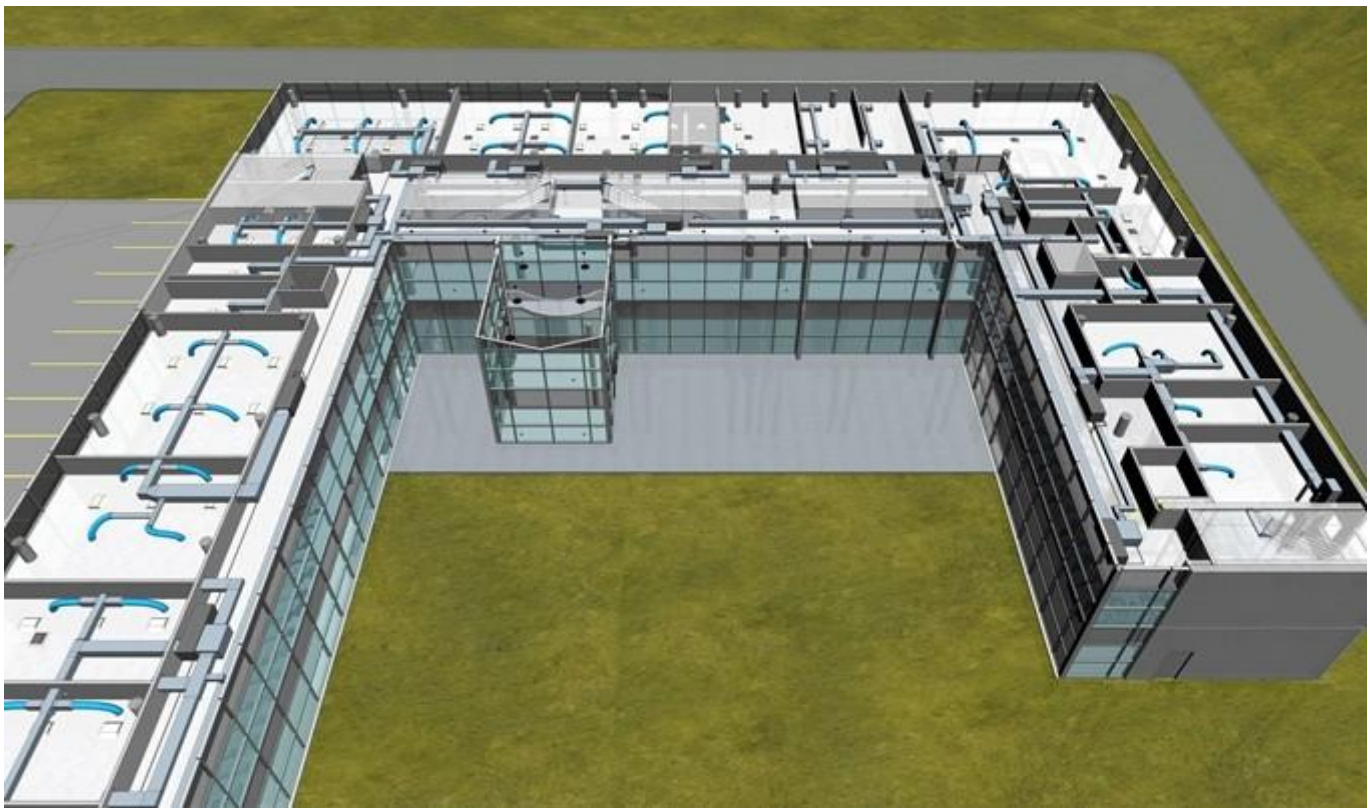
National Occupational Standards



Bexel - BIM based Project Management (3D/4D/5D/6D BIM)

Unit Code: ICE/CON/N1601

Version: 1.0

NSQF Level: 5

INTEGRATED COUNCIL FOR ENTREPRENEURSHIP AND SKILLING || 533-R
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Description

A BEXEL BIM professional supports digital construction by creating and managing 3D/4D/5D models for planning, cost control and project tracking using open BIM workflows across the project lifecycle.

Scope

The scope covers the following :

- Understand BIM Fundamentals and Industry Standards
- Apply Construction Project Lifecycle and BEXEL Manager Essentials
- Conduct BIM Data Validation, Clash Detection and Quantity Take-Off
- Integrate 4D Scheduling and Project Monitoring
- Execute 5D BIM for Cost Management
- Implement 6D BIM and Facilities Management in BEXEL Cloud

Elements and Performance Criteria

Understand BIM Fundamentals and Industry Standards

To be competent, the user/individual on the job must be able to:

PC1. explain the need for Building Information Modeling (BIM) and its strategic role in the construction industry

PC2. identify emerging job roles and career opportunities within the BIM domain

PC3. describe international BIM standards including ISO 19650 and their relevance in structured information management

PC4. discuss the importance of standardization and data consistency in BIM workflows

PC5. respond appropriately to clients' Exchange Information Requirements (EIR) using standardized BIM procedures

