

TECHNICAL SPECIFICATIONS

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SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A General:

1. The Contract Documents describe the Work to be performed under this Contract which includes, but is not limited to, furnishing all tools, equipment, materials, supplies, and manufactured articles for the Project. It shall also include the furnishing of all transportation and services, including fuel, power, water, and essential communications necessary for the performance of all labor, work, or other operations required for the performance of the Contract in accordance with the Contract Documents.
2. The Contractor should carefully review all sections of the Specifications in order to completely understand the Work and all constraints including schedule, environmental, permit and material requirements.
3. Contractor is encouraged to proceed in an orderly and expeditious manner based on the constraints shown on the Drawings and described in the Specifications. All Work is to be constructed in strict accordance with the Contract Drawings and Specifications and subject to the terms and conditions of the Contract.

B. The Contractor shall completely review, be familiar with and adhere to the terms of all permits and agency approvals for this project. Appendix A to these Specifications contain permits received to date. The City of Fortuna will be providing the Contractor copies of permits, certifications, or authorizations from the following agencies including, but not limited to: California Department of Fish and Wildlife; U.S. Army Corps of Engineers; California Regional Water Quality Control Board (forthcoming). Copies of all permits are available from the City and will remain at the project site throughout the duration of construction.

C. Contractor shall obtain all other necessary permits and comply with them and all other applicable Local, State, and Federal laws and regulations.

1. Compliance with City permits: Contractor is responsible for obtaining and complying with any relevant City Encroachment permit needed for the proposed construction activities, including, but not limited to, traffic and encroachment permits related to the delivery and hauling of construction equipment and materials, and traffic control measures. The Contractor must follow all pertinent Caltrans requirements for hauling large vehicles or equipment to the project site. To determine requirements for the specific vehicles to be used, see the web site at <http://www.dot.ca.gov/hq/traffops/permits>, if a City road is used for heavy equipment transport or wide loads, pertinent clearances with the City Department of Public Works must be obtained.

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D. Location of the Work:

1. The project is located in Fortuna, CA. A Vicinity Map is provided on the cover sheet of the drawings that illustrates the location of the project. The design drawings provide information regarding the limits of the project and its topography.

E. Technical Data and Other Reports:

- a. Limited data is available for the project site. Contractor is to familiarize themselves with the site conditions and discuss discrepancies with construction manager.

F. Contractor's Duties:

1. Except as specifically noted, provide and pay for:
 - a. Labor, materials, and equipment.
 - b. Tools, construction equipment, and machinery.
 - c. Water and utilities required for construction.
 - d. All other facilities and services necessary for proper execution and completion of Work.
2. Pay legally required sales, consumer, and use taxes.
3. Conform to the requirements of the project permits.
4. Secure and pay for, as necessary for proper execution and completion of the Work, all other applicable permits and licenses.
5. Give required notices.
6. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities which bear on performance of the Work.
7. Promptly submit written notice to Construction Manager of observed variance of Contract Documents from legal requirements.
8. If any Subcontractor or person employed by the Contractor shall appear to the Construction Manager to be incompetent or to act in a disorderly or improper manner, he shall be discharged immediately on the requisition of the Construction Manager, and such person shall not again be employed on the Work.

1.02 CONTRACT DESCRIPTION

A. General:

1. All Work is contained in this Contract. The limits of Work are shown in the Contract Drawings and described in these Specifications. It will be the Contractor's responsibility to coordinate their activities to resolve conflicts.

2. All risk of loss, damage or diminution to the Work shall rest with Contractor until final acceptance of the Work by the City.
- B. Work conducted includes, but is not limited to:
1. Installation of temporary stormwater BMPs.
 2. Installation of temporary construction entrances, and equipment and material handling/storage areas;
 3. Install cofferdams and creek diversion system;
 4. Clearing and grubbing;
 5. Relocation, protection and support of utilities;
 6. Excavation and material off haul/disposal;
 7. Complete instream work and associated structures;
 8. Complete concrete flat work and paving;

1.03 SPECIAL CONSTRUCTION REQUIREMENTS

- A. General:
1. The project is predominantly on private property and the City has obtained temporary construction easements from each owner. However the Contractor will be required to coordinate their schedule with the Construction Manager to minimize interruptions to private property owners and businesses. Should field conditions or property owners warrant the postponement of work on a portion of a particular reach, as determined by the Construction Manager, the Contractor shall be prepared to resume work at an alternate location along the channel corridor as field conditions and property owners permit and shall not be claimed as a delay by the Contractor.
 2. A proposed construction sequence is presented below. THIS PROJECT IS HIGHLY SENSITIVE TO TIMING CONSTRAINTS RELATED TO SPECIAL STATUS SPECIES, ASSOCIATED PERMIT CONDITIONS AND PHYSICAL CONDITIONS. The phasing/sequencing of most construction elements will be constrained by construction schedules stipulated by special status species in terms of construction windows and clearance and monitoring requirements, and requirements in environmental permits. Weather conditions may also affect project scheduling.
 3. Biological restrictions: Prior to start of construction, the Construction Manager will arrange for a qualified biologist to give Contractor's staff a presentation regarding special status species and restrictions required in terms of construction start clearance surveys, and construction monitoring. Because of the high number of special status species that occur in the area, most, if not all, elements may not be implemented until after certain dates and after construction clearance surveys by a qualified biologist have been performed and completed.
 4. Prior to start of construction, a qualified biologist under the direction of the Construction Manager must complete a check for presence of sensitive aquatic, avian

and terrestrial species within construction areas. In certain instances, only one clearance survey may be required. In other instances, particularly in certain areas where special status species are sighted or known to occur, surveys to clear the site may be required on a more frequent basis. Once the site has been cleared, the Construction Manager will authorize the Contractor to begin work.

5. Required clearance surveys: if special status species are located during clearance surveys, the Contractor shall stop work immediately and notify the Construction Manager. If possible, a Biologist under direction of the Construction Manager will conduct seining or trapping to relocate the species a safe distance away from the construction activities and out of the work limit line. However, in some instances, a buffer zone may need to be established in which no work would be conducted within some specified distance from the species' location. Further required actions could include, but are not limited to: 1) temporary delay in construction while species are relocated by qualified biologists; or 2) delay of construction until predetermined date after breeding season with no construction occurring within a buffer zone around the area where species were found. Owner and their representatives are not liable for such delays.
 6. Scheduling of required clearance surveys: The Contractor will be required to provide a construction schedule. On a weekly basis, the Contractor and Construction Manager will meet and discuss the status of the project and updates to schedules. Clearance surveys will be scheduled with the basis of this revised weekly schedule. The Contractor will not be allowed to start construction in specific areas until clearance surveys have been performed and authorization is given by the Construction Manager. It is the responsibility of the Contractor to provide the Construction Manager an updated schedule that allows for adequate time to schedule the clearance surveys required.
 7. All in-stream construction activities within the Harlan Way drainage channels, including but not limited to channel excavation, bank stabilization, in-stream structures, and in-stream erosion control measures, shall be limited to June 15th thru October 15th, unless written authorization from California Department of Fish and Wildlife, Army Corps of Engineers and California Water Board is received to extend the work period. Contractor shall not begin any work in Harlan Way drainage channel without prior approval of Construction Manager. In the event of rain, Contractor shall suspend all work until Construction Manager provides approval to resume work.
 8. Work windows specified in the various project permit conditions may conflict within one another therefore the most restrictive windows shall be exercised.
 9. The Contractor shall have all in-stream project work completed by October 15. The City is not liable for any expenses this regulatory-driven change in schedule may incur.
- B. Specific Sequence and Constraints:
1. The Contractor shall note that only certain constraints are addressed in this section. All Work, whether or not addressed here, shall be governed by applicable parts of this section, and schedules and procedures further submitted for approval.
 2. The first order of business is submission of submittals. Complete submittals for all items to be incorporated into the Work shall be made no later than fifteen (15)

calendar days following receipt of Notice to Proceed unless noted otherwise in these specifications.

3. The Contractor shall include all Work described in this section in the construction schedule. The sequence and constraints identified in this section shall be followed in the construction of the Work. However, alternatives to these sequences and constraints may be submitted by the Contractor for review by the City.
4. Specific Sequencing constraints include:
 - a. The pre-construction conference described in this Section shall be coordinated to accommodate attendance by representatives of the City.
 - b. Contractor shall anticipate weekly construction progress meetings with City staff to review work progress and issues (see Section 01 33 00).
 - c. Contractor shall notify City of Fortuna Fire Department of any construction activity that may affect traffic and potentially impact emergency vehicle and fire apparatus access. Additionally, Contractor shall notify the City of Fortuna of any life safety concerns.
 - d. Stockpiling of excavated soils that are potentially contaminated is not allowed. If hazardous materials are encountered, contractor to remove contaminated material from the site and dispose of it at an approved disposal site subject to the approval by the Construction Manager.

1.04 CONTRACT METHOD

- A. The Contractor shall include the requirements of the General Conditions of the Contract as a part of all of its subcontract agreements.
- B. All work as identified and described in the construction drawings and Specifications. In the case that there are discrepancies between Drawings and Specifications, Specifications take precedence over drawings.

1.05 UNDERGROUND FACILITIES

- A. The Contractor shall exercise care in all excavations to avoid damage to existing underground facilities. This shall include potholing and hand digging in those areas where underground facilities are known to exist until they have been sufficiently located to avoid damage to the facilities.
- B. Limited information on PG&E, AT&T, and City of Fortuna facilities intersecting the project alignment is known. The Contractor shall provide temporary shoring and support systems to protect and maintain services for all existing facilities. Shoring and support systems are subject to approval, inspection and oversight by PG&E, AT&T, the City of Fortuna and the Construction Manager.
- C. Prior to fabrication of any materials, the Contractor shall verify the locations and elevations of existing underground facilities which the Contractor is connecting to.
- D. The Contractor shall exercise care in maintaining those pipes, valves, and appurtenances to be abandoned and/or removed which are required for the continuing operation of the existing facilities until such time as they can be abandoned. The Contractor shall exercise extreme

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caution in working in any area adjacent to existing underground pipes. It is essential that the existing utilities be maintained in service until the new Work is ready for full-time operation and is placed in service.

- E. No additional compensation shall be provided the Contractor for compliance with the provisions of this section for the damage and repair of such facilities due to the lack of care.

1.06 PROJECT MEETINGS

- A. Section 01 30 00 - Administrative Requirements: Preconstruction Meeting, Progress Meetings, and Close Out Meetings.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION [NOT USED]

END OF SECTION 01 11 00

SECTION 01 14 19

USE OF SITE

PART 1 GENERAL

1.01 DESCRIPTION

- A. Related Requirements specified elsewhere:
 - 1. Section 31 10 13 - Demolition/Debris Removal
 - 2. Section 31 11 00 – Clearing and Grubbing

1.02 INFORMATION OF ON SITE CONDITIONS

- A. Information obtained by the Construction Manager regarding site conditions, subsurface information, and existing facilities, and similar data are shown on the Plans and are from the information made available by the City of Fortuna. Exact location and completeness are not guaranteed.
- B. Construction activities are limited to the limits of disturbance areas shown on drawings.

1.03 CONTRACTOR'S RESPONSIBILITIES

- A. The project is located within the City of Fortuna right-of-way. The Contractor is responsible to execute the work within these areas in accordance to the plans and specifications.
- B. If additional areas beyond the limits of disturbance shown on the plans are desired by the Contractor to execute the work, the Contractor shall first receive authorization from the Construction Manager. Contractor shall obtain all necessary permissions and approvals for use of these areas and shall submit a signed statement from the property owner granting permission and holding the City harmless from any and all damages that may result from the Contractor's use of the site.
- C. The Contractor shall satisfy their self as to the nature and location of the work, the general and local conditions, particularly those bearing upon availability of transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads, work in sensitive environment and uncertainties of weather, stream flow variation or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment facilities needed preliminary to and during the prosecution of the work and all other matters which can in any way affect the work or the cost thereof under this contract.
- D. The Contractor further shall satisfy their self as to the character, quality, and quantity of materials to be encountered from inspecting the site, any exploratory work done by the City, as well as from information presented by the Plans and Specifications made a part of this contract. Any failure by the Contractor to acquaint himself with all the available information available as part of the Bid Documents or referenced in the Bid Documents will not relieve him from responsibility for properly estimating the difficulty or cost of successfully performing the work.

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- E. The Contractor shall note that some staging and stockpile areas and construction entrances are located on private property and that heavy truck and equipment operations may cause damage. The Contractor shall restore these areas back to pre-project conditions or better. Damage caused by Contractor's operations shall be repaired by the Contractor at no additional cost to the City or property owner.
- F. Damage caused to the streets and all other vehicular and pedestrian travel ways by Contractor's operations shall be repaired by the Contractor at no additional cost to the City.

1.04 USE OF SITE AND ACCESS ROADS

- A. The Contractor shall:
 - 1. Conduct all operations with the least possible obstruction and inconvenience to the public and adjacent landowners.
 - 2. Have under construction no greater length or amount of work than can be continuously and vigorously prosecuted properly with due regards to the rights of the public.
 - 3. To the extent possible, finish each section before beginning work on the next.
 - 4. Be cognizant of other construction projects within the vicinity that may create traffic delays to trucks transporting material between the Project and offsite disposal sites.
 - 5. Assume full responsibility for protection and safekeeping of products stored on premises.
 - 6. Manage construction worker parking and access to avoid impeding access for emergency vehicles and local area residents.
- B. Protect the rights of abutting property owners by:
 - 1. Planning and conducting construction operations so that the least inconvenience as possible is caused to abutting property owners;
 - 2. Prohibit access of staff and subcontractors to properties abutting the project site, except as approved in writing by the Construction Manager.
- C. Access to Private Properties:
 - 1. Contractor shall maintain access for local vehicular and pedestrian traffic to private properties at all times.
- D. The Contractor shall be responsible for providing adequate safeguards, safety devices, and protective equipment, and for taking any other needed actions to protect the life, health, and safety of the public, and to protect property in connection with the performance of the work covered by the Contract.
- E. The Contractor shall stage materials and equipment in designated staging and stockpile areas as shown on the plans and within the construction disturbance area. All staging and stockpile areas shall be subject to review and approval by the Construction Manager. Staging in permitted areas shall be at the Contractor's risk.

The City or their representatives shall not be held liable for any damage to or loss of materials or equipment located within these areas or at any location on the project site(s).

- F. Access to worksite: Contractor and Contractor's employees and subcontractors shall use access routes as indicated on project plans.
- G. After demobilization, Contractor shall repair any damage to existing roads and property to pre-existing conditions or better.
- H. The Contractor shall remediate temporary haul roads and staging areas at the conclusion of use through removal of all rock and construction materials, and blading, ripping or otherwise removing ruts and de-compaction. The Construction Manager reserves the right to require the Contractor to repair damage where haul roads and staging areas were constructed. Restore access roads and staging areas to pre-existing conditions or better.
- I. Construction access routes and equipment staging areas shall be limited within the project disturbance areas to the extent feasible and as shown on the plans. Construction activities shall be prohibited from unnecessarily disturbing aquatic habitat. Disturbance such as excavation, filling or dewatering of any existing ditches, channels and other ponded water areas shall occur only after the area has been seined and cleared by the biologist.
- J. Hauling Restrictions:
 - 1. Comply with all legal load restrictions in the hauling of materials. Delivery and haulage access, including contractor mobilization and demobilization, will be scheduled to minimize impacts on traffic on area roadways.
 - 2. Do not load structure, roadway or roadway shoulder with weight that will endanger or render unusable any structures or roadways or underground utilities.
- K. Parking and Traffic Regulations:
 - 1. Persons involved in construction operations shall comply with parking and traffic regulations for use of City/County/State streets, as enforced by City/County/State authorities, except for other arrangements as may be agreed to between Contractor and authorities and approved by the Construction Manager.
- L. Existing Improvements in Streets:
 - 1. Existing street signs, electroliers, traffic signals, fire hydrants, underground valves and meter boxes, manholes, trees and other items occurring in streets adjacent to the site shall be left undisturbed, unobstructed, and easily accessible at all times during construction, except as otherwise indicated or agreed to between Contractor and City authorities.
- M. Covering, moving, trimming, or altering trees and other vegetation which may become necessary shall be done only with consent of and in cooperation with City authorities and Construction Manager. Contractor shall pay costs, which may be incurred.

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- N. Construction Camp: Establishment of a camp within the project property will not be permitted.
- O. Residence trailers will not be allowed within the project site, or designated staging and stockpiling areas, except for security purposes as approved by the Construction Manager.

1.05 PROTECTION OF NATURAL FEATURES

- A. Avoid impacts to vegetation outside the limits of construction disturbance. Prior to any construction, the Contractor shall demarcate the limits of construction disturbance. No access or construction is permitted outside of the designated work / access zones without prior approval from the Construction Manager.
- B. Confine all operations to limits shown for the project. Prevent damage to natural surroundings. Restore damaged areas, repairing or replacing damaged trees and plants, at no additional expense to the City.
- C. Do not remove, injure, or destroy trees or other plants without prior approval of the Construction Manager. Consult with the Construction Manager and remove agreed upon roots and branches that interfere with construction. All pruning of canopy or cutting of roots will be done under the supervision of the Construction Manager or their representative, and shall be done as set forth by the National Arborist Association or the International Society of Arboriculture.
- D. If the Contractor destroys or injures trees and shrubs designated for protection or outside of the work limits, the Contractor shall replant at a 3:1 ratio and as directed by the Construction Manager.
- E. As specified in Section 01 57 00, the Contractor shall take all preventative measures to protect the staging areas from contamination due to oil or fuel spills or any other contaminants. The Contractor will submit to the Construction Manager for approval a Spill Prevention and Response Plan. Any leaks or spills which occur on the project site shall be fully removed from the project site. If contamination occurs, the Contractor shall immediately notify the Construction Manager, and decontaminate the area to the satisfaction of the Construction Manager, prior to further improvement or further construction activities in general.
- F. All staging and laydown areas disturbed by the Contractor or construction or construction related activities shall be restored to their pre-existing state or in accordance with these Specifications.

