

CHAPTER

# 3

## Site Preparation



**I**n preparation for constructing buildings on a property, the builder must consider a number of factors related to code requirements. The buildings must be located according to the approved site plan to meet the requirements of the *International Residential Code*<sup>®</sup> (IRC<sup>®</sup>) and any applicable local ordinances. The soil must be suitable for the support of the building and is factored into the design of the foundations. The building must also be elevated sufficiently and the site graded to provide surface drainage away from the building. The plans examiner considers these factors when checking the construction drawings and site plan, but the inspector will be responsible for verifying the requirements at the jobsite (Figure 3-1).



Figure 3-1 Sitework.

## LOCATION ON PROPERTY

The IRC regulates a building's location on the property primarily to guard against the spread of fire between buildings. The code is concerned with not only protecting the new building on the property being developed, but preventing the spread of fire to buildings on the adjacent property. Structural considerations also play a part in locating buildings on a lot. The code regulates distances between the structure and adjacent steep slopes to protect the integrity of the foundation. Local zoning or other ordinances may be more restrictive in regulating the location, height and area of buildings on properties.

### Fire Separation Distance

By definition, fire separation distance (FSD) is measured from the face of the building to the closest lot line or to the center of an adjacent street. When multiple dwellings are constructed on the same lot, which is not often permitted by zoning ordinances, FSD is measured to an imaginary line created between the dwellings so an equivalent separation or protection can be provided without a lot line to reference. However, for all practical purposes, fire separation distance typically will be of concern only when measured to the interior lot line. No separation distance or fire resistance rating is required for

### Code Essentials

#### Exterior walls perpendicular to the wall facing the property line

- No minimum fire separation distance
- Fire resistance not required
- Unlimited openings
- No protection required for penetrations ●

