STRUCTURAL DRAWINGS

DESIGN OF G+5 MIXED-USE BUILDING OF RICBL AT DEKI LANE, PHUENTSHOLING.

PLOT NO. PGT-2405
THRAM NO. 2035
List of Structural Drawings for the Proposed Construction of Mixed-Use Building at Dekilane, Phuentsholing

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Note: Dimensions in millimeters. Do not measure from this drawing. Report any discrepancies to the designer.
A. GENERAL

1. READ THIS DRAWINGS IN CONJUNCTION WITH ARCHITECTS’ AND OTHER ENGINEERS’ DRAWINGS AND SPECIFICATIONS, AND SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED.

2. ALL DIMENSIONS ARE IN MILLIMETRE UNLESS STATED OTHERWISE.

3. DIMENSIONS SHALL NOT BE SCALLED FROM THE DRAWINGS.

4. DESIGN CONFORMS TO:
   - IS456:2000  CODE OF PRACTICE FOR PLAIN AND REINFORCED CONCRETE
   - IS12035-1:2002 CODE FOR EARTHQUAKE RESISTANT STRUCTURES.
   - IS 12035-1:2002 CRITERIA FOR EARTHQUAKE RESISTANT STRUCTURES.

5. VERIFY ALL SETTING OUT DIMENSIONS WITH THE ENGINEER/ARCHITECT. VERIFY LOCATION AND DIMENSIONS OF CHASES, INSERTS, OPENINGS, WASHES, DRIPS, DEPRESSIONS, AND OTHER PROJECT REQUIREMENTS NOT SHOWN ON THE STRUCTURAL DRAWINGS.

6. IF IN DOUBT, ASK.

7. REFER ANY DISCREPANCY TO ENGINEER/ARCHITECT BEFORE PROCEEDING WITH THE WORK.

8. 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.

9. CHECK ALL DIMENSIONS BEFORE STARTING WORK.

10. ALWAYS REFER ADDITIONAL NOTES PROVIDED IN THE DRAWINGS.

11. UNLESS OTHERWISE INDICATED, DETAILS SHOWN ARE TO BE CONSIDERED TYPICAL FOR SIMILAR CONDITIONS.

12. NO FRAMING OR STRUCTURAL MEMBERS ARE TO BE MODIFIED, NOTCHED, OR CUT WITHOUT THE APPROVAL OF THE ENGINEER.

13. THE OWNER SHALL FAMILIARIZE THEMSELVES WITH THE DRAWINGS. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE AFFECTED WORK. ANY VARIATIONS OR SUBSTITUTIONS OF MATERIALS OR DETAILS FROM THOSE INDICATED ON THE DRAWINGS MAY ONLY BE MADE WITH PRIOR APPROVAL OF THE ENGINEER.

B. FOUNDATION

1. FOOTINGS ARE DESIGNED FOR AN ALLOWABLE BEARING CAPACITY OF 115KN/PA. VERIFY THE SOIL STRENGTH AND OBTAIN APPROVAL FROM THE ENGINEER BEFORE PLACING CONCRETE.

2. FOUNDATION SHALL BEAR ON UNDISTURBED NATURAL MATERIAL OR PROPERLY PLACED AND COMPACTED CONTROLLED STRUCTURAL FILL HAVING A MINIMUM BEARING CAPACITY OF 150 KPA.

3. CONTROLLED STRUCTURAL FILL SHALL CONSIST OF CLEAN GRANULAR MATERIAL FREE OF ORGANIC OR OTHER DELETERIOUS MATTER AND CONFORM TO THE REQUIREMENTS OF STANDARDS AND QUALITY CONTROL AUTHORITY.

4. MASONRY WALLS IN THE FORM OF RANDOM RUBBLE MASONRY SHALL BE PROVIDED BELOW THE EXTERIOR AS WELL AS INTERIOR PLINTH BEAM.

5. FOOTINGS ARE DESIGNED CONSIDERING THE MINIMUM DEPTH OF 200MM BELOW THE ORIGINAL GROUND LEVEL. NOTIFY ENGINEER IF THE DEPTH OF FOOTINGS REQUIRED TO BE PROVIDED VARIES FROM THE DEPTH SPECIFIED ABOVE.

6. ALL EXCAVATION SHALL BE DRY BEFORE PLACING ANY CONCRETE.

7. IF SEEPAGE IS ENCOUNTERED DURING FOUNDATION EXCAVATION, PUMP OUT WATER BEFORE PLACING CONCRETE.

8. THE FOUNDATIONS UNDER THE CONCRETE BASE SLAB SHALL BE COMPACTED THROUGHOUT AND A MINIMUM 200MM LAYER OF COURSE AGGREGATE SHALL BE PLACED OVER THE COMPACTED EARTH AND SEALED WITH 75MM THICK LAYER OF BLINDING CONCRETE.

9. BACKFILLING AGAINST BUILDING FOUNDATION WALLS SHALL BE DONE ONLY AFTER WALLS ARE BRACED TO PREVENT MOVEMENT.

10. CARE SHALL BE TAKEN NOT TO OVERSTRESS ANY ADJACENT RETAINING WALLS AND STRUCTURES DURING BACKFILLING AROUND FOUNDATIONS.

11. COMPACTION OF FOUNDATION SHALL BE APPROVED BY ENGINEER PRIOR TO PLACEMENT OF CONCRETE.

12. PRECAUTIONARY MEASURE SHALL BE TAKEN WHILE EXCAVATING THE FOUNDATION NEAR BY THE DRAIN.

C. CONCRETE

1. CONCRETE QUALITY SHALL COMPLY WITH IS456:2000.

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 0.55, MINIMUM CEMENT CONTENT SHALL BE 300KG/M3 AND MAXIMUM AMOUNT OF WATER SHALL BE 165L FOR 300KG/M3 OF CEMENT.


6. MECHANICALLY VIBRATE CONCRETE IN THE FORM TO GIVE MAXIMUM COMPACTATION WITHOUT SEGREGATION OF THE CONCRETE.

7. CURE CONCRETE AS REQUIRED BY THE CLAUSE 13.5 OF IS456:2000 AND WORK SPECIFICATIONS.

8. IN THE DRAWINGS THE BEAM SIZES ARE DESIGNATED WIDTH X DEPTH (INCLUDES SLAB THICKNESS IF ANY).

9. CONCRETE SIZES AS DRAWN ARE MINIMUM AND DO NOT INCLUDE APPLIED FINISHES.

10. DO NOT PLACE OR STORE BUILDING MATERIALS ON CONCRETE MEMBERS WITHOUT ENGINEER’S APPROVAL.

11. DO NOT MAKE UNSPECIFIED HOLES OR CHASES WITHOUT ENGINEER’S PRIOR APPROVAL.

12. NO FRAMING OR STRUCTURAL MEMBERS ARE TO BE MODIFIED, NOTCHED, OR CUT WITHOUT THE APPROVAL OF THE ENGINEER.

13. THE CHARACTERISTIC STRENGTH OF CONCRETE AT 28 DAYS SHALL BE 20MPA. THE CONCRETE SHALL BE ASSESSED AS PER THE ANALYSIS PROCEDURE SPECIAL MOMENT RESISTING FRAME.

D. LOADING

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

   1.1 DEAD LOADS:
   - UNIT WEIGHT OF WALL: 25 KN/M3 (CEMENT CONCRETE BLOCK)
   - UNIT WEIGHT OF RCC: 25 KN/M3
   - UNIT WEIGHT OF PCC: 24 KN/M3

   1.2 SUPERIMPOSED LOADS (LIVE LOADS):
   - LIVE LOAD FOR FLOORS: 3 kN/MM2 (load on commercial building)
   - LIVE LOAD FOR STAIRCASE: 3.5 kN/MM2
   - LIVE LOAD FOR ROOF: 0.75 kN/MM2 (not accessible)

   1.3 WIND LOAD:
   - BASIC WIND SPEED (ASSUMED): 47 M/S
   - BUILDING CLASS: A
   - TERRAIN CATEGORY: III

   1.4 EARTHQUAKE DESIGN DATA:
   - SEISMIC ZONE: V
   - BASIC SEISMIC FORCE RESISTING SYSTEM: SPECIAL MOMENT RESISTING FRAME
   - ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE PROCEDURE

2. MAINTAIN STRUCTURE IN STABLE CONDITION DURING CONSTRUCTION.

3. DO NOT PLACE OR STORE BUILDING MATERIALS ON CONCRETE MEMBERS WITHOUT ENGINEER’S APPROVAL.

4. DESIGN CONFORMS TO:
   - IS456:2000 CODE OF PRACTICE FOR PLAIN AND REINFORCED CONCRETE
   - IS12035-1:2002 CRITERIA FOR EARTHQUAKE RESISTANT STRUCTURES.
   - IS 12035-1:2002 CODE FOR EARTHQUAKE RESISTANT STRUCTURES.

