



**SECTION PRODUCT REQUIREMENTS SUBSTITUTION REQUEST FORM**

**DATE:** \_\_\_\_\_

**PROJECT: CLOSURE CONSTRUCTION AT THE MECCA II SANITARY LANDFILL**

\_\_\_\_\_ hereby submits for County of Riverside's  
(NAME OF CONTRACTOR)  
consideration the following item instead of the specified item for the above project:

<u>SECTION</u>	<u>PARAGRAPH</u>	<u>SPECIFIED ITEM</u>
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\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

PROPOSED SUBSTITUTION:

Provide product data sheets, manufacturers' written installation instructions, drawings, details and similar information to demonstrate the Contractor's proposed substitution is an Approved Equal. Where answers require additional space, provide information on additional attached pages. Fill in blanks below:

State differences between proposed substitution and specified item. Differences include, but are not limited to interrelationship with other items; materials and equipment; function; utility; life cycle costs; applied finishes; appearance; and quality.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Demonstrate how the proposed substitution is compatible with or modifies other systems, parts, equipment or components of the Project and Work under the Contract.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

What effect does the proposed substitution have on dimensions indicated on the Project Drawings and previously reviewed Shop Drawings?

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What effect does the proposed substitution have on the construction schedule and Contract Time?

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What effect does the proposed substitution have on the Contract Price? This includes all direct, indirect, impact and delay costs.

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Manufacturer's guarantees of the proposed and specified items are:

\_\_\_\_\_ Same \_\_\_\_\_ Different (explain on attachment)

The undersigned state that the function, utility, life cycle costs, applied finishes, appearance and quality of the proposed substitution are equal or superior to those of the specified item.

**Submitted by:**

**For Use by County:**

\_\_\_\_\_  
Contractor's Signature

Accepted \_\_\_\_\_ Accepted as Noted \_\_\_\_\_

Not Accepted \_\_\_\_\_ Received Too Late \_\_\_\_\_

\_\_\_\_\_  
Firm

By \_\_\_\_\_

Date \_\_\_\_\_

Remark \_\_\_\_\_

Telephone \_\_\_\_\_

Date \_\_\_\_\_

END OF SECTION 01 6000



**SPECIFICATIONS – DETAILED PROVISIONS**  
**SECTION 01 7000: EXECUTION REQUIREMENTS**  
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## SECTION 01 7000 EXECUTION REQUIREMENTS

### PART 1 GENERAL

#### 1.01 SUMMARY

- A. Section includes the following:
1. Examination, preparation, and general installation procedures.
  2. Construction and Tolerances.
  3. Site Restoration, Cleaning and protection.
  4. Starting of systems and equipment.
  5. Demonstration and instruction of County personnel.

#### 1.02 REFERENCES

- A. Comply with the requirements of Detailed Provisions Section 01 4200 – Reference Standards and Abbreviations and as listed herein.

#### 1.03 PROJECT CONDITIONS

- A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- B. Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent airborne dust from dispersing into atmosphere.

#### 1.04 COORDINATION

- A. Coordinate scheduling, submittals, and requirements of Detailed Provisions Section 01 – 3100 Project Management and Coordination to ensure efficient and orderly sequence of installation of interdependent construction elements.
- B. Notify and coordinate with affected utility companies and comply with their requirements.

### PART 2 PRODUCTS – NOT USED

### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. The Contractor shall require the subcontractors, suppliers, and installers of each element of the Work to perform a detailed inspection of work conditions prior to its performance of Work.

1. Inspect substrates, quality of work, conditions of the work area, and activities associated with adjacent and concurrent work by others.
  2. Examine and verify specific conditions described in individual Detailed Provisions Sections.
  3. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
  4. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or mis-fabrication.
  5. Review all Contract Documents, RFI responses, Changes to the Work, Shop Drawing reviews.
- B. Contractor Responsibilities for Existing Underground Conditions, Utilities, Structures, and Improvements.
1. Certain Available Information and Drawings provided by the County indicate existence of underground conditions, obstructions, utilities, structures, and improvements known to the County prior to execution of the Contract, which are within the Construction Limits.
    - a. Review the Available Information and Drawings prior to performing Work adjacent, above or otherwise potentially affecting underground conditions, obstructions, utilities, structures, and improvements.
    - b. Immediately notify the County of conditions which are not as indicated within the Available Information and Drawings.
  2. Coordinate efforts to locate existing underground utilities.
    - a. Contractor shall call Underground Service Alert of Southern California (USA/SC) at 811, the one-call underground facility locating service two (2) working days prior to making an excavation. Contractor shall be responsible for such notification of sub-contractor's work, or shall require sub-contractor to assume this responsibility.
    - b. The Contractor's attention is directed to the possible existence of pipe, conduit and other underground improvements which may or may not be shown on the Project Drawings. Preserve and protect any such improvements whether shown on the Project Drawings or not. Expose such improvements in advance of the underground construction to allow for changes in alignment as necessary. Where it is necessary to remove and replace or to relocate such improvements in order to prosecute work, they shall be removed, maintained, and permanently replaced by the Contractor at their expense. Relocation of said improvements shall not be performed without written permission of the County or the owner of the utility. Unless otherwise noted, existing underground utilities shall be protected in place.
  3. Examine, mark and record location of existing underground utilities, structures and improvements prior to commencing other Work activities.

4. Repair or replace any underground utilities, structures or improvements which are damaged or destroyed or rendered unusable by actions caused by or arising from the performance of Work by the Contractor or its subcontractors
- C. Contractor Responsibilities for Existing Above-Grade Utilities:
1. The Contractor shall be responsible to coordinate its work activities around existing above-grade utilities, e.g. meters, power poles, light poles, electrical lines, transformers.
  2. In the event the Contractor elects to adjust, move or relocate existing above-grade utilities, the Contractor shall obtain the approval of the County or utility owner, and furnish notification and work plan information fourteen (14) calendar days prior to making such adjustments or relocations.
  3. The Contractor shall be responsible for costs associated with its decision to adjust, move, or relocate existing above-grade utilities.
  4. No additional costs shall be paid by the County if the Contractor elects to make such adjustments or relocations, except those noted to be relocated in the Project Drawings.

### **3.02 PREPARATION**

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

### **3.03 LAYING OUT THE WORK**

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify County of any discrepancies discovered.
- C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- D. Promptly report to County the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- E. Replace dislocated survey control points based on original survey control. Make no changes without prior written approval from the County.
- F. Utilize recognized engineering survey practices.
- G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
  1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
- H. See Detailed Provisions Section 01 4320 – Surveying.

### 3.04 INSTALLATION

#### A. General:

1. Provide all attachments, connection devices, and accessory components necessary for the completion and physical attachment and support of the Work.
2. Comply with requirements of regulatory agencies and authorities having jurisdiction for bracing, restraints, supports, and attachments.
3. Install products as specified in individual Detailed Provisions Sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
4. Unless otherwise noted, make vertical elements plumb and horizontal elements level.
5. Unless otherwise noted, install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines.

#### B. Make neat transitions between different surfaces, maintaining texture and appearance.

#### C. Install equipment, products, coatings, materials, and finishes in accordance with the Contract Documents and manufacturer's written installation instructions.

1. In the event there is a conflict or inconsistency between the Contract Documents and manufacturer's written installation instructions, promptly inform the County of such issue through a Request for Information (RFI).

#### D. Work Results:

1. Install components, products, materials, equipment, and other items, and assemblies, only during appropriate weather conditions for that Work.
2. Coordinate installation activities such that these activities do not subject unfinished Work to adverse weather, cold temperatures, or other conditions detrimental to the Work.

#### E. Cutting and Patching:

1. Whenever possible, execute the Work by methods that avoid cutting or patching.
2. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
3. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
4. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
5. Restore work with new products in accordance with requirements of Contract Documents.

6. Patching:
  - a. Finish patch surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
  - b. Match color, texture, and appearance.
  - c. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

### **3.05 CONSTRUCTION**

- A. All construction means and methods, and any specialized techniques, employed or selected by the Contractor in the performance of the Work are the sole responsibility of the Contractor.
- B. The Contractor's work shall be coordinated to correctly interface, fit and come together with adjacent surfaces and utility structures, roadway structures, and grades.

### **3.06 TOLERANCES**

- A. Substantial Completion Conditions:
  1. Earthwork and Paving:
    - a. Conform to the grades and contours indicated on the Project Drawings.
    - b. Deviation from compacted thickness: +/- 1/4 inch.
    - c. Variation from Design Elevation: +/- 1 inch.
    - d. Variation from Design Horizontal Location: 1 inch in any direction.
  2. Retaining Walls:
    - a. Deviation for Design Elevation: +/- 1 inch.
    - b. Variation from Design Horizontal Location: 1 inch in any direction.
    - c. Variation in Plumb: one-half (1/2) of one (1) percent.
  3. Anchor Bolts, Base Plates and Concrete Embeds:
    - a. Deviation from Design Elevation: +/- 1/2 inch.
    - b. Variation from Design Horizontal Location: one-sixteenth (1/16) inch in any direction.
  4. Utility Systems:
    - a. Deviation from Design Elevation: +/- one-half (1/2) inch.
    - b. Deviation from Design Horizontal Position: +/- one (1) inch.
    - c. Deviation from Design Pipe Slope (gravity lines only): plus one-half (1/2) or minus zero (0) inch per foot.

5. Review other individual Detailed Provisions Sections for additional tolerance information. More stringent tolerances in other Detailed Provisions Sections or required by manufacturers of products and equipment being supplied on the Project shall supersede the tolerances above.

### **3.07 SITE RESTORATION**

- A. All areas, items, utilities or structures damaged or destroyed by the Contractor or its subcontractors and suppliers during the construction of the Project, whether inside or outside of the Construction Limits, shall be restored by the Contractor to the satisfaction of the County, prior to the issuance of the Certificate of Substantial Completion.

### **3.08 CLEANING**

- A. Maintain the Project Location in a neat and orderly condition, removing empty containers, rags and rubbish daily.
- B. Cleaning of Vehicles:
  1. Before leaving the Project Location, all vehicles and equipment shall be free of dust, mud, rocks, debris, and soils.
- C. Street Cleaning:
  1. If Contractor earthwork operations affect landfill and public roadways, all paved roadways used by the Contractor's trucks or any other equipment hauling material to and from the area shall be kept clean by the Contractor and shall be continuously serviced by the Contractor's use of broomed vacuum sweeper trucks to control dust and mud.
    - a. Contractor shall comply with all permit requirements to keep public roadways clean of dust, dirt, and debris. Any associated costs shall be borne by the Contractor at no additional cost to the County.
  2. Damage to roadway surfaces from the direct or indirect result of the Contractor's operation shall be repaired by the Contractor to the satisfaction of the responsible agency and the County at no additional cost to the County.
  3. Do not allow sediment laden or contaminated surface water to enter storm water systems.
- D. Remove rocks, dirt, debris, trash, shavings, filings, and surface dust from limited access spaces, vaults, pull boxes, and similar spaces.
- E. Clean Project Location:
  1. Sweep paved areas to a broom-clean condition.
  2. Remove stains, petrochemical spills, and other foreign deposits.

### 3.09 PROTECTION

#### A. Temporary Protective Coverings:

1. Temporary protective coverings shall include sheet plastic, tarpaulins, sand bags, geotextiles, matting, and accessories as identified in the Contract Documents.
2. Apply temporary protective coverings when, where, and to the degree required by the Contract Documents to ensure continuous protection from damage, deterioration, and prohibited exposures until Substantial Completion of the work is issued by the County.
3. Apply temporary protective coverings appropriate to the installation.
4. Removal:
  - a. Remove temporary protection devices and facilities when requested by the County.
  - b. Do not remove protection when subsequent work activities including corrective work could damage surfaces.

#### B. Limitation of Exposures:

1. Supervise and coordinate construction activities to ensure no part of the construction completed, or in progress, is subject to deleterious exposure during the construction period.
2. Protect against the following exposures:
  - a. Excessive loading, including static and dynamic forces.
  - b. Excessive pressures.
  - c. Excessive high and low temperatures.
  - d. Ice contamination of materials and products.
  - e. Air contamination, pollution, solvents, chemical, including release of volatile organic compounds.
  - f. Construction traffic.
  - g. Soiling, staining.
  - h. Mold, mildew, bacteria, and other organic processes.
  - i. Excessive electrical current or load.
  - j. Inadequate separation and/or isolation between dissimilar metals.
  - k. Improper shipping, handling, packing.
  - l. Unprotected, improper, insufficient storage.

END OF SECTION 01 7000

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**SPECIFICATIONS – DETAILED PROVISIONS**  
**SECTION 01 7419: CONSTRUCTION WASTE MANAGEMENT**  
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## SECTION 01 7419 CONSTRUCTION WASTE MANAGEMENT

### PART 1 GENERAL

#### 1.01 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
  - 1. Requirements for preparation of Waste Recycling Plan.
  - 2. Waste reduction measures including reuse, salvage, and recycling of construction and demolition waste.
  - 3. Requirements for reporting recycled material quantities.
- B. Related Contract Document Sections:
  - 1. General Provisions.
  - 2. Detailed Provisions Section 02 4100 – Demolition.
  - 3. Detailed Provisions Section 31 1000 – Site Clearing.

#### 1.02 REFERENCES

- A. Comply with the requirements of Detailed Provisions Section 01 4200 – Reference Standards and Abbreviations and as listed herein.
- B. California Green Building Standards (CALGreen).

#### 1.03 DEFINITIONS

- A. C&D: Construction and demolition waste.
- B. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, or repair operations. Construction waste includes packaging. The Contractor shall be responsible for the disposal of waste generated from the Project. Waste shall be stored in proper containers and picked up on a daily basis by the Contractor.
- C. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- D. Disposal: Removal from Project Location of demolition and construction waste and subsequent recycling, reuse, salvage, or deposit in landfill acceptable to authorities having jurisdiction.

#### 1.04 WASTE RECYCLING PLAN (WRP) REQUIREMENTS

- A. Develop and implement a Waste Recycling Plan (WRP):
  - 1. The County has adopted the California Green Building Standards (CALGreen) which requires mandatory construction and demolition (C&D) recycling. To

comply, the Contractor is required to prepare and submit a project-specific Waste Recycling Plan (WRP) to identify the type and quantities of waste that will be generated from the Project and designate these materials for recycling, reuse, salvaging, and/or landfilling. The Contractor shall prepare a WRP by completing and submitting a County-supplied form (Construction and Demolition Waste Diversion Program – Form B) for County’s review and acceptance. Project construction activities shall not be allowed to commence prior to County’s acceptance of the WRP. Copies of the County-supplied WRP form are available for review at the County office and can be downloaded from the following web site: [www.rcwaste.org/Waste-Guide/CandD](http://www.rcwaste.org/Waste-Guide/CandD)

2. The Contractor must recycle, reuse, or salvage a minimum of 50% by weight of construction generated wastes, including but not limited to, hardened concrete waste (see Detailed Provisions Section 03 3131 – Concrete Mixing, Placing, Jointing, and Curing) and metal waste material. All hardened concrete and metal waste materials generated from the Project shall be separated from construction debris or general refuse generated from construction and properly recycled by the Contractor by either using a “no charge” account at the Mecca II and/or Oasis Sanitary Landfill or using an independent recycling vendor or facility. The Contractor shall submit to the County, documentation such as receipt or manifest, as proof of proper recycling of material.
3. List of Recyclable/Salvageable Materials: Contractor shall identify and include a list of potential materials for recycling and salvage, approximate volumes, waste hauler, and end product for the materials.
  - a. Primary Recycling Target Materials: The following categories shall be diverted from landfill to a recycling facility:
    - 1) Land-clearing debris, excluding soil.
    - 2) Clean dimensional wood, pallet wood, plywood, oriented strand board, and particleboard.
    - 3) Brick and masonry.
    - 4) Ferrous and non-ferrous metals
    - 5) Gypsum products, acoustical ceiling tile.
    - 6) Cardboard, paper, paper-based packaging.
  - b. Secondary Recycling Target Materials: The following categories shall be considered for diversion from landfill to a recycling facility:
    - 1) Paint.
    - 2) Glass (bottles and plate) porcelain.
    - 3) Plastics, plastic film, fiberglass (solid).
    - 4) Carpet and pad.
    - 5) Non-asbestos roofing.
    - 6) Mechanical and electrical equipment.

- 7) Batteries.
  - 8) Doors, window frames, relites, hardware, millwork.
4. Materials Handling Procedures: Protect materials to be recycled from contamination. Handle, store, and transport materials in a manner that meets the requirements of the designated facilities for acceptance.
    - a. Remove and relocate reusable materials to be reinstalled or retained in a manner to prevent damage or contamination.
  5. During construction, the Contractor shall complete and submit reporting forms to demonstrate the actual quantity of waste materials recycled and list the authorized recycling/disposal facilities to which the materials were delivered. The Contractor shall use County-supplied reporting forms (Construction and Demolition Waste Diversion Program – Form C) and attach certified weights of all materials recycled, reused, salvaged and/or landfilled. Progress or final payments shall be withheld by the County if the Contractor fails to complete and submit the County-supplied form (Form C) as required. Copies of the County-supplied reporting form are available for review at the County office and can be downloaded from the following web site: [www.rcwaste.org/Waste-Guide/CandD](http://www.rcwaste.org/Waste-Guide/CandD)
- B. Throughout all phases of construction, including suspension of work and until final acceptance of the Project, the Contractor shall keep the work areas clean and free of refuse generated as a result of the Contractor’s operations. All non-hazardous material generated from the Project, shall be disposed of as a “no charge” account at the Mecca II Sanitary Landfill. Contractor shall be responsible for loading and hauling refuse through the Mecca II Sanitary Landfill and unloading in the designated disposal area as directed by the County.
  - C. Recycling and Waste Bin Areas: Provide the necessary containers and bins, to facilitate the Waste Recycling Plan. Arrange for adequate collection, and transportation to deliver the recovered materials to the approved recycling center or processing facility.
    1. Separate construction waste at the Project Location by one of the following methods:
      - a. Source Separated Method: Waste products and materials, that are recyclable, are separated from refuse and sorted into appropriately marked separate containers and then transported to the respective recycling facility for further processing. Refuse from the Project may be loaded and hauled through the Mecca II Sanitary Landfill on a “no charge” account basis and unloaded within the landfill disposal area as directed by the County.
      - b. Comingled Method: Selected waste materials are placed into a single container and then transported to an off-site recycling facility where the recyclable materials are sorted and processed and the remaining refuse and waste materials are handled separately.
      - c. Hazardous Wastes: Separate, store, and dispose of hazardous waste in accordance with regulations governing the Project, see Detailed Provisions Section 01 5600 – Project Environmental Controls.

- d. Other methods proposed by the Contractor and approved by the County.
  2. Keep recycling and waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
  3. As part of regular clean-up schedule visual inspections of dumpsters and recycling bins to identify potential contamination of materials.
- D. Refuse generated from source other than the Project will not be accepted on a “no charge” basis. The Contractor shall not allow its employees, subcontractors and suppliers to dispose of personal related refuse or refuse unrelated to the Project.

## **1.05 QUALITY ASSURANCE**

### **A. Meetings:**

1. Pre-construction/installation meetings:
  - a. Prior to beginning work at the Project Location, or as each subcontractor commences work, schedule and conduct a meeting to review the Waste Recycling Plan (WRP) and related procedures, schedules, coordination and specific requirements for waste materials recycling and disposal.
  - b. Subcontractors shall be required to participate in pre-construction/installation meetings.
2. Regular Meetings:
  - a. At a minimum, waste management goals and issues shall be discussed at regularly scheduled weekly project meetings.
  - b. Subcontractors who will be on-site prior to the next scheduled regular project meeting shall be required to participate.
  - c. Identify progress on meeting the WRP objectives and targets.
  - d. Identify corrective actions when necessary to meet the WRP objectives and targets.
  - e. Review the Look Ahead Schedule to identify items that may produce large volumes of waste and that have opportunities to enhance performance of the plan.
  - f. Identify activities and performance in reducing construction waste being directed to landfills.

## **1.06 SUBMITTALS**

### **A. Waste Recycling Plan (WRP) – Form B:**

1. Contractor is to prepare a project-specific Waste Recycling Plan (WRP) and submit to the County for review and acceptance within two (2) weeks of the award of contract by the Riverside County Board of Supervisors, and prior to delivering equipment and commencing work at the Project Location. Form B can be found at: <https://www.rcwaste.org/Portals/0/Files/Planning/FORM%20B.pdf>.

B. Waste Reporting Forms – Form C:

1. Submit waste reporting forms complete with certified weights attached throughout the duration of the Project. All forms must be submitted and approved by the County prior to final acceptance of the Project. Form C can be found at: <https://www.rcwaste.org/Portals/0/Files/Planning/FORM%20C.pdf>.

## **PART 2 PRODUCTS**

### **2.01 WASTE CONTAINERS**

- A. Durable, covered, secured, reusable containers for each category of waste.
- B. Signs for each container: At least 6-feet by 3-feet, exterior grade panel, painted, message in large letters identifying waste category.
  1. Signs shall include waste category in both English and Spanish.

## **PART 3 EXECUTION**

### **3.01 IMPLEMENTATION**

- A. General: As part of the WRP, the Contractor shall use Best Management Practices (BMPs) throughout the duration of the Project.
- B. Provide instruction to personnel in the proper implementation of the WRP.
- C. Instruct and train subcontractors on WRP implementation.
- D. Minimize the creation of construction and demolition waste on the job site. Best Management Practices steps may include:
  1. Prevent waste in the first place:
    - a. Order material precut to required size.
    - b. Order only quantity required.
    - c. Use detailed take-offs to identify location and uses in structure to reduce risk of unplanned and potentially wasteful cuts.
    - d. Verify that field measurements are as indicated on Project and Shop Drawings before confirming product orders or proceeding with work.
    - e. Protect products from damage during storage, installation and in-place.
    - f. Materials that become wet, damp or unusable for any reason due to improper storage shall be replaced at the Contractor's expense.
    - g. Request products delivered to the Project Location with packing materials that can be returned to sender, reused by others, or easily recycled.
    - h. Coordinate the schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

2. Reuse materials that would otherwise become waste:
    - a. Use temporary materials and facilities that will be reused at other projects.
    - b. Reuse on-site waste for patching existing work.
    - c. Arrange for the return of packing materials, such as wood pallets, where economically feasible.
- E. Separation:
1. Separate materials in accordance with the WRP.
  2. Maintain materials in separate areas and containers after these have been separated.
  3. Do not permit separated materials to be ruined or made unusable as a result of exposure to adverse weather to the degree this is possible and economically feasible.

END OF SECTION 01 7419





**SPECIFICATIONS – DETAILED PROVISIONS**  
**SECTION 01 7700: CLOSEOUT PROCEDURES**  
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## SECTION 01 7700 CLOSEOUT PROCEDURES

### PART 1 GENERAL

#### 1.01 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Substantial Completion procedures
  - 2. Final Completion/Final Acceptance procedures.
  - 3. Project Record Documents
  - 4. Warranties.
  - 5. Repair Work.
  - 6. Final Cleaning.
- B. Related Sections:
  - 1. General Provisions.

#### 1.02 REFERENCES

- A. Comply with the requirements of Detailed Provisions Section 01 4200 – Reference Standards and Abbreviations and as listed herein.

#### 1.03 DEFINITIONS

- A. Project Record Documents: Various documents that define the constructed facility that are kept current by neat, legible hand annotation of all deviations from what is shown or required by the Contractor during the course of construction to accurately document the “as-built” facility, including, but not limited to the following:
  - 1. Project Drawings.
  - 2. Shop Drawings.
  - 3. Contract Documents (Administrative Provisions, General Provisions, Special Provisions, Detailed Provisions and Appendices).
  - 4. Addenda.
  - 5. Change Orders.
  - 6. Request for Information (RFI).
  - 7. Completed Work Verification Survey: electronic copy and one (1) full-size hard copy.
  - 8. Coordinate utility plans.
  - 9. Field Directives.

- 10. Correspondence.
- 11. Submittals.

#### **1.04 SUBSTANTIAL COMPLETION**

- A. Contractor shall notify the County in writing that the Work is Substantially Complete.
  - 1. The County shall promptly inspect the Work and, if the County does not agree that the Work is substantially complete, the County will prepare a Punch List (list of items to be completed or corrected).
    - a. The County reserves the right to add to, modify, or change the Substantial Completion Punch List as circumstances dictate.
    - b. Failure by the County to include any items on such list does not alter the responsibility of the Contractor to complete or correct the Work in accordance with the Contract.
  - 2. With the Contractor's Substantially Complete request, the Contractor shall provide the following:
    - a. Provide the Completed Work Verification Survey in accordance with Detailed Provisions Section 01 4320 – Surveying.
    - b. Obtain and submit releases enabling County's full and unencumbered use of the Work, including access to utilities and other administrative approvals.
    - c. Make final changeover of locks, keys, gates, and other access restriction measures consistent with removal of the Contractor's personnel from the area of Work.
    - d. Deliver tools, spare parts, extra stock of materials, and similar physical items to the County in accordance with the requirements of the Contract Documents.
- B. At the Contractor's request, the County may identify those Punch List items that must be completed or corrected in order for the Contractor to achieve Substantial Completion.
  - 1. When the County determines that those Punch List items have been completed or corrected by the Contractor, the County shall make a determination that the Work is Substantially Complete.
  - 2. A Certificate of Substantial Completion will be issued by the County, which shall establish the date of Substantial Completion.
  - 3. The Certificate of Substantial Completion shall state the responsibilities of the County and the Contractor for security, maintenance, heat, utilities, damage to the Work, insurance, and the time to complete remaining Punch List work before liquated damages begin to accrue for the Contractor's failure to achieve Final Completion/Final Acceptance in a timely manner.
  - 4. The County shall assess liquated damages for the Contractor's failure to complete or correct the required Punch List items for Substantial Completion within the Contract Time.

## **1.05 PUNCH LIST PROCEDURES**

- A. The County shall prepare the Punch List (list of incomplete items of Work including discrepancies found in the Completed Work Verification Survey) when notified by the Contractor that the Work is Substantially Complete.
- B. The Contractor shall correct all Punch List items and re-issue the County Punch List, with their initials and date complete, along with a written statement that the entire Project is physically complete and ready to receive the Certificate of Substantial Completion.
- C. Prior to issuance of the Certificate of Substantial Completion, the County shall perform all necessary inspections to verify that all Punch List items of Work are complete.

## **1.06 FINAL INSPECTION AND FINAL PUNCH LIST**

- A. All remaining Punch List items that were not corrected prior to Substantial Completion shall be successfully completed by the Contractor prior to the Contractor's request for Final Acceptance. When the Contractor considers that all Contract Work is ready for final inspection and Final Acceptance, the Contractor shall give written notice to the County.
- B. County shall promptly perform a final inspection of the Work and, if necessary, prepare a Final Punch List (a list of items to be completed or corrected by the Contractor prior to the County granting Final Acceptance).
- C. Final Punch List items may include but are not limited to: Copies of warranties and guarantees required by the Contract; Permit approvals and Certificates of Occupancy/Use; Operation and Maintenance Manuals, Project Record Documents; Right of Way, Easements and Property Releases, and any other documents called for elsewhere in the Contract Documents.
- D. The Contractor shall complete or correct the items identified in the Final Punch List within the time period as required in the Certificate of Substantial Completion. Should the Contractor fail to complete or correct all remaining Final Punch List items within the required time, the County may assess liquated damages against the Contractor for failure to achieve Final Acceptance in a timely manner.
- E. After the Contractor completes all items identified in the Final Punch List(s), the Contractor shall notify the County in writing that the Final Punch List items have been successfully completed. After verification by the County that such completion was satisfactory, the Contractor shall submit a Final Application for Payment.

## **1.07 REQUIREMENTS FOR FINAL APPLICATION FOR PAYMENT**

- A. In addition to any other requirement identified in the Contract Documents, the Final Application for Payment shall include the following documents:
  - 1. Affidavit of Wages Paid for Contractor and all Subcontractors in accordance with state law;

2. Contractor's release of claims against the County from all parties who are entitled to claims against the subject project, property or improvement pursuant to the provisions of law;
3. Contractor certification that all Subcontractors and Suppliers have been paid and there are no outstanding liens;
4. Right of Way, Easements and Property Releases;
5. Final, Project Record Documents ten (10) working days following issuance of the Certificate of Substantial Completion.
  - a. One (1) complete full size set of finalized Project Record Drawings on bond.
  - b. One (1) complete set of finalized Project Record Specifications.
  - c. One (1) complete set of Contract documents, including approved Field Work Directives and Change orders.
  - d. One (1) complete set of Contractor's correspondence, including but not limited to RFIs, memorandums, and e-mails.
6. Final Application for Payment;
7. Completed permits and/or certificates of occupancy/use ten (10) working days following issuance of the Certificate of Substantial Completion; and
8. Complete the following:
  - a. Complete Final Cleaning and Project Location cleanup.
  - b. Complete all remaining obligations as set forth within this Section.

#### **1.08 FINAL COMPLETION/FINAL ACCEPTANCE**

- A. Final Completion/Final Acceptance shall be achieved when all the obligations of the Contract have been successfully performed by the Contractor in accordance with the Contract and accepted by the County.
- B. Neither Final Acceptance, nor Final Payment, shall release Contractor or its sureties from any obligations under this Contract or the Performance and Payment Bonds, or constitute a waiver of any claims by the County arising from or related to Contractor's performance or failure to perform the Work and to meet all Contractual obligations in accordance with the Contract, including but not limited to:
  1. Unsettled liens, security interests or encumbrances;
  2. Damaged, non-conforming, or defective Work discovered by the County;
  3. Terms of any warranties or guarantees required by the Contract; and
  4. Payments made in error.
- C. Except for any Claims properly submitted in accordance with the General Provisions, acceptance of Payment on the Final Application for Payment by the Contractor shall, on behalf of itself and its Subcontractors or Sureties, forever and unconditionally release and discharge the County, its officers, agents, employees, from:

1. Any and all disputes or claims, including but not limited to claims for damages, fines, interest, taxes, attorney fees, or costs, demands, rights, actions or causes of actions, known or unknown, arising out of or in any way related to the parties' performance under the Contract and/or Project; and
2. Any and all known and/or unknown liabilities, obligations, demands, actions, suits, debts, charges, causes of action, requests for money and/or payment under the Contract, outstanding invoices, or claims directly or indirectly arising out of or related to the Contract and/or Project.

## **1.09 PROJECT RECORD DOCUMENTS**

- A. Provide to the County one (1) complete set of the Project Record Documents in accordance with the requirements of this Section.
- B. Store Project Record Documents separate from documents used for construction.
- C. Contractor shall red-line the Project Record Documents on a weekly basis concurrent with construction progress. The Contractor shall supply a red-line of the Project Record Documents that shall document all additions and modifications to the original Contract Documents as follows:
  1. Specifications: Legibly mark and record at each Section description of actual Products installed, including the following:
    - a. Manufacturer's name and product model and number.
    - b. Product substitutions or alternates utilized.
    - c. Changes made by Addenda.
  2. Project Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
    - a. Measured horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
    - b. Measure locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
    - c. Field changes of dimension and detail.
    - d. Details not on original Contract Documents.
    - e. Mark the Project Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
  3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
- D. Project Record Documents Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up Project Record Documents and prepare a full set of corrected digital data files of the Project Record Documents in PDF format as follows:

1. Format: Scan Project Record Documents and assemble submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
2. Incorporate changes and additional information previously marked on red-line copies of the Project Record Documents. Delete, redraw, and add details and notations where applicable.
3. County will furnish Contractor with PDF of Contract Documents for use in recording information.

#### **1.10 WARRANTIES/GUARANTEES**

- A. As specified in General Provisions, Section 5.13 – Guarantee of Work, the Contractor shall guarantee all Work for two (2) years.
- B. Provide two (2) executed copies of each warranty document required by the Contract Documents ten (10) working days following the issuance of the Certificate of Substantial Completion for the portion of the Work covered by that warranty.

#### **1.11 SCHEDULE OF CONTRACT CLOSEOUT PROCEDURES**

- A. The following Closeout Procedures Checklist gives the order and responsibility for the requirements of the Final Contract Closeout. This list may not include all items required by the General Provisions and Detailed Provisions.
- B. Contract Closeout Documents Checklist: Complete the items indicated, and submit this Checklist when directed by the County.



<b>Checklist Item No.</b>	<b>Responsibility</b>	<b>Procedure</b>	<b>Date</b>
1	Contractor	Notify County in Writing that the Work is Substantially Complete	
2	County	Inspect the Work, prepare Punch List and identify items requiring completion/correction for Substantial Completion.	
3	Contractor	Complete/correct punch list items required for Substantial Completion.	
4	County	Verify Substantial Completion Punch List items have been completed/corrected and issue Certificate of Substantial Completion.	
5	Contractor	Notify County in Writing that the Work is ready for Final Acceptance: Prepare Final Application for Payment that includes the following: a. Affidavit of Wages Paid for Contractor and all Subcontractors. b. Contractor release of claims. c. Release of Liens Certificate from all Subcontractors. d. Project Record Documents. e. Operation and Maintenance Manuals. f. Warranties. g. Permits and Certificates of Occupancy/Use.	
6	County	Perform Final Inspection and if necessary issue Final Punch List.	
7	Contractor	Complete/correct Final Punch List items.	
8	County	Verify completion/correction of Final Punch List items. Prepare Notice of Completion and Final Payment for County Board of Supervisors Approval.	
9	County	County Board of Supervisor approves Notice of Completion and Final Payment. Notice of Completion is recorded.	
10	County	Release of all retention funds shall be within thirty-five (35) days after the recordation of the Notice of Completion. See General Provisions, Section. 7.7 – Final Payment.	

## 1.12 SUBMITTALS

### A. Warranties:

1. Organize warranty documents into an orderly sequence based on the Detailed Provision Sections:
  - a. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2 by 11 inch paper.
  - b. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and name, address, and telephone number of Installer.
  - c. Identify each binder on the front and spine with the typed title "WARRANTIES," Project name, and name of Contractor.
  - d. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
2. Provide additional copies of each warranty to include in operation and maintenance manuals.

### B. Final, Project Record Documents:

1. One (1) complete full size set of finalized Project Drawings and Shop Drawings on bond.
2. One (1) complete set of finalized Project Record Specifications.
3. One (1) complete set of Contract documents, including approved Field Work Directives and Change orders.
4. One (1) complete set of Contractor's correspondence, including but not limited to RFIs, memorandums, and e-mails.
5. Project Record Documents Digital Data Files:
  - a. Format: Scan Project Record Documents and assemble submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

C. Affidavit of Wages Paid for Contractor and all Subcontractors in accordance with state law.

D. Contractor's release of claims against the County from all parties who are entitled to claims against the subject project, property or improvement pursuant to the provisions of law.

E. Contractor certification that all Subcontractors and Suppliers have been paid and there are no outstanding liens;

F. Final Application for Payment;

G. Completed permits and/or certificates of occupancy/use.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

## **PART 3 EXECUTION**

### **3.01 REPAIR OF THE WORK**

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. When damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
  2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
    - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
  3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
  4. Replace burned-out bulbs and bulbs noticeably dimmed by hours of use to comply with requirements for new fixtures.

### **3.02 FINAL CLEANING**

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial/industrial

building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project:
  - a. Clean Project Location, yard and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
  - b. Sweep paved areas broom clean. Remove spills, stains, and other foreign deposits.
  - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
  - d. Remove tools, construction equipment, machinery, and surplus material from Project Location.
  - e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
  - f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, attics, and similar spaces.
  - g. Sweep concrete floors broom clean in unoccupied spaces.
  - h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
  - i. Clean transparent materials. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
  - j. Remove labels that are not permanent.
  - k. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
  - l. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
  - m. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
  - n. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
  - o. Leave Project Location clean and ready for occupancy.

### **3.03 PROJECT RECORD DOCUMENTS – RECORDING AND MAINTENANCE**

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to Project Record Documents as they occur; do not wait until the end of the Project.
- B. Maintenance of Project Record Documents and Samples: Store record documents and Samples at the Project Location apart from the documents used for construction. Do not use Project Record Documents for construction purposes. Maintain record documents in organized, clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for County’s reference during normal working hours.
- C. Filing and Archiving Requirements:
  - 1. Boxes shall have attached lids.
  - 2. All file folders shall be standard letter size, 8-1/2 x 11 inches.
  - 3. Three ring binders are not acceptable for archiving. Chicago Screws are acceptable for “binding” specifications and correspondence in chronological order.
  - 4. Hanging folders and/or rubber bands are not acceptable. Accordion folders or manila folders are acceptable.
  - 5. Do not return file folders labeled with subject matter(s) that were not used in the Contract.
  - 6. If Contractor did not use County’s file code index, a copy of the Contractor’s file code index shall be included with the files.
  - 7. Do not separate transmittal cover sheets from the deliverable.
  - 8. Do not include duplicates unless mandated in Contract Documents.



**TABLE 1.10 – ITEMS SUBJECT TO TEN (10) YEAR WARRANTY**

<b>SECTION</b>	<b>DESCRIPTION</b>	<b>COMPANY</b>	<b>CONTACT</b>	<b>PHONE</b>
32 3113	Chain-Link Fencing and Gate			

END OF SECTION 01 7700

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**SPECIFICATIONS – DETAILED PROVISIONS**  
**SECTION 02 0100: MAINTENANCE OF EXISTING CONDITIONS**  
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## **SECTION 02 0100 MAINTENANCE OF EXISTING CONDITIONS**

### **PART 1 GENERAL**

#### **1.01 SUMMARY**

A. Section includes:

1. Identification and field mark out of any and all on-site utility lines to remain in operation during construction.
2. Identification and in-place protection of existing groundwater monitoring wells and gas monitoring probes.
3. Identification and in-place protection of existing drainage features.
4. Identification and in-place protection of existing subgrade sections.
5. Repair of any damage during construction operations.

B. Related Contract Document Sections include, but are not limited to:

1. Detailed Provisions Section 01 1400 – Work Restrictions
2. Detailed Provisions Section 01 4320 – Surveying
3. Detailed Provisions Section 01 5000 – Temporary Facilities and Controls
4. Detailed Provisions Section 31 1000 – Site Clearing
5. Detailed Provisions Section 31 2300 – Earthwork
6. Detailed Provisions Section 33 1153 – Groundwater Monitoring Well Elevation Adjustment
7. Detailed Provisions Section 33 5139 – Gas Probe elevation Adjustment
8. Project Drawings

### **PART 2 PRODUCTS – NOT USED**

### **PART 3 EXECUTION**

#### **3.01 IDENTIFICATION**

- A. Locate all existing utilities which are to remain in service during construction as shown on the Project Drawings.
- B. Identify all existing concrete slabs and drainage structures within the project limits as shown on the Project Drawings.
- C. Identify subgrade section where design contours match existing contours as shown on the Project Drawings.

### **3.02 PROTECTION**

- A. Flag, barricade or suitably protect existing utilities during construction operations and equipment movement. Install shoring and bracing as required.
- B. Prevent interruption of existing utility service to occupied or used facilities, except when authorized in writing by authorities having jurisdiction.
- C. Existing utility lines that are indicated on the Project Drawings or which are made known to the Contractor prior to grading activities, and all utility lines that are constructed during grading activities shall be protected from damage during grading activities.
- D. All existing hardscape, which includes, but is not limited to: curb and gutters, drainage driveways, and concrete slabs-on-grade shall be protected in place during construction activities to prevent damage.
- E. Existing subgrade sections that are to remain in-place as shown on Project Drawings shall be identified and marked by means of survey as outlined in Detailed Provision Section 01 4320 – Surveying. Grading activities involving excavation or backfill for anything other than utility trenching and backfilling shall not take place within the existing subgrade section. Contractor shall keep subgrade section marked and protected for the duration of all grading activities.

### **3.03 REPAIR**

- A. Any damage to existing, operational utilities by the Contractor or his/her subcontractors during the ongoing construction operation shall be immediately repaired to operational standards at the Contractor's expense. If the repairs are not immediately addressed by the Contractor, the County shall contract for the repair at the Contractor's expense.
- B. Any and all damage to protected features shall be repaired by the Contractor at his/her own expense. Protected features include, but are not limited to: existing drainage structures, concrete slabs-on-grade, and subgrade sections. In the event the County elects to make necessary repairs with their own workforce, the Contractor shall reimburse the County for the cost of repairs. Contractor shall repair or replace any and all damaged features as required to return it to its original state before final payment shall be issued by the County.

END OF SECTION 02 0100



**SPECIFICATIONS – DETAILED PROVISIONS**  
**SECTION 02 4100: DEMOLITION**  
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## **SECTION 02 4100 DEMOLITION**

### **PART 1 GENERAL**

#### **1.01 SUMMARY**

A. Section Includes:

1. Deconstruction, removal, abandonment, and salvage, recycle, or disposal of various existing improvements including, but not limited to, reinforced concrete slabs and foundations or portions thereof, concrete and asphalt drainage structures, utilities, asphalt and concrete pavement, fencing, signs, poles, reinforced concrete or CMU walls, reinforced concrete structures including below-grade slabs and foundations, structure mechanical and electrical systems, and other incidental items necessary for the completion of the Project.
2. Furnish all labor, materials, tools, equipment, and services for Demolition, as indicated, in accordance with provisions of the Contract Documents.
3. Completely coordinate work with of other trades.

B. Related Detailed Provisions Sections include, but are not limited to:

1. Section 01 5600 – Project Environmental Controls
2. Section 01 7419 – Construction Waste Management
3. Section 02 0100 – Maintenance of Existing Conditions
4. Section 02 6113 – Refuse Excavation, Handling and Disposal
5. Section 26 0505 – Site Electrical Decommissioning
6. Section 31 1000 – Site Clearing

#### **1.02 QUALITY ASSURANCE**

- A. Conduct work in accordance with Cal-OSHA and EPA requirements.
- B. Comply with American National Standards Institute (ANSI) /American Society of Safety Professionals (ASSP) A10.6 – Safety and Health Program Requirements for Demolition Operations.
- C. Comply with National Fire Protection Agency (NFPA) 241 – Standard for Safeguarding Construction, Alteration, and Demolition Operations.
- D. Use only firms or individual trades qualified to perform work required under this Section.

#### **1.03 DEFINITIONS**

- A. Abandon: Cut, cap, and fill the feature as approved by County of the feature and leave in place.

- B. Relocate: Preserve the feature and the functionality of the feature. Move the feature to the designated location.
- C. Remove: Take appropriate action to eliminate the feature from the Project Location. Removal may include disposal, recycling, or salvage.
- D. Salvage: Preserve and protect the feature and the functionality of the feature. Move the feature to the designated location and turn over custody to the County.
- E. Cal-OSHA: California Department of Industrial Relations – Division of Occupational Safety and Health.
- F. EPA: United States Environmental Protection Agency.

#### **1.04 SUBMITTALS**

- A. Submittal Procedures: Detailed Provisions Section 01 3300 – Submittal Procedures for requirements for the mechanics and administration of the submittal process.
- B. Approval Submittals:
  - 1. Demolition Plan not later than fourteen (14) calendar days prior to the intended start of demolition work. Demolition Plan shall include, but not limited to, discussing the following items:
    - a. Sequencing of the work.
    - b. Protection of workers and the public.
    - c. Traffic control, where demolition is adjacent to existing facility operations or as required in public right-of-way.
    - d. Environmental protection.
    - e. Means and methods to minimize disposal and maximize salvage and recycling.
    - f. Demolition disposal procedures.
    - g. Salvaged items to be delivered to County.
    - h. Disposal of demolition debris.
      - 1) Coordinate with the Waste Recycling Plan required in Detailed Provisions Section 01 7419 – Construction Waste Management.

#### **1.05 DESCRIPTION**

- A. Work includes:
  - 1. Demolition of structures, utilities, and other site features as indicated.
  - 2. Removal of demolition debris.
  - 3. Protection of construction to remain, including:
    - a. Utilities to remain.
    - b. Other items indicated.



- B. Condition of existing structures to be demolished:
  - 1. County assumes no responsibility for actual condition of structures to be demolished.
  - 2. Conditions existing at time of inspection for bidding purposes will be maintained by County insofar as practicable.

## **1.06 JOB CONDITIONS**

- A. Perform preliminary investigations as required to ascertain extent of work.
  - 1. Conditions which would be apparent by such investigation will not be allowed as cause for claims for extra costs.
- B. Before start of work, obtain and pay for permits required by Authorities Having Jurisdiction and notify interested utility companies.
- C. Observe safety precautions in all phases of the work. Included shall be trench shoring, bracing, lighting, and barricades as dictated by reason and by Safety Orders of the Division of Industrial Safety, State of California (Cal-OSHA). Shoring is required for all trench portions greater than 4-feet in depth. Trenches greater than 20-feet in depth require protection systems designed by Professional Structural Engineer licensed in California.
- D. Hazardous Materials and Dangerous Wastes – If materials suspected of containing hazardous materials are encountered do not disturb; immediately notify the County. Hazardous materials will be removed by County under a separate contract or negotiated with the Contractor via a change order.
- E. When performing underground work, the Contractor shall call Underground Service Alert of Southern California (USA/SC) at 811, the one-call underground facility locating service two (2) working days prior to making an excavation. Contractor shall be responsible for such notification of sub-contractor's work, or shall require sub-contractor to assume this responsibility.
- F. On-site storage or sale of removed items or materials is not permitted.

## **PART 2 PRODUCTS – (NOT APPLICABLE TO THIS SECTION)**

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Identification:
  - 1. Field locate and mark all structures to be removed.
  - 2. Existing Utilities:
    - a. Locate utilities within or adjacent to the Project Locations.
    - b. Take all necessary precautionary measures to protect utilities.

- c. Provide adequate means of support and protection during removal operations for utilities that are to remain in service.
  - d. Do not interrupt existing utilities services, except when permitted in writing by the County, and then only after acceptable temporary utility services have been provided if required by the County and utility owner.
    - 1) Provide minimum ten (10) working days notice to County and utility owner, and receive written notice to proceed before interrupting any utility.
- B. Protection:
- 1. Maintain facility operations traffic for the duration of the work in accordance with Detailed Provisions Section 01 1400 – Work Restrictions.
  - 2. Take all necessary precautionary measures to protect all utilities, structures and surrounding areas.
- C. Comply with all requirements of ANSI/ASSP A10.6 and NFPA 241.

### **3.02 POLLUTION CONTROLS**

- A. Provide erosion and sediment controls in accordance with Detailed Provisions Section 01 5600 – Project Environmental Controls prior to initiating work.
- B. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations.
- C. Alleviate dust and provide dust control measures as needed.
- D. Return adjacent areas to condition existing prior to start or work.

### **3.03 ITEMS TO BE SALVAGED FOR COUNTY**

- A. Unless determined as unsalvageable by the County, all items designated for salvage shall be removed with care to prevent damage.
- B. If, in the opinion of the County, salvageable features were unnecessarily damaged, damaged salvageable features shall be replaced or repaired, to the satisfaction of the County, by the Contractor at no additional cost to the County.
- C. Remove salvage items at appropriate stage of demolition, but early enough to prevent damage to them by demolition operations.
- D. Coordinate with County on items the County wants to salvage or relocate:
  - 1. Groundwater monitoring well monuments.
  - 2. Gas probe monuments.

### **3.04 ITEMS SALVAGED FOR CONTRACTOR**

- A. Items of salvage value to Contractor not designated in Contract Documents as items to salvage or relocate may be removed from the Project Locations as work progresses.
- B. Transport salvaged items from Project Locations as they are removed. Storage or sale of removed items not permitted on the Project Locations.

### **3.05 ITEMS TO BE REMOVED FOR RE-INSTALLATION IN PROJECT**

- A. Remove items designated for re-use:
  - 1. Tag, protect from damage, store if required, and deliver to designated locations.

### **3.06 GENERAL DEMOLITION PROCEDURES**

- A. Remove features/structures as indicated on the Project Drawings and as necessary to complete the project.
- B. Comply with all requirements of ANSI/ASSP A10.6 and NFPA 241.
- C. Keep elements of the deconstructed features/structures that are designated as contaminated and not suitable for recycling as designated in Detailed Provisions Section 01 7419 – Construction Waste Management, such as contaminated concrete and asphalt separate from similar materials that are recyclable. Demolished reinforced concrete that contains steel reinforcement is not suitable for recycling or salvaging unless the Contractor processes the material to crush concrete and separate steel reinforcement from concrete to the County’s satisfaction.
- D. The Contractor shall break-up waste material to the County’s satisfaction, load, haul and unload the material in the designated disposal area as shown in Drawing 4. The Contractor shall then proceed to handle and bury the material in accordance with Detailed Provision Section 02 6113 – Refuse Excavation, Handling and Disposal.
- E. Demolition of entire features/structures:
  - 1. Demolish completely and dispose at the designated dispose area.
  - 2. Use such methods as required to complete work within limitations of governing regulations.
- F. Demolitions of portions of features/structures:
  - 1. Cut, cap, sawcut, or otherwise provide clean break between the portion of the feature to be demolished and portion to remain.
  - 2. Protect portion of feature to remain in place from damage during demolition.
- G. Start and complete work as established by approved schedule; operational procedures and sequence of work are optional provided schedule is maintained.
- H. Protect property to remain:
  - 1. Promptly repair damage caused by demolition, as directed by the County, at no cost to the County.

2. Conduct operations to prevent damage by falling debris or other cause to adjacent structures or features as well as persons.
  3. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement or collapse of structures.
- I. Conduct operations to ensure minimum interference with roads, walks, entrances, exits, and other adjacent occupied facilities.
    1. Do not close or obstruct public thoroughfares or walks unless approved by Authorities having Jurisdiction.
    2. Provide alternate routes around closed or obstructed traffic ways.
  - J. Provide covered passageways where necessary to ensure safe passage of persons in or near areas of work.
  - K. Provide barricades and safety lights as required.
  - L. Abandon utilities that have been designated to be abandoned.
  - M. If suspected hazardous materials or unexpected structures such as underground storage tanks are encountered, Contractor shall stop work and notify the County immediately for further direction.
  - N. Structural Demolition:
    1. Demolish concrete and masonry in small sections.
    2. Perform removal to avoid excessive loads on supporting walls, floor or framing.

### **3.07 SAWCUTTING**

- A. Make a neat vertical saw cut at the boundaries of the asphalt and/or concrete area to be removed.
  1. Care shall be taken when saw cutting so as not to damage any of the existing asphalt concrete pavement to remain in place.
  2. Sawcutting shall extend through the full slab/pavement depth, or to a maximum depth of 12-inches whichever is less.
  3. Any slab/pavement damaged by Contractor due to its operations shall be repaired or replaced at no cost to the County.
  4. Contractor is responsible for ensuring that special precautions are taken so that no concrete or concrete by-products, or products and by-products used in the sawcut of asphalt or concrete, are discharged into any storm water drainage system or surface waters.
- B. Wastewater from Cutting Operations:
  1. Wastewater from Portland Cement Concrete, masonry, and asphalt concrete cutting operations shall not be discharged to storm water drainage system or surface waters.
  2. Cutting operations typically increase the pH of wastewater, therefore, just filtering of wastewater at treatment prior to discharge is not acceptable.

3. To thoroughly clean saw cuts where necessary, use high pressure water (high pressure water is considered greater than 1400 psi).
4. All wastewater shall be collected using a wet-dry vacuum or pumped into appropriate storage containers for proper disposal.
5. Impervious surfaces contaminated with sediment and grit from cutting or pulverizing operations shall be cleaned by sweepers to prevent contaminants from entering the storm water drainage system or surface waters.

### **3.08 EXISTING PIPE ABANDONMENT**

- A. Clean interior contact surfaces of all pipes to be cut off and abandoned.
- B. Construct concrete plug in ends of pipes.
  1. Minimum length of plug shall be equal to two (2) diameters of the pipe.
- C. Concrete shall completely fill the pipe opening.

### **3.09 REMOVAL AND/OR RESETTING OF MISCELLANEOUS ITEMS**

- A. Remove and/or reset miscellaneous items as described in the Project Drawings and as necessary to satisfactorily complete the project.
- B. Items requiring resetting shall be protected from damage during removal. If, in the opinion of the County, an item requires replacement due to the Contractor's operations it shall be replaced in kind at Contractor's expense.

### **3.10 CLEAN-UP AND DISPOSAL OF DEMOLITION MATERIALS**

- A. Materials, except those identified as salvage, resulting from the demolition work shall be hauled to an approved waste disposal site, secured by the Contractor and shall be disposed of in such a manner as to meet the requirements of federal, state, county, and municipal regulations regarding health, safety, and public welfare.
  1. Coordinate with the Waste Recycling Plan required in Detailed Provisions Section 01 7419 – Construction Waste Management.
  2. Contractor is responsible for all fees associated with proper disposal of unsalvageable items.
- B. The Designated Disposal Area, as shown on Drawing 4 should be utilized to dispose of all acceptable refuse generated from this Project. Dispose of acceptable refuse at this location shall be on a "No Charge" account, with the Contractor estimating the total tonnage. All on-site refuse disposal shall be done in accordance with Detailed Provision Section 02 6113 – Refuse Excavation, Handling and Disposal.
  1. Treated Wood Power Poles: While most waste can be disposed of on-site, the treated wood power poles cannot. They must be properly disposed of off-site
- C. Clean up all other debris resulting from this work.

END OF SECTION 02 4100

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**SPECIFICATIONS – DETAILED PROVISIONS**

**SECTION 02 6113: REFUSE EXCAVATION, HANDLING AND DISPOSAL  
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## **SECTION 02 6113 REFUSE EXCAVATION, HANDLING AND DISPOSAL**

### **PART 1 GENERAL**

#### **1.01 SUMMARY**

**A. Section Includes:**

1. This work shall include furnishing all labor, supervision, tools equipment and materials necessary for the excavation, handling and disposal of refuse.

**B. Related Detailed Provisions Sections include, but are not limited to:**

1. Section 01 5600 – Project Environmental Controls
2. Section 01 7419 – Construction Waste Management
3. Section 02 0100 – Maintenance of Existing Conditions
4. Section 02 4100 – Demolition
5. Section 31 1000 – Site Clearing
6. Section 31 2300 – Earthwork

#### **1.02 QUALITY ASSURANCE**

**A. Conduct work in accordance with Cal-OSHA and EPA requirements.**

**B. Use only firms or individual trades qualified to perform work required under this Section.**

#### **1.03 DEFINITIONS**

**A. Alternative Daily Cover (ADC): Includes but is not limited to: 6-inches of cover soil, Greenwaste material, tarps or other approved equals.**

**B. Cal-OSHA: California Department of Industrial Relations – Division of Occupational Safety and Health.**

**C. Designated Disposal Area: An area within the permitted landfill unit that shall be used to dispose of any project related refuse.**

**D. EPA: United States Environmental Protection Agency.**

**E. Final Cover: minimum 3 feet thick final cover layer in accordance with Detailed Provision Section 32 2300 – Earthwork required to be placed over any refuse.**

**F. Refuse: Non-hazardous municipal solid waste for disposal.**

**G. Remove: Take appropriate action to eliminate the feature from the Project Location. Removal may include disposal, recycling, or salvage.**

**H. Salvage: Preserve and protect the feature and the functionality of the feature. Move the feature to the designated location and turn over custody to the County.**

#### **1.04 SUBMITTALS**

- A. Submittal Procedures: Detailed Provisions Section 01 3300 – Submittal Procedure for requirements for the mechanics and administration of the submittal process.

#### **1.05 DESCRIPTION**

- A. Work includes:
  - 1. Refuse may be encountered and further excavation to haul all the refuse encountered may be required.
  - 2. Handling refuse by hauling it from the location encounter to the designated disposal area for disposal.
  - 3. Disposal:
    - a. Covering refuse at the end of the day with ADC.
    - b. Placing the final cover layer over refuse once no more refuse shall be disposed.

#### **1.06 JOB CONDITIONS**

- A. Perform preliminary investigations as required to ascertain extent of work.
  - 1. Conditions which would be apparent by such investigation will not be allowed as cause for claims for extra costs.
- B. Before start of work, obtain and pay for permits required by Authorities Having Jurisdiction and notify interested utility companies.
  - 1. The County shall apply for and obtain a Rule 1150 Excavation Management Permit.
- C. Observe safety precautions in all phases of the work. Included shall be trench shoring, bracing, lighting, and barricades as dictated by reason and by Safety Orders of the Division of Industrial Safety, State of California (Cal-OSHA). Shoring is required for all trench portions greater than 4-feet in depth. Trenches greater than 20-feet in depth require protection systems designed by Professional Structural Engineer licensed in California.
- D. Hazardous Materials and Dangerous Wastes – If materials suspected of containing hazardous materials are encountered do not disturb; immediately notify the County. Hazardous materials will be removed by County under a separate contract or negotiated with the Contractor via a change order.
- E. When performing underground work, the Contractor shall call Underground Service Alert of Southern California (USA/SC) at 811, the one-call underground facility locating service two (2) working days prior to making an excavation. Contractor shall be responsible for such notification of sub-contractor’s work, or shall require sub-contractor to assume this responsibility.
- F. On-site storage or sale of refuse is not permitted.

### **PART 2 PRODUCTS – (NOT APPLICABLE TO THIS SECTION)**

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

#### A. Identification:

1. Field locate and mark all refuse to be disposed of.

#### B. Protection:

1. Maintain facility operations traffic for the duration of the work in accordance with Detailed Provisions Section 01 1400 – Work Restrictions.
2. Take all necessary precautionary measures to protect all utilities, structures and surrounding areas.

#### C. Comply with all requirements of ANSI/ASSP A10.6 and NFPA 241.

### **3.02 POLLUTION CONTROLS**

#### A. Provide erosion and sediment controls in accordance with Detailed Provisions Section 01 5600 – Project Environmental Controls prior to initiating work.

#### B. Alleviate dust and provide dust control measures as needed.

#### C. Return adjacent areas to condition existing prior to start or work.

### **3.03 REFUSE EXCAVATION, HANDLING AND DISPOSAL PROCEDURES**

#### A. Refuse or soil co-mingled with refuse may be encountered during excavation within the landfill footprint limits, however, is it possible that refuse may also be encountered in any excavation area within the Project Limits shown on the Project Drawings.

#### B. The Contractor shall remove interim cover soil, refuse or soil co-mingled refuse encountered during excavation from within the Project Limits shown on the Project Drawings.

#### C. Excavated interim cover soil that does not contain co-mingled refuse or has been deemed suitable by the County may be used as source material for engineered fill and other miscellaneous sources.

#### D. Contractor shall haul excavated refuse and soil co-mingled with refuse to the designated disposal area and cover the exposed refuse with a minimum of 6-inches of clean compacted earthen cover material or approved ADC as directed by the County.

#### E. If the cover material placed over refuse is to act as subgrade for engineered fill, a drainage structure, etc. Contractor shall prepare the cover soil according to the proper Detailed Provisions.

#### F. At the end of the workday, Contractor shall cover all refuse surfaces and may not allow refuse surfaces to be exposed overnight. If refuse excavation to design grade has not been completed by the end of the workday, Contractor may cover the refuse surface with 6-inches of clean compacted earthen cover soil or alternative daily cover including but not limited to: 6-inches of process greenwaste material, tarps or approved equal.

- G. In the event the County or Contractor suspects any excavation material from the landfill is hazardous (as defined by CalRecycle or the Local Enforcement Agency), the Contractor shall stockpile the suspect material in a location separate from the rest of the excavated material. The Contractor shall immediately notify the County if excavation material is suspected to be hazardous. The County will make the appropriate analyses to determine if the suspected hazardous material is hazardous by CalRecycle or LEA definition. The Contractor shall dispose of determined hazardous material in the hazardous waste disposal site designated by the County. The Contractor shall be compensated for disposal for such hazardous waste. This work shall be considered as extra work and therefore, will be paid for in accordance with Section 2.7 of the General Provisions entitled "Extra Work". (Any hazardous material generated by the Contractor, including but not limited to spills or leaks during routine equipment maintenance or any spills caused by any of the Contractor's subcontractors or suppliers, shall be properly disposed of at the Contractor's expense as stated in the Contract Documents.
- H. The Contractor shall fill the Designated Disposal Area and place the Final Cover Layer over the Designated Disposal Area last to provide an area for any Project related demolition to be buried. The Final Cover Layer will be a minimum of 3-feet thick if placed on exposed refuse or 2-feet thick over a minimum 1-foot thick intermediate cover layer. The Final Cover Layer material and placement shall be in accordance with Detailed Provision 31 2300 – Earthwork.
1. While most waste can be disposed of on-site at the designated disposal area, the on-site treated wood power poles cannot. They must be properly disposed of off-site.
- I. Start and complete work as established by approved schedule; operational procedures and sequence of work are optional provided schedule is maintained.
- J. The County is in the process of obtaining a South Coast Air Quality Management District (SCAQMD) Rule 1150 Permit for refuse excavation. The Contractor must place refuse within the limits of the landfill footprint as shown on the Project Drawings; and the Contractor shall also comply with all requirements of the SCAQMD permit conditions (i.e., daily cover, transportation, dust suppression, etc.) at any time refuse is encountered. A sample SCAQMD permit and associated conditions can be provided upon request. The County will provide required personnel to monitor the activities in accordance with the SCAQMD 1150 permit.

END OF SECTION 02 6113



**SPECIFICATIONS – DETAILED PROVISIONS**  
**SECTION 03 0505: CONCRETE TESTING**  
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## SECTION 03 0505 CONCRETE TESTING

### PART 1 GENERAL

#### 1.01 SUMMARY

A. Description:

1. This work consists of testing concrete and grout where required by the Contract Documents or where designated by the County.

B. Related Detailed Provisions Sections include, but are not limited to:

1. Section 01 4300 – Quality Assurance and Control
2. Section 03 2100 – Concrete Reinforcement
3. Section 03 3100 – Cast-in-Place Structural Concrete
4. Section 03 3131 – Concrete Mixing, Placing, Jointing, and Curing
5. Section 03 3713 – Shotcrete

#### 1.02 RESPONSIBILITY AND PAYMENT

A. County will hire a Testing/Inspection Provider to perform the following testing and inspection services and provide test results to the County and Contractor.

1. Testing and inspection of concrete, grout, and concrete reinforcement produced for incorporation into the work during the construction of the Project for compliance with the Contract Documents.
2. Additional testing or retesting of materials occasioned by their failure, re-test or inspection, to meet requirements of the Contract Documents.
3. Strength testing on concrete required by the County or Special Inspector when the water-cement ratio exceeds the water-cement ratio of the typical test cylinders.
4. In-place testing of concrete as may be required by County when strength of structure is considered potentially deficient.
5. Other testing services needed or required by Contractor such as field curing of test specimens and testing of additional specimens for determining when forms, form shoring or reshoring may be removed.
6. County will pay for services defined in Paragraph 1.02A.1.

B. Contactor shall hire a qualified testing agency to perform the following testing and provide test results to the County.

1. Testing of materials and mixes proposed by the Contractor for compliance with the Contract Documents and retesting in the event of changes.
2. Additional testing and inspection required because of changes in materials or proportions requested by Contractor.

3. Contractor shall pay for services defined in Paragraphs 1.02B.1. and 1.02B.2.
4. Contractor shall reimburse County for testing services defined in Paragraphs 1.02A.2., 1.02A.3., 1.02A.4., and 1.02A.5.

C. Duties and Authorities of Testing/Inspection Provider:

1. Any Testing/Inspection Provider or agencies and their representatives retained by Contractor or County for any reason are not authorized to revoke, alter, relax, enlarge, or release any requirement of Contract Documents, nor to reject, approve or accept any portion of the Work.
2. Testing/Inspection Provider shall inform the Contractor and County regarding acceptability of or deficiencies in the work including materials furnished and work performed by Contractor that fails to fulfill requirements of the Contract Documents.
3. Testing/Inspection Provider shall submit test reports and inspection reports to the County and Contractor immediately after they are performed.
  - a. All test reports shall include exact location in the work at which batch represented by a test was placed.
  - b. Reports of strength tests to include detailed information on storage and curing of specimens prior to testing.
4. County retains the responsibility for ultimate rejection or approval of any portion of the Work.

### **1.03 QUALITY ASSURANCE**

A. Referenced Standards:

1. American Association of State Highway and Transportation Officials (AASHTO):
  - a. AASHTO T260 – Standard Method of Test for Sampling and Testing for Chloride Ion in Concrete and Concrete Raw Materials.
2. American Concrete Institute (ACI):
  - a. ACI 318 – Building Code Requirements for Structural Concrete.
3. American Society for Testing and Materials (ASTM):
  - a. ASTM C31 – Standard Practice for Making and Curing Concrete Test Specimens in the Field.
  - b. ASTM C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
  - c. ASTM C42 – Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
  - d. ASTM C109 – Standard Test Method for Compressive Strength of Hydraulic Cement Mortars.



- e. ASTM C138 – Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
  - f. ASTM C143 – Standard Test Method for Slump of Hydraulic-Cement Concrete.
  - g. ASTM C157 – Standard Test Method for Length Change of Hardened Hydraulic-Cement, Mortar, and Concrete.
  - h. ASTM C172 – Standard Practice for Sampling Freshly Mixed Concrete.
  - i. ASTM C173 – Standard Test Method for Air Content of Freshly Mixed Concrete by Volumetric Method.
  - j. ASTM C231 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
  - k. ASTM C311 – Standard Test Method for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland Cement Concrete.
  - l. ASTM C596 – Standard Test Method for Drying Shrinkage of Mortar Containing Hydraulic Cement.
  - m. ASTM C827 – Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures.
  - n. ASTM C939 – Standard Test Method for Flow of Grout for Preplaced-Aggregate Concrete.
  - o. ASTM C1077 – Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation.
  - p. ASTM C1090 – Standard Test Method for Measuring Changes in Height of Cylindrical Specimens of Hydraulic-Cement Grout.
  - q. ASTM C1218 – Standard Test Method for Water-Soluble Chloride in Mortar and Concrete.
  - r. ASTM C1260 – Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method).
  - s. ASTM E329 – Standard Specification for Agencies Engaged in Construction Inspection, Testing or Special Inspection.
4. National Bureau of Standards (NBS):
- a. Cement and Concrete Reference Laboratory (CCRL).
- B. Qualifications:
- 1. Contractor's testing agency:
    - a. Meeting requirements of ASTM E329.
    - b. Provide evidence of recent inspection by CCRL of NBS, and correction of deficiencies noted.

