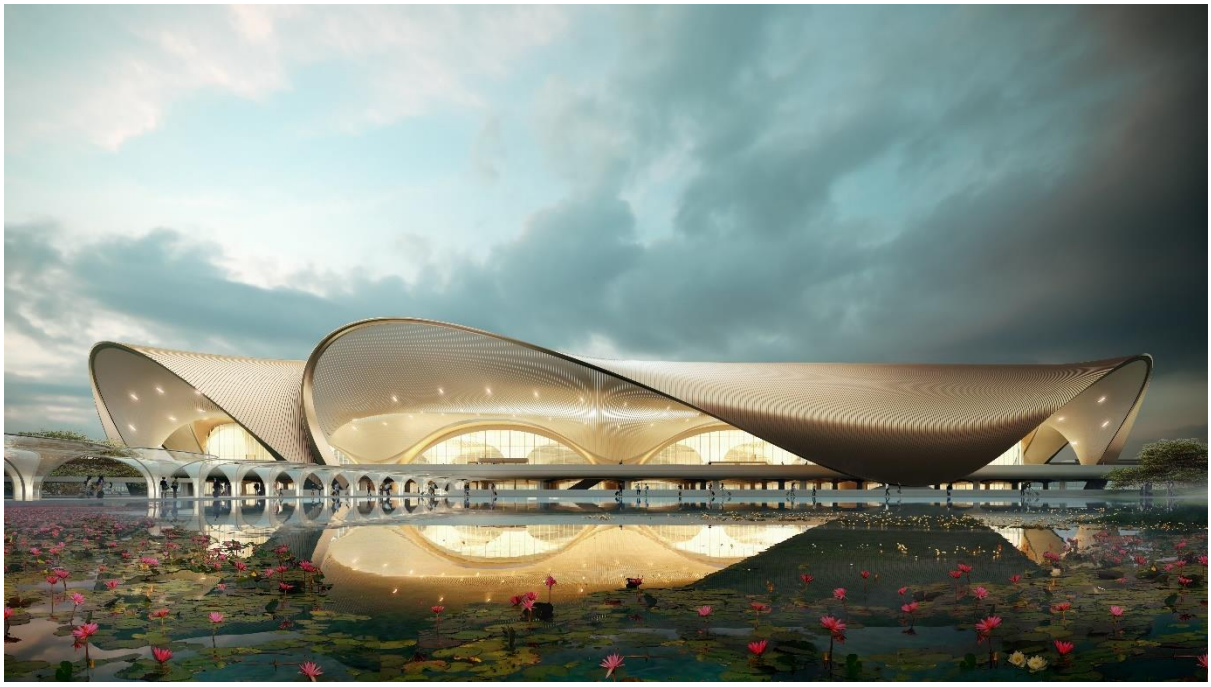
NAVI MUMBAI INTERNATIONAL AIRPORT



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Status:	In-Progress
Document Title:	BIM Execution Plan
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0	25-03-2022	For Approval	Potu	MJG	NG/KSP/MJG
1	28-05-2022	For Approval	Potu	MJG	NG/KSP/MJG
2	01-08-2022	For Approval	Potu	MJG	NG/KSP/MJG

Acronyms

BEP	BIM Execution Plan
BIM	BIM Building Information Modelling
CDE	Common Data Environment
CDR	Clash Detection & Resolution process
COBie	Construction Operation Building Information exchange
DC	Document Control
DM	Document Management
DMS	Design Management System
DT	Design Team
DTM	Design Team Meeting
C4R	Collaboration for Revit
EDMS	Engineering Design & Management System
ER	Employers Requirements
FM	Facilities Management
GC/MC	General Contractor / Main Contractor
GIS	Geographic Information System
IFC	Issue for Construction
LOD	Level Of Development/Level of Detail of the model element
MED	Model Element Matrix
MEP	Mechanical, Electrical and Public Health
MBR	Monthly BIM Report
QA / QMS	Quality Assurance / Quality Management System
QTO	Quantity Take-Off
TBA	To Be Advised / To Be Approved
TBD	To Be Decided
VC	Video Conference
VR/MR	Virtual reality/ Mixed Reality
WBR	Weekly BIM Report

Terms and Definitions

BIM	BIM stands for Building Information Modelling, which is a "model based" process of generating and managing building data during the life cycle of a project.
Asset Information Model	Field verified 'as built' model(s) with validated data and documentation.
Augmented reality	Live view of a physical, real-world environment whose elements are augmented (or supplemented) by computer-generated sensory input such as sound, video, graphics etc.
BIM Author	Any Project Team Member responsible for authoring the Project BIM
BIM Model	Up-to-date 3D models and associated information for the project A subset of the Project BIM identified by a discipline or trade for which in most cases the responsibility will rest with a specific BIM Author.
BIM Leader	The assurance and approving authority and representative of the SC
Building Information Management	A managed approach to the collection and exploitation of information across a project. At the heart of the process lies computer-generated 3D model(s) containing all graphical and tabular information about the design, construction, and operation of the asset. For clarity, the term BIM includes the act of 3D and information modelling.
	Important Note: There are several terms incorporating the word BIM used in this document. They are to be understood as per the explanations in this and the following sections and not to be read by expanding BIM (as Building Information Management).
Level of Definition	Combination of the Level of Development (LOD) and Level of Information (LOI).
BIM Model	3D Revit model created for the entire project and / or parts of the project model containing discipline specific building elements or components, e.g. Architectural, Structural, MEP, and Civil.
Component	A component is a model element that can be reused in a number of situations. Examples include doors, stair cores, furniture, façade panels, columns, walls etc. Components are typically inserted and moved/rotated into required position.
Family	A Revit component as described above.
Federated model	A federated model is a composite model consisting of linked but independent components or native models

It may be noted that this document has undergone modification to include the employer's comments. However, in case of ambiguity the requirement set in the contract shall govern.

1 SECTION- A : PROJECT INTRODUCTION

1.1 PROJECT DETAILS

Project Name:	Engineering, Procurement and Construction of the Main Works of the Airport at Navi Mumbai.
Employer:	Navi Mumbai International Airport Private Limited.
Project Location:	Ulwe, Navi Mumbai.
Project Scope:	A Greenfield Airport of 20MPPA in Phase 1 along with other associated facilities to make it functional.

1.2 PROJECT DESCRIPTION

Navi Mumbai International Airport is a Greenfield airport developed for the Mumbai Metropolitan Region, which shall operate alongside Chhatrapati Shivaji Maharaj International Airport (CSMIA) located in suburban Mumbai, Maharashtra. The proposed Master Plan for NMIA includes 4(four) phases with an ultimate capacity of 60 (sixty) Million Annual Passengers (MAP). The initial development of the airport to operate with a declared capacity of 20 MAP, shall be completed and commissioned in Phase-1&2.

Image: 1.01

This BIM Execution Plan prepared by the EPC Contractor is a core document to explain the EPC's methodology for delivering the project using BIM as well as to achieve the Employer's Requirements defined in Volume 3 of the Contract and per associated standards. This document will guide the process of BIM on the Project and shall address the required inputs and outputs at each stage. It will also serve as a series of defined project level instructions and guidelines on the method of provision of integrated processes which are to be followed throughout the design and delivery of the Project.

This document shall mandatorily be read in conjunction with the Contract and Volume-3 Employer's Requirements, Appendix 3. Considering the dynamic nature of the Project, it is also understood that this document may be periodically reviewed for updates

1.3 PROJECT MILESTONES

Below are the major milestones including

- DD submission
- GFC submission
- As built & handover submission

All the Project milestones and Deliverables are in a Separate document – Drawing Control Index.

1.4 PROJECT BIM TEAMS

The present Work involved is L&T teams, which Includes B&F IC and TI IC and NMIAL employer team, and subsequently we can add other consultants/ sub- contractors coming on board.

Role and Name	Contact Details
Employer-BIM Manager	
Tushar Kulkarni	**Tel:** 9923881900 **Email:** tushar.kulkarni@adani.com
EPC Contractor-BIM Manager	
Potu Raghuram	**Tel:** 9445045899 **Email:**potu@lntecc.com
EPC Contractor B&F IC Design team	
Marie Joseph Gerard	**Tel:** 9176276103 **Email:**mjg@lntecc.com
EPC Contractor TI IC Design Team	
Sithara Chandran	**Tel:** 9833674672 **Email:**sithara@lntecc.com
EPC Contractor Project Controls team (4D activities)	
Bharat Yadav	**Tel:** 9444398697 **Email:** by@lntecc.com
EPC Contractor construction team (logistics planning)	
Bharat Yadav	**Tel:** 9444398697 **Email:** by@lntecc.com
Package wise Subcontractor(s)	
TBD	**Tel:** **Email:**
Design Consultant(s)	
TBD	**Tel:** **Email:**

Table: 1.01

1.5 PROJECT OBJECTIVES

To achieve 100% in developing the Parametric BIM model up to the level of LOD 500 in construction-GFC and as-built model.

All consultants and sub consultants (architecture, structure, MEP, fire protection, BHS, etc.) will create a BIM model and produce 2D construction documents natively using Autodesk Revit (current approved version-Revit 2023) or equivalent software.

"COBie stands for the Construction Operations Building Information Exchange, and it is an international standard that relates to the exchange of building information. It is most commonly used in the product data handover from the construction team to the operations team.

COBie is a data structure intended to replace unorganized traditional handover documentation with organized handover information that can be input directly into facility operations, maintenance and asset management software systems at project completion.

To prepare 4D construction sequence and simulations using specified software tools (Autodesk Navisworks) and monitor progress visually through Planned vs Actual comparisons.

The models developed for this Project are intended to be used in the following purposes:

- Quantity take-offs (QTO)
- Clash analysis & resolution
- Shop drawing preparation.
- Construction progress reporting at regular intervals
- Preparation of COBie documentation
- Schedules
- As built models
- Compatible to BIM 360 construction.

1.6 PROJECT BIM STRATEGY

The objective is to have a BIM process that will ensure that the multitude of stakeholder requirements and design interfaces across the package are managed through a collaborative 3D model-based environment which is reliant upon quality information management. Our BIM approach shall be able to optimize the working and performance enhancements to be achieved as we look beyond the convention approach that models are purely a 3D physical representation of an asset.

1.6.1 EPC's Sub Contractor Model strategy

L&T Building and Factories will prepare all the models in NMIAL CDE which is provided by EPC contractor. After DD submission, access to the Model located in CDE shall be provided for Particular Vendor / Subcontractor for preparation of Shop Drawings/ As- Built.

1.6.2 Model Element Matrix

The below listed model element matrix is applicable to buildings listed in Section C- 3.2

	DETAILED DESIGN STAGE		CONSTRUCTION STAGE		AS BUILT	
	LOD	MEA	LOD	MEA	LOD	MEA
SUBSTRUCTURE						
Foundations						
Standard Foundations	350	EPC	450	EPC	500	EPC
Special Foundations	350	EPC	450	EPC	500	EPC
Slab on Grade	350	EPC	450	EPC	500	EPC
Basement Construction						
Walls	350	EPC	450	EPC	500	EPC
SUPERSTRUCTURE						

Primary Frame	350	EPC	450	EPC	500	EPC
Secondary Frame	350	EPC	450	EPC	500	EPC
Floor Construction	350	EPC	450	EPC	500	EPC
Roof Construction	350	EPC	450	EPC	500	EPC
SHELL						
Envelope						
Exterior Walls	350	EPC	450	EPC	500	EPC
Exterior Windows	350	EPC	450	EPC	500	EPC
Curtain Walls	350	EPC	450	EPC	500	EPC
Exterior Doors	350	EPC	450	EPC	500	EPC
Roofing	350	EPC	450	EPC	500	EPC
Roof Coverings	350	EPC	450	EPC	500	EPC
Roof Opening	350	EPC	450	EPC	500	EPC
INTERIORS						
Interior Construction						
Interior Walls	350	EPC	450	EPC	500	EPC
Interior Windows	350	EPC	450	EPC	500	EPC
Interior Curtain Walls	350	EPC	450	EPC	500	EPC
Interior Doors	350	EPC	450	EPC	500	EPC
FF & E	350	EPC	450	EPC	500	EPC
Stairs						
Stair Construction	350	EPC	450	EPC	500	EPC
Interior Finishes						
Raised Floors	350	EPC	450	EPC	500	EPC
Suspended Ceilings	350	EPC	450	EPC	500	EPC
BUILDING SERVICES						
Conveying Systems						
Lifts	350	EPC	450	EPC	500	EPC
Escalators	350	EPC	450	EPC	500	EPC
Other Systems	350	EPC	450	EPC	500	EPC
Mechanical Services						
Heating Generation	350	EPC	450	EPC	500	EPC
Cooling Systems	350	EPC	450	EPC	500	EPC
Distribution Systems	350	EPC	450	EPC	500	EPC

Terminal Units	350	EPC	450	EPC	500	EPC
System Testing	350	EPC	450	EPC	500	EPC
Other HVAC Systems	350	EPC	450	EPC	500	EPC
Electrical Services						
Electrical Distribution	350	EPC	450	EPC	500	EPC
Lighting	350	EPC	450	EPC	500	EPC
Communications	350	EPC	450	EPC	500	EPC
Security Systems	350	EPC	450	EPC	500	EPC
Other Electrical Systems	350	EPC	450	EPC	500	EPC
Fire Protection						
Sprinklers	350	EPC	450	EPC	500	EPC
Standpipes	350	EPC	450	EPC	500	EPC
Fire Protection Systems	350	EPC	450	EPC	500	EPC
Other Fire Systems	350	EPC	450	EPC	500	EPC
Public Health						
Sanitary ware	350	EPC	450	EPC	500	EPC
Water Distribution	350	EPC	450	EPC	500	EPC
Sanitary Waste	350	EPC	450	EPC	500	EPC
Rain Water Drainage	350	EPC	450	EPC	500	EPC
Other Plumbing Systems	350	EPC	450	EPC	500	EPC
EQUIPMENT						
Equipment						
Commercial Equipment	350	EPC	450	EPC	500	EPC
Special Equipment	350	EPC	450	EPC	500	EPC
Other Equipment	350	EPC	450	EPC	500	EPC
Fittings						
Fixture Furniture	350	EPC	450	EPC	500	EPC
EXTERNAL						
Landscaping						
Roadways	350	EPC	450	EPC	500	EPC
Parking Lots	350	EPC	450	EPC	500	EPC

Pedestrian Paving	350	EPC	450	EPC	500	EPC
Hard Landscaping	350	EPC	450	EPC	500	EPC
Soft Landscaping	350	EPC	450	EPC	500	EPC
Street Furniture	350	EPC	450	EPC	500	EPC
Irrigation	350	EPC	450	EPC	500	EPC
Landscape Lighting	350	EPC	450	EPC	500	EPC
Water Features	350	EPC	450	EPC	500	EPC
Underground						
Underground Drainage	350	EPC	450	EPC	500	EPC
Water Supply	350	EPC	450	EPC	500	EPC
Sanitary Sewer Systems	350	EPC	450	EPC	500	EPC
Other Utilities	350	EPC	450	EPC	500	EPC
Electrical	350	EPC	450	EPC	500	EPC
Lighting	350	EPC	450	EPC	500	EPC
CONSTRUCTION SYS.						
Temporary Works						
Temporary Structures	200	EPC	200	EPC	200	EPC
Enabling Works	200	EPC	200	EPC	200	EPC
Speacial Systems	200	EPC	200	EPC	200	EPC
Site Logistics						
Tower Crane	200	EPC	200	EPC	200	EPC
Hoists	200	EPC	200	EPC	200	EPC
Site Welfare Facilities	200	EPC	200	EPC	200	EPC
Temporary Security	200	EPC	200	EPC	200	EPC
Construction Act. Space	200	EPC	200	EPC	200	EPC
Logistics	200	EPC	200	EPC	200	EPC
BIM USES						
Design Reviews	350	EPC	450	EPC	500	EPC
3D Coordination	350	EPC	450	EPC	500	EPC
Clash Detection	350	EPC	450	EPC	500	EPC
Construction Seq.	300	EPC	300	EPC	N A	EPC
As Built Models	N A	N A	500	EPC	500	EPC

Table: 1.02

In General, elements smaller than 25mm shall not be modelled eg. Electrical /IT Wires & conducts, paint surface, Hardware sets for Door windows etc.

All reinforcements, Structural inserts in all RCC structures internal, external, supplementary type shall not be modelled.

However, their 2D representations shall be indicated in the sheet files for conveying accurate design intent.

2 SECTION- B: BIM SCOPE OF WORK

The Building information management (BIM) has been identified as a fundamental process for ensuring efficiency, quality and delivery of the Navi Mumbai International Airport.

This document 'BIM Execution Plan for NMIA (hereinafter referred to as 'BEP') presents an agreed unified approach for delivering the BIM requirements

as set forth in the "Volumne-3 Appendix - 3 of Employer's Requirements - NMIA BIM Management Plan"(hereinafter referred to as NMIA BIM-MP). In conjunction with that document, this BEP forms the complete source of information concerning BIM on the NMIA project.

- This document is binding on all Project Team Members responsible for authoring and quality assurance of BIM Models and associated data.
- All Project Team Members shall comply with the BEP BIM Requirements and NMIA BIM-MP in its entirety.
- A thorough understanding of the NMIA BIM-MP is a prerequisite to using this document.
- In the event of conflict between the two documents, the details presented in the NMIA BIM-MP requirements shall prevail unless exceptions/non-compliance has been documented explicitly in this document with NMIA approval.
- This shall be the only BIM Execution Plan used by all the Project Team Members. All relevant organizational standards and methods of working shall be incorporated as per this BEP.
- The BEP is a 'live' document and shall be kept up to date with agreed amendments that reflect changes to the Project, the Project Team Members, NMIA BIM-MP requirements, and any other project environment.

2.1 BIM SCOPE ACROSS THE PROJECT

The EPC Contractor’s scope of work in general for the above mentioned 20 MAP includes the following facilities which shall be read in conjunction with volume 3 employer requirement.

1. Passenger Terminal buildings.
2. Land side facilities including roads & parking
3. Support facilities
4. Utilities
5. Airfield development works

2.2 EY PROJECT STAKEHOLDERS:

Employer	**NMIAL**
EPC Contractor	**L&T Construction (L&T)**
L&T B&F IC -Design team L&T TI IC -Design team	**Architectural, Structural, HVAC, Electrical, IT & Airport system, FEMS , PHE, External consultants.** **Geotech, Pavements, Drainage, Structural, Traffic, Lighting**
Subcontractors	**For the above EPC 2 works**
Related works contractors/Consultants	**As advised by NMIAL**

Table: 2.02

2.3 STAKE HOLDER RESPONSIBILITY

Role	Responsibility
NMIAL (Employer)	a) Ensure that compliant component parts of the Information Model are received from the Employer and disseminated.
Project BIM Manager (EPC)	a) Responsible for ensuring processes and collaborative behaviours are fully embraced across the project. b) Be a focal point for all data/ information management issues on the project. c) Responsible for coordinating the project needs for IT solutions. d) Responsible for implementing data and information structure standards for the Information Model (to meet Employer's requirements). e) Ensure the components of the BIM Model are strictly controlled and disseminated efficiently to the intended parties using a mechanism of document distribution which eradicates copy documents in circulation. f) Set-up and manage the Common Data Environment (CDE). g) Manage the CDE processes and validate compliance (including agreeing information exchange protocols and processes). h) Responsible for ensuring that the BIM Model has been produced, used and managed in accordance with the Employer's Requirements and BIM Execution Plan. i) Trigger sharing data and information once a month.

	j) Responsible for educating and training the project team on the BIM standards and process adopted for the project.
Design Coordination Manager (EPC-Site)	a) Provide a communications link between the various design teams and the construction teams. b) Coordinate the design deliverables of the EPC's design teams, specialist consultants; if any, Contractors, and Sub-contractors against the construction programme to ensure delivery in accordance with the agreed project programme.
Discipline Leads	a) Manage the design, including the development and approvals of the BIM Model. b) Responsible for co-ordinating the delivery of the BIM Model in accordance with the agreed project programme. c) Responsible for ensuring all approvals are in place for their team's components of the BIM Model prior to publishing to the Project Shared Area for sharing with EPC design team. d) Responsible for publishing their task team's components of the BIM Model to the Project Shared Area for sharing with other project participants or exchanging with the Employer.

Table: 2.03

Refer attached Annexure-A stake holder's chart.

3 SECTION- C: BIM EXECUTION AND DELIVERY

3.1 DELIVERY OF INFORMATION TO NMIAL

The BIM deliverables indicated below shall be submitted with the standard deliverables for each project phase. The level of development for each BIM deliverable shall at a minimum be sufficient to fulfil the 2D document submission requirement.

- Drawings/documentation
- Design reviews
- Clash detection
- Construction & Planning (4D activities)
- Schedules
- As built / record model with CoBie data All the 3D files shall be available for view access in BIM 360 Cloud

3.2 PROJECT BIM DOCUMENT INDEX

Below is the broad list of facilities including airside and land side works that will be considered for modelling. Refer volume 3 employer requirement for detailed list of works/ facilities.

S.No	Building name
A	**Terminal and Others**
1	Passenger Terminal Building
2	Forecourt area
3	MLCP & PTB connection
4	Utility Trench
B	**Landside facilities - parking and security check points**
1	Multi-Level Car parking
2	Secirity Checkpoints (landside)
3a	Parking- Cafeteria and Toilet - East
3b	Parking- Cafeteria and Toilet - West
C	**Support facilities**
1	South ARFF with ATC tower
2	ATC technical block
3	Airport maintenance building
4	Meteorological station
5	NavAids support building - ASR
6a	NavAids support building - SMR
6b	NavAids - Localiser - East
6c	NavAids - Localiser - West
6d	NavAids - GPA - East
6e	NavAids - GPA - West
6f	NavAids - DVOR
7a	Gate house - East

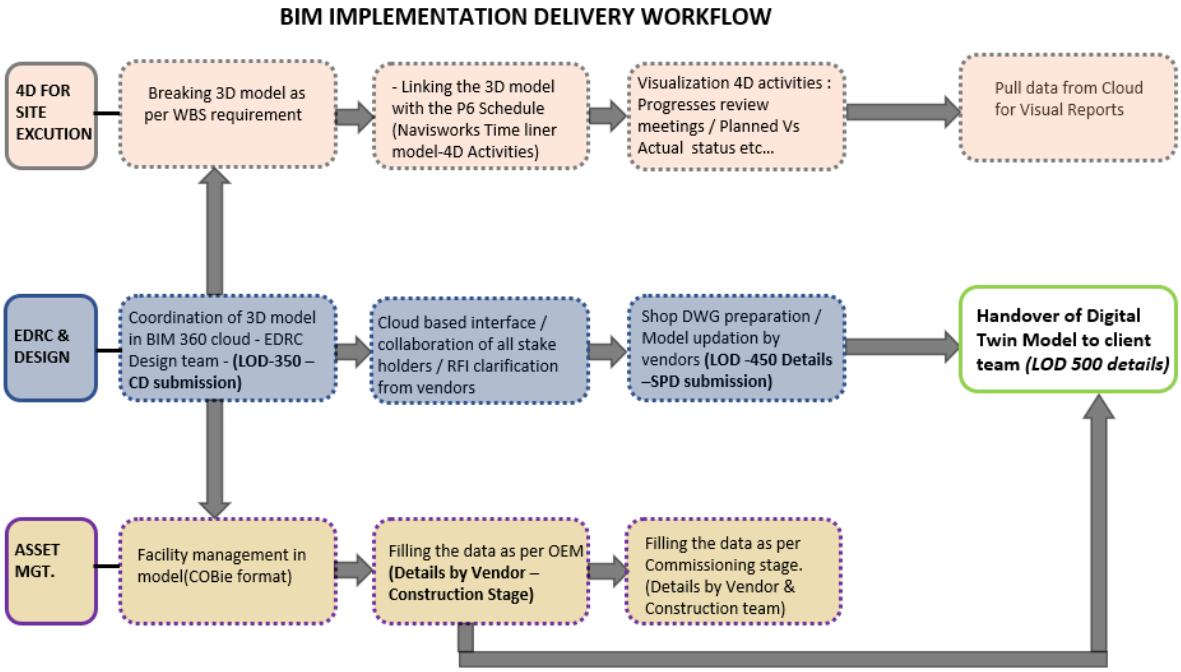
7b	Gate house - West
8a	AGL sub-stations/CCRs - East
8b	AGL sub-stations/CCRs - West
D.	**Utilities**
1	Chiller plant and cooling water
2a	Water tank and pump house - East
2b	Water tank and pump house - West
3a	Sewerage treatment plant - East
3b	Sewerage treatment plant - West
4a	Triturator - East
4b	Triturator - West
5a	Solid waste facility - East
5b	Solid waste facility - West
6	33KV GIS receiving sub - station
7	DSS - E
8	DSS - W
9a	Collection well - Terminal
9b	Collection well- Utilities West
9c	Collection well - Parking
9d	Collection well- MLCP
9e	Collection well- Hotel
E	**Airside Development works**
1	South Runway system including associated works
2	Taxiway System including associated works
3	Apron System including associated works
4	AGL system including associated works
F	**Land side Development works**
1	Parking including MLCP
2	Roads

Table: 3.01

The facilities listed above does not limit any of the buildings / facilities that are part of scope of the contract and any new facility/building that may be added in the scope of work later in the timeline of the project.

Refer attached Annexure-B list of model files & Sheet files.

3.3 BIM EXECUTION METHODOLOGY



All 3D model files will contain the respective 3D objects only, while sheet files will carry the respective drawings (No model geometry).

All Architectural, Structural & MEP service models for the **terminal building** will be created separately, as per the below mentioned zoning methodology.