5. FOR THE ABOVE GRADE TO BE ACHIEVED, MAXIMUM FREE WATER-CEMENT RATIO SHALL BE 0.55, MINIMUM CEMENT CONTENT SHALL BE 300KG/M3 AND MAXIMUM AMOUNT OF WATER SHALL BE 165L FOR 300KG/M3 OF CEMENT.


7. MECHANICALLY VIBRATE CONCRETE IN THE FORM TO GIVE MAXIMUM COMPACTATION WITHOUT SEGREGATION OF THE CONCRETE.

8. CURE CONCRETE AS REQUIRED BY THE CLAUSE 13.5 OF IS456:2000 AND WORK SPECIFICATIONS.

9. IN THE DRAWINGS THE BEAM SIZES ARE DESIGNATED WIDTH X DEPTH (INCLUDES SLAB THICKNESS IF ANY).

10. CONCRETE SIZES AS DRAWN ARE MINIMUM AND DO NOT INCLUDE APPLIED FINISHES.

11. DO NOT PLACE CONDUITS, PIPES AND THE LIKE WITHIN COVER CONCRETE.

12. AGGREGATES SHALL COMPLY WITH CLAUSE 5.3 OF IS456:2000. NOMINAL SIZE OF COARSE AGGREGATES SHALL BE 20MM.

13. ALL FORMWORKS FOR BEAMS AND SLABS ARE TO BE REMOVED BEFORE CONSTRUCTION OF WALLS OR OTHER PERMANENT LOADINGS. ALL FORMWORK AND ITS REMOVAL MUST BE IN ACCORDANCE TO IS456:2000.

14. ALL FLOOR SLABS ARE REINFORCED CONCRETE SLABS.
E. REINFORCEMENT
1. GRADE OF STEEL USED FOR RCC WORKS SHALL BE FE500 (TMT).
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.
5. REINFORCEMENT SHALL NOT BE CUT, BENT OR HEATED ON SITE WITHOUT ENGINEER’S PRIOR APPROVAL.
6. THE DEVIATION OF REINFORCEMENT FROM ITS SPECIFIED POSITION SHALL NOT EXCEED THE FOLLOWING (MM):
   6.1) TOLERANCE FOR COVER -0, +10 MM. WHERE A NEGATIVE VALUE INDICATES A DECREASE IN SPECIFIED COVER, AND POSITIVE VALUE INDICATES AN INCREASE IN COVER.
   6.2) TOLERANCES ON PLACING OF REINFORCEMENT:
   I) FOR SLABS AND STAIRCASE -10, +10 MM.
   II) FOR BEAMS AND FOUNDATION -15, +15 MM.
7. SPACERS AND SUPPORTS SHALL BE LOCATED AT CENTRES CLOSE ENOUGH (PREFERABLY NOT EXCEEDING 750 MM C/C FOR COLUMN AND BEAM REINFORCEMENT, AND 450 MM FOR SLAB REINFORCEMENT) TO PREVENT DISPLACEMENT OF REINFORCEMENT BY WORKMEN OR EQUIPMENT DURING FIXING, AND SUBSEQUENT CONCRETE PLACEMENT WITHIN THE TOLERANCE GIVEN IN 6 ABOVE.
8. THE COVER TO THE REINFORCEMENT NEAREST TO THE CONCRETE SURFACE SHALL NOT BE LESS THAN THE FOLLOWING EXCEPT WHERE SPECIFIED OTHERWISE:
   - BEAMS: 30 MM
   - COLUMNS: 40 MM
   - FLOOR SLABS AND STAIRCASE: 20 MM
   - FOUNDATION: 50 MM
10. REINFORCEMENT SHALL BE SUBJECT TO LABORATORY TEST TO DETERMINE DUCTILE PROPERTY.
11. INSTALLATION OF REINFORCEMENT SHALL BE COMPLETED AT LEAST 24 HOURS PRIOR TO SCHEDULED CONCRETE PLACEMENT. NOTIFY ENGINEER AT LEAST 48 HOURS PRIOR TO SCHEDULED CONCRETE PLACEMENT, TO ALLOW TIME FOR INSPECTION.

F. TIMBER
1. ALL STRUCTURAL TIMBER SHALL CONFORM TO THE IS883. (If available use the Bhutanese Timber Code)
2. MOISTURE CONTENT OF THE STRUCTURAL TIMBER SHALL NOT EXCEED 12%.
3. ALL STRUCTURAL TIMBER SHALL HAVE A MINIMUM ALLOWABLE BENDING STRESS, Fb, OF 7MPA, A MINIMUM ALLOWABLE HORIZONTAL SHEAR STRESS, Fv, OF 0.6MPA, A MINIMUM MODULUS OF ELASTICITY, E, OF 9800MPA, AND MAXIMUM UNIT WEIGHT OF 5.75 KN/M3.

G. FORMWORK
1. PROPERLY BRACE AND SHORE FORMWORK TO MAINTAIN ALIGNMENT AND TOLERANCE IN ACCORDANCE WITH IS456:2000.
NOTES:

1. GROUND LEVEL REFERS TO THE LEVELLED GROUND AFTER HAVING REMOVED ALL THE TOP ORGANIC SOIL.
2. THE MINIMUM DEPTH OF FOUNDATION SHALL BE 2000MM FROM THE GROUND LEVEL.
3. BACK FILL SHALL BE FULLY COMPACTED BEFORE PLACING GROUND FLOOR CONCRETE.
4. PROPER ANCHORAGE OF BEAM BARS IN EXTERIOR COLUMN SHALL BE PROVIDED AS DETAILED IN DRAWING NO. STR/15.
5. IN ORDER TO ACHIEVE PROPER ANCHORAGE OF BEAM BARS INTO EXTERIOR COLUMNS, ALL EXTERIOR COLUMN SHALL BE CAST ONLY UP TO 3/4 OF THEIR HEIGHT BEFORE LAYING BEAM REINFORCEMENT IN UPPER FLOOR.

REFERENCE:

1. REFER DRG. NO. STR/02 FOR COLUMN LAYOUT PLAN.
2. REFER DRG. NO. STR/03 FOR FOOTING & WALL FOUNDATION DETAILS.
3. REFER DRG. NO. STR/06 FOR COLUMN DETAILS
4. REFER DRG. NO. STR/08 FOR COLUMN SPLICE DETAILS.
5. REFER DRG. NO. STR/09 FOR BEAM SPLICE DETAILS
6. REFER DRG. NO. STR/10 FOR BEAM-COLUMN JUNCTION DETAILS.
NOTES:
1. GROUND LEVEL REFERS TO THE LEVELLED GROUND AFTER HAVING REMOVED ALL THE TOP ORGANIC SOIL.
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REFERENCE:
1. REFER DRG. NO. STR/01 FOR FOOTING LAYOUT PLAN
2. REFER DRG. NO. STR/03 FOR FOOTING & WALL FOUNDATION DETAILS.
3. REFER DRG. NO. STR/04 & 05 FOR SHEAR WALL DETAILS.
4. REFER DRG. NO. STR/08 FOR COLUMN DETAILS
5. REFER DRG. NO. STR/09 FOR COLUMN SPLICE DETAILS.
6. REFER DRG. NO. STR/10 FOR BEAM SPLICE DETAILS
7. REFER DRG. NO. STR/11 FOR BEAM- COLUMN JUNCTION DETAILS.