1.06 PROTECTION OF PROPERTY AND LANDSCAPE

- A. Preserve public and private property, and protect monuments established for the purpose of perpetuating horizontal, vertical, cadastral, or boundary control. When necessary to destroy a monument, reestablish the monument according to applicable state statute or by the direction of the Construction Manager. The Contractor shall notify the Construction Manager of any monument that may need to be destroyed. If the Construction Manager determines that the destruction of the monument is unavoidable, Construction Manager will arrange for resetting the monument and associated costs. If a monument is destroyed by the Contractor's negligence or without the Construction Manager's approval the Contractor shall pay for resetting the monument.

- B. Do not excavate, remove, damage, alter or deface any archeological or paleontological remains or specimens. Control the actions of employees and subcontractors on the project to ensure that protected sites are not disturbed or damaged. Should any of these items be encountered, suspend operations at the discovery site, notify the Construction Manager and continue operations in other areas. The Construction Manager will inform the Contractor when operations may resume at the discovery site.
- C. Existing Utilities:
 - 1. Contractor shall be responsible for locating and preventing damage to known utilities or utility support structures. If damage occurs to utilities, Contractor shall repair utility at no additional expense to City.
- D. Protect utilities from construction operations: 48 hours before beginning work in an area, the Contractor shall notify Underground Service Alert (USA), at 1-800-227-2600, to determine locations of existing utilities. Cooperate with utility owners to protect and support existing utilities and to expedite the relocation or adjustment of their utilities to minimize interruption of service and duplication of work.
- E. Any authorized agent of the City or utility owners may enter the site to repair, rearrange, alter, or connect their equipment. The Contractor shall cooperate with such efforts and shall avoid creating delays or hindrances to those doing the work. As needed, the Contractor shall arrange to coordinate work schedules.
- F. If utility services are interrupted as a result of damage by the construction activities, immediately notify the utility owner, the Construction Manager, and other proper authorities. Cooperate with them until service is restored. Do not work around fire hydrants until provisions for continued service are made and approved by the local fire authority.
- G. The Contractor shall protect private or public property on or in the vicinity of the work site. The Contractor shall ensure that it is not removed, damaged, destroyed, or prevented from being used unless the contract so specifies.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION [NOT USED]

END OF SECTION 01 14 19

SECTION 01 15 00

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 GENERAL

- A. Unless otherwise specified in other individual sections of these specifications, quantities of work have been determined from the typical sections shown on the plans.
- B. Units of measurement shall be in accordance with U.S. Standard Measures.
- C. See the general conditions for special provisions related to progress payments and payment schedule to the contractor.
- D. The measurement and payment items are listed below:
 - 1. Pay Item Quantities- The quantities set forth in the Bid Schedule are approximate, as determined by typical sections, and are given to establish a uniform basis for the comparison of bids. Pay item quantities will be determined based on the lines and grades measured in the field. The City reserves the right to increase or decrease the quantity of any class or portion of the work during the progress of construction in accordance with the terms of the Contract.
 - 2. The payments to the Contractor are based on the following items. It is the intent that the scope of the description of the following items encompasses the entire scope of the work as shown on the plans and described in the specifications. The bid amounts shall be for complete in place installations.

1.02 BASE BID SCHEDULE

ITEM 1. MOBILIZATION/DEMOBILIZATION

Measurement for this item shall be on a LUMP SUM basis. Payment shall correspond to percent complete as confirmed by the Construction Manager and described in this bid item. This Work covers all Contractor costs and effort associated with mobilizing equipment, materials, and labor to the project site as well as demobilization of same for the base bid schedule. The incremental mobilization/demobilization costs associated with any additive bid items will be covered in those items, if awarded. Items covered by this item include, but are not limited to, bonds, insurance, contracting, administrative and permitting costs, equipment mobilization to the work areas, temporary facilities and utilities, construction entrances, punch list items, repairs of damaged property, site cleanup, final site restoration, road repairs, and project maintenance and warranty.

- 1. Any other work shown on the plans or required by the specifications and not specifically mentioned/described in the following bid items will be paid under mobilization/demobilization.

ITEM 2. TEMPORARY TRAFFIC CONTROL

Measurement for this item shall be on a LUMP SUM basis. Payment shall correspond to percent complete as confirmed by the Construction Manager and described in this bid item. This Work covers all Contractor costs and effort associated with providing traffic control measures as described in these Specifications, the Plans, and Contractor provided traffic

control plan. Items covered by this include, but are not limited to, labor, materials, equipment, signage, and other expenses for complete traffic control throughout the length of the project including times when the Contractor is not working on site. Included are notifications, road closures and detours, flaggers as necessary, and all other materials and equipment needed to control traffic temporarily throughout the project.

ITEM 3. WATER MANAGEMENT, DUST/EROSION CONTROL AND ENVIRONMENTAL PROTECTION

Measurement for this item shall be on a LUMP SUM basis. Payment shall include full compensation for all materials, labor, equipment, temporary or permanent facilities, and supervision necessary to manage water meeting permit requirements including control, diversion and disposal of water. Items covered by this include, but are not limited to, installation and use of power, cooperation with biologists, diversion piping and sediment basins as needed, dewatering pumps, hoses and tanks, dewatering bags, and disposal of water. This item also includes maintenance and removal of water management system. This item also includes routine dust suppression, maintenance of existing construction entrances, tire cleaning stations as needed to prevent tracking, and cleaning of public roads. This Work covers all Contractor costs and effort associated with obtaining construction water from approved sources, applying water to prevent fugitive dust and as needed or routine street sweeping/vacuuming on City roads to comply with project permits.

ITEM 4. UTILITY LOCATION AND IDENTIFICATION (POTHOLING)

Measurement for this item shall be on an EACH basis. Payment shall include full compensation for all materials, labor, equipment and supervision necessary to complete the utility location including but not limited to traffic control, locating equipment and associated labor, saw cutting or cutting asphalt concrete pavement, excavation, backfilling, moisture conditioning, compaction, additional backfill material, cold asphalt patching, permanent resurfacing over the pothole with asphalt concrete, and the hauling and disposal of excess material and construction debris.

ITEM 5. TEMPORARY SHORING AND UTILITY SUPPORT/PROTECTION

Measurement for this item shall be on a LINEAR FOOT basis. Payment shall include full compensation for all design, materials, labor, equipment and supervision necessary to complete the installation and removal of the temporary shoring as necessary to construct the project in accordance to the plans and specifications and support existing underground utilities. This item also includes preparation of the trench safety plan submittal for review and approval by the Construction Manager.

ITEM 6. CLEARING AND GRUBBING

Measurement and Payment for this item shall be on an SQUARE FOOT basis. Payment shall include full compensation for all materials, labor, equipment and supervision necessary to fall, clear, and grub all vegetation, stumps, trunks, stems, roots, logs, and other woody debris encountered on the surface or subsurface as required to complete the work. The cleared and grubbed material shall be off-hauled to approved disposal location(s).

ITEM 7. EARTHWORK (EXCAVATION, MATERIAL HAULING AND OFFSITE DISPOSAL)

Measurement and payment for this item shall be on a CUBIC YARD basis. Payment shall include full compensation for all materials, labor, equipment and supervision necessary to complete the excavation, material hauling, and offsite disposal in accordance to the requirements as shown on the plans and as described in the specifications.

ITEM 8. EARTHWORK (PERVIOUS BACKFILL)

Measurement and payment for this item shall be on a CUBIC YARD basis. Payment shall include full compensation for all materials, labor, equipment and supervision necessary to complete all onsite placement and finished grading of pervious backfill required to achieve

the lines and grades shown on the plans and as described in the specifications.

- ITEM 9. EARTHWORK (CLASS II AGGREGATE BASE)
Measurement and payment for this item shall be on a CUBIC YARD basis. Payment shall include full compensation for all materials, labor, equipment and supervision necessary to complete all onsite placement, finished grading, compaction and testing of aggregate base for culvert bedding, to achieve the required lines and grades shown on the plans and as required by the specifications, including but not limited to water conditioning, compaction, testing, and any necessary re-testing.
- ITEM 10. GEOTEXTILE FABRIC (MIRAFI 500X, AT CULVERT, WINGWALL AND ENTRANCE SUBGRADE)
Measurement and payment for this item shall be on a SQUARE YARD basis. Payment shall include full compensation for all materials, labor, equipment and supervision necessary to complete all onsite placement of geotextile fabric as shown on the plans and as required by the specifications.
- ITEM 11. GEOTEXTILE FILTER FABRIC (MIRAFI 140N, AT CULVERT, WINGWALL AND ENTRANCE SUBGRADE)
Measurement and payment for this item shall be on a SQUARE YARD basis. Payment shall include full compensation for all materials, labor, equipment and supervision necessary to complete all onsite placement of geotextile fabric as shown on the plans and as required by the specifications.
- ITEM 12. ROCK SLOPE PROTECTION (FACING CLASS) AND GEOTEXTILE FILTER FABRIC
Measurement for this item shall be on a CUBIC YARD basis. Payment shall include full compensation for all materials, labor, equipment and supervision necessary to excavate, place geotextile fabric, place RSP, and backfill RSP voids with native backfill as shown on the plans or as required to meet the intent of the plans and as required in the specifications.
- ITEM 13. STORMDRAIN PIPE (36" DIA HDPE DUAL WALL)
Measurement for this item shall be on a LINEAR FOOT basis. Payment shall include full compensation for all materials, labor, equipment and supervision necessary for completing all the work involved in installing and backfilling as shown on plans and as required by the specifications.
- ITEM 14. STORMDRAIN JUNCTION BOX AND MANHOLE
Measurement for this item shall be on an EACH basis. Payment shall include full compensation for all materials, labor, equipment and supervision necessary for completing all the work involved in installing, penetrating, grouting, backfilling and compaction as shown on plans and as required by the specifications.
- ITEM 15. HOT MIX ASPHALT (TYPE A, 3 INCHES THICK)
Measurement for this item shall be on a SQUARE FOOT basis. Payment shall include full compensation for all materials, labor, equipment and supervision necessary for completing all the work involved in asphalt pavement, conform paving, and all other work as shown on the plans and as required by the specifications.
- ITEM 16. MINOR CONCRETE (4" SIDEWALK AND DRIVEWAY APRON)
Measurement for this item shall be on a SQUARE FOOT basis. Payment shall include full compensation for all materials, labor, equipment and supervision necessary for completing all the work involved in minor concrete as shown on the plans and as required by the specifications.

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ITEM 17. HOT MIX ASPHALT DIKE (CALTRANS PLAN NO. A87B)

Measurement for this item shall be on a LINEAR FOOT basis. Payment shall include full compensation for all materials, labor, equipment and supervision necessary for completing all the work involved in installing as shown on plans and as required by the specifications.

PART 2 [NOT USED]

PART 3 EXECUTION [NOT USED]

END OF SECTION 01 15 00

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Coordination and project conditions
- B. Field Construction Managing
- C. Pre-bid meeting
- D. Preconstruction meeting
- E. Progress meetings
- F. Environmental compliance training

1.02 MEASUREMENT AND PAYMENT

- A. Refer to Section 01 15 00 Measurement and Payment.

1.03 COORDINATION AND PROJECT CONDITIONS

- A. Coordinate scheduling, submittals, and Work of various sections of Project to ensure efficient and orderly sequence of installation of construction elements.

1.04 PRE-BID MEETING

- A. Prior to awarding the Contract, a Pre-Bid meeting will occur as established in the Advertisement for Bids. The Pre-Bid meeting shall be attended by the City of Fortuna representatives and any other parties requested by the Contractor or the Construction Manager.

1.05 PRECONSTRUCTION MEETING

- A. Construction Manager will schedule meeting after Notice of Award.
- B. Prior to the commencement of Work at the site, a Preconstruction meeting will be held at a mutually agreed time and place.
- C. Unless previously submitted to the Construction Manager, the Contractor shall bring to the conference three (3) copies of each of the following:
 - 1. Draft Construction Schedule.
 - 2. Procurement schedule of major equipment and materials and items requiring long lead time.
 - 3. Submittal schedule.

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4. Substitution Requests per Section 01300, "Administrative Requirements."
 5. Letter of Responsibility designating emergency contacts for the Contractor after business hours (3 copies).
- D. The purpose of the meeting is to designate responsible personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established.
- E. The Construction Manager will preside at the Preconstruction Meeting and will arrange for keeping the minutes and distributing the minutes to all persons in attendance.
- F. Agenda (Tentative):
1. Notice to Proceed date.
 2. Contractor's tentative schedules.
 3. Submission of list of Subcontractors, list of products, schedule of values, and progress schedule.
 4. Critical work sequencing.
 5. Designation of personnel representing parties in Contract, and Construction Manager.
 6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 7. Scheduling.
 8. Major equipment deliveries and priorities.
 9. Use of premises by the City and Contractor.
 10. Environmental compliance.
 11. Owner's requirements and occupancy.
 12. Site Safety Contractor's assignments for safety and first aid.
 13. Construction facilities and controls provided by the City.
 14. Temporary utilities provided by the City.
 15. Application for payment procedures.
 16. Procedures for maintaining record documents.

1.06 PROGRESS MEETINGS

- A. The Construction Manager shall schedule, arrange and conduct progress meetings. These meetings shall be conducted once per week, or as mutually agreed by Contractor and the City, and shall be attended by the Contractor's superintendent and representatives of key

Subcontractors, utilities, and others, who are active in the execution of the Work. The purpose of these meetings shall be to review the Contractor's schedule provided in accordance with this Section, resolve conflicts, and in general, coordinate and expedite the execution of the Work.

- B. Construction Manager will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings and record the meeting minutes.
- C. Attendance Required: Job superintendent, key subcontractors, the City, Construction Manager, as appropriate to agenda topics for each meeting.
- D. Agenda (Tentative):
 - 1. Review and acceptance of minutes of previous meeting.
 - 2. Review of Work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Site Safety.
 - 5. Environmental compliance.
 - 6. Identification of problems impeding planned progress.
 - 7. Review of submittals schedule and status of submittals.
 - 8. Review of delivery schedules.
 - 9. Maintenance of progress schedule.
 - 10. Corrective measures to regain projected schedules.
 - 11. Planned progress during succeeding work period.
 - 12. Coordination of projected progress.
 - 13. Maintenance of quality and work standards.
 - 14. Effect of proposed changes on progress schedule and coordination.
 - a. Progress Payment.
 - b. Change Orders.
 - c. Claims.
 - 15. Other business relating to Work.
- E. Construction Manager will record minutes and distribute copies within two days after meeting to participants, with one copy each to Construction Manager, the City, and those affected by decisions made.

1.07 ENVIRONMENTAL COMPLIANCE TRAINING

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- A. All personnel working on site will be required to participate in a short briefing by the Construction Manager and qualified biologist about the 1) presence of federally and state-listed bird, fish, amphibian, reptile, mammalian, and plant species at the site, 2) non disturbance areas; 3) construction windows and effects on sequencing of work; 4) buffers between construction activities and breeding/nesting areas; 5) pre-construction and construction clearance surveys and construction monitoring requirements prior to initiating and continuing work in construction work areas, including the potential necessity for trapping or seining and relocation; 6) Need to halt work if potential special status species located by Contractor or representative and notify the Construction Manager before proceeding with work; 7) Requirements for minimizing other environmental impacts, including noise, traffic, etc.; and 8) The possible presence of archaeological or cultural resources and need to halt work if suspected archaeological or historic resources are found and notify the Construction Manager before proceeding with work.

- B. Contractor shall ensure that all on-site workers and contractors understand and agree to observe the standards for work outlined in project permits.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION [NOT USED]

END OF SECTION 01 30 00

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Submittal procedures.
- B. Construction progress schedules.
- C. Product data & shop drawings.
- D. Test reports.
- E. Certificates.

1.02 MEASUREMENT AND PAYMENT

- A. Measurement and payment for this item shall be included in the Bid Item to which it relates. No additional measurement or payment will be included for the requirements of this section.

1.03 SUBMITTAL PROCEDURES

- A. Submit on Submittal Form with information similar to the attached.
- B. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.
- C. Identify Project, Contractor, Subcontractor and supplier; pertinent drawing and detail number, and specification section number, appropriate to submittal.
- D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite Project, and deliver to Construction Manager.
- F. For each submittal for review, allow fourteen (14) calendar days excluding delivery time to and from Contractor.
- G. Identify variations from Contract Documents and product or system limitations which maybe detrimental to successful performance of completed Work.
- H. When revised for resubmission, clearly identify changes made since previous submission.
- I. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.

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1.04 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit initial schedules within ten (10) calendar days after date of Notice to Proceed. After review, resubmit required revised data within ten (10) calendar days.
- B. Submit revised Progress Schedules with each Application for Payment.
- C. Distribute copies of reviewed schedules to Project site file, Subcontractors, suppliers, and other concerned parties.
- D. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.
- E. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities.
- F. Indicate estimated percentage of completion for each item of Work at each submission.
- G. Revisions To Schedules:
 - 1. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
 - 2. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.

1.05 PRODUCT DATA AND SHOP DRAWINGS

- A. Product Data and Shop Drawings: Submit to Construction Manager for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Submit a single re-producible copy or email an electronic version of the submittal to the Construction Manager.
- C. Mark submittal to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

1.06 TEST REPORTS

- A. Submit for Construction Manager's knowledge as contract administrator.
- B. Submit test reports for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.07 CERTIFICATES

- A. When specified in individual specification sections, submit certification by manufacturer, installation/application subcontractor, or Contractor to Construction Manager, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Construction Manager.

