# BIM EXECUTION PLAN

MASSACHUSETTS INSTITUTE OF TECHNOLOGY DEPARTMENT OF FACILITIES 77 MASSACHUSETTS AVENUE CAMBRIDGE, MA 02139-4307

OPTIONAL IMAGE OR
RENDERING OF
BUILDING OR SITE

**MIT** Project Name
**MIT** Project Number

DEVELOPED IN COLLABORATION WITH

Construction Company

Architect

AND

Engineer

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# 1. BIM EXECUTION PLAN OVERVIEW

To successfully implement Building Information Modeling (BIM) on a project, the project team has developed this detailed BIM Project Execution Plan. The BIM Project Execution Plan defines uses for BIM on the project (e.g. design authoring, cost estimating, and design coordination), along with a detailed design of the process for executing BIM throughout the project lifecycle.

This is also a pilot use of BIM at MIT where the client is engaged in the BIM process alongside the design and construction teams.

There will be six interlinked BIM files by the design team: an Existing Conditions/Architectural Design Model by ARCH; Mechanical, Plumbing, Electrical, Communications, and Access Control models by ENG.; and then a Coordination Model by CONS. The design models will be in Revit Architecture 2010. The Coordination Model will be in Navisworks.

# 2. PROJECT INFORMATION

1. Project Owner: MIT
2. Project Name: MIT W1 Renovation Project
3. Project Location and Address: 305 Memorial Drive, Cambridge, MA 02138, USA
4. Contract Type/Delivery Method:
5. Project Description: Massachusetts Institute of Technology Building W-1 construction services for $00 million, 185,000 sf design/build renovation and restoration of seven-story, historic (1900s) residence hall, including common areas, dining room, kitchen, and lobby; scope of work will include reconfiguration of dormitory rooms, ADA compliance upgrades, and all new life-safety and M/E/P systems; site is in a high-profile location on Massachusetts Avenue, requiring extensive logistical coordination; project is targeting LEED® Silver Certification
6. Project Numbers

| PROJECT INFORMATION | NUMBER |
|---|---|
| MIT Project Number | 07063 |
| CONSTRUCTION Project Number | 090193 |
| ARCHITECTURAL Project Number | |
| ENGINEERING Project Number | 2958.04 |
| | |

7. Project Schedule/Phase/Milestones

| PROJECT PHASE / MILESTONE | ESTIMATED START DATE | ESTIMATED COMPLETION DATE | PROJECT STAKEHOLDERS INVOLVED |
|---|---|---|---|
| Existing conditions documentation | 2/10/2008 | 12/1/2010 | Owner, A/E, sub-consultants, CM |
| CD level model with major A/MEP coordination | 8/01/2008 | 12/18/2009 | A/E |
| Contractor coordination implemented into model. | 6/17/2010 | 8/12/2010 | CM, subcontractors |
| Incorporate as-built information into model | 8/12/2010 | 11/11/2010 | CM, subcontractors |
| | | | |

# 3. KEY PROJECT CONTACTS

| ROLE | ORGANIZATION | CONTACT NAME | LOCATION | E-MAIL | PHONE |
|---|---|---|---|---|---|
| Program Manager | MIT | Sonia Richards | NE49 | | |
| Project Manager | CONS | Joe Smith | Boston | | |
| Senior Associate | ARCH | James Smith | Boston | | |
| Manager FIS | MIT | Michael Parkin | NE49 | mparkin@plant.mit.edu | 617.252.1544 |
| Virtual CM | CONS | Jane Smith | Boston | | |
| | ENG | John Smith | Boston | | |
| | ENG | Jen Smith | Boston | | |
| | | | | | |

# 4. PROJECT GOALS/BIM USES

## 4.1 MAJOR BIM GOALS/OBJECTIVES

| PRIORITY | GOAL DESCRIPTION | POTENTIAL BIM USES |
|---|---|---|
| High | Streamline MEP/FP coordination | Clash free BIM |
| Medium (Open-Ended) | Explore how spaces and objects in the model can be enriched with data in a fashion that dovetails with CAFM and COBie-compliant data conversion | |
| Low | | |
| | | |