COLUMN LAYOUT PLAN
FOOTING SCHEDULE

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FOOTING SCHEDULE

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FOOTING & WALL FOUNDATION DETAILS

NOTES:
1. GROUND LEVEL REFERS TO THE LEVELLED GROUND AFTER HAVING REMOVED ALL THE TOP ORGANIC SOIL.
2. THE MINIMUM DEPTH OF FOUNDATION SHALL BE 2000MM FROM THE GROUND LEVEL.
3. BACK FILL SHALL BE FULLY COMPACTED BEFORE PLACING GROUND FLOOR CONCRETE.
4. PROPER ANCHORAGE OF BEAM BARS IN EXTERIOR COLUMN SHALL BE PROVIDED AS DETAILED IN DRAWING NO. STR/08.
5. IN ORDER TO ACHIEVE PROPER ANCHORAGE OF BEAM BARS INTO EXTERIOR COLUMNS, ALL EXTERIOR COLUMN SHALL BE CAST ONLY UP TO 3/4 OF THEIR HEIGHT BEFORE LAYING BEAM REINFORCEMENT IN UPPER FLOOR.
FOOTING SCHEDULE

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<td>3000</td>
<td>3000</td>
<td>800</td>
<td>120Ø@120 c/c</td>
</tr>
<tr>
<td>CF1</td>
<td>7050</td>
<td>3200</td>
<td>650</td>
<td>120Ø@100 c/c</td>
</tr>
<tr>
<td>CF2</td>
<td>7050</td>
<td>3200</td>
<td>650</td>
<td>120Ø@100 c/c</td>
</tr>
</tbody>
</table>

FOOTING SCHEDULE

<table>
<thead>
<tr>
<th>FOOTING MARK</th>
<th>FOOTING SIZE</th>
<th>BOTTOM REBAR IN L-DIRECTION</th>
<th>BOTTOM REBAR IN B-DIRECTION</th>
<th>TOP REBAR IN BOTH DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF1</td>
<td>7050</td>
<td>3200</td>
<td>650</td>
<td>120Ø@140 c/c</td>
</tr>
<tr>
<td>CF2</td>
<td>7050</td>
<td>3200</td>
<td>650</td>
<td>120Ø@140 c/c</td>
</tr>
</tbody>
</table>

FOOTING & WALL FOUNDATION DETAILS

1. **FOOTING SCHEDULE**

   - **FOOTING MARK**: F1, F2, F3, F4, F5, F6, CF1, CF2
   - **FOOTING SIZE**: 3000, 3000, 3000, 3000, 3000, 3000, 7050, 7050
   - **BOTTOM REBAR IN L-DIRECTION**: 650, 750, 700, 800, 800, 800, 650, 650
   - **BOTTOM REBAR IN B-DIRECTION**: 120Ø@150 c/c, 120Ø@150 c/c, 120Ø@120 c/c, 120Ø@140 c/c, 120Ø@120 c/c, 120Ø@120 c/c, 120Ø@100 c/c, 120Ø@100 c/c
   - **TOP REBAR IN BOTH DIRECTION**: 120Ø@180 c/c, 120Ø@180 c/c, 120Ø@180 c/c, 120Ø@180 c/c, 120Ø@180 c/c, 120Ø@180 c/c, 120Ø@180 c/c, 120Ø@180 c/c

2. **REVISION DATE**: NT

3. **CONTENT**: AS MENTIONED

4. **CLIENT**: RICBL

5. **G.M. (D&P)**

6. **CEO (NHDCL)**

7. **NOTES**:
   - **SAME WALL FOUNDATION DETAILS SHALL BE ADOPTED FOR ALL WALLS.**
   - **NOTES**:
     - 1. **GROUND LEVEL REFERS TO THE LEVELLED GROUND AFTER HAVING REMOVED ALL THE TOP ORGANIC SOIL.**
     - 2. **THE MINIMUM DEPTH OF FOUNDATION SHALL BE 2000MM FROM THE GROUND LEVEL.**
     - 3. **BACK FILL SHALL BE FULLY COMPACTED BEFORE PLACING GROUND FLOOR CONCRETE.**
     - 4. **PROPER ANCHORAGE OF BEAM BARS IN EXTERIOR COLUMN SHALL BE PROVIDED AS DETAILED IN DRAWING NO. STR/08.**
     - 5. **IN ORDER TO ACHIEVE PROPER ANCHORAGE OF BEAM BARS INTO EXTERIOR COLUMN, ALL EXTERIOR COLUMN SHALL BE CAST ONLY UP TO 3/4 OF THEIR HEIGHT BEFORE LAYING BEAM REINFORCEMENT IN UPPER FLOOR.**

---

**FOOTING SCHEDULE**

<table>
<thead>
<tr>
<th>FOOTING MARK</th>
<th>FOOTING SIZE</th>
<th>BOTTOM REBAR IN L-DIRECTION</th>
<th>BOTTOM REBAR IN B-DIRECTION</th>
<th>TOP REBAR IN BOTH DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF1</td>
<td>7050</td>
<td>3200</td>
<td>650</td>
<td>120Ø@140 c/c</td>
</tr>
<tr>
<td>CF2</td>
<td>7050</td>
<td>3200</td>
<td>650</td>
<td>120Ø@140 c/c</td>
</tr>
</tbody>
</table>
REFERENCES:
1. REFER DRG. NO. STR/01 FOR FOOTING LAYOUT PLAN.
2. REFER DRG. NO. STR/10 FOR BEAM-COLUMN JUNCTION DETAILS.
3. REFER DRG. NO. STR/08 FOR COLUMN SPLICE DETAILS.
4. REFER DRG. NO. STR/70 TO 74 FOR STAIRCASE DETAILS.

TIES AT S1, SPLICES BELOW PLINTH LEVEL
10Ø @ 75C/C
10Ø @ 75C/C

MAIN BAR TYPE
C2
C1

SIZE
500x500
500x500

COLUMNS

NOTES:
1. ALL SPLICES TO BE PROVIDED NEAR THE MIDDLE OF COLUMN.
2. NOT MORE THAN 50% OF COLUMN BARS SHALL BE SPLICED AT ONE SECTION.
3. SPLICING OF COLUMN BARS AT GROUND FLOOR IS NOT PERMITTED.
4. COLUMN DETAILS IS SAME UP TO ROOF LEVEL.
5. TIE SPACING OF 75 MM C/C SHALL BE PROVIDED THROUGHOUT FOR COLUMNS SUPPORTING STAIRCASE.
6. TIE SPACING OF 75 MM C/C SHALL BE PROVIDED UP TO GROUND FLOOR LEVEL IN ALL COLUMNS.
7. COLUMN C7 & C8 WILL TERMINATE A LOWER GROUND FLOOR LEVEL.
8. COLUMN C9 WILL TERMINATE AT FIRST FLOOR LEVEL.
9. COLUMN SHALL CONTINUE AS PROP WHERE NECESSARY.
10. ALL THE COLUMN TIES SHALL BE 10Ø UNLESS STATED OTHERWISE.
11. SAME TIE AND SPLICING DETAILS SHALL BE ADOPTED IN ALL COLUMNS.
12. Ld (57Ø)
   16Ø = 950 MM
   20Ø = 1150 MM
   25Ø = 1450 MM

