

**CITY & COUNTY OF DENVER  
COMMUNITY PLANNING & DEVELOPMENT  
BUILDING PERMIT POLICY**

**Subject: EXCAVATION, BENCHING, SLOPING, AND SHORING FOR IRC STRUCTURES**

**Approved: Eric Browning - Interim Building Official**

**Drafted by: Firnhaber,  
Browning, Renn**

**Number: ADMIN 130, 131, & IBC 3307**

**Effective Date: September 26, 2008  
Revised: November 12, 2021**

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**REFERENCE: ADMIN SECTION 130 AND 131, AND IBC AND IBCA SECTION 3307**

**A. PURPOSE**

To establish the conditions, procedures, and specific permit and submittal requirements for the review and inspection of excavation sloping, benching, and shoring for any structure designed and permitted under the International Residential Code, including new construction, additions, and accessory structures. See terms in Attachment 4, Example 1 and Example 2 for items including but not limited to Top and Bottom of Excavation, Property Line, Slope, Depth of Excavation, and Edge of Footing.

**B. WHEN IS AN EXCAVATION PERMIT REQUIRED?**

A permit for excavation is required for any building or structure designed and permitted under the International Residential Code, except as outlined below. See Sections C.2 and C.3 below for minimum submittal requirements for sloping, shoring, and benching designs, and what must be submitted to document compliance with the following exceptions.

**Exceptions:**

1. Excavations with vertical or slope cuts that are 18 inches or less in depth.
2. Excavations with vertical or slope cuts that are more than 18 inches and no more than 4 feet in depth when:
  - a. The bottom edge of the cut is at least as far from adjacent structures as the depth of the excavation, and
  - b. The bottom edge of the cut is at least as far from the property line as the depth of the excavation, or the applicant submits an affidavit from the adjacent property owner if the applicant is proposing to use the adjacent property for excavation.
3. Excavations greater than 4 feet in depth with slope cuts no steeper than 1.5 feet horizontal to 1 foot vertical when:
  - a. Multiple structures are being built across multiple lots by one contractor,
  - b. There are no structures on adjoining lots, and
  - c. All lots are owned by the same entity.
4. Excavations for the following project types:
  - a. Prefabricated window well units when:
    - i. They are installed immediately after excavation,
    - ii. They are no larger than 8 feet in depth, 6 feet in length as measured parallel to the structure, and 4 feet in width as measured perpendicular to the structure, and
    - iii. The bottom edge of the cut is at least as far from adjacent structures as the depth of the excavation.
  - b. Swimming pool, hot tub, and pond excavations where the excavation walls are used as the form for gunite or shotcrete walls, and when there are no structures or spoil piles located horizontally within a dimension equal to the depth of the pool excavation at that location;
  - c. Excavations for individual piers,

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- d. Fences,
- e. Excavations for meter pits, electrical, irrigation, utility boxes, and similar 'small areas' (50 sq ft maximum footprint) when no more than 5-feet in total depth,
- f. Retaining walls, and
- g. Similar excavations as approved by the Building Official.

**C. SUBMITTAL REQUIREMENTS:**

**1. Submittal Requirements for Exceptions 1 and 4 in Section B, above:**

Excavations outlined in Exceptions 1 and 4 in Section B above do not require an excavation submittal to confirm the exemption requirements.

**2. Submittal Requirements for Sloping and Exceptions 2 and 3 in Section B, above:**

Sloping or an excavation design that meets Exception 2 or 3 in Section B, above, shall submit the following:

- a. Excavation plan and section(s) that graphically shows, labels, and dimensions the following:
  - i. Property lines,
  - ii. Structures that are within 10 feet of the top of the excavation, including on adjacent properties if within 10 feet,
  - iii. Edge of the footing or foundation,
  - iv. Elevation of existing grade,
  - v. Depth of excavation,
  - vi. Slope of excavation (e.g. 1.5 horizontal to 1 vertical), and
  - vii. Extent of the excavation (location of vertical cut, or top of excavation slope and bottom of excavation slope).
    - 1. Dimension from the top of excavation to the bottom of excavation,
    - 2. Dimension from the bottom of the excavation to the property line, and
    - 3. Dimension from the top of the excavation to the property line.
- b. A current geotechnical investigation report with an excavation / sloping evaluation bearing the seal and signature of a Colorado professional engineer when the applicant is proposing a slope steeper than 1.5 feet horizontal to 1 foot vertical for excavations greater than 4 feet in depth.
- c. Underpinning documents bearing the seal and signature of a Colorado professional engineer may be required when the horizontal distance from an existing structure to the bottom edge of the excavation cut is less than the depth of excavation. The engineer must define if underpinning is required and specifically explain the contractor's excavation procedures. Underpinning documents must be submitted, reviewed, and approved. A permit for excavation is required for underpinning.
- d. Affidavit(s) from the adjacent unique property owner(s) if the applicant is proposing to use the adjacent property for excavation.

**3. Submittal Requirements for an Engineered Benching Design**

Benching that is not exempt from a permit for excavation shall have the following requirements and the submittal shall include:

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- a. A current geotechnical investigation report with an excavation / benching evaluation bearing the seal and signature of a Colorado professional engineer.
- b. Benching construction documents bearing the seal and signature of a Colorado professional engineer.
  - i. Construction documents must show adjacent property lines, distance of benching installation from the property lines, and any structures that are within 10 feet of the proposed benching. The adjacent structures shall include those on adjacent properties if within the aforementioned 10 feet.
  - ii. Benching design shall reference and be based on the current geotechnical investigation report.
  - iii. All benching reviewed by the residential team are required to meet the following criteria. Any deviations from these criteria will require a plan review from the structural plan review team.
    1. If there is an existing structure within a horizontal distance from the vertical face of a bench that is equal to or less than the depth of the bench, engineer must define if underpinning is required and specifically explain the contractor's excavation procedures. Underpinning documents must be submitted, reviewed, and approved with the benching.
    2. Any benching within 5 feet of a property line must have the vertical face of the bench located a minimum horizontal distance from the property line that is equal to the depth of the bench.
- c. Affidavit(s) from the adjacent unique property owner(s) if the applicant is proposing to use the adjacent property for excavation.
- d. Submit evidence of notification to adjoining property owner(s) per IBCA Section 3307.1.1.

#### **4. Submittal Requirements for Engineered Shoring Design**

Shoring shall have the following requirements and the submittal shall include:

- a. A current geotechnical investigation report with an excavation / shoring evaluation bearing the seal and signature of a Colorado professional engineer.
- b. Shoring construction documents bearing the seal and signature of a Colorado professional engineer.
  - i. Construction documents must show adjacent property lines, distance of shoring installation from the property lines, and any structures that are within 10 feet of the proposed shoring. The adjacent structures shall include those on adjacent properties if within the aforementioned 10 feet.
  - ii. All shoring reviewed by the residential team are required to meet the following criteria. Any deviations from these criteria will require a plan review from the structural plan review team.
    1. Shoring design shall reference and be based on the current geotechnical investigation report.
    2. Concrete piers shall be spaced not more than 3'-0" on center,
    3. Concrete piers must be at least 10" diameter and reinforced based on design analysis by a Colorado registered professional engineer, and
    4. The pier embedment, measured from the lowest point of the excavation to the bottom of the pier, must be at least equal to the depth of the excavation. For example, if the excavation is a depth of 10 feet, the pier must have at least 10 feet embedment below the lowest excavation point. Note: under certain soils conditions and water table levels this may not be adequate and requires verification from the soils and structural engineers.
- c. Provide name and phone number of designated special inspector / engineer inspecting the installation of shoring.

