CONSTRUCTION CONTRACT

COMMUNITY PARK 42 – PROJECT NO. 122061

1. **Parties and Date.**

This Contract is made and entered into this _____ day of _____, _____ by and between the City of Merced, a public agency of the State of California ("City") and American Paving Co., a California Corporation with its principal place of business at 525 W. Alluvial Ave, Fresno, CA 93711 ("Contractor"). City and Contractor are sometimes individually referred to as "Party" and collectively as "Parties" in this Contract.

2. **Recitals.**

2.1 City. City is a public agency organized under the laws of the State of California, with power to contract for services necessary to achieve its purpose.

2.2 Contractor. Contractor desires to perform and assume responsibility for the provision of certain construction services required by the City on the terms and conditions set forth in this Contract. Contractor represents that it is duly licensed and experienced in providing services such as construction of two (2) soccer/football fields, two (2) volleyball courts, two (2) tennis courts, a futsal court, a concession/restroom building, an additional restroom building, shade structures, and other utilities and appurtenances. The following license classifications are required for this Project: Class A

2.3 Project. City desires to engage Contractor to render such services for the Community Park 42 – Project No. 122061 as set forth in this Contract.

2.4 Project Documents & Certifications. Contractor has obtained, and delivers concurrently herewith, a performance bond, a payment bond, and all insurance documentation, as required by the Contract.

3. **Terms**

3.1 Incorporation of Documents. This Contract includes and hereby incorporates in full by reference the following documents, including all exhibits, drawings, specifications and documents therein, and attachments and addenda thereto:

- Services/Schedule (Exhibit "A")
- Plans and Specifications (Exhibit "B")
- Special Conditions (Exhibit "C")
- Contractor's Certificate Regarding Workers' Compensation (Exhibit "D")
- Public Works Contractor Registration Certification (Exhibit "E")
- Payment and Performance Bonds (Exhibit "F")
- Addenda
- Change Orders executed by the City

- Latest Edition of the Standard Specifications for Public Works Construction (Green Book), Excluding Sections 1-9
- Notice Inviting Bids, if any
- Instructions to Bidders, if any
- Contractor's Bid

3.2 Contractor's Basic Obligation; Scope of Work. Contractor promises and agrees, at its own cost and expense, to furnish to the City all labor, materials, tools, equipment, services, and incidental and customary work necessary to fully and adequately complete the Project, including all structures and facilities necessary for the Project or described in the Contract (hereinafter sometimes referred to as the "Work"), for a Total Contract Price as specified pursuant to this Contract. All Work shall be subject to, and performed in accordance with the above referenced documents, as well as the exhibits attached hereto and incorporated herein by reference. The plans and specifications for the Work are further described in Exhibit "B" attached hereto and incorporated herein by this reference. Special Conditions, if any, relating to the Work are described in Exhibit "C" attached hereto and incorporated herein by this reference.

3.2.1 Change in Scope of Work. Any change in the scope of the Work, method of performance, nature of materials or price thereof, or any other matter materially affecting the performance or nature of the Work shall not be paid for or accepted unless such change, addition or deletion is approved in writing by a valid change order executed by the City. Should Contractor request a change order due to unforeseen circumstances affecting the performance of the Work, such request shall be made within five (5) business days of the date such circumstances are discovered or shall waive its right to request a change order due to such circumstances. If the Parties cannot agree on any change in price required by such change in the Work, the City may direct the Contractor to proceed with the performance of the change on a time and materials basis.

3.2.2 Substitutions/"Or Equal". Pursuant to Public Contract Code Section 3400(b), the City may make a finding that designates certain products, things, or services by specific brand or trade name. Unless specifically designated in this Contract, whenever any material, process, or article is indicated or specified by grade, patent, or proprietary name or by name of manufacturer, such Specifications shall be deemed to be used for the purpose of facilitating the description of the material, process or article desired and shall be deemed to be followed by the words "or equal."

Contractor may, unless otherwise stated, offer for substitution any material, process or article which shall be substantially equal or better in every respect to that so indicated or specified in this Contract. However, the City may have adopted certain uniform standards for certain materials, processes and articles. Contractor shall submit requests, together with substantiating data, for substitution of any "or equal" material, process or article no later than thirty-five (35) days after award of the Contract. To facilitate the construction schedule and sequencing, some requests may need to be submitted before thirty-five (35) days after award of Contract. Provisions regarding submission of "or equal" requests shall not in any way authorize an extension of time for performance of this Contract. If a proposed "or equal" substitution request is rejected, Contractor shall be responsible for providing the specified material, process or article. The burden of proof as to the equality of any material, process or article shall rest with Contractor.

The City has the complete and sole discretion to determine if a material, process or article is an "or equal" material, process or article that may be substituted. Data required to substantiate requests for substitutions of an "or equal" material, process or article data shall include a signed affidavit from Contractor stating that, and describing how, the substituted "or equal"

material, process or article is equivalent to that specified in every way except as listed on the affidavit. Substantiating data shall include any and all illustrations, specifications, and other relevant data including catalog information which describes the requested substituted "or equal" material, process or article, and substantiates that it is an "or equal" to the material, process or article. The substantiating data must also include information regarding the durability and lifecycle cost of the requested substituted "or equal" material, process or article. Failure to submit all the required substantiating data, including the signed affidavit, to the City in a timely fashion will result in the rejection of the proposed substitution.

Contractor shall bear all of the City's costs associated with the review of substitution requests. Contractor shall be responsible for all costs related to a substituted "or equal" material, process or article. Contractor is directed to the Special Conditions (if any) to review any findings made pursuant to Public Contract Code section 3400.

3.3 Period of Performance and Liquidated Damages. Contractor shall perform and complete all Work under this Contract within **180 working days**, beginning the effective date of the Notice to Proceed ("Contract Time"). Contractor shall perform its Work in strict accordance with any completion schedule, construction schedule or project milestones developed by the City. Such schedules or milestones may be included as part of Exhibits "A" or "B" attached hereto or may be provided separately in writing to Contractor. Contractor agrees that if such Work is not completed within the aforementioned Contract Time and/or pursuant to any such completion schedule, construction schedule or project milestones developed pursuant to provisions of the Contract, it is understood, acknowledged and agreed that the City will suffer damage. Pursuant to Government Code Section 53069.85, Contractor shall pay to the City as fixed and liquidated damages the sum of **$4,800 per day** for each and every calendar day of delay beyond the Contract Time or beyond any completion schedule, construction schedule or Project milestones established pursuant to the Contract.

3.4 Standard of Performance; Performance of Employees. Contractor shall perform all Work under this Contract in a skillful and workmanlike manner, and consistent with the standards generally recognized as being employed by professionals in the same discipline in the State of California. Contractor represents and maintains that it is skilled in the professional calling necessary to perform the Work. Contractor warrants that all employees and subcontractors shall have sufficient skill and experience to perform the Work assigned to them. Finally, Contractor represents that it, its employees and subcontractors have all licenses, permits, qualifications and approvals of whatever nature that are legally required to perform the Work, including any required business license, and that such licenses and approvals shall be maintained throughout the term of this Contract. As provided for in the indemnification provisions of this Contract, Contractor shall perform, at its own cost and expense and without reimbursement from the City, any work necessary to correct errors or omissions which are caused by Contractor's failure to comply with the standard of care provided for herein. Any employee who is determined by the City to be uncooperative, incompetent, a threat to the safety of persons or the Work, or any employee who fails or refuses to perform the Work in a manner acceptable to the City, shall be promptly removed from the Project by Contractor and shall not be re-employed on the Work.

3.5 Control and Payment of Subordinates; Contractual Relationship. City retains Contractor on an independent contractor basis and Contractor is not an employee of City. Any additional personnel performing the work governed by this Contract on behalf of Contractor shall at all times be under Contractor's exclusive direction and control. Contractor shall pay all wages, salaries, and other amounts due such personnel in connection with their performance under this Contract and as required by law. Contractor shall be responsible for all reports and obligations

respecting such additional personnel, including, but not limited to: social security taxes, income tax withholding, unemployment insurance, and workers' compensation insurance.

3.6 City's Basic Obligation. City agrees to engage and does hereby engage Contractor as an independent contractor to furnish all materials and to perform all Work according to the terms and conditions herein contained for the sum set forth above. Except as otherwise provided in the Contract, the City shall pay to Contractor, as full consideration for the satisfactory performance by Contractor of the services and obligations required by this Contract, the below-referenced compensation in accordance with compensation provisions set forth in the Contract.

3.7 Compensation and Payment.

3.7.1 Amount of Compensation. As consideration for performance of the Work required herein, City agrees to pay Contractor the Total Contract Price of Five Million Eight Hundred Thousand Five Hundred Eighty Dollars Seventy Cents ($5,800,580.70) ("Total Contract Price") provided that such amount shall be subject to adjustment pursuant to the applicable terms of this Contract or written change orders approved and signed in advance by the City.

3.7.2 Payment of Compensation. If the Work is scheduled for completion in thirty (30) or less calendar days, City will arrange for payment of the Total Contract Price upon completion and approval by City of the Work. If the Work is scheduled for completion in more than thirty (30) calendar days, City will pay Contractor on a monthly basis as provided for herein. On or before the fifth (5th) day of each month, Contractor shall submit to the City an itemized application for payment in the format supplied by the City indicating the amount of Work completed since commencement of the Work or since the last progress payment. These applications shall be supported by evidence which is required by this Contract and such other documentation as the City may require. The Contractor shall certify that the Work for which payment is requested has been done and that the materials listed are stored where indicated. Contractor may be required to furnish a detailed schedule of values upon request of the City and in such detail and form as the City shall request, showing the quantities, unit prices, overhead, profit, and all other expenses involved in order to provide a basis for determining the amount of progress payments.

3.7.3 Prompt Payment. City shall review and pay all progress payment requests in accordance with the provisions set forth in Section 20104.50 of the California Public Contract Code. However, no progress payments will be made for Work not completed in accordance with this Contract. Contractor shall comply with all applicable laws, rules and regulations relating to the proper payment of its employees, subcontractors, suppliers, or others.

3.7.4 Contract Retentions. From each approved progress estimate, five percent (5%) will be deducted and retained by the City, and the remainder will be paid to Contractor. All Contract retention shall be released and paid to Contractor and subcontractors pursuant to California Public Contract Code Section 7107.

3.7.5 Other Retentions. In addition to Contract retentions, the City may deduct from each progress payment an amount necessary to protect City from loss because of: (1) liquidated damages which have accrued as of the date of the application for payment; (2) any sums expended by the City in performing any of Contractor's obligations under the Contract which Contractor has failed to perform or has performed inadequately; (3) defective Work not remedied; (4) stop notices as allowed by state law; (5) reasonable doubt that the Work can be completed for the unpaid balance of the Total Contract Price or within the scheduled completion date; (6) unsatisfactory prosecution of the Work by Contractor; (7) unauthorized deviations from the Contract;

(8) failure of Contractor to maintain or submit on a timely basis proper and sufficient documentation as required by the Contract or by City during the prosecution of the Work; (9) erroneous or false estimates by Contractor of the value of the Work performed; (10) any sums representing expenses, losses, or damages as determined by the City, incurred by the City for which Contractor is liable under the Contract; and (11) any other sums which the City is entitled to recover from Contractor under the terms of the Contract or pursuant to state law, including Section 1727 of the California Labor Code. The failure by the City to deduct any of these sums from a progress payment shall not constitute a waiver of the City's right to such sums.

3.7.6 Substitutions for Contract Retentions. In accordance with California Public Contract Code Section 22300, the City will permit the substitution of securities for any monies withheld by the City to ensure performance under the Contract. At the request and expense of Contractor, securities equivalent to the amount withheld shall be deposited with the City, or with a state or federally chartered bank in California as the escrow agent, and thereafter the City shall then pay such monies to Contractor as they come due. Upon satisfactory completion of the Contract, the securities shall be returned to Contractor. For purposes of this Section and Section 22300 of the Public Contract Code, the term "satisfactory completion of the contract" shall mean the time the City has issued written final acceptance of the Work and filed a Notice of Completion as required by law and provisions of this Contract. Contractor shall be the beneficial owner of any securities substituted for monies withheld and shall receive any interest thereon. The escrow agreement used for the purposes of this Section shall be in the form provided by the City.

3.7.7 Title to Work. As security for partial, progress, or other payments, title to Work for which such payments are made shall pass to the City at the time of payment. To the extent that title has not previously been vested in the City by reason of payments, full title shall pass to the City at delivery of the Work at the destination and time specified in this Contract. Such transferred title shall in each case be good, free and clear from any and all security interests, liens, or other encumbrances. Contractor promises and agrees that it will not pledge, hypothecate, or otherwise encumber the items in any manner that would result in any lien, security interest, charge, or claim upon or against said items. Such transfer of title shall not imply acceptance by the City, nor relieve Contractor from the responsibility to strictly comply with the Contract and shall not relieve Contractor of responsibility for any loss of or damage to items.

3.7.8 Labor and Material Releases. Contractor shall furnish City with labor and material releases from all subcontractors performing work on, or furnishing materials for, the Work governed by this Contract prior to final payment by City.

3.7.9 Prevailing Wages. Contractor is aware of the requirements of California Labor Code Section 1720 et seq., and 1770 et seq., as well as California Code of Regulations, Title 8, Section 16000 et seq., ("Prevailing Wage Laws"), which require the payment of prevailing wage rates and the performance of other requirements on "public works" and "maintenance" projects. Since the Services are being performed as part of an applicable "public works" or "maintenance" project, as defined by the Prevailing Wage Laws, and since the total compensation is $1,000 or more, Contractor agrees to fully comply with such Prevailing Wage Laws. City shall provide Contractor with a copy of the prevailing rates of per diem wages in effect at the commencement of this Contract upon request. Contractor shall make copies of the prevailing rates of per diem wages for each craft, classification or type of worker needed to execute the Services available to interested parties upon request and shall post copies at Contractor's principal place of business and at the project site. Contractor shall defend, indemnify and hold the City, its officials, officers, employees and agents free and harmless from any claim or liability arising out of any failure or alleged failure to comply with the Prevailing Wage Laws. Contractor and any subcontractor shall forfeit a penalty

of up to $200 per calendar day or portion thereof for each worker paid less than the prevailing wage rates.

3.7.10 Apprenticeable Crafts. When Contractor employs workmen in an apprenticeable craft or trade, Contractor shall comply with the provisions of Section 1777.5 of the California Labor Code with respect to the employment of properly registered apprentices upon public works. The primary responsibility for compliance with said section for all apprenticeable occupations shall be with Contractor. The Contractor or any subcontractor that is determined by the Labor Commissioner to have knowingly violated Section 1777.5 shall forfeit as a civil penalty an amount not exceeding $100 for each full calendar day of noncompliance, or such greater amount as provided by law.

3.7.11 Hours of Work. Contractor is advised that eight (8) hours labor constitutes a legal day's work. Pursuant to Section 1813 of the California Labor Code, Contractor shall forfeit a penalty of $25.00 per worker for each day that each worker is permitted to work more than eight (8) hours in any one calendar day and forty (40) hours in any one calendar week, except when payment for overtime is made at not less than one and one-half (1-1/2) times the basic rate for that worker.

3.7.12 Payroll Records. Contractor and each subcontractor shall keep an accurate payroll record, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection with the public work. The payroll records shall be certified and shall be available for inspection at all reasonable hours at the principal office of Contractor in the manner provided in Labor Code section 1776. In the event of noncompliance with the requirements of this section, Contractor shall have 10 days in which to comply subsequent to receipt of written notice specifying in what respects such Contractor must comply with this section. Should noncompliance still be evident after such 10-day period, Contractor shall, as a penalty to City, forfeit not more than $100.00 for each calendar day or portion thereof, for each worker, until strict compliance is effectuated. The amount of the forfeiture is to be determined by the Labor Commissioner. A contractor who is found to have violated the provisions of law regarding wages on Public Works with the intent to defraud shall be ineligible to bid on Public Works contracts for a period of one to three years as determined by the Labor Commissioner. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, such penalties shall be withheld from progress payments then due. The responsibility for compliance with this section is on Contractor. The requirement to submit certified payroll records directly to the Labor Commissioner under Labor Code section 1771.4 shall not apply to work performed on a public works project that is exempt pursuant to the small project exemption specified in Labor Code Section 1771.4.

3.7.13 Contractor and Subcontractor Registration. Pursuant to Labor Code sections 1725.5 and 1771.1, all contractors and subcontractors that wish to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. No bid will be accepted nor any contract entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work. Contractor is directed to review, fill out and execute the Public Works Contractor Registration

Certification attached hereto as Exhibit "E" prior to contract execution. Notwithstanding the foregoing, the contractor registration requirements mandated by Labor Code Sections 1725.5 and 1771.1 shall not apply to work performed on a public works project that is exempt pursuant to the small project exemption specified in Labor Code Sections 1725.5 and 1771.1.

3.7.14 Labor Compliance; Stop Orders. This Project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. It shall be the Contractor's sole responsibility to evaluate and pay the cost of complying with all labor compliance requirements under this Contract and applicable law. Any stop orders issued by the Department of Industrial Relations against Contractor or any subcontractor that affect Contractor's performance of Work, including any delay, shall be Contractor's sole responsibility. Any delay arising out of or resulting from such stop orders shall be considered Contractor caused delay subject to any applicable liquidated damages and shall not be compensable by the City. Contractor shall defend, indemnify and hold the City, its officials, officers, employees and agents free and harmless from any claim or liability arising out of stop orders issued by the Department of Industrial Relations against Contractor or any subcontractor.

3.8 Performance of Work; Jobsite Obligations.

3.8.1 Water Quality Management and Compliance.

3.8.1.1 Water Quality Management and Compliance. Contractor shall keep itself and all subcontractors, staff, and employees fully informed of and in compliance with all local, state and federal laws, rules and regulations that may impact, or be implicated by the performance of the Work including, without limitation, all applicable provisions of the Federal Water Pollution Control Act (33 U.S.C. §§ 1300); the California Porter-Cologne Water Quality Control Act (Cal Water Code §§ 13000-14950); local ordinances regulating discharges of storm water; and any and all regulations, policies, or permits issued pursuant to any such authority regulating the discharge of pollutants, as that term is used in the Porter-Cologne Water Quality Control Act, to any ground or surface water in the State.

3.8.1.2 Compliance with the Statewide Construction General Permit. Contractor shall comply with all conditions of the most recent iteration of the National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction Activity, issued by the California State Water Resources Control Board ("Permit"). It shall be Contractor's sole responsibility to file a Notice of Intent and procure coverage under the Permit for all construction activity which results in the disturbance of more than one acre of total land area or which is part of a larger common area of development or sale. Prior to initiating work, Contractor shall be solely responsible for preparing and implementing a Storm Water Pollution Prevention Plan (SWPPP) as required by the Permit. Contractor shall be responsible for procuring, implementing and complying with the provisions of the Permit and the SWPPP, including the standard provisions, and monitoring and reporting requirements as required by the Permit. The Permit requires the SWPPP to be a "living document" that changes as necessary to meet the conditions and requirements of the job site as it progresses through difference phases of construction and is subject to different weather conditions. It shall be Contractor's sole responsibility to update the SWPPP as necessary to address conditions at the project site.

3.8.1.3 Other Water Quality Rules Regulations and Policies. Contractor shall comply with the lawful requirements of any applicable municipality, drainage City, or local agency regarding discharges of storm water to separate storm drain systems or other

watercourses under their jurisdiction, including applicable requirements in municipal storm water management programs.

3.8.1.4 Cost of Compliance. Storm, surface, nuisance, or other waters may be encountered at various times during construction of The Work. Therefore, the Contractor, by submitting a Bid, hereby acknowledges that it has investigated the risk arising from such waters, has prepared its Bid accordingly, and assumes any and all risks and liabilities arising therefrom.

3.8.1.5 Liability for Non-Compliance. Failure to comply with the Permit is a violation of federal and state law. Pursuant to the indemnification provisions of this Contract, Contractor hereby agrees to defend, indemnify and hold harmless the City and its officials, officers, employees, volunteers and agents for any alleged violations. In addition, City may seek damages from Contractor for any delay in completing the Work in accordance with the Contract, if such delay is caused by or related to Contractor's failure to comply with the Permit.

3.8.1.6 Reservation of Right to Defend. City reserves the right to defend any enforcement action brought against the City for Contractor's failure to comply with the Permit or any other relevant water quality law, regulation, or policy. Pursuant to the indemnification provisions of this Contract, Contractor hereby agrees to be bound by, and to reimburse the City for the costs (including the City's attorney's fees) associated with, any settlement reached between the City and the relevant enforcement entity.

3.8.1.7 Training. In addition to the standard of performance requirements set forth in paragraph 3.4, Contractor warrants that all employees and subcontractors shall have sufficient skill and experience to perform the Work assigned to them without impacting water quality in violation of the laws, regulations and policies described in paragraph 3.8.1. Contractor further warrants that it, its employees and subcontractors will receive adequate training, as determined by City, regarding the requirements of the laws, regulations and policies described in paragraph 3.8.1 as they may relate to the Work provided under this Agreement. Upon request, City will provide the Contractor with a list of training programs that meet the requirements of this paragraph.

3.8.2 Safety. Contractor shall execute and maintain its work so as to avoid injury or damage to any person or property. Contractor shall comply with the requirements of the specifications relating to safety measures applicable in particular operations or kinds of work. In carrying out its Work, Contractor shall at all times be in compliance with all applicable local, state and federal laws, rules and regulations, and shall exercise all necessary precautions for the safety of employees appropriate to the nature of the Work and the conditions under which the Work is to be performed. Safety precautions as applicable shall include, but shall not be limited to, adequate life protection and lifesaving equipment; adequate illumination for underground and night operations; instructions in accident prevention for all employees, such as machinery guards, safe walkways, scaffolds, ladders, bridges, gang planks, confined space procedures, trenching and shoring, fall protection and other safety devices, equipment and wearing apparel as are necessary or lawfully required to prevent accidents or injuries; and adequate facilities for the proper inspection and maintenance of all safety measures. Furthermore, Contractor shall prominently display the names and telephone numbers of at least two medical doctors practicing in the vicinity of the Project, as well as the telephone number of the local ambulance service, adjacent to all telephones at the Project site.

3.8.3 Laws and Regulations. Contractor shall keep itself fully informed of and in

compliance with all local, state and federal laws, rules and regulations in any manner affecting the performance of the Contract or the Work, including all Cal/OSHA requirements, and shall give all notices required by law. Contractor shall be liable for all violations of such laws and regulations in connection with Work. If Contractor observes that the drawings or specifications are at variance with any law, rule or regulation, it shall promptly notify the City in writing. Any necessary changes shall be made by written change order. If Contractor performs any work knowing it to be contrary to such laws, rules and regulations and without giving written notice to the City, Contractor shall be solely responsible for all costs arising therefrom. City is a public entity of the State of California subject to certain provisions of the Health & Safety Code, Government Code, Public Contract Code, and Labor Code of the State. It is stipulated and agreed that all provisions of the law applicable to the public contracts of a municipality are a part of this Contract to the same extent as though set forth herein and will be complied with. Contractor shall defend, indemnify and hold City, its officials, officers, employees and agents free and harmless, pursuant to the indemnification provisions of this Contract, from any claim or liability arising out of any failure or alleged failure to comply with such laws, rules or regulations.

3.8.4 Permits and Licenses. Contractor shall be responsible for securing City permits and licenses necessary to perform the Work described herein, including, but not limited to, any required business license. While Contractor will not be charged a fee for any City permits, Contractor shall pay the City's business license fee, if any. Any ineligible contractor or subcontractor pursuant to Labor Code Sections 1777.1 and 1777.7 may not perform work on this Project.

3.8.5 Trenching Work. If the Total Contract Price exceeds $25,000 and if the Work governed by this Contract entails excavation of any trench or trenches five (5) feet or more in depth, Contractor shall comply with all applicable provisions of the California Labor Code, including Section 6705. To this end, Contractor shall submit for City's review and approval a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trench or trenches. If such plan varies from the shoring system standards, the plan shall be prepared by a registered civil or structural engineer.

3.8.6 Hazardous Materials and Differing Conditions. As required by California Public Contract Code Section 7104, if this Contract involves digging trenches or other excavations that extend deeper than four (4) feet below the surface, Contractor shall promptly, and prior to disturbance of any conditions, notify City of: (1) any material discovered in excavation that Contractor believes to be a hazardous waste that is required to be removed to a Class I, Class II or Class III disposal site; (2) subsurface or latent physical conditions at the site differing from those indicated by City; and (3) unknown physical conditions of an unusual nature at the site, significantly different from those ordinarily encountered in such contract work. Upon notification, City shall promptly investigate the conditions to determine whether a change order is appropriate. In the event of a dispute, Contractor shall not be excused from any scheduled completion date and shall proceed with all Work to be performed under the Contract, but shall retain all rights provided by the Contract or by law for making protests and resolving the dispute.

3.8.7 Underground Utility Facilities. To the extent required by Section 4215 of the California Government Code, City shall compensate Contractor for the costs of: (1) locating and repairing damage to underground utility facilities not caused by the failure of Contractor to exercise reasonable care; (2) removing or relocating underground utility facilities not indicated in the construction drawings; and (3) equipment necessarily idled during such work. Contractor shall not be assessed liquidated damages for delay caused by failure of City to provide for removal or

relocation of such utility facilities.

3.8.8 Air Quality. Contractor must fully comply with all applicable laws, rules and regulations in furnishing or using equipment and/or providing services, including, but not limited to, emissions limits and permitting requirements imposed by the California Air Resources Board (CARB). Although CARB limits and requirements are more broad, Contractor shall specifically be aware of their application to "portable equipment", which definition is considered by CARB to include any item of equipment with a fuel-powered engine. Contractor shall indemnify City against any fines or penalties imposed by CARB, or any other governmental or regulatory agency for violations of applicable laws, rules and/or regulations by Contractor, its subcontractors, or others for whom Contractor is responsible under its indemnity obligations provided for in this Agreement.

3.8.9 State Recycling Mandates. Contractor shall comply with State Recycling Mandates. Any recyclable materials/debris collected by the contractor that can be feasibly diverted via reuse or recycling must be hauled by the appropriate handler for reuse or recycling.

3.9 Completion of Work. When Contractor determines that it has completed the Work required herein, Contractor shall so notify City in writing and shall furnish all labor and material releases required by this Contract. City shall thereupon inspect the Work. If the Work is not acceptable to the City, the City shall indicate to Contractor in writing the specific portions or items of Work which are unsatisfactory or incomplete. Once Contractor determines that it has completed the incomplete or unsatisfactory Work, Contractor may request a reinspection by the City. Once the Work is acceptable to City, City shall pay to Contractor the Total Contract Price remaining to be paid, less any amount which City may be authorized or directed by law to retain. Payment of retention proceeds due to Contractor shall be made in accordance with Section 7107 of the California Public Contract Code.

3.10 Claims; Government Code Claim Compliance.

3.10.1 Intent. Effective January 1, 1991, Section 20104 et seq., of the California Public Contract Code prescribes a process utilizing informal conferences, non-binding judicial supervised mediation, and judicial arbitration to resolve disputes on construction claims of $375,000 or less. Effective January 1, 2017, Section 9204 of the Public Contract Code prescribes a process for negotiation and mediation to resolve disputes on construction claims. The intent of this Section is to implement Sections 20104 et seq. and Section 9204 of the California Public Contract Code. This Section shall be construed to be consistent with said statutes.

3.10.2 Claims. For purposes of this Section, “Claim” means a separate demand by the Contractor, after a change order duly requested in accordance with the terms of this Contract has been denied by the City, for (A) a time extension, (B) payment of money or damages arising from Work done by or on behalf of the Contractor pursuant to the Contract, or (C) an amount the payment of which is disputed by the City. Claims governed by this Section may not be filed unless and until the Contractor completes all procedures for giving notice of delay or change and for the requesting of a time extension or change order, including but not necessarily limited to the change order procedures contained herein, and Contractor’s request for a change has been denied in whole or in part. Claims governed by this Section must be filed no later than fourteen (14) days after a request for change has been denied in whole or in part or after any other event giving rise to the Claim. The Claim shall be submitted in writing to the City and shall include on its first page the following in 16 point capital font: “THIS IS A CLAIM.” Furthermore, the claim shall include the documents necessary to substantiate the claim. Nothing in this Section is intended to extend the time limit or supersede notice requirements otherwise provided by contract for the filing of claims,

including all requirements pertaining to compensation or payment for extra Work, disputed Work, and/or changed conditions. Failure to follow such contractual requirements shall bar any claims or subsequent lawsuits for compensation or payment thereon.

3.10.3 Supporting Documentation. The Contractor shall submit all claims in the following format:

3.10.3.1 Summary of claim merit and price, reference Contract Document provisions pursuant to which the claim is made

3.10.3.2 List of documents relating to claim:

(A) Specifications

(B) Drawings

(C) Clarifications (Requests for Information)

(D) Schedules

(E) Other

3.10.3.3 Chronology of events and correspondence

3.10.3.4 Analysis of claim merit

3.10.3.5 Analysis of claim cost

3.10.3.6 Time impact analysis in CPM format

3.10.3.7 If Contractor's claim is based in whole or in part on an allegation of errors or omissions in the Drawings or Specifications for the Project, Contractor shall provide a summary of the percentage of the claim subject to design errors or omissions and shall obtain a certificate of merit in support of the claim of design errors and omissions.

3.10.3.8 Cover letter and certification of validity of the claim, including any claims from subcontractors of any tier, in accordance with Government Code section 12650 *et seq*.

3.10.4 City's Response. Upon receipt of a claim pursuant to this Section, City shall conduct a reasonable review of the claim and, within a period not to exceed 45 days, shall provide the Contractor a written statement identifying what portion of the claim is disputed and what portion is undisputed. Any payment due on an undisputed portion of the claim will be processed and made within 60 days after the public entity issues its written statement.

3.10.4.1 If City needs approval from its governing body to provide the Contractor a written statement identifying the disputed portion and the undisputed portion of the claim, and the governing body does not meet within the 45 days or within the mutually agreed to extension of time following receipt of a claim sent by registered mail or certified mail, return receipt requested, City shall have up to three days following the next duly publicly noticed meeting of the governing body after the 45-day period, or extension, expires to provide the Contractor a written statement identifying the disputed portion and the undisputed portion.

3.10.4.2 Within 30 days of receipt of a claim, City may request in writing additional documentation supporting the claim or relating to defenses or claims City may have against the Contractor. If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of City and the Contractor.

3.10.4.3 City's written response to the claim, as further documented, shall be submitted to the Contractor within 30 days (if the claim is less than $50,000, within 15 days) after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information or requested documentation, whichever is greater.

3.10.5 Meet and Confer. If the Contractor disputes City's written response, or City fails to respond within the time prescribed, the Contractor may so notify City, in writing, either within 15 days of receipt of City's response or within 15 days of City's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand, City shall schedule a meet and confer conference within 30 days for settlement of the dispute.