1.08 REQUESTS FOR SUBMITTALS

- A. Contractor is directed to each Specification section for required submittals, however, the anticipated Submittals shall consist of, but is not necessarily limited to the following:

Section	Submittal Title	Due Date
01 30 00	Draft Construction Schedule (3 copies)	Preconstruction Meeting
	Procurement Schedule (3 copies)	
	Submittal Schedule (3 copies)	
	Substitution Requests (3 copies)	
	Letter of Responsibility (3 copies)	
01 30 00	Updated Construction Schedule	10 calendar days following Notice to Proceed & With Each Application for Payment
01 50 00	Construction Water Sources	Within five working days following Preconstruction Meeting
01 55 50	Temporary Traffic Management Plan	Prior to receiving a notice to proceed 10 working days prior to any work in or on public roadways or private right-of-ways
	Letter of Responsibility	Prior to receiving a notice to proceed 10 working days prior to any work in or on public roadways or private right-of-ways
	Traffic Management Letter	Prior to road/lane closure
01 57 00	Water Management Plan	Within five working days following Preconstruction Meeting and prior to related activities
	Spill Prevention and Response Plan	
	Tire Tracking Control Plan	
	Dust Prevention Plan	
01 60 00	Product Substitutions	Within 60 calendar days after date established in Notice to Proceed and prior to installation.
01 71 23.16	Verify the primary horizontal and vertical control (notify if differences)	within 30 days of Notice to Proceed
01 77 00	Completion of Work Inspection Request	at least seven calendar days in advance of the requested date of the preliminary inspection
	Record Drawings	Draft/Ongoing- at time of progress pay request Final- Prior to Completion of Work Inspection Request
	Guarantees and Bonds	Prior to Notice to Proceed
	Spare parts and material	Ongoing
	Closeout Reports	Prior to Notice of Completion
02 25 00	State Division of Industrial Safety Permit for excavation greater than 5-foot depth	Prior to initiating work associated with permit
	Trench Safety and Shoring Plan	Ten (10) working days before the Contractor intends to begin trenching or excavation work

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Section	Submittal Title	Due Date
31 10 13 31 11 00 31 20 00	Disposal Plan	Within five (5) working days of Award of Contract
31 20 00	Product Data: Submit data sheets for the following: A. Pervious Backfill B. Aggregate Base C. Geotextile Fabric	Prior to installation
	Compaction Testing Reports	At time of Progress Pay Request
32 12 16	Hot Mix Asphalt Product Data Hot Mix Asphalt Job Mix Formula	Prior to installation
32 13 13	Concrete Paving (Minor Concrete) Design Mixes	Prior to installation
33 05 13	Manholes and Structures	Prior to installation
33 41 00	Storm Utility Drainage Piping Product Data Concrete Junction Box with Manhole	Prior to installation

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION [NOT USED]

END OF SECTION 01 33 00

SHOP DRAWING/MATERIAL REVIEW REQUEST

INSTRUCTION: Complete this form and attach to each specific Shop Drawing Submittal.

- 1. Contract Name _____
- 2. Submission No. _____
- Submittal: 3. New _____ 4. Resubmittal _____
- 5. Date of this submittal _____
- 6. Date of receipt by Construction Manager _____
- 7. Previous Submission No. (if any) _____
- 8. Contractor _____
- 9. Submitted by (signature and date)

	11. Specification Section and <u>Paragraph Nos.</u>	12. Description of Material (Name, Type, Model, <u>Catalog No., Mfg., Etc.</u>)
10. <u>Item</u>		
_____	_____	_____
_____	_____	_____
_____	_____	_____

- 13. Comment:
Include all drawing titles and numbers, specific information not on drawings, information coming later, etc.

For Use of Construction Manager Only:

- 14. Action taken* _____
 - 15. Review by (signature and date)
-

*See review stamp on individual items.

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Quality control and control of installation.
- B. Tolerances.
- C. References.
- D. Mock-up requirements.
- E. Testing and inspection services.
- F. Manufacturers' field services.
- G. Examination.
- H. Preparation.

1.2 QUALITY CONTROL AND CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. When manufacturers' instructions conflict with Contract Documents, request clarification from Construction Manager before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform Work by persons qualified to produce required and specified quality.
- F. Verify field measurements are as indicated on Shop Drawings or as instructed by manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.3 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

- B. Comply with manufacturers' tolerances. When manufacturers' tolerances conflict with Contract Documents, request clarification from Construction Manager before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

1.4 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date for receiving bids, except where specific date is established by code.
- C. Obtain copies of standards where required by product specification sections.
- D. When specified reference standards conflict with Contract Documents, request clarification from Construction Manager before proceeding.
- E. Neither contractual relationships, duties, nor responsibilities of parties in Contract nor those of Construction Manager shall be altered from Contract Documents by mention or inference otherwise in reference documents.

1.5 MOCK-UP REQUIREMENTS

- A. Tests will be performed under provisions identified in this section and identified in respective product specification sections.
- B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mock-ups shall be the comparison standard for remaining Work.
- D. Where mock-up has been accepted by Construction Manager and is specified in product specification sections to be removed; remove mock-up and clear area when directed to do so by Construction Manager.

1.6 TESTING AND INSPECTION SERVICES

- A. Employ and pay for services of an independent testing agency or laboratory acceptable to Owner to perform specified testing.
 - 1. Prior to start of Work, submit testing laboratory name, address, and telephone number, and names of full time specialist and responsible officer.
 - 2. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of deficiencies reported by inspection.

- B. The independent firm will perform tests, inspections and other services specified in individual specification sections and as required by Construction Manager.
 - 1. Laboratory Staff: Maintain full time specialist on staff to review services.
 - 2. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to National Bureau of Standards or accepted values of natural physical constants.
- C. Testing, inspections and source quality control may occur on or off project site. Perform off-site testing as required by Construction Manager.
- D. Reports will be submitted by independent firm to Construction Manager and Contractor, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
 - 1. Submit final report indicating correction of Work previously reported as non-compliant.
- E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
 - 1. Notify Construction Manager and independent firm 24 hours prior to expected time for operations requiring services.
 - 2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
- F. Testing and employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- G. Re-testing or re-inspection required because of non-conformance to specified requirements shall be performed by same independent firm on instructions by Construction Manager. Payment for re-testing or re-inspection will be by Contractor.
- H. Contractor Responsibilities:
 - 1. Provide qualified third party testing entity.
 - 2. Collect samples as required by contract documents and as needed for Contractor means and methods. Review test results provided for by Contractor.
 - 3. Provide qualified personnel at site. Cooperate with Construction Manager and Owner in performance of services.
 - 4. Perform specified sampling and testing of products in accordance with specified standards.
 - 5. Provide test results to Construction Manager for review.
 - 6. Promptly notify Construction Manager of any observed irregularities or non-conformance of Work or products.
 - 7. Attend preconstruction meetings and progress meetings as needed to review results.
- I. Reports: After each test, Contractor to promptly submit one copy of report to Construction Manager, Contractor, and authority having jurisdiction. When requested by Construction Manager, provide interpretation of test results. Include the following:
 - 1. Date issued.
 - 2. Project title and number.

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3. Name of inspector.
4. Date and time of sampling or inspection.
5. Identification of product and specifications section.
6. Location in Project.
7. Type of inspection or test.
8. Date of test.
9. Results of tests.
10. Conformance with Contract Documents.

J. Limits On Testing Authority:

1. Contractor or their third party testing entity may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Contractor, their third party testing entity, or laboratory may approve or accept any portion of the Work.

1.7 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Construction Manager 20 working days in advance of required observations. Observer is subject to approval of Construction Manager.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- D. Refer to Section 01 33 00 - Submittal Procedures, MANUFACTURERS' FIELD REPORTS article.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Contractor to provide and pay for third party testing and analysis services as required by the contract documents and in general conformance with the standard of care for such services.
- B. Contractor shall notify Construction Manager a minimum of 48 hours prior to collecting samples.
- C. Contractor shall deliver results within 24 hours of receiving them.

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- D. Contractor is responsible for any rework necessitated by Contractor proceeding prior to Construction Manager's written acceptance of test results demonstrating conformance with contract requirements.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Public Utilities
 - 1. Agencies Affected
 - 2. Notification Requirements
 - 3. Contractor Responsibility
- B. Temporary Utilities
 - 1. Temporary electricity
 - 2. Temporary sanitary facilities
- C. Existing Utilities and Improvements
 - 1. General
 - 2. District Right of Access
 - 3. Underground Utilities Indicated
 - 4. Underground Utilities not Indicated
 - 5. Approval of Repairs
 - 6. Maintain in Service
- D. Temporary Field Office and Storage Facility
- E. Vehicular Access
- F. Parking
- G. Progress Cleaning and Waste Removal
- H. Barriers
- I. Security
- J. Construction Water
- K. Removal of utilities, facilities, and controls

1.02 RELATED SECTIONS

- A. Section 01 33 00 – Submittal Procedures

1.03 MEASUREMENT AND PAYMENT

- A. Refer to Section 01 15 00 Measurement and Payment.

1.04 SUBMITTAL REQUIREMENTS

- A. Section 01 33 00 - Submittal Procedures

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1. Construction Water

- a. Within five (5) working days of Preconstruction Meeting, Contractor shall prepare and submit a written statement of construction water source.

1.05 PUBLIC UTILITIES

A. Agencies Affected

- 1. Electrical: Pacific Gas & Electric. Underground electrical service may be within the project area. It should be noted that where a structure is known to receive service does not have overhead service then underground service shall be assumed to exist
- 2. Gas: Pacific Gas & Electric. Underground gas mains may be within the project area. It should be noted that where a structure is known to receive service does not have overhead service then underground service shall be assumed to exist
- 3. Telephone/Cable Service: AT&T and Suddenlink. Communication lines and conduits may be located in the project area. It should be noted that where service to a structure is known to receive service does not have overhead service then underground service shall be assumed to exist.
- 4. Potable Water Service: Known water mains are identified on the plans. City has jurisdiction over potable water usage within the project area.
- 5. Sanitary Sewer Service: Sanitary sewer service is known to exist in the project area. The City has jurisdiction over sanitary sewer usage within the project area.
- 6. Drainage: Drainage features to be modified are identified on the plans. The City has jurisdiction over drainage within the project area.

B. Notification Requirements

- 1. Prior to any excavation in the vicinity of any existing underground facilities, including all water, sewer, storm drain, gas or other pipelines; all buried electric power, communications, or television cables; all traffic signal and street lighting facilities; and all roadway improvements; the Contractor shall notify the respective authorities representing the owners or agencies responsible for such facilities not less than three (3) work days nor more than seven (7) work days prior to excavation.
- 2. Notify USA at (800) 227-2600 at least three (3) work days, but no more than fourteen (14) work days, prior to such excavation.

C. Contractor Responsibility

- 1. The Contractor shall anticipate encountering water, gas, electrical, communication, drainage and telephone/cable services. It may be expected that there will be variation in location from that as shown on the Plans to the actual location. Contractor is responsible for verifying actual location in the field after pre-marking by the various utilities affected.
- 2. No extra payment will be allowed for the removal, replacement, repair, or possible increased cost caused by inadvertent or planned interception and breaking of underground obstructions which may exist.

3. It should be understood that the various utilities are indicated on the Plans to show only the approximate location and location of previous potholing, and must be verified in the field by the Contractor. The various utility agencies will cooperate with the Contractor to endeavor to familiarize him with all known underground utilities obstructions, but this will not relieve the Contractor from full responsibility in anticipating and locating their actual location.
4. The Contractor, in conjunction with the affected utility company(s), shall pothole and establish the horizontal and vertical locations of all utilities shown on the Plans and marked in the field. This may be done on an area-by-area basis, but shall be accomplished at least five working days in advance of the date of construction within such area. Any discrepancies (horizontal and/or vertical) between the locations of utilities found by the potholing operation than that shown on the Plans shall be brought to the Construction Manager's attention immediately. Potholing shall be required at the connection to existing facilities prior to the shop drawing submittals.

1.06 TEMPORARY UTILITIES

A. Temporary Electricity

1. PG&E supplied temporary electricity is not currently available. Contractor may coordinate a temporary power supply from PG&E. Alternate options may include adjacent properties, however use of power supply from adjacent properties is the contractor's responsibility to coordinate.
2. Contractor shall provide such temporary electrical facilities as necessary for Work, to supply temporary power for water diversion pumps, temporary lighting for work operations and temporary power for portable power driven tools. Contractor will pay cost of energy used and is responsible for all necessary permits, permissions, code and regulatory compliance associated with such use.
3. Before temporary electrical facilities are installed either by utility company or Contractor, the exact location of such facilities shall be approved by the Construction Manager. It is essential that Contractor located facilities so as not to interfere with construction equipment, materials handling or storage, traffic areas, later project construction or site development, other contracts, or subsequent work.

B. Temporary Sanitary Facilities

1. Contractor to provide and maintain required facilities and enclosures sufficient to accommodate Contractor and Subcontractor personnel at locations easily accessible from work. Provide facilities at time of project mobilization and at location approved by the Construction Manager.
2. Contractor is responsible for cleaning, maintenance, security, placement and removal of facilities.

1.07 EXISTING UTILITIES AND IMPROVEMENTS

A. General

1. The Contractor shall protect all underground utilities and other improvements that may be impaired during construction operations. It shall be the Contractor's responsibility to ascertain the actual location of all existing utilities and other improvements that will be encountered in its construction operations, and to see that such utilities or other improvements are adequately protected from damage due to such operations. The Contractor shall take all possible precautions for the protection of unforeseen utility lines to provide for uninterrupted service and to provide such special protection as may be necessary.
2. In case it shall be necessary to move the property of any public utility or franchise holder, such utility company or franchise holder will, upon request of the Contractor, be notified by the City to move such property. Time of relocation of the utility by the utility company is not a responsibility of the City. When utility lines that are to be removed are encountered within the area of operations, the Contractor shall notify the Construction Manager a sufficient time in advance for the necessary measures to be taken to prevent interruption of service.
3. Where the proper completion of the Work requires the temporary or permanent removal and/or relocation of an existing utility or other improvement that is indicated, the Contractor shall remove and, without unnecessary delay, temporarily replace or relocate such utility or improvement in a manner satisfactory to the Construction Manager and the City. In all cases of such temporary removal or relocation, restoration to former location shall be accomplished by the Contractor in a manner that will restore or replace the utility or improvement as nearly as possible to its former location and to equal or better condition as found prior to removal.

B. Right of Access

1. The right is reserved to the City, regulatory agencies, private property owners to enter at any time upon any public street, alley, right-of-way, or easement for the purpose of making changes in their property when necessary during the performance of the Work of this Contract.

C. Underground Utilities Indicated

1. Existing utility lines that are indicated or the locations of which are made known to the Contractor prior to excavation and that are to be retained, and all utility lines that are constructed during excavation operations shall be protected from damage during excavation and backfilling, and if damaged, shall be immediately repaired or replaced by the Contractor.

D. Underground Utilities not indicated

1. In the event that the Contractor damages any existing utility lines that are not indicated or the locations of which are not made known to the Contractor prior to excavation, a written report there-of shall be made by the Contractor to the City.
2. All costs of locating, repairing damage not due to failure of the Contractor to exercise reasonable care, and removing or relocating such utility facilities not shown in the

Contract documents with reasonable accuracy, and for equipment on the project which was actually working on that portion of the Work which was interrupted or idled during such Work will be paid for as extra Work.

E. Approval of Repairs

1. All repairs to a damaged utility or improvement are subject to inspection and approval by an authorized representative of the utility or improvement Owner before being concealed by backfill or other Work. Contractor to schedule with Owner for the inspection and shall notify the Construction Manager of the schedule and place of the inspection a minimum of three (3) calendar days prior to inspection.

F. Maintain In Service

1. All power and telephone or the communication cable ducts, gas and water mains, sewer lines, storm drain lines, poles, and overhead power and communication wires and cables encountered along the corridor of Work shall remain continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the Construction Manager are made with the Owner of said pipelines, duct, main, sewer, storm drain, pole, or wire or cable. The Contractor shall be responsible for and shall repair all damage due to its operations, and the provisions of this section shall not be abated even in the event such damage occurs after backfilling or is not discovered until after completion of the backfilling.

1.08 TEMPORARY FIELD OFFICE AND STORAGE FACILITY

- A. Jobsite trailers, offices, additional parking, fuel storage and small equipment storage maybe located within staging area or area subject to the approval of the Construction Manager.

1.09 VEHICULAR ACCESS

- A. At all times Contractor shall provide unimpeded access to all adjacent commercial properties and residences.
- B. Provide means of removing mud from vehicle wheels before entering streets.
- C. Use existing on-site roads for construction traffic and temporary haul routes as shown on the plans.
- D. Reasonable precautions shall be taken to prevent the entry of unauthorized vehicles into the corridor and application areas during non-work hours.

1.10 PARKING

- A. Arrange for temporary surface parking areas in staging/stockpiling areas to accommodate construction personnel.
- B. Use of existing on-site driveways used for construction traffic is NOT permitted, unless authorized by the Construction Manager.
- C. Tracked vehicles not allowed on paved areas.
- D. Maintenance

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1. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, and mud.
 2. Maintain existing areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain surface course and drainage in original, or specified, condition.
- E. Removal, Repair
1. Remove temporary materials and construction at Substantial Completion.
 2. Repair existing facilities damaged by use, to original condition.
- 1.11 PROGRESS CLEANING AND WASTE REMOVAL
- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in clean and orderly condition.
 - B. Collect and remove waste materials, debris, and rubbish from site weekly and dispose off-site.
- 1.12 SIGNS
- A. At all times during construction, Contractor shall install and maintain precautionary signage or fencing of the project area in order to provide adequate warning notices of the potential safety hazards associated with project construction.
- 1.13 BARRIERS
- A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations. Access to private property shall not be restricted or denied at any time.
- 1.14 SECURITY
- A. Security Program
 1. Protect Work, existing premises and operations from theft, vandalism, and unauthorized entry.
 2. Initiate program in cooperation with existing property owners.
 3. Maintain program throughout construction period until City acceptance precludes need for Contractor security.
 - B. Entry Control
 1. Restrict entrance of unauthorized persons and vehicles into active construction area.
 2. The City will control entrance of persons and vehicles related to City operations.