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- d. Affidavit(s) from the adjacent unique property owner(s) if the applicant is proposing to use the adjacent property for excavation.
- e. Submit evidence of notification to adjoining property owners per IBCA Section 3307.1.1.
- f. A copy of the Excavation Bond approval from the Department of Transportation and Infrastructure, Sewer Use and Drainage Permitting is required prior to permit issuance for those excavations that extend within one foot of the angle of repose, or a slope of one to one, to any public sidewalk, street, alley or other public property, per the provisions of IBCA Section 3307.3.

#### **D. GEOTECHNICAL ENGINEERING/SOILS REPORTS**

A geotechnical engineering / soils report submitted with a permit application is considered "current" if the date of the report is within two years of the date of submittal. If the report is older than two years but not older than five years, applicants must also submit a letter signed and sealed by the geotechnical engineer of record (or from another engineer in that company) confirming the applicability and recommendations of the original report. Reports older than five years will not be accepted.

#### **E. HOW TO SUBMIT:**

##### **1. One- and Two- Family Dwellings and their Accessory Structures**

For one- and two- family dwellings and their accessory structures, submittal requirements for excavation, sloping, benching, or shoring shall be included with the submittal for the structure's residential construction permit.

##### **2. IRC Townhouses and their Accessory Structures**

For townhouses and their accessory structures, submittal for a permit for excavation, sloping, benching, or shoring shall be separate from the submittal for the structure's residential construction permit and will be reviewed by the structural plan review team.

#### **F. PERMIT ISSUANCE**

##### **1. One- and Two- Family Dwellings and their Accessory Structures**

- a. A permit for excavation will be issued separate from and prior to the construction permit once the entire project (meaning the permit application for the structure or structures submitted for review) has received approval from all applicable agencies.
- b. Once the permit for excavation has obtained its final sign off from the Building Inspection Division Construction Inspector, then the permit for the construction of the structure may be issued.

##### **2. IRC Townhouses and their Accessory Structures**

A permit for excavation will be issued separate from the construction permit once the permit for excavation has received approval, which may be prior to the approval of the townhouses' construction permits.

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## **G. INSPECTION REQUIREMENTS:**

### **1. Pre-Construction Meeting**

Prior to excavation for sloping, benching, or shoring a pre-construction meeting is required. Before starting any excavation, sloping, benching, or shoring work, the contractor shall meet the Building Inspection Division Construction Inspector on site to review construction / excavation procedures, including but not limited to, fencing and signage, as well as compliance with and appropriateness of the excavation, sloping, benching, or shoring plan.

### **2. Special Inspections**

Special inspection is required in accordance with IBC Section 1704 for all shoring that requires a permit for excavation. A Colorado registered professional engineer may act as the special inspector, provided they qualify as special inspectors in accordance with Denver Building Code Policy IBC 1704. The owner must hire the special inspector.

### **3. Final Inspection for Engineered Shoring Design**

Once the required shoring has been installed, given a minimum time to cure, inspected by the special inspector, and the excavation is completed; schedule a final inspection with the Building Inspection Division online through the ePermits portal ([denvergov.org/epermits](http://denvergov.org/epermits)). The special inspector shall provide a report outlining their inspection of the shoring installation with their original ("wet") signature, which shall be provided to the Construction Inspector at the time of final inspection. Alternatively, the special inspector may upload the report with their electronic signature to the permit record in the ePermits portal prior to requesting the final inspection.

### **4. Final Inspection for Engineered Sloping or Benching Design**

Once all sloping or benching is completed, schedule a final inspection with the Building Inspection Division online through the ePermits portal ([www.denvergov.org/epermits](http://www.denvergov.org/epermits)).

## **H. ATTACHMENTS**

1. Affidavit for Excavation & Neighbor Notification for Applicants that Own Multiple Lots in a Row
2. Adjacent Property Owner Affidavit for Excavation
3. Neighbor Notification
4. Example Excavation Plans and Sections
  - a. Example 1 – Vertical excavation cut for depths 4 feet or less.
  - b. Example 2 – Excavations with slope cuts no steeper than 1.5 feet horizontal to 1 foot vertical.

