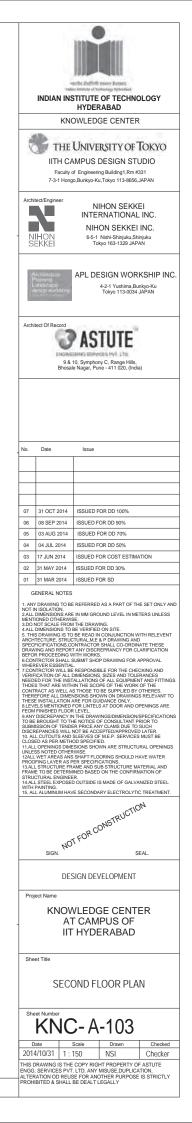


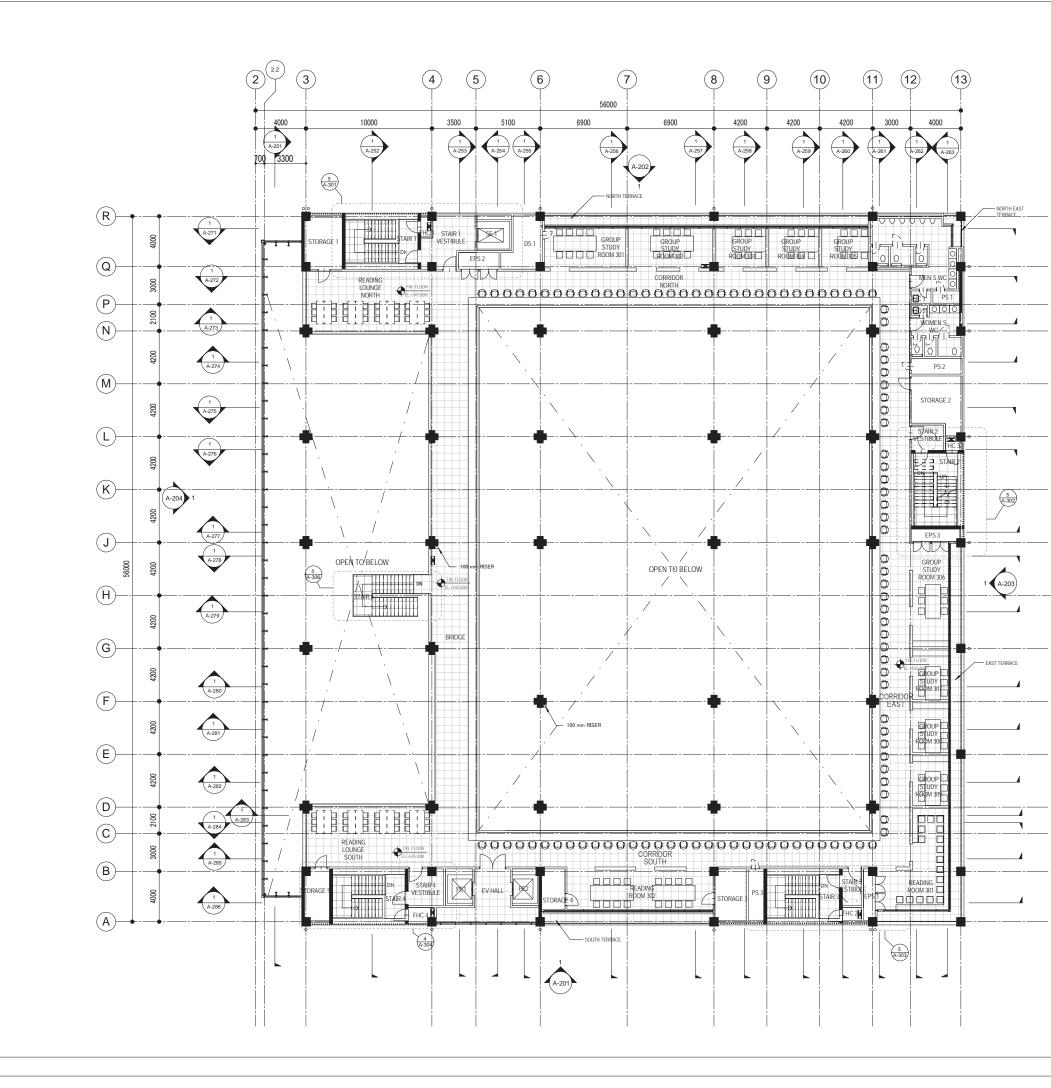
1 FIRST FLOOR PLAN 1:150



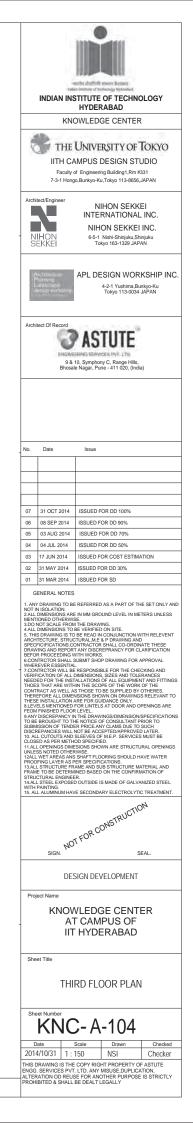


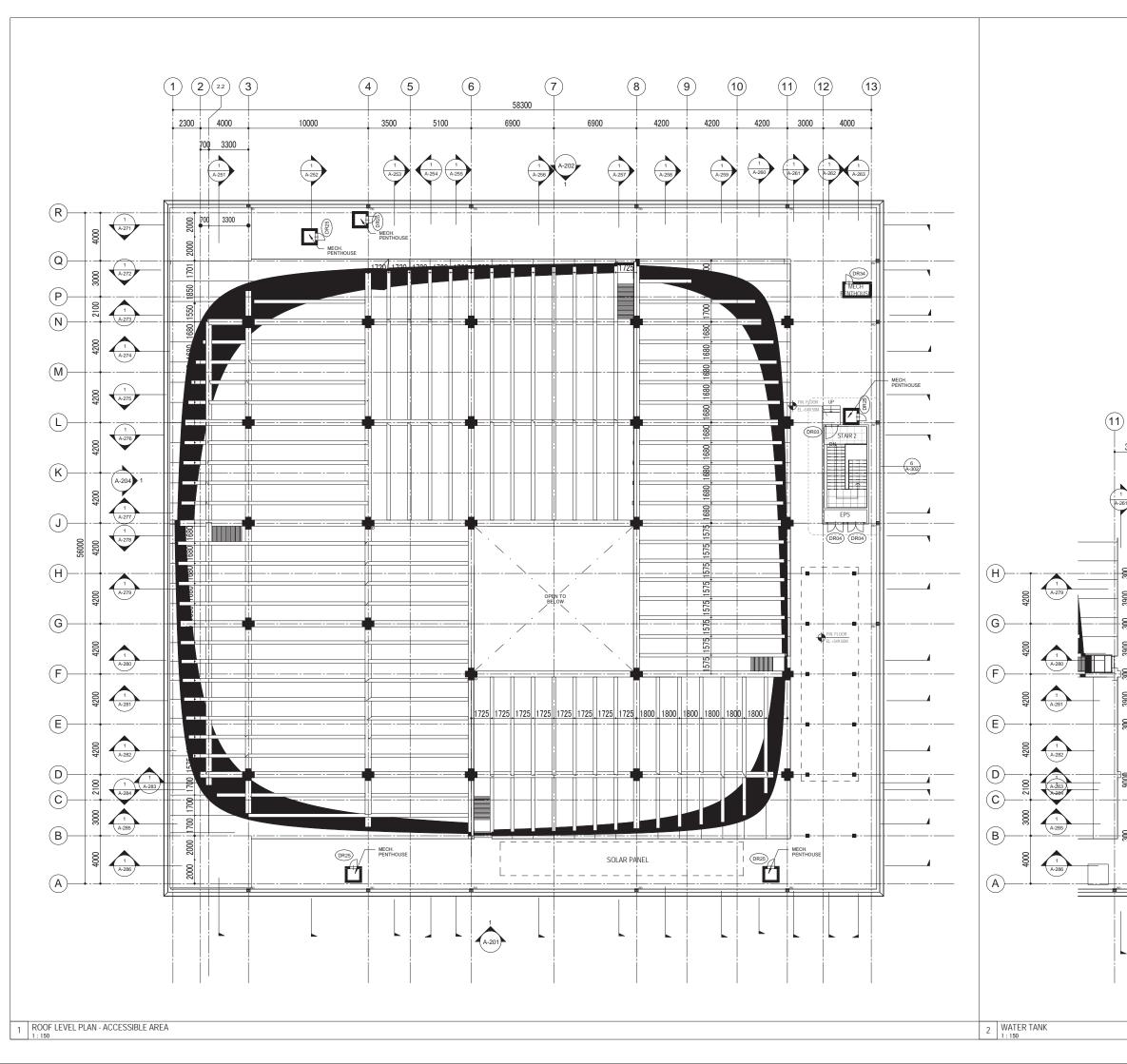
1 SECOND FLOOR PLAN 1 : 150

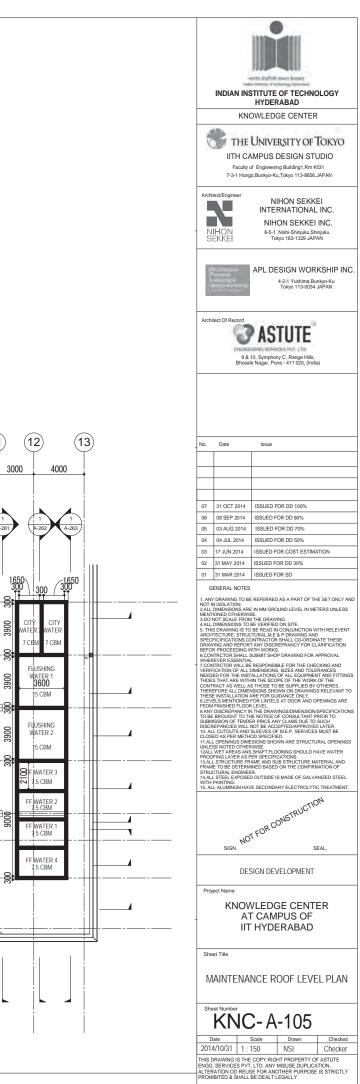