## 4.2 BIM USES

| X | PLAN | X | DESIGN | X | CONSTRUCT | X | OPERATE |
|---|---|---|---|---|---|---|---|
| | PROGRAMMING | X | DESIGN AUTHORING | X | SITE UTILIZATION PLANNING | | BUILDING MAINTENANCE SCHEDULING |
| | SITE ANALYSIS | X | DESIGN REVIEWS | X | CONSTRUCTION SYSTEM DESIGN | | BUILDING SYSTEM ANALYSIS |
| | | X | 3D COORDINATION | X | 3D COORDINATION | X | ASSET MANAGEMENT |
| | | | STRUCTURAL ANALYSIS | | DIGITAL FABRICATION | | SPACE MANAGEMENT / TRACKING |
| | | | LIGHTING/Shading ANALYSIS | | 3D CONTROL AND PLANNING | | DISASTER PLANNING |
| | | | ENERGY/MEP ANALYSIS | X | RECORD MODELING | X | RECORD MODELING |
| | | X | COMMUNICATION w/ HISTORIC COMMISSION and MIT COMMUNITY | X | Virtual Mockup | | |
| | | | CODE, LEED EVALUATION | | | | |
| | 4D MODELING | X | 4D MODELING | X | 4D MODELING | | 4D MODELING |
| | COST ESTIMATION | | COST ESTIMATION | | COST ESTIMATION | | COST ESTIMATION |
| | EXISTING CONDITIONS MODELING | X | EXISTING CONDITIONS MODELING | X | EXISTING CONDITIONS MODELING | X | EXISTING CONDITIONS MODELING |

## 4.3 BIM USES ANALYSIS WORKSHEET

The BIM Uses Analysis Worksheet will specifically identify important information for the development of the chosen BIM Uses in an organized way to increase efficiency and collaboration. The worksheet can be found in Appendix **.

# 5. ORGANIZATIONAL ROLES/STAFFING

| MODEL NAME | MODEL CONTENT | PROJECT PHASE | AUTHORING COMPANY | AUTHORING TOOL |
|---|---|---|---|---|
| Architectural Model | Architectural existing conditions | CD level drawings | ARCH | Autodesk® Revit® Architecture |
| HVAC Model | Completed design modeled with spatial requirements of and diagrammatic locations for equipment, piping, ductwork, valves etc. | CD level drawings | END | Autodesk® Revit® MEP |
| Plumbing Model | Completed design modeled with spatial requirements of and diagrammatic locations for piping, equipment, valves etc. | CD level drawings | ENG | Autodesk® Revit® MEP |
| Electrical Model | Completed design modeled with spatial requirements of and diagrammatic locations for electrical panels, equipment, starters, disconnects, outlets, switches etc. Conduits 4" and over shall be modeled. | CD level drawings | ENG | Autodesk® Revit® MEP |
| Communications Model | | | END | Autodesk® Revit® MEP |
| Access Control Model | | | END | Autodesk® Revit® MEP |
| Coordination Model | Architectural, structural, and MEP components | | CONS | Autodesk® Revit® Architecture |
| As-Built Model | As- built conditions | | CONS | Autodesk® Navisworks |
| | | | | |