## 1.04 DEFINITIONS

- A. Testing/Inspection Provider: A professional testing/inspection firm or service hired by the County to perform testing, inspection or analysis services as directed, and as provided in the Contract Documents.

## 1.05 SUBMITTALS

- A. Submittal Procedures: See Detailed Provisions Section 01 3300 – Submittal Procedures for requirements for the mechanics and administration of the submittal process.

- B. Approval Submittals:

- 1. Product technical data, including, but not limited to:

- a. Concrete materials and concrete mix designs proposed for use.

- 1) Include results of all testing performed to qualify materials and to establish mix designs.
- 2) Place no concrete until approval of mix designs has been received in writing.
- 3) Submittal for each concrete mix design to include:
  - (a) Sieve analysis and source of fine and coarse aggregates.
  - (b) Test for aggregate organic impurities.
  - (c) Proportioning of all materials.
  - (d) Type of cement with mill certificate for the cement.
  - (e) Brand, quantity and class of fly ash proposed for use along with other submittal data as required for fly ash by Detailed Provisions Section 03 3100 – Cast-In-Place Structural Concrete.
  - (f) Slump.
  - (g) Brand, type and quantity of air entrainment and any other proposed admixtures.
  - (h) Shrinkage test results in accordance with ASTM C157.
  - (i) Total chloride ion content per cubic yard of concrete determined in accordance with AASHTO T260.
  - (j) 28-day compression test results and any other data required by Detailed Provisions Section 03 3100 – Cast-In-Place Structural Concrete to establish concrete mix design.

- C. Quality Assurance Submittals: Testing agency qualifications.

## PART 2 PRODUCTS – (NOT APPLICABLE TO THIS SECTION)

## **PART 3 EXECUTION**

### **3.01 TESTING SERVICES TO BE PERFORMED BY COUNTY**

- A. The following concrete testing will be performed by the County's Testing/Inspection Provider:
1. Concrete strength testing:
    - a. Secure concrete samples in accordance with ASTM C172.
      - 1) Obtain each sample from a different batch of concrete on a random basis, avoiding selection of test batch other than by a number selected at random before commencement of concrete placement.
    - b. For each strength test, mold and cure five (5) cylinders from each sample in accordance with ASTM C31. Samples shall be formed in 6" x 12" long non-absorbent cylindrical molds.
      - 1) Record any deviations from requirements on test report.
      - 2) Cylinder size: Per ASTM C31.
    - c. Field cure one cylinder for the seven (7) day test.
      - 1) Laboratory cure the remaining cylinders.
    - d. Test cylinders in accordance with ASTM C39.
      - 1) Test one (1) cylinder at 7 days.
      - 2) Test one (1) cylinder at 14 days.
      - 3) Test two (2) cylinders at 28 days.
      - 4) Hold remaining cylinder in reserve.
    - e. Strength test result:
      - 1) Average of strengths of two (2) cylinders from the same sample tested at 28 days.
      - 2) If one (1) cylinder in a test manifests evidence of improper sampling, molding, handling, curing, or testing, discard and test reserve cylinder; average strength of remaining cylinders shall be considered strength test result.
      - 3) Should all cylinders in a test show any of above defects, discard entire test.
    - f. Frequency of tests:
      - 1) Concrete sand cement grout: One (1) strength test for each four (4) hour period of grout placement or fraction thereof.
      - 2) Precast concrete, concrete topping, concrete fill and lean concrete: One (1) strength test for each 10 CY or fraction thereof placed in any one (1) day.

- 3) All other concrete:
  - (a) One (1) strength test consisting to be taken not less than once a day, nor less than once for each 60 CY or fraction thereof placed in any one (1) day.
  - (b) If total volume of concrete on the Project is such that frequency of testing required in above paragraph will provide less than five (5) strength tests for each concrete mix, tests shall then be made from at least five (5) randomly selected batches or from each batch if fewer than five (5) batches are provided.
2. Slump testing:
  - a. Determine slump of concrete sample for each strength test.
    - 1) Determine slump in accordance with ASTM C143.
  - b. If consistency of concrete appears to vary, the County shall be authorized to require a slump test for each concrete truck.
    - 1) This practice shall continue until the County deems it no longer necessary.
3. Air content testing: Determine air content of concrete sample for each strength test in accordance with either ASTM C231 or ASTM C173.
4. Fly ash testing in compliance with ASTM C311 with a minimum of one sample weighing four pounds taken from each 200 tons of fly ash supplied for the Project.
5. Temperature testing: One test hourly when air temperature is 40 Deg F and below and when 80 Deg F and above and one test for each composite sample per ASTM C1064.
6. In-place concrete testing (if required).

### **3.02 SAMPLING ASSISTANCE AND NOTIFICATION FOR COUNTY**

- A. To facilitate testing and inspection, perform the following:
  1. Furnish any necessary labor to assist Testing/Inspection Provider in obtaining and handling samples on-site.
  2. Provide and maintain for sole use of Testing/Inspection Provider adequate facilities for safe storage and proper curing of test specimens on-site for first 24 hours as required by ASTM C31.
- B. Notify County sufficiently in advance of operations (minimum of 48 hours) to allow completion of quality tests for assignment of personnel and for scheduled completion of quality tests.

### 3.03 ACCEPTANCE

- A. Completed concrete work which meets applicable requirements will be accepted without qualification.
- B. Completed concrete work which fails to meet one or more requirements, but which has been repaired to bring it into compliance will be accepted without qualification.
- C. Completed concrete work which fails to meet one or more requirements and which cannot be brought into compliance may be accepted or rejected as provided in these Contract Documents.
  - 1. In this event, modifications may be required to assure that concrete work complies with requirements.
  - 2. Modifications, as directed by County, to be made at no additional cost to County.
- D. Dimensional Tolerances:
  - 1. Formed surfaces resulting in concrete outlines smaller than permitted by tolerances shall be considered potentially deficient in strength and subject to modifications required by the County.
  - 2. Formed surfaces resulting in concrete outlines larger than permitted by tolerances may be rejected and excess material subject to removal.
    - a. If removal of excess material is permitted, accomplish in such a manner as to maintain strength of section and to meet all other applicable requirements of function and appearance.
  - 3. Concrete members cast in wrong location may be rejected if strength, appearance or function of structure is adversely affected or misplaced items interfere with other construction.
  - 4. Inaccurately formed concrete surfaces exceeding limits of tolerances and which are exposed to view, may be rejected.
    - a. Repair or remove and replace if required.
  - 5. Finished slabs exceeding tolerances may be required to be repaired provided that strength or appearance is not adversely affected.
    - a. High spots may be removed with a grinder, low spots filled with a patching compound, or other remedial measures performed as permitted or required.
- E. Appearance:
  - 1. Concrete surfaces exposed to view with defects which, in opinion of County, adversely affect appearance as required by specified finish shall be repaired by approved methods.
  - 2. Concrete not exposed to view is not subject to rejection for defective appearance unless, in the opinion of the County, the defects impair the strength or function of the member.

F. High Water-Cement Ratio:

1. Concrete with water in excess of the specified maximum water-cement ratio will be considered potentially deficient in durability.
2. Remove and replace concrete with high water-cement ratio or make other corrections as directed by County.

G. Strength of Structure:

1. Strength of structure in place will be considered potentially deficient if it fails to comply with any requirements which control strength of structure, including but not limited to the following:
  - a. Low concrete strength:
    - 1) Test results for standard molded and cured test cylinders to be evaluated separately for each mix design.
      - (a) Such evaluation shall be valid only if tests have been conducted in accordance with specified quality standards.
      - (b) For evaluation of potential strength and uniformity, each mix design shall be represented by at least three (3) strength tests.
      - (c) A strength test shall be the average of two (2) cylinders from the same sample tested at 28 days.
    - 2) Acceptance:
      - (a) Strength level of each specified compressive strength shall be considered satisfactory if both of the following requirements are met:
        - i. Average of all sets of three (3) consecutive strength tests equal or exceed the required specified 28 day compressive strength.
        - ii. If an individual strength tests falls below 60% or the required minimum 28 day strength, the concrete shall be immediately rejected and shall be removed and replaced at no additional cost to the County.
  - b. Reinforcing steel size, configuration, quantity, strength, position, or arrangement at variance with requirements in Detailed Provisions Section 03 2100 – Concrete Reinforcement or requirements of the Project Drawings or approved Shop Drawings.
  - c. Concrete which differs from required dimensions or location in such a manner as to reduce strength.
  - d. Curing time and procedure not meeting requirements of this Detailed Provisions Section.
  - e. Inadequate protection of concrete from extremes of temperature during early stages of hardening and strength development.
  - f. Mechanical injury, construction fires, accidents or premature removal of formwork likely to result in deficient strength.
  - g. Concrete defects such as voids, honeycomb, cold joints, spalling, cracking, etc., likely to result in deficient strength or durability.

2. Structural analysis and/or additional testing may be required when strength of structure is considered potentially deficient.
3. In-place testing of concrete may be required when strength of concrete in place is considered potentially deficient.
  - a. Testing by impact hammer, sonoscope, or other nondestructive device may be permitted by the County to determine relative strengths at various locations in structure or for selecting areas to be cored.
    - 1) Such tests shall not be used as a basis for acceptance or rejection.
  - b. Core tests:
    - 1) Where required, test cores will be obtained in accordance with ASTM C42.
      - (a) If concrete in structure will be dry under service conditions, air dry cores (temperature 60 to 80 Deg F, relative humidity less than 60 percent) for seven (7) days before test then test dry.
      - (b) If concrete in structure will be wet or subjected to high moisture atmosphere under service conditions, test cores after immersion in water for at least 40 hours and test wet.
      - (c) Testing wet or dry to be determined by County.
    - 2) Three (3) representative cores may be taken from each member or area of concrete in place that is considered potentially deficient.
      - (a) Location of cores shall be determined by the County so as least to impair strength of structure.
      - (b) If, before testing, one (1) or more of cores shows evidence of having been damaged subsequent to or during removal from structure, damaged core shall be replaced.
    - 3) Concrete in area represented by a core test will be considered adequate if average strength of three (3) cores is equal to at least 85 percent of specified strength and no single core is less than 75 percent of specified strength.
    - 4) Fill core holes with nonshrink grout and finish to match surrounding surface when exposed in a finished area.
4. If core tests are inconclusive or impractical to obtain or if structural analysis does not confirm safety of structure, load tests may be required and their results evaluated in accordance with ACI 318, Chapter 20.
5. Correct or replace concrete work judged inadequate by structural analysis or by results of core tests or load tests with additional construction, as directed by County, at Contractor's expense.
6. Contractor to pay all costs incurred in providing additional testing and/or structural analysis required.
7. Should test samples fail strength testing, the County may require changes in proportions or materials, or both, to apply to the remainder of the work. Furthermore, the County may require additional curing on those portions of the structure represented by the test samples which fall below the specified values. The

cost of such additional curing shall be at no additional cost to the County. In the event that such additional curing does not give the strength required, as evidenced by core and/or load tests, the County may require strengthening or replacement of those portions of the structure which fail to develop the required strength. Coring and testing and/or load tests and any strengthening or concrete replacement required because of strengths or test samples are below specified values, shall be at no additional cost to the County. In such cases of failure to meet strength requirements the Contractor and County shall confer to determine what adjustment, if any, can be made in compliance with Sections titled “Strength” and “Failure to Meet Strength Requirements” of ASTM C94. The “purchaser” referred to in ASTM C94 is the Contractor.

END OF SECTION 03 0505





**SPECIFICATIONS – DETAILED PROVISIONS**

**SECTION 03 1113: FORMWORK – STRUCTURAL CAST-IN-PLACE  
CONCRETE**

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## SECTION 03 1113 FORMWORK – STRUCTURAL CAST-IN-PLACE CONCRETE

### PART 1 GENERAL

#### 1.01 SUMMARY

- A. Section Includes: Formwork requirements for concrete construction.
  - 1. This work includes but is not limited to:
    - a. Structural foundations/footings.
    - b. Structural slabs.
    - c. Drainage structures.
- B. Related Detailed Provisions Sections include, but are not limited to:
  - 1. Section 03 0505 – Concrete Testing
  - 2. Section 03 2100 – Concrete Reinforcement
  - 3. Section 03 3100 – Cast-In-Place Structural Concrete
  - 4. Section 03 3131 – Concrete Mixing, Placing, Jointing, and Curing

#### 1.02 QUALITY ASSURANCE

- A. Referenced Standards:
  - 1. American Concrete Institute (ACI):
    - a. ACI 116R –Cement and Concrete Terminology.
    - b. ACI 301 – Specifications for Structural Concrete.
    - c. ACI 347 – Guide to Formwork for Concrete.
  - 2. California Building Code (CBC):
    - a. 2016 CBC, referred to herein as Building Code.
  - 3. APA – Engineered Wood Association (APA)
- B. Miscellaneous:
  - 1. Design and engineering of formwork, shoring and reshoring as well as its construction is the responsibility of the Contractor.
  - 2. Design requirements:
    - a. Design formwork for loads, lateral pressures and allowable stresses outlined in ACI 347 and for design considerations, wind loads, allowable stresses and other applicable requirements of the CBC.
      - 1) Where conflicts occur between the above two (2) standards, the more stringent requirements shall govern.

- b. Design formwork to limit maximum deflection of form facing materials reflected in concrete surfaces exposed to view to 1/240 of span between structural members.
- c. Conform to all requirements of CBC 2016.

### **1.03 SUBMITTALS**

- A. Submittal Procedures: See Detailed Provisions Section 01 3300 – Submittal Procedures for requirements for the mechanics and administration of the submittal process.
- B. Approval Submittals:
  - 1. Product technical data, including, but not limited to:
    - a. Acknowledgement that products submitted meet requirements of standards referenced.
    - b. Manufacturer’s installation instructions.
    - c. Manufacturer and type of proposed form materials.
    - d. Manufacturer and type of proposed form ties.
    - e. Manufacturer and type of proposed form coating and release agent materials.
    - f. Manufacturer and type of void forms including compressive strength.

## **PART 2 PRODUCTS**

### **2.01 ACCEPTABLE MANUFACTURERS**

- A. Void Forms:
  - 1. SureVoid Products, Inc.; [www.surevoid.com](http://www.surevoid.com)
  - 2. Deslauriers, Inc.; [www.deslinc.com](http://www.deslinc.com)
  - 3. Or approved equal.
- B. Stay-In-Place Forms:
  - 1. AMICO a part of Gibraltar Industries Company; [www.amicoglobal.com/](http://www.amicoglobal.com/)
  - 2. Nuform Building Technologies Inc.; [www.nuformdirect.com](http://www.nuformdirect.com)
  - 3. Or approved equal.
- C. Tubular Fiber Forms:
  - 1. Sonoco Products Company, plastic lined; [www.sonotube.com](http://www.sonotube.com)
  - 2. Or approved equal.

## 2.02 MATERIALS

### A. Forms for Surfaces Exposed to View:

1. Wood forms:
  - a. New structural wood members of concrete form grade.
  - b. Built-in-place or prefabricated type panel.
  - c. When approved by County, wood may be reused.
2. Metal forms:
  - a. Metal forms excluding aluminum may be used.
  - b. Forms to be tight to prevent leakage, free of rust and straight without dents to provide members of uniform thickness.

### B. Forms for Surfaces Not Exposed to View:

1. Wood or metal sufficiently tight to prevent leakage.
2. Do not use aluminum forms.

### C. Tubular Fiber Forms:

1. Tubular column forms spirally constructed of laminated piles of fiber. Piles shall be laminated using a non-water sensitive adhesive and surface wax impregnated for moisture protection. Forms shall give a smooth and seamless appearance to the cast concrete. Provide reveals, as shown on the Project Drawings, as supplied by the form manufacturer.

## 2.03 ACCESSORIES

### A. Form Ties:

1. Commercially fabricated for use in form construction.
  - a. Do not use wire ties.
2. Constructed so that ends or end fasteners can be removed without causing spalling at surfaces of the concrete.
3. 3/4 inch minimum to 1 inch maximum diameter cones on both ends.
4. Embedded portion of ties to be not less than 1 – 1/2 inch from face of concrete after ends have been removed.
5. Provide ties with built-in waterstops in all walls that will be in contact with liquid.
6. Through-wall ties that are designed to be entirely removed are not allowed in all walls that will be in contact with liquid.

**B. Form Coating:**

1. Non-grain and non-staining types of form coating that will not leave residual matter on the face of the concrete or adversely affect proper bonding of any subsequent paint or other surface applications.
  - a. Form coating containing mineral oils or other non-drying materials will not be permitted for any concrete work.
  - b. For project pursuing sustainable design, provide a concrete form release agent with a volatile organic compound (VOC) content less than 100 grams per liter.

**C. Void Forms:**

1. Continuous void forms.
2. Specially designed and manufactured for the purpose of creating a void area directly under concrete members which will allow a space for soil vertical upward movement.
3. Able to support the weight of concrete and construction loads to be placed thereon with no decrease in required void form depth.
4. Constructed from double-faced corrugated cardboard or fiberboard which is was impregnated and laminated with moisture-resistant adhesive.
5. Capable of resisting moisture with no loss or load carrying strength or change in depth or configuration.

**D. Stay-In-Place Forms:**

1. Ribbed expanded metal leave-in-place concrete forms commercially fabricated to provide an intentionally rougher surface.
2. Hot-dipped galvanized.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

**A. Form Surface Treatment:**

1. Before placing of either reinforcing steel or concrete, cover surfaces of forms with an approved coating material that will effectively prevent absorption of moisture and prevent bond with concrete, will not stain concrete or prevent bonding of future finishes.
  - a. A field applied form release agent or sealer of approved type or a factory applied non-absorptive liner may be used.
2. Do not allow excess form coating material to stand in puddles in forms nor in contact with hardened concrete against which fresh concrete is to be placed.

- B. Clean surfaces of forms, reinforcing steel and other embedded materials of any accumulated mortar or grout from previous concreting and of all other foreign material before concrete is placed.**

### 3.02 ERECTION

- A. Install products in accordance with manufacturer's instructions. Construct substantial forms to the shapes, lines, grades and elevations necessary to complete Work.
- B. Tolerances:
  - 1. Establish and maintain in an undisturbed condition and until final completion and acceptance of the Project, sufficient control points and bench marks to be used for reference purposes to check tolerances.
  - 2. Regardless of tolerances listed allow no portion of structure to extend beyond legal boundary of the Project.
  - 3. To maintain specified tolerances, camber formwork to compensate for anticipated deflections in formwork prior to hardening of concrete.
- C. Plywood joints shall be square and tight; plywood shall be arranged in such manner as to minimize number of joints and to provide a smooth, attractive finished concrete surface.
- D. Make forms sufficiently tight to prevent loss of mortar from concrete. Forms shall be tied, clamped and braced to prevent spreading, shifting or settling.
- E. Place 3/4 inch chamfer strips in exposed to view corners of forms to produce 3/4 inch wide beveled edges.
- F. At construction joints, overlap contact surface of form sheathing for flush surfaces exposed to view over hardened concrete in previous placement by at least 1 inch.
  - 1. Hold forms against hardened concrete to prevent offsets or loss of mortar at construction joint and to maintain a true surface.
  - 2. Where possible, locate juncture of built-in-place wood or metal forms at architectural lines, control joints or at construction joints.
- G. Anchor formwork to shores or other supporting surfaces or members so that movement of any part of formwork system is prevented during concrete placement.
- H. Provide positive means of adjustment (wedges or jacks) of shores and struts and take up all settlement during concrete placing operation.
  - 1. Securely brace forms against lateral deflection.
  - 2. Fasten wedges used for final adjustment of forms prior to concrete placement in position after final check.
- I. After void forms are in place and before concrete is placed thereon, cover joints between abutting form sections and cover ends of forms to prevent intrusion of soil, concrete or any other materials.
  - 1. Install void forms in accordance with manufacturer's instructions.
- J. Stay-In-Place Forms:
  - 1. Support stay-in-place forms as required to maintain the formwork in proper position.

2. Hold the edge of stay-in-place forms back a minimum of 2 inches from all smooth formed concrete surfaces.
3. Stay-in place forms may be used at the Contractor's option at:
  - a. Surfaces that will be backfilled with soil.
    - 1) Maintain a minimum of 3-inches of concrete cover over all reinforcing.
  - b. Roughened construction joints.
  - c. Other locations as approved by the County.

### 3.03 REMOVAL OF FORMS

- A. Do not remove forms before the concrete has attained a strength of at least 30% of its specified design strength for walls and vertical surfaces, nor before reaching the following number of day-degrees of curing (whichever is the longer):

<u>Forms for</u>	<u>Degree Days</u>
Vertical Surfaces	100

Degree-days are defined as the total number of 24 hour periods multiplied by the weighted average daily air temperature at the surface of the concrete (e.g. 2 days at an average 50 Deg F = 100 degree-days).

- B. When required for concrete curing in hot weather, required for repair of surface defects or when finishing is required at an early age, remove forms as soon as concrete has hardened sufficiently to resist damage from removal operations or lack of support.
- C. In cold weather, when temperature of concrete exceeds ambient air temperature by 20 Deg F. at the end of the protection period, loosen forms and leave in place for at least 24 hours to allow concrete to cool gradually to ambient air temperature.
- D. Remove top forms on sloping surfaces of concrete as soon as concrete has attained sufficient stiffness to prevent sagging.
  1. Perform any needed repairs or treatment required on such sloping surfaces at once, followed by curing specified in Detailed Provision Section 03 3131 – Concrete Mixing, Placing, Jointing and Curing.

END OF SECTION 03 1113





**SPECIFICATIONS – DETAILED PROVISIONS**  
**SECTION 03 2100: CONCRETE REINFORCEMENT**  
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## SECTION 03 2100 CONCRETE REINFORCEMENT

### PART 1 GENERAL

#### 1.01 SUMMARY

- A. Section Includes: Reinforcing bar requirements for concrete construction. Furnish and install reinforcing for all concrete, including dowels, bars, chairs, spacers, stirrups, ties, bolsters, etc., necessary for supporting and fastening reinforcement in place as shown on the Project Drawings and specified herein.
1. This work includes but is not limited to:
    - a. Drainage structures.
    - b. Structural slabs.
- B. Related Detailed Provisions Sections include, but are not limited to:
1. Section 03 0505 – Concrete Testing
  2. Section 03 1113 – Formwork – Structural Cast-In-Place Concrete
  3. Section 03 3100 – Cast-In-Place Structural Concrete
  4. Section 03 3131 – Concrete Mixing, Placing, Jointing, and Curing
  5. Section 03 3713 – Shotcrete

#### 1.02 QUALITY ASSURANCE

- A. Referenced Standards:
1. American Concrete Institute (ACI):
    - a. ACI 66 – ACI Detailing Manual.
    - b. ACI 301 – Specifications for Structural Concrete for Buildings.
    - c. ACI 315 – Details and Detailing of Concrete Reinforcing.
    - d. ACI 318 – Building Code Requirements for Structural Concrete.
  2. American Society for Testing and Materials (ASTM):
    - a. ASTM A615 – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
    - b. ASTM A706 – Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
    - c. ASTM A775 – Standard Specification for Epoxy-Coated Steel Reinforcing Bars.
    - d. ASTM A1064 – Standard Specification for Carbon Steel Wire and Welded Wire Reinforcement, Plain and Deformed for Concrete.
  3. California Building Code (CBC)

4. Concrete Reinforcing Steel Institute (CRSI):
  - a. Manual of Standard Practice.
5. Federal Specifications (FS)

### **1.03 SUBMITTALS**

- A. Submittal Procedures: See Detailed Provisions Section 01 3300 – Submittal Procedures for requirements for the mechanics and administration of the submittal process.
- B. Approval Submittals:
  1. Product technical data, including, but not limited to:
    - a. Acknowledgement that products submitted meet requirements of standards referenced.
    - b. Manufacturer’s installation instructions for all materials.
    - c. Mill certificates for all reinforcing indicating chemical and physical analysis. Tensile and bend tests shall be performed by the mill in accordance with ASTM A615.

### **1.04 DELIVERY, STORAGE AND HANDLING**

- A. Support and store all reinforcing above ground.

## **PART 2 PRODUCTS**

### **2.01 ACCEPTABLE MANUFACTURERS**

- A. Reinforcing steel bar and welded wire fabric:
  1. Manufacturer regularly engaged in the production of steel bar and welded wire fabric reinforcement.

### **2.02 MATERIALS**

- A. Reinforcing Bars: ASTM A615, Grade 60, deformed.
- B. Welded Wire Reinforcement: ASTM A1064.
- C. Stirrups and Ties: ASTM A615, Grade 60.

### **2.03 ACCESSORIES**

- A. Metal Chairs, Runners, Bolsters, Spacers, Hangers, and Other Rebar Supports:
  1. Unless noted otherwise, CRSI Class 2 wire supports
  2. Plastic-coated tips in contact with forms.
  3. Plastic coating meeting requirements of CRSI Manual of Standard Practice.
- B. Tie Wires: FS-QQ-W-461, annealed steel, black, 16 gauge minimum.

## **2.04 FABRICATION AND SOURCE QUALITY CONTROL**

- A. Shop fabricate reinforcement to meet requirements of Project Drawings. Fabricate reinforcement in accordance with the requirements of ACI 315 where specific details are not shown or where Project Drawings and Detailed Provisions are not more demanding.
- B. Steel reinforcement shall not be bent or straightened in a manner that will degrade the material. Bars with kinks or bends not shown on the Drawings shall not be used. Heating of bars for bending will not be permitted.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. All reinforcement shall be accurately set in place, lapped, spliced, spaced, rigidly and securely held in place and tied with specified wire at all splices and crossing points. All wire tie ends shall point away from the form. Carefully locate all dowel steel to align with wall and column steel.
- B. Minimum concrete protective covering for reinforcement, unless otherwise shown on the Project Drawings:
  - 1. Concrete against and permanently exposed to earth: 3-inch.
  - 2. Concrete exposed to earth or weather:
    - a. No. 6 bars and larger: 2-inch.
    - b. No. 5, W31 or D31 wire, and smaller: 1-½ inch.
- C. Unless indicated otherwise, provide splice lengths for reinforcing as follows:
  - 1. For rebar: Class B splice meeting the requirements of Paragraph 12.15 of ACI 318.
  - 2. For welded wire reinforcement:
    - a. Splice lap length measured between outermost cross wires of each fabric sheet shall not be less than one (1) spacing of cross wires plus 2 inches, nor less than 1.5 x development length nor less than 6 inches.
    - b. Development length shall be as required for the yield strength of the welded wire reinforcement in accordance with Paragraph 12.8 of ACI 318.
  - 3. Provide splices of reinforcing not specifically indicated or specified subject to approval by the County.
    - a. Mechanical proprietary splice connectors may only be used when approved by the County and shall be in compliance with current ICC-ES evaluation reports.
- D. Placing Rebar:
  - 1. Assure that reinforcement at time concrete is placed is free of mud, oil or other materials that may affect or reduce bond.

2. Reinforcement with rust, mill scale or a combination of both will be accepted as being satisfactory without cleaning or brushing provided dimensions and weights including heights of deformations on a cleaned sample is not less than required by applicable ASTM Specification that governs for the rebar supplied.
3. Rebar support:
  - a. Uncoated rebar:
    - 1) Support rebar and fasten together to prevent displacement by construction loads or placing of concrete.
      - (a) Locate and support reinforcement with bar supports to maintain minimum concrete cover.
      - (b) Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
    - 2) On ground, provide supporting concrete blocks or metal bar supports with bottom plate.
      - (a) Do not use concrete blocks to support slab-on-grade reinforcing.
    - 3) Over formwork, provide plastic-coated metal chairs, runners, bolsters, spacers, hangers and other rebar support.
      - (a) Only tips in contact with the forms need to be plastic coated.
4. Support rebar over cardboard void forms by means of concrete supports which will not puncture or damage the void forms during construction nor impair the strength of the concrete members in any way.
5. Extend reinforcement to within 2 inches of concrete perimeter edges.
  - a. If perimeter edge is formed by earth or stay-in-place forms, extend reinforcement to within 3 inches of the edge.

### **3.02 FIELD QUALITY CONTROL**

- A. County and/or Testing/Inspection Provider retained by the County shall perform field inspection in accordance with CBC requirements. When required, County shall procure services of a Special Inspector to inspect reinforcing placement per CBC Section 1704.
- B. Reinforcement Congestion and Interferences:
  1. Notify County whenever the specified clearances between rebar cannot be met.
  2. Do not place any concrete until the County approves a solution to rebar congestion problem.
  3. Rebar may be moved as necessary to avoid interference with other reinforcing steel, conduits, or embedded items.
  4. If rebar are moved more than one bar diameter, obtain County approval of resulting arrangement of rebar.
  5. No cutting of rebar shall be done without approval from the County.

END OF SECTION 03 2100



**SPECIFICATIONS – DETAILED PROVISIONS**  
**SECTION 03 3100: CAST-IN-PLACE STRUCTURAL CONCRETE**  
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## SECTION 03 3100 CAST-IN-PLACE STRUCTURAL CONCRETE

### PART 1 GENERAL

#### 1.01 SUMMARY

##### A. Section Includes:

1. Furnish concrete materials in the proportions and strengths necessary to complete the work specified. This work includes but is not limited to:
  - a. Structural foundations/footings.
  - b. Structural slabs.
  - c. Drainage Structures.

##### B. Related Detailed Provisions Sections include, but are not limited to:

1. Section 03 0505 – Concrete Testing
2. Section 03 1113 – Formwork Structural Cast in Place Concrete
3. Section 03 2100 – Concrete Reinforcement
4. Section 03 3131 – Concrete Mixing, Placing, Jointing, and Curing
5. Section 03 3132 – Concrete Finishing

#### 1.02 QUALITY ASSURANCE

##### A. Referenced Standards:

1. American Concrete Institute (ACI):
  - a. ACI 116R – Cement and Concrete Terminology.
  - b. ACI 211.1 – Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
  - c. ACI 212.3R – Chemical Admixtures for Concrete.
  - d. ACI 232.2 – Use of Fly Ash in Concrete.
  - e. ACI 301 – Specification for Structural Concrete.
  - f. ACI 304R – Guide for Measuring, Mixing, Transporting and Placing Concrete.
  - g. ACI 305 – Hot Weather Concreting.
  - h. ACI 306 – Cold Weather Concreting.
  - i. ACI 318 - Building Code Requirements for Structural Concrete.
  - j. ACI 350 – Code Requirements for Environmental Engineering Concrete Structures.

2. American Society for Testing and Materials (ASTM):
  - a. ASTM C33 – Standard Specification for Concrete Aggregates.
  - b. ASTM C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
  - c. ASTM C94 – Standard Specification for Ready-Mixed Concrete.
  - d. ASTM C109 – Standard Test Method for Compressive Strength of Hydraulic Cement Mortars
  - e. ASTM C150 – Standard Specification for Portland Cement.
  - f. ASTM C157 – Standard Test Method for Length Change of Hardened Hydraulic-Cement, Mortar, and Concrete.
  - g. ASTM C192 – Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory.
  - h. ASTM C231 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
  - i. ASTM C260 – Standard Specification for Air-Entraining Admixtures for Concrete.
  - j. ASTM C494 – Standard Specification for Chemical Admixtures for Concrete.
  - k. ASTM C595 – Standard Specification for Blended Hydraulic Cements.
  - l. ASTM C618 – Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
  - m. ASTM C685 – Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing.
  - n. ASTM C827 – Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures.
  - o. ASTM C939 – Standard Test Method for Flow of Grout for Preplaced-Aggregate Concrete.
  - p. ASTM C1017 – Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
  - q. ASTM C1064 – Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
  - r. ASTM C1090 – Standard Test Method for Measuring Changes in Height of Cylindrical Specimens of Hydraulic-Cement Grout.
  - s. ASTM C1107 – Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
3. National Bureau of Standards (NBS):
  - a. NBS Handbook No. 44

4. National Ready Mixed Concrete Association (NRMCA)
  - a. Quality Control Manual, Section 3 – Certification of Ready Mixed Concrete Production Facilities.
5. Truck Mixer Manufacturers Bureau (TMMB)
  - a. TMMB 100 – Truck Mixer, Agitator and Front Discharge Concrete Carrier Standards.
6. United States Army Corps of Engineers (USACE):
  - a. USACE CRD-C621 – Standard Specification for Packaged, Dry, Hydraulic-Cement Grout (NonShrink).

### **1.03 DEFINITIONS**

- A. Words and terms used in these Detailed Provisions are defined in ACI 116R.

### **1.04 SUBMITTALS**

- A. Submittal Procedures: See Section 01 3300 – Submittal Procedures for requirements for the mechanics and administration of the submittal process.
- B. Approval Submittals:
  1. Product technical data, including, but not limited to:
    - a. Acknowledgement that products submitted meet requirements of standards referenced.
    - b. Manufacturer's instructions.
    - c. Concrete mix designs as required by Detailed Provisions Section 03 0505 – Concrete Testing.
    - d. Manufacturer and type of proposed admixtures.
    - e. Manufacturer and type of proposed non-shrink grout and grout cure/seal compound.
- C. Quality Assurance Submittals:
  1. Certifications:
    - a. Certification of standard deviation data for each proposed concrete mix based on statistical records. Provide the following for each strength data point used in the calculation of the standard deviation for determination of the minimum required average strength:
      - 1) Date of sampling and name of testing laboratory.
      - 2) Name of concrete batch plant.
      - 3) Water cementitious ratio.
      - 4) Slump of batch.
      - 5) Air content of batch.

- 6) 28 day compression test results.
- 7) If available, temperature and unit weight of batch.

Provide data from projects not more strictly controlled than outlined in these Detailed Provisions. Provide summary sheet showing all pertinent data and the computation of the standard deviation.

- b. Certification that the fly ash meets the quality requirements of ASTM C618, and fly ash supplier's certified test reports for each shipment of fly ash delivered to concrete supplier.
  - c. Certification that the class of coarse aggregate meets the requirements of ASTM C33 for type and location of concrete construction.
  - d. Certification of aggregate gradation.
2. Test reports:
    - a. Cement mill reports for all cement to be supplied.
  3. Delivery Tickets:
    - a. Furnish a delivery ticket for ready mixed concrete to the County as each truck arrives. Provide a printed record of the weight of cement and each aggregate as batched individually on each ticket. Use the type of indicator that returns for zero punch or returns to zero after a batch is discharged. Indicate for each batch the weight of fine and coarse aggregate, cement, fly ash, and water, moisture content of fine and coarse aggregate at time of batching, and types, brand and quantity of each admixture, the quantity of concrete delivered, the time any water is added and the amount, and the numerical sequence of the delivery. Show the time of day batched and time of discharge from the truck. Indicate the number of revolutions of transit mix truck.

## **1.05 DELIVERY, STORAGE AND HANDLING**

A. Delivery, Storage, and Handling shall be made in accordance with the following:

1. Store cement and pozzolan in weathertight buildings, bins, or silos which will exclude moisture and contaminants.
2. Arrange aggregate stockpiles and use in a manner to avoid excessive segregation and to prevent contamination with other materials or other aggregates of like sizes.
3. Allow natural sand to drain until it has reached a relatively uniform moisture content before use.
4. Store admixtures in such a manner as to avoid contamination, evaporation, or damage.
  - a. For those used in form of suspensions or non-stable solutions, provide agitating equipment to assure thorough distribution of ingredients.
  - b. Protect liquid admixtures from freezing and temperature changes which would adversely affect their characteristics and performance.

## **PART 2 PRODUCTS**

### **2.01 ACCEPTABLE MANUFACTURERS**

- A. Subject to compliance with the Contract Documents, the manufacturers listed in the applicable Articles below are acceptable.
- B. Submit request for substitution in accordance with Detailed Provisions Section 01 6000 – Product Requirements.

### **2.02 MATERIALS**

#### **A. General:**

- 1. The County and Testing/Inspection Provider shall have access to and have the right to inspect all batch plants, cement mills and supply facilities providing products under these Detailed Provisions. Batch plants shall have current certificates that all scales have been tested and are certified within the tolerances as set forth in the National Bureau of Standards Handbook No. 44.

#### **B. Portland Cement:**

- 1. ASTM C150, Type II, Low Alkali.
- 2. Cement type used shall correspond to that upon which selection of concrete proportions was based in the mix design.

#### **C. Fly Ash:**

- 1. ASTM C618, Class F, including the requirements of Section 2.8 but with the Loss of Ignition (LOI) limited to 3 percent maximum and the optional physical requirements of Table 3.
- 2. Non-staining.
- 3. Suited to provide hardened concrete of uniform light gray color.
- 4. Maximum loss on ignition: 3 percent.
- 5. Compatible with other concrete ingredients and having no deleterious effects on the hardened concrete.
- 6. Cement and fly ash type used shall correspond to that upon which selection of concrete proportions was based in the mix design.

#### **D. Admixtures:**

- 1. Air entraining: ASTM C260.
- 2. Water reducing, retarding, and accelerating: Conform to ASTM C494, Types A through E, and provisions of ACI 212.3R. Follow manufacturer's instructions.
- 3. High range water reducers (superplasticizers): Conform to ASTM C494, Types F or G.
- 4. Admixtures to be chloride free.
  - a. Do not use calcium chloride or admixtures containing calcium chloride.

5. Do not use admixtures causing retarded or accelerated setting of concrete without written approval from the County.
  6. Provide admixtures of same type, manufacturer and quantity as used in establishing required concrete proportions in the mix design.
- E. Water:
1. ASTM C94 and potable.
  2. Clean and free from deleterious substances.
  3. Free of oils, acids, and organic matter.
- F. Aggregates for Normal Weight Concrete:
1. ASTM C33, graded.
  2. All concrete aggregates shall be obtained from sources acceptable to the County, shall be non-reactive, sound, uniformly graded and free of deleterious material.
  3. Fine and coarse aggregates to be regarded as separate ingredients.
  4. Coarse aggregate shall consist of gravel, crushed gravel or crushed stone made up of clean, hard, durable particles free from coatings, organic matter or other foreign substances. Thin or elongated pieces having a length greater than four (4) times the average thickness shall not exceed fifteen percent (15%) by weight.
  5. Fine aggregates for concrete or mortar shall consist of clean, natural sand or combination of natural and manufactured sands that are hard and durable. Fine aggregates shall be free of materials with deleterious reactivity to alkali in cement.
  6. Coarse aggregate sieve analysis:
    - a. For lean concrete, concrete topping, and integral wearing course: ASTM C33, size number 7 (maximum ½-inch).
    - b. For foundations: ASTM C33, 1-inch nominal maximum.
    - c. For slabs on grade, walls, and all other concrete: ASTM C33, ¾-inch nominal maximum.
- G. Maximum total chloride ion content for concrete mix including all ingredients measured as a weight percent of cement:
1. Prestressed concrete: 0.06.
  2. All other concrete: 0.10.
- H. Sand Cement Grout:
1. Approximately three (3) parts sand, one (1) part Portland cement, 6 +/- 1 percent entrained air and water to produce a slump which allows grout to completely fill required areas and surround adjacent reinforcing.
    - a. Provide sand in accordance with requirements for fine aggregate for concrete.
  2. Minimum 28 day compressive strength: 3,000 psi.

I. Non-shrink Grout:

1. Non-shrink, non-metallic, non-corrosive, and non-staining conforming to ASTM C1107 and USACE CRD-C621.
2. Premixed with only water to be added in accordance with manufacturer's instructions at jobsite.
3. Shrinkage: 0% at 28 days when tested in accordance with ASTM C827 and ASTM C1090.
4. Expansion: 0.4% maximum at 28 days when tested in accordance with ASTM C157.
5. Minimum 28 day compressive strength: 5,000 psi when tested in accordance with ASTM C109.
6. Add the minimum amount of water necessary to produce the desired flow not exceeding a flow of 20 seconds per ASTM C939.
7. Acceptable manufacturers:
  - a. Euclid Chemical Company "NS Grout"; [www.euclidchemical.com](http://www.euclidchemical.com)
  - b. L&M Construction Chemicals a part of LATICRETE International, Inc., "Crystex"; [www.lmcc.com](http://www.lmcc.com)
  - c. Master Builders Solutions by BASF "MasterFlow, 713"; [www.master-builders-solutions.basf.us](http://www.master-builders-solutions.basf.us).
  - d. Sauereisen Cements "F-100 Level Fill Grout"; [www.sauereisen.com](http://www.sauereisen.com).
  - e. Sika Corporation "Sika Grout 212"; [www.usa.sika.com](http://www.usa.sika.com).
  - f. U.S. Grout, LLC. "Five Star Grout"; [www.usgrout.com](http://www.usgrout.com).
  - g. Or approved equal.

J. Epoxy Grout:

1. Three-component epoxy resin system:
  - a. Two (2) liquid epoxy components.
  - b. One (1) inert aggregate filler component.
2. Adhesive acceptable manufacturers:
  - a. Euclid Chemical Company "E3-G"; [www.euclidchemical.com](http://www.euclidchemical.com).
  - b. Master Builders Solutions by BASF "MasterFlow 648"; [www.master-builders-solutions.basf.us](http://www.master-builders-solutions.basf.us).
  - c. Sika Corporation "Sikadur Hi-Mod"; [www.usa.sika.com](http://www.usa.sika.com).
  - d. U.S. Grout, LLC. "Five Star Epoxy Grout"; [www.usgrout.com](http://www.usgrout.com).
  - e. Or approved equal.

3. Aggregate acceptable manufacturers:
  - a. Euclid Chemical Company “Euclid aggregate”; [www.euclidchemical.com](http://www.euclidchemical.com).
  - b. Master Builders Solutions by BASF “MasterFlow 648”; [www.master-builders-solutions.basf.us](http://www.master-builders-solutions.basf.us).
  - c. Sika Corporation “Sika aggregate”; [www.usa.sika.com](http://www.usa.sika.com).
  - d. U.S. Grout, LLC. “U.S. Grout aggregate”; [www.usgrout.com](http://www.usgrout.com).
  - e. Or approved equal.
4. Aggregate manufacturer shall be the same as the adhesive manufacturer.
5. The aggregate shall be compatible with the adhesive.
6. Each component furnished in separate package for mixing at jobsite.

### **2.03 MIXES**

- A. General: Mixing of concrete shall be done in accordance with:
  1. Provide concrete capable of being placed without aggregate segregation and, when cured, of developing all properties specified.
  2. Ready-mixed concrete shall conform to ASTM C94.
  3. All concrete to be normal weight concrete, weighing approximately 145 to 150 lbs per cu. ft. at 28 days after placement.
- B. Minimum 28 Day Compressive Strengths: As indicated on Project Drawings.
- C. Air Entrainment:
  1. Provide air entrainment in all concrete resulting in a total air content percent by volume as follows:
    - a. 1-1/2 inch maximum aggregate size: 4-1/2 to 6-1/2 percent total air content.
    - b. 1 inch maximum aggregate size: 5 to 7 percent total air content.
    - c. 3/4 inch maximum aggregate size: 5 to 7 percent total air content.
    - d. 1/2 inch maximum aggregate size: 5-1/2 to 8 percent total air content.
    - e. Interior slabs and mats with power trowel finish: Maximum 3 percent total air content.
- D. Slump:
  1. 4-inch maximum, 1-inch minimum measured at point of discharge into the concrete construction member.
  2. Concrete of lower than minimum slump may be used provided it can be properly placed and consolidated.



3. Provide additional water or water reducing admixture at ready mix plant for concrete that is to be pumped to allow for slump loss due to pumping.
  - a. Provide only enough additional water so that slump of concrete at discharge end of pump hose does not exceed maximum slump specified and the maximum specified water-cement ratio is not exceeded.

E. Proportioning:

1. General:
  - a. Proportion ingredients to produce a mixture which will work readily into corners and angles of forms and around reinforcement by methods of placement and consolidation employed without permitting materials to segregate or excessive free water to collect on surface.
  - b. Proportion ingredients to produce proper placability, durability, strength, maximum specified allowable shrinkage and other required properties.
2. Minimum Compressive Strength: Unless otherwise indicated on Project Drawings, concrete shall have a 28 day compressive strength of 3,000 psi.
3. Maximum Water-Cementitious Materials Ratio: 0.45.
4. Specific mix for 4,000 psi concrete indicated on Project Drawings proportioned as follows:
  - a. Minimum Compressive Strength: 4,000 psi at 28 days.
  - b. Maximum Water-Cementitious Material Ratio: 0.45
  - c. Minimum Cement per cubic yard (94 lb sacks): 6.0.
  - d. Slump Limit: 3-inches, plus or minus 1-inch or 8-inches for concrete with verified slump of 2 to 4-inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1-inch.
  - e. Air Content: Refer to Section 2.03.C.1.
5. Maximum concrete shrinkage shall comply with ASTM C157 for testing indicated.
6. Fly ash:
  - a. For cast-in-place concrete only.
  - b. If fly ash is used, the water to fly ash plus cement ratio not to exceed the maximum water cement ratio specified in this Detailed Provisions Section.
7. Water reducing, retarding, and accelerating admixtures:
  - a. Use in accordance with manufacturer's instructions.
  - b. Do not use unless required by these Detailed Provisions or approved for use by the County.
8. High range water reducers (superplasticizers):
  - a. Use in accordance with manufacturer's instructions.

- b. Do not use unless required by these Detailed Provisions or approved for use by the County.

9. Trial Batch and Laboratory Tests:

- a. Before placing any concrete, the Contractor shall submit certified trial batch results of each class of concrete having a 28-day strength of 4,000 psi or higher, based on the preliminary concrete mixes submitted by the Contractor. All concrete shall conform to the requirements of this Section, whether the aggregate proportions are from the Contractor's preliminary mix design, or whether the proportions have been adjusted during the trial batch process. The trial batch shall be prepared using aggregates, cement and admixture proposed for the project. The cost for the trial batch tests shall be borne by the Contractor.
- b. The determination of compressive strength will be made by testing 6-inch diameter by 12-inch high cylinders; made, cured and tested in accordance with ASTM C192 and ASTM C39. Three (3) compression test cylinders will be tested at 7-days and three (3) at 28 days. The average compressive strength for the three (3) cylinders tested at 28-days for any give trial batch shall not be less than 125% of the specified compressive strength.
- c. A standard sieve analysis of the combined aggregate for each trial batch shall be performed according to the requirements for ASTM C136. Values shall be given for percent passing each sieve.
- d. In lieu of trial batches, field test records for concrete made with similar ingredients may be used in accordance with ACI 301.
  - 1) Use of proposed concrete mix proportions based on field test records subject to approval by County based on information contained in field test records and demonstrated ability to provide the required average strength and meet allowable shrinkage requirements.
  - 2) Test records shall represent materials, proportions and conditions similar to those specified.

F. Concrete Mix for Groundwater Well Elevation Adjustment:

- 1. Cement used for the well elevation adjustment shall be a Type II Portland cement conforming to ASTM C150.
- 2. The cement mix used for the well elevation adjustment shall be a 10.5-sack sand cement grout. There shall be not more than two parts by weight of sand to one part by weight of cement. The water cement ratio shall be 7 gallons per sack of cement (94 pounds).
- 3. Materials used as additives for Portland cement mixtures in the field shall meet the requirements of ASTM C494.
- 4. Special quick-setting cement, retardants to setting, and other additives, including hydrated lime to make the mix fluid (up to 10 percent of the volume of cement) may be used.

5. Please see Detailed Provision Section 33 1153 – Groundwater Monitoring Well Elevation Adjustment for more information.
- G. Concrete Mix for Gas Probe Elevation Adjustment:
1. Cement used for the gas probe elevation adjustment shall be a Type II Portland cement conforming to ASTM C150.
  2. Unless otherwise indicated, Concrete shall have a 28 day compressive strength of 3,000 psi.
  3. Please see Detailed Provision Section 33 5139 – Gas Probe Elevation Adjustment for more information.

## **2.04 SOURCE QUALITY CONTROL**

- A. To assure stockpiles are not contaminated or materials are segregated, perform any test for determining conformance to requirements for cleanness and grading on samples secured from aggregates at point of batching.

## **PART 3 EXECUTION**

### **3.01 FIELD QUALITY CONTROL**

- A. Perform concrete tests per this Section and Detailed Provisions Section 03 0505 – Concrete Testing.
- B. Perform strength test on any concrete to which water has been added at the jobsite.

END OF SECTION 03 3100

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**SPECIFICATIONS – DETAILED PROVISIONS**

**SECTION 03 3131: CONCRETE MIXING, PLACING, JOINTING AND CURING**

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## SECTION 03 3131 CONCRETE MIXING, PLACING, JOINTING, AND CURING

### PART 1 GENERAL

#### 1.01 SUMMARY

A. Section Includes: Mixing, placing, jointing, and curing of concrete construction.

1. This work includes but is not limited to:

- a. Structural foundations/footings.
- b. Structural slabs.
- c. Drainage structures.

B. Related Detailed Provisions Sections include, but are not limited to:

1. Section 03 0505 – Concrete Testing
2. Section 03 1113 – Formwork Structural Cast in Place Concrete
3. Section 03 2100 – Concrete Reinforcement
4. Section 03 3100 – Cast-In-Place Structural Concrete
5. Section 03 3132 – Concrete Finishing
6. Section 03 3713 – Shotcrete

#### 1.02 QUALITY ASSURANCE

A. Referenced Standards:

1. American Concrete Institute (ACI):

- a. ACI 116R – Cement and Concrete Terminology.
- b. ACI 301 – Specification for Structural Concrete.
- c. ACI 302.1R – Guide for Concrete Floor and Slab Construction.
- d. ACI 304R – Guide for Measuring, Mixing, Transporting and Placing Concrete.
- e. ACI 305R – Hot Weather Concreting.
- f. ACI 306R – Cold Weather Concreting.
- g. ACI 308R – Guide to Curing Concrete.
- h. ACI 309R – Guide for Consolidation of Concrete.

2. American Society for Testing and Materials (ASTM):

- a. ASTM C94 – Standard Specification for Ready-Mixed Concrete.
- b. ASTM C156 – Standard Test Method for Water Loss (from a Mortar Specimen) Through Liquid Membrane-Forming Curing Compounds for Concrete.
- c. ASTM C171 – Standard Specification for Sheet Materials for Curing Concrete.

- d. ASTM C309 – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
  - e. ASTM D994 – Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
  - f. ASTM D1056 – Standard Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.
  - g. ASTM D1751 – Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- 3. National Bureau of Standards (NBS):
    - a. NBS Handbook No. 44
  - 4. Truck Mixer Manufacturers Bureau (TMMB)
    - b. TMMB 100 – Truck Mixer, Agitator and Front Discharge Concrete Carrier Standards.
  - 5. National Ready Mixed Concrete Association (NRMCA):
    - a. Checklist for Certification of Ready Mixed Concrete Production Facilities.
  - 6. NSF International (NSF)
- B. Qualifications:
- 1. Ready Mixed Concrete Batch Plant: Certified by NRMCA.

### **1.03 DEFINITIONS**

- A. Words and terms used in these Detailed Provisions are defined in ACI 116R.

### **1.04 SUBMITTALS**

- A. Submittal Procedures: See Detailed Provisions Section 01 3300 – Submittal Procedures for requirements for the mechanics and administration of the submittal process.
- B. Approval Submittals:
  - 1. Product technical data, including, but not limited to:
    - a. Acknowledgement that products submitted meet requirements of standards referenced.
    - b. Manufacturer’s installation instructions.
      - 1) Procedure for adding high-range water reducer at the jobsite.
    - c. Manufacturer and types:
      - 1) Joint fillers.
      - 2) Curing agents.
      - 3) Construction joint bonding adhesive.



2. Cold Weather Plan.
  3. Hot Weather Plan.
- C. Quality Assurance Submittals:
1. Certifications:
    - a. Ready mix concrete plant certification.
- D. Closeout Submittals: Copies of concrete delivery tickets.

## **1.05 DELIVERY, STORAGE AND HANDLING**

### **A. Delivery:**

1. Concrete:
  - a. Prepare a delivery ticket for each load ready mixed concrete.
  - b. Truck operator shall hand ticket to Contractor at the time of delivery.
  - c. Provide a printed record of the weight of cement and each aggregate as batched individually on each ticket. Use the type of indicator that returns for zero punch or returns to zero after a batch is discharged. Indicate for each batch the weight of fine and coarse aggregate, cement, fly ash, and water, moisture content of fine and coarse aggregate at time of batching, and types, brand and quantity of each admixture, the quantity of concrete delivered, the time any water is added and the amount, and the numerical sequence of the delivery. Show the time of day batched and time of discharge from the truck. Indicate the number of revolutions of transit mix truck.

## **PART 2 PRODUCTS**

### **2.01 ACCEPTABLE MANUFACTURERS**

- A. Subject to compliance with the Contract Documents, the manufacturers listed in the applicable Articles below are acceptable. Placement shall be in accordance with manufacturer's written instructions.
- B. Submit request for substitution in accordance with Detailed Provisions Section 01 6000 – Product Requirements.

### **2.02 COMPONENTS**

#### **A. Neoprene Expansion Joint Fillers:**

1. Acceptable manufacturers:
  - a. Euclid Chemical Company; [www.euclidchemical.com](http://www.euclidchemical.com)
  - b. Master Builders Solutions by BASF; [www.master-builders-solutions.basf.us](http://www.master-builders-solutions.basf.us)
  - c. Rubatex a part of GCP Industrial Products; [www.rubatexusa.com](http://www.rubatexusa.com)
  - d. W.R. Meadows, Inc.; [www.wrmeadows.com](http://www.wrmeadows.com)

- e. Or approved equal.
- 2. Materials:
  - a. Closed cell neoprene.
  - b. ASTM D1056, Class SC.
  - c. Compression deflection: As required to limit deflection to 50 percent of joint thickness under pressure from concrete pour height.
- B. Epoxy Joint Fillers:
  - 1. Comply with requirements of ACI 302.1R.
  - 2. Acceptable manufacturers:
    - a. Euclid Chemical Company; [www.euclidchemical.com](http://www.euclidchemical.com)
    - b. Master Builders Solutions by BASF; [www.master-builders-solutions.basf.us](http://www.master-builders-solutions.basf.us)
    - c. W.R. Meadows, Inc.; [www.wrmeadows.com](http://www.wrmeadows.com)
    - d. Or approved equal.
- C. Polyurea Joint Fillers:
  - 1. Comply with requirements of ACI 302.1R.
  - 2. Acceptable manufacturers:
    - a. Euclid Chemical Company, Euco QWIKjoint UVR; [www.euclidchemical.com](http://www.euclidchemical.com)
    - b. Master Builders Solutions by BASF, MasterSeal CR 100; [www.master-builders-solutions.basf.us](http://www.master-builders-solutions.basf.us)
    - c. W.R. Meadows, Inc.; [www.wrmeadows.com](http://www.wrmeadows.com)
    - d. Or approved equal.
- D. Sand cement grout, non-shrink grout and epoxy grout: See Detailed Provisions Section 03 3100 – Cast-In-Place Structural Concrete.
- E. Curing Materials:
  - 1. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
  - 2. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
  - 3. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet. The loss of moisture, when determined in accordance with the requirements of ASTM C156, shall not exceed 0.055 grams per square centimeter of surface.
  - 4. Polyethylene sheet for use as concrete curing blanket shall be white and shall have a normal thickness of 6 mils.
  - 5. Water: Potable.

6. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C309, Type 1, Class B, dissipating. The curing compound shall contain a fugitive dye so that areas of application will be readily distinguishable. Compound shall contain no wax, paraffin, or oil. Curing compound shall be non-yellowing and have a unit moisture loss no greater than 0.039 gm/ square centimeter at 72 hours as measured by ASTM C156. Curing compound shall not prevent bonding of floor finishes and comply with Federal, State, and local VOC limits.
  - a. Acceptable manufacturers:
    - 1) Euclid Chemical Company; [www.euclidchemical.com](http://www.euclidchemical.com)
    - 2) W.R. Meadows, Inc.; [www.wrmeadows.com](http://www.wrmeadows.com)
    - 3) Or approved equal.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

#### **A. General:**

1. Complete formwork.
  - a. See Detailed Provisions Section 03 1113 – Formwork – Structural Cast-In-Place Concrete.
2. Remove earth, water, and other foreign materials from areas that will receive concrete.
3. Secure reinforcement in place.
  - a. See Detailed Provisions Section 03 2100 – Concrete Reinforcement.
4. Position expansion joint material, anchors and other embedded items. Pipe, conduit, dowels, sleeves and other ferrous items required to be embedded in concrete construction shall be adequately positioned and supported prior to placement of concrete. There shall be a minimum of 2-inches clearance between embedded items and any of the concrete reinforcement. Securing embedments in position by wiring or welding them to the reinforcement will not be permitted. Embedded items shall be clean and free of rust, mud, dirt, grease, oil, ice, or other contaminants which would reduce or prevent bonding with concrete. Close open ends of piping, conduits, and sleeves embedded in concrete with caps or plugs prior to placing concrete. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
5. Obtain approval of reinforcement erection and placement prior to placing concrete.
6. Do not place concrete during rain, unless adequate protection is provided and County approval is obtained.
  - a. Plan size of crews with due regard for effects of concrete temperature and

atmospheric conditions on rate of hardening of concrete as required to obtain good surfaces and avoid unplanned cold joints.

b. Do not allow rainwater to increase mixing water nor to damage surface finish.

7. Prepare all construction joints for proper bond per Paragraph 3.04.C of this Detailed Provisions Section.
8. Where concrete is to be cast against old existing concrete, the old concrete shall be thoroughly roughened to exposed, hard aggregate by sandblasting or chipping. Any additional surface preparation shall be as called for in the Project Drawings.
9. No concrete shall be placed in any structure until all water entering the space to be filled with concrete has been properly cut off or diverted out of the forms and clear of the work. No concrete shall be deposited under water or allowed to rise on any concrete until the concrete has attained its initial set. Pumping or other necessary dewatering operations for removing groundwater, if required, shall be the responsibility of the Contractor and will be subject to review by the County.
10. Remove hardened concrete and foreign materials from inner surfaces of conveying equipment and formwork.
11. Provide slabs and beams of minimum indicated required depth when sloping structural foundation base slabs and elevated slabs to drains.
  - a. For floor slabs on grade, slope top of subgrade to provide slab of required uniform thickness.

B. Preparation of Subgrade for Slabs on Ground:

1. Subgrade drained and of adequate and uniform load-bearing nature.
2. Obtain approval of subgrade compaction density prior to placing slabs on ground.
3. Maintain subgrade at a temperature above 32 Deg F before concrete placing begins for a sufficient amount of time to remove frost.
4. Moisten subgrade to eliminate absorption.
  - a. Keep subgrade moist at time of concreting.
  - b. Allow no free-standing water on subgrade or soft or muddy spots when concrete is placed.
5. Furnish, place, protect, and repair sheet vapor retarder according to ASTM E1643 and manufacturer's written instructions.
  - a. Lap joints 6-inches and seal with manufacturer's recommended tape.

C. Edge Forms and Screeds:

1. Set accurately to produce designated elevations and contours of finished surface.
2. Sufficiently strong to support vibrating screeds or roller pipe screeds, if required.
3. Use strike off templates, or approved vibrating type screeds, to align concrete surfaces to contours of screed strips.

D. Concrete Washout Area:

1. The Contractor shall provide a temporary concrete washout area at a location approved by the County within the project limits. The concrete washout area shall be identified as a BMP in the Contractor's SWPPP, see Detailed Provisions Section 01 5600 – Project Environmental Controls.

### 3.02 CONCRETE MIXING

A. General:

1. Provide all concrete from a central plant conforming to Checklist for Certification of Ready Mixed Concrete Production Facilities of the NRMCA.
2. Comply with ACI 318, ASTM C94, and TMMB 100 for all central plant and rolling stock equipment and methods.
3. Measure, batch, mix, and transport in accordance with ASTM C94 and furnish batch ticket information.
  - a. When air temperature is between 85 and 90 Deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 Deg F, reduce mixing and delivery time to 60 minutes.
4. Mixing equipment shall be subject to the County's approval. Mixers shall be of the stationary plant or truck mixer type. Adequate equipment and facilities shall be provided for accurate measurement and control of all materials and for readily changing the proportions of the material. The mixing equipment shall be maintained in good working order and shall be capable of combining the aggregates, cement and water within the specified time into a thoroughly mixed and uniform mass and of discharging the mixture without segregation. Cement and aggregate shall be proportioned by weight.
5. Select equipment of size and design to provide continuous flow of concrete at the delivery end. Use metal or metal-lined non-aluminum discharge chutes with slopes not exceeding one (1) vertical to two (2) horizontal and not less than one (1) vertical to three (3) horizontal. Chutes more than 20-foot long and chutes not meeting slope requirements may be used if concrete is discharged into a hopper before distribution.
6. The batch plant shall be capable of controlling and delivering of all material to within one percent (1%) by weight of the individual material. If bulk cement is used, it shall be weighed on a separate visible scale which will accurately register the scale load at any stage of the weighing operation from zero to full capacity.
7. Cement shall not come in contact with aggregate or with water until the materials are in the mixer ready for complete mixing with all mixing water. The procedure of mixing cement with sand or with sand and coarse aggregate for delivery to the jobsite for final mixing and an addition of mixing water will not be permitted. Re-tempering of concrete will not be permitted. The entire batch shall be discharged before recharging. The volume of the mixed material per batch shall not exceed the manufacturers rated capacity of the mixer.

8. Each mixer shall be equipped with a device for accurately measuring and indicating the quantity of water entering the concrete, and the operating mechanism shall be such that leakage will not occur when the valves are closed. Each mixer shall be equipped with a device for automatically measuring, indicating and controlling the time required for mixing. This device shall be interlocked to prevent the discharge of concrete from the mixer before the expiration of the mixing period.
9. Transit-mixed concrete shall be mixed and delivered in accordance with ASTM C94. After the drum is once started, it shall be revolved continuously until it has completely discharged its batch. Water shall not be admitted to the mix until the drum has started revolving. The right is reserved to increase the required minimum number of revolutions allowed, if necessary, to obtain satisfactory mixing, and the Contractor will not be entitled to additional compensation because of such an increase or decrease.
10. Mixed concrete shall be delivered to the site of the work and discharge shall be completed within one (1) hour after the addition of the cement to the aggregates. In hot weather or under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 85 Deg F or above, the time between the introduction of the cement to the aggregates and discharge shall not exceed forty-five (45) minutes. The use of non-agitating equipment for transporting concrete will not be permitted.
11. Truck mixers shall be equipped with counters so that the number of revolutions of the drum may be readily verified. The counter shall be resettable type and shall be actuated at the time of starting mixers at mixing speeds. Concrete shall be mixed in a truck mixer for not less than seventy (70) revolutions of the drum or blades at the rate of rotation designated by the manufacturer of the equipment. Additional mixing, if any, shall be at the speed designated by the manufacturer of the equipment as agitating speed. All materials including mixing water shall be in the mixer drum before actuating the revolution counter for determining the number of revolutions of mixing.
12. Truck mixers and their operation shall be such that the concrete throughout the mixed batch as discharged is within acceptable limits of uniformity with respect to consistency, mix, and grading. If slump tests taken at approximately the  $\frac{1}{4}$  and  $\frac{3}{4}$  points of the load during discharge give slumps differing by more than one (1) inch when the specified slump is more than three (3) inches, the mixer shall not be used on the work unless the causing condition is corrected and satisfactory performance is verified by additional slump test. All mechanical details of the mixer, such as water measuring and discharge apparatus, condition of the blades, speed of rotation, general mechanical condition of the unit, and clearance of the drum, shall be checked before a further attempt to use the unit will be permitted.

B. Control of Admixtures:

1. Charge admixtures into mixer as solutions.
  - a. Measure by means of an approved mechanical dispensing device.
  - b. Liquid considered a part of mixing water.

- c. Admixtures that cannot be added in solution may be weighed or measured by volume if so recommended by manufacturer.
  2. Add separately, when two or more admixtures are used in concrete, to avoid possible interaction that might interfere with efficiency of either admixture, or adversely affect concrete.
  3. Complete addition of retarding admixtures within one minute after addition of water to cement has been completed, or prior to beginning of last three quarters of required mixing, whichever occurs first.
- C. Tempering and Control of Mixing Water:
  1. Mix concrete only in quantities for immediate use.
  2. Discard concrete which has set.
  3. Discharge concrete from ready mix trucks within time limit and drum revolutions stated in ASTM C94.
  4. Addition of water at the jobsite:
    - a. See Detailed Provisions Section 03 3100 – Cast-In-Place Structural Concrete for specified water cement ratio and slump.
    - b. Do not exceed maximum specified water cement ratio or slump.
    - c. Incorporate water by additional mixing equal to at least half of total mixing required.
    - d. Perform strength test on any concrete to which water has been added at the jobsite.
      - 1) See Detailed Provisions Section 03 0505 – Concrete Testing.

### **3.03 PLACING OF CONCRETE**

#### **A. General:**

1. Comply with ACI 301, 304R, 304.2R and 318.
2. No concrete shall be placed until all formwork, installation of parts to be embedded, reinforcement steel and preparation of surfaces involved in the placing have been completed and accepted by the County at least four (4) hours before placement of concrete. All reinforcement, anchor bolts, sleeves, inserts and similar items shall be set and secured in the forms where shown on Drawings and shall be acceptable to the County before any concrete is placed.
3. Deposit concrete:
  - a. Continuously to avoid cold joints.
  - b. In horizontal layers not to exceed 24-inches in depth.
  - c. Uniformly distributed during the placing process and in no case after depositing shall any portion be displaced in the forms more than 2-feet in horizontal direction.

4. Locate construction joints at locations approved by the County.
    - a. Plan size of crews with due regard for effects of concrete temperature and atmosphere conditions to avoid unplanned cold joints.
  5. Place concrete at such a rate that concrete, which is being integrated with fresh concrete, is still workable.
  6. Do not deposit concrete which has partially hardened or has been contaminated by foreign materials.
  7. Spreaders:
    - a. Temporary: Remove as soon as concrete placing renders their function unnecessary.
    - b. Embedded:
      - 1) Obtain County approval.
      - 2) Materials: Concrete or metal.
      - 3) Ends of metal spreaders coated with plastic coating 2-inches from each end.
  8. Deposit concrete as nearly as practicable in its final position to avoid segregation.
    - a. Maximum free fall: 4 feet.
    - b. Free fall exceeding 4 feet: Place concrete by means of hopper, elephant trunk or tremie pipe extending down to within 4 feet of surface placed upon.
  9. Perform the following operations before bleeding water has an opportunity to collect on surface:
    - a. Spread.
    - b. Consolidate.
    - c. Straightedge.
    - d. Darby or bull float.
- B. Admixtures:
1. All admixtures to be introduced at the batch plant in accordance with manufacturer's recommendations.
- C. Cold Weather Concrete Placement:
1. For this Detailed Provision Section, "cold weather" is defined as a period when for more than three (3) successive days, the average daily outdoor temperature drops below 40 Deg F. Calculate average daily temperature as the average of the highest and the lowest temperature during the period from midnight to midnight.
  2. Batch, deliver, place, cure and protect concrete during cold weather in compliance with the recommendations of ACI 306R and the additional requirements of this Section.