**END OF DOCUMENT**



## AFFIDAVIT FOR EXCAVATION & NEIGHBOR NOTIFICATION FOR APPLICANTS THAT OWN MULTIPLE LOTS IN A ROW

**PROPERTY OWNER INFORMATION**

Property Owner	Name	
	Phone	
	Email	
	Address	
Contractor	Name	
	Contact	
	Phone	
	Email	
	Address	

**ADDRESSES OWNED BY THE SAME OWNER**

Property Addresses (Limit this form to addresses on one block)	1.	
	2.	
	3.	
	4.	
	5.	
	6.	
	7.	
	8.	
	9.	
	10.	

**OWNER ACKNOWLEDGMENT – AFFIDAVIT AND NEIGHBOR NOTIFICATION**

As the owner of multiple lots in a row, this form shall serve as:

1. Proof of ownership of multiple lots in a row;
2. Neighbor notification per DCBA IBC Section 3307.1.1; and
3. Permission to excavate on the properties listed above.

Owner / Owner's Representative	
Date	

**REQUIRED ATTACHMENTS**

The following documents are required to be submitted to prove ownership of the adjacent property:

- A copy of the adjacent property title if the owner information differs from that shown in the Denver Property Taxation and Assessment System.
- If the adjacent property is owned by a corporation, company or trust, the owner's representative may sign this document.



# ADJACENT PROPERTY OWNER AFFIDAVIT FOR EXCAVATION EXCAVATION, SLOPING, BENCHING & SHORING

## SUBJECT PROPERTY INFORMATION

Property Address		
Property Owner	Name	
	Phone	
	Email	
	Address	
Contractor	Name	
	Contact	
	Phone	
	Email	
	Address	

## ADJACENT PROPERTY OWNER INFORMATION

Property Address(es)		
Property Owner	Name	
	Phone	
	Email	
	Address	

## ADJACENT PROPERTY OWNER ACKNOWLEDGEMENT

As the adjacent property owner:

- I acknowledge that I am sole owner or one of the owners of the adjacent property as shown in the Denver Property Taxation and Assessment System at [denvergov.org/property/](http://denvergov.org/property/) or as shown on the property title.
- I acknowledge that I may have this agreement notarized, but the City and County of Denver will not require it to be notarized.
- I have reviewed the excavation construction documents submitted by the subject property owner and understand the extent of the excavation.
- I grant permission for the subject property owner to excavate onto my property to the extent shown on the excavation construction documents.
- I understand that any dispute arising from this acknowledgment is a civil matter.

Owner / Owner's Representative	
Date	

## REQUIRED ATTACHMENTS

The following documents are required to be submitted to prove ownership of the adjacent property:

- A copy of the adjacent property title if the owner information differs from that shown in the Denver Property Taxation and Assessment System.
- If the adjacent property is owned by a corporation, company or trust, the owner's representative may sign this document.



## NEIGHBOR NOTIFICATION

### EXCAVATION, DEMOLITION, OR RELOCATION

SUBJECT PROPERTY INFORMATION		
Property Address		
Notification for:		<input type="checkbox"/> Excavation <input type="checkbox"/> Demolition <input type="checkbox"/> Relocation
Property Owner	Name	
	Phone	
	Email	
	Address	
Contractor	Name	
	Contact	
	Phone	
	Email	
	Address	

**Adjacent owners:** Please read the following Denver Building Code Sections which specify the protection to be provided by the contractor.

**DCBA IBC Section 3307.1 Protection Required.** Adjacent public and private property shall be protected from damage during construction; excavation, remodeling, demolition and building relocation work. Protection is the responsibility of the person performing the construction, excavation, remodeling, demolition, or building relocation work. Protection shall be provided for footings, foundations, party walls, chimneys, skylights, roofs, fences and landscaping. Provisions shall be made to control water runoff and erosion during construction, excavation, remodeling, demolition or building relocation activities.