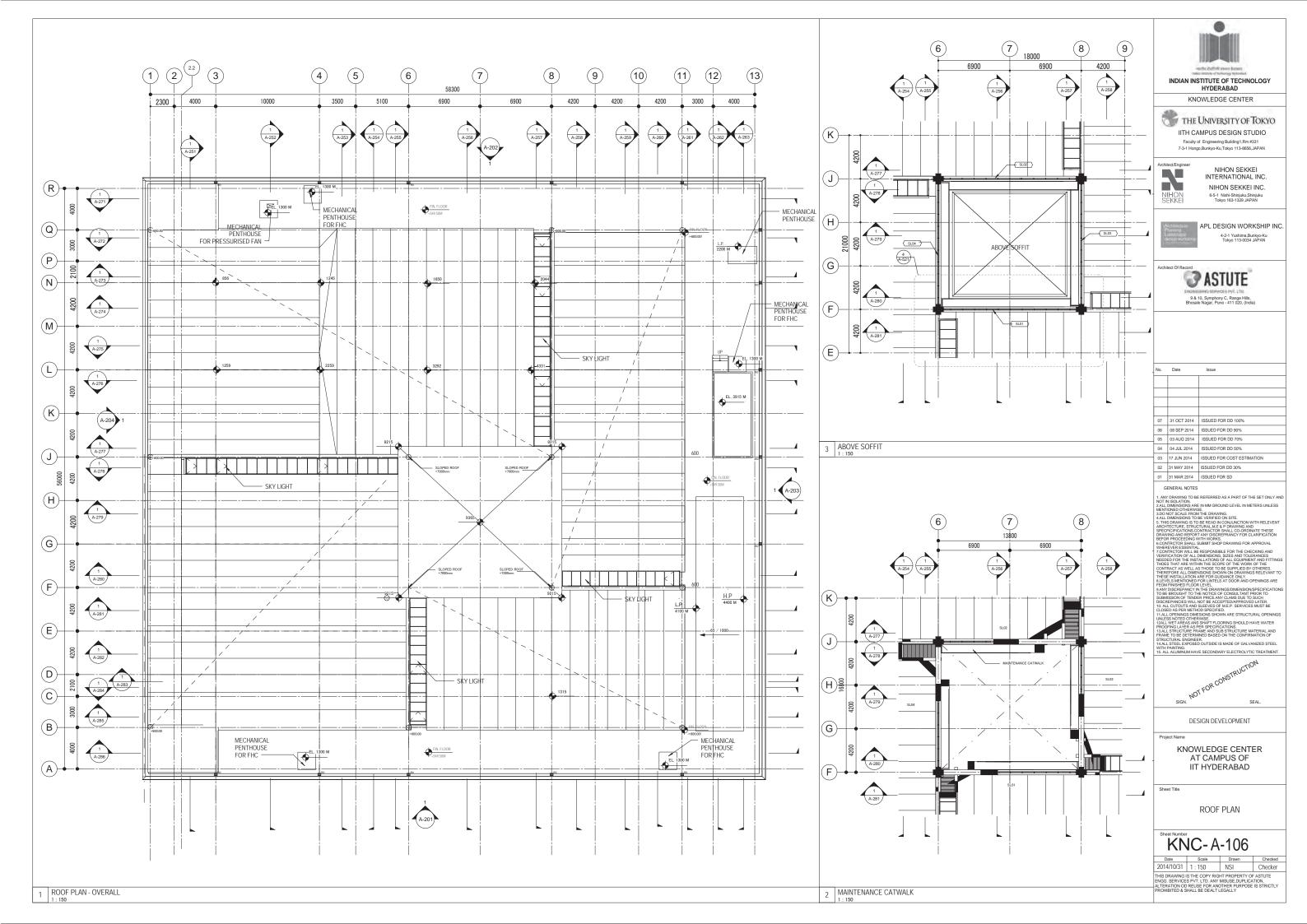


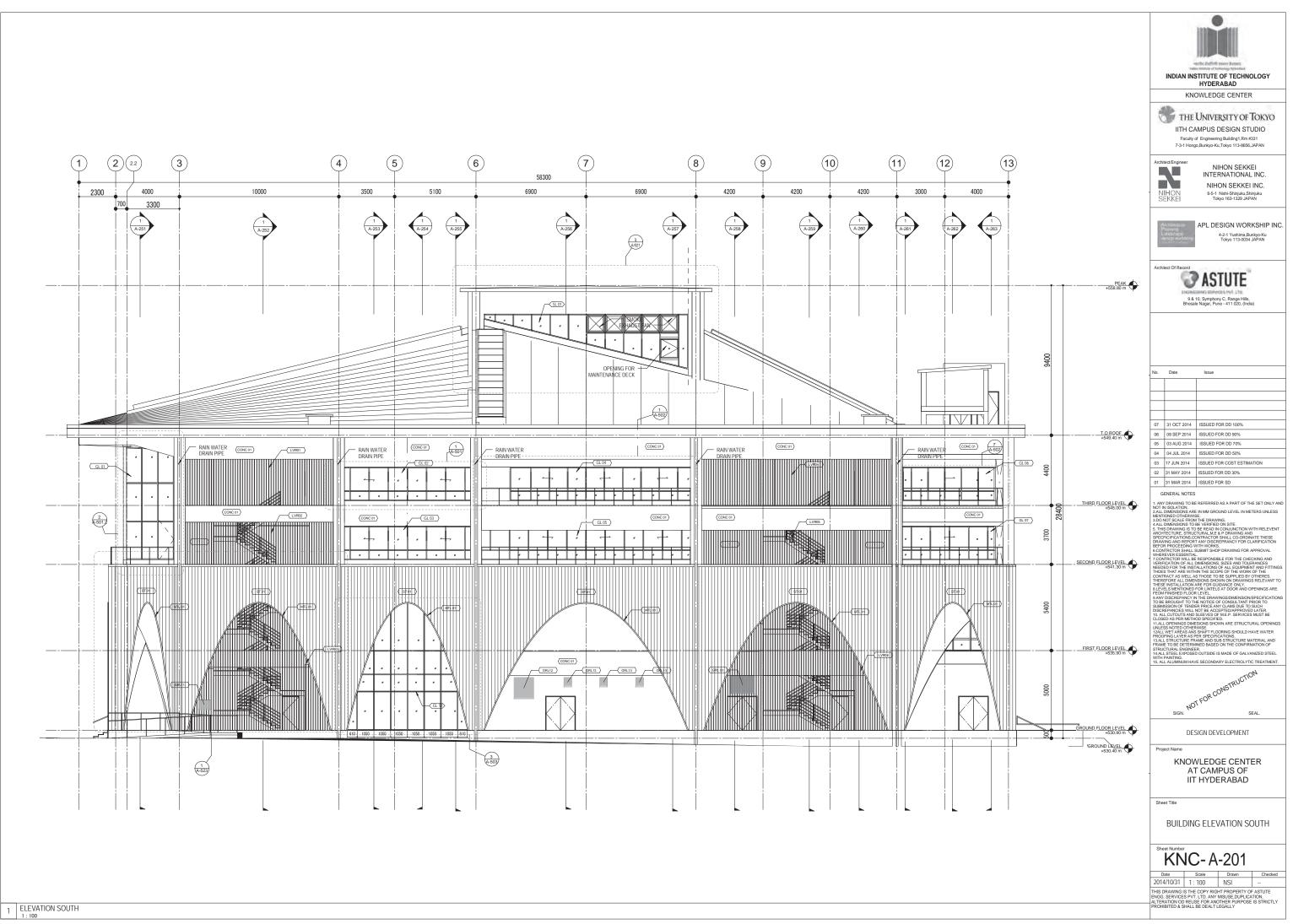
1 THIRD FLOOR PLAN 1 : 150

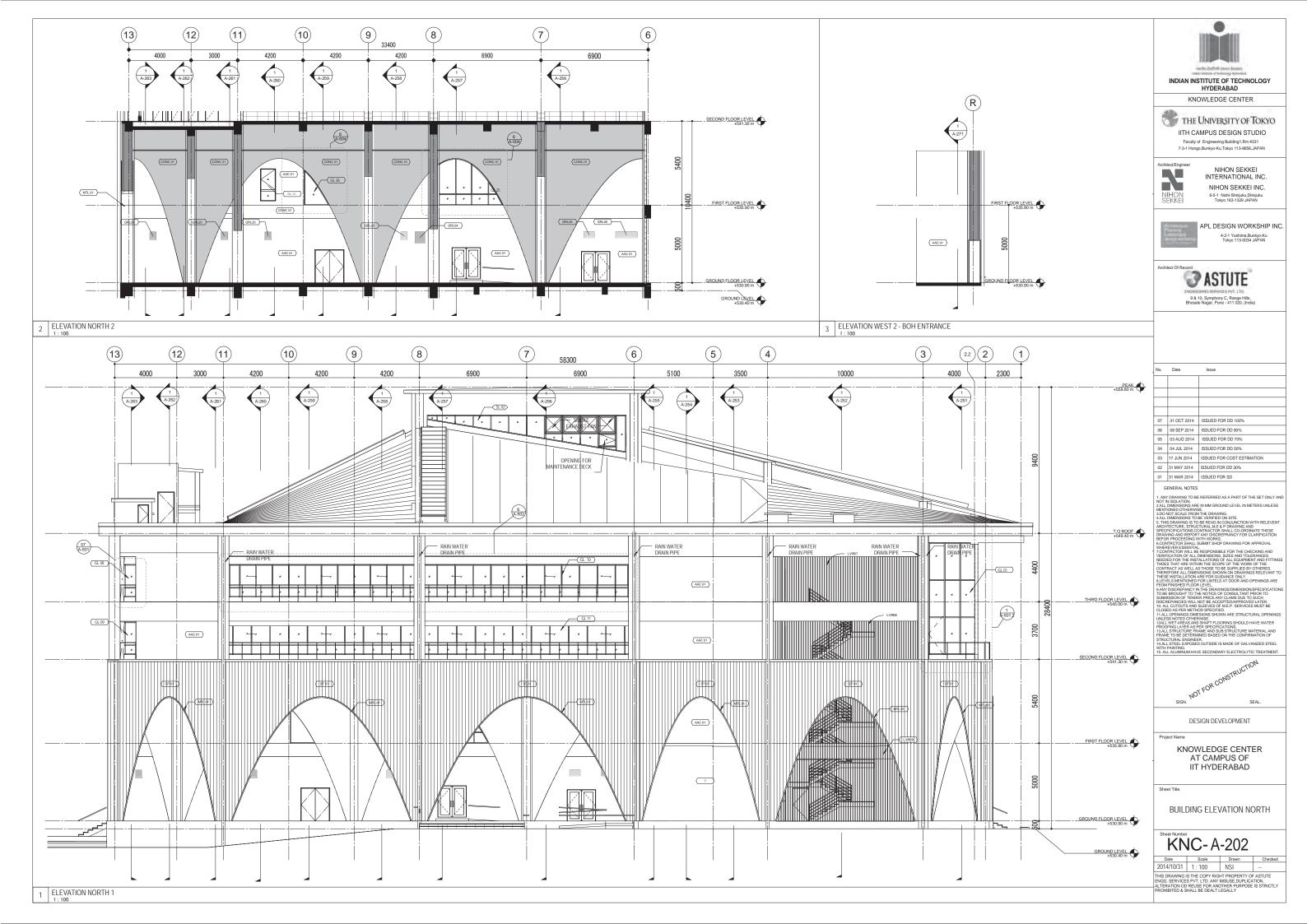


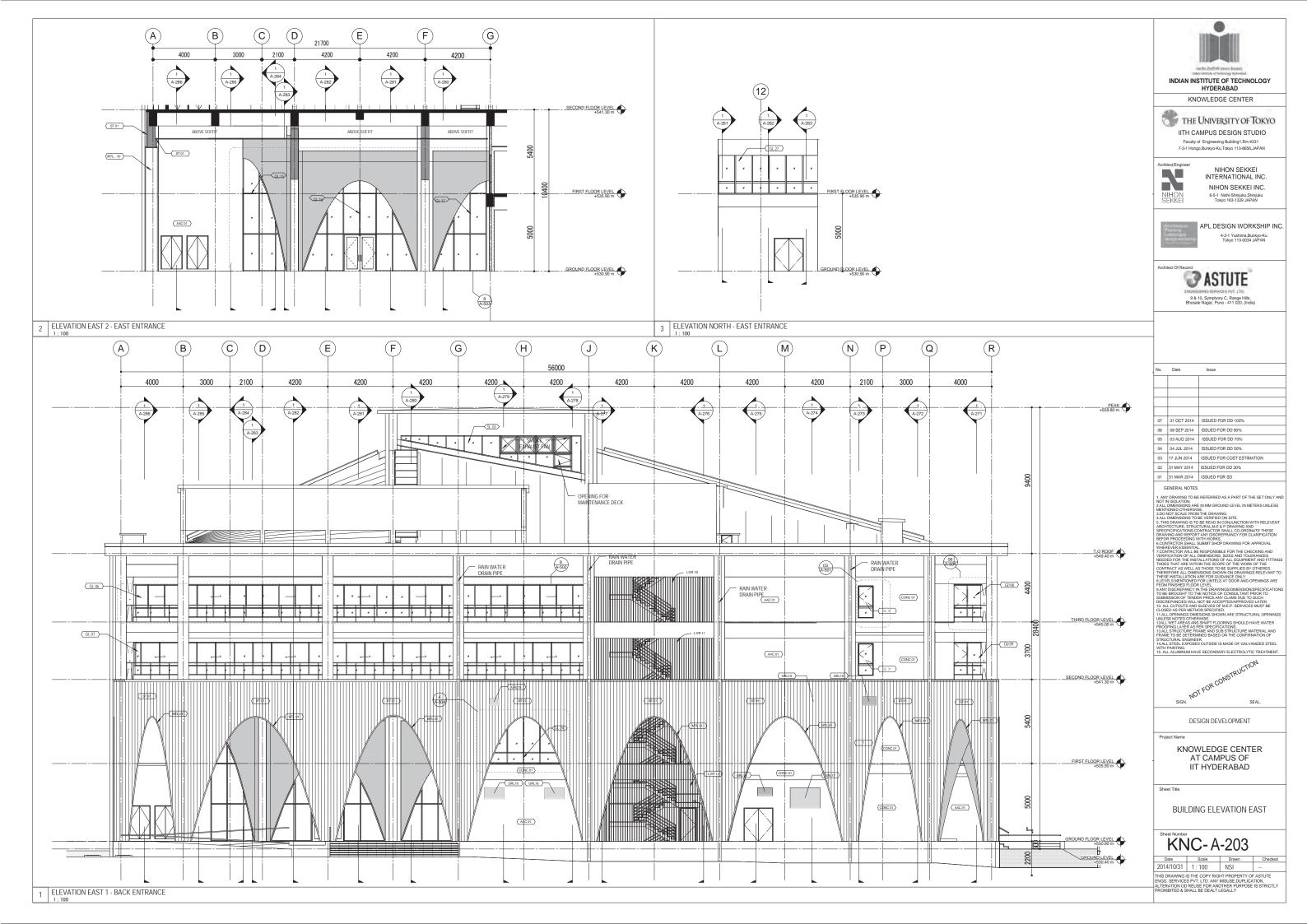


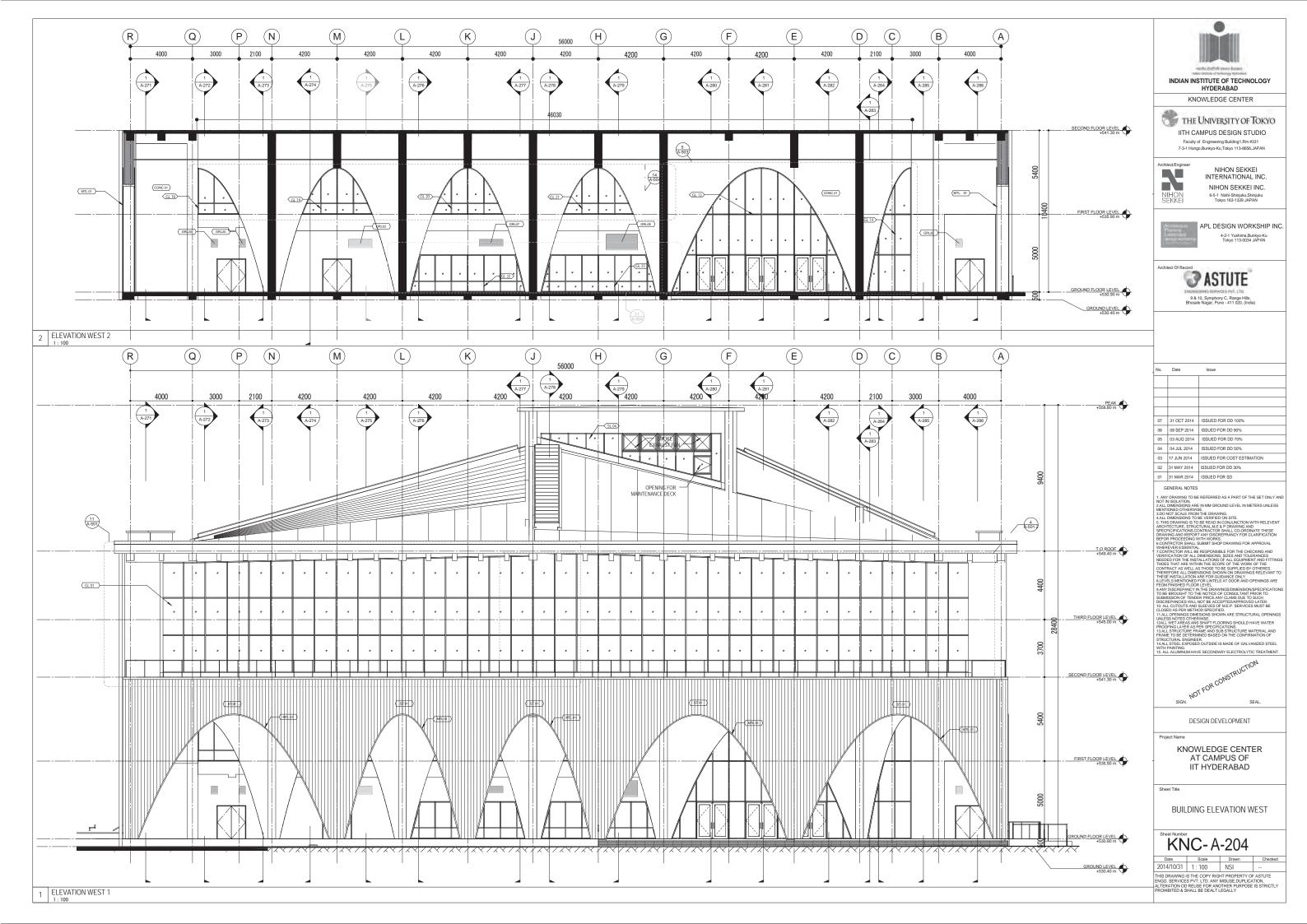


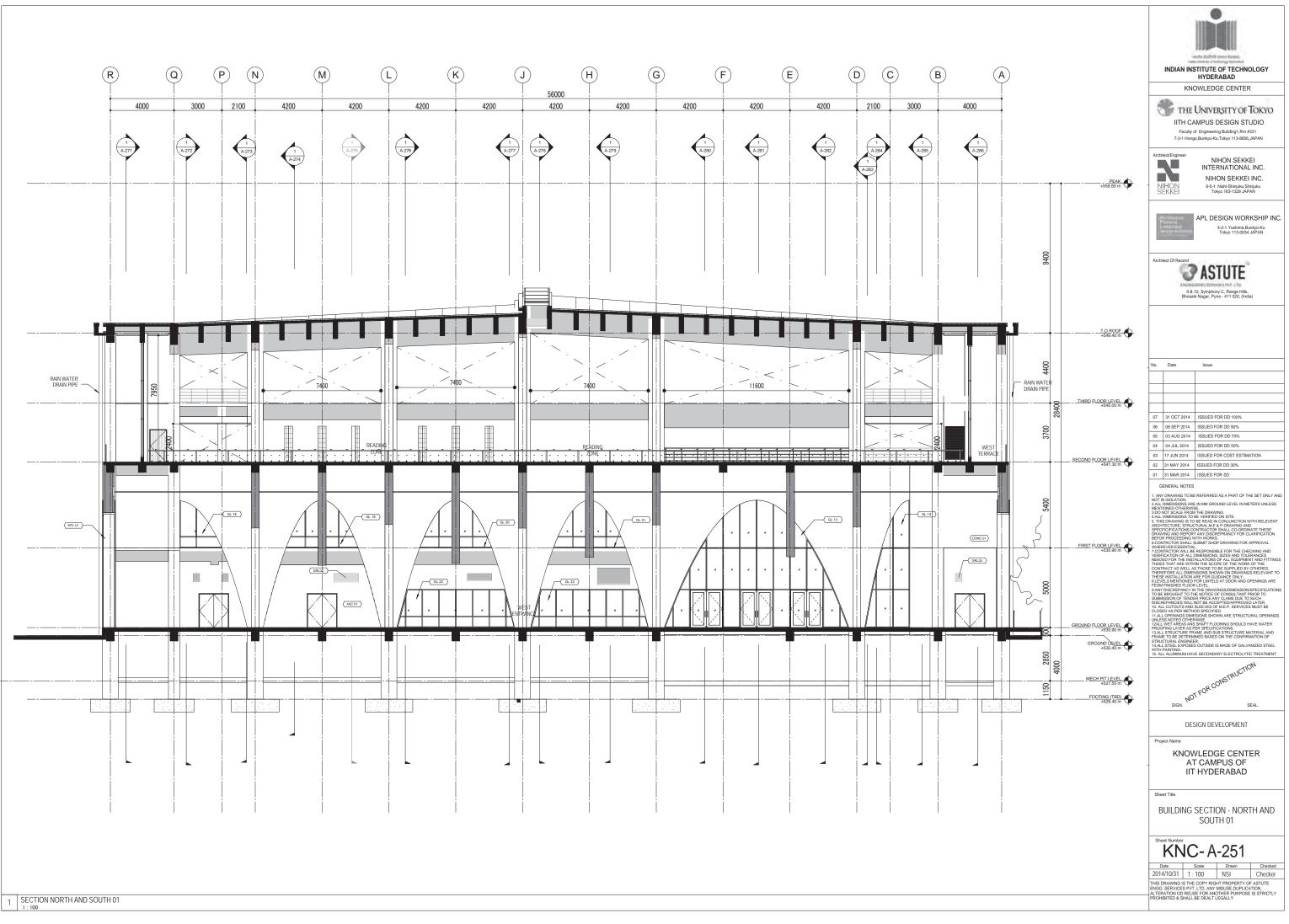


