SESSION TRANSACTION PLAN FOR TWO-DAY CAPACITY BUILDING PROGRAMME FOR PUBLIC WORKS DEPARTMENT (BUILDINGS)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SESSION NUMBER** | **SESSION TITLE AND DURATION** | **OBJECTIVE** | **SESSION TRANSACTION PLAN** | **EXPECTED OUTCOME AND FOLLOW-UP**  **RESOURCES** |
| SESSION 1 | **Session Title:** "Optimizing Construction  Projects: Principles and Standards in Project  Management"  **Duration:**  1 Hour | To provide participants with an understanding of construction project  management principles,  practices, and BIS standards, ensuring efficient project execution and quality outcomes. | **Session Breakdown**   1. **Introduction (5 minutes)**    * **Objective:** Set the context for construction project management.    * **Content:**      + Definition of construction project management.      + Importance of project management in the construction industry.      + Role of BIS in setting standards for project management.    * **Methodology:**      + Brief presentation with an overview and objectives of the session. 2. **Overview of BIS Standards in Construction Project Management (10 minutes)**    * **Objective:** Familiarize participants with relevant BIS standards.    * **Content:**      + Key standards (e.g., IS 15883 series on project management practices).      + Explanation of standards' application in project phases.    * **Methodology:**      + Interactive lecture with handouts summarizing key BIS standards. 3. **Project Lifecycle and Key Management Areas (15 minutes)**    * **Objective:** Explain the phases and management areas of construction projects.    * **Content:**      + Project lifecycle: initiation, planning, execution, monitoring, and   closure. | **Expected Outcomes:**   * Understanding of BIS standards for construction project management. * Familiarity with the project lifecycle and key management areas. * Ability to apply project management principles to real-world construction projects.   **Follow-up Resources:**   * Access to BIS documents and standards. * Contact information for further queries or guidance. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | * Key management areas: scope, time, cost, quality, risk, and communication management. * **Methodology:**   + Slide presentation with flowcharts and diagrams.  1. **Interactive Activity: Project Planning Exercise (15 minutes)**    * **Objective:** Apply project management concepts through a hands-on exercise.    * **Content:**      + Participants work in groups to develop a basic project plan for a hypothetical construction project.      + Focus on defining scope, scheduling, and risk management.    * **Methodology:**      + Group activity with presentations of their plans, followed by feedback. 2. **Conclusion and Q&A (5 minutes)**    * **Objective:** Summarize the session and provide an opportunity for questions.    * **Content:**      + Recap of key takeaways.      + Open floor for participant questions and clarifications.    * **Methodology:**      + Facilitator-led summary and Q&A session. |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SESSION 2 | **Session Title:** "Foundations of Stability: Geotechnical Investigation and Design"  **Duration:**  1 Hour | To provide a comprehensive understanding of geotechnical investigation and design principles, emphasizing BIS standards, methodologies, and best practices. | **Session Breakdown**   1. **Introduction (10 minutes)**    * **Objective:** Introduce the importance of geotechnical investigation and design in construction.    * **Content:**      + Definition and significance of geotechnical investigation.      + Overview of how subsurface investigation impacts geotechnical design, structural stability and safety.      + Brief introduction to relevant BIS standards.    * **Methodology:**      + Presentation with an overview and key objectives. 2. **Overview of BIS Standards for Geotechnical Investigation (10 minutes)**    * **Objective:** Familiarize participants with BIS standards related to geotechnical investigation.    * **Content:**      + Key standards (e.g., IS 1892 for soil investigation, IS 6403 for bearing capacity of shallow foundations).      + Application and relevance of these standards in construction projects.    * **Methodology:**      + Interactive lecture with handouts summarizing key standards. 3. **Geotechnical Investigation Methods (15 minutes)**    * **Objective:** Explain various geotechnical investigation methods and their applications.    * **Content:**      + Common field investigation techniques (e.g., borehole drilling, standard penetration test, cone penetration test).      + Laboratory testing of soil samples (e.g., grain size analysis, Atterberg limits, shear strength tests).      + Importance of accurate data collection and interpretation.    * **Methodology:**      + Presentation with images and videos of investigation methods. 