

- F. Fill Samples: Submit 50 lb sample of each type of fill to CDCR's testing laboratory.
- G. Excess Soils Disposal Plan. Submit drawings showing a proposed grading plan for the disposal of material at the on-site soils disposal area. Plans must include dimensions, elevations, slopes, drainage patterns, erosion control methods and materials, and drainage facilities.

1.6 QUALITY ASSURANCE

- A. CDCR will employ and pay for the services of an independent testing laboratory to perform specified testing per CCR Title 24, and any other testing specifically indicated in the Contract Documents to verify compliance with the Contract Documents.
- B. When relative compaction, moisture content, or other material tests indicate that the specified requirements have not been achieved, that portion of the Work must be reworked until the required density, moisture content, or other material property has been attained. Re-testing to show compliance will be at the Contractor's expense.
- C. Where soil material is required to be compacted to a percentage of maximum density, the maximum density at optimum moisture content will be determined in accordance with ASTM D 1557. Field density in-place tests will be performed in accordance with ASTM D 6938, or by such other means acceptable to the Engineer.

1.7 STORAGE AND HANDLING

- A. Cover and protect earth materials stockpiled for use from erosion and contamination.

1.8 ENVIRONMENTAL CONDITIONS

- A. Weather: Protect bearing surfaces under foundations. Should bearing surfaces become softened, excavate to solid bearing and backfill with fill materials as approved by the CDCR Representative, to elevations indicated.
- B. No fill material is to be placed, spread, or rolled if weather conditions increase the moisture content above permissible limits. When work is interrupted by rain, the earthwork operations must stop and not be resumed until conditions allow for fill material to be placed within permissible moisture content limits..

PART 2 PRODUCTS

2.1 MATERIALS

- A. Structural Fill
 - 1. Fill material for structural fill areas may be native materials obtained from onsite excavations, free from organic and inorganic debris. Particle size must not exceed 3 inches in any dimension.
 - 2. Imported materials used in structural fill areas must have a maximum Plasticity Index of 20, a maximum Liquid Limit of 35, and a maximum particle size of 3 inches. When used in pavement areas imported materials must also have a minimum R-value of 25.
 - 3. Representative samples of material to be used for structural fill must be tested to determine the maximum density, optimum moisture content, and classification of the soil.

4. During earthwork operations, soil types other than those identified and/or analyzed in the Geotechnical Report for the project may be encountered. CDCR's Representative will determine the use or disposal of these soils.
- B. Embankments
1. Native, on-site, fine grained materials or imported materials may be used. These materials must be free of organic or other deleterious matter and must not contain lumps or stones larger than 3 inches in maximum dimension. The materials must have a minimum of 30 percent passing the No. 200 sieve and have a plasticity index greater than 20 and less than 30. The use of on-site materials must be approved by the CDCR Representative prior to excavation.
- C. Fill Material for Influence Areas
1. Must meet the criteria for Structural Fill described in 2.1.A, described above.
- D. Drain Rock
1. Conform to Section 68 of the Caltrans Standard Specifications, Class 2 permeable. Material may be obtained and used from on-site excavation with the approval of the CDCR Representative.
- E. Sand
1. Material with 100 percent passing a 3/8 inch sieve, at least 90 percent passing a No. 4 sieve, and a sand equivalent value not less than 30.
- F. Filter Fabric
1. Filter fabric must be a pervious sheet of polyester, polyethylene, nylon, or polypropylene filaments, non-woven, and formed into a uniform pattern. The fabric must have the following minimum properties when measured in accordance with the referenced standard:
 - a. Grab tensile strength, ASTM D1682 140 lbs
 - b. Trapezoidal tear, ASTM D2263 70 lbs
 - c. Mullen Burst, ASTM D751 200 psi
 - d. Permeativity 50 gpm/sf
 2. The filter fabric must be finished so that the filaments will retain their relative positive with respect to each other. The edges of fabric must be finished to prevent the outer material from pulling away from the fabric.
- G. Aggregate Base
1. Aggregate base must be crushed rock aggregate base material meeting the requirements of Section 26 of the Caltrans Standard Specifications for Class 2 Aggregate Base, 3/4-inch maximum.
- H. Topsoil
1. Topsoil material may be selected excavated, crushed material, graded, free of roots, rocks larger than 2 inches, subsoil, debris, and large weeds. Excavated soil from on-site grading operations may be used for topsoil with the approval of the CDCR Representative.

