

TECHNICAL NOTES

CODES AND STANDARDS

1.

IS 456:2000

PLAIN AND REINFORCED CONCRETE CODE OS PRACTICE.
2.

IS 1893: 2002

CRITERIA FOR EARTHQUAKE RESISTANT DESIGN OF STRUCTURES.
3.

IS13920:1993

DUCTILE DETAILING OF REINFORCED CONCRETE STRUCTUR
SUBJECTED TO SEISMIC FORES.
4.

S 4326:1993

EARTHQUAKE RESISTANT DESIGN AND CONSTRUCTION OF BUILDINGS.
5.

BTS-002-2003

BUILDING CODE OF BHUTAN 2003.
6.

MANUAL FOR TIMBER ENGINEERING DESIGN (NUDC).

LOADS.

1. THIS STRUCTURE HAS BEEN DESIGNED FOR THE FOLLOWING LOADS.

(a).

DEAD LOADS:

UNIT WEIGHT OF BRICK WALL

19 kN/m³

UNIT WEIGHT OF RCC

25 kN/m³

UNIT WEIGHT OF PCC

24 kN/m³

UNIT WEIGHT OF STONE

28 kN/m³

(b).

SUPERIMPOSED (LIVELOADS)

LIVELOAD FOR FLOORS

2 kN/m²

LIVE LOAD FOR ROOF

0.75 kN/m² (IS:875)

(c).

WIND LOAD

WIND PRESSURE

1.276 kN/m² (BST-002-2003)

(d).

EARTHQUAKE LOAD

AS PER IS 1893:2002, ZONE V
2. MAINTAIN STRUCTURE IN STABLE CONDITION DURING CONSTRUCTION.
3. DONOT PLACE OR STORE BUILDING MATERIALS ON CONCRETE MEMBERS WITHOUT ENGINEER'S APPROVAL.

CONCRETE.

1. CONCRETE QUALITY SHALL COMPLY WITH IS 456:2000
2. PROJECT ASSESSMENT OF CONCRETE STRENGTH IS REQUIRED.
3. GRADE OF CONCRETE IS M20 (1:1.5:3) FOR ALL RCC WORKS.
4. FOR THE ABOVE GRADE TO BE ACHIEVED, MAXIMUM FREE WATER-CEMENT RATIO SHALL BE 0.5, MINIMUM CEMENT CONTENT SHALL BE 300 Kg/m³ AND MAXIMUM AMOUNT OF WATER SHALL BE 180 L.
5. WATER USED FOR MIXING AND CURING SHALL COMPLY WITH CLAUSE 5.4 OF IS 456:2000.

GENERAL NOTES FOR STRUCTURAL DRAWINGS.

1. STRUCTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH ARCHITECTURAL DRAWINGS AND OTHER ENGINEERS' DRAWINGS AND SPECIFICATIONS.
2. ALL DIMENSIONS ARE IN MM AND RELATIVE LEVEL IN M UNLESS STATED OTHERWISE.
3. DIMENSIONS SHALL NOT BE SCALED FROM THE DRAWINGS.
4. VERIFY ALL SETTING OUT DIMENSIONS WITH ENGINEER/ARCHITECT.
5. REFER ANY DISCREPANCY TO ENGINEER/ARCHITECT BEFORE PROCEEDING THE WORK.
6. ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL COMPLY WITH THE SPECIFICATIONS FOR BUILDING AND ROAD WORKS TOGETHER WITH THE REQUIREMENTS OF ALL RELEVANT CODES OF PRACTICE REFERRED TO HEREIN AND THE REQUIREMENTS OF ALL STATUTORY AUTHORITIES.
7. ALWAYS REFER ADDITIONAL NOTES PROVIDED IN THE DRAWINGS.

FOUNDATIONS AND FOOTINGS.

1. FOOTINGS ARE DESIGNED FOR AN ALLOWABLE BEARING CAPACITY OF 150 kN/m².
2. SOIL TYPE MEDIUM AS PER IS:1893-2002.
3. WALLS SHALL BE PROVIDED BELOW THE EXTERIOR PLINTH BEAM. IT IS RECOMMENDED TO PROVIDE THE SAME BELOW THE INTERNAL PLINTH BEAM.
4. FOOTINGS ARE DESIGNED CONSIDERING THE MINIMUM DEPTH OF 1.5 M BELOW THE ORIGINAL GROUND LEVEL.
5. ALL CONCRETE SHALL BE PLACED "IN THE DRY" FOR FOUNDATIONS.
6. COMPACTION OF FOUNDATION SHALL BE APPROVED BY ENGINEER PRIOR TO PLACEMENT OF CONCRETE.
7. MECHANICALLY VIBRATE CONCRETE IN THE FORM TO GIVE MAXIMUM COMPACTION WITHOUT SEGREGATION OF THE CONCRETE.
8. CURE CONCRETE AS REQUIRED BY THE CLAUSE 13.5 OF IS456:2000 AND WORK SPECIFICATIONS.
9. CONCRETE SIZES AS DRAWN ARE MINIMUM AND DONOT INCLUDE APPLIED FINISHES.
10. DONOT MAKE UNSPECIFIED HOLES OR CHASES WITHOUT ENGINEER'S APPROVAL.
11. DONOT PLACE CONDUITS, PIPES etc. WITHIN CONCRETE COVER.
12. AGGREGATES SHALL COMPLY WITH CLAUSE 5.3 OF IS456:2000. NOMINAL SIZE OF COARSE AGGREGATES SHALL BE 20MM.
13. THE CHARACTERISTICS STRENGTH OF CONCRETE AT 28 DAYS SHALL BE 20MPA. NOTE THAT THE MEAN COMPRESSIVE STRENGTH OBTAINED FROM THE LABORATORY HAS TO BE WELL ABOVE THIS VALUE.
14. ALL FORMWORKS FOR BEAMS AND SLABS ARE TO REMOVED BEFORE CONSTRUCTION OF WALLS OR OTHER PERMANENT LOADINGS. ALL FORMWORK AND ITS REMOVAL MUST BE IN ACCORDANCE TO IS 456:2000.



