



Project Manual

Increment One

HERITAGE HIGH SCHOOL, New Classroom Buildings

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PROFESSIONAL SEALS AND DSA IDENTIFICATION STAMP



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DOCUMENT 00 0110

TABLE OF CONTENTS

00 0101 - COVER
00 0107 - PROFESSIONAL SEALS AND DSA IDENTIFICATION STAMP
00 0110 - TABLE OF CONTENTS
00 0115 - LIST OF DRAWINGS

TECHNICAL SPECIFICATIONS

DIVISION 01 - GENERAL REQUIREMENTS

NOT USED

DIVISION 02 - EXISTING CONDITIONS

NOT USED

DIVISION 03 - CONCRETE

NOT USED

DIVISION 04 - MASONRY

NOT USED

DIVISION 05 - METALS

NOT USED

DIVISION 06 - WOOD, PLASTICS AND COMPOSITES

NOT USED

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

NOT USED

DIVISION 08 - OPENINGS

NOT USED

DIVISION 09 - FINISHES

NOT USED

DIVISION 10 - SPECIALTIES

NOT USED

DIVISION 11 - EQUIPMENT

NOT USED

DIVISION 12 - FURNISHINGS

NOT USED

DIVISION 13 - SPECIAL CONSTRUCTION

NOT USED

DIVISION 14 - CONVEYING EQUIPMENT

NOT USED

DIVISION 15 THROUGH DIVISION 20

NOT USED

DIVISION 21 - FIRE SUPPRESSION

NOT USED

DIVISION 22 - PLUMBING

NOT USED

DIVISION 23 - HEATING VENTILATING AND AIR CONDITIONING (HVAC)

NOT USED

DIVISION 25 - INTEGRATED AUTOMATION

NOT USED

DIVISION 26 - ELECTRICAL

NOT USED

DIVISION 27 - COMMUNICATIONS

NOT USED

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

NOT USED

DIVISION 31- EARTHWORK

31 1000 - SITE CLEARING AND DEMOLITION
31 2000 - EARTHWORK
31 2313 - SUBGRADE PREPARATION

DIVISION 32- EXTERIOR IMPROVEMENTS

NOT USED

DIVISION 33 - UTILITIES

NOT USED

DIVISION 34 - TRANSPORTATION

NOT USED

DIVISION 35 - WATERWAY AND MARINE CONSTRUCTION

NOT USED

DIVISIONS 40 THROUGH 47

NOT USED

DIVISION 48 - ELECTRICAL POWER GENERATION

NOT USED

END OF TABLE OF CONTENTS

DOCUMENT 00 0115 - LIST OF DRAWINGS

PROJECT INFORMATION

- G-0.1 COVER PAGE
- G-0.2 ABBREVIATIONS AND NOTES
- G-0.3 PROJECT SITE PLAN

CIVIL

- C-1.0 EXISTING CONDITIONS / DEMOLITION
- C-2.0 ROUGH GRADING

SECTION 31 1000

SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Protecting existing vegetation to remain.
 - 2. Removing existing vegetation.
 - 3. Clearing and grubbing.
 - 4. Stripping and stockpiling topsoil.
 - 5. Removing above- and below-grade site improvements.
 - 6. Disconnecting, capping or sealing, and abandoning site utilities in place.
 - 7. Temporary erosion- and sedimentation-control measures.
- B. Related Sections:
 - 1. Section 01 7300 "Execution" for field engineering and surveying.

1.3 DEFINITIONS

- A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.
- C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow.
- D. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other non-soil materials.
- E. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.
- F. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 MATERIAL OWNERSHIP

- A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 INFORMATIONAL SUBMITTALS

- A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
 - 1. Use sufficiently detailed photographs or videotape.
 - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.
- B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 QUALITY ASSURANCE

- A. Preinstallation Conference: Conduct conference at Liberty High School at 20 Oak Street, Brentwood, CA.