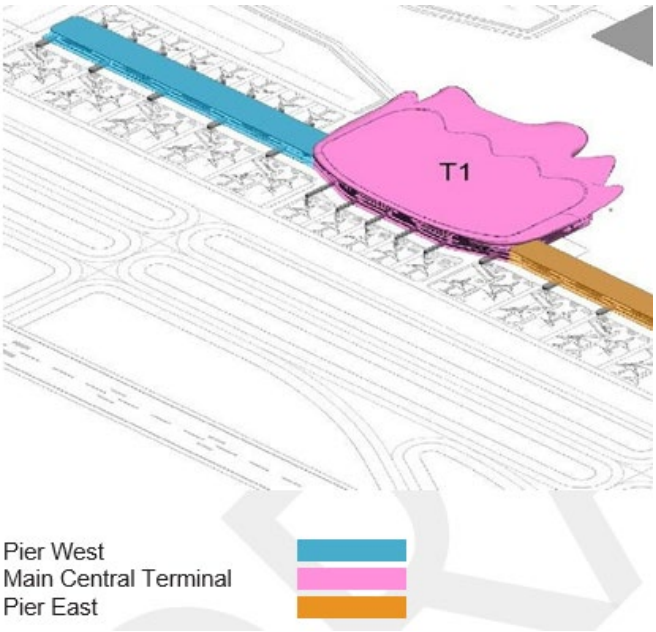


Image: 3.01

Remaining all building models will be created building wise & service wise

3.3.1 3D Modelling

- Parametric modelling of all building works (3DModeling) as per construction sequency
  - Site modelling (Topography/ road network, side walks etc..)
  - All building positions with respective master plan layout
  - Structure elements modelling like: Substructure & Super structure
  - Architectural elements
  - Envelope elements including roof
  - MEP Elements
  - Architectural finishes

- Spatial coordination between all disciplines of the projects.
- Quantity take-offs.
- Design Documentation

3.3.2 4D Activities

- Site analysis for logistics and construction equipment placement
- Sequencing of construction tasks
- Construction scheduling & progress reporting at regular intervals (mutually agreed schedule.)

3.3.3 As built

- As built models
- Preparation of COBiE documentation and data integration in the as built models.

Refer attached Annexure-C detailed workflow BIM execution methodology.

3.3.4 Software list.

Below listed software have been identified for preliminary working. Additional software will be added as per requirement after approval from NMAIL .

Sr.No	BIM Objective	Primary BIM Software	Version
1	ARCHITECTURAL WORKS	Revit	2023
2	STRUCTURAL	Revit /Tekla	2023
3	MEP SERVICES	Revit	2023
4	EXTERNAL WORKS	Revit /CIVIL 3D	2023
5	IT/SECURITY	Revit	2023
6	BHS SYSTEMS	Revit /Vendor specified Software	2023
7	CLASH DETECTION	Navisworks	2023
8	4D SIMULATION	Navisworks	2023
9	COBie	Excel /PDF /IFC	
10	AIR side works	Auto CAD/Revit	2023
11	As built	Revit /Auto CAD	2023

Table: 2.01

3.4 BIM USES MATRIX

GOAL	KEY NOTES	DESCRIPTION
1	Interface	Prepare & share the BIM models between project stake holders to coordinate: • Between the interfaces and junctions between different design packages. • Between different Buildings and construction packages • Between different material finishes (Visualization studies) • Between different battery limits
2	Clash analysis	Conduct conflict resolution analysis during design to eliminate design clashes, resulting in a well-coordinated model prior to construction.
3	Constructability review	Utilize model for 3D Design Reviews to assist with equipment clearances and Employer's design decisions.
4	Coordination process	Conduct coordination review of key systems with all stake holders and specialty trade contractors during construction.
5	Asset information	Include and/or link all information in the model as per NMIAL required COBiE parameters at different stages of submission.
6	Shop drawings	Prepare accurate design and construction documents from the model to establish basis of design within the traditional standard code of provisions that govern the design of the project.
7	QTO	Utilize model for quantity extraction to enable material management.
8	4D activities	To prepare 4D construction sequence and simulations and monitor progress visually through Planned vs Actual comparisons.
9	CDE	Use BIM360 applications for sharing and accessing latest 3D models during design and construction phases.
10	VR /MR	Shall Pilot on utilizing latest VR/MR technologies for better collaboration and utilization of BIM during design and construction phases.

Table: 3.02

3.5 BIM MODELLING STANDARDS

3.5.1 Model Base point

The architectural model shall act as the basis for the coordinate systems. The Project Shared Coordinates system shall be established by the Architect and then adopted across all native models.

3.5.2 Units & Measurement

Models shall use consistent units and measurement across the project. Default project units shall be millimetres with two decimal places to display accuracy in the temporary dimensions.

Site layout drawings relating to the project coordinate system to an accuracy of 3 decimal places.

• 1 unit = 1 millimeter

Elements, details, sections, elevations and building structure outlines to an accuracy of 0 decimal places. CAD data shall be scaled to the appropriate units prior to linking into the BIM environment

3.5.3 Model accuracy and tolerance

All models to be drawn at 1:1 scale (1 unit = 1 millimetre) and should include all appropriate dimensioning as needed for design intent, analysis, and construction.

Default project units shall be millimetres with two decimal places to display accuracy in the temporary dimensions. Models from different disciplines shall use consistent units and measurement across the project and in accordance to BS1192:2007 and AEC (UK) BIM Standards for Revit rev2.

3.5.4 Coordinate system

The architectural model shall act as the basis for the coordinate systems. The Project Shared Coordinates system shall be established by the Architect and then adopted across all native models.

The EPC Contractor shall coordinate and review with all Subcontractors associated with the Project. N/S:2100019611.980, E/W: 294492173.332 & rotation angle 352.99999962°deg shall be used for this purpose.

3.5.5 Model Position

Architecture models have been setup via project-based point and inter linked to each other by Project base point to project basepoint. The BIM Manager shall coordinate within the team for all stakeholders to acquire project coordinates from the central Architectural model or a master grid file created for such purpose.

3.5.6 True North Angle

N/S : 2100019611.980	Latitude	18° 59' 40" N
E/W : 294492173.332	Longitude	73° 04' 13" E
ANGLE: 352.99999962°		

3.5.7 Site BIM Model & Grid System

Site BIM model shall contain the entire project site, Project Boundary compound walls, Boundary walls for 20MAP project boundary, Boundary wall between Airside & Landside, Boundary wall between different facilities & other external works details like marking the plots as per Mater plan, etc.

Refer attached Annexure D for the grid system

3.5.8 Service disciplines colour codes & Design stage codes

Discipline Code	Description
AC	Acoustics
AP	Airside Planning
AR	Architectural
AS	Aviation Information System
BH	Baggage Handling
CO	Communication
CV	Civil
EL	Electrical
EN	Envelope
ES	Electronic Monitoring System
FA	Fire Alarm System
FP	Fire Protection
GN	General
GR	Graphics and Signage
IT	ICT
IN	Interiors
LA	Landscape
LP	Landside Planning
LG	Lighting
ME	ME Mechanical
PL	Plumbing
PS	Public Information System
RS	Retail Strategy
SS	Security and Access Control
SW	Signage &Wayfinding
ST	Structural
SU	Sustainability
VT	VHT

Table: 3.03

The below listed colour codes proposed for each MEP system in BIM modelling.

S.No	System Name	Color	Color Code
1	E_Lan	Yellow	255. 255.000
2	E_Speaker	Yellow	255. 255.000
3	E_DDC	Yellow	255. 255.000
4	E_Etbs	Yellow	255. 255.000
5	E_Cctv	Yellow	255. 255.000

6	E_Access Control	Yellow	255. 255.000
7	E_Junction Box	Yellow	255. 255.000
8	E_Diesel Generator	Yellow	255. 255.000
9	E_Transformer	Yellow	255. 255.000
10	E_Scribber	Red	255.000.000
11	E_Fuel Pipe	Red	255.000.000
12	E_Exhaust Routing	Red	255.000.000
13	E_hume Pipe	Blue	000.000.255
14	E_Earth Mat	Magenta	255.000.255
15	E_Street Light	Yellow	255. 255.000
16	E_Earth Pit	Yellow	255. 255.000
1	E_Cable Tray	Magenta	255.000.255
2	E_Light Fixture	Yellow	255. 255.000
3	E_Power	Yellow	255. 255.000
4	E_panel	Yellow	255. 255.000
5	E_Earth Strip		255. 159.127
6	E_Earth Bus		255. 159.127
7	E_CU Strip		255. 159.127
8	E_Cable Trench	Cyan	000.255.255
9	E_Cable Routing		204.000.102
1	M_Supply Air Duct		000.191.255
2	M_Return Air Duct	Magenta	255.000.255
3	M_Exhaust System Duct Work		127.000.255
4	M_Flexible Duct	Green	000.255.000
5	M_Outside Air Duct		191.000.255
6	M_Secondary Supply Air Duct	Blue	000.000.255
7	M_Ventilation Air Duct		255.128.128
8	M_Fresh Air Duct		123.036.114
9	M_Pressureation Air Duct		128.064.000
10	M_Smoke Air Duct		098.098.049
11	M_Transfer Air Duct		128.064.064
12	M_Toilet Exhaust Air Duct		117.000.117
13	M_Bypass Air Duct		000.128.255
14	M_Chilled Water Supply	Cyan	000.255.255
15	M_Chilled Water Return	Red	255.000.000
16	M_Condenser Water Supply		255.159.127
17	M_Condenser Water Return		204.000.000
18	M_Condensate Drain Piping		255.191.127
19	M_Refrigerent Pipe		000.000.127
20	M_Condenser Pipe		063.127.000

1	P_dewat_HDPE		000-130-255
2	P_Sewag pmpng		130-000-255
3	P_soil_upvc		225-175-200
4	P_waste_upvc		225-255-255
5	P_soil_C.I.		225-175-200
6	P_waste_C.I.		225-255-255
7	P_rigid pvc-soil		230-200-200
8	P_rigid pvc-waste		190-255-255
9	P_MS pipe		255-225-165
10	P_flush wat_cpvc		165-255-165
11	P_dome wat_cpvc		130-130-255
12	P_soft cold wat_cpvc		165-165-255
13	P_soft hot wat_cpvc		220-225-000
14	P_hot wat_cpvc		100-185-000
15	P_hot wat-return_cpvc		100-175-225
16	P_flush wat_HDPE		165-255-165
17	P_dome wat_HDPE		130-130-255
18	P_soft cold wat_HDPE		165-165-255
19	P_soft hot wat_HDPE		220-225-000
20	P_hot wat_HDPE		100-185-000
21	P_hot wat-return_HDPE		100-175-225
22	P_flush wat_G.I.		165-255-165
23	P_dome wat_G.I.		130-130-255
24	P_G.I-waste pipe-floor trap		225-255-255
25	P_rain water_upvc		165-255-165
26	C-AIRP-PRTY-BDRY		0-165-82
27	C-FUEL-STTN		95-63-127
28	PL-PRPD-RECT-DRAN		0-191-255
29	E-DUCT-AGLX--DU02		0-63-255
30	E-SECO-COND-50MM		255-0-255

Table: 3.04

3.5.9 Project BIM models & volume Segregation Strategy

Refer Section C- 3.2 for the building details and Annexure -A for the BIM file Segregation list.

3.6 BIM MODEL EXTENTS

The model will include the below listed elements. Rerefer Section A- 1.6.2 for detailed MEA (Model Element Authorship)

- Below ground and below slab services
- All above ground accommodation
- All basement structures
- External works and support buildings
- Hard Landscaping & water bodies

- Below ground, incoming and outgoing, site infrastructure services
- Civil (including external roads and footpaths)
- Structural elements
- MEP services.

3.7 LEVEL OF DEVELOPMENT IN GENERAL:

For the purpose of this document, below is a summary of LOD (Level of Detailing or Level of Development). The information is subject to change in line with the changes to International BIM Standards or LOD Standards or FM Standards.

LOD 200: The model element is graphically represented within the model as a generic system, object or assembly with approximate quantities, size, shape, location, and orientation.

LOD 300/350: The model element is graphically represented within the model as a generic system, object, or assembly in terms of quantity, size, shape, location, and orientation including MEP elements. Non-graphical information may also be attached to the Model Element.

LOD 450: The Model is a digital replica of the actual/physical construction suitable for conducting joint verification with various stakeholders of the Project.

LOD 500: As-Built Record model.

LOD to be followed in the project at different stages shall be as below:

- Detailed Design-LOD 300 /350
- Construction Documentation-LOD 400/450
- As-Built Documentation-LOD 500.

However, based on latest LOD details from BIM forum, LOD details can be updated with mutual agreement with Employer team.

3.8 DATA SEGREGATION (WORKSETS & LINKING)

Work sets shall generally adhere to the following logic but may vary between disciplines and evolve in response to Project needs as it progresses.

All elements are modelled with respective to the object names, arranged level wise. This promotes multiuser working without any interface issues. Each link files have a separate workset, in the below listed format. It will enhance the link file management systems.

Example: Level 0_Floors

Level 1 _ walls

Level B_foundations

For linking the other files will follow the following work set protocols

Ex: LINK_ NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMH01

3.9 DRAWING COMPILATION (SHEET TILING &SCOPING)

All the drawings shall be delivered as direct Pdf sheets printed from the Revit native BIM models.

The drawing outputs will be created in separate sheets.

The 2D drawings extracted from 3D BIM model will be exported as per requirements, on milestones, regarding naming conventions and graphic standards for any given part of the building by zones, areas, levels, specific details, or disciplines. The part of the BIM model relevant for the analysis is to be developed according to the BIM Modelling procedure.

The scope boxes in Revit to set out the A0/A1 sheets at the different drawing scales required. The scope boxes are named logically to inform the 'Sequence' field of the sheet number.

The scope boxes are to be shared with consultants to have consistency in the documentation across all disciplines.

A0 Drawing sheet for the terminal building.

A1 Drawing sheet for all other buildings including Support, facility buildings, airside and land side works .

The below zoning methodology will be planning to adopt for drawing preparation

Air Side and Land Side zones methodology

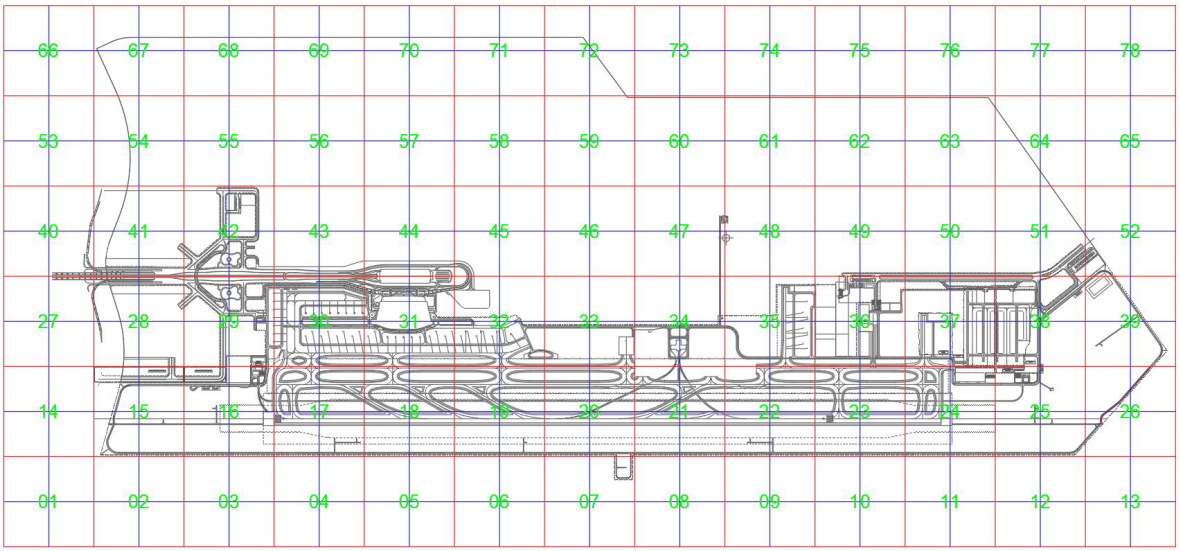


Image: 3.03

Terminal building zones methodology

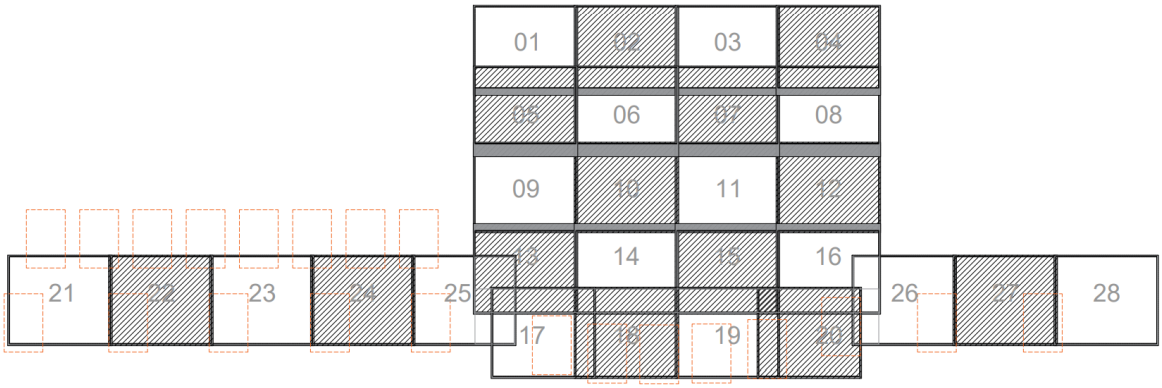


Image: 3.04

In addition to the above any further building's tiles shall be added an annexure in the document.

3.10 FOLDER STRUCTURE & NAMING CONVERSTION

The defined structure follows the principles of "Work in Progress (WIP) "and "Client shared" segregation of data within a designated set of folders.

Where a project comprises of several separate elements such as multiple buildings, zones or areas, the BIM structure shall be maintained within a set of designated sub-folders representing the various project elements

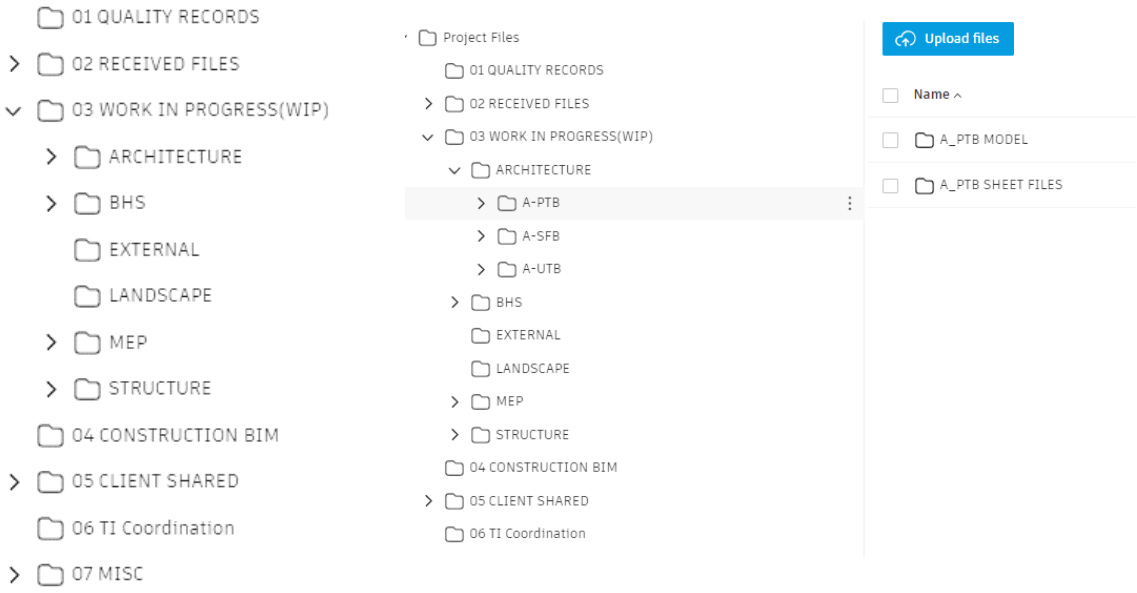


Image: 3.05

3.11 MODEL & FILE NAMING CONVENTIONS

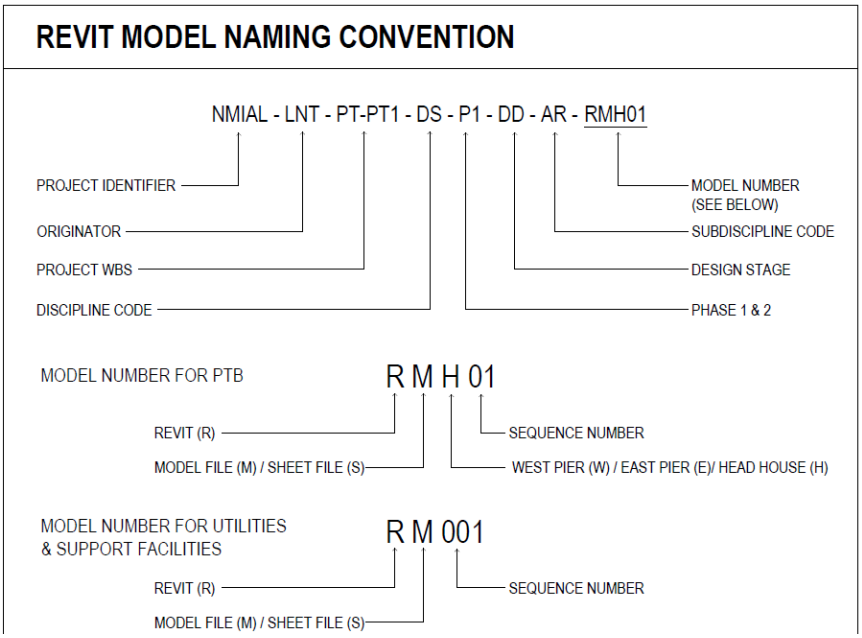


Image: 3.06

3.11.1 File Naming for Terminal Building:

Model file naming is divided, and group formatted as follows (Employer's standards)

Field 1	Field 2	Field 3	Field 4	Field 5	Field 6	Field 7	Field 8	Field 9	Field 10
NMIAL	LNT	PT-PT1	DS	P1	DD	AR	RM	H	01

Field 1: Project (5 Characters) Project Name – NMIAL

Field 2: Originator Code (3 characters) - Code that represents EPC Contractor in this case – LNT

Field 3: Project WBS (4 characters)-Identifier of building, PT-PT1 for Passenger Terminal building-1,

Field 4: Discipline Code (2 characters)- DS for design and planning

Field 5: Project Phase – P1 which combines Phase 1 and phase 2

Field 6: Design Stage (Recommended 2 characters) CD, SD, DD, GF etc.

Field 7: Subdiscipline code (Recommended 2 character) AR for Architecture

Field 8: RM for Revit model file, RS for Revit sheet file

Field 9: H for head house, W for west pier, E for east pier

Field 10: Model sequence number

Example: NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMH01

Example: NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSE01

3.11.2 File Naming for Support Facility and Utility Buildings:

Model file naming is divided, and group formatted as follows (Employer's standards)

Field 1	Field 2	Field 3	Field 4	Field 5	Field 6	Field 7	Field 8	Field 9
NMIAL	LNT	PT-PT1	DS	P1	DD	AR	RM	001

Field 1: Project (5 Characters) Project Name – NMIAL

Field 2: Originator Code (3 characters) - Code that represents EPC Contractor in this case – LNT

Field 3: Project WBS (4 characters)-Identifier of building, SF-XXX for Support Facility buildings, UT-XXX for Utilities buildings.

Field 4: Discipline Code (2 characters)- DS for design and planning

Field 5: Project Phase – P1 which combines Phase 1 and phase 2

Field 6: Design Stage (Recommended 2 characters) CD, SD, DD, GF etc.

Field 7: Subdiscipline code (Recommended 2 character) AR for Architecture

Field 8: RM for Revit model file, RS for Revit sheet file

Field 9: Model sequence number

Example: NMIAL-LNT-SF-AMB-DS-P1-DD-AR-RM001

Example: NMIAL-LNT-UT-CUP-DS-P1-DD-AR-RS001

3.11.3 Family Naming (Equipment naming)

Model family naming is divided, and group formatted as follows (EPC Contractor's Standards)

MEP Equipment naming -short form Equipment Name - Family Name

System code	Equipment code	Sequence Number
HVAC	FCU	001

Example: HVAC-FCU-001

Long form Equipment Number - Instance Name (Type) -Shared Parameter

Building Code	Floor level	Room Number	System Code	Equipment code	Sequence No
PT1	H0	Per Arch room	TBD	TBD	001,002

Example: PT1-H0-0024-01-HVAC-FCU-001

3.11.4 Room and Space Naming

Room & Space Naming will follow as per existing model conditions. (Employer's Standards)

Example:

BHS BREAK-UP
HB8001
12024 m²

3.12 BIM QUALITY ASSURANCE & QUALITY CONTROL

The purpose of this process is to ensure project teams adhere to the best practices in the development and file exchange of models and facility data. This will be an ongoing process, which will be conducted by the project team and validated by the BIM Manager at project milestones as well at random intervals to ensure that each model is being constructed in accordance with the BIM Standards discussed in this document and is suitably modelled for its intended use. The goal will be to ensure that there are no unresolved issues during construction or any significant loss of data upon transfer of As-Built models and record documents at facility turnover.

Each stakeholder shall be responsible for running quality control checks on their model(s) on a consistent and frequent basis. For issues involving others, the issue shall be made known to the corresponding Discipline Lead or BIM Manager.

CHECKS	DEFINITION	RECOMMENDED PROJECT MILESTONES
Standards	Ensure that BIM Standards and Guidelines have been followed	Preliminary Planning, Respective Design Stages, Construction Documents, Project Closeout Visual.
Visual	Ensure there are no unintended model components, and the design intent has been followed.	Respective Design Stages, Construction Documents, Project Closeout.
Model Integrity	Ensure that the facility Data set has no undefined, incorrectly defined, or duplicated elements; ensure a reporting process and corrective action plans have been developed for non-compliant elements	Construction Documents, Project Closeout.
Model Commissioning	Provide report verifying model and database compliance with defined quality control procedures for component LOD and stakeholder information	Construction Documents, Project Closeout.

Table: 3.05

Refer Annexure E for the BIM QA /QC checklist.

