TECHNICAL BULLETIN
Planning & Development Services
Building Inspections Division

TOPIC: Retaining Walls

This Technical Bulletin is intended to serve as a guide in aiding contractors and citizens in constructing and permitting a retaining wall. A permit is required for any retaining wall that is required to be engineered. The following retaining walls shall be designed and sealed by a Professional Engineer licensed to practice in the State of Texas:

- Any retaining wall(s) that supports a building, driveway or other permanent construction or imposed load that is located closer to the wall than one and one-half (1½) times the exposed height of the wall
- Any wall with a developed height (height above and below grade measured from the bottom of the footing or lowest portion of wall, including any foundation and/or piers) that exceeds four feet
- A series of two or more walls built in tiers shall be considered a single wall in height when the base of the upper tier is set back from the base of the lower tier less than one and one-half (1½) times the height of the exposed wall height below.

At a minimum, include the following plan(s) with the permit application submittal:

- Design drawings and requirements for the wall(s) sealed by the engineer of record
- Design drawings must be project location specific, must be dated, and must contain a reference number
- Design drawings shall include:
    - a note that states that the wall(s) are designed with a minimum safety factor of 1.5
    - state that the plans have been designed to the soil conditions based on the soil analysis prepared by Engineer, P.E., {list name of engineer} dated {list the date of the soils report}, and
    - The plans shall identify the soil data characteristics from the soils report.
- In lieu of a soils analysis, the city will accept an engineer's design based on the following assumptions:
    - Vertical foundation pressure(Q_u) = 1,500 psf
    - Lateral bearing pressure = 100 psf/ft below grade

Additional minimal requirements for the general preparation of the plans and the construction of retaining wall(s) may include, but are not necessarily limited to:

- Plans must specify materials used. (For example, if wall is to be constructed using CMU block, weight and/or dimension of CMU must be specified).
- Plans for masonry walls must specify mortar requirements.
- Plans must provide specifics for any reinforcement materials.
- When plans indicate compacted soil, specify compaction standard.
- When plans provide drainage provisions (pipe/weep holes) through the wall, then drainage openings must be within 6" of the foundation or base.
- When gravel or crushed rock is used behind the wall as part of the drainage system, specify the gradient of gravel or crushed rock.
- When gravel or crushed rock is used behind the wall as part of the drainage system, the plans must specify a filter fabric to be installed between the gravel or crushed rock and the soil.
- The plans must indicate the point of discharge of the drainage system.

RETAINING WALLS

INSPECTION	MINIMUM CRITERIA - General		
	CMU Wall	**Poured in place wall**	**Pave Stone wall (interlocking dry laid block)**
Piers **Pre-Pour/Sub-Base/Footing**	Diameter, depth, reinforcement, quantity & size per approved plans	Diameter, depth, reinforcement, quantity & size per approved plans	Diameter, depth, reinforcement, quantity & size per approved plans
Forming of footing and/or beams **Pre-Pour/Sub-Base/Footing**	Forms placed & supported; depth; width; location; and reinforcement per approved plans	Depending on the design may be a monolithic pour with wall section. If separate: Forms placed & supported, depth, width, correct location, reinforcement –quantity/size/laps, reinforcement tie for wall section. All per approved plans	The wall site is excavated & the leveling pad is placed & compacted. Will check proper layout, width, level grading of pad, material, & depth of material per approved plans
Drainage/Wall Construction (Partial construction of wall up to about 4 feet)	Wall per approved plans	Form & reinforcement set per approved plans with thru wall drainage features installed. Partial inspection will be after forms are removed & the drainage system is installed to the top of the perforated piping.	Base course laid & backfilled front & rear, core cells are filled. Partial inspection the drainage pipe installed if applicable with filter fabric installed. Next partial inspection is the first layer of any geosynthetic reinforcement (if required by engineer).
Drainage/Wall Construction (Partial construction of wall over about 4 feet)	Wall per approved plans, for CMU wall: reinforcement - quantity/size/laps, cells to be filled, drain system per plans, back fill for first section	Form & reinforcement set per plan design with thru wall drainage features installed. Next partial inspection is with the filter fabric installed before backfilling of finish grade.	Base course laid & backfilled front & rear, core cells are filled. Partial inspection the drainage pipe installed if applicable with filter fabric installed. Next partial inspection is the first layer of geosynthetic reinforcement (if required by engineer).
Building Final	Scope of work is complete and matches approved plans		

Notes:

1. Piers greater than 6’ in depth must be inspected by the engineer of record or designee. An inspection report, sealed by the engineer of record must be provided to the inspector at the time of the “**Pre-Pour/Sub-Base/Footing**” inspection.
2. When compaction is part of the engineer of record’s design, then compaction report is required at appropriate inspection stage