3.10.6 Mediation. Within 10 business days following the conclusion of the meet and confer conference, if the claim or any portion of the claim remains in dispute, City shall provide the Contractor a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after City issues its written statement. Any disputed portion of the claim, as identified by the Contractor in writing, shall be submitted to nonbinding mediation, with City and the Contractor sharing the associated costs equally. City and Contractor shall mutually agree to a mediator within 10 business days after the disputed portion of the claim has been identified in writing, unless the parties agree to select a mediator at a later time.

3.10.6.1 If the Parties cannot agree upon a mediator, each Party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the claim. Each Party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator.

3.10.6.2 For purposes of this section, mediation includes any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the Parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this section.

3.10.6.3 Unless otherwise agreed to by City and the Contractor in writing, the mediation conducted pursuant to this section shall excuse any further obligation under Section 20104.4 to mediate after litigation has been commenced.

3.10.6.4 The mediation shall be held no earlier than the date the Contractor completes the Work or the date that the Contractor last performs Work, whichever is earlier. All unresolved claims shall be considered jointly in a single mediation, unless a new unrelated claim arises after mediation is completed.

3.10.7 Procedures After Mediation. If following the mediation, the claim or any portion remains in dispute, the Contractor must file a claim pursuant to Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of

the Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time the Contractor submits his or her written claim pursuant to subdivision (a) until the time the claim is denied, including any period of time utilized by the meet and confer conference or mediation.

3.10.8 Civil Actions. The following procedures are established for all civil actions filed to resolve claims subject to this Section:

3.10.8.1 Within 60 days, but no earlier than 30 days, following the filing or responsive pleadings, the court shall submit the matter to non-binding mediation unless waived by mutual stipulation of both parties or unless mediation was held prior to commencement of the action in accordance with Public Contract Code section 9204 and the terms of these procedures.. The mediation process shall provide for the selection within 15 days by both parties of a disinterested third person as mediator, shall be commenced within 30 days of the submittal, and shall be concluded within 15 days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court.

3.10.8.2 If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1114.11 of that code. The Civil Discovery Act of 1986 (Article 3 (commencing with Section 2016) of Chapter 3 of Title 3 of Part 4 of the Code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration.

3.10.8.3 In addition to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, (A) arbitrators shall, when possible, be experienced in construction law, and (B) any party appealing an arbitration award who does not obtain a more favorable judgment shall, in addition to payment of costs and fees under that chapter, also pay the attorney's fees on appeal of the other party.

3.10.9 Government Code Claims. In addition to any and all contract requirements pertaining to notices of and requests for compensation or payment for extra work, disputed work, claims and/or changed conditions, Contractor must comply with the claim procedures set forth in Government Code sections 900 et seq. prior to filing any lawsuit against the City. Such Government Code claims and any subsequent lawsuit based upon the Government Code claims shall be limited to those matters that remain unresolved after all procedures pertaining to extra work, disputed work, claims, and/or changed conditions have been followed by Contractor. If no such Government Code claim is submitted, or if any prerequisite contractual requirements are not otherwise satisfied as specified herein, Contractor shall be barred from bringing and maintaining a valid lawsuit against the City. A Government Code claim must be filed no earlier than the date the work is completed or the date the Contractor last performs work on the Project, whichever occurs first. A Government Code claim shall be inclusive of all unresolved claims unless a new unrelated claim arises after the Government Code claim is submitted.

3.10.10 Non-Waiver. City's failure to respond to a claim from the Contractor within the time periods described in this Section or to otherwise meet the time requirements of this Section shall result in the claim being deemed rejected in its entirety. City's failure to respond shall not waive City's rights to any subsequent procedures for the resolution of disputed claims.

3.11 Loss and Damage. Except as may otherwise be limited by law, Contractor shall be responsible for all loss and damage which may arise out of the nature of the Work agreed to herein,

or from the action of the elements, or from any unforeseen difficulties which may arise or be encountered in the prosecution of the Work until the same is fully completed and accepted by City.

3.12 Indemnification.

3.12.1 Scope of Indemnity**.** To the fullest extent permitted by law, Contractor shall defend, indemnify and hold the City, its officials, employees, agents and authorized volunteers free and harmless from any and all claims, demands, causes of action, suits, actions, proceedings, costs, expenses, liability, judgments, awards, decrees, settlements, loss, damage or injury of any kind, in law or equity, to property or persons, including wrongful death, (collectively, "Claims") in any manner arising out of, pertaining to, or incident to any alleged acts, errors or omissions, or willful misconduct of Contractor, its officials, officers, employees, subcontractors, consultants or agents in connection with the performance of the Contractor's services, the Project or this Agreement, including without limitation the payment of all consequential damages, expert witness fees and attorneys' fees and other related costs and expenses. Notwithstanding the foregoing, to the extent required by Civil Code section 2782, Contractor's indemnity obligation shall not apply to liability for damages for death or bodily injury to persons, injury to property, or any other loss, damage or expense arising from the sole or active negligence or willful misconduct of the City or the City's agents, servants, or independent contractors who are directly responsible to the City, or for defects in design furnished by those persons.

3.12.2 Additional Indemnity Obligations**.** Contractor shall defend, with counsel of City's choosing and at Contractor's own cost, expense and risk, any and all Claims covered by this section that may be brought or instituted against City or its officials, employees, agents and authorized volunteers. In addition, Contractor shall pay and satisfy any judgment, award or decree that may be rendered against City or its officials, employees, agents and authorized volunteers as part of any such claim, suit, action or other proceeding. Contractor shall also reimburse City for the cost of any settlement paid by City or its officials, employees, agents and authorized volunteers as part of any such claim, suit, action or other proceeding. Such reimbursement shall include payment for City's attorney's fees and costs, including expert witness fees. Contractor shall reimburse City and its officials, employees, agents and authorized volunteers, for any and all legal expenses and costs incurred by each of them in connection therewith or in enforcing the indemnity herein provided. Contractor's obligation to indemnify shall not be restricted to insurance proceeds, if any, received by the City, its officials, employees, agents and authorized volunteers.

3.13 Insurance.

3.13.1 Time for Compliance. Contractor shall not commence Work under this Contract until it has provided evidence satisfactory to the City that it has secured all insurance required under this section. In addition, Contractor shall not allow any subcontractor to commence work on any subcontract until it has provided evidence satisfactory to the City that the subcontractor has secured all insurance required under this section. Failure to provide and maintain all required insurance shall be grounds for the City to terminate this Contract for cause.

3.13.2 Minimum Requirements. Contractor shall, at its expense, procure and maintain for the duration of the Contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the Work hereunder by Contractor, its agents, representatives, employees or subcontractors. Contractor shall also require all of its subcontractors to procure and maintain the same insurance for the duration of the Contract. Such insurance shall meet at least the following minimum levels of

coverage:

3.13.2.1 Minimum Scope of Insurance. Coverage shall be at least as broad as the latest version of the following: (1) *General Liability:* Insurance Services Office Commercial General Liability coverage (occurrence form CG 00 01) OR Insurance Services Office Owners and Contractors Protective Liability Coverage Form (CG 00 09 11 88) (coverage for operations of designated contractor); (2) *Automobile Liability:* Insurance Services Office Business Auto Coverage form number CA 00 01, code 1 (any auto); and (3) *Workers' Compensation and Employer's Liability:* Workers' Compensation insurance as required by the State of California and Employer's Liability Insurance. Policies shall not contain exclusions contrary to this Contract.

3.13.2.2 Minimum Limits of Insurance. Contractor shall maintain limits no less than: (1) *General Liability:* $5,000,000 per occurrence and $5,000,000 aggregate for bodily injury, personal injury and property damage; (2) *Automobile Liability:* $5,000,000 per accident for bodily injury and property damage; and (3) *Workers' Compensation and Employer's Liability:* Workers' compensation limits as required by the Labor Code of the State of California. Employer's Liability limits of $1,000,000 each accident, policy limit bodily injury or disease, and each employee bodily injury or disease. Defense costs shall be available in addition to the limits. Notwithstanding the minimum limits specified herein, any available coverage shall be provided to the parties required to be named as additional insureds pursuant to this Contract.

3.13.3 Insurance Endorsements. The insurance policies shall contain the following provisions, or Contractor shall provide endorsements (amendments) on forms supplied or approved by the City to add the following provisions to the insurance policies:

3.13.3.1 General Liability. (1) Such policy shall give the City, its officials, employees, agents and authorized volunteers additional insured status using ISO endorsements CG20 10 10 01 plus CG20 37 10 01, or endorsements providing the exact same coverage, with respect to the Work or operations performed by or on behalf of Contractor, including materials, parts or equipment furnished in connection with such work; (2) all policies shall waive or shall permit Contractor to waive all rights of subrogation which may be obtained by the Contractor or any insurer by virtue of payment of any loss or any coverage provided to any person named as an additional insured pursuant to this Contract, and Contractor agrees to waive all such rights of subrogation; and (3) the insurance coverage shall be primary insurance as respects the City, its officials, employees, agents and authorized volunteers, or if excess, shall stand in an unbroken chain of coverage excess of Contractor's scheduled underlying coverage. Any insurance or self-insurance maintained by the City, its officials, employees, agents and authorized volunteers shall be excess of Contractor's insurance and shall not be called upon to contribute with it.

3.13.3.2 Automobile Liability. (1) Such policy shall give the City, its officials, employees, agents and authorized volunteers additional insured status with respect to the ownership, operation, maintenance, use, loading or unloading of any auto owned, leased, hired or borrowed by Contractor or for which Contractor is responsible; (2) all policies shall waive or shall permit Contractor to waive all rights of subrogation which may be obtained by the Contractor or any insurer by virtue of payment of any loss or any coverage provided to any person named as an additional insured pursuant to this Contract, and Contractor agrees to waive all such rights of subrogation; and (3) the insurance coverage shall be primary insurance as respects the City, its officials, employees, agents and authorized volunteers, or if excess, shall stand in an unbroken chain of coverage excess of Contractor's scheduled underlying coverage. Any insurance or self-insurance maintained by the City, its officials, employees, agents and authorized volunteers shall be excess of Contractor's insurance and shall not be called upon to contribute with it in any way.

3.13.3.3 Workers' Compensation and Employer's Liability Coverage. The insurer shall agree to waive all rights of subrogation against the City, its officials, employees, agents and authorized volunteers for losses paid under the terms of the insurance policy which arise from work performed by Contractor.

3.13.3.4 All Coverages. Each insurance policy required by this Contract shall be endorsed to state that: (1) coverage shall not be suspended, voided, reduced or canceled except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the City; and (2) any failure to comply with reporting or other provisions of the policies, including breaches of warranties, shall not affect coverage provided to the City, its officials, employees, agents and authorized volunteers.

3.13.4 Separation of Insureds; No Special Limitations. All insurance required by this Section shall contain standard separation of insureds provisions. In addition, such insurance shall not contain any special limitations on the scope of protection afforded to the City, its officials, employees, agents and authorized volunteers.

3.13.5 Deductibles and Self-Insurance Retentions. Any deductibles or self-insured retentions must be declared to and approved by the City. Contractor shall guarantee that, at the option of the City, either: (1) the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the City, its officials, employees, agents and authorized volunteers; or (2) the Contractor shall procure a bond or other financial guarantee acceptable to the City guaranteeing payment of losses and related investigation costs, claims and administrative and defense expenses.

3.13.6 Acceptability of Insurers. Insurance is to be placed with insurers with a current A.M. Best's rating no less than A:VII, licensed to do business in California, and satisfactory to the City. Exception may be made for the State Compensation Insurance Fund when not specifically rated.

3.13.7 Verification of Coverage. Contractor shall furnish City with original certificates of insurance and endorsements effecting coverage required by this Contract on forms satisfactory to the City. The certificates and endorsements for each insurance policy shall be signed by a person authorized by that insurer to bind coverage on its behalf, and shall be on forms supplied or approved by the City. All certificates and endorsements must be received and approved by the City before work commences. The City reserves the right to require complete, certified copies of all required insurance policies, at any time.

3.13.8 Subcontractors. All subcontractors shall meet the requirements of this Section before commencing Work. Contractor shall furnish separate certificates and endorsements for each subcontractor. Subcontractor policies of General Liability insurance shall name the City, its officials, employees, agents and authorized volunteers as additional insureds using form ISO 20 38 04 13 or endorsements providing the exact same coverage. All coverages for subcontractors shall be subject to all of the requirements stated herein except as otherwise agreed to by the City in writing.

3.13.9 Reporting of Claims. Contractor shall report to the City, in addition to Contractor's insurer, any and all insurance claims submitted by Contractor in connection with the Work under this Contract.

3.14 Bond Requirements.

3.14.1 Payment Bond. If required by law or otherwise specifically requested by City in Exhibit "C" attached hereto and incorporated herein by reference, Contractor shall execute and provide to City concurrently with this Contract a Payment Bond in an amount required by the City and in a form provided or approved by the City. If such bond is required, no payment will be made to Contractor until the bond has been received and approved by the City.

3.14.2 Performance Bond. If specifically requested by City in Exhibit "C" attached hereto and incorporated herein by reference, Contractor shall execute and provide to City concurrently with this Contract a Performance Bond in an amount required by the City and in a form provided or approved by the City. If such bond is required, no payment will be made to Contractor until the bond has been received and approved by the City.

3.14.3 Bond Provisions. Should, in City's sole opinion, any bond become insufficient or any surety be found to be unsatisfactory, Contractor shall renew or replace the effected bond within (ten) 10 days of receiving notice from City. In the event the surety or Contractor intends to reduce or cancel any required bond, at least thirty (30) days prior written notice shall be given to the City, and Contractor shall post acceptable replacement bonds at least ten (10) days prior to expiration of the original bonds. No further payments shall be deemed due or will be made under this Contract until any replacement bonds required by this Section are accepted by the City. To the extent, if any, that the Total Contract Price is increased in accordance with the Contract, Contractor shall, upon request of the City, cause the amount of the bond to be increased accordingly and shall promptly deliver satisfactory evidence of such increase to the City. If Contractor fails to furnish any required bond, the City may terminate the Contract for cause.

3.14.4 Surety Qualifications. Only bonds executed by an admitted surety insurer, as defined in California Code of Civil Procedure Section 995.120, shall be accepted. If a California-admitted surety insurer issuing bonds does not meet these requirements, the insurer will be considered qualified if it is in conformance with Section 995.660 of the California Code of Civil Procedure, and proof of such is provided to the City.

3.15 Warranty. Contractor warrants all Work under the Contract (which for purposes of this Section shall be deemed to include unauthorized work which has not been removed and any non-conforming materials incorporated into the Work) to be of good quality and free from any defective or faulty material and workmanship. Contractor agrees that for a period of one year (or the period of time specified elsewhere in the Contract or in any guarantee or warranty provided by any manufacturer or supplier of equipment or materials incorporated into the Work, whichever is later) after the date of final acceptance, Contractor shall within ten (10) days after being notified in writing by the City of any defect in the Work or non-conformance of the Work to the Contract, commence and prosecute with due diligence all Work necessary to fulfill the terms of the warranty at its sole cost and expense. Contractor shall act sooner as requested by the City in response to an emergency. In addition, Contractor shall, at its sole cost and expense, repair and replace any portions of the Work (or work of other contractors) damaged by its defective Work or which becomes damaged in the course of repairing or replacing defective Work. For any Work so corrected, Contractor's obligation hereunder to correct defective Work shall be reinstated for an additional one year period, commencing with the date of acceptance of such corrected Work. Contractor shall perform such tests as the City may require to verify that any corrective actions, including, without limitation, redesign, repairs, and replacements comply with the requirements of the Contract. All costs associated with such corrective actions and testing, including the removal, replacement, and reinstitution of equipment and materials necessary to gain access, shall be the sole responsibility

of Contractor. All warranties and guarantees of subcontractors, suppliers and manufacturers with respect to any portion of the Work, whether express or implied, are deemed to be obtained by Contractor for the benefit of the City, regardless of whether or not such warranties and guarantees have been transferred or assigned to the City by separate agreement and Contractor agrees to enforce such warranties and guarantees, if necessary, on behalf of the City. In the event that Contractor fails to perform its obligations under this Section, or under any other warranty or guaranty under this Contract, to the reasonable satisfaction of the City, the City shall have the right to correct and replace any defective or non-conforming Work and any work damaged by such work or the replacement or correction thereof at Contractor's sole expense. Contractor shall be obligated to fully reimburse the City for any expenses incurred hereunder upon demand.

3.16 Employee/Labor Certifications.

3.16.1 Contractor's Labor Certification. By its signature hereunder, Contractor certifies that he is aware of the provisions of Section 3700 of the California Labor Code which require every employer to be insured against liability for Worker's Compensation or to undertake self-insurance in accordance with the provisions of that Code, and agrees to comply with such provisions before commencing the performance of the Work. A certification form for this purpose, which is attached to this Contract as Exhibit "D" and incorporated herein by reference, shall be executed simultaneously with this Contract.

3.16.2 Equal Opportunity Employment. Contractor represents that it is an equal opportunity employer and that it shall not discriminate against any employee or applicant for employment because of race, religion, color, national origin, ancestry, sex, age or other interests protected by the State or Federal Constitutions. Such non-discrimination shall include, but not be limited to, all activities related to initial employment, upgrading, demotion, transfer, recruitment or recruitment advertising, layoff or termination.

3.16.3 Verification of Employment Eligibility. By executing this Contract, Contractor verifies that it fully complies with all requirements and restrictions of state and federal law respecting the employment of undocumented aliens, including, but not limited to, the Immigration Reform and Control Act of 1986, as may be amended from time to time, and shall require all subcontractors and sub-subcontractors to comply with the same.

3.17 General Provisions.

3.17.1 City's Representative. The City hereby designates the General Manager, or his or her designee, to act as its representative for the performance of this Contract ("City's Representative"). City's Representative shall have the power to act on behalf of the City for all purposes under this Contract. Contractor shall not accept direction or orders from any person other than the City's Representative or his or her designee.

3.17.2 Contractor's Representative. Before starting the Work, Contractor shall submit in writing the name, qualifications and experience of its proposed representative who shall be subject to the review and approval of the City ("'Contractor's Representative"). Following approval by the City, Contractor's Representative shall have full authority to represent and act on behalf of Contractor for all purposes under this Contract. Contractor's Representative shall supervise and direct the Work, using his best skill and attention, and shall be responsible for all construction means, methods, techniques, sequences and procedures and for the satisfactory coordination of all portions of the Work under this Contract. Contractor's Representative shall devote full time to the Project and either he or his designee, who shall be acceptable to the City,

shall be present at the Work site at all times that any Work is in progress and at any time that any employee or subcontractor of Contractor is present at the Work site. Arrangements for responsible supervision, acceptable to the City, shall be made for emergency Work which may be required. Should Contractor desire to change its Contractor's Representative, Contractor shall provide the information specified above and obtain the City's written approval.

3.17.3 Termination. This Contract may be terminated by City at any time, either with or without cause, by giving Contractor three (3) days advance written notice. In the event of termination by City for any reason other than the fault of Contractor, City shall pay Contractor for all Work performed up to that time as provided herein. In the event of breach of the Contract by Contractor, City may terminate the Contract immediately without notice, may reduce payment to Contractor in the amount necessary to offset City's resulting damages, and may pursue any other available recourse against Contractor. Contractor may not terminate this Contract except for cause. In the event this Contract is terminated in whole or in part as provided, City may procure, upon such terms and in such manner as it may determine appropriate, services similar to those terminated. Further, if this Contract is terminated as provided, City may require Contractor to provide all finished or unfinished documents, data, diagrams, drawings, materials or other matter prepared or built by Contractor in connection with its performance of this Contract.

3.17.4 Contract Interpretation. Should any question arise regarding the meaning or import of any of the provisions of this Contract or written or oral instructions from City, the matter shall be referred to City's Representative, whose decision

3.17.5 Anti-Trust Claims. This provision shall be operative if this Contract is applicable to California Public Contract Code Section 7103.5. In entering into this Contract to supply goods, services or materials, Contractor hereby offers and agrees to assign to the City all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2, commencing with Section 16700, of Part 2 of Division 7 of the Business and Professions Code) arising from purchases of goods, services, or materials pursuant to the Contract. This assignment shall be made and become effective at the time the City tender final payment to Contractor, without further acknowledgment by the Parties.

3.17.6 Notices. All notices hereunder and communications regarding interpretation of the terms of the Contract or changes thereto shall be provided by the mailing thereof by registered or certified mail, return receipt requested, postage prepaid and addressed as follows:

CONTRACTOR:

American Paving Co
525 W Alluvial Ave
Fresno, CA 93711

Stephen J. Poindexter, President

CITY:

City of Merced
2525 "O" Street
Merced, California 95340
Attn: Mr. Michael R. Beltran II, PE
City Engineer

Any notice so given shall be considered received by the other Party three (3) days after deposit in the U.S. Mail as stated above and addressed to the Party at the above address. Actual notice shall be deemed adequate notice on the date actual notice occurred, regardless of the method of service.

3.17.7 Time of Essence. Time is of the essence in the performance of this Contract.

3.17.8 Assignment Forbidden. Contractor shall not, either voluntarily or by action of law, assign or transfer this Contract or any obligation, right, title or interest assumed by Contractor herein without the prior written consent of City. If Contractor attempts an assignment or transfer of this Contract or any obligation, right, title or interest herein, City may, at its option, terminate and revoke the Contract and shall thereupon be relieved from any and all obligations to Contractor or its assignee or transferee.

3.17.9 No Third Party Beneficiaries. There are no intended third party beneficiaries of any right or obligation assumed by the Parties.

3.17.10 Governing Laws; Venue. This Agreement shall be interpreted in accordance with the laws of the State of California. If any action is brought to interpret or enforce any term of this Agreement, the action shall be brought in a state or federal court situated in the County of Merced, State of California.

3.17.11 Counterparts. This Contract may be executed in counterparts, each of which shall constitute an original.

3.17.12 Successors. The Parties do for themselves, their heirs, executors, administrators, successors, and assigns agree to the full performance of all of the provisions contained in this Contract.

3.17.13 [Reserved]

3.17.14 Solicitation. Contractor maintains and warrants that it has not employed nor retained any company or person, other than a bona fide employee working solely for Contractor, to solicit or secure this Contract. Further, Contractor warrants that it has not paid nor has it agreed to pay any company or person, other than a bona fide employee working solely for Contractor, any fee, commission, percentage, brokerage fee, gift or other consideration contingent upon or resulting from the award or making of this Contract. For breach or violation of this warranty, City shall have the right to terminate this Contract without liability.

3.17.15 Conflict of Interest. Contractor maintains and warrants that it has not employed nor retained any company or person, other than a bona fide employee working solely for Contractor, to solicit or secure this Agreement. Further, Contractor warrants that it has not paid nor has it agreed to pay any company or person, other than a bona fide employee working solely for Contractor, any fee, commission, percentage, brokerage fee, gift or other consideration contingent upon or resulting from the award or making of this Agreement. For breach or violation of this warranty, City shall have the right to rescind this Agreement without liability. For the term of this Contract, no official, officer or employee of City, during the term of his or her service with City, shall have any direct interest in this Contract, or obtain any present or anticipated material benefit arising therefrom. In addition, Contractor agrees to file, or to cause its employees or subcontractors to file, a Statement of Economic Interest with the City's Filing Officer as required under state law in the performance of the Work.

3.17.16 Certification of License.

3.17.16.1 Contractor certifies that as of the date of execution of this Contract, Contractor has a current contractor's license of the classification indicated below under Contractor's signature.

3.17.16.2 Contractors are required by law to be licensed and regulated by the Contractors' State License Board which has jurisdiction to investigate complaints against contractors if a complaint regarding a patent act or omission is filed within four (4) years of the date of the alleged violation. A complaint regarding a latent act or omission pertaining to structural defects must be filed within ten (10) years of the date of the alleged violation. Any questions concerning a contractor may be referred to the Registrar, Contractors' State License Board, P.O. Box 26000, Sacramento, California 95826.

3.17.17 Authority to Enter Contract. Each Party warrants that the individuals who have signed this Contract have the legal power, right and authority to make this Contract and bind each respective Party.

3.17.18 Entire Contract; Modification. This Contract contains the entire agreement of the Parties with respect to the subject matter hereof, and supersedes all prior negotiations, understandings or agreements. This Contract may only be modified by a writing signed by both Parties.

3.17.19 Non-Waiver. None of the provisions of this Agreement shall be considered waived by either party, unless such waiver is specifically specified in writing.

3.17.20 City's Right to Employ Other Contractors. City reserves right to employ other contractors in connection with this Project or other projects.

[SIGNATURES ON NEXT PAGE]

SIGNATURE PAGE FOR CONSTRUCTION CONTRACT
BETWEEN THE CITY OF MERCED
AND AMERICAN PAVING CO.

IN WITNESS WHEREOF, the Parties have entered into this Agreement as of the _____ day of _____, 2023.

CITY OF MERCED

By: _____
Stephanie Dietz
City Manager

AMERICAN PAVING CO.

By: _____

Its: President

Printed Name: Stephen J. Poindexter

ATTEST:

By: _____
Deputy City Clerk

(SEAL)

APPROVED AS TO FORM:

_____
Contractor Printed Name

By: _____
City Attorney

By: _____
Contractor licensed in accordance with an act providing for the registration of contractors.

ACCOUNT DATA:

Project No.: **122061 / CP220061**

Project Account Number(s) / Amount:

Taxpayer ID No.: 77-0004110

Vendor No.: _____

Address: 525 W. Alluvial Avenue
Fresno CA 93711

Phone: (559) 441-1900
Fax: (559) 487-7949
Email: SPoindexter@americanpavingco.com

By: _____
Finance Officer Verification

EXHIBIT “A” - SERVICES / SCHEDULE

The work to be performed includes, but not limited to, construction of two (2) soccer/football fields, two (2) volleyball courts, two (2) tennis courts, a futsal court, a concession/restroom building, an additional restroom building, shade structures, and other utilities and appurtenances.

Such other items or details, not mentioned above, that are required by the Drawings and Technical Specifications Plans, City of Merced Standard Specifications and Typical Details, and the Special Conditions shall be performed, placed, constructed, or installed.

The project is located on the northwest corner of Mission Avenue and Tyler Road in Merced, CA. Bids are required for the entire work described herein.

The work shall be Completed within 180 working days of Notice to Proceed.

BID SCHEDULE 'A' - BASE BID					
ITEM NO.	ITEM	UNIT	QUANTITY	UNIT PRICE	ITEM TOTAL
1	Permits, Bonds, Licenses & Insurance	LS	1	$ 30,000.00	$ 30,000.00
2	Public Convenience and Safety	LS	1	$ 50,000.00	$ 50,000.00
3	Water Pollution Control	LS	1	$ 30,000.00	$ 30,000.00
4	Street Sweeping	LS	1	$ 100.00	$ 100.00
5	Surveying Services	LS	1	$ 30,000.00	$ 30,000.00
6	Monumentation	LS	1	$ 2,500.00	$ 2,500.00
7	Portable Changeable Message Signs	LS	1	$ 15,000.00	$ 15,000.00
8	Site Preparation (Clearing, Grubbing & Disposal)	LS	1	$ 136,000.00	$ 136,000.00
9	Soil Import	LS	1	$ 20,000.00	$ 20,000.00
10	Site Grading (Rough/ Fine)	SF	406,375	$ 2.90	$ 1,178,487.50
11	30" Storm Drain	LF	313	$ 260.00	$ 81,380.00
12	24" Storm Drain	LF	778	$ 175.00	$ 136,150.00
13	18" Storm Drain	LF	621	$ 120.00	$ 74,520.00
14	12" Storm Drain	LF	320	$ 80.00	$ 25,600.00
15	10" Storm Drain	LF	348	$ 70.00	$ 24,360.00
16	8" Storm Drain	LF	1,202	$ 52.00	$ 62,504.00
17	6" Storm Drain	LF	703	$ 52.00	$ 36,556.00
18	Storm Drain Manholes	EA	4	$ 3,500.00	$ 14,000.00
19	Type "C" Catch Basin	EA	4	$ 3,200.00	$ 12,800.00
20	Storm Drain Area Drains	EA	19	$ 2,400.00	$ 45,600.00
21	Storm Drain Outfall	EA	1	$ 4,200.00	$ 4,200.00
22	4" Sewer	LF	440	$ 48.00	$ 21,120.00
23	6" Sewer	LF	1,170	$ 177.00	$ 207,090.00
24	Sewer Manhole	EA	3	$ 5,000.00	$ 15,000.00
25	Sewer Cleanout	EA	2	$ 1,200.00	$ 2,400.00
26	Connect to Existing Sewer Manhole	EA	1	$ 3,000.00	$ 3,000.00
27	10" Water Line (Irrigation Main)	LF	60	$ 120.00	$ 7,200.00
28	3" Water Line	LF	740	$ 42.00	$ 31,080.00
29	1" Water Line	LF	370	$ 30.00	$ 11,100.00
30	10" Water Meter	EA	1	$ 40,000.00	$ 40,000.00
31	3" Water Meter	EA	1	$ 20,000.00	$ 20,000.00
32	Connect to Existing Water Main	EA	2	$ 4,000.00	$ 8,000.00
33	10" Water Line (Offsite)	LF	1,780	$ 90.00	$ 160,200.00
34	Fire Hydrant Assembly	EA	1	$ 14,000.00	$ 14,000.00
35	Electrical	LS	1	$ 618,000.00	$ 618,000.00
36	Parking lot Light Pole w/ 4-head fixture (Site Feature '40')	EA	2	$ 12,000.00	$ 24,000.00

37	Parking Lot Light Pole w/ single-head fixture (Site Feature ‘33’)	EA	2	$ 7,500.00	$ 15,000.00
38	Pedestrian Light Pole w/ fixture (Site Feature ‘15’)	EA	3	$ 11,000.00	$ 33,000.00
39	Concrete Flatwork (Site Finish ‘A’)	SF	77,842	$ 8.60	$ 669,441.20
40	Asphalt Parking Lot with striping (Site Finish ‘B’)	SF	75,619	$ 2.10	$ 158,799.90
41	Plexipave Surfacing Tennis Court Field (Site Finish ‘C’)	SF	5,616	$ 2.00	$ 11,232.00
42	Plexipave Surfacing Tennis Court Striping (Site Finish ‘D’)	LF	1,032	$ 2.00	$ 2,064.00
43	Plexipave Surfacing Futsal Court Field (Site Finish ‘H’)	SF	9,695	$ 2.00	$ 19,390.00
44	Plexipave Surfacing Futsal Court Striping (Site Finish ‘I’)	LF	629	$ 2.00	$ 1,258.00
45	Sand Volleyball Courts (Site Finish ‘E’)	SF	8,631	$ 4.00	$ 34,524.00
46	12” Concrete Mow Curb (Site Feature ‘1’)	LF	215	$ 55.00	$ 11,825.00
47	12” Concrete Curb at Volleyball Courts (Site Feature ‘3’)	LF	215	$ 52.00	$ 11,180.00
48	Thickened Sidewalk Edge at Playground (Site Feature ‘2’)	LF	115	$ 32.00	$ 3,680.00
49	Parking Lot Curbs- Vertical/ Flush- (Site Feature ‘23’)	LF	2,491	$ 20.00	$ 49,820.00
50	Parking Lot Curb & Gutter (Site Feature ‘23’)	LF	654	$ 57.00	$ 37,278.00
51	Vertical Curb at Drop-Off Area (Site Feature ‘42’)	LF	250	$ 23.00	$ 5,750.00
52	Truncated Domes (Site Feature ‘43’)	LF	198	$ 250.00	$ 49,500.00
53	Parking Lot Rolled Curb (Site Feature ‘45’)	LF	60	$ 34.00	$ 2,040.00
54	AC Dike	LF	425	$ 18.00	$ 7,650.00
55	2x4 Header at Limit of Phase 1 (Site Feature ‘50’)	LF	1769	$ 16.00	$ 28,304.00
56	Thickened Sidewalk Edge at Volleyball Courts (Site Feature ‘51’)	LF	164	$ 36.00	$ 5,904.00
57	Directional Signage (Site Feature ‘5’)	EA	2	$ 1,900.00	$ 3,800.00
58	Field Location Signage (Site Feature '6')	EA	2	$ 1,900.00	$ 3,800.00
59	Removable Bollards (Site Feature '7')	EA	6	$ 1,900.00	$ 11,400.00
60	Fixed Bollards (Site Feature '8')	EA	8	$ 1,700.00	$ 13,600.00
61	Picnic Tables (Site Feature '9')	EA	2	$ 2,300.00	$ 4,600.00
62	Accessible Picnic Tables (Site Feature '10')	EA	1	$ 2,800.00	$ 2,800.00
63	Bench (Site Feature '11')	EA	12	$ 2,200.00	$ 26,400.00
64	Drinking Fountain (Site Feature ‘12’)	EA	1	$ 9,500.00	$ 9,500.00