Points listed below shall be minimum check points while performing the model quality checks:

Check model file name conforms to Standards ☐

Review and fix all warning messages where possible ☐

Check that all families conform to relevant Standard naming conventions ☐

Check Line Styles conform to Standard naming conventions ☐

Check that all content is in the correct Work sets and conforms to Standards ☐

Check model is correctly assembled through visual inspection ☐
Splash page

3.13 DESIGN REVIEW & MODEL COORDINATION PROCESS

Design review and coordination workshops shall be conducted while the preparation of federated model(s) is in progress at each design stage. These shall be reviewed and interrogated, ensuring that the design meets project requirements, that the model content is as designed, and that the overall design is coordinated and integrated.

Prior to the programmed meetings, it will be the responsibility of the applicable Discipline Leads to ensure their designs have been checked, that a federated model of their discipline team is reviewed and available, that the complete design has been through the clash detection software and the model files are published to the agreed project shared area.

The federated models in conjunction with the clash detection reports will be assessed and where possible resolved during the workshops. Where issues are identified and are unable to be resolved within the workshop, an owner shall be assigned who will then be responsible to facilitate a resolution within an agreed timescale.

To control the clash detection, process the following hierarchy shall be used:

1. Architectural model including exterior envelope & interiors.
2. Structural model
3. MEP model
    a. Drainage (Gravity services will take priority)
    b. HVAC
    c. Electrical
    d. IT Systems
    e. Fire services
    f. Piping System
    g. Water Supply system
4. BHS systems
5. VHT Systems
6. Other Airport Systems

Design Review / Coordination Workshops

BIM shall be utilised to integrate & coordinate MEP services and generate clash free 3D models as well as extract corresponding drawings for execution.
For spatial coordination and clash detection, the model shall be coordinated with all the stake holders to identify the clashes between different disciplines and achieve a complete coordinated design of the project. Below workflow procedures explains the typical clash detection process.

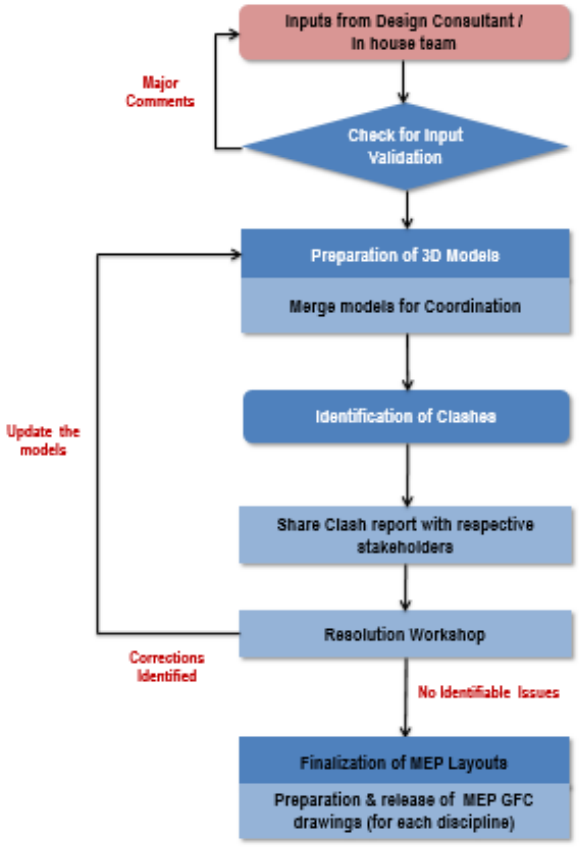


Image: 3.07

Autodesk Navisworks export trade colours for Spatial Coordination:

1.	Fire Protection	:	Red
2.	Plumbing	:	Magenta
3.	HVAC Duct	:	Blue
4.	HVAC Pipe	:	lime green
5.	Electrical	:	cyan
6.	Fire Alarm	:	Light Brown
7.	Pneumatic Tube	:	Dark green
8.	Concrete	:	Light grey
9.	Structural Steel	:	maroon
10.	Architectural	:	white
11.	PNG	:	yellow
12.	BHS	:	Dark grey

Refer attached annexure -F for a sample clash analysis report template.

3.14 BIM QA / QC WORKFLOW PROCEDURE FOR EMPLOYER REVIEW

The workflow procedure below is planned for NMAIL employer team review.

- Visualization & comments -BIM 360 docs
- Visualization through link Revit models.
- Visualization through Navis works.

3.14.1 Visualization & Comments -BIM 360

EPC Contractor will share the building wise files in employers shared location on mutually agreed time frame. All the files will have the version control.

Employer team will share the comments to the respective teams to address the issues.

All issues will control through dashboards. In terms of raised issues, open issues, closed issues, in review issues etc…

Sample image

Image: 3.07

3.14.2 Visualization through Link Revit models:

EPC contractor team will provide the link access (read access) to the employer team to review the models in building wise in employer shared location.

Employer team will review the models for any clarifications required.

3.14.3 Visualization through Navis works.

EPC contractor team will provide the coordinated Navis file to employer team for better visualization and understanding along with drawing submission

3.15 BIM COORDINATION MEETING(FREQUENCY)

The BIM Manager will plan, conduct, and manage the BIM coordination meetings across the total duration of the project. BIM manager will identify the frequency of design coordination meetings based upon the design and construction stages of the project. These meeting will be organized at regular intervals in alignment with the design/construction stage submittals in the respective phase of the project

Time and frequency of design coordination meetings will be additionally adapted to design stage and status of the scope and will be discussed during BIM execution Review meetings.

Collaboration meetings will be organized and held using a web-based system if stakeholders are not able to attend in person, otherwise are presumed to be attended in person.

After the meetings, the minutes of the coordination meeting including attendees, interference matrix and details as well as views about each discussed nterference should be recorded and sent to all meeting participants.

Type	Objective	Attendees	Frequency
Project Design Review	Review Federated Design Check Conflicts Check Clearances Baseline Coordinated Design	Architectural, Structural, all MEP Leads, Consultant's Lead & Employer's Representative	Once a Month(TBD)
Architectural & Structural Design Review	Review Federated Structural and Architectural Design Check Conflicts Check Clearances Baseline Design	Mechanical Lead, Electrical Lead, Public Health Lead, Structural Lead, Architectural Lead, Project Model Manager, Consultant Model Managers, Employer's Representative	Prior to release of Design Submissions
MEP Design Review	Review Combined Services Check Conflicts Between Designed Systems Check Clearances Between Designed Systems Baseline Design	Mechanical Lead, Electrical Lead, Public Health Lead, Fire Engineer, Structural Lead, Architectural Lead, Project Model Manager, Consultant Model Manager, Employer's Representative	Prior to release of Design Submissions
MEP Coordination	Review MEP And Fire Space Allocation Within Architectural and Structural Boundaries Review MEP And Fire Flow and Isolation Requirements, Functional Area Configurations and Fire Containment	Civil Lead, Architectural Lead, Structural Lead, Project Model Manager, Consultant Model Manager, Employer's Representative	Once every Fortnight
Model Coordination	Review Allocated Volumes	Consultant Model Managers, Project Model Manager, Lead Design Consultant Representative, Employer Representative, Architectural Lead, Project Model Manager, Consultant Model Managers, Lead Design Consultant Representative, Employer Representative	Once every Fortnight

Table: 3.06

3.16 BIM PROGRESS REPORTING

- Weekly BIM Progress Report

Weekly progress report as internal document will be used as a checklist of executed plans regarding BIM work in progress process. It shall be used as a marker for better coordination of all design teams helping to achieve planned goals on time.

- Monthly Progress Report

Monthly progress report as part of the Project Progress Report shall be indicator of the level of completion of each distinctive BIM process at the current stage of the project.

The report shall contain Modelling Progress Summary as a tabular display of progress for each of the buildings & disciplines. It shall contain columns showing planned activities, targets achieved.

As part of agreed submission schedules, BIM models shall also be submitted along with submission package.

Appendix to the report table shall be table showing graphical presentation of status for each model discipline.

Also, Clash Detection summary report with analysis and results will be part of the monthly report.

4D simulations screenshots and 4D comparisons Planned vs. Actual screenshots shall be included as a part of Monthly progress report in the construction stage of the project. "

3.17 COMMON DATA ENVIRONMENT (CDE)

An electronic workspace COMMON DATA ENVIRONMENT (CDE) shall be established for the purpose of efficient and timely transfer of model and database files. This workspace will provide a collaborative location where the current Contract Revit files, coordination files, and fully coordinated submittal files shall reside. Each BIM coordination team member shall store and obtain data from this location. Project team members shall be required to upload, update copies of their files, provide notification, and to make collaboration comments and annotations as often as necessary to achieve the deliverables.

A separate BIM 360 host created for NMIAL project requirement. All Stake holder for NMIA project shall use the same location for the data storage / sharing with other stake holders.

3.17.1 Data Exchange between L&T and internal teams

L&T Building and Factories will prepare all the models in NMAIL CDE and L&T Transportation and Infrastructure will prepare as per the local servers. For data exchange between two parties, L&T B&F will provide a common folder structure in NMAIL CDE with work-sharing collaboration.

3.17.2 Data Exchange between L&T and NMIAL

L&T Building and Factories will prepare all the models in NMAIL CDE and will provide a common folder structure in NMAIL CDE with view- access for work-sharing collaboration for NMAIL team data access.

3.17.3 Data Exchange between L&T and Subcontractors/Vendors

L&T Building and Factories will prepare all the models in NMAIL CDE. After DD submission, the Model will relocate in CDE shall be provided access for Particular Vendor / Subcontractor for preparation of shop drawings/ As- Build

S.No	Central Repository	Type of Documents	Particulars
1	EDMS	Project Management Commercial Organization assets Deliverables (Archive) All drawings and PDF's	All Engineering documents
2	BIM360 DOCS	All 3D models, Drawings and PDF's	Engineering documents like model, drawing, schedules, specification, reports etc.,
3	C4R	All 3D models, Drawings and PDF's	Sharing access of 3D models to the stake holders.

Table: 3.07

3.18 INTEROPERABILITY

In this project the interoperability is considered in following scenarios:

- Design information
- Construction information
- Coordination & Interface related Data
- As built data from various manufacturers

3.18.1 Introduction

The term interoperability is used to describe the capability of different programs to exchange data via a common set of exchange formats, to read and write the same file formats, and to use the same protocols.

3.18.2 Interoperability procedures

The possibility of interoperability scenarios:

- Graphical Element Data
- Non-Graphical Element Data

Graphical elements Data: Tekla, Civil 3D, 12D etc..

Non-Graphical element data: OEM data (Catalogues, spread sheets, warranty data, cut sheets etc…) from vendors / Suppliers

All Graphical elements which are prepared other than Revit software, will be converted from native format to IFC format & then imported to Revit with project base point as mentioned in the Section 3.5.6.

The same procedure will be adopted in conversion of Revit models to other software native formats also.

Illustrative example

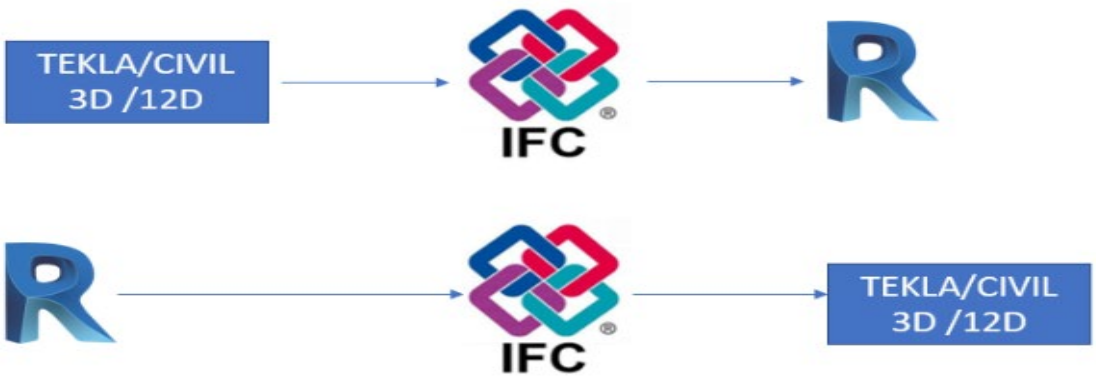


Image: 3.06

Non -Graphical element like, spread sheets, OEM manuals, product catalogues will be placed in NMAIL- CDE location as per mutually agreed folder locations.

The relevant data will be linked to the specified 3D object (Revit families) through COBie Parameters.

4 SECTION- D : BIM OUTCOMES

4.1 PROJECT DELIVERABLES:

The BIM deliverables indicated below shall be submitted with the standard deliverables for each project phase. The BEP has established the responsible parties and corresponding tasks for each deliverable. The level of development for each BIM deliverable shall minimum be sufficient to fulfil the 2D document submission requirement.

4.1.1 Design deliverable requirement

BIM DELIVERABLE	FORMAT	NOTES
BIM Project Execution Plan	.pdf	
Design Intent Model(s) (At completion of each design stage of the facility)	.nwd .rvt	See information Exchange Worksheet to ensure that the proper information is contained in the model
Design Drawings: (At completion of each design stage of the facility)	.rvt .pdf	Documents to be printed directly from model. Documents to be stamped and signed in traditional practice.
Interference Check Reports	.nwd .xls, .pdf	Clash reports generated from Navisworks
Facility Attribute Data Compliance Report (COBie).	.pdf .xls IFC	COBie data for High side equipment's. IFC format - Based on employer request.

Table: 4.01

4.1.2 Construction deliverable stages

BIM DELIVERABLE	FORMAT	NOTES
Construction Intent Model(s)	.nwd .rvt	See information Exchange Worksheet to ensure that the proper information is contained in the model
Construction documents	.pdf	Documents to be printed directly from model. Documents to be stamped and signed in traditional practice.
Interference Check Reports	.xls,, .pdf	Clash reports generated from Navisworks
4D simulations	.nwd,.pdf	4D construction sequence generated by linking construction schedule.
Facility Attribute Data Compliance Report (COBie).	.pdf,.xls, IFC	COBie data for high side equipment's. IFC format-Based on employer request.

Table: 4.02

4.1.3 Project closeout deliverable

BIM DELIVERABLE	FORMAT	NOTES
Record/ As- built Model	.rvt .nwd	See information Exchange Worksheet to ensure that the proper information is contained in the model
Record drawings	.pdf	Documents to be printed directly from model. Documents to be stamped and signed in traditional practice.
Facility Attribute Data Compliance Report (COBie).	.pdf,.xls,IFC	COBie data for high side equipment's. IFC format - Based on employer request.

Table: 4.03

4.2 DESIGN MODELS:

Design models will be developed further from the models received from employer with LOD 300 /350 details.

4.2.1 Drawings

The drawing outputs shall be created in separate sheets, according to the DCI approved by NMIAL.The 2D drawings extracted from 3D BIM model.

Regarding naming conventions and graphic standards for any given part of the building by zones, areas, levels, specific details, or disciplines. The part of the BIM model relevant for the analysis is to be developed according to the BIM Modelling procedure.

A Model Issue Sheet in .pdf format will be issued together with the EPC's BIM material to inform about the latest updates on the model and main characteristics. i.e.: Levels, Shared Coordinates, Phasing, etc.

4.2.2 Schedules

The intent of the Quantity Take-Off requirement is that quantities will be extracted from the model to help confirm the project team's quantification for the project.

All schedules required as part of the documentation shall be created within the BIM authoring environment.

In addition to the above schedules, the BIM Author shall maintain one schedule per component category in a format that presents the information requested in the MEA Matrix (only). COBie Spread sheets

All schedules must remain in the BIM Model during information exchange.

Schedules shall be named as per communication protocol and documented as part of the Project BIM Documents Register.

If any third-party tools that requires data to be hosted outside the BIM model & they show dependency on project team members for accessing the data, such tools shall not be used without prior approval by NMIAL.

The Quantity Take-offs are based on the requirements regarding the Work Breakdown Structure and descriptions. The Procedure shows the process of Quantity Takeoff development using the BIM model, with the main inputs and responsible personnel, as well as the designated outputs and quality control procedures including WBS checks, setup validation and inconsistencies in reports. The part of the BIM model relevant for the analysis is to be developed according to the BIM Modelling procedure.

Following Schedules shall be generated inside the BIM models & shall be delivered with the design & milestone submissions:

- Room schedules
- Door Schedules
- Windows Schedules
- FF & E schedules
- MEP Equipment Schedule
- Drawings list Schedule

All the schedules shall be part of all progress & milestone submissions by EPC to NMIAL

4.2.3 Specifications

Model components shall be associated with the correct classification as per CSI Master Format (Latest version). They shall include a reference which will link it to the relevant item in the design specifications

4.2.4 Accessibility Studies

The accessibility requirement shall be followed as per the relevant standard and the space allocation, circulation spaces are shown in the model.

4.2.5 Structural Analysis

The Structural analysis shall be done using E-Tabs & the structural member sizes shall be reflected in the Structural BIM model. Necessary design inputs as per the E-Tabs model will be shared with the BIM team to update the model. All the necessary QA/QC will do by respective engineers to ensure the accuracy levels of sizes.

4.2.6 Lighting Analysis

General lighting calculations will be undertaken via Dialux software, latest version. The lighting levels will be based upon the recommendations set out within NBC 2016 and relevant IS codes. All lighting fixtures added in the BIM model shall contain IES data for lighting capacity.

4.2.7 Energy Analysis

The software, IES Virtual Environment provides advanced Dynamic Thermal Modelling of buildings in order to establish energy consumption of the spaces at an annual, monthly, hourly and sub-hourly time steps. BIM models built for design & construction shall be built to provide input for energy analysis software and energy analysis shall be done. add LEED assessment.

4.2.8 Clash Detection & Coordination

Refer Section 3.13 clash detection coordination procedure.

4.2.9 Design interface coordination

In regard to design, the interfaces between works and elements of the facilities shall be coordinated using the respective Revit files to ensure a federated model based on various information of stakeholders. This shall also ensure that all elements required to complete the works have been considered. Interfaces may not only be limited to large areas viz airside-

landside but also could for example include elements like rotunda with airside pavement works etc

4.2.10 Health & Safety planning

Hazards shall be identified in the Project BIM as intelligent components that can be highlighted to ensure safety. A generic model will be used to mark the location of the SH&E hazards in BIM. This will ensure residual risks from the pre-construction stages can carry on to site. Information about these risks will be store within the BIM Material for future use.

4.3 CONSTRUCTION MODELS

Construction models will be developed from the design models progressed during detail design stage.

Vendors/ Subcontractors will develop from LOD 300/350 to LOD 450 during the construction stage, along with shop drawings.

4.3.1 Constructability studies

Construction Planning shall be carried out by the EPC to optimize the project execution and to provide logistics information. Once the 4D sequencing model is established a workshop shall be held to review the 4D model to identify conflicts related to the construction processes & their sequencing.

- Optimized 4D model
- Optimized construction schedule
- Logistics Information

4.3.2 Visual Method Statement

BIM shall be utilized for illustrating construction method statements. Visual method statements can be developed for complex site works using BIM to breakdown the works into individual activities, which enhances the clarity of information for the site teams, thus improving workmanship and enhancing the site safety.

4.3.3 Construction sequencing & Progress monitoring

Construction progress shall be monitored visually through 4D comparisons.

Once the 4D construction simulations are selected and construction commences, detailed progress information can be entered and tracked. Progress information input can be generated from various sources – from selection sets of constructed elements, to as-built drawings and actual Progress. Based on the input, 4D construction simulations are regenerated to fit the construction progress, automatically updating the construction simulation and providing a very informative planned vs. actual analysis.

Based on this information, the schedule can be updated if needed. The quality control procedure ensures minimizing the risk of bad input or reports not satisfying the quality standards.

Inputs:

- 4D Construction Simulation
- Actual work Progress

Outputs:

- Planned vs. Actual Report
- Monthly progress report
- Updated 4D Construction Simulation.

Refer Annexure G for a sample 4D report template

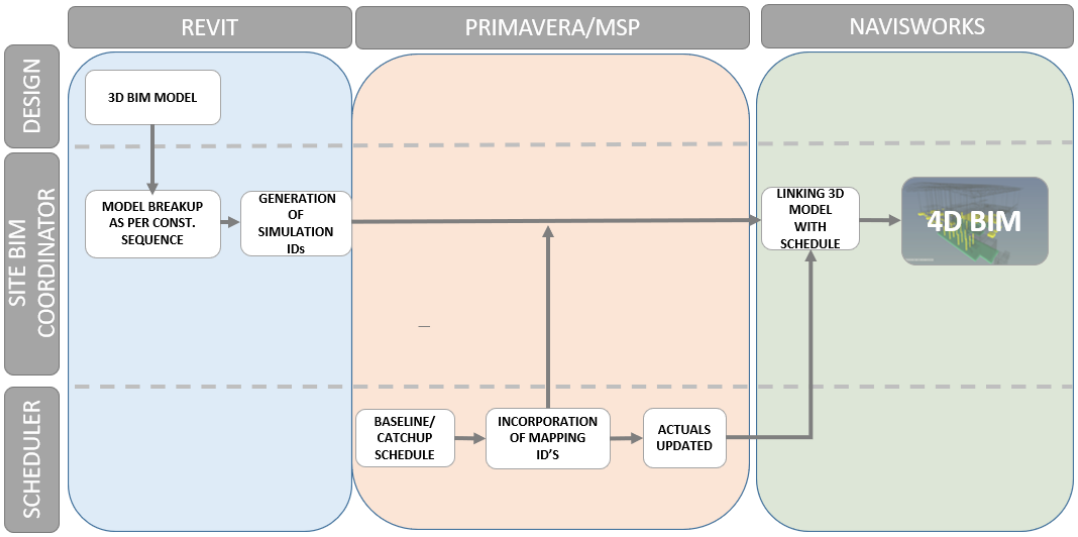


Image: 4.01

Porposed workflow for generating 4D simulations.

4.3.4 Modular Construction

If any modular construction utilized, the same shall implemented in BIM models. Any prototypes used for standard design, spaces, etc. in the design shall be used for modular construction and shall be implemented in the BIM modelling for the project.

4.3.5 Virtual prototyping

Any design options created for repetitive elements in the project design shall be modelled for virtual prototyping. These prototyping shall be developed in the BIM models and used for construction after approval from NMIAL.

4.4 FIELD BIM MODELS

Field BIM will ensure the use BIM directly on the construction site. The Construction site will have a dedicated hardware and software for reviewing the models and simulations. The same shall be accessible to all stakeholders involved directly in the construction process. Frequent model updates and constant interaction of the site team, design management and planning team is supported by dedicated on-site BIM studios and workshops.. Enabling of specific field BIM software such as BIM 360 or similar is planned progressively, following previous software selection, hardware implementation and staff training.

4.4.1 COBie Deliverables

The COBie deliverable shall be separated in 2 stages. The stages shall be as per the Construction condition of LOD 350 – LOD 450 & As Built Conditions. This shall be a parallel exercise carried out with the specialist Subcontractors.

4.4.2 Design Development Deliverable:

a) Responsibility: All responsible stakeholders.
b) Expectations: Complete design with all COBie data captured in a single worksheet along with contributing Revit models.
c) Assets: A single COBie worksheet per building (facility) & associated Revit Model(s)

4.4.3 As-Built Construction Deliverables:

The As-Built models will be with the information of the site constructed with approved GFC drawings and any sketches issued during the construction requirement.

Completion of Works, EPC shall provide As-Built data in a structured BIM format, consistent with the COBiE format and to prepare COBiE documentation and data integration in the as-built models. It shall be ensured that the As-Built BIM model is prepared in accordance with Good Industry Practice, using latest proven, systems and technology and accepted professional standards, codes of practice and regulations, and shall meet the intents and objectives of the Contract, including facilities maintenance and operations through BIM.

4.4.4 Example of COBie parameters extraction:

Sample cooling tower (COT) – COBie parameters (Instance & Type)

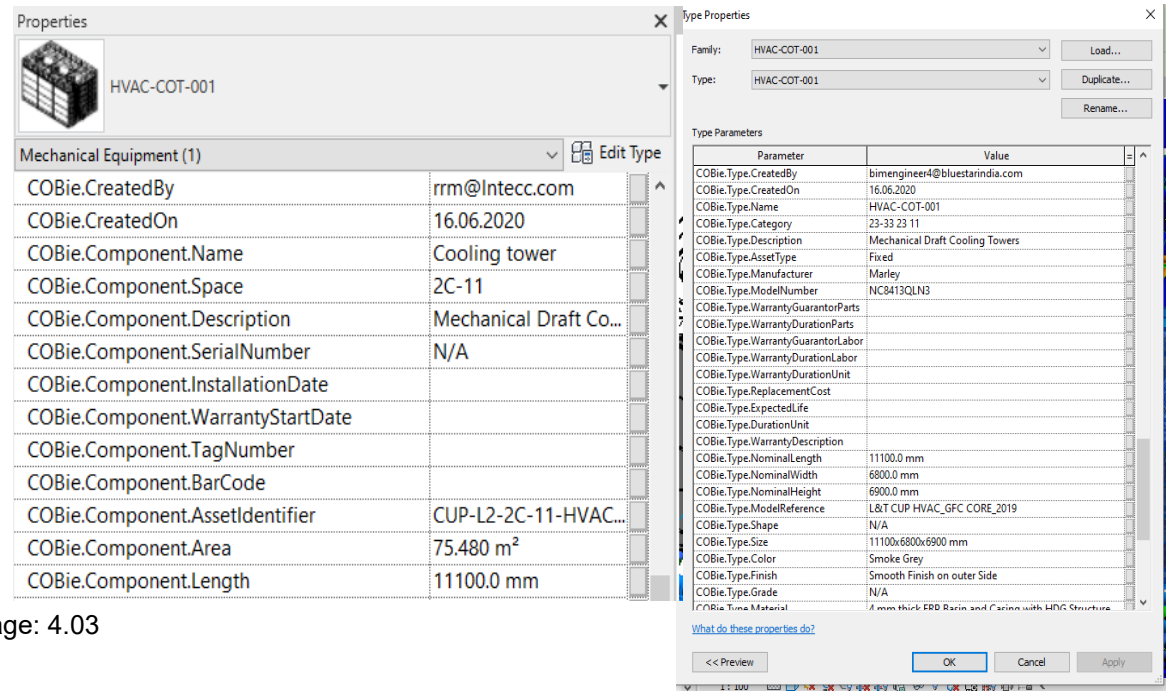


Image: 4.03

4.4.5 Proposed COBie equipment list

The below listed equipment's are proposed to part of COBie deliverables.

