East Turlock Subbasin GSA

IMPLEMENTATION STANDARDS AND MANAGEMENT PRACTICES
FOR GENERAL EARTHWORK

Overview

Description

Earthwork is the term for excavating, moving, ripping, and/or compacting soil for site preparation or feature construction to support Multi-Benefit Land Repurposing Projects. Earthwork may include, but is not necessarily limited to, berm construction, excavation, ditching, backfilling, contouring, ripping, road construction and cut-fill operations. These East Turlock Subbasin Groundwater Sustainability Agency (ETSGSA) *Implementation Standards and Management Practices for General Earthwork* cover: Benefits and Objectives, Applicable Land Repurposing Practices, Requirements, Best Practices and Guidelines, and References.

ETSGSA reserves the right to update these *Implementation Standards*.

Benefits and Objectives

General Earthwork may be required to achieve the benefits and objectives of various land repurposing strategies. The benefits of General Earthwork vary depending on the application objective(s) of the project the earthwork supports (the Project). Benefits of earthwork may include, but are not necessarily limited to, supporting the following:

- Modification of surface hydrology resulting in flood flow spreading, floodplain connection, improved runoff retention, flood flow attenuation, enhanced recharge and improved habitat quality;
- Construction of water management facilities that facilitate delivery and use of surface water for irrigation or recharge;
- Deep ripping to improve percolation of surface water for recharge; and
- Contour grading to promote natural hydrology, surface stability and vegetation development.

Applicable Land Repurposing Strategies

These *Implementation Standards and Management Practices for General Earthwork* are supplemental standards that apply to the construction and maintenance of various land repurposing strategies as part of a Project, including, but not necessarily limited to, the following:

- Rewilding;
- Flood flow dispersal;
- Floodplain reconnection;
- Basins; and
- Ponds

Additional requirements for these strategies are presented in their respective *Implementation Standards and Management Practices*.

Requirements

General

Unless otherwise indicated, these Requirements apply to General Earthwork implemented by an Owner or Operator or their contractor for MLRP or other projects under one or more of ETSGSA's incentive programs. General Earthwork implemented by an Owner or Operator that is not covered by an agreement under ETSGSA's incentive programs is not covered by these Requirements.

Unless otherwise indicated, all requirements listed herein are the responsibility of the Owner or Operator. Specifically, an Owner or Operator implementing General Earthwork as part of a Project shall be solely responsible for:

- All earthwork design, implementation and the stability of the resulting surfaces, cuts and fills;
- Performance monitoring and maintenance, as may be required;
- Safety and environmental protection during and after the work;
- Control of dust emissions;
- Control of erosion and sedimentation in accordance with a Storm Water Pollution Prevention Plan (SWPPP); and
- Maintaining the land in a condition that does not create a nuisance as a result of, but not necessarily limited to: fire danger, dust emissions, erosion, spread of noxious weeds and invasive plants, spread of plant or vector-borne diseases, or pests.

This supplemental standard supports various land repurposing strategies. Refer to the respective ETSGSA *Implementation Standards and Management Practices* for those strategies for information on Requirements associated with those activities.

Site Review

The following Requirements related to Site Review apply to General Earthwork implemented as part of project:

- Applicable regulations require utilization of Dig Alert to identify and demarcate any existing underground utilities within 5 feet of any proposed excavation or deep ripping. Notification of Dig Alert for work on private agricultural properties may not yield meaningful results; however, it is required for construction projects. In addition, under this Implementation Standard, known subsurface utilities within 50 feet of the proposed earthwork should be identified by the Owner or Operator, shown on a site plan and demarcated in the field.
- Earthwork encompassing more than 1 acre is subject to the requirements of the National Pollution Discharge Elimination System (NPDES) General Construction Stormwater Permit. The site will require review by a Qualified Stormwater Designer (QSD) to evaluate the extent and nature of ground disturbing activities and site drainage and soil characteristics, and develop a Construction SWPPP, including the deployment of Best Management Practices (BMPs) to prevent erosion and sedimentation during earthwork construction activities.

