

Mark Daniels, P.E.
428 Laws Drive
Norman, Oklahoma 73072
405-406-9546


FLOODPLAIN ANALYSIS
FOR GARDEN WALL, RETAINING WALL, CONCRETE PATIO, PERGOLA AND HOT TUB
428 LAWS DRIVE

The homeowner of Lot 18, Block 1, Cambridge III Addition (428 Laws Drive) has constructed improvements in the back yard of the existing residential dwelling which is adjacent to Ten Mile Flat Creek. The improvements consist of a garden wall, a retaining wall and a circular concrete patio with a hot tub and pergola situated on the patio. A portion of the area of construction is within the 0.1% Special Flood Hazard Area (SPFHA) as depicted on the National Flood Hazard Layer Firmette dated 06/03/25 (the floodplain) and provided by the City of Norman. The floodplain elevation at the location of the improvements is approximately 1121.7 as interpolated between Section B/B (Elevation 1121.6) and Section C/C (elevation 1122.0) from the FEMA map.

The eastern boundary of current 100-year floodplain limit is depicted on the aerial map provided by the City of Norman and included as Attachment 1; the previous eastern limit of the floodplain is also shown. The improvements were generally constructed in two phases; the garden wall, retaining wall and patio slab were constructed in 2020/2021 while the hot tub and pergola were constructed in 2024.

Phase 1: The volume of the concrete blocks to construct the garden wall, the retaining wall materials, as well as the soils from the patio excavation placed behind the garden wall and within the floodplain were constructed as shown on Attachment 6; calculations are shown in Attachment 7. The soils removed from the floodplain for the patio excavation exceed the volume of the garden wall, the retaining wall and soils placed behind the garden wall within the floodplain. Excess soils (CUT) totaling about 45 cubic feet (CF) were deposited outside the floodplain. The concrete placed for the patio slab was below the pre-construction grade and is therefore excluded from floodplain fill calculations. The Phase 1 improvements had no negative impact on the floodwaters or increase the base flood elevation (BFE).

Phase 2: Installation of a hot tub was permitted through the City of Norman and a pergola was then installed over the hot tub. In this case, the floodplain volume consumed would be calculated from the top of patio slab 1119.0 to 100-year floodplain elevation of 1121.7. The floodplain volume consumed (FILL) by the hot tub and the pergola columns is about 161 CF and must be offset if they are to remain in place. The homeowner will provide compensatory storage of at least 116 CF by extending the garden wall downward along the full length of the wall and removing a triangular shaped wedge of soil to the west of the wall from the floodplain. As shown in Attachment 7, the excavation at the garden wall must be at least 11.25 inches in depth to provide the required compensatory storage for the floodwaters. Homeowner may deepen the excavation to about 16 inches to match the elevation of the existing patio. Additional blocks or concrete footings installed will be below the pre-construction grade and are thus not considered fill in the floodplain. All excavated materials will be removed from the 100-year floodplain. As a result, the Phase 2 construction will not have a negative impact on the floodwaters or increase the base flood elevation (BFE).

 11-23-25
J. Mark Daniels, P.E. #13833