3. Review the cold weather concreting plan at the preconstruction meeting. Include the methods and procedures for use during cold weather including the production, transportation, placement, protection, curing and temperature monitoring of the concrete and the procedures to be implemented upon abrupt changes in weather conditions or equipment failures.
4. Do not place concrete or substrates that are below 32 Deg F or contain frozen material.
5. Maintain all materials, forms, reinforcement, subgrade and any other items which concrete will come in contact with free of frost, ice or snow at time of concrete placement.
6. The minimum temperature of concrete immediately after placement and during the protection periods shall be:

Minimum Concrete Temperature for Sections with Dimension Less than 12-inches (Deg F)	Minimum Concrete Temperature for Sections with Dimension 12-inches to 36-inches (Deg F)
55	50

The temperature of the concrete in place and during the protection period shall not exceed these values by more than 20 Deg F. Prevent overheating and non-uniform heating of the concrete.

7. Protect concrete during periods of cold weather to provide continuous warm, moist curing (with supplementary heat when required by weather conditions) for a total of at least 350 degree-days of curing.
  - a. Degree-days are defined as the total number of 24 hour periods multiplied by the weighted average daily air temperature at the surface of the concrete (e.g. 7 days at an average 50 Deg F = 350 degree-days).
  - b. To calculate the weighted average daily air temperature, sum hourly measurements of the air temperature in the shade at the surface of the concrete taking any measurement less than 50 Deg F as 0 Deg F. Divide the sum thus calculated by 24 to obtain the weighted average temperature for that day.
8. Do not use salt, manure or other chemicals for protection.
9. At the end of the protection period, allow the concrete to cool gradually to the ambient temperature. If water curing has been used, do not expose concrete to temperatures below those listed in this Section until at least 24 hours after water curing has been terminated and air dry concrete for at least 3 days prior to first exposure to freezing temperatures.
10. Heat subgrade, forms, and reinforcement so the temperature of the subgrade, forms, and reinforcement will be between 45 and 70 Deg F, when temperature of surrounding air is 40 Deg F or below at time concrete is placed.
  - a. Remove all frost from subgrade, forms and reinforcement before concrete is placed.

11. Do not place slabs on ground if temperature is below 40 Deg F or if temperature surrounding the slab will be below 40 Deg F before structure is enclosed and heated.
12. During periods not defined as cold weather, but when freezing temperatures are expected or occur, protect concrete surfaces from freezing for the first seventy-two (72) hours.

D. Hot Weather Concrete Placement:

1. For this Detailed Provision Section, “hot weather” is defined as any combination of high air temperatures, low relative humidity and wind velocity which produces a rate of evaporation as estimated in ACI 305R, approaching or exceeding 0.2 pounds per square foot per hour (lb/sq ft/hr).
2. Batch, deliver, place, cure and protect concrete during hot weather in compliance with the recommendations of ACI 305R and the additional requirements of this Section.
  - a. Temperature of concrete being placed shall not exceed 90 Deg F. Maintain a uniform concrete mix temperature below this level. The temperature of the concrete shall not cause loss of slump, flash set or cold joints.
  - b. Promptly deliver concrete to the site and promptly place the concrete upon its arrival at the site, not exceeding the maximum time interval specified in Paragraph 3.02.A.10. Provide vibration immediately after placement.
  - c. The County may direct the Contractor to immediately cover concrete with sheet curing material.
3. Review the hot weather concreting plan at the preconstruction meeting. Include the methods and procedures for use during hot weather including production, placement, and curing.
4. Cool ingredients before mixing, or add flake ice or well crushed ice of a size that will melt completely during mixing for all or part of mixing water if high temperature, low slump, flash set, cold joints, or shrinkage cracks are encountered.
5. Temperature of concrete when placed:
  - a. Not to exceed 90 Deg F.
  - b. Not so high to cause:
    - 1) Shrinkage cracks.
    - 2) Difficulty in placement due to loss of slump.
    - 3) Flash set.
6. Temperature of forms and reinforcing when placing concrete:
  - a. Not to exceed 90 Deg F.
  - b. May be reduced by spraying with water to cool below 90 Deg F.
    - 1) Leave no standing water to contact concrete being placed.

- E. Consolidating:
1. Consolidate in accordance with ACI 309R except as modified herein.
  2. Consolidate by vibration so that concrete is thoroughly worked around reinforcement, embedded items and into corners of forms.
    - a. Eliminate:
      - 1) Air or stone pockets.
      - 2) Honeycombing or pitting.
      - 3) Planes of weakness.
  3. Internal vibrators:
    - a. Minimum frequency of 8,000 vibrations per minute.
    - b. Insert and withdraw at points approximately 18-inches apart.
      - 1) Allow sufficient duration at each insertion to consolidate concrete but not to cause segregation.
    - c. Use in:
      - 1) Beams and girders of framed slabs.
      - 2) Columns and walls.
    - d. Size of vibrators shall be in accordance with ACI 309R, Table 5.1.5.
  4. Obtain consolidation of slabs with internal vibrators, vibrating screeds, roller pipe screeds, or other approved means.
  5. Do not use vibrators to transport concrete within forms.
  6. Provide spare vibrators on jobsite during all concrete placing operations.
  7. Bring a full surface of mortar against form by vibration supplemented if necessary by spading to work coarse aggregate back from formed surface, where concrete is to have an as-cast finish.
  8. Use suitable form vibrators located just below top surface of concrete, where internal vibrators cannot be used in areas of congested reinforcing.
  9. Prevent construction equipment, construction operations, and personnel from introducing vibrations into freshly placed concrete after the concrete has been placed and consolidated.
- F. Handle concrete from mixer to place of final deposit by methods which will prevent segregation of loss of ingredients and in a manner which will assure that required quality of concrete is maintained.
1. Use truck mixers, agitators, and non-agitating units in accordance with ASTM C94.
  2. Horizontal belt conveyors:
    - a. Mount at a slope which will not cause segregation or loss of ingredients.
    - b. Protect concrete against undue drying or rise in temperature.

- c. Use an arrangement at discharge end to prevent segregation.
  - d. Do not allow mortar to adhere to return length of belt.
  - e. Discharge conveyor runs into equipment specially designed for spreading concrete.
3. Metal or metal line chutes:
- a. Slope not exceeding 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal.
  - b. Chutes more than 20 feet long and chutes not meeting slope requirements may be used provided they discharge into a hopper before distribution.
  - c. Provide end of each chute with a device to prevent segregation.
4. Pumping or pneumatic conveying equipment:
- a. Designed for concrete application and having adequate pumping capacity.
  - b. Control pneumatic placement so segregation is avoided in discharged concrete.
  - c. Loss of slump in pumping or pneumatic conveying equipment shall not exceed 1- 1/2 inch.
  - d. Do not convey concrete through pipe made of aluminum or aluminum alloy.
  - e. Provide pumping equipment without Y sections.

### **3.04 JOINTS AND EMBEDDED ITEMS**

#### **A. Construction Joints – General:**

- 1. Locate joints as indicated on Project Drawings or as directed during concrete placement.
- 2. Make joints perpendicular to main reinforcement with all reinforcement continuous across joints.
- 3. Provide roughened construction joints at all construction joints unless indicated otherwise.
  - a. Clean the previously hardened concrete interface and remove all laitance.
  - b. Intentionally roughen the interface to a full amplitude of ¼-inch.
  - c. Provide recessed flat surface as required to install strip type waterstops.
- 4. Allow a minimum of 48 hours before placement of adjoining concrete construction.

#### **B. Construction Joints – Bonding:**

- 1. Obtain bond between concrete pours at construction joints by thoroughly cleaning and removing all laitance from construction joints.
  - a. Before new concrete is placed, all construction joints shall be coated with cement grout, or dampened.
    - 1) General: Use cement grout or dampening for all construction joints.

2. Roughened construction joints:
    - a. Roughen the surface of the concrete to expose the aggregate uniformly.
    - b. Remove laitance, loosened particles of aggregate or damaged concrete at the surface, or at the Contractor's option, use an approved chemical retarder which delays but does not prevent setting of the surface of the mortar in accordance with the manufacturer's recommendations.
      - 1) Retarded mortar shall be removed within 24 hours after placing to produce a clean exposed aggregate bonding surface.
    - c. Cover the hardened concrete of horizontal joints with a coat of cement grout of similar proportions to the concrete, except substitute fine aggregate for coarse aggregate.
    - d. Place 1-inch layer of grout in bottoms of wall or column lifts immediately before placing concrete.
      - 1) Vibrate grout and first layer of concrete simultaneously.
    - e. Place fresh concrete before the grout has attained its initial set.
  3. Other keyed construction joints:
    - a. Thoroughly clean construction joints and remove all laitance.
    - b. Dampen the hardened concrete (but do not saturate) immediately prior to placing of fresh concrete.
- C. Expansion Joints:
1. Do not permit reinforcement or other embedded metal items bonded to concrete (except smooth dowels bonded on only one side of joint) to extend continuously through an expansion joint.
  2. Use neoprene expansion joint fillers, unless noted otherwise.
  3. Seal expansion joints as shown on Drawings in accordance with Section 201-3 "Expansion Joint Filler and Joint Sealants" and Section 303-5.4 "Joints" of the current edition of the Greenbook.
- D. Other Embedded Items:
1. Place sleeves, inserts, anchors, and embedded items required for adjoining work or for its support, prior to initiating concreting.
  2. Do not place electrical conduit, drains, or pipes in or thru concrete slabs, walls, columns, foundations, beams or other structural members unless approved by the County.
- E. Placing Embedded Items:
1. Position expansion joint material and other embedded items accurately.
  2. Support against displacement.

3. Fill voids in sleeves, inserts and anchor slots temporarily with readily removable material to prevent entry of concrete into voids.

### **3.05 FINISHING**

- A. See Detailed Provisions Section 03 3132 – Concrete Finishing and Repair of Surface Defects.
- B. Coordinate mixing and placing with finishing.

### **3.06 INSTALLATION OF GROUT**

- A. Grout Schedule of Use:
  1. Sand cement grout:
    - a. General use.
  2. Non-shrinking, non-metallic grout:
    - a. Filling form tie holes.
    - b. Under column and beam base plates.
    - c. Other uses indicated on the Drawings.
  3. Epoxy grout:
    - a. Patching cavities in concrete.
    - b. Other uses indicated on the Drawings.
- B. Grout Installation:
  1. Sand cement grout:
    - a. Cure grout by one of methods specified.
  2. Non-shrink, non-metallic grout:
    - a. Clean concrete surface to receive grout.
    - b. Saturate concrete with water for 24 hours prior to grouting.
    - c. Mix in a mechanical mixer.
    - d. Use no more water than necessary to produce flowable grout.
    - e. Place in accordance with manufacturer's instructions.
    - f. Provide under beam, column, and equipment base plates, in joints between precast concrete filter slabs, and in other locations indicated on the Drawings.
    - g. Completely fill all spaces and cavities below the top of base plates.
    - h. Provide forms where base plates and bed plates do not confine grout.
    - i. Where exposed to view, finish grout edges smooth.
    - j. Except where a slope is indicated on the Drawings, finish edges flush at the base plate, bed plate, member or piece of equipment.

- k. Coat exposed edges of grout with cure or seal compound recommended by the grout manufacturer.
3. Epoxy grout:
- a. Mix and place in accordance with manufacturer's instructions.
  - b. Apply only to clean, dry, sound surface.
  - c. Obtain manufacturer's field technical assistance as required to assure proper placement.

### **3.07 CURING AND PROTECTION**

- A. Protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury immediately after placement, and maintain with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement, hardening, and compressive strength gain.
- 1. Comply with ACI 306R for cold-weather protection during curing.
  - 2. Comply with ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lbs/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. In accordance with ACI 308.1, apply one of the following curing procedures immediately after completion of placement and finishing, for concrete surfaces not in contact with forms.
- 1. Moisture Curing: Keep surfaces continuously moist for not less than seven (7) days.
  - 2. Moisture-Retaining Cover Curing: Cover concrete surfaces with moisture retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven (7) days. Immediately repair any holes or tears during curing period using cover material and waterproof tape. Application of waterproof sheet materials, conforming to ASTM C171.
  - 3. Curing Compound: Application of a curing compound conforming to ASTM C309.
    - a. Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's recommendations immediately after any water sheen which may develop after finishing has disappeared from concrete surface.
    - b. Recoat areas subjected to heavy rainfall within three (3) hours after initial application. Maintain continuity of coating and repair damage during curing period.
    - c. Do not use on any surface against which additional concrete or other material is to be bonded unless it is proven that curing compound will not prevent bond.

- d. Where a vertical surface is cured with a curing compound, the vertical surface shall be covered with a minimum of two (2) coats of the curing compound.
  - 1) Apply the first coat of curing compound to a vertical surface immediately after form removal.
  - 2) The vertical concrete surface at the time of receiving the first coat shall be damp with no free water on the surface.
  - 3) Allow the preceding coat to completely dry prior to applying the next coat.
  - 4) A vertical surface: Any surface steeper than 1 vertical to 4 horizontal.

D. Curing Concrete in Contact with Forms:

1. Minimize moisture loss and temperature gain of concrete placed in forms exposed to heating by sun by keeping forms wet and cool until they can be safely removed.
  2. After form removal, cure concrete until end of time prescribed.
    - a. Use one of methods listed above.
  3. Forms left in place shall not be used as a method of curing in hot weather.
  4. In hot weather, remove forms from vertical surfaces as soon as concrete has gained sufficient strength so that the formwork is no longer required to support the concrete.
- E. Continue curing for at least seven (7) days for all concrete except high early strength concrete for which period shall be at least three (3) days.
1. If one of curing procedures indicated above is used initially, it may be replaced by one of other procedures indicated any time after concrete is one (1) day old, provided concrete is not permitted to become surface dry during transition.

F. Cold Weather:

1. Follow recommendations of ACI 306R.
2. Maintain temperature of concrete between 50 and 70 Deg F for required curing period, when outdoor temperature is 40 Deg F, or less.
3. Use heating, covering, insulating, or housing of the concrete work to maintain required temperature without injury due to concentration of heat.
4. Do not use combustion heaters unless precautions are taken to prevent exposure of concrete to exhaust gases which contain carbon dioxide.
5. Interior slabs in areas intended to be heated shall be adequately protected so that frost does not develop in the supporting subgrade.

G. Hot Weather:

1. Follow recommendations of ACI 301.
2. Make provision for cooling forms, reinforcement and concrete, windbreaks, shading, fog spraying, sprinkling, ponding, or wet covering with a light colored material.



3. Provide protective measures as quickly as concrete hardening and finishing operations will allow.
- H. Rate of Temperature Change:
1. Keep changes in temperature of air immediately adjacent to concrete as uniform as possible, during and immediately following curing period.
  2. Do not exceed a temperature change of 5 Deg F in any one (1) hour or 50 Deg F in any twenty-four (24) hour period.
- I. Protection from Mechanical Injury:
1. Protect concrete from damaging mechanical disturbances, such as load stresses, heavy shock, and excessive vibration.
  2. Protect finished concrete surfaces from damage by construction equipment, materials, or methods, and by rain or running water.
  3. Do not load self-supporting structures in such a way as to overstress concrete.

### **3.08 CLEAN UP**

- A. Upon completion of all concrete work and before Substantial Completion, the Contractor shall remove all tools, surplus materials, apparatus, debris, etc., from the site and the site shall be left in a clean, neat, and acceptable condition to the County.
- B. Hardened concrete material accumulated in the designated washout area for the Project shall be recycled by the Contractor. The Contractor shall break-up material to the County's satisfaction, load, haul, unload and spread the material in an area within the borrow area to be used as a road stabilizer.

### **3.09 FIELD QUALITY CONTROL**

- A. Tests in accordance with Detailed Provisions Section 03 0505 – Concrete Testing.
  1. Perform a strength test on all concrete to which water or superplasticizer, above the amount stated in the approved concrete mix design, has been added.
    - a. Perform sampling after water or superplasticizer has been added and additional mixing has been performed.
- B. All cracks wider than 1/64 –inch in new concrete appearing within six (6) months of concrete placement shall be repaired using epoxy adhesive injection by the Contractor at no cost to the County.

END OF SECTION 03 3131

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**SPECIFICATIONS – DETAILED PROVISIONS**

**SECTION 03 3132: CONCRETE FINISHING AND REPAIR OF SURFACE DEFECTS**  
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## SECTION 03 3132 CONCRETE FINISHING AND REPAIR OF SURFACE DEFECTS

### PART 1 GENERAL

#### 1.01 SUMMARY

- A. Section Includes: This work consists of providing concrete surface finishes and repairing surface finishes of all defects.
1. This work includes but is not limited to:
    - a. Structural slabs.
    - b. Drainage Structures.
- B. Related Detailed Provisions Sections include, but are not limited to:
1. Section 03 3100 – Cast-In-Place Structural Concrete
  2. Section 03 3131 – Concrete Mixing, Placing, Jointing and Curing
  3. Section 03 3713 – Shotcrete

#### 1.02 QUALITY ASSURANCE

- A. Referenced Standards:
1. American Concrete Institute (ACI):
    - a. ACI 116R – Cement and Concrete Terminology.
    - b. ACI 301 – Specification for Structural Concrete.
  2. American Society for Testing and Materials (ASTM):
    - a. ASTM C150 – Standard Specification for Portland Cement.
    - b. ASTM D4258 – Standard Practice for Surface Cleaning Concrete for Coating.
    - c. ASTM D4259 – Standard Specification for Preparation of Concrete by Abrasion Prior to Coating Application.
  3. The Society for Protective Coatings/NACE International (SSPC/NACE):
    - a. SSPC/NACE No. 6 – Surface Preparation of Concrete
- B. Qualifications:
1. Manufacturer of acrylic epoxy surface/filler shall have minimum of five (5) years experience in manufacturing of same with documented performance history for similar installations.
  2. Installer/applicator of acrylic epoxy surfacer/filler shall have minimum of three (3) years experience installing similar materials and shall be licensed or approved in writing by manufacturer to install/apply this product.

### **1.03 DEFINITIONS**

#### **A. Vertical Surface Defects:**

1. Any void in the face of the concrete deeper than 1/8-inch, such as:
  - a. Tie holes, Air pockets (bug holes), Honeycombs and Rock holes.
2. Scabbing:
  - a. Scabbing is defect in which parts of the form face, including release agent, adhere to concrete.
3. Foreign material embedded in face of concrete.
4. Fins 1/16-inch or more in height.

#### **B. Installer or Applicator:**

1. Installer or applicator is the person actually installing or applying the product in the field at the Project Location.
2. Installer or applicator are synonymous.

#### **C. Other words and terms used in this Detailed Provisions Section are defined in ACI 116R.**

### **1.04 SUBMITTALS**

#### **A. Submittal Procedures: See Detailed Provisions Section 01 3300 – Submittal Procedures for requirements for the mechanics and administration of the submittal process.**

#### **B. Approval Submittals:**

1. Product technical data, including, but not limited to:
  - a. Acknowledgement that products submitted meet requirements of standards referenced.
  - b. Manufacturer's installation instructions.

#### **C. Quality Assurance Submittals:**

1. Certifications:
  - a. Certification that products being used will not interfere with bonding of future floor or wall finishes.

### **1.05 DELIVERY, STORAGE AND HANDLING**

#### **A. Comply with manufacturer's recommendations and requirements for materials used.**

#### **B. Materials shall be delivered to the jobsite in sealed, undamaged containers. Each container shall be clearly marked with manufacturer's label showing type of material, color and lot number.**

## **PART 2 PRODUCTS**

### **2.01 ACCEPTABLE MANUFACTURERS**

- A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
  - 1. Bonding agents:
    - a. Euclid Chemical Company; [www.euclidchemical.com](http://www.euclidchemical.com)
    - a. L&M Construction Chemicals a part of LATICRETE, Inc.; [www.lmcc.com](http://www.lmcc.com)
    - b. Master Builders Solutions by BASF; [www.master-builders-solutions.basf.us](http://www.master-builders-solutions.basf.us)
    - c. Or approved equal.
- B. Submit request for substitution in accordance with Detailed Provisions Section 01 6000 – Product Requirements.

### **2.02 MATERIALS**

- A. Bonding Agent:
  - 1. For use only on concrete surfaces not receiving liquid water repellent coating:
    - a. High solids acrylic latex base liquid for interior or exterior application as a bonding agent to improve adhesion and mechanical properties of concrete patching mortars.
  - 2. For use only on concrete surface receiving liquid water repellent:
    - a. Non-acrylic base liquid for interior or exterior application as a bonding agent to improve adhesion and mechanical properties of concrete patching mortars.
- B. Cement:
  - 1. ASTM C150, Type II Portland.
- C. Aggregate:
  - 1. Sand: Maximum size #30 mesh sieve.
  - 2. For exposed aggregate finish surfaces: Same as surrounding floor and/or wall.
- D. Water: Potable.
- E. Non-Shrink Grout: See Detailed Provisions Section 03 3100 – Cast-In-Place Structural Concrete and Section 03 3131 – Concrete Mixing, Placing, Jointing, and Curing.

### **2.03 MIXES**

- A. Bonding Grout: One (1) part cement to one (1) part aggregate.
- B. Patching Mortar: One (1) part cement to two and one-half (2-1/2) parts aggregate by damp loose volume.
  - 1. Substitute white Portland cement for a part of gray Portland cement to produce color matching surrounding concrete.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. For methods of curing, see Detailed Provisions Section 03 3131 – Concrete Mixing, Placing, Jointing, and Curing.
- B. Preparation of Bonding Grout Mixture:
  - 1. Mix cement and aggregate.
  - 2. Mix bonding agent and water together in separate container in accordance with manufacturer's instructions.
  - 3. Add bonding agent/water mixture to cement/aggregate mixture.
  - 4. Mix to consistency of thick cream.
  - 5. Bonding agent itself may be used as bonding grout if approved by manufacturer and County.
- C. Preparation of Patching Mortar Mixture:
  - 1. Mix cement and aggregate.
  - 2. Mix bonding agent and water together in separate container in accordance with manufacturer's instructions.
  - 3. Add only enough bonding agent/water mixture to cement/aggregate mixture to allow handling and placing.
  - 4. Let stand with frequent manipulation with a trowel, until mix has reached stiffest consistency to allow placement.
- D. Clean surfaces in accordance with ASTM D4258 to remove dust, dirt, form oil, grease, or other contaminants prior to abrasive blasting, chipping, grinding or wire brushing.
  - 1. Abrasive blast surfaces in accordance with ASTM D4259 and SSPC/NACE No. 6 to completely open defects down to sound concrete and remove laitance.
    - a. If additional chipping or wire brushing is necessary, make edges perpendicular to surface or slightly undercut.
    - b. No featheredges will be permitted.
  - 2. Rinse surface with clean water and allow surface water to evaporate prior to repairing surface defects.
- E. Repairing Surface Defects:
  - 1. Fill and repair using patching mortar mix specified in Paragraph 2.03.
    - a. Use non-shrink grout to fill tie-holes as outlined in this Detailed Provisions Section.
  - 2. If required by bonding agent manufacturer, etch surfaces with a muriatic acid solution followed by a thorough rinse with clean water.



- a. Test concrete to determine pH level and continue flushing with clean water until surface pH is within acceptable limits.
3. Dampen area to be patched and an area at least 6-inches wide surrounding it prior to application of bonding grout.
4. Brush bonding grout into the surface after the surface water has evaporated.
5. Allow bonding grout to set for period of time required by bonding agent manufacturer before applying premixed patching mortar.
6. Fill tie-holes with non-shrink nonmetallic grout.
  - a. Where exposed to view and scheduled to receive concrete Finish #2 or #5, hold grout below surface of concrete and fill with patching mortar to match surrounding concrete.
7. Fill all other defects with patching mortar.
  - a. Match color of surrounding floor and/or wall.
  - b. Do not use acrylic bonding agent in patching mortar for filling defects in surfaces to be treated with liquid water repellent.
8. Consolidate grout or mortar in place and strike off so as to leave patch slightly higher than surrounding surface.
9. Leave undisturbed for at least 60 minutes before finishing level with surrounding surface.
  - a. Do not use metal tools in finishing a patch in a formed wall which will be exposed or coated with other materials.
10. Keep areas damp in accordance with grout manufacturer or bonding agent manufacturer's directions.

### **3.02 INSTALLATION AND APPLICATION**

- A. Do not repair surface defects or apply wall or floor finishes when temperature is or is expected to be below 50 Deg F.
  1. If necessary, enclose and heat area to between 50 and 70 Deg F during repair of surface defects and curing of patching material.
    - a. Use only clean fuel, indirect fired heating apparatus.
- B. Concrete Finishes for Horizontal Slab Surfaces:
  1. General:
    - a. Tamp concrete to force coarse aggregate down from surface.
    - b. Screed with straightedge, eliminate high and low places, bring surface to required finish elevations; slope uniformly to drains.
    - c. Dusting of surface with dry cement or sand during finishing processes is not permitted.

2. Unspecified slab finish:
  - a. When type of finish is not indicated, use following finishes as applicable:
    - 1) Exterior slabs, sidewalks, platforms, steps and landings, and ramps, not covered by other finish materials: Broom or belt finish.
    - 2) All slabs to receive a floated finish before final finishing.
3. Scratched slab finish: After concrete has been placed, consolidated, struck off, and leveled to a Class B tolerance, roughen surface with stiff brushes or rakes before final set.
4. Floated finish:
  - a. After concrete has been placed, consolidated, struck off, and leveled, do no further work until ready for floating.
  - b. Begin floating when water sheen has disappeared and surface has stiffened sufficiently to permit operations.
    - 1) Use wood or cork float.
  - c. During or after first floating, check planeness of entire surface with a 10-foot straightedge applied at not less than two (2) different angles.
  - d. Cut down all high spots and fill all low spots to produce a surface with Class B tolerance throughout.
  - e. Refloat slab immediately to a uniform texture.
5. Troweled finish:
  - a. Float finish surface to true, even plane.
  - b. Power trowel, and finally hand trowel.
  - c. First troweling after power troweling shall produce a smooth surface which is relatively free of defects, but which may still show some trowel marks.
  - d. Perform additional trowelings by hand after surface has hardened sufficiently.
  - e. Final trowel when a ringing sound is produced as trowel is moved over surface.
  - f. Thoroughly consolidate surface by hand troweling.
  - g. Leave finished surface essentially free of trowel marks, uniform in texture and appearance and plane to a Class A tolerance.
  - h. On surfaces intended to support floor coverings, remove any defects that would show through floor covering by grinding.
6. Broom or belt finish: Immediately after concrete has received a float finish as specified, give it a transverse scored texture by drawing a broom or burlap belt across surface.
7. Underside of concrete slab finish:
  - a. Match finish as specified for adjacent vertical surfaces.

- b. If more than one (1) finish occurs immediately adjacent to underside of slab surface, provide surface with most stringent formed surface requirement.

### **3.03 FIELD QUALITY CONTROL**

- A. Horizontal slab finishes will be accepted provided:
  - 1. Water does not pond in areas sloped to drain.
- B. Unacceptable finishes shall be replaced or, if approved in writing by County, may be corrected provided strength and appearance are not adversely affected.
  - 1. High spots to be removed by grinding and/or low spots filled with a patching compound or other remedial measures to match adjacent surfaces.

END OF SECTION 03 3132

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**SPECIFICATIONS – DETAILED PROVISIONS**  
**SECTION 03 3713: SHOTCRETE**  
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## **SECTION 03 3713 SHOTCRETE**

### **PART 1 GENERAL**

#### **1.01 SUMMARY**

A. Section includes:

1. Pneumatically placed concrete.
2. This work includes but is not limited to:
  - a. Drainage structures

B. Related Detailed Provisions Sections include, but are not limited to:

1. Section 03 0505 – Concrete Testing
2. Section 03 2100 – Concrete Reinforcement
3. Section 03 3131 – Concrete Mixing, Placing, Jointing & Curing
4. Section 03 3132 – Concrete Finishing

#### **1.02 QUALITY ASSURANCE**

A. Referenced Standards:

1. American Concrete Institute (ACI):
  - a. ACI 116R – Cement and Concrete Terminology.
  - b. ACI 117R – Specifications for Tolerances for Concrete Construction and Materials.
  - c. ACI 301 – Specifications for Structural Concrete.
  - d. ACI 305R – Hot Weather Concreting.
  - e. ACI 306.1 – Specification for Cold Weather Concreting.
  - f. ACI 506R – Guide to Shotcrete.
  - g. ACI 506.2 – Specification for Materials, Proportioning, and Application of Shotcrete.
2. American Society for Testing and Materials (ASTM):
  - a. ASTM A123 – Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - b. ASTM A615 – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
  - c. ASTM A884 – Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Fabric for Reinforcement.

- d. ASTM A1064 – Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- e. ASTM C33 – Standard Specification for Concrete Aggregates.
- f. ASTM C42 – Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
- g. ASTM C94 – Standard Specification for Ready Mixed Concrete.
- h. ASTM C131 – Standard Test Method for Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- i. ASTM C150 – Standard Specification for Portland Cement.
- j. ASTM C173 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
- k. ASTM C231 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
- l. ASTM C260 – Standard Specification for Air Entraining Admixtures for Concrete.
- m. ASTM C330 – Standard Specification for Lightweight Aggregates for Structural Concrete.
- n. ASTM C332 – Standard Specification for Lightweight Aggregates for Insulating Concrete.
- o. ASTM C494 – Standard Specification for Chemical Admixtures for Concrete.
- p. ASTM C618 – Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
- q. ASTM C1064 – Standard Test Method for Temperature of Freshly Mixed Hydraulic Cement Concrete.
- r. ASTM C1077 – Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
- s. ASTM C1140 – Standard Practice for Preparing and Testing Specimens from Shotcrete Test Panels.
- t. ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
- u. ASTM D1751 – Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction.
- v. ASTM E329 – Standard Specification for Agencies Engaged in Construction Inspection and/or Testing.

### **1.03 DEFINITIONS**

A. Words and terms used in this Detailed Provisions Section are defined in ACI 116R



## 1.04 SUBMITTALS

A. Submittal Procedures: See Detailed Provisions Section 01 3300 – Submittal Procedures for requirements for the mechanics and administration of the submittal process.

B. Approval Submittals:

1. Product technical data, including, but not limited to:

- a. Acknowledgement that products submitted meet requirements of standards referenced.
- b. Manufacturer's instructions.
- c. Concrete mix designs as required by Detailed Provisions Section 03 0505 – Concrete Testing.
- d. Manufacturer and type of proposed admixtures.
- e. Manufacturer and type of proposed non-shrink grout and grout cure/seal compound.

C. Quality Assurance Submittals

1. Certifications:

- a. Certification of standard deviation data for each proposed concrete mix based on statistical records. Provide the following for each strength data point used in the calculation of the standard deviation for determination of the minimum required average strength:
  - 1) Date of sampling and name of testing laboratory.
  - 2) Name of concrete batch plant.
  - 3) Water cementitious ratio.
  - 4) Slump of batch.
  - 5) Air content of batch.
  - 6) 28-day compression test results.
  - 7) If available, temperature and unit weight of batch.

Provide data from projects not more strictly controlled than outlined in these specifications. Provide summary sheet showing all pertinent data and the computation of the standard deviation.

- b. Certification that the class of coarse aggregate meets the requirements of ASTM C33 for type and location of concrete construction.
- c. Certification of aggregate gradation.

2. Test reports: Cement mill reports for all cement to be supplied.

3. Delivery tickets: Furnish a delivery ticket for ready mixed concrete to the County as each truck arrives. Provide a printed record of weight of cement and each aggregate as batched individually on each ticket. Use the type of indicator that returns for zero punch or returns to zero after a batch is discharged. Indicate for

each batch the weight of fine and coarse aggregate, cement, fly ash, and water, moisture content of fine and coarse aggregate at time of batching, and types, brand, and quantity of each admixture, the quantity of concrete delivered, the time any water is added and the amount, and the numerical sequence of the delivery. Show the time of day batched and time of discharge from the truck. Indicate the number of revolutions of transit mix truck.

## **1.05 DELIVERY, STORAGE AND HANDLING**

- A. Delivery, storage, and handling shall be made in accordance with the following:
1. Store cement and Pozzolan in weathertight buildings, bins, or silos which will exclude moisture and contaminants.
  2. Arrange aggregate stockpiles and use in a manner to avoid excessive segregation and to prevent contamination with other materials or with other sizes of like aggregates.
  3. Allow natural sand to drain until it has reached a relatively uniform moisture content before use.
  4. Store admixtures in such a manner as to avoid contamination, evaporation, or damage.
    - a. For those used in form of suspensions or non-stable solutions, provide agitating equipment to assure thorough distribution of ingredients.
    - b. Protect liquid admixtures from freezing and temperature changes which would adversely affect their characteristics and performance.

## **PART 2 PRODUCTS**

### **2.01 ACCEPTABLE MANUFACTURERS**

- A. Subject to compliance with the Contract Documents, the manufacturers listed in the applicable articles below are acceptable.
- B. Submit requests for substitution in accordance with Detailed Provisions Section 01 6000 – Product Requirements.

### **2.02 MATERIALS**

- A. General:
1. The County and Testing/Inspection Provider shall have access to and have the right to inspect all batch plants, cement mills, and supply facilities providing products under these specifications. Batch plants shall have current certificates that all scales have been tested and are certified within the tolerances as set forth in the National Bureau of Standards Handbook No. 44.
  2. The Contractor shall not use calcium chloride or fly ash and related materials. The County does not require admixtures; however, if the Contractor proposes

admixtures, they shall conform to SIKA Chemical Corporation's "Plastiment", or approved equal, and shall be applied in accordance with manufacturer's directions and also conform to Section 201-1.2.4, "Chemical Admixtures" requirements of the Standard Specifications. Any admixture proposal shall be approved by the County. Upon review of any proposed admixture, the County may accept or reject any proposal.

**B. Portland Cement:**

1. Cement shall be Class 650-D-3250P (Shotcrete) in conformance with Section 201-1 of the Standard Specifications and shall be air-placed with a 4-inch maximum slump in conformance with sub-section 303-2.1.3 Method B (Shotcrete) of the Standard Specifications.

**C. Aggregate:**

1. Concrete coarse aggregate shall conform to ASTM C33 requirements, and also meet the requirements of Section 201-1.2.2, "aggregates" of the Standard Specifications, or nonconforming aggregate which by test or actual service produces concrete of required strength and conforms to local governing codes. Aggregates shall be uniformly graded and conform to ASTM C-131 Test Grading C.
2. Fine aggregates shall conform to ASTM C33 requirements, and also meet the requirements of Section 200-1.5.3, "Sand for Portland Cement Concrete" of the Standard Specifications.

**D. Water:**

1. ASTM C94 and potable.
2. Clean and free from deleterious substances.
3. Free of oils, acids, and organic material.

**E. Curing Compound:**

1. Type II white-pigmented curing compound for concrete/shotcrete structures shall conform to sub-section 201-4.1.1 of the Standard Specifications.

**F. Welded Wire Reinforcement:**

1. Welded Wire Reinforcement (WWR) for downdrains and drainage swales shall conform to sub-section 201-2.2.3 of the Standard Specifications. The gage of wire and dimensions of the mesh are specified in the Project Drawings. If deemed to be more efficient, Contractor may use the reinforcing steel (rebar) equivalent in lieu of WWR for the reinforcement of shotcrete downdrains not warranting additional compensation.

## **2.03 MIXES**

**A. General: Mixing of concrete shall be done in accordance with:**

1. Provide concrete capable of being placed without aggregate segregation and, when cured, of developing all properties specified.

2. Ready-mixed concrete shall conform to ASTM C94.
- B. Minimum 28-Day Compressive Strength: 3,250 psi or as indicated on Project Drawings.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

#### **A. Subgrade:**

1. The subgrade for shotcrete structures shall be prepared to conform to lines, grades, and cross-sections as shown on the Project Drawings or as directed by the County.
  - a. Where the structures are in native cut, the upper six (6) inches of subgrade shall be compacted to a minimum of 90% of the maximum density as determined per ASTM D1557. This shall be achieved by scarifying the exposed surface to a depth of six (6) inches and recompacting.
  - b. Where structures are in engineered fill, the finished subgrade shall be firm and suitable for placement of shotcrete structures and shall be compacted to a minimum of 90% of the maximum density as determined per ASTM D1557.

#### **B. Welded Wire Reinforcement:**

1. Forms and ground wires for shotcrete drainage structures shall be installed in accordance with sub-section 303-2.7 of the Standard Specifications. Ground wires shall be placed at approximately 5-foot intervals.
2. Welded wire mesh shall be spliced not less than two meshes. Mortar blocks with wire ties, or other means acceptable to the County shall be used to secure the reinforcement firmly in position.

### **3.02 APPLICATION**

#### **A. Concrete Mixing**

1. Concrete mixing shall comply with Detailed Provisions Section 03 3131 – Concrete Mixing, Placing, Jointing and Curing.

#### **B. Concrete Placement**

1. Concrete placement for shotcrete drainage structures shall be in accordance with Part 3, Section 303-2.1 of the Standard Specifications and Detailed Provisions Section 03 3131 – Concrete Mixing, Placing, Jointing, and Curing. Nozzle shall be directed in such a manner as to result in minimum rebound of the shotcrete. The velocity of the material as it leaves the nozzle shall be maintained at a uniform rate that shall be determined for the given job conditions.
2. When drainage structures and adjoining drainage structures are constructed on multiple pours, Contractor shall utilize a construction joint with adjoining steel dowels between the construction joint. Steel dowels shall adhere to Section 201-2.2.1 of the Standard Specifications.

### **3.03 FIELD QUALITY CONTROL**

- A. After the shotcrete has been placed as nearly as practicable to the required depth, the surface shall be checked with a straightedge, and any low spots or depressions shall be brought to grad by placing additional shotcrete in such a manner that the finished surface will be reasonably smooth and uniform for the type of work involved. Loose areas of shotcrete shall be removed and replaced by the Contractor at the Contractor's expense.
- B. Perform concrete tests per Detailed Provisions Section 03 0505 – Concrete Testing.

**END OF SECTION 03 3713**

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**SPECIFICATIONS – DETAILED PROVISIONS**  
**SECTION 26 0505: SITE ELECTRICAL DECOMMISSIONING**  
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## SECTION 26 0505 SITE ELECTRICAL DECOMMISSIONING

### PART 1 GENERAL

#### 1.01 SUMMARY

##### A. Section Includes:

1. Requirements of this Detailed Provisions Section apply to all electrical systems decommissioning on the Project including those found in other Divisions even if not specifically referenced in individual Articles of those Detailed Provisions Sections.

##### B. Related Detailed Provisions Sections include, but are not limited to:

1. Division 01 – General Requirements.
2. Division 26 – Electrical.

#### 1.02 QUALITY ASSURANCE

##### A. Referenced Codes and Standards

1. Provide electrical equipment and materials decommissioning, conforming to the following latest codes and standards, as applicable. The equipment and materials shall bear labels to indicate manufacturing conformance to the specified standards or equal. Where two codes or standards are at variance, conform to the more restrictive requirement:
  - a. Aluminum Association (AA)
  - b. American National Standards Institute (ANSI)
  - c. American Society for Testing and Materials (ASTM)
  - d. California Building Code (CBC), Title 24, Parts 1 and 2
  - e. California Code of Regulations (CCR), Title 8, Subchapter 5
  - f. California Electrical Code (CEC), Title 24, Part 3
  - g. California Fire Code (CFC), Title 24, Part 9
  - h. California Occupational Safety and Health Administration (CalOSHA)
  - i. California State Fire Marshall
  - j. Certified Ballast Manufacturers Standards
  - k. Illuminating Engineering Society Handbook Standards
  - l. Institute of Electrical and Electronic Engineers (IEEE)
  - m. Insulated Power Cable Engineers Association Standards
  - n. International Electrotechnical Commission (IEC)

- o. National Electrical Code (NEC)
- p. National Electrical Manufacturers' Association (NEMA)
- q. National Electrical Safety Code
- r. National Electrical Testing Association (NETA)
- s. National Fire Protection Association (NFPA)
- t. Underwriters Laboratories (UL)

### **1.03 DEFINITIONS**

- A. Demolish: Detach items from existing construction and legally dispose of items off site, unless indicated as removed and salvaged, or removed and reinstalled.
- B. Remove: Planned deconstruction and disassembly of electrical items from existing construction including removal of conduit, junction boxes, cabling and wiring from electrical component to panel taking care not to damage adjacent assemblies designated to remain; legally dispose of items off site, unless indicated as removed and salvaged, or removed and reinstalled.
- C. Hazardous Substances: Dangerous substances, dangerous goods, hazardous commodities and hazardous products may include asbestos, mercury and lead, PCB s, poisons, corrosive agents, flammable substances, radioactive substances, or other material that can endanger human health or wellbeing or environment if handled improperly as defined by Federal Hazardous Products Act (RSC 1985) including latest amendments.
- D. Hazardous Areas: Class I, II, or III areas as defined in NFPA 70.

### **1.04 UTILITY COMPANY REQUIREMENTS**

- A. The serving utility for the Project is Imperial Irrigation District (IID).
- B. Comply with all IDD requirements for utility service as follows:
  - 1. Energy Regulations, <https://www.iid.com/energy/rates-regulations/regulations>

### **1.05 SUBMITTALS**

- A. Submittal Procedures: See Detailed Provisions Section 01 3300 – Submittal Procedures for requirements for the mechanics and administration of the submittal process.
- B. Submit an Electrical Decommissioning Plan for removing electrical for the Site.

### **1.06 DEBRIS MATERIALS**

- A. Demolished electrical items shall become Contractor's property and will be removed from Project site. Treated-wood power poles will need to be properly disposed of off-site.

## **1.07 JOB CONDITIONS**

- A. When performing underground work, the Contractor shall call Underground Service Alert of Southern California (USA/SC) at 811, the one-call underground facility locating service two (2) working days prior to making an excavation. Contractor shall be responsible for such notification of sub-contractor's work, or shall require sub-contractor to assume this responsibility.
- B. Before proceeding with trenching, the Contractor shall investigate the proposed location to determine subsurface conditions or the existence of foreign pipes or ducts. If foreign substructures are found in or along the trenching path, trenching will be stopped until their purpose and ownership is investigated for proper installation of underground conduits. It may be necessary to utilize an electronic locating device or dig test holes to locate any underground obstacles.
- C. Movement of construction machinery and equipment over pipes and utilities during construction shall be at the Contractor's risk. Excavation made with power-driven equipment is not permitted within five (5) feet of any known utility or subsurface construction. For work immediately adjacent to or for excavations exposing a utility or other buried obstruction, the Contractor shall use hand labor or light equipment excavation. The Contractor shall start hand labor or light equipment excavation on each side of the encountered obstruction and continue until the obstruction is uncovered or until adequate clearance for the new proposed conduits are assured. The Contractor shall support uncovered substructures or other existing elements affected by the contract excavation until approval for backfill is granted by the County or its representative. The Contractor shall report damage to utility lines or subsurface construction immediately to the County.
- D. The Contractor shall provide temporary steel plating and shoring support for the plates, to completely cover the excavation created across roadways. Temporary steel plating must be provided by the Contractor for areas which will remain open overnight. The temporary plating shall be a minimum of 0.75-inch thickness steel, but in no case shall the thickness be less than that required to support AASHTO-H20 traffic loading. Provide a visible barrier along the excavation path on each side of the roadway with a combination of highly visible "Caution Tape" and construction cones.
- E. Coordinate electrical work with all trades, code authorities, public utilities, and County.

## **PART 2 PRODUCT – NOT USED**

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verification of existing conditions
  - 1. Visit site, thoroughly examine and become familiar with conditions that may affect the Work of this Section.
  - 2. The County will not consider claims for extra work or materials necessary for proper execution and completion of the contract that could have been determined by a site visit.

### **3.02 PREPARATION**

- A. Verify power is disconnected.
  - Contact local service provider if necessary.

### **3.03 EXECUTION**

- A. Disconnect electrical circuits and panel feeders; prior to removing Site electrical service and main distribution panel.
- B. Prior to demolition of existing Fee Booth, remove existing luminaires, electrical devices and equipment including associated conduits, boxes, wiring, and similar items unless specifically noted otherwise. Disconnect and remove communication systems including associated conduits, boxes, cabling, and similar items unless specifically noted otherwise. Disconnect and remove telephone outlets, associated conduit, cabling and sub terminal backboards and related accessories; maintain telephone service and main terminal backboard as is.
- C. Perform demolition work in a neat and workmanlike manner:
  - 1. Remove tools or equipment after completion of work, and leave site clean and ready for subsequent renovation work.
  - 2. Repair and restore damages caused as a result of work of this Section to match existing materials and finishes.
- D. Remove existing conduits, boxes, cabling and wiring associated with removed luminaires, electrical devices and equipment.
- E. Grind off conduits and remove a minimum 1-foot below grade, seal open ends of conduit with silicone sealant and leave in place.

### **3.04 SUPERVISION**

- A. Assign a competent representative to supervise the electrical decommissioning work from beginning to completion.

### **3.05 WORKMANSHIP**

- A. Employ skilled craftsmen experienced in decommissioning of the types of electrical materials and equipment specified. Use specialized installation tools and equipment as applicable. Produce acceptable decommissioning free of defects.

### **3.06 CLOSEOUT ACTIVITIES**

- A. Upon completion of the work, arrange for legal disposal and remove of demolished materials, including but not limited to surplus materials, rubbish and debris.
  - 1. While most of the waste can be disposed of on-site at the designated disposal area, the treated wood power poles must be properly disposed of off-site.
  - 2. Disposal shall be in accordance with Detailed Provision Section 02 4100 – Demolition.

END OF SECTION 26 0505

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**SPECIFICATIONS – DETAILED PROVISIONS**  
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## **SECTION 31 1000 SITE CLEARING**

### **PART 1 GENERAL**

#### **1.01 SUMMARY**

##### **A. Description:**

1. This work consists of site clearing, grubbing, stripping of topsoil, and demolition of structures and obstructions found within the limits of the Project including work for loading, hauling, and disposing of non-salvageable materials obtained as part of the Contractor's site clearing operation.

##### **B. Related Detailed Provisions Sections include, but are not limited to:**

1. Division 01 – General Requirements.
2. Section 02 4100 – Demolition.
3. Section 31 2300 – Site Earthwork.

#### **1.02 QUALITY ASSURANCE**

- ##### **A. Requirements of Regulatory Agencies: Perform Work, including disposal of debris, in accordance with rules and regulations of Federal, State and local agencies having jurisdiction.**

#### **1.03 SUBMITTALS**

##### **A. Project Record Documents**

1. Record actual locations of building, structures, utilities, and infrastructure improvements and elevations. Identify and describe unexpected variations to subsoil conditions or discovery of undocumented utilities.

#### **1.04 SURROUNDING SITE CONDITION SURVEY**

- ##### **A. Prior to commencing the Work, Contractor and County shall tour the jobsite together to examine and record damage to the site. This record shall serve as basis for determination of subsequent damage due to Contractor's operations and shall be signed by all parties making the tour. Any cracks, sags, or damage to adjacent buildings, structures, and infrastructure improvements not noted in the original survey, but subsequently discovered, shall be reported to the County immediately.**

#### **1.05 PROTECTION OF EXISTING STRUCTURES AND UTILITIES**

- ##### **A. Prior to commencing the Work, Contractor shall locate and surface mark (various colors specified by USA) all known existing underground structures and utilities. Stake and flag utility valve boxes and other surface improvements. Prior to commencing the Work call Underground Service Alert of Southern California (USA/SC) at 811, the**

- one-call underground facility locating service two (2) working days prior to start. Contractor shall be responsible for such notification of sub-contractor's work, or shall require sub-contractor to assume this responsibility. Provide USA/SC notification permit number to County prior to starting site work. Existing underground structures and utilities shall be kept in service unless approval to interrupt or shutdown service is obtained from County. If damaged, the utility shall be repaired at no additional cost to the County.
- B. Contractor shall uncover, prior to any earthwork, all existing piping where crossings, interferences, close proximity (5 feet or less) or connections are shown on the Project Drawings, from 1 foot below proposed elevation to the existing ground surface. Any variation in the actual elevations and the indicated elevations shall be brought to the County's attention. If the Contractor does not expose all existing utilities, Contractor shall not be entitled to additional compensation for work necessary to avoid interferences.
  - C. If interferences occur at locations other than the general locations shown on the Drawings, and such utilities are damaged before their locations have been established, or create an interference, the Contractor shall notify the County and a method for repairing the damage or correcting the interference shall be provided by the County. Payment for additional Work due to interferences not shown on the Project Drawings shall be in accordance with the General Provisions.
  - D. Care shall be exercised to prevent damage to adjacent facilities including structures, pavement and drainage facilities from settlement, lateral movement, undermining, and washout and other hazards. Where equipment will pass over obstructions, suitable planking and/or bridging shall be provided by the Contractor. Damaged facilities due to the Contractor's operations shall be removed and replaced at the Contractor's expense.
  - E. If any structure or utility is damaged, take immediate action to ensure the safety of persons and property. Correct damage immediately. Contractor shall bear all costs of correction, replacement, repair, restoration, including related damages additional testing, inspection, and compensation for County's services and expenses. Compensation to the County shall be made by deducting expenses from final contract payment.
  - F. No Work is to be performed on energized electrical equipment unless scheduled with the County.

## **PART 2 PRODUCTS – NOT USED**

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Notify County before starting work and comply with County requirements.
- B. Do not close or obstruct roadways, structures or utilities without County's approval.

### **3.02 SITE CLEARING**

- A. Conduct clearing with minimum interference to public and private access. Maintain egress and access from adjacent areas at all times.
- B. Clear the site within the limits shown and remove all pavement, aggregate base, shrubs, remaining brush, stumps and waste material that would interfere with construction operations, except as specifically indicated otherwise on the Project Drawings or as identified by the County.
- C. Topsoil Removal:
  - 1. Strip topsoil to depths encountered.
    - a. Remove heavy growths of grass before stripping.
    - b. Separate from underlying subsoil or objectionable material.
  - 2. Stockpile topsoil where directed by County.
    - a. Construct storage piles to freely drain surface water.
    - b. Cover storage piles to prevent erosion.
- D. Clearing and Grubbing:
  - 1. Clear from within limits of construction all vegetation not marked to remain.
    - a. Include shrubs, brush, downed timber, rotten wood, heavy growth of grass and weeds, vines, rubbish, pavement, structures and debris.
  - 2. Grub (remove) from within limits of construction all stumps, roots, root mats, logs and debris encountered.
    - a. Totally grub under areas to be paved and where structures will be constructed.
- E. Pollution and Dust:
  - 1. Wet down dirt areas by spraying as required to prevent dust from becoming airborne.
- F. In areas not to be further excavated, fill depressions resulting from site clearing. Place and compact satisfactory soil materials to 90 percent compaction in 6-inch lifts.
- G. Disposal of Waste Materials:
  - 1. Dispose of accepted waste material at the Designated Disposal Area shown on the Project Drawings.
  - 2. Do not burn combustible materials on-site.

### **3.03 ACCEPTANCE**

- A. Upon completion of the site clearing, obtain County's acceptance of the extent of clearing, depth of stripping and rough grade.

END OF SECTION 31 1000



**SPECIFICATIONS – DETAILED PROVISIONS**  
**SECTION 31 2300: EARTHWORK**  
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## **SECTION 31 2300 EARTHWORK**

### **PART 1 GENERAL**

#### **1.01 SUMMARY**

- A. Work covered by this section includes but is not limited to: excavation of earthwork material from the on-site borrow area suitable for use as Final Cover Layer; mixing, blending and processing (including crushing and screening, as needed) the material in accordance with the Contract Documents; placing and compacting fill material for construction of the final cover system; general site engineered fill, and construction of drainage diversion berms. The final cover system shall consist of a three (3) foot thick monolithic section of earth material which includes from bottom to top: a lower layer (aka foundation layer), directly adjacent to refuse materials, that is no less than one (1) foot thick of existing intermediate cover soil (aka foundation layer) and an upper layer (aka final cover layer) that is no less than two (2) feet thick of native soil. Regardless of the nature or type of material encountered, Work includes but is not limited to:
1. Excavation and processing (including crushing and screening, as needed) of on-site borrow area material.
  2. Existing landfill surface preparation, scarification and recompaction.
  3. Subgrade preparation, engineered fill placement and final cover placement.
  4. Over-excavation and recompaction of suitable materials.
  5. Establish finish grades that conform to the Project Drawings.
  6. Dust alleviation and control.
  7. Removal of unsuitable materials.
- B. Related Detailed Provisions Sections include, but are not limited to:
1. Section 31 1000 – Site Clearing.
  2. Section 31 2500 – Erosion and Sedimentation Controls.
  3. Section 33 1153 – Groundwater Monitoring Well Elevation Adjustment
  4. Section 33 5139 – Gas Probe Elevation Adjustment
- C. Related Available Information:
1. Geotechnical Reports:
    - a. Alternative Final Cover Design Report, Mecca II Sanitary Landfill, Prepared by Geo-Logic Associates for Riverside County Department of Waste Resources, May 2017.
      - 1) The geotechnical reports are not intended as the County’s representation of geotechnical conditions, except for those conditions at the specific times and locations of the investigations.

- 2) County does not warrant and specifically disclaims responsibility for the interpretation by Contractor of such geotechnical information.
2. Appendix E – Project Construction Quality Assurance/Quality Control (QA/QC) Plan.

## 1.02 QUALITY ASSURANCE

### A. Referenced Standards:

1. American Association of State Highway and Transportation Officials (AASHTO):
  - a. AASHTO T90 – Determining the Plastic Limit and Plasticity of Index Soils.
  - b. AASHTO T180 – Standard Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop.
2. American Society for Testing and Materials (ASTM):
  - a. ASTM D698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
  - b. ASTM D1556 – Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
  - c. ASTM D2167 – Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
  - d. ASTM D2216 – Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
  - e. ASTM D2419 – Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregates.
  - f. ASTM D2487 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
  - g. ASTM D2488 – Standard Practice for Description and Identification of Soils (Visual-Manual Procedures)
  - h. ASTM D2937 – Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method.
  - i. ASTM D3786 – Standard Test Method for Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method.
  - j. ASTM D4318 – Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
  - k. ASTM D4632 – Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
  - l. ASTM D4643 – Standard Test Method for Determination of Water Content of Soil and Rock by Microwave Oven Heating.
  - m. ASTM D4959 – Standard Test Method for Determination of Water Content of Soil by Direct Heating.



- n. ASTM D6913 – Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis.
  - o. ASTM D6938 – Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
3. California Code of Regulations (CCR): Title 8 – Construction Safety Orders.
  4. California Department of Industrial Relations – Division of Occupational Safety and Health (Cal-OSHA).
  5. South Coast Air Quality Management District (SCAQMD): Rule 403 Fugitive Dust Regulations and Rule 403.1 Supplemental Fugitive Dust Control Requirements for Coachella Valley.
  6. State of California; Business, Transportation and Housing Agency; Department of Transportation (Caltrans):
    - a. Cal Trans Standard Specifications – Division III: Earthwork and Landscape
- B. Testing and Inspection Service:
1. County will procure Testing/Inspection Provider and/or QA/QC Consultant services, for quality assurance testing during earthwork operations.

### **1.03 DEFINITIONS**

- A. Backfill: refill of an excavation, previously removed.
- B. Earth Excavation: Earth excavation includes excavation of pavement and other obstructions visible on the ground surface, underground structures, utilities and other items to be demolished and removed; together with earth and other materials encountered that are not classified as rock or unauthorized excavation.
- C. Fill: placement of material in an excavation or on prepared subgrade to final grade.
- D. Final Cover Layer: Engineered fill material placed as part of upper two (2) feet of final cover system.
- E. Finish Grade: The establishment of grades to a plus or minus 0.05' of final grades as indicated on Project Drawings or applicable Detailed Provisions Sections.
- F. Grading Intent: Spot elevations (grades) and contours are indicated based on the best available data. Drawings are referenced to provide additional site grading data. The intent is to maintain constant slopes between spot elevations. If a spot elevation is determined to be in error, or the difference in elevation between points change, contact the County immediately for field adjustments of spot elevations.
- G. Relative Compaction: Ratio, expressed as a percentage of the in-place dry-density as compacted to a laboratory maximum dry-density of representative sample of the same material determined by ASTM D698 for all Engineered Fill.
- H. Rough Grade: The establishment of grades to one-tenth (1/10) of a foot plus or minus tolerance of grades required to accomplish the Work described on Project Drawings or applicable Detailed Provisions Sections.

- I. Standard Specifications: Refers to the publication “Standard Specifications for Public Works Construction”, latest edition, written and promulgated by the Joint Cooperative Committee of the Southern California Chapter American Public Works Association and Southern California Departments Associated General Contractors of California. This publication is also known as the “Green Book”.
- J. State Standard Specifications: Refer to the Standard Specifications of the State of California, Department of Transportation, latest edition.
- K. Structural Fill: Any fill placed under structures and any backfill placed adjacent to buried walls.
- L. Sub-base: Compacted layer of approved material used between the subgrade and the pavement.
- M. Subgrade: Previously undisturbed material prepared, and compacted to required density and elevation to support a structure, pavement system, or to receive additional specified materials.
- N. Unauthorized Excavation: Includes removal and disposal of material beyond subgrade elevations, and dimensions indicated without prior approval of the County.
- O. Unsuitable Material: Shall consist of materials determined by the County and/or Testing/Inspection Provider to be:
  - 1. Soft, loose, unstable or yielding, or
  - 2. Previously placed uncontrolled fill, or
  - 3. Designated material to be overexcavated per geotechnical report requirements, or
  - 4. Unable to be compacted to specified density using ordinary methods at optimum moisture content, or
  - 5. Contains visible or excessive deleterious material as determined by the County or Testing/Inspection Provider, or
  - 6. Too wet to be properly compacted and circumstances prevent processing suitable in-place drying prior to being used as backfill, or
  - 7. Otherwise unsuitable for planned use. Such material shall be removed to the limits directed by the County and the resulting excavation backfilled with engineered fill material.

#### **1.04 SUBMITTALS**

- A. Submittal Procedures: See Detailed Provisions Section 01 3300 – Submittal Procedures for requirements for the mechanics and administration of the submittal process.
- B. Approval Submittals:
  - 1. Deliver bulk samples of import materials to County in quantities sufficient for testing. Deliver at least 15 days prior to use.

2. Trench shoring or shield (trench box) certification if employed:
    - a. Specific to Project Conditions.
    - b. Certified by Professional Structural Engineer, registered in California.
    - c. County is not responsible to, and will not, review and approve.
    - d. Cal-OSHA Contractor compliance information for trench safety. Submit an exemption letter or trenching permit from Cal OSHA and comply with Labor Code Section 6705, Excavation Plans for Worker Protection.
    - e. Submit a Confined Space Emergency Plan prior to any personnel entering trenches or excavations greater than four (4) feet in depth.
  3. Excavation Plan:
    - a. In accordance with Section 5.1.5 – Accident Prevention of the General Provisions, Contractor shall submit to the County a detailed plan showing the design of shoring, bracing, sloping of the sides of trenches, or other provisions to be made for the protection of personnel during earthwork operations.
    - b. County acceptance of the Excavation Plan does not release the Contractor of liability in the event of an accident or injury, nor does it place any liability on the County or any County employees.
  4. Testing laboratory reports verifying that imported material conforms to the specified gradations or characteristics.
- C. Certifications:
1. SCAQMD Certification for Rule 403 and Rule 403.1 Supplemental Fugitive Dust Control Requirements for Coachella Valley for Large Operation.
- D. Qualifications:
1. Contractor staff trained and certified for SCAQMD Rule 403 and Rule 403.1 Supplemental Fugitive Dust Control Requirements for Coachella Valley for Large Operation.
- E. Quality Assurance Submittals:
1. Submit sieve analysis reports on all imported granular materials.
  2. Submit field quality control test results.

## **1.05 SAFETY PRECAUTIONS**

- A. Observe safety precautions in all phases of the work. Included shall be trench shoring, bracing, lighting, and barricades as dictated by reason and by Safety Orders of the Division of Industrial Safety, State of California (Cal-OSHA).
- B. Acquire an exemption letter or trenching permit from Cal-OSHA and comply with Labor Code Section 6705, Excavation Plans for Worker Protection. Submit a copy of the exemption letter or trenching permit with excavation drawings to the County prior to excavation work.

## **1.06 DELIVERY, STORAGE AND HANDLING**

- A. Stockpile satisfactory excavated materials in a location approved by the County, until required for backfill or fill. Place, grade, shape, and stabilize stockpiles for proper drainage and erosion control.
1. Separate differing materials with dividers or stockpile separately to prevent intermixing. Segregate stockpiles for asphalt, concrete, rock and soil generated during construction. To the extent possible, separate saturated soil from unsaturated soil.
  2. Each stockpile will be placed on, at minimum, 6-mil plastic sheeting and, at a minimum, the sides and top will be covered by one layer of 6-mil plastic sheeting at all times except when the material is being handled. Contractor will cover each stockpile segment at the end of the workday.
  3. Provide berms around the stockpile area to contain precipitation runoff and to prevent run-on.

## **1.07 GEOTECHNICAL REPORT**

1. County has referred to reports prepared by Geo-Logic Associates which are designated in Paragraph 1.01 as Related Available Information documents.
2. The geotechnical reports are not intended as the County's representation of geotechnical conditions, except for those conditions at the specific times and locations of the investigations.
3. County does not warrant and specifically disclaims responsibility for the interpretation by Contractor of such geotechnical information.

## **1.08 SOILS INVESTIGATIONS**

- A. Soils investigations have been made for the Project, with results available in the Geotechnical Reports. Such investigations have been made for the purposes of design only and neither the County nor the geotechnical engineer guarantee adequacy 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 their own investigations.

## **1.09 PROJECT CONDITIONS**

- A. Avoid overloading or surcharge a sufficient distance back from edge of excavation to prevent slides or caving.
1. Maintain and trim excavated materials in such manner to be as little inconvenience as possible to public and adjoining property owners.
- B. Protect and maintain bench marks, monuments or other established points and reference points and if disturbed or destroyed, replace items to full satisfaction of the County and no additional cost to the County.

- C. Verify location of existing underground utilities.
- D. When performing underground work, the Contractor shall call Underground Service Alert of Southern California (USA/SC) at 811, the one-call underground facility locating service two (2) working days prior to making an excavation. Contractor shall be responsible for such notification of sub-contractor's work, or shall require sub-contractor to assume this responsibility.
- E. The Contractor's attention is directed to the possible existence of pipe, conduit and other underground improvements which may or may not be shown on the Project Drawings. Preserve and protect any such improvements whether shown on the Project Drawings or not. Expose such improvements in advance of the underground construction to allow for changes in alignment as necessary. Where it is necessary to remove and replace or to relocate such improvements in order to prosecute work, they shall be removed, maintained, and permanently replaced by the Contractor at their expense. Relocation of said improvements shall not be performed without written permission of the County or the owner of the utility. Unless otherwise noted, existing underground utilities shall be protected in place.
- F. Excavation made with power driven equipment is not permitted within five (5) feet of any know utility or subsurface construction. For work immediately adjacent to or for excavation exposing a utility or other buried obstruction, use hand or light equipment excavation. Start excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured. Support uncovered lines or other existing work as affected by the contract excavation until approval for backfill is granted by the County. The Contractor shall report damage of utility lines or subsurface construction immediately to the County and make repairs at no additional cost to the County.
- G. 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.
- H. Protect existing streams, ditches and storm drain inlets using proper erosion control methodology.
- I. Do not use explosives unless approved otherwise in writing by the County.
- J. Provide dust alleviation and control measures continuously during the course of the work to the satisfaction of the County.

## **1.10 EXISTING CONDITIONS**

- A. A topographic survey of the property has been included in the Project Drawings, it is for reference only. Upon beginning the earthwork, the Contractor represents that they have inspected the project areas and are satisfied as to actual grades and levels and the true conditions under which the work is to be performed.

## **1.11 SOILS TESTING**

- A. A QA/QC Consultant will be procured by the County for testing and inspection as required by the Contract Documents. All work performed as part of this Section shall be in accordance with Appendix E – Project Construction Quality Assurance/Quality Control (QA/QC) Plan.
- B. All materials, work, methods and equipment shall be subject to inspection at the Project Location and import sources. Material or workmanship not complying with the Contract Documents will not be accepted. The Contractor shall give the QA/QC Consultant reasonable notice when ready for inspection and shall supply samples for inspection without extra charge.
- C. Cost of Testing:
  - 1. With the exceptions of retest due to material or Contractor workmanship, the County will assume the cost for all tests and inspections specified to be performed by the QA/QC Consultant. Additional costs of retesting incurred by the County shall be deducted from the Contract Final Payment.
- D. Tests performed by the QA/QC Consultant shall be in accordance with Appendix E – Project Construction Quality Assurance/Quality Control (QA/QC) Plan.
- E. Make excavation for compaction tests at the locations and to the depths designated by the QA/QC Consultant. Backfill and re-compact the excavation at completion of testing. When test indicate that the compaction is less than the specified relative compaction, rework and retest those areas until the specified relative compaction has been obtained.

## **1.12 MAINTENANCE**

- A. Protect newly graded areas from traffic, erosion, and settlement. Repair and reestablish damaged or eroded slopes, elevations, or grades and restore surface construction prior to acceptance.

## **PART 2 PRODUCTS**

### **2.01 FILL MATERIAL**

- A. This section applies to all engineered and final cover system fill material.
  - 1. All fill material shall be approved by the County and conform to requirements of the Caltrans Standard Specifications Section 19 – “Earthwork and Landscape” and Appendix E – Project Construction Quality Assurance/Quality Control (QA/QC) Plan.
  - 2. Fill required shall consist of suitable on-site excavated material as may be required for the work to conform to the requirements of this Section and Appendix E – Project Construction Quality Assurance/Quality Control (QA/QC) Plan. In either case, fill material shall be provided at the Contractor’s expense, and shall be included in the Contractor’s proposed costs. Excavated material may need to be

processed (crushing and screening as needed), moisture conditioned and mixed to meet specification requirements and shall be provided at the Contractor's expense.