HVAC

- Air Handling Unit
- Chillers
- Cooling Tower
- Double suction Vertical Inline Primary Chilled water pump-Motor assembly
- In-Rack Cooling units for Alternate Computer Rooms
- Electro chemical scale treatment system
- Double suction Vertical Inline Condenser water pumps-Motor Assy
- Double suction Vertical Inline Secondary Chilled water pumps-Motor Assy
- Side Stream Filtration system
- Chemical dosing system

FPS

- Electrical Driven common Jockey pump
- Electric Main fire pumps for combined system
- Electrical Driven common Standby pump

Electrical Distribution System & Power System

- 11 Kilo Volt Ring Main Unit
- Transformer (Dry type)
- Generators

Plumbing and Drainage

- Booster pump
- Rainwater sump pump
- Soil and wastewater sump pump
- Transfer pump
- Wastewater sump pump

4.4.6 Accessing BIM Models on Mobile Devices

During construction process field BIM software such as BIM 360 or similar shall be used. Presentations of Field BIM software capabilities shall be held in order to introduce the stakeholders with the technology. Training sessions shall be organized in order to enable team of dedicated professionals from EPC to use and manage technology on the site. The trained personnel shall use

all software capabilities for adopting processes such as collaboration, integration of the design team, in order to share and review information graphically by accessing through various mobile devices. Requirement of Specific necessary hardware and software/ computers will be further discussed and progressively implemented on site.

4.4.7 Field verification models

This is the process used to depict the accurate representation of Physical conditions and assets of the Project/ facility. One of the key steps involved in this process is Field verification.

All the in-field updates & deviations from the approved GFC, Shop drawings shall be recorded as constructed on the drawings (either hard or soft copy)and shall be jointly verified by concerned Engineers of EPC & NMIAL representatives.

BIM models at GFC, Shop drawing stage shall be updated based upon these in field deviations marked up on the hard copy/ soft copy of the drawings to record the as-built conditions in the BIM models. These models shall further augmented with OEM data, warranty data, Specifications, MEP equipment cut sheets, etc. to record them as "As -built models before Hand over stage of the project

5 SECTION- E : PROPOSED RESOURCE PLAN

5.1 BIM TEAM

The team roles applicable in- house, Subcontractors, vendors, and consultants except the 4D works.

BIM Manager: BIM Manager will provide technical expertise, leadership and management to the construction team during the pre-construction planning, construction, and delivery phases of the project, ultimately ensuring full execution of BIM across the project life cycle.

Trade/ discipline BIM Coordinator: All major design technical disciplines/trades (Architecture, structural, MEP, interior design, etc.) will be assign a single BIM Coordinator to internally coordinate their work among the entire Design team and between the Design and Construction team

BIM Modelers: All teams will have BIM modelers /detailers to work in alignment with the BIM requirement per disciplines. They will create/update the 3D models for respective disciplines, create detailing and documentation through the model, etc. as required per the BIM deliverables.

4D BIM Champion: Separate BIM expert will deploy for 4D work on the project. This BIM member will work in coordination with project planning team,
construction team and BIM team to generate, maintain and report the actual construction status via 4D sequencing and construction simulation.

5.2 BIM TEAM TRAING PLAN/STRATEGY

Necessary training shall be provided to all BIM team through our BIM Academy. Latest versions of software, technologies in BIM like VR/MR, 4D, COBie will be considered as per requirement. This shall be reviewed on Quarterly basis and teams will be nominated as need.

Training shall be done to the Employer for integration of models and modelling methodology adopted at the closeout stage.

6 SECTION- F: IT ENVERONEMENT FOR BIM

6.1 HARDWARE STRATEGY

BIM team will be provided with minimum 64GB RAM, 8GB Graphics card with dual monitors. This shall be reviewed periodically, and necessary upgradations shall be done on need basis. For working in BIM360 cloud, necessary Internet bandwidth will be provided.

6.2 SOFTWARE STRATEGY

The Software agreed is Autodesk platform version 2023. However, if any upgradation is required, will discuss with all parties, and come to the common conclusion.

6.3 INFORMATION SECUIRITY

Standard security protocols shall be used which have been designed to meet the rigorous set of physical, logical, process and management controls defined employer team

The BIM Model Manager will manage and maintain all user accounts and model access rights that include the creation, deletion, and modification of elements. All project participants will be given view and download rights to the federated model files. The BIM Model Manager will apply access controls to users so that only authorized users of the model can add the files for their respective component odels.

6.4 IT PLAN

The contractor shall have a dedicated team for IT services, such as servicing and maintaining IT equipment, setting up and provide support and guidance. The details of the on-site team shall be developed for the construction phase.

6.5 INDUSTRY MODEL STANDARDS

Following Industry standards shall be followed while implementing BIM on the entire project during its entire project contract duration.

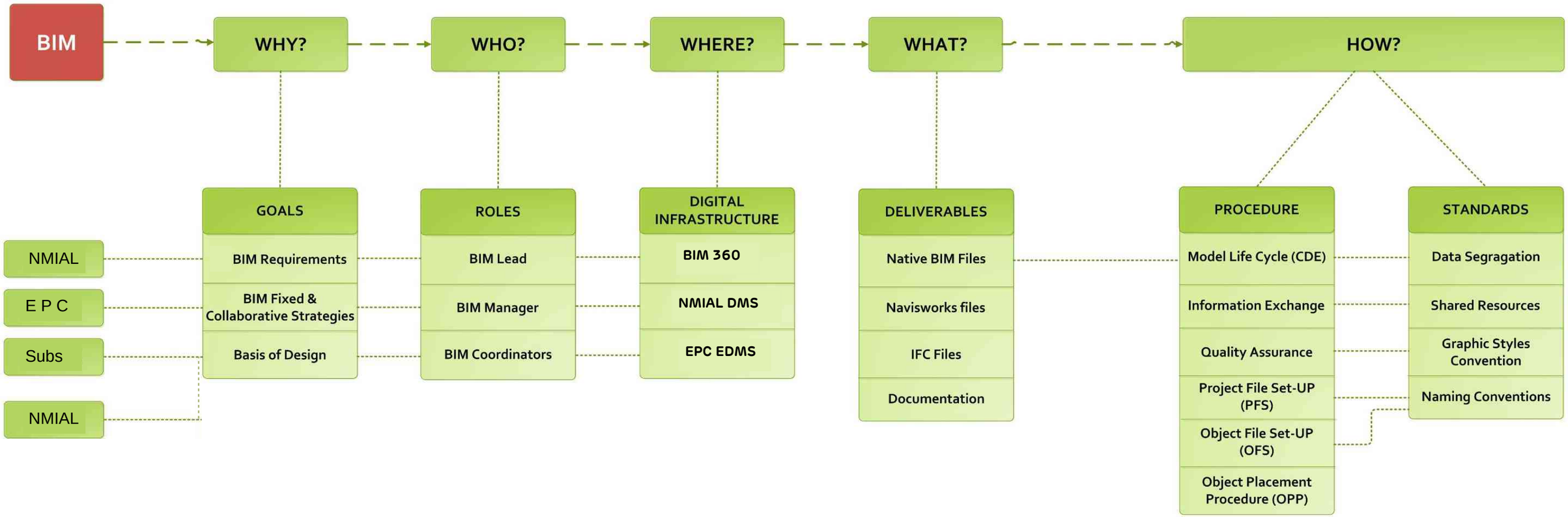
Standard Ref.	Title
BS1192:2007+A2:2016	Collaborative Production of AEC Information
PAS1192-2:2013	Specification for Information Management for the capital/delivery phase of construction projects using building information modelling
BS1192-4:2014	Collaborative production of information – Part 4: Fulfilling employer's information exchange requirements using COBie – Code of practice
PAS1192-5:2015	Specification for security-minded building information modelling, digital built environments, and smart asset management

Table 6.01

7 LIST OF ANNEXURES

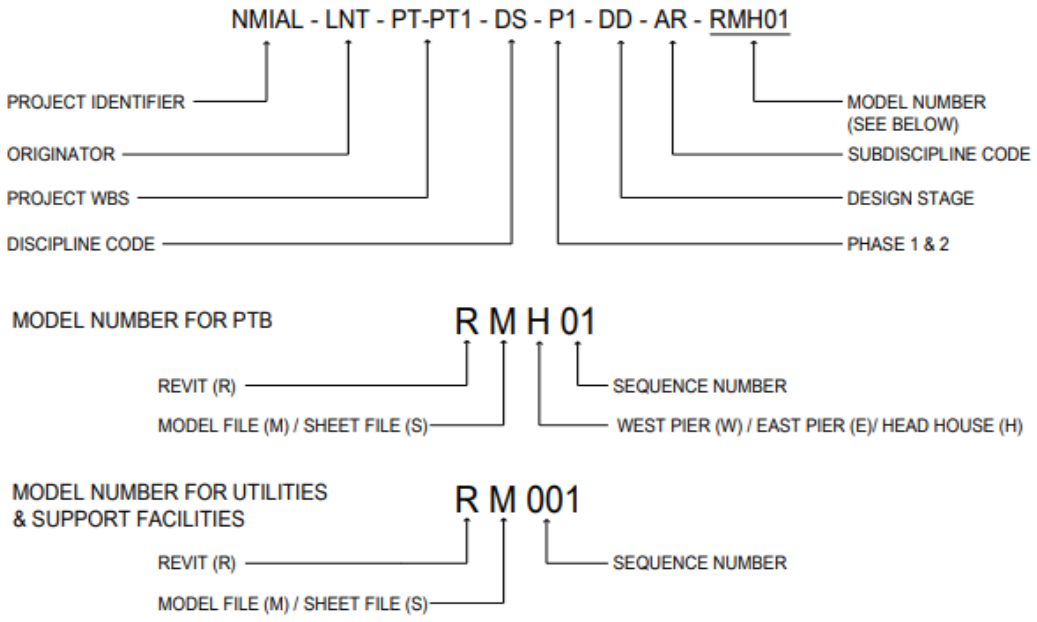
A. Annexure A_Stake Holders process
B. Annexure B_NMIAL BIM File naming
C. Annexure C_Detailed workflow procedure
D. Annexure D _Project Grid Co-ordinate System
E. Annexure E_NMIAL BIM QAQC check list
F. Annexure G_ Clash analysis template
G. Annexure F_NMAIL 4D activity template

ANNEXURE A- STAKE HOLDERS CHART



ANEXTURE B -NMIAL PROJECT BIM FILE NAMING SYSTEM

REVIT MODEL NAMING CONVENTION



WBS CODES LIST

PASSENGER TERMINAL DEVELOPMENT

PT-PT1 PASSENGER TERMINAL-1

SUPPORT FACILITIES

SF-AMB AIRPORT MAINTENANCE BUILDING
SF-ARF SOUTH ARFF FACILITY & INTERIM ATC TOWER
SF-ATB ATC TECHNICAL BLOCK
SF-CCE AIRFIELD GROUND LIGHTING SUBSTATION (CCR) - EAST
SF-CCW AIRFIELD GROUND LIGHTING SUBSTATION (CCR) - WEST
SF-MET METEOROLOGICAL STATION / IMD FACILITY
SF-SG1 AIRSIDE SECURITY GATE SOUTH EAST
SF-SG2 AIRSIDE SECURITY GATE SOUTH WEST
SF-SMR SMR
SF-SR1 ASR (INSIDE NMIA BOUNDARY)

UTILITIES

UT-CUP CHILLER PLANT / CUP BUILDING
UT-DSS POWER DISTRIBUTION SUBSTATION (DSS) INCLUDING POWER NETWORK
UT-PNG PNG NETWORK
UT-RSS POWER RECEIVING STATION (RSS)
UT-STP SEWERAGE TREATMENT PLANT INCLUDING SEWAGE NETWORK & COLLECTION WELLS
UT-SWF SOLID WASTE FACILITY
UT-TRC TRICHURATOR
UT-WSD WATER PLANT (WEST & EAST) INCLUDING DISTRIBUTION WATER SUPPLY & RECYCLED WATER NETWORK
UT-EXT EXTERNAL UTILITIES

Building Name	Discipline	SR No	File Number	File Name	Content	Model /Sheet	Remarks
PTB_ Head House	Arch	1	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMH01.rvt	HH_Core Architecture file	Base Core Model File for headhouse - All walls, doors, windows, VHT, rooms, Room names, Staircase, Flooring	Model	
		2	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMH02.rvt	HH_Interior work- partiitons	BOH False ceiling , Railing , Interior partition walls, columns gaurds, glass partitions, architectural finishes	Model	
		3	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMH03.rvt	HH_Toilets	All HH toilets, fixtures , Ceilings, Flooring , tilings, accessories, Urinal partitions	Model	
		4	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMH04.rvt	HH_ BOH furniture	All furntitures of BOH, Millworks, impact protection of walls and columns	Model	
		5	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMH05.rvt	HH_ FOH furniture	All furntitures of FOH, Millworks, ATRS, WFMD, SBD, Impact protection	Model	
		6	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMH06.rvt	HH_ Signage and Wayfinding	Signages (including FLBs), Wayfinding	Model	
		7	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMH07.rvt	HH_ FOH Design geometries	Petal ceiling , Lighting , roof opening	Model	
		8	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMH08.rvt	HH_Facade file	Façade Model elements	Model	
		9	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMH09.rvt	HH_Roof file	Roof, skylights	Model	
		10	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMH10.rvt	HH_ FLB's	FLBs , Connecting Bridges, Rotundas , partitions, railings	Model	
		11	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMH11.rvt	HH_ Landscape	Land scape (Hard scape,planters,water bodies)	Model	
		12	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMH20.rvt	HH_FOH finish works	FOH Finishes (Wall & Floor)	Model	
		13	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RS000.rvt	Over all plans	1:1500 for PTB	Sheet	
		14	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSH01.rvt	HH_ sheet files- Floor plans , general layouts	Annotaions for floor plans & BOH wall finishes	Sheet	
		15	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSH02.rvt	HH_ sheet files- Flooring and Ceiling	Annotaions for flooring & Ceing annotations	Sheet	
		16	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSH03.rvt	HH_ sheet files- All Staircases	Annotations for Staircases & BOH Toilets	Sheet	
		17	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSH04.rvt	HH_ sheet files- Toilets	Annotations for FOH Toilets	Sheet	
		18	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSH05.rvt	HH_sheet files - elevations	Annotations for Elevations	Sheet	
		19	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSH06.rvt	HH_sheet files - FLB'S	Annotations for FLB'S	Sheet	
		20	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSH07.rvt	HH_FOH_Interior finishes	Annotations for FOH works	Sheet	
		21	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSH08.rvt	HH_FOH_FOH Design geometries	Annotations FOH works	Sheet	
		22	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSH09.rvt	Flow diagrms,Fire Compartment routes etc…	Genral fire escape routes	Sheet	
PTB_ East pier	Arch	23	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RME01.rvt	EP_Core Architecture file	Base Core Model File for headhouse - All walls, doors, windows, VHT, rooms, Room names, Staircase, Flooring	Model	
		24	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RME02.rvt	EP_Interior work- partiitons	BOH False ceiling , Railing , Interior partition walls, columns gaurds, glass partitions, architectural finishes	Model	
		25	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RME03.rvt	EP_Toilets	All HH toilets, fixtures , Ceilings, Flooring , tilings, accessories, Urinal partitions	Model	
		26	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RME04.rvt	EP_ BOH furniture	All furntitures of BOH, Millworks, impact protection of walls and columns	Model	
		27	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RME05.rvt	EP_ FOH furniture	All furntitures of FOH, Millworks, ATRS, WFMD, SBD, Impact protection	Model	
		28	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RME06.rvt	EP_ Signage and Wayfinding	Signages (including FLBs), Wayfinding	Model	
		29	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RME07.rvt	EP_ FOH Design geometries	Petal ceiling , Lighting , roof opening	Model	
		30	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RME08.rvt	EP_Facade file	Façade Model elements	Model	
		31	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RME09.rvt	EP_Roof file	Roof, skylights	Model	
		32	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RME10.rvt	EP_ FLB'S	FLBs , Connecting Bridges, Rotundas , partitions, railings	Model	
		33	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RME11.rvt	EP_ Landscape	Land scape - All Harscape and Softsccape (soil geotextie membrane,planters,water bodies)	Model	
		34	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RME20.rvt	EP_FOH finish works	FOH Finishes (Wall & Floor)	Model	
		35	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSE01.rvt	EP_ sheet files- Floor plans , general layouts	Annotaions for floor plans & BOH wall finishes	Sheet	
		36	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSE02.rvt	EP_ sheet files- Flooring and Ceiling	Annotaions for flooring & Ceing annotations	Sheet	
		37	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSE03.rvt	EP_ sheet files- All Staircases	Annotations for Staircases & BOH Toilets	Sheet	
		38	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSE04.rvt	EP_ sheet files- Toilets	Annotations for FOH Toilets	Sheet	
		39	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSE05.rvt	EP_sheet files - elevations	Annotations for Elevations	Sheet	
		40	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSE06.rvt	EP_sheet files - FLB'S	Annotations for FLB'S	Sheet	
		41	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSE07.rvt	EP_FOH_Interior finishes	Annotations for FOH works	Sheet	
		42	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSE08.rvt	EP_FOH_FOH Design geometries	Annotations FOH works	Sheet	
PTB_ West pier	Arch	43	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMW01.rvt	WP_ Core Architecture file	Base Core Model File for headhouse - All walls, doors, windows, VHT, rooms, Room names, Staircase, Flooring	Model	
		44	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMW02.rvt	WP_ Interior work- partiitons	False ceiling , Railing , Interior partition walls, columns gaurds, glass partitions, architectural finishes	Model	
		45	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMW03.rvt	WP_ Toilets	All HH toilets, fixtures , Ceilings, Flooring , tilings, accessories, Urinal partitions	Model	
		46	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMW04.rvt	WP_BOH furniture	All furntitures of BOH, Millworks, impact protection of walls and columns	Model	
		47	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMW05.rvt	WP_FOH furniture	All furntitures of FOH, Millworks, ATRS, WFMD, SBD, Impact protection	Model	
		48	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMW06.rvt	WP_Signage and Wayfinding	Signages (including FLBs), Wayfinding	Model	
		49	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMW07.rvt	WP_FOH Design geometries	Petal ceiling , Lighting , roof opening	Model	
		50	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMW08.rvt	WP_ Facade file	Façade Model elements	Model	
		51	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMW09.rvt	WP_ Roof file	Roof, skylights	Model	
		52	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMW10.rvt	WP_FLB'S	All FLB elements , Connecting Bridges, Rotundas , partitions, railings	Model	
		53	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMW11.rvt	WP_Landscape	Land scape - All Harscape and Softsccape (soil geotextie membrane,planters,water bodies)	Model	
		54	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMW20.rvt	WP_FOH finish works	FOH Finishes (Wall & Floor)	Model	
		55	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSW01.rvt	WP_sheet files- Floor plans , general layouts	Annotaions for floor plans & BOH wall finishes	Sheet	
		56	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSW02.rvt	WP_sheet files- Flooring and Ceiling	Annotaions for flooring & Ceing annotations	Sheet	
		57	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSW03.rvt	WP_sheet files- All Staircases	Annotations for Staircases & BOH Toilets	Sheet	
		58	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSW04.rvt	WP_sheet files- Toilets	Annotations for FOH Toilets	Sheet	
		59	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSW05.rvt	WP_ sheet files - elevations	Annotations for Elevations	Sheet	
		60	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSW06.rvt	WP_sheet files - FLB'S	Annotations for FLB'S	Sheet	
		61	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSW07.rvt	WP_FOH_Interior finishes	Annotations for FOH works	Sheet	
		62	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSW08.rvt	WP_FOH_FOH Design geometries	Annotations FOH works	Sheet	
Forecourt	Arch	63	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RMF01.rvt	Forecourt - Model file	Model of forecourt including all forecourt elements like parking bollards, Retail pods	Model	
		64	NMIAL-LNT-PT-PT1-DS-P1-DD-AR-RSF02.rvt	Forecourt - Sheet File	Annotaions for floor plans of forecourt	Sheet	
SFB							
AMB	Arch	65	NMIAL-LNT-SF-AMB-DS-P1-DD-AR-RM001.rvt	AMB_ Core Architecture file	All Architectural Model elements	Model	
		66	NMIAL-LNT-SF-AMB-DS-P1-DD-AR-RS001.rvt	AMB_ Sheet Architecture file	All Architectural Sheets	Sheet	
ARF		67	NMIAL-LNT-SF-ARF-DS-P1-DD-AR-RM001.rvt	ARF_ Core Architecture file	All Architectural Model elements	Model	
		68	NMIAL-LNT-SF-ARF-DS-P1-DD-AR-RS001.rvt	ARF_ Sheet Architecture file	All Architectural Sheets	Sheet	
ATB		69	NMIAL-LNT-SF-ATB-DS-P1-DD-AR-RM001.rvt	ATB_ Core Architecture file	All Architectural Model elements	Model	
		70	NMIAL-LNT-SF-ATB-DS-P1-DD-AR-RS001.rvt	ATB_ Sheet Architecture file	All Architectural Sheets	Sheet	
CCE		71	NMIAL-LNT-SF-CCE-DS-P1-DD-AR-RM001.rvt	CCE_ Core Architecture file	All Architectural Model elements	Model	
		72	NMIAL-LNT-SF-CCE-DS-P1-DD-AR-RS001.rvt	CCE_ Sheet Architecture file	All Architectural Sheets	Sheet	
CCW		73	NMIAL-LNT-SF-CCW-DS-P1-DD-AR-RM001.rvt	CCW_ Core Architecture file	All Architectural Model elements	Model	
		74	NMIAL-LNT-SF-CCW-DS-P1-DD-AR-RS001.rvt	CCW_ Sheet Architecture file	All Architectural Sheets	Sheet	
MET		75	NMIAL-LNT-SF-MET-DS-P1-DD-AR-RM001.rvt	MET_ Core Architecture file	All Architectural Model elements	Model	
		76	NMIAL-LNT-SF-MET-DS-P1-DD-AR-RS001.rvt	MET_ Sheet Architecture file	All Architectural Sheets	Sheet	
SG1		77	NMIAL-LNT-SF-SG1-DS-P1-DD-AR-RM001.rvt	SG1_ Core Architecture file	All Architectural Model elements	Model	
		78	NMIAL-LNT-SF-SG1-DS-P1-DD-AR-RS001.rvt	SG1_ Sheet Architecture file	All Architectural Sheets	Sheet	
SG2		79	NMIAL-LNT-SF-SG2-DS-P1-DD-AR-RM001.rvt	SG2_ Core Architecture file	All Architectural Model elements	Model	
		80	NMIAL-LNT-SF-SG2-DS-P1-DD-AR-RS001.rvt	SG2_ Sheet Architecture file	All Architectural Sheets	Sheet	
SMR		81	NMIAL-LNT-SF-SMR-DS-P1-DD-AR-RM001.rvt	SMR_ Core Architecture file	All Architectural Model elements	Model	
		82	NMIAL-LNT-SF-SMR-DS-P1-DD-AR-RS001.rvt	SMR_ Sheet Architecture file	All Architectural Sheets	Sheet	
SR1		83	NMIAL-LNT-SF-SR1-DS-P1-DD-AR-RM001.rvt	SR1_ Core Architecture file	All Architectural Model elements	Model	
		84	NMIAL-LNT-SF-SR1-DS-P1-DD-AR-RS001.rvt	SR1_ Sheet Architecture file	All Architectural Sheets	Sheet	
UTB							
CUP	Arch	85	NMIAL-LNT-UT -CUP-DS-P1-DD-AR-RM001.rvt	CUP_ Core Architecture file	All Architectural Model elements	Model	
		86	NMIAL-LNT-UT -CUP-DS-P1-DD-AR-RS001.rvt	CUP_ Sheet Architecture file	All Architectural Sheets	Sheet	
DSS		76	NMIAL-LNT-UT -DSS-DS-P1-DD-AR-RM001.rvt	DSS_ Core Architecture file	All Architectural Model elements	Model	
		77	NMIAL-LNT-UT -DSS-DS-P1-DD-AR-RS001.rvt	DSS_ Sheet Architecture file	All Architectural Sheets	Sheet	
PNG		78	NMIAL-LNT-UT -PNG-DS-P1-DD-AR-RM001.rvt	PNG_ Core Architecture file	All Architectural Model elements	Model	
		79	NMIAL-LNT-UT -PNG-DS-P1-DD-AR-RS001.rvt	PNG_ Sheet Architecture file	All Architectural Sheets	Sheet	
RSS		80	NMIAL-LNT-UT -RSS-DS-P1-DD-AR-RM001.rvt	RSS_ Core Architecture file	All Architectural Model elements	Model	
		81	NMIAL-LNT-UT -RSS-DS-P1-DD-AR-RS001.rvt	RSS_ Sheet Architecture file	All Architectural Sheets	Sheet	
STP		82	NMIAL-LNT-UT -STP-DS-P1-DD-AR-RM001.rvt	STP_ Core Architecture file	All Architectural Model elements	Model	
		83	NMIAL-LNT-UT -STP-DS-P1-DD-AR-RS001.rvt	STP_ Sheet Architecture file	All Architectural Sheets	Sheet	
SWF		84	NMIAL-LNT-UT -SWF-DS-P1-DD-AR-RM001.rvt	SWF_ Core Architecture file	All Architectural Model elements	Model	
		85	NMIAL-LNT-UT -SWF-DS-P1-DD-AR-RS001.rvt	SWF_ Sheet Architecture file	All Architectural Sheets	Sheet	
TRC		86	NMIAL-LNT-UT -TRC-DS-P1-DD-AR-RM001.rvt	TRC_ Core Architecture file	All Architectural Model elements	Model	
		87	NMIAL-LNT-UT -TRC-DS-P1-DD-AR-RS001.rvt	TRC_ Sheet Architecture file	All Architectural Sheets	Sheet	
WSD		88	NMIAL-LNT-UT -WSD-DS-P1-DD-AR-RM001.rvt	WSD_ Core Architecture file	All Architectural Model elements	Model	
		89	NMIAL-LNT-UT -WSD-DS-P1-DD-AR-RS001.rvt	WSD_ Sheet Architecture file	All Architectural Sheets	Sheet	
EXTERNAL WORKS							
External	Arch	90	NMIAL-LNT-UT -EXT-DS-P1-DD-AR-RM001.rvt	External Hardscape & Land scape Model	All External Architectural Model	Model	
		91	NMIAL-LNT-UT -EXT-DS-P1-DD-AR-RS001.rvt	External Hardscape & Land scape Sheet	All External Architectural Sheet files	Sheet	

Note : Model files conatin only Model elements & Sheet files conatin only sheet elements : Annotations , dimensions, notes or legends.