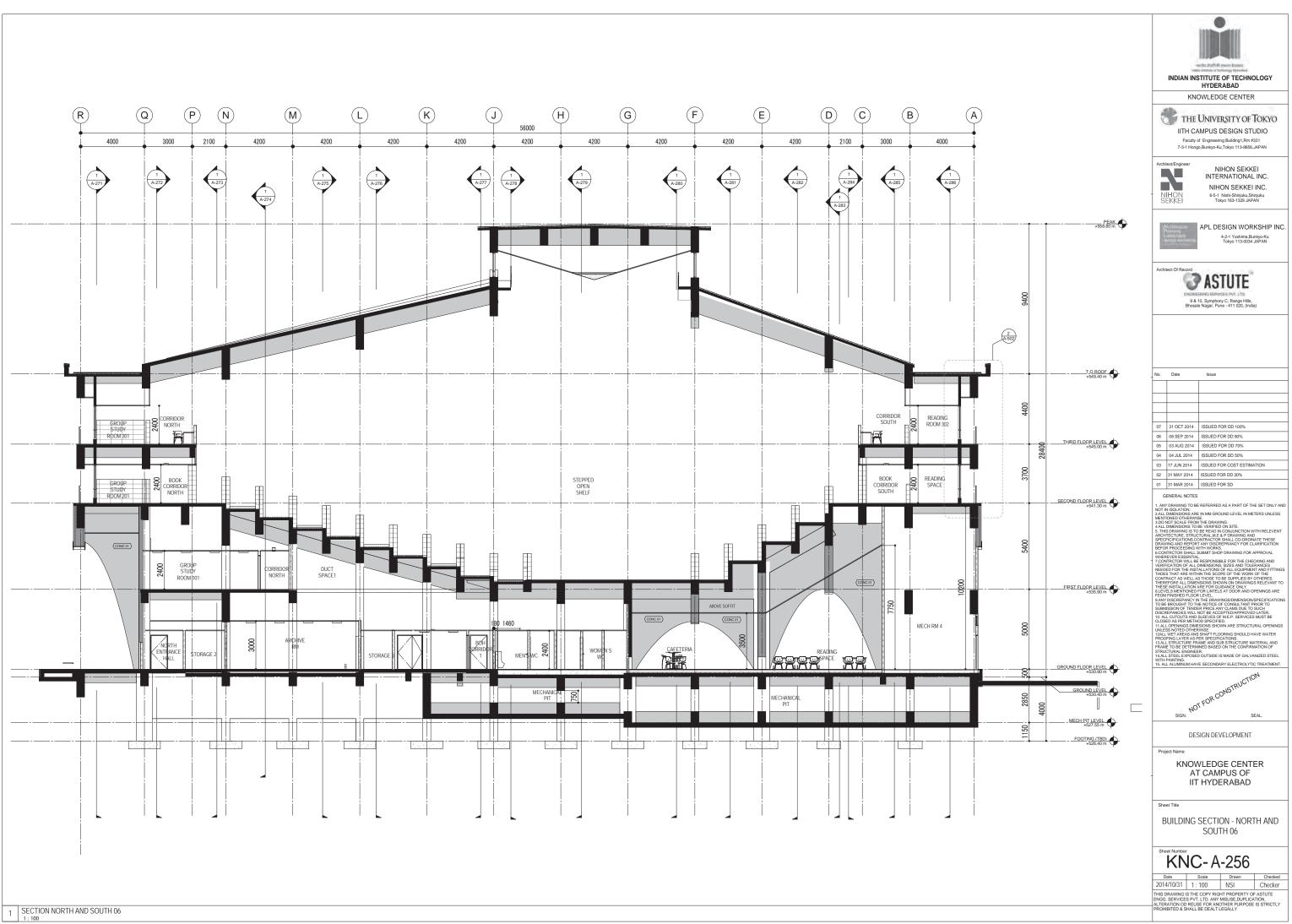


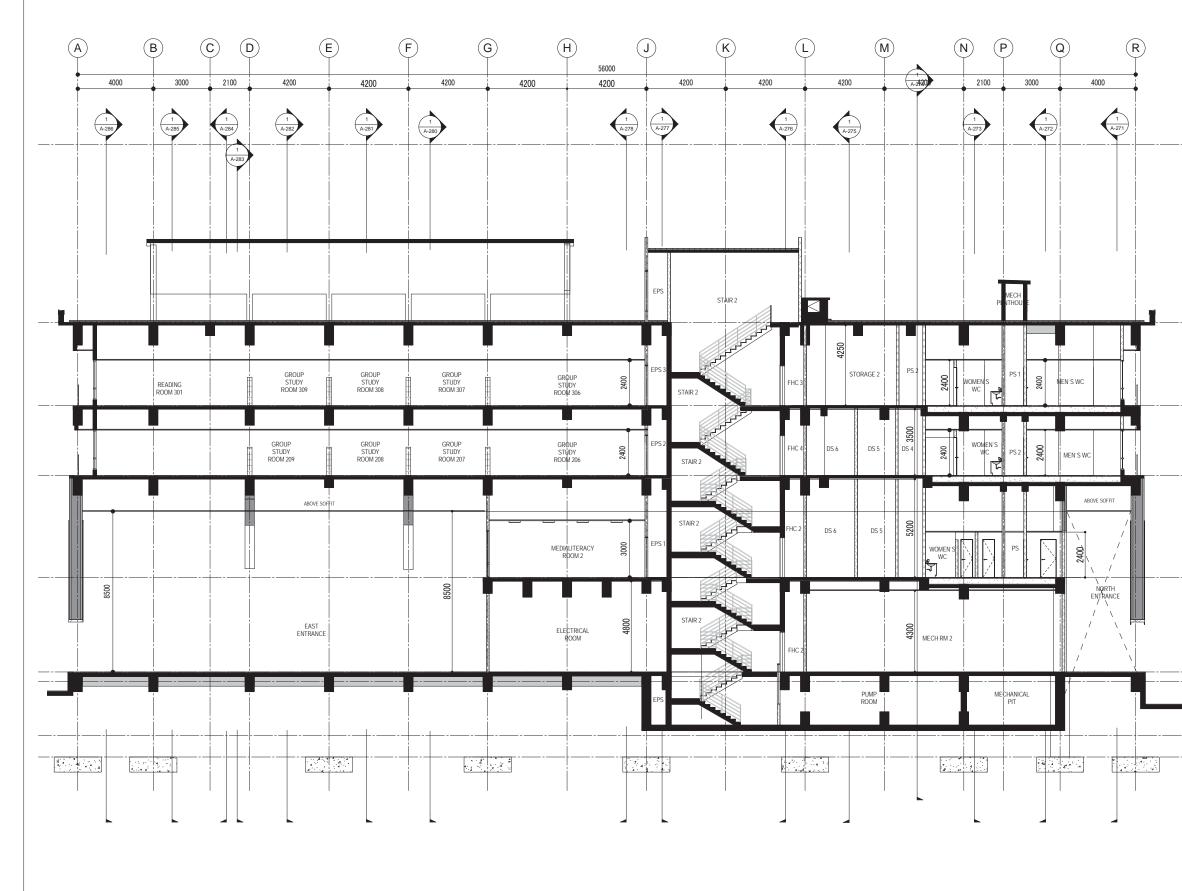




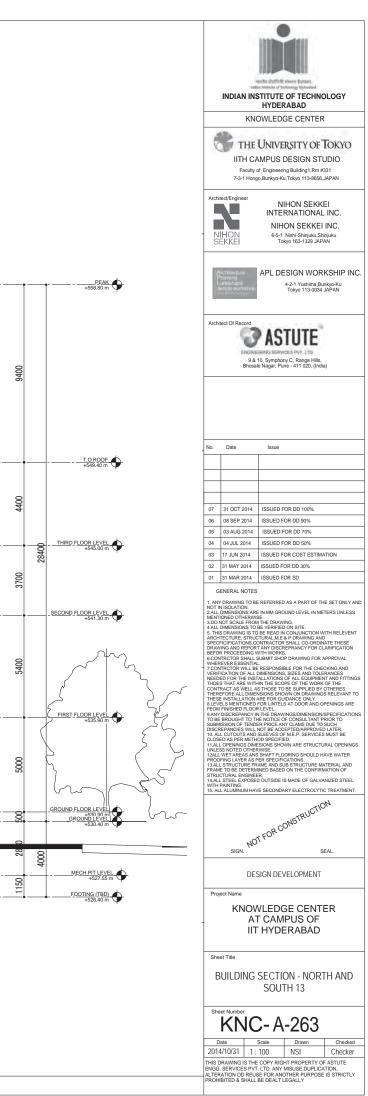


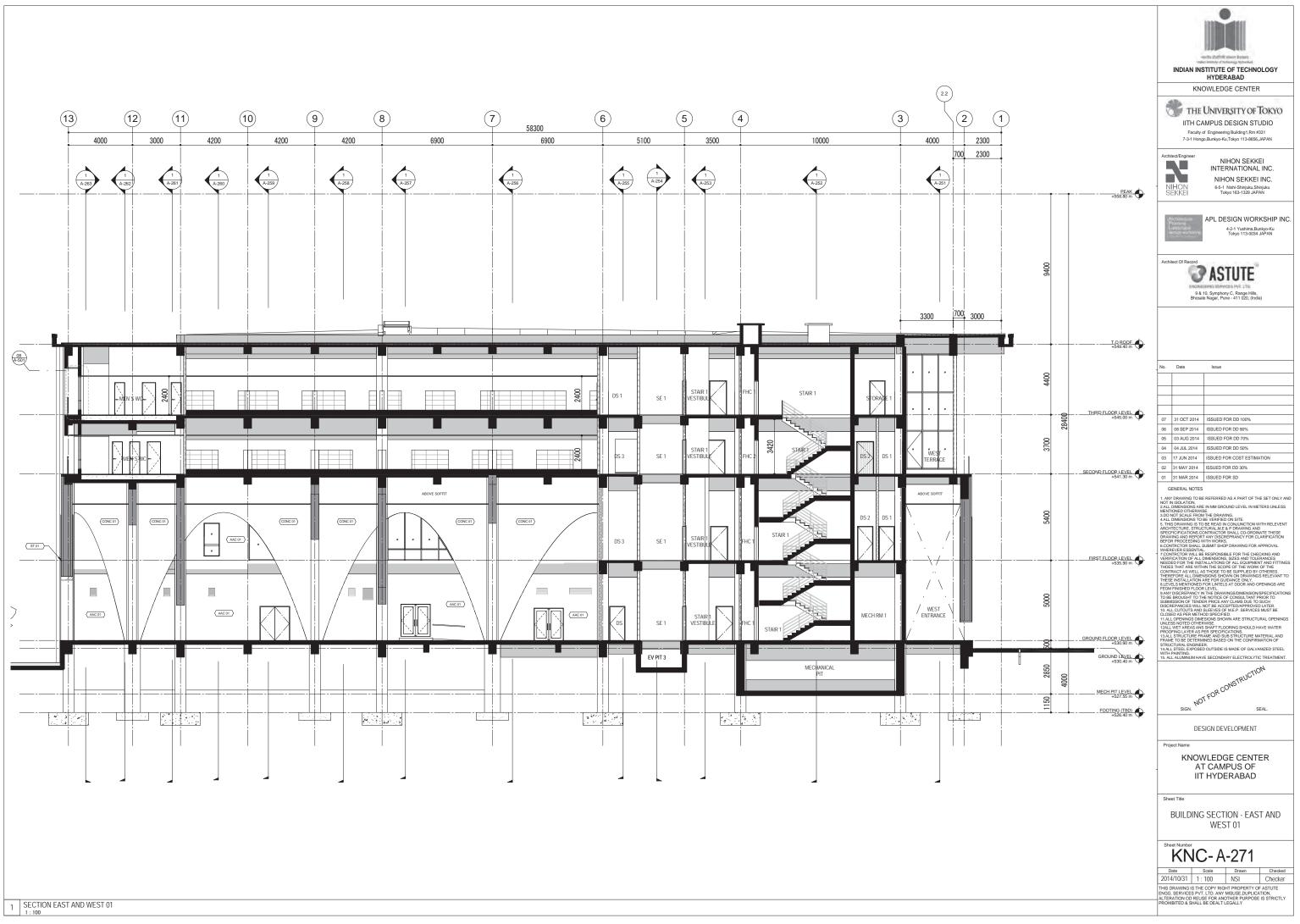


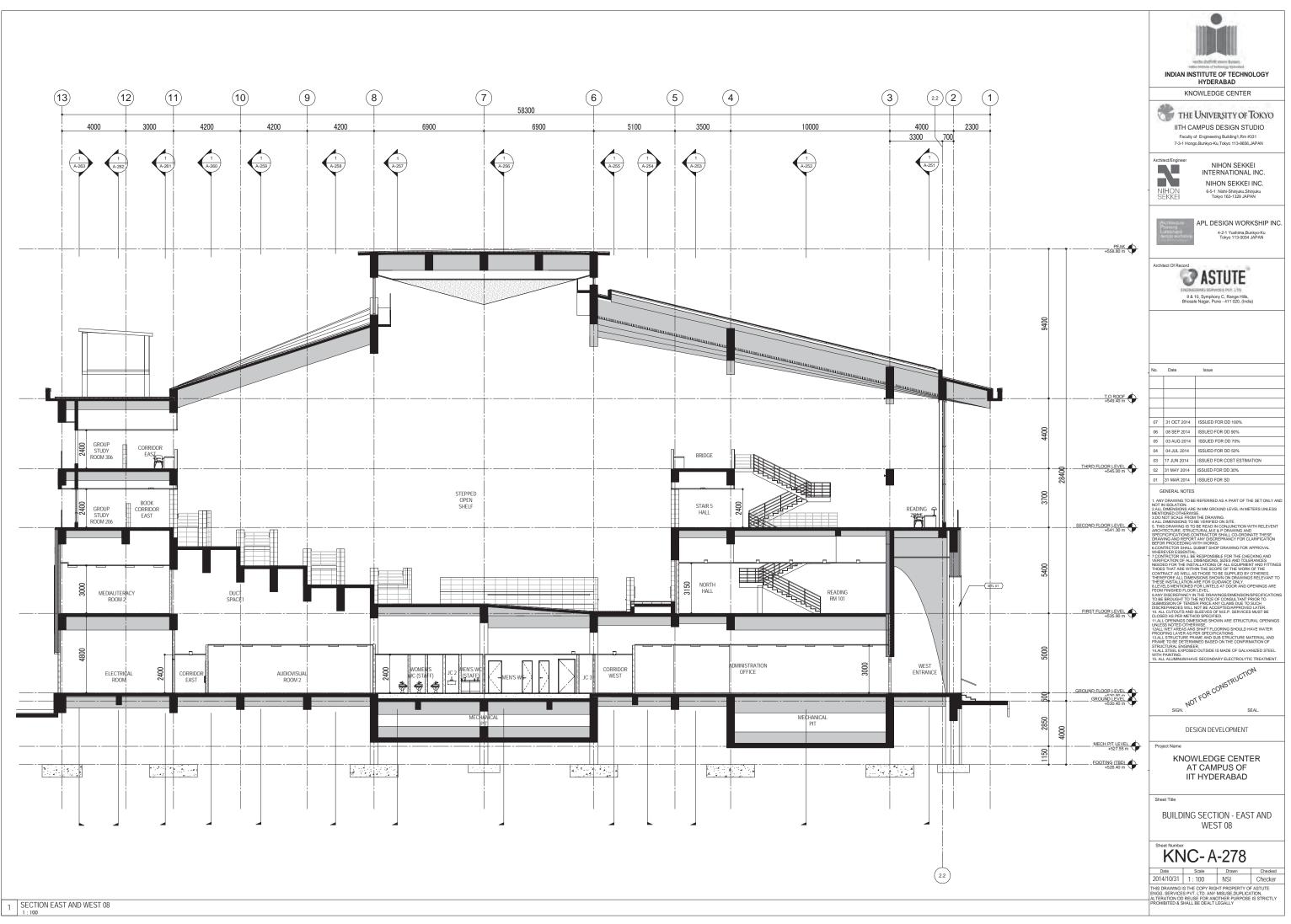


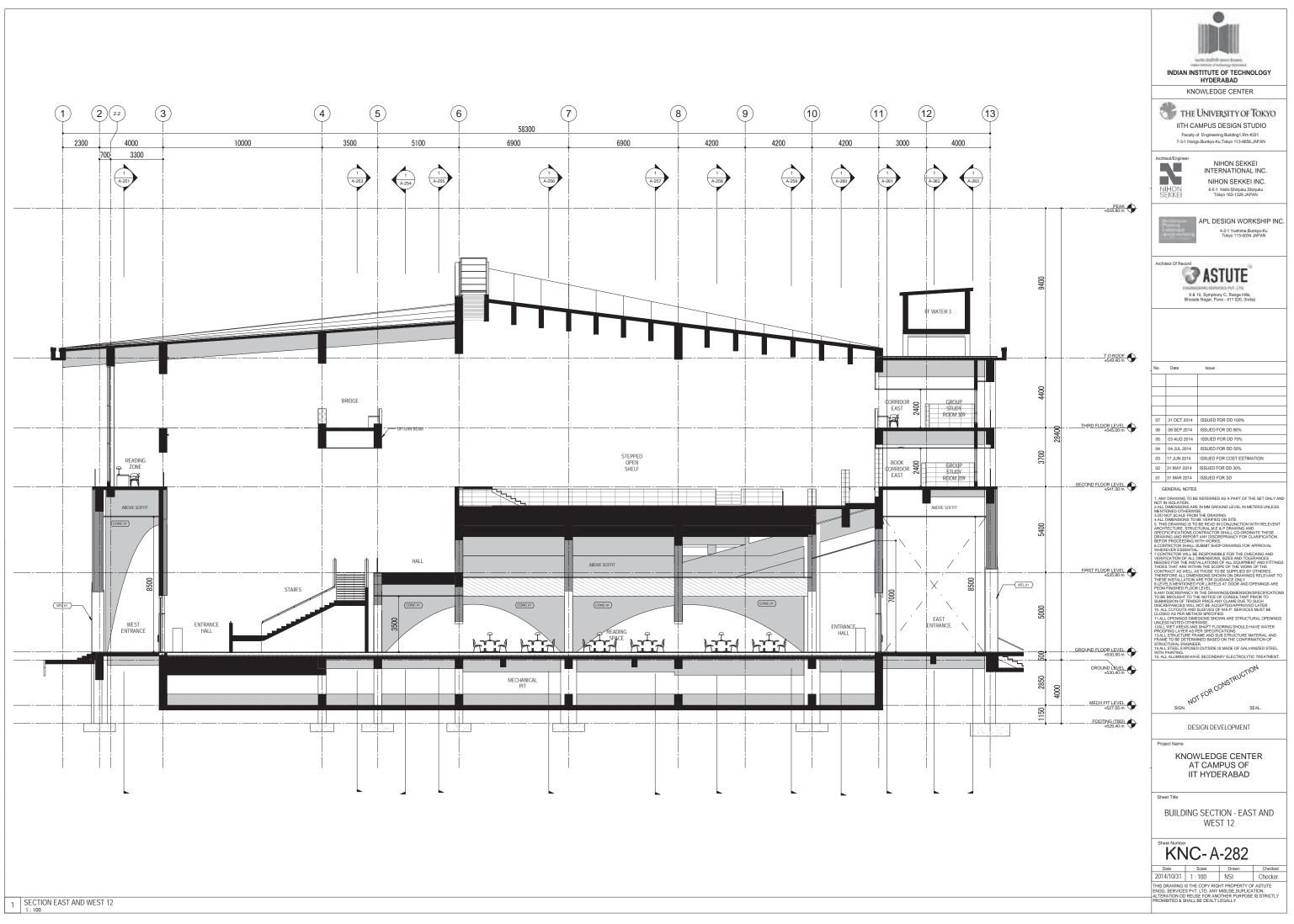