3. The Contractor shall selectively excavate soils from pre-approved on-site borrow sources as identified by the County and QA/QC Consultant (or their representative) during the grading operations. Contractor shall notify the County and QA/QC Consultant in writing two (2) working days prior to commencement of any work in new areas. This will allow the County and QA/QC Consultant time to inspect cleared or grubbed areas to determine suitability of proposed material.
4. Representative samples of materials to be used for engineered fill shall be tested by the QA/QC Consultant to determine soil classification, potential contaminants (for imported soil materials), maximum dry density, optimum moisture content and particle size.
5. All fill material placed on the landfill surface shall consist only of selectively graded, screened (as needed), transported and processed on-site soils. The final cover layer shall contain sufficient fine-grained constituents such that gravel (material retained on a No. 4 sieve) size and larger fragments do not cluster during construction. Irreducible rock or rock fragments in excess of three (3) inches in maximum dimension shall not be utilized in the final cover system.
6. Materials shall be free of trash, lumber, debris, leaves, grass, roots, stumps, and other vegetable matter. Materials shall not be contaminated with hydrocarbons or other chemical contaminants.
7. Cover soils shall contain sufficient fine-grained constituents such that gravel size and larger fragments do not cluster during construction.
8. All soils shall be free of potential hazardous environmental pollutants.

## **2.02 EROSION MONUMENTS**

- A. Erosion monuments shall be constructed by welding a 2-inch dia. x 6-foot steel pipe (1/4"-inch thick) to a 1/4-inch thick, 2-foot by 2-foot minimum steel plate.
- B. The bottom 3-feet of the steel pipe, which will be buried, shall have slotted markings at 3-inch intervals.
- C. The upper 3-feet, which shall be above ground, shall be painted high visibility yellow with reflective tape.
- D. Settlement monuments shall be survey control points established and installed by Others.

## **2.03 WATER**

- A. Water used in compaction shall have a maximum chloride concentration of 500 mg/l, a maximum sulfate concentration of 500 mg/l, and shall have a pH of 7.0 to 9.0. Water shall be free of acid, alkali, or organic materials.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing grades and conditions are as indicated on the Project Drawings. Designate and identify datum elevation and project engineering reference points. Set required lines, levels, and elevations.
- B. Notify County if indicated conditions on Project Drawings conflict with actual conditions. Non-notification of discrepancies between actual field conditions and the conditions shown on the Project Drawings, in writing, shall indicate Contractor's acceptance of such field conditions. Adjustments/modifications to the construction to accommodate the inconsistencies (without notification) shall be at no additional cost to the County.

### **3.02 PROTECTION**

- A. Protection of the jobsite during the performance of earthwork shall be the responsibility of the Contractor.
- B. Protect the jobsite from flooding, ponding, or inundation during site clearing, excavation, placement of fill and grading. Make temporary provisions during the rainy season to adequately direct surface drainage away from and off the jobsite. Dispose of water in a manner to prevent damage to adjacent property and in accordance with regulatory agency requirements.
- C. Use plastic sheeting to prevent unprotected slopes from becoming saturated. Install checkdams, desilting basins, riprap, sand bags, or other devices or methods necessary to control erosion.
- D. Following periods of rainfall, the County and QA/QC Consultant will visually assess rain related damage. At the request of the County and QA/QC Consultant, the Contractor shall make excavations in order to evaluate the extent of rain related damage. Rain related damage will be considered to include, but may not be limited to, erosion, silting, saturation, swelling, structural distress and other adverse conditions identified by the County. Where soil has been adversely affected by rain related damage, it shall be overexcavated and replaced with compacted fill or other remedial grading as directed by the County and QA/QC Consultant. Repairs shall be performed at Contractor's expense.
- E. Call Underground Service Alert of Southern California (USA/SC) at 811, the one-call underground facility locating service two (2) working days prior to making an excavation. Contractor shall be responsible for such notification of sub-contractor's work, or shall require sub-contractor to assume this responsibility.
- F. Protect existing surface and subsurface features on-site and adjacent to jobsite as follows:
  - 1. Provide barricades, coverings, or other type of protection necessary to prevent damage to existing items indicated to remain in place.



2. Protect and maintain benchmarks, monuments or other established reference points and property corners.
  - a. If disturbed or destroyed, Contractor shall replace at their own expense to full satisfaction of the County and controlling agency.
3. Verify location of utilities:
  - a. Omissions or inclusion of utility items does not constitute nonexistence of definite location.
  - b. Secure and examine local utility records.
  - c. Take necessary precautions to protect existing utilities from damage due to any construction activity.
  - d. Remove abandoned utility service lines from areas of excavation. Cap, plug, or seal abandoned lines and identify termination points at grade level with markers.
  - e. Perform excavation work near utilities by hand and provide necessary shoring, sheeting, and supports as the work progresses.
  - f. Repair damages to utility items at Contractor's expense.
  - g. In case of damage, notify County at once so required protective measures may be taken.
4. Maintain free of damage, utilities, existing concrete, structures, and pavement to the greatest extent possible.
  - a. Any item known or unknown or not properly located that is damaged shall be repaired to original condition.
  - b. All repairs to be made at Contractor's expense.
5. Four (4) groundwater monitoring wells exist on-site and shall be protected-in-place unless noted otherwise. The Contractor shall not commence work within a ten (10) foot radius of any existing groundwater monitoring well without submitting a written notice to the County five (5) working days in advance. Three (3) groundwater monitoring wells (MII-1, MII-2, and MII-3) are located adjacent to the landfill disposal area and shall be extended by the Contractor in accordance with Detailed Provision Section 33 1153: Groundwater Monitoring Well Elevation Adjustment and details provided in the Project Drawings.
6. Five (5) active perimeter landfill gas monitoring probes exist on-site and shall be protected-in-place unless noted otherwise. The Contractor shall not commence work within a ten (10) foot radius of any existing gas probe without submitting a written notice to the County five (5) working days in advance. One gas probe (P-7) is located adjacent to the landfill disposal area and shall be extended by the Contractor in accordance with Detailed Provision Section 33 5139: Gas Probe Elevation Adjustment and details provided in the Project Drawings.

7. Protect in place and provide full access to areas required for landfill operations and other points as designated by the County such as the Radio Tower Facility, to prevent serious interruption of travel.
8. Maintain stockpiles and excavations in such a manner to prevent inconvenience or damage to structures on-site.
9. Avoid surcharge or excavation procedures which can result in heaving, caving, or slides.
10. Contractor shall observe temporary and permanent excavations on a regular basis for signs of instability. Should signs of instability be noted, the Contractor shall notify the County and the QA/QC Consultant immediately, and the Contractor shall undertake remedial measures as soon as possible subject to the approval of the County and QA/QC Consultant.

### **3.03 PREPARATION**

- A. The Contractor shall provide all construction staking and layout of all work to be performed under the direction of a Professional Land Surveyor registered in the State of California.
  1. Stake all units, structures, piping, roads, and utilities and establish their elevations.
  2. Perform other layout work required.
  3. Replace benchmarks, monuments, and/or property corner markers to original location if disturbed or destroyed.
  4. See Detailed Provisions Section 01 4320 – Surveying for more information.
  5. Unlike typical earthwork projects, landfill cover systems are not filled to precise grades. Instead, the existing surface is smoothed, re-compacted, and additional soil is placed to create a minimum required thickness. Due to the potential for settlement occurring during the placement of the final cover cap, the Contractor is advised to use physical means of thickness measurement, such as ledger boards, during construction and not to rely solely on surveys to measure thickness during the final cover layer placement.
- B. Unless otherwise stated, equipment used in the excavation, transport, screening, crushing, processing, stockpiling, installation and compaction of all materials used in construction of the final cover system shall be standard practice grading machinery of known specifications suitable for performing this type of landfill closure work in a timely, proper, and efficient manner.
- C. Develop off-site water source for soil moisture conditioning and application for dust control in accordance with Detailed Provision Section 01 5000: Temporary Facilities and Controls. The Contractor shall be responsible for and shall provide dust abatement and control measures in accordance with SCAQMD Rule 403 and Supplemental Coachella Valley requirements continuously during the course of the work.
- D. Site clearing, grubbing, and stripping shall be performed in accordance with Detailed Provisions Section 31 1000 – Site Clearing.

### 3.04 EXCAVATION

- A. Earth excavation shall include the satisfactory removal and disposal of all materials encountered, regardless of the nature of the materials, the condition of the materials at the time they are excavated, or the manner in which they were excavated.
- B. This work may include ripping, breaking, and dozing of materials using standard practice earthmoving equipment of known specifications suitable for performing this type of work. Based on a previous subsurface soil investigation, the material within limits of excavation has been determined to be rippable. In the event non-rippable material is encountered, the Contractor shall immediately notify the County. Prior to the removal of non-rippable material, Contractor and the County shall mutually decide upon the most acceptable method of removal for this material. This work shall be considered as extra work and therefore will be paid for in accordance with Section 2.7 of the General Provisions entitled "Extra Work." This item shall also include keeping excavation areas neat and orderly and completing the excavation to the satisfaction of the County.
- C. All excavated materials incorporated as part of compacted engineered fill must be inspected and approved to be suitable by the County and/or QA/QC Consultant.
- D. Excavation shall be performed to the lines and grades indicated. During excavation, material suitable for fill materials shall be stockpiled in an orderly manner within the designated processing area at a minimum distance from the banks of excavation area equal to one-half the depth of the excavation, but in no instance closer than five (5) feet. At Contractor's expense, excavated material not required or not suitable for fill materials shall be disposed of in a lawful manner. If excess material contains no contaminants, material may be placed within the borrow area or at a location as approved and directed by the County. If approved, not suitable material with contaminants will be accepted for no-charge, but Contractor shall be responsible for hauling and stockpiling material within the landfill disposal area.
- E. Permanent cut slopes shall be finish graded by vertically track-walking and left in a clean, safe, and stable conditions upon completion of excavation activities.
- F. Do not operate excavation equipment within five (5) feet of structures or utilities. Excavate with hand tools in these areas or light equipment as approved by the County or QA/QC Consultant.
- G. Excavate Unsuitable Materials extending below required elevations to depth as directed by the County and/or QA/QC Consultant.
- H. Take every precaution to prevent water from entering, softening, and undercutting excavated areas, including but not limited to: pits, footings, and trenches.
- I. Borrow area shall be built towards achieving the ultimate grades as shown on the Project Drawings. Limits of the excavation are subject to change based upon material quality changes and field conditions encountered during excavation as determined by the QA/QC Consultant of the County
- J. All borrow area elevations shown may be achieved within +/- 1 foot provided that all areas within the borrow area grading limit are graded to drain while maintain the

drainage pattern and flow direction shown on the Project Drawings at all times. Unless directed by the OA/QC Consultant or the County, the Contractor shall never cause or allow the elevations of the excavation areas to be lower than the elevations shown on the excavation plans provided in the Project Drawings.

- K. All excavations shall be barricaded in conformance with Cal-OSHA standards.
- L. Sheeting and shoring for the work and for the safety of personnel shall be in compliance with Cal-OSHA regulations. Shoring is required for all trench portions greater than 4-feet in depth. Trenches greater than 20-feet in depth require protection systems designed by Professional Structural Engineer licensed in California.
- M. Contractor at all times shall maintain access through the borrow area to the on-site Radio Tower Facility.
- N. Notify the County immediately upon discovery of Unsuitable Materials or unforeseen site conditions. Excavation shall include the complete removal of the Unsuitable Materials and its legal disposal thereof.

### **3.05 FILL MATERIAL PROCESSING**

- A. The Contractor shall develop a plan to be approved by the County and the QA/QC Consultant, to assure that the excavated on-site material designated for use as engineered fill is thoroughly processed (crushing and screening, if needed), moisture conditioned, and mixed for suitable use. The plan shall designate a processing area and describe laydown methods, mixing methods (rotomixer, discing, etc.), screening and moisture conditioning.
- B. All fill material shall consist only of selectively graded, screened (as needed), transported and processed on-site soils. Processed fill material shall contain sufficient fine-grained constituents such that gravel (material retained on a No. 4 sieve) size and larger fragments do not cluster during construction. Processed fill material shall not contain irreducible rock or rock fragments in excess of three (3) inches in maximum dimension.
- C. On-site borrow material shall be thoroughly processed to generate a single uniform material and moisture conditioned (or dried) to  $\pm 2$  percent optimum moisture content as determined by ASTM D698.
- D. The Contractor shall place processed final cover layer material on the landfill surface within one (1) working day of generation. Neither material excavation or final cover material placement shall exceed the capability of processing material to meet specification requirements. If inadequate processed materials are placed, the Contractor shall immediately reprocess these materials or return them to the material processing area where they will be reprocessed.
- E. All material considered by the QA/QC Consultant, or the County, to be unsuitable for use in the construction of the cover system shall be removed, placed and graded within the on-site borrow area as directed.

### **3.06 PLACING AND COMPACTING FILL MATERIAL**

#### **A. Existing Landfill Surface Preparation:**

1. To provide uniform compaction, the existing landfill surface shall be scarified, disced or bladed until it is uniform and free from uneven features and meets the following requirements:
  - a. Contains no irreducible rock in excess of three (3) inches in maximum dimension,
  - b. Be brought to within two (2) percent below or above optimum moisture content, mixed as required and;
  - c. Compacted to a minimum of 87 percent of the maximum dry density as determined by ASTM D698.
2. If the scarified depth is greater than 12 inches, the excess shall be removed and place in lifts of six to eight inches in thickness.

#### **B. Placement of Fill Material and Final Cover Layer:**

1. Any fill where site preparation, type of material, or compaction is not approved or observed by the County and/or the QA/QC Consultant shall be removed and/or re-compacted until the requirements are satisfied.
2. Suitable and sufficient hauling, processing, grading and compaction equipment shall be continuously utilized to handle the amount of fill material being generated and placed. Excavation or hauling equipment shall be shut down temporarily in order to allow time for proper preparation, placement, and/or compaction of fill material. Sufficient moisture conditioning equipment shall be provided by the Contractor with consideration to the type of fill material, rate of placement, and weather conditions.
3. Prior to placing Final Cover Layer material, the Contractor shall construct a Final Cover Layer test pad at least 100 feet long by 20 feet wide by 2 feet high on a side slope portion of the landfill surface to demonstrate to the County and the QA/QC Consultant that the Contractor's procedures and equipment are adequate to meet specified requirements. If the test pad is approved by the County and the QA/QC Consultant, the Contractor shall use the same procedures and equipment for the remainder of the Final Cover Layer. Under no circumstances is the Contractor to commence any construction activities using procedures and equipment
4. Fill materials shall be placed in uniform layers which, when loose, shall not exceed 6-inches for hand operated mechanical compactors and not to exceed 8-inches per layer for heavy equipment compactors. Each layer shall be spread evenly and shall be thoroughly mixed during the spreading to insure uniformity of material and moisture.
5. The top of each previously compacted layer shall be scarified to provide a good bond between lift layers and minimize separation between lift layers.
6. All fill materials shall be moisture conditioned (or dried) to within two (2) percent below or above optimum moisture content (OMC) and compacted to a minimum of

87 percent of the maximum dry density as determined by ASTM D698. If any material is placed that does not have correct moisture content, it shall be aerated if too wet or wetted if too dry. Fill materials shall be aerated by plowing, discing, blading, or other satisfactory methods until moisture content is acceptable. Aerating of material is considered incidental to the work and no additional compensation will be allowed. "Puddling" or "soaking" is not permitted. Soft, spongy or springy material causing areas that "pump" when heavy loads pass over them shall be removed and replaced with suitable material. This condition shall be considered as sufficient evidence without further testing that the moisture content is not correct and the material shall be removed and no additional compensation will be allowed.

7. In areas of excess lift thickness, re-grading and compacting of the surface to the maximum lift thickness must be completed by the Contractor prior to construction of additional lifts.
  8. Backfilling against concrete will not be permitted until the concrete has reached the specified strength as verified via the compressive strength testing or as approved by the County.
  9. As determined by the QA/QC Consultant, portions of fill material placed over cut slopes shall be properly keyed through top soils, colluvium or creep material into rock or firm material. All transitions shall be stripped of all loose spoils prior to placing engineered fill.
  10. Existing sloped surfaces to receive fill material shall be keyed and benched. Excavate horizontal keys and vertical benches into the slope area to receive the fill material. Keying and benching shall provide at least 15-foot wide benches and a minimum of 4 feet of vertical bench height within the firm subgrade. Fill material shall be keyed into the subgrade a minimum of 5 feet deep at the toe of all fill slopes.
  11. Where work is interrupted by heavy rains, fill placement shall not resume until observations and field test by the QA/QC Consultant or County indicate in-place fills and/or materials intended for placement are firm, stable and within the limits specified in the Contract Documents. Erosion damage shall be evaluated by the QA/QC Consultant or County and reworked by Contractor, as necessary and at the Contractor's expense, to meet the project requirements.
  12. Do not operate earthmoving equipment within 5-feet of concrete structures. Place and compact backfill adjacent to concrete walls with hand-operated tampers or other equipment that will not damage the structure.
- C. The Contractor shall not fill the Designated Disposal Area, as shown on the Project Drawings until all other areas have received final cover layer material. This will provide a designated disposal area for any project related materials generated during demolition, clearing, grubbing, stripping or removal of unsuitable material.
1. In the unlikely event that refuse is encountered during excavation, it shall be disposed of in the Designated Disposal Area as shown on the Project Drawings. All refuse excavation, handling and disposal shall be done in accordance with Detailed Provision 02 6113 – Refuse Excavation, Handling and Disposal.

### **3.07 EROSION MONUMENTS**

- A. Erosion Monuments shall be placed at the approximate locations shown on the Project Drawings before the final 3 feet of final cover is placed at that location.
  - 1. If a location requires less than 3 feet of final cover, the Contractor shall remove soil until 3 feet of final cover material is required to make the finished grade and then the Contractor shall place the Erosion Monument to be buried 3-feet.
- B. Once placed, the Erosion Monuments shall be buried 3 feet, leaving the final slotted marking flushed with the finished final cover surface and the remaining 3 feet above ground.

### **3.08 FINISH GRADING**

- A. Grade surfaces to assure areas drain away from structures and to prevent ponding and pockets of surface drainage.
- B. Finish Grade:
  - 1. Remove exposed roots and rocks exceeding 3-inches in greatest dimension. Round tops of banks to circular curves to not less than a 6-foot radius. Neatly and smoothly trim rounded surfaces.
  - 2. Finish grade tolerance plus or minus 0.05 feet to finished grades shown on the Project Drawings.
  - 3. Existing grades which are to remain but are disturbed by the Contractor's operations shall be restored. Any disturbed slopes shall be track-walked and flatter grounds shall be finish graded with a blade-grader or approved equal, and graded to drain by the Contractor as directed by the County.
  - 4. Surface of all slopes shall be finished by track walking with Dozer-type equipment or approved equal by the County and QA/QC Consultant in the field and left in a uniformly graded condition.
    - a. Operate tracked machinery up and down the slope to leave horizontal depressions in the soil. Do not back-blade during the final grading operation.
  - 5. Surface of flat areas shall be finished graded with a motor grader or approved equal by the County and QA/QC Consultant in the field and left in a uniformly graded condition.

### **3.09 SETTLEMENT MONUMENTS**

- 1. When the Contractor has finished placing the Final Cover Layer to the satisfaction of the QA/QC Consultant, the Contractor shall notify the County to perform an aerial survey of the Site. Prior to the aerial survey, Riverside County Flood Control staff will come on-site to establish survey control points including the four (4) Settlement Monuments as shown on the Project Drawing.

### **3.10 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)**

- A. All earthwork shall be performed and completed in conformance with this Section and Appendix E – Project Construction Quality Assurance/Quality Control (QA/QC) Plan.
- B. The County shall procure the services of a QA/QC Consultant to oversee excavation, processing, placement of earthwork materials and conduct soils testing to assure that all work complies with the Contract Documents.
- C. Construction shall be continuously observed routinely sampled and tested by the QA/QC Consultant to confirm compliance with all applicable requirements.
- D. Contractor shall provide a minimum 48 hour advance notice to County when ready for compaction or subgrade testing and inspection.
- E. Should any test or inspection fail to meet specification requirements, the Contractor shall perform corrective work as necessary at no additional cost to the County. Contractor shall be responsible for all costs associated with corrective work and retesting resulting from failing any testing requirements.
- F. The soils testing frequencies stated in Appendix E – Project Construction Quality Assurance/Quality Control (QA/QC) Plan are considered a minimum. Additional tests will be conducted by the QA/QC Consultant to retest previously failed areas and at any time that, in the opinion of the QA/QC Consultant, additional testing is required and/or a deficiency is suspected. At the discretion of the QA/QC Consultant retest of previously failed areas will be performed after sufficient reworking of such areas to warrant a retest has been performed by the Contractor. Following re-working of a previously failed area, the QA/QC Consultant will perform retests to verify that the specification requirements are satisfied.
- G. If placed fill fails to meet compaction requirements, the Contractor shall remove and replace fill material at proper density or shall bring the density up to specified level by other means acceptable to the County. Subsequent testing required to confirm that the reconstructed material has been brought up to specified density shall be paid for by the Contractor.
- H. Contractor shall assure County and QA/QC Consultant staff have immediate access for testing of all soils related work. Ensure excavations are safe for testing personnel.
- I. All earthwork shall be consistent with the findings and recommendations of geotechnical reports prepared for the Project and are subject to inspection and verification by the QA/QC Consultant.
- J. The Contractor shall demonstrate and the QA/QC Consultant shall confirm that the minimum compacted three (3) foot total final cover system thickness requirement has been met. The thickness of the existing intermediate cover one (1) foot minimum layer and the minimum two (2) foot final cover layer shall be verified using the following methods:
  - 1. Existing Intermediate Cover/Foundation Layer
    - a. Prior to placement of final cover material, the Contractor shall auger vertically, in the presence of the County and the QA/QC Consultant, a maximum of fifteen



(15) test holes (no larger than twelve (12) inches and no smaller than six (6) inches in diameter) into the prepared existing intermediate cover surface in locations determined by the County or QA/QC Consultant.

- b. The County and the QA/QC Consultant will verify that the existing intermediate cover layer is equal to or greater than one (1) foot thick vertically.
- c. The auger holes shall be backfilled with final cover system material in accordance with the Contract Documents or hydrated bentonite chips, immediately upon verbal authorization from the County.

## 2. Final Cover Layer

- a. The Contractor shall conduct auger tests to demonstrate that the full three (3) foot final cover system thickness has been met.
- b. Auger testing shall be conducted by auguring holes (no larger than twelve (12) inches and no smaller than eight (8) inches in diameter) vertically into the completed cover system in the presence of the County and the QA/QC representative.
- c. The County and the QA/QC Consultant will verify the minimal vertical thickness of the final cover system has been met.
- d. The auger holes shall be backfilled with hydrated bentonite chips, immediately upon verbal authorization from the County.
- e. The County or QA/QC Consultant shall at their discretion, designate the locations for auger tests.
- f. The location of the auger tests shall be as stated in the Contract Documents. In addition, the example layout for auger hole locations is provided in the Project Drawings. Although this map is provided as an example only, the County may direct the Contractor to conduct additional auger verification thickness tests at any location.

## 3. Release Form

- a. Release forms shall be completed for both the completion of the preparing the existing intermediate layer and the placement of the final cover layer.
- b. Prior to release and approval by the County of the existing intermediate layer preparation work, the work will have been completed in accordance with the Contract Documents (as determined by the County and the QA/QC Consultant) and the County shall have performed an as-built topographic survey of the specific area.
- c. The minimum area the County will consider for release is one acre.
- d. Final Cover Layer work shall not commence until an Existing Intermediate Layer Preparation release form is issued by the County for the area in which the Contractor wishes to place Engineered Fill for the Final Cover Layer.

- e. Prior to release and approval by the County of the Final Cover Layer work, the County and/or QA/QC Consultant shall verify that the work has been completed by the Contractor in accordance with the Contract Documents.
- f. The Contractor shall not continue any earthwork activities until a release form is issued by the County.

### **3.11 COUNTY ACCEPTANCE**

- A. The Contractor shall retain all responsibility for the earthwork until formal final acceptance by the County. Conditions for formal final earthwork acceptance (by the County) shall include but not be limited to the following:
  - 1. The installation of the final cover system is properly finished and summarized in writing by the QA/QC Consultant.
  - 2. All required laboratory testing has been completed and summarized in writing by the QA/QC Consultant.
  - 3. All record drawings to be used in the drafting of the As-Built Plans have been completed and summarized in writing by the QA/QC Consultant.
  - 4. All documentation concerning the earthwork is received from the QA/QC Consultant and Contractor and is approved by the County.

END OF SECTION 31 2300



**SPECIFICATIONS – DETAILED PROVISIONS**  
**SECTION 31 3700: RIPRAP**  
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## **SECTION 31 3700 RIPRAP**

### **PART 1 GENERAL**

#### **1.01 SUMMARY**

- A. Section Includes: Excavation, grading, and installation of riprap.
- B. Related Detailed Provisions Sections include, but are not limited to:
  - 1. Section 03 3131 – Concrete Mixing, Placing, Jointing, and Curing
  - 2. Section 03 3132 – Concrete Finishing
  - 3. Section 31 2300 – Earthwork.

#### **1.02 QUALITY ASSURANCE**

- A. Referenced Standards:
  - 1. American Association of State Highway and Transportation Officials (AASHTO):
    - a. AASHTO T85 – Standard Method of Testing for Specific Gravity and Absorption of Coarse Aggregate.
    - b. AASHTO T103 – Standard Method of Test for Soundness of Aggregates by Freezing and Thawing.
    - c. AASHTO T104 – Standard Method of Test for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
    - d. AASHTO T248 – Reducing Field Samples of Aggregate Test Size.
  - 2. American Society for Testing and Materials (ASTM):
    - a. ASTM C33 – Standard Specification for Concrete Aggregates.
    - b. ASTM C131 – Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
    - c. ASTM D75 – Standard Practice for Sampling Aggregates.
  - 3. California Code of Regulations (CCR): Title 8 – Construction Safety Orders.
  - 4. California Department of Industrial Relations – Division of Occupational Safety and Health (Cal-OSHA.)
  - 5. State of California; Business, Transportation and Housing Agency; Department of Transportation (Caltrans.)
    - a. Cal Trans Standard Specifications – Division III: Earthwork and Landscape.

### 1.03 DEFINITIONS

- A. Backfill: refill of an excavation, previously removed.
- B. Fill: placement of material in an excavation or on prepared subgrade to final grade.
- C. Finish Grade: The establishment of grades to a plus or minus 0.05' of final grades as indicated on Project Drawings.
- D. Finished Grade Elevations: Indicated on Project Drawings.
- E. Standard Specifications: Refers to the publication "Standard Specifications for Public Works Construction", latest edition, written and promulgated by the Joint Cooperative Committee of the Southern California Chapter American Public Works Association and Southern California Departments Associated General Contractors of California. This publication is also known as the "Green Book".
- F. State Standard Specifications: Refer to the Standard Specifications of the State of California, Department of Transportation, latest edition.
- G. Sub-base: Compacted layer of approved material used between the subgrade and the pavement.
- H. Subgrade: Previously undisturbed material prepared, and compacted to required density and elevation to support a structure, pavement system, or to receive additional specified materials.
- I. Subgrade Elevations: 4-inches below finish grade elevations indicated on Project Drawings, unless otherwise indicated.
- J. Unsuitable Material: Shall consist of materials determined by the County and/or soils testing agency to be:
  - 1. Soft, loose, unstable or yielding, or
  - 2. Previously placed uncontrolled fill, or
  - 3. Designated material to be overexcavated per geotechnical report requirements, or
  - 4. Unable to be compacted to specified density using ordinary methods at optimum moisture content, or
  - 5. Contains visible or excessive deleterious material as determined by the County or soils testing agency, or
  - 6. Too wet to be properly compacted and circumstances prevent processing suitable in-place drying prior to being used as backfill, or
  - 7. Otherwise unsuitable for planned use.

Such material shall be removed to the limits directed by the County and the resulting excavation backfilled with engineered fill material.

## 1.04 SUBMITTALS

- A. Submittal Procedures: See Detailed Provisions Section 01 3300 – Submittal Procedures for requirements for the mechanics and administration of the submittal process.
- B. Approval Submittals:
  - 1. Acknowledgement that products submitted meet requirements of standards referenced.
- C. Quality Assurance Submittals:
  - 1. Prior to deliver of material, the Contractor shall submit rock supplier gradation results and ready-mix grout supplier mix design to the County for approval.
  - 2. Submit field quality control test results.

## PART 2 PRODUCTS

### 2.01 MATERIALS

- A. Grout:
  - 1. When grouting is required, ready-mixed grout shall conform to Section 202-3.2 of the Standard Specifications.
- B. Riprap:
  - 1. Stone shall be approved durable broken stone quarry run, and of such quality that it will not disintegrate on exposure to water or weathering and free from structural fractures and defects, and shall not contain shale, unsound sandstone, or other material which will readily disintegrate
  - 2. The riprap used shall be composed of a well-graded mixture of rocks. The gradation of rocks shall conform to Table 200-1.6.2 of the Standard Specifications as follows:

**Table 200-1.6.2. Riprap Gradation**

Rock Size	500lbs (225kg) Class	375lbs (170kg) Class	200lbs (90kg) Class	77lbs (35kg) Class
500lbs	50%-100%	10%-50%	0%-5%	-

- 3. Unless otherwise indicated, the minimum thickness of the rip rap stones shall be eighteen (18) inches.
- 4. The maximum stone size shall not be larger than the thickness of the riprap.
- 5. Neither width nor thickness of a single stone of riprap shall be less than one-third (1/3) of its length.
- 6. Riprap specific gravity shall be according to the bulk-saturated, surface-dry basis, in accordance with AASHTO T85.
- 7. The riprap shall have a percentage loss of not more than forty percent (40%) after five hundred (500) revolutions when tested in accordance with ASTM C131.

8. The riprap shall have a percentage loss of not more than ten percent (10%) after twelve (12) cycles of freezing and thawing when tested in accordance with AASHTO T103 for ledge rock, procedure A.
9. The Riprap shall have a percentage loss of not more than ten percent (10%) after five (5) cycles when tested in accordance with AASHTO T104 for ledge rock using sodium sulfate.
10. Rock shall be free of calcite intrusions.
11. Gradation:
  - a. Each load of riprap shall be reasonably well graded from the smallest to the largest size specified.
  - b. Stones smaller than two to ten percent (2 to 10%) size will not be permitted in an amount exceeding ten percent (10%) by weight of each load.
  - c. Control of gradation shall be by visual inspection. However in the event engineer determines the riprap to be unacceptable engineer shall pick two (2) random truckloads to be dumped and checked for gradation.
    - 1) Mechanical equipment and labor needed to assist in checking gradation shall be provided by contractor at no additional cost.
12. Color:
  - a. The color of the riprap shall be gray with gray/blue hues or other acceptable colors approved by engineer prior to delivery to the project site.
  - b. Color shall be consistent on the entire project and shall match the color of rock to be used for all other portions of the work.
13. Broken concrete or asphalt shall not be acceptable for use in the work. Rounded river rock is not acceptable unless specifically designated on the drawings.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Channel slope, bottom, or other areas that are to be protected with riprap, shall be free of brush, trees, stumps, and other objectionable material and be graded to a smooth compacted surface as shown on the drawings.
- B. Contractor shall excavate areas to receive riprap to the subgrade as shown on the drawings accounting for granular beddings.
- C. Contractor shall excavate areas to receive riprap to the specified depth.
- D. Subgrade Materials:
  1. The subgrade materials shall be stable.
  2. If unsuitable materials are encountered, they shall be removed and replaced with stable subgrade materials.



E. Additional Compaction:

1. Additional compaction shall not be required unless specified by engineer.
2. When subgrade is built up with embankment material it shall be compacted to ninety five percent (90%) maximum density (ASTM D698).

### 3.02 RIPRAP PLACEMENT

A. Machine Placed Riprap

1. Riprap shall be placed on the prepared slope or channel bottom area in a manner which will produce a reasonably well graded mass of stone with the minimum practicable percentage of voids.
2. Riprap shall be machine placed, unless otherwise stipulated in the drawings or specifications
3. It is the intent of these specifications to produce a fairly compact riprap protection in which all sizes of material are placed in their proper proportions. Unless otherwise authorized by engineer, the riprap protection shall be placed in conjunction with the construction of embankment or channel bottom with only sufficient delay in construction of the riprap protection, as may be necessary, to allow for proper construction of the portion of the embankment and channel bottom which is to be protected.
4. Slope placement:
  - a. When riprap is placed on slope, placement shall commence at the bottom of the slope working up the slope.
5. The entire mass of the riprap shall be placed on either channel slope or bottom so as to be in conformance with the required gradation mixture and to line, grade, and thickness shown on the drawings.
6. Riprap shall be placed to full course thickness at one operation and in such a manner as to avoid displacing the underlying bedding material. Placing of riprap in layers, or by dumping into chutes, or by similar methods shall not be permitted.
7. All material used for riprap protection for channel slope or bottom shall be placed and distributed such that there shall be no large accumulations of either the larger or smaller sizes of stone. Some hand placement may be required to achieve this distribution.
8. The basic procedure shall result in larger materials flush to the top surface with faces and shapes arranged to minimize voids, and smaller material below and between larger materials.
9. Surface grade shall be plane or as indicated, but projections above or depressions under the finished design grade by more than ten percent (10%) of the rock layer thickness shall not be allowed.
10. Smaller rock shall be securely locked between the larger stone. It is essential that the material between the larger stones not be loose or easily displaced by flow or

by vandalism,

11. The stone shall be consolidated by the bucket of the backhoe or other means that will cause interlocking of the material.
12. All rock is to be placed in a dewatered condition beginning at the toe of the slope or other lowest point.
13. Contractor shall maintain the riprap protection until accepted. Any material displaced for any reason shall be replaced to the lines and grades shown on the drawings at no additional cost to owner. If the bedding materials are removed or disturbed, such material shall be replaced prior to replacing the displaced riprap.

**B. Hand Placed Riprap:**

1. Hand placed riprap shall be performed during machine placement of riprap and shall conform to all the requirements of part 2, above.
2. Hand placed riprap shall also be required when the depth of riprap is less than two (2) times the nominal stone size of when required by the drawings or specifications.
3. After the riprap has been placed, hand placing or rearranging of individual stones by mechanical equipment shall be required to the extent necessary to secure a flat uniform surface and the specified depth of riprap, to the lines and grades as shown on the drawings.

**C. Soil Replacement Over Riprap:**

1. Where riprap is designated to be buried, place onsite excavated material that is free from trash and organic matter in riprap voids by washing and rodding.
2. Prevent excessive washing of material into stream
3. When voids are filled and the surface accepted by engineer place a nominal six (6) inches of topsoil over the area, or as designated on the drawings.

**D. Grouted Riprap**

1. The construction method of the grouted rip rap structures shall be performed in accordance with Section 3.02.A of this Detailed Provision and Section 72-3 Concreted-Rock Slope Protection, method B of the State Standard Specifications.

### **3.03 REJECTION OF WORK AND MATERIALS**

- A. Engineer will reject placed riprap and bedding that do not conform to this section. Contractor shall immediately remove and re-lay the riprap and bedding to conform to specifications.
- B. Riprap and bedding that does not conform to this section shall be rejected, whether delivered to the job site or placed.
- C. Rejected riprap and bedding shall be removed from the project site by contractor at contractor's expense.

END OF SECTION 31 3700

RIPRAP



**SPECIFICATIONS – DETAILED PROVISIONS**  
**SECTION 32 1123: AGGREGATE BASE COURSE**  
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## SECTION 32 1123 AGGREGATE BASE COURSE

### PART 1 GENERAL

#### 1.01 SUMMARY

A. Section includes:

1. Furnish all necessary labor, materials, equipment, tools, and supervision for construction and installation of aggregate base features including, but not limited to: asphalt pavement subgrade.

B. Related Detailed Provisions Sections include, but are not limited to:

1. Division 01 – General Requirements.
2. Section 31 2300 – Earthwork.

#### 1.02 QUALITY ASSURANCE

A. Reference Standards:

1. American Association of State Highway and Transportation Officials (AASHTO):
  - a. AASHTO M147 – Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base, and Surface Courses.
  - b. AASHTO T11 – Standard Method of Test for Materials Finer Than 75 $\mu$ m (No. 200) Sieve in Mineral Aggregates by Washing.
  - c. AASHTO T27 – Standard Method of Test for Sieve Analysis of Fine and Course Aggregates.
  - d. AASHTO T89 – Standard Method of Test for Determining the Liquid Limit of Soils.
  - e. AASHTO T90 – Standard Method of Test for Determining the Plastic Limit and Plasticity Index of Soils.
  - f. AASHTO T99 – Standard Method of Test for Moisture-Density Relations of Soils using a 2.5 kg (5.5 pounds) Rammer and a 305 mm (12 in) Drop.
  - g. AASHTO T180 – Standard Method of Test for Moisture-Density Relations of soils using a 4.54 kg (10 pound) Rammer and a 457 mm (18 in) Drop.
  - h. AASHTO T190 – Standard Method of Test for Resistance R-Value and Expansion Pressure of Compacted Soils.
  - i. AASHTO T265 – Standard Method of Test for Laboratory Determination of Moisture Content of Soils.
  - j. AASHTO T310 – Standard Method of Test for In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

2. American Society for Testing and Materials (ASTM):
  - a. ASTM C88 – Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
  - b. ASTM C131 – Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
  - c. ASTM C136 – Standard Test Method for Sieve Analysis of Fine and coarse Aggregates.
  - d. ASTM D698 – Standard Test Methods for Laboratory Compaction Characteristics of soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
  - e. ASTM D1556 – Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
  - f. ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>)).
  - g. ASTM D1883 – Test Method for California Bearing Ratio (CBR) of Laboratory Compacted Soils.
  - h. ASTM D2167 – Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
  - i. ASTM D2419 – Test Method for Sand equivalent Value of Soils and Fine Aggregate.
  - j. ASTM D2487 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
  - k. ASTM D4318 – Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
  - l. ASTM D4791 – Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
  - m. ASTM D6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
3. State of California; Business, Transportation and Housing Agency, Department of Transportation (Caltrans):
  - a. Caltrans Standard Specifications – Division IV: Subbases and Bases

### **1.03 SUBMITTALS**

- A. Submittal Procedures: See Detailed Provisions Section 01 3300 – Submittal Procedures for requirements for the mechanics and administration of the submittal process.
- B. Approval Submittals:
  - 1. Product technical data including:
    - a. Acknowledgement that products submitted meet requirements of standards referenced.
    - b. Material source
  - 2. Certified supplier gradation results for imported aggregate base materials.
  - 3. Deliver bulk samples of import aggregate base material to County in quantities sufficient for testing. Deliver at least 15 days prior to use.
  - 4. Testing laboratory reports verifying that imported aggregate base material conforms to the specified gradations or characteristics.
- C. Quality Assurance Submittals:
  - 1. Sieve analysis reports on all imported aggregate base material.
  - 2. Field quality control test results.
  - 3. Delivery Tickets: Furnish a delivery ticket for imported aggregate base to the County as each truck arrives. Provide a printed record of the weight of the aggregate base material on each ticket.

### **1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Stockpile satisfactory excavated materials in a location approved by the County, until required for placement. Place, grade, shape, and stabilize stockpiles for proper drainage and erosion control.
  - 1. Separate differing materials with dividers or stockpile separately to prevent intermixing. Segregate stockpiles for asphalt, concrete, rock, and soil generated during construction.
  - 2. Each stockpile will be placed on, at a minimum, 6-mil plastic sheeting and, at a minimum, the sides and top will be covered by one layer of 6-mil plastic sheeting at all times except when the material is being handled. Contractor will cover each stockpile segment at the end of the workday.
  - 3. Provide berms around the stockpile area to contain precipitation runoff and to prevent run-on.

### **1.05 SOURCE QUALITY CONTROL**

- A. To assure stockpiles are not contaminated or materials are segregated, perform any test for determining conformance to requirements for cleanness and grading on samples secured from aggregates at point of batching.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Class II Aggregate Base and Crushed Miscellaneous Base (CMB) shall conform to the following gradation per Section 26-1.02B of the State Standard Specifications for ¾” maximum particle size:

Sieve Size	Percent Passing Sieve
1-inch	100%
No. 4	35-60%
No. 30	10-30%
No. 200	2-9%

- B. Material for Crushed Miscellaneous Base shall consist of any combination of the following: broken stone, crushed gravel, natural rough surfaced gravel, sand, and processed reclaimed asphalt concrete of Portland Cement concrete.
- C. Material for 2” to 4” Aggregate Rock shall consist entirely of crushed rock greater than two inches in diameter but smaller than four inches.
- D. All aggregate must be clean and consist of materials as described in the State Standard Specifications Section 26-1.02A.
- E. Aggregate base shall be mixed in a stationary or traveling plant. Proportion aggregates by weight or volume in quantities to meet the project-specified requirements for the aggregate base material. Incorporate, during the mixing operation, water in quantities sufficient to provide the necessary moisture content for the specified compaction. Mixing operations shall produce satisfactory uniform blending and the method of discharging into trucks shall not produce segregation. Placing aggregate base shall be in accordance with Section 301-2.2 – “Spreading” of the current edition of the Standard Specifications for Public Works Construction (the “Greenbook”).

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that survey benchmarks and intended elevations for the Work are as indicated.
- B. Verify aggregate base subgrade has been inspected and approved, gradients and elevations are correct, and material is dry.
- C. Verify aggregate base material to be placed is free from clay or other objectionable matter.

### **3.02 PREPARATION**

- A. Subgrade preparation for aggregate base shall be performed in accordance with Section 26 of the State Standard Specifications.
- B. Subgrade for aggregate base shall be compacted to a minimum of 95 percent relative compaction (or as otherwise noted on the Project Drawings) as determined by ASTM D1557.



- C. Correct irregularities in aggregate base subgrade gradient and elevation by scarifying, reshaping, and re-compacting. Aggregate base may be used to fill areas of the subgrade that are lower than the grade established by the Project Drawings with approval from the County.
- D. Do not place aggregate base on soft, muddy, or frozen surfaces.

### **3.03 INSTALLATION**

- A. Aggregate base placement operations (adding water, spreading, and compacting) shall be performed in accordance with Section 26 of the State Standard Specifications and Section 301-2.2 – “Spreading” of the current edition of the Standard Specifications for Public Works Construction (the “Greenbook”). The Contractor shall not process or drag base material to which may cause the segregation or loss of gradation of the base material.
- B. Subgrade and finished aggregate base surfaces shall be graded to ensure positive drainage towards drainage structures as shown on the Project Drawings.
- C. Place earth or other accepted materials along the edge of the aggregate base material in such a quantity that it will compact to the thickness of the course being constructed. When the aggregate base is being constructed in two or more layers, place material to the width of the shoulder to be rolled and compacted simultaneously with the rolling and compacting of each base layer.
- D. Aggregate base material shall be compacted to a minimum of 95% relative compaction (or as otherwise noted on the Project Drawings) as determined by AASHTO T180. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.
- E. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

### **3.04 FIELD QUALITY CONTROL**

- A. The County shall procure the services of a Testing/Inspection Provider and laboratory to conduct in-place moisture-density tests to assure that all Work complies with this Detailed Provisions Section.
- B. Testing:
  - 1. Perform in-place moisture-density tests as directed by the County.
  - 2. Perform tests through recognized testing laboratory approved by the County.
  - 3. Perform additional tests as directed until compaction meets or exceeds requirements.
  - 4. Assure County and Testing/Inspection Provider staff has immediate access for testing of all soils related work.
  - 5. Ensure excavations are safe for testing personnel.

**END OF SECTION 32 1123**

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**SPECIFICATIONS – DETAILED PROVISIONS**  
**SECTION 32 3113: CHAIN LINK FENCES AND GATES**  
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## SECTION 32 3113 CHAIN LINK FENCES AND GATES

### PART 1 GENERAL

#### 1.01 SUMMARY

A. Section includes:

1. The work covered by this section shall consist of furnishing all necessary labor, materials, tools, equipment, transportation, services, coordination, supervision, and all other items necessary for the construction of facility perimeter chain link fencing and gates.

B. Related Detailed Provisions Sections include, but are not limited to:

1. Division 01 – General Requirements.
2. Division 03 – Concrete.
3. Section 31 2300 – Earthwork.

#### 1.02 QUALITY ASSURANCE

A. Reference Standards:

1. American Society for Testing and Materials (ASTM):
  - a. ASTM A36 – Standard Specification for Carbon Structural Steel.
  - b. ASTM A53 – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
  - c. ASTM A121 – Standard Specification for Metallic-Coated Carbon Steel Barbed Wire.
  - d. ASTM A153 – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  - e. ASTM A392 – Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric
  - f. ASTM A500 – Standard Specification for Cold Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
  - g. ASTM A513 – Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.
  - h. ASTM A641 – Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
  - i. ASTM A653 – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

- j. ASTM A787 – Standard Specification for Electric-Resistance-Welded Metallic-Coated Carbon Steel Mechanical Tubing.
- k. ASTM A1008 – Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy (HSLA) and HSLA with Improved Formability, Solution Hardened and Bake Hardenable.
- l. ASTM B6 – Standard Specification for Zinc.
- m. ASTM B117 – Standard Test Method of Salt Spray (Fog) Testing.
- n. ASTM B221 – Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wires, Shapes and Tubes.
- o. ASTM C1107 – Standard Specification for Packaged Dry, Hydraulic-Cement Grout.
- p. ASTM D1499 – Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Plastics.
- q. ASTM D2247 – Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
- r. ASTM D2794 – Standard Test Method for Resistance of Organic Coatings to the Effect of Rapid Deformation (Impact).
- s. ASTM D3359 – Standard Test Methods for Measuring Adhesion by Tape Test.
- t. ASTM F626 – Standard Specification for fence Fittings.
- u. ASTM F900 – Standard Specification for Industrial and Commercial Steel Swing Gates.
- v. ASTM F934 – Standard Specification for Standard Colors for Polymer-Coated Chain Link Fence Materials.
- w. ASTM F1043 – Standard Specification for Strength and Protective Coatings on Steel Industrial Fence Framework.
- x. ASTM F1184 – Standard Specification for Industrial and Commercial Horizontal Slide Gates.
- y. ASTM F2919 – Standard Specification for Welded Wire Mesh Fence Fabric (Metallic-Coated or Polymer-Coated) with Variable Mesh Patterns or Meshes Greater than 6 Square Inch (3871 mm<sup>2</sup>) in Panels.

### **1.03 SUBMITTALS**

- A. Submittal Procedures: See Detailed Provisions Section 01 3300 – Submittal Procedures for requirements for the mechanics and administration of the submittal process.
- B. Approval Submittals:
  - 1. Product data for fence and gate posts, rails, fittings, gates, and hardware, including:
    - a. Indicate materials, dimensions, sizes, weights, and finishes of components.

2. Shop Drawings:
  - a. Show locations of fence, each gate, posts, rails, and details of swing gates, hardware, accessories and other operations as specified.
  - b. Indicate plans, elevations, sections, swing gates and other required installation and operational clearances, and details of post anchorage, attachment, and bracing.
  - c. Installation procedures and instructions describing details for a typical fence and gates.
3. Qualification Data:
  - a. Include list of Qualified Installer's completed projects with project names and addresses, names and addresses of architects and owners, and other information as specified.

C. Warranty Documentation

## **1.04 QUALITY ASSURANCE**

A. Installer Qualifications:

1. Minimum 2 years' experience installing fences and gates similar in material, design, and extent to those indicated for the Project and whose work has resulted in construction with a record of successful in-service performance.

B. Source Limitations for Fences and Gates:

1. Obtain each component for fences and gates from one source with resources to provide fences and gates of consistent quality in appearance and physical properties.

## **1.05 DELIVERY, STORAGE AND HANDLING**

A. Deliver and store products in Manufacturer's tagged and unopened packaging until ready for installation.

B. Handle products in accordance with Manufacturer's instructions.

## **1.06 PROJECT CONDITIONS**

A. Existing Utilities:

1. Do not interrupt utilities serving facilities occupied by the County unless permitted under the following conditions:
  - a. Notify local utility marking services before beginning work.
  - b. Unless otherwise indicated in the General Provisions, notify the County no less than two days in advance of the proposed utility interruptions.
  - c. Do not proceed with utility interruptions without the County's written permission.

B. Field Measurements:

1. Verify layout information for fences and gates shown on drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

**1.07 MANUFACTURER’S WARRANTY**

- A. In addition to the two (2) year guarantee applicable to all Work, as specified in General Provisions, Section 5.13 – Guarantee of Work, the Contractor shall provide and issue a ten (10) warranty in the County’s name.

**PART 2 PRODUCTS**

**2.01 FENCING FABRIC AND POSTS**

- A. Chain link fencing posts, fabric, braces, framing, rails, tension wire and accessories shall conform to Section 206-6, “Chain Link Fence” of the Standard Specifications.
- B. Submit requests for substitution in accordance with Detailed Provisions Section 01 6000 – Product Requirements.
- C. Posts, braces, and rails shall be new galvanized pipe manufactured in accordance with ASTM A53 and shall be of the following sizes and weights:

Post Location	Nominal Pipe Size	Approximate Outside Diameter	Pipe Weight
End, Corner and Walk Gate Posts	2-1/2	2-7/8”	Standard
Line Posts	2	2-3/8”	Standard
Braces, rails and gate frames	1-1/4	1-5/8”	Standard
Concrete Strip Footing Sleeves	Inside Diameter equal to +1/8” Outside Diameter of Fence Post (3” I.D. for End Posts) (2” I.D. for Line Posts)		Minimum 10 gauge

- D. Braces shall be fitted with clamps on each end, one clamp to fit gate posts and the other clamp to fit standard line posts.
- E. Changes in alignment of more than 30 degrees shall be considered as corners, and corner posts and braces shall be installed.
- F. Chain link fabric shall be No. 11 AWG gauge galvanized steel wire woven in a 2” mesh, manufactured in accordance with the requirements of ASTM A392. The fabric shall have a zinc coating, Class 1, by hot-dip galvanizing after weaving.
- G. Concrete strip footing pipe sleeves shall be ASTM A36 steel pipe, 24” long and +1/8” diameter of fence post specified for installation. Pipe shall have a welded cap on one end and be lined with a two coat epoxy, Tnemac Series 66 or approved equal. Pipe sleeves that will not be receiving fence posts shall be capped at both ends.



- H. All tension wire shall be No. 7 AWG gauge galvanized, hard drawn, steel spring wire.
- I. All tie wire shall be No. 9 AWG gauge galvanized steel wire.
- J. Truss rods shall be made from 3/8" diameter galvanized steel rod, with drop forged turnbuckles, and galvanized in accordance with ASTM A153.
- K. All hardware, hinges, clamps, fasteners, bolts, nuts, turnbuckles, fittings, post caps, stretcher bars, and other ferrous material not previously covered in these specifications, shall be manufactured of steel and shall be galvanized in accordance with ASTM A153.
- L. Walk gates shall be four (4) feet wide. Gate frames shall be cross trussed with 3/8" steel truss rods equipped with drop forged turnbuckles. The corners of gate frames shall be fastened together and reinforced with a malleable iron fitting designed for the purpose or welded securely. Surplus welding material shall be removed prior to galvanizing. Chain link fabric shall be the same type as specified for the fence and shall be fastened to the frame by the use of stretcher bars, clamps, and tie wire as specified for the fence, and suitable tension connectors spaced at approximately 1' intervals. Gates shall be hung by hinges not less than three (3) inches in width so designed as to securely clamp to the gate post and permit the gate to swing back against the fence. Hinges shall be of high malleable iron of the ball and socket type which will permit the gate to swing back against the fence. The lower hinges of the gate shall support the entire vertical load of the gates as well as provide for the resultant horizontal reaction. Each gate shall be outfitted with approved latches and provisions for padlocking. Latches, hasps and bolts shall be accessible from either side of the gate.

## **2.02 SWING GATES**

- A. Configuration: Single swing or double swing gates.
- B. Gate Frames:
  - 1. Two (2) horizontal ASTM F900 galvanized square steel tubes, 16 gauge, 1-1/2 in x 1-1/2 in., and two (2) vertical tubes 2 in. x 2 in. welded at intersections to create a rigid frame.
- C. Gate Posts:
  - 1. Material:
    - a. Cold-rolled 1008 grade steel to meet requirements of ASTM A500 and A787.
  - 2. Installation:
    - a. In-ground, post length as required by local frost line requirements.
  - 3. Post Size:
    - a. To be determined by Manufacturer.
- D. Gate Hardware:
  - 1. Material:
    - a. Hot-dipped galvanized steel conforming to ASTM F900

- b. Non-moving components shall be powder-coated.
- 2. Hinge:
  - a. Structurally designed by Manufacturer to support gates without deformation during opening and closing.
- 3. Latch:
  - a. Clamp-on, self-latching, gravity system.
- 4. Shared Access Keyed Lock-Box:
  - a. LOCINOX or approved equal with double levers, both sides of gates. Swing gate latching mechanism must be able to accommodate shared access for a minimum of eight (8) individual locks.

## **2.03 ACCESSORIES**

### **A. Concrete Footing:**

- 1. Unless otherwise specified in Detailed Provisions Division 03 – Concrete, provide the following:
  - a. Normal-weight concrete with not less than 3,000 psi 28-day compressive strength.
  - b. 3 in. slump and containing coarse aggregate of minimum diameter of 0.2 in. to maximum of ¾ in.
  - c. 5% to 7% air entrainment.

### **B. Non-shrink, Nonmetallic Grout:**

- 1. Premixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with ASTM C1107.
- 2. Provide grout, recommended in writing by the Manufacturer, for exterior applications.

### **C. Erosion-Resistant Anchoring Cement:**

- 1. Factory-packaged, non-shrink, non-staining, hydraulic-controlled expansion cement formulation for mixing with potable water on-site to create pourable anchoring, patching, and grouting compound.
- 2. Provide formulation resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and recommended in writing by the Manufacturer for exterior applications.

### **D. Mounting kit including pedestals.**

## **2.04 FINISHES**

### **A. Zinc coating:**

1. Wire mesh shall be coated with 0.5 oz/sq. ft. zinc in conformity with ASTM A641 Class 1.
2. Fence posts and swing gate frames and posts shall be zinc coated (galvalume process) with a minimum of 0.9 oz/sq. ft. as per ASTM A653.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, or other conditions affecting performance.
1. Do not begin installation before final grading is completed, unless otherwise permitted by the County.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 ft. or line of sight between stakes.
- B. Indicate locations of utilities, underground structures, benchmarks, and property monuments marked by a registered surveyor and utility companies.

### **3.03 FENCE POST LAYOUT**

- A. Layout fencing on established boundaries within project limits.
- B. Terminal Posts Layout:
1. Locate terminal end, corner, and gate posts at changes in horizontal or vertical alignment of:
    - a. 15 degrees or more.
- C. Post shall be spaced not more than ten (10) feet center to center of posts. Posts shall be set in a vertical position and carefully aligned. End, corner, and gate posts shall be braced to the nearest line post.

### **3.04 IN-GROUND CONCRETE INSTALLATION**

- A. Drill or hand-excavate holes for posts to spacing indicated, in firm, undisturbed or compacted soil.
- B. Dig holes with a diameter four (4) times the diameter of the post and 6 in. deeper than the bottom of the post.
1. Minimum 8 inches in diameter and 42 inches in depth.

- C. Concrete forms are not necessary or recommended. Crown concrete at top to shed water.
- D. Measure, batch, and mix on-site-mixed concrete according to ASTM C94. Pour concrete and let cure in accordance with ACI 301 and Detailed Provisions Section 03 3131 – Concrete Mixing, Placing, Jointing and Curing.
- E. Concealed Concrete Footings:
  - 1. Stop footings 2 in. below grade or as indicated on the Project Drawings to allow covering with surface material.
- F. Post Setting:
  - 1. Set posts in concrete footing.
  - 2. Protect portion of posts above ground from concrete splatter.
  - 3. Place concrete around posts and consolidate.
  - 4. Use of mechanical devices to set posts is not permitted.
  - 5. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during placement and finishing operations until concrete is sufficiently cured.

### **3.05 CHAIN LINK FENCE INSTALLATION**

- A. Chain link fencing and gate shall be constructed in accordance with Section 304-3, “Chain link Fence” of the Standard Specifications.
  - 1. Install fence and gate in accordance with the fence manufacture’s written installation instructions except as modified herein.
- B. Install chain link fence and gate on a prepared subgrade surface to line and grade as indicated in the Project Drawings.
- C. Install top and bottom rails before installing chain link fabric and pull wires taut. Top and bottom rails shall be within the respective fabric line.
- D. Once post installation is complete, chain link fabric shall be stretched taut and securely fastened to the posts, the top rails, and/or tension wires. The fabric shall be fastened to end, corner, and gate posts with 3/16” by 5/8” steel stretcher bars and not less than 1/8” by 1” steel stretcher bar bands spaced one (1) foot apart and fastened to line posts, rails, and tension wires with tie wires or metal bands spaced approximately 14” on line posts and 18” on rails and tension wires. Bottom tension wires and fabric shall be stretched straight from post to post.
- E. The Contractor shall horizontally weave and tack weld together a 3/8” anti-thief tension rod through the chain link fabric.

### **3.06 GATE INSTALLMENT AND ADJUSTMENT**

- A. Install gate posts in accordance with Manufacturer's instructions.
- B. Concrete Set Gate Posts:
  - 1. Drill holes in firm, undisturbed or compacted soil.
  - 2. Holes shall have a diameter four (4) times the outer diameter of the post and 6 in. deeper than the bottom of the frost level.
  - 3. Set post bottom 36 in. below surface when in firm, undisturbed soil.
  - 4. Excavate and set posts deeper where required for adequate support in soft and loose soils, and for posts with heavy lateral loads.
  - 5. Place concrete around posts in a continuous pour, tamp for consolidation.
  - 6. Trowel finish around gate posts and slope to direct water away.
  - 7. Check each post for vertical and top alignment, and maintain in position during placement and finishing operations.
- C. Install gates perfectly horizontal and levelled (at junction), plumb, and secure for full opening without interference.
- D. Attach hardware with nuts inside the property making the assembly tamper-proof to prevent unauthorized removal. Install ground-set items in concrete for anchorage.
- E. Furnish and install a gate keeper for each gate.
- F. Adjust hardware for smooth operation and lubricate where necessary to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

### **3.07 PROTECTION**

- A. Protect installed products until completion of the Project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

**END OF SECTION 32 3113**

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**SPECIFICATIONS – DETAILED PROVISIONS**  
**SECTION 32 3913: MANUFACTURED METAL BOLLARDS**  
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## **SECTION 32 3913 MANUFACTURED METAL BOLLARDS**

### **PART 1 GENERAL**

#### **1.01 SUMMARY**

A. Section includes:

1. The work covered by this section shall consist of furnishing all necessary labor, materials, tools, equipment, transportation, services, coordination, supervision, and all other items necessary for the construction of manufactured metal bollards.

B. Related Detailed Provisions Sections include, but are not limited to:

1. Divisions 01 – General Requirements.
2. Section 03 3100 – Cast-In-Place Structural Concrete.
3. Section 31 2300 – Earthwork.

#### **1.02 QUALITY ASSURANCE**

A. Reference Standards:

1. American Society for Testing and Materials (ASTM):
  - a. ASTM A36 – Standard Specification for Carbon Structural Steel.
  - b. ASTM A53 – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  - c. ASTM A312 – Standard Specification for Seamless, Welded, and Heavy Cold Worked Austenitic Stainless Steel Pipes.
  - d. ASTM A500 – Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
  - e. ASTM A536 – Standard Specification for Ductile Iron Castings.
  - f. ASTM B26 – Standard Specification for Aluminum-Alloy Sand Castings.
  - g. ASTM D1654 – Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.

#### **1.03 SUBMITTALS**

A. Submittal Procedures: See Detailed Provisions Section 01 3300 – Submittal Procedures for requirements for the mechanics and administration of the submittal process.

B. Approval Submittals:

1. Product Data: Provide bollard type, component, finish, and any accessory specified.

2. Shop Drawings:
  - a. Show mounted items and coordination required for work specified in other Detailed Provisions Sections.
  - b. Indicate construction and installation details.
3. Verification Samples:
  - a. Provide one (1) sample of each product specified, representing colors and finishes to be installed.
4. Maintenance Information:
  - a. Submit Manufacturer's touch-up, cleaning, and maintenance information.

#### **1.04 DELIVERY, STORAGE AND HANDLING**

- A. Protect bollards and accessories during delivery, storage, and handling.

### **PART 2 PRODUCTS**

#### **2.01 ACCEPTABLE MANUFACTURERS**

- A. Subject to compliance with the Contract Documents, the following Manufacturers are acceptable:
  1. Calpipe Security Bollards; [www.calpipebollards.com](http://www.calpipebollards.com)
  2. Lakewood Pipe & Steel; [www.lakewoodpipe.com](http://www.lakewoodpipe.com)
  3. Alameda Pipe & Steel Co.; [www.alamedapipe.com](http://www.alamedapipe.com)
- B. Submit requests for substitution in accordance with Detailed Provisions Section 01 6000 – Product Requirements.

#### **2.02 MANUFACTURED METAL BOLLARDS**

- A. Overall Dimensions:
  1. Outer Diameter: 4 in.
  2. Height: 4 ft. (from Finished Surface Elevation to top of bollard)
- B. Material:
  1. Flat top carbon steel pipe filled solid with grout.
- C. Concrete Footing:
  1. Concrete footing shall extend 6 in. on both sides of and below the bollard.
  2. Bollard shall be fixed, embedded into concrete footing a minimum of 2 ft.
  3. All Concrete work shall be done in accordance with Detailed Provision Section 31 2300 - Earthwork.

D. Finish:

1. Polymer powder coat finish utilizing an epoxy prime coat and a polyester top coat.
2. Color: Safety Yellow, RAL 1023
3. Provide reflective band approximately 4-inches from top of bollard.

E. Spacing:

1. Post location shall be  $\geq 3'$  from the protected object.
2. Post spacing shall be  $\leq 4'$  on-center of separation.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrate for compliance with manufacturer's requirements for placement and location of embedment, condition of substrate, and other conditions affecting installation procedures.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

- A. General: Comply with manufacturer's installation instructions and Construction Drawings.
- B. Do not install damaged, cracked, chipped, deformed, or marred bollards. Field touch-up minor imperfections in accordance with manufacturer's instructions. Replace bollards that cannot be field repaired.

### **3.03 CLEANING AND PROTECTION**

- A. Protect bollards against damage.
- B. Immediately prior to Substantial Completion, clean bollards in accordance with Manufacturer's instructions to remove dust, dirt, adhesives, and other foreign materials.
- C. Touch up damaged finishes according to Manufacturer's instructions.

END OF SECTION 32 3913

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**SPECIFICATIONS – DETAILED PROVISIONS**  
**SECTION 33 1153: GROUNDWATER MONITORING WELL**  
**ELEVATION ADJUSTMENT**  
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## **SECTION 33 1153 GROUNDWATER MONITORING WELL ELEVATION ADJUSTMENT**

### **PART 1 GENERAL**

#### **1.01 SUMMARY**

- A. The work covered by this Section shall consist of furnishing all necessary labor, materials, equipment, tools, permits, and supervision for the elevation adjustment of existing groundwater monitoring wells at locations shown on the Project Drawings.
- B. Related Contract Document Sections include, but are not limited to:
  - 1. General Provisions
  - 2. Detailed Provisions Section 01 1100 – Summary of Work
  - 3. Detailed Provisions Section 02 0100 – Maintenance of Existing Conditions
  - 4. Detailed Provisions Section 03 3100 – Cast-in-Place Structural Concrete
  - 5. Detailed Provisions Section 31 2300 – Site Earthwork
  - 6. Detailed Provisions Section 32 3913 – Manufactured Metal Bollards.

#### **1.02 REFERENCES**

- A. The “Greenbook” Standard Specifications for Public Works Construction.
- B. Department of Water Resources, Bulletin 74-81
- C. Water Well Standards: State of California and Bulletin 74-90 (Supplement to Bulletin 74-81).
- D. California Well Standards and Riverside County Ordinance No. 682.2.

#### **1.03 QUALITY ASSURANCE**

- A. All work shall be performed by a contractor with a State of California C-57 Well Drilling License and registered with the Riverside County Department of Environmental Health.
- B. All work shall be done to the satisfaction of the County and applicable regulatory agencies.

#### **1.04 SUBMITTALS**

- A. Submittal Procedures: See Detailed Provisions Section 01 3300 – Submittal Procedure for requirements for the mechanics and administration of the submittal process.
- B. Product Details:
  - 1. Submit for County approval product details of the blank well casing, above ground monument and sanitary seal to be used for the Project.

C. Well Report:

1. Provide Well Drillers report for elevation adjustment for submittal to regulatory agencies for approval.

**1.05 DELIVERY, STORAGE AND HANDLING**

A. Delivery, Storage and Handling shall be made in accordance with the following:

1. Maintain end caps through shipping, storage and handling to prevent damage and to prevent entrance of dirt, debris and moisture. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
2. Protect from weather. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.
3. Use slings to handle materials if size requires handling by crane or lift. Rig materials to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.
4. Store plastic piping protected from direct sunlight and provide support to prevent sagging and bending.

**PART 2 PRODUCTS**

**2.01 BLANK WELL CASING**

- A. The blank well casing shall be nominal 4-inch inner diameter, schedule 80, PVC as specified in ASTM D1785, equipped with threaded joints at the ends of the blank casing sections. The blank casings shall be factory assembled.
- B. Threaded joints shall be machined with beveled/interference compression fit shoulder seals to increase compressional strength.
- C. O-ring seals shall be provided within the threaded joints to mitigate leakage and contaminants from entering at the threaded joint.
- D. All casing material shall be new.

**2.02 ABOVE GROUND MONUMENT**

- A. The above-ground monument installed to protect the wellhead shall be an EMCO Wheaton A0728-006, or County approved equal.

**2.03 CONCRETE**

- A. Cement used for the well elevation adjustment shall be a Type II Portland cement conforming to ASTM C150.
- B. The cement mix used for the well elevation adjustment shall be a 10.5-sack sand cement grout. There shall be not more than two parts by weight of sand to one part by weight of cement. The water cement ratio shall be 7 gallons per sack of cement (94 pounds).