COLUMN SCHEDULE & DETAILS

NOTES:
1. ALL SPLICES TO BE PROVIDED NEAR THE MIDDLE OF COLUMN.
2. NOT MORE THAN 50% OF COLUMN BARS SHALL BE SPLICED AT ONE SECTION.
3. SPLICING OF COLUMN BARS AT GROUND FLOOR IS NOT PERMITTED.
4. COLUMN DETAILS IS SAME UP TO ROOF LEVEL.
5. TIE SPACING OF 75 MM C/C SHALL BE PROVIDED THROUGHOUT FOR COLUMNS SUPPORTING STAIRCASE.
6. TIE SPACING OF 75 MM C/C SHALL BE PROVIDED UP TO GROUND FLOOR LEVEL IN ALL COLUMNS.
7. COLUMN C7 & C8 WILL TERMINATE A LOWER GROUND FLOOR LEVEL.
8. COLUMN C9 WILL TERMINATE AT FIRST FLOOR LEVEL.
9. COLUMN SHALL CONTINUE AS PROP WHERE NECESSARY.
10. ALL THE COLUMN TIES SHALL BE 10Ø UNLESS STATED OTHERWISE.
11. SAME TIE AND SPLICING DETAILS SHALL BE ADOPTED IN ALL COLUMNS.
12. Ld (57Ø)
   16Ø = 950 MM
   20Ø = 1150 MM
   25Ø = 1450 MM
Details of Kachen:

- 2-legged 8Ø@150c/c

Details in End Kachen:

- 3-12Ø
- 10@75c/c Throughout the Kachen Height (Refer Str/06)
- Zhu Shall be as per Architectural Drawings

Details in Middle Kachen:

- 3-12Ø
- 8Ø@75c/c Throughout Kachen Height

Note:
- All dimensions in millimeters.
- Do not measure from this drawing.
- Report any discrepancies to the designer.
COLUMN SPLICE DETAILS

<table>
<thead>
<tr>
<th>Rebar size</th>
<th>Development length, Ld</th>
<th>Anchorage length, Lc</th>
<th>Bend Radius, r</th>
<th>4Ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>10Ø</td>
<td>570</td>
<td>670</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>13Ø</td>
<td>700</td>
<td>850</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>16Ø</td>
<td>950</td>
<td>1100</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td>20Ø</td>
<td>1150</td>
<td>1350</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>25Ø</td>
<td>1450</td>
<td>1700</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

NOTES:
1. ALL SPLICES TO BE PROVIDED NEAR THE MIDDLE OF COLUMN.
2. NOT MORE THAN 50% OF COLUMN BARS SHALL BE SPICED AT ONE SECTION.
3. SPICING OF COLUMN BARS AT BASEMENT AND GROUND FLOOR IS NOT PERMITTED.
4. COLUMN DETAILS IS SAME UP TO ROOF LEVEL.
5. CLOSER SPACING OF TIES OF 75 MM C/C SHOULD BE PROVIDED THROUGHOUT THE COLUMN SUPPORTING STAIRCASE.
6. TIES SPACING OF 75 MM C/C SHOULD BE PROVIDED IN ALL COLUMNS UP TO GROUND FLOOR.
7. COLUMN SHOULD CONTINUE TILL TIE BEAM SUPPORTING TRUSSES AND BEAMS.
8. IN ORDER TO ACHIEVE PROPER ANCHORAGE OF BEAM BARS INTO EXTERIOR COLUMNS ALL EXTERIOR COLUMN SHALL BE CAST ONLY UP TO 3/4 OF THEIR HEIGHT BEFORE LAYOUT BEAM REINFORCEMENT IN UPPER FLOORS.

National Housing Development Corporation Ltd.
Design & Planning Services
PO Box 1439
Thimphu

NAME OF THE DRAWING:- G+5 RICBL COMMERCIAL BUILDING
AS RECIPIENT
SCALE:- NTS
DRAWING NO:- PGT-2405
DATE:- DEC, 2017

2035

NAME OF THE DESIGNER:- TASHI NAMGYAL
AS MENTIONED

G.M (D&PFS)
CEO (NHDC)

THRAM NO.

NOTE:-

V-SHAPED COVER (MIN.)

SPLICES WITH OFFSET CRANKED BARS IN COLUMN

TYPICAL COLUMN DETAIL

BEND RADIUS, 4Ø
1. Splicing of bottom beam bars shall be provided 2D away from the face of the column.

2. Splicing of top beam bars shall be at mid span (L/2).

3. Not more than 50% of beam bars shall be spliced at one section.

4. Stirrups spacing at splices shall be 8Ø @ 75C/C.

5. Splicing length shall not be less than development length, Ld.

** Typical Arrangement of Stirrups & Splices in Beams **

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**Notes:**

1. Splicing of bottom beam bars shall be provided 2D away from the face of the column.
2. Splicing of top beam bars shall be at mid span (L/2).
3. Not more than 50% of beam bars shall be spliced at one section.
4. Stirrups spacing at splices shall be 8Ø @ 75C/C.
5. Splicing length shall not be less than development length, Ld.
NOTES:

1. GROUND LEVEL REFERS TO THE LEVELLED GROUND AFTER HAVING REMOVED ALL THE TOP ORGANIC SOIL.
2. THE MINIMUM DEPTH OF FOUNDATION SHALL BE 2000MM FROM THE GROUND LEVEL.
3. BACK FILL SHALL BE FULLY COMPACTED BEFORE PLACING GROUND FLOOR CONCRETE.
4. PROPER ANCHORAGE OF BEAM BARS IN EXTERIOR COLUMN SHALL BE PROVIDED AS DETAILED IN DRAWING NO. STR/15.
5. IN ORDER TO ACHIEVE PROPER ANCHORAGE OF BEAM BARS INTO EXTERIOR COLUMNS, ALL EXTERIOR COLUMN SHALL BE CAST ONLY UP TO 3/4 OF THEIR HEIGHT BEFORE LAYING BEAM REINFORCEMENT IN UPPER FLOOR.

PLINTH BEAM LAYOUT PLAN

REFERENCE:

1. REFER DRG. NO. STR/02 FOR COLUMN LAYOUT PLAN.
2. REFER DRG. NO. STR/03 FOR FOOTING & WALL FOUNDATION DETAILS.
3. REFER DRG. NO. STR/06 FOR COLUMN DETAILS
4. REFER DRG. NO. STR/08 FOR COLUMN SPLICE DETAILS.
5. REFER DRG. NO. STR/09 FOR BEAM SPLICE DETAILS
6. REFER DRG. NO. STR/10 FOR BEAM- COLUMN JUNCTION DETAILS.
PLINTH BEAM DETAILS

Stirrups Details:
- S1 = 8Ø @100c/c
- S2 = 8Ø @150c/c

NOTES:
- LOWER THE BEAM IN GRID 3, 300MM LOWER THAN THE OTHER

REFERENCES:
- REFER DRG. NO. STR/11 FOR PLINTH BEAM LAYOUT PLAN.
- REFER DRG. NO. STR/10 FOR BEAM-COLUMN JUNCTION DETAILS.
- REFER DRG. NO. STR/09 FOR BEAM SPLICE DETAILS.
- REFER DRG. NO. STR/67 TO 70 FOR STAIRCASE DETAILS.
PLINTH BEAM DETAILS

NOTES
1. LOWER THE BEAM IN GRID 3, 300MM LOWER THAN THE OTHER

REFERENCES:
1. REFER DRG. NO. STR/11 FOR PLINTH BEAM LAYOUT PLAN.
2. REFER DRG. NO. STR/10 FOR BEAM-COLUMN JUNCTION DETAILS.
3. REFER DRG. NO. STR/09 FOR BEAM SPLICE DETAILS.
4. REFER DRG. NO. STR/67 TO 70 FOR STAIRCASE DETAILS.
NOTES:

1. GROUND LEVEL REFERS TO THE LEVELLED GROUND AFTER HAVING REMOVED ALL THE TOP ORGANIC SOIL.
2. THE MINIMUM DEPTH OF FOUNDATION SHALL BE 2000MM FROM THE GROUND LEVEL.
3. BACK FILL SHALL BE FULLY COMPACTED BEFORE PLACING GROUND FLOOR CONCRETE.
4. PROPER ANCHORAGE OF BEAM BARS IN EXTERIOR COLUMN SHALL BE PROVIDED AS DETAILED IN DRAWING NO. STR/15.
5. IN ORDER TO ACHIEVE PROPER ANCHORAGE OF BEAM BARS INTO EXTERIOR COLUMNS, ALL EXTERIOR COLUMN SHALL BE CAST ONLY UP TO 3/4 OF THEIR HEIGHT BEFORE LAYING BEAM REINFORCEMENT IN UPPER FLOOR.