Building Name	Discipline	SR No	File Number	File Name	Content	Model /Sheet	Remarks
PTB	STR	1	NMIAL-LNT-PT-PT1-DS-P1-DD-ST-RMH01.rvt	HH_Core Structural file	All concrete elements : Foundatuions, columns, beams, floors, Staircase, ramps etc..	Model	
		2	NMIAL-LNT-PT-PT1-DS-P1-DD-ST-RME01 .rvt	EP_Core Structural file	All concrete elements : Foundatuions, columns, beams, floors, Staircase, ramps etcc..	Model	
		3	NMIAL-LNT-PT-PT1-DS-P1-DD-ST-RMW01.rvt	WP_Core Structural file	All concrete elements : Foundatuions, columns, beams, floors, Staircase, ramps etcc..	Model	
		4	NMIAL-LNT-PT-PT1-DS-P1-DD-ST-RMF01.rvt	Forecourt_Core Structural file	All concrete elements : Foundatuions, columns, beams, floors, Staircase, ramps etcc..	Model	
		5	NMIAL-LNT-PT-PT1-DS-P1-DD-ST-RMH02.rvt	HH_Core Steel Structural file	All Steel structural elements	Model	
		6	NMIAL-LNT-PT-PT1-DS-P1-DD-ST-RME02.rvt	EP_Core Steel Structural file	All Steel structural elements	Model	
		7	NMIAL-LNT-PT-PT1-DS-P1-DD-ST-RMW02.rvt	WP_Core Steel Structural file	All Steel structural elements	Model	
		8	NMIAL-LNT-PT-PT1-DS-P1-DD-ST-RMF02.rvt	Forecourt_Core Steel Structural file	All Steel structural elements	Model	
		9	NMIAL-LNT-PT-PT1-DS-P1-DD-ST-RMH03.rvt	HH_FLB Concrete & Steel file	All FLB Concrete & Steel Models	Model	
		10	NMIAL-LNT-PT-PT1-DS-P1-DD-ST-RME03.rvt	EP_FLB Concrete & Steel file	All FLB Concrete & Steel Models	Model	
		11	NMIAL-LNT-PT-PT1-DS-P1-DD-ST-RMW03.rvt	WP_FLB Concrete & Steel file	All FLB Concrete & Steel Models	Model	
		12	NMIAL-LNT-PT-PT1-DS-P1-DD-ST-RMH04.rvt	HH_Lintel & Mullions	All HH Mullions & Lintels	Model	
		13	NMIAL-LNT-PT-PT1-DS-P1-DD-ST-RME04.rvt	EP_Lintel & Mullions	All EP Mullions & Lintels	Model	
		14	NMIAL-LNT-PT-PT1-DS-P1-DD-ST-RMW04.rvt	WP_Lintel & Mullions	All WP Mullions & Lintels	Model	
		15	NMIAL-LNT-PT-PT1-DS-P1-DD-ST-RS001.rvt	Concrete Sheet file- PTB combined	Annotations for concrete	Sheet	
		16	NMIAL-LNT-PT-PT1-DS-P1-DD-ST-RS002.rvt	Steel Sheet file- PTB combined	Annotations for steel	Sheet	
		17	NMIAL-LNT-PT-PT1-DS-P1-DD-ST-RS003.rvt	All FLB Concrete & Steel file	Annotations for steel & Concrete	sheet	
SFB							
AMB	STR	18	NMIAL-LNT-SF-AMB-DS-P1-DD-ST-RM001.rvt	AMB_ Core Structure file	All Structural Model elements	Model	
		19	NMIAL-LNT-SF-AMB-DS-P1-DD-ST-RS001.rvt	AMB_ Sheet Structure file	All Structural Sheets	Sheet	
ARF		20	NMIAL-LNT-SF-ARF-DS-P1-DD-ST-RM001.rvt	ARF_ Core Structure file	All Structural Model elements	Model	
		21	NMIAL-LNT-SF-ARF-DS-P1-DD-ST-RS001.rvt	ARF_ Sheet Structure file	All Structural Sheets	Sheet	
ATB		22	NMIAL-LNT-SF-ATB-DS-P1-DD-ST-RM001.rvt	ATB_ Core Structure file	All Structural Model elements	Model	
		23	NMIAL-LNT-SF-ATB-DS-P1-DD-ST-RS001.rvt	ATB_ Sheet Structure file	All Structural Sheets	Sheet	
CCE		24	NMIAL-LNT-SF-CCE-DS-P1-DD-ST-RM001.rvt	CCE_ Core Structure file	All Structural Model elements	Model	
		25	NMIAL-LNT-SF-CCE-DS-P1-DD-ST-RS001.rvt	CCE_ Sheet Structure file	All Structural Sheets	Sheet	
CCW		26	NMIAL-LNT-SF-CCW-DS-P1-DD-ST-RM001.rvt	CCW_ Core Structure file	All Structural Model elements	Model	
		27	NMIAL-LNT-SF-CCW-DS-P1-DD-ST-RS001.rvt	CCW_ Sheet Structure file	All Structural Sheets	Sheet	
MET		28	NMIAL-LNT-SF-MET-DS-P1-DD-ST-RM001.rvt	MET_ Core Structure file	All Structural Model elements	Model	
		29	NMIAL-LNT-SF-MET-DS-P1-DD-ST-RS001.rvt	MET_ Sheet Structure file	All Structural Sheets	Sheet	
SG1		30	NMIAL-LNT-SF-SG1-DS-P1-DD-ST-RM001.rvt	SG1_ Core Structure file	All Structural Model elements	Model	
		31	NMIAL-LNT-SF-SG1-DS-P1-DD-ST-RS001.rvt	SG1_ Sheet Structure file	All Structural Sheets	Sheet	
SG2		32	NMIAL-LNT-SF-SG2-DS-P1-DD-ST-RM001.rvt	SG2_ Core Structure file	All Structural Model elements	Model	
		33	NMIAL-LNT-SF-SG2-DS-P1-DD-ST-RS001.rvt	SG2_ Sheet Structure file	All Structural Sheets	Sheet	
SMR		34	NMIAL-LNT-SF-SMR-DS-P1-DD-ST-RM001.rvt	SMR_ Core Structure file	All Structural Model elements	Model	
		35	NMIAL-LNT-SF-SMR-DS-P1-DD-ST-RS001.rvt	SMR_ Sheet Structure file	All Structural Sheets	Sheet	
SR1		36	NMIAL-LNT-SF-SR1-DS-P1-DD-ST-RM001.rvt	SR1_ Core Structure file	All Structural Model elements	Model	
		37	NMIAL-LNT-SF-SR1-DS-P1-DD-ST-RS001.rvt	SR1_ Sheet Structure file	All Structural Sheets	Sheet	
UTB							
CUP	STR	38	NMIAL-LNT-UT -CUP-DS-P1-DD-ST-RM001.rvt	CUP_ Core Structure file	All Structural Model elements	Model	
		39	NMIAL-LNT-UT -CUP-DS-P1-DD-ST-RS001.rvt	CUP_ Sheet Structure file	All Structural Sheets	Sheet	
DSS		40	NMIAL-LNT-UT -DSS-DS-P1-DD-ST-RM001.rvt	DSS_ Core Structure file	All Structural Model elements	Model	
		41	NMIAL-LNT-UT -DSS-DS-P1-DD-ST-RS001.rvt	DSS_ Sheet Structure file	All Structural Sheets	Sheet	
PNG		42	NMIAL-LNT-UT -PNG-DS-P1-DD-ST-RM001.rvt	PNG_ Core Structure file	All Structural Model elements	Model	
		43	NMIAL-LNT-UT -PNG-DS-P1-DD-ST-RS001.rvt	PNG_ Sheet Structure file	All Structural Sheets	Sheet	
RSS		44	NMIAL-LNT-UT -RSS-DS-P1-DD-ST-RM001.rvt	RSS_ Core Structure file	All Structural Model elements	Model	
		45	NMIAL-LNT-UT -RSS-DS-P1-DD-ST-RS001.rvt	RSS_ Sheet Structure file	All Structural Sheets	Sheet	
STP		46	NMIAL-LNT-UT -STP-DS-P1-DD-ST-RM001.rvt	STP_ Core Structure file	All Structural Model elements	Model	
		47	NMIAL-LNT-UT -STP-DS-P1-DD-ST-RS001.rvt	STP_ Sheet Structure file	All Structural Sheets	Sheet	
SWF		48	NMIAL-LNT-UT -SWF-DS-P1-DD-ST-RM001.rvt	SWF_ Core Structure file	All Structural Model elements	Model	
		49	NMIAL-LNT-UT -SWF-DS-P1-DD-ST-RS001.rvt	SWF_ Sheet Structure file	All Structural Sheets	Sheet	
TRC		50	NMIAL-LNT-UT -TRC-DS-P1-DD-ST-RM001.rvt	TRC_ Core Structure file	All Structural Model elements	Model	
		51	NMIAL-LNT-UT -TRC-DS-P1-DD-ST-RS001.rvt	TRC_ Sheet Structure file	All Structural Sheets	Sheet	
WSD		52	NMIAL-LNT-UT -WSD-DS-P1-DD-ST-RM001.rvt	WSD_ Core Structure file	All Structural Model elements	Model	
		53	NMIAL-LNT-UT -WSD-DS-P1-DD-ST-RS001.rvt	WSD_ Sheet Structure file	All Structural Sheets	Sheet	
EXTERNAL WORKS							
External	STR	54	NMIAL-LNT-UT -EXT-DS-P1-DD-ST-RM001.rvt	External Core Structural Concrete Utility Services (Trenches, Ramps,VUP (Vehicale under pass),culverts, boudary walls, ,parking structure, bus bay parking,Sumpits out side the Terminal)	All External Structural Model (incuding all structural infrastructre works)	Model	
		55	NMIAL-LNT-UT -EXT-DS-P1-DD-ST-RS001.rvt	External concrete utility sheet file	All External structural Sheet files	Sheet	

Note : Model files conatin only Model elements & Sheet files conatin only sheet elements : Annotations , dimensions, notes or legends.

Building Name	Discipline	SR No	File Number	File Name	Content	Model /Sheet	Remarks
PTB	HVAC	1	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RMH01.rvt	HH_HVAC Equipment file	All HVAC Equipments : AHU's,CSU, FCU ,TFA ,DXUI, DXUO, FANS	Model	
		2	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RMH02.rvt	HH_HVAC ducting file	All Ducting works	Model	
		3	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RMH03.rvt	HH_HVAC Piping file	All Piping works	Model	
		4	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RMH04.rvt	HH_FLB HVAC works	All FLB HVAC works	Model	
		5	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RMH05.rvt	HH_HVAC supports	All HH HVAC services supports	Model	
		6	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RME01.rvt	EP_HVAC equipment file	All HVAC Equipments : AHU's,CSU, FCU ,TFA ,DXUI, DXUO, FANS	Model	
		7	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RME02.rvt	EP_HVAC ducting file	All Ducting works	Model	
		8	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RME03.rvt	EP_HVAC Piping file	All Piping works	Model	
		9	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RME04.rvt	EP_FLB HVAC works	All FLB HVAC works	Model	
		10	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RME05.rvt	EP_ HVAC supports	All EP HVAC services supports	Model	
		11	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RMW01.rvt	WP_HVAC equipment file	All HVAC Equipments : AHU's,CSU, FCU ,TFA ,DXUI, DXUO, FANS	Model	
		12	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RMW02.rvt	WP_HVAC ducting file	All Ducting works	Model	
		13	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RMW03.rvt	WP_HVAC Piping file	All Piping works	Model	
		14	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RMW04.rvt	WP_FLB HVAC works	All FLB HVAC works	Model	
		15	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RMW05.rvt	WP_ HVAC supports	All WP HVAC services supports	Model	
		16	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RSH01.rvt	HH_HVAC Sheet file 1	Annotation for HH	Sheet	
		17	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RSE01.rvt	EP_HVAC Sheet file 2	Annotation for EP	Sheet	
		18	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RSW01.rvt	WP_HVAC Sheet file 3	Annotation for WP	Sheet	
		19	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RMF01.rvt	Fore Court HVAC Model	All Fourcourt HVAC works	Model	
		20	NMIAL-LNT-PT-PT1-DS-P1-DD-ME-RSF01.rvt	Fore Court HVAC Sheet	All Fourecourt annotations	Sheet	
SFB							
AMB	HVAC	21	NMIAL-LNT-SF-AMB-DS-P1-DD-ME-RM001.rvt	AMB_ Core HVAC file	All HVAC Model elements	Model	
		22	NMIAL-LNT-SF-AMB-DS-P1-DD-ME-RS001.rvt	AMB_ Sheet HVAC file	All HVAC Sheets	Sheet	
ARF		23	NMIAL-LNT-SF-ARF-DS-P1-DD-ME-RM001.rvt	ARF_ Core HVAC file	All HVAC Model elements	Model	
		24	NMIAL-LNT-SF-ARF-DS-P1-DD-ME-RS001.rvt	ARF_ Sheet HVAC file	All HVAC Sheets	Sheet	
ATB		25	NMIAL-LNT-SF-ATB-DS-P1-DD-ME-RM001.rvt	ATB_ Core HVAC file	All HVAC Model elements	Model	
		26	NMIAL-LNT-SF-ATB-DS-P1-DD-ME-RS001.rvt	ATB_ Sheet HVAC file	All HVAC Sheets	Sheet	
CCE		27	NMIAL-LNT-SF-CCE-DS-P1-DD-ME-RM001.rvt	CCE_ Core HVAC file	All HVAC Model elements	Model	
		28	NMIAL-LNT-SF-CCE-DS-P1-DD-ME-RS001.rvt	CCE_ Sheet HVAC file	All HVAC Sheets	Sheet	
CCW		29	NMIAL-LNT-SF-CCW-DS-P1-DD-ME-RM001.rvt	CCW_ Core HVAC file	All HVAC Model elements	Model	
		30	NMIAL-LNT-SF-CCW-DS-P1-DD-ME-RS001.rvt	CCW_ Sheet HVAC file	All HVAC Sheets	Sheet	
MET		31	NMIAL-LNT-SF-MET-DS-P1-DD-ME-RM001.rvt	MET_ Core HVAC file	All HVAC Model elements	Model	
		32	NMIAL-LNT-SF-MET-DS-P1-DD-ME-RS001.rvt	MET_ Sheet HVAC file	All HVAC Sheets	Sheet	
SG1		33	NMIAL-LNT-SF-SG1-DS-P1-DD-ME-RM001.rvt	SG1_ Core HVAC file	All HVAC Model elements	Model	
		34	NMIAL-LNT-SF-SG1-DS-P1-DD-ME-RS001.rvt	SG1_ Sheet HVAC file	All HVAC Sheets	Sheet	
SG2		35	NMIAL-LNT-SF-SG2-DS-P1-DD-ME-RM001.rvt	SG2_ Core HVAC file	All HVAC Model elements	Model	
		36	NMIAL-LNT-SF-SG2-DS-P1-DD-ME-RS001.rvt	SG2_ Sheet HVAC file	All HVAC Sheets	Sheet	
SMR		37	NMIAL-LNT-SF-SMR-DS-P1-DD-ME-RM001.rvt	SMR_ Core HVAC file	All HVAC Model elements	Model	
		38	NMIAL-LNT-SF-SMR-DS-P1-DD-ME-RS001.rvt	SMR_ Sheet HVAC file	All HVAC Sheets	Sheet	
SR1		39	NMIAL-LNT-SF-SR1-DS-P1-DD-ME-RM001.rvt	SR1_ Core HVAC file	All HVAC Model elements	Model	
		40	NMIAL-LNT-SF-SR1-DS-P1-DD-ME-RS001.rvt	SR1_ Sheet HVAC file	All HVAC Sheets	Sheet	
UTB							
CUP	HVAC	41	NMIAL-LNT-UT -CUP-DS-P1-DD-ME-RM001.rvt	CUP_ Core HVAC file	All HVAC Model elements	Model	
		42	NMIAL-LNT-UT -CUP-DS-P1-DD-ME-RS001.rvt	CUP_ Sheet HVAC file	All HVAC Sheets	Sheet	
DSS		43	NMIAL-LNT-UT -DSS-DS-P1-DD-ME-RM001.rvt	DSS_ Core HVAC file	All HVAC Model elements	Model	
		44	NMIAL-LNT-UT -DSS-DS-P1-DD-ME-RS001.rvt	DSS_ Sheet HVAC file	All HVAC Sheets	Sheet	
PNG		45	NMIAL-LNT-UT -PNG-DS-P1-DD-ME-RM001.rvt	PNG_ Core HVAC file	All HVAC Model elements	Model	
		46	NMIAL-LNT-UT -PNG-DS-P1-DD-ME-RS001.rvt	PNG_ Sheet HVAC file	All HVAC Sheets	Sheet	
RSS		47	NMIAL-LNT-UT -RSS-DS-P1-DD-ME-RM001.rvt	RSS_ Core HVAC file	All HVAC Model elements	Model	
		48	NMIAL-LNT-UT -RSS-DS-P1-DD-ME-RS001.rvt	RSS_ Sheet HVAC file	All HVAC Sheets	Sheet	
STP		49	NMIAL-LNT-UT -STP-DS-P1-DD-ME-RM001.rvt	STP_ Core HVAC file	All HVAC Model elements	Model	
		50	NMIAL-LNT-UT -STP-DS-P1-DD-ME-RS001.rvt	STP_ Sheet HVAC file	All HVAC Sheets	Sheet	
SWF		51	NMIAL-LNT-UT -SWF-DS-P1-DD-ME-RM001.rvt	SWF_ Core HVAC file	All HVAC Model elements	Model	
		52	NMIAL-LNT-UT -SWF-DS-P1-DD-ME-RS001.rvt	SWF_ Sheet HVAC file	All HVAC Sheets	Sheet	
TRC		53	NMIAL-LNT-UT -TRC-DS-P1-DD-ME-RM001.rvt	TRC_ Core HVAC file	All HVAC Model elements	Model	
		54	NMIAL-LNT-UT -TRC-DS-P1-DD-ME-RS001.rvt	TRC_ Sheet HVAC file	All HVAC Sheets	Sheet	
WSD		55	NMIAL-LNT-UT -WSD-DS-P1-DD-ME-RM001.rvt	WSD_ Core HVAC file	All HVAC Model elements	Model	
		56	NMIAL-LNT-UT -WSD-DS-P1-DD-ME-RS001.rvt	WSD_ Sheet HVAC file	All HVAC Sheets	Sheet	
EXTERNAL WORKS							
External	HVAC	57	NMIAL-LNT-UT -EXT-DS-P1-DD-ME-RM001.rvt	External HVAC Model	All External HVAC Model	Model	
		58	NMIAL-LNT-UT -EXT-DS-P1-DD-ME-RS001.rvt	External HVAC Sheet	All External HVAC Sheet files	Sheet	

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Building Name	Discipline	SR No	File Number	File Name	Content	Model /Sheet	Remarks
PTB	ELEC	1	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RMH01.rvt	HH_Lighting file	All Electrical Lighting fixtures (Including Arch lighting), sockets, and DB's	Model	
		2	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RMH02.rvt	HH_Equipment & Cable tray file	All Elec equipments and Cable trays	Model	
		3	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RMH03.rvt	HH_Raceway & lighting protction file	All Elec raceways & Lighting protection	Model	
		4	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RMH04.rvt	HH_Support system	All Elec Supports	Model	
		5	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RMH05.rvt	HH_FLB Elec File	All Elec FLB	Model	
		6	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RME01.rvt	EP_Lighting file	All Electrical Lighting fixtures (Including Arch lighting), sockets, and DB's	Model	
		7	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RME02.rvt	EP_Equipment & Cable tray file	All Elec equipments and Cable trays	Model	
		8	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RME03.rvt	EP_Raceway & lighting protction file	All Elec raceways & Lighting protection	Model	
		9	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RME04.rvt	EP_Support system	All Elec Supports	Model	
		10	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RME05.rvt	EP_FLB Elec File	All Elec FLB	Model	
		11	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RMW01.rvt	WP_Lighting file	All Electrical Lighting fixtures (Including Arch lighting), sockets, and DB's	Model	
		12	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RMW02.rvt	WP_Equipment & Cable tray file	All Elec equipments and Cable trays	Model	
		13	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RMW03.rvt	WP_Raceway & lighting protction file	All Elec raceways & Lighting protection	Model	
		14	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RMW04.rvt	WP_Support system	All Elec Supports	Model	
		15	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RMW05.rvt	WP_FLB Elec File	All Elec FLB	Model	
		16	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RSH01.rvt	HH_ELEC Sheet file	Annotation for HH	Sheet	
		17	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RSE01.rvt	EP_ELEC Sheet file	Annotation for EP	Sheet	
		18	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RSW01.rvt	WP_ELEC Sheet file	Annotation for WP	Sheet	
		19	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RMF01.rvt	Fore Court ELEC Model	All Fourcourt ELEC works	Model	
		20	NMIAL-LNT-PT-PT1-DS-P1-DD-EL-RSF01.rvt	Fore Court ELEC Sheet	All Fourecourt annotations	Sheet	
SFB							
AMB	ELEC	21	NMIAL-LNT-SF-AMB-DS-P1-DD-EL-RM001.rvt	AMB_ Core ELEC file	All ELEC Model elements	Model	
		22	NMIAL-LNT-SF-AMB-DS-P1-DD-EL-RS001.rvt	AMB_ Sheet ELEC file	All ELEC Sheets	Sheet	
ARF		23	NMIAL-LNT-SF-ARF-DS-P1-DD-EL-RM001.rvt	ARF_ Core ELEC file	All ELEC Model elements	Model	
		24	NMIAL-LNT-SF-ARF-DS-P1-DD-EL-RS001.rvt	ARF_ Sheet ELEC file	All ELEC Sheets	Sheet	
ATB		25	NMIAL-LNT-SF-ATB-DS-P1-DD-EL-RM001.rvt	ATB_ Core ELEC file	All ELEC Model elements	Model	
		26	NMIAL-LNT-SF-ATB-DS-P1-DD-EL-RS001.rvt	ATB_ Sheet ELEC file	All ELEC Sheets	Sheet	
CCE		27	NMIAL-LNT-SF-CCE-DS-P1-DD-EL-RM001.rvt	CCE_ Core ELEC file	All ELEC Model elements	Model	
		28	NMIAL-LNT-SF-CCE-DS-P1-DD-EL-RS001.rvt	CCE_ Sheet ELEC file	All ELEC Sheets	Sheet	
CCW		29	NMIAL-LNT-SF-CCW-DS-P1-DD-EL-RM001.rvt	CCW_ Core ELEC file	All ELEC Model elements	Model	
		30	NMIAL-LNT-SF-CCW-DS-P1-DD-EL-RS001.rvt	CCW_ Sheet ELEC file	All ELEC Sheets	Sheet	
MET		31	NMIAL-LNT-SF-MET-DS-P1-DD-EL-RM001.rvt	MET_ Core ELEC file	All ELEC Model elements	Model	
		32	NMIAL-LNT-SF-MET-DS-P1-DD-EL-RS001.rvt	MET_ Sheet ELEC file	All ELEC Sheets	Sheet	
SG1		33	NMIAL-LNT-SF-SG1-DS-P1-DD-EL-RM001.rvt	SG1_ Core ELEC file	All ELEC Model elements	Model	
		34	NMIAL-LNT-SF-SG1-DS-P1-DD-EL-RS001.rvt	SG1_ Sheet ELEC file	All ELEC Sheets	Sheet	
SG2		35	NMIAL-LNT-SF-SG2-DS-P1-DD-EL-RM001.rvt	SG2_ Core ELEC file	All ELEC Model elements	Model	
		36	NMIAL-LNT-SF-SG2-DS-P1-DD-EL-RS001.rvt	SG2_ Sheet ELEC file	All ELEC Sheets	Sheet	
SMR		37	NMIAL-LNT-SF-SMR-DS-P1-DD-EL-RM001.rvt	SMR_ Core ELEC file	All ELEC Model elements	Model	
		38	NMIAL-LNT-SF-SMR-DS-P1-DD-EL-RS001.rvt	SMR_ Sheet ELEC file	All ELEC Sheets	Sheet	
SR1		39	NMIAL-LNT-SF-SR1-DS-P1-DD-EL-RM001.rvt	SR1_ Core ELEC file	All ELEC Model elements	Model	
		40	NMIAL-LNT-SF-SR1-DS-P1-DD-EL-RS001.rvt	SR1_ Sheet ELEC file	All ELEC Sheets	Sheet	
UTB							
CUP	ELEC	41	NMIAL-LNT-UT -CUP-DS-P1-DD-EL-RM001.rvt	CUP_ Core ELEC file	All ELEC Model elements	Model	
		42	NMIAL-LNT-UT -CUP-DS-P1-DD-EL-RS001.rvt	CUP_ Sheet ELEC file	All ELEC Sheets	Sheet	
DSS		43	NMIAL-LNT-UT -DSS-DS-P1-DD-EL-RM001.rvt	DSS_ Core ELEC file	All ELEC Model elements	Model	
		44	NMIAL-LNT-UT -DSS-DS-P1-DD-EL-RS001.rvt	DSS_ Sheet ELEC file	All ELEC Sheets	Sheet	
PNG		45	NMIAL-LNT-UT -PNG-DS-P1-DD-EL-RM001.rvt	PNG_ Core ELEC file	All ELEC Model elements	Model	
		46	NMIAL-LNT-UT -PNG-DS-P1-DD-EL-RS001.rvt	PNG_ Sheet ELEC file	All ELEC Sheets	Sheet	
RSS		47	NMIAL-LNT-UT -RSS-DS-P1-DD-EL-RM001.rvt	RSS_ Core ELEC file	All ELEC Model elements	Model	
		48	NMIAL-LNT-UT -RSS-DS-P1-DD-EL-RS001.rvt	RSS_ Sheet ELEC file	All ELEC Sheets	Sheet	
STP		49	NMIAL-LNT-UT -STP-DS-P1-DD-EL-RM001.rvt	STP_ Core ELEC file	All ELEC Model elements	Model	
		50	NMIAL-LNT-UT -STP-DS-P1-DD-EL-RS001.rvt	STP_ Sheet ELEC file	All ELEC Sheets	Sheet	
SWF		51	NMIAL-LNT-UT -SWF-DS-P1-DD-EL-RM001.rvt	SWF_ Core ELEC file	All ELEC Model elements	Model	
		52	NMIAL-LNT-UT -SWF-DS-P1-DD-EL-RS001.rvt	SWF_ Sheet ELEC file	All ELEC Sheets	Sheet	
TRC		53	NMIAL-LNT-UT -TRC-DS-P1-DD-EL-RM001.rvt	TRC_ Core ELEC file	All ELEC Model elements	Model	
		54	NMIAL-LNT-UT -TRC-DS-P1-DD-EL-RS001.rvt	TRC_ Sheet ELEC file	All ELEC Sheets	Sheet	
WSD		55	NMIAL-LNT-UT -WSD-DS-P1-DD-EL-RM001.rvt	WSD_ Core ELEC file	All ELEC Model elements	Model	
		56	NMIAL-LNT-UT -WSD-DS-P1-DD-EL-RS001.rvt	WSD_ Sheet ELEC file	All ELEC Sheets	Sheet	
EXTERNAL WORKS							
External	ELEC	57	NMIAL-LNT-UT -EXT-DS-P1-DD-EL-RM001.rvt	External ELEC Model	All External ELEC Model	Model	
		58	NMIAL-LNT-UT -EXT-DS-P1-DD-EL-RS001.rvt	External ELEC Sheet	All External ELEC Sheet files	Sheet	

Note : Model files conatin only Model elements & Sheet files conatin only sheet elements : Annotations , dimensions, notes or legends.