- C. Water used for the cement mix shall be clean and of potable quality.
- D. Materials used as additives for Portland cement mixtures in the field shall meet the requirements of ASTM C494.
- E. Special quick-setting cement, retardants to setting, and other additives, including hydrated lime to make the mix fluid (up to 10 percent of the volume of cement) may be used.

## **PART 3 EXECUTION**

### **3.01 GENERAL**

- A. The Contractor is cautioned to properly secure/stabilize the well during all phases of construction. Improper or poor security/stabilization of the well may lead to delays. Such delays will be the responsibility of the Contractor and the County shall not pay any cost associated with such delays.

### **3.02 ELEVATION ADJUSTMENT**

- A. The Contractor shall connect a new piece of blank well casing to the existing well casing to raise the well elevation to approximately 24 inches above the top of the final cover ground surface.
- B. Contractor shall cut off the well casing such that the casing extends approximately 24 inches above the top of surrounding finished ground surface. The cut edges shall be regular in appearance and Contractor shall file the edges to remove all burrs and sharp corners from the edge. Contractor shall equip each cut well casing with a fitted J-plug.
- C. Contractor shall furnish and install stabilizers to prevent movement of the blank well casing inside the monument.
- D. Upon completion of all work in connection with well elevation adjustment, the well shall be capped by placing a lockable J-plug on the top of the casing. The Contractor will submit each wells new depth to the County and other appropriate parties.

### **3.03 CONCRETE**

- A. Mixture
  - 1. Water, sand and cement shall be mixed in ratios specified in Section 2.03 “Concrete” of this Detailed Provision.
  - 2. The final minute of concrete shall be thoroughly blended before pumping. Cement and sand shall be completely incorporated into the mixture, no unmixed lumps of material shall exist in the mixture.
  - 3. Please see Detailed Provision Section 03 3100 – Cast-in-Place Structural Concrete for more information.

### **3.04 ABOVE GROUND MONUMENT**

- A. Contractor shall install the monument on top of the existing above ground well monument such that the elevation of the top of the monument is approximately three-feet above the surrounding finished final cover ground surface.
- B. Contractor shall install concrete between the monument and the excavation walls to the elevation matching the surrounding grade. The concrete shall be placed from bottom to top in a continuous operation.
- C. Contractor shall install minimum three (3) inches of concrete between the outside of the monument and the ground. The concrete shall be placed from bottom to top in a continuous operation.
- D. Contractor shall install a concrete pad measuring four feet by four feet by four-inches in thickness, centered on the monument. The concrete pad shall consist of structural concrete installed in a single pour at the same time the concrete is placed surrounding the monument.
- E. The Contractor shall take whatever precautions are necessary to prevent borehole and/or casing collapse during placement of the concrete. In the event any borehole and/or casing collapses prior to completion of the concrete, the Contractor shall take whatever steps are necessary to reopen the borehole, replace the casing and place the concrete as specified. Any such remedial action shall be conducted at the Contractor's expense.
- F. Contractor shall install four bollards around the well monument to protect the well casing from vehicular traffic, such that they are positioned no more than six (6) inches from the corners of the concrete pad and spaced no more than five (5) feet along the concrete pad sides, as determined by the Engineer. Each bollard shall be free of burrs, sharp corners and shall be in accordance with Detailed Provision Section 32 3913 – Manufactured Metal Bollards.
- G. The Contractor shall calculate the amount of seal material necessary to complete the sanitary seal. The volume placed shall not be less than the calculated volume of the annular space between the borehole and the well casing. The Contractor shall record all calculations and volumes used, and measurements obtained after each interval is pumped. The Contractor shall provide the calculations and volumes to the Engineer for his review and approval.
- H. Contractor shall provide a concrete washout, in compliance with state NPDES requirements.
- I. Contractor shall reuse and place the salvaged well cap and locking well cover.
- J. No activity shall occur directly adjacent to the well site, nor will stand-by time be granted, during a minimum 24-hour period immediately following the placement of the sanitary seal. The casings shall be adequately secured such that no damage or contamination will occur during this period.

END OF SECTION 33 1153



**SPECIFICATIONS – DETAILED PROVISIONS**  
**SECTION 33 5139: GAS PROBE ELEVATION ADJUSTMENT**  
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## **SECTION 33 5139 GAS PROBE ELEVATION ADJUSTMENT**

### **PART 1 GENERAL**

#### **1.01 SUMMARY**

- A. The work covered by this Section shall consist of furnishing all necessary labor, materials, equipment, tools, permits, and supervision for the elevation adjustment of existing gas probes at locations shown on the Project Drawings.
- B. Related Contract Document Sections include, but are not limited to:
  - 1. General Provisions
  - 2. Detailed Provisions Section 01 1100 – Summary of Work
  - 3. Detailed Provisions Section 02 0100 – Maintenance of Existing Conditions
  - 4. Detailed Provisions Section 03 3100 – Cast-in-Place Structural Concrete
  - 5. Detailed Provisions Section 31 2300 – Site Earthwork

#### **1.02 REFERENCES**

- A. Standard Specifications for Public Works Construction “Green Book”
- B. State of California Department of Transportation Standard Specifications (SS)

#### **1.03 QUALITY ASSURANCE**

- A. All work shall be done to the satisfaction of the designated QA/QC representative and shall meet the approval of the Resident Engineer.
- B. The Contractor or Subcontractors doing the work shall have a Class A or C-34 Contractor’s License.

#### **1.04 SUBMITTALS**

- A. Submittal Procedures: See Detailed Provisions Section 01 3300 – Submittal Procedure for requirements for the mechanics and administration of the submittal process.
- B. Pipe and Parts:
  - 1. Submit for County approval product details of the pipes and parts to be used for the Project.

## **1.05 DELIVERY, STORAGE AND HANDLING**

- A. Delivery, Storage and Handling shall be made in accordance with the following:
1. Maintain end caps through shipping, storage and handling to prevent damage and to prevent entrance of dirt, debris and moisture. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
  2. Protect from weather. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.
  3. Use slings to handle materials if size requires handling by crane or lift. Rig materials to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.
  4. Store plastic piping protected from direct sunlight and provide support to prevent sagging and bending.

## **PART 2 PRODUCTS**

### **2.01 PIPE AND PARTS**

- A. The County shall supply one-half inch diameter solid PVC square thread pipe.
- B. The County shall supply one-half inch diameter PVC slip caps.
1. The Contractor shall try and salvage any existing PVC slip caps.
- C. The Contractor shall furnish all other parts required to extend the gas probe.

### **2.02 PROTECTIVE STEEL SLEEVE WITH LOCKABLE LID**

- A. The steel multi-level probe protective sleeve shall be removed and salvaged by the County before the start of the project.
1. If the steel multi-level probe protector is still present, the Contractor will remove and salvage the probe protector.
- B. The County will provide to the Contractor a new six (6) inch by six (6) inch square by five (5) foot long steel protective sleeve with lockable hinged lid if salvaging the existing probe protector is not possible.

### **2.03 CONCRETE**

- A. The Contractor will provide 60 or 90 pound bags of Type II Portland cement. Unless otherwise indicated, Concrete shall have a 28 day compressive strength of 3,000 psi.
- B. Please see Detailed Provision Section 03 3100 – Cast-in-Place Structural Concrete for more information.

### **2.04 CARDBOARD COLUMN TUBING**

- A. The Contractor shall supply a thirty-six (36) inch cardboard column tubing, one-foot in height of White Cap or approved equivalent brand.

## **PART 3 EXECUTION**

### **3.01 ELEVATION ADJUSTMENT**

- A. The Contractor shall furnish all labor, materials, equipment and incidentals necessary to perform all elevation adjustment, excavation, backfill, placement of steel multi-level probe protector and placement of concrete required to complete the work shown on the Project Drawings and specified herein. The work shall include, but not necessarily be limited to adjusting the probe elevations, excavating soil around the steel protective sleeve, placement of concrete, disposal of waste and surplus materials.
- B. The steel multi-level probe protector will be removed and salvaged by the County before the start of the project.
  - 1. If the steel multi-level probe protector is still present, the Contractor will remove and salvage the probe protector.
- C. The Contractor shall connect and extend the multi-level gas probes to approximately 4ft above the finished final cover grade.
  - 1. The Contractor shall take precautions to protect in place the extended multi-level gas probes while constructing the final cover near the gas probe.
- D. The top of the each probe shall be capped immediately following elevation adjustment. Each probe will have its new depth written on the pipe casing adjacent to the cap with a water proof permanent marker.
- E. No glue or solvent of any kind shall be used in the drilling or construction of the multi-level probes, unless previously approved by the County.

### **3.02 STEEL MULTI-LEVEL PROBE PROTECTOR**

- A. The County will supply the Contractor with a six (6) inch by six (6) inch square by five (5) foot long steel protective sleeves with lockable hinged lid. The protective steel sleeve will have been already painted yellow by the County. The Contractor shall install the steel protective cover over each multi-level probe cluster as indicated in the Project Drawings and as specified herein.
- B. The Contractor shall excavate and/or backfill and compact soil and protect the probes and steel sleeve in a manner to allow the placement of the steel sleeve and 36" cardboard tubing. No concrete is to be placed in the inside of the steel sleeve or in such a manner that the concrete is underneath the steel sleeve or near the probes. The steel sleeve shall be placed over the probes, before the concrete is poured.
- C. Concrete shall be poured to fill around the outside of the 6" x 6" square protective steel sleeve and within the 36" cardboard tubing. The steel sleeve shall be adjusted until it is vertical. The area around the sleeve shall be leveled so that the tubing sits level on the ground.
- D. Contractor shall provide a concrete washout, in compliance with state NPDES requirements.

END OF SECTION 33 5139

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# **Appendices**

**Appendix A - Landfill Site Safety Rules**

**Appendix B - National Pollutant Discharge and Elimination System (NPDES), Storm Water Pollution Prevention Plan (SWPPP) for the Mecca II Sanitary Landfill**

**Appendix C - South Coast Air Quality Management District (SCAQMD), Rule 1150 Excavation Permit**

**Appendix D - South Coast Air Quality Management District (SCAQMD), Rule 403 and 403.1 (Supplemental for Coachella Valley) Fugitive Dust**

**Appendix E - Project Construction Quality Assurance / Quality Control (QA/QC) Plan**

**Appendix F - Project Drawings (Reduce Size 11" x 17")**

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# **Appendix A**

## **Landfill Site Safety Rules**

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# MECCA II LANDFILL FACILITY

For services/complaints contact the Riverside County Department of Waste Resources at (951) 486-3200 or via website [www.rcwaste.org](http://www.rcwaste.org)  
Para los servicios y el contacto de las quejas llame Riverside County Department of Waste Resources at (951)486-3200 o via website [www.rcwaste.org](http://www.rcwaste.org)

## LANDFILL RULES

- **Obey County personnel and signs. It is for your safety.** (Deben obedecer toda personal del Condado de Riverside y reglas/regulaciones. Es por su seguridad).
- **Anyone under 16 years of age and pets must remain in vehicle.** (Cualquier persona menos de 16 años y animales domesticos deben permanecer dentro del vehiculo en todo momento).
- **High visibility safety vest must be worn at all times.** (Los chalecos de seguridad de alta visibilidad seran usados en todo momento.)
- **Stay within 5 feet of your vehicle while unloading and 15 feet away from heavy equipment.** (Deben mantenerse 5 pies de su vehiculo cuando descargan basura y 15 pies alejados de la maquinaria pesada).
- **No alcohol, drugs, weapons, smoking, salvaging, or loitering.** (No se permite bebidas alcohólicas, el uso de drogas ilegales, armas, fumar, recoger ningún artículo o vagaren el basurero).
- **Commercial refuse vehicles must have an operational back-up alarm.** (Todos los vehiculos comerciales deben disponer de un sistema de alarma de reversa que esta en funcionamiento).

## STAY ALERT – STAY ALIVE

**County is not responsible for damage to customer’s vehicle and/or equipment due to customer’s negligence or failure to follow site rules and reserves the right to deny access to anyone violating said rules or creating a safety hazard. Landfills are dangerous construction zones. Disposal is at customer’s own risk.** (El Condado no se hace responsable por daños al vehiculo del cliente o equipamiento, en caso de cliente no obedien las reglas del sitio y se reserve el derecho a denegar el acceso a cualquier persona que viole las normas o la creación de un riesgo de seguridad. Los basureros son zonas peligrosas de la construcción. La eliminación de basura es por cuenta y riesgo del cliente).

## ALL LOADS SUBJECT TO INSPECTION

**Disposal of hazardous, toxic, flammable, corrosive, explosive and radioactive waste/materials may be prosecuted under Health and Safety Code 25189.5 and Penal Code 374.8.** (Eliminación de residuos peligrosos, toxicos, inflamables, corrosivos, residuos de explosivos y radioactivos materiales pueden ser procesados bajo Health and Safety Code 25189.5 and Penal Code 374.8).

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## **Appendix B**

# **National Pollutant Discharge and Elimination System (NPDES), Storm Water Pollution Prevention Plan (SWPPP) for the Mecca II Sanitary Landfill**

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National Pollutant Discharge Elimination System  
(NPDES)

Storm Water Pollution Prevention Plan  
(SWPPP)

For the

**Mecca II Sanitary Landfill**  
**July 2015**

Prepared By



Owner and Operator

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## **A. Introduction**

The Riverside County Department of Waste Resources (Department) has developed and implemented this site-specific Storm Water Pollution Prevention Plan (SWPPP) for the Mecca II Sanitary Landfill (Site) in accordance with the requirements of the Industrial General Permit for Storm Water Discharges associated with Industrial Activities Order Number 2014-0057-DWQ NPDES Number CAS000001 (IGP).

The first objective of this SWPPP is to identify and evaluate existing and potential sources of pollution that affect the quality of industrial storm water discharges associated with landfill activities that take place at the Site. The second objective is to identify and implement site-specific Best Management Practices (BMPs) to reduce or prevent pollutants associated with landfilling activities in storm water discharges and authorized non-storm water discharges. This SWPPP has been formatted in general conformance with the outline provided in Section X of the IGP. The description of the assessment of the potential pollutant sources and corresponding BMPs at the Site are discussed throughout this SWPPP and also summarized in Table 1 – Industrial Activities, Pollutant Sources, Industrial Pollutants, and Corresponding BMP Measures.

### **A.1 Facility Description**

The Mecca II Landfill is owned and operated by the Riverside County Department of Waste Resources (Department). The Department headquarters office address is 14310 Frederick Street, Moreno Valley, CA 92553. The landfill is located in unincorporated area of Riverside County at the following address: 95250 66<sup>th</sup> Avenue, Mecca, CA 92254 as shown on Figure 1 – Vicinity Map. The Site is remotely located approximately 90 miles from the Department's headquarters office and encompasses 80 acres, with a total of 19 acres used as landfill disposal area as shown on Figure 2 – Site Map and Active Areas.

Mecca II Landfill is a Class III facility as defined by California Code of Regulations (CCR) Title 27, Sections 20240 through 20260. The Site is currently operating under a Solid Waste Facility Permit (SWFP) No. 33-AA-0071 which was issued by the California Department of Resources Recycling and Recovery (CalRecycle) on January 15, 2015 and conforms to Waste Discharge Requirements Order No. 01-142.

The Site is typically open to the public two (2) days per year, the second Saturday in April and the second Saturday in October. The permit allows the Department the flexibility of responding to service needs by opening the Site, if necessary, on Wednesdays and Saturdays and further increase the number of operating days to not exceed four (4) days per week. Currently, the landfill is closed to the public on the following holidays: New Year's Day, Memorial Day, Independence Day, the Sunday prior to Labor Day, Labor Day, Thanksgiving Day, and Christmas Day. The exact holiday schedule is subject to change and, in this case, will be transmitted to the LEA as a minor change to the Solid Waste Facility Permit.

Currently, the Site is open to the public from 8:00 am to 4:30 pm. The permit allows the Department the flexibility of responding to service needs by increasing hours of operation to 6:00 am to 8:00 pm, with the stipulation that the site operates only during daylight hours. The Department shall notify the Local Enforcement Agency (LEA) pursuant to the requirements of Section 21620 (a) (1) (F) of CCR Title 27 when operating hours and/or days are changed.

### **A.2 General Facility Activities**

The Site accepts non-hazardous solid waste for disposal and other materials, such as scrap metals, white goods/appliances, E-waste and universal waste for recycling and/or off-site management. The service area for the Site includes unincorporated communities of Mecca, Thermal, Oasis, North Shore, and surrounding agricultural lands. Generally, waste originating from anywhere within Riverside County may be accepted for disposal at the Site.

The types of waste material in customer vehicles are identified by site personnel who instruct customers to follow traffic control signs to guide customers to the appropriate unloading location.

The current solid waste disposal operation can generally be described as the “area method.” Solid waste materials are spread and compacted into thin layers within a specified area. At the end of each work day the compacted refuse layer is covered with a minimum of twelve (12) inches of intermediate cover soil.

## **B. Storm Water Pollution Prevention Plan Implementation and Revisions**

This SWPPP shall be submitted to the California Regional Water Quality Control Board Colorado River Region (CRWQCB-CRR) prior to July 1, 2015 via the State Water Resources Control Board’s (SWRCB) Storm Water Multiple Application and Report Tracking System (SMARTS) website. All BMPs described in this SWPPP will be implemented prior to July 1, 2015. The installation of new or additional BMP measures due to changing site conditions will be implemented as needed. The SWPPP shall be revised and re-submitted via SMARTS website within 30 days whenever there is a significant revision or 90 days for any other revisions to the SWPPP.

In accordance with General Permit, Section XV Annual Comprehensive Facility Compliance Evaluation, the Department shall conduct one Annual Evaluation for each reporting year (July 1st to June 30th) and shall revise the SWPPP, as appropriate, and implement the revisions within 90 days of the Annual Evaluation.

### **B.1 Temporary Suspension of Industrial Activities**

As stated in Section A.1, the Site is typically only open for two (2) days per year and located approximately 90 miles from the Department’s headquarters. For the remainder of the year, landfill disposal and recycling operations are suspended. During suspension, the Site is not staffed and no materials or equipment are stored at the facility. The landfill disposal area is stabilized by covering refuse with cover soil (refer to Section A.2) to prevent contact with storm water. Cover soil is properly graded to convey runoff away for the disposal area.

Beginning July 1, 2015 and in accordance with Section X.H.3 of the new IGP, the Department shall notify the SWRCB seven (7) days prior to temporary suspension of industrial activities that exceed ten (10) or more consecutive days during the year. Notification shall take place by uploading any of the following applicable information to the SWRCB’s SMARTS website:

- Any necessary SWPPP revisions addressing facility stabilization BMPs;
- Justification for why monitoring is infeasible at the facility during the period of temporary suspension of industrial activities (e.g., the facility is not staffed, or the facility is remote or inaccessible);
- The date the facility is fully stabilized for temporary suspension of industrial activities; and,
- The projected date that industrial activities will resume at the facility.

During the period of suspension, the Department is not required to:

- Perform monthly visual observation; or,
- Perform sampling and analysis

The Department shall notify the SWRCB via SMARTS the date in which industrial activities resume at the Site and will be required to perform all compliance activities as required by the IGP.

## C. Planning and Organization

### C.1 Pollution Prevention Team

Section X.D.1 of the General Permit requires the Department to identify the pollution prevention team responsible for developing, implementing, revising, and conducting monitoring program activities for this SWPPP. The Department's Engineering and Environmental Divisions constitute the groups responsible for developing, implementing, monitoring, and updating this SWPPP. The SWPPP was developed by personnel from both the Engineering and Environmental Divisions under the direction of the Environmental Division's Senior Civil Engineer (SCE) and the Engineering Division's SCE. The Engineering Division's SCE shall review, sign, and submit the SWPPP to the California Regional Water Quality Control Board, Colorado River Region (CRWQCB-CRR) via SMARTS.

The SWPPP team consists of the following:

- Environmental Technicians conduct monthly Site NPDES Inspections, observe any storm water or non-storm water discharges, and collect storm water discharge samples for testing.
- Environmental Engineers develop and implement the Monitoring Implementation Plan (Section H), prepare draft Annual Comprehensive Facility Compliance Evaluation report, review the SWPPP, and provide BMP recommendations.
- Hazardous Waste Inspectors implement the Department's Hazardous Waste Inspection Program, which detects and prevents landfill disposal of hazardous waste.
- Engineering Division Engineers develop, certify, and update the SWPPP as necessary in accordance with Section X of the General Permit. This responsibility includes the design of the surface drainage and erosion control system and design of the BMPs to be implemented at the site. Engineers also finalize the Annual Comprehensive Facility Compliance Evaluation report.
- Engineering Division Technicians coordinate the implementation of the final approved SWPPP and provide construction observation and inspection during the installation of the BMP measures.
- Engineering Division Technicians conduct monthly, pre-storm, and post-storm inspections, and coordinate any necessary or routine site maintenance activities.
- Landfill Maintenance and Litter Control Crew staff install and maintain BMPs and surface drainage structures throughout the site, per the Engineering Division's recommendations and direction. Site staff collect litter during days the site is operational.

The engineers and technicians from each division are trained and qualified to perform each other's assignments in regards to monitoring and inspections to ensure adequate coverage for the implementation of the SWPPP.

### C.2 Other Requirements and Existing Facility Plans

This SWPPP has been developed and implemented in accordance with the General Permit, and is consistent with all applicable municipal, state, and federal requirements. The Department currently operates the Site according to regulatory requirements that are enforced by the following agencies: Riverside County Department of Environmental Health/ Local Enforcement Agency (LEA), South Coast Air Quality Management District (SCAQMD), California Regional Water Quality Control Board Colorado River Region (CRWQCB-CRR) and California Department of Resources Recycling and Recovery (CalRecycle).

Department staff has developed other facility-specific environmental compliance plans that complement the SWPPP's objectives of reducing and preventing pollutant discharges via the storm water drainage system and are available on-site, at the Department's main office, and on the Department's intranet, and can also be made available upon request. The following is a list of these plans:

- Waste Discharge Requirement
- Emergency Action Plan
- Hazardous Waste Inspection Program Guide
- Waste Acceptance Policy Guide
- Waste Recycling Program Guide

## **D. Site Maps**

The following site maps have been developed to address the conditions of the General Permit Section X.E. “Site Map”:

- Figure 1 – Vicinity Map
- Figure 2 – Site Map and Active Areas
- Figure 3 – Surface Drainage Map
- Figure 4 – BMP Implementation Map

## **E. List of Industrial Materials and Potential Pollutant Source**

Below is a description of potential pollutant sources at the Site:

### **E.1 Industrial Processes**

#### **E.1.a Solid Waste Disposal**

Types of routine wastes accepted for disposal at the Site include, but are not limited to: municipal and agricultural waste, inert material, construction demolition/renovation waste, contaminated soil (subject to the Department’s written approval process), industrial waste (subject to the Department’s written approval process), and registered vehicles. Types of special wastes accepted at the Site for onsite disposal and/or off site recycling include, but are not limited to: tires, dead animals, gypsum/drywall, and appliances. Waste types and their unloading, handling, recycling, and disposal procedures are discussed in detail in the Department’s Waste Acceptance Policy Guide. During the previous two Site openings on April 11, 2015 and October 11, 2014, the Site received approximately 1.3 tons of refuse on each day. Hazardous waste is not accepted for burial at the Site.

The potential sources of pollution on the active disposal pad are as follows:

- Landfilled solid waste coming into contact with storm water runoff.
- Accidental fluid spills and leaks from heavy equipment and other vehicles operating on the active disposal pad.
- Sediment generated from erosion of daily cover stockpiles adjacent to the disposal pad and landfill slopes.
- Wind-blown litter coming into contact with storm water runoff.
- Track out generated by landfill customers and employees vehicles.

#### **E.1.b Equipment Maintenance and Repairs**

Equipment is typically only on-site for the two (2) days per year the Site is scheduled to be open. Equipment repairs, maintenance, and fueling are performed off-site prior to delivery of equipment to the site.

#### **E.1.c Daily Cover Excavation**

During the two (2) days per year the Site is open, daily cover soil material for landfill operations



is obtained daily from the Active Borrow Area as shown on Figure 2 – Site Map and Active Areas. Approximately two (2) cubic yards of cover soil material is used for each operating day.

Potential sources of pollution within the Borrow Area is as follows:

- Accidental fluid spills and leaks from heavy equipment working within the borrow area
- Sediment generated from erosion within the active excavation areas

#### **E.1.d Site Construction Projects**

This SWPPP will be included in the Contract Documents for all future public works construction projects at the Site. All awarded contractors and their subcontractors will be required to abide by the requirements of this SWPPP while working at the Site. All public works contract documents will also include a designated section for Storm Water Pollution Prevention and Hazardous Materials Management that the awarded contractors must implement throughout the duration of project construction. Each contractor will be required to prepare and submit to the Department a project-specific SWPPP, outlining procedures to reduce or prevent pollutants (directly or indirectly related to the contractor's activities) in storm water runoff. The contractor's SWPPP will become an attachment to the current site's SWPPP throughout the duration of the project. The existing Notice of Intent and monitoring program (Section H) for the Site will be sufficient for compliance with the General Permit for Storm Water Discharges associated with Industrial Activity as long as the SWPPP is amended during times of construction to include and address the Contractor's specific activities.

### **E.2 Material Handling and Storage Areas**

#### **E.2.a Fuel, Oil, & Lubricating Fluids**

A radio communication tower is located on-site as shown on Figure 2 – Site Map and Active Areas. The tower is part of Riverside County's Public Safety Enterprise Communication (PSEC) system that provides emergency communication to law enforcement and fire/rescue agencies. The tower area consists of a 26' x 12' pre-fabricated equipment room, 1,000-gallon steel propane tank, and 150' tall antenna. The propane tank is an emergency fuel source to power a generator located within the equipment room in the event electrical service from the power utility is lost. With the exception of oil stored within the generator's engine, no other petroleum products are stored within the tower area. No fuel, oil, coolant, lubricants, or other fluids are stored on-site to support the landfill operation due to site being limited to two (2) openings per year.

- Accidental fluid spill and leak from emergency generator

#### **E.2.b Metals/Recyclable Materials Collection and Temporary Storage**

Residential customers are directed to separate and unload recyclable materials within the designated recycling area as shown on Figure 2 – Site Map and Active Areas. The area is used by customers to unload appliances, scrap metal, universal waste, and tires. At the end of each operation day all recyclable materials are transported to the Department's Lamb Canyon Landfill or an off-site recycler. White goods (appliances) and scrap metals are continuously separated out from the refuse stream that enters the site and directed to the designated recycling area. Hazardous components of recyclable materials (appliances and electrical items) are regulated as hazardous or universal waste and are removed by trained staff for transportation to off-site recycler. No recyclable materials are stored on-site overnight.

The potential sources of pollution within the designated recycling area are as follows:

- Recyclable items stored temporarily within the area coming into contact with storm water runoff.

### **E.2.c Hazardous Waste Load Check and Collection**

Hazardous waste is not accepted for disposal at the Mecca II Landfill. The Department implements a Hazardous Waste Inspection Program to detect and prevent landfill disposal of hazardous waste as required by California Code of Regulations (CCR) Title 27, Section 20870 and to comply with Riverside County Ordinance No. 779. Waste Inspection staff perform random load checks on incoming refuse to the Site. When hazardous materials are found, the customer is informed that the materials are not accepted at the site and are provided with the proper methods of disposal. When hazardous materials are found without a responsible party, Waste Inspection staff remove the materials from the Site on the same day and transport to the Department's Central Accumulation Facility (CAF) at the Lamb Canyon Landfill in Beaumont, California or an approved off-site facility. All hazardous waste stored at the Lamb Canyon CAF is sent to an approved treatment, storage, and disposal facility for further handling. The Lamb Canyon CAF is permitted by the Department of Toxic Substance Control Act as a Permit-By-Rule Permanent Household Hazardous Waste Collection Facility (PHHWCF). No hazardous materials are stored overnight at the Site.

Due to the procedures outlined in the Department's Hazardous Waste Inspection and HHW Collection programs, hazardous waste has little to no exposure to storm water. Hazardous waste may be directly exposed to storm water by spilling or leaking these hazardous wastes. It may be indirectly exposed to storm water by being dumped with other waste, and soaking into the soil.

Potential sources of pollution within the hazardous waste metal storage container is as follows:

- Leaks from containers containing hazardous wastes including but not limited to: antifreeze, batteries (lead acid and alkaline), used oil and filters, cooking oil, paint care products, aerosols, florescent bulbs, smoke detectors, pesticides, cleaners, chlorine bleach, thinners, pool supplies, hairsprays, etc.

### **E.3 Dust and Particulate Generating Activities**

Active daily cover excavation areas, unpaved roads, stockpiles, and other active disturbed areas (as show on Figure 2 – Site Map and Active Areas) are potential sources for generating dust and particulate on-site. These activities can create airborne dust that can travel within and outside of the site.

### **E.4 Significant Spills and Leaks**

There have been no significant spills or leaks of toxic or hazardous pollutants released into storm water runoff within the last 5-year period. The Department has created a Hazardous Waste Inspection Program Guide to address any potential spills that may occur at the Site.

### **E.5 Non-Storm Water Discharges (NSWDs)**

No illicit contributions to the storm water discharge shall exist at the Site. The Department does not plan on authorized NSWDs occurring at the Site.

### **E.6 Erodible Surfaces**

Erodible surfaces at the Site include the active borrow area, landfill disposal area, and surrounding natural areas located within the landfill property. Erosion control methods utilized at the Site for these erodible surfaces are described in Section G.1.e Erosion and Sediment Controls. In addition, the Site is surrounded by natural terrain which is susceptible to natural erosion that may come into contact with storm water. Any erosion observed on-site will be noted and necessary measures (i.e. structural drainage improvements or best management practices) will be taken to repair the erosion and prevent future erosions from developing.

## **F. Assessment of Potential Pollutant Sources**

The descriptive narrative of all industrial pollutant sources located at the Site can be found in this document under Section E List of Industrial Materials and Potential Pollutant Source. The characteristics and quantities of all potential pollutants materials that are handled, produced, stored, recycled, or disposed at the Site can be found in the Department's Waste Recycling Program Guide, Hazardous Waste Inspection Program, Household Hazardous Waste Collection Program, and Waste Acceptance Policy Guide. The description of the assessment of the potential pollutant sources and corresponding BMPs at the Site are listed in Table 1 – Industrial Activities, Pollutant Sources, Industrial Pollutants, and Corresponding BMP Measures and Section G Best Management Practices (BMPs). The effectiveness of the in-place BMP measures are evaluated as part of the routine site inspections conducted by the Pollution Prevention Team.

## **G. Best Management Practices (BMPs)**

It is the Department's goal to prevent and/or reduce the potential pollutants described in Section E from coming into contact with storm water discharges by implementing site-specific BMPs as deemed necessary. The two types of BMPs implemented at the Site are non-structural (Minimum BMPs) and structural (Advanced BMPs). Non-structural BMPs generally consist of processes, prohibitions, procedures, schedule of activities, etc., that prevent pollutants associated with industrial activity from coming in contact with storm water. Structural BMPs generally consist of structural devices that reduce or prevent pollutants associated with industrial activity from coming in contact with storm water. The following sections describe the minimum and advanced BMPs implemented and maintained at the Site:

### **G.1 Minimum BMPs**

The following is a description of the Minimum BMPs that are implemented and maintained at the Site to reduce or prevent pollutants in industrial storm water discharges:

#### **G.1.a Good Housekeeping**

Good housekeeping consists of practical procedures that are implemented on a regular basis to maintain a clean and orderly facility. Site inspections performed by Department personnel as described in Section H, which aid in ensuring that appropriate good housekeeping practices are being successfully implemented. Any areas that are not in compliance with the Department's good housekeeping requirements are documented and immediately addressed.

Active excavation areas, unpaved roads, stockpiles and other active disturbed areas are watered as necessary with a water truck to control dust generation. Dust generation is also reduced by the waste load cover requirement and the 15 mph vehicle speed limit throughout the landfill property.

Along with Site Operations staff, the Department's Landfill Maintenance and Litter Control Crew are responsible for litter control, site maintenance, and site improvements at the site. During each operation day, Operations and/or Litter Control staff pickup wind-blown litter, thus keeping the litter out of drainage areas and decreasing the probability of contaminants coming into contact with storm water runoff.

The Landfill Maintenance and Litter Control Crew is utilized to construct, repair, and maintain the surface drainage system throughout the Site. The duties of this crew include but are not limited to the following: construction of asphalt drains and bench crossing, installation of metal flume down drains, placement of sandbag check dams within drainage channels to capture sediment, and removal of accumulated sediment from drains and catch basins.

Vehicle spills, such as oil, brake fluid, etc. will be cleaned up immediately and contaminated soil properly disposed of. All hazardous wastes, including equipment maintenance waste are

immediately removed from the Site and disposed of pursuant to the applicable Federal, State, and local laws, regulations, and ordinances.

#### **G.1.b Preventive Maintenance**

Protection against potential erosion damage due to storm water runoff is provided by implementing and maintaining the site's BMPs as verified through regular inspections. Monthly and NPDES site inspections are conducted by Department personnel in order to identify problems and/or needed improvements of the surface drainage system and BMP measures. Areas of concern that are noted on the inspection reports are corrected in orderly and timely manners. Positive gradients along drainage benches and planer work areas are maintained to ensure proper drainage and to prevent erosion.

Municipal solid waste, engine oil, waste oil, diesel fuel, and lubricating fluids are handled as described in Section E in order to prevent the contact of these potential pollutant sources with storm water runoff.

#### **G.1.c Spill and Leak Prevention and Response**

As part of walk-around equipment inspections, operations staff looks for and report leaks/spills to aid in repairing the equipment as soon as possible. The equipment is on a set maintenance schedule and is maintained regularly. If a piece of equipment has minor leaks, plastic and/or drip pans are used to catch any leaking fluids. Any spills or leaks are cleaned up according to the Hazardous Waste Inspection Program Guide. Equipment and/or vehicles are not typically stored at the Site.

#### **G.1.d Material Handling and Waste Management**

As discussed in Section E.2, no materials are stored on-site. In general, materials are handled to minimize the potential for spills and leaks and also to minimize exposure of significant materials coming into contact with storm water runoff.

All materials or wastes on site are handled as little as possible in order to reduce the chance of spills through human error. All equipment is fueled, serviced, and repaired off-site prior to delivery for Site opening. Hazardous waste that is found on site is removed from the Site by the end of the operation day. Metals and other recyclables are placed in metal roll-off bins and immediately removed from the Site. Waste is covered with soil at the end of business hours. Stockpiled materials are located away from storm water flows. Trash generated by site personnel and other miscellaneous activities at the site are collected in trash receptacles and disposed of at the active disposal pad.

On days that the site is open, a portable chemical toilet is typically delivered to the site for use by onsite personnel. The portable chemical toilet is removed immediately after the Site is non-operational. The typical portable toilet is a self-enclosed structure, constructed of high strength fiberglass material, equipped with secondary containment. The contaminants that are likely to be present are human waste, portable toilet chemicals, and toiletries. The potential for these contaminants to come in contact with storm water is low since they are contained within a self-enclosed structure that is equipped with secondary containment.

#### **G.1.e Erosion and Sediment Controls**

It is the Department's goal to prevent water ponding and reduce erosion by means of good facility design and routine site maintenance. The site is designed to divert surface drainage away from the landfill areas. Appropriate drainage structures are constructed as sections of the landfill are being completed. A high-density polyethylene (HDPE) down drain has been installed on the southeast portion of the landfill disposal area. A Rip-rap pad was installed at the bottom of this down-drain

to help to reduce erosion at the bottom of the drain. Earthen berms along the hinges of the landfill's top deck are installed as necessary to guide surface water runoff into the down drain located on landfill slopes. Uniformly graded side slopes and adequate down gradient along benches and top deck areas promote proper drainage within the site. Long term stockpiles of earthen material are established at reasonable distances from major drainage courses, and are typically compacted or covered to minimize erosion damage and sediment runoff. In accordance with CCR Title 27 requirements, refuse within the landfill area is covered at the end of each operation day to ensure that refuse material does not come into contact with storm water.

Erosion control BMP measures protect the soil surface by covering and/or binding soil particles to limit the mobility of soil. The locations of current erosion control BMPs are shown on Figure 4 – BMP Implementation Map.

The Department implements fugitive dust control measures at the Site to comply with South Coast Air Quality Management District (SCAQMD) Rule 403 – Fugitive Dust. Active excavation areas, unpaved roads, stockpiles, and other active disturbed areas are watered as necessary with a water truck to control dust generation. Dust generation is also reduced by the waste load cover requirement and the 15 mph vehicle speed limit throughout the landfill property.

Site stabilization is maintained by conducting grading activities in a manner which, if possible, allows for phased construction at the site, thus minimizing the disturbance of native areas. Grading activities shall not block, divert, or impact drainage courses.

Track out has not been observed at the site, so no stabilized construction entrance is in place right now. If track out is found in the future, a rock apron and rumble racks will be installed as necessary to stabilize construction zones.

In addition to current erosion control devices being implemented, the following may be used in the future if deemed necessary: sandbags, gravel bags, fiber rolls, silt fences, and sedimentation basins.

#### **G.1.f Employee Training Program**

On an annual basis, site supervisors, technicians, and engineers from the Engineering, Environmental, and Operation divisions are required to attend a NPDES Storm Water Quality training class. This class discusses personnel responsibility for implementing the various compliance activities of the General Permit, BMP implementation and evaluations, BMP observations, monitoring activities, overview of the Monitoring Implantation Plan (MIP) and elements of the SWPPP. The class also discusses the types of pollutants typically encountered during construction and industrial/commercial activities, and provides information on the different types of BMPs available to control them. The class is conducted by trained Department staff.

Site facility personnel are also educated on pollution control laws and regulations during their initial hiring and at least once a year thereafter. A spill prevention review is provided annually to operation personnel to ensure adequate understanding of spill response and any past spill events or failures are discussed and staff is updated on any recently developed precautionary measures. Training on oil spill prevention, containment and retrieval methods are also provided to select staff from Operation during the annual hazardous materials business emergency plan training.

In addition to the load check program performed by the Department's Hazardous Waste Section, all site personnel are trained at a "Hazardous Waste Awareness" level and instructed on how to properly identify hazardous waste. This training also provides instruction on the proper

procedures that are to be followed when hazardous waste is identified in refuse loads. Only personnel from the Environmental Division's Hazardous Waste Section are allowed to handle hazardous waste materials discovered within the waste stream. Hazardous Waste Section personnel are trained in-house, on the job, and by professional instructors to be "first responder" and CPR certified. In addition, Engineering, Environmental, and Operation Supervision personnel are required to attend a 40-hour Hazardous Waste Operator Emergency Response (HAZWOPER) training course to become certified, and an annual 8-hour refresher course thereafter to maintain certification.

The Department maintains all documentation of all completed training classes and personnel that received training for five (5) years in the Department's electronic Training and Document Tracking Database (TaDTP).

### **G.1.g Quality Assurance and Record Keeping**

After each site inspection, Department personnel transmit any information regarding the inspection, spills, maintenance activities, corrective actions, visual observations, etc. to the Senior Civil Engineer in charge of the Site. A work plan is then designed and implemented to address items noted in the site inspection report. The Department is in the process of developing a digital tracking spreadsheet that will include the following: date and type of inspection, short description of all noted items, corresponding repair plan and BMPs to be implemented, date repair work was completed.

The Department has developed management procedures to ensure that appropriate Department staff implements all elements of this SWPPP. This information is discussed in Section H.

## **G.2 Advanced BMPs**

The following is a description of the Advanced BMPs that are implemented and maintained at the Site to reduce or prevent discharges of pollutants in storm water discharges in a manner that reflects best industry practice considering technological availability, economic practicability, and achievability:

### **G.2.a Control Devices**

Surface runoff is controlled and conveyed through the Site by maintaining an approximate three percent minimum drainage gradient and with the use of various drainage structures located strategically throughout the Site as shown in Figure 3 – Surface Drainage Map. The following is a list of current drainage control devices that have been implemented at the site:

#### **G.2.a.1 Earthen Berms**

Earthen berms are utilized along the top deck of the landfill unit to quickly divert surface runoff into down drain channels. In addition, perimeter earthen berms are used to convey off-site runoff away from the landfill areas.

#### **G.2.a.2 Track-Walking Slopes**

Slopes without vegetation are track-walked so the soil material on the slope is compacted and horizontal divots are created. This decreases the velocity of storm water flow and aids in preventing slope erosion. This type of slope maintenance is done on an as needed basis.

#### **G.2.a.3 Velocity Dissipation Devices**

Velocity dissipation devices are constructed of rip-rap stone pads that are typically located at the downstream end of drainage structures. This BMP measure slows the velocity of concentrated storm water flows and also reduces soil sediment contamination of storm water. Velocity dissipation devices are maintained by site personnel as deemed necessary.

### **G.3 Design Storm Standards for Treatment Control BMPs**

Existing surface drainage control structures were designed to handle storm water runoff from a 100 year, 24-hour frequency storm. This design method is a more conservative approach than what is required in the General Permit, Section X.H.6. However, starting July 1, 2015, any new treatment control BMPs (as described in the General Permit Section X.H.2.b.iii.) or drainage structures to be installed at the Site will be designed in accordance with the General Permit Section X.H.6, for the 85th Percentile, 24-hour Storm Event for the Site.

## **H. Monitoring Implementation Plan (MIP)**

The Department has developed a Monitoring Implementation Plan in accordance with the requirements of the General Permit. The following sections describe the site specific monitoring implementation plan.

### **H.1 Team Members for MIP**

Engineers and technicians from the Department's Environmental Division are responsible for performing monthly visual observations, discharge sampling event visual observations and discharge sample collection. Depending on the date and time of storm events, site operations personnel may be utilized to conduct inspections, visual observations, and sampling.

### **H.2 Discharge Locations**

The following table summarizes the discharge locations at the Mecca II Sanitary Landfill:

Discharge I.D.	Discharge Location
MIISW01	West side of the site, asphalt down drain

Mecca II Sanitary Landfill discharge locations are illustrated on Figure 3 – Surface Drainage Map.

### **H.3 Monthly Visual Observations Procedures**

The Department shall visually observe each drainage area discharge point at least once per calendar month, on the select days when the facility is scheduled to open. The monthly visual observations shall be conducted during landfill operation hours and on days without precipitation.

The discharge point shall be observed for the visual presence or indications of prior, current or potential unauthorized non-storm water discharges (NSWDs) and their source(s). Possible NSWDs that could occur at the landfill include spills and leaks of leachate or gas condensate.

The Department shall also visually observe the drainage areas where landfill activities and all supporting activities are ongoing. Observation areas shall include all areas identified in the SWPPP as potential pollutant sources. In addition, the Department will observe the condition and operation of structural BMPs. Deficiencies or maintenance of the BMPs will be identified so that appropriate action can be completed. Suggestions for supplemental BMPs will also be included, where appropriate, when monthly visual observations are performed.

At this time, the Department has no authorized NSWDs discharges at the site. In the future, if the Department has an authorized NSWDs, the Department shall update the SWPPP and MIP to reflect the site change.

### **H.4 Sampling Event Visual Observation Procedures**

Sampling event visual observations shall be conducted at the same time sampling occurs at a discharge location. At each discharge location where a sample is obtained, the Department shall visually observe and record the presence or absence of floating and suspended materials, oil and grease, discoloration, turbidity, odors, trash/debris and sources(s) of any discharged pollutants.

If the Department is not able to visually observe a discharge location during the sampling event, the Department shall record which discharge locations were not observed during the sampling event and

the reason why observations were not completed.

#### **H.5 Sampling Procedures**

The Department shall collect and analyze storm water samples from two (2) qualifying storm events (QSEs) within the first half of each reporting year (July 1 to December 31) and two (2) QSEs within the second half of each reporting year (January 1 to June 30). A QSE is a precipitation event that produces a discharge for a least one drainage area and is preceded by 48-hours with no discharge from any drainage area. Sampling events shall be limited to the days that the facility is open and operating.

The Department shall collect samples from each discharge location within four (4) hours of the start of the discharge. If the QSE begins within the previous 12-hour period before facility operating hours, the Department shall collect samples within four (4) hours of the facility opening. For example, if the QSE begins on Monday morning at 1AM, continues until 2PM, and the landfill opens at 6AM on Monday, the Department shall have from 6AM until 10AM to collect stormwater discharge samples.

Sample collection shall be conducted during facility operating hours and when sampling conditions are not restricted due to dangerous weather conditions. Dangerous weather conditions include flooding, electrical storms or when storm size/intensity prohibits safe ingress and egress from discharge sample locations.

Sampling procedures for obtaining a discharge sample is as follows:

- 1) Collect stormwater samples from the discharge locations identified on the SWPPP map, or as specifically directed.
- 2) Some stormwater discharge sample locations have a sampler sump (generally those discharge locations that convey stormwater over concrete).
- 3) When stormwater flow is of sufficient rate/volume, collect the stormwater samples directly upstream of the sampling sump.
- 4) Samples shall be collected from the horizontal and vertical center of the flow line, from a turbulent section of the flow.
- 5) Minimize stirring up bottom sediments in the discharge channel; avoid touching the bottom or sides of the stormwater channel.
- 6) Hold the sampling container so the opening faces upstream.
- 7) Avoid touching the inside of the container to prevent cross contamination.
- 8) Keep the sample free from uncharacteristic debris. Debris that is typical of the discharge is OK.
- 9) Fill the bottle to the appropriate level depending on the analyte to be tested, without overfilling the container.
- 10) VOC sample bottles need to be filled differently than all other sample bottles. Slowly fill VOC sample bottles until a reverse meniscus is formed over the top of the collection bottle (the surface of the water should be convex). Carefully and immediately screw the cap onto the bottle. A small amount of water should drip from the bottle when the cap is screwed on. Once the cap is secured tight, turn the bottle over (cap side down) and gently tap the bottle. The sample has been collected properly if there are no air bubbles visible.
- 11) When stormwater flow is NOT of sufficient rate/volume to allow sample collection directly from the stormwater channel, the sump will be utilized to facilitate sampling.



- 12) Remove standing water from the sump.
- 13) Hold the sample container in the sump, in the void space of the sump, and allow the stormwater to flow directly into the sample container.
- 14) Repeats steps 3 through 13 as many times as is necessary to collect the required number of sample bottles.

#### **H.6 Visual Observation Response Procedures**

The Environmental Division shall submit monthly visual observations, sampling event visual observations and laboratory test results to the Engineering Division for review. The Engineering Division shall assess the merits and significance of the visual conditions documented and recommendations provided by the Environmental Division. As determined appropriate by the Engineering Division, the Engineering Division shall revise the SWPPP based on the visual observations and recommendations. SWPPP revisions shall include revised BMPs, as necessary, when the visual observations indicate pollutant sources have not been adequately addressed in the SWPPP. If the SWPPP has adequately addressed the pollutant source and corresponding BMPs, but the visual observations are a result of improper BMP implementation, then an appropriate remedy shall be implemented. The implementation schedule of any such remedy shall be determined by the Engineering Division.

#### **H.7 Field Monitoring Instrument Calibration Procedure**

The Department shall utilize field monitoring instruments to analyze the discharge samples for pH. The Department is utilizing an Hanna Instrument HI 98127/HI 98128 and the field monitoring instrument calibration instructions are as follows:

From normal measuring mode, press and hold the MODE button until OFF on the secondary LCD is replaced by CAL. Release the button. The LCD enters the calibration mode displaying “pH 7.01 USE” (or “pH 6.86 USE” if the NIST buffer set was selected)

After 1 second the meter activates the automatic buffer recognition feature. If a valid buffer is detected then its value is shown on the primary display and REC appears on the secondary LCD. If no valid buffer is detected, the meter keeps the USE indication active for 12 seconds, and then it replaces it with WRNG, indicating the sample being measured is not a valid buffer.

For a two-point calibration, place the electrode in pH 7.01 (or pH 6.86) buffer. After the first calibration point has been accepted, the “pH 4.01 USE” ;message appears. The message is held for 12 seconds, unless a valid buffer is recognized. If no valid buffer is recognized, then the WRNG message is shown. If a valid buffer (pH 4.01, pH 10.01 or pH 9.18) is detected then the meter completes the calibration procedure. When the buffer is accepted, the LCD shows the accepted value with the “OK 2” message and then the meter returns to the normal measuring mode.

For better accuracy, frequent calibration of the instrument is recommended. In addition, the instrument must be recalibrated whenever:

- a) The pH electrode is replaced.
- b) After testing aggressive chemicals.
- c) Where high accuracy is required
- d) At least once a month

#### **H.8 Visual Observation Records**

Visual observation records shall include the date, approximate time, locations observed, presence and probably source of any observed pollutants, name of person(s) that conducted the observations and any response action(s) and/or additional SWPPP revision(s) necessary in response to the visual observations.

All discharge samples submitted for laboratory analysis shall be transported with chain of custody documentation (refer to Figure 5 – Chain of Custody Form)Figure 5 – Chain of Custody Form.

The Department shall retain, for a period of at least five (5) years, either a paper or electronic copy of all storm water monitoring information, records, data and reports required by this General Permit. Copies shall be kept at the Department Headquarters, located at 14310 Frederick Street, Moreno Valley, CA.

## **I. References**

California State Water Resources Control Board, Order 2014-0057-DWQ DWQ National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated With Industrial Activities, April 1, 2014.

California State Water Resources Control Board, Order No. 01-142, Waste Discharge Requirements for Mecca II Sanitary Landfill, November 14, 2001.

Riverside County Waste Management Department, Emergency Action Plan – Mecca II Sanitary Landfill, September 2014.

Riverside County Waste Management Department, Hazardous Waste Inspection Program Guide, February 2014

Riverside County Waste Management Department, Waste Acceptance Policy Guide, April 2014


Riverside County Waste Management Department, Waste Recycling Program Guide, February 2014

Riverside County Waste Management Department, Mecca II Hydrology Study, January 2015.

Riverside County Department of Environmental Health/ Local Enforcement Agency, Solid Waste Facility Permit – Mecca II Sanitary Landfill, January 15, 2015.

## J. Statement of Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

  
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Jeff L. Gow, P.E.  
Senior Civil Engineer  
Riverside County Department of Waste Resources



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## **Appendix C**

# **South Coast Air Quality Management District (SCAQMD), Rule 1150 Excavation Permit**

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## **Appendix D**

### **South Coast Air Quality Management District (SCAQMD), Rule 403 and 403.1 (Supplemental for Coachella Valley) Fugitive Dust**

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(Adopted May 7, 1976) (Amended November 6, 1992)  
(Amended July 9, 1993) (Amended February 14, 1997)  
(Amended December 11, 1998)(Amended April 2, 2004)  
(Amended June 3, 2005)

**RULE 403. FUGITIVE DUST**

(a) Purpose

The purpose of this Rule is to reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (man-made) fugitive dust sources by requiring actions to prevent, reduce or mitigate fugitive dust emissions.

(b) Applicability

The provisions of this Rule shall apply to any activity or man-made condition capable of generating fugitive dust.

(c) Definitions

- (1) ACTIVE OPERATIONS means any source capable of generating fugitive dust, including, but not limited to, earth-moving activities, construction/demolition activities, disturbed surface area, or heavy- and light-duty vehicular movement.
- (2) AGGREGATE-RELATED PLANTS are defined as facilities that produce and / or mix sand and gravel and crushed stone.
- (3) AGRICULTURAL HANDBOOK means the region-specific guidance document that has been approved by the Governing Board or hereafter approved by the Executive Officer and the U.S. EPA. For the South Coast Air Basin, the Board-approved region-specific guidance document is the Rule 403 Agricultural Handbook dated December 1998. For the Coachella Valley, the Board-approved region-specific guidance document is the Rule 403 Coachella Valley Agricultural Handbook dated April 2, 2004.
- (4) ANEMOMETERS are devices used to measure wind speed and direction in accordance with the performance standards, and maintenance and calibration criteria as contained in the most recent Rule 403 Implementation Handbook.
- (5) BEST AVAILABLE CONTROL MEASURES means fugitive dust control actions that are set forth in Table 1 of this Rule.

- (6) BULK MATERIAL is sand, gravel, soil, aggregate material less than two inches in length or diameter, and other organic or inorganic particulate matter.
- (7) CEMENT MANUFACTURING FACILITY is any facility that has a cement kiln at the facility.
- (8) CHEMICAL STABILIZERS are any non-toxic chemical dust suppressant which must not be used if prohibited for use by the Regional Water Quality Control Boards, the California Air Resources Board, the U.S. Environmental Protection Agency (U.S. EPA), or any applicable law, rule or regulation. The chemical stabilizers shall meet any specifications, criteria, or tests required by any federal, state, or local water agency. Unless otherwise indicated, the use of a non-toxic chemical stabilizer shall be of sufficient concentration and application frequency to maintain a stabilized surface.
- (9) COMMERCIAL POULTRY RANCH means any building, structure, enclosure, or premises where more than 100 fowl are kept or maintained for the primary purpose of producing eggs or meat for sale or other distribution.
- (10) CONFINED ANIMAL FACILITY means a source or group of sources of air pollution at an agricultural source for the raising of 3,360 or more fowl or 50 or more animals, including but not limited to, any structure, building, installation, farm, corral, coop, feed storage area, milking parlor, or system for the collection, storage, or distribution of solid and liquid manure; if domesticated animals, including horses, sheep, goats, swine, beef cattle, rabbits, chickens, turkeys, or ducks are corralled, penned, or otherwise caused to remain in restricted areas for commercial agricultural purposes and feeding is by means other than grazing.
- (11) CONSTRUCTION/DEMOLITION ACTIVITIES means any on-site mechanical activities conducted in preparation of, or related to, the building, alteration, rehabilitation, demolition or improvement of property, including, but not limited to the following activities: grading, excavation, loading, crushing, cutting, planing, shaping or ground breaking.
- (12) CONTRACTOR means any person who has a contractual arrangement to conduct an active operation for another person.
- (13) DAIRY FARM is an operation on a property, or set of properties that are contiguous or separated only by a public right-of-way, that raises cows or

produces milk from cows for the purpose of making a profit or for a livelihood. Heifer and calf farms are dairy farms.

- (14) **DISTURBED SURFACE AREA** means a portion of the earth's surface which has been physically moved, uncovered, destabilized, or otherwise modified from its undisturbed natural soil condition, thereby increasing the potential for emission of fugitive dust. This definition excludes those areas which have:
  - (A) been restored to a natural state, such that the vegetative ground cover and soil characteristics are similar to adjacent or nearby natural conditions;
  - (B) been paved or otherwise covered by a permanent structure; or
  - (C) sustained a vegetative ground cover of at least 70 percent of the native cover for a particular area for at least 30 days.
- (15) **DUST SUPPRESSANTS** are water, hygroscopic materials, or non-toxic chemical stabilizers used as a treatment material to reduce fugitive dust emissions.
- (16) **EARTH-MOVING ACTIVITIES** means the use of any equipment for any activity where soil is being moved or uncovered, and shall include, but not be limited to the following: grading, earth cutting and filling operations, loading or unloading of dirt or bulk materials, adding to or removing from open storage piles of bulk materials, landfill operations, weed abatement through disking, and soil mulching.
- (17) **DUST CONTROL SUPERVISOR** means a person with the authority to expeditiously employ sufficient dust mitigation measures to ensure compliance with all Rule 403 requirements at an active operation.
- (18) **FUGITIVE DUST** means any solid particulate matter that becomes airborne, other than that emitted from an exhaust stack, directly or indirectly as a result of the activities of any person.
- (19) **HIGH WIND CONDITIONS** means that instantaneous wind speeds exceed 25 miles per hour.
- (20) **INACTIVE DISTURBED SURFACE AREA** means any disturbed surface area upon which active operations have not occurred or are not expected to occur for a period of 20 consecutive days.
- (21) **LARGE OPERATIONS** means any active operations on property which contains 50 or more acres of disturbed surface area; or any earth-moving operation with a daily earth-moving or throughput volume of 3,850 cubic

meters (5,000 cubic yards) or more three times during the most recent 365-day period.

- (22) **OPEN STORAGE PILE** is any accumulation of bulk material, which is not fully enclosed, covered or chemically stabilized, and which attains a height of three feet or more and a total surface area of 150 or more square feet.
- (23) **PARTICULATE MATTER** means any material, except uncombined water, which exists in a finely divided form as a liquid or solid at standard conditions.
- (24) **PAVED ROAD** means a public or private improved street, highway, alley, public way, or easement that is covered by typical roadway materials, but excluding access roadways that connect a facility with a public paved roadway and are not open to through traffic. Public paved roads are those open to public access and that are owned by any federal, state, county, municipal or any other governmental or quasi-governmental agencies. Private paved roads are any paved roads not defined as public.
- (25) **PM<sub>10</sub>** means particulate matter with an aerodynamic diameter smaller than or equal to 10 microns as measured by the applicable State and Federal reference test methods.
- (26) **PROPERTY LINE** means the boundaries of an area in which either a person causing the emission or a person allowing the emission has the legal use or possession of the property. Where such property is divided into one or more sub-tenancies, the property line(s) shall refer to the boundaries dividing the areas of all sub-tenancies.
- (27) **RULE 403 IMPLEMENTATION HANDBOOK** means a guidance document that has been approved by the Governing Board on April 2, 2004 or hereafter approved by the Executive Officer and the U.S. EPA.
- (28) **SERVICE ROADS** are paved or unpaved roads that are used by one or more public agencies for inspection or maintenance of infrastructure and which are not typically used for construction-related activity.
- (29) **SIMULTANEOUS SAMPLING** means the operation of two PM<sub>10</sub> samplers in such a manner that one sampler is started within five minutes of the other, and each sampler is operated for a consecutive period which must be not less than 290 minutes and not more than 310 minutes.
- (30) **SOUTH COAST AIR BASIN** means the non-desert portions of Los Angeles, Riverside, and San Bernardino counties and all of Orange

County as defined in California Code of Regulations, Title 17, Section 60104. The area is bounded on the west by the Pacific Ocean, on the north and east by the San Gabriel, San Bernardino, and San Jacinto Mountains, and on the south by the San Diego county line.

- (31) **STABILIZED SURFACE** means any previously disturbed surface area or open storage pile which, through the application of dust suppressants, shows visual or other evidence of surface crusting and is resistant to wind-driven fugitive dust and is demonstrated to be stabilized. Stabilization can be demonstrated by one or more of the applicable test methods contained in the Rule 403 Implementation Handbook.
  - (32) **TRACK-OUT** means any bulk material that adheres to and agglomerates on the exterior surface of motor vehicles, haul trucks, and equipment (including tires) that have been released onto a paved road and can be removed by a vacuum sweeper or a broom sweeper under normal operating conditions.
  - (33) **TYPICAL ROADWAY MATERIALS** means concrete, asphaltic concrete, recycled asphalt, asphalt, or any other material of equivalent performance as determined by the Executive Officer, and the U.S. EPA.
  - (34) **UNPAVED ROADS** means any unsealed or unpaved roads, equipment paths, or travel ways that are not covered by typical roadway materials. Public unpaved roads are any unpaved roadway owned by federal, state, county, municipal or other governmental or quasi-governmental agencies. Private unpaved roads are all other unpaved roadways not defined as public.
  - (35) **VISIBLE ROADWAY DUST** means any sand, soil, dirt, or other solid particulate matter which is visible upon paved road surfaces and which can be removed by a vacuum sweeper or a broom sweeper under normal operating conditions.
  - (36) **WIND-DRIVEN FUGITIVE DUST** means visible emissions from any disturbed surface area which is generated by wind action alone.
  - (37) **WIND GUST** is the maximum instantaneous wind speed as measured by an anemometer.
- (d) **Requirements**
- (1) No person shall cause or allow the emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area such that:

- (A) the dust remains visible in the atmosphere beyond the property line of the emission source; or
  - (B) the dust emission exceeds 20 percent opacity (as determined by the appropriate test method included in the Rule 403 Implementation Handbook), if the dust emission is the result of movement of a motorized vehicle.
- (2) No person shall conduct active operations without utilizing the applicable best available control measures included in Table 1 of this Rule to minimize fugitive dust emissions from each fugitive dust source type within the active operation.
- (3) No person shall cause or allow PM<sub>10</sub> levels to exceed 50 micrograms per cubic meter when determined, by simultaneous sampling, as the difference between upwind and downwind samples collected on high-volume particulate matter samplers or other U.S. EPA-approved equivalent method for PM<sub>10</sub> monitoring. If sampling is conducted, samplers shall be:
- (A) Operated, maintained, and calibrated in accordance with 40 Code of Federal Regulations (CFR), Part 50, Appendix J, or appropriate U.S. EPA-published documents for U.S. EPA-approved equivalent method(s) for PM<sub>10</sub>.
  - (B) Reasonably placed upwind and downwind of key activity areas and as close to the property line as feasible, such that other sources of fugitive dust between the sampler and the property line are minimized.
- (4) No person shall allow track-out to extend 25 feet or more in cumulative length from the point of origin from an active operation. Notwithstanding the preceding, all track-out from an active operation shall be removed at the conclusion of each workday or evening shift.
- (5) No person shall conduct an active operation with a disturbed surface area of five or more acres, or with a daily import or export of 100 cubic yards or more of bulk material without utilizing at least one of the measures listed in subparagraphs (d)(5)(A) through (d)(5)(E) at each vehicle egress from the site to a paved public road.
- (A) Install a pad consisting of washed gravel (minimum-size: one inch) maintained in a clean condition to a depth of at least six inches and extending at least 30 feet wide and at least 50 feet long.

- (B) Pave the surface extending at least 100 feet and at least 20 feet wide.
  - (C) Utilize a wheel shaker/wheel spreading device consisting of raised dividers (rails, pipe, or grates) at least 24 feet long and 10 feet wide to remove bulk material from tires and vehicle undercarriages before vehicles exit the site.
  - (D) Install and utilize a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the site.
  - (E) Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the actions specified in subparagraphs (d)(5)(A) through (d)(5)(D).
- (6) Beginning January 1, 2006, any person who operates or authorizes the operation of a confined animal facility subject to this Rule shall implement the applicable conservation management practices specified in Table 4 of this Rule.
- (e) Additional Requirements for Large Operations
- (1) Any person who conducts or authorizes the conducting of a large operation subject to this Rule shall implement the applicable actions specified in Table 2 of this Rule at all times and shall implement the applicable actions specified in Table 3 of this Rule when the applicable performance standards can not be met through use of Table 2 actions; and shall:
    - (A) submit a fully executed Large Operation Notification (Form 403 N) to the Executive Officer within 7 days of qualifying as a large operation;
    - (B) include, as part of the notification, the name(s), address(es), and phone number(s) of the person(s) responsible for the submittal, and a description of the operation(s), including a map depicting the location of the site;
    - (C) maintain daily records to document the specific dust control actions taken, maintain such records for a period of not less than three years; and make such records available to the Executive Officer upon request;

- (D) install and maintain project signage with project contact signage that meets the minimum standards of the Rule 403 Implementation Handbook, prior to initiating any earthmoving activities;
  - (E) identify a dust control supervisor that:
    - (i) is employed by or contracted with the property owner or developer;
    - (ii) is on the site or available on-site within 30 minutes during working hours;
    - (iii) has the authority to expeditiously employ sufficient dust mitigation measures to ensure compliance with all Rule requirements;
    - (iv) has completed the AQMD Fugitive Dust Control Class and has been issued a valid Certificate of Completion for the class; and
  - (F) notify the Executive Officer in writing within 30 days after the site no longer qualifies as a large operation as defined by paragraph (c)(18).
- (2) Any Large Operation Notification submitted to the Executive Officer or AQMD-approved dust control plan shall be valid for a period of one year from the date of written acceptance by the Executive Officer. Any Large Operation Notification accepted pursuant to paragraph (e)(1), excluding those submitted by aggregate-related plants and cement manufacturing facilities must be resubmitted annually by the person who conducts or authorizes the conducting of a large operation, at least 30 days prior to the expiration date, or the submittal shall no longer be valid as of the expiration date. If all fugitive dust sources and corresponding control measures or special circumstances remain identical to those identified in the previously accepted submittal or in an AQMD-approved dust control plan, the resubmittal may be a simple statement of no-change (Form 403NC).
- (f) **Compliance Schedule**  
The newly amended provisions of this Rule shall become effective upon adoption. Pursuant to subdivision (e), any existing site that qualifies as a large operation will have 60 days from the date of Rule adoption to comply with the notification and recordkeeping requirements for large operations. Any Large Operation



Notification or AQMD-approved dust control plan which has been accepted prior to the date of adoption of these amendments shall remain in effect and the Large Operation Notification or AQMD-approved dust control plan annual resubmittal date shall be one year from adoption of this Rule amendment.

(g) Exemptions

(1) The provisions of this Rule shall not apply to:

- (A) Dairy farms.
- (B) Confined animal facilities provided that the combined disturbed surface area within one continuous property line is one acre or less.
- (C) Agricultural vegetative crop operations provided that the combined disturbed surface area within one continuous property line and not separated by a paved public road is 10 acres or less.
- (D) Agricultural vegetative crop operations within the South Coast Air Basin, whose combined disturbed surface area includes more than 10 acres provided that the person responsible for such operations:
  - (i) voluntarily implements the conservation management practices contained in the Rule 403 Agricultural Handbook;
  - (ii) completes and maintains the self-monitoring form documenting sufficient conservation management practices, as described in the Rule 403 Agricultural Handbook; and
  - (iii) makes the completed self-monitoring form available to the Executive Officer upon request.
- (E) Agricultural vegetative crop operations outside the South Coast Air Basin whose combined disturbed surface area includes more than 10 acres provided that the person responsible for such operations:
  - (i) voluntarily implements the conservation management practices contained in the Rule 403 Coachella Valley Agricultural Handbook; and
  - (ii) completes and maintains the self-monitoring form documenting sufficient conservation management practices, as described in the Rule 403 Coachella Valley Agricultural Handbook; and
  - (iii) makes the completed self-monitoring form available to the Executive Officer upon request.