4. **Geotechnical Design Principles (15 minutes)**    * **Objective:** Discuss principles of geotechnical design and their application. | **Expected Outcomes:**   * Comprehensive understanding of geotechnical   investigation processes.   * Familiarity with BIS standards for geotechnical   engineering.   * Ability to apply geotechnical design principles to real-world projects.   **Follow-up Resources:**   * Access to BIS documents and standards. * Contact information for further queries or guidance. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | * **Content:**   + Design of shallow and deep foundations (e.g., spread footings- IS 1904, IS 1080, pile foundations-IS 2911).   + Considerations for slope stability and earth retaining structures.   + Impact of soil properties on foundation design and load-bearing capacity. * **Methodology:**   + Presentation with design examples.   **5. Conclusion and Q&A (10 minutes)**   * **Objective:** Recap key points and address participant questions. * **Content:**   + Summary of geotechnical investigation and design practices.   + Importance of adherence to BIS standards for project safety.   + Open floor for participant questions and clarifications. * **Methodology:**   + Facilitator-led summary and Q&A session. |  |
| SESSION 3 | **Session Title: "Good Construction Practices: Masonry, RCC, and Steel"**  **Duration:**  **1 Hour 15 Minutes** | **To provide participants with an understanding of construction practices involving**  **masonry, steel, and reinforced concrete (RCC), focusing on BIS standards,**  **materials,**  **methods, and best practices for quality**  **construction.** | **Session Breakdown**   1. **Introduction (10 minutes)**    * **Objective:** Introduce participants to the importance of masonry, steel, and RCC in construction.    * **Content:**      + Overview of masonry, steel, and RCC as fundamental building materials.      + Importance of understanding construction methods to ensure quality, durability, and safety.      + Role of BIS in setting standards for these materials and practices.    * **Methodology:**      + Brief presentation and overview of session objectives. 2. **Overview of BIS Standards for Construction Practices (15 minutes)**    * **Objective:** Familiarize participants with relevant BIS standards for masonry, steel, and RCC.    * **Content:** | **Expected Outcomes:**   * Familiarity with the key construction practices for masonry, steel, and RCC. * Understanding of BIS standards for each material and construction practice. * Knowledge of best practices for quality control and material testing in construction.   **Follow-up Resources:** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | * Key BIS standards for masonry (e.g., IS 1905 for brick masonry, IS 3495 for testing of bricks). * BIS standards for steel structures (e.g., IS 800 for general structural design, IS 1363 for bolts). * BIS standards for RCC (e.g., IS 456 for design and construction of reinforced concrete structures). * **Methodology:**   + Interactive presentation with handouts summarizing key BIS standards.  1. **Masonry Construction Practices (15 minutes)**    * **Objective:** Explain masonry construction methods and best practices.    * **Content:**      + Types of masonry: Brick, stone, and block masonry.      + Mortar types, curing techniques, and structural considerations.    * **Methodology:**      + Presentation with visual aids and real-world examples of masonry practices. 2. **Steel Construction Practices (15 minutes)**    * **Objective:** Discuss steel construction practices and considerations.    * **Content:**      + Types of steel sections and their applications.      + Design and fabrication of steel structures (e.g., welding, bolting).    * **Methodology:**      + Slide presentation discussing about standards. 3. **RCC Construction Practices (15 minutes)**    * **Objective:** Explain reinforced concrete construction techniques.    * **Content:** | * Access to relevant BIS documents and standards. * Contact information for further queries or guidance. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | * Basics of RCC design: Concrete mix, reinforcement, and curing practices. * Methods of forming and placing concrete (e.g., shuttering, vibrating, curing). * Quality control in RCC work (e.g., testing of concrete, ensuring proper reinforcement). * **Methodology:**   + Presentation with diagrams and examples of RCC construction in practice.  1. **Conclusion and Q&A (5 minutes)**    * **Objective:** Recap key points and answer participant questions.    * **Content:**      + Summary of masonry, steel, and RCC practices and their importance in construction.      + Open floor for questions and clarifications.    * **Methodology:**      + Facilitator-led summary and interactive Q&A session. |  |