Building Name	Discipline	SR No	File Number	File Name	Content	Model /Sheet	Remarks
PTB	PHE	1	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RMH01.rvt	HH_ PHE IR CORE file	All Irrigation Works	Model	
		2	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RMH02.rvt	HH_ PHE ST CORE file	All Storm Works	Model	
		3	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RMH03.rvt	HH_ PHE SW CORE file	All Sewerage Works	Model	
		4	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RMH04.rvt	HH_ PHE WS file	All Water Supply Works	Model	
		5	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RMH05.rvt	HH_FLB PHE file	All FLB PHE works	Model	
		6	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RMH06.rvt	HH_PHE Support file	All Support fies	Model	
		7	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RME01.rvt	EP_ PHE IR CORE file	All Irrigation Works	Model	
		8	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RME02.rvt	EP_ PHE ST CORE file	All Storm Works	Model	
		9	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RME03.rvt	EP_ PHE SW CORE file	All Sewerage Works	Model	
		10	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RME04.rvt	EP_ PHE WS file	All Water Supply Works	Model	
		11	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RME05.rvt	EP_FLB PHE file	All FLB PHE works	Model	
		12	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RME06.rvt	EP_PHE Support file	All Support fies	Model	
		13	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RMW01.rvt	WP_ PHE IR CORE file	All Irrigation Works	Model	
		14	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RMW02.rvt	WP_ PHE ST CORE file	All Storm Works	Model	
		15	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RMW03.rvt	wP_ PHE SW CORE file	All Sewerage Works	Model	
		16	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RMW04.rvt	WP_ PHE WS file	All Water Supply Works	Model	
		17	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RMW05.rvt	WP_FLB PHE file	All FLB PHE works	Model	
		18	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RMW06.rvt	WP_PHE Support file	All Support fies	Model	
		19	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RSH01.rvt	HH_PHE Sheet file 1	Annotation for HH	Sheet	
		20	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RSE01.rvt	EP_PHE Sheet file 2	Annotation for EP	Sheet	
		21	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RSW01.rvt	WP_PHE Sheet file 3	Annotation for WP	Sheet	
		22	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RMF01.rvt	Fore Court PHE Model	All Fourcourt HVAC works	Model	
		23	NMIAL-LNT-PT-PT1-DS-P1-DD-PL-RSF02.rvt	Fore Court PHE Sheet	All Fourecourt annotations	Sheet	
SFB							
AMB	PHE	24	NMIAL-LNT-SF-AMB-DS-P1-DD-PL-RM001.rvt	AMB_ Core PHE file	All PHE Model elements	Model	
		25	NMIAL-LNT-SF-AMB-DS-P1-DD-PL-RS001.rvt	AMB_ Sheet PHE file	All PHE Sheets	Sheet	
ARF		26	NMIAL-LNT-SF-ARF-DS-P1-DD-PL-RM001.rvt	ARF_ Core PHE file	All PHE Model elements	Model	
		27	NMIAL-LNT-SF-ARF-DS-P1-DD-PL-RS001.rvt	ARF_ Sheet PHE file	All PHE Sheets	Sheet	
ATB		28	NMIAL-LNT-SF-ATB-DS-P1-DD-PL-RM001.rvt	ATB_ Core PHE file	All PHE Model elements	Model	
		29	NMIAL-LNT-SF-ATB-DS-P1-DD-PL-RS001.rvt	ATB_ Sheet PHE file	All PHE Sheets	Sheet	
CCE		30	NMIAL-LNT-SF-CCE-DS-P1-DD-PL-RM001.rvt	CCE_ Core PHE file	All PHE Model elements	Model	
		31	NMIAL-LNT-SF-CCE-DS-P1-DD-PL-RS001.rvt	CCE_ Sheet PHE file	All PHE Sheets	Sheet	
CCW		32	NMIAL-LNT-SF-CCW-DS-P1-DD-PL-RM001.rvt	CCW_ Core PHE file	All PHE Model elements	Model	
		33	NMIAL-LNT-SF-CCW-DS-P1-DD-PL-RS001.rvt	CCW_ Sheet PHE file	All PHE Sheets	Sheet	
MET		34	NMIAL-LNT-SF-MET-DS-P1-DD-PL-RM001.rvt	MET_ Core PHE file	All PHE Model elements	Model	
		35	NMIAL-LNT-SF-MET-DS-P1-DD-PL-RS001.rvt	MET_ Sheet PHE file	All PHE Sheets	Sheet	
SG1		36	NMIAL-LNT-SF-SG1-DS-P1-DD-PL-RM001.rvt	SG1_ Core PHE file	All PHE Model elements	Model	
		37	NMIAL-LNT-SF-SG1-DS-P1-DD-PL-RS001.rvt	SG1_ Sheet PHE file	All PHE Sheets	Sheet	
SG2		38	NMIAL-LNT-SF-SG2-DS-P1-DD-PL-RM001.rvt	SG2_ Core PHE file	All PHE Model elements	Model	
		39	NMIAL-LNT-SF-SG2-DS-P1-DD-PL-RS001.rvt	SG2_ Sheet PHE file	All PHE Sheets	Sheet	
SMR		40	NMIAL-LNT-SF-SMR-DS-P1-DD-PL-RM001.rvt	SMR_ Core PHE file	All PHE Model elements	Model	
		41	NMIAL-LNT-SF-SMR-DS-P1-DD-PL-RS001.rvt	SMR_ Sheet PHE file	All PHE Sheets	Sheet	
SR1		42	NMIAL-LNT-SF-SR1-DS-P1-DD-PL-RM001.rvt	SR1_ Core PHE file	All PHE Model elements	Model	
		43	NMIAL-LNT-SF-SR1-DS-P1-DD-PL-RS001.rvt	SR1_ Sheet PHE file	All PHE Sheets	Sheet	
UTB							
CUP	PHE	44	NMIAL-LNT-UT -CUP-DS-P1-DD-PL-RM001.rvt	CUP_ Core PHE file	All PHE Model elements	Model	
		45	NMIAL-LNT-UT -CUP-DS-P1-DD-PL-RS001.rvt	CUP_ Sheet PHE file	All PHE Sheets	Sheet	
DSS		46	NMIAL-LNT-UT -DSS-DS-P1-DD-PL-RM001.rvt	DSS_ Core PHE file	All PHE Model elements	Model	
		47	NMIAL-LNT-UT -DSS-DS-P1-DD-PL-RS001.rvt	DSS_ Sheet PHE file	All PHE Sheets	Sheet	
PNG		48	NMIAL-LNT-UT -PNG-DS-P1-DD-PL-RM001.rvt	PNG_ Core PHE file	All PHE Model elements	Model	
		49	NMIAL-LNT-UT -PNG-DS-P1-DD-PL-RS001.rvt	PNG_ Sheet PHE file	All PHE Sheets	Sheet	
RSS		50	NMIAL-LNT-UT -RSS-DS-P1-DD-PL-RM001.rvt	RSS_ Core PHE file	All PHE Model elements	Model	
		51	NMIAL-LNT-UT -RSS-DS-P1-DD-PL-RS001.rvt	RSS_ Sheet PHE file	All PHE Sheets	Sheet	
STP		52	NMIAL-LNT-UT -STP-DS-P1-DD-PL-RM001.rvt	STP_ Core PHE file	All PHE Model elements	Model	
		53	NMIAL-LNT-UT -STP-DS-P1-DD-PL-RS001.rvt	STP_ Sheet PHE file	All PHE Sheets	Sheet	
SWF		54	NMIAL-LNT-UT -SWF-DS-P1-DD-PL-RM001.rvt	SWF_ Core PHE file	All PHE Model elements	Model	
		55	NMIAL-LNT-UT -SWF-DS-P1-DD-PL-RS001.rvt	SWF_ Sheet PHE file	All PHE Sheets	Sheet	
TRC		56	NMIAL-LNT-UT -TRC-DS-P1-DD-PL-RM001.rvt	TRC_ Core PHE file	All PHE Model elements	Model	
		57	NMIAL-LNT-UT -TRC-DS-P1-DD-PL-RS001.rvt	TRC_ Sheet PHE file	All PHE Sheets	Sheet	
WSD		58	NMIAL-LNT-UT -WSD-DS-P1-DD-PL-RM001.rvt	WSD_ Core PHE file	All PHE Model elements	Model	
		59	NMIAL-LNT-UT -WSD-DS-P1-DD-PL-RS001.rvt	WSD_ Sheet PHE file	All PHE Sheets	Sheet	
EXTERNAL WORKS							
External	PHE	60	NMIAL-LNT-UT -EXT-DS-P1-DD-PL-RM001.rvt	External PHE Model	All External PHE Model	Model	
		61	NMIAL-LNT-UT -EXT-DS-P1-DD-PL-RS001.rvt	External PHE Sheet	All External PHE Sheet files	Sheet	

Note : Model files conatin only Model elements & Sheet files conatin only sheet elements : Annotations , dimensions, notes or legends.

Building Name	Discipline	SR No	File Number	File Name	Content	Model /Sheet	Remarks
PTB	FPS	1	NMIAL-LNT-PT-PT1-DS-P1-DD-FP-RMH01.rvt	HH_ core FPS file	All HH FPS works	Model	
		2	NMIAL-LNT-PT-PT1-DS-P1-DD-FP-RME01.rvt	EP_ core FPS file	All EP FPS works	Model	
		3	NMIAL-LNT-PT-PT1-DS-P1-DD-FP-RMW01.rvt	WP_ core FPS file	All WP FPS works	Model	
		4	NMIAL-LNT-PT-PT1-DS-P1-DD-FP-RMH02.rvt	HH_ FLB core FPS file	All HH FLB works	Model	
		5	NMIAL-LNT-PT-PT1-DS-P1-DD-FP-RME02.rvt	EP_ FLB core FPS file	All EP FLB works	Model	
		6	NMIAL-LNT-PT-PT1-DS-P1-DD-FP-RMW02.rvt	WP_ FLB core FPS file	All WP FLB works	Model	
		7	NMIAL-LNT-PT-PT1-DS-P1-DD-FP-RMF02.rvt	Fore Court core FPS file	All Fore court FPS works	Model	
		8	NMIAL-LNT-PT-PT1-DS-P1-DD-FP-RMH03.rvt	HH_ FPS supports	All HH FPS supports	Model	
		9	NMIAL-LNT-PT-PT1-DS-P1-DD-FP-RME03.rvt	EP_ FPS supports	All EP FPS supports	Model	
		10	NMIAL-LNT-PT-PT1-DS-P1-DD-FP-RMW03.rvt	WP_ FPS supports	All WP FPS supports	Model	
		11	NMIAL-LNT-PT-PT1-DS-P1-DD-FP-RSH01.rvt	HH_FPS Sheet file 1	Annotation for HH	Sheet	
		13	NMIAL-LNT-PT-PT1-DS-P1-DD-FP-RSE01.rvt	EP_FPS Sheet file 2	Annotation for EP	Sheet	
		14	NMIAL-LNT-PT-PT1-DS-P1-DD-FP-RSW02.rvt	WP_FPS Sheet file 3	Annotation for WP	Sheet	
SFB							
AMB	FPS	15	NMIAL-LNT-SF-AMB-DS-P1-DD-FP-RM001.rvt	AMB_ Core FPS file	All FPS Model elements	Model	
		16	NMIAL-LNT-SF-AMB-DS-P1-DD-FP-RS001.rvt	AMB_ Sheet FPS file	All FPS Sheets	Sheet	
ARF		17	NMIAL-LNT-SF-ARF-DS-P1-DD-FP-RM001.rvt	ARF_ Core FPS file	All FPS Model elements	Model	
		18	NMIAL-LNT-SF-ARF-DS-P1-DD-FP-RS001.rvt	ARF_ Sheet FPS file	All FPS Sheets	Sheet	
ATB		19	NMIAL-LNT-SF-ATB-DS-P1-DD-FP-RM001.rvt	ATB_ Core FPS file	All FPS Model elements	Model	
		20	NMIAL-LNT-SF-ATB-DS-P1-DD-FP-RS001.rvt	ATB_ Sheet FPS file	All FPS Sheets	Sheet	
CCE		21	NMIAL-LNT-SF-CCE-DS-P1-DD-FP-RM001.rvt	CCE_ Core FPS file	All FPS Model elements	Model	
		22	NMIAL-LNT-SF-CCE-DS-P1-DD-FP-RS001.rvt	CCE_ Sheet FPS file	All FPS Sheets	Sheet	
CCW		23	NMIAL-LNT-SF-CCW-DS-P1-DD-FP-RM001.rvt	CCW_ Core FPS file	All FPS Model elements	Model	
		24	NMIAL-LNT-SF-CCW-DS-P1-DD-FP-RS001.rvt	CCW_ Sheet FPS file	All FPS Sheets	Sheet	
MET		25	NMIAL-LNT-SF-MET-DS-P1-DD-FP-RM001.rvt	MET_ Core FPS file	All FPS Model elements	Model	
		26	NMIAL-LNT-SF-MET-DS-P1-DD-FP-RS001.rvt	MET_ Sheet FPS file	All FPS Sheets	Sheet	
SG1		27	NMIAL-LNT-SF-SG1-DS-P1-DD-FP-RM001.rvt	SG1_ Core FPS file	All FPS Model elements	Model	
		28	NMIAL-LNT-SF-SG1-DS-P1-DD-FP-RS001.rvt	SG1_ Sheet FPS file	All FPS Sheets	Sheet	
SG2		29	NMIAL-LNT-SF-SG2-DS-P1-DD-FP-RM001.rvt	SG2_ Core FPS file	All FPS Model elements	Model	
		30	NMIAL-LNT-SF-SG2-DS-P1-DD-FP-RS001.rvt	SG2_ Sheet FPS file	All FPS Sheets	Sheet	
SMR		31	NMIAL-LNT-SF-SMR-DS-P1-DD-FP-RM001.rvt	SMR_ Core FPS file	All FPS Model elements	Model	
		32	NMIAL-LNT-SF-SMR-DS-P1-DD-FP-RS001.rvt	SMR_ Sheet FPS file	All FPS Sheets	Sheet	
SR1		33	NMIAL-LNT-SF-SR1-DS-P1-DD-FP-RM001.rvt	SR1_ Core FPS file	All FPS Model elements	Model	
		34	NMIAL-LNT-SF-SR1-DS-P1-DD-FP-RS001.rvt	SR1_ Sheet FPS file	All FPS Sheets	Sheet	
UT							
CUP	FPS	35	NMIAL-LNT-UT -CUP-DS-P1-DD-FP-RM001.rvt	CUP_ Core FPS file	All FPS Model elements	Model	
		36	NMIAL-LNT-UT -CUP-DS-P1-DD-FP-RS001.rvt	CUP_ Sheet FPS file	All FPS Sheets	Sheet	
DSS		37	NMIAL-LNT-UT -DSS-DS-P1-DD-FP-RM001.rvt	DSS_ Core FPS file	All FPS Model elements	Model	
		38	NMIAL-LNT-UT -DSS-DS-P1-DD-FP-RS001.rvt	DSS_ Sheet FPS file	All FPS Sheets	Sheet	
PNG		39	NMIAL-LNT-UT -PNG-DS-P1-DD-FP-RM001.rvt	PNG_ Core FPS file	All FPS Model elements	Model	
		40	NMIAL-LNT-UT -PNG-DS-P1-DD-FP-RS001.rvt	PNG_ Sheet FPS file	All FPS Sheets	Sheet	
RSS		41	NMIAL-LNT-UT -RSS-DS-P1-DD-FP-RM001.rvt	RSS_ Core FPS file	All FPS Model elements	Model	
		42	NMIAL-LNT-UT -RSS-DS-P1-DD-FP-RS001.rvt	RSS_ Sheet FPS file	All FPS Sheets	Sheet	
STP		43	NMIAL-LNT-UT -STP-DS-P1-DD-FP-RM001.rvt	STP_ Core FPS file	All FPS Model elements	Model	
		44	NMIAL-LNT-UT -STP-DS-P1-DD-FP-RS001.rvt	STP_ Sheet FPS file	All FPS Sheets	Sheet	
SWF		45	NMIAL-LNT-UT -SWF-DS-P1-DD-FP-RM001.rvt	SWF_ Core FPS file	All FPS Model elements	Model	
		46	NMIAL-LNT-UT -SWF-DS-P1-DD-FP-RS001.rvt	SWF_ Sheet FPS file	All FPS Sheets	Sheet	
TRC		47	NMIAL-LNT-UT -TRC-DS-P1-DD-FP-RM001.rvt	TRC_ Core FPS file	All FPS Model elements	Model	
		48	NMIAL-LNT-UT -TRC-DS-P1-DD-FP-RS001.rvt	TRC_ Sheet FPS file	All FPS Sheets	Sheet	
WSD		49	NMIAL-LNT-UT -WSD-DS-P1-DD-FP-RM001.rvt	WSD_ Core FPS file	All FPS Model elements	Model	
		50	NMIAL-LNT-UT -WSD-DS-P1-DD-FP-RS001.rvt	WSD_ Sheet FPS file	All FPS Sheets	Sheet	
EXTERNAL WORKS							
External	FPS	51	NMIAL-LNT-UT -EXT-DS-P1-DD-FP-RM001.rvt	External FPS Model	All External FPS Model	Model	
		52	NMIAL-LNT-UT -EXT-DS-P1-DD-FP-RS001.rvt	External FPS Sheet	All External FPS Sheet files	Sheet	

Note : Model files conatin only Model elements & Sheet files conatin only sheet elements : Annotations , dimensions, notes or legends.

Building Name	Discipline	SR No	File Number	File Name	Content	Model /Sheet	Remarks
PTB	FAS	1	NMIAL-LNT-PT-PT1-DS-P1-DD-FA-RMH01.rvt	HH_ core FAS file	All HH FAS works	Model	
		2	NMIAL-LNT-PT-PT1-DS-P1-DD-FA-RME01.rvt	EP_ core FAS file	All EP FAS works	Model	
		3	NMIAL-LNT-PT-PT1-DS-P1-DD-FA-RMW01.rvt	WP_ core FAS file	All WP FAS works	Model	
		4	NMIAL-LNT-PT-PT1-DS-P1-DD-FA-RMH02.rvt	HH_ FLB core FAS file	All HH FLB works	Model	
		5	NMIAL-LNT-PT-PT1-DS-P1-DD-FA-RME02.rvt	EP_ FLB core FAS file	All EP FLB works	Model	
		6	NMIAL-LNT-PT-PT1-DS-P1-DD-FA-RMW02.rvt	WP_ FLB core FAS file	All WP FLB works	Model	
		7	NMIAL-LNT-PT-PT1-DS-P1-DD-FA-RMF02.rvt	Fore Court core FAS file	All Fore court FAS works	Model	
		8	NMIAL-LNT-PT-PT1-DS-P1-DD-FA-RMH03.rvt	HH_ FAS supports	All HH FAS supports	Model	
		9	NMIAL-LNT-PT-PT1-DS-P1-DD-FA-RME03.rvt	EP_ FAS supports	All EP FAS supports	Model	
		10	NMIAL-LNT-PT-PT1-DS-P1-DD-FA-RMW03.rvt	WP_ FAS supports	All WP FAS supports	Model	
		11	NMIAL-LNT-PT-PT1-DS-P1-DD-FA-RSH01.rvt	HH_FAS Sheet file 1	Annotation for HH	Sheet	
		13	NMIAL-LNT-PT-PT1-DS-P1-DD-FA-RSE01.rvt	EP_FAS Sheet file 2	Annotation for EP	Sheet	
		14	NMIAL-LNT-PT-PT1-DS-P1-DD-FA-RSW02.rvt	WP_FAS Sheet file 3	Annotation for WP	Sheet	
SFB							
AMB	FAS	15	NMIAL-LNT-SF-AMB-DS-P1-DD-FA-RM001.rvt	AMB_ Core FAS file	All FAS Model elements	Model	
		16	NMIAL-LNT-SF-AMB-DS-P1-DD-FA-RS001.rvt	AMB_ Sheet FAS file	All FAS Sheets	Sheet	
ARF		17	NMIAL-LNT-SF-ARF-DS-P1-DD-FA-RM001.rvt	ARF_ Core FAS file	All FAS Model elements	Model	
		18	NMIAL-LNT-SF-ARF-DS-P1-DD-FA-RS001.rvt	ARF_ Sheet FAS file	All FAS Sheets	Sheet	
ATB		19	NMIAL-LNT-SF-ATB-DS-P1-DD-FA-RM001.rvt	ATB_ Core FAS file	All FAS Model elements	Model	
		20	NMIAL-LNT-SF-ATB-DS-P1-DD-FA-RS001.rvt	ATB_ Sheet FAS file	All FAS Sheets	Sheet	
CCE		21	NMIAL-LNT-SF-CCE-DS-P1-DD-FA-RM001.rvt	CCE_ Core FAS file	All FAS Model elements	Model	
		22	NMIAL-LNT-SF-CCE-DS-P1-DD-FA-RS001.rvt	CCE_ Sheet FAS file	All FAS Sheets	Sheet	
CCW		23	NMIAL-LNT-SF-CCW-DS-P1-DD-FA-RM001.rvt	CCW_ Core FAS file	All FAS Model elements	Model	
		24	NMIAL-LNT-SF-CCW-DS-P1-DD-FA-RS001.rvt	CCW_ Sheet FAS file	All FAS Sheets	Sheet	
MET		25	NMIAL-LNT-SF-MET-DS-P1-DD-FA-RM001.rvt	MET_ Core FAS file	All FAS Model elements	Model	
		26	NMIAL-LNT-SF-MET-DS-P1-DD-FA-RS001.rvt	MET_ Sheet FAS file	All FAS Sheets	Sheet	
SG1		27	NMIAL-LNT-SF-SG1-DS-P1-DD-FA-RM001.rvt	SG1_ Core FAS file	All FAS Model elements	Model	
		28	NMIAL-LNT-SF-SG1-DS-P1-DD-FA-RS001.rvt	SG1_ Sheet FAS file	All FAS Sheets	Sheet	
SG2		29	NMIAL-LNT-SF-SG2-DS-P1-DD-FA-RM001.rvt	SG2_ Core FAS file	All FAS Model elements	Model	
		30	NMIAL-LNT-SF-SG2-DS-P1-DD-FA-RS001.rvt	SG2_ Sheet FAS file	All FAS Sheets	Sheet	
SMR		31	NMIAL-LNT-SF-SMR-DS-P1-DD-FA-RM001.rvt	SMR_ Core FAS file	All FAS Model elements	Model	
		32	NMIAL-LNT-SF-SMR-DS-P1-DD-FA-RS001.rvt	SMR_ Sheet FAS file	All FAS Sheets	Sheet	
SR1		33	NMIAL-LNT-SF-SR1-DS-P1-DD-FA-RM001.rvt	SR1_ Core FAS file	All FAS Model elements	Model	
		34	NMIAL-LNT-SF-SR1-DS-P1-DD-FA-RS001.rvt	SR1_ Sheet FAS file	All FAS Sheets	Sheet	
UTB							
CUP	FAS	35	NMIAL-LNT-UT -CUP-DS-P1-DD-FA-RM001.rvt	CUP_ Core FAS file	All FAS Model elements	Model	
		36	NMIAL-LNT-UT -CUP-DS-P1-DD-FA-RS001.rvt	CUP_ Sheet FAS file	All FAS Sheets	Sheet	
DSS		37	NMIAL-LNT-UT -DSS-DS-P1-DD-FA-RM001.rvt	DSS_ Core FAS file	All FAS Model elements	Model	
		38	NMIAL-LNT-UT -DSS-DS-P1-DD-FA-RS001.rvt	DSS_ Sheet FAS file	All FAS Sheets	Sheet	
PNG		39	NMIAL-LNT-UT -PNG-DS-P1-DD-FA-RM001.rvt	PNG_ Core FAS file	All FAS Model elements	Model	
		40	NMIAL-LNT-UT -PNG-DS-P1-DD-FA-RS001.rvt	PNG_ Sheet FAS file	All FAS Sheets	Sheet	
RSS		41	NMIAL-LNT-UT -RSS-DS-P1-DD-FA-RM001.rvt	RSS_ Core FAS file	All FAS Model elements	Model	
		42	NMIAL-LNT-UT -RSS-DS-P1-DD-FA-RS001.rvt	RSS_ Sheet FAS file	All FAS Sheets	Sheet	
STP		43	NMIAL-LNT-UT -STP-DS-P1-DD-FA-RM001.rvt	STP_ Core FAS file	All FAS Model elements	Model	
		44	NMIAL-LNT-UT -STP-DS-P1-DD-FA-RS001.rvt	STP_ Sheet FAS file	All FAS Sheets	Sheet	
SWF		45	NMIAL-LNT-UT -SWF-DS-P1-DD-FA-RM001.rvt	SWF_ Core FAS file	All FAS Model elements	Model	
		46	NMIAL-LNT-UT -SWF-DS-P1-DD-FA-RS001.rvt	SWF_ Sheet FAS file	All FAS Sheets	Sheet	
TRC		47	NMIAL-LNT-UT -TRC-DS-P1-DD-FA-RM001.rvt	TRC_ Core FAS file	All FAS Model elements	Model	
		48	NMIAL-LNT-UT -TRC-DS-P1-DD-FA-RS001.rvt	TRC_ Sheet FAS file	All FAS Sheets	Sheet	
WSD		49	NMIAL-LNT-UT -WSD-DS-P1-DD-FA-RM001.rvt	WSD_ Core FAS file	All FAS Model elements	Model	
		50	NMIAL-LNT-UT -WSD-DS-P1-DD-FA-RS001.rvt	WSD_ Sheet FAS file	All FAS Sheets	Sheet	
EXTERNAL WORKS							
External	FAS	51	NMIAL-LNT-UT -EXT-DS-P1-DD-ME-RM001.rvt	External FAS Model	All External FAS Model	Model	
		52	NMIAL-LNT-UT -EXT-DS-P1-DD-ME-RS001.rvt	External FAS Sheet	All External FAS Sheet files	Sheet	

Note : Model files conatin only Model elements & Sheet files conatin only sheet elements : Annotations , dimensions, notes or legends.