- The Owner or Operator, or their engineer or contractor, shall inspect the surface conditions, vegetation, drainage, topography and soil conditions in the earthwork area, and identify any areas where soils appear unstable or prone to erosion or sedimentation, or where earthwork may impinge upon natural drainages, ponds, or other aquatic habitat. These features shall be considered during the development of plans for the proposed earthwork, and may require review by a qualified professional.

Planning and Design

The following general design Requirements shall apply for all General Earthwork:

- For MLRP projects that are part of an active agricultural operation, it is assumed that the Owners or Operators may possess sufficient knowledge and expertise to design and implement their own earthwork projects. Alternatively, the Owners or Operators may choose to retain a qualified contractor or engineer to perform these services.
- Design plans shall be developed for the Project, with the level of detail commensurate with the complexity or sensitivity of the Project. Plans shall include, at a minimum, maps illustrating the location and extent of earthwork areas, combined with sections as needed to illustrate the dimensions of all earthwork included in the Project.
- The design plans shall be accompanied by an estimate of the quantities of earthwork (areas and/or volumes).
- Designs shall be developed to avoid underground utility conflicts.
- If the earthwork area is more than 1 acre in size, the design plans shall include a SWPPP with plans showing the locations of all dust and erosion control BMPs and accompanying notes.
- Plans shall be included for surface stabilization after completion of ground disturbing activities through planting, mulching or other means.
- Access to water shall be adequate for moisture conditioning and dust control.
- The plans shall account for the disposal or use of any removed organic materials or excess soil.
- The Owner, Operator or their contractor shall be responsible to assure that adequate plans are in place to address construction site and excavation safety, security, personal protective equipment, first aid, fire protection, hazard communication, first responder coordination, and routes to off-site medical facilities.

Environmental Compliance and Permitting

Environmental compliance and permitting requirements for the land repurposing strategies supported by this supplemental standard are described in the *Implementation Standards and Management Practices* for those strategies. The following requirements apply specifically to General Earthwork:

- Water retention berms or embankments shall be designed to avoid being so large that they become classified as a dam as defined by California Water Code Division 3 Part 1 (Sections 6000-6009), as may be amended.
- Earthwork encompassing more than 1 acre is subject to the requirements of the NPDES General Construction Stormwater Permit. Specific environmental compliance requirements associated with this permit include the following:

- Preparation of Storm Water Pollution Prevention Plan (SWPPP) by a Qualified Stormwater Designer (QSD);
- Implementation of Best Management Practices (BMPs) that prevent erosion and sedimentation during construction;
- Periodic construction monitoring by a Qualified Stormwater Professional (QSP) to monitor the implementation of BMPs, especially during runoff-producing storm events;
- Stabilization of disturbed areas after the completion of construction;
- Documentation and reporting of field activities; and
- Permit closure.

Earthwork Requirements

The following requirements shall apply to General Earthwork under ETSGSA's MLRP.

Surface preparation

- Surfaces to receive fill shall be prepared by grubbing and stripping to remove vegetation and organic materials, and cutting level surfaces to receive the fill, including benches, if necessary.
- Surfaces to receive structural fill (such as berms, dams, embankments or pads) shall be scarified to a depth or at least 6 inches, moisture conditioned to near optimum moisture levels for compaction, and compacted by mechanical means to at least 90 percent relative compaction.[1]

Fill

- Structural fill shall consist of clean soil containing no more than 2% organic material and preferably predominantly granular in texture. Heavy clays should be avoided, if possible.
- Fill should be moisture conditioned to near optimum moisture content for compaction, placed in uniform lifts not exceeding 6 inches in uncompacted thickness, and compacted by mechanical means to at least 90 percent relative compaction. For fills exceeding 5 feet in thickness, the portion that is more than 5 feet below the finished surface shall be compacted to at least 95 percent relative compaction.