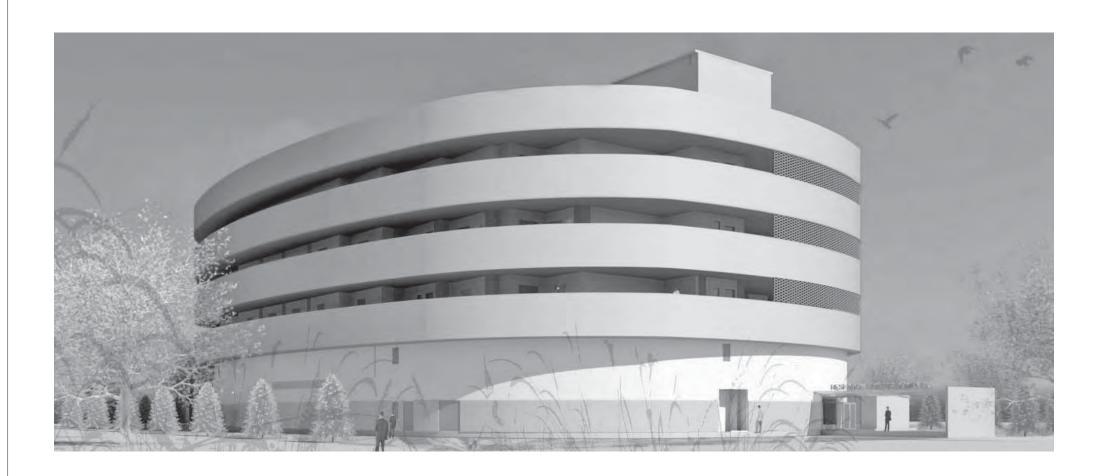
1 SECTION NORTH AND SOUTH 13 1 : 100











RESEARCH CENTRE COMPLEX AT INDIAN INSTITUTE OF TECHNOLOGY HYDERABAD

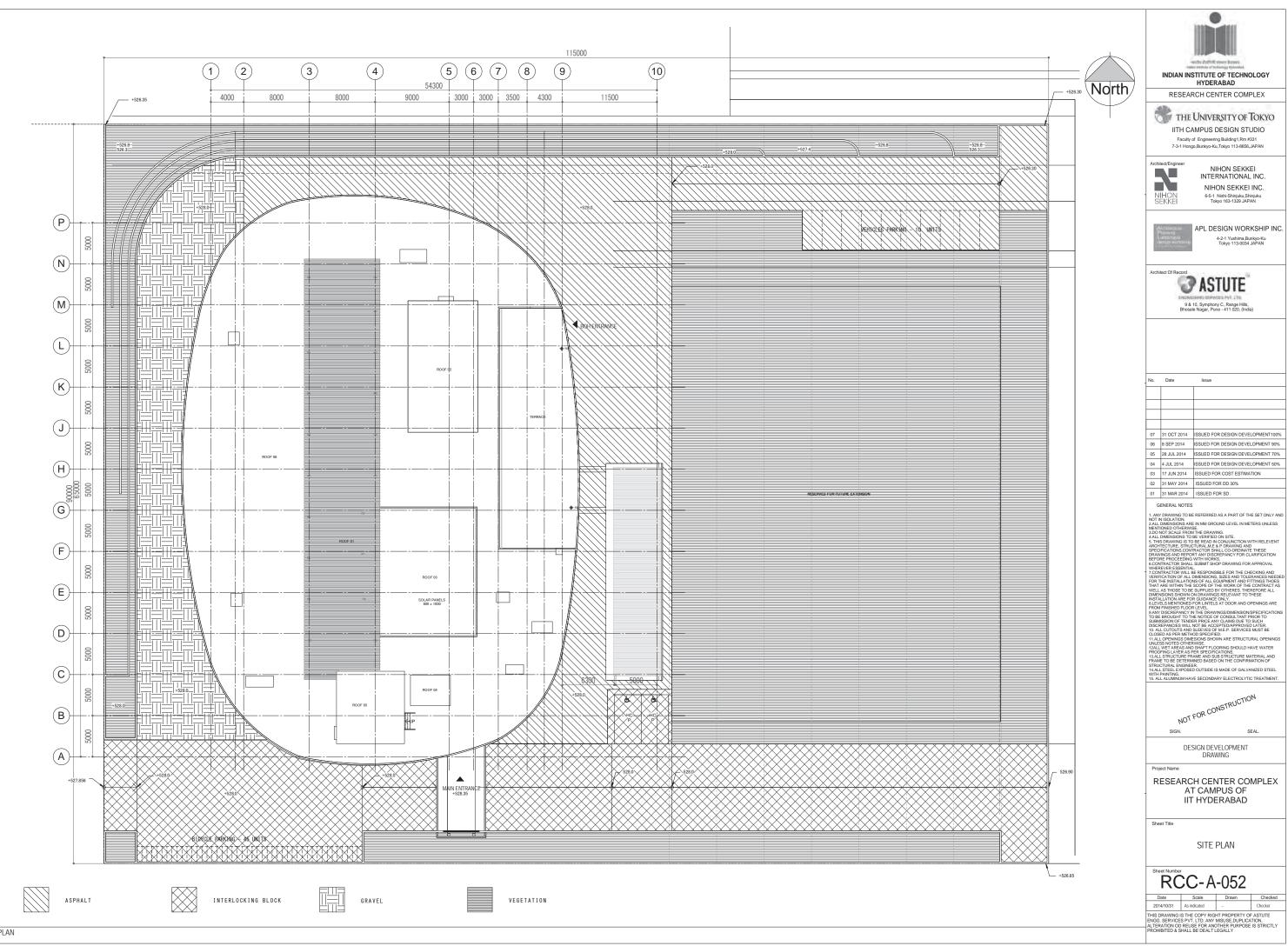
ARCHITECTURE



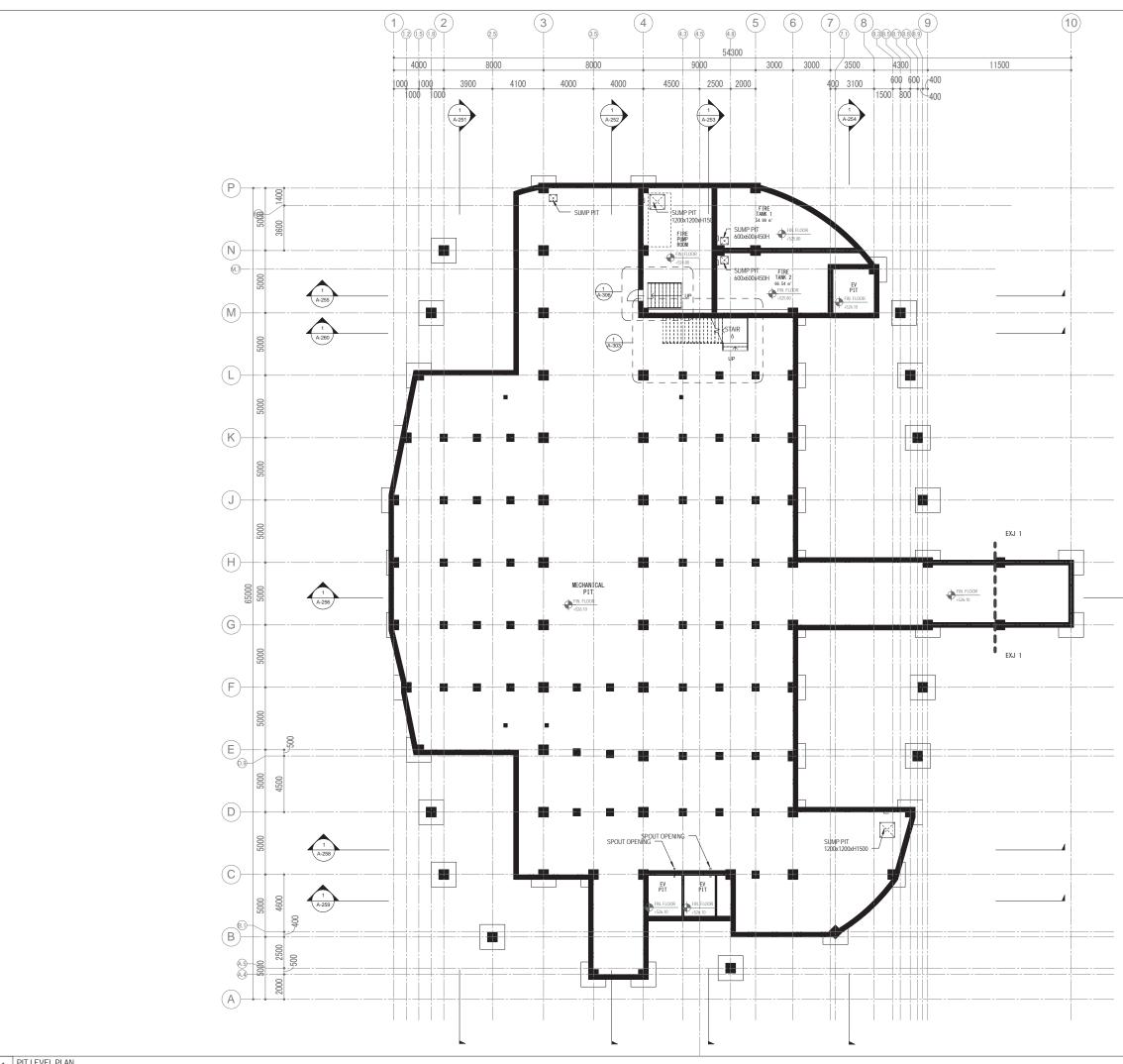
INDIAN INSTITUTE OF TECHNOLOGY HYDERABAD