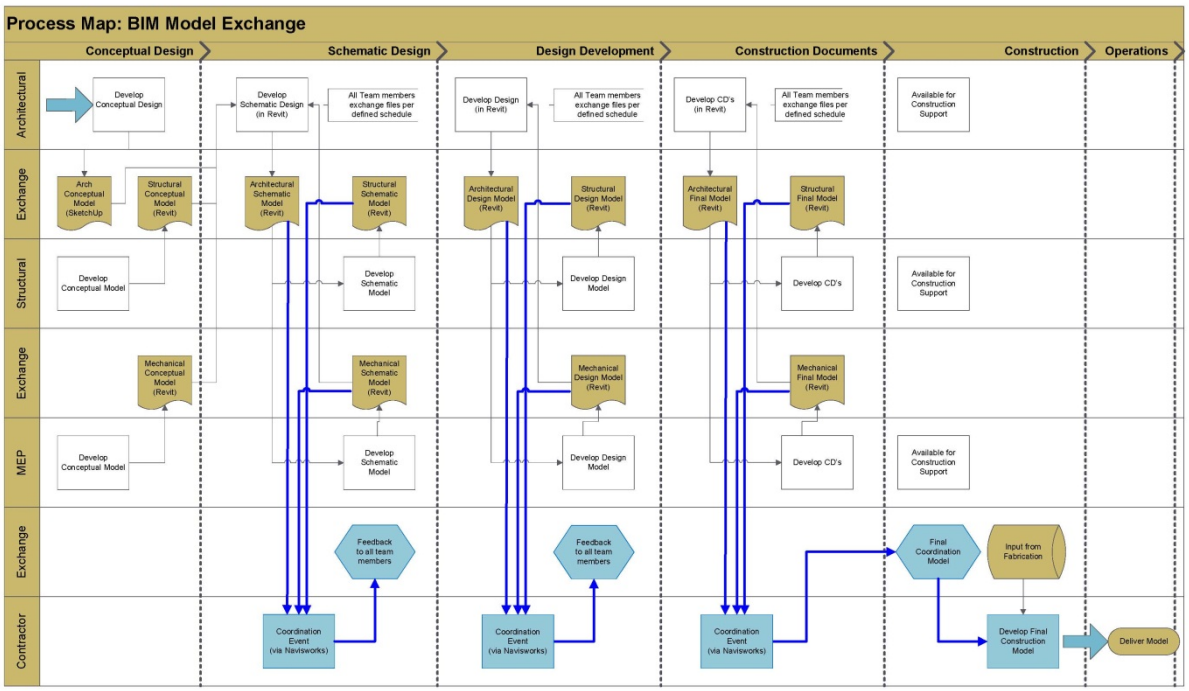
*Architectural and MEP models are separate but linked.

| BIM USE | ORGANIZATION | NUMBER OF TOTAL STAFF FOR BIM USE | ESTIMATED STAFF HOURS | LOCATION(S) | LEAD CONTACT |
|---|---|---|---|---|---|
| Existing Model | Contractor A | | | | |
| | | | | | |
| | | | | | |

# 6. MODEL TRANSITION PROCESS DIAGRAM

Provide model transition process diagram for each BIM model. This process diagram will provide a detailed plan for execution of each BIM model, building the foundation for the entire execution plan. A sample diagram (see below) is available for download at http://fis.mit.edu/resources/guidelines.html. (Please note that this is a sample diagram and should be modified based on project specific information and requirements).

## 6.1 OVERVIEW DIAGRAM



# 7. BIM INFORMATION EXCHANGES

Model elements by discipline, level of detail, and any specific attributes important to the project are documented using information exchange worksheet. See Chapter Four: Defining the Requirements for Information Exchanges in the BIM Project Execution Planning Guide for details on completing this template.

## 7.1 LIST OF INFORMATION EXCHANGE WORKSHEETS

The following is a list of the Information Exchange Worksheets that can be found in Appendix **.

The following are examples. Modify for specific project. Some Information Exchanges may need to be removed, while some Information Exchanges may need to be added.

- Existing Conditions Modeling
- Cost Estimation
- 4D Modeling
- Programming
- Site Analysis
- Design Reviews
- Design Authoring
- Energy Analysis
- Structural Analysis
- Lighting Analysis
- 3D Coordination
- Site Utilization Planning
- 3D Control and Planning
- Record Modeling
- Maintenance Scheduling
- Building System Analysis

## 7.2 MODEL DEFINITION WORKSHEET

(Attach Model Definition Worksheet)

# 8. BIM AND FACILITY DATA REQUIREMENTS

MIT seeks to use this model process to explore how MIT Space Accounting data can be integrated into the model. Spaces should follow MIT standards as described in the MIT Space Accounting Guidelines V3.0, and data should be created so that it can export via ODBC and other standard connectivity standards, such as a newly emerging 'lite' form of COBie. The MIT Space Accounting Guidelines can be found at **.