1.7 PROJECT CONDITIONS

- A. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises.
- B. Utility Locator Service: Notify Call Before You Dig for area where Project is located before site clearing.
- C. Do not commence site clearing operations until temporary erosion- and sedimentation-control measures are in place.
- D. The following practices are prohibited within protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- E. Do not direct vehicle or equipment exhaust towards protection zones.
- F. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

- G. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 31 2000 "Earthwork."
 - 1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated. Wrap a 1-inch blue vinyl tie tape flag around each tree trunk at 54 inches above the ground.
- C. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.
- B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

- A. General: Protect trees and plants remaining on-site according to requirements in Section 015639 "Temporary Tree and Plant Protection."
- B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

3.4 EXISTING UTILITIES

- A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.
 - 1. Verify that utilities have been disconnected and capped before proceeding with site clearing.
- B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.
 - 1. Arrange with utility companies to shut off indicated utilities.
 - 2. Owner will arrange to shut off indicated utilities when requested by Contractor.
- C. Locate, identify, and disconnect utilities indicated to be abandoned in place.
- D. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Architect not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Architect's written permission.
- E. Excavate for and remove underground utilities indicated to be removed.
- F. Removal of underground utilities is included in earthwork sections and with applicable fire suppression, plumbing, HVAC, electrical, communications, electronic safety and security and utilities sections and Section 024116 "Structure Demolition" and Section 024119 "Selective Demolition."

3.5 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - 2. Grind down stumps and remove roots larger than 1/2-inch diameter, obstructions, and debris to a depth of 18 inches below exposed subgrade.
 - 3. Use only hand methods for grubbing within protection zones.
 - 4. Chip removed tree branches and dispose of off-site.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

3.6 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to depth of 3 inches in a manner to prevent intermingling with underlying subsoil or other waste materials.
 - 1. Remove subsoil and non-soil materials from topsoil, including clay lumps, gravel, and other objects more than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.
- C. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.
 - 1. Limit height of topsoil stockpiles to 60 inches.
 - 2. Do not stockpile topsoil within protection zones.
 - 3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.
 - 4. Stockpile surplus topsoil to allow for resspreading deeper topsoil.

3.7 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
 - 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
 - 2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.
- B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION 31 1000

SECTION 31 2000

EARTHWORK

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. All earthwork shall be in conformance with the soils report.
- B. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division I Specification Section, apply to this section.
- C. Published specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to Work of this Section where cited by abbreviations noted below (latest editions apply unless otherwise noted).
 - 1. California Code of Regulations, Title 24, 2019 edition, also known as California Building Code (CBC).
 - 2. American Society for Testing and Materials (ASTM).
 - 3. American Association of State Highway and Transportation Officials (AASHTO), "Standard Specifications for Highway Materials and Methods of Sampling and Testing."
 - 4. State of California, Business and Transportation Agency, Department of Public Works, Division of Highways:
 - (a) "Standard Specifications."
 - (b) "Materials Manual," (CMM).

1.2 SUMMARY

- A. Section Includes:
 - 1. Excavation including removal of known on- or below-grade construction or obstructions, and filling and backfilling.
 - 2. Provision of rock courses, sand beds, and vapor retarders under slabs on grade.
- B. Related Sections include:
 - 1. Section 31 2333 "Trenching and Backfill" for trenching and backfilling underground utilities and detectable warning tapes.

1.3 DEFINITIONS:

- A. Compaction: Ratio expressed as percentage of dry density of material compacted in field to maximum dry density of same material as determined by ASTM 01557.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Comply with rules and regulations of local and State agencies having jurisdiction.
 - 2. Comply with State and local code requirements for disposal of debris.
- B. Allowable Tolerances:
 - 1. Excavations shall not exceed 1/10-foot variation from dimensions and elevations shown or noted on plans.
 - 2. Fill and backfill shall be placed within tolerance of plus or minus 1/10-foot.