**DCBA IBC Section 3307.1.1 Notification for buildings regulated by the IRC.** The person making or causing an excavation that requires shoring or benching, a demolition requiring a total demolition permit, or relocation shall provide written notice to the owners or homeowner associations of adjoining properties, advising them that the excavation demolition or relocation is to be made, providing contact information for the person doing the excavation, demolition or relocation and that they shall protect adjacent properties as required by the applicable provisions of Chapter 33 of the International Fire Code. Said notification shall be delivered not less than 10 days prior to the scheduled starting date of the excavation, demolition and/or relocation.

ADJACENT PROPERTY OWNER INFORMATION		
Adjacent Property Owner	Name	
	Phone	
	Email	
	Address	
	Signature	
	Date	



PROPERTY LINE

LOT 10

LOT 11

LOT 12

GRADE ELEV. = 0'-0"

SOIL TYPE: C  
EXCAVATION SLOPE:  
1 VERTICAL TO  
1.5 HORIZONTAL

TOP OF EXCAVATION

BOTTOM OF EXCAVATION

DEPTH OF EXCAVATION  
ELEV. = (-) 9'-0"

EDGE OF FOOTING

ADJACENT  
STRUCTURE

ADJACENT  
STRUCTURE

PROPERTY LINE

STREET NAME



**EXAMPLE 1 -  
EXCAVATION PLAN**

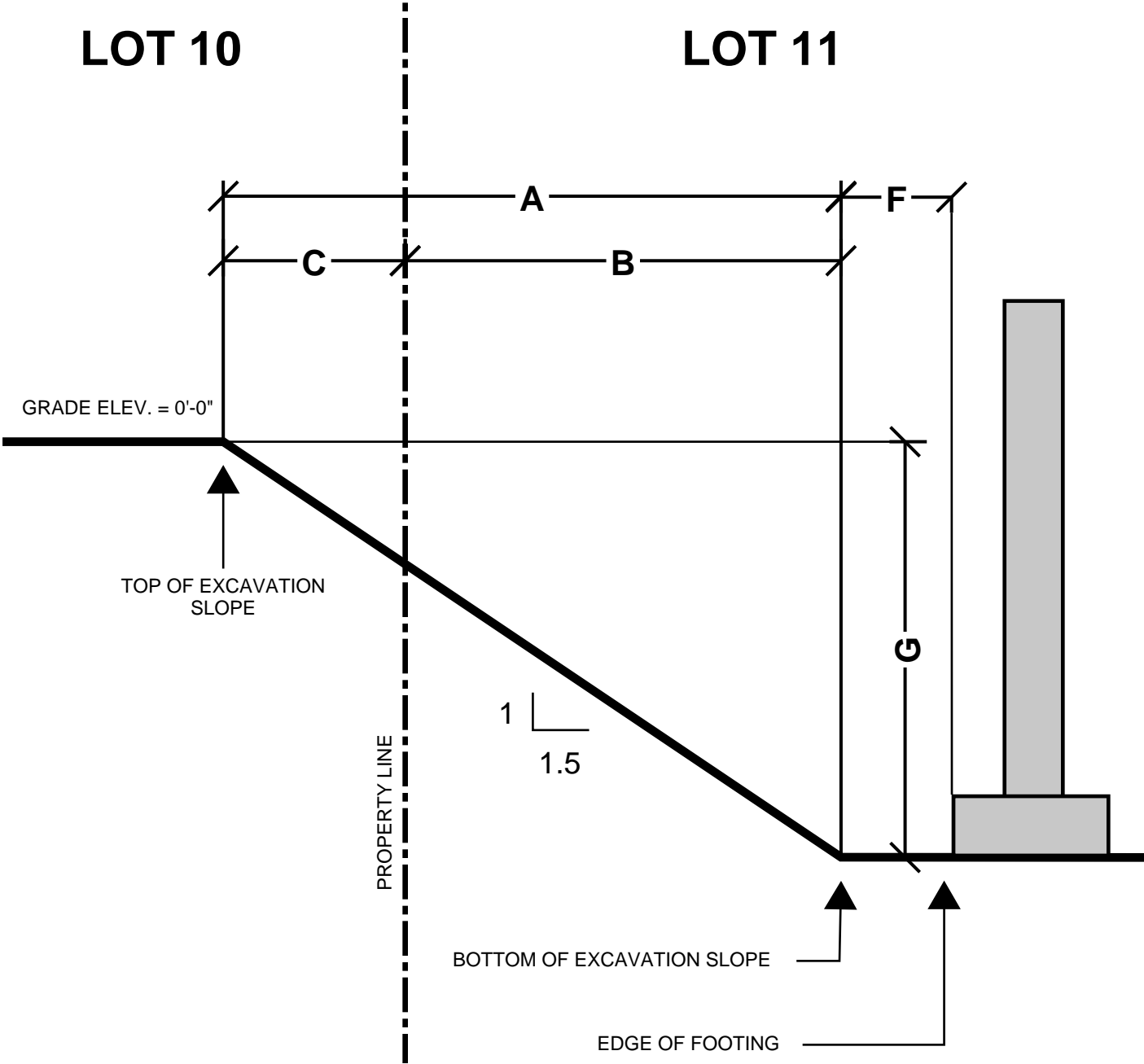
ADDRESS  
SCALE:

**DIMENSION LEGEND:**

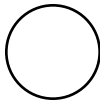
- A - TOP OF EXCAVATION TO BOTTOM OF EXCAVATION = DEPTH OF EXCAVATION X 1.5 HORIZONTAL
- B - BOTTOM OF EXCAVATION TO PROPERTY LINE
- C - PROPERTY LINE TO TOP OF EXCAVATION
- D - TOP OF EXCAVATION TO STRUCTURES WITHIN 10 FEET OF EXCAVATION

LOT 10

LOT 11



**EXAMPLE 1 - SECTION E-E**



ADDRESS SCALE:

**DIMENSION LEGEND:**

- A - TOP OF EXCAVATION TO BOTTOM OF EXCAVATION = DEPTH OF EXCAVATION X 1.5 HORIZONTAL
- B - BOTTOM OF EXCAVATION TO PROPERTY LINE
- C - PROPERTY LINE TO TOP OF EXCAVATION
- F - BOTTOM OF EXCAVATION TO EDGE OF FOOTING
- G - DEPTH OF EXCAVATION

PROPERTY LINE

**LOT 10**

**LOT 11**

**LOT 12**

GRADE ELEV. = 0'-0"

VERTICAL CUT =  
4'-0" OR LESS

TOP OF EXCAVATION

DEPTH OF EXCAVATION  