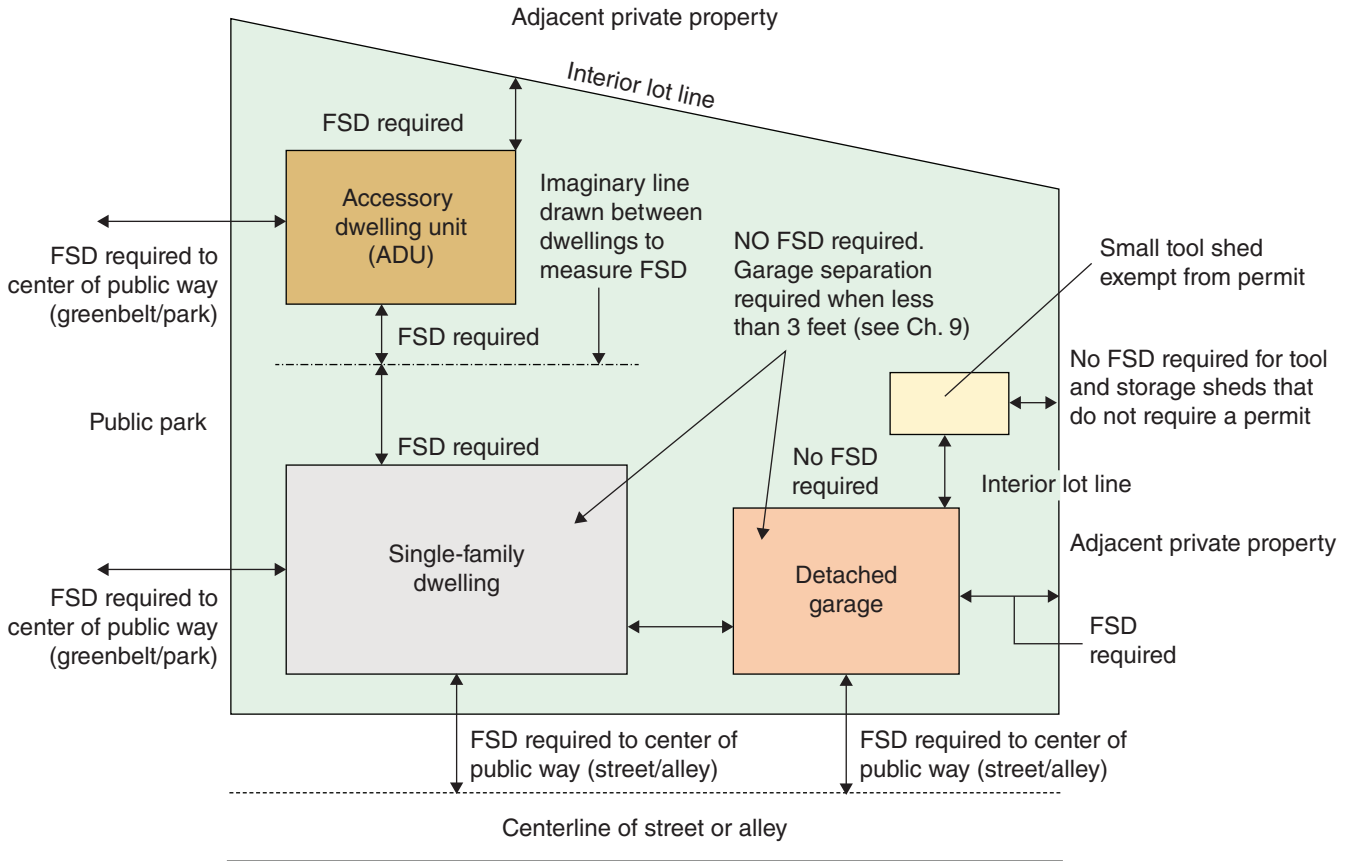


Figure 3-2 Measuring fire separation distance.

opposing walls of detached dwellings and accessory structures on the same lot. Fire separation distance is measured at a right angle to the face of the exterior wall (Figures 3-2 and 3-3). [Ref. R202]

Provisions that regulate the construction of exterior walls in proximity to lot lines have long been recognized as effective in preventing the spread of fire from a building on one property to a building on another property. Measuring each building to the lot line, rather than building to building, allows each property owner equal opportunity to build in proximity to the lot line while meeting the equivalent requirements. Protection can be achieved by providing a clear space between the building and lot line or by using fire-resistance-rated construction. The code does not prohibit placing a building with zero clearance to the lot line provided the exterior wall meets the prescribed fire resistance requirements. When the building is set a certain distance away from the lot line, fire resistance is not required. For dwellings and townhouses protected with an automatic fire sprinkler system, this minimum separation distance is 3 feet. For dwellings without sprinkler systems and for detached

