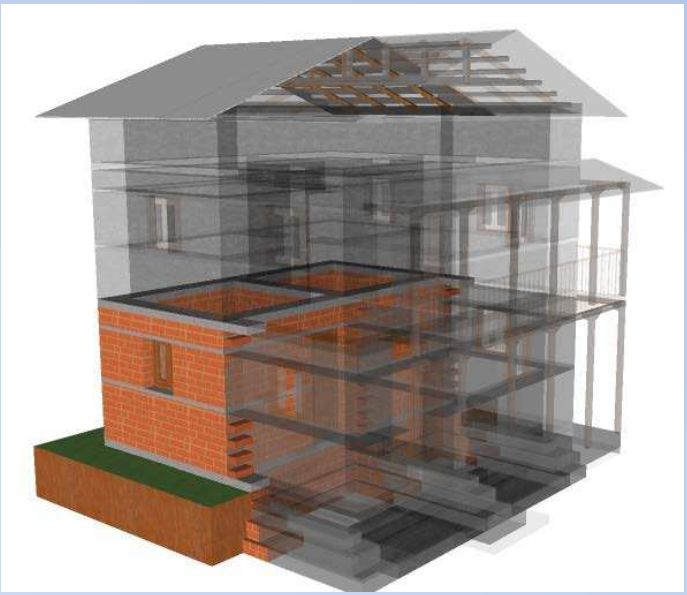
Nepal Housing Reconstruction Programme

TECHNICAL DETAIL Progressive Expansion Provision For Brick Masonry in Cement Mortar



MercyCorps
Be the change

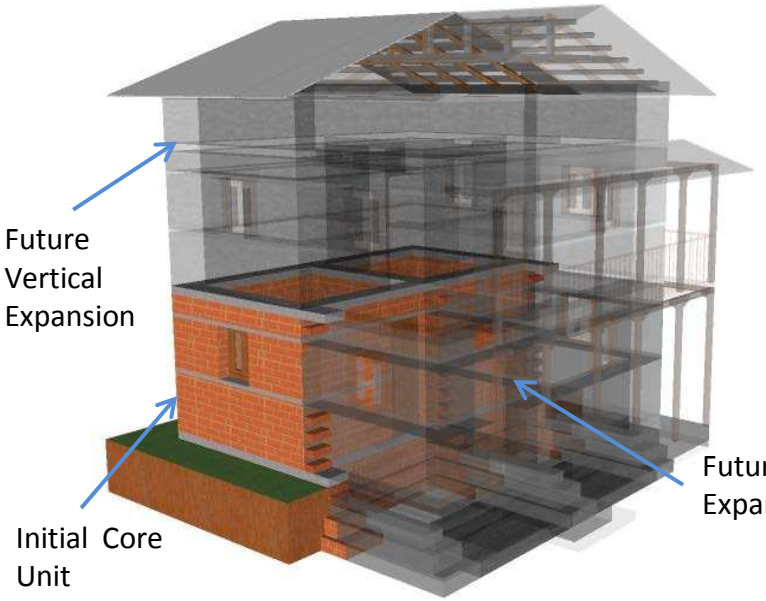
Submitted By

BUILD CHANGE

November 30, 2015

Considerations for Progressive Expansion of Buildings

General Provisions



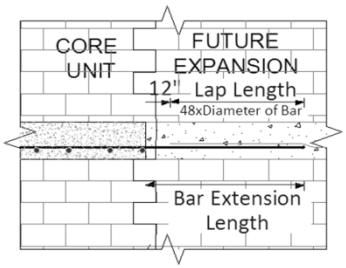
Plan ahead: Prepare a master plan of the building and site layout considering future requirements.

Select a smaller core unit for construction now and plan for progressive expansion.

Opt for horizontal expansion first then vertical expansion. This will minimize the risk of differential settlements of the old and new construction parts of the building.