1.15 CONSTRUCTION WATER

- A. The City has identified the following potential water sources for use during construction. Additional sources may be available and subject to review and approval by the Construction Manager. The Contractor shall make arrangements for water required for construction, and furnish all necessary equipment, labor, materials and owner compensation as needed. All water sources, including those listed below shall be approved by the Construction Manager prior to use. Clear water diverted from any surface water tributaries shall not be used for construction purposes and shall be bypassed to Harlan Way drainage channel downstream of construction activities.

Optional Sources		Contact (Owner)	Available Volume	Notes
1	Nuisance water encountered during excavation	NA	Undefined	Water withdrawal shall comply with project permits
2	City Potable Water System	City	As needed for project use	Contractor may draw water at no charge at a hydrant location approved by the City and the City will provide a meter for tracking water usage.
3	Other unidentified sources	TBD	TBD	To be approved by Construction Manager

1.16 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION

3.01 HOUSEKEEPING

- A. The Contractor shall keep project site neat, orderly, and in a safe condition at all times.
- B. The Contractor shall provide enough containers for collecting construction debris and construction materials to be recycled.
- C. The Contractor shall cover or wet down dry materials and rubbish when necessary to prevent blowing dust.
- D. The Contractor shall keep volatile wastes in covered containers.
- E. The Contractor shall use excavated material as soon as possible.
- F. The Contractor shall place construction debris in refuse containers at least daily.

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- G. The Contractor shall contain stockpiled soil/material in a neat and orderly fashion and prevent from eroding or migrating into any water bodies. The Contractor shall use silt fencing or similar, if necessary.
- H. The Contractor shall keep all construction equipment and construction materials, including stock-piles, out of road-side drainages.

END OF SECTION 01 50 00

SECTION 01 55 50

TEMPORARY TRAFFIC CONTROL SYSTEMS

PART 1 GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall provide all materials, equipment, and labor necessary to furnish, place, and maintain all temporary traffic control systems, including construction and maintenance area traffic control devices and flaggers as required to perform the Work in accordance with this Section, and all other appurtenant Work, complete in place, as shown on the Contract Drawings and as specified herein.
- B. The contractor is responsible for obtaining all traffic permits related to the delivery and hauling of construction equipment and materials, and traffic control measures and devices. The contractor must follow all pertinent state and local requirements for transporting large vehicles and equipment to the project site.
- C. The contractor is responsible for temporary placement, maintenance and removal of temporary traffic control devices and signs for the approved traffic management plan. If signs are to be placed on private property, the contractor shall receive permission from the construction manager and property owner prior to placement.
- D. Work Specified in this Section
 - 1. Review of proposed Work areas to determine temporary traffic control requirements.
 - 2. Submittal and verification of temporary traffic controls with the City and Construction Manager prior to implementation.
 - 3. Maintenance of traffic control during the Work.
 - 4. Monitoring traffic control during the Work to determine necessary changes required to maintain adequacy.
 - 5. Maintenance of traffic control during non-work hours to maintain adequacy.
 - 6. Removal of temporary traffic control systems after completion of the Work.

1.02 MEASUREMENT AND PAYMENT

- A. Refer to Section 01 15 00 Measurement and Payment.

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. State of California, Department of Transportation (Caltrans) Specifications and Standards
 - 1. Standard Specifications
 - a. Section 7 Legal Relations and Responsibility
 - b. Section 12 Construction Area Traffic Control Devices

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2. California Manual on Uniform Traffic Control Devices, Current Edition (California MUTCD)
- B. Commercial Standards
1. State of California, Division of Industrial Safety, Department of Industrial Relations.
 2. Safety Orders of the Division of Industrial Safety, Department of Industrial Relations of the State of California, current edition.

1.04 SUBMITTALS

- A. In addition to the submittal requirements of Section 01 33 00 "Submittal Procedures," the Contractor shall provide the following at least ten (10) working days prior to any work in or on public roadways or private right-of-ways and shall meet with the approval of the Construction Manager:
1. Prior to receiving a notice to proceed, the contractor shall provide a Temporary Traffic Management Plan for review and approval by the Construction Manager and the City. The Temporary Traffic Management Plan shall conform to the provisions on the plans, these specifications, the City encroachment permit provisions and shall be a living document, subject to modification and updated as project conditions change. If changes are made to the traffic plan, Contractor shall submit and allow 10 working days for plan review and approval by the construction manager and the City. The traffic plan shall be specific to the proposed activities that will occur on the existing roads:
 - a. Traffic plan shall be developed and implemented in accordance to the latest edition of the California manual on uniform traffic control devices (MUTCD) and all other pertinent state and local requirements. The traffic plan shall include, but is not limited to, the proposed average daily traffic (ADT), duration of work, haul routes, sign placement, and frequency of on-site meetings to be performed to review and update the traffic plan.
 - b. Locations of all encroachments and excavations associated with temporary traffic controls.
 - c. Plans for protection of the public from construction-related hazards.
 - d. Lane closures and traffic routing including consideration of construction-related trucking routes.
 - e. Lane closure markings, barricade locations, and sign locations showing the necessary signing, methods of delineation and channelization and reference to the appropriate Caltrans standards and California MUTCD details for all affected roads.
 - f. Dimensions of lanes affected by traffic control that will be open to traffic.
 - g. Dimensions and locations of signs and cone tapers.
 - h. Identification of side streets and driveways affected by construction and show how they will be handled.

- i. Time periods of lane closures and detours.
2. No work except for installation of project identification signs will be allowed to commence prior to approval of the Traffic Plan.
3. A "Letter of Responsibility," on company letterhead, indicating the names and telephone numbers of at least three different persons who shall be available to be contacted in case of emergency at any time during the life of the contract. Said persons must have decision-making authority within the company.

PART 2 PRODUCTS

2.01 GENERAL

- A. All construction area stationary and portable sign panels, lights, barricades, and traffic control devices shall be the product of a commercial sign or safety device manufacturer conforming to the requirements of Section 12, "Construction Area Traffic Control Devices," of the Caltrans Standard Specifications, unless otherwise specified in this Section, shown on the Drawings, and/or as directed by the Construction Manager.

PART 3 EXECUTION

3.01 GENERAL

- A. No work shall commence until traffic control signing has been approved by the Construction Manager and the encroachment permit issued by the County.
- B. The Contractor shall take all necessary precautions for the protection of the Work and the safety of its employees and the public. Traffic shall be maintained through the construction or maintenance zone in accordance with Sections 7-1.08, 7-1.09 and 12 of the Caltrans Standard Specifications and Sections 01 11 00 "Summary of Work."
- C. Field changes to traffic control plans shall be approved by the Construction Manager and City prior to installation.
- D. The Contractor shall provide all appropriate traffic control measures in accordance with this Section prior to start of construction in the public right-of-way or in any area adjacent to the street right-of-way where public safety is affected.
- E. All construction area signs, lights, barricades, and traffic control devices shall be furnished, installed, maintained, and removed in conformance with the latest edition of the California MUTCD. Additional or alternate signs may only be used when specifically authorized by the Construction Manager.
- F. The Contractor shall monitor traffic and safety conditions and maintain adequate traffic control measures during both work and non-work hours in order to maintain compliance with the requirements of this Section.
- G. If a hazardous condition is observed and the Construction Manager notifies the Contractor either directly or by telephone, the Contractor shall correct the condition immediately. If the Contractor fails to correct the hazardous condition immediately, the City reserves the right to call in a local contractor to perform the necessary work needed to improve public safety. The cost incurred shall be billed to the Contractor. Should the Construction Manager point out any inadequacy of warning and protective measures, such action on the part of the Construction

Manager shall not relieve the Contractor from responsibility for public safety nor abrogate his obligation to furnish and pay for these devices.

- H. All construction area signs, lights, barricades, and temporary traffic control devices shall be completely removed from the roadway when not in use. Locations and methods of storing traffic control equipment adjacent to the roadway between interrupted use shall require prior approval of the Construction Manager.
- I. Unless noted otherwise on the plans, the Contractor shall completely remove all temporary signs, striping and/or delineators and restore the pavement, as necessary, upon removal or relocation of any temporary traffic controls or detours constructed as part of the Work.
- J. Temporary traffic control measures shall be in effect only during work hours. Normal traffic routing shall be reestablished at the end of each workday.
- K. Contractor shall conduct his operation as to offer the least possible obstruction and inconvenience to the public, and he shall have under construction no greater amount of work than he can prosecute properly with due respect to the rights of the public. Contractor shall provide personal advance notice to each affected resident or business informing him of impending work and provide ample time to remove vehicles and estimated time of driveway closure. This shall be accomplished by delivering a notice to all houses or businesses to be affected by the impending work. The notice shall be typed and signed by the contractor or his designated superintendent. The format and contents of the notice shall be approved by the Construction Manager prior to commencement of the Work.
- L. Construction operations shall be conducted in such a manner as to cause as little inconvenience as possible to abutting property owners. Convenient access to driveways, houses, and buildings along the line of the work shall be maintained, and temporary approaches to crossings or intersecting roads shall be provided and kept in good condition.
- M. Whenever the Contractor's operations create a condition hazardous to the public, furnish, erect, and maintain such fences, barricades, lights, signs and other devices as are necessary to prevent accidents or damage or injury to the public.
- N. Should the Contractor appear to be neglectful or negligent in furnishing warning and protective measures as above specified, the Construction Manager may direct attention to the existence of hazard, and the necessary warning and protective measures shall be furnished and installed by the Contractor at his expense, without cost to the Owner. Should the Construction Manager point out any inadequacy of warning and protective measures, such action on the part of the Construction Manager shall not relieve the Contractor from responsibility for public safety nor abrogate his obligation to furnish and pay for these devices.
- O. Under no circumstances shall access to businesses or residences be held up more than fifteen (15) minutes at any one time, unless noted otherwise on the plans or in the specifications. The Contractor may coordinate with property and business owners to schedule work so that longer delays do not adversely affect residents or business owners to their satisfaction. In addition, Contractor shall give personal notice to all affected property owners as specified in paragraph K, hereinbefore. Before closing any street to through traffic, Contractor shall obtain prior approval from the Construction Manager seven (7) calendar days in advance of closure. Contractor shall at all times provide access to public facilities such as schools, etc. and make provisions for passage of emergency vehicles.
- P. The Contractor shall keep the Fortuna Fire Department informed regarding the closure of any traveled way. At a minimum, the Contractor shall call the Fortuna Fire Department, daily to

report any traveled way closure. This requirement applies immediately upon closure for that day and again immediately after removal of the closure. For closures over multiple days, the daily notification still applies. This requirement does not apply for single lane closures on multiple lane local streets.

3.02 USE OF CITY RIGHT OF WAY, PUBLIC AND PRIVATE ROADS

- A. Anticipated site ingress/egress have been shown on the plans. If the Contractor desires an alternative ingress/egress not shown on the plans, the Contractor shall become familiar with the proposed ingress/egress and submit request to the Construction Manager. All alternative ingress/egress not shown on the plans shall be pre-approved by the Construction Manager and included in the Traffic Management Plan submittal provided by the Contractor.
- B. The contractor will be responsible for repair of any damage to City/private roads, pathways or parking areas resulting from the construction and hauling activities. The post-project road, pathway or parking area conditions shall meet or exceed pre-project conditions and, if necessary, be repaired by the Contractor to the satisfaction of the Construction Manager at contractor's expense. The Construction Manager will photo document the roads prior to commencement.
- C. Site visibility must be maintained at the construction entrances in conformance with City code.
- D. Temporary lane closure traffic control to be consistent with the current edition of Caltrans manual of traffic controls and in conformance with the project specifications.
- E. Trucks leaving the project area shall have tires free of sediment to prevent/minimize sediment from being tracked onto public roadways.
- F. All public roads and bridges impacted by the construction activities shall be cleared of all soil and debris on a daily basis or as directed by the Construction Manager.
- G. All active construction areas and access paths/roads shall be watered at a rate sufficient to keep soil moist and prevent wind-blown dust.
- H. All trucks hauling soil, sand, and other loose materials shall be covered, or all trucks shall be required to maintain adequate freeboard, or shall have adequate moisture content to prevent dust, or utilize some other methods that prevents generation of fugitive dust.
- I. Contractor shall maintain access for local vehicular and pedestrian traffic to private properties and businesses at all times.
- J. Closure of more than two travel lanes on Fortuna Boulevard will not be permitted. A minimum of one north bound and one south bound travel lane must be provided at all times.
- K. Closure of the two northbound lanes at the same time, is limited to 14 calendar days. Closure of the two southbound lanes at the same time, is limited to 14 calendar days. Example two lane closures are shown on the Traffic Control Plan Sheet G-006.

END OF SECTION 01 55 50

SECTION 01 57 00

ENVIRONMENTAL REQUIREMENTS AND WATER MANAGEMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Water Management (Clear Water Diversion and Dewatering)
- B. Permit Compliance
- C. Spill Prevention
- D. Dust Control
- E. Tire Tracking Prevention
- F. Related Sections
 - 1. Section 01 33 00 – Submittal Procedures
 - 2. Appendix A – Permit Conditions

1.02 MEASUREMENT AND PAYMENT

- A. Refer to Section 01 15 00 Measurement and Payment.

1.03 SUBMITTAL REQUIREMENTS

- A. Section 01 33 00 – Submittal Procedures
- B. Water Management Plan

The Contractor shall submit a Water Management Plan within five (5) working days following the Preconstruction Meeting. The Plan shall describe, in detail, the Contractor's approach to control water during construction activities. The Plan shall cover both clear water diversion and dewatering, which should be described separately.

- 1. Clear Water Diversion
 - a. Harlan Way drainage channel is an intermittent stream that does not convey base flow during dry months. All work shall be performed when surface water is no longer present and therefore clear water diversion is not required.
- 2. Dewatering
 - a. Shallow groundwater may exist beneath the project site. The Contractor shall anticipate encountering groundwater during excavation activities. This water, and other water that enters the construction area is referred to as nuisance water and is not permitted to be discharged downstream. The Contractor must manage nuisance water in order to conduct construction activities and comply with project permits.

- b. The Contractor shall be responsible for final design, installation, maintenance and removal of all dewatering systems.
 - c. The Contractor is required to meet the surface water discharge limit requirements listed below and outlined by the Regional Water Quality Control Board (forthcoming). The Construction Manager will conduct sampling downstream of the discharge location to monitor compliance.
 - d. The Contractor is required to dewater construction areas to provide for proper excavation and filling. Although dewatering methods are left to the discretion of the Contractor, the Dewatering Plan needs to be approved by the Construction Manager prior to beginning and construction work. Water pumped from typical channel excavations is likely to contain suspended sediments or other materials, and may not be discharged directly to surface waters. Sediment controls shall be provided to remove sediments generated during the dewatering activities, pumped water shall be discharged in conformance with all applicable laws and permit requirements.
 - e. Potential Dewatering discharge areas include:
 - Any surface water within the Harlan Way drainage channel shall be identified and brought to the attention of the construction manager or City.
 - Groundwater/nuisance water encountered during channel excavation may be spray dispersed and infiltrated within pervious areas of the project site, open graded areas, access roads and application areas for dust suppression where discharge waters will not impede any construction activities and subject to approval by the Construction Manager.
 - f. Because dewatering may occur in areas that have special status species, the Contractor will need to work with the Construction Manager and Aquatic Biologist to develop dewatering plan approaches that will allow appropriate time for surveys and relocation efforts or to develop alternatives for dewatering that would reduce the amount of "take" of a special status species.
 - g. The Water Management Plan shall include, but not be limited to, the methods used, schedule of operation, description of equipment such as sump pumps, baker tanks or other forms of conveyance and storage and/or filtration equipment to be used for groundwater pumping and treatment, discharge location and erosion control measures.
- C. Spill Prevention and Response Plan
1. Prior to beginning of work and within five (5) working days after date of the Preconstruction Meeting, the Contractor shall prepare and submit for approval by the Construction Manager, a Spill Prevention and Response Plan to regulate the use of hazardous and toxic materials, such as fuels and lubricants for construction equipment. The Construction Manager will review, approve, and oversee implementation of the Spill Prevention and Response Plan.
 2. The Contractor's Spill Prevention and Response Plan must include: 1) spill cleanup procedures; 2) worker training; and 3) impact avoidance measures.

3. As part of the Plan, the Contractor shall indicate fueling areas for equipment and shall be a minimum of 100 feet away from waters.

D. Tire Tracking Control Plan

1. Prior to beginning of work and within five (5) working days after date of the Preconstruction Meeting, the Contractor shall provide a Tire Tracking Control Plan for all trucks and construction equipment, which enter and leave the construction site during the project. Prior to any construction activities, the Contractor shall prepare and submit to the Construction Manager for review and approval.
2. The Contractor shall provide means of removing sand, mud, vegetation, rhizomes/roots, and seeds from vehicle wheels and under carriage before entering and exiting the construction site onto City or private roadways through installation of stable rock construction entrances, steel grates, tire cleaning stations and routine street sweeping/vacuuming and as necessary to maintain the roads free of sediment.
3. Roads utilized as part of the project shall be monitored by the Contractor on a daily basis for sediment tracking and other materials due to construction activities, and swept in a timely manner, as needed to prevent suspension of material which has a tendency to become airborne, or that could wash off into waterways. Roads shall be left clean at the end of each working day; cleaning operations shall not create water runoff or dust.
4. The plan shall include the location, size, maintenance and removal of such controls and designated monitoring periods and personnel to minimize sediment tracking onto roads.

E. Dust Prevention Plan

1. Within five working days following Preconstruction Meeting the Contractor shall provide a Dust Prevention Plan for all construction activities that have the potential to generate visible dust. Activities including, but not limited to grubbing, stripping, excavation, hauling, travel on gravel roads, and sediment placement on application areas. Prior to any construction activities, the Contractor shall prepare and submit to the Construction Manager for review and approval.
2. At a minimum the submittal shall include the water source(s), proposed spray/application methods, frequency of watering, location, possible tarping of haul trucks, designated monitoring periods and personnel to prevent visible dust in accordance to these specifications and project permits.