The following is a list of items that should be included in the model for Facilities Management use:

* Include list of items to be included in the model from FM standpoint

# 9. COLLABORATION PROCEDURES

## 9.1 COLLABORATION STRATEGY

The project team will use an FTP site as a tool for communication, document management and transfer.

## 9.2 MEETING PROCEDURES

| MEETING TYPE | PROJECT STAGE | FREQUENCY | PARTICIPANTS | LOCATION |
|---|---|---|---|---|
| BIM REQUIREMENTS KICK-OFF | | | | MIT |
| DESIGN COORDINATION | | | | MIT |
| CONSTRUCTION PROGRESS REVIEWS | | Weekly, as needed | | MIT |
| BIM DEMONSTRATION AT CLOSEOUT | To team; To leadership of MIT Facilities; to other audiences | TBD | | MIT |
| | | | | |

## 9.3 MODEL DELIVERY SCHEDULE OF INFORMATION EXCHANGE FOR SUBMISSION AND APPROVAL

| INFORMATION EXCHANGE | FILE SENDER | FILE RECEIVER | ONE-TIME / FREQUENCY | DUE DATE/ START DATE | MODEL FILE | MODEL SOFTWARE | NATIVE FILE TYPE | FILE EXCHANGE TYPE |
|---|---|---|---|---|---|---|---|---|
| Existing Model | ARCH | MDS (FTP POST) (COORDINATION LEAD) | WEEKLY | [DATE] | Arch | Revit Arch 2010 | .rvt | .rvt |
| Engineering Models | ENG | RWS (FTP POST) (COORDINATION LEAD) | WEEKLY OR SOONER TBD | [DATE] | MEP | Revit Arch 2010 | .rvt | .rvt |
| Coordination Model | CONS | SDC (FTP POST) (COORDINATION LEAD) | WEEKLY | [DATE] | A/MEP | Navisworks | .nwd | .nwd |

## 9.4 INTERACTIVE WORKSPACE

The project team should consider the physical environment it will need throughout the lifecycle of the project to accommodate the necessary collaboration, communication, and reviews that will improve the BIM Plan decision making process. Describe how the project team will be located. Consider questions like "will the team be collocated?" If so, where is the location and what will be in that space? Will there be a BIM Trailer? If yes, where will it be located and what will be in the space such as computers, projectors, tables, table configuration? Include any additional information necessary about workspaces on the project.

## 9.5 ELECTRONIC COMMUNICATION PROCEDURES:

| FILE LOCATION | FILE STRUCTURE / NAME | FILE TYPE | PASSWORD PROTECT | FILE MAINTAINER | UPDATED |
|---|---|---|---|---|---|
| | MIT – W1/Renovations | FOLDERS | YES | | ONCE/wk |
| | MIT – W1/Renovations | FOLDERS | YES | | ONCE/wk |

# 10. QUALITY CONTROL

## 10.1 OVERALL STRATEGY FOR QUALITY CONTROL / QUALITY CONTROL CHECKS

The following checks will be performed to assure quality and we will seek to capture the process as we proceed through the project.

| CHECKS | DEFINITION | RESPONSIBLE PARTY | SOFTWARE PROGRAM(S) | FREQUENCY |
|---|---|---|---|---|
| VISUAL CHECK | Ensure there are no unintended model components and the design intent has been followed | CONS and ARCH and MIT | Revit, ADR | At submittals |
| INTERFERENCE CHECK | Detect problems in the model where two building components are clashing including soft and hard; this is limited in scope for this project but will mainly involve interference with built surfaces. | CONS and ARCH and MIT | Revit, ADR | At submittals |
| STANDARDS CHECK | Ensure that the BIM and AEC CADD Standard have been followed (fonts, dimensions, line styles, levels/layers, etc) | CONS and ARCH and MIT | Revit, ADR | At submittals |
| MODEL INTEGRITY CHECKS | Describe the QC validation process used to ensure that the Project Facility Data set has no undefined, incorrectly defined or duplicated elements and the reporting process on non-compliant elements and corrective action plans | CONS and ARCH and MIT | Revit, ADR | At submittals |