Ensure that adequate length of rebar are extended as part of the initial construction so that it is sufficient for lapping with new rebar during expansion. The length of rebar to be extended for different rebar sizes, including lap length and additional 12 inches, is given in the table below:

Rebar Diameter (mm)	Bars Extension (mm)	Bars Extension (inches)
4.75	550	22
8	675	27
10	750	30
12	875	35
16	1050	42
20	1250	50

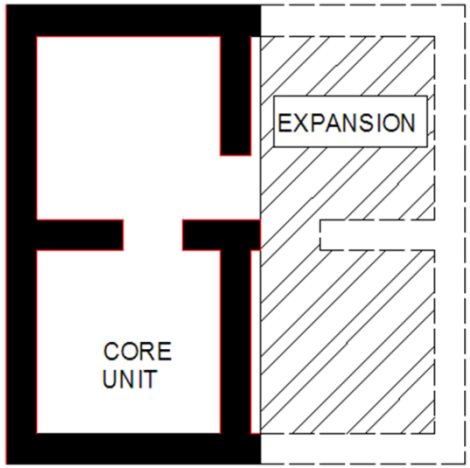


CONNECTION DETAIL FOR CORE UNIT AND FUTURE EXPANSION UNIT

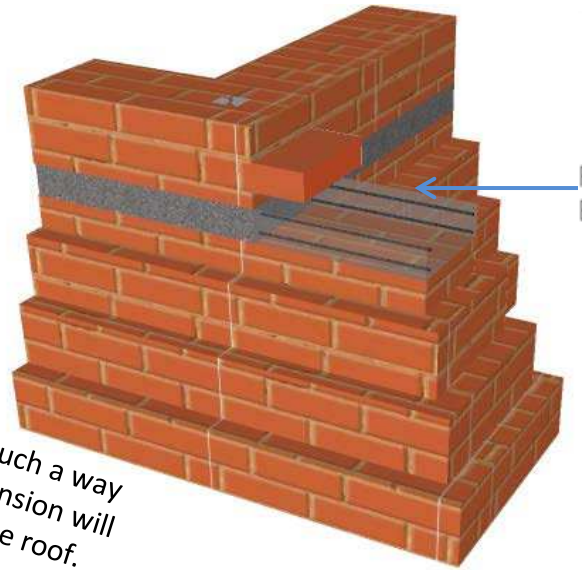
Use lean concrete to protect rebar extended for future expansion. Concrete mix proportion of 1:3:6 cement, sand, coarse aggregate ratio can be used for lean concrete.

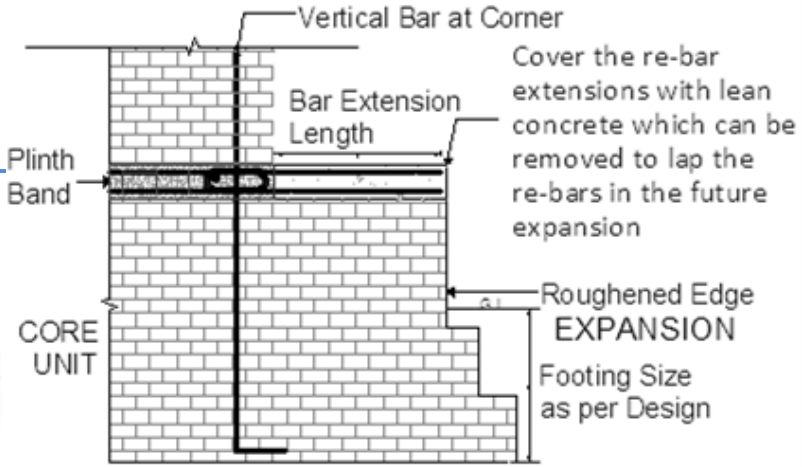
Considerations for Progressive Expansion of Buildings

Horizontal Expansion



Extend plinth band rebar for the bar extension length, noted in the table on previous page, beyond the walls and including the strip footing underneath it. Extend the footing beyond the extended plinth band by providing stepping for proper connection for future wall footing