65	Volleyball Poles, Ground Sleeves, and Net (Site Feature '13')	EA	4	$ 2,200.00	$ 8,800.00
66	Dual Post Football Goal (Site Feature '14')	EA	2	$ 13,000.00	$ 26,000.00
67	Soccer Goal and Net (Site Feature '16')	EA	4	$ 6,800.00	$ 27,200.00
68	Restroom/Concessions Building (Site Feature '17')	LS	1	$ 20,000.00	$ 20,000.00
69	ADA Ramp with Truncated Domes (Site Feature '18')	EA	16	$ 1,300.00	$ 20,800.00
70	ADA Parking Stall Signage (Site Feature '19')	EA	8	$ 350.00	$ 2,800.00
71	Tow-Away Signage (Site Feature '20')	EA	1	$ 350.00	$ 350.00
72	No Parking Signage (Site Feature '21')	EA	1	$ 350.00	$ 350.00
73	Drop-Off Signage (Site Feature '22')	EA	1	$ 350.00	$ 350.00
74	Restroom Building (Site Feature '27')	LS	1	$ 20,000.00	$ 20,000.00
75	Tree Grate (Site Feature '30')	EA	1	$ 4,000.00	$ 4,000.00
76	Chain Link Fence at Tennis Court (Site Feature '31')	LF	476	$ 103.00	$ 49,028.00
77	Chain Link Gates At Tennis Court (Site Feature '32')	EA	4	$ 4,600.00	$ 18,400.00
78	Chain Link Fence at Futsal Court (Site Feature '34')	LF	280	$ 111.00	$ 31,080.00
79	Chain Link Gates at Futsal Court (Site Feature '35')	EA	2	$ 4,600.00	$ 9,200.00
80	Decorative Fence at Futsal Court (Site Feature ‘36’)	LF	140	$ 229.00	$ 32,060.00
81	Bike Rack (Site Feature '37')	EA	6	$ 700.00	$ 4,200.00
82	Tubular Steel Gates at Vehicular Entry (Site Feature '38')	EA	2	$ 16,000.00	$ 32,000.00
83	Waste Receptacle Corrals (Site Feature '39')	EA	3	$ 7,500.00	$ 22,500.00
84	Tennis Posts and Ground Sleeves (Site Feature '41')	EA	4	$ 2,000.00	$ 8,000.00
85	No Camping/Over Night Parking Signage at Entry (Site Feature '44')	EA	1	$ 600.00	$ 600.00
86	No Camping/Over Night Parking Signage at Restroom Buildings (Site Feature '46')	EA	2	$ 600.00	$ 1,200.00
87	Park Welcome Signage (Site Feature '47')	EA	1	$ 600.00	$ 600.00
88	Park Rules Signage (Site Feature '48')	EA	1	$ 600.00	$ 600.00
89	Doggie-Pot Waste Station (Site Feature '49')	EA	5	$ 1,100.00	$ 5,500.00
90	Futsal Goal and Net (Site Feature ‘54’)	EA	2	$ 2,800.00	$ 5,600.00

91	Soil Preparation & Amendment	SF	295,170	$ 0.25	$ 73,792.50
92	Turf Hydroseed – Sports Field Blend	SF	271,689	$ 1.20	$ 326,026.80
93	NOT IN USE	---	---	----------	
94	1 Gallon Shrubs	EA	1,387	$ 19.40	$ 26,907.80
95	24” Box Trees	EA	108	$ 448.00	$ 48,384.00
96	Tree Root Barriers	LF	1,830	$ 6.00	$ 10,980.00
97	Top Dressing - Decorative Bark Mulch	SF	23,484	$ 1.00	$ 23,484.00
98	Irrigation System	LS	1	$ 161,500.00	$ 161,500.00
99	Irrigation Controller	LS	1	$ 21,500.00	$ 21,500.00
100	Irrigation Point of Connection (Water Meter, Backflow, Booster Pump)	LS	1	$ 161,500.00	$ 161,500.00
101	Landscape Maintenance Period (180 Days)	LS	1	$ 10,800.00	$ 10,800.00
102	FDR-C Process (1.0’)	LS	1	$ 159,000.00	$ 159,000.00
			TOTAL SCHEDULE ‘A’ BID		**$ 5,800,580.70**

BID SCHEDULE 'B' - ADD ALTERNATE #1 BID					
ITEM NO.	ITEM	UNIT	QUANTITY	UNIT PRICE	ITEM TOTAL
1	Permits, Bonds, Licenses & Insurance	LS	1	$ 1.00	$ 1.00
2	Public Convenience and Safety	LS	1	$ 1.00	$ 1.00
3	Site Grading (Mass/Fine)	SF	31,864	$ 6.00	$ 191,184.00
4	6" Storm Drain Line	LF	131	$ 52.00	$ 6,812.00
5	Storm Drain Area Drains	EA	3	$ 2,400.00	$ 7,200.00
6	Pedestrian Light Pole w/ fixture (Add. Alt. #1 Site Feature '13')	EA	6	$ 13,200.00	$ 79,200.00
7	Concrete Flatwork (Add. Alt. #1 Site Finish '1')	SF	20,386	$ 10.30	$ 209,975.80
8	Rubberized Play Surfacing – 01 (2-5 area) (Add. Alt. #1 Site Finish '2')	SF	1,396	$ 27.50	$ 38,390.00
9	Rubberized Play Surfacing – 02 (2-5 area) (Add. Alt. #1 Site Finish '3')	SF	1,579	$ 27.50	$ 43,422.50
10	Rubberized Play Surfacing – 01 (5-12 area) (Add. Alt. #1 Site Finish '4')	SF	2,501	$ 27.50	$ 68,777.50
11	Rubberized Play Surfacing – 02 (5-12 area) (Add. Alt. #1 Site Finish '5')	SF	1,922	$ 27.50	$ 52,855.00
12	Play Area Base Preparation (Add. Alt. #1 Site Finishes '2' - '5')	SF	7,398	$ 6.00	$ 44,388.00
13	Thickened Sidewalk Edge At Play Area (Add. Alt. #1 Site Feature '11')	LF	138	$ 33.00	$ 4,554.00
14	12" wide Concrete Mow Curb (Add. Alt. #1 Site Feature '12')	LF	225	$ 123.00	$ 27,675.00
15	Chain Link Fence with concrete curb below fence behind Soccer Goals (Add. Alt. #1 Site Feature '19')	LF	542	$ 107.00	$ 57,994.00
16	Play Equipment (2-5) (Add. Alt. #1 Site Feature '7')	LS	1	$ 80,000.00	$ 80,000.00
17	Play equipment (5-12) (Add. Alt. #1 Site Feature '8')	LS	1	$ 135,000.00	$ 135,000.00
18	Picnic Tables (Add. Alt. #1 Site Feature '9')	EA	3	$ 2,100.00	$ 6,300.00
19	Accessible Picnic Tables (Add. Alt. #1 Site Feature '10')	EA	1	$ 2,800.00	$ 2,800.00
20	Bike Rack (Add. Alt. #1 Site Feature '17')	EA	4	$ 700.00	$ 2,800.00
21	Waste Receptacle Corrals (Add. Alt. #1 Site Feature '15')	EA	1	$ 9,400.00	$ 9,400.00

22	Doggi-Pot Pet Waste Station (Add. Alt. #1 Site Feature ‘16’)	EA	1	$ 1,300.00	$ 1,300.00
23	Removable Bollard (Add. Alt. #1 Site Feature ‘14’)	EA	2	$ 3,100.00	$ 6,200.00
24	Field Marker Identification Signage (Add. Alt. #1 Site Feature ‘20’)	EA	4	$ 1,900.00	$ 7,600.00
25	Soil Amendments and Conditioning	SF	20,386	$ 0.10	$ 2,038.60
26	1-Gallon Shrubs	EA	94	$ 20.00	$ 1,880.00
27	24” Box Trees	EA	4	$ 560.00	$ 2,240.00
28	Tree Root Barriers	LF	90	$ 14.00	$ 1,260.00
29	Top Dressing - Decorative Bark Mulch	SF	1,787	$ 1.00	$ 1,787.00
30	Irrigation System	LS	1	$ 1,000.00	$ 1,000.00
31	Landscape Maintenance Period (180 Days)	LS	1	$ 1,000.00	$ 1,000.00
32	NOT IN USE	---	---	----------	----------
		TOTAL SCHEDULE ‘B’ BID			**$ 1,095,035.40**

BID SCHEDULE 'C' - ADD ALTERNATE #2 BID					
ITEM NO.	**ITEM**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**ITEM TOTAL**
1	Permits, Bonds, Licenses & Insurance	LS	1	$ 1.00	$ 1.00
2	Public Convenience and Safety	LS	1	$ 1.00	$ 1.00
3	Electrical Feeder to Shade Structure from Panel	LS	1	$ 59,900.00	$ 59,900.00
4	50x100' Shade Structure (Add. Alt. #2 Site Finish '21')	LS	1	$ 452,000.00	$ 452,000.00
5	Picnic Tables (Add. Alt. #2 Site Feature '22')	EA	12	$ 2,100.00	$ 25,200.00
6	Accessible Picnic Tables (Add. Alt. #2 Site Feature '23')	EA	6	$ 2,100.00	$ 12,600.00
		TOTAL SCHEDULE 'C' BID			**$ 549,702.00**

BID SCHEDULE 'D' - ADD ALTERNATE #3					
ITEM NO.	**ITEM**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**ITEM TOTAL**
1	Permits, Bonds, Licenses & Insurance	LS	1	$ 1.00	$ 1.00
2	Public Convenience and Safety	LS	1	$ 1.00	$ 1.00
3	Electrical Feeder to Shade Structure from Panel	LS	1	$ 11,400.00	$ 11,400.00
4	Concrete Flatwork (Add. Alt. #3 Site Finish '24')	SF	1,300	$ 14.00	$ 18,200.00
5	30x30' Shade Structure (Add. Alt. #3 Site Feature '25')	EA	1	$ 88,000.00	$ 88,000.00
6	Picnic Tables (Add. Alt. #3 Site Feature '26')	EA	3	$ 2,100.00	$ 6,300.00
7	Accessible Picnic Tables (Add. Alt. #3 Site Feature '27')	EA	1	$ 2,800.00	$ 2,800.00
8	Waste receptacle Corrals (Add. Alt. #3 Site Feature '28')	EA	1	$ 9,400.00	$ 9,400.00
9	NOT IN USE	---	---	----------	----------
		TOTAL SCHEDULE 'D' BID			**$ 136,102.00**

BID SCHEDULE 'E' - ADD ALTERNATE #4 BID					
ITEM NO.	ITEM	UNIT	QUANTITY	UNIT PRICE	ITEM TOTAL
1	Permits, Bonds, Licenses & Insurance	LS	1	$ 1.00	$ 1.00
2	Public Convenience and Safety	LS	1	$ 10,000.00	$ 10,000.00
3	Water Pollution Control	LS	1	$ 5,000.00	$ 5,000.00
4	Street Sweeping	LS	1	$ 1.00	$ 1.00
5	Surveying Services	LS	1	$ 2,000.00	$ 2,000.00
6	Monumentation	LS	1	$ 1,500.00	$ 1,500.00
7	Portable Changeable Message Signs	LS	1	$ 1,500.00	$ 1,500.00
8	Site Grading (Mass/Fine)	SF	22,733	$ 7.00	$ 159,131.00
9	6" Storm Drain Line	LF	47	$ 52.00	$ 2,444.00
10	Storm Drain Manholes	EA	1	$ 3,500.00	$ 3,500.00
11	Type 'C' Catch Basin	EA	1	$ 3,200.00	$ 3,200.00
12	Outfall	EA	1	$ 4,200.00	$ 4,200.00
13	Parking lot Light Pole w/ single-head fixture (Add. Alt. #4 Site Feature '35')	EA	7	$ 8,700.00	$ 60,900.00
14	Asphalt Parking Lot with striping (Add. Alt. #4 Site Finish '30')	SF	22,733	$ 2.20	$ 50,012.60
15	Parking Lot Curbs- Vertical/ Flush (Add. Alt. #4 Site Feature '33')	LF	599	$ 33.00	$ 19,767.00
16	Parking Lot Curb & Gutter (Add. Alt. #4 Site Feature '36')	LF	806	$ 38.00	$ 30,628.00
17	Park Sign (Add. Alt. #4 Site Feature '31')	EA	1	$ 9,400.00	$ 9,400.00
18	Fixed Bollard (Add. Alt. #4 Site Feature '32')	EA	8	$ 1,600.00	$ 12,800.00
19	Tubular Steel Gates at Vehicular Entry (Add. Alt. #4 Site Feature '34')	EA	2	$ 15,400.00	$ 30,800.00
20	FDR-C Process (1.0')	LS	1	$ 58,500.00	$ 58,500.00
		TOTAL SCHEDULE 'E' BID			**$ 465,284.60**

BID SCHEDULE 'F' - ADD ALTERNATE #5 BID					
ITEM NO.	**ITEM**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**ITEM TOTAL**
1	Permits, Bonds, Licenses & Insurance	LS	1	$ 1.00	$ 1.00
2	Public Convenience and Safety	LS	1	$ 1.00	$ 1.00
3	Surveying Services	LS	1	$ 2,200.00	$ 2,200.00
4	Parking Lot Light Pole w/ 4-head fixture (Site Feature '4')	EA	6	$ 12,400.00	$ 74,400.00
5	Parking Lot Light Pole w/ single-head fixture (Site Feature '29')	EA	9	$ 9,300.00	$ 83,700.00
		TOTAL SCHEDULE 'F' BID			**$ 160,302.00**

EXHIBIT “B” - DRAWINGS AND TECHNICAL SPECIFICATIONS

SCOPE OF WORK

The Work to be performed is included in Exhibit B – Drawings and Technical Specifications. Such other items or details, not mentioned above (Exhibit A), that are required by the drawings, and technical specifications, or the following special conditions (Exhibit C) shall be performed, placed, constructed or installed.

PERFORMANCE

The Contractor shall furnish all labor, materials, tools, equipment, incidentals, and do all work described in the Plans and these Special Provisions.

COORDINATION/COOPERATION

The Contractor shall notify the Engineer at (209) 385-6846 at least three (3) working days in advance of the tentative starting date.

The Contractor shall be responsible for contacting and coordinating with all utility companies, including the City, with regards to the location of existing underground facilities in the construction area. The Contractor shall call Underground Service Alert at (800) 642-2444, at least 2 working days before commencement of underground work for location of underground facilities.
Utility facilities damaged, temporarily disconnected, or relocated as a result of construction shall be repaired/reconnected as directed by the governing utility at the Contractor's expense.
Full compensation for conforming to the requirements of this section shall be considered as included in the price paid for the various contract items of work involved and no additional compensation will be made.

INSPECTION OF SITE

The Contractor shall inspect the work site and note all existing conditions before submitting a bid for this project. A site tour is scheduled immediately following the pre-bid/LBE meeting if requested.

DUST CONTROL

It shall be the responsibility of the Contractor to minimize dust during earth moving operations. A water truck shall be made available if necessary for dust control.

Full compensation for conforming to the requirements of this section shall be considered as included in the price paid for the various contract items of work involved and no additional compensation will be made.

PERMITS, BONDS, LICENSES AND INSURANCE

The Contractor shall procure all permits, bonds, licenses and insurance, pay all charges and fees, and give all notices necessary and incidental to the prosecution of the work.

Payment for "Permits, Bonds, Licenses and Insurance," shall be at the contract lump sum price as

set forth in the proposal, and shall include all fees associated with permits, bonds, licenses, inspections, and all other fees necessary for the completion of this item.

PUBLIC CONVENIENCE AND SAFETY

The Contractor shall be responsible for all the provisions of this item, including issuance of all notices necessary for prosecution of the work.

Construction Area Signs -- Construction area signs and traffic cones shall be furnished, installed, maintained, and removed when no longer required in accordance with the provisions in Section 12, "Temporary Traffic Control," of the State Specifications, and these Special Provisions. Specifically included in this item are all detour signage.

The Contractor shall notify the appropriate regional notification center for operators of subsurface installations at least two (2) working days, but not more than 14 calendar days, prior to commencing any excavation for construction area sign posts. The regional notification centers include, but not limited to the following:

Notification Center	Telephone
Underground Service Alert (USA) (Northern California)	1-800-227-2600

All excavations required to install construction area signs shall be performed by hand methods without the use of power equipment, except that power equipment may be used if it is determined that there were no utility facilities in the area of the proposed post holes.

Sign substrates for stationary mounted construction area signs may be fabricated from fiberglass reinforced plastic as specified under “Prequalified and Tested Signing and Delineation Materials” elsewhere in these Special Provisions.

Type IV reflective sheeting for sign panels for portable construction area signs shall conform to the requirements specified under “Prequalified and Testing Signing and Delineation Materials” elsewhere in these Special Provisions.

The term “construction area signs” shall also include temporary object markers required for the direction of public traffic through or around the work during construction. Object markers listed or designated on the plans as construction area signs shall be considered to be signs and shall be furnished, erected, maintained and removed by the Contractor in the same manner specified for construction area signs and the following:

Object markers shall be stationary mounted on wood or metal posts in accordance with the details shown on the plans and the requirements in Section 82, “Markers and Delineators,” of the Standard Specifications.

Marker panels for Type N, Type P and Type R object markers shall conform to the requirements for sign panels for stationary mounted signs.

Target plates for Type K and Type L object markers and posts, reflectors and hardware shall conform to the requirements in said Section 82, but need not be new.

When a street section is to be closed, it shall be solidly barricaded, and signs shall be posted at the closure points indicating “Street Closed.”

Full cost of providing and removing construction area signs shall be borne exclusively by the Contractor and shall be considered as included in the contract lump sum price for Item 10-1.07, “Public Convenience & Safety.”

Maintaining Traffic -- Attention is directed to Section 7-1.03, "Public Convenience," Section 7-1.04, "Public Safety," and Section 12, "Temporary Traffic Control," of the State Specifications. Nothing in these Special Provisions shall be construed as relieving the Contractor from its responsibility as provided in Section 7-1.04 of the State Specifications.
All traffic cones used for night lane closures shall have reflective cone sleeves as specified in the specifications. One (1) 12-foot wide traffic lane must be open at all times.

The second and third paragraphs of Section 12-3.10, “Traffic Cones,” of the State Standard Specifications are amended to read:

The type of reflective cone sleeve used shall be at the option of the Contractor. Only one type of reflective cone sleeve shall be used on the project.

Lane closures shall conform to the provisions in the section of these special provisions entitled “Traffic Control System for Lane Closure.”

Personal vehicles of the Contractor's employees shall not be parked on the traveled way or shoulders, including any section closed to public traffic.

The Contractor shall notify local authorities of its intent to begin work at least five (5) days before work is begun. The Contractor shall cooperate with local authorities relative to handling traffic through the area and shall make its own arrangements relative to keeping the working area clear of parked vehicles.

The Contractor shall provide access to all businesses and residences within the construction zone at all times throughout the project. When the work requires the closing of a business driveway or other entrance, the Contractor shall post signs directing the public to the most convenient access to the business.

The Contractor shall provide access to all private driveways when construction is not actively in progress. Access to driveways fronting the construction area shall not be hindered or blocked for time periods greater than 4 hours without notifying the property owner or tenant in writing 24 hours prior to blockage.

The Contractor shall provide safe public access around the work site in accordance with the American Disabilities Act requirements during the work.

Whenever vehicles or equipment are parked on the shoulder within six feet of a traffic lane, the shoulder area shall be closed with fluorescent traffic cones or portable delineators placed on a taper in advance of the parked vehicles or equipment and along the edge of the pavement at 25-foot intervals to a point not less than 25 feet past the last vehicle or piece of equipment. A minimum of nine (9) cones or portable delineators shall be used for the taper. A C23 (Road Work Ahead) or C24 (Shoulder Work Ahead) sign shall be mounted on a telescoping flag tree with flags. The flag tree shall be placed where directed by the Engineer.

When the Contractor’s operations create a condition hazardous to traffic or to the public, he shall furnish, erect and maintain, at his expense and without cost to the City, such fences, barricades,

lights, signs and other devices as are necessary to prevent accidents or damage or injury to the public. The Contractor shall also furnish such flagmen, provided with the necessary equipment kept clean and in good condition by the Contractor at his expense, as may be necessary to give adequate warning to traffic or to the public that the roadway is under construction or of any dangerous conditions to be encountered. The flagmen shall perform their duties and their work of furnishing and placing such signs, lights, flags and other warning and safety devices as set forth in the current "Work Area Traffic Control Handbook" as published by the Building News, Inc., Los Angeles, California.

Minor deviations from the requirements of this section concerning hours of work which do not significantly change the cost of the work may be permitted upon the written request of the Contractor if, in the opinion of the Engineer, public traffic will be better served and the work expedited. Such deviations shall not be adopted until the Engineer has indicated its written approval. All other modifications will be made by contract change order.

Full cost of conforming to this section shall be considered as included in the contract lump sum price for "Public Convenience and Safety."

Traffic Control System for Lane Closure -- A traffic control system shall be provided by the Contractor and shall be in accordance with the provisions of Section 12, "Temporary Traffic Control," of the State Specifications, the provisions under "Maintaining Traffic" elsewhere in these Special Provisions.

The provisions in this section shall not relieve the Contractor from its responsibility to provide such additional devices, or take such measures as may be necessary, to comply with the provisions in Section 7-1.04, "Public Safety," of the State Standard Specifications.

Prior to any lane closures, it shall be the responsibility of the Contractor to provide 72-hour notice to the City and obtain City approval of the lane closure. Failure to notify the City in a timely manner is cause for the City to prevent the lane closure.

Whenever a lane closure is made, the Contractor shall close the lane by placing fluorescent traffic cones, portable cones, portable delineators, or other devices approved by the Engineer, along a taper and along the edge of the closed lane adjacent to public traffic. One telescoping flag tree with flags shall be placed at the beginning and at the end of the taper.
If any component in the traffic control system is displaced or ceases to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair said component to its original condition or replace said component, and shall restore the component to its original location. Full cost of providing flaggers shall be borne exclusively by the Contractor.

The Contractor shall submit a traffic control plan and approved by the City Engineer prior to commencing any work.

Protection of the Work -- To minimize traffic congestion during the resurfacing operation, the work shall be done in stages. Residents with driveways within the closed section shall be notified at least 24 hours in advance of closure via door hangers and signs within the limits of the project.
Barricades and signs and their cost of replacement, the cost of flagmen necessary for the protection of the work and the public and costs of notification of affected residents will be considered as included in the contract price paid for bid items shown in the proposal, and no separate payments shall be made.
Payment for "Public Convenience and Safety," shall be at the contract lump sum price as set forth

in the proposal, and shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item.

WATER POLLUTION CONTROL

Summary

It shall be the responsibility of the Contractor to comply with all of the requirements of the latest NPDES General Permit for "Storm Water Discharges Associated with Construction and Land Disturbance Activities" (Order No. 2009-0009-DWQ, NPDES No. CAS000002) hereinafter called the "Permit" and standard industry practice.

This includes, but is not limited to, preparing plans and application, maps as well as all necessary reporting on the SWQCB's Storm Water Multiple Application and Report Tracking System (SMARTS System). The Contractor, working with their certified Qualified Storm Water Pollution Prevention Plan (SWPPP) Developer (QSD), will determine what would be the best course of action to comply with the latest State NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities Order No. 2009-0009- DWQ. If the Contractor's QSD determines a SWPPP is the best course of action, it shall be the responsibility of the Contractor and their QSD to submit to Construction Management a completed SWPPP for review. Upon acceptance of the SWPPP document by Construction Management, the QSD shall prepare a Notice of Intention (NOI) application in the SWQCB's SMARTS System and upload all necessary documents and maps to be approved by the Legally Responsible Person (LRP). Until a written approval of the SWPPP has been obtained from the SWQCB, no construction activity shall commence on the project site. Upon obtaining written approval of the SWPPP, it shall be the responsibility of the Contractor to implement the SWPPP. Throughout the course of the project, the Contractor's Qualified SWPPP Practitioner (QSP) shall conduct periodic inspections, testing, any reporting on the SMARTS System as well as coordinate with the QSD to update the SWPPP as necessary. At the conclusion of construction, it shall be the responsibility of the Contractor and his or her QSD/QSP to ensure Annual Report(s) have been prepared on the SMARTS System as well as prepare the Notice of Termination (NOT) for City's approval. The Contractor shall keep a copy of the approved SWPPP, and amendments thereto, at the job site and in the general business office of the Contractor. In addition, the Contractor shall make available to Construction Management copies of all amendments to the SWPPP as prepared by the Contractor. The SWPPP shall be made available upon request of a representative of the Fresno Metropolitan Flood Control District, Regional Water Quality Control Board, State Water Resources Control Board or U. S. Environmental Protection Agency. Requests by the public shall be directed to the Engineer.

If the Contractor and/or his/her QSD determines that a SWPPP is not necessary, then it shall be the responsibility of the Contractor to provide a list of Best Management Practices (BMP) that are to be implemented during the Work to Construction Management. The Contractor shall implement the BMP in a timely manner and maintain throughout the duration of the project. The Contractor shall keep a copy of the BMP list and any modification to the list at the job site and in the general business office of the Contractor. In addition, the Contractor shall make available to the City copies of all modifications to the BMP list. The BMP list shall be made available upon request of a representative of the Fresno Metropolitan Flood Control District, Regional Water Quality Control Board, State Water Resources Control Board or U. S. Environmental Protection Agency. Requests by the public shall be directed to Construction Management.

Notice of violation and/or fines for any non-compliance will be the responsibility of the Contractor.

Manage work activities to reduce the discharge of pollutants to surface waters, groundwater, or municipal separate storm sewer systems including work items shown in the Bid Item List for:

1. Prepare Storm Water Pollution Prevention Plan. SWPPP preparation includes obtaining SWPPP approval, amending the SWPPP, preparing a CSMP and a SAP, and monitoring and inspecting WPC practices at the job site.
2. Storm Water Annual Report. Storm Water Annual Report preparation includes certifications, monitoring and inspection results, and obtaining Storm Water Annual Report acceptance.
3. Storm Water Sampling and Analysis Day. Storm Water Sampling and Analysis Day includes reporting of storm water quality per qualifying rain event. If specified for the risk level, the work includes preparation, collection, analysis, and reporting of storm water samples for turbidity, pH, and other constituents.
4. Rain Event Action Plan. If specified for the project risk level, REAP preparation includes preparing and submitting REAP forms and monitoring weather forecasts.

Do not start work until:

1. SWPPP is approved by the City.
2. SWPPP is uploaded onto the SMART System.
3. WDID is issued.
4. SWPPP review requirements have been fulfilled. If the RWQCB requires time for SWPPP review, allow 30 days for the RWQCB to review the SWPPP as specified under "Submittals" of these special provisions.

This project is anticipated to be Risk Level 1.

Definitions and Abbreviations

active and inactive areas: (1) Active areas have soil disturbing work activities occurring at least once within 14 days, and (2) Inactive areas are areas that have not been disturbed for at least 15 days.

BMPs: Best Management Practices are water pollution control practices.

construction phase: Construction phases are (1) Highway Construction including work activities for building roads and structures, (2) Plant Establishment including maintenance on vegetation installed for final stabilization, and (3) Suspension where work activities are suspended and areas are inactive.

CSMP: Construction Site Monitoring Program.

NAL: Numeric Action Level.

NEL: Numeric Effluent Limit.

NPDES: National Pollutant Discharge Elimination System.

NOI: Notice of Intent.

Normal working hours: The hours you normally work on this project.

Preparation Manual: The Department's "Storm Water Pollution Prevention Plan and Water Pollution Control Program Preparation Manual."

QSD: Qualified SWPPP Developer.

QSP: Qualified SWPPP Practitioner.

Qualified rain event: A qualified rain event is a storm that produces at least 0.5 inch of precipitation with a 48 hour or greater period between storms.

REAP: Rain Event Action Plan.

RWQCB: Regional Water Quality Control Board.

SAP: Sampling and Analysis Plan.

SSC: Suspended Sediment Concentration.
SWRCB: State Water Resources Control Board. SWPPP: Storm Water Pollution Prevention Plan. **WDID:** Waste Discharge Identification Number. WPC: Water Pollution Control.
WPC Manager: Water Pollution Control Manager. The WPC Manager implements water pollution control work described in the SWPPP and oversees revisions and amendments to the SWPPP.

Submittals

Within 20 days after contract approval, start the following process for SWPPP approval:

1. Submit 3 copies of the SWPPP and allow 20 days for the Engineer's review. If revisions are required, the Engineer provides comments and specifies the date that the review stopped.
2. Change and resubmit the SWPPP within 15 days of receipt of the Engineer's comments. The Engineer's review resumes when the complete SWPPP is resubmitted.
3. When the Engineer approves the SWPPP, submit an electronic and 4 printed copies of the approved SWPPP.
4. If the RWQCB reviews the approved SWPPP, the Engineer submits one copy of the approved SWPPP to the RWQCB for their review and comment. RWQCBs requiring time to review SWPPPs include:
5. If the Engineer requests changes to the SWPPP based on RWQCB comments, amend the SWPPP within 10 days.

Submit:

1. Storm water training records including training dates and subjects for employees and subcontractors. Include dates and subjects for ongoing training, including tailgate meetings.
2. Employee training records.

