

Unit 6

00300 Roadwork



00300 – Roadwork

- Removal of Structures and Obstructions (310)
- Clearing and Grubbing (320)
- Earthwork (330)
- Subgrade Stabilization (331)
- Geosynthetic Installation (350)



Unit 6 Topics:

- Differentiate between clearing and grubbing and removal of structures and obstructions
- Differentiate between embankment and excavation requirements
- Lift thickness requirements
- Earthwork compaction requirements
- Subgrade stabilization
- Geosynthetics requirements



00310 – Removal of Structures and Obstructions

00310.00 Scope

- Guardrails, barrier, inlets, and curbs
- Buildings – concrete floors, slabs, and walls
- Other man-made objects



00310 – Removal of Structures and Obstructions

00310.40 Construction

- Guardrail / barrier protection
- When abutting work is to remain, make saw cuts to prevent damage
- Remove obstructions at least two feet below subgrade
- Scarify pavements
- Breakup slabs and walls



00310 – Removal of Structures and Obstructions

- Unanticipated structures
 - Stop work in area
 - Contact Engineer



00310 – Removal of Structures and Obstructions

00310.80 Measurement

00310.90 Payment

- **Lump Sum Basis** – No measurement of quantities will be made.
- **Separate Item Basis** – Quantities of work performed will be measured either on a length and area or each basis.
- No separate or additional payment will be made for barriers used for temporary protection where guardrail or barriers have been removed



00320 – Clearing and Grubbing

00320.00 Scope

- Removing and disposing of vegetation and buried matter.
- Preserving the vegetation and objects designated to remain in place.



00320 – Clearing and Grubbing

00320.40 & 00320.41 Operations

- Trim Trees
 - 20' over roadway surface
 - 8' over sidewalks
- Grub to 6" below ground
- All matter and debris accumulated become the property of the Contractor.



00320 – Clearing and Grubbing

00320.80 Measurement

00320.90 Payment

- **Lump Sum Basis**
No measurement will be made.
- **Area Basis**
Measurement will be the ground surface, limited to the area shown.



00330 – Earthwork

00330.00 Scope

Consists of excavation, embankment, ditching, backfilling, grading, leveling, and other earthwork required for construction of the project.



00330 – Earthwork

00330.10 Materials

- Selected materials
- Native materials
- Stone embankment



00330.20 Equipment

- Tamping foot rollers
- Vibratory rollers



0330.30 Labor

- CEBT and CDT



00330 – Earthwork

00330.40-41 Construction

▪ **Excavation, Preparation**

- Protect existing surfacings
- Sawcut existing pavement
- Remove unsuitable materials
- Avoid detrimental operations
- Disposal permit



00330 – Earthwork

00330.41 Construction (continued)

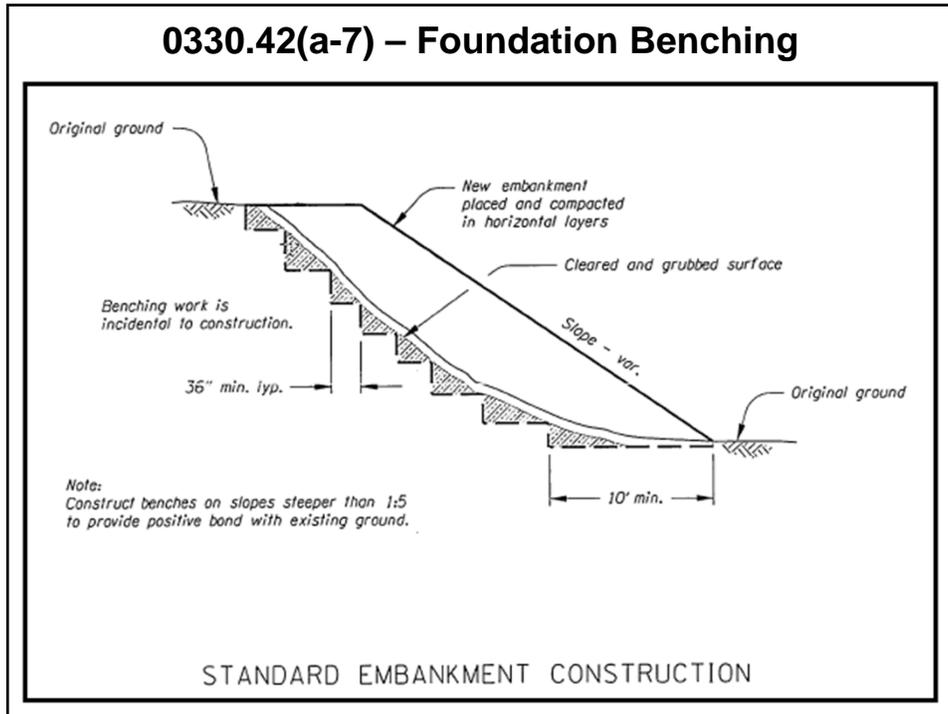
- **Excavation, Types**
 - General
 - Foundation
 - Toe trench
 - Borrow



00330 – Earthwork

- **Embankment, Preparation**
 - Unstable areas
 - Foundation benching
 - Excessive moisture





00330 – Earthwork

00330.42(c) Embankment Construction

- **330.42(c-1)** General embankment material
 - Place fills in nearly horizontal 8-inch lifts
- **330.42(c-2)** For materials with up to 50% durable rock
 - Sort material to place in 8-inch lifts or isolate larger rocks to provide adequate compaction around fragments



00330 – Earthwork

00330.42(c) Embankment Construction (continued)