- (F) Active operations conducted during emergency life-threatening situations, or in conjunction with any officially declared disaster or state of emergency.
  - (G) Active operations conducted by essential service utilities to provide electricity, natural gas, telephone, water and sewer during periods of service outages and emergency disruptions.
  - (H) Any contractor subsequent to the time the contract ends, provided that such contractor implemented the required control measures during the contractual period.
  - (I) Any grading contractor, for a phase of active operations, subsequent to the contractual completion of that phase of earth-moving activities, provided that the required control measures have been implemented during the entire phase of earth-moving activities, through and including five days after the final grading inspection.
  - (J) Weed abatement operations ordered by a county agricultural commissioner or any state, county, or municipal fire department, provided that:
    - (i) mowing, cutting or other similar process is used which maintains weed stubble at least three inches above the soil; and
    - (ii) any discing or similar operation which cuts into and disturbs the soil, where watering is used prior to initiation of these activities, and a determination is made by the agency issuing the weed abatement order that, due to fire hazard conditions, rocks, or other physical obstructions, it is not practical to meet the conditions specified in clause (g)(1)(H)(i). The provisions this clause shall not exempt the owner of any property from stabilizing, in accordance with paragraph (d)(2), disturbed surface areas which have been created as a result of the weed abatement actions.
  - (K) sandblasting operations.
- (2) The provisions of paragraphs (d)(1) and (d)(3) shall not apply:
- (A) When wind gusts exceed 25 miles per hour, provided that:

- (i) The required Table 3 contingency measures in this Rule are implemented for each applicable fugitive dust source type, and;
    - (ii) records are maintained in accordance with subparagraph (e)(1)(C).
  - (B) To unpaved roads, provided such roads:
    - (i) are used solely for the maintenance of wind-generating equipment; or
    - (ii) are unpaved public alleys as defined in Rule 1186; or
    - (iii) are service roads that meet all of the following criteria:
      - (a) are less than 50 feet in width at all points along the road;
      - (b) are within 25 feet of the property line; and
      - (c) have a traffic volume less than 20 vehicle-trips per day.
  - (C) To any active operation, open storage pile, or disturbed surface area for which necessary fugitive dust preventive or mitigative actions are in conflict with the federal Endangered Species Act, as determined in writing by the State or federal agency responsible for making such determinations.
- (3) The provisions of (d)(2) shall not apply to any aggregate-related plant or cement manufacturing facility that implements the applicable actions specified in Table 2 of this Rule at all times and shall implement the applicable actions specified in Table 3 of this Rule when the applicable performance standards of paragraphs (d)(1) and (d)(3) can not be met through use of Table 2 actions.
  - (4) The provisions of paragraphs (d)(1), (d)(2), and (d)(3) shall not apply to:
    - (A) Blasting operations which have been permitted by the California Division of Industrial Safety; and
    - (B) Motion picture, television, and video production activities when dust emissions are required for visual effects. In order to obtain this exemption, the Executive Officer must receive notification in writing at least 72 hours in advance of any such activity and no nuisance results from such activity.
  - (5) The provisions of paragraph (d)(3) shall not apply if the dust control actions, as specified in Table 2, are implemented on a routine basis for

each applicable fugitive dust source type. To qualify for this exemption, a person must maintain records in accordance with subparagraph (e)(1)(C).

- (6) The provisions of paragraph (d)(4) shall not apply to earth coverings of public paved roadways where such coverings are approved by a local government agency for the protection of the roadway, and where such coverings are used as roadway crossings for haul vehicles provided that such roadway is closed to through traffic and visible roadway dust is removed within one day following the cessation of activities.
- (7) The provisions of subdivision (e) shall not apply to:
  - (A) officially-designated public parks and recreational areas, including national parks, national monuments, national forests, state parks, state recreational areas, and county regional parks.
  - (B) any large operation which is required to submit a dust control plan to any city or county government which has adopted a District-approved dust control ordinance.
  - (C) any large operation subject to Rule 1158, which has an approved dust control plan pursuant to Rule 1158, provided that all sources of fugitive dust are included in the Rule 1158 plan.
- (8) The provisions of subparagraph (e)(1)(A) through (e)(1)(C) shall not apply to any large operation with an AQMD-approved fugitive dust control plan provided that there is no change to the sources and controls as identified in the AQMD-approved fugitive dust control plan.

(h) Fees

Any person conducting active operations for which the Executive Officer conducts upwind/downwind monitoring for PM<sub>10</sub> pursuant to paragraph (d)(3) shall be assessed applicable Ambient Air Analysis Fees pursuant to Rule 304.1. Applicable fees shall be waived for any facility which is exempted from paragraph (d)(3) or meets the requirements of paragraph (d)(3).

**TABLE 1**  
**BEST AVAILABLE CONTROL MEASURES**  
**(Applicable to All Construction Activity Sources)**

Source Category	Control Measure	Guidance
Backfilling	01-1 Stabilize backfill material when not actively handling; and 01-2 Stabilize backfill material during handling; and 01-3 Stabilize soil at completion of activity.	<ul style="list-style-type: none"> <li>✓ Mix backfill soil with water prior to moving</li> <li>✓ Dedicate water truck or high capacity hose to backfilling equipment</li> <li>✓ Empty loader bucket slowly so that no dust plumes are generated</li> <li>✓ Minimize drop height from loader bucket</li> </ul>
Clearing and grubbing	02-1 Maintain stability of soil through pre-watering of site prior to clearing and grubbing; and 02-2 Stabilize soil during clearing and grubbing activities; and 02-3 Stabilize soil immediately after clearing and grubbing activities.	<ul style="list-style-type: none"> <li>✓ Maintain live perennial vegetation where possible</li> <li>✓ Apply water in sufficient quantity to prevent generation of dust plumes</li> </ul>
Clearing forms	03-1 Use water spray to clear forms; or 03-2 Use sweeping and water spray to clear forms; or 03-3 Use vacuum system to clear forms.	<ul style="list-style-type: none"> <li>✓ Use of high pressure air to clear forms may cause exceedance of Rule requirements</li> </ul>
Crushing	04-1 Stabilize surface soils prior to operation of support equipment; and 04-2 Stabilize material after crushing.	<ul style="list-style-type: none"> <li>✓ Follow permit conditions for crushing equipment</li> <li>✓ Pre-water material prior to loading into crusher</li> <li>✓ Monitor crusher emissions opacity</li> <li>✓ Apply water to crushed material to prevent dust plumes</li> </ul>

**TABLE 1  
BEST AVAILABLE CONTROL MEASURES  
(Applicable to All Construction Activity Sources)**

Source Category	Control Measure	Guidance
Cut and fill	05-1 Pre-water soils prior to cut and fill activities; and 05-2 Stabilize soil during and after cut and fill activities.	<ul style="list-style-type: none"> <li>✓ For large sites, pre-water with sprinklers or water trucks and allow time for penetration</li> <li>✓ Use water trucks/pulls to water soils to depth of cut prior to subsequent cuts</li> </ul>
Demolition – mechanical/manual	06-1 Stabilize wind erodible surfaces to reduce dust; and 06-2 Stabilize surface soil where support equipment and vehicles will operate; and 06-3 Stabilize loose soil and demolition debris; and 06-4 Comply with AQMD Rule 1403.	<ul style="list-style-type: none"> <li>✓ Apply water in sufficient quantities to prevent the generation of visible dust plumes</li> </ul>
Disturbed soil	07-1 Stabilize disturbed soil throughout the construction site; and 07-2 Stabilize disturbed soil between structures	<ul style="list-style-type: none"> <li>✓ Limit vehicular traffic and disturbances on soils where possible</li> <li>✓ If interior block walls are planned, install as early as possible</li> <li>✓ Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes</li> </ul>
Earth-moving activities	08-1 Pre-apply water to depth of proposed cuts; and 08-2 Re-apply water as necessary to maintain soils in a damp condition and to ensure that visible emissions do not exceed 100 feet in any direction; and 08-3 Stabilize soils once earth-moving activities are complete.	<ul style="list-style-type: none"> <li>✓ Grade each project phase separately, timed to coincide with construction phase</li> <li>✓ Upwind fencing can prevent material movement on site</li> <li>✓ Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes</li> </ul>

**TABLE 1**  
**BEST AVAILABLE CONTROL MEASURES**  
**(Applicable to All Construction Activity Sources)**

Source Category	Control Measure	Guidance
Importing/exporting of bulk materials	09-1 Stabilize material while loading to reduce fugitive dust emissions; and 09-2 Maintain at least six inches of freeboard on haul vehicles; and 09-3 Stabilize material while transporting to reduce fugitive dust emissions; and 09-4 Stabilize material while unloading to reduce fugitive dust emissions; and 09-5 Comply with Vehicle Code Section 23114.	<ul style="list-style-type: none"> <li>✓ Use tarps or other suitable enclosures on haul trucks</li> <li>✓ Check belly-dump truck seals regularly and remove any trapped rocks to prevent spillage</li> <li>✓ Comply with track-out prevention/mitigation requirements</li> <li>✓ Provide water while loading and unloading to reduce visible dust plumes</li> </ul>
Landscaping	10-1 Stabilize soils, materials, slopes	<ul style="list-style-type: none"> <li>✓ Apply water to materials to stabilize</li> <li>✓ Maintain materials in a crusted condition</li> <li>✓ Maintain effective cover over materials</li> <li>✓ Stabilize sloping surfaces using soil binders until vegetation or ground cover can effectively stabilize the slopes</li> <li>✓ Hydroseed prior to rain season</li> </ul>
Road shoulder maintenance	11-1 Apply water to unpaved shoulders prior to clearing; and 11-2 Apply chemical dust suppressants and/or washed gravel to maintain a stabilized surface after completing road shoulder maintenance.	<ul style="list-style-type: none"> <li>✓ Installation of curbing and/or paving of road shoulders can reduce recurring maintenance costs</li> <li>✓ Use of chemical dust suppressants can inhibit vegetation growth and reduce future road shoulder maintenance costs</li> </ul>

**TABLE 1**  
**BEST AVAILABLE CONTROL MEASURES**  
**(Applicable to All Construction Activity Sources)**

Source Category	Control Measure	Guidance
Screening	12-1 Pre-water material prior to screening; and 12-2 Limit fugitive dust emissions to opacity and plume length standards; and 12-3 Stabilize material immediately after screening.	<ul style="list-style-type: none"> <li>✓ Dedicate water truck or high capacity hose to screening operation</li> <li>✓ Drop material through the screen slowly and minimize drop height</li> <li>✓ Install wind barrier with a porosity of no more than 50% upwind of screen to the height of the drop point</li> </ul>
Staging areas	13-1 Stabilize staging areas during use; and 13-2 Stabilize staging area soils at project completion.	<ul style="list-style-type: none"> <li>✓ Limit size of staging area</li> <li>✓ Limit vehicle speeds to 15 miles per hour</li> <li>✓ Limit number and size of staging area entrances/exits</li> </ul>
Stockpiles/ Bulk Material Handling	14-1 Stabilize stockpiled materials. 14-2 Stockpiles within 100 yards of off-site occupied buildings must not be greater than eight feet in height; or must have a road bladed to the top to allow water truck access or must have an operational water irrigation system that is capable of complete stockpile coverage.	<ul style="list-style-type: none"> <li>✓ Add or remove material from the downwind portion of the storage pile</li> <li>✓ Maintain storage piles to avoid steep sides or faces</li> </ul>



**TABLE 1**  
**BEST AVAILABLE CONTROL MEASURES**  
**(Applicable to All Construction Activity Sources)**

Source Category	Control Measure	Guidance
Traffic areas for construction activities	15-1 Stabilize all off-road traffic and parking areas; and 15-2 Stabilize all haul routes; and 15-3 Direct construction traffic over established haul routes.	<ul style="list-style-type: none"> <li>✓ Apply gravel/paving to all haul routes as soon as possible to all future roadway areas</li> <li>✓ Barriers can be used to ensure vehicles are only used on established parking areas/haul routes</li> </ul>
Trenching	16-1 Stabilize surface soils where trencher or excavator and support equipment will operate; and 16-2 Stabilize soils at the completion of trenching activities.	<ul style="list-style-type: none"> <li>✓ Pre-watering of soils prior to trenching is an effective preventive measure. For deep trenching activities, pre-trench to 18 inches soak soils via the pre-trench and resuming trenching</li> <li>✓ Washing mud and soils from equipment at the conclusion of trenching activities can prevent crusting and drying of soil on equipment</li> </ul>
Truck loading	17-1 Pre-water material prior to loading; and 17-2 Ensure that freeboard exceeds six inches (CVC 23114)	<ul style="list-style-type: none"> <li>✓ Empty loader bucket such that no visible dust plumes are created</li> <li>✓ Ensure that the loader bucket is close to the truck to minimize drop height while loading</li> </ul>
Turf Overseeding	18-1 Apply sufficient water immediately prior to conducting turf vacuuming activities to meet opacity and plume length standards; and 18-2 Cover haul vehicles prior to exiting the site.	<ul style="list-style-type: none"> <li>✓ Haul waste material immediately off-site</li> </ul>

**TABLE 1  
BEST AVAILABLE CONTROL MEASURES  
(Applicable to All Construction Activity Sources)**

Source Category	Control Measure	Guidance
Unpaved roads/parking lots	19-1 Stabilize soils to meet the applicable performance standards; and 19-2 Limit vehicular travel to established unpaved roads (haul routes) and unpaved parking lots.	✓ Restricting vehicular access to established unpaved travel paths and parking lots can reduce stabilization requirements
Vacant land	20-1 In instances where vacant lots are 0.10 acre or larger and have a cumulative area of 500 square feet or more that are driven over and/or used by motor vehicles and/or off-road vehicles, prevent motor vehicle and/or off-road vehicle trespassing, parking and/or access by installing barriers, curbs, fences, gates, posts, signs, shrubs, trees or other effective control measures.	

**Table 2**  
**DUST CONTROL MEASURES FOR LARGE OPERATIONS**

<b>FUGITIVE DUST SOURCE CATEGORY</b>	<b>CONTROL ACTIONS</b>
<b>Earth-moving (except construction cutting and filling areas, and mining operations)</b>	<p>(1a) Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations each subsequent four-hour period of active operations; OR</p> <p>(1a-1) For any earth-moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.</p>
<b>Earth-moving: Construction fill areas:</b>	<p>(1b) Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. For areas which have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM Method 1557 or other equivalent method approved by the Executive Officer and the California Air Resources Board and the U.S. EPA, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four-hour period of active operations.</p>

Table 2 (Continued)

<b>FUGITIVE DUST SOURCE CATEGORY</b>	<b>CONTROL ACTIONS</b>
<b>Earth-moving: Construction cut areas and mining operations:</b>	(1c) Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.
<b>Disturbed surface areas (except completed grading areas)</b>	(2a/b) Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas which cannot be stabilized, as evidenced by wind driven fugitive dust must have an application of water at least twice per day to at least 80 percent of the unstabilized area.
<b>Disturbed surface areas: Completed grading areas</b>	(2c) Apply chemical stabilizers within five working days of grading completion; OR  (2d) Take actions (3a) or (3c) specified for inactive disturbed surface areas.
<b>Inactive disturbed surface areas</b>	(3a) Apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind driven fugitive dust, excluding any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions; OR  (3b) Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR  (3c) Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR  (3d) Utilize any combination of control actions (3a), (3b), and (3c) such that, in total, these actions apply to all inactive disturbed surface areas.

Table 2 (Continued)

<b>FUGITIVE DUST SOURCE CATEGORY</b>	<b>CONTROL ACTIONS</b>
<b>Unpaved Roads</b>	(4a) Water all roads used for any vehicular traffic at least once per every two hours of active operations [3 times per normal 8 hour work day]; OR (4b) Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour; OR (4c) Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.
<b>Open storage piles</b>	(5a) Apply chemical stabilizers; OR (5b) Apply water to at least 80 percent of the surface area of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust; OR (5c) Install temporary coverings; OR (5d) Install a three-sided enclosure with walls with no more than 50 percent porosity which extend, at a minimum, to the top of the pile. This option may only be used at aggregate-related plants or at cement manufacturing facilities.
<b>All Categories</b>	(6a) Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 2 may be used.

**TABLE 3**  
**CONTINGENCY CONTROL MEASURES FOR LARGE OPERATIONS**

<b>FUGITIVE DUST SOURCE CATEGORY</b>	<b>CONTROL MEASURES</b>
<b>Earth-moving</b>	(1A) Cease all active operations; OR (2A) Apply water to soil not more than 15 minutes prior to moving such soil.
<b>Disturbed surface areas</b>	(0B) On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; OR (1B) Apply chemical stabilizers prior to wind event; OR (2B) Apply water to all unstabilized disturbed areas 3 times per day. If there is any evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; OR (3B) Take the actions specified in Table 2, Item (3c); OR (4B) Utilize any combination of control actions (1B), (2B), and (3B) such that, in total, these actions apply to all disturbed surface areas.
<b>Unpaved roads</b>	(1C) Apply chemical stabilizers prior to wind event; OR (2C) Apply water twice per hour during active operation; OR (3C) Stop all vehicular traffic.
<b>Open storage piles</b>	(1D) Apply water twice per hour; OR (2D) Install temporary coverings.
<b>Paved road track-out</b>	(1E) Cover all haul vehicles; OR (2E) Comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads.
<b>All Categories</b>	(1F) Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 3 may be used.

**Table 4**  
**(Conservation Management Practices for Confined Animal Facilities)**

<b>SOURCE CATEGORY</b>	<b>CONSERVATION MANAGEMENT PRACTICES</b>
<b>Manure Handling</b>  <b>(Only applicable to Commercial Poultry Ranches)</b>	(1a) Cover manure prior to removing material off-site; AND (1b) Spread the manure before 11:00 AM and when wind conditions are less than 25 miles per hour; AND (1c) Utilize coning and drying manure management by removing manure at laying hen houses at least twice per year and maintain a base of no less than 6 inches of dry manure after clean out; or in lieu of complying with conservation management practice (1c), comply with conservation management practice (1d). (1d) Utilize frequent manure removal by removing the manure from laying hen houses at least every seven days and immediately thin bed dry the material.
<b>Feedstock Handling</b>	(2a) Utilize a sock or boot on the feed truck auger when filling feed storage bins.
<b>Disturbed Surfaces</b>	(3a) Maintain at least 70 percent vegetative cover on vacant portions of the facility; OR (3b) Utilize conservation tillage practices to manage the amount, orientation and distribution of crop and other plant residues on the soil surface year-round, while growing crops (if applicable) in narrow slots or tilled strips; OR (3c) Apply dust suppressants in sufficient concentrations and frequencies to maintain a stabilized surface.
<b>Unpaved Roads</b>	(4a) Restrict access to private unpaved roads either through signage or physical access restrictions and control vehicular speeds to no more than 15 miles per hour through worker notifications, signage, or any other necessary means; OR (4b) Cover frequently traveled unpaved roads with low silt content material (i.e., asphalt, concrete, recycled road base, or gravel to a minimum depth of four inches); OR (4c) Treat unpaved roads with water, mulch, chemical dust suppressants or other cover to maintain a stabilized surface.
<b>Equipment Parking Areas</b>	(5a) Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR (5b) Apply material with low silt content (i.e., asphalt, concrete, recycled road base, or gravel to a depth of four inches).

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(Adopted January 15, 1993)(Amended June 16, 2000)(Amended April 2, 2004)

**RULE 403.1. SUPPLEMENTAL FUGITIVE DUST CONTROL REQUIREMENTS FOR COACHELLA VALLEY SOURCES**

(a) Purpose

The purpose of this rule is to reduce or prevent the amount of fine particulate matter (PM<sub>10</sub>) entrained in the ambient air from anthropogenic (man-made) fugitive dust sources.

(b) Applicability

The provisions of this rule are supplemental to Rule 403 requirements and shall apply only to fugitive dust sources in the Coachella Valley.

(c) Definitions

(1) ACTIVE OPERATIONS shall mean any source capable of generating fugitive dust, including, but not limited to, earth-moving activities, construction/demolition activities, disturbed surface areas, or agricultural operations.

(2) AGRICULTURAL OPERATIONS means any operation occurring on a ranch or farm directly related to the growing of crops, or raising of fowls or animals for the primary purpose of making a profit or for a livelihood.

(3) ANEMOMETERS are devices used to measure wind speed in accordance with the performance standards, maintenance and calibration criteria specified in the Rule 403.1 Implementation Handbook.

(4) BULK MATERIAL is sand, gravel, soil, aggregate material less than two inches in length or diameter and other organic and inorganic particulate matter.

(5) CHEMICAL STABILIZERS are any non-toxic chemical dust suppressant which must not be used if prohibited for use by the Regional Water Quality Control Boards, the California Air Resources Board, the U.S. Environmental Protection Agency (U.S. EPA), or any applicable law, rule or regulation. The chemical stabilizers shall meet any specifications, criteria, or tests required by any federal, state, or local water agency. Unless otherwise indicated, the use of a non-toxic chemical stabilizer shall be of sufficient concentration and application frequency to maintain a stabilized surface.

- (6) COACHELLA VALLEY means that portion of Riverside County, as defined in Rule 103, subdivision (h).
- (7) COACHELLA VALLEY BLOWSAND ZONE means the corridor of land extending two miles to either side of the centerline of the I-10 Freeway beginning at the SR-111/I-10 junction and continuing southeast to the I-10/ Jefferson Street interchange in Indio.
- (8) CONSTRUCTION/DEMOLITION ACTIVITIES means any on-site mechanical activities conducted in preparation of or related to, the building, alteration, rehabilitation, demolition or improvement of property, including, but not limited to the following activities: grading, excavation, loading, crushing, cutting, planing, shaping or ground breaking.
- (9) DISTURBED SURFACE AREA means a portion of the earth's surface which has been physically moved, uncovered, destabilized, or otherwise modified from its undisturbed natural soil condition, thereby increasing the potential for emission of fugitive dust. This definition excludes those areas which have:
  - (A) been restored to a natural state, such that vegetative ground cover and soil characteristics are similar to adjacent or near-by natural conditions;
  - (B) been paved or otherwise covered by a permanent structure;
  - (C) sustained a vegetative ground cover of at least 70 percent of the average native cover for a particular area for at least 30 days.
- (10) DUST CONTROL SUPERVISOR means a person with the authority to expeditiously employ sufficient dust mitigation measures to ensure compliance with all Rule 403 and Rule 403.1 requirements at an active operation.
- (11) DUST SUPPRESSANTS are water, hygroscopic materials, or non-toxic chemical stabilizers used as a treatment material to reduce fugitive emissions.
- (12) EARTH-MOVING ACTIVITIES means the use of any equipment for any activity where soil is being moved or uncovered and shall include, but not be limited to the following: such operations as grading, loading or unloading of dirt or bulk materials, adding to or removing from open storage piles of bulk materials, landfill operations, weed abatement through disking, soil mulching and agricultural tilling.

- (13) FUGITIVE DUST means any solid particulate matter that becomes airborne, other than that emitted from an exhaust stack, directly or indirectly as a result of the activities of any person.
- (14) FUGITIVE DUST CONTROL PLAN means a plan to control fugitive dust plan as described in subdivision (e).
- (15) ON-SITE means within the property lines of a property, or as otherwise approved by the Executive Officer.
- (16) OPEN STORAGE PILE is any accumulation of bulk material which is not fully enclosed, covered or chemically stabilized, and which attains a height of three feet or more and a total surface area of 150 or more square feet.
- (17) PARTICULATE MATTER means any material, except uncombined water, which exists in a finely divided form as a liquid or solid at standard conditions.
- (18) PM<sub>10</sub> means particulate matter with an aerodynamic diameter smaller than or equal to 10 microns as measured by the applicable state and federal reference test methods.
- (19) PROPERTY LINE means the boundaries of an area in which a person allowing the emission has the legal use or possession of the property. Where such property is divided into one or more sub-tenancies, the property line(s) shall refer to the boundaries dividing the areas of all sub-tenancies.
- (20) RULE 403.1 IMPLEMENTATION HANDBOOK means a guidance document that has been approved by the Governing Board on April 2, 2004 or hereafter approved by the Executive Officer and the U.S. EPA.
- (21) STABILIZED SURFACE means any previously disturbed surface area which, through the application of dust suppressants, shows visual or other evidence of surface crusting and is resistant to wind-driven fugitive dust and is demonstrated to be stabilized. Stabilization can be demonstrated by one or more of the applicable test methods contained in the Rule 403.1 Implementation Handbook.
- (22) UNPAVED ROADS means any unsealed or unpaved roads, equipment paths, or travel ways that are not covered by one of the following: concrete, asphaltic concrete, recycled asphalt, asphalt or other materials with equivalent performance as determined by the Executive Officer, the California Air Resources Board, and the U.S. EPA. Public unpaved roads

are any unpaved roadway owned by federal, state, county, municipal or other governmental or quasi-governmental agencies. Private unpaved roads are all other unpaved roadways not defined as public.

- (23) WIND-DRIVEN FUGITIVE DUST means visible emissions from any disturbed surface area which is generated by wind action alone.
- (24) WIND GUST is the maximum instantaneous wind speed as measured by an anemometer.

(d) General Requirements

- (1) Any person who is responsible for any active operation, open storage pile, or disturbed surface area, and who seeks an exemption pursuant to Rule 403, paragraph (g)(2) shall be required to determine when wind speed conditions exceed 25 miles per hour. The wind speed determination shall be based on either District forecasts or through use of an on-site anemometer as described in subdivision (g).
- (2) Any person involved in active operations in the Coachella Valley Blowsand Zone shall stabilize new man-made deposits of bulk material within 24 hours of making such bulk material deposits. Stabilization procedures shall include one or more of the following:
  - (A) Application of water to at least 70 percent of the surface area of any bulk material deposits at least 3 times for each day that there is evidence of wind driven fugitive dust; or
  - (B) Application of chemical stabilizers in sufficient concentration so as to maintain a stabilized surface for a period of at least 6 months; or
  - (C) Installation of wind breaks of such design so as to reduce maximum wind gusts to less than 25 miles per hour in the area of the bulk material deposits.
- (3) Any person involved in active operations in the Coachella Valley Blowsand Zone shall stabilize new deposits of bulk material originating from off-site undisturbed natural desert areas within 72 hours. Stabilization procedures shall include one or more of the following:
  - (A) Application of water to at least 70 percent of the surface area of any bulk material deposits at least 3 times for each day that there is evidence of wind driven fugitive dust; or
  - (B) Application of chemical stabilizers in sufficient concentration so as to maintain a stabilized surface for a period of at least six months.

- (4) A person who conducts or authorizes the conducting of an active operation shall implement at least one of the control actions specified in Rule 403, Table 2 for the source category "Inactive Disturbed Surface Areas" to minimize wind driven fugitive dust from disturbed surface areas at such time when active operations have ceased for a period of at least 20 days.
  - (5) Any person involved in agricultural tilling or soil mulching activities shall cease such activities when wind speeds exceed 25 miles per hour. The wind speed determination shall be based on either District forecasts or through use of an on-site anemometer as described in subdivision (g).
- (e) Fugitive Dust Control Plan and Other Requirements for Construction Projects/Earth-Moving Activities
- (1) Any person who conducts or authorizes the conducting of an active operation with a disturbed surface area of more than 5,000 square feet shall not initiate any earth-moving activities unless a fugitive dust control plan is prepared and approved by the Executive Officer in accordance with the requirements of subdivision (f) and the Rule 403.1 Implementation Handbook. These provisions shall not apply to active operations exempted by paragraph (i)(4).
  - (2) Any operator required to submit a fugitive dust control plan under paragraph (e)(1) shall maintain a complete copy of the approved fugitive dust control plan on site in a conspicuous place at all times and the fugitive dust control plan must be provided upon request.
  - (3) Any operator required to submit a fugitive dust control plan under paragraph (e)(1) shall install and maintain signage with project contact information that meets the minimum standards of the Rule 403.1 Implementation Handbook prior to initiating any type of earth-moving activities.
  - (4) Any operator required to submit a fugitive dust control plan under paragraph (e)(1) for a project with a disturbed surface area of 50 or more acres shall have an Dust Control Supervisor that:
    - (A) is employed by or contracted with the property owner or developer; and
    - (B) is on-site or is available to be on-site within 30 minutes of initial contact; and

- (C) has the authority to expeditiously employ sufficient dust mitigation measures to ensure compliance with all Rule 403 and 403.1 requirements; and
  - (D) has completed the AQMD Coachella Valley Fugitive Dust Control Class and has been issued a valid Certificate of Completion for the class.
- (5) Failure to comply with any of the provisions of an approved fugitive dust control plan shall be a violation of this rule.
- (f) Fugitive Dust Control Plan Preparation, Submittal, and Approval Requirements
- (1) A fugitive dust control plan prepared pursuant to paragraph (e)(1) must include the following information in a 8 ½ by 11 inch format:
    - (A) the name(s), address(es), and phone number(s) of the person(s) responsible for the preparation, submittal, and implementation of the fugitive dust control plan; and
    - (B) a description of the operation(s), including a map depicting the location of the site; and
    - (C) a listing of all sources of fugitive dust emissions within the property lines; and
    - (D) a description of the control measures as identified by the Rule 403.1 Implementation Handbook as applied to each of the sources identified in the fugitive dust control plan. The description of the control measures must be sufficiently detailed to demonstrate that the applicable best available control measures will be utilized and/or installed during all periods of active operations; and
    - (E) a description of the required contingency control measures (e.g., increased watering) for immediate implementation upon notice of visible dust crossing any property line.
  - (2) In the event that there are special technical (e.g., non-economic) circumstances, including safety, which prevent the use of at least one of the control measures as identified by the Rule 403.1 Implementation Handbook for any of the sources identified in the fugitive dust control plan, a justification statement must be provided in lieu of the description. The justification statement must explain the reason(s) why the required control measures cannot be implemented.
  - (3) Within 30 calendar days of the receipt of a fugitive dust control plan submitted pursuant to paragraph (e)(1), the Executive Officer will either

approve or apply any necessary conditions to the fugitive dust control plan in writing. For a fugitive dust control plan to be approved, the requirements of paragraph (f)(1) must be satisfied.

- (4) The Executive Officer will apply conditions if the stated fugitive dust control plan measures do not satisfactorily conform to the best available control measures and guidance contained in the Rule 403.1 Implementation Handbook. The conditions necessary to modify the fugitive dust control plan will be provided in writing to the person(s) identified in subparagraph (f)(1)(A). A letter to the Executive Officer stating that such modifications will be incorporated into the fugitive dust control plan shall be deemed sufficient to result in approval of the fugitive dust control plan.
- (5) Any fugitive dust control plan approved by the Executive Officer shall be valid for a period of one year from the date of approval. Any approved fugitive dust control plan must be resubmitted annually, at least 30 days prior to the expiration date, or the fugitive dust control plan shall expire as of the expiration date. If all fugitive dust sources and corresponding control measures or special circumstances remain identical to those identified in the previously approved fugitive dust control plan, the submittal may contain a simple statement of no-change (Form 403NC). Otherwise, a resubmittal must contain all the items specified in subparagraphs (f)(1)(A) through (f)(1)(E).

(g) **Wind Monitoring Implementation Requirements**

- (1) The determination of wind speed conditions in excess of 25 miles per hour, as specified in paragraphs (d)(1) and (d)(5), shall be based on the following criteria:
  - (A) For facilities with an on-site anemometer:
    - (i) When the on-site anemometer registers at least two wind gusts in excess of 25 miles per hour within a consecutive 30-minute period. Wind speeds shall be deemed to be below 25 miles per hour if there is no recurring wind gust in excess of 25 miles per hour within a consecutive 30-minute period; or
  - (B) For facilities without an on-site anemometer:

- (i) When wind speeds in excess of 25 miles per hour are forecast to occur in the Coachella Valley for that day. This condition shall apply to the full calendar day for which the forecast is valid. (The Executive Officer shall determine meteorological conditions which will cause wind speeds in excess of 25 miles per hour, and shall issue daily forecasts of expected wind conditions. Such forecasts shall be available to the public); or
  - (ii) When wind speeds in excess of 25 miles per hour are not forecast to occur by the District, and fugitive dust emissions are visible for a distance of at least 100 feet from the origin of such emissions, and there is visible evidence of wind driven fugitive dust.
- (2) Any person who elects to install an on-site anemometer shall:
  - (A) Notify the Executive Officer no more than 10 days after installing such equipment. The notification shall contain, at a minimum, the person's name, address, telephone number, description of the operation(s), and first day of operation, as specified in the District's Rule 403.1 Implementation Handbook.
  - (B) Be subject to the provisions of subparagraph (g)(1)(B) for wind speed determinations if equipment outages, malfunctions, or invalid data exceed one hour during active operations on a calendar day.
- (h) Recordkeeping
  - (1) A person subject to the provisions of this rule shall compile written daily records to document the specific actions taken to comply with this Rule. Such records shall be retained for not less than three years and shall be made available to the Executive Officer upon request.
  - (2) In addition to the provisions of paragraph (h)(1), any person who elects to install an on-site anemometer shall also compile written records. Such records shall contain:
    - (A) Location, vendor, model, and serial number of the anemometer;
    - (B) The time of occurrence of any wind gust in excess of 25 miles per hour during hours of active operations;



- (C) The actions taken to comply with the provisions of paragraphs (d)(5) and (i)(3), as applicable.
- (i) Exemptions
- (1) The provisions of this rule shall not apply to ceased or inactive mining operations subject to the requirements of the Surface Mining and Recovery Act (SMARA) of 1975, provided that the provisions of the SMARA Reclamation Plan are implemented by the owner and are at least as stringent as those contained in this rule;
  - (2) The provisions of paragraphs (d)(2), (d)(3), and (d)(4) shall not apply to:
    - (A) Any active operation, open storage pile, or disturbed surface area for which necessary fugitive dust preventive or mitigative actions are in conflict with the Endangered Species Act as determined in writing by the State or federal agency responsible for making such determinations;
    - (B) Any disturbed surface areas or bulk material deposits with a surface area less than 2,500 square feet;
    - (C) Non-routine or emergency maintenance of flood control channels and water spreading basins.
  - (3) The provisions of paragraph (d)(5) shall not apply to agricultural tilling activities or soil mulching activities under the following conditions:
    - (A) If the prohibitory requirements of this Rule have occurred during six or more hours of active operations on each of two previous consecutive days, then a one-day exemption will be allowed. (These activities would again be subject to the prohibitory requirements of this Rule following this one day exemption.)
    - (B) If the prohibitory requirements of this Rule have occurred during sixty or more cumulative hours of active operations within a calendar month, then an exemption will be allowed for the remainder of the calendar month. (These activities would again be subject to the prohibitory requirements of this Rule at the start of the following month.)
    - (C) During periods of precipitation.

- (4) The provisions of paragraph (e)(1) shall not apply to any active operation which is required to submit a dust control plan to any city or county government that has adopted a District-approved dust control ordinance.
  
- (j) Fees
  - (1) Any person subject to a fugitive dust control plan submittal pursuant to paragraph (e)(1) shall be assessed applicable filing and evaluation fees pursuant to Rule 306.
  - (2) The submittal of an annual statement of no-change, pursuant to paragraph (f)(5), shall not be considered as an annual review, and therefore shall not be subject to annual review fees, pursuant to Rule 306.

## **Appendix E**

# **Project Construction Quality Assurance / Quality Control (QA/QC) Plan**

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**QUALITY ASSURANCE AND  
QUALITY CONTROL PLAN  
(QA/QC PLAN)**

**FOR**

**CLOSURE CONSTRUCTION**

**AT THE**

**MECCA II SANITARY LANDFILL**

**APRIL 2020**

Prepared by:

**RIVERSIDE COUNTY  
DEPARTMENT OF WASTE RESOURCES**

14310 Frederick Street  
Moreno Valley, CA 92553

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# 1 GENERAL

## 1.1 Objectives of the Construction QA/QC Plan

The Construction QA/QC Plan has been prepared to meet the following objectives:

- Provide quality control procedures and a quality assurance program which will demonstrate that the closure design is properly implemented by performing monitoring and testing during construction.
- Provide a mechanism which allows the evaluation of design changes that occur during construction.
- Prepare and maintain documentation that can demonstrate the design has been implemented and the performance requirements have been met. The final report document will satisfy Title 27, Section 21880(b) closure certification requirements.
- Serve as a reference source for personnel performing and monitoring the construction activities.
- Establish lines of communication and responsibilities of all project personnel.

A Quality Assurance (QA) program consists of inspection and selected testing of the final product completed in order to provide the Riverside County Department of Waste Resources (County) an evaluation of whether the end product is of the specified quality of materials and workmanship. Since in earthwork construction it is both inefficient and impractical to withhold QA testing until completion of work, an on-going QA program is typically conducted during construction to ascertain the quality of the end product. Because of possible conflicts of interest, neither the Contractor nor the County should undertake the QA function directly. Rather, QA inspection and testing should be left under the objective authority of a single team of design and inspection professionals (QA/QC Consultant).

The QA program shall be implemented by the QA/QC Consultant's qualified personnel. This program consists of continuously overseeing the project to confirm that observation and testing procedures are being implemented by qualified personnel, as planned; that procedures and workmanship are in compliance with applicable regulations, standards, and Contract Documents; and that all work, including the final product, is appropriately documented, filed, and made readily available for review.

A Quality Control (QC) program consists of monitoring, observing, inspecting, and performing selected tests during construction which can assist the Contractor in producing the quality product that is required. While the QC program function is the sole responsibility of the Contractor, the County may, at its discretion, provide information regarding the on-going QA monitoring for the Contractor's use in implementing his/her QC function. Release of the QA data to the Contractor would be for convenience only and would, in no way, relieve the Contractor from sole responsibility for fulfilling the project requirements.

The Contractor must be aware that QA/QC influences the Contractor's daily operations and can affect the Contractor's progress and profitability. The Contractor should therefore prepare its bid accordingly.

This document presents the construction QA/QC Plan for the construction and installation of the final cover system at the Mecca II Sanitary Landfill. This QA/QC Plan details the quality assurance tests and procedures to be implemented during construction and shall be used in conjunction with the Contract Documents for the closure construction of the Mecca II Sanitary Landfill.

An independent testing laboratory will be responsible for conducting QA/QC tests on all construction materials. The laboratory shall be independent of the County, Manufacturer, Contractor, or any party involved with the manufacturing or installation of any of the construction materials. The QA/QC tests must be conducted using a California-certified independent testing laboratory for soil property analyses and tests.

## 1.2 Summary of Work

The County plans to close the Mecca II Sanitary Landfill in accordance with the Final Closure and Post-Closure Maintenance Plan (Closure Plan) prepared by the County for this landfill. The Closure Plan was prepared in compliance with the applicable federal, state, and local regulations. This document presents the construction QA/QC Plan to be implemented during the closure construction at the site.

The final cover system for the Mecca II Sanitary Landfill consists of compacted engineered fill which will function as the containment system for closure of the waste management area. The final cover system will consist of a three (3) foot section of earth material which includes from bottom to top: a lower layer (aka foundation layer), directly adjacent to refuse materials, that is no less than one (1) foot thick of existing intermediate cover and an upper layer (aka final cover layer) that is no less than two (2) feet thick of native soil. It is critical that each separate lift in construction of the final cover system meet design specifications prior to construction of successive or overlying lifts and that the Contractor perform any method deemed necessary by the County or QA/QC Consultant to prevent lamination between lifts.

This document details the procedures along with the type and frequency of quality assurance tests to be performed during construction of the earthwork portions of the final cover system and drainage structure installation.

Each of the components of the final cover system functions as an integral part of the overall system, and consequently must become a finished product during construction. Thus, construction of the final cover system will be performed in phases, with each portion completed prior to construction of successive or overlying portions; therefore, it is necessary to conduct an ongoing QA/QC program during construction to verify the quality end product. Nevertheless, it is the Contractor's responsibility to complete the project in accordance with the Contract Documents; and nothing stated in this document or any testing, inspection or observation by the QA/QC Consultant or the County shall in any way relieve the Contractor of its obligations to properly construct the project in accordance with all of the Contract Documents.

This project is formatted to meet State requirements for closure of landfills under Title 27 of the California Code of Regulations (CCR) as administered by the California Department of Resources, Recycling and Recovery (CalRecycle), Local Enforcement Agency (LEA), and the Colorado River - Regional Water Quality Control Board (RWQCB).

### **1.3 Responsible Parties**

The responsible parties for closure construction at the Mecca II Sanitary Landfill, as set forth herein, are as follows:

Landfill Owner/Operator:

Riverside County  
Department of Waste Resources  
14310 Frederick Street  
Moreno Valley, California 92553  
Phone: (951) 486-3200  
Representative: Mr. Hans W. Kernkamp, P.E.

Project Manager:

Riverside County  
Department of Waste Resources  
14310 Frederick Street  
Moreno Valley, California 92553  
Phone: (951) 486-3200  
Representative: Mr. Jeff L. Gow, P.E.

Resident Engineer:

Riverside County  
Department of Waste Resources  
14310 Frederick Street  
Moreno Valley, California 92553  
Phone: (951) 486-3200  
Representative: Mr. Alex S. Argueta

Lead Field Inspector:

Riverside County  
Department of Waste Resources  
14310 Frederick Street  
Moreno Valley, California 92553  
Phone: (951) 486-3200  
Representative: Mr. Donald Gerber

QA/QC Consultant

[To be selected]

### **1.4 Project Organization**

The principal functions of the QA/QC team are presented below:

#### **1.4.1 Landfill Owner/Operator**

The Mecca II Sanitary Landfill Owner and Operator is the Riverside County Department of Waste Resources (County). Work shall always be subject to approval by the County.

#### **1.4.1.1 Project Manager**

The Project Manager shall be the person working on behalf of the County having authority on the project and its QA/QC activities (unless County Board or General Manager - Chief Engineer approval is required). The Project Manager will be responsible for reviewing all design and QA/QC issues which may arise during construction. The approval of the Project Manager shall be required prior to any design and/or QA/QC changes.

#### **1.4.1.2 Construction Manager and Lead Field Inspector**

The Construction Manager and Lead Field Inspector will serve as the Project Manager's on-site representatives. Other County personnel may temporarily fill in for designated County staff during the course of construction. All coordination, reporting, and issues related to non-compliance shall be directed through the Construction Manager, or the Lead Field Inspector in his absence. In addition, he/she will participate with the Project Manager, and QA/QC Consultant in all decisions related to design and QA/QC issues which arise during the course of construction.

#### **1.4.2 Contractor**

The Contractor is the firm or its representatives responsible for the construction activities. Responsibilities of the Contractor include, but are not limited to, the following:

- Assign duties and supervise the construction crew.
- Manage the day-to-day execution of construction activities in accordance with the Contract Documents and the provisions of this plan.
- Conform to federal, state, and local safety regulations pertinent to the construction work.
- Notify the QA/QC Consultant when materials are going to be delivered on site so that the excavation and mixing monitoring work can be performed.
- Immediately report to the County, in writing, any unexpected field conditions.
- Responsible for any Sub-Contractors
- Complete construction records required by this plan.

#### **1.4.3 QA/QC Consultant**

The QA/QC Consultant shall have authority for QA/QC activities only and shall maintain continuous communication with the Project Manager, Construction Manager, and Lead Field Inspector regarding QA/QC activities. The QA/QC Consultant organization will consist of a team that includes a QA/QC Manager and QA/QC Monitors (Field Engineers, Field Geologist, and Technicians). The QA/QC Manager has overall responsibility for reviewing and approving QA/QC activities and is responsible for daily direction of QA/QC and testing laboratories. The QA/QC Monitors conduct observation, sampling, testing, and documentation as required by this document and as directed by the QA/QC Manager. This work shall always be subject to consultation with and/or approval from the County.

The work to be done by the QA/QC Consultant as stated in the QA/QC Plan shall not in any way relieve the Contractor of its own obligations or responsibilities under the Contract Documents.

Along with County staff, the QA/QC Consultant is responsible for observing, inspecting, testing, and documenting activities related to construction QA/QC during the closure construction. The role of the QA/QC Consultant is critical to successful control and demonstration of construction procedures and required documentation. Their responsibilities include, but are not limited to, the following:

- Perform materials receiving, monitoring, and obtain required samples of incoming materials for testing.
- Perform construction monitoring and in situ (in place) tests as specified and at the frequencies required.
- Evaluate and collect samples in the field for subsequent testing by on-site or off-site laboratories.
- Report non-conformance product, as appropriate, to the Contractor's representatives, if correction can be made during the normal course of work.
- Report non-conformance product to the County, if correction cannot be readily achieved to the satisfaction of the QA/QC Consultant, so that resolution can be accomplished.
- Report to the County any activities which are adverse to overall quality and any non-conformance which are recurring, even though resolution is readily achievable.
- Document non-conformance.
- Document the construction monitoring and testing activities and prepare the as-built report.
- Evaluate and approve any earth or geosynthetic material modifications or for any design modifications which may impact the performance of the final cover.

#### **1.4.3.1 QA/QC Manager**

The QA/QC manager must be a registered civil engineer or certified engineering geologist as stated in Title 27 California Code of Regulations (CCR) §20324. The QA/QC Manager shall serve as the QA/QC Consultant's on-site representative. All QA/QC functions shall be under his direct authority. The QA/QC Manager is responsible for all QA/QC coordination, review, construction observation, sampling, testing, and reporting activities. All noncompliance issues shall be directed to the QA/QC Manager. In addition, he will communicate directly with the Construction Manager in all decisions related to potential design and construction changes and any problems that arise during the course of construction.

The QA/QC Manager will be responsible for overall review of observation, sampling, and testing activities for earthwork. Specific duties will include the following:

- Review and knowledge of all Contract Documents.

- Review of all Contractor submittals and design changes.
- Implementation of the QA/QC Plan, including assigning and managing all QA/QC personnel, reviewing all daily field reports and logs
- Providing engineering review of all QA/QC-related issues.
- Serving as the on-site representative of the QA/QC Consultant.
- Attendance at all QA/QC-related meetings, including pre-construction, progress, and special meetings, as required.
- Participation in the preparation of the As-Built Drawings.
- Coordination of all field testing, sampling, and laboratory testing, and shipping samples to laboratories.
- Review of the results of field and laboratory testing, and the preparation of appropriate recommendations.
- Review of all QA/QC Monitor's daily reports and logs.
- Responsibility for observation and notation of on-site activities and/or conditions that could jeopardize the quality or function of the construction, and reporting these to the County and QA/QC Consultant.
- Observation and evaluation of all cut slopes that may be impacted by geologic conditions.
- Confirmation of the quality and engineering characteristics of the subgrade or engineered fill used to support compacted engineered fill.
- Confirmation that the constructed earthwork and concrete conform to the requirements of the Contract Documents.
- Preparation of a monthly summary of QA/QC activities.
- Familiarize all QA/QC Monitors with the site and the QA/QC requirements for the project.
- Designation of a Senior QA/QC Monitor to act on his behalf at the site during his absence and while operations are ongoing.
- Preparation of the final As-Built report for all completed earthwork construction of the project.

#### **1.4.3.2 QA/QC Monitors**

The QA/QC Consultant will confirm that all native deposits, processed on-site soils, and earth materials conform to the requirements of the Contract Documents. This will include the following tasks:

- Confirmation of the adequacy of all clearing, grubbing, stripping, and site preparation in areas to receive engineered fill or borrow source excavations.
- Observation and evaluation of all cut slopes that may be impacted by geologic conditions.

The duties of the QA/QC Monitors include monitoring, logging, and documenting all construction operations. The operations to be monitored include the following:

- Material delivery.
- Unloading and on-site transport and storage.

- All placement operations.
- Selection of samples for conformance testing by the independent testing laboratory.
- Repair operations.

The QA/QC Monitors shall verify in writing on a daily basis during installation that the interim as-built plans include the following:

- Identification of problems or unusual conditions by reference to the surveyor coordinates.

The QA/QC Technicians shall observe and document all grading operations to provide a basis for giving an opinion that construction is carried out in conformance with the Contract Documents. Their duties will include (but are not necessarily limited to) the following tasks:

- Verification of preparation and condition of soil subgrade, including over excavation and replacement with engineered fill.
- Verification that engineered fill is derived from approved sources.
- Visual confirmation that the physical soil properties are consistent with the Contract Documents.
- Identification of deleterious materials or other deficiencies in soil quality and taking action to prevent such materials from being incorporated within compacted engineered fill or permeable layers of the project.
- Monitoring of lift thickness of compacted earthen materials.
- Verification that proper moisture conditioning and mixing is performed to achieve uniformity of material and compaction requirements.
- Verification that all oversize material is removed from the native soil or the permeable materials using rock-rakes or screens, and that all clods are broken down to maximum sizes in accordance with the Contract Documents.
- Observation of uniformity of coverage of compaction equipment, especially at edges and turnaround areas.
- Observation of the engineered fill at the beginning of each grading day, and establishment of requirements for wetting, drying, or processing prior to placing additional materials.
- Recovery of samples for laboratory testing.
- Undertaking of field density tests at the minimum frequencies noted herein, or at any time that a deficiency is suspected.
- Confirmation that the field density and grain size of all compacted engineered fill are in conformance with the Contract Documents and this QA/QC Plan, which will include retests of any previously failed areas.

## **1.5 Surveying**

### **1.5.1 Contractor's Surveyors**

The responsibilities of the Contractor's Surveyor include the following functions:

- Protection of all primary control points set by the County; any required replacement of these points, due to Contractor negligence, shall be at the Contractor's expense.
- Provision of elevation checks to assure that slopes, elevations, grades, and alignments adhere to the Contract Documents.
- Strict control of the line (as required) and grade of subgrade during earthwork operations.
- Performance of regular field surveys to provide control, verification, and documentation of the required thickness and position of the in-place final cover system as shown in the Contract Documents.
- Establishment of secondary control points within the area of work for monitoring of construction progress.
- Completion of As-Built Plan(s) of the constructed surfaces prior to construction of the subsequent layers.
- Placement of cut/fill stakes on slopes, stakes at all pad-slope and slope-bench transitions, and stakes on the perimeters of the earthwork layers.
- Provision of horizontal and vertical location of reference points for geotechnical field testing and sampling.
- Removing all stakes and properly repairing all resulting holes in the completed earthwork layers.
- As-built surveying of finished grades of the project.
- Responsibility to immediately report in writing any errors, discrepancies, or omissions that could lead to inaccurate control point placement to the County for interpretation or correction prior to proceeding with that portion of work.

### **1.5.2 County Surveyors**

The responsibilities of the County Surveyors include the following functions:

- Establishment of primary control points on firm ground, outside the limits of the work at the landfill site to be used throughout the construction period.
- Verification of the Contractor's work as the County deems appropriate.
- Performance of periodic field surveys to provide a basis for progress payments, evaluating and documenting that the thickness and position of the earthen layers are consistent with the Contract Documents.



## **1.6 Meetings**

Communication between project participants is essential and includes the exchange of information which allows required reporting and work to proceed. Communications in the form of construction documents, monitoring results, test results, and daily logs must be timely so that reviews and evaluation of construction activities can take place.

In order to assure a high degree of quality during construction, close coordination between the County, QA/QC Consultant, Contractor, and subcontractor(s) is essential. To assist in achieving this objective, the following meetings will be held:

### **1.6.1 Pre-Construction Meeting**

Before construction begins, a pre-construction meeting will be held and led by the Project Manager. Attendance at the meeting should include: the County, QA/QC Consultant, the Contractor's project manager and other representatives such as superintendents and foremen. Representatives of the regulatory agencies may be invited to attend the meeting. Meeting notes shall be prepared by the County and maintained in the on-site records system. Subcontractor personnel shall attend the meeting as appropriate to their scope of work. Specific items to be considered at this meeting include but are not necessarily limited to the following:

- Distribution of relevant documents to all parties.
- Review of the responsibilities of each party.
- Review of lines of authority and communication.
- Review of work area security and safety protocol.
- Review of methods for documenting and reporting, distributing and filing documents and reports, and processing of shop drawing submittals.
- Review of proposed methods of construction, including equipment, with specific emphasis on preparation of existing slopes, mixing, blending, transporting, compacting, moisture conditioning, cutting slopes, as related to the Contract Documents.
- Review of the procedures for field and laboratory QA/QC testing.
- Review procedure for change orders.
- Review procedure for application for payments and processing.
- Establishment of procedures for project documentation and reporting and distribution of documents and reports.
- Review of the project schedule.
- Conduct of a site inspection to discuss work areas, stockpile areas, storage areas, access roads, haul roads, and related items.

The meeting will be documented by the County, and minutes will be distributed to all parties. Additions or corrections to minutes shall be submitted within five working days of receipt.

### **1.6.2 Weekly Progress Meetings**

A progress meeting shall be held each week. At a minimum, these meetings shall be attended by the Construction Manager, the QA/QC Consultant and the Contractor. The purpose of these meetings shall be the following:

- Health and safety related issues will be discussed.
- Review the previous week's activities, progress, and Contractor performance. The Contractor shall submit a written report signed by a representative of the Contractor which shall include, but not be limited to: the number of people and major pieces of equipment under his employment, including subcontractors, work accomplished by them, weather conditions, safety incidents, and accidents in the previous week.
- Test data will be reviewed.
- Quantities and percentages that indicate the progress of work to date will be discussed and agreed upon. The County's estimate, if different than the Contractor's estimate, shall govern partial payments.
- Scheduled work activities for the next two weeks shall be discussed. The Contractor shall submit a chart for the schedule of work during this period.
- Contractor and subcontractor personnel, equipment, and assignments for the next week will be discussed. The Contractor shall submit a written report signed by a representative of the Contractor, that shall include, but not be limited to: the number of people and major pieces of equipment anticipated under his employment, including subcontractors, and their anticipated accomplishments for the next week.
- Discuss section(s) of the QA/QC Plan that will be pertinent in the next week.
- Expected Contractor submittals for upcoming work shall be reviewed.
- Problems shall be discussed. The Contractor shall submit a written report, signed by a representative of the Contractor, that shall include, but not be limited to; a description of problem areas (recent, current, and anticipated), any resulting delays and their impact, and an explanation of corrective actions taken or proposed.

The meetings shall be documented by the County, and minutes shall be distributed to all parties. Additions or corrections to the minutes shall be submitted within five working days of receipt.

### **1.6.3 Quality Resolution Meeting**

A special meeting may be called by the County, the Contractor, or the QA/QC Consultant to discuss activities adverse to construction quality and to provide resolution. It is intended that these meeting may be called to discuss quality problems or deficiencies which cannot be readily resolved and/or which are ongoing or recurring.

The meeting should:

- Define and discuss the quality-related problems or deficiencies.
- Review possible corrective actions or solutions.
- Implement a plan to resolve the quality-related problems or deficiencies.

- Determine if a design modification is required.
- Establish whether change orders are required.

The County and/or QA/QC Consultant will document the meeting and minutes will be distributed to all parties. Additions or corrections to minutes shall be submitted within five working days of receipt.

## **1.7 Documentation and Record Keeping**

To provide evidence of satisfactory work performance, all stages of the Mecca II Sanitary Landfill closure construction shall be documented.

### **1.7.1 General**

The QA/QC Plan requires thorough monitoring and documentation of all construction activities. Therefore, the QA/QC Consultant shall document that all QA/QC requirements have been addressed and satisfied.

Documentation shall also consist of daily reports, construction problem reports, weekly progress reports, photographs, design and specification revisions, and a final report of the as-built product (supplemented by documentation from all material manufacturers and suppliers). The documentation is to include copies of manufacturer and supplier specification sheets, certification sheets, shop drawings, transportation tickets, and any other pertinent documents.

The information shall be recorded on standardized forms and in a bound field logbook.

### **1.7.2 Daily Reports**

The purpose of daily record keeping is to record construction activities, including results of continuous visual observations, laboratory/field test data, sampling, review of test results, repairs, problems, solutions and general field activity. The daily record keeping will include a daily field activity log and a daily test summary report, as discussed below.

The daily record keeping shall include a daily field observation report, a daily test summary report, a summary of daily meetings with the Contractor and subcontractors, when applicable, observation and data reports, and construction problem reports.

#### **1.7.2.1 Daily Field Observation Reports**

The QA/QC Monitor(s) shall keep a daily field observation report of project activities. At a minimum, this report shall include the following:

- Date and project identification.
- Review possible corrective actions or solutions.
- Field activity and work locations.
- Summaries of field communications.
- Summary of equipment and personnel used.
- Work activity monitored, general location on-site and tests taken.

- Record of material sampling and testing activities.
- Any variance from specified methods and standards.
- Estimated quantities of material placed and compacted.
- Unusual events.
- Actions regarding acceptance/rejection of work.
- Weather conditions.
- Signature of person preparing the report.

The QA/QC Consultant shall be responsible for observation at the Mecca II Sanitary Landfill Site. The daily field inspection report shall be reviewed by the QA Manager and shall be submitted to the County. One complete set of daily reports shall be kept on site by the QA/QC personnel at all times.

#### **1.7.2.2 Daily Test Summary Report**

A daily Test Summary Report of the field and laboratory tests for the QA/QC of earthwork shall be prepared under the direction of the QA/QC Manager. The Daily Test Summary Report will include:

- Locations and results of all field and laboratory tests on the compacted engineered fill with pass and/or fail data and status of corrective compliance requirements.
- Results of all retests for failed tests with remarks showing the corrective action before the retest. If retest also shows rejection, final corrective action shall be noted.

#### **1.7.3 Construction Problem Reports**

These reports identify and document construction problems and solutions. They are intended to document problems involving significant rework, and are not intended to document problems that are easily corrected, unless the problems are recurring. Each report shall include:

- A detailed description of the problem.
- The location and cause of the problem.
- How the problem was identified.
- A solution to the problem.
- Personnel involved.
- Signatures of the QA/QC Manager, Construction Manager, and Contractor, as appropriate.

The results of equipment calibration, laboratory analysis, daily field activity logs, daily test summaries, and internal memoranda can be used as portions of the nonconformance report.

#### **1.7.4 Weekly Progress Reports**

A weekly progress report shall be prepared by the Construction Manager. This weekly progress report shall summarize the work activities, deficiencies, and corrective actions implemented. It shall also summarize the QA/QC test results.

### **1.7.5 Photographs**

The QA/QC Monitors shall prepare and maintain a photographic record as part of the construction control activities. Photographs shall be in color and shall include photographs of construction activities, problem areas, corrective actions, and final constructed features. Photographs shall be identified with the site designation, the date taken, the location, and a description of the activity covered by the photograph.

### **1.7.6 Design and Specification Revisions**

If revision to the Contract Documents is required during construction the QA/QC Consultant shall immediately notify the County. Revisions to the Contract Documents shall become official only after written approval by the County.

### **1.7.7 As-Built Plans and Documentation**

As the work is completed, the Contractor shall prepare final As-Built Plans and the QA/QC Consultant shall prepare a report. The As-Built Plans and the report shall be submitted by the Contractor and the QA/QC Consultant, respectively, to the County.

Interim As-Built plans shall be updated daily by the Contractor, under the direction of the QA/QC Consultant and Construction Manager, utilizing the records prepared by the Contractor's Surveyors, in preparation of the final As-Built Plans.

The As-Built Plans shall be prepared by the Contractor, under the direction of the QA/QC Consultant and County, utilizing the interim as-built plans, and if required, records prepared by the Contractor's Surveyors during construction. The As-Built Plans shall be to scale and show the location and elevation, where applicable, of all materials used in construction. These Plans shall be retained as a permanent record of construction.

The final report by the QA/QC Consultant shall include a summary of field and laboratory test results; and photographs showing and narrative describing typical construction conditions and procedures used throughout the entire duration of the project.

### **1.7.8 Final Construction Report**

At completion of the work, the QA/QC Consultant shall submit a final construction report to the County. The QA/QC consultant is expected to submit the final construction report within two weeks of construction completion.

**END OF SECTION**

## 2 EARTHWORK REQUIREMENTS

### 2.1 General

The following earthwork requirements are the minimum requirements applicable to the Contractor's earthwork operations used in construction of this project. The Contractor must strictly comply with these requirements.

The final cover system shall consist of a minimum three (3) foot thick monolithic section of earth material which includes from bottom to top: a lower layer (aka foundation layer), directly adjacent to refuse materials, that is no less than one (1) foot thick of existing intermediate cover soil (aka foundation layer) and an upper layer (aka final cover layer) that is no less than two (2) feet thick of native soil.

All material considered by the County or the QA/QC Consultant to be unsuitable shall be removed. All materials incorporated as part of compacted engineered fill must be inspected and placement must be observed by the QA/QC Consultant.

The ground surface to receive final cover system material shall be prepared to the satisfaction of the QA/QC Consultant and the County; and the engineered fill shall be prepared, placed, spread, mixed, watered, and compacted in strict accordance with this QA/QC Plan and the other Contract Documents.

Construction of the final cover system shall be continuously observed, routinely sampled and tested by the QA/QC Consultant during construction operations for the physical parameters described in this section. During processing and/or grading operations, no soils or soil types other than those previously analyzed may be used, unless the QA/QC Consultant documents the suitability of these soils with additional testing. The testing frequency presented herein is a minimum. Additional tests shall be conducted by the QA/QC Consultant at any time for retests and/or when a deficiency is suspected. Retests of previously failed areas shall be performed at the discretion of the QA/QC Consultant when, in his opinion, sufficient reworking of the area has been performed by the Contractor to warrant a retest.

Following a thorough re-working of a failed area, retesting shall be performed by the QA/QC Consultant to evaluate whether the re-worked area meets the requirements of the project.

Unless otherwise specified by the QA/QC Consultant, no permanent cut slopes shall be excavated higher or steeper than that allowed by the ordinances of controlling governmental agencies.

All excavated or fill surfaces shall be graded to provide positive drainage and prevent ponding of water. Surface water shall be controlled to avoid damage to adjoining properties or to finish work on the site.

If any unanticipated earth conditions of an adverse or potentially adverse nature are encountered during grading, the QA/QC Consultant shall investigate, analyze and make recommendations to mitigate these conditions

## 2.2 Specifications

### 2.2.1 Contractor Responsibility

All materials used or placed to construct the final cover system must meet or exceed the criteria indicated in this QA/QC Plan and the Contract Documents. The Contractor shall be solely responsible for the satisfactory completion of all earthwork in strict accordance with the Contract Documents.

### 2.2.2 Ground Surface Preparation

Surfaces receiving fill and on-site borrow sources shall be cleared, grubbed, stripped, and prepared to the satisfaction of the QA/QC Consultant and the County. Prior to fill placement, the prepared surface to receive fill shall be inspected by the QA/QC Consultant.

### 2.2.3 Material

#### 2.2.3.1 General

This Section applies to all fill material including the preparation of the existing landfill surface (intermediate cover or foundation layer), final cover layer, and general site engineered fill (i.e fill not placed within landfill unit). The Contractor shall selectively excavate soils from pre-approved on-site borrow sources as identified by the County and QA/QC Consultant (or his representative) during the grading operations.

The Contractor shall place all fill materials in thin lifts with un-compacted thickness of **no less than six (6) inches and no greater than eight (8) inches.** Each layer shall be spread evenly, thoroughly mixed, and compacted to obtain a near uniform condition in each layer. In areas of excess lift thickness, re-grading of the surface to the maximum lift thickness must be completed by the Contractor prior to construction of additional lifts.

As determined by the QA/QC Consultant, portions of fill material placed over cut slopes shall be properly keyed through top soils, colluvium, or creep material into rock or firm material. All transitions shall be stripped of all loose spoils prior to placing engineered fill.

Contractor shall selectively excavate soils from pre-approved on-site borrow sources as identified by the County and QA/QC Consultant during grading operations. Cover soils shall contain sufficient fine-grained constituents such that gravel size and larger fragments do not cluster during construction. All soils shall be free of potentially hazardous environmental pollutants.

All fill materials shall be moisture conditioned (or dried) to within **two (2) percent** below or above optimum moisture content (OMC) and compacted to a minimum of **87 percent** of the maximum dry density as determined by ASTM D698. Where work is interrupted by heavy rains, fill placement shall not resume until observations and field tests by the QA/QC Consultant or County indicate in-place fills and/or materials intended for placement are

firm, stable, and within the limits specified in the Contract Documents. Erosion damage shall be evaluated by the QA/QC Consultant or County and reworked by Contractor, as necessary, to meet the project requirements.

#### **2.2.3.2 Existing Landfill Surface**

To provide uniform compaction, the existing landfill surface shall be scarified, disced or bladed until it is uniform, free from uneven features and contains no irreducible rock in excess of three (3) inches in maximum dimension. The scarified ground surface shall then be brought to within **two (2) percent** below or above optimum moisture content, mixed as required and compacted to a minimum of **87 percent** of the maximum dry density as determined by ASTM D698. If the scarified depth is greater than 12 inches, the excess shall be removed and placed in lifts of six to eight inches in thickness.

#### **2.2.3.3 Final Cover Layer**

All fill material placed on the landfill surface shall consist only of selectively graded, screened (as needed), transported, and processed on-site soils as specified in Detailed Provision Section 31 2300: Earthwork. The cover soils shall contain sufficient fine-grained constituents such that gravel (material retained on a No. 4 sieve) size and larger fragments do not cluster during construction. **Irreducible rock or rock fragments in excess of three (3) inches in maximum dimension shall not be utilized in the final cover system.**

Fill material shall be moisture conditioned to be within **two (2) percent** below or above optimum moisture content and compacted to a minimum of **87 percent** of the maximum dry density as determined by ASTM D698.

If inadequate processed materials are placed, the Contractor shall immediately reprocess these materials or return them to the material processing area where they will be reprocessed.

#### **2.2.3.4 Unsuitable Material**

All material considered by the QA/QC Consultant, or the County, to be unsuitable for use in the construction of the cover system shall be removed.

Material deemed unlikely to meet the performance specifications and not disposed of during clearing and grubbing or demolition shall be removed from the stockpiles, borrow and/or fill as directed by the QA/QC Consultant and will be disposed of off-site.

### **2.2.4 Material Processing Area**

On-site borrow material shall be thoroughly processed to generate a single uniform material, and moisture conditioned (or dried) to  $\pm 2$  percent optimum moisture content as determined by ASTM D698.



The Contractor shall develop a plan to be approved by the County and the QA/QC Consultant, to assure that the materials are appropriately mixed and processed. The plan shall designate a processing area and describe laydown methods, mixing methods (rotomixer, discing, etc.), screening, and moisture conditioning.

The Contractor shall place processed final cover layer material on the landfill surface within one (1) working day of generation. Neither material excavation or final cover material placement shall exceed the capability of processing material to meet specification requirements.

### **2.2.5 Equipment**

Equipment used in the excavation, transport, screening, mixing, stockpiling, processing, installation, and compaction of all materials used in construction of the final cover system shall be of standard practice grading machinery of known specifications suitable for performing this type of landfill closure work in a timely, proper, and efficient manner.