   2.1. Within 5 days of SWPPP approval for existing employees
   2.2. Within 5 days of training for new employees
   2.3. At least 5 days before subcontractors start work for subcontractor's employees

Prepare a Storm Water Annual Report for the reporting period from July 1st to June 30th. For the prior reporting period, submit the report no later than July 15th if construction occurs from July 1st through June 30th or within 15 days after contract acceptance if construction ends before June 30th.
Submit the Storm Water Annual Report as follows:

1. Submit 2 copies of the Storm Water Annual Report and allow 10 days for the Engineer's review. If revisions are required, the Engineer provides comments and specifies the date that the review stopped.
2. Change and resubmit the Storm Water Annual Report within 5 days of receipt of the Engineer's comments. The Engineer's review resumes when the complete Storm Water Annual Report is resubmitted.
3. When the Engineer accepts the Storm Water Annual Report, insert the WPC Manager's signed certification and the Engineer's signed certification.

Submit one electronic copy and 2 printed copies of the accepted Storm Water Annual Report. Submit as required:

1. NAL Exceedance Reports

2. NEL Exceedance Reports
3. Visual Monitoring Reports
4. Inspection Reports
5. BMP Status Report

At least 5 days before operating any construction support facility, submit:

1. A plan showing the location and quantity of WPC practices associated with the construction support facility
2. A copy of the NOI approved by the RWQCB and the SWPPP approved by the RWQCB if you will be operating a batch plant or a crushing plant under the General Industrial Permit

Quality Control and Assurance Training

Provide storm water training for:

1. Project managers
2. Supervisory personnel
3. Employees involved with WPC work

Train all employees, including subcontractor's employees, in the following subjects:

1. WPC rules and regulations
2. Implementation and maintenance for:
   - 2.1. Temporary Soil Stabilization
   - 2.2. Temporary Sediment Control
   - 2.3. Tracking Control
   - 2.4. Wind Erosion Control
   - 2.5. Material pollution prevention and control
   - 2.6. Waste management
   - 2.7. Non-storm water management
   - 2.8. Identifying and handling hazardous substances
   - 2.9. Potential dangers to humans and the environment from spills and leaks or exposure to toxic or hazardous substances

Employees must receive initial WPC training before working on the job site. Conduct weekly training meetings covering:

1. WPC BMP deficiencies and corrective actions
2. BMPs that are required for work activities during the week
3. Spill prevention and control
4. Material delivery, storage, use, and disposal
5. Waste management
6. Non-storm water management procedures

Training for personnel to collect water quality samples must include:

1. SAP review
2. Health and safety review
3. Sampling simulations

A Storm Water Information Handout has been prepared for this contract and is available as described in "Supplemental Project Information" of these special provisions.

If you operate construction support facilities, protect storm water systems or receiving waters from the discharge of potential pollutants by using WPC practices.

Construction support facilities include:

1. Staging areas
2. Storage yards for equipment and materials
3. Mobile operations
4. Batch plants for PCC and HMA
5. Crushing plants for rock and aggregate
6. Other facilities installed for your convenience such as haul roads

If you operate a batch plant to manufacture PCC, HMA, or other material; or a crushing plant to produce rock or aggregate; obtain coverage under the General Industrial General Permit. You must be covered under the General Industrial Permit for batch plants and crushing plants located:

1. Outside of the job site
2. Within the job site that serve one or more contracts

Discharges from manufacturing facilities such as batch plants must comply with the general waste discharge requirements for Order No. 97-03-DWQ, NPDES General Permit No. CAS000001, issued by the SWRCB for "Discharge of Stormwater Associated with Industrial Activities Excluding Construction Activities." For the General Industrial Permit, go to:

http://www.waterboards.ca.gov/

You may obtain copies of the Preparation Manual from the Publication Distribution Unit. The mailing address for the Publication Distribution Unit is:

State of California
Department of Transportation
Publication Distribution Unit
1900 Royal Oaks Drive
Sacramento, California 95815
Telephone: (916) 445-3520

The Preparation Manual and other WPC references are available at the Department's "Construction Storm Water and Water Pollution Control" Web site. For the Web site, go to:

http://www.dot.ca.gov/hq/construc/stormwater/stormwater1.htm

Water Pollution Control Manager

Assign one WPC Manager to implement the SWPPP. The WPC Manager must comply with the Permit qualifications for a QSP and a QSD. You may assign a different QSD to prepare the SWPPP.

The QSD must have the following qualifications:

1. Department approved storm water management training described in the Department's "Construction Storm Water and Water Pollution Control" web site
2. Registration or certification described in the Permit

The QSP must meet the qualifications of the QSD or have the following certifications:

1. Department approved storm water management training described in the Department's "Construction Storm Water and Water Pollution Control" web site
2. Certification described in the Permit

At the job site, the WPC Manager must:

1. Be responsible for WPC work
2. Be the primary contact for WPC work
3. Oversee the maintenance of WPC practices
4. Oversee and enforce hazardous waste management practices
5. Have the authority to mobilize crews to make immediate repairs to WPC practices
6. Ensure that all employees have current water pollution control training
7. Implement the approved SWPPP and amend the SWPPP when required

WPC Manager must oversee:

1. Inspections of WPC practices identified in the SWPPP
2. Inspections and reports for visual monitoring
3. Preparation and implementation of REAPs
4. Sampling and analysis
5. Preparation and submittal of:
    - 5.1. NAL exceedance reports
    - 5.2. NEL exceedance reports
    - 5.3. SWPPP annual certification
    - 5.4. Annual reports
    - 5.5. BMP status reports

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

General

SWPPP work includes preparing a SWPPP including a CSMP, obtaining SWPPP approval, amending the SWPPP, inspecting and reporting on WPC practices at the job site. The SWPPP must comply with the Preparation Manual and the Permit. The SWPPP must be submitted in place of the water pollution control program under Section 13-2, "Water Pollution Control Program," of the Standard Specifications.

Additional WPC work will be paid for as extra work under Section 4-1.05, "Changes and Extra Work," of the Standard Specifications.

The SWPPP must include sections as specified for the project risk level as follows:

1. For risk level 1:
    - 1.1. Schedule
    - 1.2. CSMP
2. For risk level 2:
    - 2.1. Schedule
    - 2.2. CSMP

    2.3. Adherence to Effluent Standards for NALs
    2.4. REAP
3. For risk level 3:
    3.1. Schedule
    3.2. CSMP
    3.3. Adherence to Effluent Standards for NALs and NELs
    3.4. REAP

The SWPPP must include WPC practices for:

1. Storm water and non-stormwater from areas outside of the job site related to project work activities such as:
    1.1. Staging areas
    1.2. Storage yards
    1.3. Access roads
2. Activities or mobile operations related to contractor obtained NPDES permits
3. Construction support facilities

The SWPPP must include a copy of permits obtained by the Department such as Fish & Game permits, US Army Corps of Engineers permits, RWQCB 401 Certifications, and RWQCB Waste Discharge Requirements for Aerially Deposited Lead Reuse.

Amend the SWPPP annually and resubmit it by July 15th. Amend the SWPPP if:

1. Changes in work activities could affect the discharge of pollutants
2. WPC practices are added by change order work
3. WPC practices are added at your discretion
4. Changes in the amount of disturbed soil are substantial
5. Objectives for reducing or eliminating pollutants in storm water discharges have not been achieved
6. There is a Permit violation

Whenever you amend the SWPPP, follow the same process specified for SWPPP approval. Retain a printed copy of the approved SWPPP at the job site.

SWPPP Schedule

The SWPPP schedule must:

1. Describe when work activities will be performed that could cause the discharge of pollutants into storm water
2. Describe WPC practices associated with each construction phase
3. Identify soil stabilization and sediment control practices for disturbed soil areas

Construction Site Monitoring Program (CSMP)

General

The QSD must prepare a CSMP as part of the SWPPP. The CSMP must be developed before starting work and be revised to reflect current construction activities as necessary.

The CSMP must include sections for the project risk level as follows:

1. For risk level 1:
    1.1. Visual Monitoring
    1.2. SAP for Non-Visible Pollutants
2. For risk level 2:
    2.1. Visual Monitoring
    2.2. SAP for Non-Visible Pollutants
    2.3. SAP for sediment and turbidity
    2.4. SAP for pH
3. For risk level 3:
    3.1. Visual Monitoring
    3.2. SAP for Non-Visible Pollutants
    3.3. SAP for sediment and turbidity
    3.4. SAP for pH
    3.5. SAP for receiving waters
    3.6. SAP for temporary active treatment systems

Visual Monitoring

The WPC Manager must oversee the performance of visual inspections for qualifying rain events. For each qualifying rain event, perform visual inspections and record observations during normal working hours as follows:

1. Record the time, date, and rain gauge reading
2. Observe:
    2.1. Within 2 days before the storm:
        2.1.1 Drainage areas for spills, leaks, or uncontrolled pollutants
        2.1.2 Proper implementation of WPC practices
        2.1.3 Storm water storage areas for leaks and adequate freeboard
    2.2. Every 24 hours during the storm:
        2.2.1 WPC practices for effective operation
        2.2.2 WPC practices needing maintenance and repair
    2.3. Within 2 days after the storm event:
        2.3.1. Discharge locations
        2.3.2. WPC practices to evaluate the design, implementation, and effectiveness
        2.3.3. To identify where additional WPC practices may be needed.

Perform non-stormwater discharge visual inspections as follows:

1. At least once during each of the following periods:
    1.1. January through March
    1.2. April through June
    1.3. July through September
    1.4. October through December
2. Observe flowing and contained storm water for the presence of floating and suspended materials, sheen on the surface, discoloration, turbidity, odors, and sources of observed pollutants
3. Observe the job site for the presence of authorized and unauthorized non-stormwater discharges and their sources

The WPC Manager must prepare visual inspection reports that include the following:

1. Name of personnel performing the inspection, inspection date, and date inspection report completed
2. Storm and weather conditions
3. Locations and observations
4. Corrective actions taken

Maintain visual inspections reports at the job site as part of the SWPPP.

Sampling and Analysis Plan (SAP)

General

Include a SAP in the CSMP to monitor the effectiveness of WPC practices. The SAP must comply with the Preparation Manual.

Assign trained personnel to collect water quality samples. Document their training in the SAP. Describe the following water quality sampling procedures in the SAP:

1. Sampling equipment
2. Sample preparation
3. Collection
4. Field measurement methods
5. Analytical methods
6. Quality assurance and quality control
7. Sample preservation and labeling
8. Collection documentation
9. Sample shipping
10. Chain of custody
11. Data management and reporting
12. Precautions from the construction site health and safety plan
13. Laboratory selection and certifications

Whenever assigned field personnel take samples, comply with the equipment manufacturer's recommendation for collection, analysis methods, and equipment calibration.

Samples taken for laboratory analysis must follow water quality sampling procedures and be analyzed by a State-certified laboratory under 40 CFR Part 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants."

The SAP must identify the State-certified laboratory, sample containers, preservation requirements, holding times, and analysis method. For a list of State-certified laboratories, go to:

http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx

Include procedure for sample collection during precipitation.

Retain water quality sampling documentation and analytical results with the SWPPP at the job site. Show pollutant sampling locations on SWPPP drawings.

If discharges or sampling locations change because of changed work activities or knowledge of site conditions, amend the SAP.

If the project is risk level 2 or risk level 3, include procedures for collecting and analyzing at least 3 samples for each day of each qualifying rain event. Describe the collection of effluent samples at all locations where the storm water is discharged off-site.

Analytical Results and Evaluation

Submit an electronic copy (in file format .xls, .txt, .csv, .dbs, or .mdb) and a printed copy of water quality analytical results, and quality assurance and quality control within 48 hours of field analysis sampling, and within 30 days for laboratory analysis. Also provide an evaluation of whether the downstream samples show levels of the tested parameter that are higher than the control sample.

Electronic water quality analysis results must have the following information:

1. Sample identification number
2. Contract number
3. Constituent
4. Reported value
5. Analytical method
6. Method detection limit
7. Reported limit

SAP for Non-Visible Pollutants

The SAP must include a description of the sampling and analysis strategy for monitoring non- visible pollutants.

The SAP must identify potential non-visible pollutants present at the job site associated with any of the following:

1. Construction materials and waste
2. Existing contamination due to historical site usage
3. Application of soil amendments, including soil stabilization materials, with the potential to change pH or contribute toxic pollutants to storm water

SWPPP drawings must show the locations planned for storage and use of potential non-visible pollutants.

The SAP must include sampling procedures for the following conditions when observed during a storm water visual inspection. For each of the following, collect at least one sample for each qualifying storm event:

1. Materials or waste containing potential non-visible pollutants that are not stored under watertight conditions
2. Materials or waste containing potential non-visible pollutants that are stored under watertight conditions, but a breach, leakage, malfunction, or spill is observed; the leak or spill has not been cleaned up before precipitation; and material or waste could discharge non-visible pollutants to surface waters or drainage system
3. Chemical applications, including fertilizer, pesticide, herbicide, methyl methacrylate concrete sealant, or non-pigmented curing compound used during precipitation or within 24 hours preceding precipitation, and could discharge pollutants to surface waters or drainage system

4. Applied soil amendments, including soil stabilization materials that could change pH levels or contribute toxic pollutants to storm water runoff and discharge pollutants to surface waters or drainage system, unless available independent test data indicates acceptable concentrations of non-visible pollutants in the soil amendment
5. Storm water runoff from an area contaminated by historical usage of the site that could discharge pollutants to surface waters or drainage systems

The SAP must provide sampling procedures and schedule for:

1. Sample collection during the first 2 hours of each rain event that generate runoff
2. Sample collection during normal working hours
3. Each non-visible pollutant source
4. Uncontaminated control sample

The SAP must identify locations for sampling downstream and control samples, and reasons for selecting those locations. Select control sample locations where the sample will not come in contact with materials, waste, or areas associated with potential non-visible pollutants or disturbed soil areas.

SAP for Sediment and Turbidity

If the project is risk level 2 or risk level 3, sample and analyze for turbidity:

Parameter	Test Method	Detection Limit (Min)	Unit
Turbidity	Field test with calibrated portable instrument	1	NTU

If the project is risk level 3 and the turbidity NEL has been exceeded, sample and analyze for SSC:

Parameter	Test Method	Detection Limit (Min)	Unit
SSC	ASTM Method D3977-97	5	Mg/L

SAP for pH

If the project is risk level 2 or risk level 3, sample and analyze for pH:

Parameter	Test Method	Detection Limit (Min)	Unit
pH	Field test with calibrated portable instrument	0.2	pH units

SAP for Receiving Waters

If the project is risk level 3, describe procedures for obtaining samples from representative and accessible locations:

1. Upstream of the discharge point
2. Downstream of the discharge point

Show receiving water sampling locations on SWPPP drawings.

If there are several discharge points, describe procedures for obtaining samples from a single upstream and a single downstream location.

Rain Event Action Plan (REAP)

REAP work includes preparing and submitting REAP forms and monitoring weather forecasts. The WPC Manager must submit a REAP to protect the job site at least 48 hours before a predicted rain event.

Prepare a REAP when the National Weather Service is predicting at least a 50 percent probability of precipitation within 72 hours.

For the REAP, use approved forms and include:

1. Site location
2. Risk level
3. Contact information including 24-hour emergency phone numbers for:
   - 3.1. WPC Manager
   - 3.2. Erosion and sediment control providers or subcontractors
   - 3.3. Storm water sampling providers or subcontractors
4. Storm Information
5. Construction phase information for:
   - 5.1. Highway Construction including active and inactive areas for work activities for building roads and structures
   - 5.2. Plant Establishment including maintenance on vegetation installed for final stabilization where areas are inactive
   - 5.3. Suspension where work activities are suspended and areas are inactive
6. Construction phase information including:
   - 6.1. Construction activities
   - 6.2. Subcontractors and trades on the job site
   - 6.3. Pre-storm activities including:
     - 6.3.1. Responsibilities of the WPC Manager
     - 6.3.2. Responsibilities of the crew and crew size
     - 6.3.3. Stabilization for active and inactive disturbed soil areas
     - 6.3.4. Stockpile management
     - 6.3.5. Corrective actions taken for deficiencies identified during pre-storm visual inspection
   - 6.4. Activities to be performed during storm events including:
     - 6.4.1. Responsibilities of the WPC Manager
     - 6.4.2. Responsibilities of the crew and crew size
     - 6.4.3. BMP maintenance and repair
   - 6.5. Description of flood contingency measures

You must have the REAP onsite at least 24 hours before a predicted rain event. A printed copy of each REAP must be at the job site as part of the SWPPP

Implement the REAP including mobilizing crews to complete activities no later than 24 hours before precipitation occurs.

IMPLEMENTATION REQUIREMENTS

SWPPP Implementation

Obtain, install, and maintain a rain gauge at the job site. Observe and record daily precipitation.

Monitor the National Weather Service Forecast Office on a daily basis. For forecasts, go to:

http://www.srh.noaa.gov/forecast

Whenever you or the Engineer identifies a deficiency in the implementation of the approved SWPPP:

1. Correct the deficiency immediately, unless the Engineer agrees to a later date for making the correction
2. Correct the deficiency before precipitation occurs

If you fail to correct the deficiency by the agreed date or before the onset of precipitation, the Department may correct the deficiency and deduct the cost of correcting the deficiency from payment.

Continue SWPPP implementation during any temporary suspension of work activities.

Install WPC practices within 15 days or before predicted precipitation, whichever occurs first.

Numeric Action Levels (NALs)

If the project is risk level 2 or risk level 3, then it is subject to NALs:

Parameter	Test Method	Detection Limit (Min)	Unit	Numeric Action Limit
pH	Field test calibrated with portable instrument	0.2	pH units	Lower NAL = 6.5 Upper NAL = 8.5
Turbidity	Field test calibrated with portable instrument	1	NTU	250 NTU

Numeric Effluent Limits (NELs)

If the project is risk level 3, then it is subject to NELs:

Parameter	Test Method	Detection Limit (Min)	Unit	Numeric Effluent Limit
pH	Field test calibrated with portable instrument	0.2	pH units	Lower NEL = 6.0 Upper NEL = 9.0

Turbidity	Field test calibrated with portable instrument	1	NTU	500 NTU

The storm event daily average for storms up to the 5-year, 24-hour storm, must not exceed the NEL for turbidity.

The daily average sampling results must not exceed the NEL for pH.

Storm Water Sampling and Analysis Day

Storm Water Sampling and Analysis Day work includes preparation, collection, analysis, and reporting of storm water samples for turbidity, pH, and other constituents. If the project is risk level 2 or risk level 3, and there is a qualified rain event that produces runoff, comply with the project's SAP for preparation, collection, analysis, and reporting of storm water samples. Collect:

1. Samples for each non-visible pollutant source and a corresponding uncontaminated control sample
2. Samples for turbidity, pH, and other constituents as specified
3. At least 3 samples for each day of each qualifying rain event
4. Samples for all locations where the storm water is discharged off-site

Perform sample collection during:

1. First 2 hours of each qualified rain event that produces runoff
2. Normal working hours

If the project is risk level 3, obtain receiving water samples.

You are not required to physically collect samples during dangerous weather conditions such as flooding or electrical storms.

If downstream samples show increased levels, assess WPC practices, site conditions, and surrounding influences to determine the probable cause for the increase.

Inspection

The WPC Manager must oversee inspections for WPC practices identified in the SWPPP:

1. Before a forecasted storm
2. After precipitation that causes site runoff
3. At 24-hour intervals during extended precipitation
4. On a predetermined schedule, a minimum of once a week

The WPC Manager must oversee daily inspections of:

1. Storage areas for hazardous materials and waste
2. Hazardous waste disposal and transporting activities
3. Hazardous material delivery and storage activities
4. WPC practices specified under "Construction Site Management" of these special provisions

The WPC Manager must use the Storm Water Site Inspection Report provided in the Preparation

Manual.

The WPC Manager must prepare BMP status reports that include the following:

1. Location and quantity of installed WPC practices
2. Location and quantity of disturbed soil for the active or inactive areas

Within 24 hours of finishing the weekly inspection, the WPC Manager must submit:

1. Copy of the completed site inspection report
2. Copy of the BMP status report

REPORTING REQUIREMENTS

Storm Water Annual Report

Storm Water Annual Report work includes certifications, monitoring and inspection results, and obtaining Storm Water Annual Report acceptance. The WPC Manager must prepare a Storm Water Annual Report. The report must:

1. Use an approved report format
2. Include project information including description and location
3. Include storm water monitoring information including:
   - 3.1. Summary and evaluation of sampling and analysis results including laboratory reports
   - 3.2. Analytical methods, reporting units, detections limits for analytical parameters
   - 3.3. Summary of corrective actions
   - 3.4. Identification of corrective actions or compliance activities that were not implemented
   - 3.5. Summary of violations
   - 3.6. Names of individuals performing storm water inspections and sampling
   - 3.7. Logistical information for inspections and sampling including location, date, time, and precipitation
   - 3.8. Visual observations and sample collection records
4. Include documentation on training for:
   - 4.1. Individuals responsible for NPDES permit compliance
   - 4.2. Individuals responsible for BMP installation, inspection, maintenance, and repair
   - 4.3. Individuals responsible for preparing, revising, and amending the SWPPP

NAL Exceedance Report

If the project is risk level 2 or risk level 3 and an effluent sample exceeds a NAL, notify the Engineer and submit a NAL Exceedance Report no later than 48 hours after the conclusion of the storm event. The report must:

1. Include the following field sampling results and inspections:
   - 1.1. Analytical methods, reporting units, and detection limits
   - 1.2. Date, location, time of sampling, visual observation and measurements
   - 1.3. Quantity of precipitation of the storm event
2. Description of BMPs and corrective actions taken to manage NAL exceedance

NEL Violation Report

If the project is risk level 3 and an NEL is exceeded, notify the Engineer and submit a NEL Violation

Report within 6 hours. The report must:

1. Include the following field sampling results and inspections:
   1.1. Analytical methods, reporting units, and detection limits
   1.2. Date, location, time of sampling, visual observations and measurements
   1.3. Quantity of precipitation of the storm event
2. Description of BMPs and corrective actions taken to manage NEL exceedance

If the project is risk level 2 or risk level 3, submit all sampling results to the Engineer no later than 48 hours after the conclusion of a storm event.

PAYMENT

The contract lump sum price paid for “Water Pollution Control” includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in street sweeping, including disposal of collected material, as shown on the plans, as specified in the Standard Specifications, these special provisions, and as directed by the Engineer.

The contract lump sum price paid for prepare storm water pollution prevention plan includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in preparing, obtaining approval of, and amending the SWPPP and CSMP, inspecting water pollution control practices, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The City does not adjust payment for an increase or decrease in the quantity of storm water sampling and analysis day.

You may request or the Engineer may order laboratory analysis of storm water samples. Laboratory analysis of storm water samples will be paid for as extra work under Section 4- 1.05D, "Extra Work," of the State Standard Specifications.

The City does not pay for the preparation, collection, laboratory analysis, and reporting of storm water samples for non-visible pollutants if WPC practices are not implemented before precipitation or if a failure of a WPC practice is not corrected before precipitation.

The City does not pay for implementation of WPC practices in areas outside the highway right- of-way not specifically provided for in the plans or in the special provisions.

The City does not pay for WPC practices installed at your construction support facilities.

WPC practices for which there are separate bid items of work are measured and paid for as those bid items of work.

STREET SWEEPING

This work includes street sweeping.

The SWPPP must describe and include the use of street sweeping as a water pollution control practice for sediment control and tracking control.

Submittals

At least 5 business days before starting clearing and grubbing, earthwork, or other activities with the potential for tracking sediment or debris, submit:

1. Number of sweepers described in the SWPPP
2. Type of sweeper technology

Quality Control and Assurance

Retain and submit records of street sweeping including:

1. Quantity of sweeping waste disposal
2. Sweeping times and locations

CONSTRUCTION

Street Sweepers

Sweepers must use one of these technologies:

1. Mechanical sweeper followed by a vacuum-assisted sweeper
2. Vacuum-assisted dry (waterless) sweeper
3. Regenerative-air sweeper

Operation

Street sweeping must be done at:

1. Paved roads at job site entrance and exit locations
2. Paved areas within the job site that flow to storm drains or water bodies

Street sweeping must be done:

1. During clearing and grubbing activities
2. During earthwork activities
3. During trenching activities
4. During roadway structural section activities
5. When vehicles are entering and leaving the job site
6. After soil disturbing activities
7. After observing offsite tracking of material

Monitor paved areas and roadway within the jobsite. Street sweeping must be done:

1. Within 1 hour, if sediment or debris is observed during activities that require sweeping
2. Within 24 hours, if sediment or debris is observed during activities that do not require sweeping

At least 1 sweeper must be on the job site at all times when sweeping work is required. The sweeper must be in good working order.

Perform street sweeping to minimize dust. If dust generation is excessive or sediment pickup is ineffective, use water or a vacuum.

You may stockpile collected material on the jobsite according to the approved SWPPP. Dispose

of collected material at least once per week.

Material collected during street sweeping must be removed and disposed of under Section 7-1.13, "Disposal of Material Outside the Street Right of Way," of the Standard Specifications.

Your WPCM must inspect paved roads at job site access points:

1. Daily if earthwork and other sediment or debris generating activities occur daily
2. Weekly if earthwork and other sediment or debris generating activities do not occur daily
3. When the National Weather Service predicts precipitation with a probability of at least 30 percent

The contract lump sum price paid for “Street Sweeping” includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in street sweeping, including disposal of collected material, as shown on the plans, as specified in the Standard Specifications, these special provisions, and as directed by the Engineer.

SURVEYING SERVICES

The Contractor will arrange for performance of survey work and construction layout and will be responsible for the accuracy of surveying adequate for construction. The selection of a Surveyor by the Contractor will be subject to approval by the Engineer. The Contractor shall preserve construction survey stakes and marks for the duration of their usefulness. If any construction survey stakes are lost or disturbed and need to be replaced, such replacement shall be by the Surveyor at the expense of the Contractor. The Contractor will dig all holes necessary for line and grade stakes. Full cost of providing surveys shall be borne exclusively by the Contractor.

Payment for "Surveying Services," shall be at the contract lump sum price as set forth in the proposal and shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item.

MONUMENTATION

As of the date of the start of Notice to Proceed (NTP), the contractor shall comply with preservation of all survey monuments as shown on record maps and on the project plan of the job site.
As required in the Business and Professional Code Section §8771, when monuments exist that control the location of subdivisions, tracts, boundaries, roads, streets, or highways, or provide horizontal or vertical survey control, the monuments shall be located and referenced by or under the direction of a licensed land surveyor or registered civil engineer prior to the time when any streets, highways, other rights-of-way, or easements are improved, constructed, reconstructed, maintained, resurfaced, or relocated, and a corner record or record of survey of the references shall be filed with the county surveyor prior to any construction.

The decision to file either the required corner record or a record of survey pursuant to subdivision shall be at the election of the licensed land surveyor or registered civil engineer submitting the document.

If a survey monument is destroyed after the NTP, the Contractor shall be responsible for the replacement of the monument.

A survey monument will be considered destroyed that has been:

- Moved more than 0.02 ft in any direction from the ties provided by and certified by a Licensed Land Surveyor
- Broken.
- Disturbed to a point that the survey monument's position is no longer fixed or stable.
- Removed from the ground for any reason.
- Vertically adjusted without the written authorization of the City Engineer.

Adjustment of survey monuments shall be completed under the direction of a Land Surveyor or a Registered Engineer licensed to practice in the State of California. The City Engineer or the City Surveyor shall be provided with the final positional data (both horizontal and/or vertical), along with certification by the Land Surveyor licensed by the State of California supervising the work that the position of adjusted monument meets the specification that the horizontal position is maintained within 0.01 ft of the original position of the monument and/or that the vertical position shall be within 0.006 ft relative to the measured difference between the original and the final adjusted vertical position of the monument. A corner record or record of survey shall be filed with the county surveyor to satisfy Business and Professional Code Section §8771.

DESTROYED SURVEY MONUMENT

Any survey monument that is destroyed after the date of the start of work, and the responsible party is unclear or not determinable, the monument shall be replaced by the City of Merced, unless otherwise approved by the City Engineer, and there shall be a $2,000.00 deduction from the cost of the contract in favor of the City of Merced.

REMOVE EXISTING SURVEY MONUMENT

This shall include the cost of: removing, cleaning and storing existing monument, frame and cover; making arrangement for pickup; and disposal of damaged or unusable monument, frame and cover.

INSTALL NEW MONUMENT FRAME AND COVER

This shall include the cost of purchasing and installing the new frame and cover; removing and disposing existing frame and cover.

RESET EXISTING MONUMENT FRAME AND COVER

This shall include the cost of removing, cleaning, and resetting existing frame and cover.

VERTICAL ADJUSTMENT OF EXISTING SURVEY MONUMENT

This shall include the cost of: removing, cleaning, and reinstalling existing frame and cover; reestablishing the point of elevation and the theoretical position value. The price shall also include the filing of all necessary documents with the proper agencies.

Where all or part of a project is within the City of Merced limits, the Contractor shall adhere to the City of Merced Survey Monument Specification – M-5 - SURVEY MONUMENTATION for those monuments that are part of the project within the city limits.

Payment will be made only if monument(s) may be affected by the proposed work, and then only

for ordinary and necessary expenses of compliance with this section.

Payment for “Monumentation,” will be made only if monuments are affected within the proposed work and shall be at the contract unit price for two (2) items “Monumentation” and “Survey Monument Wells” as set forth in the proposal and shall include all labor, materials, tools, equipment and all work necessary for the completion of this item.

PORTABLE CHANGEABLE MESSAGE SIGNS

The contractor shall furnish and maintain four (4) changeable message signs.

GENERAL

Summary

Work includes furnishing, placing, operating, maintaining, and removing portable changeable message signs.

Comply with Section 12-3.32 "Portable Changeable Message Signs," of the Standard Specifications.

Definitions
useable shoulder area: Paved or unpaved contiguous surface adjacent to the traveled way with:

1. Sufficient weight bearing capacity to support portable changeable message sign
2. Slope not greater than 6:1 (horizontal:vertical)

Submittals

Upon request, submit a Certificate of Compliance for each portable changeable message sign under Section 6-2.03C, "Certificates of Compliance," of the Standard Specifications.
Quality Control and Assurance

Comply with the manufacturer's operating instructions for portable changeable message sign. Approaching drivers must be able to read the entire message for all phases at least twice at the posted speed limit before passing portable changeable message sign. You may use more than 1 portable changeable message sign to meet this requirement.

Only display the message shown on the plans or ordered by the Engineer or specified in these special provisions.

MATERIALS

Portable changeable message sign must have 24-hour timer control or remote control capability.

The text of the message displayed on portable changeable message sign must not scroll, or travel horizontally or vertically across the face of the message panel.

CONSTRUCTION

Continuously repeat the entire message in no more than 2 phases of at least 3 seconds per phase. If useable shoulder area is at least 15 feet wide, the displayed message on

portable changeable message sign must be minimum 18-inch character height. If useable shoulder area is less than 15 feet wide, you may use a smaller message panel with minimum 12-inch character height to prevent encroachment in the traveled way.

