

## **DIVISION 31—EARTH MOVING**

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### **FORMAT**

1. Technical specifications content and numbering system shall be based on CSI 2004 MasterFormat.

### **BASIS OF DESIGN**

1. BGSU Design standards shall not replace fully developed, project and market specific technical specification. Architect/Engineer (A/E) shall utilize the Standards as a minimum standard to guide the design and execution in the field. Exceptions to these standards are allowed provided they are approved by Design & Construction.

### **RELATED SECTIONS**

1. 02-Existing Conditions
2. 33-Utilities

### **GENERAL PROVISIONS**

1. A/E shall conduct geotechnical analysis in coordination with the University to determine the extent of rock presence. Coordinate with the University representative the best method to ascertain the amount of rock to be expected during excavation.
2. In the interest of limiting over-excavation of rock, A/E shall ensure contractor identifies areas where rock needs to be removed and regularly review rock removal documentation verified by a third party testing agency employed by the University or the A/E.

### **31 23 16—ROCK REMOVAL**

1. The following section shall be conspicuously incorporated into the construction documents:
  1. Rock excavation shall consist of the following:
    - a. Solid rock
    - b. Non-fracturable materials that cannot be removed without systematic drilling, blasting or grinding, such as rock materials in ledges or aggregate conglomerate deposits that are so firmly cemented as to possess the characteristics of solid rock.
    - c. Removal and disposal of boulders one (1) cubic yard or larger in dimension.
    - d. Hard and compact materials such a cemented gravel, glacial till, and relatively soft, fracturable or disintegrated rock that can be removed without continuous and systematic drilling,

blasting or grinding will not be considered as rock excavation.

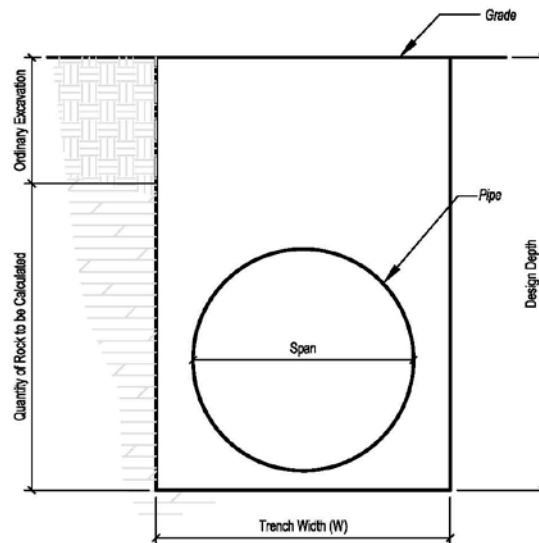
- e. Measurement of rock depth shall take place before pipe, conduit, duct bank, and stone bedding is installed.
- f. **Contractor shall daily coordinate the measurements of rock quantities with a third party testing agency hired by the A/E or the University. Should this coordination be neglected, the University will pay only for ordinary excavation.**

## 2. Sanitary, Storm, Steam, Etc.

- a. In determining the width of trenching through rock, for the purpose of calculating quantity of rock removed for billing purposes, contractor shall use the following formula and diagram, which shall be incorporated conspicuously into the construction documents:<sup>†</sup>

WIDTH (W) in ft
$1.33 \times \text{SPAN}^*$

\*Conduit span is the horizontal distance from the outside wall or outside corrugation measured at the widest point of the conduit.



- b. Rock and soil conditions may vary.

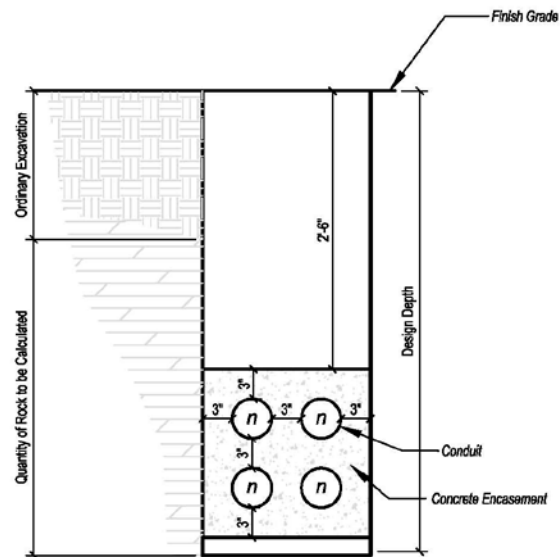
<sup>†</sup>Adapted from State of Ohio Dept. of Transportation, Office of Structural Engineering, Drawing DM-1.4, April 21, 2006.

## 3. Concrete Encased Communications Conduit

- a. In determining the width of trenching through rock, for the purpose of calculating quantity of rock removed for billing purposes,

contractor shall use the following formula and diagram, which shall be incorporated conspicuously into the construction documents:

DEPTH	WIDTH
$30'' + n(x) + 3(x)$	$n(x) + 3(x)$



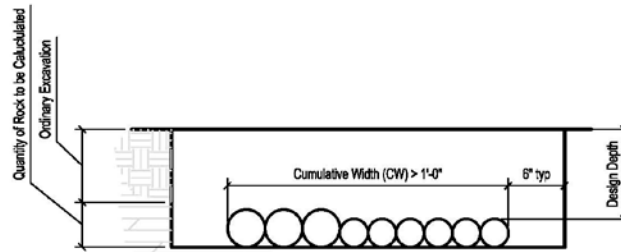
b. Quantity and dimension of conduits, rock and soil may vary.

#### 4. Electrical Conduit

- The minimum width of a trench for electrical conduit shall be 1'-0". If the cumulative width and engineered separation of conduit lying side by side exceeds 1'-0", then width of trench shall be increased by 1'-0".
- Contractor may, with the A/E's or University's approval "stack" conduit and make the trench deeper rather than making it wider.
- In determining the width of trenching through rock, for the purpose of calculating quantity of rock removed for billing purposes rock removal shall be calculated, which shall be incorporated conspicuously into the construction documents.

<b>IF CUMULATIVE WIDTH OF CONDUIT EXCEEDS 1'-0":</b>
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$CW + 1'-0"$
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d. Quantity and dimension of conduits, rock and soil may vary.

#### 5. Structures

- a. For excavation for structures, excavation shall be limited to the outer edge and bottom of the foundation, spread footer, grade beam, etc. The following statement shall be conspicuously incorporated into the construction documents:

“Contractor shall limit excavation to outer edges and bottoms of foundation.”

End of Section