## 10.2 MODEL ACCURACY AND TOLERANCES

Models should include all appropriate dimensioning as needed for design intent, analysis, and construction. Level of detail and included model elements are provided in the Information Exchange Worksheet in Appendix **.

| PHASE | DISCIPLINE | TOLERANCE |
|---|---|---|
| Existing Model | Arch | Existing structural columns and beams were modeled on an as needed basis from STP contract drawings and original structural drawings.<br><br>Footprint of the masonry structure is approximate based on survey, field measurements and original drawings.<br><br>Light fixtures, plumbing fixtures and toilet accessories are accurately located but the objects are not representative of the actual fixtures. |
| Design Models | MEP | All MEP system components shall be fully coordinated by the contractor's prior to installation. What is specified and shown in the model is not necessarily what will be submitted, approved, and or installed. Due to the scale of the drawings bid/CD drawings are diagrammatic in nature. The creation of a 3D model in REVIT is done to assure that the major coordination issues can be resolved prior to installation; the 3D model will then be passed onto the contractors for their use in creating the as-built model with updated information and content, at a scale suitable to reflect the installation clearly on a printed sheet. |

# 11. TECHNOLOGICAL INFRASTRUCTURE NEEDS

## 11.1 SOFTWARE

| BIM USE | DISCIPLINE (if applicable) | SOFTWARE | VERSION |
|---|---|---|---|
| Existing Model Authoring | ARCH | REVIT | 2010 |
| Mech. Design Models Authoring | ENG | REVIT | 2010 |
| Coordination Model Authoring | CONS | NAVIS | 2010 |

## 11.2 COMPUTERS / HARDWARE

| BIM USE | HARDWARE | OWNER OF HARDWARE | SPECIFICATIONS |
|---|---|---|---|
| DESIGN AUTHORING | XXX COMPUTER SYSTEM | ARCHITECT X | PROCESSOR, OPERATING SYSTEM, MEMORY STORAGE, GRAPHICS, NETWORK CARD, ETC. |

## 11.3 MODELING CONTENT AND REFERENCE INFORMATION

| BIM USE | DISCIPLINE (if applicable) | MODELING CONTENT / REFERENCE INFORMATION | VERSION |
|---|---|---|---|
| DESIGN AUTHORING | ARCH | To be determined further into the process | |

# 12. MODEL STRUCTURE

## 12.1 FILE NAMING STRUCTURE

| FILE NAMES FOR MODELS SHOULD BE FORMATTED AS: | |
|---|---|
| CAMPUS_BUILDING_MIT PROJECT #_MODELNAME_DATE.xyz | |
| EXISTING MODEL | MIT_W1_07063_EXIST- MMDDYY .rvt |
| HVAC MODEL | MIT_W1_07063_HVAC- MMDDYY .rvt |
| PLUMBING MODEL | MIT_W1_07063_PLUMB- MMDDYY .rvt |
| ELECTRICAL MODEL | MIT_W1_07063_ELEC- MMDDYY .rvt |
| COMMUNICATIONS MODEL | MIT_W1_07063_COMM- MMDDYY .rvt |
| ACCESS CONTROL MODEL | MIT_W1_07063_ACCESS- MMDDYY .rvt |
| ENERGY MODEL | Not Applicable unless decided otherwise by client |
| CONSTRUCTION LOGISTICS MODEL | MIT_W1_07063_CONST- MMDDYY .rvt |
| DISCIPLINE COORDINATION MODEL | MIT_W1_07063_COORD- MMDDYY .rvt |

## 12.2 MODEL STRUCTURE

The model will be organized by level (floor 0,1,2,3,4,etc.).

| MODELING STANDARDS | |
|---|---|
| Draft to be developed from list below and augmented throughout the modeling process | |
| Modeling should avoid: | Modeling Should: |
| Stacked walls | Use the overall coordinate system provided by MIT |
| Locking dimensions in the project | Model different construction elements separately even if they are adjacent (e.g., sills separate from windows) |
| Creating unnecessary parameters in the project | Use the shaft opening tool for shafts and elevators |
| Doors as curtain panels | Create views organized by sheet set or use (Working, Documentation, Presentation) |
| Attaching walls to floors and roofs | Create set of existing plans under the working folder, with dimensions. |
| Using mass families for anything except overall building massing | Use dependent views wherever they break up plans to fit on a sheet. |
| Openings in walls and openings as ways of windows to cut walls (use voids instead) | Use Uniformat for worksets |
| | Follow naming convention for any new families created |
| | Uniformat for 3d components |
| | CSI for 2d components |

## 12.3 EXCLUSIONS

The following tables provide lists of objects that are to be excluded from the model(s).