Start displaying the message on portable changeable message sign 15 minutes before closing the lane. Place portable changeable message sign in advance of the first warning sign for:

1. Each stationary lane closure

For 5 days starting on the day of signal activation, place 1 portable changeable message sign in each direction of travel and display the message, "SIGNAL AHEAD -- PREPARE TO STOP." Place portable changeable message sign as far from the traveled way as practicable where it is legible to traffic and does not encroach on the traveled way. Place portable changeable sign before or at the crest of vertical roadway curvature where it is visible to approaching traffic. Avoid placing portable changeable message sign within or immediately after horizontal roadway curvature. Where possible, place portable changeable message sign behind guardrail or temporary railing (Type K).

Except where placed behind guardrail or temporary railing (Type K) use traffic control for shoulder closure to delineate portable changeable message sign.

Remove portable changeable message sign when not in use.

MEASUREMENT AND PAYMENT

Payment for "Portable Changeable Message Signs," shall be at the contract unit price as set forth in the proposal and shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item.

Portable changeable message signs ordered by the Engineer in excess of the number shown on the plans or specified in these special provisions will be paid for as extra work under Section 4-1.05, "Changes and Extra Work," of the Standard Specifications.

AS-BUILT DRAWINGS

Record Drawings shall be submitted before the notice of completion is filed and must include the following:

- Shall be submitted on Mylar, at least 24”x 36”, and shall bear the name, address, telephone number of the firm preparing the drawings and in electronic (AutoCAD) format.
- Surveyor’s/Engineers statement (with embossed or wet seal and with and original signature on each sheet) shall verify the as-built drawings reflect the true conditions in the field.
- Contractor’s statement (with original signature on each sheet) shall verify all construction specifications and product qualities have been met or exceeded.
- “AS-BUILT DRAWINGS” or “RECORD DRAWINGS” shall be clearly labeled on each sheet.
- The location and elevation of the benchmark referenced will be shown on the drawing.
- Corrected placement, grade, elevation and alignment of roads, water system, sewer and storm system, lighting system and appurtenances, pipe sizes, material changes, shall all be shown on as-built drawing.

- All horizontal distances shall be shown to the nearest tenth of a foot (0.1’). All elevations shall be shown to the nearest five hundredths of a foot (0.05’).

Full compensation for conforming to the requirements of this section shall be considered as included in the price paid for the various contract items of work involved and no additional compensation will be made.

TECHNICAL SPECIFICATIONS
FOR:

Community Park- 42
City of Merced

January, 2023

BID SUBMITTAL

Prepared by:

O'DELL ENGINEERING

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BID ITEM DESCRIPTIONS

BID ITEM DESCRIPTIONS
The descriptions below are general descriptions and do not include estimated quantities. See plans and bid summary for estimated quantities. Estimated quantities are provided as a courtesy only. Actual numbers and quantities of symbols on plans prevail.

Bid Schedule 'A' – Base Bid

Bid Item 1 - Permits, Bonds, Licenses & Insurance:
The lump sum bid for this item shall include all costs for permits, bonds, licenses and insurance. The item also includes all charges and fees, and give all notices necessary and incidental to the prosecution of the work as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 2 - Public Convenience and Safety:
The lump sum bid for this item shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 3 - Water Pollution Control:
The lump sum bid for this item shall also include preparation of storm water pollution prevention plan including all labor, materials, tools, equipment, and incidentals and for doing all the work involved in preparing, obtaining approval of, and amending the SWPPP and CSMP, inspecting water pollution control practices, as required by the Drawings and Specifications, and as directed by the Engineer. Item also includes implementation of water pollution prevention plan including all labor, materials, tools, equipment, and incidentals.

Bid Item 4 - Street Sweeping:
The lump sum bid for this item includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in street sweeping, including disposal of collected material, as required by the Drawings and Specifications, and as directed by the Engineer.

Bid Item 5 - Surveying Services:
The lump sum bid for this item includes shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item.

Bid Item 6 - Monumentation:
The lump sum bid for this item will be made only if monuments are affected within the proposed work and shall be at the contract unit price for two (2) items as set forth in the proposal and shall include all labor, materials, tools, equipment and all work necessary for the completion of this item.

Bid Item 7 - Portable Changeable Message Signs:

The lump sum bid for this item shall be at the contract unit price as set forth in the proposal and shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item.

Bid Item 8 - Site Preparation (Clearing, Grubbing, & Disposal):

The lump sum bid for this item shall include all costs for soil clearing, grubbing and removal. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 9 - Soil Import:

The lump sum bid for this item shall include all costs for soil import per landscape and civil plans. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 10 - Site Grading (Mass/Fine):

The square footage bid for this item shall include all costs for rough grading, fine grading, and if needed, soil removal and disposal. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 11 - 30" Storm Drainage Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage systems structures, solid and perforated piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 12 - 24" Storm Drain Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage systems structures, solid and perforated piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 13 - 18" Storm Drain Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage systems structures, solid and perforated piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 14 - 12" Storm Drain Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage systems structures, solid and perforated piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 15 - 10" Storm Drain Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage systems structures, solid and perforated piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 16 - 8" Storm Drain Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage systems structures, solid and perforated piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 17 - 6" Storm Drain Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage systems structures, solid and perforated piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 18 - Storm Drainage Manholes:

The unit price bid for this item shall include all costs for purchase and installation of storm drainage manholes, and related components and connections to storm drainage system, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 19 - Type "C" Catch Basins:

The unit price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage system inlet structures, and related components, as indicated on the Drawings as well as finish grading of landscape areas to meet rim and invert elevations. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 20 - Storm Drain Area Drains:

The unit price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage system inlet structures, and related components, as indicated on the Drawings as well as finish grading of landscape areas to meet rim and invert elevations. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 21 - Storm Drain Area Outfalls:

The unit price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage system outfall structures, and related components, as indicated on the Drawings as well as finish grading of landscape areas to meet rim and invert elevations. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 22 - 4" Sewer Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional sanitary sewer system structures, solid piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 23 - 6" Sewer Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully

functional sanitary sewer system structures, solid piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 24 - Sewer Manhole

The unit price bid for this item shall include all costs for purchase and installation of sanitary sewer manholes, and related components and connections to sanitary sewer system, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 25 - Sewer Cleanout

The unit price bid for this item shall include all costs for purchase and installation of sanitary sewer cleanout, and related components and connections to sanitary sewer system, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 26 - Connect to Existing Sewer Manhole

The unit price bid for this item shall include all costs for purchase, lane closure/road control, line trenching, placement, backfill, and connection to City Sewer System with traffic rated boxes as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid form as a pay item.

Bid Item 27 - 10” Water Line (Irrigation Main)

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional water system structures, solid piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 28 - 3” Water Line

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional water system structures, solid piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 29 - 1” Water Line

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional water system structures, solid piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 30 - 10” Water Meter

The unit price bid for this item shall include all costs for purchase and installation of water meters, reducer connections, and final connections to the water systems in locations indicated on the Drawings. The item also includes labor, materials, and all other work required by Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 31 - 3" Water Meter

The unit price bid for this item shall include all costs for purchase and installation of water meters, reducer connections, and final connections to the water systems in locations indicated on the Drawings. The item also includes labor, materials, and all other work required by Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 32 -Connect to Existing Water Main

The unit price bid for this item shall include all costs for purchase, lane closure/road control, line trenching, placement, backfill, and connection to City Water system with traffic rated boxes as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid form as a pay item.

Bid Item 33 -10" Water Line (Offsite)

The unit price bid for this item shall include all costs for purchase and installation of water meters, reducer connections, and final connections to the water systems in locations indicated on the Drawings. The item also includes labor, materials, and all other work required by Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 34 -Fire Hydrant Assembly:

The unit price bid for this item shall include all costs for purchase and installation of fire hydrant assembly, and related components and connections to water system, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 35 -Electrical:

The lump sum price bid for this item shall include all costs for purchase and installation of a fully functional electrical power and lighting system, including switchboard, panels, transformers, grounding, conduits, pullboxes, conductors, light fixtures (including poles), devices and equipment as indicated on the Drawings and Specifications within Division 26. For light poles and structures listed as bid alternate within this contract, the bidder shall provide a N16 pullbox at the termination point/location as part of base bid. This item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 36 - Parking Lot Light Pole – 4 head fixture (Site Feature '40'):

The unit price bid for this item shall include all costs for purchase and installation of parking lot light poles, 4- head fixtures, foundations, and power conductors in areas indicated on the Drawings (conduits & boxes are already part of the base bid). The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 37 - Parking Lot Light Pole – Single head fixture (Site Feature '33'):

The unit price bid for this item shall include all costs for purchase and installation of parking lot light poles, single head fixtures, foundations, and power conductors in areas indicated on the Drawings (conduits & boxes are already part of the base bid). The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 38 - Pedestrian Light Pole with Fixture (Site Feature '15'):

The unit price bid for this item shall include all costs for purchase and installation of pedestrian light poles, conduits, conductors, and pullboxes as identified on the Drawings. The item also includes labor, materials

and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 39 - Concrete Flatwork (Site Finish 'A'):
The square foot price bid for this item shall include all costs for installation, soil preparation forming, sub-grade compaction, concrete additives, pigments and sealers, pouring concrete pavement, finishing, joints, and joint sealants in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 40 - Asphalt Parking Lot with Striping (Site Finish 'B'):
The square footage price bid for this item shall include all costs for purchase, installation, and preparation of asphalt surfacing in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 41 - Plexipave Surfacing Tennis Court Field (Site Finish 'C'):
The square footage price bid for this item shall include all costs for purchase, installation and preparation of Plexipave court including surfacing and the flatwork in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 42 - Plexipave Surfacing Tennis Court Striping (Site Finish 'D'):
The linear footage price bid for this item shall include all costs for purchase, installation and preparation of Plexipave court striping included on the surfacing in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 43 - Plexipave Surfacing Futsal Court Field (Site Finish 'H'):
The square footage price bid for this item shall include all costs for purchase, installation and preparation of Plexipave court including surfacing and the flatwork in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 44 - Plexipave Surfacing Futsal Court Striping (Site Finish 'I'):
The linear footage price bid for this item shall include all costs for purchase, installation and preparation of Plexipave court striping included on the surfacing in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 45 -Sand Volleyball Courts (Site Finish 'E'):
The square foot price bid for this item shall include all costs for installation and preparation of sand volleyball courts including sub-grade compaction and edging in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 46 - 12" Wide Concrete Mow Curb (Site Feature '1'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade,

reinforcement and compaction, concrete additives, sealers, pouring concrete band, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 47 - 12" Wide Concrete Curb at Volleyball Courts (Site Feature '3'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, concrete additives, sealers, pouring concrete curb, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 48 - Thickened Sidewalk Edge at Playground (Site Feature '2'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, aggregate base, concrete additives, sealers, pouring thickened concrete curbs, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 49 - Parking Lot Curbs- Vertical/ Flush (Site Feature '23'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, aggregate base, concrete additives, sealers, pouring concrete curbs, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 50 - Parking Lot Curb & Gutter (Site Feature '23'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, aggregate base, concrete additives, sealers, pouring concrete curbs, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 51 - Vertical Curb at Drop-Off Area (Site Feature '42'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, aggregate base, concrete additives, sealers, pouring concrete curbs, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 52 - Truncated Domes (Site Feature '43'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, concrete additives, pigments and sealers, saw cutting, cast-in-place truncated domes, and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 53 - Parking Lot Rolled Curb (Site Feature '45'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, aggregate base, concrete additives, sealers, pouring concrete curbs, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other

work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 54 - AC Dike:

The linear footage price bid for this item shall include all costs for purchase, installation, and preparation of asphalt dike in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 55 - 2x4 Header at Limit of Phase 1 (Site Feature '50'):

The linear footage price bid for this item shall include all costs for purchase, installation, and preparation of header in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 56 - Thickened Sidewalk Edge at Volleyball Courts (Site Feature '51'):

The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, aggregate base, concrete additives, sealers, pouring thickened concrete curbs, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 57 - Directional Signage (Site Feature '5'):

The unit price bid for this item shall include all costs for material purchase and installation of directional signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 58 - Field Location Signage (Site Feature '6'):

The unit price bid for this item shall include all costs for material purchase and installation of field location signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 59 - Removable Bollards (Site Feature '7'):

The unit price bid for this item shall include all costs for purchase and installation of removable bollards, footings, and fasteners in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 60 - Fixed Bollards (Site Feature '8'):

The unit price bid for this item shall include all costs for purchase and installation of fixed bollards, footings, and fasteners in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 61 - Picnic Tables (Site Feature '9'):

The unit price bid for this item shall include all costs for purchase and installation of picnic tables, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also

includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 62 - Accessible Picnic Tables (Site Feature '10'):
The unit price bid for this item shall include all costs for purchase and installation of ADA picnic tables, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 63 - Bench (Site Feature '11'):
The unit price bid for this item shall include all costs for purchase and installation of benches, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 64 - Drinking Fountain (Site Feature '12')
The unit price bid for this item shall include all costs for purchase and installation of a fully functioning bi-level drinking fountain with bottle filler in location shown on Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item. Water line, backflow preventer and sewer line shall be part of Bid Item 11.

Bid Item 65 - Volleyball poles, Ground Sleeves, and Net (Site Feature '13'):
The unit price bid for this item shall include all costs for purchase and installation of a volleyball pole equipment, footings, sleeves, and net as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 66 - Dual Post Football Goal (Site Feature '14'):
The unit price bid for this item shall include all costs for purchase and installation of a dual post football goal and footings sleeves as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 67 - Soccer Goal and Net (Site Feature '16'):
The unit price bid for this item shall include all costs for purchase and installation of a dual soccer goal and net as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 68 - Restroom / Concessions Building (Site Feature '17'):
The lump sum price bid for this item shall include all costs for purchase and installation of a fully functioning prefabricated restroom and concessions building as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item. Contractor shall also be responsible for coordinating and securing applicable building permit/s prior to installation.

Bid Item 69 - ADA Ramp with Truncated Domes (Site Feature '18'):
The unit price bid for this item shall include all costs for purchase and installation of ADA Ramp with truncated domes in locations indicated on the Drawings. The item also includes labor, materials and all other

work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 70 - ADA Parking Signage (Site Feature '19'):
The lump sum price bid for this item shall include all costs for material purchase and installation of ADA parking signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 71 - Tow-Away Signage (Site Feature '20'):
The lump sum price bid for this item shall include all costs for material purchase and installation of tow-away signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 72 - No Parking Signage (Site Feature '21'):
The lump sum price bid for this item shall include all costs for material purchase and installation of no parking signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 73 - Drop-off Signage (Site Feature '22'):
The lump sum price bid for this item shall include all costs for material purchase and installation of drop-off signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 74 - Restroom Building (Site Feature '27'):
The lump sum price bid for this item shall include all costs for purchase and installation of a fully functioning prefabricated restroom building as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item. Contractor shall also be responsible for coordinating and securing applicable building permit/s prior to installation.

Bid Item 75 - Tree Grate (Site Feature '30'):
The unit price bid for this item shall include all costs for purchase and installation of tree grates in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 76 - Chain Link Fence at Tennis Court (Site Feature '31'):
The linear foot price bid for this item shall include all costs for purchase and installation of chain link fence panels, rails, posts and footings, and all hardware and fasteners in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 77 - Chain Link Gate at Tennis Court (Site Feature '32'):
The linear foot price bid for this item shall include all costs for purchase and installation of chain link gate and panels, rails, posts and footings, and all hardware and fasteners in locations indicated on the Drawings.

The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 78 -Chain Link Fence at Futsal Court (Site Feature '34'):
The linear foot price bid for this item shall include all costs for purchase and installation of chain link fence panels, rails, posts and footings, and all hardware and fasteners in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 79 - Chain Link Gate at Futsal Court (Site Feature '35'):
The linear foot price bid for this item shall include all costs for purchase and installation of chain link gate and panels, rails, posts and footings, and all hardware and fasteners in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 80 -Decorative Fence at Futsal Court (Site Feature '36'):
The linear foot price bid for this item shall include all costs for purchase and installation of chain link gate and panels, rails, posts and footings, and all hardware and fasteners in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 81 -Bike Rack (Site Feature '37'):
The unit price bid for this item shall include all costs for purchase and installation of bike racks, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 82 - Tubular Steel Gates at Vehicular Entry (Site Feature '38'):
The unit price bid for this item shall include all costs for purchase and installation of tubular steel gates and mounting hardware per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 83 - Waste Receptacle Corrals (Site Feature '39'):
The unit price bid for this item shall include all costs for purchase and installation of waste receptacle corral, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 84 - Tennis Posts and Ground Sleeves (Site Feature '41')
The unit price bid for this item shall include all costs for purchase and installation of all pickleball posts, footing, and sleeves as indicated on the Drawings. The item also includes materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 85 - No Camping/Over Night Parking Signage at Park Entry (Site Feature '44'):
The unit price bid for this item shall include all costs for material purchase and installation of field marker identification signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in

the Bid Form as a pay item.

Bid Item 86 - No Camping/Over Night Parking Signage at Restroom Buildings (Site Feature '46'):
The unit price bid for this item shall include all costs for material purchase and installation of field marker identification signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 87 - Park Welcome Signage (Site Feature '47'):
The unit price bid for this item shall include all costs for material purchase and installation of park welcome signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 88 - Park Rules Signage (Site Feature '48'):
The unit price bid for this item shall include all costs for material purchase and installation of park rules signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 89 - Doggie-Pot Waste Station (Site Feature '49'):
The unit price bid for this item shall include all costs for material purchase and installation of doggie-pot waste station, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 90 - Futsal Goal and Net (Site Feature '54'):
The unit price bid for this item shall include all costs for purchase and installation of a dual soccer goal and net as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 91 -Soil Preparation & Amendment:
The square foot price bid for this item shall include all costs for soil testing, purchase and installation of fertilizers, organic material and soil conditioners as indicated by soil laboratory tests (contractor responsibility) and as indicated on the Drawings and Specifications. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 92 - Turf Hydroseed- Sports Field Blend:
The square foot price bid for this item shall include all costs for soil testing, purchase and installation of fertilizers, organic material and soil conditioners as indicated by soil laboratory tests (contractor responsibility), and turf hydroseed as indicated on the planting plans, details and specifications. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 93 - Turf Hydroseed:
The square foot price bid for this item shall include all costs for soil testing, purchase and installation of fertilizers, organic material and soil conditioners as indicated by soil laboratory tests (contractor

responsibility), and turf hydroseed as indicated on the planting plans, details and specifications. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 94 - 1 Gallon Shrubs:

The lump sum price bid for this item shall include all costs for purchase and installation of fertilizers, fertilizer packs, as indicated by soil laboratory tests (contractor responsibility), and purchase and installation of 1-gallon shrubs as indicated on the Drawings and Specifications. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 95 - 24" Box Trees:

The unit price bid for this item shall include all costs for purchase and installation of fertilizers, fertilizer packs, as indicated by soil laboratory tests (contractor responsibility), stakes, tree ties, and purchase and installation of 24" box trees as indicated on the Drawings and Specifications. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 96 - Tree Root Barriers:

The linear foot price bid for this item shall include all costs for purchase and installation of root barriers as indicated on planting plans and details. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 97 - Top Dressing- Decorative Bark Mulch:

The square foot price bid for this item shall include all costs for purchase and installation of a 3" depth of organic mulch as indicated on the Drawings and Specifications. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 98 - Irrigation System:

The lump sum price bid for this item shall include all costs for purchase and installation of irrigation pipe, equipment, heads, bubblers, wires, remote control valves, sensors, backflow preventer, fittings, and all other miscellaneous irrigation components for a fully functioning irrigation system as indicated on the Drawings and Specifications as required in the field. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 99 - Irrigation Controller:

The lump sum price bid for this item shall include all costs for purchase and installation of controller and pad as indicated on the Drawings and Specifications as required in the field. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 100 - Irrigation Point of Connection:

The lump sum price bid for this item shall include all costs for purchase and installation of new point of connection – water meter, backflow preventer, booster pump and all other miscellaneous irrigation components for a fully functioning irrigation point of connection as indicated on the Drawings and Specifications as required in the field. The item also includes labor, materials and all other work required by

the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 101 - Landscape Maintenance Period (180 Days):
The lump sum price bid for this item shall include all costs for maintaining installed landscape areas for a period of 180 days as indicated on the Drawings as well as replacements for plants and equipment. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 102 - FDR-C Process (1.0'):
The square footage price bid for this item shall include all costs for installation and preparation of sub-grade using Full Depth Reclamation-Cement (FDR-C) in the areas indicated on the Drawings. This item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

BID ITEM DESCRIPTIONS – ADD ALTERNATES

Bid Schedule 'B' - Add Alternative #1

Bid Item 1 - Permits, Bonds, Licenses & Insurance
The lump sum bid for this item shall include all costs for permits, bonds, licenses and insurance. The item also includes all charges and fees, and give all notices necessary and incidental to the prosecution of the work as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 2 - Public Convenience and Safety
The lump sum bid for this item shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 3 - Site Grading (Mass/Fine):
The square footage bid for this item shall include all costs for rough grading, fine grading, and if needed, soil removal and disposal. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 4 - 6" Storm Drain Line:
The linear footage price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage systems structures, solid and perforated piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 5 - Storm Drain Area Drains:
The unit price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage system inlet structures, and related components, as indicated on the Drawings as well as finish grading of landscape areas to meet rim and invert elevations. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 6 - Pedestrian Light Poles w/Fixture (Add. Alt. #1 Site Feature '13'):

The unit price bid for this item shall include all costs for purchase and installation of pedestrian light poles, conduits, conductors, and pullboxes as identified on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 7 - Concrete Flatwork: (Add. Alt. #1 Site Finish '1'):

The square foot price bid for this item shall include all costs for installation, soil preparation forming, sub-grade compaction, concrete additives, pigments and sealers, pouring concrete pavement, finishing, joints, and joint sealants in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 8 - Rubberized Play Surfacing – 01 (2-5 Area) (Add. Alt. #1 Site Finish '2'):

The square foot price bid for this item shall include all costs for purchase and installation of rubberized play surfacing wear layer and cushion layer as indicated on the Drawings, in the construction details and with manufacturers' certifications. The item also includes labor, materials and all other work required by the Drawings and specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 9 - Rubberized Play Surfacing – 02 (2-5 Area) (Add. Alt. #1 Site Finish '3'):

The square foot price bid for this item shall include all costs for purchase and installation of rubberized play surfacing wear layer and cushion layer as indicated on the Drawings, in the construction details and with manufacturers' certifications. The item also includes labor, materials and all other work required by the Drawings and specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 10 - Rubberized Play Surfacing – 01 (5-12 Area) (Add. Alt. #1 Site Finish '4'):

The square foot price bid for this item shall include all costs for purchase and installation of rubberized play surfacing wear layer and cushion layer as indicated on the Drawings, in the construction details and with manufacturers' certifications. The item also includes labor, materials and all other work required by the Drawings and specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 11 - Rubberized Play Surfacing – 01 (5-12 Area) (Add. Alt. #1 Site Finish '5'):

The square foot price bid for this item shall include all costs for purchase and installation of rubberized play surfacing wear layer and cushion layer as indicated on the Drawings, in the construction details and with manufacturers' certifications. The item also includes labor, materials and all other work required by the Drawings and specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 12 - Play Area Base Preparation (Add. Alt. #1 Site Finishes '2' – '5'):

The square foot price bid for this item shall include all costs for installation, soil preparation forming, sub-grade compaction, and aggregate base (per grading plans) under all rubberized play surfacing areas as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 13 - Thickened Sidewalk Edge at Play Area (Add. Alt. #1 Site Feature '11'):

The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, aggregate base, concrete additives, sealers, pouring thickened concrete curbs, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in

the Bid Form as a pay item.

Bid Item 14 - 12" wide Concrete Mow Curb (Add. Alt. #1 Site Feature '12'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, concrete additives, sealers, pouring concrete band, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 15 - Chain Link Fence with concrete curb below fence behind Soccer Goals (Add. Alt. #1 Site Feature '19'):
The linear foot price bid for this item shall include all costs for purchase and installation of chain link fence panels, rails, posts, footings, concrete curb, and all hardware and fasteners in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 16 - Play Equipment (2-5) (Add. Alt. #1 Site Feature '7'):
The lump sum price bid for this item shall include all costs for purchase, shipment, and installation of all 2-5 play equipment, as indicated on the Drawings. The item also includes materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 17 - Play Equipment (5-12) (Add. Alt. #1 Site Feature '8'):
The lump sum price bid for this item shall include all costs for purchase, shipment, and installation of all 5-12 play equipment, as indicated on the Drawings. The item also includes materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 18 - Picnic Tables (Add. Alt. #1 Site Feature '9'):
The unit price bid for this item shall include all costs for purchase and installation of picnic tables, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 19 - Accessible Picnic Tables (Add. Alt. #1 Site Feature '10'):
The unit price bid for this item shall include all costs for purchase and installation of ADA picnic tables, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 20 - Bike Rack (Add. Alt. #1 Site Feature '17'):
The unit price bid for this item shall include all costs for purchase and installation of bike racks, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 21 - Waste Receptacle Corrals (Add. Alt. #1 Site Feature '15'):
The unit price bid for this item shall include all costs for purchase and installation of waste receptacle corral, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 22 - Doggie-Pot Waste Station (Add. Alt. #1 Site Feature '16'):

The unit price bid for this item shall include all costs for material purchase and installation of doggie-pot waste station, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 23 - Removable Bollard (Add. Alt. #1 Site Feature '14'):

The unit price bid for this item shall include all costs for purchase and installation of removable bollards, footings, and fasteners in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 24 - Field Marker Identification Signage (Add. Alt. #1 Site Feature '20'):

The unit price bid for this item shall include all costs for material purchase and installation of field marker identification signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 25 - Soil Preparation & Amendment:

The square foot price bid for this item shall include all costs for soil testing, purchase and installation of fertilizers, organic material and soil conditioners as indicated by soil laboratory tests (contractor responsibility) and as indicated on the Drawings and Specifications. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 26 - 1 Gallon Shrubs:

The lump sum price bid for this item shall include all costs for purchase and installation of fertilizers, fertilizer packs, as indicated by soil laboratory tests (contractor responsibility), and purchase and installation of 1-gallon shrubs as indicated on the Drawings and Specifications. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 27 - 24" Box Trees:

The unit price bid for this item shall include all costs for purchase and installation of fertilizers, fertilizer packs, as indicated by soil laboratory tests (contractor responsibility), stakes, tree ties, and purchase and installation of 24" box trees as indicated on the Drawings and Specifications. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 28 - Tree Root Barriers:

The linear foot price bid for this item shall include all costs for purchase and installation of root barriers as indicated on planting plans and details. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 29 - Top Dressing- Decorative Bark Mulch:

The square foot price bid for this item shall include all costs for purchase and installation of a 3" depth of organic mulch as indicated on the Drawings and Specifications. The item also includes labor, materials and

all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 30 - Irrigation System:

The lump sum price bid for this item shall include all costs for purchase and installation of irrigation pipe, equipment, heads, bubblers, wires, remote control valves, sensors, backflow preventer, fittings, and all other miscellaneous irrigation components for a fully functioning irrigation system as indicated on the Drawings and Specifications as required in the field. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 31 - Landscape Maintenance Period (180 Days):

The lump sum price bid for this item shall include all costs for maintaining installed landscape areas for a period of 180 days as indicated on the Drawings as well as replacements for plants and equipment. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 32 - FDR-C Process (1.0'):

The square footage price bid for this item shall include all costs for installation and preparation of sub-grade using Full Depth Reclamation-Cement (FDR-C) in the areas indicated on the Drawings. This item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Schedule 'C' - Add Alternative #2

Bid Item 1 - Permits, Bonds, Licenses & Insurance

The lump sum bid for this item shall include all costs for permits, bonds, licenses and insurance. The item also includes all charges and fees, and give all notices necessary and incidental to the prosecution of the work as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 2 - Public Convenience and Safety

The lump sum bid for this item shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 3 - Electrical at Shade Structure from Panel:

The unit price bid for this item shall include all costs for purchase and installation of light fixtures, receptacles, and conduit on the structure as well as all related conductors from the panel to structure. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 4 - Shade Structure 50'x100' (Add. Alt. #2 Site Feature '21'):

The lump sum price bid for this item shall include all costs for purchase, fabrication, and installation of a fully functioning prefabricated 50'x100'shade structure. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay

item. Contractor shall also be responsible for the coordinating the structural engineering package with the County prior to installation and securing applicable building permit/s.

Bid Item 5 - Picnic Tables (Add. Alt. #2 Site Feature '22'):
The unit price bid for this item shall include all costs for purchase and installation of picnic tables, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 6 - Accessible Picnic Tables (Add. Alt. #2 Site Feature '23'):
The unit price bid for this item shall include all costs for purchase and installation of ADA picnic tables, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Schedule 'D' - Add Alternative #3

Bid Item 1 - Permits, Bonds, Licenses & Insurance
The lump sum bid for this item shall include all costs for permits, bonds, licenses and insurance. The item also includes all charges and fees and give all notices necessary and incidental to the prosecution of the work as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 2 - Public Convenience and Safety
The lump sum bid for this item shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 3 - Electrical at Shade Structure from Panel:
The unit price bid for this item shall include all costs for purchase and installation of light fixtures, receptacles, and conduit on the structure as well as all related conductors from the panel to structure. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 4 - Concrete Flatwork (Add. Alt. #3 Site Finish '24'):
The square foot price bid for this item shall include all costs for installation, soil preparation forming, sub-grade compaction, concrete additives, pigments and sealers, pouring concrete pavement, finishing, joints, and joint sealants in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 5 - Shade Structure 30'x30' (Add. Alt. #3 Site Feature '25'):
The lump sum price bid for this item shall include all costs for purchase, fabrication, and installation of a fully functioning prefabricated 30'x30'shade structure. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item. Contractor shall also be responsible for the coordinating the structural engineering package with the County prior to installation and securing applicable building permit/s.

Bid Item 6 - Picnic Tables (Add. Alt. #3 Site Feature '26'):

The unit price bid for this item shall include all costs for purchase and installation of picnic tables, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 7 - Accessible Picnic Tables (Add. Alt. #3 Site Feature '27'):

The unit price bid for this item shall include all costs for purchase and installation of ADA picnic tables, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 8 - Waste Receptacle Corrals (Add. Alt. #3 Site Feature '28'):

The unit price bid for this item shall include all costs for purchase and installation of waste receptacle corral, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 9 - FDR-C Process (1.0'):

The square footage price bid for this item shall include all costs for installation and preparation of sub-grade using Full Depth Reclamation-Cement (FDR-C) in the areas indicated on the Drawings. This item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Schedule 'E' - Add Alternative #4

Bid Item 1 - Permits, Bonds, Licenses & Insurance

The lump sum bid for this item shall include all costs for permits, bonds, licenses and insurance. The item also includes all charges and fees, and give all notices necessary and incidental to the prosecution of the work as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 2 - Public Convenience and Safety

The lump sum bid for this item shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 3 - Water Pollution Control

The lump sum bid for this item shall also include preparation of storm water pollution prevention plan including all labor, materials, tools, equipment, and incidentals and for doing all the work involved in preparing, obtaining approval of, and amending the SWPPP and CSMP, inspecting water pollution control practices, as required by the Drawings and Specifications, and as directed by the Engineer. Item also includes implementation of water pollution prevention plan including all labor, materials, tools, equipment, and incidentals.