REFERENCE:

1. REFER DRG. NO. STR02 FOR COLUMN LAYOUT PLAN.
2. REFER DRG. NO. STR03 FOR FOOTING & WALL FOUNDATION DETAILS.
3. REFER DRG. NO. STR06 FOR COLUMN DETAILS
4. REFER DRG. NO. STR08 FOR COLUMN SPLICE DETAILS.
5. REFER DRG. NO. STR09 FOR BEAM SPLICE DETAILS
6. REFER DRG. NO. STR10 FOR BEAM- COLUMN JUNCTION DETAILS.
FIRST FLOOR BEAM DETAILS

Stirrups Details
S1 = 8Ø @100c/c
S2 = 8Ø @150c/c
FIRST FLOOR BEAM DETAILS

L-SECTION OF FIRST FLOOR BEAM ALONG GRID A (300 X 550)

L-SECTION OF FIRST FLOOR BEAM ALONG GRID B (300 X 550)

L-SECTION OF FIRST FLOOR BEAM ALONG GRID C (300 X 550)

L-SECTION OF FIRST FLOOR BEAM ALONG GRID D (300 X 550)

L-SECTION OF FIRST FLOOR BEAM ALONG GRID E (300 X 550)

L-SECTION OF FIRST FLOOR BEAM ALONG GRID F (300 X 550)

L-SECTION OF FIRST FLOOR BEAM ALONG GRID G (300 X 550)
NOTES:

1. GROUND LEVEL REFERS TO THE LEVELLED GROUND AFTER HAVING REMOVED ALL THE TOP ORGANIC SOIL.
2. THE MINIMUM DEPTH OF FOUNDATION SHALL BE 2000MM FROM THE GROUND LEVEL.
3. BACK FILL SHALL BE FULLY COMPACTED BEFORE PLACING GROUND FLOOR CONCRETE.
4. PROPER ANCHORAGE OF BEAM BARS IN EXTERIOR COLUMN SHALL BE PROVIDED AS DETAILED IN DRAWING NO. STR/15.
5. IN ORDER TO ACHIEVE PROPER ANCHORAGE OF BEAM BARS INTO EXTERIOR COLUMNS, ALL EXTERIOR COLUMN SHALL BE CAST ONLY UP TO 3/4 OF THEIR HEIGHT BEFORE LAYING BEAM REINFORCEMENT IN UPPER FLOOR.

SECOND FLOOR BEAM LAYOUT PLAN

REFERENCE:

1. REFER DRG. NO. STR/02 FOR COLUMN LAYOUT PLAN.
2. REFER DRG. NO. STR/03 FOR FOOTING & WALL FOUNDATION DETAILS.
3. REFER DRG. NO. STR/06 FOR COLUMN DETAILS
4. REFER DRG. NO. STR/08 FOR COLUMN SPLICE DETAILS.
5. REFER DRG. NO. STR/09 FOR BEAM SPLICE DETAILS
6. REFER DRG. NO. STR/10 FOR BEAM- COLUMN JUNCTION DETAILS.
SECONDFLOOR BEAM DETAILS

Stirrups Details
S1 ~ 8Ø @100c/c
S2 ~ 8Ø @150c/c
SECOND FLOOR BEAM DETAILS

L-SECTION OF FIRST FLOOR BEAM ALONG GRID A (300 X 550)
L-SECTION OF FIRST FLOOR BEAM ALONG GRID B (300 X 550)
L-SECTION OF FIRST FLOOR BEAM ALONG GRID C (300 X 550)
L-SECTION OF FIRST FLOOR BEAM ALONG GRID D (300 X 550)
L-SECTION OF FIRST FLOOR BEAM ALONG GRID E (300 X 550)
L-SECTION OF FIRST FLOOR BEAM ALONG GRID F (300 X 550)
L-SECTION OF FIRST FLOOR BEAM ALONG GRID G (300 X 550)
NOTES:

1. GROUND LEVEL REFERS TO THE LEVELLED GROUND AFTER HAVING REMOVED ALL THE TOP ORGANIC SOIL.
2. THE MINIMUM DEPTH OF FOUNDATION SHALL BE 2000MM FROM THE GROUND LEVEL.
3. BACK FILL SHALL BE FULLY COMPACTED BEFORE PLACING GROUND FLOOR CONCRETE.
4. PROPER ANCHORAGE OF BEAM BARS IN EXTERIOR COLUMN SHALL BE PROVIDED AS DETAILED IN DRAWING NO. STR/15.
5. IN ORDER TO ACHIEVE PROPER ANCHORAGE OF BEAM BARS INTO EXTERIOR COLUMNS, ALL EXTERIOR COLUMN SHALL BE CAST ONLY UP TO 3/4 OF THEIR HEIGHT BEFORE LAYING BEAM REINFORCEMENT IN UPPER FLOOR.

REFERENCE:
1. REFER DRG. NO. STR/02 FOR COLUMN LAYOUT PLAN.
2. REFER DRG. NO. STR/03 FOR FOOTING & WALL FOUNDATION DETAILS.
3. REFER DRG. NO. STR/06 FOR COLUMN DETAILS.
4. REFER DRG. NO. STR/08 FOR COLUMN SPLICE DETAILS.
5. REFER DRG. NO. STR/09 FOR BEAM SPLICE DETAILS.
6. REFER DRG. NO. STR/10 FOR BEAM-COLUMN JUNCTION DETAILS.
STIRRUPS DETAILS

S1 = 8Ø @100c/c
S2 = 8Ø @150c/c

THIRD FLOOR BEAM DETAILS

G+5 RICBL COMMERCIAL BUILDING, OKILANE, PHUENSTHOLING
NAME OF THE DRAWING: AS MENTIONED
SCALE: NTS
DATE: DEC, 2017
DRAWING NO: STR21

CLIENT: RICBL
DESIGNED & DRAWN BY: TASHI NAMGYAL

G.M (D&P)
CEO (NHDCL)

NOTE: DO NOT MEASURE FROM THIS DRAWING
REPORT ANY DISCREPANCIES TO THE DESIGNER

ALL DIMENSIONS IN MILLIMETERS.
THIRDFLOOR BEAM DETAILS
NOTES:

1. GROUND LEVEL Refers to the levelled ground after having removed all the top organic soil.
2. The minimum depth of foundation shall be 2000mm from the ground level.
3. Back fill shall be fully compacted before placing ground floor concrete.
4. Proper anchorage of beam bars in exterior column shall be provided as detailed in Drawing No. STR/15.
5. In order to achieve proper anchorage of beam bars into exterior columns, all exterior column shall be cast only up to 3/4 of their height before laying beam reinforcement in upper floor.

FOURTHFLOOR BEAM LAYOUT PLAN

REFERENCE:
1. REFER DRG. NO. STR/02 FOR COLUMN LAYOUT PLAN.
2. REFER DRG. NO. STR/03 FOR FOOTING & WALL FOUNDATION DETAILS.
3. REFER DRG. NO. STR/06 FOR COLUMN DETAILS.
4. REFER DRG. NO. STR/08 FOR COLUMN SPLICE DETAILS.
5. REFER DRG. NO. STR/09 FOR BEAM SPLICE DETAILS.
6. REFER DRG. NO. STR/10 FOR BEAM-COLUMN JUNCTION DETAILS.
Stirrups Details
S1 = 8Ø @100c/c
S2 = 8Ø @150c/c
FOURTHFLOOR BEAM DETAILS

L-SECTION OF FOURTHFLOOR BEAM ALONG GRID A (300 X 500)

L-SECTION OF FOURTHFLOOR BEAM ALONG GRID B (300 X 500)

L-SECTION OF FOURTHFLOOR BEAM ALONG GRID C (300 X 500)

L-SECTION OF FOURTHFLOOR BEAM ALONG GRID D (300 X 500)

L-SECTION OF FOURTHFLOOR BEAM ALONG GRID E (300 X 500)

L-SECTION OF FOURTHFLOOR BEAM ALONG GRID F (300 X 500)

L-SECTION OF FOURTHFLOOR BEAM ALONG GRID G (300 X 500)
NOTES:

1. GROUND LEVEL REFERS TO THE LEVELLED GROUND AFTER HAVING REMOVED ALL THE TOP ORGANIC SOIL.
2. THE MINIMUM DEPTH OF FOUNDATION SHALL BE 2000MM FROM THE GROUND LEVEL.
3. BACK FILL SHALL BE FULLY COMPACTED BEFORE PLACING GROUND FLOOR CONCRETE.
4. PROPER ANCHORAGE OF BEAM BARS IN EXTERIOR COLUMN SHALL BE PROVIDED AS DETAILED IN DRAWING NO. STR/15.
5. IN ORDER TO ACHIEVE PROPER ANCHORAGE OF BEAM BARS INTO EXTERIOR COLUMNS, ALL EXTERIOR COLUMN SHALL BE CAST ONLY UP TO 3/4 OF THEIR HEIGHT BEFORE LAYING BEAM REINFORCEMENT IN UPPER FLOOR.