See Appendix ** for LOD exhibit.

| ITEMS TO BE EXCLUDED FROM THE ARCHITECTURAL MODEL |
|---|
| Door hardware |
| Food Service Equipment and casework |
| Appliances |
| Skylights |
| Lobby reception desk |
| Handrails |
| Finishes, wood trim (not consistently), signage, window treatments, acoustic wall panels |

| ITEMS TO BE EXCLUDED FROM THE HVAC DESIGN MODEL |
|---|
| NOTE: the items omitted/not connected are for drawing clarity reasons or the systems were drafted in CAD.<br>All required offsets due to structural and other obstructions. |
| The full extent of piping and accessories associated with mechanical equipment. |
| Final connections to mechanical equipment (VAV, UH, FCU, etc.). |
| Connections between horizontal and vertical ductwork at shafts. |
| Pipe anchors. |
| Refrigerant Liquid and Suction lines between AC's and HPs |

| |
|---|
| Various shut-off valves, gauges, drain valves, etc. required throughout the building. (See details and diagrams) |
| Hangers, seismic bracing, vibration isolation |

| ITEMS TO BE EXCLUDED FROM THE PLUMBING DESIGN MODEL |
|---|
| NOTE: the items omitted/not connected are for drawing clarity reasons or the systems were drafted in CAD.<br><br>Horizontal piping and connections in fixture chases, other than main risers and stacks. |
| Hangers, seismic bracing, vibration isolation |
| Piping in the west wing on the ground floor including the kitchen area |
| Piping in the Servery area of the first floor (west wing) |
| Underground piping including floor cleanouts |
| The full extent of piping and accessories associated with the hot water heaters, thermostatic mixing valves and balancing valves |
| Exact locations of plumbing fixtures |
| Typical bathroom piping layout and pipe sizes (seen on bathroom part plans) shown on all floors |
| Final Connections to equipment (Hot Water Heaters, Sewage Ejector, Sump Pumps, Dryers, Stoves, etc.) may not be made for drawing clarity. |
| All required piping offsets due to structural and other obstructions |
| Various shut-off valves, gauges, drain valves, etc. required throughout the building |

| ITEMS TO BE EXCLUDED FROM THE ELECTRICAL DESIGN MODEL |
|---|

| |
|---|
| Electrical conduits have not been modeled. Please refer to Electrical schedules for conduit sizing. |
| Conductor sizes have not been included within the model. Unless otherwise noted on plans, please refer to Electrical schedules for conductor sizing. |
| Equipment by other trades have not been included in the model. Electrical services for equipment has been provided. |
| Main service equipment (i.e. 15kV Switches, Substation, Generator, etc.) have not been included in the model. |
| Lighting Control System for Servery/Dining Area has not been modeled. |
| Details, Symbol Legend, General Notes, Riser Diagrams, Schedules have not been modeled. |

| **ITEMS TO BE EXCLUDED FROM THE COMMUNICATIONS DESIGN MODEL** |
|---|
| Communications conduits have not been modeled. |
| Communications wiring have not been modeled |
| Part Plans for Telecommunications rooms have not been modeled |
| Details, Symbol Legend, General Notes, Faceplate details, Riser Diagrams have not been modeled. |
| Communications work area outlets have not been modeled completely on correct elevation height |

| **ITEMS TO BE EXCLUDED FROM THE ACCESS CONTROL DESIGN MODEL** |
|---|
| Access controls conduits have not been modeled. |
| Access controls  wiring have not been modeled |

| |
|---|
| Part Plans for Telecommunications rooms have not been modeled |
| Details, Symbol Legend, General Notes, Riser Diagrams have not been modeled. |
| Access control points, control panel and device locations have not been modeled completely. Some devices shown as line work only. |