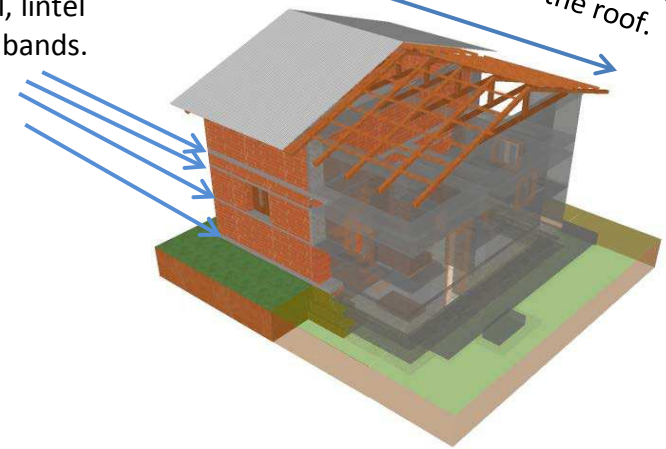


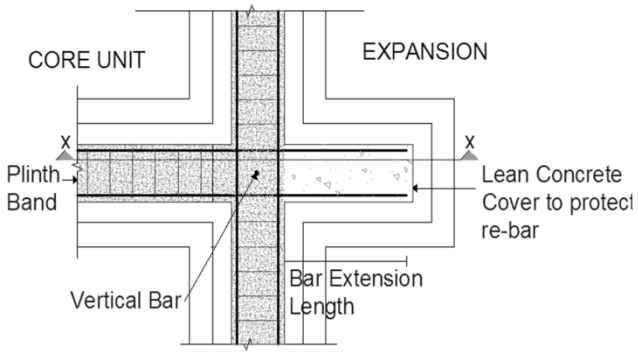


SECTION X-X SHOWING JOINT FOR HORIZONTAL EXPANSION FOR PLINTH LEVEL AND FOOTING

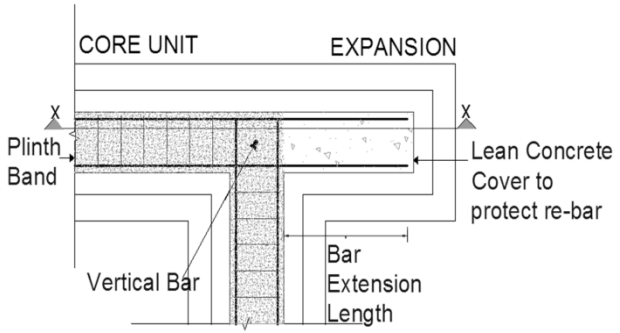
Provide bar extensions at all horizontal bands: plinth, sill, lintel and floor bands.

Plan the expansion in such a way that the horizontal expansion will be along the ridge of the roof.