PC6. identify and use 3D BIM authoring tools and explain their role in the project lifecycle

PC7. differentiate BIM dimensions from 1D (basic awareness) to 6D (FM and lifecycle management), and their applications

PC8. explain BIM maturity levels and Level of Development (LoD) as part of implementation strategies

PC9. summarize global practices and success stories related to BIM implementation across various geographies

Apply Construction Project Lifecycle and BEXEL Manager Essentials

To be competent, the user/individual on the job must be able to:

PC10. outline the construction project lifecycle and its stages with reference to PMBOK knowledge areas

PC11. identify practical tools and digital platforms used for construction project management

PC12. navigate the BEXEL Manager interface, understanding views, tabs and functional areas

PC13. perform operations such as importing bx3/IFC files and reviewing project metadata

PC14. use tools like the Building Explorer, Property Panel and Schedule tab to analyze BIM components

PC15. access and utilize auxiliary BEXEL features such as Viewer, Portfolio Manager and Dashboards for documentation and project tracking

Conduct BIM Data Validation, Clash Detection and Quantity Take-Off

To be competent, the user/individual on the job must be able to:

PC16. explore model information layers and validate data properties using attribute filters and queries

PC17. perform data editing tasks, such as adding or modifying element properties and exporting results

PC18. conduct model validation using quality control tools and property check add-ins

PC19. identify and resolve model conflicts via clash detection, applying both hard and soft conflict checks

PC20. generate visualized and color-coded quantity takeoffs and summarize model-based metrics by structure, story or element type

Integrate 5D Scheduling and Project Monitoring

To be competent, the user/individual on the job must be able to:

PC21. create cost elements using queries and quantity formulas aligned with model data

PC22. import and export cost databases using Excel or integrated cost systems

PC23. define and manage resources such as labor, materials, and equipment within the cost framework

PC24. assign and manage cost items linked to model elements and perform multi-version cost comparisons

PC25. create stand-alone cost elements not linked to 3D models, enabling flexible financial modeling

Execute 4D BIM for Cost Management

To be competent, the user/individual on the job must be able to:

PC26. create and manage construction schedules using logic-based methods and zone planning

PC27. adjust durations, task relationships, and export scheduling data for stakeholder review

PC28. simulate 4D construction progress and visually analyze project sequencing

PC29. generate time-based task reports and conduct cash flow and S-curve analysis

PC30. track actual vs. planned progress using BIM data inputs and generate certified monthly payment reports

Implement 6D BIM and Facilities Management in BEXEL Cloud

To be competent, the user/individual on the job must be able to:

PC31. generate simulations and link construction models to document and asset management workflows

PC32. develop Facility Maintenance (FM) plans and associate them with BIM elements for lifecycle management

PC33. configure automated notifications, filter FM data and manage task entries using BEXEL Cloud

PC34. link FM contracts, activities and plans to document, ensuring traceability and compliance

PC35. control access rights at contract or plan level and apply data governance protocols in FM environments

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. BIM designing processes and standards

KU2. different stages of a BIM designing project lifecycle

KU3. software(s) required for BIM designing/reviewing
KU4. BIM project management and relevant BIM coordination activities
KU5. bidding process for BIM designing projects
KU6. appropriate information and documents required to bid for BIM design projects
KU7. make effective representations to clients and answer their queries
KU8. documentation requirements concerning the bidding process for BIM design projects
KU9. importance of determining the project objectives and scope before its execution
KU10. importance of time management and scheduling in construction projects
KU11. benefits of integrating BIM into project execution planning (4D BIM), e.g. prevention of time and cost inefficiencies on the construction site
KU12. use of 4D BIM models to improve construction time management and allocate time and resources relating to work activities
KU13. how to conduct planned vs actual schedule analysis
KU14. identify and prevent problems related to the sequential, spatial and temporal aspects of the construction process
KU15. risk visualization with 5D BIM Modeling to improve design decisions
KU16. use of 5D project planning process, i.e. mapping of model elements to cost items, element-based cost analysis, budgeting and preparation of bill of quantities, 5D scheduling, productivity rates and resource planning, using the BIM management software
KU17. facility maintenance planning process using 6D BIM
KU18. storage of graphical and text-based information in a BIM model
KU19. use of 6D BIM software in the design and operation phases of construction to make a building self-sustainable and energy efficient
KU20. benefits of integrating BIM with the IoT technology for facility maintenance
KU21. objectives of 7D BIM - operations and facility management
KU22. importance of using a scalable and configurable BIM management system like BEXEL FM/Docs

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. maintain work-related notes and records
GS2. listen attentively to understand the information/ instructions being shared by the speaker
GS3. read the relevant literature to learn about the latest developments in the field of work
GS4. communicate clearly and politely with co-workers and clients
GS5. coordinate with co-workers to achieve work objectives
GS6. plan and prioritize tasks to ensure timely completion
GS7. identify possible disruptions to work and take appropriate preventive measures
GS8. take quick decisions to deal with workplace emergencies/ accidents