## 12.4 REVIT OBJECT CATEGORIES

The following table gives the status of each object category required in the model(s).

| OBJECT CATEGORY | STATUS |
|---|---|
| Areas | Not in Model |
| Casework | Not in Model |
| Ceilings | **In Existing Model**, suspended vs attached differentiated |
| Columns | **In Existing Model** |
| Curtain Systems | Not in Model, may be used in design model |
| Detail Items | **In all Models as needed** |
| Doors | **In Existing Model**, for location and overall size, not detail of panels |
| Electrical Equip. | **In Existing Model**, only as needed |
| Electrical Fixtures | **In Existing Model**, only as needed |
| Entourage | NA |
| Floors | **In Existing Model** |
| Furniture/Systems | Not in Model |
| Gen Models | Not in Model |
| Lighting | **In Existing Model**, to be discussed as per design scope |
| Lines | Are any needed for MIT georeferencing? |
| Mass | To be discussed |
| Mechanical Equip. | **In Existing Model**, only as needed |
| Parking | NA |
| Planting | **In Existing Model**, only as needed |
| Plumbing | **In Existing Model**, only as needed |
| Railings | **In Existing Model**, scope at stairs to be discussed |
| Ramps | NA |
| Raster | Survey images, to be discussed |
| Roads | **In Existing Model**, only as needed |
| Roofs | **In Existing Model**, pitch scope to be discussed |
| Rooms | **In Existing Model**, need data standards from MIT |
| Shafts | **In Existing Model**, only as needed |
| Site | Only immediate area, not full topographies |

| | |
|---|---|
| Spec. Equip. | NA |
| Str. Beam | **In Existing Model** |
| Str. Columns | **In Existing Model** |
| Str. Found. | To be drawn, not modeled (all subterranean work) |
| Str. Framing | To be discussed |
| Topography | See site |
| Walls | **In Existing Model** |
| Windows | **In Existing Model**, unhosted, w/o openings (only voids), to be refined extensively in design model |

## 12.5 MEASUREMENT AND COORDINATE SYSTEMS

Imperial Units; Georeferenced Coordinates provided by MIT.

## 12.6 BIM AND CAD STANDARDS

| STANDARD | VERSION | BIM USES APPLICABLE | ORGANIZATIONS APPLICABLE |
|---|---|---|---|
| MIT CAD & BIM Guidelines | V3.2 | DESIGN AUTHORING | ARCH/ENG |
| UNIFORMAT | | WORKSET AND FAMILY ORGANIZATION | ARCH/ENG |

# 13. PROJECT DELIVERABLES

In this section, list the BIM deliverables for the project and the format in which the information will be delivered.

| BIM SUBMITTAL ITEM | STAGE | APPROXIMATE DUE DATE | FORMAT | NOTES |
|---|---|---|---|---|
| | | | .DWG | |
| | | | .RVT | |
| | | | .RVT | |
| | | | .PDF / .DWG | |
| | | | .RVT | |
| | | | .RVT | |
| | | | .RVT | |
| | | | .RVT<br>.NWD | |

# 14. DELIVERY STRATEGY/CONTRACT

## 14.1 DELIVERY AND CONTRACTING STRATEGY FOR THE PROJECT

What additional measures need to be taken to successfully use BIM with the selected delivery method and contract type?

## 14.2 TEAM SELECTION PROCEDURE

How will you select future team members in regards to the above delivery strategy and contract type?

## 14.3 BIM CONTRACTING PROCEDURE

How should BIM be written into the future contracts?

# APPENDICES


A. BIM GOAL AND USE WORKSHEET A-1

B. MODEL PROCESS DIAGRAM B-1

C. INFORMATION EXCHANGE WORKSHEET C-1

D. MODEL DEFINITION WORKSHEET D-1

# A. BIM GOAL AND USE WORKSHEET

# B. MODEL PROCESS DIAGRAM

# C. INFORMATION EXCHANGE WORKSHEET

# D. MODEL DEFINITION WORKSHEET