Suitable and sufficient quantity of processing and compaction equipment shall be onsite to handle the amount of fill being stockpiled, processed, screened, mixed, and/or placed. If necessary, excavation equipment will be shut down temporarily in order to allow time for proper preparation and/or compaction of fills. Sufficient watering apparatus shall be provided with due consideration to the type of fill material, curing characteristics, rate of placement, and time of year.

## **2.3 Monitoring: Observations and Testing**

Construction of the final cover system shall be performed strictly in accordance with the Contract Documents and the QA/QC Plan. Construction shall be continuously observed, routinely sampled, and tested by the QA/QC Consultant to confirm compliance with all applicable requirements.

The testing frequencies stated in the following tables are considered a minimum. Additional tests will be conducted by the QA/QC Consultant to retest previously failed areas and at any time that, in the opinion of the QA/QC Consultant, additional testing is required and/or a deficiency is suspected. At the discretion of the QA/QC Consultant, retests of previously failed areas will be performed after sufficient reworking of such areas to warrant a retest has been performed by the Contractor. Following re-working of a previously failed area, the QA/QC Consultant will perform retests to verify that the requirements of the Contract Documents are satisfied.

Representative samples of materials to be used for the final cover system will be tested in the laboratory in order to determine the physical characteristics of the material. During the preparation of the existing intermediate cover layer and the placement of the Final Cover Layer, no soil types other than those previously analyzed may be used unless the QA/QC Consultant documents the suitability of these soils with appropriate testing paid for by the Contractor.

Laboratory and field QA/QC verification testing shall be performed on the source for the fill material in the on-site excavation area and also once in place on the landfill. The minimum testing requirements for fill material is specified in the following tables: “Table

1 – On-Site Excavation/Material Processing Area Testing Requirements”, and “Table 2 – Fill Material Testing Requirements.”

**2.3.1 Processing of Borrow Source Materials**

Select on-site materials will be thoroughly screened, blended, mixed with a disc or equivalent mixing apparatus as deemed necessary; and moisture conditioned by applying water and repeatedly furrowing soils until a uniform material and moisture condition is attained.

The generated processed material shall be evaluated according to “Table 1 – On-Site Excavation/Material Processing Area Testing Requirements” prior to placement as engineered fill. Should the processing operations proceed without complications, these tests and minimum testing frequency may be modified as proposed by the QA/QC Consultant and the County and as approved by the appropriate Agencies.

<b>TABLE 1 – ON-SITE EXCAVATION/MATERIAL PROCESSING AREA TESTING REQUIREMENTS</b>				
<b>LABORATORY TESTING REQUIREMENTS</b>				
<b>DESCRIPTION</b>	<b>Particle Size Analysis</b>	<b>Atterberg Limits</b>	<b>Classification of Soils for Engineering Purposes</b>	<b>Processed Material Moisture Content (following blending and moisture conditioning)</b>
<i>DESIGNATION</i>	ASTM D6913	ASTM D4318	ASTM D2487	ASTM D4643 (microwave) or ASTM D4959 (oven)
<i>PROJECT MINIMUM VALUE</i>	<3"	N/A	N/A	2% below or above OMC
<i>MINIMUM FREQUENCY</i>	One per 5,000 CY or One per day minimum per material type	One per 5,000 CY	One per 5,000 CY or One per day minimum per material type	Two per day or One per Material
<b>FIELD TESTING REQUIREMENTS</b>				
<b>DESCRIPTION</b>	<b>Visual Inspection</b>			
<i>DESIGNATION</i>	ASTM D2488			
<i>PROJECT MINIMUM VALUE</i>	Per QA/QC			
<i>MINIMUM FREQUENCY</i>	Daily or One per Material			

**2.3.2 Engineered Fill**

Field and laboratory testing for compaction, moisture content, and engineering properties shall be completed during the preparation of the existing intermediate cover and during the placement of the Final Cover Layer in accordance to the following minimum testing frequency (with the greater frequency of testing to apply). Should the fill operations proceed without complications, these tests and minimum testing frequency may be modified as proposed by the QA/QC Consultant and the County and as approved by the appropriate Agencies. Engineered fill for Intermediate cover preparation or for the Final Cover Layer shall conform to the Testing Frequency stated in “Table 2 – Fill Material Testing Requirements.”

<b>TABLE 2 – FILL MATERIAL TESTING REQUIREMENTS</b>				
<b>LABORATORY TESTING REQUIREMENTS</b>				
<b>TEST TYPE DESCRIPTION</b>	<b>Moisture Density Relationship</b>	<b>Particle Size Analysis</b>	<b>Atterberg Limits</b>	<b>Classification of Soils for Engineering Purposes</b>
DESIGNATION	ASTM D698	ASTM D6913	ASTM D4318	ASTM D2487
PROJECT MINIMUM VALUE	+/- 2% OMC	<3"	N/A	N/A
MINIMUM FREQUENCY	The greater of: One per 10,000 CY or one per material type	One per 5,000 CY or one sample per day minimum per material type	One per 5,000 CY	One per 5,000 CY or 1 per day minimum per material
<b>FIELD TESTING REQUIREMENTS</b>				
<b>TEST TYPE DESCRIPTION</b>	<b>In-Place Density and Moisture Content (Nuclear or Drive Ring)</b>	<b>In-Place Density and Moisture Content (Sand Cone)</b>		<b>Visual Inspection</b>
DESIGNATION	ASTM D2937 ASTM D6938	ASTM D1556		ASTM D2488
PROJECT MINIMUM VALUE	87% of Maximum Dry Density and ±2% OMC	87% of Maximum Dry Density and ±2% OMC		Per QA/QC
ENGINEERED FILL MINIMUM FREQUENCY	Four (4) tests for each 1,000 CY placed or at a minimum of four (4) tests per construction day	10% of required density tests		Daily or One per material.

## 2.4 Acceptance Criteria

### 2.4.1 General

Field laboratory testing for compaction, moisture content, and engineering properties will be completed during construction of the final cover according to the minimum schedule in “Table 2 – Fill Material Testing Requirements”. Should operations proceed without complications in mixing these tests and minimum testing frequency during fill placement may be modified as approved by the QA/QC Consultant and appropriate Agencies.

No additional engineered fill shall be placed over an area until the existing engineered fill has been tested and determined by QA/QC Consultant and the County to meet the requirements of the Contract Documents.

Where test results indicate that any portion of the final cover system is not in strict compliance with the requirements of the Contract Documents, that particular portion shall be retested, re-worked, and/or replaced. Corrective action shall persist until the required condition has been attained and the resulting product meets or exceeds the project requirements. If in the opinion of the QA/QC Consultant, or the County, that the conditions warrant location detail, the area to be reworked shall be recorded by survey, recorded, and verified after the work is completed.

An area represented by a non-conformance test shall be understood to extend from the previous limits of conformance. The non-conformance area shall be established by proceeding from the non-conformance test location limits, parallel and perpendicular to the slope, to the identified region of the previously passing test locations. At the discretion of the QA/QC Consultant or the County, additional tests may be made in the area between the initial non-conformance test location and the adjacent conformance test area. The area to be reworked will be verified by survey if in the opinion of the QA/QC Consultant conditions warrant this detail.

#### **2.4.2 Grain-Size Distribution**

Grain size distribution tests (ASTM D6913) will be performed on the Engineered Fill Material as stated in Table 2.

The final cover engineered fill material shall not contain particles in excess of three (3) inches and shall be rejected for use in the final cover system. If inadequate materials are placed, the Contractor shall immediately reprocess these materials or return them to the materials processing area/borrow source where they will be reprocessed.

#### **2.4.3 Moisture-Density Relationship of Material**

Material property testing of the soils used as engineered fill shall include laboratory moisture-density tests in accordance with ASTM D698. The frequency of the Moisture-Density Relationship determination (ASTM D698) is specified in Table 2. In addition to the specified frequency, changes in the final cover system material shall be monitored by visual observation of the soils, ongoing review of in-place density test results, and any other industry standard (for landfill closure) deemed suitable by the QA/QC Consultant.

Upon placement, in-place density and moisture content tests, as specified in Table 2, will be performed by the frequencies listed in Table 2. If test results indicate a relative dry density of less than 87 percent of the maximum dry density as determined by ASTM D698 or a moisture content outside of the specified limits ( $\pm 2$  percent of the optimum moisture content), then two additional field density/moisture content tests shall be conducted in the immediate area. If either of these tests fail to meet the moisture content or 87 percent minimum compaction requirements, the area shall be considered inadequate and shall be reworked or the material removed. Any reworked areas shall be retested by the QA/QC Monitor to assure the reworked area meets the density and moisture content requirements. The reworked areas must be retested by the QA/QC Consultant to confirm that it meets the density and moisture content requirements.

If, in the opinion of the QA/QC Consultant or the County, fill materials that have been placed or are ready to be placed do not visually appear to have a uniform and homogeneous material characteristic and moisture content throughout, these materials shall be removed, by the Contractor, without testing and shall be reprocessed and/or reworked until the material meets the project requirements.

For soils placed closer than one foot to waste, a relative density of slightly less than 87 percent of the ASTM D698 maximum dry density may be approved if, in the

opinion of the QA/QC Consultant, the yielding nature of the underlying refuse prism creates a situation where the minimum required density cannot readily be achieved. In no event will the minimum density requirement of the remainder of the cover system be modified.

#### **2.4.4 Lift Thickness and Processing**

If at any time the QA/QC Consultant representatives observes an un-compacted lift thickness (less than (6) inches or greater than eight (8) inches or observes materials being placed without the required processing, the Contractor shall immediately cease placing additional fills in that area. Each layer shall be spread evenly, thoroughly mixed, and compacted to obtain a near uniform condition in each layer.

For a lift greater than eight (8) inches thick, the Contractor shall immediately grade and trim the surface to reduce the lift thickness to the lift thickness requirements of the Contract Documents prior to compaction of the lift. If inadequate mixed materials are placed, the Contractor shall immediately reprocess these materials or return them to the mixing table/borrow site where they will be reprocessed.

No additional lifts shall be placed until the previous lift is processed, compacted, and accepted by the QA/QC Consultant. The Contractor shall perform any method deemed necessary by the QA/QC Consultant or the County to prevent lamination between lifts.

#### **2.4.5 Final Cover System Thickness**

The Contractor shall demonstrate and the QA/QC Consultant shall verify that the minimum compacted three (3) foot total final cover system thickness requirement has been met. The thickness of the existing intermediate cover one (1) foot minimum layer and the minimum two (2) foot final cover layer shall be verified using the following methods:

##### **2.4.5.1 Existing Intermediate Cover/Foundation Layer**

Prior to placement of final cover material, the Contractor shall auger vertically, in the presence of the County and the QA/QC Consultant, a maximum of twenty-two (22) test holes (no larger than twelve (12) inches and no smaller than six (6) inches in diameter) into the prepared existing intermediate cover surface in locations determined by the County or QA/QC Consultant. The County and the QA/QC Consultant will verify that the existing intermediate cover layer is equal to or greater than one (1) foot thick vertically. The auger holes shall be backfilled with final cover system material in accordance with the Contract Documents or hydrated bentonite chips, immediately upon verbal authorization from the County.

##### **2.4.5.2 Final Cover Layer**

The Contractor shall conduct auger tests to demonstrate that the full three (3) foot final cover system thickness has been met. Auger testing shall be conducted by auguring holes (no larger than twelve (12) inches and no smaller than eight (8) inches in diameter) vertically into the completed cover

system in the presence of the County and the QA/QC representative. The County and the QA/QC Consultant will verify the minimal vertical thickness of the final cover system has been met. The auger holes shall be backfilled with hydrated bentonite chips, immediately upon verbal authorization from the County. The County or QA/QC Consultant shall at their discretion, designate the locations for auger tests. The location of the auger tests shall be as stated in the Contract Documents. In addition, the example layout of the auger hole locations is provided in the Project Drawings. Although this map is provided as an example only, the County may direct the Contractor to conduct additional auger verification thickness tests at any location.

### **2.4.5.3 Release Form**

Release forms shall be completed for both the completion of the preparing the existing intermediate layer and the placement of the final cover layer. Prior to release and approval by the County of the existing intermediate layer preparation work, the work will have been completed in accordance with the Contract Documents (as determined by the County and the QA/QC Consultant) and the County shall have performed an as-built topographic survey of the specific area. The minimum area the County will consider for release is one acre. Final Cover Layer work shall not commence until an Existing Intermediate Layer Preparation release form is issued by the County for the area in which the Contractor wishes to place Engineered Fill for the Final Cover Layer.

Prior to release and approval by the County of the Final Cover Layer work, the County and/or QA/QC Consultant shall verify that the work has been completed by the Contractor in accordance with the Contract Documents. The Contractor shall not continue any earthwork activities until a release form is issued by the County.

### **2.4.6 County Acceptance**

The Contractor shall retain all responsibility for the earthwork until formal final acceptance by the County. Conditions for formal final earthwork acceptance (by the County) shall include but not be limited to the following:

- The installation of the final cover system is properly finished and summarized in writing by the QA/QC Consultant.
- All required laboratory tests have been completed and summarized in writing by the QA/QC Consultant.
- All record drawings to be used in the drafting of the As-Built Plans have been completed and summarized in writing by the QA/QC Consultant.
- All documentation concerning the earthwork is received from the QA/QC Consultant and Contractor and is approved by the County.

**END OF SECTION**

## **Appendix F**

### **Project Drawings (Reduce Size 11" x 17")**

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# MECCA II SANITARY LANDFILL

## PLANS FOR CLOSURE CONSTRUCTION

### MAY 2020

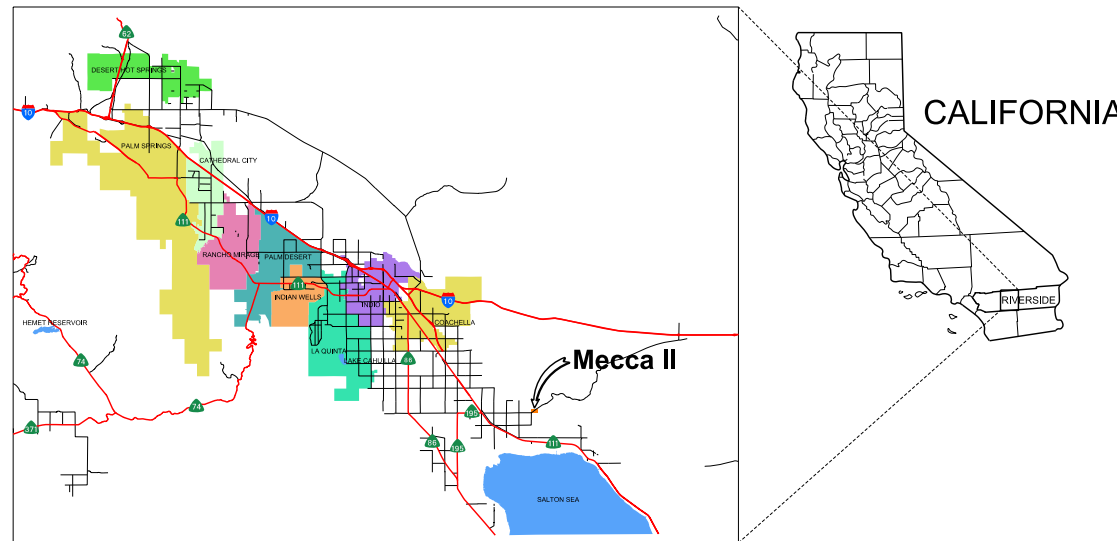
PREPARED BY

RIVERSIDE COUNTY DEPARTMENT OF WASTE RESOURCES

HANS KERNKAMP, GENERAL MANAGER / CHIEF ENGINEER

14310 FREDERICK STREET  
MORENO VALLEY, CALIFORNIA 92553  
TEL. (951) 486-3200 FAX (951) 486-3205





**LOCATION MAP**

N.T.S.



**VICINITY MAP**

N.T.S.

**Mecaa II Sanitary Landfill**  
**95250 66th Ave.**  
**Mecca, CA. 92254**

**LEGEND**

- Property line (~ 80 Acres)
- Refuse Limits (~ 19 Acres)
- Design Contours
- Existing Contours (Oct 2019)
- Project Grading Limits
- Slope Transition
- Gradient & Direction
- Flow Line / Flow Direction
- Slope
- Existing Surveying Control Points (PIP)
- Earthen Berms
- Shotcrete Reinforced Earthen Berms
- Existing Chain-Link Fence to be Removed
- Existing Chain-Link Fence (PIP)
- Temporary Concrete Barrier Rails with Chain-Link Barrier Fence Panels
- Temporary Chain-Link Fence
- New Chain-Link Fence
- Perimeter Gas Probe
- Groundwater Monitoring Well
- Erosion Monuments

**FILL PATTERNS**

- Existing Ground/Intermediate Soil
- Final Cover
- Grouted Rip-Rap
- Concrete/Shotcrete
- Grout
- Crushed Misc. Base
- Engineered Fill
- Existing Asphalt
- Existing Refuse
- Non-Hazardous Project Related Materials

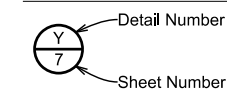
**ABBREVIATIONS**

- AC Asphalt Concrete
- APPROX. Approximate
- AWG American Wire Gauge
- C Cut
- CL or CL Center Line
- CMB Crushed Misc. Base
- CVWD Coachella Valley Water District
- DIA Diameter
- E Easting
- EL Elevation
- Exist. Existing
- F Fill
- FL or FL Flow Line
- F&I Furnish and Install
- GB Grade Break
- HP Hinge Point
- IID Imperial Irrigation District
- LDPE Low-Density Polyethylene
- LF Linear Feet
- L Length
- Max. Maximum
- Min. Minimum
- Misc. Miscellaneous
- N Northing
- NAD North American Datum
- NPS Nominal Pipe Size
- NTS Not To Scale
- PPM Processed Palm Material
- PIP Protect In Place
- PL or PL Property Line
- R.C.E. Registered Civil Engineer
- RCFC Riverside County Flood Control
- RS Reinforced Shotcrete
- STA Station
- TOE Toe of Slope
- TS Top of Slope
- TYP Typical
- Vert. Vertical
- WWF Welded Wire Fabric

**INDEX OF DRAWINGS**

SHEET	FILE NAME	TITLE	SCALE (D Size)
1	MeII_FC_s01 Title.dgn	Title Sheet	NTS
2	MeII_FC_s02 Index.dgn	Index, Legend & Vicinity Map	NTS
3	MeII_FC_s03 Site Map.dgn	Site Map	1" = 100'
4	MeII_FC_s04 Demolition & Temp Fence Plan.dgn	Demolition & Temporary Fencing Plan	1" = 60'
5	MeII_FC_s05 Grading Plan - Final Cover.dgn	Grading Plan - Final Cover	1" = 60'
6	MeII_FC_s06 Grading Plan - Final Cover Isopach.dgn	Grading Plan - Final Cover Isopach	1" = 60'
7	MeII_FC_s07 Grading Plan - Final Cover X-Sections.dgn	Grading Plan - Final Cover X-Sections	1" = 50'
8	MeII_FC_s08 Grading Plan - Borrow Area.dgn	Grading Plan - Borrow Area	1" = 60'
9	MeII_FC_s09 Grading Plan - Borrow Area Isopach.dgn	Grading Plan - Borrow Area Isopach	1" = 60'
10	MeII_FC_s10 Grading Plan - Borrow Area X-Sections.dgn	Grading Plan - Borrow Area X-Sections	1" = 50'
11	MeII_FC_s11 Drainage, Settlement & Fencing Plan.dgn	Drainage, Settlement Monuments & Fencing Plan	1" = 60'
12	MeII_FC_s12 Drainage Details.dgn	Drainage Details	NTS
13	MeII_FC_s13 Drainage Details.dgn	Drainage Details	NTS
14	MeII_FC_s14 Fencing Details.dgn	Fencing Details	NTS
15	MeII_FC_s15 Site Photos.dgn	Site Photos	NTS
16	MeII_FC_s16 Auger Map.dgn	Augering Location Map	1" = 60'

**DETAIL CALLOUTS**



**CONSTRUCTION NOTE CALLOUT**



**GENERAL NOTES**

- DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN IN THESE PROJECT DRAWINGS SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF ALL APPLICABLE CONTRACT DOCUMENTS OR AS DIRECTED BY THE COUNTY.
- CONTRACTOR SHALL PROVIDE PROJECT MANAGEMENT, ADMINISTRATION AND COORDINATION SERVICES TO SUCCESSFULLY COMPLETE THE PROJECT IN ACCORDANCE WITH THE FOLLOWING DETAILED PROVISIONS: 01 2900: PAYMENT PROCEDURES, 01 3100: PROJECT MANAGEMENT AND COORDINATION, 01 3200: CONSTRUCTION PROGRESS DOCUMENTATION, 01 3300: SUBMITTAL PROCEDURES, 01 4300: QUALITY ASSURANCE AND CONTROL, 01 7000: EXECUTION REQUIREMENTS AND 01 7700: CLOSEOUT PROCEDURES.
- CONTRACTOR SHALL PROVIDE ALL TEMPORARY FACILITIES, UTILITIES (WATER, ELECTRICAL, SANITARY FACILITIES, WASTE COLLECTION, TELEPHONE SERVICE, ETC.) AND CONTROLS AS NECESSARY TO SUCCESSFULLY COMPLETE ANY AND ALL CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH DETAILED PROVISION 01 5000: TEMPORARY FACILITIES AND CONTROLS. THE TEMPORARY ELECTRICAL SHALL BE INSPECTED AND APPROVED BY IID PRIOR TO ENERGIZING.
- CONTRACTOR SHALL PROVIDE AND PERFORM ALL ENVIRONMENTAL PROTECTION CONTROLS (EROSION CONTROL, HAZARDOUS WASTE MANAGEMENT, STORM WATER QUALITY PROTECTION, AIR QUALITY, ETC.) AS REQUIRED TO SUCCESSFULLY COMPLETE ANY AND ALL CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH DETAILED PROVISION 01 5600: PROJECT ENVIRONMENTAL CONTROLS.
- CONTRACTOR SHALL PREPARE AND IMPLEMENT A PROJECT-SPECIFIC HEALTH AND SAFETY PLAN (HASP) IN ACCORDANCE WITH DETAILED PROVISION 01 3500: HEALTH AND SAFETY.
- CONTRACTOR SHALL PREPARE AND IMPLEMENT A PROJECT-SPECIFIC WASTE RECYCLING PLAN IN ACCORDANCE WITH DETAILED PROVISION 01 7419: CONSTRUCTION WASTE MANAGEMENT.
- CONTRACTOR SHALL PREPARE AND IMPLEMENT A PROJECT-SPECIFIC STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH SPECIFICATION SECTION 01 5600: PROJECT ENVIRONMENTAL CONTROLS.
- CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING STRUCTURES AND UTILITIES (INCLUDING BUT NOT LIMITED ELECTRICAL CONDUIT AND CABLE, POWER POLES, GAS LINES, FENCES, MONITORING WELLS, TELEPHONE/DATA LINES, ETC.) UNLESS NOTED OTHERWISE. ANY DAMAGED ITEM SHALL BE RESTORED TO ITS ORIGINAL CONDITION, TO THE SATISFACTION OF THE COUNTY OR REPLACED AT THE CONTRACTOR'S EXPENSE. IF IN THE EVENT ANY EXISTING UTILITIES ARE DAMAGED; IT SHALL REMAIN EXPOSED UNTIL THE REPAIR PLAN IS ACCEPTED BY THE COUNTY AND THE AFFECTED UTILITY.
- ALL EXISTING AND PROPOSED DIMENSIONS SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO STARTING WORK. THE COUNTY SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES.
- GROUND TOPOGRAPHY CONTOURS WERE DEVELOPED BY AERIAL FLIGHT SURVEY DATED OCTOBER 2019. ELEVATIONS ARE IN FEET BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). GRID TICKS ARE BASED ON NORTH AMERICAN DATUM OF 1983 (NAD83), EPOCH 2007.00. NAVD 88 AND NAD83 DATUMS ARE TO BE USED FOR ALL SURVEY WORK. CONTRACTOR SHALL PROVIDE SURVEYING SERVICES TO LAYOUT, CONTROL, INSPECT AND AS-BUILT THE WORK IN ACCORDANCE WITH DETAILED PROVISION 01 4320: SURVEYING.

**DEPARTMENT OF WASTE RESOURCES**

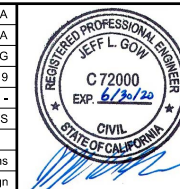
APPROVED: 5/7/20  
 General Manager - Chief Engineer R.C.E. C-45868 Exp. 12/31/20

SUBMITTED: 5/16/2020  
 Principal Engineer R.C.E. C-72000 Exp. 6/30/20

RECOMMENDED: 5/7/20  
 Assistant Chief Engineer R.C.E. C-51694 Exp. 6/30/20



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CHECKED BY:	JLG
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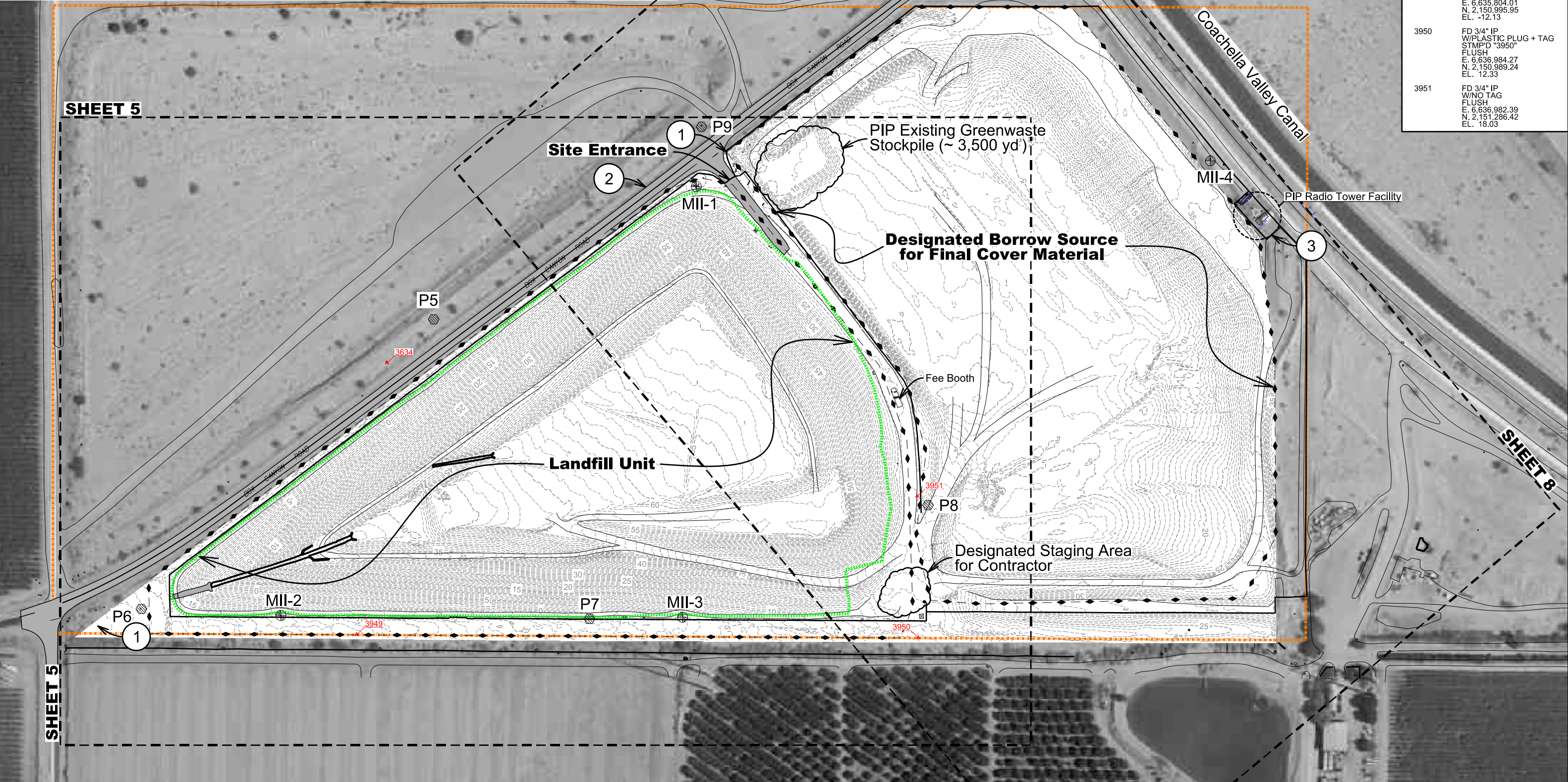
Mecca II Sanitary Landfill  
 Plans for Closure Construction  
**Index, Legend & Vicinity Map**



**CONSTRUCTION NOTES:**

- ① CONTRACTOR SHALL FURNISH AND INSTALL TWO (2) PROJECT SIGNS AT LOCATIONS DESIGNATED BY THE COUNTY. SEE DETAILED PROVISION 01 1100: SUMMARY OF WORK.
- ② BOX CANYON RD. - PIP PAVEMENT AND MAINTAIN TWO-WAY TRAFFIC AT ALL TIMES. THROUGHOUT THE CONSTRUCTION DURATION, CONTRACTOR SHALL PROVIDE TEMPORARY CONCRETE BARRIER RAILS WITH 4 FT. MIN. HIGH CHAIN-LINK BARRIER FENCE PANELS ALONG THE ENTIRE INTERFACE OF THE LANDFILL UNIT/BOX CANYON RD. CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL MEASURES IN CONFORMANCE WITH THE CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND DETAILED PROVISION 01 5000: TEMPORARY FACILITIES AND CONTROLS.
- ③ MAINTAIN ON-ROAD VEHICLE ACCESS TO EXISTING COUNTY RADIO TOWER FACILITY AT ALL TIMES DURING CONSTRUCTION DURATION.

REF NO	DESCRIPTION
3634	FD 1/2" IR W/PLASTIC TBM CAP FLUSH E. 6,635,867.82 N. 2,151,567.04 EL. -2.88
3949	FD 3/4" IP W/PLASTIC PLUG + TAG STMP'D "3949" FLUSH E. 6,635,804.01 N. 2,150,995.95 EL. -12.13
3950	FD 3/4" IP W/PLASTIC PLUG + TAG STMP'D "3950" FLUSH E. 6,636,984.27 N. 2,150,989.24 EL. 12.33
3951	FD 3/4" IP W/NO TAG FLUSH E. 6,636,982.39 N. 2,151,286.42 EL. 18.03



**Legend**

- Property Line (~ 80 Acres)
- Refuse Limits (~ 19 Acres)
- ⊕ Perimeter Gas Probe
- ⊕ Groundwater Monitoring Well
- Existing Contours
- Existing Asphalt
- Project Grading Limits
- ▲ Survey Control Points

NO.	REVISIONS	BY	APPROVED	DATE

Hans Kernkamp, General Manager-Chief Engineer

Scale: 1" = 200' (11x17) 1" = 100' (Full)

Datum is mean sea level

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**Mecca II Sanitary Landfill**  
 Plans for Closure Construction

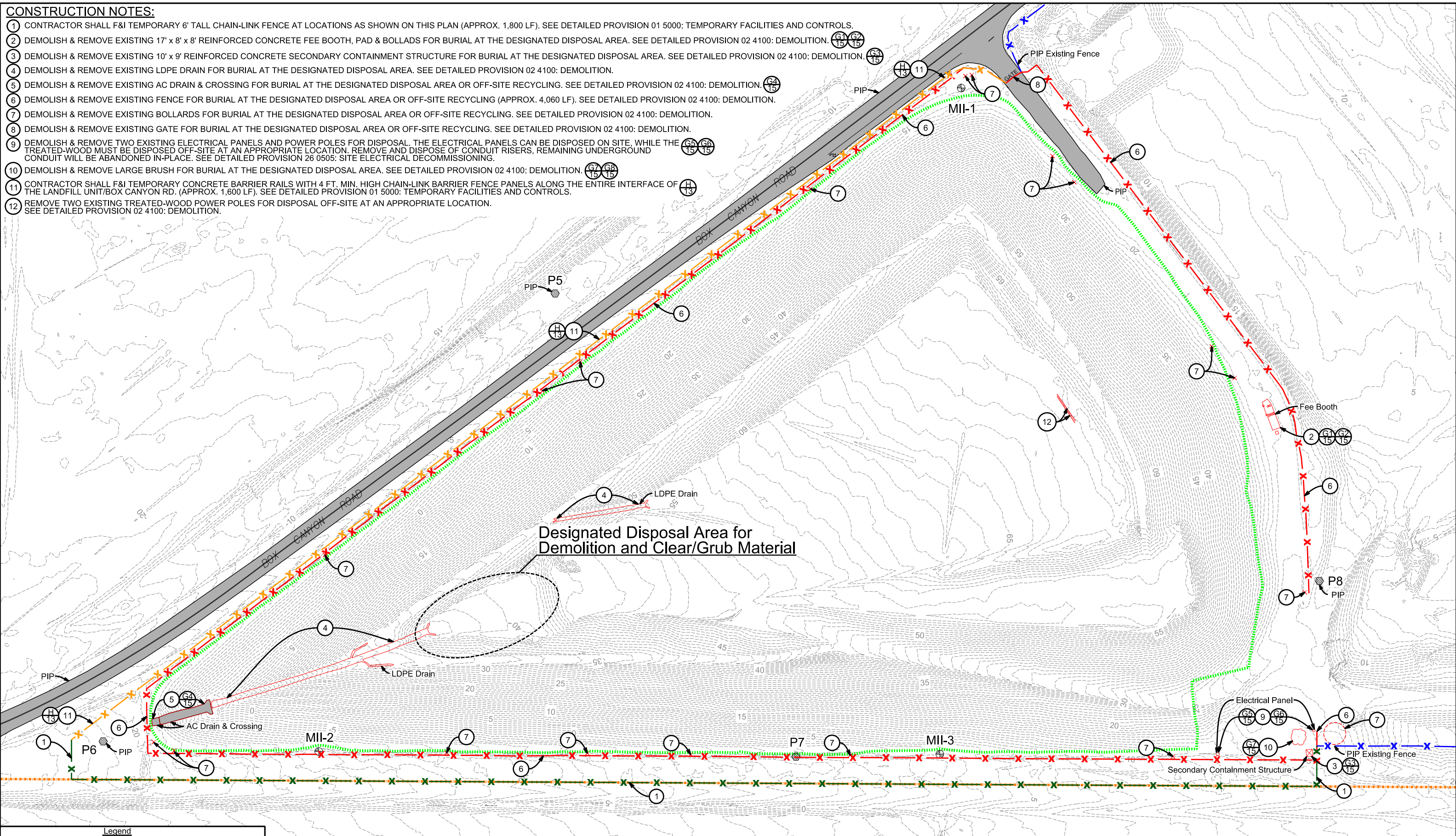
Site Map

SHEET 3 OF 16



**CONSTRUCTION NOTES:**

- 1 CONTRACTOR SHALL F&I TEMPORARY 6' TALL CHAIN-LINK FENCE AT LOCATIONS AS SHOWN ON THIS PLAN (APPROX. 1,800 LF). SEE DETAILED PROVISION 01 5000: TEMPORARY FACILITIES AND CONTROLS.
- 2 DEMOLISH & REMOVE EXISTING 17' x 8' x 8' REINFORCED CONCRETE FEE BOOTH, PAD & BOLLARDS FOR BURIAL AT THE DESIGNATED DISPOSAL AREA. SEE DETAILED PROVISION 02 4100: DEMOLITION.
- 3 DEMOLISH & REMOVE EXISTING 10' x 9' REINFORCED CONCRETE SECONDARY CONTAINMENT STRUCTURE FOR BURIAL AT THE DESIGNATED DISPOSAL AREA. SEE DETAILED PROVISION 02 4100: DEMOLITION.
- 4 DEMOLISH & REMOVE EXISTING LDPE DRAIN FOR BURIAL AT THE DESIGNATED DISPOSAL AREA. SEE DETAILED PROVISION 02 4100: DEMOLITION.
- 5 DEMOLISH & REMOVE EXISTING AC DRAIN & CROSSING FOR BURIAL AT THE DESIGNATED DISPOSAL AREA OR OFF-SITE RECYCLING. SEE DETAILED PROVISION 02 4100: DEMOLITION.
- 6 DEMOLISH & REMOVE EXISTING FENCE FOR BURIAL AT THE DESIGNATED DISPOSAL AREA OR OFF-SITE RECYCLING (APPROX. 4,060 LF). SEE DETAILED PROVISION 02 4100: DEMOLITION.
- 7 DEMOLISH & REMOVE EXISTING BOLLARDS FOR BURIAL AT THE DESIGNATED DISPOSAL AREA OR OFF-SITE RECYCLING. SEE DETAILED PROVISION 02 4100: DEMOLITION.
- 8 DEMOLISH & REMOVE EXISTING GATE FOR BURIAL AT THE DESIGNATED DISPOSAL AREA OR OFF-SITE RECYCLING. SEE DETAILED PROVISION 02 4100: DEMOLITION.
- 9 DEMOLISH & REMOVE TWO EXISTING ELECTRICAL PANELS AND POWER POLES FOR DISPOSAL. THE ELECTRICAL PANELS CAN BE DISPOSED ON SITE, WHILE THE TREATED-WOOD MUST BE DISPOSED OFF-SITE AT AN APPROPRIATE LOCATION. REMOVE AND DISPOSE OF CONDUIT RISERS, REMAINING UNDERGROUND CONDUIT WILL BE ABANDONED IN-PLACE. SEE DETAILED PROVISION 26 0505: SITE ELECTRICAL DECOMMISSIONING.
- 10 DEMOLISH & REMOVE LARGE BRUSH FOR BURIAL AT THE DESIGNATED DISPOSAL AREA. SEE DETAILED PROVISION 02 4100: DEMOLITION.
- 11 CONTRACTOR SHALL F&I TEMPORARY CONCRETE BARRIER RAILS WITH 4 FT. MIN. HIGH CHAIN-LINK BARRIER FENCE PANELS ALONG THE ENTIRE INTERFACE OF THE LANDFILL UNIT/BOX CANYON RD. (APPROX. 1,600 LF). SEE DETAILED PROVISION 01 5000: TEMPORARY FACILITIES AND CONTROLS.
- 12 REMOVE TWO EXISTING TREATED-WOOD POWER POLES FOR DISPOSAL OFF-SITE AT AN APPROPRIATE LOCATION. SEE DETAILED PROVISION 02 4100: DEMOLITION.



**Legend**

- Property Line (~ 80 Acres)
- Refuse Limits (~ 19 Acres)
- Existing Contours
- Existing Asphalt
- x- Existing Chain-Link Fence to be Removed (~ 4,060 LF)
- x- Temporary Concrete Barrier Rails with Chain-Link Barrier Fence Panels (~ 1,600 LF)
- x- Temporary Chain-Link Fence (~ 1,800 LF)
- x- Existing Chain-Link Fence (PIP)
- ⊕ Perimeter Gas Probe
- ⊕ Groundwater Monitoring Well

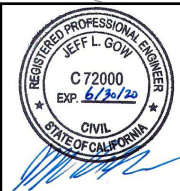
NO.	REVISIONS	BY	APPROVED	DATE

Hans Kernkamp, General Manager-Chief Engineer

Scale: 1" = 120' (11x17) 1" = 60' (Full)

Datum is mean sea level

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CHECKED BY:	JLG
DRAWING DATE:	Oct 2019
TOPO DATE:	Oct 2019
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**Mecca II Sanitary Landfill**  
 Plans for Closure Construction

**Demolition & Temporary Fencing Plan**

SHEET 4 OF 16

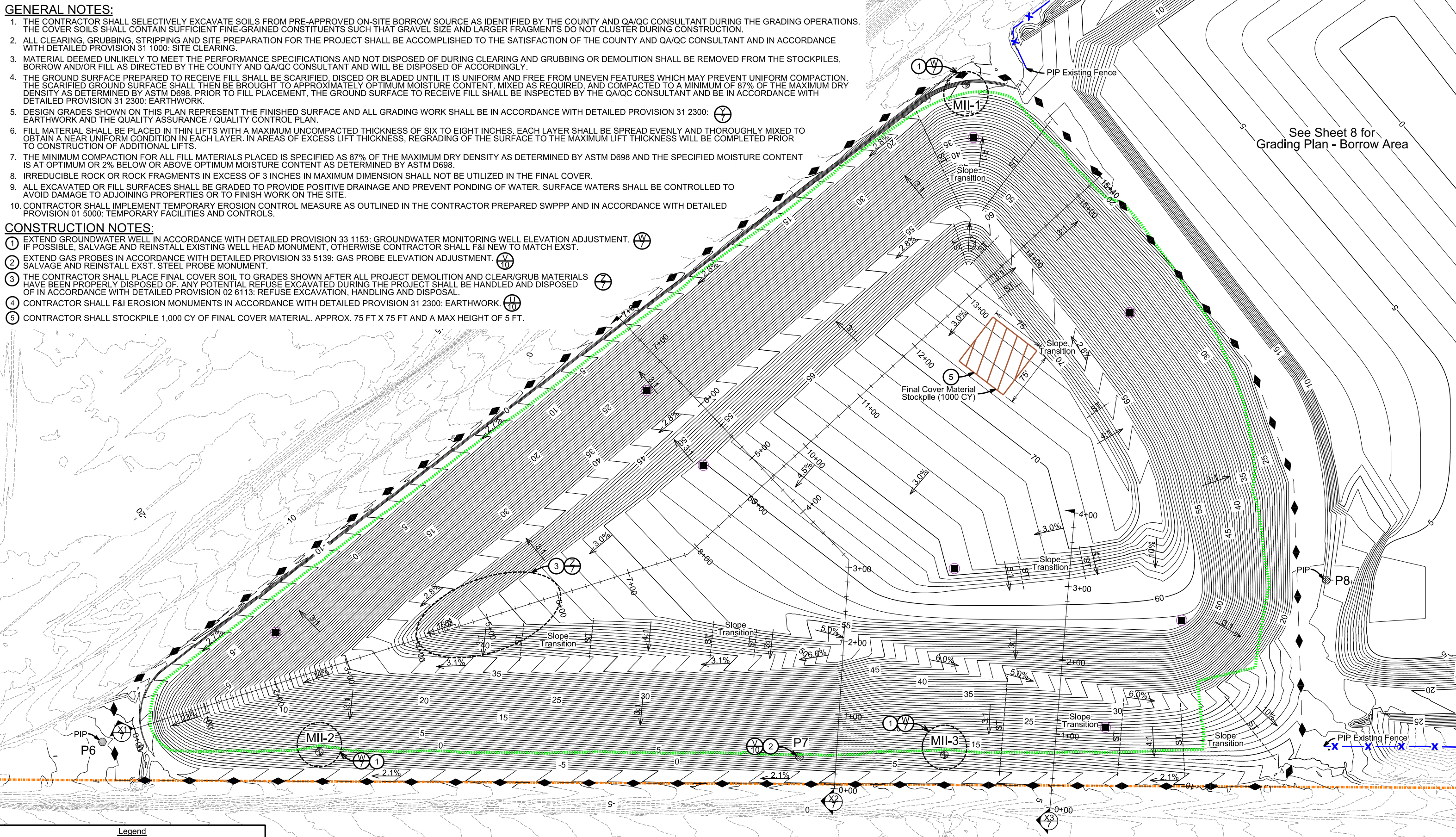


**GENERAL NOTES:**

1. THE CONTRACTOR SHALL SELECTIVELY EXCAVATE SOILS FROM PRE-APPROVED ON-SITE BORROW SOURCE AS IDENTIFIED BY THE COUNTY AND QA/QC CONSULTANT DURING THE GRADING OPERATIONS. THE COVER SOILS SHALL CONTAIN SUFFICIENT FINE-GRAINED CONSTITUENTS SUCH THAT GRAVEL SIZE AND LARGER FRAGMENTS DO NOT CLUSTER DURING CONSTRUCTION.
2. ALL CLEARING, GRUBBING, STRIPPING AND SITE PREPARATION FOR THE PROJECT SHALL BE ACCOMPLISHED TO THE SATISFACTION OF THE COUNTY AND QA/QC CONSULTANT AND IN ACCORDANCE WITH DETAILED PROVISION 31 1000: SITE CLEARING.
3. MATERIAL DEEMED UNLIKELY TO MEET THE PERFORMANCE SPECIFICATIONS AND NOT DISPOSED OF DURING CLEARING AND GRUBBING OR DEMOLITION SHALL BE REMOVED FROM THE STOCKPILES, BORROW AND/OR FILL AS DIRECTED BY THE COUNTY AND QA/QC CONSULTANT AND WILL BE DISPOSED OF ACCORDINGLY.
4. THE GROUND SURFACE PREPARED TO RECEIVE FILL SHALL BE SCARIFIED, DISCED OR BLADED UNTIL IT IS UNIFORM AND FREE FROM UNEVEN FEATURES WHICH MAY PREVENT UNIFORM COMPACTION. THE SCARIFIED GROUND SURFACE SHALL THEN BE BROUGHT TO APPROXIMATELY OPTIMUM MOISTURE CONTENT, MIXED AS REQUIRED, AND COMPACTED TO A MINIMUM OF 87% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698. PRIOR TO FILL PLACEMENT, THE GROUND SURFACE TO RECEIVE FILL SHALL BE INSPECTED BY THE QA/QC CONSULTANT AND BE IN ACCORDANCE WITH DETAILED PROVISION 31 2300: EARTHWORK.
5. DESIGN GRADES SHOWN ON THIS PLAN REPRESENT THE FINISHED SURFACE AND ALL GRADING WORK SHALL BE IN ACCORDANCE WITH DETAILED PROVISION 31 2300: EARTHWORK AND THE QUALITY ASSURANCE / QUALITY CONTROL PLAN.
6. FILL MATERIAL SHALL BE PLACED IN THIN LIFTS WITH A MAXIMUM UNCOMPACTED THICKNESS OF SIX TO EIGHT INCHES. EACH LAYER SHALL BE SPREAD EVENLY AND THOROUGHLY MIXED TO OBTAIN A NEAR UNIFORM CONDITION IN EACH LAYER. IN AREAS OF EXCESS LIFT THICKNESS, REGRADING OF THE SURFACE TO THE MAXIMUM LIFT THICKNESS WILL BE COMPLETED PRIOR TO CONSTRUCTION OF ADDITIONAL LIFTS.
7. THE MINIMUM COMPACTION FOR ALL FILL MATERIALS PLACED IS SPECIFIED AS 87% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698 AND THE SPECIFIED MOISTURE CONTENT IS AT OPTIMUM OR 2% BELOW OR ABOVE OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D698.
8. IRREDUCIBLE ROCK OR ROCK FRAGMENTS IN EXCESS OF 3 INCHES IN MAXIMUM DIMENSION SHALL NOT BE UTILIZED IN THE FINAL COVER.
9. ALL EXCAVATED OR FILL SURFACES SHALL BE GRADED TO PROVIDE POSITIVE DRAINAGE AND PREVENT PONDING OF WATER. SURFACE WATERS SHALL BE CONTROLLED TO AVOID DAMAGE TO ADJOINING PROPERTIES OR TO FINISH WORK ON THE SITE.
10. CONTRACTOR SHALL IMPLEMENT TEMPORARY EROSION CONTROL MEASURE AS OUTLINED IN THE CONTRACTOR PREPARED SWPPP AND IN ACCORDANCE WITH DETAILED PROVISION 01 5000: TEMPORARY FACILITIES AND CONTROLS.

**CONSTRUCTION NOTES:**

1. EXTEND GROUNDWATER WELL IN ACCORDANCE WITH DETAILED PROVISION 33 1153: GROUNDWATER MONITORING WELL ELEVATION ADJUSTMENT. IF POSSIBLE, SALVAGE AND REINSTALL EXISTING WELL HEAD MONUMENT. OTHERWISE CONTRACTOR SHALL F&I NEW TO MATCH EXST.
2. EXTEND GAS PROBES IN ACCORDANCE WITH DETAILED PROVISION 33 5139: GAS PROBE ELEVATION ADJUSTMENT. SALVAGE AND REINSTALL EXST. STEEL PROBE MONUMENT.
3. THE CONTRACTOR SHALL PLACE FINAL COVER SOIL TO GRADES SHOWN AFTER ALL PROJECT DEMOLITION AND CLEAR/GRUB MATERIALS HAVE BEEN PROPERLY DISPOSED OF. ANY POTENTIAL REFUSE EXCAVATED DURING THE PROJECT SHALL BE HANDLED AND DISPOSED OF IN ACCORDANCE WITH DETAILED PROVISION 02 6113: REFUSE EXCAVATION, HANDLING AND DISPOSAL.
4. CONTRACTOR SHALL F&I EROSION MONUMENTS IN ACCORDANCE WITH DETAILED PROVISION 31 2300: EARTHWORK.
5. CONTRACTOR SHALL STOCKPILE 1,000 CY OF FINAL COVER MATERIAL. APPROX. 75 FT X 75 FT AND A MAX HEIGHT OF 5 FT.



See Sheet 8 for Grading Plan - Borrow Area

**Legend**

- Property Line (~ 80 Acres)
- Refuse Limits (~ 19 Acres)
- Design Contours
- Existing Contours
- Erosion Monuments
- Final Cover Material Stockpile (1000 CY)
- ⊕ Perimeter Gas Probe
- ⊕ Groundwater Monitoring Well
- Slope Transition
- Final Cover Project Grading Limits
- Existing Chain-Link Fence (PIP)

NO.	REVISIONS	BY	APPROVED	DATE

Hans Kernkamp, General Manager-Chief Engineer

Scale: 1" = 120' (11x17) 1" = 60' (Full)

Datum is mean sea level

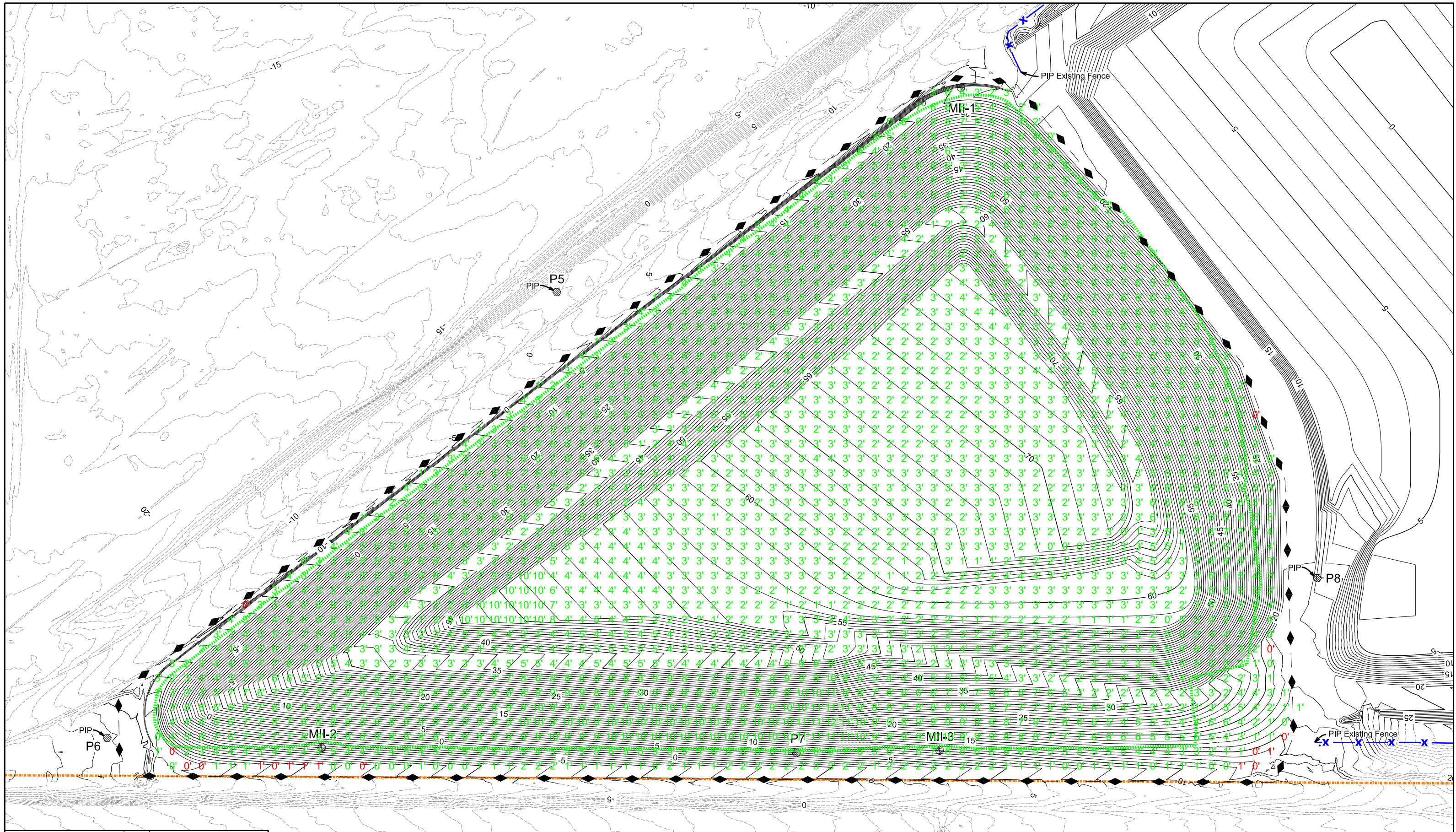
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**Mecca II Sanitary Landfill**  
 Plans for Closure Construction  
**Grading Plan - Final Cover**

SHEET 5 OF 16





**Legend**

- Property Line (~ 80 Acres)
- Refuse Limits (~ 19 Acres)
- Design Contours
- - - Existing Contours
- 2' Fill Thickness
- 0' Cut Thickness
- Perimeter Gas Probe
- ⊙ Groundwater Monitoring Well
- Final Cover Project Grading Limits
- x — Existing Chain-Link Fence (PIP)

NO.	REVISIONS	BY	APPROVED	DATE

RIVERSIDE COUNTY  
DEPARTMENT OF  
**WASTE RESOURCES**

Hans Kernkamp, General Manager-Chief Engineer

Scale: 1" = 120' (11x17) 1" = 60' (Full)

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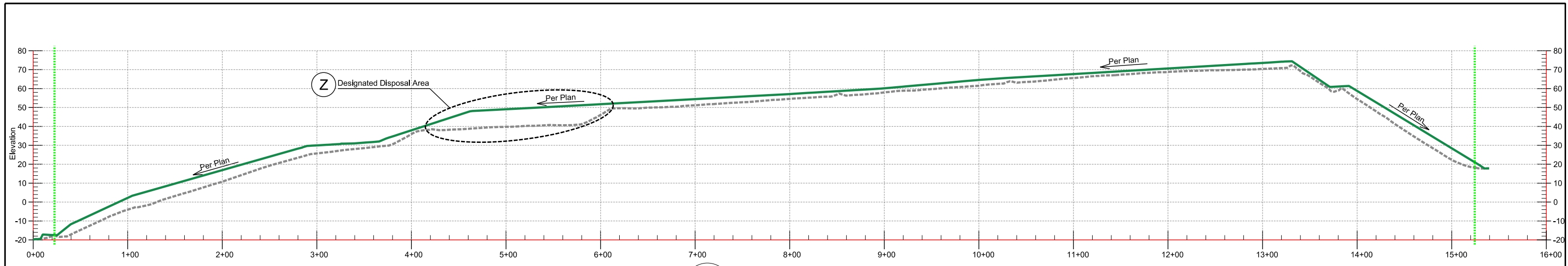
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Mecca II Sanitary Landfill  
Plans for Closure Construction

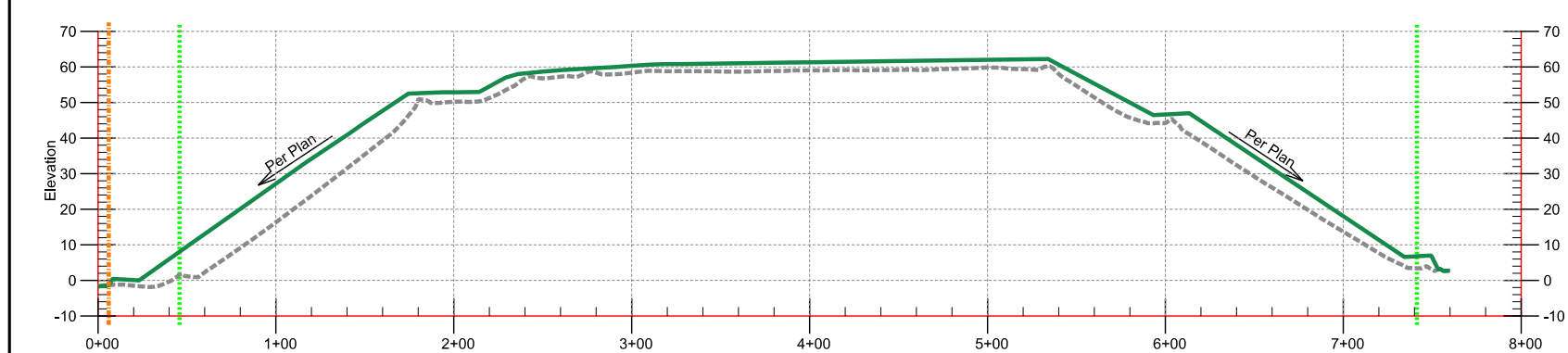
**Grading Plan - Final Cover  
Isopach**

SHEET 6 OF 16

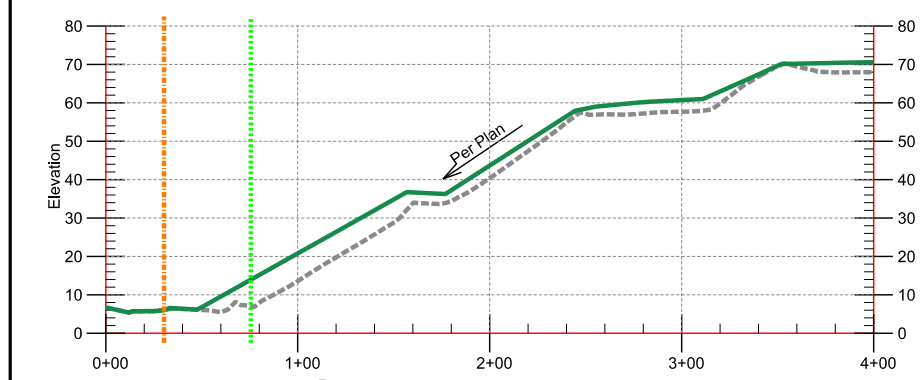




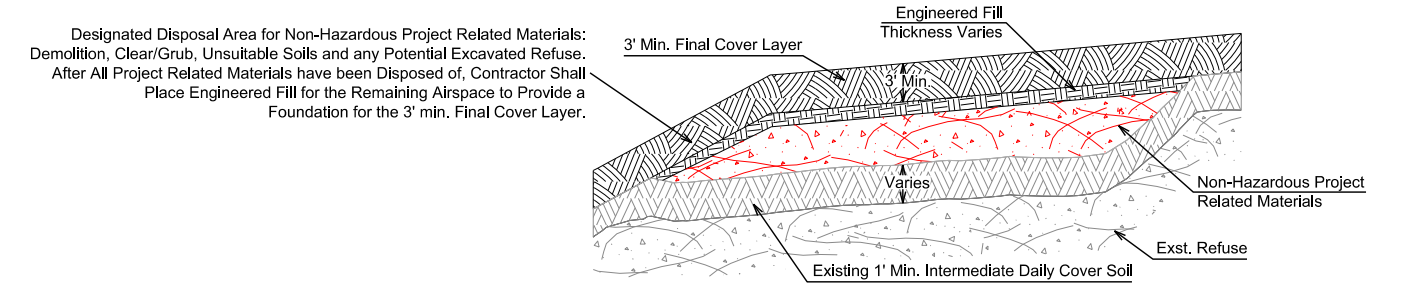
**X1 Final Cover X-Section**  
Scale 1H:2V



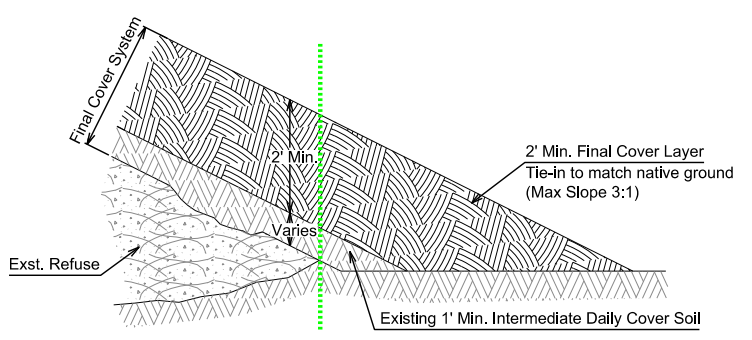
**X2 Final Cover X-Section**  
Scale 1H:2V



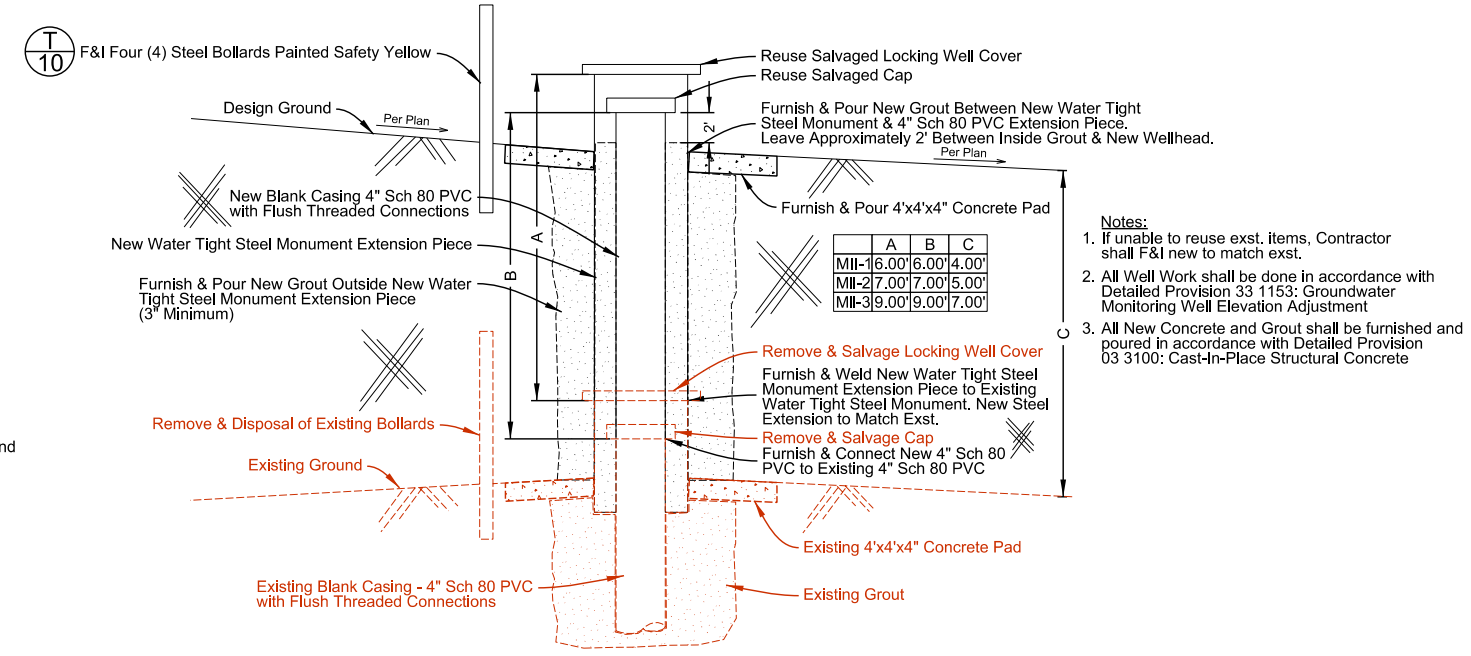
**X3 Final Cover X-Section**  
Scale 1H:2V



**Z Designated Disposal Area**  
Not To Scale



**Y Typical Final Cover Tie-In**  
Not To Scale



**W Groundwater Well Elevation Adjustment**  
Not To Scale

**Legend**

- Final Cover
- - - Existing Ground
- - - Property Line (~ 80 Acres)
- - - Refuse Limits (~ 19 Acres)
- Existing Ground/Intermediate Soil
- Final Cover
- Engineered Fill
- Non-Hazardous Project Related Materials
- Exst. Refuse
- Concrete/Shotcrete
- Grout

NO.	REVISIONS	BY	APPROVED	DATE

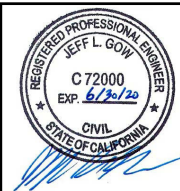
**RIVERSIDE COUNTY**  
**DEPARTMENT OF**  
**WASTE RESOURCES**

Hans Kernkamp, General Manager-Chief Engineer

HORIZ: 1"=50' VERT: 1"=25' (ANSI D)  
HORIZ: 1"=100' VERT: 1"=50' (11x17)

Datum is mean sea level

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Mecca II Sanitary Landfill  
Plans for Closure Construction  
**Grading Plan - Final Cover**  
**X-Sections**

SHEET 7 OF 16

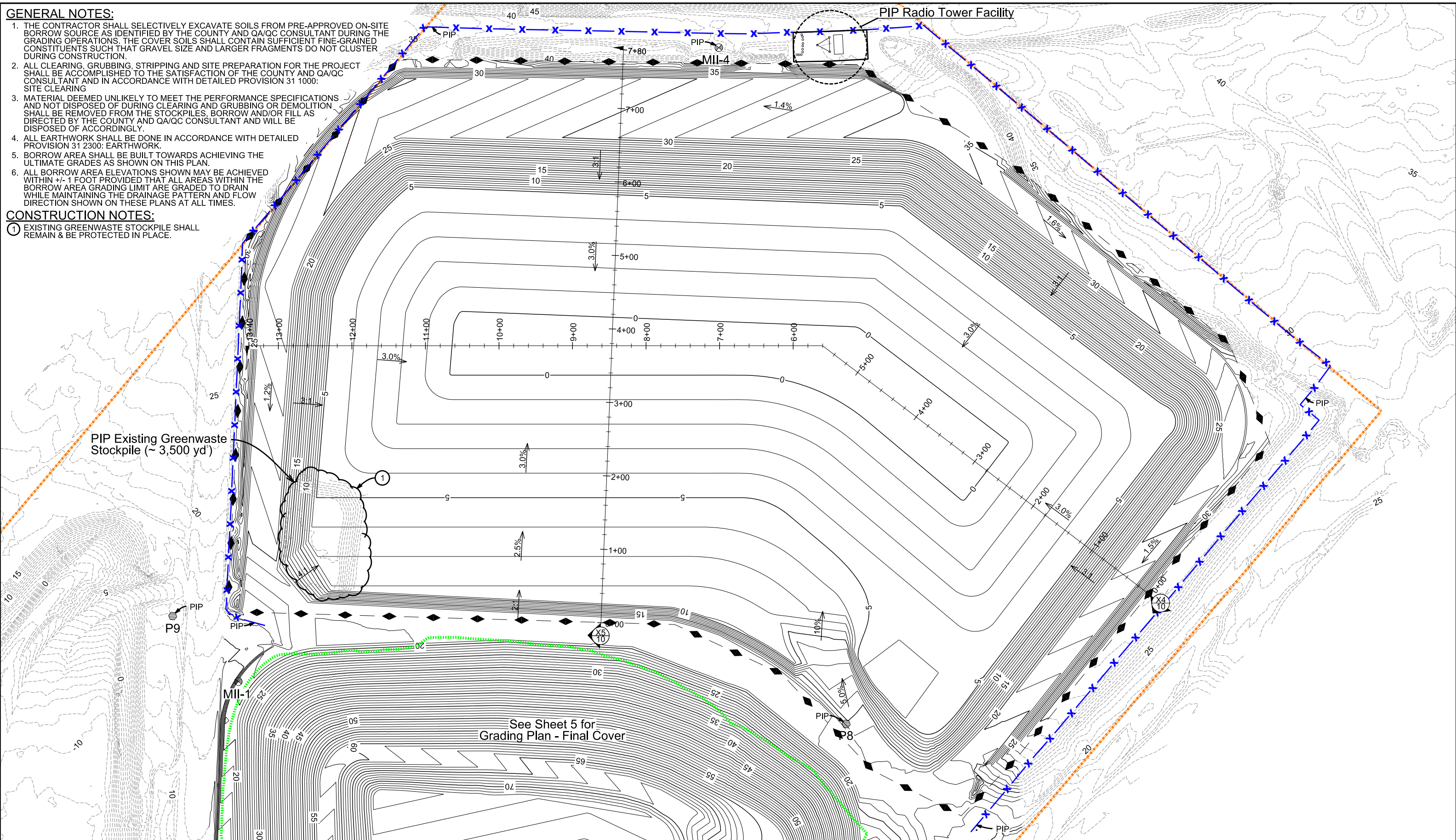


**GENERAL NOTES:**

1. THE CONTRACTOR SHALL SELECTIVELY EXCAVATE SOILS FROM PRE-APPROVED ON-SITE BORROW SOURCE AS IDENTIFIED BY THE COUNTY AND QA/QC CONSULTANT DURING THE GRADING OPERATIONS. THE COVER SOILS SHALL CONTAIN SUFFICIENT FINE-GRAINED CONSTITUENTS SUCH THAT GRAVEL SIZE AND LARGER FRAGMENTS DO NOT CLUSTER DURING CONSTRUCTION.
2. ALL CLEARING, GRUBBING, STRIPPING AND SITE PREPARATION FOR THE PROJECT SHALL BE ACCOMPLISHED TO THE SATISFACTION OF THE COUNTY AND QA/QC CONSULTANT AND IN ACCORDANCE WITH DETAILED PROVISION 31 1000: SITE CLEARING
3. MATERIAL DEEMED UNLIKELY TO MEET THE PERFORMANCE SPECIFICATIONS AND NOT DISPOSED OF DURING CLEARING AND GRUBBING OR DEMOLITION SHALL BE REMOVED FROM THE STOCKPILES, BORROW AND/OR FILL AS DIRECTED BY THE COUNTY AND QA/QC CONSULTANT AND WILL BE DISPOSED OF ACCORDINGLY.
4. ALL EARTHWORK SHALL BE DONE IN ACCORDANCE WITH DETAILED PROVISION 31 2300: EARTHWORK.
5. BORROW AREA SHALL BE BUILT TOWARDS ACHIEVING THE ULTIMATE GRADES AS SHOWN ON THIS PLAN.
6. ALL BORROW AREA ELEVATIONS SHOWN MAY BE ACHIEVED WITHIN +/- 1 FOOT PROVIDED THAT ALL AREAS WITHIN THE BORROW AREA GRADING LIMIT ARE GRADED TO DRAIN WHILE MAINTAINING THE DRAINAGE PATTERN AND FLOW DIRECTION SHOWN ON THESE PLANS AT ALL TIMES.