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Understand BIM Fundamentals and Industry Standards	4	10	-	-
PC1. explain the need for Building Information Modeling (BIM) and its strategic role in the construction industry	-	-	-	-
PC2. identify emerging job roles and career opportunities within the BIM domain	-	-	-	-
PC3. describe international BIM standards including ISO 19650 and their relevance in structured information management	-	-	-	-
PC4. discuss the importance of standardization and data consistency in BIM workflows	-	-	-	-
PC5. respond appropriately to clients' Exchange Information Requirements (EIR) using standardized BIM procedures	-	-	-	-
PC6. identify and use 3D BIM authoring tools and explain their role in the project lifecycle	-	-	-	-
PC7. differentiate BIM dimensions from 1D (basic awareness) to 6D (FM and lifecycle management), and their applications	-	-	-	-
PC8. explain BIM maturity levels and Level of Development (LoD) as part of implementation strategies	-	-	-	-
PC9. summarize global practices and success stories related to BIM implementation across various geographies	-	-	-	-
Apply Construction Project Lifecycle and BEXEL Manager Essentials	4	10	-	-
PC10. outline the construction project lifecycle and its stages with reference to PMBOK knowledge areas	-	-	-	-
PC11. identify practical tools and digital platforms used for construction project management	-	-	-	-
PC12. navigate the BEXEL Manager interface, understanding views, tabs and functional areas	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. perform operations such as importing bx3/IFC files and reviewing project metadata	-	-	-	-
PC14. use tools like the Building Explorer, Property Panel and Schedule tab to analyze BIM components	-	-	-	-
PC15. access and utilize auxiliary BEXEL features such as Viewer, Portfolio Manager and Dashboards for documentation and project tracking	-	-	-	-
Conduct BIM Data Validation, Clash Detection and Quantity Take-Off	8	10	-	-
PC16. explore model information layers and validate data properties using attribute filters and queries	-	-	-	-
PC17. perform data editing tasks, such as adding or modifying element properties and exporting results	-	-	-	-
PC18. conduct model validation using quality control tools and property check add-ins	-	-	-	-
PC19. identify and resolve model conflicts via clash detection, applying both hard and soft conflict checks	-	-	-	-
PC20. generate visualized and color-coded quantity takeoffs and summarize model-based metrics by structure, story or element type	-	-	-	-
Integrate 5D Scheduling and Project Monitoring	8	10	-	-
PC21. create cost elements using queries and quantity formulas aligned with model data	-	-	-	-
PC22. import and export cost databases using Excel or integrated cost systems	-	-	-	-
PC23. define and manage resources such as labor, materials, and equipment within the cost framework	-	-	-	-
PC24. assign and manage cost items linked to model elements and perform multi-version cost comparisons	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC25. create stand-alone cost elements not linked to 3D models, enabling flexible financial modeling	-	-	-	-
Execute 4D BIM for Cost Management	8	10	-	-
PC26. create and manage construction schedules using logic-based methods and zone planning	-	-	-	-
PC27. adjust durations, task relationships, and export scheduling data for stakeholder review	-	-	-	-
PC28. simulate 4D construction progress and visually analyze project sequencing	-	-	-	-
PC29. generate time-based task reports and conduct cash flow and S-curve analysis	-	-	-	-
PC30. track actual vs. planned progress using BIM data inputs and generate certified monthly payment reports	-	-	-	-
Implement 6D BIM and Facilities Management in BEXEL Cloud	8	10	-	-
PC31. generate simulations and link construction models to document and asset management workflows	-	-	-	-
PC32. develop Facility Maintenance (FM) plans and associate them with BIM elements for lifecycle management	-	-	-	-
PC33. configure automated notifications, filter FM data and manage task entries using BEXEL Cloud	-	-	-	-
PC34. link FM contracts, activities and plans to document, ensuring traceability and compliance	-	-	-	-
PC35. control access rights at contract or plan level and apply data governance protocols in FM environments	-	-	-	-
NOS Total	**40**	**60**	-	-

National Occupational Standards (NOS) Parameters

NOS Code	ICE/CON/N1601
NOS Name	Bexel - BIM based Project Management (3D/4D/5D/6D BIM)
Sector	Construction
Sub-Sector	Real Estate Infrastructuire and Management
Occupation	BIM Project Management
NSQF Level	5
Credits	2.5
Minimum Job Entry Age	18
Minimum Educational Qualification & Experience	Completed 2nd year of UG (UG Diploma) (B.E. / B.Tech in Civil Engineering / B.Arch)
Version	1.0
Last Reviewed Date	07/10/2025
Next Review Date	07/10/2028
NSQC Clearance Date	07/10/2025
Reference code on NQR	NG-05-CO-046372025-V1-ICES
NQR Version	1.0
CCN Category	1
Remarks	Min. Job Entry Age is as per Govt. Norms