Slopes

- Temporary cut slopes may be cut vertically if less than 2 feet in height. Temporary cut slopes exceeding 2 feet in height should be cut at inclinations no steeper than ½:1 (horizontal:vertical) or 1:1 (horizontal:vertical), depending on soil conditions.
- Permanent cut or fill slopes shall not exceed inclinations of 2:1 (horizontal:vertical).

Roads and Pads

- Roads and pads shall be constructed on prepared surfaces as indicated above.
- Structural fill for roads and pads shall consist of predominantly granular material, if possible.

[1] "Relative compaction" as used herein refers to maximum dry density determined in accordance with ASTM Test Designation D1557; however, it is not expected that fills placed for the purpose of MLRP projects on agricultural land would be tested, unless deemed necessary by the Owner's or Operator's contractor or engineer.

- Road surfaces may be graded to drain inboard, outboard or be crowned. Surface slopes of at least 2.5 percent shall be maintained to promote positive drainage.
- Roads with inboard drainage shall be equipped with culverts or water bars spaced along the road to pass drainage to downslope areas.

Surface Stabilization

- Cut or fill slopes shall be stabilized by one or more of the following methods:
  - Track rolling perpendicular to the slope;
  - Mulching; and/or
  - Planting with a conservation, native or beneficial seed mix.
- Areas of concentrated drainage may require armoring using one of the following methods:
  - Gravel lag;
  - Suitably sized rip-rap;
  - Gabions;
  - Cellular geotextile confinement systems;
  - Check dams; or
  - Other suitable methods selected based on site-specific conditions

Maintenance

The following additional maintenance Requirements shall apply to General Earthwork, as applicable to the Project's design:

- The Owner or Operator shall conduct regular routine inspections and as-needed maintenance or repair of earthwork so the components of the Project retain their intended function(s), including water infiltration, water retention, and/or water impoundment, as applicable.
- Maintenance may include, but is not necessarily limited to: removal of sediment or debris, repair of erosion, repair of failed slopes or fills, replacement of slope stabilization materials, and regrading of roads.

Monitoring

Not Applicable to General Earthwork portions of the Projects.

Reporting

It is the responsibility of the Owner or Operator to ensure that all reporting required by any permits issued for the Project is conducted. In addition, any earthwork failures that affect the intended function of a Project component shall be reported to ETSGSA. Refer to the respective ETSGSA *Implementation Standards and Management Practices* for Project type of which the General Earthwork is a part for information on other reporting requirements.

Best Practices and Guidelines

General

The following additional best practices and guidelines for General Earthwork Projects may be considered, but are not required:

- Design plans for General Earthwork may include additional specifications and details related to earthwork, excavation, and grading. The design plans may include the following:
  - Description of the work and methods of excavation, soil salvage, and/or debris disposal, as applicable;
  - Plan-view layout map showing the location and extent of earthwork activities (e.g., graded slopes, swale contours, berms);
  - Typical cross-section drawings of earthwork structures (e.g., berms), as applicable;
  - Surface drainage control including a stable outlet or other stormwater management practices to handle runoff;
  - A grading plan showing existing and final proposed grades and specifying cut and fill quantities.
- Avoid reverse grades by removing irregularities and grading short level sections, as applicable.
- United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Conservation Practice Standard (CPS) 462 “Precision Land Forming and Smoothing” may serve as a reference guide for grading plans.
- Grading should aim to balance cut and fill, utilize uniform slopes to the extent possible, and adhere to applicable regulations for acceptable grades and maximum slope lengths.
- General Earthwork design should incorporate the most current NRCS erosion prediction technology and the most current NRCS wind erosion prediction methods, as applicable.

References

United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), 2021. Conservation Practice Standard: Precision Land Forming and Smoothing, Code 462.

West Turlock Subbasin Groundwater Sustainability Agency and East Turlock Subbasin Groundwater Sustainability Agency (WTSGSA and ETSGSA), 2023. Consolidated Final Turlock Subbasin Groundwater Sustainability Plan Program Environmental Impact Report. State Clearinghouse No. 2022010100. March 2023. Available: https://turlockgroundwater.org/peir.