1.5 PROJECT CONDITIONS

- A. Existing Conditions:
 - 1. Carefully maintain bench marks, monuments, and survey control references.
 - 2. Verify or determine locations of underground utilities and avoid damage. Should damage occur, notify the Architect and repair at no additional cost to the Contract.
 - 3. Restore grades disturbed by construction activity or other causes to elevations shown or noted.
- B. Environmental Requirements: When unfavorable weather conditions necessitate interrupting filling and grading operations, prepare areas by compaction of surface and grading to avoid collection of water. Provide adequate temporary drainage to prevent erosion. After interruption, re-establish compaction specified in last layer before resuming work.
- C. Protection: Conduct earthwork operations so as to prevent windblown dust and dirt from interfering with the Owner's and adjacent property owner's normal operations. Assume liability for all claims related to windblown dust and dirt. Protect building structures and adjacent surfaces to remain.
- D. Sequencing: Sequence operations so as to maintain safe working conditions and preserve existing Work which is to remain.

- E. Layout: If any discrepancies are found by Surveyor between Drawings and actual conditions at Site, Architect reserves right to make such minor adjustments in Work specified hereunder, as are necessary to accomplish the intent of the Contract Documents, at no increase in Contract price.

1.6 RECORDS OF INVESTIGATION

- A. The following record of investigation is available as a reference for the Contractor:
1. Title: Geotechnical Investigation Report and Geologic Hazard Assessment, Heritage High School Culinary Arts Building and Future Two-Story Classrooms
 2. Author: BSK Associates
 3. Date: October 29, 2018
 4. Availability: Available for reference at the offices of the author of the report and the Architect.

1.7 RESPONSIBILITY FOR ACCURACY OF SITE DATA

- A. The Contractor shall promptly, and before such condition is disturbed, notify the Architect in writing of soil or subsurface conditions which differ materially from those conditions shown in the Contract Documents or in the records of investigations of soil or subsurface conditions referred to above. The Architect shall promptly investigate the conditions. If he finds the conditions materially different from those which reasonably should have been anticipated on the basis of a careful consideration of said records of investigations, logs of borings and examination of the site, and finds that said conditions will cause an increase or decrease in the cost of, and/or the time required for performance of the Contract, he will, after approval by the Owner, modify the Contract Terms in writing to provide for an equitable adjustment in cost and/or time of performance. Any claim of the Contractor shall not be allowed unless he has given the required written notice.

PART 2 PRODUCTS

2.1 MATERIALS

- A. All earthwork shall be in conformance with the soils report.
- B. Typical Fill and Backfill:
 - 1. Granular, not showing excessive shrinkage or swelling when subjected to changes in water content.
 - 2. Free of organic matter and other deleterious substances and containing no rocks or lumps over 3-inches in greatest dimension.
 - 3. All fill material shall be moisture conditioned to at least 3-percent over optimum moisture content as determined by ASTM D1557.
 - 4. On-site soils may be used as fill material except where granular fill material is specified. The moisture content must be within the above limits to be acceptable. Some drying of on-site soils may be required.
 - 5. Conform to the following minimum requirements:
 - (a) Maximum Plasticity Index: 15.
 - (b) Liquid Limit: Less than 30%.
 - (c) % Passing #200 Sieve: 8% - 40%

PART 3 EXECUTION

3.1 INSPECTION

- A. The Contractor shall be deemed to have inspected site and informed himself of actual grades, levels, and other conditions under which Work is to be performed.

3.2 EXCAVATION

- A. All earthwork shall be in conformance with the soils report.
- B. General Requirements:
 - 1. Excavate to dimensions and elevations shown or noted with bottoms square and true.
 - 2. Remove debris, old foundations, tree stumps, and loose rocks from bottom of excavation.