- **330.42(c-2-d)** For materials with more than 50% durable rock
 - Manipulate rocks to minimize voids and form dense mass
 - Lift thickness may be increased to 15 inches
 - If percent passing the #200 is visibly less than 20%, rock fragment size and lift thickness may be increased to average maximum size of rock, but not to exceed 36 inches
- **330.42(c-2-e)** for materials with nondurable rock
 - Pulverize nondurable rock to 12 inches and place in 12-inch horizontal lifts



00330 – Earthwork

**00330.42(d)
Stone Embankment Construction**

Rock fragments larger than 15 inches but no larger than 36 inches may be incorporated

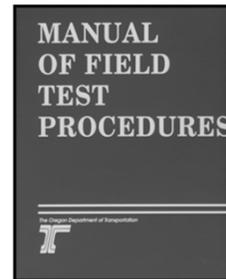
- Material in upper foot embankments or within 1 foot of culvert shall not exceed 3 inches in size
- Deflection test according to ODOT TM158



00330 – Earthwork

00330.43 Earthwork Compaction

- Earthwork compaction tested according to MFTP
- Moisture-density testable materials
 - Route hauling trucks over full width of the embankment area
 - Deflection testing according TM 158
 - Density/moisture



00330 – Earthwork

00330.43 Construction (continued)

- Non-moisture-density testable materials
 - Check Special Provisions
 - 12-inch nearly horizontal lifts
 - Compact each layer with a minimum of four full coverages
 - Deflection test TM 158



00330 – Earthwork

00330.80 Measurement

Earthwork will be measured as follows:

Volume Basis

based on the Agency's digital terrain model (DTM).



00330 – Earthwork

00330.81 Measurement

- Excavation will be measured as follows:
Measured in their original position BEFORE excavation.
- The following items will be measured on excavation basis:
 - Borrow excavation
 - Ditch excavation
 - Foundation excavation
 - General excavation
 - Toe trench excavation



00330 – Earthwork

00330.82 Measurement

- Embankment will be measured as follows:
Measured in their final embankment position. Measurement will be limited to lines, grades, and slopes of the **ORIGINAL** ground contours established before the Contractor begins any work on the project.
- The following items will be measured on embankment basis:
 - Embankment in place
 - Stone embankment
 - Extra for selected _____ material

00330 – Earthwork

00330.90 Payment

The accepted quantities of earthwork performed under this section will be paid at the contract unit price, per unit of measurement, for each item that appears in the contract Bid Items.

What is the basis of performance for earthwork on contract 14785? excavation or embankment project?

Verify in Special Provisions



00331 – Subgrade Stabilization

00331.00 Scope

This work consists of:

- Remove unstable materials
- Replace with stone embankment and/or aggregate as shown or directed



00331 – Subgrade Stabilization

00331.10 Materials

- Aggregate base
- Aggregate subbase
- Stone embankment
- Subgrade geotextile, Certification Level B
- Water



00331 – Subgrade Stabilization

00331.40 Construction

- Excavate as shown or directed
- Orient geotextile parallel to roadway centerline
- No deflection, or yielding under compactor



00331 – Subgrade Stabilization

00331.80 Measurement

Measure and compute:

- By area to full depth as shown
- If other than depth shown, adjusted to a proportionate volume

00331.90 Payment

- Excavation, geotextile, and backfill material are incidental
- Include a drawing and/or spreadsheet with paynote



00331 – Subgrade Stabilization
Class Example for converting to equivalent area

Given: Plan depth 24 inches

Scenario: Contractor performs subgrade stabilization on an area that is 25 feet wide, 75 feet long, and at a depth of 36 inches.

Question: What is the Payable area?



00331 – Subgrade Stabilization
Class Example Solution

Excavation Area: 25' wide x 75' long = 1875 ft²

Proportional Depth: $\frac{\text{Actual}}{\text{Given(assumed)}} = \frac{36''}{24''} = 1.5$

Subgrade Stabilization Area:

$$1875 \text{ ft}^2 \times 1.5 = 2812.5 \text{ ft}^2$$

$$\text{Switch to yd}^2 = 2812.5 \text{ ft}^2 / 9 = 312.5 \text{ yd}^2$$

Answer: 312.5 yd²



00350 – Geosynthetic Installation

00350.00 Scope

Drainage, embankments, pavements, rip rap, etc.



00350.10 Materials

Furnish materials meeting requirements of Section 02320.

- **Filtration:** Drainage, rip rap, sediment fence
- **Separation:** Subgrade
- **Reinforcement:** Embankment, pavement overlay



00350 – Geosynthetic Installation

00350.41 Construction

- “Loosely” place fabric on smooth surfaces.
- On slopes, “roof-lap” starting at the bottom and proceed upwards. “Cap” top of slope
- Overlap according to 00350.41(a-2)



00350 – Geosynthetic Installation

00350.41 Construction (continued)

- Protect Fabric
 - From UV rays (cover within 5 days)
 - Do not end dump directly onto fabric
 - No traffic on uncovered fabric



00350 – Geosynthetic Installation

00350.80 Measurement

00350.90 Payment

- Payment will be in full for furnishing and placing all materials, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified.
- No payment for construction laps, seams, joints, or repair patches.



Key Inspection Points

- Look for soft spots in subgrade
- Perform informal deflection testing
- Identify maximum depth and limits of stabilization.
Do it once, do it right
- Keep project site stable
- Diligence on geosynthetic measurement
- Estimate quantities of excavation or embankment
- Resolve quantity discrepancies as soon as possible



Unit 6 Review:

- ✓ Clearing and grubbing and removal of structures and obstructions
- ✓ Embankment and excavation requirements
- ✓ Earthwork compaction requirements
- ✓ Subgrade stabilization requirements
- ✓ Geosynthetics requirements