Building Name	Discipline	SR No	File Number	File Name	Content	Model /Sheet	Remarks
		1	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RMH01.rvt	HH_ICT fixtures	All ICT fixtures: WIFI,CCTV,ACS,DAS,PA,BMS	Model	
		2	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RMH02.rvt	HH_ICT Cable tray & Raceways	All ICT Cable trays & Raceways	Model	
		3	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RMH03.rvt	HH_ICT socket file	All ICT raceways & Lighting protection	Model	
		4	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RMH04.rvt	HH_Support system	All ICT Supports	Model	
		5	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RMH05.rvt	HH_FLB ICT File	All ICT FLB works	Model	
		6	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RME01.rvt	EP_ICT fixtures	All ICT fixtures: WIFI,CCTV,ACS,DAS,PA,BMS	Model	
		7	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RME02.rvt	EP_ICT Cable tray & Raceways	All ICT Cable trays & Raceways	Model	
		8	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RME03.rvt	EP_ICT socket file	All ICT raceways & Lighting protection	Model	
		9	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RME04.rvt	EP_Support system	All ICT Supports	Model	
		10	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RME05.rvt	EP_FLB ICT File	All ICT FLB works	Model	
		11	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RMW01.rvt	WP_ICT fixtures	All ICT fixtures: WIFI,CCTV,ACS,DAS,PA,BMS	Model	
		12	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RMW02.rvt	WP_ICT Cable tray & Raceways	All ICT Cable trays & Raceways	Model	
		13	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RMW03.rvt	WP_ICT socket file	All ICT raceways & Lighting protection	Model	
		14	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RMW04.rvt	WP_Support system	All ICT Supports	Model	
		15	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RMW05.rvt	WP_FLB ICT File	All ICT FLB works	Model	
		16	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RSH01.rvt	HH_ICT Sheet file 1	Annotation for HH	Sheet	
		17	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RSE01.rvt	EP_ICT Sheet file 2	Annotation for EP	Sheet	
		18	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RSW01.rvt	WP_ICT Sheet file 3	Annotation for WP	Sheet	
		19	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RMF01.rvt	Fore Court ICT Model	All Fourcourt ICT works	Model	
PTB	ICT	20	NMIAL-LNT-PT-PT1-DS-P1-DD-IT-RSF02.rvt	Fore Court ICT Sheet	All Fourecourt annotations	Sheet	
SFB							
		21	NMIAL-LNT-SF-AMB-DS-P1-DD-IT-RM001.rvt	AMB_ Core ICT file	All ICT Model elements	Model	
AMB		22	NMIAL-LNT-SF-AMB-DS-P1-DD-IT-RS001.rvt	AMB_ Sheet ICT file	All ICT Sheets	Sheet	
		23	NMIAL-LNT-SF-ARF-DS-P1-DD-IT-RM001.rvt	ARF_ Core ICT file	All ICT Model elements	Model	
ARF		24	NMIAL-LNT-SF-ARF-DS-P1-DD-IT-RS001.rvt	ARF_ Sheet ICT file	All ICT Sheets	Sheet	
		25	NMIAL-LNT-SF-ATB-DS-P1-DD-IT-RM001.rvt	ATB_ Core ICT file	All ICT Model elements	Model	
ATB		26	NMIAL-LNT-SF-ATB-DS-P1-DD-IT-RS001.rvt	ATB_ Sheet ICT file	All ICT Sheets	Sheet	
		27	NMIAL-LNT-SF-CCE-DS-P1-DD-IT-RM001.rvt	CCE_ Core ICT file	All ICT Model elements	Model	
CCE		28	NMIAL-LNT-SF-CCE-DS-P1-DD-IT-RS001.rvt	CCE_ Sheet ICT file	All ICT Sheets	Sheet	
		29	NMIAL-LNT-SF-CCW-DS-P1-DD-IT-RM001.rvt	CCW_ Core ICT file	All ICT Model elements	Model	
CCW		30	NMIAL-LNT-SF-CCW-DS-P1-DD-IT-RS001.rvt	CCW_ Sheet ICT file	All ICT Sheets	Sheet	
		31	NMIAL-LNT-SF-MET-DS-P1-DD-IT-RM001.rvt	MET_ Core ICT file	All ICT Model elements	Model	
MET		32	NMIAL-LNT-SF-MET-DS-P1-DD-IT-RS001.rvt	MET_ Sheet ICT file	All ICT Sheets	Sheet	
		33	NMIAL-LNT-SF-SG1-DS-P1-DD-IT-RM001.rvt	SG1_ Core ICT file	All ICT Model elements	Model	
SG1		34	NMIAL-LNT-SF-SG1-DS-P1-DD-IT-RS001.rvt	SG1_ Sheet ICT file	All ICT Sheets	Sheet	
		35	NMIAL-LNT-SF-SG2-DS-P1-DD-IT-RM001.rvt	SG2_ Core ICT file	All ICT Model elements	Model	
SG2		36	NMIAL-LNT-SF-SG2-DS-P1-DD-IT-RS001.rvt	SG2_ Sheet ICT file	All ICT Sheets	Sheet	
		37	NMIAL-LNT-SF-SMR-DS-P1-DD-IT-RM001.rvt	SMR_ Core ICT file	All ICT Model elements	Model	
SMR		38	NMIAL-LNT-SF-SMR-DS-P1-DD-IT-RS001.rvt	SMR_ Sheet ICT file	All ICT Sheets	Sheet	
		39	NMIAL-LNT-SF-SR1-DS-P1-DD-IT-RM001.rvt	SR1_ Core ICT file	All ICT Model elements	Model	
SR1	ICT	40	NMIAL-LNT-SF-SR1-DS-P1-DD-IT-RS001.rvt	SR1_ Sheet ICT file	All ICT Sheets	Sheet	
UTB							
		41	NMIAL-LNT-UT -CUP-DS-P1-DD-IT-RM001.rvt	CUP_ Core ICT file	All ICT Model elements	Model	
CUP		42	NMIAL-LNT-UT -CUP-DS-P1-DD-IT-RS001.rvt	CUP_ Sheet ICT file	All ICT Sheets	Sheet	
		43	NMIAL-LNT-UT -DSS-DS-P1-DD-IT-RM001.rvt	DSS_ Core ICT file	All ICT Model elements	Model	
DSS		44	NMIAL-LNT-UT -DSS-DS-P1-DD-IT-RS001.rvt	DSS_ Sheet ICT file	All ICT Sheets	Sheet	
		45	NMIAL-LNT-UT -PNG-DS-P1-DD-IT-RM001.rvt	PNG_ Core ICT file	All ICT Model elements	Model	
PNG		46	NMIAL-LNT-UT -PNG-DS-P1-DD-IT-RS001.rvt	PNG_ Sheet ICT file	All ICT Sheets	Sheet	
		47	NMIAL-LNT-UT -RSS-DS-P1-DD-IT-RM001.rvt	RSS_ Core ICT file	All ICT Model elements	Model	
RSS		48	NMIAL-LNT-UT -RSS-DS-P1-DD-IT-RS001.rvt	RSS_ Sheet ICT file	All ICT Sheets	Sheet	
		49	NMIAL-LNT-UT -STP-DS-P1-DD-IT-RM001.rvt	STP_ Core ICT file	All ICT Model elements	Model	
STP		50	NMIAL-LNT-UT -STP-DS-P1-DD-IT-RS001.rvt	STP_ Sheet ICT file	All ICT Sheets	Sheet	
		51	NMIAL-LNT-UT -SWF-DS-P1-DD-IT-RM001.rvt	SWF_ Core ICT file	All ICT Model elements	Model	
SWF		52	NMIAL-LNT-UT -SWF-DS-P1-DD-IT-RS001.rvt	SWF_ Sheet ICT file	All ICT Sheets	Sheet	
		53	NMIAL-LNT-UT -TRC-DS-P1-DD-IT-RM001.rvt	TRC_ Core ICT file	All ICT Model elements	Model	
TRC		54	NMIAL-LNT-UT -TRC-DS-P1-DD-IT-RS001.rvt	TRC_ Sheet ICT file	All ICT Sheets	Sheet	
		55	NMIAL-LNT-UT -WSD-DS-P1-DD-IT-RM001.rvt	WSD_ Core ICT file	All ICT Model elements	Model	
WSD	ICT	56	NMIAL-LNT-UT -WSD-DS-P1-DD-IT-RS001.rvt	WSD_ Sheet ICT file	All ICT Sheets	Sheet	
EXTERNAL WORKS							
		57	NMIAL-LNT-UT -EXT-DS-P1-DD-IT-RM001.rvt	External ICT Model	All External ICT Model	Model	
External	ICT	58	NMIAL-LNT-UT -EXT-DS-P1-DD-IT-RS001.rvt	External ICT Sheet	All External ICT Sheet files	Sheet	

Note : Model files conatin only Model elements & Sheet files conatin only sheet elements : Annotations , dimensions, notes or legends.

Building Name	Discipline	SR No	File Number	File Name	Content	Model /Sheet	Remarks
PTB	BHS	1	NMIAL-LNT-PT-PT1-DS-P1-DD-BH-RMH01.rvt	BHS Core file	AlL BHS works (Conveyors, belts,motors etc..)	Model	
		2	NMIAL-LNT-PT-PT1-DS-P1-DD-BH-RMH02.rvt	BHS Cat walkfile	BHS cat walk system	Model	
		3	NMIAL-LNT-PT-PT1-DS-P1-DD-BH-RMH03.rvt	BHS Steel support	Steel support system	Model	
		4	NMIAL-LNT-PT-PT1-DS-P1-DD-BH-RSH01.rvt	BHS sheet file 1	BHS sheet file	Sheet	
		5	NMIAL-LNT-PT-PT1-DS-P1-DD-BH-RSH02.rvt	BHS sheet file 2	BHS sheet file	Sheet	

Note : Model files conatin only Model elements & Sheet files conatin only sheet elements : Annotations , dimensions, notes or legends.

Building Name	Discipline	SR No	File Number	File Name	Content	Model /Sheet	Remarks
Airside and Landside Infrastructures	CIVIL	1	NMIAL-LNT-AS-RWY-DS-P1-DD-CV-CMA01	Civil 3d model file	Pavement (Pavement Layers, Slabs Layout), Geometry	Model	Airside models
		2	NMIAL-LNT-LS-GRD-DS-P1-DD-ST-RML02	Revit Model	Structures like Elevated Corridor, Underpasses, Ramp, FOB	Model	Landside Model
		3	NMIAL-LNT-AS-PNA-DS-P1-DD-ST-RMA05	Revit Model	High mast Foundations, VDGS Foundations, Apron Furniture	Model	Airside models
		4	NMIAL-LNT-AS-RWY-DS-P1-DD-ST-RMA09	Revit Model	Nav-Aid Duct Bank, Chambers, Pits, Equipment Foundations	Model	Airside models
	Electrical	5	NMIAL-LNT-AS-RWY-DS-P1-DD-EL-RMA03	Revit Model	AGL Duct bank, Chambers Pits	Model	Airside models
		6	NMIAL-LNT-AS-RWY-DS-P1-DD-EL-RMA04	Revit Model	Secondary Conduits & Light fixtures	Model	Airside models
	Storm Water Drainage	7	NMIAL-LNT-AS-RWY-DS-P1-DD-PL-CMA06	Revit Model	Drains & Drainage Structures (Chambers, OWS, Outfalls, Silting Pond, RWHP, Grated Drain, Box Culverts, Rectangular Open Drains	Model	Airside models
		8	NMIAL-LNT-LS-GRD-DS-P1-DD-PL-CML06	Civil 3d model file	Landside Drains and Drainage Structures	Model	Landside Model
	Road Furniture & Signages	9	NMIAL-LNT-AS-RWY-DS-P1-DD-GR-RMA08	Revit Model	Airfield Signages (MAGS) and Marking	Model	Airside models
		10	NMIAL-LNT-LS-GRD-DS-P1-DD-GR-RML07	Revit Model	Plan Markings for Roads & Road Furniture	Model	Landside Model

ANNEXURE C - DETAILED WORK FLOW PROCEDURE

LEVEL 1: BIM EXECUTION PLANNING PROCESS
Project Title

Developed with the BIM Project Execution Planning Procedure by the Penn State CIC Research Team
http://www.engr/psu.edu/ae/cic/bimex

BIM USES

Planning
Validate Program
Owner | Programming

Schematic Design
Author Schematic Design
Architect | Design Authoring

Schematic Design
Perform 3D Coordination
Architect | 3D Macro Coordination

Schematic Design
Develop 3D models
Architect | Virtual Prototyping

Design Development
Author Design Development
Architect | Design Authoring

Design Development
Perform 3D Coordination
All stake holders | 3D Macro Coordination

Design Development
Develop 3D models
All stake holders | Virtual Prototyping

Design Development
Create 4D Model
Contractor | 4D Modeling

Construction Documents
Author Construction Documents
Architect | Detailed Map

Construction Documents
Perform 3D Coordination
All Stake holders | 3D Macro Coordination

Construction Documents
Develop 3D models
Subcontractors/ Vendors | Virtual Prototyping

Construction Documents
Create 4D Model
Contractor | 4D Modeling

Operations
Compile Record Model
Contractor | Record Model

END PROCESS

INFO EXCHANGE

Program Model

Schematic Design
- Architectural Model
- MEP Model
- Structural Model
- Civil Model

Schematic Design 3D Macro Coordination Model

Design Development
- Architectural Model
- MEP Model
- Structural Model
- Civil Model

Design Development 4D Model

Design Development 3D Macro Coordination Model

Design Development 3D models

Construction Documents (WP)
- Architectural Model
- MEP Model
- Structural Model
- Civil Model

CD (MP) 3D Macro Coordination Model

CD (MP) 4D Model

CD (MP) 3D models

Record Model

TECHNICAL MEMORANDUM

NMIA Project Grid Co-ordinate System

PREPARED FOR:	NMIAL
COPY TO:	Chanderbhan Manwani, Gaurav Vatsa, Santanu Ghosh
PREPARED BY:	Ramesh Bashyam / Rajilal V
DATE:	May 25, 2018
PROJECT NUMBER:	TBD
DOCUMENT NUMBER:	NMIAL-CH2M-REP-TS-DS-GN-0022
REVISION NO.:	0
APPROVED BY:	Tom Foster

1.0 Introduction

The purpose of this document is to define the survey grid co-ordinate system for NMIA project. A project specific grid system is added to the UTM co-ordinate system. The project grid system is defined in 4 digits and it is made parallel to horizontal for the convenience of surveyors, designers & contractors. Further this will be convenient at site to manage to reduce the chances for errors and also in a long term asset management / maintenance perspective of airside infrastructure. Such project specific grid systems are being practiced in many of the airports around the world. On the other hand, the UTM co-ordinate system is the global co-ordinate system which is also to be maintained for Nav-aids reporting and publishing of aerodrome information to concern authorities

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2.0 Dual co-ordinate system

Considering the benefits of both the grid systems, a switchable grid co-ordinated system is proposed. This is will avoid moving the CAD objects from one co-ordinate system to another. Through the switchable grid system, co-ordinates from both the grid systems can be extracted at any point of time. The procedure to handle this co-ordinate system is explained under “CAD Settings” in this memo.

3.0 Runway Bearing

As per the updated master plan, UTM co-ordinate of south runway threshold 08R (west end) is N 2100019.612, E 294492.173. The orientation of the proposed NMIA South Runway is 83d 00m 00s to the UTM north.

4.0 Reference for UTM & Project Grid System

All model files in Autocad will remain in UTM Grid system and can be switched to Project Grid system without moving or rotating the objects in model files. By using “UCS” command in AutoCAD this can be achieved. South Runway Threshold 08R coordinate & its Bearing will be used as reference point in all drawings. Below note will be added in all layout drawings. As a result, the intersection of landside main access road centerline and the line connecting the 08 threshold of both runways will have project co-ordinate as 6000 N, 2000 E and its UTM co-ordinate is 2100803.723 N, 294395.897 E.

GRIDS SHOWN ARE PROJECT GRID.

GRID DATA REFERENCE POINT - AT THRESHOLD 08R SOUTH RUNWAY.

PROJECT COORDINATE : E 6000.000, N 1210.000

UTM COORDINATE : E 294492.173, N 2100019.612

ORIENTATION - THRESHOLD 08R TO THRESHOLD 26L AS

PROJECT GRID BEARING : 90°- 00' - 00"

UTM GRID BEARING : 83° - 00' - 00"

DATUM REFERENCE: WGS84

5.0 CAD settings

Procedure to setup the project grid system is explained below:

Step 1

Open the CAD file on which we need to establish project grid and in model space, set the UCS to "WORLD". This can be done through "UCS" command in AutoCAD.

Step 2

Insert "NMIA Project Grid UCS.dwg" file from ProjectWise (file will be shared with all consultants) in the model file. Use "Explode" command to explode NMIA Project Grid UCS file in current model file. Type "Zoom" then "Extents" to see the line inserted whose left end point will be the base point 0,0 of Project grid coordinate. See Figure 1

Step 3

Type "UCS" command and press enter; then type "OB" and press enter; then select left edge of the line inserted in step 2 and press enter. To change view orientation of the model file to match current Grid, type "Plan" and press enter. See Figures 1 & 2

Figure 1

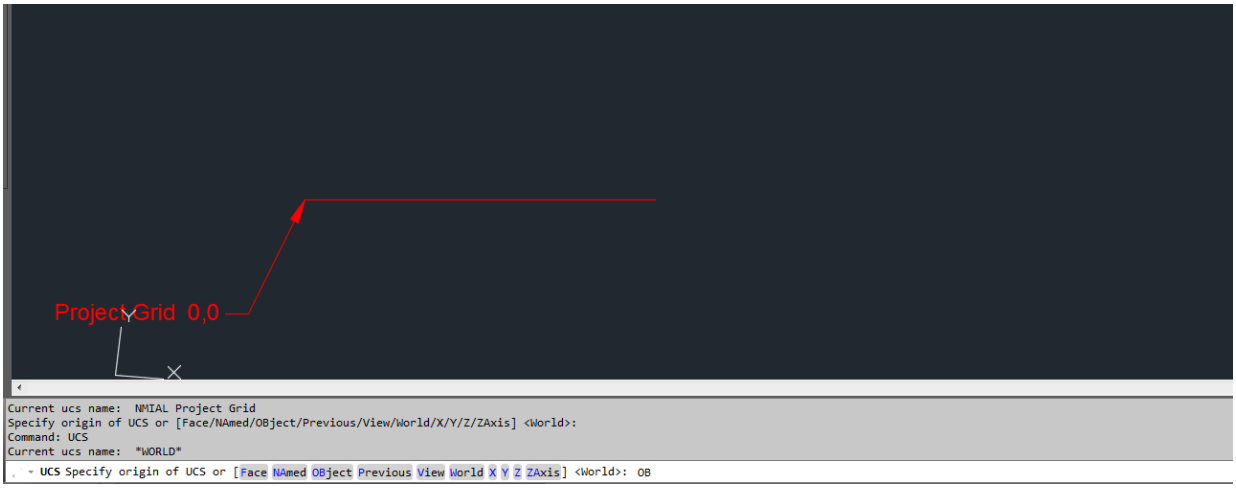
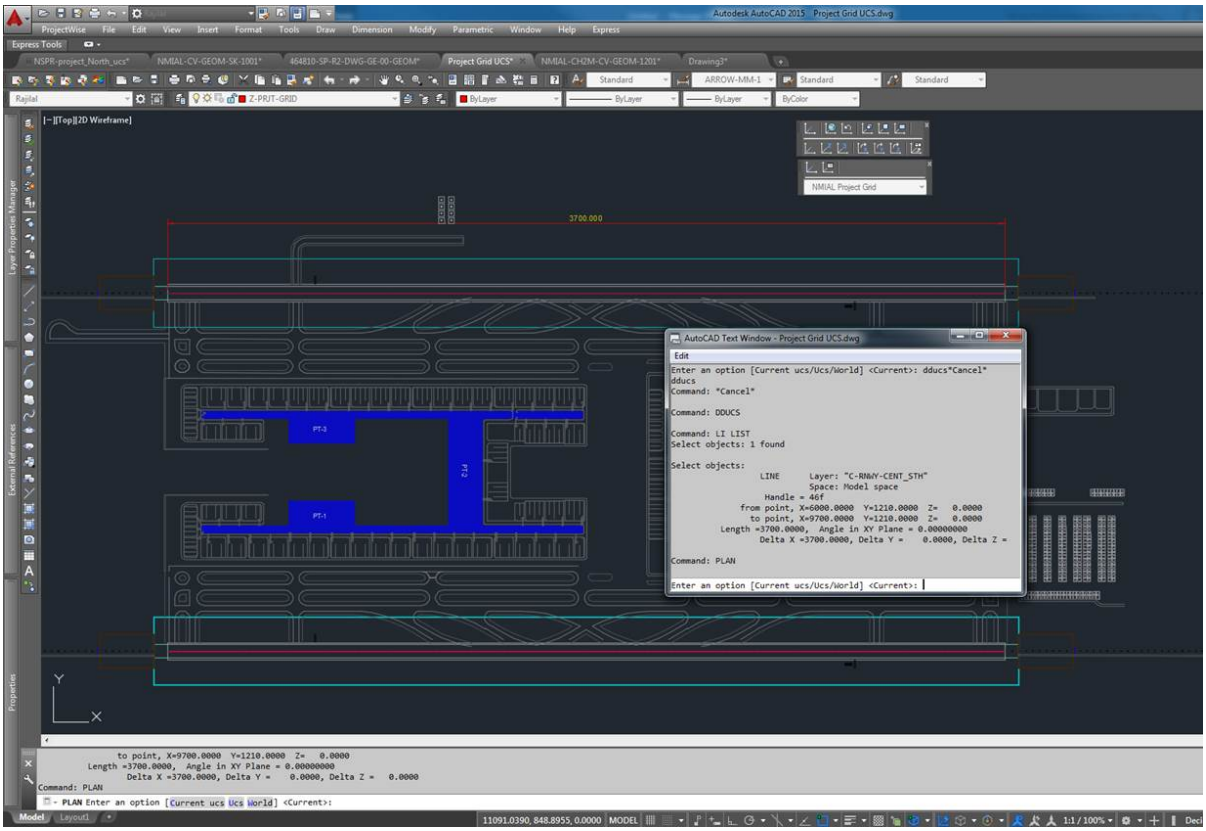


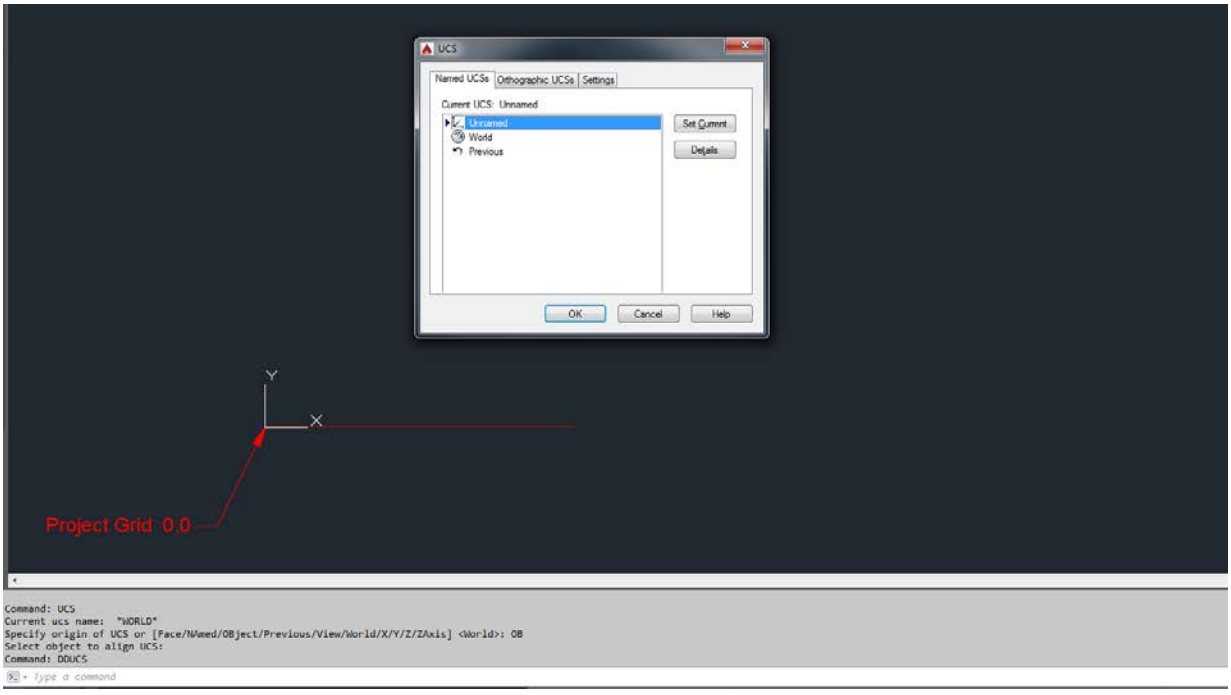
Figure 2



Step 4

Type “DDUCS” to display saved UCSs and rename the current UCS “Unnamed” as “NMIA Project Grid” and save it by clicking ok. See Figure 3

Figure 3



Step 5

Now we have two UCS; one is the default UCS “World” and this will be the UTM Grid System and the other one what we saved in Step 4 as “NMIA Project Grid” will be used for Project Grid Co-ordinate System.