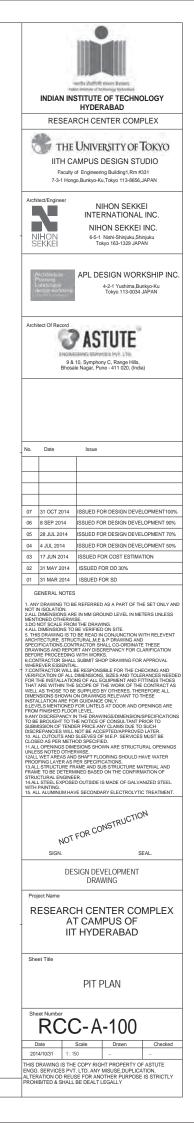
CONCEPT DESIGN THE UNIVERSITY OF TOKYO IITH CAMPUS DESIGN STUDIO Faculty of Engineering Building 1, Rm#331 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-8656, JAPAN ARCHITECT/ENGINEER NIHON SEKKEI INTERNATIONAL INC. NIHON SEKKEI INC. 6-5-1 Nishi-Shinjuku, Shinjuku, NIHON Tokyo 163-1329 JAPAN ASSOCIATE ARCHITECT APL DESIGN WORKSHOP INC. 4-2-1 Yushima, Bunkyo-ku Tokyo 113-0034 JAPAN ARCHITECT OF RECORD ASTUTE NG SERVICES PVT. LTD 9 & 10, Symphony C, Range Hills, Bhosale Nagar, Pune - 411 020, (India) PUNE OFFICE LOCAL STRUCTURAL CONSULTANTS: SAUCHAMRERS DE PUNE-M HVAC CONSULTANTS: R S Kulkami Fellow & Life Member - ASHRAE HVACR Consultant Office No., 512 + 513, Skidharth Towers Sangam Press Road, Kolhrud, Pune 411 029 Tel. No. : 020 2544 60 14 / 2546 59 20 / 3252 20 69 FAX: 020 - 2543 6684 Email: rskulkami@rskhvacr.c PLUMBING & FIRE FIGHTING CONSULTANTS : M/s Ace Consultants Omkar Building, Flat No. 2, P.O. No. 20, S.No 117/118. Madhav Baug Co. Op. Hsg. Society, Near Shashikant Sutar Bungalow, Shivtirth Nagar, PUNE - 411 038 LOCAL ELECTRICAL CONSULTANTS Stree Swami Krupa, Piot No. 6 Piot No. 6, Neelkamal Housing ELECTRICAL CONSULTANTS A

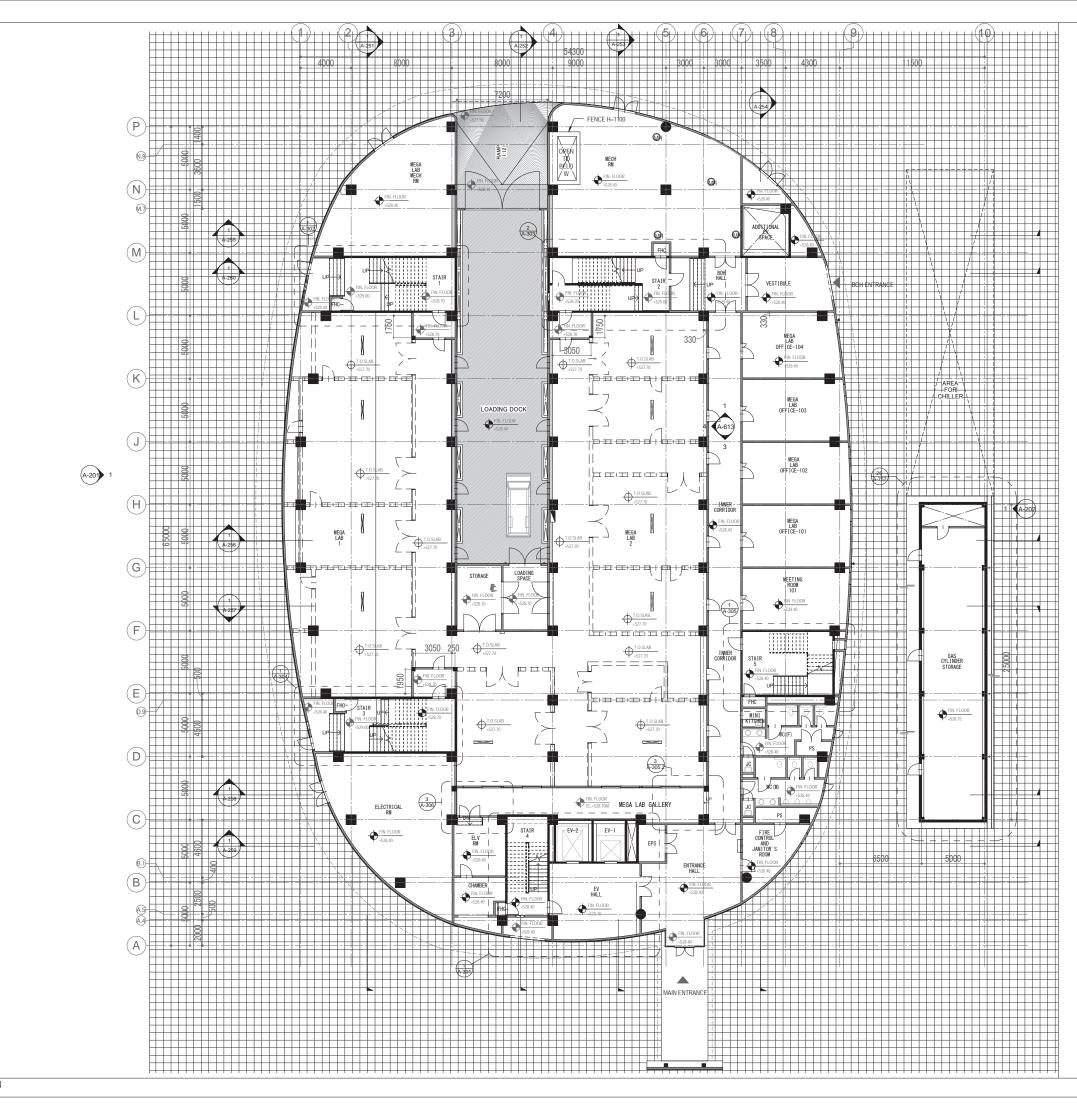
ISSUED FOR DESIGN DEVELOPMENT 100% OCTOBER 31ST, 2014