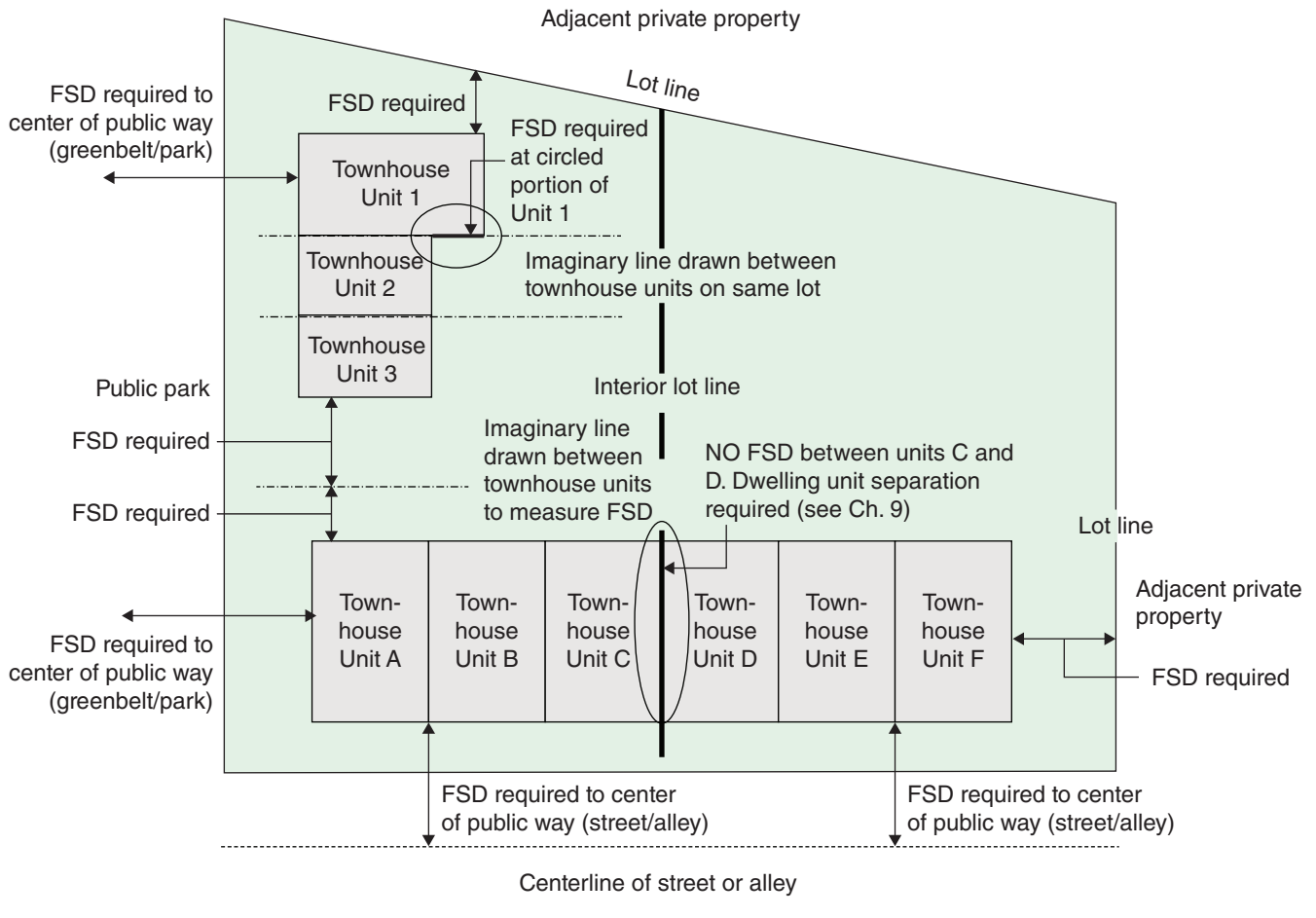


Figure 3-3 Measuring townhouse fire separation distance.

accessory buildings, the minimum separation between the unrated wall and the lot line is 5 feet. See Chapter 9 for further discussion of fire separation distance and fire-resistant protection of exterior walls. [Ref. R302.1]

## SITE PREPARATION

Regulation of site preparation activities related to construction of buildings under the IRC varies based on geographic location and local or site-specific conditions. The code is basically concerned with two things: soil characteristics related to the support and stability of foundations and grading to provide surface drainage away from foundations. Additionally, construction in flood hazard areas must comply with the elevation and design requirements of the IRC or local floodplain regulations. There may also be local or state laws that

require grading permits and regulate erosion control, storm water management and soil conservation measures. A number of other factors may affect site preparation and building design, including high water tables and sloped sites.

## General Site Requirements

Preparation of the site for construction includes stripping of vegetation and topsoil, grading to the rough contours if necessary and excavation for basements and foundations. The IRC requires that all exterior footings be placed at least 12 inches below the undisturbed ground level and be protected against frost where applicable. Footings must bear on undisturbed natural soil or compacted engineered fill. The code also prescribes suitable base requirements for concrete basement and garage floors, other slabs on grade and the base for crawl spaces. In all cases, the ground must be stripped of vegetation and organic material. The base for concrete floor slabs within the perimeter walls must be of suitable materials and compacted to prevent settlement. The thickness of compacted fill material below slabs is generally limited to 24 inches for clean sand or gravel and 8 inches for soil unless otherwise approved by the building official (Figure 3-4). [Ref. R403.1, R408.5, R506.3]



Figure 3-4 Excavation for foundation of a detached dwelling.

## Soil Properties

The designer or builder must carefully consider soil properties not only for adequate support of the foundation but also for stability to prevent future damage to the structure. Based on experience and known local soil conditions, the building official will often permit design based on a presumptive load-bearing value without soil testing or a geotechnical report. Typically, the presumed load-bearing value will range from 1,500 to 3,000 pounds per square foot (psf) based on local soil conditions and according to the values in Table 3-1. The building official may assume conservative values based on the average or the lowest soil characteristics likely to be encountered on a site. Soil type is verified at the time of footing inspection. If found to be of a poorer grade than the presumed value, testing or mitigation is required prior to placing concrete footings. The builder always has the option of providing the results of soil testing in a geotechnical report in order to use a higher load-bearing value than would otherwise be presumed. [\[Ref. R401.4.1\]](#)

Where available data indicates that the soil may not be suitable for the foundation design, the building official is authorized to require a geotechnical evaluation and report prepared by an approved agency or registered design professional. Expansive, compressible or shifting soils have the potential to damage the structure. Highly organic soils (laden with decayed material from plants and animals), such as organic clays, organic silts and peat, are not included in Table 3-1 and are outside the scope of foundation design under the IRC.

**Table 3-1** Presumptive Load-Bearing Values of Foundation Materials<sup>a</sup>

Class of Material	Load-Bearing Pressure (pounds per square foot)
Crystalline bedrock	12,000
Sedimentary and foliated rock	4,000
Sandy gravel and/or gravel (GW and GP)	3,000
Sand, silty sand, clayey sand, silty gravel and clayey gravel (SW, SP, SM, SC, GM and GC)	2,000
Clay, sandy, silty clay, clayey silt, silt and sandy siltclay (CL, ML, MH and CH)	1,500 <sup>b</sup>
<a href="#">[Ref. Table R401.4.1(1)]</a>	

- a. Where soil tests are required by Section R401.4, the allowable bearing capacities of the soil shall be part of the recommendations.
- b. Where the building official determines that in-place soils with an allowable bearing capacity of less than 1,500 psf are likely to be present at the site, the allowable bearing capacity shall be determined by a soils investigation.