Attachment A

USG Minimum Design and Construction Requirements for Wood Framed Structures

1. General Design Criteria

1.1. Per Adopted Georgia State Minimum Standard Building Code

1.2. Minimum Live Loads

Dormitory rooms and corridors serving them:
Live Load: 40 PSF  
Partitions: 15 PSF (Including demising walls)

Public rooms and corridors serving them:
Live Load: 100 PSF

Storage rooms, mechanical rooms and kitchens:
Live Load: 125 PSF

1.3. Minimum Superimposed Dead Loads (Self weight additional)

Typical unless noted:
Dead Load: 5 PSF

Above Kitchens and Mechanical Rooms:
Dead Load: 15 PSF minimum

Equipment:
In addition to the above load, account for the weight of all equipment (mechanical, electrical and plumbing units; including piping, piping risers, kitchen hoods, elevators, exhaust ducts, etc.

1.4. Account for anticipated future build-out or occupancy changes.

1.5. Deflection Criteria:

Roofs:  
Live Load: L/240 (1” max.)  
Total Load: L/180

Floors:  
Live Load: L/480 (0.5” max.)  
Total Load: L/240
1.6. Wood Shrinkage

Per IBC Section 2304.3.3, for structures with wooden walls supporting more than two floors and a roof, prepare and submit calculations and details, signed and sealed by a GA Professional Engineer, indicating that shrinkage of wood framing will not have adverse affects on the following:

- Equipment (including piping risers, elevator guiderails, etc.).
- Architectural finishes (including interior walls, doors and finishes).
- Exterior walls doors, windows and veneers.
- Structural levelness (including roof drainage systems).

Provide details to accommodate computed differential movements. For brick veneer, details should accommodate brick veneer expansion as well as wood shrinkage.

2. Materials/Specifications

2.1. Exterior and Loadbearing Wall Framing:

- Studs: Min. 2x6 So. Pine or SPF, No. 2., 19% max. moisture content @ 24”o/c max.

- Plates: Min. So. Pine or SPF, No. 2, 15% max. moisture content. Provide double top plates to support floor & roof trusses.

Handling and storage of material shall be such that these moisture contents are not exceeded at the time of installation.

2.2. Floor Framing:

- Floor Joists: Wooden trusses or engineered wood products @ 24” o/c max. Dimension lumber is allowed for special framing conditions.

- Rim Bands and Blocking at Loadbearing Walls: Use of low shrinkage engineered wood rim bands and loadbearing blocking (such as OSB or LSL products) to minimize cross-grain shrinkage. LVL products shall not be assumed to minimize cross grain shrinkage.
2.3. Roof Framing:

Wooden trusses or engineered wood products @ 24” o/c max. Dimension lumber is allowed for special conditions.

2.4. Sheathing:

Floor Sheathing:
APA Rated Sheathing (Plywood or OSB), min. ¾” T&G, Exposure 1. Place sheathing with face grain perpendicular to the supporting framing. Splice panels only over supporting joists. Provide blocking at non-T&G joints perpendicular to supporting joists.

All floor sheathing shall be glued and screwed to all supporting framing members.

Water resistant floor sheathing (i.e. Advantech) is recommended to minimize warping, cupping or swelling.

Roof Sheathing:
APA Rated Sheathing (Plywood or OSB), min. 5/8”, Exposure 1. Place sheathing with face grain perpendicular to the supporting framing.

2.5. Masonry Veneer Anchors: Secure directly to framing (not sheathing) with stainless steel screws and in accordance with manufacturer’s recommendations (nails not allowed).

2.6. All wooden framing including beams, studs, plates and blocking that are in contact with concrete or masonry or that are exposed to weather or water shall be pressure treated (PT) lumber.

2.7. All connectors and hangers shall be galvanized.

3. Structural Layout

3.1. Design stacking unit demising walls as loadbearing elements wherever possible. Stacking demising walls will act as loadbearing elements whether or not they are assumed to be. Not accounting for this may result in unintended structural behavior and distress. Where non-loadbearing demising walls are unavoidable, provide connections that allow vertical slip between the wall top plate and the floor or roof structure above and detail finishes accordingly.
3.2. Avoid offsetting loadbearing walls between levels. If stacking of loadbearing wall is not feasible, provide LVL, steel or similar heavy structural member instead of relying on typical floor framing for support.

3.3. Minimize cross grain shrinkage within floor systems at loadbearing elements. Use low shrinkage rim bands and loadbearing blocking.

3.4. For loadbearing walls, avoid offsetting studs between floors. Where more studs are required at a lower story than at an upper story, it is recommended to have lower floor studs directly beneath upper floor studs plus additional lower floor studs. It is recommended to match spacing of studs and supported floor members. At special conditions where offsetting studs must be used, explicitly design wall top plates to transfer load between studs above and below without excessive stress or deflection.

3.5. Where floor joists or trusses run parallel to a girder, loadbearing wall, or other stiff structural element, place the first joist or truss at 6" max. from the adjacent stiff element (in order to minimize differential displacement).

3.6. Avoid spread or strip footing founded on fill wherever possible. Where unavoidable, limit soil settlement to ½” max. Step strip footings at 1V : 2H max. at grade transitions.

4. Structural Design

4.1. Account for differential vertical movement at intersections of loadbearing and non-loadbearing walls.


4.3. Design wall-opening headers to support load from all levels above unless openings stack exactly from floor to floor.

4.4. Design for the transfer of shearwall lateral loads through the floor system. Indicate required blocking, nailing and connectors to provide a continuous load path.