Bid Item 4 - Street Sweeping

The lump sum bid for this item includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in street sweeping, including disposal of collected material, as required by the Drawings and Specifications, and as directed by the Engineer.

Bid Item 5 - Surveying Services

The lump sum bid for this item includes shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item.

Bid Item 6 - Monumentation

The lump sum bid for this item will be made only if monuments are affected within the proposed work and shall be at the contract unit price for two (2) items as set forth in the proposal and shall include all labor, materials, tools, equipment and all work necessary for the completion of this item.

Bid Item 7 - Portable Changeable Message Signs

The lump sum bid for this item shall be at the contract unit price as set forth in the proposal and shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item.

Bid Item 8 - Site Grading (Mass/Fine):

The square footage bid for this item shall include all costs for rough grading, fine grading, and if needed, soil removal and disposal. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 9 - 6" Storm Drain Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage systems structures, solid and perforated piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 10 - Storm Drain Manholes:

The unit price bid for this item shall include all costs for purchase and installation of storm drainage manholes, and related components and connections to storm drainage system, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 11 - Type 'C' Catch Basins:

The unit price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage system inlet structures, and related components, as indicated on the Drawings as well as finish grading of landscape areas to meet rim and invert elevations. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 12 - Storm Drain Area Outfalls:

The unit price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage system outfall structures, and related components, as indicated on the Drawings as well as finish grading of landscape areas to meet rim and invert elevations. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid

Form as a pay item.

Bid Item 13 - Parking Lot Light Poles (Add. Alt. #4 Site Feature '35'):
The unit price bid for this item shall include all costs for purchase and installation of conduits and pullboxes as identified on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 14 - Asphalt Parking Lot with Striping (Add. Alt. #4 Site Finish '30'):
The square footage price bid for this item shall include all costs for purchase, installation, and preparation of asphalt surfacing in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 15 - Parking Lot Curbs- Vertical/ Flush (Add. Alt. #4 Site Feature '33'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, aggregate base, concrete additives, sealers, pouring concrete curbs, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 16 -Parking Lot Curb & Gutter (Add. Alt. #4 Site Feature '36'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, aggregate base, concrete additives, sealers, pouring concrete curbs, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 17 - Park Sign (Add. Alt. #4 Site Feature '31'):
The unit price bid for this item shall include all costs for material purchase and installation of park monument sign and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 18 - Fixed Bollard: (Add. Alt. #4 Site Feature '32'):
The unit price bid for this item shall include all costs for purchase and installation of fixed bollards, footings, and fasteners in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 19 - Tubular Steel Gates at Vehicular Entry (Add. Alt #4 Site Feature '34'):
The unit price bid for this item shall include all costs for purchase and installation of tubular steel gates and mounting hardware per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 20 -FDR-C Process (1.0'):
The square footage price bid for this item shall include all costs for installation and preparation of sub-grade using Full Depth Reclamation-Cement (FDR-C) in the areas indicated on the Drawings. This item also

includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Schedule 'F' - Add Alternative #5

Bid Item 1 - Permits, Bonds, Licenses & Insurance

The lump sum bid for this item shall include all costs for permits, bonds, licenses and insurance. The item also includes all charges and fees, and give all notices necessary and incidental to the prosecution of the work as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 2 - Public Convenience and Safety

The lump sum bid for this item shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 3 - Surveying Services

The lump sum bid for this item includes shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item.

Bid Item 4 - Parking Lot Light Poles – 4-head fixture (Site Feature '4'):

The unit price bid for this item shall include all costs for purchase and installation of parking lot light poles, 4- head fixtures, foundations, and power conductors in areas indicated on the Drawings (conduits & boxes are already part of the base bid). The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 5 - Parking Lot Light Poles – single-head fixture (Site Feature '29'):

The unit price bid for this item shall include all costs for purchase and installation of parking lot light poles, single head fixtures, foundations, and power conductors in areas indicated on the Drawings (conduits & boxes are already part of the base bid). The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

END OF SECTION

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

1.3 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.

1.4 ACTION SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by City and separate contractors that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of Designers and City.
h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.

i. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
j. Cost information, including a proposal of change, if any, in the Contract Sum.
k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

2. Landscape Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Landscape Architect will notify Contractor through City of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

a. Forms of Acceptance: Change Order, Construction Change Directive, or Landscape Architect's Supplemental Instructions for minor changes in the Work.
b. Use product specified if Landscape Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.7 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

1. Conditions: Landscape Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Landscape Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution offers City a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities City must assume. City's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by City, and similar considerations.
b. Requested substitution does not require extensive revisions to the Contract Documents.
c. Requested substitution is consistent with the Contract Documents and will produce indicated results.

d. Requested substitution has the same aesthetically value or play features.
e. Substitution request is fully documented and properly submitted.
f. Requested substitution will not adversely affect Contractor's construction schedule.
g. Requested substitution has received necessary approvals of authorities having jurisdiction.
h. Requested substitution is compatible with other portions of the Work.
i. Requested substitution has been coordinated with other portions of the Work.
j. Requested substitution provides specified warranty.
k. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Not allowed.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General coordination procedures.
2. Coordination drawings.
3. Request for Information (RFIs).
4. Digital project management procedures.
5. Project meetings.

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

C. Related Requirements:

1. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

A. RFI: Request for Information. Request from City, Landscape Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Key Personnel Names: Within ten (10) days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1. Post copies of list in project meeting room, in temporary field office, and in prominent location in built facility. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for City and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and scheduled activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

1.6 REQUEST FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Landscape Architect will return without response those RFIs submitted to Landscape Architect by other entities controlled by Contractor.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Landscape Architect.
6. RFI number, numbered sequentially.
7. RFI subject.

8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Landscape Architect.

1. Attachments shall be electronic files in PDF format.

D. Landscape Architect's and City Action: Landscape Architect and City will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Landscape Architect or City after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:

    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for approval of Contractor's means and methods.
    d. Requests for coordination information already indicated in the Contract Documents.
    e. Requests for adjustments in the Contract Time or the Contract Sum.
    f. Requests for interpretation of Landscape Architect's actions on submittals.
    g. Incomplete RFIs or inaccurately prepared RFIs.

2. Landscape Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Landscape Architect or City of additional information.

3. Landscape Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal.

    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Landscape Architect and City in writing within 5 days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log bi-weekly. Include the following:

1. Project name.
2. Name and address of Contractor.
3. Name and address of City.
4. Name and address of Landscape Architect.
5. RFI number including RFIs that were returned without action or withdrawn.
6. RFI description.
7. Date the RFI was submitted.

8. Date Landscape Architect's and City's response was received.
9. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
10. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

F. On receipt of Landscape Architect's and City's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Landscape Architect and City's within 5 days if Contractor disagrees with response.

1.7 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify City and Landscape Architect of scheduled meeting dates and times a minimum of 10 working days prior to meeting.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including City and Landscape Architect, within three days of the meeting.

B. Preconstruction Conference: Landscape Architect and City will schedule and conduct a preconstruction conference before starting construction, at a time convenient to City and Landscape Architect, but no later than 10 days after execution of the Agreement.

1. Attendees: Authorized representatives of City, Landscape Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

    a. Tentative construction schedule.
    b. Critical work sequencing and long lead items.
    c. Designation of key personnel and their duties.
    d. Lines of communications.
    e. Procedures for processing field decisions and Change Orders.
    f. Procedures for RFIs.
    g. Procedures for testing and inspecting.
    h. Procedures for processing Applications for Payment.
    i. Distribution of the Contract Documents.
    j. Submittal procedures.
    k. Sustainable design requirements.
    l. Preparation of Record Documents.
    m. Use of the premises and existing building.
    n. Work restrictions.
    o. Working hours.
    p. City's occupancy requirements.
    q. Responsibility for temporary facilities and controls.
    r. Procedures for disruptions and shutdowns.
    s. Construction waste management and recycling.
    t. Parking availability.
    u. Progress cleaning.

3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other sections and when required for coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Landscape Architect and City of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

   a. Contract Documents.
   b. Options.
   c. Related RFIs.
   d. Related Change Orders.
   e. Purchases.
   f. Deliveries.
   g. Submittals.
   h. Sustainable design requirements.
   i. Review of mockups.
   j. Possible conflicts.
   k. Compatibility requirements.
   l. Time schedules.
   m. Weather limitations.
   n. Manufacturer's written instructions.
   o. Warranty requirements.
   p. Compatibility of materials.
   q. Acceptability of substrates.
   r. Temporary facilities and controls.
   s. Space and access limitations.
   t. Regulations of authorities having jurisdiction.
   u. Testing and inspecting requirements.
   v. Installation procedures.
   w. Coordination with other work.
   x. Required performance results.
   y. Protection of adjacent work.
   z. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to City and Landscape Architect, but no later than 30 days prior to the scheduled date of Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.

2. Attendees: Authorized representatives of City, Landscape Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

    a. Preparation of Record Documents.
    b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
    c. Procedures for completing and archiving web-based Project software site data files.
    d. Submittal of written warranties.
    e. Requirements for completing sustainable design documentation.
    f. Requirements for preparing operations and maintenance data.
    g. Requirements for delivery of material samples, attic stock, and spare parts.
    h. Requirements for demonstration and training.
    i. Preparation of Contractor's punch list.
    j. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
    k. Submittal procedures.
    l. Coordination of separate contracts.
    m. City's partial occupancy requirements.
    n. Installation of City's furniture, fixtures, and equipment.
    o. Responsibility for removing temporary facilities and controls.

4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

E. Progress Meetings: Conduct progress meetings at biweekly intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of City and Landscape Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

        1) Review schedule for next period.

    b. Review present and future needs of each entity present, including the following:

        1) Interface requirements.
        2) Sequence of operations.
        3) Resolution of BIM component conflicts.

4) Status of submittals.
5) Status of sustainable design documentation.
6) Deliveries.
7) Off-site fabrication.
8) Access.
9) Site use.
10) Temporary facilities and controls.
11) Progress cleaning.
12) Quality and work standards.
13) Status of correction of deficient items.
14) Field observations.
15) Status of RFIs.
16) Status of Proposal Requests.
17) Pending changes.
18) Status of Change Orders.
19) Pending claims and disputes.
20) Documentation of information for payment requests.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

F. Coordination Meetings: Conduct project coordination meetings at biweekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: In addition to representatives of City and Landscape Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
c. Review present and future needs of each contractor present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Resolution of BIM component conflicts.
4) Status of submittals.

5) Deliveries.
6) Off-site fabrication.
7) Access.
8) Site use.
9) Temporary facilities and controls.
10) Work hours.
11) Hazards and risks.
12) Progress cleaning.
13) Quality and work standards.
14) Status of RFIs.
15) Proposal Requests.
16) Change Orders.
17) Pending changes.

3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Submittal schedule requirements.
2. Administrative and procedural requirements for submittals.

B. Related Requirements:

1. Section 013100 "Project Management and Coordination" for submitting coordination drawings and subcontract list and for requirements for web-based Project software.
2. Section 017700 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Landscape Architect's and City's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Landscape Architect's and City's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.4 SUBMITTAL SCHEDULE

A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Landscape Architect and City and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.

3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.

    a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

4. Format: Arrange the following information in a tabular format:

    a. Scheduled date for first submittal.
    b. Specification Section number and title.
    c. Submittal Category: Action; informational.
    d. Name of subcontractor.
    e. Description of the Work covered.
    f. Scheduled date for City's final release or approval.
    g. Scheduled dates for purchasing.
    h. Scheduled date of fabrication.
    i. Scheduled dates for installation.
    j. Activity or event number.

1.5 SUBMITTAL FORMATS

A. Submittal Information: Include the following information in each submittal:

1. Project name.
2. Date.
3. Name of Landscape Architect.
4. Name of City.
5. Name of Contractor.
6. Name of firm or entity that prepared submittal.
7. Names of subcontractor, manufacturer, and supplier.
8. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier; and alphanumeric suffix for resubmittals.
9. Category and type of submittal.
10. Submittal purpose and description.
11. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
12. Drawing number and detail references, as appropriate.
13. Indication of full or partial submittal.
14. Location(s) where product is to be installed, as appropriate.
15. Other necessary identification.
16. Remarks.
17. Signature of transmitter.

B. Options: Identify options requiring selection by Landscape Architect.

C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Landscape Architect and City on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

D. Paper Submittals:

1. Place a permanent label or title block on each submittal item for identification; include name of firm or entity that prepared submittal.
2. Provide a space approximately 4 by 6 inches on label or beside title block to record Contractor's review and approval markings and action taken by Landscape Architect and/or City.
3. Action Submittals: Submit two paper copies of each submittal unless otherwise indicated. Landscape Architect, through City, will return one copy. Electronic submittals will be accepted in a PDF format and must be separated into each individual submittal number.
4. Informational Submittals: Submit two paper copies of each submittal unless otherwise indicated. Landscape Architect and City will not return copies.
5. Additional Copies: Unless additional copies are required for final submittal, and unless Landscape Architect or City observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
6. Transmittal for Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using transmittal form.

E. PDF Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

1.6 SUBMITTAL PROCEDURES

A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Email: Prepare submittals as PDF package, and transmit to Landscape Architect through the City by sending via email. Include PDF transmittal form. Include information in email subject line as requested by City and Landscape Architect.

   a. Landscape Architect, through City, will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.
2. Paper: Prepare submittals in paper form, and deliver to Landscape Architect through City.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections so processing will not be delayed because of need to review submittals concurrently for coordination.

   a. Landscape Architect and City reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on City's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Landscape Architect and/or City will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 10 days for review of each resubmittal.
4. Sequential Review: Where sequential review of submittals by Landscape Architect's consultants, City, or other parties is indicated, allow 21 days for initial review of each submittal.
5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Landscape Architect and to Landscape Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to City, through Landscape Architect, before being returned to Contractor.

    a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Landscape Architect and City.

D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from Landscape Architect's and/or City's action stamp.

E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Landscape Architect's and City's action stamp.

1.7 SUBMITTAL REQUIREMENTS

A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

    a. Manufacturer's catalog cuts.
    b. Manufacturer's product specifications.
    c. Standard color charts.
    d. Statement of compliance with specified referenced standards.
    e. Testing by recognized testing agency.
    f. Application of testing agency labels and seals.
    g. Notation of coordination requirements.
    h. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:

    a. Wiring diagrams that show factory-installed wiring.
    b. Printed performance curves.

c. Operational range diagrams.
d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before Shop Drawings, and before or concurrent with Samples.

B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

a. Identification of products.
b. Schedules.
c. Compliance with specified standards.
d. Notation of coordination requirements.
e. Notation of dimensions established by field measurement.
f. Relationship and attachment to adjoining construction clearly indicated.
g. Seal and signature of professional engineer if specified.

2. Paper Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 24 by 36 inches.

a. Two opaque (bond) copies of each submittal. Landscape Architect, through City, will return one copy.

C. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other materials.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Permanently attach label on unexposed side of Samples that includes the following:

a. Project name and submittal number.
b. Generic description of Sample.
c. Product name and name of manufacturer.
d. Sample source.
e. Number and title of applicable Specification Section.
f. Specification paragraph number and generic name of each item.

3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics, and identification information for record.
4. Web-Based Project Software: Prepare submittals in PDF form, and upload to web-based Project software website. Enter required data in web-based software site to fully identify submittal.
5. Paper Transmittal: Include paper transmittal including complete submittal information indicated.
6. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.

b. Samples not incorporated into the Work, or otherwise designated as City's property, are the property of Contractor.

7. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Landscape Architect, through City, will return submittal with options selected.

8. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

a. Number of Samples: Submit 2 sets of Samples. Landscape Architect and City will retain 1 Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record Sample.

1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least 2 sets of paired units that show approximate limits of variations.

D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
2. Manufacturer and product name, and model number if applicable.
3. Number and name of room or space.
4. Location within room or space.

E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of Landscape Architects and Citys, and other information specified.

F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.

G. Certificates:

1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer

or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.

2. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
4. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
5. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

H. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

    a. Name of evaluation organization.
    b. Date of evaluation.
    c. Time period when report is in effect.
    d. Product and manufacturers' names.
    e. Description of product.
    f. Test procedures and results.
    g. Limitations of use.

1.8 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Landscape Architect.

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file copy of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.9 CONTRACTOR'S REVIEW

A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Landscape Architect and City.

B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

1. Landscape Architect and City will not review submittals received from Contractor that do not have Contractor's review and approval.

1.10 LANDSCAPE ARCHITECT'S AND CITY'S REVIEW

A. Action Submittals: Landscape Architect and/or City will review each submittal, indicate corrections or revisions required, and return it.

1. PDF or Paper Submittals: Landscape Architect and City will indicate, via markup on each submittal, the appropriate action.

a. No Exceptions Taken: Contractor is advised that fabrication, manufacture, or construction may proceed, providing it complies with contract documents.
b. Make Corrections Noted: Contractor is advised that fabrication, manufacture, or construction may proceed, providing it complies with Architect’s notations and contract documents.
c. Amend and Resubmit or Rejected-See Remarks: Contractor is advised that no work shall be fabricated, manufactured, or constructed. Contractor shall make a new submittal.

B. Informational Submittals: Landscape Architect and City will review each submittal and will not return it, or will return it if it does not comply with requirements. Landscape Architect and City will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Landscape Architect and/or City.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Landscape Architect and City will return without review submittals received from sources other than Contractor.

F. Submittals not required by the Contract Documents will be returned by Landscape Architect without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.3 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, City's construction forces, Landscape Architect, occupants of Project, testing agencies, and authorities having jurisdiction.

B. Water and Sewer Service from Existing System: Water from City's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

C. Electric Power Service from Existing System: Electric power from City's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.

B. Implementation and Termination Schedule: Within 15 days of date established for commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.

C. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.

D. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

E. Moisture- and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold.

F. Dust Control Plan: Submit coordination drawing and narrative that indicates the dust control measures proposed for use, proposed locations, and proposed time frame for their operation. Include the following:

1. Locations of dust-control at each phase of work.
2. Other dust-control measures.

1.5 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

C. Accessible Temporary Egress: Comply with applicable provisions in the United States Access Board's ADA-ABA Accessibility Guidelines.

1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before City's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts and frames.

B. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats minimum 36 by 60 inches.

C. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading, if provided.

B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

1. Store combustible materials apart from building.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as City's property.

3.2 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.3 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, City, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

1. Connect temporary sewers to private system indicated as directed by authorities having jurisdiction.

C. Water Service: Connect to City's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to City. At Substantial Completion, restore these facilities to condition existing before initial use. Confirm that no cross connections occur with existing irrigation system

D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

E. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

1. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.

F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.

1. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
2. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

G. Electric Power Service: Connect to City's existing electric power service. Maintain equipment in a condition acceptable to City.

H. Telephone Numbers: Provide telephone number on-site at all times and in common-use facilities for use by all construction personnel. At a minimum of one location on-site, post a list of important telephone numbers.

a. Police and fire departments.
b. Ambulance service.
c. Contractor's home office.

d. Contractor's emergency after-hours telephone number.
e. Landscape Architect's office.
f. Engineers' offices.
g. City's office.
h. Principal subcontractors' field and home offices.

3.4 SUPPORT FACILITIES INSTALLATION

A. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

B. Parking: Use designated areas of City's existing parking areas for construction personnel.

C. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

D. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.

1. Identification Signs: Provide Temporary Construction Area identification signs as indicated on Drawings.
2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.

a. Provide temporary, directional signs for construction personnel and visitors.

3. Maintain and touch up signs so they are legible at all times.

E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.

F. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property City to access property for that purpose.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

C. Temporary Erosion and Sedimentation Control: Comply with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent and requirements specified in Section 311000 "Site Clearing."

D. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to temporary erosion and sedimentation-control Drawings.

1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant-protection zones.
2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

E. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

F. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.

G. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.

1. Extent of Fence: As indicated on Drawings.
2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to City.

H. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.

I. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

J. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

K. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

3.6 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.

C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. City reserves right to take possession of Project identification signs.
2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.
5. Repair of the Work.

B. Related Requirements:

1. Section 017839 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of cleaning agent.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at final completion.

1.4 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

C. Field Report: For pest control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting City unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by City. Label with manufacturer's name and model number.

    a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain City's signature for receipt of submittals.

5. Submit testing, adjusting, and balancing records.
6. Submit sustainable design submittals not previously submitted.
7. Submit changeover information related to City's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise City of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to City. Advise City's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct City's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
6. Advise City of changeover in utility services.
7. Participate with City in conducting inspection and walkthrough with local emergency responders.
8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
9. Complete final cleaning requirements.
10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Landscape Architect and City will either proceed with inspection or notify Contractor of unfulfilled requirements. Landscape Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Landscape Architect, that must be completed or corrected before certificate will be issued.

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to General Provisions.
2. Certified List of Incomplete Items: Submit certified copy of Landscape Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Landscape Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report.
5. Submit final completion photographic documentation.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Landscape Architect and City will either proceed with inspection or notify Contractor of unfulfilled requirements. Landscape Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Include the following information at the top of each page:

a. Project name.
b. Date.
c. Name of City.
d. Name of Landscape Architect.
e. Name of Contractor.
f. Page number.

2. Submit list of incomplete items in the following format:

a. PDF electronic file. Landscape Architect, through City, will return annotated file.

1.9 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Landscape Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit City's rights under warranty.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by City during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

D. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

1. Submit on digital media acceptable to City.

E. Warranties in Paper Form:

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

F. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average public space and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface.

d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Clean exposed exterior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
f. Sweep concrete floors broom clean in unoccupied areas.
g. Remove labels that are not permanent.
h. Wipe surfaces of site furnishings and play equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
i. Leave Project clean and ready for occupancy.

C. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.

D. Construction Waste Disposal: Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls."

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair, or remove and replace, defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.

END OF SECTION

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.
4. Miscellaneous record submittals.

B. Related Requirements:

1. Section 017700 "Closeout Procedures" for general closeout procedures.

1.3 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit one set(s) of marked-up record prints.
2. Number of Copies: Submit copies of record Drawings as follows:

a. Initial Submittal:

1) Submit one paper-copy set(s) of marked-up record prints.
2) Submit PDF electronic files of scanned record prints.
3) Submit record digital data files and one set(s) of plots.
4) Landscape Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.

b. Final Submittal:

1) Submit one paper-copy set(s) of marked-up record prints.
2) Submit record digital data files and one set(s) of record digital data file plots.
3) Plot each drawing file, whether or not changes and additional information were recorded.

B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.

E. Reports: Submit written report indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

1.4 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

   a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
   b. Accurately record information in an acceptable drawing technique.
   c. Record data as soon as possible after obtaining it.
   d. Record and check the markup before enclosing concealed installations.
   e. Cross-reference record prints to corresponding photographic documentation.

2. Content: Types of items requiring marking include, but are not limited to, the following:

   a. Dimensional changes to Drawings.
   b. Revisions to details shown on Drawings.
   c. Depths of foundations.
   d. Locations and depths of underground utilities.
   e. Revisions to routing of piping and conduits.
   f. Revisions to electrical circuitry.
   g. Actual equipment locations.
   h. Duct size and routing.
   i. Locations of concealed internal utilities.
   j. Changes made by Change Order or Construction Change Directive.
   k. Changes made following Landscape Architect's written orders.
   l. Details not on the original Contract Drawings.
   m. Field records for variable and concealed conditions.
   n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Landscape Architect and City. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:

1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
2. Format: DWG, Microsoft Windows operating system.
3. Format: Annotated PDF electronic file with comment function enabled.
4. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
5. Refer instances of uncertainty to Landscape Architect through City for resolution.
6. Landscape Architect will furnish Contractor with one set of digital data files of the Contract Drawings for use in recording information.

    a. See Section 013100 "Project Management and Coordination" for requirements related to use of Landscape Architect's digital data files.

C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Format: Annotated PDF electronic file with comment function enabled.
3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
4. Identification: As follows:

    a. Project name.
    b. Date.
    c. Designation "PROJECT RECORD DRAWINGS."
    d. Name of City.
    e. Name of Landscape Architect.
    f. Name of Contractor.

1.5 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
5. Note related Change Orders, record Product Data, and record Drawings where applicable.

B. Format: Submit record Specifications as annotated PDF electronic file.

1.6 RECORD PRODUCT DATA

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, record Specifications, and record Drawings where applicable.

C. Format: Submit record Product Data as annotated PDF electronic file.

1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

1.7 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as PDF electronic file.

1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

1.8 MAINTENANCE OF RECORD DOCUMENTS

A. Maintenance of Record Documents: Store record documents in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Landscape Architect's and City’s reference during normal working hours.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 032000 - CONCRETE REINFORCING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Steel reinforcement bars.

B. Related Requirements:
1. Section 033000 "Cast-in-Place Concrete" for reinforcing used in precast structural concrete.
2. Section 321313 "Concrete Paving" for reinforcing related to concrete pavement and walks.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review the following:

a. Special inspection and testing and inspecting agency procedures for field quality control.
b. Construction contraction and isolation joints.
c. Steel-reinforcement installation.

1.4 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.4/D 1.4M.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. and to avoid damaging coatings on steel reinforcement.

1. Store reinforcement to avoid contact with earth.

2. Do not allow epoxy-coated reinforcement to be stored outdoors for more than 60 days without being stored under an opaque covering.
3. Do not allow dual-coated reinforcement to be stored outdoors for more than 60 days without being stored under an opaque covering.
4. Do not allow stainless steel reinforcement to come into contact with uncoated reinforcement.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design structural thermal break insulated connection system, including attachment to building construction.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A615/A615M, deformed.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protection of In-Place Conditions:

1. Do not cut or puncture vapor retarder.
2. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

3.2 INSTALLATION OF STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.

B. Accurately position, support, and secure reinforcement against displacement.

1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
2. Do not tack weld crossing reinforcing bars.

C. Preserve clearance between bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.

D. Provide concrete coverage in accordance with ACI 318.

E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

F. Splices: Lap splices as indicated on Drawings.

1. Bars indicated to be continuous, and all vertical bars shall be lapped not less than 36 bar diameters at splices, or 24 inches, whichever is greater.
2. Stagger splices in accordance with ACI 318.
3. Mechanical Splice Couplers: Install in accordance with manufacturer's instructions.
4. Weld reinforcing bars in accordance with AWS D1.4/D 1.4M, where indicated on Drawings.

3.3 JOINTS

A. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement.
2. Continue reinforcement across construction joints unless otherwise indicated.
3. Do not continue reinforcement through sides of strip placements of floors and slabs.

B. Doweled Joints: 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.

3.4 INSTALLATION TOLERANCES

A. Comply with ACI 117.

3.5 FIELD QUALITY CONTROL

A. Inspections:

1. Steel-reinforcement placement.
2. Steel-reinforcement mechanical splice couplers.
3. Steel-reinforcement welding.

B. Manufacturer's Inspections: Engage manufacturer of structural thermal break insulated connection system to inspect completed installations prior to placement of concrete, and to provide written report that installation complies with manufacturer's written instructions.

END OF SECTION 032000

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:
1. Section 032000 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.
2. Section 312000 "Earth Moving" for drainage fill under slabs-on-ground.
3. Section 321313 "Concrete Paving" for concrete pavement and walks.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixtures.
c. Ready-mix concrete manufacturer.
d. Concrete Subcontractor.
e. Special concrete finish Subcontractor.

2. Review the following:

a. Special inspection and testing and inspecting agency procedures for field quality control.
b. Construction joints, control joints, isolation joints, and joint-filler strips.
c. Semirigid joint fillers.
d. Vapor-retarder installation.
e. Anchor rod and anchorage device installation tolerances.
f. Cold and hot weather concreting procedures.
g. Concrete finishes and finishing.
h. Curing procedures.
i. Forms and form-removal limitations.
j. Shoring and reshoring procedures.
k. Floor and slab flatness and levelness measurements.
l. Concrete repair procedures.
m. Concrete protection.
n. Initial curing and field curing of field test cylinders (ASTM C31/C31M.)
o. Protection of field cured field test cylinders.

1.5 ACTION SUBMITTALS

A. Product Data: For each of the following.

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Blended hydraulic cement.
5. Silica fume.
6. Performance-based hydraulic cement
7. Aggregates.
8. Admixtures:

a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.

9. Color pigments.
10. Fiber reinforcement.
11. Vapor retarders.
12. Floor and slab treatments.
13. Liquid floor treatments.
14. Curing materials.

a. Include documentation from color pigment manufacturer, indicating that proposed methods of curing are recommended by color pigment manufacturer.

15. Joint fillers.
16. Repair materials.

B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Minimum 28-day compressive strength.
3. Durability exposure class.
4. Maximum w/cm.
5. Calculated equilibrium unit weight, for lightweight concrete.
6. Slump limit.
7. Air content.
8. Nominal maximum aggregate size.
9. Steel-fiber reinforcement content.
10. Synthetic micro-fiber content.
11. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
12. Include manufacturer's certification that permeability-reducing admixture is compatible with mix design.
13. Include certification that dosage rate for permeability-reducing admixture matches dosage rate used in performance compliance test.
14. Intended placement method.
15. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Steel Reinforcement Shop Drawings: Provide Drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

D. Shop Drawings:

1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

   a. Location of construction joints is subject to approval of the Architect.

E. Samples: For manufacturer's standard colors for color pigment and vapor retarder.

F. Concrete Schedule: For each location of each Class of concrete indicated in "Concrete Mixtures" Article, including the following:

1. Concrete Class designation.
2. Location within Project.
3. Exposure Class designation.
4. Formed Surface Finish designation and final finish.
5. Final finish for floors.
6. Curing process.
7. Floor treatment if any.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Welding certificates.

C. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Form materials and form-release agents.
4. Steel reinforcements and accessories.
5. Curing compounds.
6. Adhesives.
7. Joint-filler strips.
8. Repair materials.

D. Field quality-control reports.

E. Minutes of preinstallation conference.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs Project personnel qualified as an ACI-certified Flatwork Technician and Finisher and a supervisor who is a certified ACI Flatwork Concrete Finisher/Technician or an ACI Concrete Flatwork Technician with experience installing and finishing concrete, incorporating permeability-reducing admixtures.

1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.

B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

1. Manufacturer certified in accordance with NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Field Quality Control Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

1. Personnel conducting field tests shall be qualified as an ACI Concrete Field Testing Technician, Grade 1, in accordance with ACI CPP 610.1 or an equivalent certification program.

D. Mockups: Cast concrete slab-on-ground and formed-surface panels to demonstrate typical joints, surface finish, texture, tolerances, floor treatments, and standard of workmanship.

1. Slab-On-Ground: Build panel approximately 15 feet by 15 feet in the location indicated or, if not indicated, as directed by City.

    a. Divide panel into four equal panels to demonstrate saw joint cutting.

2. Formed Surfaces: Build panel approximately 100 sq. ft. in the location indicated or, if not indicated, as directed by Architect.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on each concrete mixture.

1. Include the following information in each test report:

    a. Admixture dosage rates.
    b. Slump.
    c. Air content.
    d. Seven-day compressive strength.
    e. 28-day compressive strength.
    f. Permeability.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM C94/C94M and ACI 301.

1.10 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 301 and ACI 306.1 and as follows.

