

METHODOLOGY STATEMENT & SEQUENCE OF WORK FOR STRUCTURAL MODIFICATION AND RETROFITTING OF EXISTING BARNES HALL LAWRENCE SCHOOL SANAWAR

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1. GENERAL EXECUTION PRINCIPLES

1.1 Structural Stability Priority

At no stage shall existing structural members be left unsupported where load redistribution could compromise safety.

1.2 Temporary Support Systems

- Adjustable steel props
- Needle beams
- Timber/steel shoring frames
- Lateral bracing systems

1.3 Dismantling Controls

- Manual dismantling preferred over mechanical demolition.
- No impact tools directly on stone masonry unless approved.
- Sequential removal only after supports are verified.

1.4 Monitoring

- Continuous crack monitoring during interventions.
- Settlement monitoring for adjacent structures.
- Daily inspection by structural engineer.

2. METHODOLOGY FOR EXTERNAL LIFT INSTALLATION

2.1 Structural Concept

- Lift structure shall be fully independent.
- Separate foundation system.
- Minimum designed expansion gap between new and old structures.
- No transfer of vertical or lateral loads to existing masonry.

2.2 Execution Steps

1. Survey and mark lift shaft location.
2. Excavate lift foundation carefully without undermining existing building foundation.

3. Provide shoring during excavation if required.
4. Cast independent RCC/steel foundation system.
5. Erect lift shaft structure.
6. Maintain expansion joint throughout height.
7. Connect only through flexible access bridges/openings.
8. Waterproof and seal expansion joint appropriately.

2.3 Critical Controls

- Foundation depth must not destabilize existing wall.
- Expansion joint must remain unobstructed.

3. METHODOLOGY FOR EXTERNAL STAIRCASE INSTALLATION

3.1 Structural Concept

- Independent staircase structural system.
- Separate footings/foundation.
- Expansion joint from existing building.
- Controlled interface at landing connections.

3.2 Execution Sequence

1. Layout staircase footprint.
2. Construct independent foundations.
3. Erect steel/RCC framing.
4. Maintain non-rigid connection with existing building.
5. Install staircase flights and landings.
6. Provide separation joints.

4. METHODOLOGY FOR MEZZANINE EXTENSION

4.1 Structural Challenge

Since new columns cannot extend to foundation due to occupancy constraints, load transfer shall occur through strengthened existing beams.

4.2 Beam Strengthening Strategy

- Install supplementary steel beam parallel/adjoining existing beam.
- Provide full-length connection plates at top and bottom.

- Ensure composite action between existing and new beam.

4.3 Execution Sequence

Stage 1: Temporary Support

- Fully support existing floor and beam using steel props/jacks.
- Ensure no live load during intervention.

Stage 2: Surface Preparation

- Expose beam faces.
- Remove finishes locally.
- Clean contact surfaces.

Stage 3: Supplemental Beam Installation

- Position additional steel beam at existing beam face.
- Align properly.
- Install top and bottom steel plates.
- Bolt/weld plates as per design.
- Verify load-sharing action.

Stage 4: Column Installation

- Install new steel columns over strengthened beam only after beam composite system is complete.
- Ensure base plate and stiffener adequacy.
- Gradually transfer loads.

Stage 5: Mezzanine Framing

- Install primary and secondary steel members.
- Decking and floor system installation.

4.4 Critical Precautions

- Existing beam deflection monitoring mandatory.
- Sequential loading required.
- Classroom operations below must be protected.
- Fireproofing of steel members.

5. TEMPORARY WORKS AND DISMANTLING SEQUENCE

5.1 Key Principles

- Support before cut.
- Strengthen before load transfer.
- Construct independent systems before interface creation.
- Remove temporary supports only after engineer approval.

5.2 Recommended Sequence

1. Structural survey and marking.
2. Temporary support installation.
3. Lift and staircase independent foundations.
4. External structures erection.
5. Existing beam strengthening.
6. Mezzanine columns installation.
7. Mezzanine floor extension.
8. Architectural finishes.