REFERENCE:
1. REFER DRG. NO. STR/02 FOR COLUMN LAYOUT PLAN.
2. REFER DRG. NO. STR/03 FOR FOOTING & WALL FOUNDATION DETAILS.
3. REFER DRG. NO. STR/06 FOR COLUMN DETAILS
4. REFER DRG. NO. STR/08 FOR COLUMN SPLICE DETAILS.
5. REFER DRG. NO. STR/09 FOR BEAM SPLICE DETAILS
6. REFER DRG. NO. STR/10 FOR BEAM- COLUMN JUNCTION DETAILS.

FIFTHFLOOR BEAM LAYOUT PLAN
L-SECTION OF FIFTHFLOOR BEAM ALONG GRID 1 (300 X 450)

L-SECTION OF FIFTHFLOOR BEAM ALONG GRID 2 (300 X 450)

L-SECTION OF FIFTHFLOOR BEAM ALONG GRID 3 (300 X 450)

Stirrups Details
S1 = 8Ø @100c/c
S2 = 8Ø @150c/c

FIFTHFLOOR BEAM DETAILS
FIFTHFLOOR BEAM DETAILS

L-SECTION OF FIFTHFLOOR BEAM ALONG GRID A (300 X 450)

L-SECTION OF FIFTHFLOOR BEAM ALONG GRID B (300 X 450)

L-SECTION OF FIFTHFLOOR BEAM ALONG GRID C (300 X 450)

L-SECTION OF FIFTHFLOOR BEAM ALONG GRID D (300 X 450)

L-SECTION OF FIFTHFLOOR BEAM ALONG GRID E (300 X 450)

L-SECTION OF FIFTHFLOOR BEAM ALONG GRID F (300 X 450)

L-SECTION OF FIFTHFLOOR BEAM ALONG GRID G (300 X 450)

SECTION 3-3

SECTION 4-4

G+5 RICBL COMMERCIAL BUILDING, DEKILANE, PHUENSTHOLING

NAME OF THE DRAWING: AS MENTIONED
SCALE: NTS
DATE: DEC, 2017

THRAM NO. 2035
NOTE: ALL DIMENSIONS IN MILLIMETERS.
DO NOT MEASURE FROM THIS DRAWING.
REPORT ANY DISCREPANCIES TO THE DESIGNER.

CLINT: RICBL

DESIGNED & DRAWN BY: TASHI NAMGYAL

G.M (D&PS)
CEO (NHDCL)

National Housing Development Corporation Ltd.
Design & Planning Services
PO Box 1439
Thimphu

PO BOX 1439

PLOT NO. PGT-2405

THRAM NO. 2035

G.M (D&PS)
CEO (NHDCL)

National Housing Development Corporation Ltd.
Design & Planning Services
PO Box 1439
Thimphu
1. GROUND LEVEL REFERS TO THE LEVELLED GROUND AFTER HAVING REMOVED ALL THE TOP ORGANIC SOIL.
2. THE MINIMUM DEPTH OF FOUNDATION SHALL BE 2000MM FROM THE GROUND LEVEL.
3. BACK FILL SHALL BE FULLY COMPACTED BEFORE PLACING GROUND FLOOR CONCRETE.
4. PROPER ANCHORAGE OF BEAM BARS IN EXTERIOR COLUMN SHALL BE PROVIDED AS DETAILED IN DRAWING NO. STR/15.
5. IN ORDER TO ACHIEVE PROPER ANCHORAGE OF BEAM BARS INTO EXTERIOR COLUMNS, ALL EXTERIOR COLUMN SHALL BE CAST ONLY UP TO ¾ OF THEIR HEIGHT BEFORE LAYING BEAM REINFORCEMENT IN UPPER FLOOR.

ROOF BEAM LAYOUT PLAN

REFERENCE:
1. REFER DRG. NO. STR/02 FOR COLUMN LAYOUT PLAN.
2. REFER DRG. NO. STR/03 FOR FOOTING & WALL FOUNDATION DETAILS.
3. REFER DRG. NO. STR/06 FOR COLUMN DETAILS
4. REFER DRG. NO. STR/08 FOR COLUMN SPLICE DETAILS.
5. REFER DRG. NO. STR/09 FOR BEAM SPLICE DETAILS
6. REFER DRG. NO. STR/10 FOR BEAM-COLUMN JUNCTION DETAILS.
L-SECTION OF ROOFFLOOR BEAM ALONG GRID 1 (300 X 400)

L-SECTION OF ROOFFLOOR BEAM ALONG GRID 2 (300 X 400)

L-SECTION OF ROOFFLOOR BEAM ALONG GRID 3 (300 X 400)

ROOF BEAM DETAILS

Stirrups Details
S1 = 8Ø @100c/c
S2 = 8Ø @150c/c
ROOF BEAM DETAILS

L-SECTION OF ROOFFLOOR BEAM ALONG GRID A (300 X 400)

L-SECTION OF ROOFFLOOR BEAM ALONG GRID B (300 X 400)

L-SECTION OF ROOFFLOOR BEAM ALONG GRID C (300 X 400)

L-SECTION OF ROOFFLOOR BEAM ALONG GRID D (300 X 400)

L-SECTION OF ROOFFLOOR BEAM ALONG GRID E (300 X 400)

L-SECTION OF ROOFFLOOR BEAM ALONG GRID F (300 X 400)

L-SECTION OF ROOFFLOOR BEAM ALONG GRID G (300 X 400)
NOTES:

1. GROUND LEVEL REFERS TO THE LEVELLED GROUND AFTER HAVING REMOVED ALL THE TOP ORGANIC SOIL.
2. THE MINIMUM DEPTH OF FOUNDATION SHALL BE 2000MM FROM THE GROUND LEVEL.
3. BACK FILL SHALL BE FULLY COMPACTED BEFORE PLACING GROUND FLOOR CONCRETE.
4. PROPER ANCHORAGE OF BEAM BARS IN EXTERIOR COLUMN SHALL BE PROVIDED AS DETAILED IN DRAWING NO. STR/15.
5. IN ORDER TO ACHIEVE PROPER ANCHORAGE OF BEAM BARS INTO EXTERIOR COLUMNS, ALL EXTERIOR COLUMN SHALL BE CAST ONLY UP TO 3/4 OF THEIR HEIGHT BEFORE LAYING BEAM REINFORCEMENT IN UPPER FLOOR.

REFERENCE:

1. REFER DRG. NO. STR/02 FOR COLUMN LAYOUT PLAN.
2. REFER DRG. NO. STR/03 FOR FOOTING & WALL FOUNDATION DETAILS.
3. REFER DRG. NO. STR/06 FOR COLUMN DETAILS
4. REFER DRG. NO. STR/08 FOR COLUMN SPLICE DETAILS.
5. REFER DRG. NO. STR/09 FOR BEAM SPLICE DETAILS.
6. REFER DRG. NO. STR/10 FOR BEAM-COLUMN JUNCTION DETAILS.