1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
2. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
3. Do not use frozen materials or materials containing ice or snow.
4. Do not place concrete in contact with surfaces less than 35 deg F, other than reinforcing steel.
5. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:

1. Maintain concrete temperature at time of discharge to not exceed 95 deg F.

2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

1.11 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to furnish replacement sheet vapor retarder/termite barrier material and accessories for sheet vapor retarder/ termite barrier and accessories that do not comply with requirements or that fail to resist penetration by termites within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301unless modified by requirements in the Contract Documents.

2.2 CONCRETE MATERIALS

A. Source Limitations:

1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
2. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant.
3. Obtain aggregate from single source.
4. Obtain each type of admixture from single source from single manufacturer.

B. Cementitious Materials:

1. Portland Cement: ASTM C150/C150M, gray.
2. Fly Ash: ASTM C618, Class C or F.
3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.

C. Normal-Weight Aggregates: ASTM C33/C33M, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.

1. Alkali-Silica Reaction: Comply with one of the following:

a. Expansion Result of Aggregate: Not more than 0.04 percent at one-year when tested in accordance with ASTM C1293.
b. Expansion Results of Aggregate and Cementitious Materials in Combination: Not more than 0.10 percent at an age of 16 days when tested in accordance with ASTM C1567.

c. Alkali Content in Concrete: Not more than 4 lb./cu. yd. for moderately reactive aggregate or 3 lb./cu. yd. for highly reactive aggregate, when tested in accordance with ASTM C1293 and categorized in accordance with ASTM C1778, based on alkali content being calculated in accordance with ACI 301.

2. Maximum Coarse-Aggregate Size: 1 inch nominal.
3. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

D. Lightweight Aggregate: ASTM C330/C330M, 1-inch nominal maximum aggregate size.

E. Air-Entraining Admixture: ASTM C260/C260M.

F. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride in steel- reinforced concrete.

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.
7. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C494/C494M, Type C.

8. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.

9. Permeability-Reducing Admixture: ASTM C494/C494M, Type S, hydrophilic, permeability-reducing crystalline admixture, capable of reducing water absorption of concrete exposed to hydrostatic pressure (PRAH).
   a. Permeability: No leakage when tested in accordance with U.S. Army Corps of Engineers CRD C48 at a hydraulic pressure of 200 psi for 14 days.

G. Color Pigment: ASTM C979/C979M, synthetic mineral-oxide pigments, color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.
1. Color: Per plan.

H. Water and Water Used to Make Ice: ASTM C94/C94M, potable

2.3 FIBER REINFORCEMENT

A. Carbon-Steel-Wire Fiber: ASTM A820/A820M, Type 1, cold-drawn wire, deformed, minimum of 2 inches long, with an aspect ratio of 35 to 40.

B. Carbon-Steel Cut Sheet Fiber: ASTM A820/A820M, Type 2, cut sheet, deformed, minimum of 2 inches long, and aspect ratio of 35 to 40.

2.4 VAPOR RETARDERS

A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A, except with maximum water-vapor permeance ; not less than 10 mils thick. Include manufacturer's recommended adhesive or pressure-sensitive tape.

2.5 FLOOR AND SLAB TREATMENTS

A. Slip-Resistive Emery Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive, crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials with 100 percent passing 3/8-inch sieve.

2.6 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.

D. Curing Paper: Eight-feet- wide paper, consisting of two layers of fibered kraft paper laminated with double coating of asphalt.

E. Water: Potable or complying with ASTM C1602/C1602M.

F. Clear, Waterborne, Membrane-Forming, Dissipating Curing Compound: ASTM C309, Type 1, Class B.

2.7 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber.

B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 in accordance with ASTM D2240.

C. Bonding Agent: ASTM C1059/C1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

D. Epoxy Bonding Adhesive: ASTM C881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade and class to suit requirements, and as follows:

1. Types I and II, nonload bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.8 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand, as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4100 psi at 28 days when tested in accordance with ASTM C109/C109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.

1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested in accordance with ASTM C109/C109M.

2.9 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.

1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash or Other Pozzolans: 25 percent by mass.
2. Slag Cement: 50 percent by mass.
3. Silica Fume: 10 percent by mass.
4. Total of Fly Ash or Other Pozzolans, Slag Cement, and Silica Fume: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
5. Total of Fly Ash or Other Pozzolans and Silica Fume: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.

C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.

1. Use high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete.
4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
5. Use permeability-reducing admixture in concrete mixtures where indicated.

D. Color Pigment: Add color pigment to concrete mixture in accordance with manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

2.10 CONCRETE MIXTURES

A. Class A: Normal-weight concrete used for footings, grade beams, and tie beams.

1. Exposure Class: ACI 318.
2. Minimum Compressive Strength: 5000 psi at 28 days.
3. Maximum w/cm: 0.50.
4. Slump Limit: 5 inches, plus or minus 1 inch
5. Air Content:

   a. Exposure Class F1: 5.0 percent, plus or minus 1.5 percent at point of delivery for concrete containing 3/4-inch nominal maximum aggregate size.
   b. Exposure Classes F2 and F3: 6 percent, plus or minus 1.5 percent at point of delivery for concrete containing 3/4-inch nominal maximum aggregate size.

6. Limit water-soluble, chloride-ion content in hardened concrete to 1.00 percent by weight of cement.

2.11 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M, and furnish batch ticket information.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete in accordance with ASTM C94/C94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd..
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:

1. Daily access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
4. Security and protection for test samples and for testing and inspection equipment at Project site.

3.3 INSTALLATION OF EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.
3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.4 INSTALLATION OF VAPOR RETARDER

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.

1. Install vapor retarder with longest dimension parallel with direction of concrete pour.
2. Face laps away from exposed direction of concrete pour.
3. Lap vapor retarder over footings and grade beams not less than 6 inches, sealing vapor retarder to concrete.
4. Lap joints 6 inches and seal with manufacturer's recommended tape.
5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
7. Protect vapor retarder during placement of reinforcement and concrete.

    a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by 6 inches on all sides, and sealing to vapor retarder.

B. Bituminous Vapor Retarders: Place, protect, and repair bituminous vapor retarder in accordance with manufacturer's written instructions.

3.5 JOINTS

A. Construct joints true to line, with faces perpendicular to surface plane of concrete.

B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.

1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
2. Place joints perpendicular to main reinforcement.

    a. Continue reinforcement across construction joints unless otherwise indicated.
    b. Do not continue reinforcement through sides of strip placements of floors and slabs.

3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
4. Locate joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.

5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
6. Space vertical joints in walls as indicated on Drawings. Unless otherwise indicated on Drawings, locate vertical joints beside piers integral with walls, near corners, and in concealed locations where possible.
7. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
8. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of control joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.

D. Isolation Joints in Slabs-on-Ground: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated on Drawings.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface, where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints:

1. Install dowel bars and support assemblies at joints where indicated on Drawings.
2. Lubricate or asphalt coat one-half of dowel bar length to prevent concrete bonding to one side of joint.

F. Dowel Plates: Install dowel plates at joints where indicated on Drawings.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.

1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.

B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.

C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect in writing, but not to exceed the amount indicated on the concrete delivery ticket.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, but not to exceed the amount indicated on the concrete delivery ticket.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

E. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.

1. If a section cannot be placed continuously, provide construction joints as indicated.
2. Deposit concrete to avoid segregation.
3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.

a. Do not use vibrators to transport concrete inside forms.
b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Do not place concrete floors and slabs in a checkerboard sequence.
2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
3. Maintain reinforcement in position on chairs during concrete placement.
4. Screed slab surfaces with a straightedge and strike off to correct elevations.

5. Level concrete, cut high areas, and fill low areas.
6. Slope surfaces uniformly to drains where required.
7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
8. Do not further disturb slab surfaces before starting finishing operations.

3.7 FINISHING FORMED SURFACES

A. As-Cast Surface Finishes:

1. ACI 301 Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material.

   a. Patch voids larger than 1-1/2 inches wide or 1/2 inch deep.
   b. Remove projections larger than 1 inch.
   c. Tie holes do not require patching.
   d. Surface Tolerance: ACI 117 Class D.
   e. Apply to concrete surfaces.

B. Rubbed Finish: Apply the following to as cast surface finishes where indicated on Drawings:

1. Smooth-Rubbed Finish:

   a. Perform no later than one day after form removal.
   b. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture.
   c. If sufficient cement paste cannot be drawn from the concrete by the rubbing process, use a grout made from the same cementitious materials used in the in-place concrete.
   d. Maintain required patterns or variances as shown on Drawings or to match design reference sample or mockups.

2. Grout-Cleaned Rubbed Finish:

   a. Clean concrete surfaces after contiguous surfaces are completed and accessible.
   b. Do not clean concrete surfaces as Work progresses.
   c. Mix 1 part portland cement to 1-1/2 parts fine sand, complying with ASTM C144 or ASTM C404, by volume, with sufficient water to produce a mixture with the consistency of thick paint. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces.
   d. Wet concrete surfaces.
   e. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap, and keep surface damp by fog spray for at least 36 hours.
   f. Maintain required patterns or variances as shown on Drawings or to match [**design reference sample**] [**field sample panels**] [**mockups**].

C. Abrasive-Blast Finish: Apply the following to as-cast surface finishes where indicated on Drawings:

1. Perform abrasive blasting after compressive strength of concrete exceeds 2000 psi.
2. Coordinate with formwork removal to ensure that surfaces to be abrasive blasted are treated at the same age.
3. Surface Continuity:

    a. Perform abrasive-blast finishing as continuous operation, maintaining continuity of finish on each surface or area of Work.
    b. Maintain required patterns or variances in depths of blast to match design reference sample and mockups.

4. Abrasive Blasting:

    a. Abrasive-blast corners and edges of patterns carefully, using backup boards to maintain uniform corner and edge lines.
    b. Determine type of nozzle pressure and blasting techniques required to match field sample.
    c. Depth of Cut: Use an abrasive grit of proper type and gradation to expose aggregate and surrounding matrix surfaces to match field sample, as follows:

        1) Brush Texture: Remove cement matrix to dull surface sheen and expose face of fine aggregate, with no significant reveal.
        2) Light Texture: Expose fine aggregate with occasional exposure of coarse aggregate and uniform color, with maximum reveal of 1/16 inch.
        3) Medium Texture: Generally, expose coarse aggregate with slight reveal and with a maximum reveal of 1/4 inch.
        4) Heavy Texture: Expose and reveal coarse aggregate to a maximum projection of one-third its diameter, with reveal range of 1/4 to 1/2 inch.

    d. Maintain required patterns or variances in reveal projection to match design reference sample and mockups.

D. Related Unformed Surfaces:

1. At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a color and texture matching adjacent formed surfaces.
2. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.8 FINISHING FLOORS AND SLABS

A. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

3.9 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

A. Filling In:

1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations:

1. Coordinate sizes and locations of concrete bases with actual equipment provided.
2. Construct concrete bases 4 inches high unless otherwise indicated on Drawings, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated on Drawings, or unless required for seismic anchor support.
3. Minimum Compressive Strength: 5000 psi at 28 days.
4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
6. Prior to pouring concrete, place and secure anchorage devices.

   a. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   b. Cast anchor-bolt insert into bases.
   c. Install anchor bolts to elevations required for proper attachment to supported equipment.

D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items.

1. Cast-in inserts and accessories, as shown on Drawings.
2. Screed, tamp, and trowel finish concrete surfaces.

3.10 CONCRETE CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 301 and ACI 306.1 for cold weather protection during curing.
2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h before and during finishing operations.

B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:

1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
2. Cure concrete containing color pigments in accordance with color pigment manufacturer's instructions.
3. If forms remain during curing period, moist cure after loosening forms.
4. If removing forms before end of curing period, continue curing for remainder of curing period, as follows:

    a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
    b. Continuous Sprinkling: Maintain concrete surface continuously wet.
    c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
    d. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.
    e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.

        1) Recoat areas subject to heavy rainfall within three hours after initial application.
        2) Maintain continuity of coating and repair damage during curing period.

3.11 TOLERANCES

A. Conform to ACI 117.

3.12 JOINT FILLING

A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least one month(s).
2. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints.

D. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.13 CONCRETE SURFACE REPAIRS

A. Defective Concrete:

1. Repair and patch defective areas when approved by Architect.
2. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete.

   a. Limit cut depth to 3/4 inch.
   b. Make edges of cuts perpendicular to concrete surface.
   c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.
   d. Fill and compact with patching mortar before bonding agent has dried.
   e. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement, so that, when dry, patching mortar matches surrounding color.

   a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
   b. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces:

1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.

   a. Correct low and high areas.
   b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
3. After concrete has cured at least 14 days, correct high areas by grinding.
4. Correct localized low areas during, or immediately after, completing surface-finishing operations by cutting out low areas and replacing with patching mortar.

a. Finish repaired areas to blend into adjacent concrete.

5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.

   a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
   b. Feather edges to match adjacent floor elevations.

6. Correct other low areas scheduled to remain exposed with repair topping.

   a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations.
   b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.

7. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete.

   a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch clearance all around.
   b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
   c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.
   d. Place, compact, and finish to blend with adjacent finished concrete.
   e. Cure in same manner as adjacent concrete.

8. Repair random cracks and single holes 1 inch or less in diameter with patching mortar.

   a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
   b. Dampen cleaned concrete surfaces and apply bonding agent.
   c. Place patching mortar before bonding agent has dried.
   d. Compact patching mortar and finish to match adjacent concrete.
   e. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.14 FIELD QUALITY CONTROL

A. Special Inspections: City will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.

B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

1. Testing agency shall be responsible for providing curing container for composite samples on Site and verifying that field-cured composite samples are cured in accordance with ASTM C31/C31M.
2. Testing agency shall immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
3. Testing agency shall report results of tests and inspections, in writing, to City, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.

a. Test reports shall include reporting requirements of ASTM C31/C31M, ASTM C39/C39M, and ACI 301, including the following as applicable to each test and inspection:

1) Project name.
2) Name of testing agency.
3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
4) Name of concrete manufacturer.
5) Date and time of inspection, sampling, and field testing.
6) Date and time of concrete placement.
7) Location in Work of concrete represented by samples.
8) Date and time sample was obtained.
9) Truck and batch ticket numbers.
10) Design compressive strength at 28 days.
11) Concrete mixture designation, proportions, and materials.
12) Field test results.
13) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.
14) Type of fracture and compressive break strengths at seven days and 28 days.

C. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.

D. Inspections:

1. Headed bolts and studs.
2. Verification of use of required design mixture.
3. Concrete placement, including conveying and depositing.

4. Curing procedures and maintenance of curing temperature.
5. Verification of concrete strength before removal of shores and forms from beams and slabs.
6. Batch Plant Inspections: On a random basis, as determined by Architect.

E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M shall be performed in accordance with the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.

   a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C143/C143M:

   a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
   b. Perform additional tests when concrete consistency appears to change.

3. Slump Flow: ASTM C1611/C1611M:

   a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
   b. Perform additional tests when concrete consistency appears to change.

4. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete; ASTM C173/C173M volumetric method, for structural lightweight concrete.

   a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

5. Concrete Temperature: ASTM C1064/C1064M:

   a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.

6. Unit Weight: ASTM C567/C567M fresh unit weight of structural lightweight concrete.

   a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

7. Compression Test Specimens: ASTM C31/C31M:

   a. Cast and laboratory cure two sets of two 6-inch by 12-inch or 4-inch by 8-inch cylinder specimens for each composite sample.

8. Compressive-Strength Tests: ASTM C39/C39M.
   a. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
10. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi if specified compressive strength is 5000 psi, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.
11. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
12. Additional Tests:

    a. Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
    b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.

        1) Acceptance criteria for concrete strength shall be in accordance with ACI 301 section 1.6.6.3.

13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
14. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

F. Measure floor and slab flatness and levelness in accordance with ASTM E1155 within 24 hours of completion of floor finishing and promptly report test results to Architect.

3.15 PROTECTION

A. Protect concrete surfaces as follows:

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
3. Prohibit vehicles from interior concrete slabs.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.

7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.
8. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using Floor Slab Protective Covering.

END OF SECTION 033000

SECTION 101423 - PANEL SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Panel signs.
2. Field-applied, vinyl-character signs.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for temporary Project identification signs and for temporary informational and directional signs.
2. Section 015639 "Temporary Tree and Plant Protection" for temporary protection-zone signage.

1.3 ALLOWANCES

A. Allowances for signage and panel signs are specified in Section 012100 "Allowances."

1.4 UNIT PRICES

A. Work of this Section is affected by unit prices specified in Section 012200 "Unit Prices."

1.5 DEFINITIONS

A. Accessible: In accordance with the accessibility standard.

B. Illuminated: Illuminated by lighting source integrally constructed as part of the sign unit.

1.6 COORDINATION

A. Furnish templates for placement of sign-anchorage devices embedded in permanent construction by other installers.

B. Furnish templates for placement of electrical service embedded in permanent construction by other installers.

1.7 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For panel signs.

1. Include fabrication and installation details and attachments to other work.
2. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
3. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign at least half size.
4. Show locations of electrical service connections.
5. Include diagrams for power, signal, and control wiring.

C. Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.

1. Include representative Samples of available typestyles and graphic symbols.

D. Samples for Verification: For each type of sign assembly showing all components and with the required finish(es), in manufacturer's standard size unless otherwise indicated and as follows:

1. Panel Signs: Full-size Sample.
2. Field-Applied, Vinyl-Character Signs: Full-size Sample of characters on glass.
3. Variable Component Materials: Full-size Sample of each base material, character (letter, number, and graphic element) in each exposed color and finish not included in Samples above.
4. Exposed Accessories: Full-size Sample of each accessory type.
5. Full-size Samples, if approved, will be returned to Contractor for use in Project.

E. Product Schedule: For panel signs. Use same designations indicated on Drawings or specified.

F. Delegated-Design Submittal: For signs indicated in "Performance Requirements" Article.

1. Include structural analysis calculations for signs indicated to comply with design loads; signed and sealed by the qualified professional engineer responsible for their preparation.

1.8 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and manufacturer.

B. Evaluation Reports: For post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

C. Sample Warranty: For special warranty.

1.9 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manuals.

1.10 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Variable Component Materials: 12 replaceable text inserts and interchangeable characters (letters, numbers, and graphic elements) of each type.
2. Tools: One set(s) of specialty tools for assembling signs and replacing variable sign components.

1.11 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.12 FIELD CONDITIONS

A. Field Measurements: Verify locations of anchorage devices and electrical service embedded in permanent construction by other installers by field measurements before fabrication, and indicate measurements on Shop Drawings.

1.13 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Deterioration of finishes beyond normal weathering.
b. Deterioration of embedded graphic image.
c. Separation or delamination of sheet materials and components.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design sign structure and anchorage of sign type(s) according to structural performance requirements.

B. Structural Performance: Signs and supporting elements shall withstand the effects of gravity and other loads within limits and under conditions indicated.

1. Uniform Wind Load: As indicated on Drawings.
2. Concentrated Horizontal Load: As indicated on Drawings.
3. Other Design Load: As indicated on Drawings.
4. Uniform and concentrated loads need not be assumed to act concurrently.

C. Thermal Movements: For exterior signs, allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

D. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 PANEL SIGNS

A. Panel Sign: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:

1. Solid-Sheet Sign and Returns: Aluminum, Stee,l Stainless-steel, Acrylic Fiberglass, or PVC sheet with finish specified in "Surface Finish and Applied Graphics" Subparagraph and as follows: As indicated on drawings.

2. Laminated Aluminum-Sheet Sign: Aluminum sheet laminated to both sides of acrylic core sheet with painted edges. As indicated on drawings.

3. Laminated-Sheet Sign: Photopolymer face sheet with raised graphics laminated over subsurface graphics to acrylic backing sheet to produce composite sheet. As indicated on drawings.

4. Composite Phenolic-Core Sign: Solid phenolic panel core with integral subsurface graphic image covered with integral, polymeric face layer. As indicated on drawings.

5. Laminated Polycarbonate-Sheet Sign: Polycarbonate face sheet laminated to each side of phenolic base sheet to produce composite sheet. As indicated on drawings.

6. Engraved Plastic-Laminate Sign: Plastic-laminate face laminated to contrasting phenolic core to produce composite sheet. As indicated on drawings.

7. Sign-Panel Perimeter: Finish edges smooth.

8. Frame: Entire perimeter. As indicated on drawings.

9. Mounting: As indicated on Drawings.
10. Surface Finish and Applied Graphics: AS INDICATED ON DRAWINGS.

11. Text and Typeface: typeface as selected by Architect from manufacturer's full range. Finish raised characters to contrast with background color, and finish Braille to match background color.
12. Flatness Tolerance: Sign shall remain flat or uniformly curved under installed conditions as indicated on Drawings and within a tolerance of plus or minus 1/16 inch measured diagonally from corner to corner.

2.3 PANEL-SIGN MATERIALS

A. Aluminum Sheet and Plate: ASTM B209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

B. Aluminum Extrusions: ASTM B221, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

C. Brass Sheet (Yellow Brass): ASTM B36/B36M, alloy recommended by manufacturer and finisher for finish indicated.

D. Bronze Plate: ASTM B36/B36M, alloy recommended by manufacturer and finisher for finish indicated.

E. Copper Sheet: ASTM B152/B152M.

F. Steel Materials:

1. Metallic-Coated Steel Sheet: ASTM A653/A653M, coating, either commercial or forming steel.
2. Steel Sheet: Uncoated, cold-rolled, ASTM A1008/A1008M, commercial steel, Type B, exposed or electrolytic zinc-coated, ASTM A879/A879M, Coating Designation 08Z, with steel-sheet substrate according to ASTM A1008/A1008M, commercial steel, exposed.
3. Steel Members Fabricated from Plate or Bar Stock: ASTM A529/A529M or ASTM A572/A572M, 42,000-psi minimum yield strength.
4. For steel exposed to view on completion, provide materials having flat, smooth surfaces without blemishes. Do not use materials whose surfaces exhibit pitting, seam marks, roller marks, rolled trade names, or roughness.

G. Stainless-Steel Sheet: ASTM A240/A240M or ASTM A666, stretcher-leveled standard of flatness.

H. Acrylic Sheet: ASTM D4802, category as standard with manufacturer for each sign, Type UVF (UV filtering).

I. Fiberglass Sheet: Multiple laminations of glass-fiber-reinforced polyester resin with UV-light stable, colorfast, nonfading, weather- and stain-resistant, colored polyester gel coat, and with manufacturer's standard finish.

J. Polycarbonate Sheet: ASTM C1349, Appendix X1, Type II (coated, mar-resistant, UV-stabilized polycarbonate), with coating on both sides.

K. PVC Sheet: Manufacturer's standard, UV-light stable, PVC plastic.

L. Plastic-Laminate Sheet: NEMA LD 3, general-purpose HGS grade, 0.048-inch nominal thickness.

M. Vinyl Film: UV-resistant vinyl film of nominal thickness indicated, with pressure-sensitive, permanent adhesive on back; die cut to form characters or images as indicated on Drawings and suitable for exterior applications.

N. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.

2.4 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signs, noncorrosive and compatible with each material joined, and complying with the following unless otherwise indicated:

1. Use concealed fasteners and anchors unless indicated to be exposed.
2. For exterior exposure, furnish nonferrous-metal, stainless-steel, or hot-dip galvanized devices unless otherwise indicated.
3. Exposed Metal-Fastener Components, General:

    a. Fabricated from same basic metal and finish of fastened metal unless otherwise indicated.
    b. Fastener Heads: For nonstructural connections, use flathead or oval countersunk screws and bolts with tamper-resistant Allen-head, spanner-head, or one-way-head slots unless otherwise indicated.

4. Sign Mounting Fasteners:

    a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material or screwed into back of sign assembly unless otherwise indicated.
    b. Projecting Studs: Threaded studs with sleeve spacer, welded or brazed to back of sign material or screwed into back of sign assembly, unless otherwise indicated.

c. Through Fasteners: Exposed metal fasteners matching sign finish, with type of head indicated, and installed in predrilled holes.

5. Inserts: Furnish inserts to be set by other installers into concrete or masonry work.

B. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC308 as appropriate for the substrate.

C. Power-Actuated Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

D. Adhesive: As recommended by sign manufacturer.

E. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, 0.045 inch thick, with adhesive on both sides.

F. Hook-and-Loop Tape: Manufacturer's standard two-part tape consisting of hooked part on sign back and looped side on mounting surface.

G. Magnetic Tape: Manufacturer's standard magnetic tape with adhesive on one side.

H. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

2.5 FABRICATION

A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.

1. Preassemble signs in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
3. Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
4. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
5. Internally brace signs for stability, to meet structural performance loading without oil-canning or other surface deformation, and for securing fasteners.
6. Provide rabbets, lugs, and tabs necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.

B. Surface-Engraved Graphics: Machine engrave characters and other graphic devices into indicated sign surface to produce precisely formed copy, incised to uniform depth.

1. Engraved Metal: Fill engraved graphics with manufacturer's standard baked enamel.
2. Engraved Opaque Acrylic Sheet: Fill engraved graphics with manufacturer's standard enamel.
3. Face-Engraved Clear Acrylic Sheet: Fill engraved copy with manufacturer's standard enamel. Apply manufacturer's standard opaque background color coating to back face of acrylic sheet.
4. Engraved Plastic Laminate: Engrave through exposed face ply of plastic-laminate sheet to expose contrasting core ply.

C. Subsurface-Applied Graphics: Apply graphics to back face of clear face-sheet material to produce precisely formed image. Image shall be free of rough edges.

D. Subsurface-Engraved Graphics: Reverse engrave back face of clear face-sheet material. Fill resulting copy with manufacturer's standard enamel. Apply opaque manufacturer's standard background color coating over enamel-filled copy.

E. Shop- and Subsurface-Applied Vinyl: Align vinyl film in final position and apply to surface. Firmly press film from the middle outward to obtain good bond without blisters or fishmouths.

F. Brackets: Fabricate brackets, fittings, and hardware for bracket-mounted signs to suit sign construction and mounting conditions indicated. Modify manufacturer's standard brackets as required.

1. Aluminum Brackets: Factory finish brackets with baked-enamel or powder-coat finish to match sign-background color color unless otherwise indicated.
2. Stainless-Steel Brackets: Factory finish brackets to match sign background finish unless otherwise indicated.

2.6 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.

D. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

2.7 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, or thicker.

B. Color Anodic Finish: AAMA 611, or thicker.

C. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

2.8 METALLIC-COATED STEEL FINISHES

A. Surface Preparation: Clean surfaces of oil and other contaminants. Use cleaning methods that do not leave residue. After cleaning, apply a conversion coating compatible with the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas and apply galvanizing repair paint, complying with SSPC-Paint 20, to comply with ASTM A780/A780M.

B. Factory Prime Finish: After cleaning and pretreating, apply an air-dried primer compatible with the organic coating to be applied over it.

C. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils.

2.9 STEEL FINISHES

A. Surface Preparation: Remove mill scale and rust, if present, from uncoated steel, and prepare for coating according to coating manufacturer's written instructions.

1. For Baked-Enamel or Powder-Coat Finish: After cleaning, apply a conversion coating compatible with the organic coating to be applied over it.

B. Factory Prime Finish: After surface preparation and pretreatment, apply manufacturer's standard, fast-curing, lead- and chromate-free, universal primer.

C. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils.

2.10 STAINLESS-STEEL FINISHES

A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

1. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

2. Directional Satin Finish: No. 4.
3. Dull Satin Finish: No. 6.
4. Reflective, Directional Polish: No. 7.
5. Mirrorlike Reflective, Nondirectional Polish: No. 8.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.

C. Verify that anchorage devices embedded in permanent construction are correctly sized and located to accommodate signs.

D. Verify that electrical service is correctly sized and located to accommodate signs.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.

1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
2. Install signs so they do not protrude or obstruct according to the accessibility standard.
3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
4. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

B. Accessible Signage: Install in locations on walls as indicated on Drawings.

C. Mounting Methods:

1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.

a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place sign in position and push until flush to surface,

embedding studs in holes. Temporarily support sign in position until adhesive fully sets.

b. Thin or Hollow Surfaces: Place sign in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.

2. Projecting Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.

   a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place spacers on studs, place sign in position, and push until spacers are pinched between sign and substrate, embedding the stud ends in holes. Temporarily support sign in position until adhesive fully sets.
   b. Thin or Hollow Surfaces: Place spacers on studs, place sign in position with spacers pinched between sign and substrate, and install washers and nuts on stud ends projecting through opposite side of surface, and tighten.

3. Through Fasteners: Drill holes in substrate using predrilled holes in sign as template. Countersink holes in sign if required. Place sign in position and flush to surface. Install through fasteners and tighten.
4. Brackets: Remove loose debris from substrate surface and install backbar or bracket supports in position so that signage is correctly located and aligned.
5. Shim-Plate Mounting: Provide 1/8-inch- thick, concealed aluminum shim plates with predrilled and countersunk holes, at locations indicated, and where other direct mounting methods are impractical. Attach plate with fasteners and anchors suitable for secure attachment to substrate. Attach signs to plate using through fastener method specified above.

D. Field-Applied, Vinyl-Character Signs: Clean and dry substrate. Align sign characters in final position before removing release liner. Remove release liner in stages, and apply and firmly press characters into final position. Press from the middle outward to obtain good bond without blisters or fishmouths. Remove carrier film without disturbing applied vinyl film.

E. Signs Mounted on Glass: Provide opaque sheet matching sign material and finish onto opposite side of glass to conceal back of sign.

3.3 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as signs are installed.

C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101423

SECTION 116800 - PLAY FIELD EQUIPMENT AND STRUCTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes playground equipment as follows:

1. All Play Equipment indicated on Drawings.

1.3 DEFINITIONS

A. Definitions in ASTM F 1487 apply to Work of this Section.

B. IPEMA: International Play Equipment Manufacturers Association.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each type of playground equipment.

1. Include plans, elevations, sections, and attachment details.
2. Include fall heights and use zones for playground equipment, coordinated with the critical-height values of protective surfacing specified in Section 321816.13 "Playground Protective Surfacing."

C. Samples for Initial Selection: For each type of exposed finish.

1. Manufacturer's color charts.
2. Include Samples of accessories involving color selection.

D. Samples for Verification: For each type of exposed finish on the following products:

1. Include Samples of accessories to verify color and finish selection.
2. Posts and Rails: Minimum 6 inches long.
3. Platforms: Minimum 6 inches square.
4. Molded Plastic: Minimum 3 inches square.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For each type of playground equipment.

C. Material Certificates: For the following items:

1. Shop finishes.
2. Wood-Preservative Treatment: Include certification by treating plant that states type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.

D. Field quality-control reports.

E. Sample Warranty: For manufacturer's special warranties.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For playground equipment and finishes to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm whose playground equipment components have been certified by IPEMA's third-party product certification service.

B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.9 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of playground equipment that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures.
b. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain playground equipment from single source from single manufacturer.