3. Shore, brace, sheet, and slope excavations as required to prevent caving, erosion, danger to persons and structures, or interference with construction operations and as required to comply with safety laws.
4. Keep excavation free of water at all times until concrete work and backfilling is complete. Grade excavated areas to provide drainage to prevent ponding of water.
- C. Excavated Soil Material: All excavated material determined unsuitable for use as fill or backfill or in excess of backfill requirements shall be removed from the site.
- D. Provisions for Formwork Construction:
 1. Extend excavations sufficient distance from walls and footings to permit placing and removal of forms, installation of services and inspection.
 2. Trim excavation walls and bottoms to reasonably smooth lines and grades.
- E. Earth Forms: The Contractor may excavate to dimensions of footing required in order to avoid constructing formwork, provided excavations are clean cut and free of spaces or cave-ins and provided the Owner's Soils Engineer approves. Continuous trenching for individual footings will not be permitted.
- F. Over-Depth Excavations: Rebuild to grade with lean concrete as directed by the Owner's Soils Engineer.
- G. Topsoil: Strip topsoil as directed by the Owner's Soils Engineer at the time of grading. The Contractor shall stockpile topsoil on the site as directed.
- H. Removal of On- or Below-Grade Construction or Obstructions:
 1. Remove known existing construction or obstructions including wells, vaults, walls, or otherwise enclosed spaces wherever they occur below new grade within immediate areas of new construction, new paving or new planted areas.
- I. Reworking of Holes, Depressions, Softened, or Disturbed Areas:
 1. Cut out the hole, depression, or unsuitable soil area to workable "cat" width or wider by use of "cat and blade" or similar means, cutting to firm subgrade at the bottom and sides.
 2. Compact the subgrade as specified hereinbefore.
 3. Fill as specified for structural backfill. "Hook" into the side of the excavation as each lift or fill is spread, as far as may be required to reach firm soil at the sides of the excavation and to bond new fill into the existing soil.

4. Fill excavation in manner specified hereinbefore until a surface is obtained which is even and continuous with adjoining grade and offers a firm, even subgrade for final usage or placement of additional fill thereon.
- J. Dewatering:
 1. Provide, operate, and remove dewatering equipment necessary to drain and keep excavations free of water under all circumstances.
 2. Prevent surface water from flowing into excavation; promptly remove any water accumulated.
 3. Dewatering system shall remain in place until construction Work below groundwater table is completed.

3.3 FILLING AND BACKFILLING

- A. All earthwork shall be in conformance with the soils report.
- B. General Requirements:
 1. Do not place fill or backfill until forms, rubbish and deleterious materials have been removed, waterproofing measures completed, and areas have been approved by the Architect.
 2. Scarify surface of area to receive fill to 12-inch depth and until surface is free from ruts, hummocks or other uneven features. Disc or blade scarify surface until free from large clods.
 3. Bring scarified material to proper moisture content and compact to specified density.
 4. Spread material in layers not to exceed 8-inch depth before compaction. Sprinkle material with sufficient moisture to compact properly; permit material with excess moisture to dry to proper water content. Thoroughly mix soil and water by blading and discing before compacting.
 5. Place granular backfill material as adjacent backfill is being placed.
 6. Adequately brace and shore footings, walls, etc., against which backfill is to be placed to prevent displacement or damage during placement. Do not remove shores or braces until permanent supports are in place and have attained their required strength.
 7. All fill material should be within 3-percent of optimum moisture contents as determined by ASTM 01557.

- C. Minimum Compaction Requirements:
 - 1. Subgrade under interior slabs: 90-percent
 - 2. Subgrade under footings: 90-percent
 - 3. Subgrade under pavements supporting automobile traffic: 95-percent
 - 4. All other fills: 90-percent
 - 5. Do not compact soil in planting areas.
- D. Compacting:
 - 1. Compact by power tamping, rolling or combinations thereof as approved by the Owner's Soils Engineer. Where impractical to use rollers in close proximity to walls, stairs, etc., compact by mechanical tamping. Scarify and recompact any layer not attaining compaction until required density is obtained.
 - 2. Compaction by flooding, ponding or jetting will not be permitted.

3.4 SLAB BASE AND VAPOR RETARDER INSTALLATION

- A. All earthwork shall be in conformance with the soils report.
- B. Rock Courses:
 - 1. Verify that all improvements such as floor drains are installed.
 - 2. Verify that the Owner's Soils Engineer has approved rough graded and compacted subgrade.
 - 3. Place nominal 6-inch thick rock course under building slabs.
 - 4. Level and compact to smooth surface.
- C. Vapor Retarder Installation: Place vapor retarder sheeting with longest parallel with direction of pour. Lap seams 6" minimum and seal with manufacturer's recommended tape.