**CONSTRUCTION NOTES:**

1. EXISTING GREENWASTE STOCKPILE SHALL REMAIN & BE PROTECTED IN PLACE.



See Sheet 5 for Grading Plan - Final Cover

**Legend**

- Property Line (~ 80 Acres)
- Refuse Limits (~ 19 Acres)
- Design Contours
- Existing Contours
- Perimeter Gas Probe
- Groundwater Monitoring Well
- Final Cover Project Grading Limits
- Existing Chain-Link Fence (PIP)

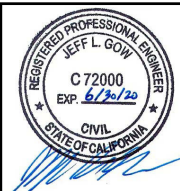
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**RIVERSIDE COUNTY DEPARTMENT OF WASTE RESOURCES**  
 Hans Kernkamp, General Manager-Chief Engineer

Scale: 1" = 120' (11x17) 1" = 60' (Full)

Datum is mean sea level

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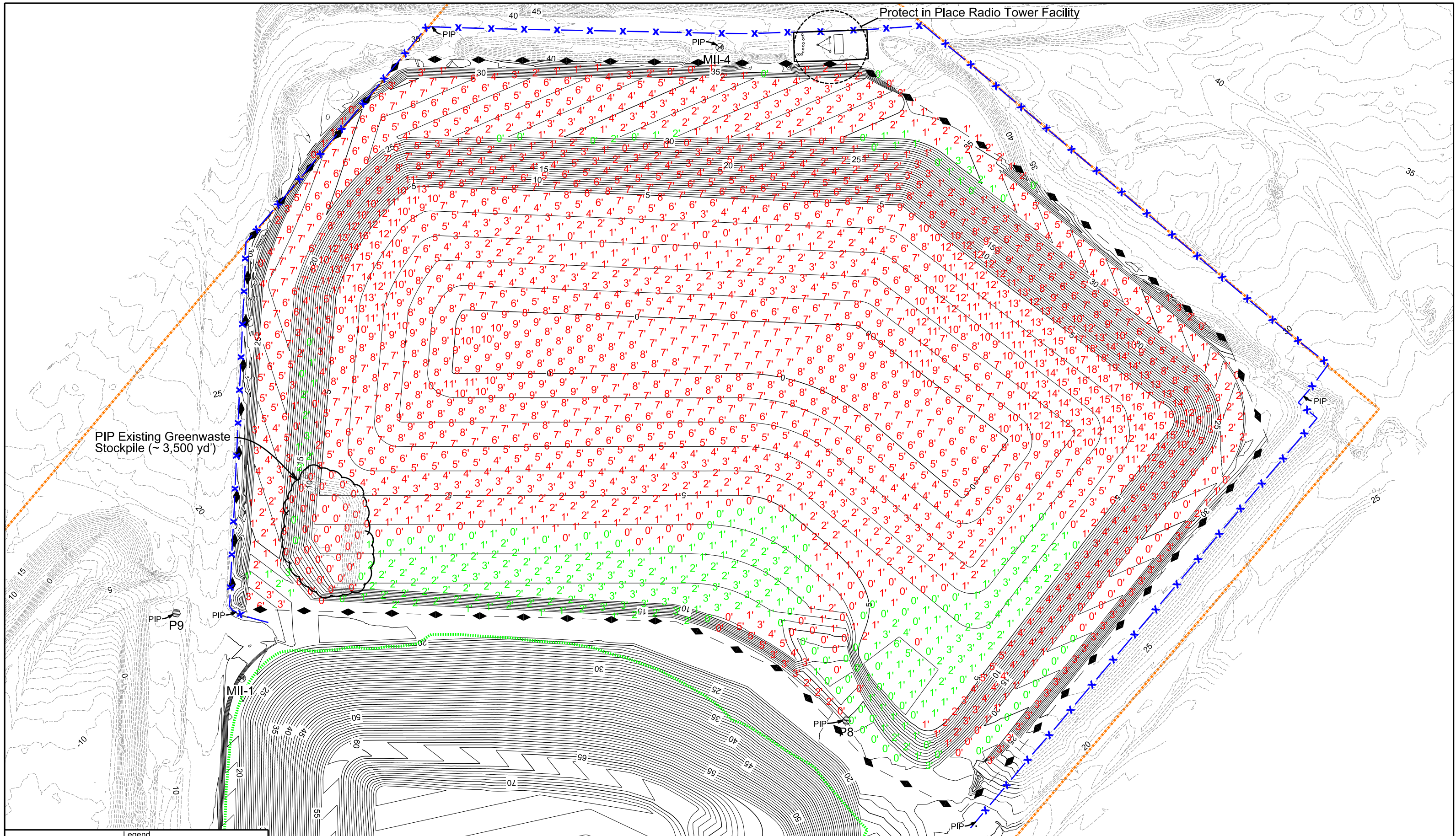


Mecca II Sanitary Landfill  
 Plans for Closure Construction

**Grading Plan - Borrow Area**

SHEET 8 OF 16





**Legend**

- Property Line (~ 80 Acres)
- Refuse Limits (~ 19 Acres)
- Design Contours
- Existing Contours
- 2' Fill Thickness
- 7' Cut Thickness
- Perimeter Gas Probe
- Groundwater Monitoring Well
- Final Cover Project Grading Limits
- Existing Chain-Link Fence (PIP)

NO.	REVISIONS	BY	APPROVED	DATE

RIVERSIDE COUNTY  
DEPARTMENT OF  
**WASTE RESOURCES**

Hans Kernkamp, General Manager-Chief Engineer

Scale: 1" = 120' (11x17) 1" = 60' (Full)

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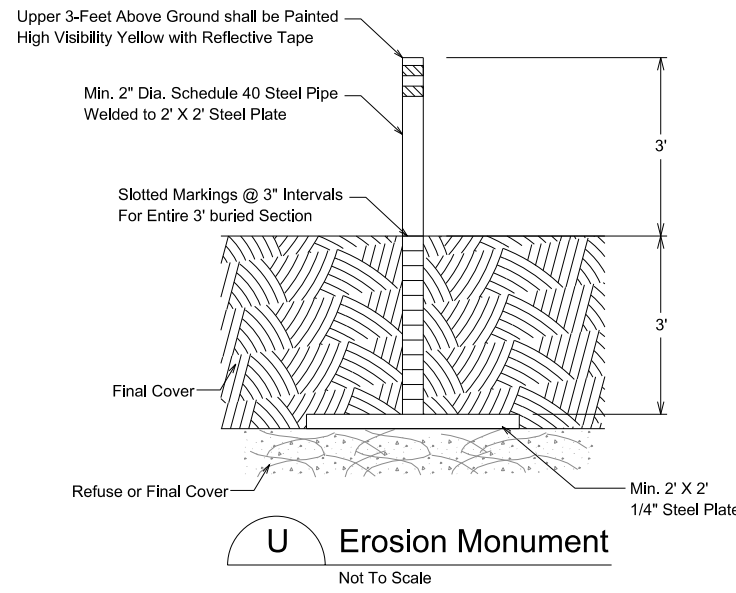
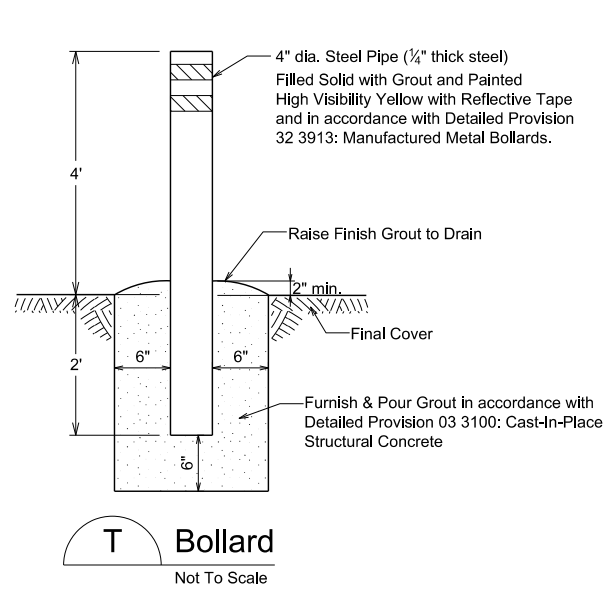
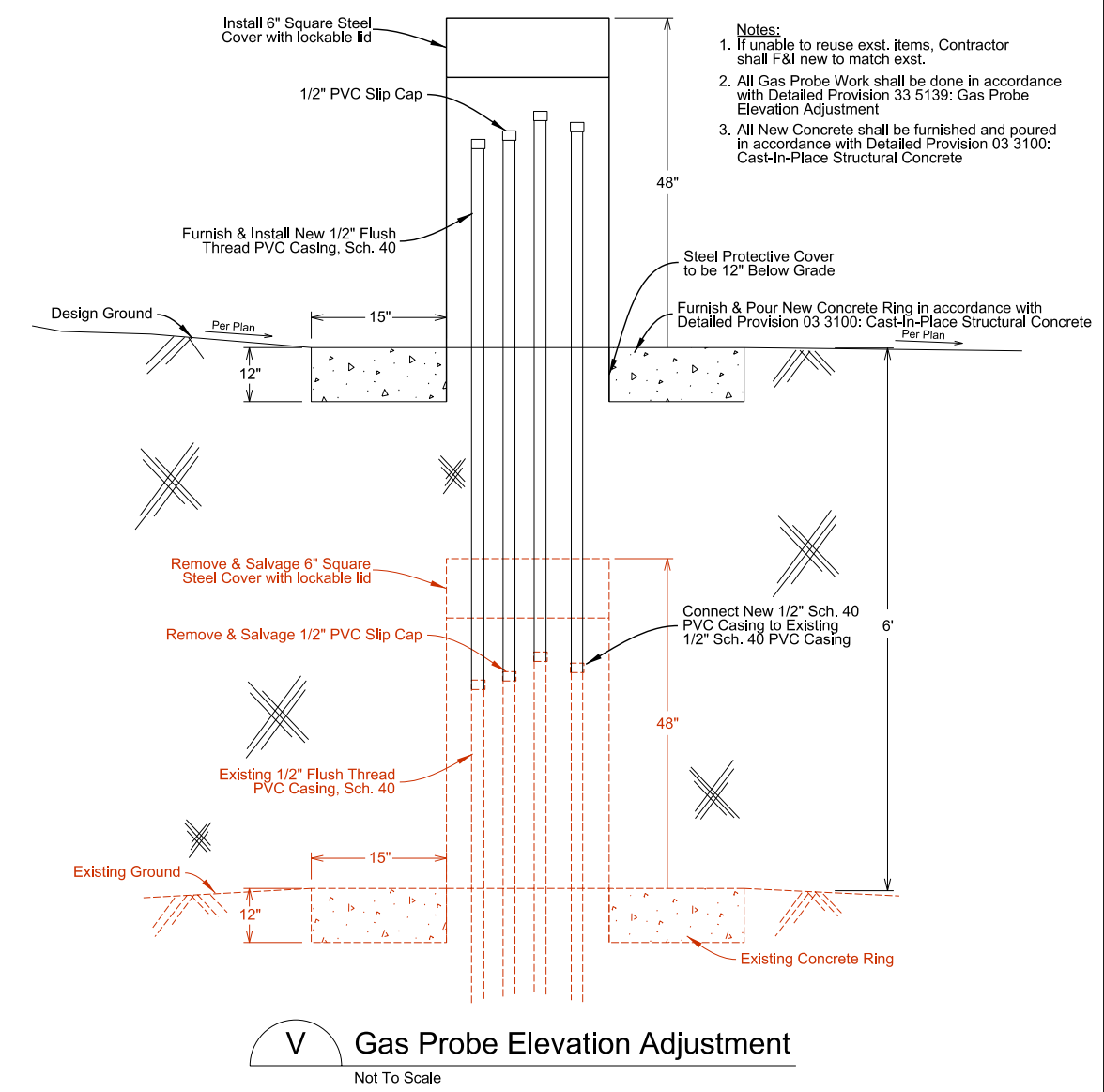
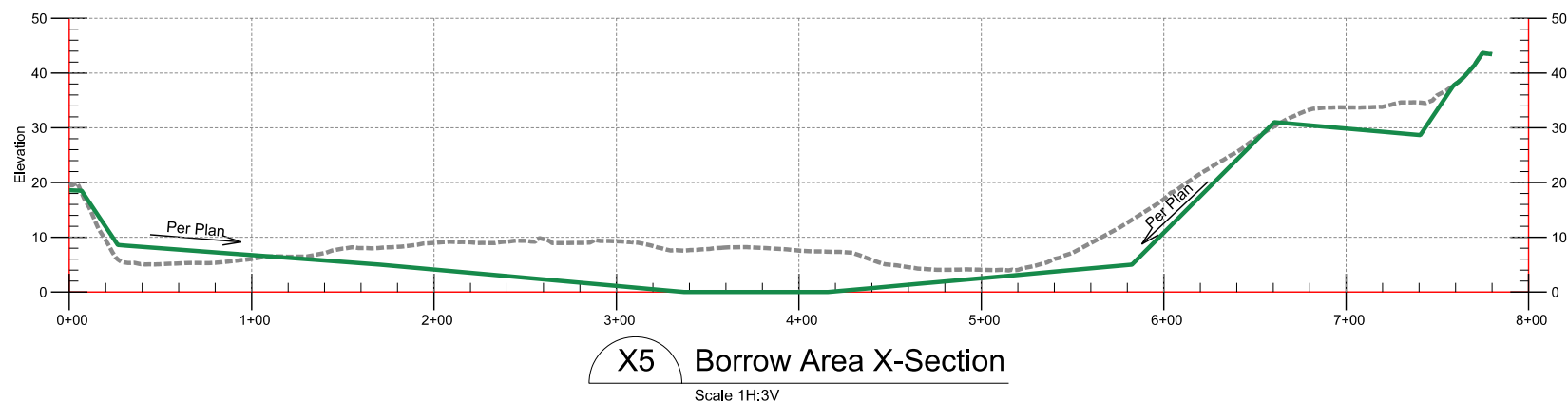
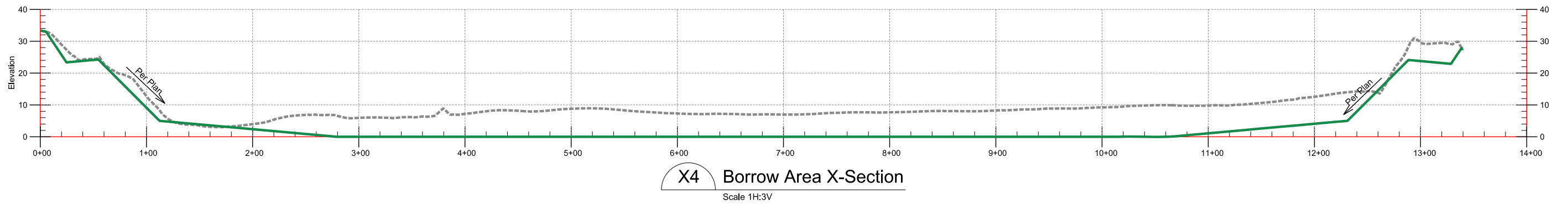


Mecca II Sanitary Landfill  
Plans for Closure Construction

## Grading Plan - Borrow Area Isopach

SHEET 9 OF 16





- Notes:**
1. If unable to reuse exst. items, Contractor shall F&I new to match exst.
  2. All Gas Probe Work shall be done in accordance with Detailed Provision 33 5139: Gas Probe Elevation Adjustment
  3. All New Concrete shall be furnished and poured in accordance with Detailed Provision 03 3100: Cast-In-Place Structural Concrete

**Legend**

	Final Cover
	Existing Ground
	Final Cover
	Concrete/Shotcrete
	Grout
	Exst. Refuse

NO.	REVISIONS	BY	APPROVED	DATE

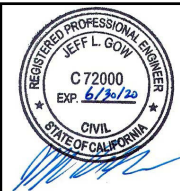
**RIVERSIDE COUNTY DEPARTMENT OF WASTE RESOURCES**  
Hans Kernkamp, General Manager-Chief Engineer

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HORIZ: 1"=100' VERT: 1"=50' (11x17)

Datum is mean sea level

DESIGNED BY: ASA  
DRAWN BY: ASA  
CHECKED BY: JLG  
DRAWING DATE: Oct 2019  
TOPO DATE: Oct 2019

PATH: T:\Sites\Mecca\Closure\Construction Plans  
FILE: Me\_FC\_s10 GradingPlan BA X-Sections.dgn



Mecca II Sanitary Landfill  
Plans for Closure Construction  
**Grading Plan - Borrow Area X-Sections**

SHEET 10 OF 16

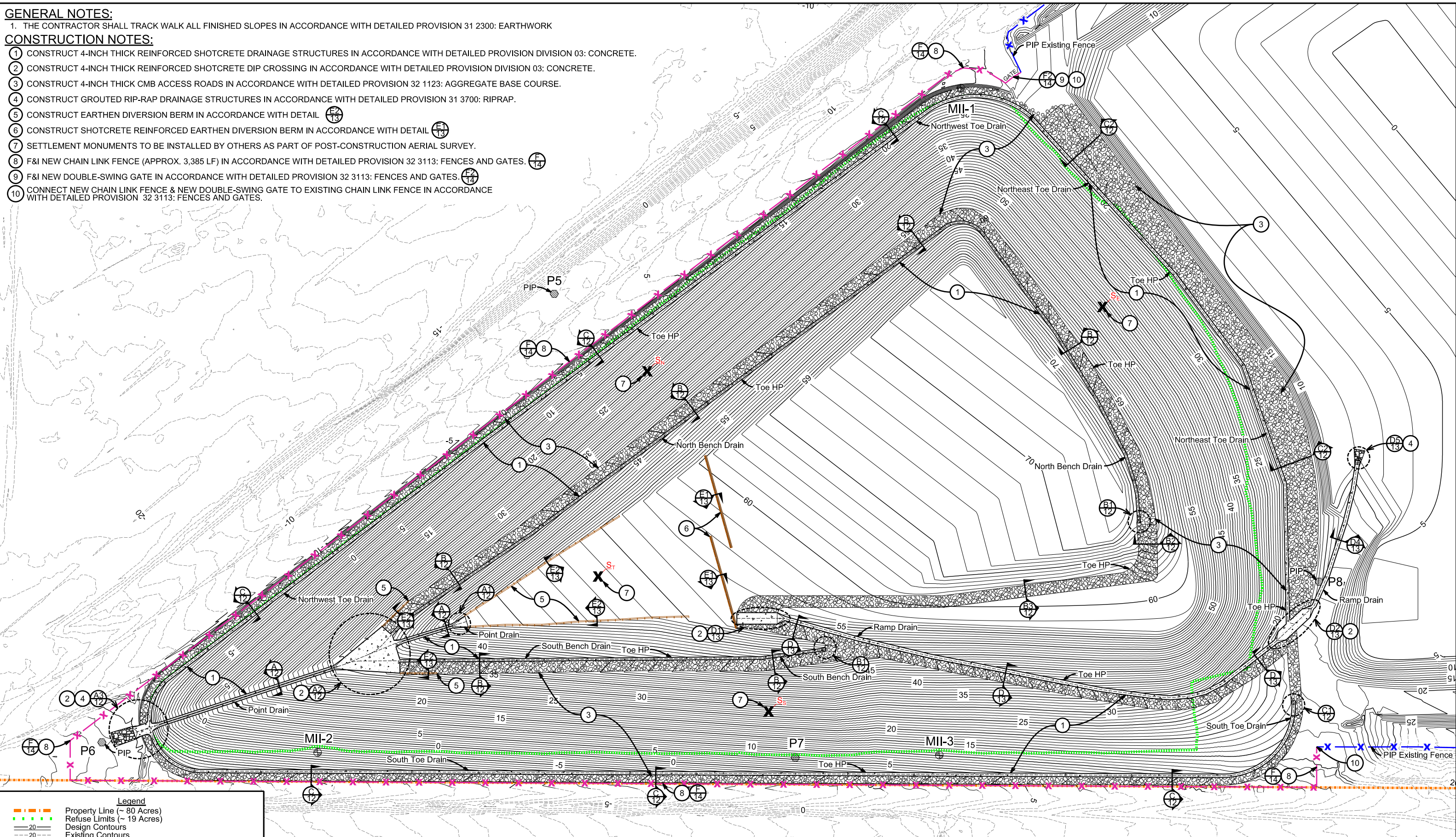


**GENERAL NOTES:**

1. THE CONTRACTOR SHALL TRACK WALK ALL FINISHED SLOPES IN ACCORDANCE WITH DETAILED PROVISION 31 2300: EARTHWORK

**CONSTRUCTION NOTES:**

- ① CONSTRUCT 4-INCH THICK REINFORCED SHOTCRETE DRAINAGE STRUCTURES IN ACCORDANCE WITH DETAILED PROVISION DIVISION 03: CONCRETE.
- ② CONSTRUCT 4-INCH THICK REINFORCED SHOTCRETE DIP CROSSING IN ACCORDANCE WITH DETAILED PROVISION DIVISION 03: CONCRETE.
- ③ CONSTRUCT 4-INCH THICK CMB ACCESS ROADS IN ACCORDANCE WITH DETAILED PROVISION 32 1123: AGGREGATE BASE COURSE.
- ④ CONSTRUCT GROUTED RIP-RAP DRAINAGE STRUCTURES IN ACCORDANCE WITH DETAILED PROVISION 31 3700: RIPRAP.
- ⑤ CONSTRUCT EARTHEN DIVERSION BERM IN ACCORDANCE WITH DETAIL  $\text{E}_{13}$
- ⑥ CONSTRUCT SHOTCRETE REINFORCED EARTHEN DIVERSION BERM IN ACCORDANCE WITH DETAIL  $\text{E}_{14}$
- ⑦ SETTLEMENT MONUMENTS TO BE INSTALLED BY OTHERS AS PART OF POST-CONSTRUCTION AERIAL SURVEY.
- ⑧ F&I NEW CHAIN LINK FENCE (APPROX. 3,385 LF) IN ACCORDANCE WITH DETAILED PROVISION 32 3113: FENCES AND GATES.  $\text{F}_{14}$
- ⑨ F&I NEW DOUBLE-SWING GATE IN ACCORDANCE WITH DETAILED PROVISION 32 3113: FENCES AND GATES.  $\text{F}_{17}$
- ⑩ CONNECT NEW CHAIN LINK FENCE & NEW DOUBLE-SWING GATE TO EXISTING CHAIN LINK FENCE IN ACCORDANCE WITH DETAILED PROVISION 32 3113: FENCES AND GATES.



**Legend**

- Property Line (~ 80 Acres)
- Refuse Limits (~ 19 Acres)
- Design Contours
- Existing Contours
- ① Reinforced Shotcrete
- ② 4" Thick CMB
- ④ Grouted Rip-Rap
- ⑤ Drainage Center Line
- ⑤ Earthen Berm
- ⑥ Shotcrete Reinforced Earthen Berm
- ⑦ Settlement Monument
- ⑧ New Chain-Link Fence (~3,385 LF)
- ⑨ Existing Chain-Link Fence (PIP)
- ⊕ Perimeter Gas Probe
- ⊕ Groundwater Monitoring Well

NO.	REVISIONS	BY	APPROVED	DATE

Hans Kernkamp, General Manager-Chief Engineer

Scale: 1" = 120' (11x17) 1" = 60' (Full)

Datum is mean sea level

DESIGNED BY: ASA  
 DRAWN BY: ASA  
 CHECKED BY: JLG  
 DRAWING DATE: Oct 2019  
 TOPO DATE: Oct 2019

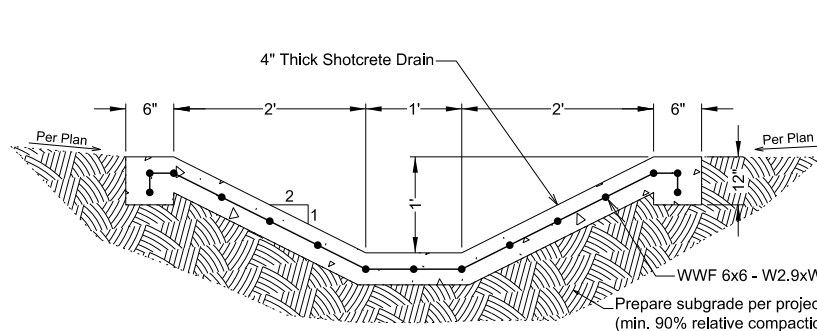
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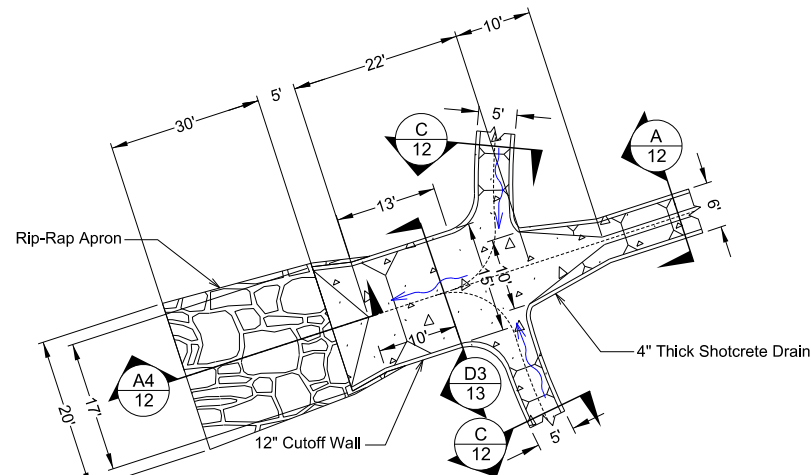
Mecca II Sanitary Landfill  
 Plans for Closure Construction  
**Drainage, Settlement  
 Monuments & Fencing Plan**

SHEET 11 OF 16

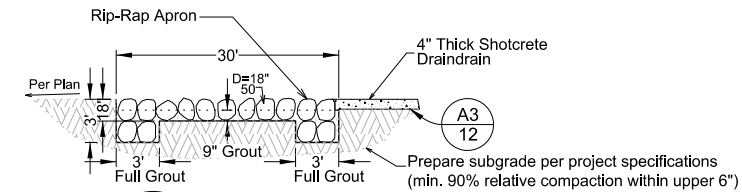




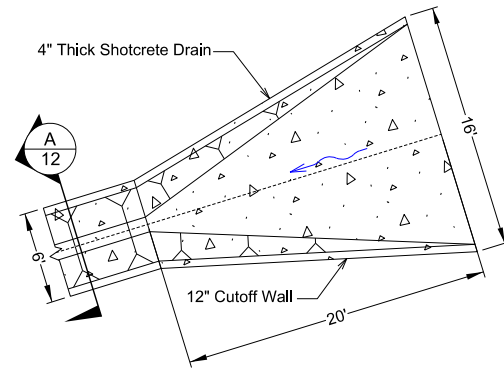
**A Shotcrete Drain Structure**  
Not To Scale



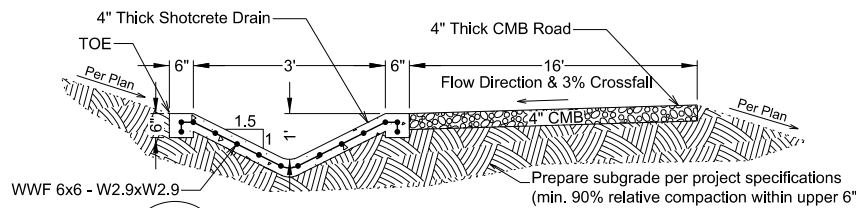
**A3 Shotcrete Inlet Transition Structure & Rip-Rap**  
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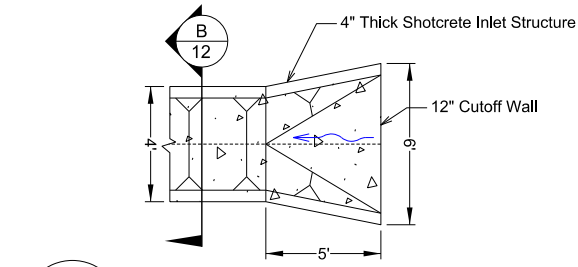
**A4 Rip-Rap Apron**  
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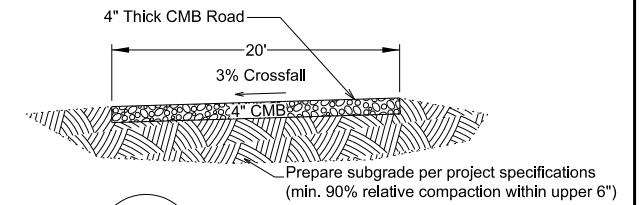
**A1 Shotcrete Inlet Structure**  
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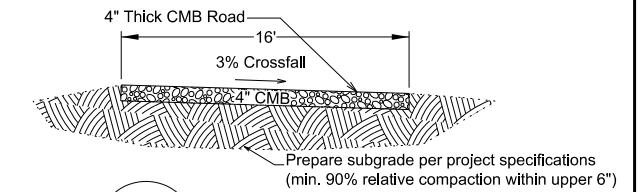
**B 3' Shotcrete Bench Drainage Swale & 16' CMB Road**  
Not To Scale



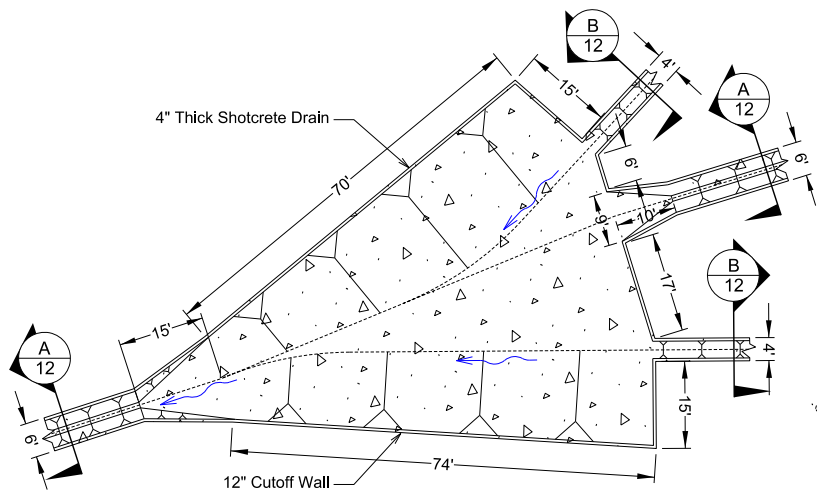
**B1 3' Shotcrete Bench Inlet Structure**  
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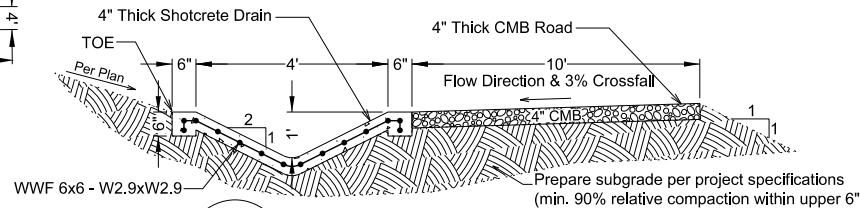
**B2 20' CMB Road**  
Not To Scale



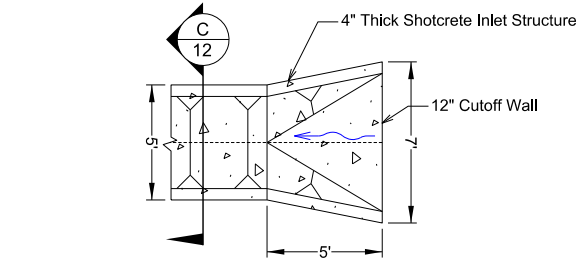
**B3 16' CMB Road**  
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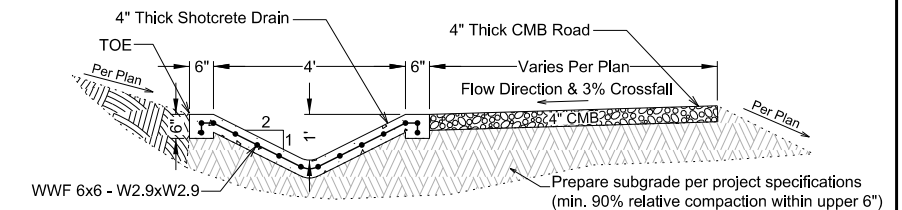
**A2 Shotcrete Inlet Transition Structure**  
Not To Scale



**C 4' Shotcrete Toe Drainage Swale & 10' CMB Road**  
Not To Scale



**C1 4' Shotcrete Toe Inlet Structure**  
Not To Scale



**C2 4' Shotcrete Toe Drainage Swale & CMD Road**  
Not To Scale

**Legend**

- Existing Ground/Intermediate Cover
- Final Cover
- Grouted Rip-Rap
- Concrete/Shotcrete
- 4" Thick CMB

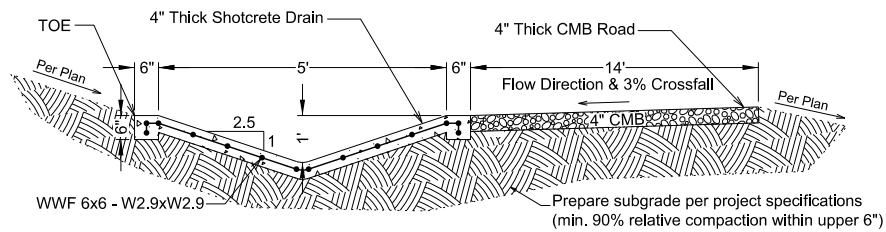
NO.	REVISIONS	BY	APPROVED	DATE



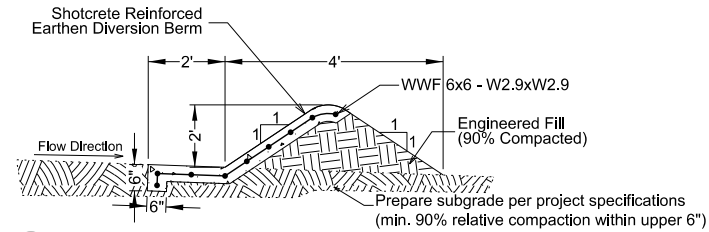
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CHECKED BY:	JLG
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TOPO DATE:	Oct 2019
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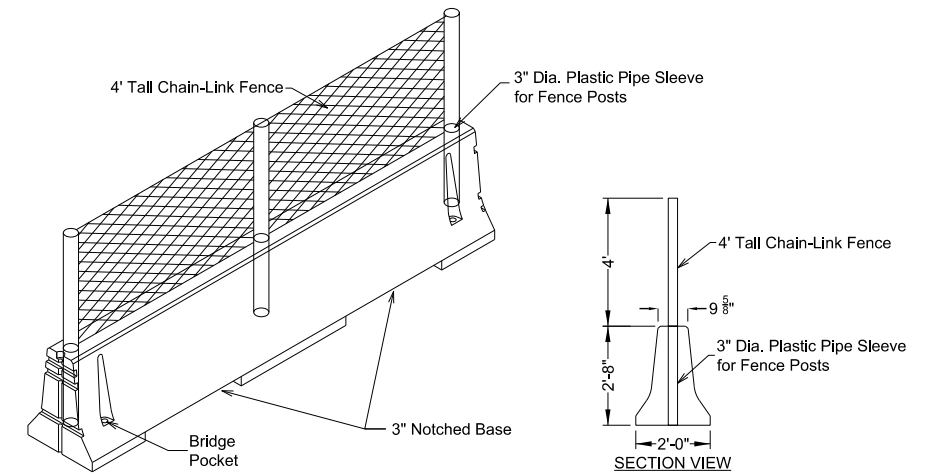
Mecca II Sanitary Landfill  
Plans for Closure Construction  
**Drainage Details**



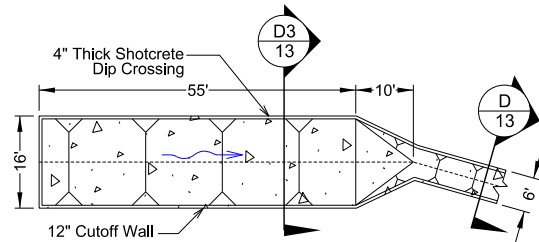
**D 5' Shotcrete Ramp Drainage Swale**  
Not To Scale



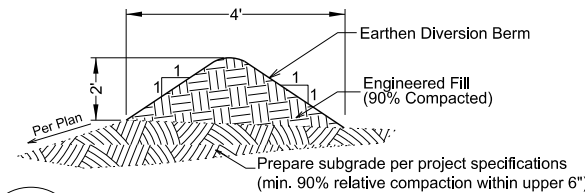
**E1 2' Tall Shotcrete Diversion Berm**  
Not To Scale



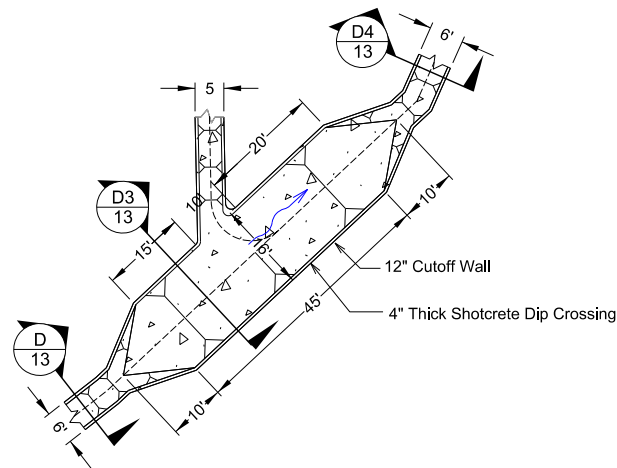
**H Temporary Concrete Barrier Rails with Chain-Link Barrier Fence Panels**  
Not To Scale



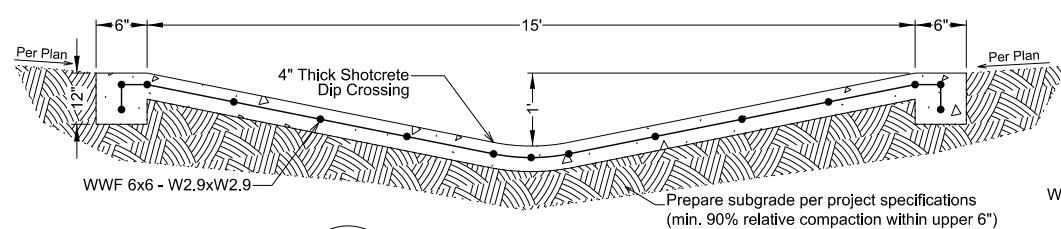
**D1 Shotcrete Inlet Structure**  
Not To Scale



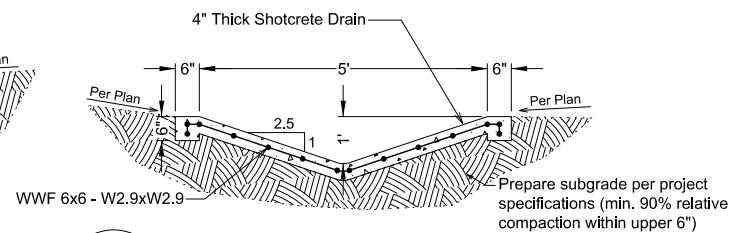
**E2 2' Tall Earthen Diversion Berm**  
Not To Scale



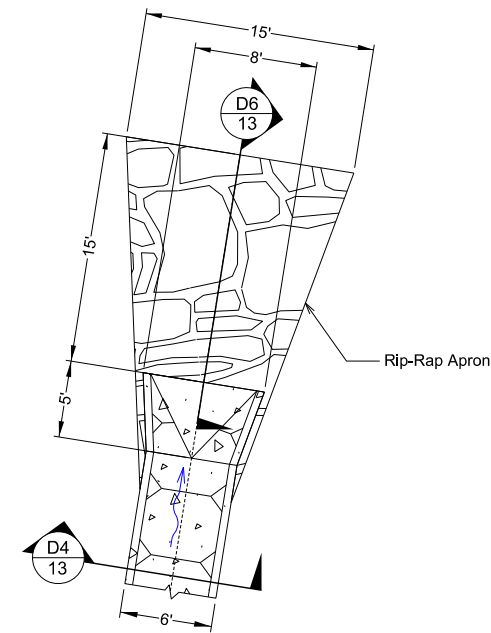
**D2 Shotcrete Dip Crossing**  
Not To Scale



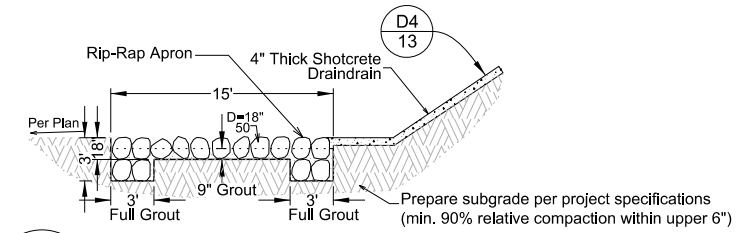
**D3 Shotcrete Dip Crossing**  
Not To Scale



**D4 6' Shotcrete Ramp Drainage Swale**  
Not To Scale



**D5 Borrow Area Rip-Rap Apron**  
Not To Scale



**D6 Rip-Rap Apron**  
Not To Scale

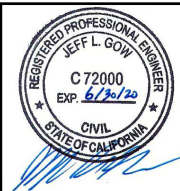
**Legend**

	Existing Ground/Intermediate Cover
	Final Cover
	Grouted Rip-Rap
	Concrete/Shotcrete
	4" Thick CMB
	Engineered Fill

NO.	REVISIONS	BY	APPROVED	DATE

**RIVERSIDE COUNTY DEPARTMENT OF WASTE RESOURCES**  
Hans Kernkamp, General Manager-Chief Engineer

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PATH:	T:\Sites\Meccal\Closure\Construction Plans
FILE:	MeII_FC_s12 - 13 Drainage Details.dgn



Mecca II Sanitary Landfill  
Plans for Closure Construction  
**Drainage Details**

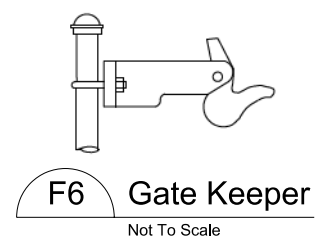
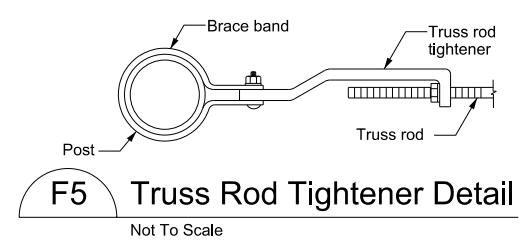
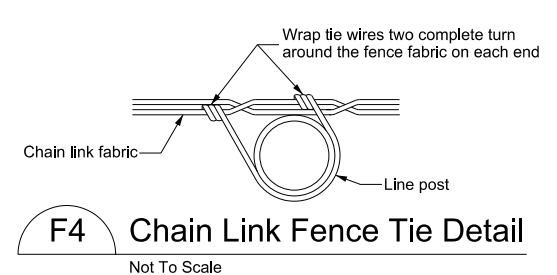
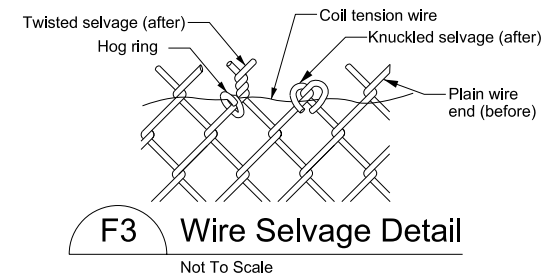
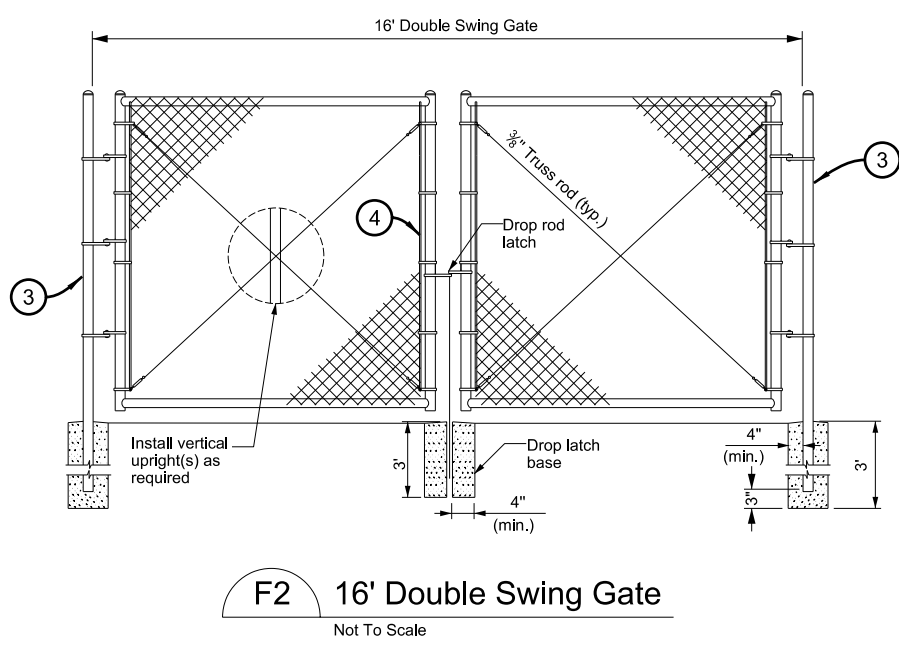
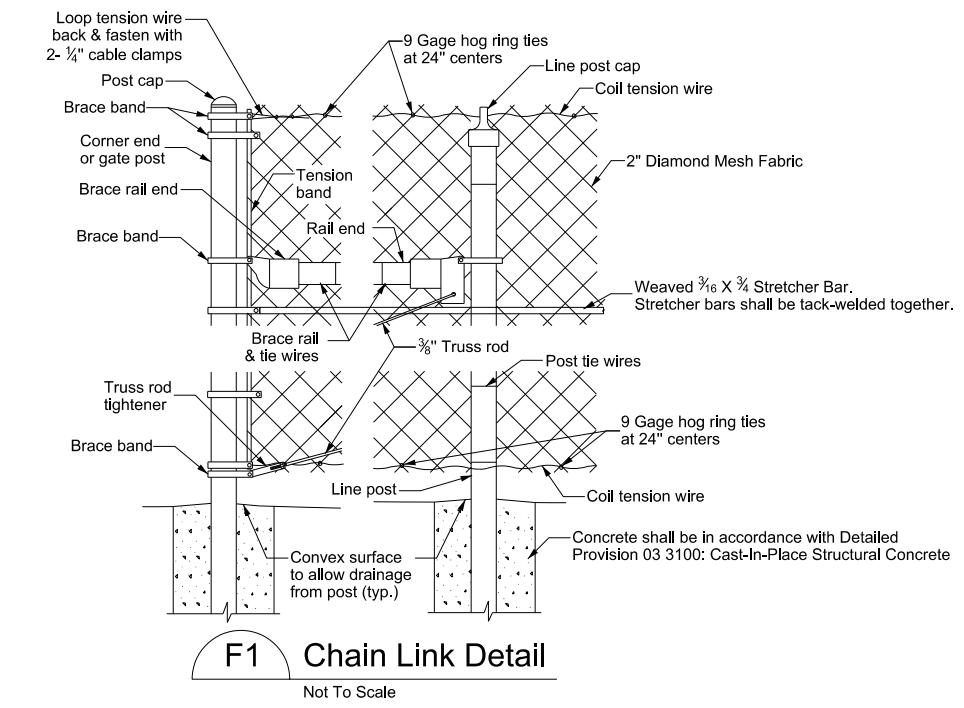
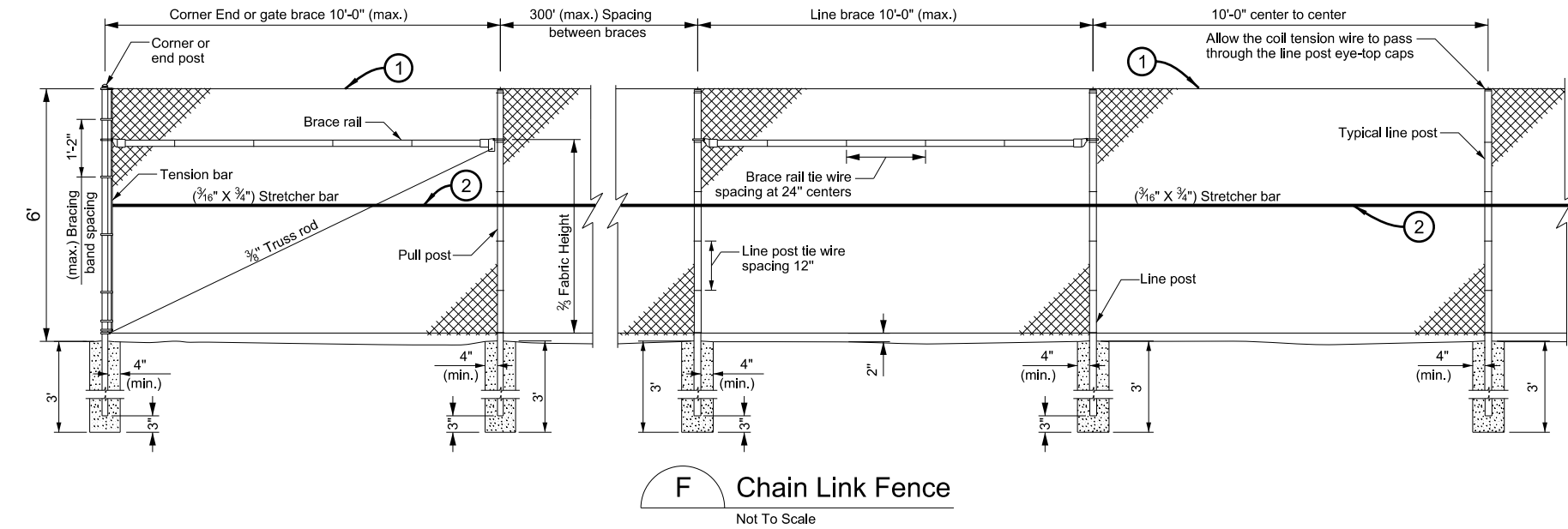
SHEET 13 OF 16

**GENERAL NOTES:**

- 1 FURNISH AND INSTALL CHAIN-LINK FENCE AND DOUBLE-SWING GATE IN ACCORDANCE WITH DETAILED PROVISION 32 3113: FENCES AND GATES.
- 2 GATE, END & CORNER POSTS SHALL BE 2.875" O.D.
- 3 LINE POST SHALL BE 2.375" O.D.
- 4 THE DESIGN OF THE CHAIN LINK HARDWARE MAY VARY FROM THE DETAILS SHOWN, HOWEVER, ALL HARDWARE AND MATERIALS USED IN A SINGLE INSTALLATION SHALL BE UNIFORM AND COMPATIBLE.
- 5 ALL CONCRETE SHALL BE FURNISHED AND POURED IN ACCORDANCE WITH DETAILED PROVISION 03 3100: CAST-IN-PLACE STRUCTURAL CONCRETE.

**CONSTRUCTION NOTES:**

- 1 ADJUST THE POST TOP ELEVATIONS TO PROVIDE A SMOOTH VISUAL FENCE PROFILE. INSTALL CORNER POSTS AT HORIZONTAL BREAKS IN THE FENCE OF 30° OR MORE.
- 2 IN AN EFFORT TO PREVENT THEFT OF FENCE FABRIC, STRETCHER BAR (3/16" X 3/4") SECTIONS SHALL BE WEAVED IN AND OUT OF FABRIC GAPS THROUGHOUT THE ENTIRE FENCE LENGTH. ENDS OF STRETCHER BAR SECTIONS SHALL BE TACK-WELDED TOGETHER.
- 3 REINFORCE THE GATE FRAME CORNERS WITH A MALLEABLE IRON OR PRESSED STEEL FITTING DESIGNED FOR THE PURPOSE OR SHOP WELD THE CORNERS. GRIND SMOOTH ALL WELDS AND FURNISH EACH GATE WITH THE NECESSARY HINGES, LATCH, AND DROP ROD LOCKING DEVICE DESIGN FOR THE TYPE OF GATE POSTS AND USED ON THE PROJECT. PROVIDE POSITIVE TYPE LATCHING DEVICES WITH PROVISIONS FOR PAD LOCKING AT ALL GATES. PROVIDE KEEPERS TO RETAIN THE GATE IN THE OPEN POSITION.
- 4 CONTRACTOR SHALL PROVIDE A SHARED GATE LOCKING MECHANISM FOR SIX (6) LOCKS.

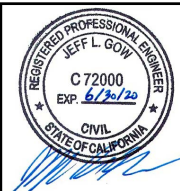


HARDWARE ITEM DESCRIPTION	STANDARD REQUIREMENTS
Brace rail and top rail	1-3/4 NPS (O.D. 1.660 Inch)
Line post	2 NPS (O.D. 2.375 Inch)
Corner, end and pull posts	2-1/2 NPS (O.D. 2.875 Inch)
Post cap	Cast non-ferrous alloy or galvanized pressed steel cap must fit snugly on post and gate top
Line post cap	Galvanized pressed steel minimum 3/32" thickness or galvanized malleable ferrous alloy
Tension band	Minimum 3/32" x 5/16" galvanized steel
Brace band	Minimum 3/32" x 5/16" galvanized steel
Band bolt	Minimum 5/16" x 1 1/4" galvanized carriage bolt, (Lock washer & flat washer for each band)
Rail end	Galvanized pressed steel or galvanized malleable ferrous alloy minimum 3/8" thickness on back bolting appendage
Brace rail end	Galvanized pressed steel or galvanized malleable ferrous alloy minimum 3/8" thickness on back bolting appendage
Truss rod tightener	Minimum 1/4" formed galvanized steel
Truss rod	3/8" Galvanized, NC threaded rod, lock washer, & flat washer with two 90° bends opposite of threaded end
Tension bar and stretcher bar	Minimum 3/16" x 3/4" galvanized steel
Fence fabric	11 AWG, 2" Diamond mesh fabric
Tie wires	9 AWG Aluminum with one hooked end
Coil tension wire	7 AWG Metallic coated wire
Gate latch	Minimum 1/8" galvanized pressed steel or malleable ferrous alloy. 1 latch per each single gate with bent minimum 3/8" attachment bolt, washer & nut.
Frame hinge	Minimum 1/8" galvanized pressed steel with 2 - 3/8" U-bolts, lockwasher & nuts per hinge. Use 2 hinges per swing gate to 8' in width and 3 hinges per swing gate widths greater than 8'.
Drop rod latch & guide	Minimum 1/8" galvanized pressed steel. Drop rod guide includes 3/8" x 3" carriage bolt with lock washer & nut. Weld drop rod fork to rod & paint with an approved zinc rich paint.

NO.	REVISIONS	BY	APPROVED	DATE



DESIGNED BY: ASA  
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 CHECKED BY: JLG  
 DRAWING DATE: Oct 2019  
 TOPO DATE: Oct 2019  
 PATH: T:\Sites\Mecca\Closure\Construction Plans  
 FILE: Mell\_FC\_s14 Fencing Details.dgn



Mecca II Sanitary Landfill  
 Plans for Closure Construction  
**Fencing Details**





**G1** 17' x 8' x 8' Reinforced Concrete Fee Booth  
Not To Scale

**G2** 17' x 8' x 8' Reinforced Concrete Fee Booth  
Not To Scale

**G3** 10' x 9' Secondary Containment Structure  
Not To Scale

**G4** AC Drainage Structure & Crossing  
Not To Scale



**G5** Main Electrical Panel  
Not To Scale

**G6** Electrical Panel  
Not To Scale

**G7** Large Vegetation  
Not To Scale

**G8** Large Vegetation  
Not To Scale

NO.	REVISIONS	BY	APPROVED	DATE



DESIGNED BY:	ASA
DRAWN BY:	ASA
CHECKED BY:	JLG
DRAWING DATE:	Oct 2019
TOPO DATE:	Oct 2019
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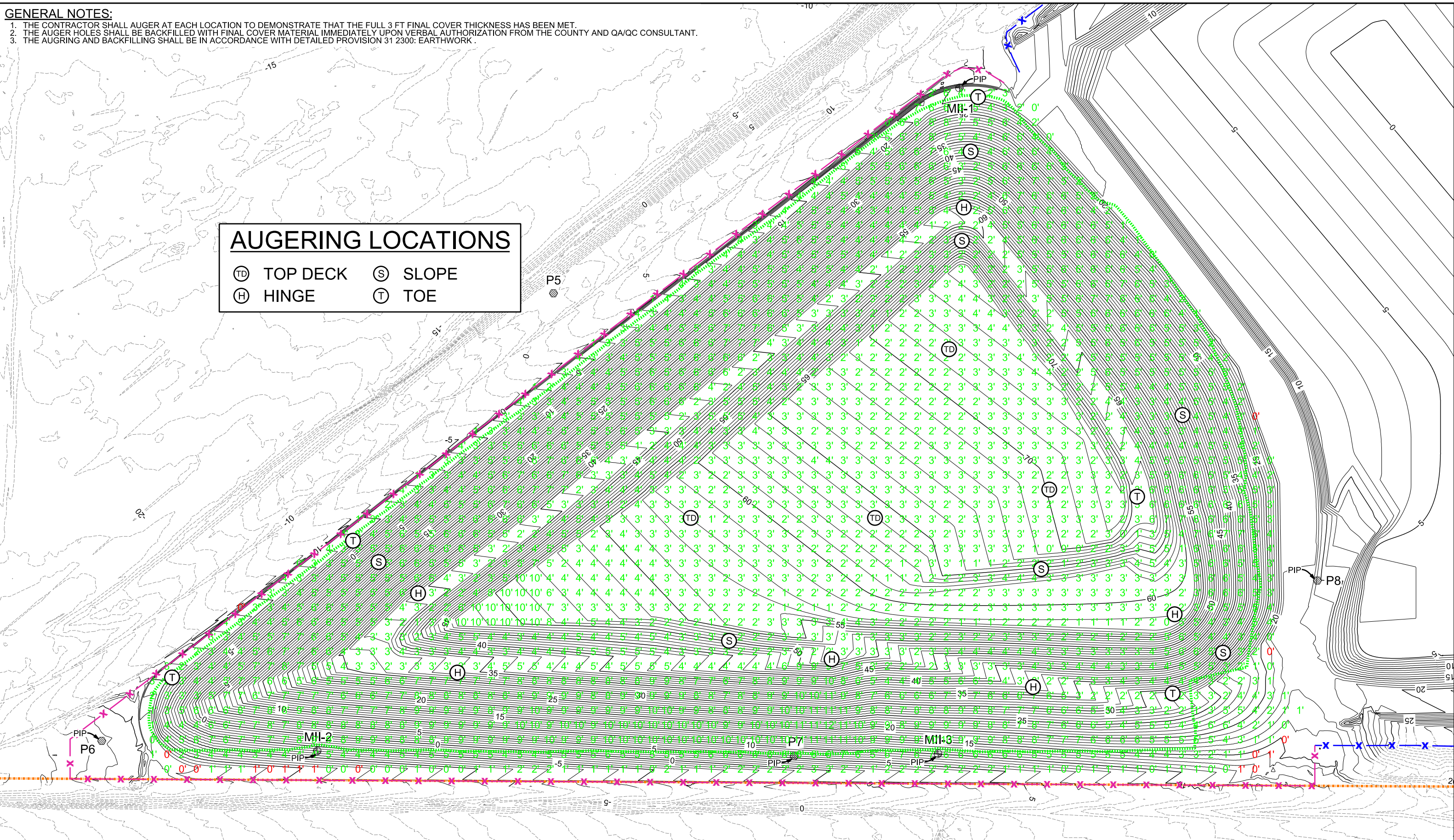


Mecca II Sanitary Landfill  
Plans for Closure Construction  
**Site Photos**



**GENERAL NOTES:**

1. THE CONTRACTOR SHALL AUGER AT EACH LOCATION TO DEMONSTRATE THAT THE FULL 3 FT FINAL COVER THICKNESS HAS BEEN MET.
2. THE AUGER HOLES SHALL BE BACKFILLED WITH FINAL COVER MATERIAL IMMEDIATELY UPON VERBAL AUTHORIZATION FROM THE COUNTY AND QA/QC CONSULTANT.
3. THE AUGRING AND BACKFILLING SHALL BE IN ACCORDANCE WITH DETAILED PROVISION 31 2300: EARTHWORK.



**Legend**

- Property Line (~ 80 Acres)
- Refuse Limits (~ 19 Acres)
- Design Contours
- Existing Contours
- Perimeter Gas Probe (PIP)
- Groundwater Monitoring Well (PIP)
- Existing Fence (PIP)
- New Chain-Link Fence (PIP If Constructed)

NO.	REVISIONS	BY	APPROVED	DATE

Hans Kernkamp, General Manager-Chief Engineer

Scale: 1" = 120' (11x17) 1" = 60' (Full)

Datum is mean sea level

DESIGNED BY:	ASA
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PATH:	T:\Sites\Meccal\Closure\Construction Plans
FILE:	MeII_FC_s16 Auger Map.dgn

Mecca II Sanitary Landfill  
 Plans for Closure Construction  
**Augering Location Map**

DESIGNED PROFESSIONAL ENGINEER  
 JEFF L. GOW  
 C 72000  
 EXP 6/26/20  
 CIVIL  
 STATE OF CALIFORNIA

SHEET 16 OF 16





**CONTRACT DOCUMENTS**  
**FOR**  
**CLOSURE CONSTRUCTION**  
**AT THE**  
**MECCA II SANITARY LANDFILL**

**MAY 2020**

FORM APPROVED COUNTY COUNSEL  
BY: Synthia M. Gunzel 5-31-2020  
SYNTHIA M. GUNZEL DATE

JUN 16 2020

12.1