PART 2 PRODUCTS

2.1 GENERAL

- A. Materials shall be furnished as required from on site sources or hauled to the site from off site sources. The use of on-site sources shall be approved by the CDCR representative prior to its use.
- B. The following material types are those considered to meet the requirements specified. Alternate materials and gradations proposed by the Contractor shall be submitted for review and approval by the CDCR representative.

2.2 ENGINEERED FILL

- A. Engineered fill shall be used for structural fill and backfill and trench backfill. Material shall consist of soil excavated on site or hauled to the site from off site sources. It shall be substantially free of organic material, wood, trash, peat and other objectionable material which may be compressible or which cannot be compacted properly. The material to be used must be acceptable to the CDCR representative. Engineered fill shall not contain stones, broken concrete, masonry, rubble or other similar material larger than 2 inches in any dimension, except that native cobbles up to 8-inch maximum dimension are allowed in pipeline trenches provided void spaces are not produced by cobble groups.

2.3 BEDDING AND BACKFILL

- A. Type A: Type A material shall be a clean crushed rock, gravel or sand conforming to the following:

<u>U.S. Standard Sieve Size</u>	<u>Percent by Weight Passing</u>
1-inch	100
3/4-inch	90-100
3/8-inch	20-55
No. 4	0-10
No. 8	0-5

- 1. Type A material shall have a minimum sand equivalent of 30, as determined by CALTEST 207-G.
 - 2. No Type A material shall be used unless it has been accepted by the CDCR representative. Samples of the material shall be submitted by the Contractor a sufficient time in advance of intended use to enable its inspection and testing.
- B. Type B: Type B material shall consist of natural sand obtained from acceptable pits and shall in all cases be washed. The control of washing of fine aggregate shall be such that the finer particles of sand are retained or removed as required. The sand shall be screened through a horizontal vibrating screen having square openings, and the grading of the fine

<u>U.S. Standard Sieve Size</u>	<u>Percent by Weight Passing</u>
1-1/2 inch	100
3/4-inch	30-100
1/2-inch	15-55
No. 4	0-10

1. No Type D material shall be used unless it has been accepted by the CDCR representative. Samples of the material shall be submitted by the Contractor a sufficient time in advance of intended use to enable its inspection and testing.

2.4 CRUSHED ROCK

- A. Crushed rock shall, in general, meet the specifications for course crushed screenings as described in Caltrans Section 37-1.02 and having the following gradation:

<u>U.S. Standard Sieve Size</u>	<u>Percent by Weight Passing</u>
3/4 inch	100
1/2 inch	95-100
3/8 inch	50-80
No. 4	0-15
No. 8	0-5
No. 200	0-2

- B. Crushed rock shall have a minimum sand equivalent of 30.

PART 3 EXECUTION

3.1 CONSTRUCTION

- A. Protection: Provide markers indicating limits of work and clear identification of items and areas requiring protection. Protect persons from injury and protect existing and new improvements from damage caused directly or indirectly by construction operations on adjacent property.
- B. Provide barricades, warning signs, and warning lights around open excavations as necessary to prevent injury to persons.
- C. Clearing and Grubbing: Clearing and grubbing shall consist of the removal and disposal of excess and unsuitable excavated materials, removal and reconstruction of existing fences, buildings, culverts, signs and markers, reestablishing existing drainage ditches and facilities, and all other items incidental to the construction of the pipelines and structures, as shown on the Plans or as herein specified.