3.5 GRADING

- A. All earthwork shall be in conformance with the soils report.
- B. Begin grading only after debris and construction materials are removed from area concerned.
- C. Grade areas to smooth, level or evenly sloped, uniform surface in conformity to contour lines and spot elevations noted. Make grades level where not otherwise indicated. Round smooth abrupt changes in slopes. Refill to required levels any settled grades. Slope ground away from building walls.
- D. Ensure finished grades and surfaces conduct water directly to area drain, gutters, etc.

- E. Place stockpiled topsoil in maximum 6-inch lifts to depth indicated. Scarify subgrade to minimum depth of 6-inches and obtain the Architect's approval before placing topsoil. Topsoil shall not be used for engineered fill.
- F. Prevent erosion of freshly graded areas during construction and until permanent drainage and erosion control measures are installed. At cut slopes, place layer mesh and plant ground cover.
- G. After finish grading is completed, perform no further excavation or filling operations except by the Architect's approval and under observation of the Owner's Soils Engineer.

3.6 FIELD QUALITY CONTROL

- A. The Owner's Soils Engineer will:
 - 1. Sample and test fill material from source designated by the Contractor.
 - 2. Observe site preparation, excavation and placing and compacting of fill and backfill.
 - 3. Perform tests and inspections deemed necessary to ensure compliance with specifications.
 - 4. Issue final report to the Owner on grading and certification of compliance with specifications.
 - 5. Submit verified report to the DSA per CBC Section 1704A.
- B. The Contractor shall:
 - 1. Furnish access to site and facilities for inspection.
 - 2. Notify the Soils Engineer 48-hours prior to any fill or backfill operations.
 - 3. Pay costs for additional inspections and tests due to noncompliance with Contract Documents.

END OF SECTION 31 2000

SECTION 31 2313

SUBGRADE PREPARATION & BASE MATERIAL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Provide subgrade preparation and the base material installation complete, including clearing, grading, excavation, filling and compaction and dewatering.
- B. Subgrade is that area on which concrete, aggregate base, or layer of any other non-organic material is to be placed.

1.2 QUALITY ASSURANCE

- A. Reference Standards
 - 1. Perform all work in accordance with all applicable laws, codes and regulations required by the City of Brentwood, and County of Contra Costa.
 - 2. Perform work in accordance to applicable sections of the Caltrans Standard Specifications.
 - 3. Reference to "Caltrans Standard Specifications" shall mean the Standard Specifications of the State of California, Business and Transportation Agency, Department of Transportation, CALTRANS.
- B. Related work specified elsewhere includes:
 - 1. Section 31 2000, Earthwork
- C. Stipulations
 - 1. The finished surface of the subgrade, at any point, shall not vary more than 0.05' above or below the elevation indicated on the drawings.
 - 2. Finish Surface Tolerance: 1/4-inch maximum variation in 10 feet.
- D. ASTM Standards.

1.3 SUBMITTALS

- A. Provisions: Comply with Division 1 Requirements.
- B. Material list and product data of all items proposed to be provided under this Section.
- C. Certificates (certified analysis of certificate of compliance) signed by the material producer.

1.4 PROJECT CONDITIONS

- A. Coordination: Coordinate this work with the work of other Sections to avoid delay and

1.5 SOILS REPORT

- A. A soil investigation report has prepared for the project by the firm of Wallace-Kuhl & Associates, entitled:
 - 1. Heritage High School Culinary Arts Building and Future Two-Story Classrooms by WKA dated October 29, 2018.
- B. This report is available in the office of the Architect and the Construction Manager for inspection by the Contractor. Unless otherwise specified, it is intended that all work be performed in accordance with the provisions of these report.