1.04 GENERAL PROJECT-WIDE MEASURES

- A. Contractor shall comply with all provisions of any additional federal, state and local permits necessary to complete the project. Contractor will maintain a copy of all permits at the Project site at all times.
- B. The City has been issued project permits from multiple regulatory agencies including but not limited to:

1. North Coast Regional Water Quality Control Board 401 Water Quality Certification,
Specifications 01 57 00-3 Environmental Requirements and
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2. California Department of Fish and Wildlife Streambed Alteration Agreement,
 3. National Marine Fisheries Service's Biological Opinion,
 4. U.S. Army Corps 404 Permit, and
 5. Final CEQA Mitigated Negative Declaration (MND)
- C. In accordance with the Code of Federal Regulations (CFR), Title 44, Part 10, Section 8(d)(2)(xvi), and in compliance with National Environmental Policy Act (NEPA), the project is Categorically Excluded from the need to prepare either an Environmental Impact Statement or Environmental Assessment, with conditions.
- D. The Contractor, Contractor's staff and Contractor's subcontractors shall be fully informed of the requirements of these permits and environmental regulatory documents as well as rules, regulations, and conditions that may govern the Contractor's operations in the project area and shall conduct the work accordingly. The Contractor shall comply with all project permit and environmental regulatory document requirements. The project permits and environmental regulatory documents have been included in the contract documents. For the Contractor's convenience a summary of relevant conditions have been tabulated in Appendix A. The Contractor is responsible to conduct the work in accordance with all project permits and environmental documents. Work windows specified in the various project permit conditions may conflict within one another, therefore the most restrictive windows shall be exercised and as shown in the schedule on the plans.
- E. The Contractor is responsible for securing all required County and California Department of Transportation permits for transporting equipment and materials to and from the project site.
- F. The Contractor shall comply with all other permit conditions, including construction windows, restrictions on work approach related to special status species and archaeologically significant resource areas, buffer zones related to special status species, pre-construction and construction clearance surveys, daily site clearances, and construction monitoring.
- G. All personnel working on site will be required to participate in a short briefing by Construction Manager and qualified biologist about the 1) presence of federally and state-listed bird, fish, amphibian, reptile, mammalian, and plant species at the site, 2) avoidance areas; 3) construction windows and effects on sequencing of work; 4) buffers between construction activities and breeding/nesting areas; and 5) pre-construction and construction clearance surveys and construction monitoring requirements prior to initiating and continuing work in construction work areas, including the potential necessity for trapping or seining and relocation; 6) Need to halt work if potential special status species located by Contractor or representative and notify Construction Manager before proceeding with work; 7) Requirements for minimizing other environmental impacts, including noise, traffic, etc.; and 8) The possible presence of archaeological or cultural resources and need to halt work if suspected archaeological or historic resources are found and notify the Construction Manager before proceeding with work.
- H. Procedures regarding Encountering Human Remains. Human remains may be encountered, given the reported presence of prehistoric sites in the vicinity. If human graves or remains are encountered, the following measures shall be implemented:
1. The Contractor will halt the work in the vicinity

1. The County Coroner will be notified. At the same time, a qualified archaeologist will be contacted to evaluate the situation.
 2. The Construction Manager will be notified.
 3. If human remains are of Native American origin, the Coroner will notify the Native American Heritage Commission within 24 hours of identification (916) 653 – 4082
- I. Procedures regarding Archeological and Cultural Sensitive Resources: Surface surveys have not detected cultural materials within the limits of planned excavation. However if any items of potential cultural or archeological significance are encountered during excavation operations, construction within this area shall be halted immediately, and the Contractor shall notify the archeologist/Construction Manager. The Contractor is advised that if any archaeological findings are discovered during construction that the monitor or archaeologist has the authority to slow or stop construction activities as they deem necessary.
- J. Hazardous Materials
1. Work Cessation in the Event Suspected Hazardous Materials are Encountered. Project construction Contractors shall stop all work in the area of any suspected soil or groundwater contamination, or any unearthing of storage drums or other potential sources of hazardous materials/wastes. The Contractor shall then comply with relevant sections of the General Conditions.
- K. Avoidance of Impacts to Nesting Birds:
1. Nesting bird clearance surveys will be conducted by the biologist prior to any site disturbance between February 15th and August 15th. All construction related disturbance will not occur until area is cleared of nesting birds and contractor shall not claim delay.
 2. If surveys identify active nests, the Contractor shall cooperate with the Construction Manager and the appropriate exclusion zones are implemented around the nests and maintained until nesting has completed.
 3. Scheduling of required clearance surveys: At the start of construction, the contractor will be required to provide an updated construction schedule. On a weekly basis, the contractor, Construction Manager, and biologist will meet and discuss the status of the project and updates to schedules. Clearance surveys will be scheduled with the basis of this revised weekly schedule. The contractor will not be allowed to start construction until all the approved clearance surveys have been performed. It is the responsibility of the contractor to provide the biologist an updated schedule that allows for adequate time to schedule the clearance surveys required.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION

3.01 DEWATERING

- A. Dewatering locations must be approved by the Construction Manager or located in accordance to the Dewatering Plan. Dewatering locations should be established consisting of a large screened drum, container, or similar structure that prohibits fish and vegetation from being entrained in the diversion pipe/hose. The screening size and mechanism shall be approved

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by the Construction Manager and the aquatic biologist prior to installation and use. Screens at the suction end of all dewatering pump intakes are required to be equipped with a maximum screen size of 1/16-inch opening mesh screen or size meeting CDFW and NOAA criteria, whichever is smaller. Screens shall be regularly checked and cleaned of debris to permit free flow of water. All work areas to be dewatered shall be cleared by the aquatic biologist prior to installation of ditch diversion station structures/equipment. The Contractor is not allowed to make modifications to the ditch bank or bed during installation and use of the ditch water diversion stations without prior authorization from Construction Manager. Contractor shall provide the necessary pumps to extract water from ditches to water trucks.

- B. Measures to reduce potential impacts, such as screening pump intake areas, will be maintained by Contractor on a daily basis to ensure proper operation. Dewatering shall continue throughout excavation activities. The Contractor shall coordinate with the Construction Manager prior to initiating dewatering activities so the site can undergo any necessary environmental clearance.
- C. Temporary dewatering structures and activities are anticipated over the life of the construction project. Any areas affected by dewatering structures/activities will be returned to pre-project condition by Contractor as part of project close-out.
- D. Contractor shall design pump intakes and outlets to minimize turbidity and the potential to wash contaminants into adjacent creeks or wetlands.
- E. A dewatering structure should be sized to allow water to flow through any outlet filtering media without overflowing the structure. An energy dissipater may be needed to prevent erosion at the outlet.
- F. Any turbid water pumped by Contractor from the work site itself, to maintain it in a dewatered state, shall be disposed of in an approved location, water truck, sediment settling tank, or equivalent, where it will not drain directly into any stream channel. The turbidity control methods need to be approved by the Construction Manager prior to implementation.
- G. During excavation, in lieu of excavating in the wet, the Contractor may want to dewater portions of the channel, generating turbid water. One potential dewatering approach is to direct turbid water via a detention and sediment control system in a downstream direction. The turbidity conveyance system needs to be sized to promote low velocity flow, the settling of solids, and stay confined to the boundaries of the Harlan Way drainage channel. Water may be discharged into the receiving water if the NCRWQCB 401 regulations are not exceeded.
- H. The Contractor shall refuel pumps in areas a minimum of 100-feet away from waters and where approved by the Construction Manager. The Contractor shall place fuel absorbent mats or other approved containment methods under pumps at all times.
- I. Once construction is completed, the dewatering facilities are to be removed by the Contractor.

3.02 AIR QUALITY AND DUST CONTROL

- A. The Contractor shall adhere to all project permits and shall utilize BMPs to minimize fugitive dust generation and assure compliance with North Coast Unified Air Quality Management District Rule 104 Section 4.0 regarding the control of fugitive dust.
- B. Unimproved access or unpaved haul roads, material stock piles, excavated and graded areas, and areas of exposed soil on the construction site shall be sprinkled with water or otherwise

treated to fully suppress dust when and where dust becomes a problem. Sources of water for dust control are provided above.

- C. At the discretion of the Construction Manager, grading and construction may be prohibited during periods of high winds (>15 mph), which have the potential to result in the generation of windblown dust and sediment not reasonably controllable with standard watering techniques.
- D. When not in use or unattended, construction equipment and vehicles will be shut down, locked up, and not left idling.
- E. Equipment and vehicles shall also be tuned and maintained in accordance with manufactures' specifications to avoid excessive emissions.
- F. All equipment shall operate with factory-equipped mufflers.
- G. Water active earthwork areas and staging areas as needed for dust control. All active construction areas and sediment application areas shall be watered at a rate sufficient to keep soil moist and prevent formation of wind-blown dust.
- H. Exposed stockpiles of dirt, sand, and similar material shall be enclosed, covered, and/or watered daily, or treated with approved non-toxic soil binders as necessary to prevent generation of fugitive dust.
- I. Contractor shall use water trucks or spray from hoses to control dust created by outdoor work operations during entire period of the Contract as directed by Construction Manager and stipulated in Specifications; Contractor shall satisfactorily control dust created by operations to the satisfaction of the Construction Manager.

END OF SECTION 01 57 00

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Products.
- B. Product delivery requirements.
- C. Product storage and handling requirements.
- D. Product options.
- E. Product substitution procedures.
- F. Equipment electrical characteristics and components.

1.2 PRODUCTS

- A. Furnish products of qualified manufacturers suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise.
- B. Do not use materials and equipment removed from existing premises, except as specifically permitted by Contract Documents.
- C. Furnish interchangeable components from same manufacturer for components being replaced.
- D. Materials and equipment are to be new.

1.3 PRODUCT DELIVERY REQUIREMENTS

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- D. Arrange deliveries of materials in accordance with construction schedules; coordinate to avoid conflict with work and conditions at the site. Deliver materials in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible. Contractor is encouraged to obtain materials in biodegradable or recyclable/reusable packaging which uses the minimum amount of packaging possible.

1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Store and protect products in accordance with manufacturers' instructions.
- B. Store with seals and labels intact and legible.
- C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- D. For exterior storage of fabricated products, place on sloped supports above ground.
- E. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.5 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions: Submit request for substitution for any manufacturer not named in accordance with the following article.
- D. The Contractor is encouraged to submit for approval products made out of recycled or environmentally responsible materials.

1.6 PRODUCT SUBSTITUTION PROCEDURES

- A. Engineer will consider requests for Substitutions only within 60 calendar days after date established in Notice to Proceed and prior to installation.
- B. Substitutions may be considered when a product becomes unavailable through no fault of Contractor.
- C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

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- D. A request constitutes a representation that Contractor:
 - 1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
 - 2. Will provide same warranty for Substitution as for specified product.
 - 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension which may subsequently become apparent.
 - 5. Will reimburse Owner for review or redesign services associated with re-approval by authorities having jurisdiction.

- E. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals, without separate written request, or when acceptance will require revision to Contract Documents.

- F. Substitution Submittal Procedure:
 - 1. Submit four copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
 - 2. Submit Shop Drawings, Product Data, and certified test results attesting to proposed product equivalence. Burden of proof is on proposer.
 - 3. Engineer will notify Contractor in writing of decision to accept or reject request.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 02 25 00

SHORING AND TRENCH SAFETY

PART 1 GENERAL

1.01. SUMMARY OF SECTION

- A. Principle items specified herein are:
 - 1. Shoring required for general safety, worker protection and protection of adjacent property from the hazards of caving ground.
 - 2. Trench excavations
 - 3. Structural excavations

1.02. MEASUREMENT AND PAYMENT

- A. Refer to Section 01 15 00 Measurement and Payment.

1.03. RELATED SECTIONS

Related work specified in other sections:

- A. General Conditions, Section 7.4 – Protection of Work and Property
- B. Section 31 20 00 - Earthwork

1.04. REFERENCED CODES AND SPECIFICATIONS

The following standards apply:

- A. Cal/OSHA, State of California Administrative Code, Title 8; Industrial Relations, Chapter 4, Subchapter 4, Construction Safety Orders.
- B. Occupational Safety and Health Administration (OSHA) Regulations, 29 CFR Part 1926 Subpart P - Excavations.
- C. Where any of these are in conflict, the more stringent requirements shall be adhered to.

1.05. CONTRACTOR'S RESPONSIBILITIES FOR SAFETY

- A. The Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons (including employees) and property during performance of the Work. This requirement shall apply continuously and not be limited to normal working hours.
- B. The duty of the Owner and Construction Manager to conduct construction review of the Contractor's performance is not intended to include a review or approval of the adequacy of the Contractor's safety supervisor, the safety program, or any safety measures taken in, on, or near the construction site.

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- C. The Owner and Construction Manager will review the submittal of the Contractor's proposed shoring system to verify the general scope of the Work, to determine that qualified professional engineering services are used and to determine that appropriate construction techniques are proposed for use. This review shall not in any way be construed to relieve the Contractor from sole responsibility for the design and safety of such shoring.
- D. The Contractor shall appoint a supervisory employee who shall be responsible for determining which of the engineered shoring systems (if alternates are provided) shall be used depending on local soil type, water table, etc.

1.06. PERMIT

- A. For trenches or excavations five feet or more in depth, obtain from the State Division of Industrial Safety a permit for such excavation; submit a copy of the permit to the Engineer, prior to initiating any work requiring said permit.

1.07. SAFETY ORDERS

- A. The Contractor shall have at the work site, copies or suitable extracts of the Construction Safety Orders of Cal-OSHA.
- B. All work shall comply with the provisions of these and all other applicable laws, ordinances and regulations.

1.08. SUBMITTALS

Submit the following in accordance with Section 01 33 00 – Submittal Procedures:

- A. Trench Safety Plan:
 - 1. For trenches or excavations five feet or more in depth, the Contractor shall submit to the Construction Manager a detailed plan design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazards of caving ground and protection of existing facilities and buildings adjacent to or intersecting the trench alignment. The design shall be coordinated with other relevant specification sections. Such plans shall be submitted at least ten (10) working days before the Contractor intends to begin trenching or excavation work. Submittal shall be for trench work and work at vaults, and other cuts 5 feet or more in depth. NOTE: Water table and moisture content will vary with rainfall and cause varying soil strength.
 - 2. Groundwater may be present in trench backfill of existing utilities. Contractor shall design shoring and dewatering systems to mitigate against washout of materials from existing utility trenches. Reconstruction of the structural section of the road will be completed at the Contractor's expense.
 - 3. The trench safety plans shall be prepared, stamped and signed by a civil or structural engineer registered in California. Stamped and sealed copies of calculations necessary to obtain approval of the systems shall be submitted also. These plans shall be available at all times at the job site.
 - 4. Nothing herein shall be deemed to allow the use of a shoring, sloping, or protective system less effective than that required by the Construction Safety Orders of the Division of Industrial Safety.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01. SHORING INSTALLATION

- A. All shoring deflection must be limited to prevent damage to adjacent property.

3.02. REMOVAL OF SHORING

- A. Removal of shoring shall not damage pipe or structures, cause settlement or heave the ground surface, or produce vibrations that could damage adjacent pipe or structures.
- B. Minimum compaction requirements must be met after shoring is removed.

END OF SECTION 02 25 00

SECTION 31 09 16
EXISTING UNDERGROUND STRUCTURES

PART 1 GENERAL

1.01 DESCRIPTION

- A. Related requirements specified elsewhere:
 - 1. See also Plans for location of utilities and underground structures known to exist.

1.02 CALIFORNIA ADMINISTRATIVE CODE

- A. Section 1540(a)1 of Construction Safety Orders (Title 8) California Administrative Code, Section 1540 states:
 - 1. "Prior to opening an excavation, effort shall be made to determine whether underground installations; i.e., sewer, water, fuel, electric lines, etc., will be encountered and, if so, where such underground installations are located. When the excavation approaches the approximate location of such an installation, the exact location shall be determined by careful probing or hand digging; and, when it is uncovered, adequate protection shall be provided for the existing installation. All known owners of underground facilities in the area concerned shall be advised of proposed work at least 48 hours prior to the start of actual excavation."
- B. The Engineer has determined the location of existing underground structures based on information made available by the Owner and potholing. Exact location and completeness are not guaranteed. However, in line with California's Administrative Code, Section 1540, Contractor shall make the effort to determine the exact location of underground installations.

PART 2 PRODUCTION - OWNERS

2.01 UTILITIES AFFECTED

- A. General
 - 1. The Underground Service Alert (USA), (800) 642-2444 or (800) 227-2600, shall be contacted at least 72 hours before any work commences.
- B. Gas and Electric
 - 1. PG&E provides electric service and gas service. It should be noted that where overhead service to a structure known requiring it does not exist, then underground power service shall be assumed to exist.
- C. Water and Sewer Service
 - 1. Water and sewer service is supplied from the City of Fortuna. Site water and sewer are owned and maintained by the City of Fortuna. All known mains are shown on the plans. The Owner's representative may be contacted for details. The contractor may use on site water. The Contractor shall provide temporary sanitary facilities for workers throughout the project.

- D. Communications
 - 1. AT&T provides communication services.

PART 3 EXECUTION

3.01 LOCATION OF UTILITIES

- A. The Owner has attempted to identify all existing locations that he has knowledge of and has shown these on the Plans.