| SESSION 4 | **Session Title:**  **"Ensuring Safety: Fire and Life Safety in Buildings"**  **Duration: 1 Hour** | **To provide participants with the knowledge of fire and life safety standards, safety measures, and best practices in building design and**  **management, in line with BIS standards.** | **Session Breakdown**   1. **Introduction (10 minutes)**    * **Objective:** Introduce the significance of fire and life safety in buildings.    * **Content:**      + Importance of fire and life safety in the built environment.      + Overview of relevant BIS standards and regulations.      + Key objectives of the session and the importance of compliance.    * **Methodology:**      + Brief presentation and discussion on the significance of fire and life safety. 2. **Overview of BIS Standards for Fire and Life Safety (10 minutes)**    * **Objective:** Familiarize participants with relevant BIS standards for fire and life safety.    * **Content:** | **Expected Outcomes:**   * Enhanced understanding of fire and life safety standards for buildings. * Familiarity with BIS guidelines for fire protection and life safety. * Knowledge of best practices for ensuring fire safety and   emergency preparedness.  **Follow-up Resources:** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | * Overview of key standards (e.g., Part 4 of National Building Code of India 2016). * Scope and application of the standards in building construction and management. * **Methodology:**   + Interactive presentation with handouts summarizing key BIS standards.  1. **Fire Safety Measures in Building Design (15 minutes)**    * **Objective:** Discuss fire safety measures during building design.    * **Content:**      + Fire-resistant building materials and their properties.      + Passive fire protection measures (e.g., fire walls, fire-resistant doors).      + Active fire protection systems (e.g., fire alarms, sprinklers).    * **Methodology:**      + Presentation with images and examples of fire safety features in buildings. 2. **Life Safety Features and Emergency Planning (15 minutes)**    * **Objective:** Explore life safety features and emergency planning measures.    * **Content:**      + Design and location of exits, emergency evacuation routes, and signage.      + Role of fire drills and training in ensuring occupant safety.      + Emergency response planning and coordination with local authorities.    * **Methodology:**      + Presentation with slides and discussing about standards. 3. **Conclusion and Q&A (10 minutes)**    * **Objective**: Recap key points and answer participant queries.    * **Content:**      + Summary of session highlights.      + Open floor for questions and clarifications from participants.    * **Methodology:**      + Facilitator-led summary and Q&A session. | * **Access to relevant BIS documents and standards.** * **Contact information for further queries or guidance.** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SESSION 5 | **Session Title:** "Efficient Building Services: HVAC and Plumbing Systems"  **Duration:**  1 Hour | **To provide participants with an understanding of HVAC and plumbing**  **systems in buildings, focusing on BIS standards, design considerations, installation practices, and**  **maintenance for optimal performance.** | **Session Breakdown**   1. **Introduction (5 minutes)**    * **Objective:** Introduce the importance of HVAC and plumbing systems in buildings.    * **Content:**      + Overview of HVAC and plumbing services and their role in building functionality.      + Importance of designing efficient, sustainable, and compliant systems.      + Brief on BIS standards for HVAC and plumbing services.    * **Methodology:**      + Presentation with an overview of session objectives. 2. **Overview of BIS Standards for HVAC and Plumbing (10 minutes)**    * **Objective:** Provide an understanding of relevant BIS standards for HVAC and plumbing systems.    * **Content:**      + Key BIS standards (e.g., Part 8/Sec 3 and Part 9 of National Building Code of India 2016).      + Scope, application, and importance of these standards.    * **Methodology:**      + Interactive lecture with handouts summarizing key standards and codes. 3. **HVAC System Design and Considerations (15 minutes)**    * **Objective:** Explain the design principles for HVAC systems in buildings.    * **Content:**      + Key components of HVAC systems (heating, ventilation, and air conditioning).      + Factors affecting HVAC design: load calculations, energy efficiency, zoning, and air quality.      + Common design and installation challenges.    * **Methodology:**      + Presentation with design diagrams, airflow examples, and energy- saving tips. 4. **Plumbing System Design and Considerations (15 minutes)** | **Expected Outcomes:**   * Understanding of HVAC and plumbing system design and operation. * Familiarity with BIS standards for HVAC and plumbing services. * Knowledge of best practices for installation and maintenance of   these systems.  **Follow-up Resources:**   * Access to BIS documents and standards. * Contact information for further queries or guidance. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | * **Objective:** Discuss design principles for plumbing systems in buildings. * **Content:**   + Key components of plumbing systems (water supply, drainage, sewage systems).   + Design considerations: water pressure, pipe material selection, and waste management.   + Common plumbing issues and their solutions. * **Methodology:**   + Slide presentation with pipe layout diagrams and real-world examples.   **5. Best Practices for Installation and Maintenance (10 minutes)**   * **Objective:** Highlight best practices for the installation and maintenance of HVAC and plumbing systems. * **Content:**   + Installation standards and guidelines for both HVAC and plumbing systems.   + Routine maintenance tasks and importance of regular checks.   + Compliance with BIS standards for installation and testing. * **Methodology:**   + Practical tips and maintenance checklists for participants to follow.   **6. Conclusion and Q&A (5 minutes)**   * **Objective:** Recap key points and answer participant questions. * **Content:**   + Summary of session highlights and the role of efficient building services.   + Open floor for questions and clarifications. * **Methodology:**   + Facilitator-led summary and interactive Q&A session. |  |
| SESSION 6 | **Session Title:** "Effective Waterproofing  Solutions for Wet | To educate participants on effective  waterproofing | **Session Breakdown**   1. **Introduction (5 minutes)**    * **Objective:** Highlight the importance of waterproofing in wet areas.    * **Content:** | **Expected Outcomes:**   * Enhanced understanding of BIS waterproofing   standards. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Areas: Adhering to BIS Standards"  **Duration:**  1 Hour | techniques for wet areas in buildings, adhering to  Bureau of Indian Standards (BIS) guidelines, ensuring  durability and minimizing water- related damages. | * Definition of wet areas (bathrooms, kitchens, balconies, basements, etc.). * Common issues due to inadequate waterproofing. * Role of BIS in establishing waterproofing standards. * **Methodology:**   + Brief presentation with examples of water damage.  1. **Overview of Relevant BIS Standards (10 minutes)**    * **Objective:** Familiarize participants with BIS standards for waterproofing.    * **Content:**      + Key standards (e.g., IS 2645, IS 12054, IS 15477).      + Scope and application of these standards.    * **Methodology:**      + Interactive lecture with handouts summarizing key points of the standards. 2. **Key Waterproofing Techniques (15 minutes)**    * **Objective:** Explain various waterproofing techniques for different wet areas.    * **Content:**      + Surface preparation.      + Use of membranes (liquid-applied, sheet membranes).      + Cementitious waterproofing.      + Application methods and best practices.    * **Methodology:**      + Slide presentation with images and step-by-step guides. 3. **Interactive Activity: Identifying Waterproofing Issues (15 minutes)** | * Improved knowledge of waterproofing techniques for wet   areas.   * Ability to identify and address waterproofing issues effectively.   **Follow-up Resources:**   * Access to BIS documents and standards. * Contact information for further queries or guidance. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | * **Objective:** Apply knowledge to identify potential waterproofing issues in a hypothetical or real scenario. * **Content:**   + Participants analyze provided images or scenarios to spot waterproofing failures.   + Suggest corrective measures based on BIS standards. * **Methodology:**   + Group activity with discussion and feedback.   **6. Conclusion and Q&A (5 minutes)**   * **Objective:** Summarize the session and address participant questions. * **Content:**   + Recap key takeaways.   + Open floor for questions and clarifications. * **Methodology:**   + Facilitator-led summary and Q&A session. |  |
| SESSION 7 | **Session Title:** "Enhancing Accessibility:  Standards and Practices in  Buildings and Built Environment"  **Duration:**  1 hour | To enhance  understanding of accessibility standards in  buildings and built environment, as outlined by Bureau of Indian Standards (BIS), promoting inclusivity for all users, including persons with disabilities. | **Session Breakdown**   1. **Introduction (5 minutes)**    * **Objective:** Provide an overview of the importance of accessibility.    * **Content:**      + Definition of accessibility.      + Significance of accessibility in buildings and public spaces.      + Role of BIS in promoting accessible design.    * **Methodology:**      + Brief presentation with key statistics and real-life examples. 2. **Overview of Relevant BIS Standards (10 minutes)**    * **Objective:** Familiarize participants with BIS standards related to accessibility.    * **Content:**      + Key standards (e.g., Part 3 of National Building Code of India 2016, IS 4963).      + Explanation of the standards' scope and application.    * **Methodology:**      + Interactive lecture with handouts summarizing standards. | **Expected Outcomes:**   * Improved understanding of BIS accessibility standards. * Enhanced ability to identify and implement accessible design   features.   * Increased awareness of the importance of   accessibility in the built environment.  **Follow-up Resources:**   * Access to BIS documents and standards. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | 1. **Key Components of Accessible Design (15 minutes)**    * **Objective:** Detail the critical elements of accessible buildings.    * **Content:**      + Entrances and pathways.      + Accessible toilets.      + Lifts and ramps.      + Signage and wayfinding.    * **Methodology:**      + Slide presentation with images and diagrams of compliant vs. non- compliant designs. 2. **Interactive Activity: Accessibility Assessment (15 minutes)**    * **Objective:** Apply knowledge to assess accessibility in a hypothetical or real scenario.    * **Content:**      + Participants work in groups to evaluate photos for compliance.      + Identify areas for improvement and suggest modifications.    * **Methodology:**      + Group activity followed by a brief presentation of findings. 3. **Conclusion and Q&A (5 minutes)**    * **Objective:** Recap key points and address participant queries.    * **Content:**      + Summary of session highlights.      + Open floor for questions and discussion.    * **Methodology:**      + Facilitator-led summary and Q&A session. | * Contact information for further queries or guidance. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SESSION 8 | **Session Title:**  "Building the  Future: Innovations in Materials and Technologies"  **Duration:**  45 Minutes | To introduce participants to the latest  advancements in building materials and technologies, highlighting their benefits,  applications, and compliance with BIS standards. | **Session Breakdown**   1. **Introduction (3 minutes)**    * **Objective:** Provide an overview of the session and the importance of innovation in construction.    * **Content:**      + Importance of adopting new materials and technologies.      + Role of BIS in standardizing innovative materials and technologies.    * **Methodology:**      + Brief presentation with an overview of the session's goals. 2. **Overview of BIS Standards for Innovative Materials (7 minutes)**    * **Objective:** Familiarize participants with BIS standards related to new building materials.    * **Content:**      + Overview of key standards for innovative materials (e.g., IS 15462 for geopolymer concrete, IS 18256 for GFRP bars).      + Discussion on the importance of compliance with these standards.    * **Methodology:**      + Interactive lecture with handouts summarizing relevant standards. 3. **Innovative Building Materials (10 minutes)**    * **Objective:** Present new building materials and their applications.    * **Content:**      + Overview of materials such as fry mix mortar, cross-laminated timber (CLT), GFRP bars, etc.      + Benefits and challenges of using these materials.    * **Methodology:**      + Slide presentation with images and discussing about standards. 4. **Advanced Building Technologies (10 minutes)**    * **Objective:** Introduce advanced technologies in construction.    * **Content:** | **Expected Outcomes:**   * Increased awareness of new building materials and technologies. * Understanding of the benefits and challenges of adopting innovative solutions. * Knowledge of BIS standards related to innovative materials and technologies.   **Follow-up Resources:**   * Access to BIS documents and standards. * Contact information for further queries or guidance. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | * Discussion on how these technologies improve efficiency, sustainability, and safety. * **Methodology:**   + Presentation with videos or animations showcasing technology applications.  1. **Conclusion and Q&A (5 minutes)**    * **Objective:** Summarize key points and provide an opportunity for participant questions.    * **Content:**      + Recap of session highlights.      + Open floor for questions and clarifications.    * **Methodology:**      + Facilitator-led summary and Q&A session. |  |
| SESSION 9 | **Session Title:** "Ensuring Excellence:  Building Material Testing and Quality Assurance"  **Duration:**  45 Minutes | To educate participants on  the importance of building material testing, the process of quality assurance, and compliance with BIS standards to  ensure the | **Session Breakdown**   1. **Introduction (5 minutes)**    * **Objective:** Introduce the importance of building material testing and quality assurance.    * **Content:**      + Overview of construction material quality and its impact on building safety and performance.      + Role of BIS in standardizing testing procedures and quality assurance.      + Session objectives and structure.    * **Methodology:** | **Expected Outcomes:**   * Comprehensive understanding of material testing processes. * Familiarity with BIS standards for material testing and quality assurance. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | durability and safety of construction projects. | * Brief presentation with introductory remarks.  1. **Overview of BIS Standards for Building Material Testing (5 minutes)**    * **Objective:** Provide an understanding of BIS standards for material testing.    * **Content:**      + Key BIS standards for common materials (e.g., IS 456 for concrete, IS 383 for aggregates).      + Scope, requirements, and compliance importance.    * **Methodology:**      + Interactive lecture with handouts summarizing key standards. 2. **Material Testing Procedures (15 minutes)**    * **Objective:** Explain the testing procedures for various building materials.    * **Content:**      + Testing procedures for concrete, steel, bricks, and aggregates.      + Laboratory testing vs. on-site testing.      + Interpreting test results and ensuring compliance.    * **Methodology:**      + Presentation with videos or images of testing processes. 3. **Quality Assurance Plan (15 minutes)**    * **Objective:** Discuss the elements of a comprehensive quality assurance plan.    * **Content:**      + Components of a quality assurance plan (QA policy, inspection plan, documentation).      + Roles and responsibilities of stakeholders in quality assurance.    * **Methodology:**      + Slide presentation with practical examples and best practices. 4. **Conclusion and Q&A (5 minutes)**    * **Objective:** Summarize key points and address participant questions.    * **Content:**      + Recap of the importance of material testing and quality assurance.      + Open floor for questions and clarifications.    * **Methodology:**      + Facilitator-led summary and Q&A session. | * Ability to develop and   implement an effective quality assurance plan.  **Follow-up Resources:**   * Access to BIS documents and standards. * Contact information for further queries or guidance. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SESSION 10 | **Session Title:**  "Building Resilience: Design and Construction for Special Areas"  **Duration:**  1 Hour | To equip participants with knowledge and  skills for designing and constructing buildings in  special areas like hilly and cyclonic regions,  emphasizing BIS standards,  challenges, and best practices. | **Session Breakdown**   1. **Introduction (5 minutes)**    * **Objective:** Set the context for designing and constructing in special areas.    * **Content:**      + Importance of adapting construction practices to regional challenges.      + Role of BIS in setting standards for safe and resilient construction.      + Overview of session objectives.    * **Methodology:**      + Brief presentation with introductory remarks and session outline. 2. **Overview of BIS Standards for Special Areas (15 minutes)**    * **Objective:** Familiarize participants with relevant BIS standards.    * **Content:**      + Key standards for hilly areas (e.g., IS 14458 for retaining walls) and cyclonic areas (e.g., IS 15498 for improving cyclonic resistance).      + Scope and application of these standards.    * **Methodology:**      + Interactive lecture with handouts summarizing key standards. 3. **Design Considerations for Hilly Areas (10 minutes)**    * **Objective:** Explain design principles for construction in hilly regions.    * **Content:**      + Topographical challenges and solutions.      + Stability and slope protection measures.      + Material selection and construction techniques suitable for hilly terrain.    * **Methodology:**      + Slide presentation with diagrams, photos, and discussing about standards. 4. **Design Considerations for Cyclonic Areas (10 minutes)**    * **Objective:** Discuss design principles for construction in cyclonic regions.    * **Content:**      + Wind load assessment and structural design.      + Use of cyclone-resistant building materials.      + Building orientation and layout considerations.    * **Methodology:** | **Expected Outcomes:**   * Comprehensive   understanding of design and construction principles for special  areas.   * Familiarity with BIS standards for resilient construction in hilly and cyclonic regions. * Ability to develop and implement effective design strategies for   special areas.  **Follow-up Resources:**   * Access to BIS documents and standards. * Contact information for further queries or guidance. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | * Presentation with videos and examples of cyclone-resistant   structures. |  |
| 1. **Interactive Activity: Designing for Special Areas (5 minutes)**    * **Objective:** Apply concepts through a hands-on exercise.    * **Content:**      + Participants work in groups to develop a basic design plan for a hypothetical building in a hilly or cyclonic area.      + Focus on site analysis, design adaptations, and material selection.    * **Methodology:**      + Group activity with presentations of their plans, followed by feedback and discussion. 2. **Conclusion and Q&A (5 minutes)**    * **Objective:** Recap key points and address participant questions.    * **Content:**      + Summary of session highlights.      + Open floor for questions and clarifications.    * **Methodology:**      + Facilitator-led summary and Q&A session. |