1.6 SOILS BORINGS

- A. Subsurface soils investigations have been made at the site and logs of the test holes are available with the soils report. Such investigations have been made for the purposes of design only, and neither the Architect, the Owner, nor the Soils Engineers guarantee adequacy or accuracy of the data, or that data are representative of all conditions to be encountered. Such information is made available for general information only and shall not relieve the Contractor of the responsibility for making his own investigations

1.7 PROJECT CONDITIONS

- A. Coordination: Coordinate this work with the work of other Sections to avoid delay and interference with other work.
- B. B. Protect excavations by shoring, bracing, sheeting, underpinning, or other methods as required to prevent cave-ins or loose dirt from entering excavations. Barricade open excavations and post warning lights at work adjacent to public streets and walks.
- C. C Underpin adjacent structure(s), including utility service lines, which may be damaged by excavation operations.
- D. Promptly repair damage to adjacent facilities caused by earthwork operations. Cost of repair at Contractor's expense.
- E. Promptly notify the Inspector of unexpected subsurface conditions.
- F. If during the course of operations, an area of pumping or otherwise unstable soil is encountered, the contractor shall immediately modify his operations in such a way as to limit the frequency and weight of vehicles traveling over the area and promptly notify the Inspector who will contact the Geotechnical Engineer for an evaluation.

1.8 EXISTING CONDITIONS

- A. A topographic survey of the property has been included in the drawings for reference only. Upon beginning the work, Contractor represents that he has inspected the site and satisfied himself as to actual grades and levels and the true conditions under which the work is to be performed.

1.9 PROTECTION

- A. Furnish, place and maintain all supports, shoring and sheet piling which may be disturbed by earthwork operations.
- B. Maintain all benchmarks, monuments, and other reference points. If disturbed or destroyed, replace as directed.
- C. Adequate protection measures shall be provided to protect workmen, passers-by, and the site. Streets and adjacent property shall be fully protected throughout the operations.
- D. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions on the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours.
- E. Any construction review of the Contractor's performance conducted by the Inspector is not intended to include review of the adequacy of the Contractor's safety measures in, on, or near the construction site.
- F. Adjacent streets, sidewalks, and property shall be kept free of mud, dirt, or similar nuisances resulting from earthwork operations.
- G. Provide for surface drainage during the period of construction in a manner to avoid creating a nuisance to adjacent areas.
- H. Water as required to suppress dust nuisance.
- I. Protection of Existing Improvements
 - 1. Provide barricades, covering, or other types of protection necessary to prevent damage to existing improvements indicated to remain in place. Protect improvements on adjoining properties. Repair damaged existing improvements to original condition as approved by authority having jurisdiction.
- J. Provide erosion control measures as required.

- K. Protection of Other Property: Excavation and other work over, under and adjacent to existing pipelines, cables, conduit runs or structures of any kind shall be procured in such a manner as not to interfere with the safe operation and use of such installations. Should any damage be incurred to existing facilities during the Contractor's operations, the Contractor shall immediately notify the Owner's Representative and authorities, and shall arrange for the immediate repair of same at his own expense.
- L. Underground Obstruction: The locations of existing underground utilities and structures, insofar as they are known from information furnished by the respective utility companies and agencies, have been shown on the drawings. The Owner assumes no responsibility for the accuracy or completeness of said data, which is offered solely for the convenience of the Contractor.
- M. Control of Water: Take measures as may be required and furnish, install and operate such pumps or other devices as may be necessary to remove any seepage, storm water or sewage that may be found or may accumulate in the excavations during the progress of the work. Keep excavations entirely free from water at all times during the construction of the work, and until the Geotechnical Engineer gives permission to cease pumping.
- N. Pavement Restoration: Pavement, bases and compacted subgrade disturbed by trenching operations shall be replaced in an acceptable manner with materials equal to the adjacent compacted subgrade, bases and pavement for a minimum distance of 12" on each side of the trench, and shall conform to the requirements of these Specifications or to local ordinances governing such replacement.

