

TERRACE

(600)

I. GENERAL

A. References

1. EFM, Chapters 2 and 8
2. Section IV of the Oklahoma Field Office Technical Guide (Conservation Practice Standards and General Specifications 600, 412 and 620).
3. Oklahoma Job Sheet JS600-1
4. Revised Universal Soil Loss Equation (RUSLE) Handbook
5. NEM, Part 503 & OK Part 503 (Engineering Activities Affecting Utilities)
6. Section V of the Oklahoma Technical Guide (CPPE-600)

II. INVESTIGATIONS AND SURVEYS

A. Design Investigations

1. Soils map.
2. Conservation plan for need, type, CP_f factor, T/K factor, and extent of terraces.
3. Location of all utilities.
4. Locations of adequate outlets considering erosion, sedimentation, and drainage and laws related to these factors. Watershed basin changes due to terrace installation should be avoided, but if found to be necessary will require proper permissions and permits.
5. Cultural Resources

B. Design Surveys

1. Gradient, level closed-end, and level open-end terraces
 - a. Design survey is usually combined with layout survey. All supplementary design surveys should be put on field notes.
 - b. Topographic detail for design purposes (where needed).
2. Parallel terraces
 - a. Make a topographic survey of the area to be terraced in order to plot a contour map on a scale of 1" = 100 or 200 ft. Set permanent stakes on 100' centers over the areas likely to need grading.
 - b. On small parallel terrace systems where a topographic map is not considered necessary for design, the design survey is usually combined with layout surveys. All supplementary design information (surveys, etc.) should be on field notes, CADD files, or worksheets.

C. Environmental Inventory

NEPA inventory of resources –

1. Document inventory and Conservation Practice Physical Effects (CPPE) as per Oklahoma NRCS requirements. Complete CPA-52.

TERRACE

(600)

III. DESIGN

A. Design Data

1. Gradient, level closed-end, and level open-end terraces - including small parallel terrace systems as needed for terrace design.
 - a. Land slope above each proposed terrace.
 - b. Vertical and/or horizontal interval for spacing for each terrace using RUSLE Handbook, formulas, and tables in the Standard for Terraces (600).
 - c. Planned terrace dimensions, grades, and lengths.
 - d. Design approved by someone with appropriate engineering job approval authority.
2. Parallel terrace system - where topographic map is used for design.
 - a. Land slope above each proposed terrace.
 - b. Vertical and/or horizontal interval for spacing for each terrace using RUSLE2 (or current) Handbook, formulas, and tables in Standard for Terraces (600).
 - c. Planned terrace dimensions, grades, and lengths.
 - d. Show layout of terrace system superimposed on topography map showing terrace interval, alignment, spacing, planned cropping equipment width, etc.
 - e. Design approved by someone with appropriate engineering job approval authority.

IV. CONSTRUCTION PLANS AND SPECIFICATIONS

A. Construction Specifications – Record on OK-ENG-18.

1. Gradient, level closed-end, and level open-end terraces - including small parallel terrace systems. Most of the following can be obtained and documented during the layout survey:
 - a. Location map with legal description and conservation plan information.
 - b. Plan view sketch with terrace numbers, direction of planned water flow, and waterways or outlets.
 - c. Terrace kinds (level, gradient, parallel, etc.)
 - d. Design slopes of terraces.
 - e. Vertical and/or horizontal intervals of terraces.
 - f. Grade by section of terraces.
 - g. Estimated length of terraces.
 - h. Planned terrace dimensions.
 - i. Safety involving utilities - OK-ENG-45 to be completed as required under OK Part 503 of the National Engineering Manual.

TERRACE

(600)

2. Parallel Terraces.
 - a. Location map with legal description and conservation plan information.
 - b. Include parallel terrace topography map with OK-ENG-18 showing terraces and pertinent elevations. Delineate odd areas. Show terrace numbers, direction of planned water flow, and waterways or outlets. Show row spacing used in design, turn row strips and farm roads as needed.
 - c. Design slopes of terraces.
 - d. Vertical and/or horizontal intervals of terraces.
 - e. Grade by section of terraces.
 - f. Estimated length of terraces.
 - g. Planned terrace dimensions.
 - h. Safety involving utilities - OK-ENG-45 to be completed as required under OK Part 503 of the National Engineering Manual.

V. LAYOUT

- A. **Layout surveys** - record in field notes and on OK-ENG-18 as appropriate.
 1. Stake centerline of channel (or ridge on ridge-type terraces) or other baseline alignment stakes using flags or 1" X 2" wooden stakes.
 2. Basic structural staking - as required for fills and cuts not normally included in baseline staking (i.e.: extra cut sections, etc.).
- B. **Quantities** - final quantities are based on staked lines and grades or approved changes.

VI. COMPLIANCE CHECKING

- A. **Compliance checking** - record in field notes and on OK-ENG-18 as appropriate.
 1. Profile notes of channel and ridge and cross sectional notes for at least one terrace in each group of terraces constructed at the same time in a field. Check the terrace that appears to be the weakest or lowest in height. Do not select a fill section. Record and plot the profile of the channel and ridge for the entire length of the terrace. The cross section shall be taken at the weakest section and shall extend from normal ground above the terrace to normal ground below the terrace ridge. In addition to minimum requirements for recorded data, the person doing the checking will run profiles and cross sections of as many terraces or parts of terraces as considered necessary to determine that the entire terrace system meets specifications. Use additional copies of page 2 of the OK-ENG-18 for additional cross sections or profiles.
 2. Compute channel cross-sectional area and record.
 3. Check ridge height, terrace width, and channel grades for the selected terraces.

TERRACE

(600)

4. If minor cuts or fills are needed to complete the terraces, show on the profile the section needing work. Initial and date when the work has been completed.
5. List in remarks a statement as to the adequacy of outlet protection when appropriate.
6. Record height of any blocks used in the terrace system.
7. Denote size, slope, and type of underground outlets where applicable.
8. Measure constructed length of each completed terrace to the nearest one foot, use measuring wheel, chain, tape, or other approved method. If accurate measurements of terrace lengths were established during terrace layout, these recorded lengths can be used for compliance checking.
9. Statement of compliance - Form OK-ENG-18 shall be dated and signed by the employee who has appropriate construction approval authority to determine that the practice meets specifications.

B. Compliance checking for terrace reconstruction or removal of terraces – record the following on the OK-ENG-18, on a copy of the plan map, or in a field note book depending on needs.

1. Terrace reconstruction – documentation to justify the need to reconstruct. This could be any of the following:

- Location of terrace breaches,
- Height of terrace ridge above channel,
- Cross section of terrace channel with computed capacity,
- Measurements of spacing between terraces,
- Profile of channel,
- Adequacy of outlets.

The length of each terrace to be reconstructed is to be recorded on the OK-ENG-18.

2. Terrace removal – Sketch showing terraces or portions of terraces to be removed, length, normal land slope, and sufficient data to document need for removal. Certification of removal requires enough profiles of land slope to show that the removal meets specifications.

VII. OPERATION AND MAINTENANCE

A. Operation and Maintenance Plan for Terraces

1. Complete O&M 600 and provide a copy to the producer or landowner.
2. Note any site specific recommendations for the installation on the second page of O&M 600.
3. Provide documentation to the file that O&M 600 was provided to the producer or landowner.