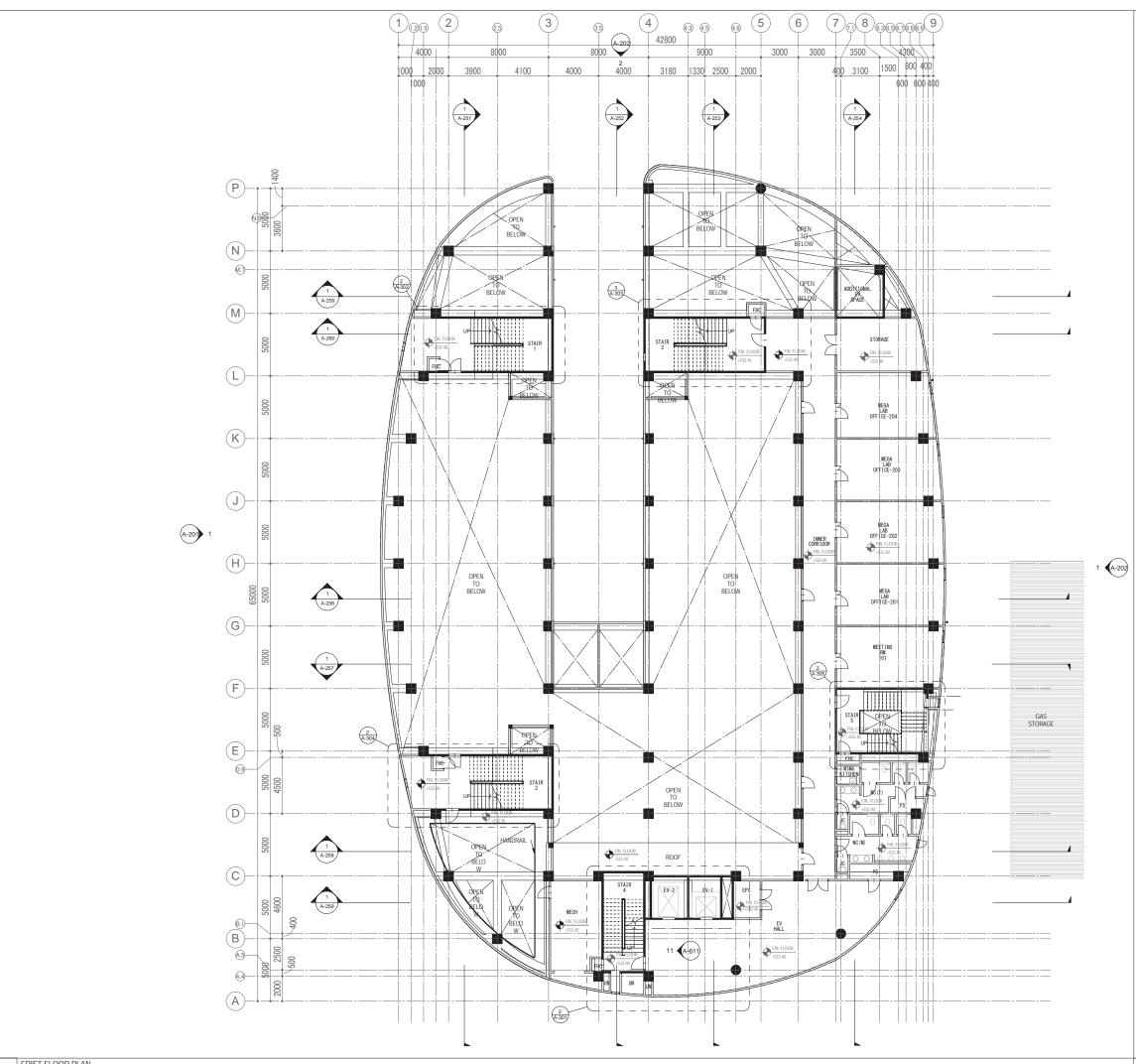
1 SITE PLAN 1 : 200

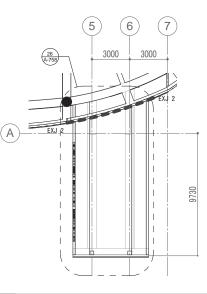










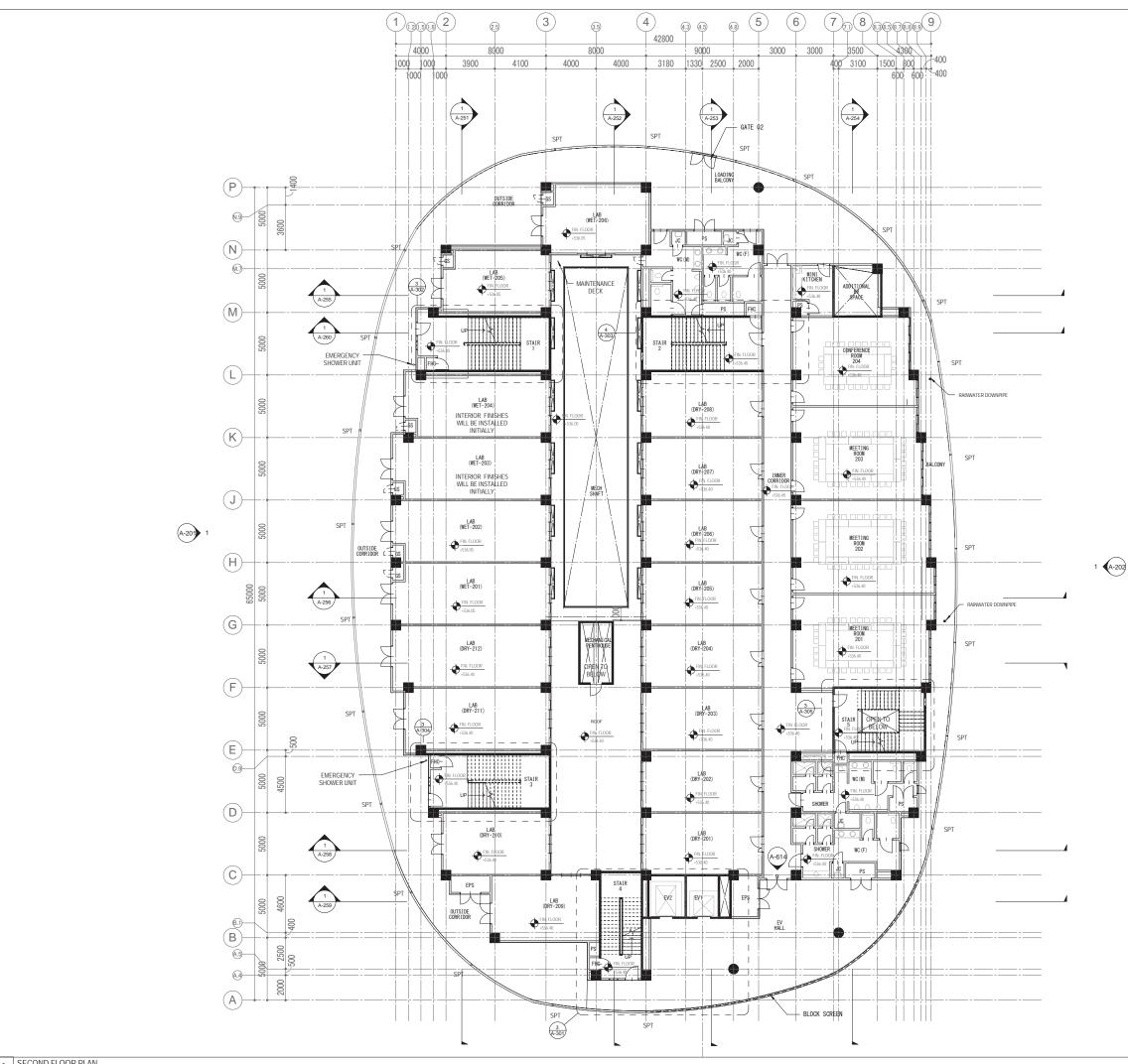


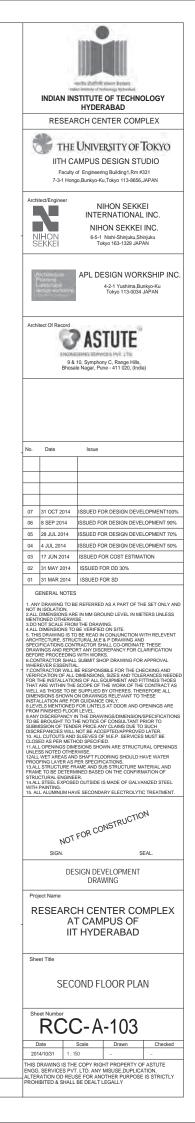


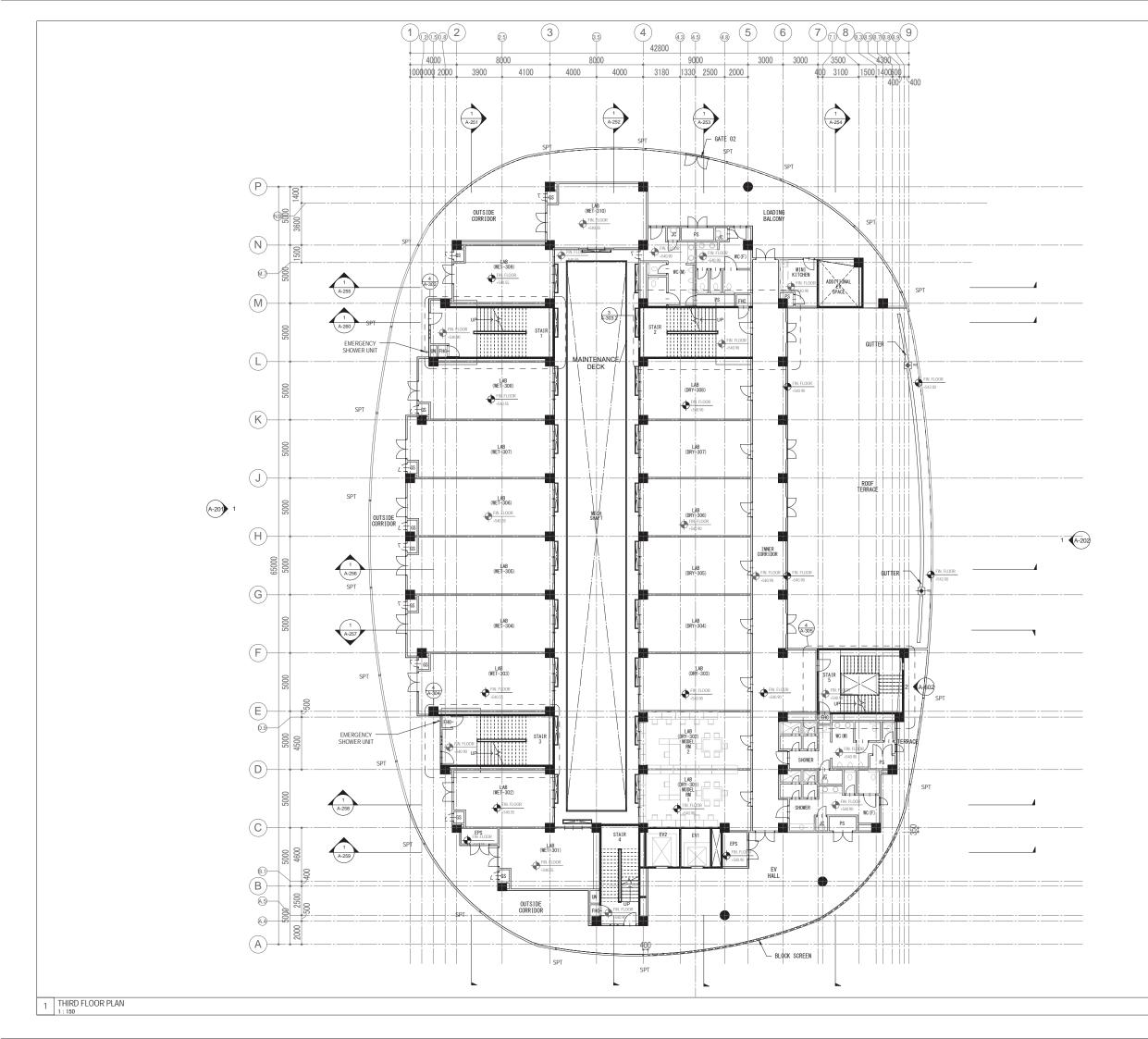


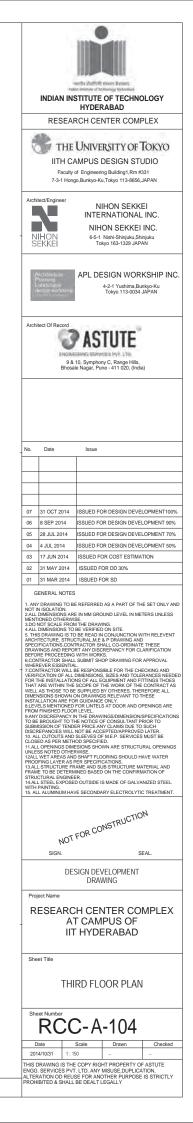
07 31 OCT 2014 ISSUED FOR DESIGN DEVELOPMENT100%

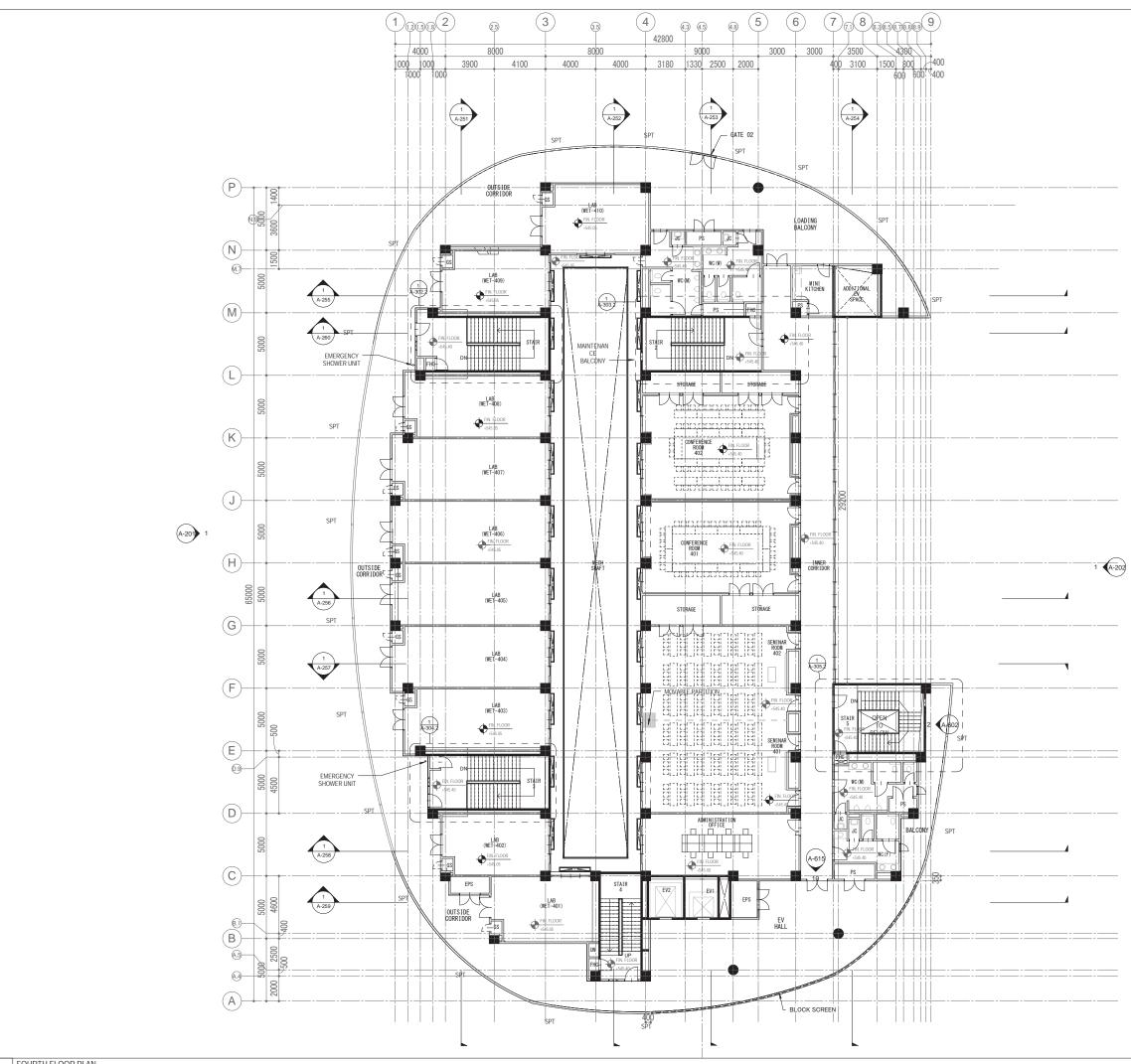
06 8 SEP 2014 ISSUED FOR DESIGN DEVELOPMENT 90%