1.10 FIELD QUALITY CONTROL

- A. Contractor shall provide adequate notice, cooperate with, provide access to the work, and assist testing agency and their representatives in execution of their function.
- B. When, during the progress of work, field tests indicate that installed compacted materials do not meet specified requirements, provide additional compaction until specified density is achieved, or remove and replace defective materials with new materials as directed by the Inspector. Cost of additional labor, materials, and testing to attain specified density at Contractor's expense.
- C. The Contractor shall engage a California Registered Civil Engineer or licensed Land Surveyor to perform field engineering.

1.11 TESTING

- A. Testing and Inspection: Testing shall be performed by a qualified independent testing laboratory under the supervision of a registered professional engineer, specializing in soils engineering.
- B. The Owner will direct, provide and pay for initial testing and inspection during operations.
- C. Provide and pay for re-testing and inspection during operations. Laboratory and inspection service shall be acceptable to the Owner.
- D. Where reference is made to relative compaction, it shall be the in-place dry density of soil expressed as a percentage of the maximum dry density of the same material, determined by the ASTM 01557 laboratory test procedure. Optimum moisture is the water content that corresponds to the maximum dry density.
- E. For structural fills under footings, slabs or pavements, determine moisture-density relationships in accordance with ASTM 01557.
- F. Plasticity Index: ASTM 4318-98.

1.12 GENERAL REQUIREMENTS

- A. When rain is forecast, temporary measures to protect areas of the exposed subgrade from saturation by rainfall or runoff shall be taken. These include, but are not limited to, covering grading and sloping of subgrade surfaces to prevent ponding, sealing disturbed, uneven subgrade, surfaces with a smooth drum roller, grading and excavating diversionary swales, trenches or detention basins.
- B. Failure by the Contractor to comply with the above requirements to take reasonable and adequate measures or exercise sound engineering and construction practices to protect the work from damage. All repair work shall be performed at no additional cost to the Owner.

PART 2 - MATERIALS

2.1 AGGREGATE BASE - CLASS 2

- A. Aggregate base shall be Class 2, and free from vegetable matter or other deleterious substances. The percentage composition by weight of aggregate base shall conform to Section 26 of the Caltrans Standard Specifications.

2.2 RECYCLED AGGREGATE BASE - CLASS 2

- B. Subject to the approval of the Geotechnical Engineer, recycled aggregate base shall be Class 2, and free from vegetable matter or other deleterious substances. The percentage composition by weight of aggregate base shall conform to Section 26 of the Caltrans Standard Specifications.

3.1 SUBGRADE PREPARATION

- A. Remove topsoil, stumps, roots, grasses and weeds to the satisfaction of the Geotechnical Engineer.
- B. Scarify subgrade to a depth specified in the geotechnical report.
- C. Remove all boulders, hardened material or rock encountered that is over 3 inches in size. The earth shall be uniform for the full depth and width of the subgrade.
- D. Lime treat the subgrade 12" deep per the Geotechnical Engineer's recommendations. Refer to the geotechnical report.
- E. The properly moisture condition and compaction per the geotechnical report.
- F. Relative compaction, maximum dry density, and optimum moisture content of fill materials shall be determined in accordance with ASTM Test Method D1557, "Moisture-Density Relations of Soils and Soil Aggregate Mixtures Using a 10-lb. Rammer and 18-in. Drop.
- G. The finished subgrade surface shall be firm and unyielding under the weight of a loaded water truck traveling over the surface.

3.2 AGGREGATE BASE

- A. Deliver to site as a uniform mixture and spread each layer in one operation without segregation.
 - 1. Class 2 Aggregate Base shall be readily compacted and spread with equipment that will provide a uniform layer conforming to the planned section, and as specified in Section 26 of the Caltrans Standard Specifications.
- B. The aggregate base shall be compacted to at least 95 percent relative compaction.
 - 1. Proof roll and mark "soft spots" for additional compaction or correction. Proof rolling operations must be performed in the presence of a Geotechnical Engineer.
- C. Unsatisfactory material shall be removed and repaired to the satisfaction of the Geotechnical Engineer.

END OF SECTION 31 23