JAMTHOG BEAM LAYOUT PLAN
L-SECTION OF ROOFFLOOR BEAM ALONG GRID 1 (250X350)

Stirrups Details
S1 = 8Ø @100c/c
S2 = 8Ø @150c/c

JAMTHOG BEAM DETAILS
NOTES:

1. LINTEL BAND SHALL BE PROVIDED FOR THE FULL LENGTH OF WALLS.

2. LAP LENGTH OF LINTEL BAND REINFORCEMENT SHALL NOT BE LESS THAN 47XØ OF BAR.

3. LINTEL BAND SHALL EXTEND FROM COLUMN TO COLUMN ENCLOSING PROJECTED WALLS

4. LINTEL BAND REINFORCEMENT SHALL BE PROPERLY ANCHORED TO COLUMNS.

LINTEL BAND DETAILS
TYPICAL LAYOUT OF VERTICAL REINFORCEMENT THROUGH PROJECTED WALLS

1. VERTICAL REINFORCEMENT SHALL BE PROVIDED WITHIN WALLS WHERE WALL ARE PROJECTED OUTWARD FROM THE MAIN BUILDING LINE.
2. VERTICAL REINFORCEMENT SHALL EXTEND FROM SECOND FLOOR SLAB/BEAM TO ROOF SLAB/BEAM.
3. VERTICAL REINFORCEMENT SHALL BE PROPERLY ANCHORED TO FLOOR SLAB/BEAM AND EMBEDMENT LENGTH SHALL BE NOT LESS THAN 47Ø OF BAR.
4. LINTEL BAND SHALL CONTINUE THROUGHOUT THE LENGTH OF WALL.

VERTICAL REINFORCEMENT FOR PROJECTED WALL AND LINTAL ANCHORAGE
CORNICE DETAILS

FIFTH FLOOR LEVEL CORNICE

ROOF LEVEL CORNICE

FOURTH FLOOR LEVEL CORNICE

FIRST FLOOR LEVEL CORNICE

- All dimensions in millimeters.
- Do not measure from this drawing.
- Report any discrepancies to the designer.

SCALE: NTS
DATE: DEC, 2017
PLOT NO.: PGT-2405
NAME OF THE DRAWING: AS MENTIONED
THRAM NO.: 2035
NOTE: 

G.M (D&PS)
CEO (NHDCL)

G+5 RICBL COMMERCIAL BUILDING, DEKILANE, PHUENSTHOLING

DESIGNED & DRAWN BY: TASHI NAMGYAL

CLIENT: RICBL

National Housing Development Corporation Ltd.
Design & Planning Services
PO Box 1439
Thimphu

PGT-2405
2035

NTS
DEC, 2017

G+5 RICBL COMMERCIAL BUILDING, DEKILANE, PHUENSTHOLING

NAME OF THE DRAWING: AS MENTIONED
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NOTE: 

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NAME OF THE DRAWING: AS MENTIONED
THRAM NO.: 2035
NOTE: 

G.M (D&PS)
CEO (NHDCL)
5525
5125
600
3250
5525
5525
3750
3750
7500
25600

NOTES:
1. FLOOR SLAB THICKNESS IS 160 MM
2. ROOF SLAB THICKNESS IS 150 MM
3. ADOPT SAME SECTION DETAILS FOR ALL SLABS
4. ADOPT DIFFERENT DETAILS FOR ROOF SLAB.

FIRST/SECOND & THIRD FLOOR SLAB LAYOUT PLAN

REFERENCE:
1. REFER DRG. NO. STR/38 FOR GROUND FLOOR SLAB BOTTOM REINFORCEMENT PLAN
2. REFER DRG. NO. STR/39 FOR LOWER GROUND FLOOR SLAB TOP REINFORCEMENT PLAN
3. REFER DRG. NO. STR/40 FOR SLAB SECTION DETAILS
4. REFER DRG. NO. STR/06 FOR CORNICE DETAILS
FIRST/SECOND & THIRD FLOOR SLAB BOTTOM REINFORCEMENT

10Ø@150 C/C
10Ø@150 C/C
SLAB SECTION DETAILS

NOTES:
1. FLOOR SLAB THICKNESS IS 180 MM
2. ROOF SLAB THICKNESS IS 150 MM
3. ADOPT SAME SECTION DETAILS FOR ALL SLABS
4. ADOPT DIFFERENT DETAILS FOR ROOF SLAB.
NOTES:

1. FLOOR SLAB THICKNESS IS 160 MM
2. ROOF SLAB THICKNESS IS 150 MM
3. ADOPT SAME SECTION DETAILS FOR ALL SLABS
4. ADOPT DIFFERENT DETAILS FOR ROOF SLAB.

REFERENCE:

1. REFER DRG. NO. STR/38 FOR GROUND FLOOR SLAB BOTTOM REINFORCEMENT PLAN.
2. REFER DRG. NO. STR/39 FOR LOWER GROUND FLOOR SLAB TOP REINFORCEMENT PLAN.
3. REFER DRG. NO. STR/40 FOR SLAB SECTION DETAILS.
4. REFER DRG. NO. STR/36 FOR CORNICE DETAILS.

FOURTH FLOOR SLAB LAYOUT PLAN
G+5 RICBL COMMERCIAL BUILDING, OEKILANE, PHUENSTHOLING

NAME OF THE DRAWING: AS MENTIONED
SCALE: NTS
DATE: DEC, 2017

THRAM NO. 2035
PLOT NO. PGT-2405

NOTE:-
- ALL DIMENSIONS IN MILLIMETERS.
- DO NOT MEASURE FROM THIS DRAWING.
- REPORT ANY DISCREPANCIES TO THE DESIGNER.

DESIGNED & DRAWN BY:
TASHI NAMGYAL

CLIENT:
RICBL

NOTE:-
- REVISION DATE:
- CONTENT:
- G.M (D&PS)
- CEO (NHDC)

G+5 RICBL COMMERCIAL BUILDING, OEKILANE, PHUENSTHOLING

NAME OF THE DRAWING: AS MENTIONED
SCALE: NTS
DATE: DEC, 2017

THRAM NO. 2035
PLOT NO. PGT-2405

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DESIGNED & DRAWN BY:
TASHI NAMGYAL

CLIENT:
RICBL

NOTE:-
- REVISION DATE:
- CONTENT:
- G.M (D&PS)
- CEO (NHDC)

G+5 RICBL COMMERCIAL BUILDING, OEKILANE, PHUENSTHOLING

NAME OF THE DRAWING: AS MENTIONED
SCALE: NTS
DATE: DEC, 2017

THRAM NO. 2035
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DESIGNED & DRAWN BY:
TASHI NAMGYAL

CLIENT:
RICBL

NOTE:-
- REVISION DATE:
- CONTENT:
- G.M (D&PS)
- CEO (NHDC)
FOURTH FLOOR SLAB TOP REINFORCEMENT

G+5 RICBL COMMERCIAL BUILDING, DEKLANE, PHUENSTHOLING

NAME OF THE DRAWING:- AS MENTIONED

SCALE:- NTS

DATE:- DEC, 2017

DRAWING NO:

THRAM NO:

2035

NOTE:-

- ALL DIMENSIONS IN MILLIMETERS

- DO NOT MEASURE FROM THIS DRAWING

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G.M (D&PS)

CEO (NHDC)

DESIGNED & DRAWN BY:

TASHI NAMGYAL

CLIENT:

RICBL

NTS

PO Box 1439

Thimphu

National Housing Development Corporation Ltd.

Design & Planning Services

PO Box 1439

Thimphu

PLOT NO.

PGT-2405

2035

REVISION DATE:

CONTENT:-

2035

- G+5 RICBL COMMERCIAL BUILDING, DEKLANE, PHUENSTHOLING

- FOURTH FLOOR SLAB TOP REINFORCEMENT

- ALL DIMENSIONS IN MILLIMETERS

- DO NOT MEASURE FROM THIS DRAWING

- REPORT ANY DISCREPANCIES TO THE DESIGNER

- RICBL
NOTES:
1. FLOOR SLAB THICKNESS IS 160 MM
2. ROOF SLAB THICKNESS IS 150 MM
3. ADOPT SAME SECTION DETAILS FOR ALL SLABS
4. ADOPT DIFFERENT DETAILS FOR ROOF SLAB.