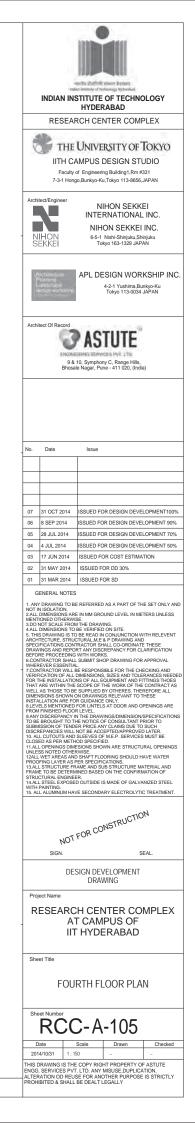


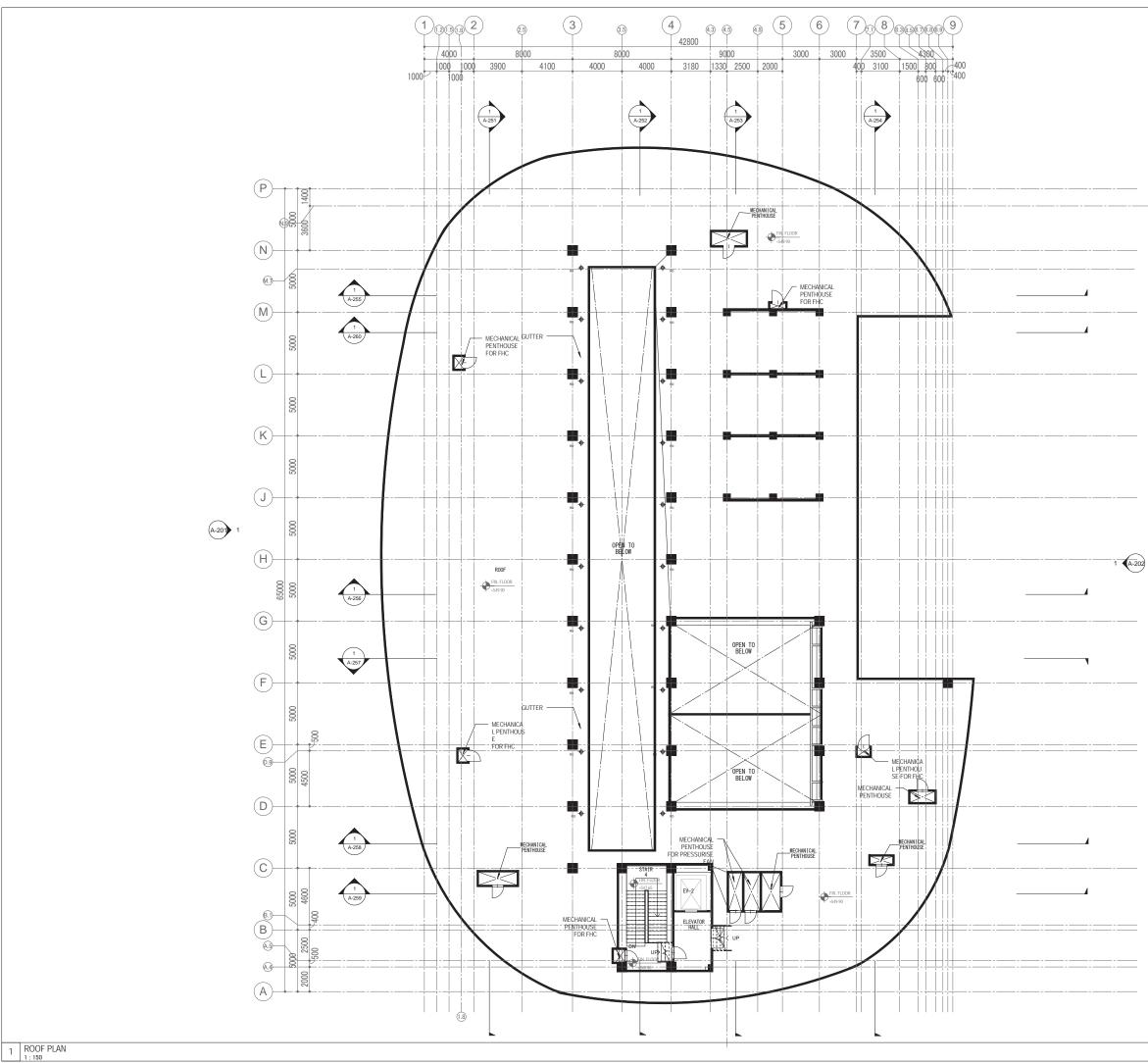




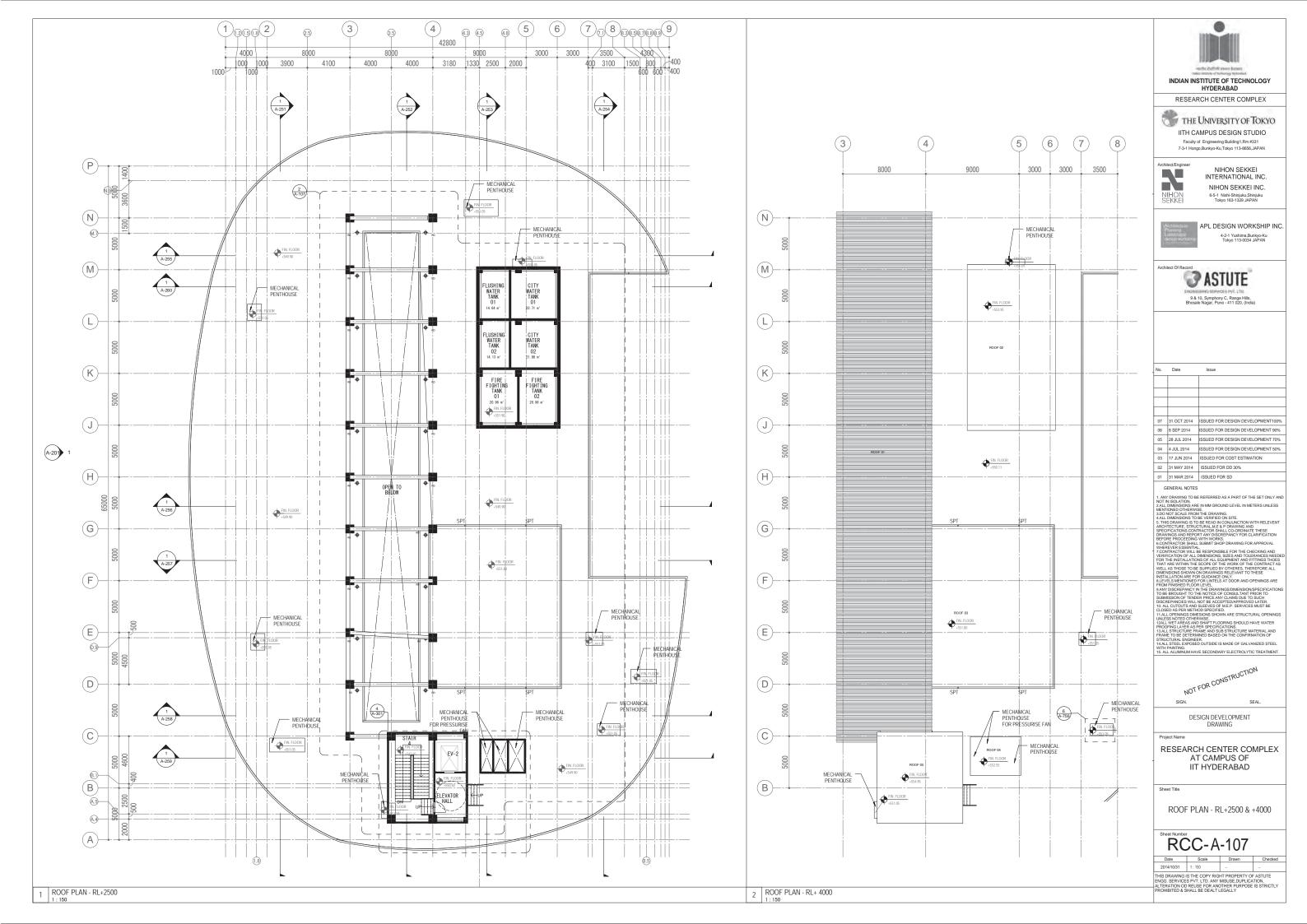


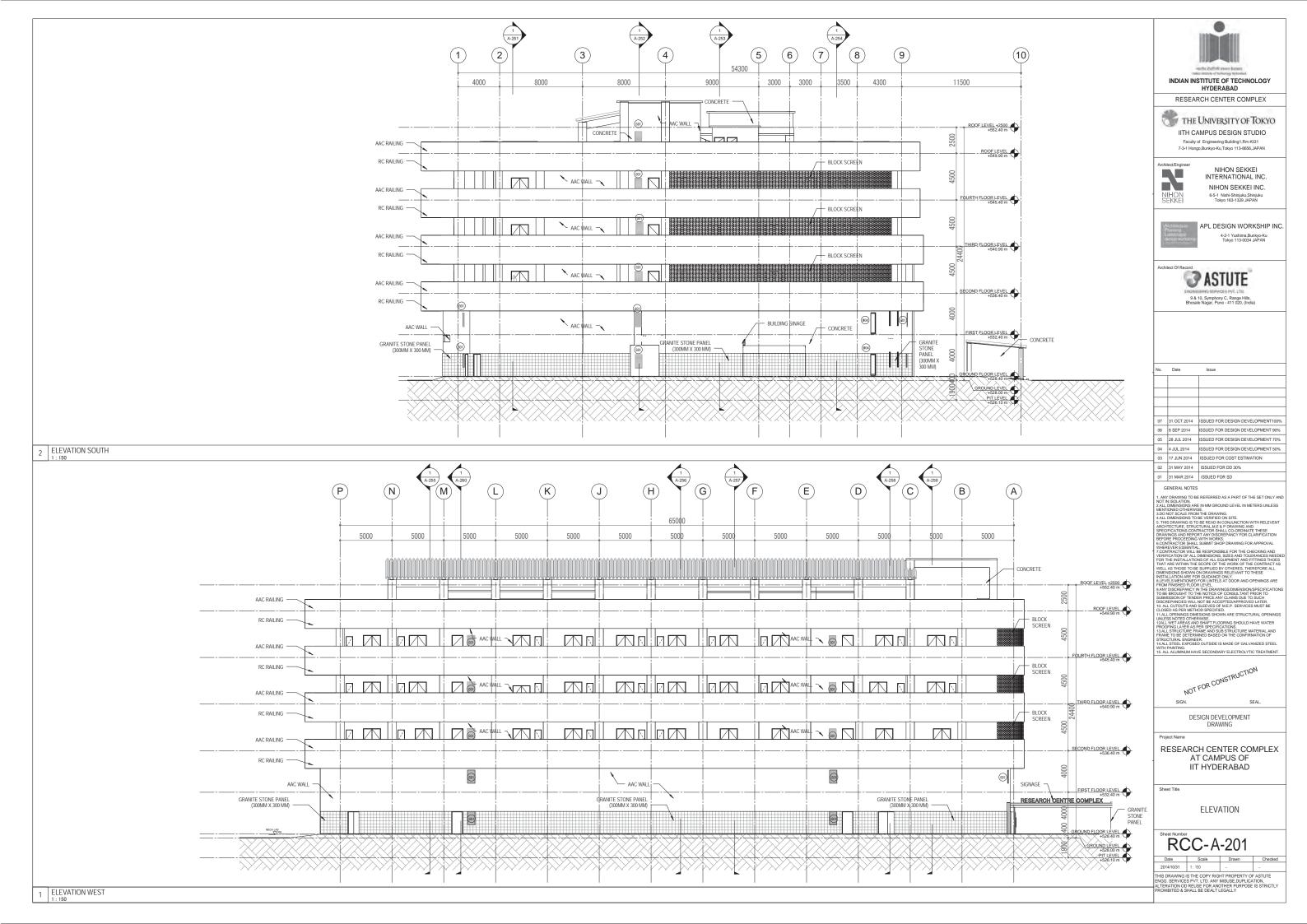


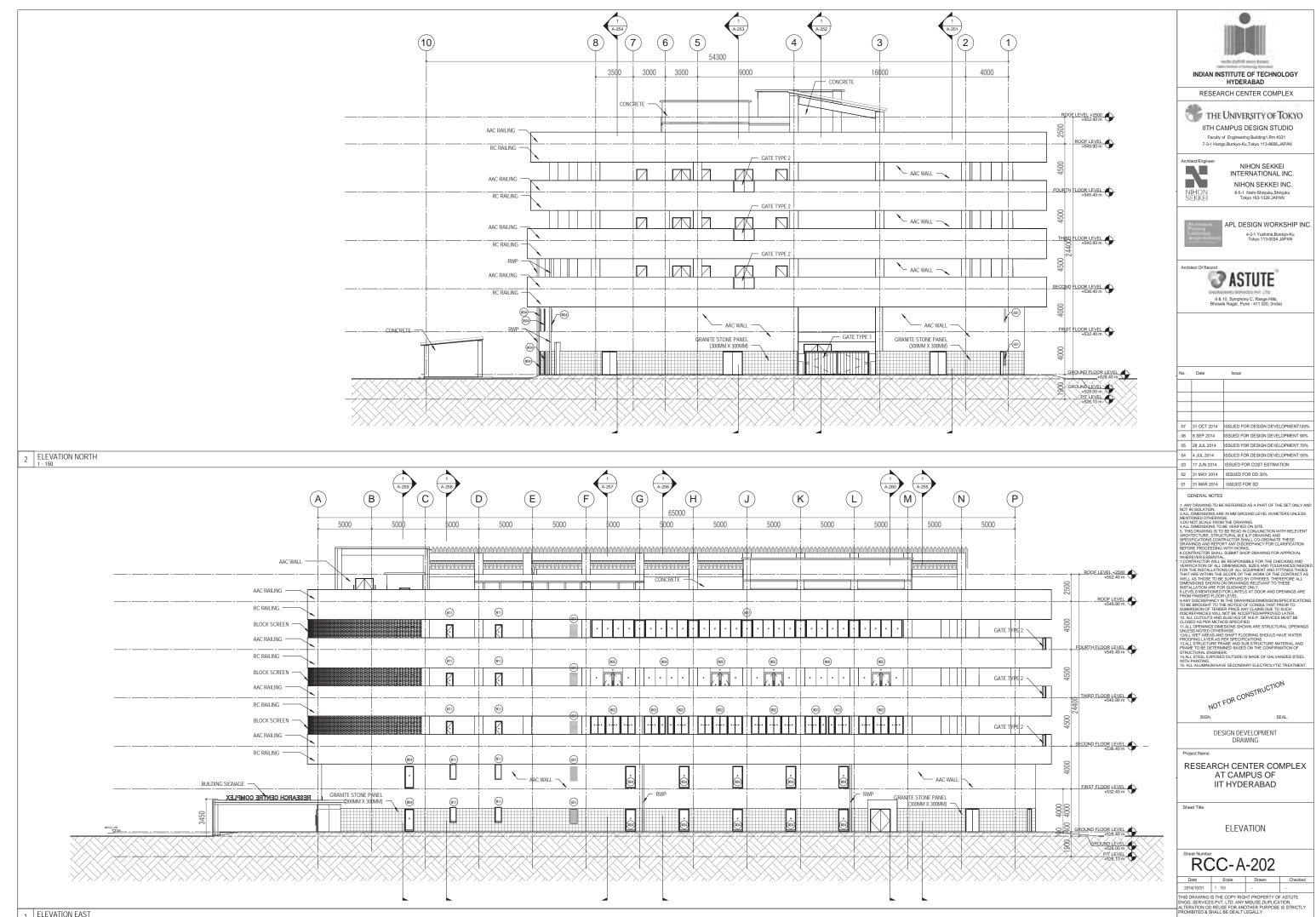




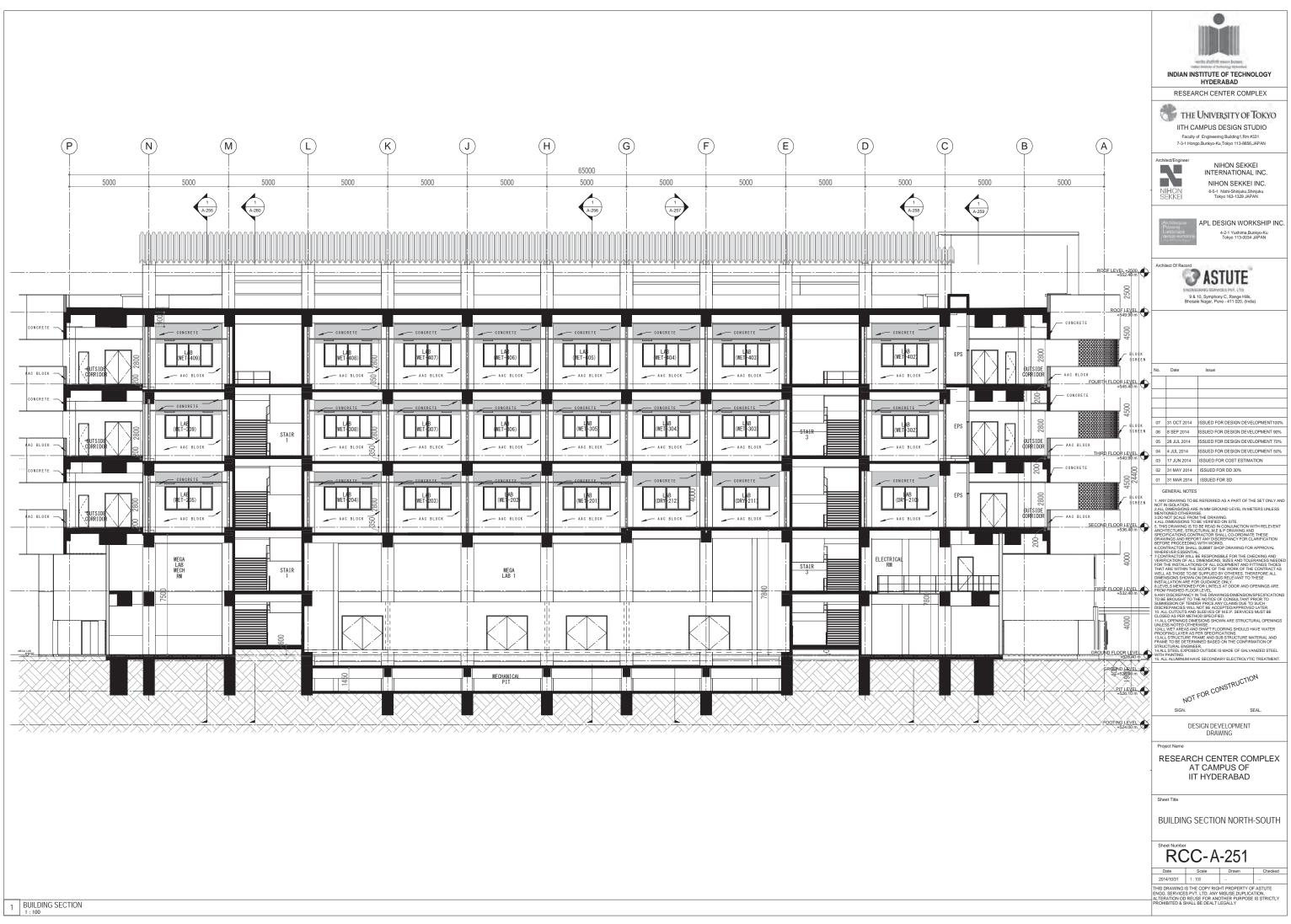




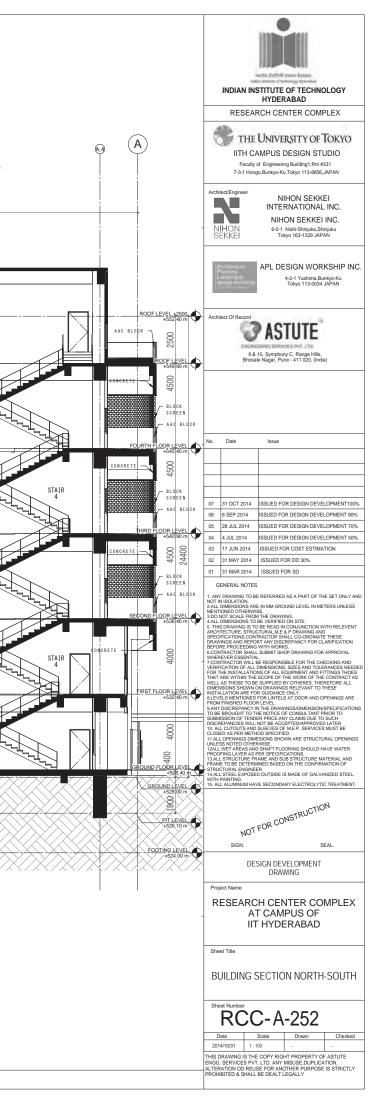


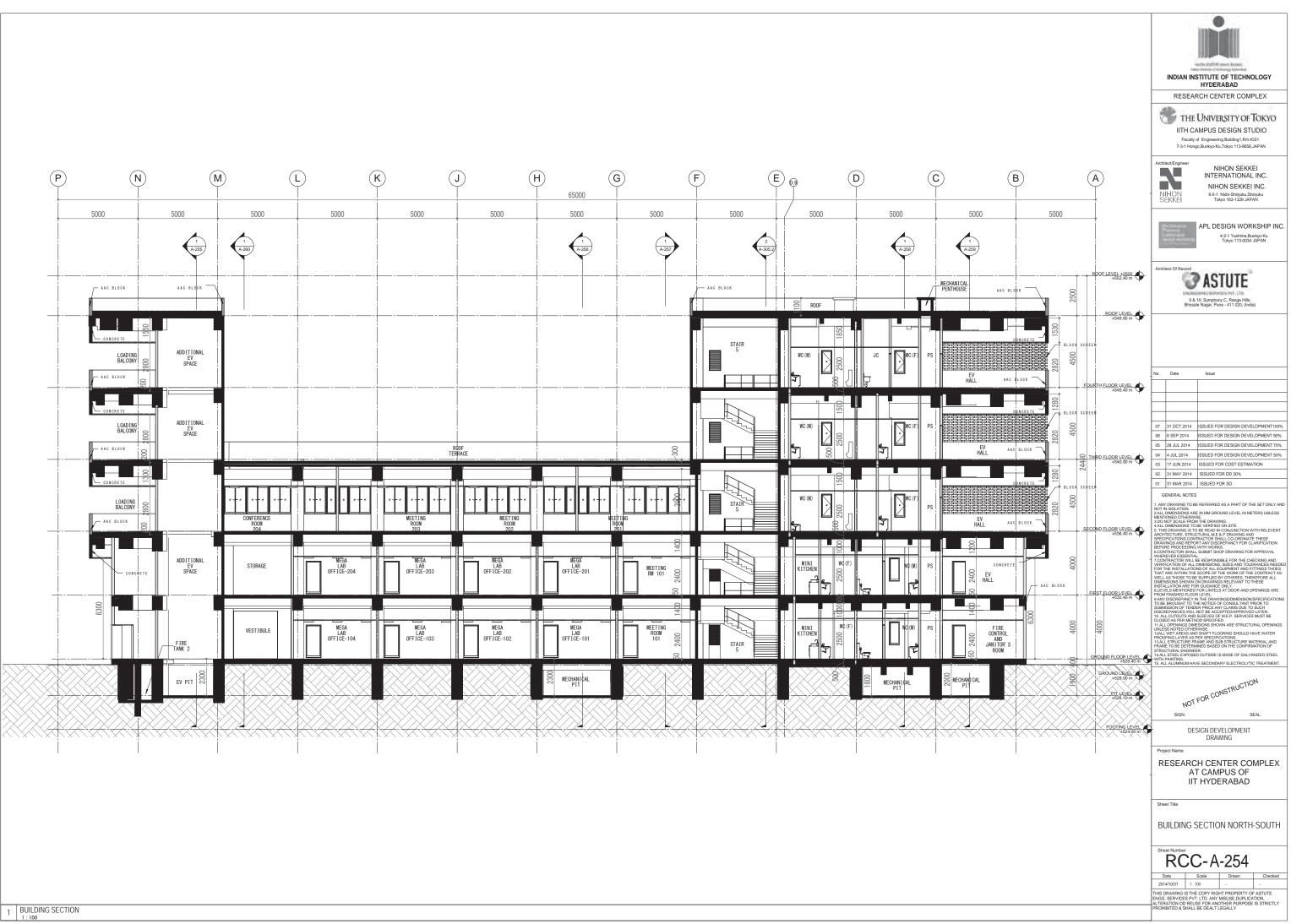


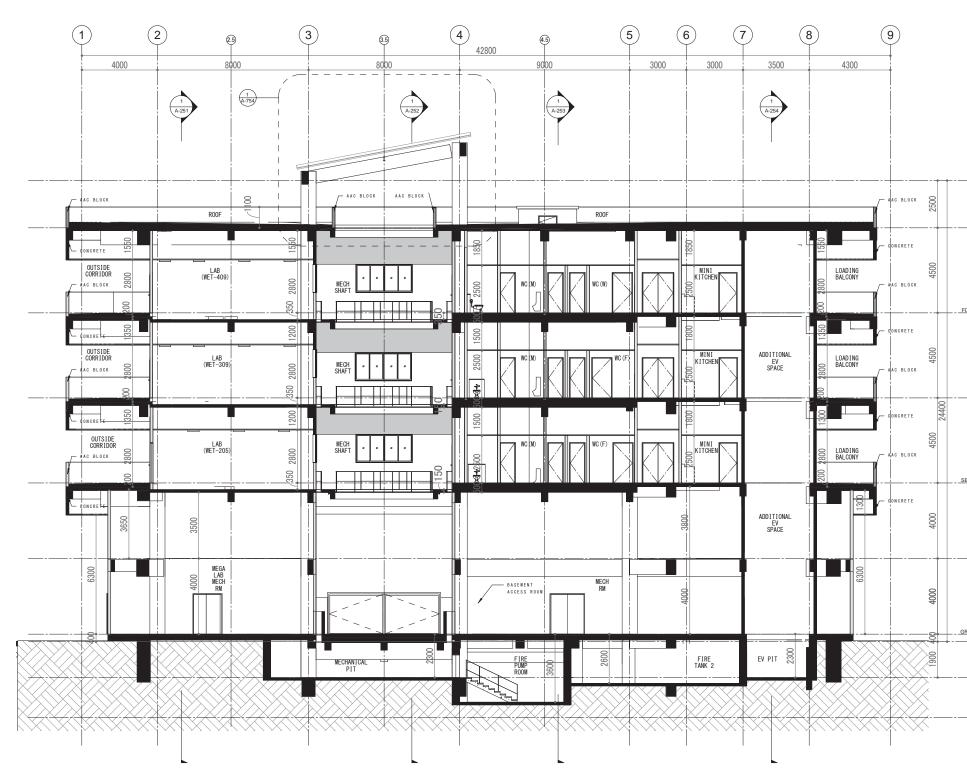
1 ELEVATION EAST



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ĺ										
	AAC BLOCK									
LAB (WET-410) 0087 0955		MECH SHAFT								
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(WET-206) 0087 0500 0500 0500 0500 0500 0500 0500							AAC BLOCK	AAC BLOCK	AAC BLOCK ROOF	AAC BLOCK
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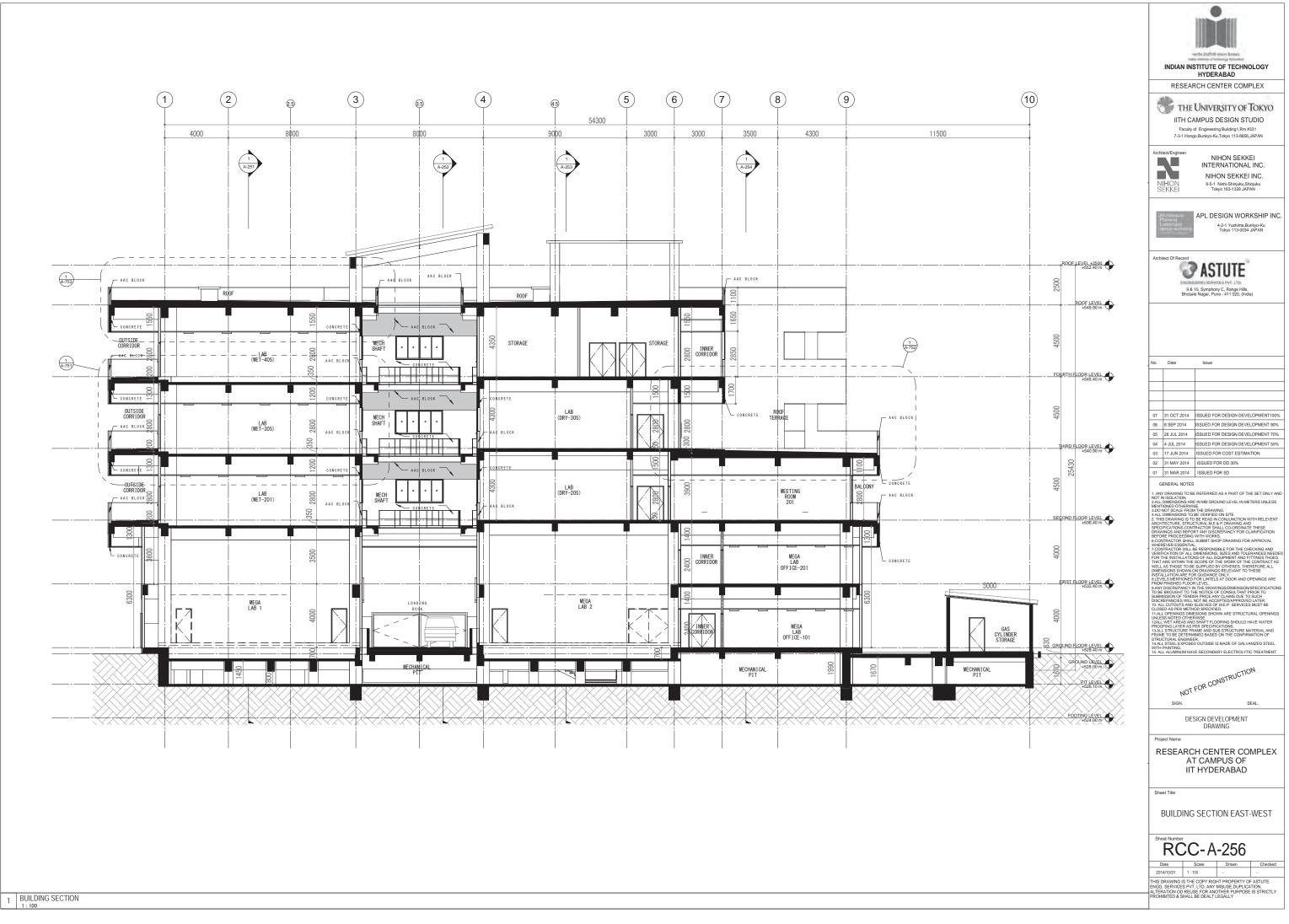


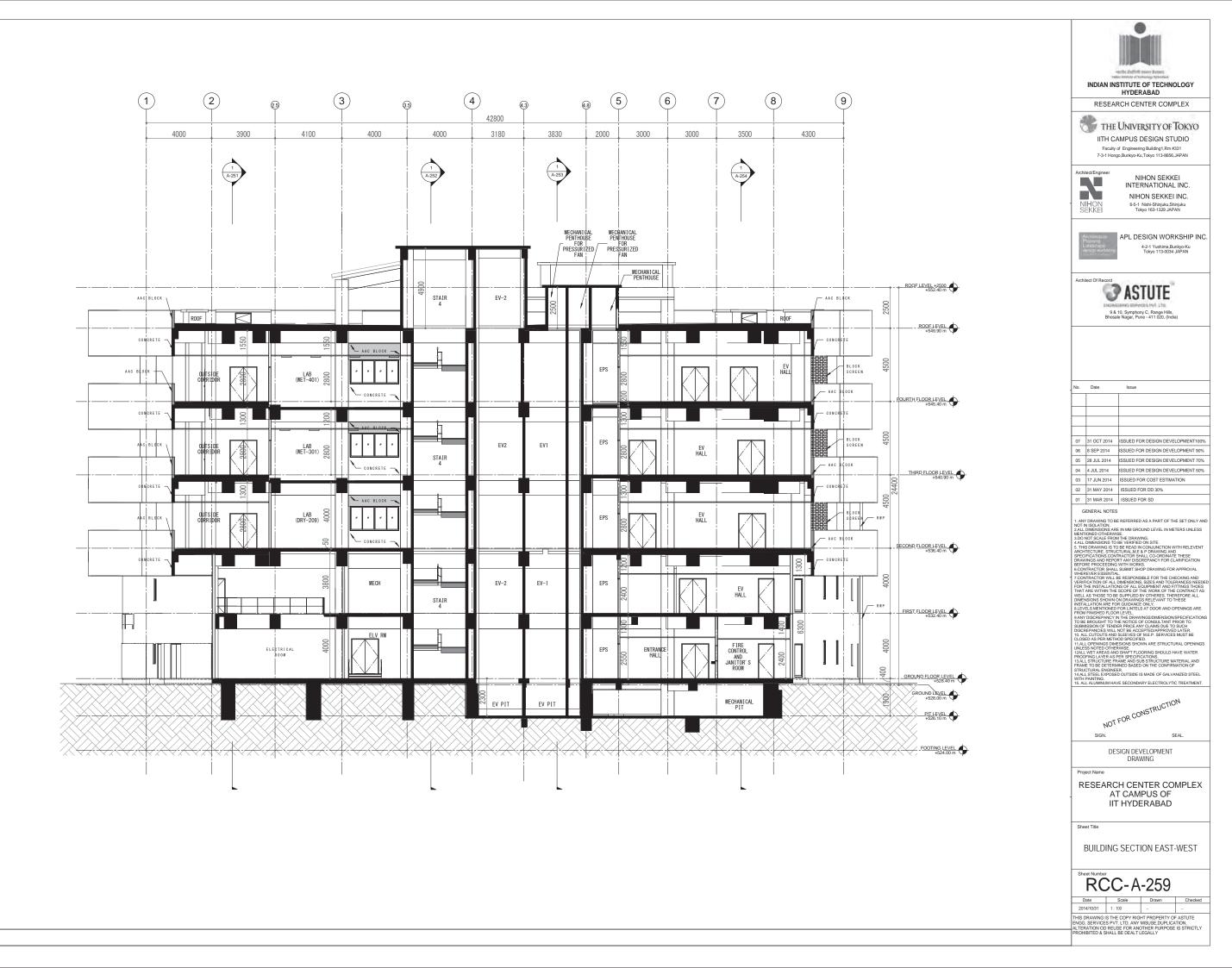




1 BUILDING SECTION 1:100

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	INDIAN INSTITUTE OF TECHNOLOGY HYDERABAD
	RESEARCH CENTER COMPLEX
	THE UNIVERSITY OF TOKYO IITH CAMPUS DESIGN STUDIO Faculty of Engineering Building 1, Rm #331 7-3-1 Hongo, Burkyo-Ku, Takyo 113-8656, JAPAN
	Architect/Engineer NIHON SEKKEI NIHON SEKKEI INC. NIHON SEKKEI INC. 6-5-1 Nish-Shinjuku Tokyo 163-1329 JAPAN
	And Networking Promotion Landon and Antonic Antonic Antonic Antonic Antonic Antonic Antonic Landon and Antonic
\$	Architect Of Record Architect Of Record ENGINEERING BERVICES PVT. LTO
<u>-</u>	9 & 10, Symphony C. Range Hills, Bhosale Nagar, Pune - 411 020, (India)
	No. Date Issue
	07 31 OCT 2014 ISSUED FOR DESIGN DEVELOPMENT100%
	06 8 SEP 2014 ISSUED FOR DESIGN DEVELOPMENT 90% 05 28 JUL 2014 ISSUED FOR DESIGN DEVELOPMENT 70%