| SESSION 11 | **Session Title:** Maximizing Value: Asset and Facility  Management Best Practices  **Duration:**  1 hour | **Objective:**  To provide participants with an understanding of asset and  facility  management  principles, the | **Session Breakdown**   1. **Introduction (5 minutes)**    * **Objective:** Introduce the concepts of asset and facility management.    * **Content:**      + Definitions and key differences between asset and facility management. | **Expected Outcomes:**   * Comprehensive   understanding of asset and facility management principles.   * Familiarity with BIS standards for asset and   facility management. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | importance of effective  management, and compliance with BIS standards for optimal  performance and sustainability. | * Importance of effective management for operational efficiency and sustainability. * Overview of BIS’s role in standardizing asset and facility management in National Building Code of India 2016. * **Methodology:**   + Brief presentation with an overview and session objectives.  1. **Overview of BIS Standards for Asset and Facility Management (10 minutes)**    * **Objective:** Familiarize participants with relevant BIS standards.    * **Content:**      + Key standards (e.g., Part 12 of NBC 2016, IS 15489 for asset management, IS 13005 for facility management).      + Scope and application of these standards.      + Importance of compliance for operational excellence.    * **Methodology:**      + Interactive lecture with handouts summarizing key BIS standards. 2. **Core Principles of Asset Management (10 minutes)**    * **Objective:** Explain the fundamental principles and lifecycle of asset management.    * **Content:**      + Asset lifecycle stages: acquisition, operation, maintenance, and disposal.      + Strategies for optimizing asset performance and value.      + Risk management and cost-benefit analysis.    * **Methodology:**      + Slide presentation with lifecycle diagrams and real-world examples. 3. **Best Practices in Facility Management (10 minutes)**    * **Objective:** Discuss best practices for efficient facility management.    * **Content:**      + Integrated facility management (IFM) approach. | * Ability to develop and implement effective management plans. * List of recommended readings and resources on asset and facility management.   **Follow-up Resources:**   * Access to BIS documents and standards. * Contact information for further queries or guidance. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | * Key aspects: space management, energy efficiency, maintenance, and safety. * Technological advancements and their impact on facility management. * **Methodology:**   + Presentation with images and discussing about standards.  1. **Interactive Activity: Developing an Asset/Facility Management Plan (10 minutes)**    * **Objective:** Apply concepts through a hands-on exercise.    * **Content:**      + Participants work in groups to develop a basic management plan for a hypothetical facility.      + Focus on asset inventory, maintenance schedules, and sustainability practices.    * **Methodology:**      + Group activity with presentations of their plans, followed by feedback and discussion. 2. **Conclusion and Q&A (5 minutes)**    * **Objective:** Recap key points and address participant questions.    * **Content:**      + Summary of session highlights.      + Open floor for questions and clarifications.    * **Methodology:**      + Facilitator-led summary and Q&A session. |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SESSION 12 | **Session Title:**  "Revitalizing Structures:  Retrofitting Existing Buildings"  **Duration:**  1 Hour | **To provide participants with an understanding of the need for retrofitting**  **existing buildings, methodologies, BIS standards, and best practices for enhancing**  **structural integrity and performance.** | **Session Breakdown**   1. **Introduction (10 minutes)**    * **Objective:** Introduce the concept and importance of retrofitting.    * **Content:**      + Definition of retrofitting and its significance.      + Common reasons for retrofitting (e.g., structural degradation, seismic vulnerability, code updates).      + Overview of session objectives.    * **Methodology:**      + Brief presentation with introductory remarks and session outline. 2. **Overview of BIS Standards for Retrofitting (10 minutes)**    * Objective: Familiarize participants with relevant BIS standards.    * **Content:**      + Key standards (e.g., IS 15988 for seismic evaluation, IS 13935 for repair and seismic strengthening).      + Scope and application of these standards.    * **Methodology:**      + Interactive lecture with handouts summarizing key standards. 