SLAB SECTION DETAILS
NOTES:
1. FLOOR SLAB THICKNESS IS 160 MM
2. ROOF SLAB THICKNESS IS 150 MM
3. ADOPT SAME SECTION DETAILS FOR ALL SLABS
4. ADOPT DIFFERENT DETAILS FOR ROOF SLAB.

REFERENCE:
1. REFER DRG. NO. STR/38 FOR GROUND FLOOR SLAB BOTTOM REINFORCEMENT PLAN.
2. REFER DRG. NO. STR/39 FOR LOWER GROUND FLOOR SLAB TOP REINFORCEMENT PLAN.
3. REFER DRG. NO. STR/40 FOR SLAB SECTION DETAILS.
4. REFER DRG. NO. STR/36 FOR CORNICE DETAILS.
FIFTH/ROOF FLOOR SLAB BOTTOM REINFORCEMENT
FIFTH/ROOF FLOOR SLAB TOP REINFORCEMENT
SLAB SECTION DETAILS

NOTES:

1. FLOOR SLAB THICKNESS IS 160 MM
2. ROOF SLAB THICKNESS IS 150 MM
3. ADOPT SAME SECTION DETAILS FOR ALL SLABS
4. ADOPT DIFFERENT DETAILS FOR ROOF SLAB.
5. ALL THE SLAB TOP REINFORCEMENT IN THE PROJECTED AREAS SHALL BE OF 12Ø
REINFORCEMENT AT OPENINGS

SECTION A-A

TYPICAL DETAIL FOR OPENING IN THE MIDDLE OF SLAB

TYPICAL DETAIL FOR OPENING NEAR BEAM

BARS TO BE FULLY ANCHORED TO BEAM

OPENING DETAILS

REINFORCEMENT AT OPENINGS

TYPICAL DETAIL FOR OPENING IN THE MIDDLE OF SLAB

TYPICAL DETAIL FOR OPENING NEAR BEAM

BARS TO BE FULLY ANCHORED TO BEAM

OPENING DETAILS

REINFORCEMENT AT OPENINGS
STAIRCASE LAYOUT PLAN

SECTION 1-1

SECTION 2-2

L-SECTION OF LANDING BEAM
SECTION B-B

RISER = 175
TREAD = 300
WAIST SLAB THICKNESS = 160
NUMBER OF STEPS = 20

SECTION A-A

STAIRCASE SECTION
PURLIN LAYOUT PLAN

NAME OF THE DRAWING: G+5 RICBL COMMERCIAL BUILDING, DEKLANE, PHUENSTHOLING

SCALE: AS MENTIONED

DATE: DEC, 2017

G.M (D&PS) CEO (NHDCL)

NOTE:

- ALL DIMENSIONS IN MILLIMETERS.
- DO NOT MEASURE FROM THIS DRAWING.
- REPORT ANY DISCREPANCIES TO THE DESIGNER.

REVISION DATE: CONTENT:

DRAWING NO: 2035

CLIENT: RICBL

DESIGNED & DRAWN BY: TASHI NAMGYAL

NTS PLOT NO. PGT-2405

GEO (NHDCL)

National Housing Development Corporation Ltd. Design & Planning Services
PO Box 1439 Thimphu
JAMTHOG ROOF TRUSS LAYOUT PLAN

G+5 RICBL COMMERCIAL BUILDING, DEKILANE, PHUENSTHOLING

NAME OF THE DRAWING: AS MENTIONED
SCALE: NTS
DATE: DEC, 2017

DESIGNED & DRAWN BY: TASHI NAMGYAL

NOTE:-
ALL DIMENSIONS IN MILLIMETERS.
DO NOT MEASURE FROM THIS DRAWING.
REPORT ANY DISCREPANCIES TO THE DESIGNER.

G.M (D&PS) NAME OF THE DRAWING NO:
CEO (NHDCCL)

DRAWING NO:
CLIENT:

THRAM NO:
REVISION
DATE:
CONTENT:

2035

PGT-2405
RICBL
TRUSS ELEVATION
## TRUSS MEMBER SCHEDULE (MAIN TRUSS)

<table>
<thead>
<tr>
<th>MEMBER</th>
<th>STEEL TUBES SIZE</th>
<th>SECTION THICKNESS, (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOP &amp; BOTTOM CHORD</td>
<td>60.3 ODM, 5.03 Kg/m</td>
<td>3.60</td>
</tr>
<tr>
<td>STRUT (INCLINED)</td>
<td>48.3 ODM, 3.56 Kg/m</td>
<td>3.20</td>
</tr>
<tr>
<td>STRUT (VERTICAL)</td>
<td>48.3 ODM, 3.56 Kg/m</td>
<td>3.20</td>
</tr>
<tr>
<td>PURLIN</td>
<td>88.90 ODM, 8.430 Kg/m</td>
<td>4.00</td>
</tr>
</tbody>
</table>

OD- Outer Diameter, M- medium

**NOTES:**
1. ALL WELDING SHOULD BE FILLET WELD OF MINIMUM 4 MM THICK
2. SIZE OF COMPLETE PENETRATION BUTT WELD GREATER THAN EQUAL TO MEMBER THICKNESS
3. STEEL GRADE ST35 (Yst 22 GRADE)
### TRUSS MEMBER SCHEDULE (JAMTHO TRUSS)

<table>
<thead>
<tr>
<th>MEMBER</th>
<th>STEEL TUBES SIZE</th>
<th>SECTION THICKNESS, (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOP &amp; BOTTOM CHORD</td>
<td>60.3 ODM, 5.070 Kg/m</td>
<td>3.60</td>
</tr>
<tr>
<td>STRUT (INCLINED)</td>
<td>48.30 ODM, 3.590 Kg/m</td>
<td>3.20</td>
</tr>
<tr>
<td>STRUT (VERTICAL)</td>
<td>48.30 ODM, 3.590 Kg/m</td>
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<td>3.60</td>
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</tbody>
</table>

OD- Outer Diameter, M- medium

### NOTES:

1. ALL WELDING SHOULD BE FILLET WELD OF MINIMUM 6 MM THICK
2. SIZE OF COMPLETE PENETRATION BUTT WELD GREATER THAN EQUAL TO MEMBER THICKNESS
3. STEEL GRADE ST35 (Yst 22 GRADE)
TRUSS CONNECTION DETAILS

**DETAIL A**
- 4 MM WELD Rafter - Rafter
- Vertical strut - Inclined strut

**DETAIL B**
- 120 x 80 x 5 mm Purlin cleat
- Principal rafter
- Vertical strut

**DETAIL C**
- Bottom tie
- Struts
- Washers 4 mm thick

**DETAIL D**
- 120 x 80 x 5 mm Purlin cleat
- Principal rafter
- Bottom tie

**DETAIL E**
- MS Flat 8 mm size = 150x150 mm
- 20 mm nuts, 250 mm long and bolts (4 Nos)
- RCC Prop
- Washer 3 mm thick

**DETAIL F**
- MS Flat 8 mm size = 150x150 mm
- 20 mm nuts, 250 mm long and bolts (4 Nos)
- RCC Prop
- MS Flat 25 x 25 x 4 mm welded to bottom chord

**TOP VIEW OF JOINT B & C & ANCHORAGE JOINTS**
- 4 nos. 20 mm nut and bolts

**INSTALLATION NOTES**
- All dimensions in millimeters.
- Do not measure from this drawing.
- Report any discrepancies to the designer.
1. SAME TRUSS CONNECTION DETAILS SHALL BE ADOPTED IN ALL CONNECTIONS.
1. FOR A FLEXIBLE SUPPORT, HOLDING DOWN BOLTS TO BE TIGHT 75 %
2. OVAL SHAPED SOLE PLATE HOLE FOR FLEXIBLE SUPPORT
3. SAME SUPPORT DETAILS TO PROVIDED AS SHOWN IN ROOF TRUSS LAYOUT PLAN.

NOTE:
H= HEIGHT OF PROP (REFER ARCHITECTURAL DRAWING FOR PROP HEIGHT)