ROYAL GOVERNMENT OF BHUTAN
DEPARTMENT OF AIR TRANSPORT

Notes

1. All dimensions are in meters unless specified otherwise.
2. All relative levels are in meters unless specified otherwise.
3. All dimensions measure unfinished surfaces unless specified otherwise.
4. All dimensions are to be read and not scaled off.
5. Any discrepancy in drawing is to be brought to the immediate notice of the Client/Supervising Engineer.
6. Minor adjustments need to be carried out on site to match with existing structure.
7. Verify dimensioning, take real measurements.
8. All construction changes on the site to be agreed with the Client/Supervising Engineer.

Client

Ministry of Information and Communications
Department of Air Transport

Aviation Planners & Engineers

Leading Edge Aviation Planning Professionals

Civil Engineering Consultant

Gyaltshen Consultancy

Project Title

BHUTAN DOMESTIC AIRPORT DESIGN & SUPERVISION
GELEPHU AIRPORT SECURITY QUATERS

No.Revision

No.	Revision	Date	By

Drawing Title

Drawing List

Scale 1 : 200 @ A3

Date December 2016

Drawn By S Tobgay, P Dorji & A Pradhan

Drawing Number

STR - 100

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REINFORCEMENT.

- 1. GRADE OF STEEL USED FOR RCC WORKS SHALL BE FE500.
- 2. BAR NOTATION GIVES THE FOLLOWING INFORMATION IN THIS ORDER: NUMBER OF BARS, BAR SIZE (MM), SPACING (MM, IF REQUIRED).
- 3. REINFORCEMENT IS REPRESENTED DIAGRAMATICALLY AND NOT NECESSARILY IN TRUE PROJECTION.
- 4. LAP REINFORCEMET ONLY AT LOCATIONS SHOWN IN THE DRAWINGS. LAP LENGTH SHALL COMPLY WITH IS456:2000. LAP SPLICES SHALL NOT BE LESS THAN THE DEVELOPMENT LENGTH IN TENSION(GENERALLY 47Ø).
- 5. REINFORCEMENT SHALL NOT BE CUT, BENT OR HEATED ON SITE WITHOUT ENGINEER'S APPROVAL.
- 6. THE DEVIATION OF REINFORCEMENT FROM ITS SPECIFIED POSITION SHALL NOT EXCEED THE FOLLOWING(MM)
 - (a). TOLERANCE FOR COVER -0,+10MM. WHERE A NEGATIVE VALUE INDICATE A DECREASE IN SPECIFED COVER, AND POSITIVE VALUE INDICATES AN INCREASE IN COVER.
 - (b). TOLERANCE ON PLACEMENT OF REINFORCEMENT.
FOR BEAMS, COLUMNS AND FOUNDATION -15,+15MM.
- 7. SPACERS AND SUPPORTS SHALL BE LOCATED AT CENTRES CLOSE ENOUGH (PREFERABLY NOT EXCEEDING 750MM C/C FOR COLUMN AND BEAM REINFORCEMENT AND 450MM FOR SLAB REINFORCEMENT). TO PREVENT DISPLACMENT OF REINFORCEMENT BY WORKMEN OR EQUIPMENT DURING FIXING AND SUBSEQUENT CONCRTE PLACEMENT WITHIN TOLERANCE GIVEN ABOVE.
- 8. THE COVER TO THE REINFORCEMENT NEAREST THE CONCRETE SURFACE SHALL NOT LESS THAN THE FOLLOWING EXCEPT WHERE SPECIFIED OTHERWISE:

FOUNDATION	75 MM
COLUMNS	40 MM
BEAMS	30 MM
SLABS	25 MM
- 9. BENDING OF REINFORCEMENT IN BEAMS AND COLUMNS SHALL COMPLY WITH TH REQUIREMENTS OF IS 456:2000
- 10. FORMWORK SHALL COMPLY WITH CLAUSE 11 OF IS 456:2000
- 11. STRIPPING OF FORMWORK SHALL COMPLY WITH CLAUSE 11.3 OF IS:456:2000

WELDING AND BOLTING.

- 1. WELDING TO BE CARRIED OUT IN ACCORDANCE WITH IS 816:1969, IS 819:1957, IS 1024:1979, IS 1261:1959, IS 1323:1982 AND IS: 9595: 1980 AS APPROPRIATE.
- 2. THE STRENGTH OF ELECTRODE USED FOR WELDING SHALL BE EQUAL TO OR GREATER THAN THE STRENGTH OF MEMBER THAT IS BEING WELDED.
- 3. ALL WELD SHALL BE COMPLETE PENETRATION BUTT WELD.
- 4. ALL BOLTS SHALL BE HIGH STRENGTH FRICTION GRIP GALVANIZED M16 AND M20 IN ACCORDANCE WITH IS 3757:1967 AND IS 800: 1984.
- 5. ALL MEMBERS OF STEEL TRUSS SHALL BE DRY AND THOROUGHLY CLEANED FROM ALL LOOSESCALE AND RUST PRIOR TO PAINTING.
- 6. THE MEMBERS SHALL BE PROVIDED WITH COAT OF ZINC COATING.



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