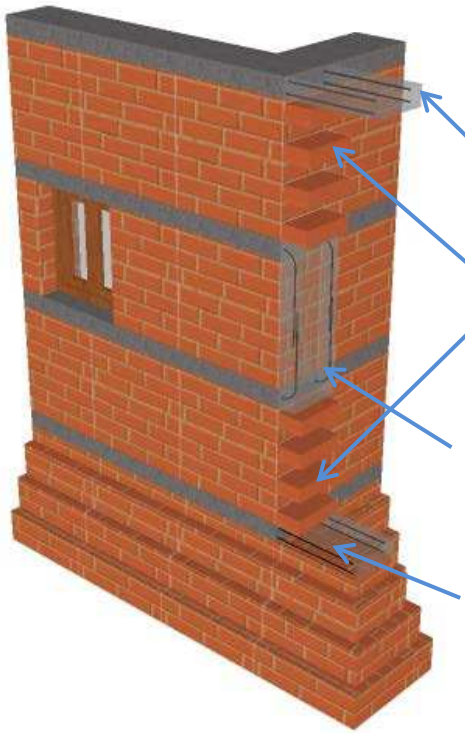
PLAN OF PLINTH BEAM FOR HORIZONTAL EXPANSION AT T-JUNCTION



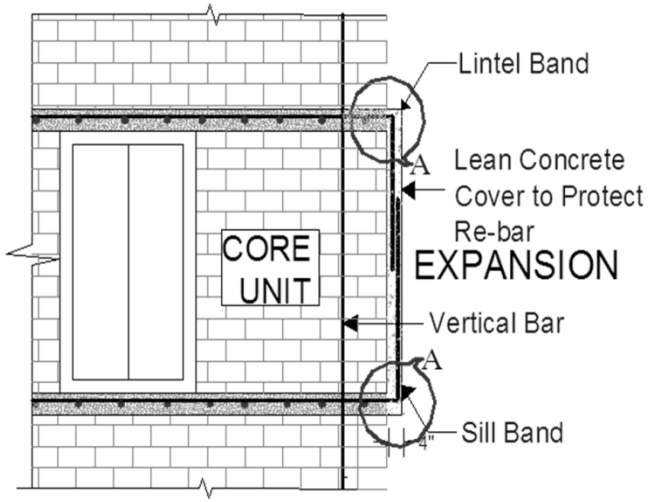
PLAN OF PLINTH BEAM FOR HORIZONTAL EXPANSION AT CORNER

Considerations for Progressive Expansion of Buildings

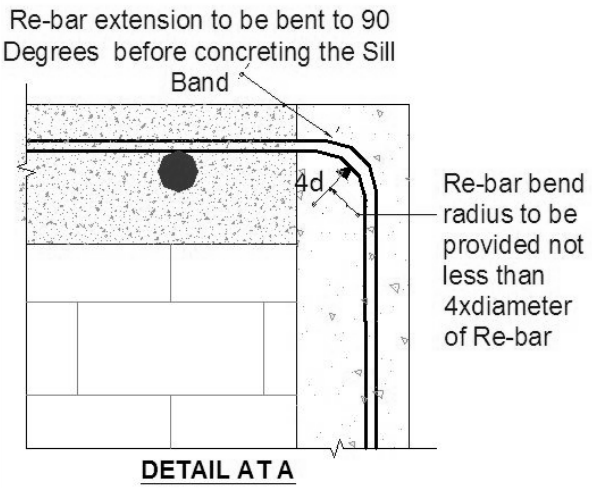
Horizontal Expansion



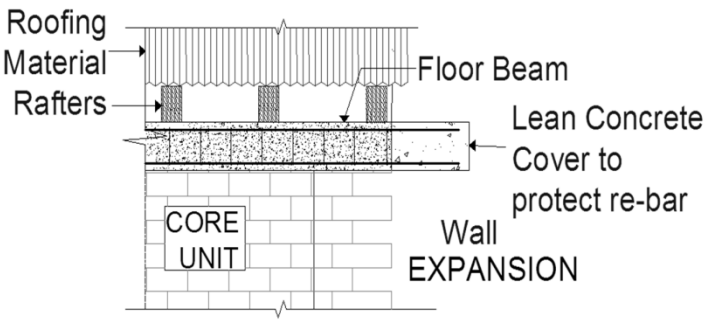
Provide 90 degree bends in the lintel and sill bands with extensions equal to the noted rebar extension length. Protect the bent rebar in lean concrete until the future extension will be built and they will be straightened



SECTION AT SILL AND LINTEL BANDS INCLUDING EXPANSION PROVISION

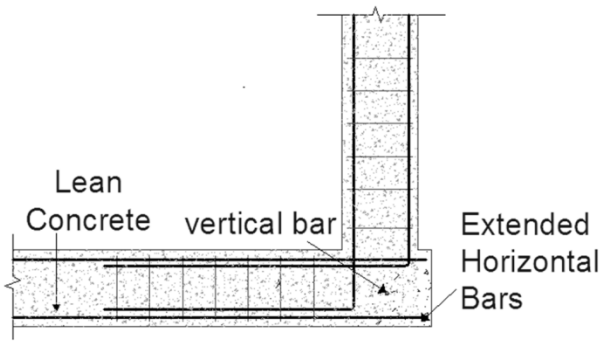


DETAIL AT A



EXTENSION DETAIL OF FLOOR BEAM

Provide toothed edges in walls where the walls will be connected to new walls during expansion in future. This will ensure proper bonding between old and new walls