3.02 CONTRACTOR RESPONSIBILITY

- A. It may be expected that there will be some variation in location of existing utilities from that as shown on the Plans. Actual location can best be determined in the field after pre-marking by the various utilities affected. Contractor is required to contact Underground Services Alert (USA) before beginning any excavations.
- B. The Contractor shall be responsible for determining the location of existing service laterals or appurtenances whenever the presence of such utilities on the site of the construction can be inferred from the presence of other visible facilities, such as building, meter and junction boxes, located on or adjacent to the site.
- C. The Contractor shall promptly notify the Owner in writing in the event that the Contractor discovers utility facilities not identified by the Owner in the Contract Plans or Specifications.
- D. It should be understood that the various utilities are indicated on the Plans to show only the approximate location and must be verified in the field by the Contractor. It may be expected that there will be variation in location from that as shown on the Plans to the actual location. Actual location can best be determined in the field after premarking by the various utilities affected. The various utilities will cooperate with the Contractor to endeavor to familiarize the Contractor with all known underground utilities obstructions, but this will not relieve the Contractor from assuming full responsibility in anticipating and locating their actual location with respect to utilities which the Contractor must locate and identify under the provisions hereof.

3.03 PRIOR INVESTIGATION

- A. Prior to bidding, the bidders shall talk to the various utilities affected to secure, for his own information, the knowledge of each utility protection and support measures required.

END OF SECTION

SECTION 31 11 00

CLEARING AND GRUBBING

PART 1 GENERAL

1.01 DESCRIPTION

- A. The work of this section consists of clearing and grubbing.
- B. No clearing or grubbing shall occur outside construction limits of disturbance without prior approval from the Construction Manager and completion of environmental clearance surveys.
- C. Clearing is defined as removing existing vegetation within the limits of grading shown on the plans. All vegetated material generated during clearing shall be hauled off-site to an authorized disposal site or used as directed by the Construction Manager.
- D. Grubbing is defined as removing sticks, brush, stumps, grass, weeds, roots, decayed vegetated matter, and woody debris resting on or protruding through the ground surface and all objectionable woody matter which is embedded in the underlying soil within the limits of grading as shown on the plans. All material generated during grubbing is to be hauled off-site to an authorized disposal site.
- E. Related work described elsewhere:
 - 1. Section 31 20 00 – Earthwork
 - 2. Section 31 10 13 – Demolition, Debris Disposal and Salvage

1.02 MEASUREMENT AND PAYMENT

- A. Refer to Section 01 15 00 Measurement and Payment.

1.03 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures
- B. Disposal Plan – See Section 31 10 13

1.04 QUALITY ASSURANCE

- A. Qualifications of workmen:
 - 1. Provide sufficient skilled workmen and supervisors who shall be present at all times during execution of this portion of the work and shall be thoroughly familiar with the type of construction involved and the materials and techniques specified.

1.05 PRESERVATION OF PROPERTY

- A. Where construction is to be performed in the vicinity of trees and shrubbery, the work shall be carried on in a manner which will cause minimum damage. Under no circumstances are additional trees, outside the limits of grading to be removed without written permission from the Construction Manager. Trees and shrubbery that are not to be removed shall be protected from injury or damage resulting from the Contractor's operations. It shall be the responsibility of the Contractor to alert his staff, his suppliers, and all sub-contractors of the intent of these Specifications pertaining to the protection of vegetation. During the execution of his work, the Contractor shall use the same care and protection of all vegetation within their work area.
- B. In areas where trees or shrubs may be damaged by construction equipment, the Contractor shall provide protective fencing, padding on tree trunks, tie-back branches or take other necessary actions to prevent damage to the trees, shrubs, or other vegetation. Damage to trees and shrubs shall include, but will not be limited to:
 - 1. Bark damage to trees
 - 2. Breakage of branches on trees or shrubs
 - 3. Breaking or tearing of roots
 - 4. Spilling toxic materials near the root zones
 - 5. Spraying toxic materials on foliage
 - 6. Fire damage to foliage and branches
 - 7. Compaction of root areas under the drip line or damage by fill or storage of materials over the root zone
 - 8. Foot or vehicular damage on low shrubs and groundcover
- C. All damage shall be immediately reported to the Construction Manager who will file a report so that penalties may be determined.
- D. If the Contractor inadvertently removes vegetation not designated for removal, the Contractor shall replant at a ratio of 3-to-1 (replanted area-to-removed area) of species, size and location directed by the Construction Manager. The penalty is also applicable to trees damaged to the extent that such damage will, in the Construction Manager's opinion, cause the tree to die.
- E. Contractor shall exercise caution when working near trees not designated to be removed, so that the trees will not be damaged. No root greater than 1 inch in diameter shall be cut unless it is necessary to do so during excavation to reach the specified grade.

1.06 PROJECT CONDITIONS

- A. Environmental requirements:
 - 1. No burning shall be permitted.

2. Contractor shall be responsible for obtaining all necessary permits, approvals and Construction Manager's authorization for disposal of material resulting from clearing and grubbing operations in areas not already specified in the contract documents.

PART 2 PRODUCTS- Not Used

PART 3 EXECUTION

3.01 LAYOUT

- A. The Contractor shall layout the clearing and grubbing limits with lath five (5) working days prior to work, for review and approval by the Construction Manager.
- B. The Construction Manager will review the clearing and grubbing layout and will direct the Contractor to make adjustments to the limits if necessary, prior to approval.

3.02 CLEARING AND GRUBBING

- A. **Within Limits of Grading:** Unless noted otherwise, as shown on the plans and directed by the Construction Manager, all remaining debris including but not limited to fence posts, trees, stumps, large roots, buried logs, decayed vegetable matter, loose above ground logs, and all other objectionable material shall be removed and chipped.
- B. **Between Limits of Grading and Limits of Disturbance:** Unless noted otherwise on the plans, all above ground dead, loose woody debris from previous vegetation clearing may remain within this area. If the Contractor chooses to move the debris in this area for construction access purposes, it shall be subject to prior approval by the Construction Manager and at no additional expense to the City. Any vegetation clearing and/or grubbing within this area is prohibited unless authorized by the Construction Manager.
- C. **Outside Limits of Disturbance:** Any clearing and/or grubbing activities outside the limits of disturbance is prohibited unless authorized by the Construction Manager.
- D. A minimum grubbing depth has not been specified however it is the Contractor's responsibility to achieve the finished grades and compaction requirements shown the plans and described in these specifications. The Contractor shall use experience and current site conditions to determine the required depth and density of grubbed material to meet these requirements.

3.03 REMOVAL AND DISPOSAL OF MATERIAL

- A. All clearing and grubbing material shall be off-hauled and disposed of in a location approved by the Construction Manager and at the Contractors' expense.

END OF SECTION 31 11 00

SECTION 31 20 00

EARTHWORK

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: excavation, trenching, backfilling, compaction, and grading necessary or required for the construction of the work as covered by these Specifications and indicated on the Drawings.

1.02 RELATED SECTIONS:

- A. Section 01 33 00 – Submittal Procedures
- B. Section 01 11 00 – Summary of Work
- C. Section 01 14 19 – Use of Site
- D. Section 31 10 13 –Demolition, Debris Disposal and Salvage
- E. Section 31 11 00 – Clearing and Grubbing
- F. Section 32 92 19 – Seed and Mulch

1.03 MEASUREMENT AND PAYMENT

- A. Refer to Section 01 15 00 Measurement and Payment.

1.04 REFERENCES

- A. California Standard Specifications – current version

1.05 SUBMITTALS

- A. Submit in accordance with Section 01 33 00 Submittal Procedures.
- B. See Section 31 10 13 Demolition, Debris Disposal and Salvage for submittal requirements which includes work completed under this specification.
- C. Submit the following:
 - 1. Product Data: Submit data sheets for the following:
 - A. Pervious Backfill
 - B. Aggregate Base
 - C. Geotextile Fabric

1.06 QUALITY ASSURANCE

- A. Before beginning construction activities, such as grading, excavation, trenching, or filling, in any part of the project site, Contractor shall install temporary structures to guide runoff away from the work area and to capture eroded material before it reaches natural watercourses.
- B. Contractor shall arrange construction activities to minimize erosion to the maximum practical extent. Clearing, excavation, and grading shall be limited to those areas of the project site necessary for construction. Contractor shall minimize the area that is exposed and unprotected.
- C. Contractor shall clearly mark and delineate the limits of work activities and Limits of Disturbance. Contractor shall not allow equipment to operate outside the limits of work or to disturb protected areas, except as already noted in specifications.
- D. Qualifications of work force:
 - 1. Provide sufficient skilled work force and supervisors who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of construction involved and the materials and techniques specified.

1.07 COMPACTION TESTING

- A. The Contractor shall engage a qualified third party compaction testing firm to provide compaction testing at the following locations. Testing reports shall be provided to the Construction Manager for review and approval.
 - 1. All locations of aggregate base placement
- B. The Construction Manager may engage a qualified compaction testing laboratory to perform field tests and inspections to verify the Contractor's compaction effort meet the compaction requirements of plans and specifications. Relative compaction tests to verify the contractor's compaction will be made at locations determined by the Construction Manager. When tests indicate that the specified compaction has not been achieved, that portion of the Work shall be reworked until the required density has been attained.
- C. The Contractor shall make all necessary excavations for compaction tests. Costs of excavating, backfilling, and compacting in connection with compaction testing shall be borne by the Contractor. Excavations for compaction tests shall be backfilled with native backfill and compacted to the specified density.
- D. Additional tests for compliance with Specifications, as determined by the Construction Manager, and as required in the specifications, will be made and paid for by the City. The Contractor shall be required to pay for all required repeat tests in that area until the required results are obtained and including all associated incurred costs **AND in areas where the Contractor inadvertently over-excavates beyond the finished grades shown on the plans.**

- E. All compaction shall be by mechanical means unless the Contractor can demonstrate other means that will accomplish required compaction to the satisfaction of the City. Compaction equipment shall be of suitable type and adequate to obtain the densities specified and approved. Compaction equipment shall be operated in strict accordance with the manufacturer's instructions and recommendations. Equipment shall be maintained in such condition that it will deliver the manufacturer's rated compactive effort.
- F. Testing Methods:
 - 1. ASTM D 1557/D6938 test procedure
 - 2. CT 216/CT 231
- G. Testing Frequency:
 - 1. **Culvert Bedding (Aggregate Base):** 1 minimum per lift per maximum 50 LF of culvert
 - 2. **Aggregate Base**
 - i. Roadway:
 - 1 minimum per lift per maximum 50 LF of culvert
- H. Definition:
 - 1. Relative Compaction: In-place density divided by the maximum dry density laboratory compaction expressed as percentage.

1.08 PRESERVATION OF PROPERTY

- A. Where construction is to be performed in the vicinity of trees and shrubbery, the work shall be carried on in a manner which will cause minimum damage.
- B. Existing power and telephone lines, fences, pipelines or other conduits, embankments, and structures in the vicinity of the work shall be supported and protected from injury by the Contractor during the construction and until the completion of the work
- C. All damage shall be immediately reported to the Construction Manager who will file a report so that penalties may be determined.
- D. The Contractor shall remove all temporary stockpiles, decompact and rehabilitate the stockpile/staging areas and leaving it in clean and neat condition.

1.09 EXPLOSIVES

- A. The Contractor shall not use explosives of any kind on the premises.

1.10 GRADES, LINES, LEVELS, AND PERMANENT MARKERS

- A. Responsibility for correctness:

1. Contractor will be held responsible for the correctness of the layout and for establishing the location of possible buried utility lines. In the event there is any conflict between actual conditions and the drawings, Contractor shall notify the Construction Manager immediately and shall not proceed with the work until directed by the Construction Manager.

B. Preservation of markers:

1. All stakes, boundary lines, corner markers, bench marks or survey markers, etc., which have been or may be established in any part of the site, shall be carefully preserved and respected by the Contractor and shall be restored at the Contractor's expense if lost or destroyed as a result of his operations.

1.11 ACCURACY OF DATA

- A. Site data given herein and on the drawings are as exact as could be secured, but their absolute accuracy cannot be guaranteed. Exact locations, distances, elevations, etc., shall be finally governed by field conditions and the Construction Manager's instructions.
- B. The Contractor shall promptly, and before such condition is disturbed, notify the Construction Manager in writing of soil or subsurface conditions which differ materially from those conditions shown in the Contract Documents or in the records of investigations of soil or subsurface conditions referred to above. The Construction Manager shall promptly investigate the conditions. If he/she finds the conditions materially different from those which reasonably should have been anticipated on the basis of a careful consideration of said records of investigations, logs of borings and examination of the site, and finds that said conditions will cause an increase or decrease in the cost of, and/or the time required for performance of the Contract, he/she will, after approval by the City, modify the Contract Terms in writing to provide for an equitable adjustment in cost and/or time of performance.
- C. A thorough attempt has been made to show the type, location, and number of all utilities, however, no guarantee is made as to the location and number of such utilities. The Contractor shall repair all utilities damaged in the progress of his work. The Contractor shall notify all owners of utilities of commencement of and sufficiently in advance to have the utilities mark the location of their facilities. The Contractor shall be prepared at all times with labor, equipment, and materials to make repairs on damaged mains or utilities.

1.12 ADDITIONAL SAFETY RESPONSIBILITIES

- A. The Contractor shall be responsible for ensuring such measures: (1) comply fully with 29 CFR Part 1926 OSHA Subpart P Excavations and Trenches requirements, (2) provide necessary support to the sides of excavations, (3) provide safe access to the Construction Manager's sampling and testing within the excavation, (4) provide safe access for backfill, compaction, and compaction testings, and (5) otherwise maintain excavations in a safe manner that shall not endanger property, life, health, or the project schedule. All earthwork shall be performed in strict accordance with applicable law, including local ordinances and applicable OSHA requirements.

PART 2 PRODUCTS

2.01 BACKFILL MATERIALS

- A. **Pervious Backfill**
 - a. Pervious backfill shall conform to Caltrans Standard Specification 19-3.02D
 - b. Native (clay/silt/sand) soils are not suitable.

- B. **Aggregate Base**
 - a. Class 2 Aggregate Base shall conform to the Caltrans Standard Specifications 26.1.02A

- C. **Geotextile Fabric**
 - a. MIRAFI 500X geotextile fabric (Tensar BX1100, Tensar Triax TX160, or equivalent)
 - b. MIRIAFI 140N filter fabric, or equivalent

PART 3 EXECUTION

3.01 OVERVIEW

- A. Contractor is responsible for excavating sediment, hauling to specified application areas and disposal site(s) in accordance to the plans and these specifications.

3.02 EXAMINATION

- A. Verification of Conditions: Prior to commencement of site grading work the Contractor shall notify the Construction Manager that the site has been cleared. The Construction Manager shall have sufficient time to review the site. Site grading shall not commence until the Construction Manager has completed review of the site and the Construction Manager has given approval to proceed.

3.03 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, freezing temperatures or frost, and other hazards created by earthwork operations. Provide protective insulating materials as necessary.

- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and roadways.

- C. Prevent surface water and ground water from entering excavations, from ponding on prepared sub grades, and from flooding Project site and surrounding area.

- D. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

3.04 CLEARING AND GRUBBING WORK REQUIRED

- A. Clearing and grubbing work shall be accomplished in accordance with the provisions of Section 31 11 00 of these specifications.

3.05 CONTROL OF WATER

- A. The Contractor shall be responsible for furnishing temporary drainage facilities to convey and dispose of surface water falling on or passing over the site. This work shall be accomplished in accordance with the provisions of Section 01 57 00 of these specifications.

3.06 EXISTING UTILITIES

- A. The known existing utilities are shown on the Drawings in their approximate location. The Contractor shall exercise care in avoiding damage to all utilities, as he will be held responsible for their repair if damaged. There is no guarantee that all utilities or obstructions are shown, or that locations indicated are accurate. Utilities are piping, conduits, wire, cable, ducts, manholes, pull boxes and the like, located at the project site and adjoining said site.
- B. Excavations around underground electrical ducts and conduits shall be performed using extreme caution to prevent injury to workers or damage to electrical ducts or conduits. Similar precautions shall be exercised around gas lines, telephone and television cables.

3.07 PRIMARY SITE ACCESS

- A. Within one (1) week of the Notice to Proceed and after obtaining an approved City Encroachment Permit, Contractor shall initiate improvements to the primary site access locations as indicated on Plans. Establishing and maintaining construction entrances is a priority as all equipment and worker access and off-hauling of material shall occur only through the construction entrances shown on the plans; no off-hauling of demolition material or excavated soil may occur along any other access without prior written consent of the Construction Manager.
- B. Contractor shall not import any fill material without receiving prior approval from the Construction Manager. No asphalt containing materials shall be imported to the site. Thus, no recycled aggregate is permitted.
- C. The City and their representatives are not liable for any delays that result from regulatory-driven changes in the construction entrance access design and/or City encroachment permit.

3.08 GRADING AND EXCAVATION

- A. Perform all excavation of every description, regardless of the type, nature, or condition of material encountered, as specified, shown, or required to accomplish the construction. Material for fill, backfill, or for protection of excavations from surface drainage shall be neatly placed and kept shaped so as to cause no interference with public travel

- B. The Contractor shall be responsible for meeting the finish grades as shown on the plans.
- C. All areas covered by the project, including excavated and filled areas and adjacent transition areas, shall be uniformly graded so those finished surfaces are at the elevations established by the plans.
- D. Cut the channel and bench accurately to the grades shown. **Take care not to over-excavate** and backfill excessive excavation to grade. Trim all roots, stumps, rock and other foreign matter from the sides and bottom.
- E. Cut ditches/outfalls/swales accurately to the grades shown. **Take care not to over-excavate**. Backfill excessive excavation to grade. Trim all roots, stumps, rock and other foreign matter from the sides and bottom of the ditches.
- F. Correct areas over-excavated with appropriate backfill and compact to a minimum of 90% relative compaction or as specified or as directed by Construction Manager.
- G. Prevent displacement or loose soil from falling into excavation; maintain soil stability.
- H. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- I. Temporary cut slopes – maximum slope of temporary cut slopes shall be maximum 1(H):1(V).
- J. Groundwater may be encountered within the planned excavation depth, including utility trenches. Dewatering may be necessary to accomplish required excavations.
- K. Due to the potential for slope failure associated with surcharges, loads and/or vibrations from the vehicle traffic, high traffic and/or high load construction roads, stored materials, excavated soils, and other similar loads should be sited outside of the projection of a 1.5(H):1(V) slope, as measured from the base of the slope.
- L. Notify the Construction Manager of unexpected subsurface conditions.