3. **Assessment and Diagnosis (10 minutes)**    * **Objective:** Explain the process of assessing and diagnosing the condition of existing buildings.    * **Content:**      + Methods for structural assessment (visual inspection, non-destructive testing).      + Identifying common structural deficiencies and vulnerabilities.    * **Methodology:**      + Slide presentation with examples of assessment techniques. 4. **Retrofitting Techniques and Approaches (15 minutes)**    * **Objective:** Discuss various retrofitting techniques.    * **Content:**      + Structural retrofitting methods (e.g., jacketing, base isolation, use of   FRP). | **Expected Outcomes:**   * **Comprehensive understanding of the need for retrofitting and its benefits.** * **Familiarity with BIS standards for retrofitting.** * **Ability to assess existing buildings and develop effective retrofitting strategies.**   **Follow-up Resources:**   * **Access to BIS documents and standards.** * **Contact information for further queries or guidance.** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | * Non-structural retrofitting considerations (e.g., fire safety, energy efficiency). * **Methodology:**   + Presentation with videos and practical examples of retrofitting techniques.  1. **Interactive Activity: Retrofitting Strategy Development (10 minutes)**    * **Objective:** Apply knowledge through a hands-on exercise.    * **Content:**      + Participants work in groups to develop a retrofitting strategy for a hypothetical building.      + Focus on assessment findings, chosen retrofitting techniques, and expected outcomes.    * **Methodology:**      + Group activity with presentations of their strategies, followed by feedback and discussion. 2. **Conclusion and Q&A (5 minutes)**    * **Objective:** Recap key points and address participant questions.    * **Content:**      + Summary of session highlights.      + Open floor for questions and clarifications.    * **Methodology:**      + Facilitator-led summary and Q&A session. |  |
| SESSION 13 | **Session Title:** "Harvesting the Future: Sustainable Water  Management  through Rainwater Harvesting"  **Duration:**  1 Hour | To educate participants on the principles, benefits, and  implementation of rainwater  harvesting systems,  highlighting BIS | **Session Breakdown**   1. **Introduction (10 minutes)**    * **Objective:** Introduce the concept and importance of rainwater harvesting.    * **Content:**      + Definition and significance of rainwater harvesting.      + Role of BIS in promoting sustainable water management.      + Overview of session objectives.    * **Methodology:**      + Brief presentation with introductory remarks and session outline. 2. **Overview of BIS Standards for Rainwater Harvesting (15 minutes)**  * **Objective:** Familiarize participants with relevant BIS standards. * **Content:**   + Key standards (e.g., IS 15797, IS 14961).   + Scope, application, and compliance requirements. * **Methodology:**   + Interactive lecture with handouts summarizing key standards.  1. **Components of Rainwater Harvesting Systems (15 minutes)**    * **Objective:** Explain the key components of rainwater harvesting systems.    * **Content:**      + Catchment areas, conveyance systems, storage tanks, filtration units.      + Integration with existing water supply systems.    * **Methodology:**      + Slide presentation with diagrams and images of system components. 2. **Design and Implementation (15 minutes)**    * **Objective:** Discuss the design principles and implementation strategies.    * **Content:**      + Site assessment and system sizing.      + Material selection and installation best practices.      + Maintenance and sustainability considerations.    * **Methodology:**      + Presentation with images discussing about standards. 3. **Conclusion and Q&A (10 minutes)**    * **Objective:** Summarize key points and address participant questions.    * **Content:**      + Recap of session highlights.      + Open floor for questions and clarifications.    * **Methodology:**   Facilitator-led summary and Q&A session. | **Expected Outcomes:**   * Comprehensive understanding of rainwater harvesting systems. * Familiarity with BIS standards for rainwater harvesting. * Ability to design and implement rainwater |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | standards and best practices. |  | harvesting systems effectively.  **Follow-up Resources:**   * Access to BIS documents and standards. * Contact information for further queries or guidance. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | * Focus on system components, sizing, and integration. * **Methodology:**   + Group activity with presentations of their designs, followed by feedback and discussion.  1. **Conclusion and Q&A (5 minutes)**    * **Objective:** Summarize key points and address participant questions.    * **Content:**      + Recap of session highlights.      + Open floor for questions and clarifications.    * **Methodology:**      + Facilitator-led summary and Q&A session. |  |