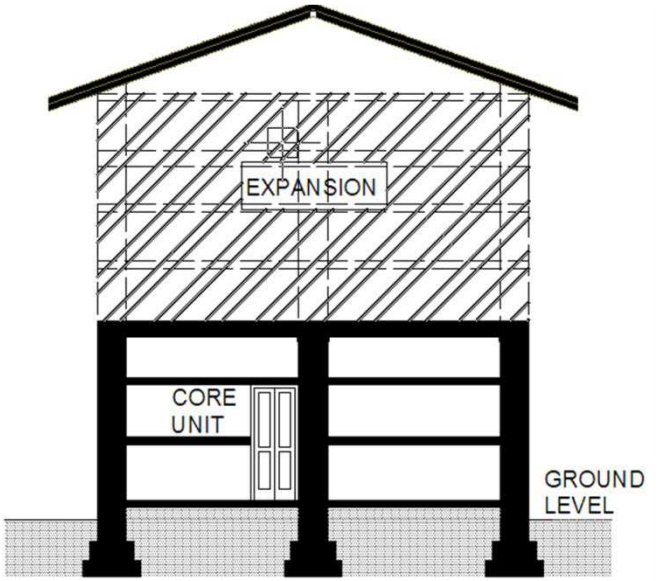


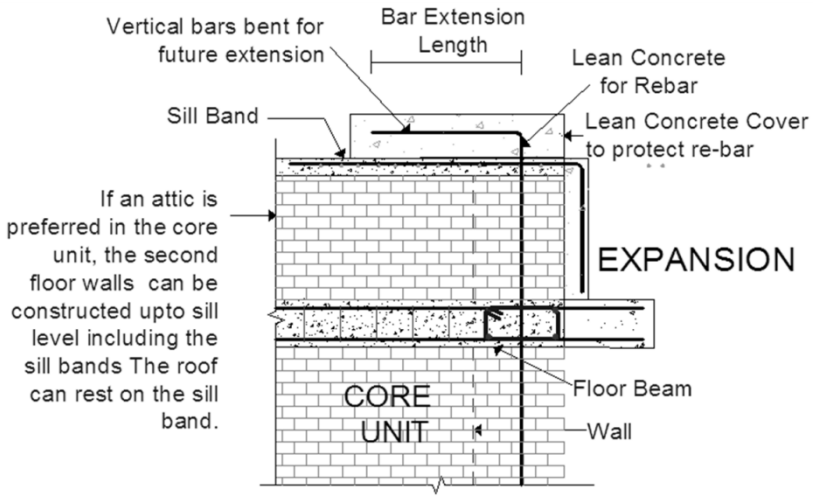
PLAN OF SILL AND LINTEL BANDS WITH EXPANSION PROVISION

Considerations for Progressive Expansion of Buildings

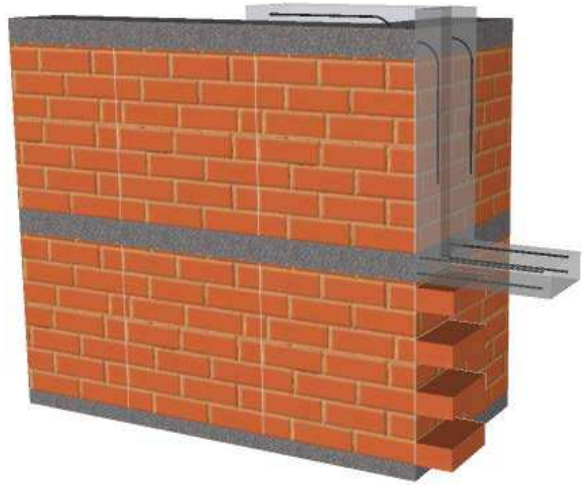
Vertical Expansion

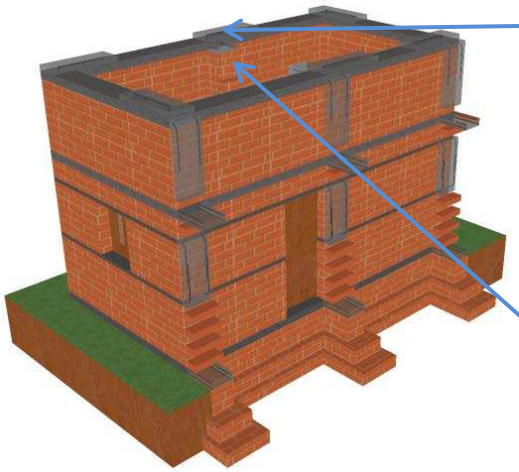
Provide 90 degree bends in the vertical bars at corners and wall junctions at the top of the walls of the core unit. Extend the hook for the bar extension length and cover with lean concrete.





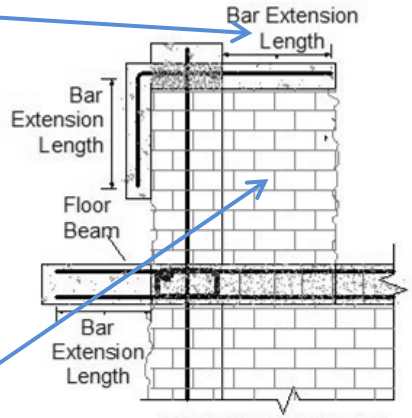
EXTENSION DETAIL OF VERTICAL BARS AT CORNER





If the initial core unit includes an attic, make sure to extend rebar at the sill level in the attic up to noted extension length and cover with lean concrete.

Extend the walls below which would help in acting as a buttress to support the longer walls.



EXTENSION DETAIL OF VERTICAL BARS AT ATTIC WALL

When future expansion is constructed:

- Chip off lean concrete and expose rebar.
- Hold the bent rebar where it extends from the structural concrete and then bend it straight.
- Lap the new rebar with the exposed rebar providing the required lap length.
- Clean the surface of the wall and coat the wall surface with cement slurry before adding new wall to it.
- For vertical expansions, remove the roof carefully and rebuild on the top of the new second floor.
- Always align the walls of the extension with the walls of the core unit, both horizontally and vertically.