ELEV. = (-) 4'-0"  
OR LESS

EDGE OF FOOTING

ADJACENT  
STRUCTURE

ADJACENT  
STRUCTURE

**E**

**E**

**B**

PROPERTY LINE

**STREET NAME**



**EXAMPLE 2 -  
EXCAVATION PLAN**

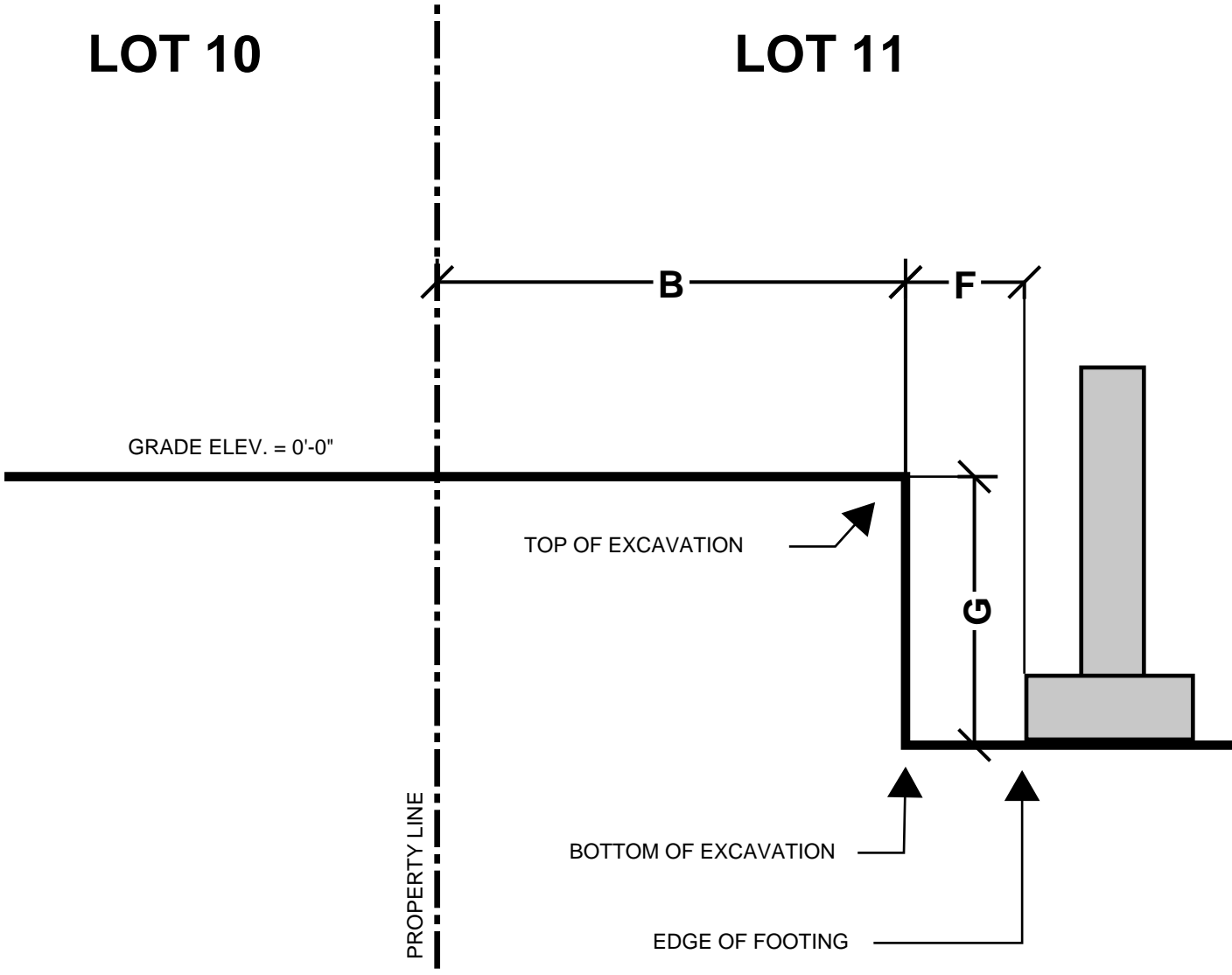
ADDRESS  
SCALE: NTS

**DIMENSION LEGEND:**

- B - TOP OF EXCAVATION TO PROPERTY LINE
- D - TOP OF EXCAVATION TO STRUCTURES WITHIN 10 FEET OF EXCAVATION

LOT 10

LOT 11



VERTICAL CUTS 4'-0" OR LESS ARE PERMITTED IF THE DISTANCE FROM THE PROPERTY LINE TO THE TOP EDGE OF THE EXCAVATION CUT IS GREATER THAN OR EQUAL TO THE DEPTH OF EXCAVATION.

**EXAMPLE 2 - SECTION E-E**



ADDRESS  
SCALE: NTS

**DIMENSION LEGEND:**

- B - TOP OF EXCAVATION TO PROPERTY LINE
- F - VERTICAL EXCAVATION CUT TO EDGE OF FOOTING
- G - DEPTH OF EXCAVATION = 4'-0" OR LESS