4.5. Trusses and their connection design calculations and shop drawings shall be prepared by registered Specialty Engineer and shall be submitted for approval.
5. Structural Drawings

5.1. Draw structural framing plans at 1/8” = 1’-0” min

5.2. Show all members on main framing plan. Avoid reference to sub-framing plans as much as possible.

5.3. Indicate all non-typical joist hangers and connectors on framing plans.

5.4. Clearly indicate all required vertical loadbearing walls and columns on framing plans. Show loadbearing elements below the floor plane vs. above.

5.5. Clearly indicate shearwalls and lateral load elements on framing plans, including locations of holdowns. Distinguish between shearwalls and gravity walls. Provide full height shearwall elevations keyed to framing plans indicating sheathing, nailing, stud placement, blocking, chords, holdowns, etc.

5.6. Account for and describe special conditions, such as transfer beams where loadbearing elements do not align above and below a floor.

6. Construction Requirements

6.1. Adhere to the following finish installation sequence requirements:

Delay installation of masonry veneer and other brittle finishes as long as possible to minimize differential movement between them and the wooden wall structure. In any case, do not begin installation until the structure in the affected area has been topped out.

Wherever possible, install gypsum board from the top story down, after the structure has been topped out.

Provide wall blocking to ensure lateral stability of loadbearing wall studs prior to gypsum board installation. As a minimum, provide one line of continuous blocking at wall mid-height for all loadbearing walls.

6.2. Store all wood members a minimum of 12” above grade and keep continuously covered to prevent exposure to rain and water. Higher than specified moisture content at time of installation shall be cause for rejection.
7. Inspection Requirements

7.1. The following inspections are required in addition to those required by Chapter 17 of the IBC, and shall be added to the Statement of Special Inspections for the project:

Wood Framing and Connections: Continuous inspection by a Georgia Professional Engineer to verify compliance with Drawings, Specifications, Shop Drawings, manufacturer’s requirements, and the requirements of this document, including the following:

- Grade of lumber, manufactured wood products and sheathing.
- Details of wood framing including member types, sizes, spacing, blocking, bridging and bearing.
- Wood connections including nailing, bolting, tie downs, hangers and anchors.
- Diaphragm sheathing thickness, fastener size and spacing.
- Metal-plate-connected wood trusses.
- Temporary and permanent restraint/bracing in accordance with the approved truss submittal package.

Masonry Veneer Anchors: Continuous inspection to verify compliance with Drawings, Specifications and manufacturer’s requirements.

Foundation subgrade: Hand auger tests and a dynamic cone penetrometer tests at each spread footing and at 20 ft. o/c at each strip footings in order to verify that fill soils conform to geotechnical report requirements and limit settlement to $\frac{1}{2}$" maximum at footings on fill.

Moisture Content: Periodic inspection of installed studs, plates, rim bands and blocking to verify that moisture content is less than specified value.

7.2. As used above, “continuous inspection” means daily observation during the performance of the indicated construction activity before the work is covered by finishes (gypsum board, sheathing, veneers, gyp-crete, etc.)
8. Typical Details (See Appendix “A”)

- Typical Plumbing Riser Requirements
- Typical Floor Level Compression Joint for Brittle Finishes
- Typical Detail at Window Head in Brick Veneer
- Typical Detail at Window Sill in Brick Veneer

9. Technical References

- USDA Wood Handbook

- Accommodating Movement in High-Rise Wood Frame Building Construction

- BIA TN-18: Volume Changes - Analysis and Effects of Movement

- American Wood Council
Appendix A

Typical Details

1. Typical Plumbing Riser Requirements
2. Typical Floor Level Compression Joint for Brittle Finishes
3. Typical Detail at Window Head in Brick Veneer
4. Typical Detail at Window Sill in Brick Veneer
TYPICAL PLUMBING RISER REQUIREMENTS

NOTES:
1. SUPPORT ENTIRE PLUMBING RISER WEIGHT (INCLUDING CONTENTS) AT LOWEST FLOOR LEVEL.
2. DETAIL RISER SUPPORT TO ACCOMMODATE COMPUTED STRUCTURAL MOVEMENT. DO NOT ASSUME VERTICAL SUPPORT AT UPPER LEVELS.
3. PROVIDE RISER LATERAL SUPPORT AT EACH FLOOR.
4. DETAIL LATERALS TO ACCOMMODATE COMPUTED STRUCTURAL MOVEMENT (PROVIDE OVERSIZED HOLES IN WOOD MEMBERS WITH GAP BETWEEN TOP OF LATERALS AND WOODEN STUDS).
2 TYP. FLOOR LEVEL COMPRESSION JOINT FOR BRITTLE FINISHES

NOTE:
1. DETAIL JOINT TO ACCOMMODATE COMPUTED STORY STRUCTURAL SHORTENING.
   ACCOUNT FOR SEALANT COMpressive CHARACTERISTICS.
   FLASH AS REQUIRED.
TYP. DETAIL AT WINDOW HEAD IN BRICK VENEER
(DETAIL AT WINDOW JAMB SIM.)

NOTE:
1. DETAIL JOINT TO ACCOMMODATE COMPUTED STRUCTURAL AND BRICK
   MOVEMENTS. ACCOUNT FOR SEALANT TENSION AND SHEAR CHARACTERISTICS.
   FLASH AS REQUIRED.
4 TYP. DETAIL AT WINDOW SILL IN BRICK VENEER

NOTE:
1. DETAIL JOINT TO ACCOMMODATE COMPUTED STRUCTURAL AND BRICK MOVEMENTS. ACCOUNT FOR SEALANT COMPRESSION CHARACTERISTICS. FLASH AS REQUIRED.