Step 6

To switch from one Grid (UCS) to another Grid, type “DDUCS” and select “World” for UTM Grid system and select “NMIA Project Grid” for Project Grid system, click “Set Current” tab and press “Ok”.
See Figure 4

Or

From Pulldown menu “Tools” > “Toolbars” > AutoCAD > turn on “UCS II” toolbar, then select “NMIA Project Grid” or “World” UCS as required from its pulldown. See Figure 5

To change view orientation of the model file to match current Grid, type “Plan” then enter.

Figure 4

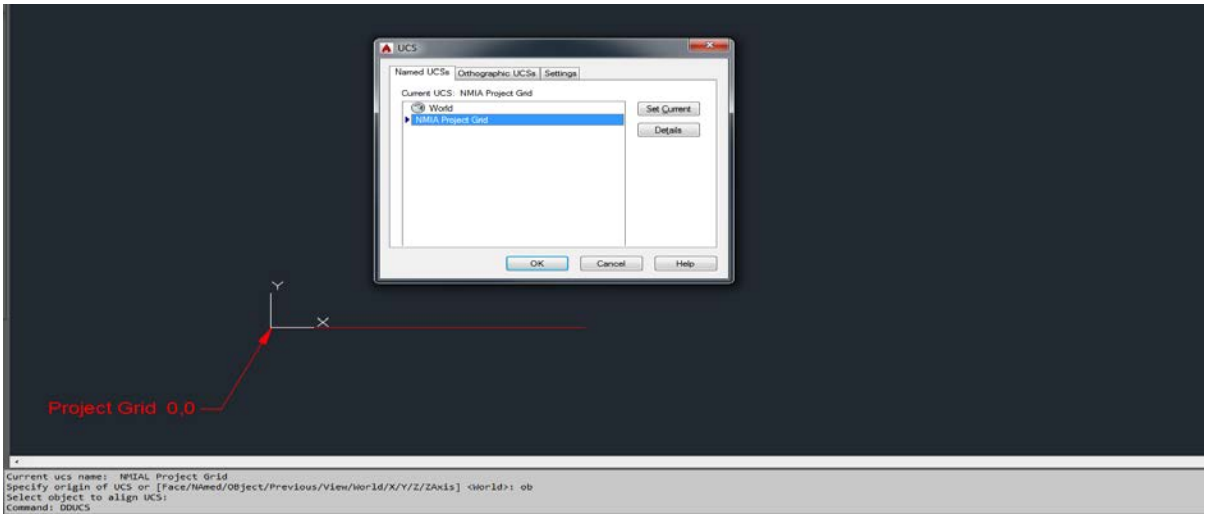
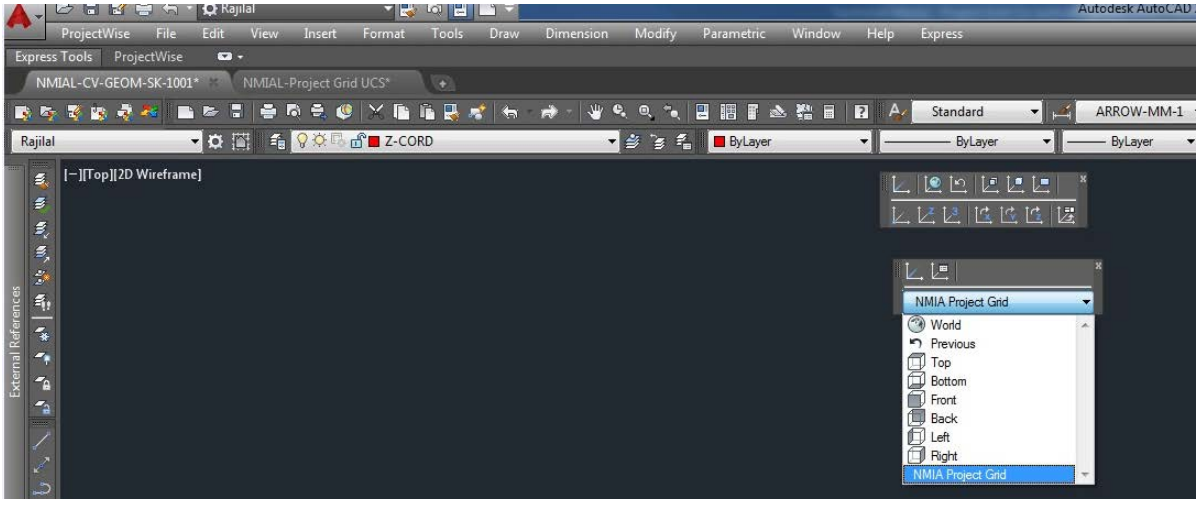


Figure 5



Step 7

Save the model file. Follow same steps in another file to save Project Grid.

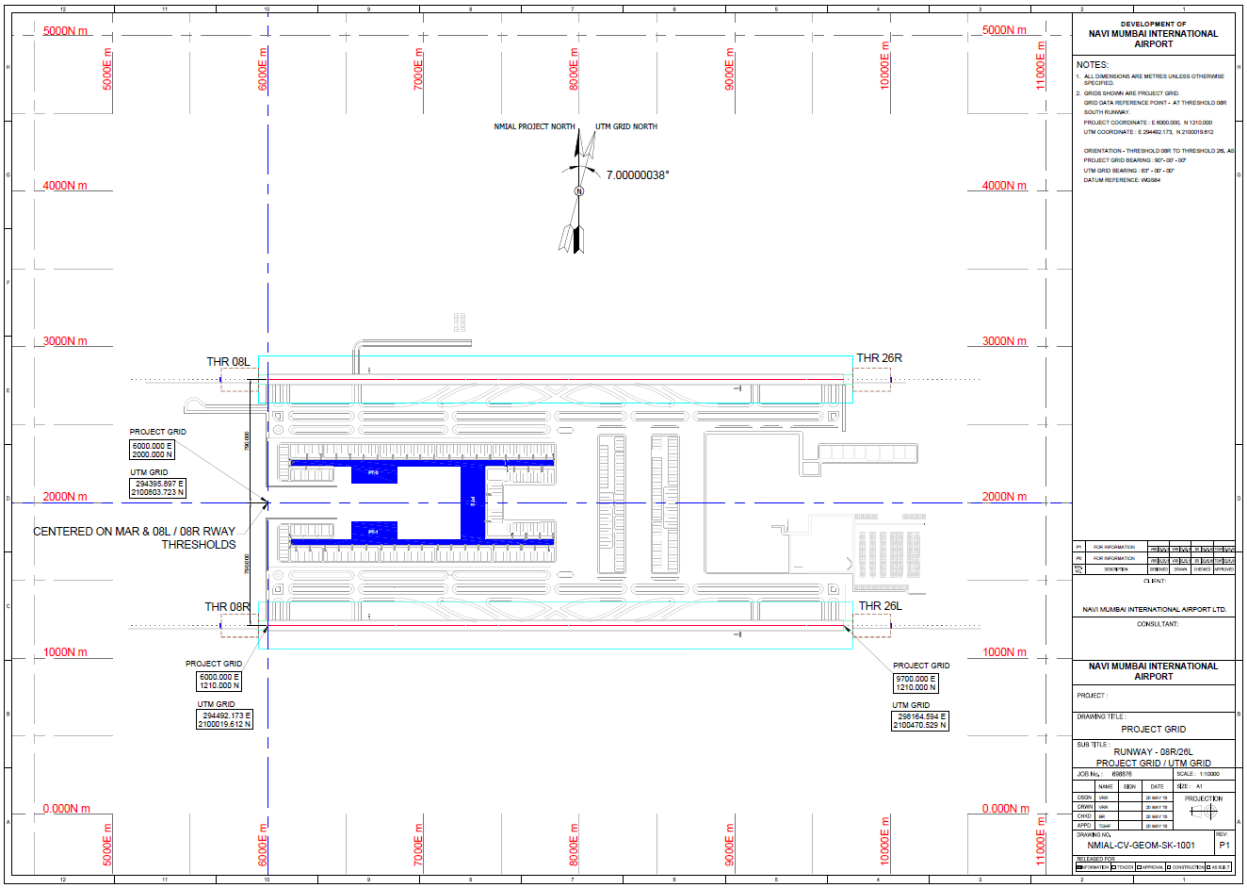
6.0 BIM Compatibility

BIM models in Revit can be simply moved and rotated to fit in both Grids.

For other BIM softwares, either UTM or NMIA Project Grid needs to be followed and those who are working in AutoCAD, Civil3D or Revit will have to give model files in same Grid system for clash analysis checking in Navisworks.

It is recommended that Final combined BIM model shall be either UTM or NMIA Project Grid, which needs to be confirmed at beginning of design models to avoid future issues. It is discussed with the BIM modelers involved in the project and recommended to use UTM grid system for combined BIM model analysis.

7.0 Sample Output



8.0 Annexures

1. NMIA Project Grid UCS.dwg
2. NMIAL-CV-GEOM-SK-1001.dwg

ANNEXURE E_ BIM QA/QC SYSTEM

L&T Construction
Buildings & Factories

ENGINEERING DESIGN AND RESEARCH CENTRE

Document No.	BIM-BF-FT-01 R1 BIM MODEL - QUALITY CHECK LIST FOR BIM STANDARDS.	Sheet
BIM-BF-FT-01 R1		1 of 2

Project No. / Name :				**OVERALL COMMENTS / OBSERVATIONS:**	
File Saved Path :					
File Name :					
Team :					
Model Prepared by :					
Audit Done by :					
Date					
Design Stage	❑ SD	❑ DD	❑ GFC	❑ AS BUILT	**Other**

Sl.No	Description	Reference	Applicable (Yes / No)	Complied (Yes / No)	Remarks
1	**Availability of Project BIM Strategy Document.**				
2	**Adherence to Common Data Enviroment (CDE).** a) Project Folder Structure Creation as per CDE. b) Model File Names - Conventions followed. c) Model Links established from Shared Location. d) Models archived properly.	Strategy Document			
3	**Master Models - Available** **Templates / Title Blocks, View Templates**				
4	**Datum: Project Origin, Levels / Grids**	Master Model			
5	**Model File Size**	<500 MB			
6	**Purged:** Unreferenced / Unused Model / Annotation Families				
7	**Removal of Unwanted Sheets / Views.**	Views NOT ON SHEETS.			
8	**CAD Files:** i) Linked in CDE location				
9	**Project Information** >> Starting View. Job Code, Project, Client, Consultant etc.				
10	**Shared Parameters Text File - Available / Used**				
11	**Key Note Text File - Created / Used for Annotation.** i.e: Door, Window, Walls, etc				
12	**Right Model Categories used**				
13	**Central Model Available.**				
14	**Elements Placed in appropriate Worksets.**				
15	**Sheets generated in Model.**				
16	**Sheet List Generated.** i.e: Sheet Name / Number	DCI			
17	**Views Extracted from Model.** i.e: Floor Plans, Elevations, Sections, Schedules _BOQ, Built Up Areas.				
18	**Views Placed on Sheets.**				
19	**Scope Boxes / Matchlines defined for Part Plans.**				
20	**Annotations - Automated.** All Components represented with Tags. **i.e: Wall, Floor, Ceiling, Door, Window, Rooms, Spaces.**	As per Master Model.			
21	**Standard Text Styles used.**	As per Master Model.			
22	**Type Marks / Marks - Assigned for all elements.**				
23	**Grid / Level Heads, Symbols, View References.**	Master Model			
24	**Revit Model Version & Build.**	Strategy Document			
25	**Model Breakdown Structure**	Strategy Document			
26	**Model Production Delivery Table - Compliance**	Strategy Document			

L&T Construction Buildings & Factories

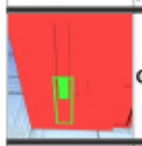
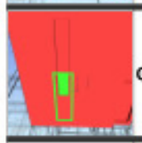
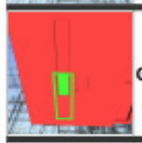
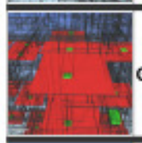
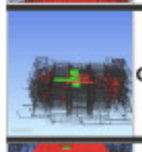
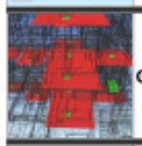
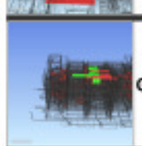
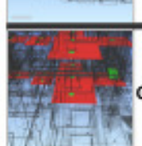
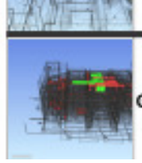
ENGINEERING DESIGN AND RESEARCH CENTRE

Document No.	BIM MODEL - QUALITY CHECK LIST FOR BIM STANDARDS.	Sheet
BIM-BF-FT-01 R1		2 of 2

Project No. / Name :					
File Saved Path :					
File Name :				**OVERALL COMMENTS / OBSERVATIONS:**	
Team :					
Model Prepared by :					
Audit Done by :					
Date					
Design Stage	❑ SD	❑ DD	❑ GFC	❑ AS BUILT	**Other**

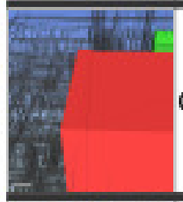
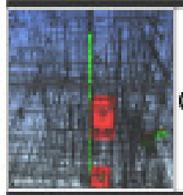
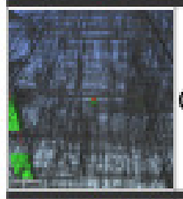
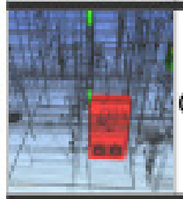
Sl.No	Description	Reference	Applicable (Yes / No)	Complied (Yes / No)	Remarks
27	**Level of Development Validated. (LOD)**	**Strategy Document**			
28	**Classification System followed. i.e: Omini class.**	**Strategy Document**			
29	**Asset Management Requirments - CoBie.**	**Strategy Document**			
30	**Family Files - Naming Conventions**	**NMIAL BIM Stds**			
31	**Elements - Naming Conventions.** **i.e: Wall Types, Floor Types**	**NMIAL BIM Stds**			
32	**Review Warnings** - Cleared.				
33	Model Coordination Reviews done				
34	Phasing:				
35	**Clash Report** Generated / Resolved.				

Building Name: Building-1
Location:

						Item 1	Item 2
Image	Clash Name	Status	Distance	Grid Location	Clash Point	Item ID	Item ID
	Group12	New	-0.023	J-8 : Level PL	x:533072.213, y:2349570.704, z:1.200	*Element ID*: 724965	*Element ID*: 2440138
	Group11	New	-0.025	J-8 : Level PL	x:533072.232, y:2349570.683, z:5.700	*Element ID*: 692051	*Element ID*: 2985302
	Group10	New	-0.025	J-8 : Level PL	x:533072.232, y:2349570.683, z:10.200	*Element ID*: 753441	*Element ID*: 3018135
	Group9	New	-0.039	E-9 : Level PL	x:533078.437, y:2349565.976, z:12.039	*Element ID*: 904326	*Element ID*: 2023489
	Group8	New	-0.046	H-4 : Level PL	x:533058.279, y:2349556.414, z:12.046	*Element ID*: 907439	*Element ID*: 3098859
	Group7	New	-0.039	E-9 : Level PL	x:533078.577, y:2349565.948, z:7.539	*Element ID*: 885406	*Element ID*: 2023006
	Group6	New	-0.046	F-3 : Level PL	x:533055.646, y:2349548.107, z:7.546	*Element ID*: 854777	*Element ID*: 2023286
	Group5	New	-0.039	E-9 : Level PL	x:533078.225, y:2349565.784, z:3.039	*Element ID*: 885375	*Element ID*: 2023162
	Group4	New	-0.046	G-3 : Level PL	x:533054.458, y:2349549.379, z:3.046	*Element ID*: 856610	*Element ID*: 2023171

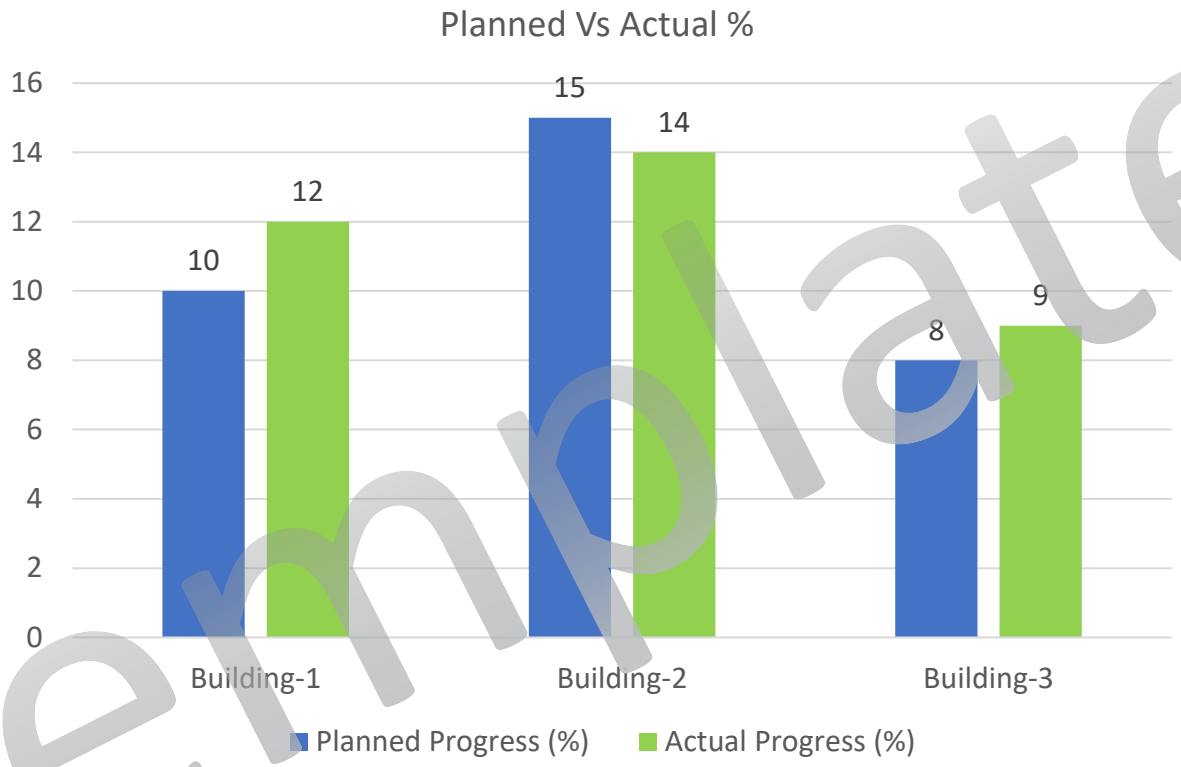
Clash Analysis report

P2_HVAC vs FP

						Item 1	Item 2
Image	Clash Name	Status	Distance	Grid Location	Clash Point	Item ID	Item ID
	Group8	New	-0.011	C-4 : Level PL	x:533065.927, y:2349546.735, z:17.710	*Element ID*: 2965373	*Element ID*: 2986472
	Group7	New	-0.088	G-9 : Level PL	x:533076.065, y:2349571.017, z:11.085	*Element ID*: 1777469	*Element ID*: 1763381
	Group6	New	-0.029	M-3 : Level PL	x:533048.501, y:2349558.438, z:-0.600	*Element ID*: 2154663	*Element ID*: 2124410
	Group5	New	-0.072	G-9 : Level PL	x:533076.062, y:2349570.997, z:2.085	*Element ID*: 1777324	*Element ID*: 1745504
	Group4	New	-0.083	G-9 : Level PL	x:533076.059, y:2349571.018, z:9.005	*Element ID*: 1777469	*Element ID*: 1763136

ANNEXURE G_4D SAMPLE REPORT

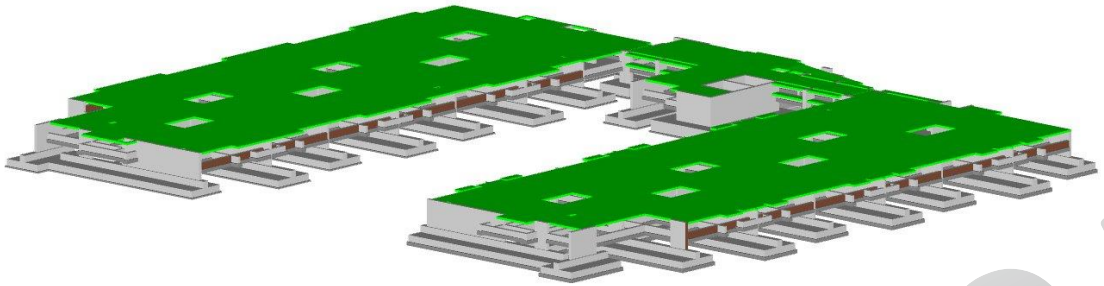
Dash Board – Overall Summary



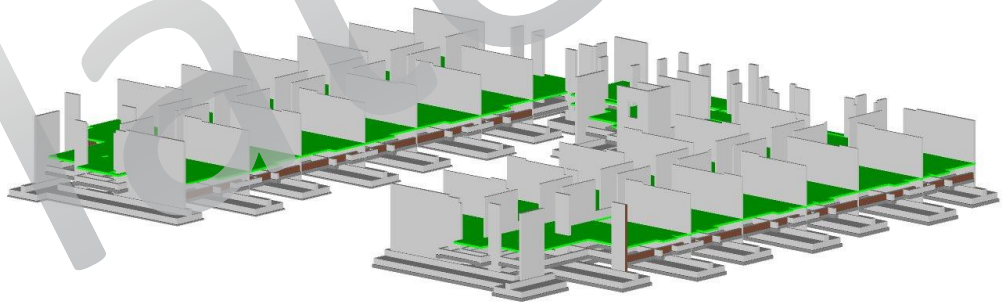
S. No	Building	Planned Progress (%)	Actual Progress (%)	Remarks
1	Building-1	10	12	
2	Building-2	15	14	
3	Building-3	8	9	

Plan VS Actual (Mxx : DD MM YYYY)

Building Name: Building-1
Location:



PLANNED STATUS

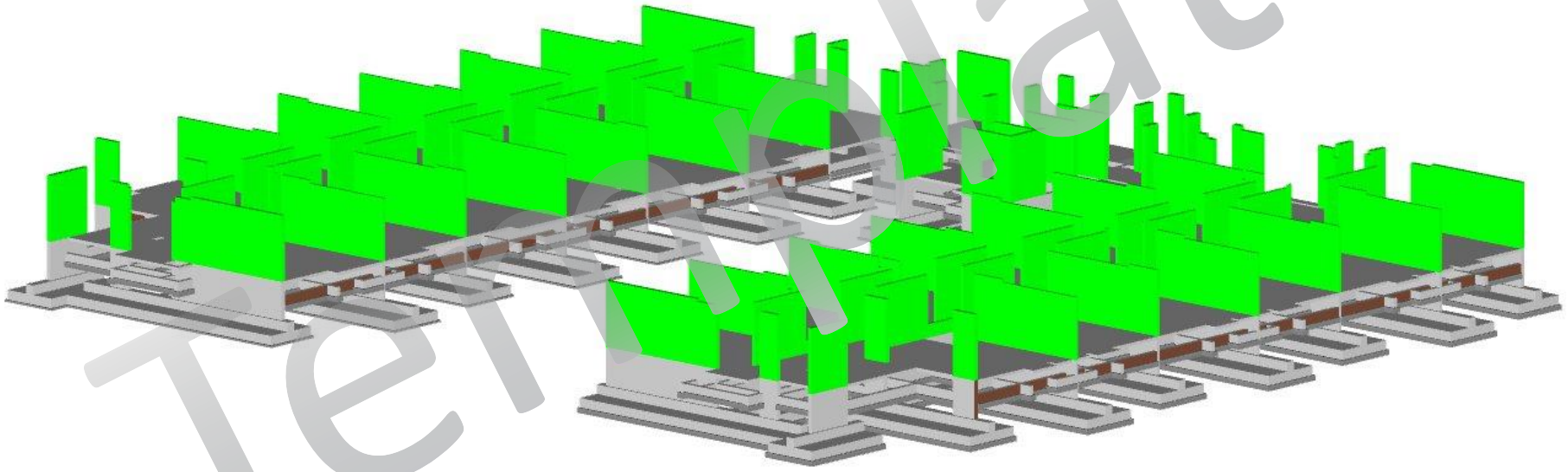


ACTUAL STATUS

Status	Color Code
Activity Early Start	
Activity Delayed	
Activity in Progress	
Activity Completed	Model Appearance

Look Ahead Report (Mxx : DD MM YYYY)

Building Name: Building-1
Location:



Status	Color Code
Activity Early Start	
Activity Delayed	
Activity in Progress	
Activity Completed	Model Appearance