<u>-</u>	04 4 JUL 2014 ISSUED FOR DESIGN DEVELOPMENT 50%
P	03 17 JUN 2014 ISSUED FOR COST ESTIMATION
	02 31 MAY 2014 ISSUED FOR DD 30% 01 31 MAR 2014 ISSUED FOR SD
L I	GENERAL NOTES 1. ANY DRAWNO TO BE REFERED AS A PART OF THE SET ONLY AND NOT IN ISGLATION 2. ALL DIMENSIONS ARE IN MM GROUND LEVEL IN METERS UNLESS MENTIONED OTHERWISE. 3. ALL DIMENSIONS TO BE WIREPUND 3. ALL DIMENSIONS TO BE WIREPUND 4. ALL DIMENSIONS TO BE WIREPUND 3. THIS DRAWNG IS TO BE READ IN CONJUNCTION WITH RELEVENT 5. THIS DRAWNG IS TO BE READ IN CONJUNCTION WITH RELEVENT 3. CONTRACT. BEFORE PROCEEDING WITH WORKS. 3. BECORTRACTOR SHALL SUBMIT SHOP DRAWING FOR APPROVAL 3. CONTRACTOR SHALL SUBMIT SHOP DRAWING FOR APPROVAL 4. CONTRACTOR SHALL SUBMIT SHOP DRAWING FOR APPROVAL 4. CONTRACTOR WILL BE REPONSIBLE FOR WITH CONTRACTS BEFORE PROCEEDING WITH WORKS. 6. CONTRACTOR WILL BEREPONSIBLE FOR WITH CONTRACTS 4. CONTRACTS WILL BEREPONSIBLE FOR WITH CONTRACTS 4. CONTRACTOR WILL BEREPONSIBLE FOR WITH CONTRACTS 4. CONTRACTS WILL BEREPONSIBLE FOR WITH THE FOR WITH THE FOR WILL AND WITH THE FOR WITH THE FOR WILL BEREPONSIBLE FOR WITH THE FOR
R LEVEL 528.40 m	FRAME TO BE DETERMINED BASED ON THE CONFIRMATION OF STRUCTURAL ENGINEER. 14.ALL STEEL EXPOSED OUTSIDE IS MADE OF GALVANIZED STEEL
m 🖓	WITH PAINTING. 15. ALL ALUMINUM HAVE SECONDARY ELECTROLYTIC TREATMENT.
↔	TICTION
•	NOT FOR CONSTRUCTION
	NO'' SIGN. SEAL.
∲	DESIGN DEVELOPMENT
т	DRAWING
	Project Name RESEARCH CENTER COMPLEX AT CAMPUS OF IIT HYDERABAD
	Sheet THE BUILDING SECTION EAST-WEST
	Sheet Number RCC-A-255
	Date Scale Drawn Checked





1 BUILDING SECTION