3.09 BACKFILLING AND COMPACTION

- A. The placement of fills to achieve the finished grades shall be done under the supervision of the Construction Manager.
- B. Compact subgrade as necessary to support density requirements of subsequent layers of fill.
- C. Fill in lifts allowing time for material tester to test each lift for compaction.
- D. Each lift shall not exceed eight inches unless otherwise indicated or as directed by the Construction Manager.

- E. All areas to receive fills shall be uniformly moisture conditioned as required to obtain the required compaction.
- F. Add water to the backfill material or dry the material as necessary to achieve specified compaction density of each layer of backfill being compacted. Employ such means as may be necessary to secure a uniform moisture content throughout the material of each lift being compacted.
- G. After the material has been moisture conditioned, compact it with compaction equipment appropriate for the use to achieve compaction specified on the plans.
- H. If the backfill material becomes saturated from rains or any other source because it was not compacted to the specified density or was not backfilled and compacted to surface grade, through negligence or otherwise, remove the faulty material and replace it with suitable material compacted to the specified density. No additional payment will be made for doing such work or removal and replacement.
- I. Recompaction: Where, in the judgment of the Construction Manager, the moisture content is not suitable or insufficient compaction has been obtained, the fill shall be reconditioned and/or recompacted to the specified density prior to placing any additional fill material. The Contractor shall be responsible for placing and compacting approved fill material in accordance with these specifications. If the Contractor fails to meet the compaction requirements, he/she shall reduce his rate of haul, furnish additional spreading, moisture conditioning and/or compacting equipment or make any other adjustments necessary to produce a satisfactory compacted fill.
- J. Heavy compaction equipment shall not be operated within two feet of any structure. Hand directed tampers or plate vibrators shall be used on areas not accessible to heavy compaction equipment. Fills compacted in this manner shall be placed in layer not greater than four inches in thickness before compaction, and shall meet the same density requirements as adjacent areas.
- K. After the placement of the backfill, the surface areas shall be left constructed and trimmed to conform to the lines, grades, and cross sections shown on the plans. The surface area shall be graded to provide surface drainage to flow to desired locations.
- D. **Pervious Backfill**
 - a. Over-excavate to a depth shown on plans below the culvert bottom (and at least 1 foot outside culvert edges)
 - b. Place MIRAFI 500X geotextile fabric.
 - c. Place pervious backfill and vibrate lift with a minimum of 3 passes with vibratory compactor (subject to modification based on contractor equipment).
 - d. Where fill will be placed over the crushed rock, place Mirafi 140N filter fabric over the crushed rock prior to fill placement. Filter fabric should be lapped up the excavation 6 inches prior to fill placement.
 - e. Fabrics should be installed in accordance with manufacturers recommendations, with a minimum sheet-to-sheet overlap of 18 inches.
- E. **Aggregate Base**
 - a. Moisture condition backfill to within 2 percent of optimum and place in maximum 8-inch thick, horizontal, loose lifts.

- b. Compact backfill to a minimum 95% percent relative compaction based on the ASTM D 1557 test procedure.

3.10 WATER FOR COMPACTION

- A. See 01 50 00 Temporary Facilities and Controls specification for optional construction water sources.
- B. Water shall be clean and free of oil, acids, salts, and other deleterious substances and suitable for agricultural purposes. Furnish as required from source approved by Construction Manager, and as specified in these specifications.
- C. Water shall be applied by means of pressure-type distributors or pipe lines equipped with a spray system or hoses with nozzles that will ensure a uniform application of water.

3.11 SUPPORT OF EXCAVATIONS

- A. All necessary measures to protect excavations and adjacent improvements from running, caving, boiling, settling, or sliding soil resulting from the groundwater table and the nature of the soil excavated. See Geotechnical Report for preliminary recommendations for shoring and setbacks from unreinforced slopes. Contractor is responsible for excavation safety and identifying soil conditions and appropriate shoring.

3.12 FINISH GRADING AND SOIL PREPARATION

- A. Except where shown otherwise in the Drawings, restore the finish grade to the original contours and to the original drainage patterns. Grade surfaces to drain away from structures.
- B. Upon completion of grading and prior to seed and mulch application, soil preparation shall occur in accordance to the seed and mulch specification section 32 92 19.
- C. Earthwork tolerances shall conform to the following:

Description of Earthwork Feature	Tolerance (ft)	
	Horizontal	Vertical
Finished channel	0.5	0.05
Limits of Grading	0.5	EG
EG = Existing Ground		

- D. Excessive passes of finish grading equipment that would compact seeding areas shall be avoided. Where equipment access routes are required, the sequence of construction activities shall be coordinated to only allow equipment access prior to preparation of soils. Upon completion of soil preparation activities, no further vehicular traffic will be allowed other than equipment required for seeding or planting. If equipment access should become necessary, the access route shall be disked and fine graded again prior to seeding to eliminate any resulting soil compaction.

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3.13 FIELD QUALITY CONTROL

- A. If, in the opinion of the Construction Manager, required compaction is not being achieved, Contractor will provide reimbursement for re-testing. The Construction Manager shall determine the number and location of tests required. The Contractor shall furnish a backhoe and operator upon request to the testing laboratory, at no cost to the City.
- B. Perform additional compacting effort or re-work as required until compaction meets or exceeds requirements.
- C. Ensure excavations are safe for testing personnel.

3.14 PROTECTION

- A. The Contractor shall prevent erosion of freshly graded areas during construction and until such time as a permanent drainage and erosion control measures have been installed.
- B. Earthwork operations shall be conducted so as to prevent windblown dust and dirt from interfering with the surrounding normal operations. Contractor shall assume liability for all claims related to windblown dust and dirt. Water shall be applied in conformance with applicable provisions of Section 17 of the State Standard Specifications and with Section 1590 (e) of CAL/OSHA, Title 8, and SWPPP.

3.15 SETTLEMENT

- A. Any settlement in excess of 0.1 feet, in backfill, fill, or in structures built over the backfill or fill, which may occur within the guarantee period specified in the General Conditions will be considered to be caused by improper compaction methods and shall be corrected at the Contractor's expense. Any structures damaged by settlement shall be restored to their original condition by the Contractor at no cost to the City.

END OF SECTION 31 20 00

SECTION 32 12 16
ASPHALT PAVING

PART 1 GENERAL

1.1 DESCRIPTION

- A. This Section includes:
 - 1. Hot-mix asphalt (HMA) paving using the STANDARD construction process. Work to be performed under this Section covers all labor, materials, tools, equipment, transportation, testing and incidentals necessary to construct asphalt concrete pavements. This shall include asphalt concrete overlays and leveling courses.

- B. Related Sections:
 - 1. Section 02 22 10 – Trench Excavation and Backfill
 - 2. Section 31 20 00 – Earthwork
 - 3. Section 32 13 13 – Concrete Paving

1.2 RELATED DOCUMENTS

- A. California Department of Transportation Standard Specifications – current version

1.3 SYSTEM DESCRIPTION

- A. Provide HMA pavement according to the materials, workmanship, and other applicable requirements of the California Standard Specifications.

1.4 SUBMITTALS

- A. Product Data: For each product specified. Include technical data and tested physical and performance properties.
- B. HMA Job Mix Formula (JMF): For each HMA mix proposed for the Work in accordance with Section 39. JMF shall be approved by Caltrans within the previous 12 months of planned work.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who has completed hot-mix asphalt paving similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Manufacturer Qualifications: Engage a firm experienced in manufacturing hot-mix asphalt similar to that indicated for this Project and with a record of successful in-service performance.

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1. Firm shall be a registered and approved paving mix manufacturer with Caltrans.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if substrate is wet or excessively damp or if the following conditions are not met:
 1. Tack Coats: Minimum surface temperature of 50 deg F.
 2. Asphalt Surface Course: Minimum surface temperature of 50 deg F at time of placement.

PART 2 PRODUCTS

2.1 AGGREGATES

- A. Use aggregates per Caltrans, Section 39, for 1/2" sieve size target value for Type A asphalt concrete.

2.2 ASPHALT MATERIALS

- A. Binder Type The asphalt grade shall be PG 64-16 conforming to Section 92, "Asphalts", of the State Standard Specifications.
- B. Tack coat shall be emulsified asphalt Grade RS-1, RS-1h, SS-1, or SS-1h and shall conform to Section 94, "Asphaltic Emulsions", of the State Standard Specifications.
- C. Water: Potable.

2.3 AUXILIARY MATERIALS

- A. Sand: ASTM D 1073, Grade Nos. 2 or 3.B.

2.3 MIXES

- A. Hot-Mix Asphalt: Provide dense, hot-laid, hot-mix asphalt plant mixes per Caltrans, Section 39, Type B, asphalt concrete.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
 1. Sweep loose granular particles from surface of unbound-aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of base course.

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- B. Tack Coat: Apply uniformly between HMA layers, curbs, gutters and construction joints in accordance with Section 39 the Standard Specifications. Apply enough material in 1 coat to penetrate and seal, but not flood, surface. Allow tack coat to cure as required.
 - 1. Protect coated surfaces from damage until ready to receive paving.

3.2 HOT-MIX ASPHALT PLACING

- A. Machine place HMA on prepared surface, spread uniformly, and strike off. Place HMA by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness, when compacted.
 - 1. Place HMA surface course in accordance with Section 39, and in lifts no thicker than 0.25 feet.
 - 2. Spread mix at minimum temperature of 250 deg F.
 - 3. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes, unless otherwise indicated.
 - 4. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- B. Place paving in consecutive strips not less than 10 feet wide, except where infill edge strips of a lesser width are required.
- C. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete asphalt base course for a section before placing asphalt surface course.
- D. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.3 JOINTS

- A. Construct joints to ensure continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of hot-mix asphalt course.
 - 1. Clean contact surfaces and apply tack coat.
 - 2. Offset longitudinal joints in successive courses a minimum of 6 inches.
 - 3. Offset transverse joints in successive courses a minimum of 24 inches.
 - 4. Construct transverse joints by straight butt joint or sawed vertical face method. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
 - 5. Compact asphalt at joints to a density within 2 percent of specified course density.

3.4 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or vibratory-plate compactors in areas inaccessible to rollers.
- B. Breakdown Rolling: Accomplish breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Repair surfaces by loosening displaced material, filling with hot-mix asphalt, and rerolling to required elevations.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling, while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
 - 1. Average Density: 96 percent of reference laboratory density according to ASTM D 1559, but not less than 94 percent nor greater than 100 percent.
 - 2. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Repairs: Remove paved areas that are defective or contaminated with foreign materials. Remove paving course over area affected and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- F. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.5 INSTALLATION TOLERANCES

- A. Where trenching damages existing pavement, the pavement and aggregate base must be replaced to match the existing grades and thicknesses. Minimum thickness for asphalt roads or driveways shall be 0.3-feet asphalt over 0.60-feet aggregate base. Minimum thickness for concrete roads or driveways shall be 6-inch concrete with #4 bars at 18-inch centers each way over 6-inch aggregate base.
- B. Thickness: Compact each course to produce the thickness indicated within the following tolerances:
 - 1. Base Course: Plus or minus 1/2 inch.
 - 2. Surface Course: Plus 1/4 inch, no minus.
- C. Surface Smoothness: Grading between required lines and points where elevations are given to be smooth and uniform. Variations from true plane for both horizontal and vertical surfaces of exposed concrete are not to exceed 1/8" in 10'-0"

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3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing agency to perform field inspections and tests and to prepare test reports.
 - 1. Testing agency will conduct and interpret tests and state in each report whether tested Work complies with or deviates from specified requirements.
- B. Surface Smoothness: Finished surface of each hot-mix asphalt course may be tested for compliance with smoothness tolerances using a 10-foot straightedge.
- C. Density Testing: Field density of in-place compacted pavement may be determined by nuclear method according to ASTM or Caltrans Test Methods.
- D. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

END OF SECTION 32 12 16

SECTION 32 13 13
CONCRETE PAVING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes
 - 1. This work consists of furnishing, placing and finishing commercial grade concrete curbs, gutters, driveways, walks, sidewalks, vehicle slabs, and miscellaneous surfaces.
- B. Related Sections
 - 1. Section 31 20 00 – Earthwork

1.02 SUBMITTALS

- A. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, joint systems, curing compounds, dry-shake finish materials, and other data.
- B. Mill Test reports for each heat or melt of steel.
- C. Design mixes for each class of concrete. Include revised mix proportions when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.
- D. Laboratory test reports for evaluation of concrete materials and mix design tests.

1.03 QUALITY ASSURANCE

- A. Concrete Standards: Comply with provisions of the following standards, except where more stringent requirements are indicated.
 - 1. American Concrete Institute (ACI) 301, "Specifications for Structural Concrete for Buildings."
 - 2. ACI 318, "Building Code Requirements for Reinforced Concrete."
 - 3. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice."
- B. Concrete Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

1.04 WARRANTY

- A. Warranty shall provide for repairing and replacing, at no cost to Owner, joint sealants which fail because of leaking, crumbling, hardening, shrinkage, bleeding, splitting, sagging, staining or loss of adhesion within 2 years of substantial completion of work.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use.
- B. Store reinforcing material in manner to prevent excessive rusting and fouling with grease,

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dirt, or other bond-weakening coatings.

- C. Take precautions to maintain identification of reinforcing material after bundles are broken.

1.06 SCHEDULING AND SEQUENCING

- A. Plan erection and removal to permit proper sequence of concrete placing without damage to concrete.

1.07 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.
- B. Temperature and Weather Requirements
 1. Do not place concrete when temperature or weather will affect performance or appearance of concrete.
 2. Minimum Ambient Temperature: 40°F
 3. Precipitation: None expected before concrete can be finished and protected.
- C. Substrate Requirements
 1. Do not place concrete on muddy or frozen substrate.
 2. Remove mud, dirt, and ice from formwork surface.

PART 2 PRODUCTS

2.01 FORMS

- A. Design of the formwork is the Contractor's responsibility.
- B. Form Materials: Plywood, metal, metal-framed plywood, or other acceptable panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces. Use flexible or curved forms for curves of a 100-foot or less radius.
- C. Form Release Agent: Provide commercial formulation form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- D. Forms and Formwork Accessories
 1. Exposed Plywood Forms: Plyform, Class I or II.
 2. Lumber and Steel Forms: Smooth face lumber or steel
 3. Chamfer Strip: radius per drawings
 4. Steel Pipe Sleeves: ASTM A 53
 5. Expansion and Isolation Joint Fillers: Granulated cork, 1/2-inch thick, ASTM D 1752, Type II
 6. Form Joint Tape: Closed cell PVC foam with pressure sensitive adhesive on one side.

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2.02 REINFORCING MATERIALS

- A. Reinforcing Bars and Tie Bars: ASTM A615, Grade 60, deformed.
- B. Joint Dowel Bars: Plain steel bars, ASTM A615, Grade 60. Cut bars true to length with ends square and free of burrs.
- C. Hook Bolts: ASTM A307, Grade A bolts, internally and externally threaded. Design hook bolt joint assembly to hold coupling against pavement form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.
- D. Supports for Reinforcement: Chairs, spacers, dowel bar supports and other devices for spacing, supporting, and fastening reinforcing bars, and dowels in place. Use wire bar-type supports complying with CRSI specifications.
 - 1. Use supports with sand plates or horizontal runners where base material will not support chair legs.

2.03 CONCRETE MATERIALS

- A. Cement: Portland conforming to ASTM C150 Type II
- B. Coarse Aggregate: ASTM C33, clean hard, durable uncontaminated, washed, graded, cleaned and screened. Crusher run stone or bank run gravel will not be permitted. Maximum size not to exceed 75% of clear spacing between reinforcement.
 - 1. Size No. 467 (1 1/2" to No. 4) for footings, foundations, walls not less than 8" thick, slabs on grade or fill and steel reinforced slabs not less than 6" thick.
 - 2. Size No. 67 (3/4" to No. 4): for other site concrete, including curbs, gutters and sidewalks.
 - 3. Do not use coarse aggregates that contain substances that cause spalling.
- C. Fine aggregate: ASTM C33, natural sand with minimum 15% passing No. 50 sieve, minimum 3% passing No. 100 sieve and fineness modulus 2.0 to 3.0.
 - 1. Do not use fine aggregates that contain substances that cause spalling.
- D. Water: Potable.

2.04 MINOR CONCRETE MIX

- A. Mix concrete in accordance with ASTM C94. Use a homogeneous mixture throughout. Concrete to have 2,800 psi compressive strength at 28 days. Proportion to ACI 211.1 or to ACI 318 based on past strength performance. Cement content to be 470 pounds (5 sacks) per cubic yard, minimum.
- B. Slump:
 - 1. Flat Work: 2" minimum to 4" maximum.
 - 2. Vertical Surfaces: 4" minimum to 6" maximum.
- C. Air Entrainment
 - 1. 2 percent \pm 1 percent.
- D. Pumped concrete: Per ACI 304.
- E. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, project conditions, weather, test results, or other

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circumstances warrant.

2.05 EXPANSION JOINTS SEALANT

- A. Premolded Joint Filler:
 - 1. Multi component polyurethane sealant
 - 2. ASTM C920
 - 3. Shore hardness 35 or greater
- B. Acceptable products include Tremco THC-900 or equal.
- C. Color to match adjacent concrete.

2.06 MISCELLANEOUS JOINT MATERIALS

- A. Primer: Non-staining, as recommended by sealant manufacturer.
- B. Backer rod shall be flexible and compressible, formed from
 - 1. closed-cell foam polyurethane or
 - 2. butyl rubber or
 - 3. open and closed-cell polyurethane.
- C. Bond breaker tape: polyurethane 4-6 mil thick, pressure sensitive.

2.07 RELATED MATERIALS

- A. Epoxy Adhesive: ASTM C 881, two-component material suitable for dry or damp surfaces. Provide material type, grade, and class to suit requirements.
- B. Non shrink grout shall:
 - 1. be premixed compound.
 - 2. be a blend of non metallic aggregate, cement, water reducing and plasticizing agents.
 - 3. have compressive strength 2,400 psi in 2 days.
 - 4. have compressive strength 7,000 psi in 28 days.

PART 3 EXECUTION

3.01 GENERAL

- A. All curbs, gutters, sidewalks and other concrete slabs construction shall conform to the plans and these specifications.

3.02 SURFACE PREPARATION

- A. Proof-roll prepare subbase surface to check for unstable areas and verify need for additional compaction. Do not begin paving work until such conditions have been corrected and are ready to receive paving.
- B. Remove loose material from compacted subbase surface immediately before placing concrete.

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3.03 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for paving to required lines, grades, and elevations. Install forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.
- B. Check completed formwork and screeds for grade and alignment to following tolerances:
 - 1. Top of Forms: Not more than 1/8 inch in 10 feet.
 - 2. Vertical Face on Longitudinal Axis: Not more than 1/4 inch in 10 feet.
- C. Clean forms after each use and coat with form release agent as required ensuring separation from concrete without damage.

3.04 PLACING REINFORCEMENT

- A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars" for placing and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.
- D. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities or replace units as required before placement. Set mats for a minimum 2 inch overlap to adjacent mats.

3.05 JOINTS

- A. General: Construct contraction, construction, and isolation joints true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to the centerline, unless indicated otherwise.
 - 1. When joining existing paving, place transverse joints to align with previously placed joints, unless indicated otherwise.
- B. Contraction Joints: Provide weakened-plane contraction joints, sectioning concrete into areas as shown on Drawings.
 - 1. Tooled Joints: Form contraction joints in fresh concrete by grooving and finishing each edge of joint with a radiused jointer tool.
 - 2. Locate expansion joints at intervals of 4 feet, unless indicated otherwise.
- C. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than 1/2 hour, unless paving terminates at isolation joints.
 - 1. Continue reinforcement across construction joints unless indicated otherwise. Do not continue reinforcement through sides of strip paving unless indicated.
 - 2. Provide tie bars at sides of paving strips where indicated.
- D. Expansion Joints: Form expansion joints of preformed joint filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
 - 1. Locate expansion joints at intervals of 20 feet, unless indicated otherwise.

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2. Extend joint fillers full width and depth of joint, not less than 1/2 inch or more than 1 inch below finished surface where joint sealant is indicated. Place top of joint filler flush with finished concrete surface when no joint sealant is required.
 3. Furnish joint fillers in one-piece lengths for full width being placed wherever possible. Where more than one length is required, lace or slip joint filler sections together.
 4. Protect top edge of joint filler during concrete placement with a metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
 5. Cure sealants in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability. Protect sealants during construction period, so that they will be without deterioration or damage (other than normal wear and weathering) at time of Final Completion.
- E. Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt-coat one half of dowel length to prevent concrete bonding to one side of joint.

3.06 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other trades to permit installation of their work. Notify the Owner's Representative minimum 24 hours prior to commencement of concreting operations.
- B. Do not place concrete until subbase and forms have been checked for line and grade. Moisten subbase if required to provide a uniform dampened condition at the time concrete is placed. Do not place concrete around manholes or other structures until they are at required finished elevation and alignment.
- C. Remove snow, ice, or frost from subbase surface and reinforcing before placing concrete. Do not place concrete on surfaces that are frozen.
- D. Moisten subbase to provide a uniform dampened condition at the time concrete is placed. Do not place concrete around manholes or other structures until they are at the required finish elevation and alignment.
- E. Comply with requirements and with ACI 304R for measuring, mixing, transporting, and placing concrete.
- F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- G. When concrete placing is interrupted for more than 1/2 hour, place a construction joint.
- H. Place concrete using methods which prevent segregation of the mix. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures to consolidate concrete complying with ACI 309R. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand-spreading and consolidation. Consolidate with care to prevent dislocating reinforcing, dowels, and joint devices. Do not break or interrupt successive pours so that cold joints occur.
- I. Place concrete to required lines and grades shown on drawings. Grading between

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required lines and points where elevations are given to be smooth and uniform. Slope finish grades to drain surface water away from buildings unless otherwise shown on drawings. Variations from true plane for both horizontal and vertical surfaces of exposed concrete are not to exceed 1/8" in 10'-0".

- J. Screed paved surfaced with a straightedge and strike off. Use bull floats or darbies to form a smooth surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces prior to beginning finishing operations.
- K. No cement water or mortar shall be added to the surface during the finishing operation.
- L. Curbs and Gutters: When automatic machine placement is used for curb and gutter placement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce curbs and gutters to required cross section, lines, grades, finish, and joining as specified for formed concrete. If results are not acceptable, remove and replace with formed concrete.
- M. When adjoining pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained 85 percent of its 28-day compressive strength.
- N. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures. Do not place concrete when air temperature is expected to fall below 45° F.

3.07 CONCRETE FINISHING

- A. Float Finish: Begin floating when bleed water sheen has disappeared and the concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand-floating if area is small or inaccessible to power units. Finish surfaces to true places within a tolerance of 1/4 inch in 10 feet as determined by a 10 foot long straightedge placed anywhere on the surface in any direction. Cut down high spots and fill low spots. Refloat surface immediately to a uniform granular texture.
 - 1. Medium-to-Fine Textured Broom Finish: Draw a soft bristle broom across concrete surface perpendicular to line of traffic to provide a uniform fine line texture finish.
- B. Final Tooling: Tool edges of paving, gutters, curbs, and joints formed in fresh concrete with a jointing tool to radius shown on drawings. Repeat tooling of edges and joints after applying surface finishes. Eliminate tool marks on concrete surfaces.

3.08 FINISHING VERTICAL SURFACES

- A. Finishing Concealed Vertical Concrete Surfaces
 - 1. Provide rough form finish, complying with ACI 301, Paragraph 10.2.1.
 - 2. Remove fins and projections exceed ¼ inch in height and patch tie holes and surface defects.
- B. Finishing Exposed Vertical Concrete Surfaces
 - 1. Forms should be stripped and exposed surface finished the same day as the concrete is placed.
 - 2. Provide smooth form finish complying with ACI 301, Paragraph 10.2.2.
 - 3. Remove fins and projections and patch tie holes and surface defects.

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4. Provide smooth rubbed finish for exposed curb and walk edges, complying with ACI 301, Paragraph 10.3.1.

3.09 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with the recommendations of ACI 306R for cold weather protection and ACI 305R for hot weather protection during curing.
- B. Evaporation Control: In hot, dry, and windy weather, protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply according to manufacturer's instructions after screeding and bull floating, but before floating.
- C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- D. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:
 1. Moisture Curing: Keep surfaces continuously moist for not less than 7 days with the following materials:
 - a. Water
 - b. Continuous water-fog spray
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with a 12-inch lap over adjacent absorptive covers.
 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. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.10 JOINING NEW TO EXISTING CONCRETE

- A. Construct suitable connections between new and existing concrete where existing driveways, walks, and other structures are cut back to permit the new construction or where the new construction abuts the existing concrete. Unless shown or directed otherwise, furnish and place minimum 1/2 inch thick performed expansion joint filler between new and existing concrete.

3.11 FIELD QUALITY CONTROL TESTING

- A. The Owner may employ a qualified testing and inspection agency to sample materials, perform tests, and submit test reports during concrete placement. Sampling and testing for quality control may include the following:
 1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
 - a. Slump: ASTM C 143; one test at point of placement for each compressive-

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strength test but no less than one test for each day's pours of each type of concrete.

- b. Air Content: ASTM C 231, pressure method.
- c. Concrete Temperature: ASTM C 1064.
- d. Compression Test Specimens: ASTM C 31.
- e. Compressive-Strength Tests: ASTM C39.

3.12 REPAIRS AND PROTECTION

- A. Remove and replace concrete paving that is broken, damaged, or defective, or does not meet the requirements of this section.
- B. Drill test cores where directed by the Owner's Representative when necessary to determine magnitude of cracks or defective, or does not meet the requirements of this section.
- C. Protect concrete from damage. Exclude traffic from paving or at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep concrete paving not more than 2 days prior to date scheduled for Substantial Completion inspections.
- E. Barricade area containing fresh concrete slabs, stairs, ramps, curbs, and walks for 24 hours minimum.
- F. Cover fresh concrete with 1/2-inch thick, plywood or oriented strand board for 48 hours minimum where exposed to public, pedestrian, and animal traffic.
- G. Protect concrete from shrinkage crack damage until protected by curing procedure.
- H. Protect concrete from physical damage or reduced strength caused by air temperatures below 45°F during curing period, as recommended in ACI 306R.
- I. Protect concrete from physical damage or reduced strength caused by air temperatures above 75°F during curing period, as recommended in ACI 305R.

3.13 REPAIRING EXPOSED VERTICAL CONCRETE SURFACES

- A. Clean, dampen, and brush-coat concrete patch areas with acrylic or epoxy bonding agents.
- B. Fill honeycomb voids and rock pockets with patching compound.
- C. Compact and screed patching compound in place as recommended by patching compound manufacturer.
- D. Finish exposed concrete patches to match adjacent surfaces.
- E. Strike off excess patching compound at exposed surface.
- F. If defects in color and texture of concrete surface cannot be repaired, remove and replace the defective concrete.

END OF SECTION

SECTION 33 05 13

MANHOLES AND STRUCTURES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Monolithic concrete manholes and structures, including catch basin, and channel drains, with transition to cover frame, covers, anchorage, and accessories.
2. Modular precast concrete manhole and structures with tongue-and-groove joints, covers, anchorage, and accessories.
3. Bedding and cover materials.

B. Related Sections:

- Section 01 33 00 – Submittal Procedures
- Section 01 11 00 – Summary of Work
- Section 01 14 19 – Use of Site
- Section 31 10 13 – Demo Debris Disposal and Salvage
- Section 31 20 00 – Earthwork
- Section 32 92 19 – Seed and Mulch

1.02 MEASUREMENT AND PAYMENT

- A. Refer to Section 01 15 00 Measurement and Payment.

1.03 REFERENCES

A. American Concrete Institute:

1. ACI 318 - Building Code Requirements for Structural Concrete.

B. ASTM International:

1. ASTM A48/A48M - Standard Specification for Gray Iron Castings.
2. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.
3. ASTM C497 - Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile.
4. ASTM C913 - Standard Specification for Precast Concrete Water and Wastewater Structures.
5. ASTM C923 - Standard Specification for Resilient Connectors between Reinforced Concrete Manhole Structures, Pipes and Laterals.

1.04 DESIGN REQUIREMENTS

- A. Equivalent strength: Based on structural design of reinforced concrete as outlined in ACI 318.
- B. Design of Lifting Devices for Precast Components: In accordance with ASTM C913.

- C. Design of Joints for Precast Components: In accordance with ASTM C913; maximum leakage of 0.025 gallons per hour per foot of joint at 3 feet of head.

1.05 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit cover and frame construction, features, configuration, and dimensions.

1.06 QUALITY ASSURANCE

- A. Perform Work in accordance with specified standards.
- B. Qualifications of work force:
 - 1. Provide sufficient skilled work force and supervisors who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of construction involved and the materials and techniques specified.

1.07 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years documented experience.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Comply with precast concrete manufacturer's instructions for unloading, storing and moving precast manholes and structures.
- B. Store precast concrete manholes and structures to prevent damage to Owner's property or other public or private property. Repair property damaged from materials storage.
- C. Mark each precast structure by indentation or waterproof paint showing date of manufacture, manufacturer, and identifying symbols and numbers shown on Drawings to indicate its intended use.

PART 2 PRODUCTS

2.01 MANHOLES AND STRUCTURES

- A. Manhole and Structure, Sections: Reinforced precast concrete in accordance with ASTM C478 with gaskets in accordance with ASTM C923.

2.02 FRAMES AND COVERS

- A. Product Description: Manhole Frame and Cover to be in accordance with Caltrans standards.

2.03 CONFIGURATION

- A. Shape: As indicated on Drawings.
- B. Clear Inside Dimensions: As indicated on Drawings.

- C. Design Depth: As indicated on Drawings.
- D. Clear Cover Opening: As indicated on Drawings.
- E. Pipe Entry: Furnish openings as indicated on Drawings.

2.04 BEDDING AND COVER MATERIALS

- A. Per Drawings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify items provided by other sections of Work are properly sized and located.
- C. Verify built-in items are in proper location, and ready for roughing into Work.
- D. Verify correct size of manhole and structure excavation.

3.02 PREPARATION

- A. Coordinate placement of inlet and outlet pipe or duct sleeves required by other sections.
- B. Do not install structures where site conditions induce loads exceeding structural capacity of structures.
- C. Inspect precast concrete structures immediately prior to placement in excavation to verify structures are internally clean and free from damage. Remove and replace damaged units.

3.03 INSTALLATION

- A. Excavation and Backfill:
 - 1. Excavate for manholes and structures in location and to depth shown. Provide clearance around sidewalls of structure for construction operations.
 - 2. When groundwater is encountered, prevent accumulation of water in excavations. Place manholes and structures in dry trench.
 - 3. Where possibility exists of watertight structure becoming buoyant in flooded excavation, anchor structure to avoid flotation.
- B. Place base pad, trowel top surface level.
- C. Place manhole and structure sections plumb and level, trim to correct elevations, anchor to base pad.
- D. Backfill excavations for manholes and structures.
- E. Form and place manhole and structures cylinder plumb and level, to correct dimensions and elevations.

- F. Cut and fit for pipe.
- G. Grout base of shaft sections to achieve slope to exit piping. Trowel smooth. Contour to form continuous drainage channel.
- H. Set cover frames and covers level without tipping, to correct elevations.
- I. Coordinate with other sections of Work to provide correct size, shape, and location.

3.04 PRECAST CONCRETE MANHOLE AND STRUCTURE INSTALLATION

- A. Lift precast components at lifting points designated by manufacturer.
- B. When lowering manholes and structures into excavations and joining pipe to units, take precautions to ensure interior of pipeline and structure remains clean.
- C. Set precast structures bearing firmly and fully on crushed, compacted stone bedding
- D. Assemble multi-section structures by lowering each section into excavation. Lower, set level, and firmly position base section before placing additional sections.
- E. Remove foreign materials from joint surfaces and verify sealing materials are placed properly. Maintain alignment between sections by using guide devices affixed to lower section.
- F. Joint sealing materials may be installed on site or at manufacturer's plant.
- G. Verify manholes and structures installed satisfy required alignment and grade.
- H. Remove knockouts or cut structure to receive piping without creating openings larger than required to receive pipe. Fill annular space with mortar.
- I. Cut pipe to finish flush with interior of structure.
- J. Shape inverts through manhole and structures as shown on Drawings.

3.05 FRAME AND COVER INSTALLATION

- A. Set frames using mortar and masonry.
- B. Set frame and cover 2 inches above finished grade for manholes with covers located within unpaved areas to allow area to be graded away from cover beginning 1 inch below top surface of frame.

3.06 FIELD QUALITY CONTROL

- A. Test concrete manhole and structure sections in accordance with ASTM C497.

END OF SECTION

SECTION 33 41 00
STORM UTILITY DRAINAGE PIPING

PART 1 GENERAL

1.01 DESCRIPTION

- A. Section Includes:
 - 1. Storm drainage piping.
- B. Related Sections:
 - 1. Section 31 20 00 – Earthwork
 - 2. Section 32 13 13 – Concrete Paving
 - 3. Section 33 05 13 – Manholes and Structures

1.02 SUBMITTALS

- A. Product Data: Submit data for pipe and accessories.

1.03 QUALITY ASSURANCE

- A. Perform Work in accordance with Caltrans standards.

PART 2 PRODUCTS

2.01 STORM DRAINAGE PIPING

- A. 4"::: PVC schedule 40 or class 125
- B. 6" and larger: ADS N-12 Dual Wall Corrugated Pipe, smooth bore, bell and spigot joint.
 - 1. Rubber Flexible Coupling meeting ASTM D 5926.

2.02 ACCESSORIES

- A. Drainage Structures: See Drawings for Drainage Structure requirements.
- B. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.

2.03 BEDDING AND COVER MATERIALS

- A. Bedding: Bedding as specified in Section 31 20 00.
- B. Cover: Cover as specified in Section 31 20 00 and 02 22 10.
- C. Backfill: Backfill as specified in Section 31 20 00 and 02 22 10.

PART 3 EXECUTION

3.01 PREPARATION AND BEDDING

- A. Excavate pipe trench in accordance with Section 31 23 17 for work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated. Correct over excavation with backfill shown on plans.
- B. Remove large stones or other hard matter which could damage piping or impede consistent backfilling or compaction.

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- C. Place bedding material at trench bottom, level materials in continuous layer.

3.02 INSTALLATION - PIPE

- A. No pipe shall be laid until the trench subgrade and bedding have been inspected and approved.
- B. Laying of lines shall begin at the lowest point in the direction of flow. All piping, fittings, and accessories shall be assembled per manufacturer's recommendations. Pipe deflections shall be kept to a minimum, any deflection in piping shall be per manufacturer's requirements.
- C. Before lowering pipe into the trench, the pipe shall be inspected. Cracked, chipped, broken, or otherwise defective pipe will be rejected and removed from the job site.
- D. Manholes, catch basins and other structures shall be placed as shown on the plans.
- E. Where sewer lines are being crossed, pipelines of 20 foot lengths shall be used with the length centered to provide 10 feet of distance from the sewer line to the nearest joint.

3.03 PROTECTION OF FINISHED WORK

- A. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.
 - 1. Take care not to damage or displace installed pipe and joints during construction of pipe supports, backfilling, testing, and other operations.
 - 2. Repair or replace pipe that is damaged or displaced from construction operations.

END OF SECTION