B. Playground equipment and components shall have the IPEMA Certification Seal.

C. The following playground equipment and components shall have the IPEMA Certification Seal:

1. All play equipment indicated on Drawings.

2.2 PERFORMANCE REQUIREMENTS

A. Safety Standard: Provide playground equipment according to ASTM F 1487.

2.3 Playground Equipment

1. Basis-of-Design Product: Subject to compliance with requirements, provide from the following company:

   a. Manufacturer: As indicated on Drawings or approved equal.
   b. Model: As indicated on Drawings.
   c. Color: As indicated on Drawings.

2.4 FABRICATION

A. Provide sizes, strengths, thicknesses, wall thickness, and weights of components as required to comply with requirements in ASTM F 1487. Factory drill components for field assembly. Unnecessary holes in components, not required for field assembly, are not permitted. Provide complete play structures, including supporting members and connections, means of access and egress, designated play surfaces, barriers, guardrails, handrails, handholds, and other components indicated or required for equipment indicated.

B. Metal Frame: Fabricate main-frame upright support posts from metal pipe or tubing with cross-section profile and dimensions as required. Unless otherwise indicated, provide each pipe or tubing main-frame member with manufacturer's standard drainable bottom plate or support flange. Fabricate secondary frame members, bracing, and connections from either steel or aluminum.

C. Composite Frame: Fabricate main-frame upright support posts from metal and plastic. Fabricate secondary frame members, bracing, and connections from either steel or aluminum.

D. Play Surfaces: Manufacturer's standard elevated drainable decks, platforms, landings, walkways, ramps, and similar transitional play surfaces, designed to withstand loads; fabricated from perforated or expanded metal polyethylene panel or plank permalene made into floor units with slip-resistant finish. Fabricate units in modular sizes and shapes to form assembled play surfaces indicated.

E. Protective Barriers: Fabricate according to ASTM F 1487. Extend barriers to height above the protected elevated surface according to requirements for use by age group indicated. Fabricate from one or more of the following:

   1. Welded-metal pipe or tubing with vertical bars.
   2. Steel sheet with openings for vision and ventilation.
   3. Metal-pipe or -tubing frame with wire-mesh infill panels.
   4. Opaque plastic panels.
   5. Permalene panels with openings for vision and ventilation.

F. Handrails: Welded metal pipe or tubing, maximum OD between 0.95 and 1.55 inches.

   1. Provide handrails at heights to comply with requirements for use by age group indicated according to ASTM F 1487.

G. Roofs and Canopies: Designed to discourage and minimize climbing by users.

   1. Fabricated from polyethylene.

H. Signs: Manufacturer's standard sign panels, fabricated from Permalene or approved equal, attached to freestanding, upright support posts.

   1. Text: Minimum informational content according to ASTM F 1487.
   2. Colors: Insert colors as indicated or manufacturer's designation.

2.5 MATERIALS

A. Aluminum: Material, alloy, and temper recommended by manufacturer for type of use and finish indicated.

B. Steel: Material types, alloys, and forms recommended by manufacturer for type of use and finish indicated, hot-dip galvanized.

C. Stainless-Steel Sheet: Type 304; finished on exposed faces with No. 2B finish or better.

D. Opaque Plastics: Color impregnated, UV stabilized, and mold resistant.

E. Transparent Plastic: Abrasion-resistant, UV-stabilized polycarbonate sheet; clear, colorless; not less than 3/16 inch thick.

F. Suspension Chain and Fittings: ASTM A 467/A 467M, Class CS, 4/0 or 5/0, welded-straight-link coil chain; zinc plated; with commercial-quality, zinc-plated steel connectors and swing or ring hangers.

G. Suspension Cable: Manufacturer's standard zinc-plated cable; with commercial-quality, zinc-plated steel connectors and swing or ring hangers.

H. Iron Castings and Hangers: Malleable iron, ASTM A 47/A 47M, Grade 32510, hot-dip galvanized.

I. Post Caps: Color to match posts.

J. Platform Clamps and Hangers: Manufacturer's standard; commercial-quality; corrosion-resistant; hot- dip galvanized steel and iron, stainless steel, or aluminum; of a vandal-resistant design.

K. Hardware: Manufacturer's standard; commercial-quality; corrosion-resistant; hot-dip galvanized steel and iron, stainless steel, or aluminum; of a vandal-resistant design.

L. Fasteners: Manufacturer's standard; corrosion-resistant; hot-dip galvanized or zinc-plated steel and iron, or stainless steel; permanently capped; and theft resistant.

2.6 CAST-IN-PLACE CONCRETE

A. Concrete Materials and Properties: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight concrete with minimum 28-day compressive strength of 3000 psi, 3-inch slump, and 1-inch-maximum-size aggregate.

B. Concrete Materials and Properties: Dry-packaged concrete mix complying with ASTM C 387/C 387M and mixed at site with potable water, according to manufacturer's written instructions, for normal-weight concrete with minimum 28-day compressive strength of 3000 psi, 3-inch slump, and 1-inch-maximum-size aggregate.

2.7 IRON AND STEEL FINISHES

A. Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils. Comply with coating manufacturer's written instructions for pretreatment, applying, and baking.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for earthwork, subgrade elevations, surface and subgrade drainage, and other conditions affecting performance of the Work.

1. Do not begin installation before final grading required for placing playground equipment and protective surfacing is completed.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written installation instructions for each equipment type unless more stringent requirements are indicated. Anchor playground equipment securely, positioned at locations and elevations indicated.

1. Maximum Equipment Height: Coordinate installed fall heights of equipment with finished elevations and critical-height values of protective surfacing. Set equipment so fall heights and elevation requirements for age group use and accessibility are within required limits. Verify that playground equipment elevations comply with requirements for each type and component of equipment.

B. Post and Footing Excavation: Excavate holes for posts and footings as indicated in firm, undisturbed or compacted subgrade soil.

C. Post Set on Subgrade: Level bearing surfaces with drainage fill to required elevation.

D. Post Set with Concrete Footing: Comply with Section 033000 "Cast-in-Place Concrete" for measuring, batching, mixing, transporting, forming, and placing concrete.

1. Set equipment posts in concrete footing. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at the correct angle, alignment, height, and spacing.

a. Place concrete around posts and vibrate or tamp for consolidation. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.

2. Embedded Items: Follow equipment manufacturer's written instructions and drawings to ensure correct installation of anchorages for equipment.
3. Finishing Footings: Smooth top, and shape to shed water.

3.3 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Perform the following tests and inspections.

1. Perform inspection and testing for each type of installed playground equipment according to ASTM F 1487.

C. Playground equipment items will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

E. Notify Owner 48 hours in advance of date(s) and time(s) of testing and inspection.

END OF SECTION

SECTION 221313 - FACILITY SANITARY SEWERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. SaniTite HP Sewer Main.
2. Cleanouts.
3. Encasement for piping.
4. Concrete.

1.3 ACTION SUBMITTALS

A. Product Data: For the following:

1. Pipe and fittings.
2. Non-pressure and pressure couplings
3. Expansion joints and deflection fittings.
4. Cleanouts.

B. Shop Drawings: For manholes. Include plans, elevations, sections, details, and frames and covers.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings:

1. Show pipe sizes, locations, and elevations. Show other piping in same trench and clearances from sewer system piping. Indicate interface and spatial relationship between manholes, piping, and proximate structures.
2. Show system piping in profile. Draw profiles to horizontal scale of not less than 1 inch equals 50 feet and to vertical scale of not less than 1 inch equals 5 feet. Indicate manholes and piping. Show types, sizes, materials, and elevations of other utilities crossing system piping.

B. Product Certificates: For each type of pipe and fitting.

C. Field quality-control reports.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic manholes, pipe, and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

C. Handle manholes according to manufacturer's written rigging instructions.

1.6 FIELD CONDITIONS

A. Interruption of Existing Sanitary Sewerage Service: Do not interrupt service to facilities occupied by City or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Notify City no fewer than two days in advance of proposed interruption of service.
2. Do not proceed with interruption of service without City's written permission.

PART 2 - PRODUCTS

2.1 SANITITE HP SEWER MAIN

A. The Contractor shall furnish and install ADS-Pipe “SaniTite HP” (High Performance Polypropylene) Pipe, or approved equal, in accordance with the manufacturer’s installation manual and the current City of Merced Standard Designs S-8 (Sanitary Sewer Data) and S-9 (Sewer System Testing), the Plans, and these Special Provisions.

B. Pipe Requirements: SaniTite HP pipe shall have a smooth interior, and annular exterior corrugations, and shall meet ASTM F2764 with the modifications listed herein.

C. Joint Performance: The pipe shall be watertight according to the requirements of ASTM D3212 10.8 psi (74kPa) laboratory test. Spigot shall have two gaskets meeting the requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with a removable wrap to ensure the gasket is free from debris. A joint lubricant supplied by the manufacturer shall be used on the gasket and bell during assembly. The pipe shall have a reinforced bell with a polymer composite band installed by the manufacturer.

Fittings shall conform to ASTM F2881 or F2764 for applicable diameters, and be capable of withstanding all operating conditions when installed. Fittings may be molded or fabricated. Fabricated fittings shall be welded at all accessible interior and exterior junctions.

D. Field Pipe and Joint Performance: To assure water tightness, field performance verification shall be accomplished by testing in accordance with ASTM F2487 for water and F1417 or C1103 for air. Appropriate safety precautions must be used when field-testing any pipe material. Contact the manufacturer for recommended leakage rates.

E. Material Properties: Polypropylene compound for pipe and fitting production shall be an impact modified copolymer meeting the material requirements ASTM F2764.

2.2 CLEANOUTS

A. Cast-Iron Cleanouts:

1. Description: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug.

2. Top-Loading Classification(s): Medium Duty.
3. Sewer Pipe Fitting and Riser to Cleanout: ASTM A74, Service class, cast-iron soil pipe and fittings.

B. PVC Cleanouts:

1. Description: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.

2.3 MANHOLES

A. The Contractor shall construct new sewer manhole where indicated on the plans, provide continuous service (existing mains), provide backfill material, and restore site paving to applicable City of Merced Standards. All manholes shall be constructed per the requirements of a 12-foot deep manhole, with a 60-inch diameter barrel. Manhole frame and cover shall be a D&L Supply Company A-1094 or approved equal. A concrete collar shall be placed around each manhole frame consisting of 4000psi concrete with two #4 rebar loops. The manhole base shall be a minimum of 7-foot diameter.

All incoming and out flowing sewer mains or laterals shall be extended and re-connected to the new manhole as required, using like materials and C-594 sewer repair couplings with stainless steel shear rings, or an approved alternative method.

The Contractor shall install new manhole frames and covers at each site. Reuse of existing frames and covers shall not be permitted.

Any sewage spills, or any construction debris that falls into the sewer main, shall be cleaned up at the Contractor's expense and to the satisfaction of the Engineer.

References:
1. Sewer Manhole Details (S-1)
2. Drop Manhole (S-2)
3. Manhole Frame and Cover (S-3)
4. Large Size Manhole Frame and Cover (S-3A)
5. General Requirements (ST-6)
6. Trench Excavation and Backfill (T-1)

7. Trenching and Backfill Requirements (T-3, T-4, T-5)
8. PCC Collar Pipe Connections (SD-8)

B. MANHOLE TIE-IN: The Contractor shall perform the manhole tie-in in accordance to the detail as shown on the Plans, and these Special Provisions.

Payment for this item shall be at the contract unit price as set forth in the proposal and shall include all labor, materials, tools, equipment, excavation, backfill, compaction, resurfacing and all work necessary for the completion of this item.

2.4 CONCRETE

A. General: Cast-in-place concrete complying with ACI 318, ACI 350, and the following:

1. Cement: ASTM C150/C150M, Type II.
2. Fine Aggregate: ASTM C33/C33M, sand.
3. Coarse Aggregate: ASTM C33/C33M, crushed gravel.
4. Water: Potable.

B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio.

1. Reinforcing Fabric: ASTM A1064/A1064M, steel, welded wire fabric, plain.
2. Reinforcing Bars: ASTM A615/A615M, Grade 60 deformed steel.

C. Manhole Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.

1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.

   a. Invert Slope: 1 percent through manhole.

2. Benches: Concrete, sloped to drain into channel.

D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water/cementitious materials ratio.

1. Reinforcing Fabric: ASTM A1064/A1064M, steel, welded wire fabric, plain.
2. Reinforcing Bars: ASTM A615/A615M, Grade 60 deformed steel.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Section 312000 "Earth Moving."

3.2 PIPING INSTALLATION

A. Installation shall be in accordance with ASTM D2321 and ADS recommended installation guidelines, with the exception that only minimum cover in traffic area shall be one foot. Backfill for minimum cover situations shall consist of Class 2 (minimum 90% SPD) material. Maximum fill heights depend on embedment material and compaction level. Contact the local representative or visit the website at www.ads-pipe.com for a copy of the installation guidelines.

This item shall include trench excavation, bedding, setting of the pipe, stub outs, caps, connections to existing sewer main, testing, backfill, compaction, paving, and all conditions described on the plans, and in the applicable City of Merced Standards. The removal of existing sewer main pipe shall be included where necessary. Connections to existing pipe of dissimilar materials shall be done using C-594 sewer repair couplings with stainless shear rings, manufacturer's recommendations, or an approved alternative method.

Where a portion of existing surfacing is to be removed, the outline of the area to be removed shall be cut on a neat line with a power-driven saw to a minimum depth of 0.17-foot before removing the surfacing.

Trench excavation and backfill work shall conform to the City of Merced Standards T-1 to T-5 (Trenching and Backfill Requirements) and shall be paid for under this item.

The new sewer main shall retain the vertical and horizontal alignments as shown on the Plans. The Contractor and the Engineer, in writing, shall agree upon any deviation from the planned alignments.

Payment for this item, "SaniTite HP Sewer Main," shall be at the contract unit price as set forth in the proposal and shall include all labor, materials, tools, equipment, compaction and all work necessary for the completion of this item.

3.3 MANHOLE INSTALLATION

A. The Contractor shall perform the manhole tie-in in accordance to the detail as shown on the Plans, and these Special Provisions.

Payment for this item shall be at the contract unit price as set forth in the proposal and shall include all labor, materials, tools, equipment, excavation, backfill, compaction, resurfacing and all work necessary for the completion of this item.

3.4 RECONNECT EXISTING SEWER LATERAL

A. The Contractor shall reconnect all existing sewer laterals (shown or not shown) in accordance to the detail as shown on the Plans, and these Special Provisions.

Connection of the new service lateral to the mainline shall be accomplished by means of a compression-fit service connection. The service connection shall be specifically designed for connection to the sewer main being installed, and shall be INSERTA TEE as manufactured by Fowler Manufacturing Co. Hillsboro, Oregon, (503) 357-2110; or approved equal. Install using procedures and equipment as referenced in manufacturer's written installation instructions.

This item includes all pipe replacement or extensions, fittings, bends, couplings, trenching, backfill, compaction and paving. The work shall comply with City Standards S-7 (Sewer Lateral).

Payment for this item shall be at the contract unit price as set forth in the proposal and shall include all labor, materials, tools, equipment, excavation, backfill, compaction, resurfacing and all work necessary for the completion of this item.

3.5 SEWER PUMP BYPASS SYSTEM

A. The Contractor shall provide a sewer pump bypass plan to the City Engineer for approval, prior to the start of work. The Contractor shall provide for the flow of the sewage around the section of sewer lines designated for replacement. The bypass shall be made by plugging the line at an existing upstream manhole, or other approved access point, and pumping or directing the flow to a downstream manhole or adjacent sanitary sewer system.

While bypass pumping is being performed, the sewer bypass system shall be monitored and maintained by the Contractor at all times. The Contractor will provide names, contact information, and schedules of all individuals who will be monitoring the sewer bypass system.

All piping, joints, and accessories must be designed to withstand at least the maximum by-pass system pressure. The bypassing pipelines will not be flexible hose type unless approved by the City. During by-pass pumping, no sewage will be leaked, dumped, or spilled in or onto any area outside of the existing sanitary sewer system.

The Contractor shall provide adequate pumping equipment and force mains in order to maintain reliable sanitary sewer service in all sanitary sewer lines involved. The Contractor must have backup pumps and force mains on the job site in case of equipment failure. Under no circumstances will the flow be interrupted or stopped such that damage is done to either private or public property or sewage flows or overflows into the storm sewer or natural waterway. When bypass pumping operations are complete, all piping must be drained into the sanitary sewer priority to disassembly.

If sewage back up or spills occur, and enter buildings or property, the contractor shall be responsible for cleanup, repairs, property damage costs, fines and claims. The Contractor shall be responsible for continuity of sanitary sewer service to any facility connected to the section of sewer during the execution of the work.

Mitigation of noise generated by the bypass system must be addressed by the Contractor. All pumps, primary and backup, will be at a minimum by sound-attenuated and insulated to maintain 60 decibels at 50-feet or better. Placement and location of all pumps shall be placed in such a way to minimize the noise level to the greatest extent possible. Pump placement details and support appurtenances must be detailed in the bypass plan submitted by the Contractor.

Included in this item are the removal & replacement of concrete valley gutter, curb and gutter, or slabs, asphalt pavement, expose existing sewer manhole for bypass process and restore back to its original condition. Bypass piping shall be installed below ground at all driveways, parking lots, and roadways per the "Bypass Trenching" detail on the plans. All other (dirt location) may be installed above ground. Access to properties shall be available to property owners at all times.

- Existing sewer flow rate ranges approximately between **10 GPM** to **100 GPM**.

3.6 CONCRETE PLACEMENT

A. Place cast-in-place concrete according to ACI 318.

3.7 CLEANOUT INSTALLATION

A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts, and use cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.

1. Use Light-Duty, top-loading classification cleanouts in earth or unpaved foot-traffic areas.
2. Use Medium-Duty, top-loading classification cleanouts in paved foot-traffic areas.
3. Use Heavy-Duty, top-loading classification cleanouts in vehicle-traffic service areas.
4. Use Extra-Heavy-Duty, top-loading classification cleanouts in roads.

B. Set cleanout frames and covers in earth in cast-in-place-concrete block in accordance with the City of Merced Standard Details.

C. Set cleanout frames and covers in concrete pavement and roads with tops flush with pavement surface.

3.8 IDENTIFICATION

A. Comply with requirements in Section 312000 "Earth Moving" for underground utility identification devices. Arrange for installation of green warning tapes directly over piping and at outside edges of underground manholes.

1. Use warning tape or detectable warning tape over ferrous piping.

2. Use detectable warning tape over nonferrous piping and over edges of underground manholes.

3.9 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Submit separate report for each system inspection.
2. Defects requiring correction include the following:

a. Alignment: Less than full diameter of inside of pipe is visible between structures.
b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
d. Infiltration: Water leakage into piping.
e. Exfiltration: Water leakage from or around piping.

3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Reinspect and repeat procedure until results are satisfactory.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.
2. Test completed piping systems according to requirements of authorities having jurisdiction.
3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
4. Submit separate report for each test.
5. Hydrostatic Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction and the following:

a. Fill sewer piping with water. Test with pressure of at least 10-foot head of water, and maintain such pressure without leakage for at least 15 minutes.
b. Close openings in system and fill with water.
c. Purge air and refill with water.
d. Disconnect water supply.
e. Test and inspect joints for leaks.

6. Air Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction, UNI-B-6, and the following:

a. Test plastic gravity sewer piping according to ASTM F1417.
b. Test concrete gravity sewer piping according to ASTM C1628.

7. Force Main: Perform hydrostatic test after thrust blocks, supports, and anchors have hardened. Test at pressure not less than 1-1/2 times the maximum system operating pressure, but not less than 150 psig.

   a. Ductile-Iron Piping: Test according to AWWA C600, "Hydraulic Testing" Section.
   b. PVC Piping: Test according to AWWA M23, "Testing and Maintenance" Chapter.

8. Manholes: Perform hydraulic test according to ASTM C969.

C. Leaks and loss in test pressure constitute defects that must be repaired.

D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

3.10 CLEANING

A. Clean dirt and superfluous material from interior of piping.

END OF SECTION 221313

SECTION 260500 – BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes

1. Provide all labor, materials and equipment necessary to complete the installation required for the items specified under Division 26.
2. Division 26 when referenced refers to the following Sections:

   a. Section 260526 Grounding and Bonding for Electrical Systems
   b. Section 260519 Conductors and Cables
   c. Section 260533 Raceway and Boxes

B. Related work under this section

1. Labor and materials required to furnish and install the electrical systems in a complete and operational fashion.
2. Carpentry, masonry, steel and concrete materials and labor required for construction of proper stands, bases and supports for electrical materials and equipment.
3. Excavating, pumping and backfilling required for installation.
4. Repair of damage to the premises resulting from construction activities under this Section to City's satisfaction.
5. Removal of work debris from construction activities to City's satisfaction.
6. Testing and cleaning of equipment installed.

C. Related Sections

1. Where items specified in other Division 26 sections conflict with the requirements of this Section, the most stringent requirement shall govern.
2. The requirements of this Section apply to all Division 26 work, as applicable.

1.2 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:

1. CCR –California Code of Regulations

   a. Title 8 –Industrial Relations; Section 1 –Department of Industrial Relations

      1) Chapter 3.2 -California Occupational Safety and Health Regulations (CAL/OSHA)
      2) Chapter 4 –Section of Industrial Safety

         a) Subchapter 4 -Construction Safety Orders (CSO)
         b) Subchapter 5 -Electrical Safety Orders (ESO)

   b. Title 24 –California Building Standards

1) Part 1 -Building Standards Administrative Code
2) Part 2 -California Building Code (CBC); International Building Code (IBC) with California amendments
3) Part 3 -California Electrical Code(CEC); NFPA 70 National Electrical Code (NEC) with California amendments
4) Part 4 -California Mechanical Code (MEC); IAPMO Uniform Mechanical Code (UMC) with California amendments
5) Part 5 -California Plumbing Code; IAPMO Uniform Plumbing Code (UPC) with California amendments
6) Part 6 -California Energy Code
7) Part 9 -California Fire Code; International Fire Code (IFC) with California amendments
8) Part 12 -California Reference Standards Code

2. CPUC –California Public Utilities Commission

   a. GO-95; Rules for Overhead Electric Line Construction
   b. GO-128; Rules for Construction of Underground Electric Supply and Communication Systems

3. IEEE –Institute of Electrical and Electronic Engineers

   a. C2; National Electrical Safety Code (NESC)

4. NECA –National Electrical Contractors Association

   a. 1; Standard Practices for Good Workmanship in Electrical Contracting
   b. 4090; Manual of Labor Units

5. All applicable local municipal codes and ordinances.

6. Applicable rules and regulations of local utility companies.

1.3 SUBMITTALS

A. Product Data

1. Refer to Division 1.

B. Closeout Submittal

1. Furnish three complete sets of maintenance and operating instructions bound in a binder and indexed to City. Start compiling data upon approval of materials and equipment. Final inspection will not be made until Engineer approves binders. Refer also to Division 1 for additional requirements.
2. Provide one of each tool required for proper equipment operation and maintenance provided under this Division. All tools shall be delivered to the City at project completion.
3. Provide two keys to City for each lock furnished under Division 26.
4. Record Drawings

   a. Refer to Division 1.

1.4 SUBSTITUTIONS

A. Refer to Division 1.

1.5 CHANGE ORDER PROPOSALS

A. Refer to Division 1.

1.6 QUALITY ASSURANCE

A. References to codes, standards, specifications and recommendations of technical societies, trade organizations and governmental agencies shall mean that latest edition of such publications adopted and published prior to bid submittal. Such codes or standards shall be considered a part of this Specification as though fully repeated herein.

B. Work and materials shall be in full accordance with the latest rules and regulations of applicable state of local laws or regulations and standards of following:

1. National Fire Protection Association (NFPA)
2. California Electrical Code (CEC)
3. California Occupational Safety Health Act (Cal-OSHA)
4. California State Fire Marshall (CSFM)
5. California Code of Regulations (CCR)
6. Electrical Safety Orders, CAC Title 8 (ESO)
7. California Public Utilities Commissions, General Order 95 (GO-95)
8. Applicable rules and regulations of local utility companies.
9. NECA 1-2006, Standard Practices for Good Workmanship in Electrical Contracting

C. All electrical equipment and material furnished under Division 26 shall conform to all CEC requirements and bear the Underwriters' Laboratories (UL) label where applicable.

D. Nothing in the Construction Documents shall be construed to permit work not conforming to these Codes. Whenever the indicated material, workmanship, arrangement or construction is of high quality or capacity than that required by the above rules and regulations, the Construction Documents shall take precedence. Should there be any direct conflict between the rules and regulations and Construction Documents, the rules shall govern.

E. All electrical equipment and material furnished under this Division shall conform to NEMA and ASTM standards, CEC and bear the Underwriters' Laboratories (UL) label where such label is applicable.

F. All electrical work shall conform to manufacturer's written instruction, and the NECA Standard Practices for Good Workmanship in Electrical Contracting and all published recommended practices at the time of project. The Contractor shall use the requirements within the Specifications whenever they exceed NECA guidelines.

G. Follow manufacturer's direction where these direction cover points not included with the Construction Documents.

1.7 DELIVERY, STORAGE AND HANDLING

A. Packing, shipping, handling and unloading

1. Damage to the equipment delivered to the site or in transit to the job shall be the responsibility of the Electrical Contractor.

2. Equipment and material delivery of shall be scheduled as required for timely, expeditious progress of work.

B. Storage and protection of job equipment is the responsibility Contractor.

1.8 PROJECT CONDITIONS

A. Discrepancies

1. In the event of discrepancies with the Contract Documents, City shall be notified with sufficient time as stated within Division 1 to allow the issuing of an addendum prior to the bid opening.
2. If, in the event that time does not permit notification of clarification of discrepancies prior to the bid opening, the following shall apply:

a. The drawings govern in matters of quantity and specifications govern in matters of quality.
b. In the event of conflict within the drawings and specifications involving quantities or quality, the greater quantity or higher quality shall apply. Such discrepancies shall be noted and clarified within the contractor's bid. No additional allowances will be made because of errors, ambiguities or omissions which reasonably should have been discovered during the bid preparation.

B. Verify all power and communication utilities' requirements prior to commencement of any utility work. Make proper adjustments to the construction to satisfy the serving utility.

C. Information shown relative to services is based upon available records and data, but shall be regarded as approximate only. Make minor deviations found necessary to conform to actual locations and conditions without extra cost. Verify locations and elevations of utilities prior to commencement of excavation for new underground installation.

D. Exercise extreme care in excavating near existing utilities to avoid any damage thereto; be responsible for any damage caused by such operations. Contact all utility companies to obtain exact locations prior to commencement of construction.

E. The electrical plans indicate the general layout and arrangement; the field conditions shall determine exact locations. Field verify all conditions and modify as required to satisfy design intent. Maintain all required working clearances.

F. Fees, permits and utility services

1. Obtain and pay for all permits and service charges required for the installation of this work. Arrange for required inspections and secure approvals from authorities having jurisdiction. Arrange for all utility connections and pay charges incurred including excess service charges if any.
2. Extra charges imposed by the electrical and communication utility companies shall be included in the bid, if available. Unless otherwise stated, these charges will be assumed to include in the bid.

G. Provide and maintain temporary construction power. The General Contractor will pay for electric energy charges. Should the Electrical Contractor be the prime contractor, the Electrical Contractor shall pay for energy charges unless negotiated with City.

1.9 SEQUENCING

A. Coordinate work within phasing plans as provided by the City.

1.10 WARRANTY

A. Refer to Division 1.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Materials mentioned herein or on Drawings require that the items be provided and of quality noted or an approved equal. All materials shall be new, full weight, standard in all respects and in first-class condition. Insofar as possible, all materials used shall be of the same brand or manufacturer throughout for each class of material or equipment.

B. Trade names or catalog numbers stated herein indicts grade or quality of material desired. Materials, where applicable, shall UL labeled and in accordance with NEMA standards.

C. Dimensions, sizes and capacities shown are a minimum. Do not make changes without written permission of Engineer

2.2 CONCRETE

A. All concrete work shall comply with all applicable requirements of CalTrans Standard Specifications, which is 3,000 psi at 28 days.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine Construction Documents and Site; be familiar with types of construction where electrical installation is involved. Note carefully other sections of Specifications with their individual cross-references, standard details, etc.

B. Any electrical work or materials shown either in Construction Documents, but not mentioned herein, or vice versa, shall be executed the same as if mentioned herein, in a workmanlike manner in accordance with all published NECA Standards of Installation.

C. Coordinate work with other crafts to avoid conflicts, and check all outlet locations with drawings and specifications. Make minor adjustments without additional cost to City.

D. City will make clarifications and rulings concerning any obvious discrepancies or omissions in work prior and after bidding. Perform all work involved in correcting obvious errors or omissions after award of contract as directed by City at Contractor's expense.

E. Examine site dimensions and locations against Drawings and become informed of all conditions under which work is to be done before submitting proposals. No allowance will be made for extra expense due to error.

F. Layouts of equipment, accessories and wiring systems are diagrammatic (not pictorial), but shall be followed as closely as possible. Construction Documents are for assistance and guidance, and exact locations, distance, levels, etc., will be governed by construction; accept same with this under standing.

G. Horsepower of motors or wattage of equipment indicated in Construction Documents is estimated horsepower or wattage requirement of equipment furnished under other sections of Specifications.

Size all feeders (conduit and wiring), motor starters, overload protection and circuit breakers to suit horsepower of motors or wattage of equipment actually furnished under various sections of specifications. However, in no case shall feeders and branch circuits (conduit and wiring) and circuit breakers be of smaller capacities or sizes than those indicated on Drawings or specified, unless approved in writing by City.

3.2 PREPARATION

A. Seal all exterior wall penetrations in an approved watertight manner and to the satisfaction of City.

B. Channels, joiners, hangers, caps, nuts and bolts and associated parts shall be plated electrolytically with zinc followed immediately thereafter by treating freshly deposited zinc surfaces with chromic acid to obtain a surface which will not form a white deposit on surface for an average of 120 hours when subjected to a standard salt spray cabinet test, or shall be hot dipped galvanized

3.3 INSTALLATION

A. Equipment identification

1. Properly identify panelboards, remote control switches, push buttons, terminal boxes, etc. with a descriptive nameplate. Make nameplate with 3/32” laminated plastic with black background and white letters. Machine engraved letters 1/8” high for equipment in device box(es) and 1/4” high for panelboards, terminal cabinets or larger items. Punched strip type nameplates and cardholders in any form are not acceptable. Fasten nameplates with oval head machine screws, tapped into front cover/panel.

B. Working spaces

1. Provide adequate working space around electrical equipment in compliance with Article 4 of Electrical Safety Orders and CEC 110.26. In general provide 78” of headroom and 30” wide minimum clear workspace in front of panelboards and controls. In addition to the above, provide the following minimum working clearances:

   a. 0V – 150V (line-to-ground) provide 36” minimum clear distance.
   b. 151V – 600V (line-to-ground) provide 42” minimum clear distance.

C. Equipment supports

1. Anchor all electrical equipment to structure. Support systems shall be adequate to withstand seismic forces per CBC.

D. Excavating and backfilling

1. Excavate and backfill as required for installation of Work. Restore all surfaces, roadways, walks, curbs, walls existing underground installations, etc., cut by installations to original condition in an acceptable manner. Maintain all warning signs, barricades, flares and lanterns as required by ESO and local ordinances.
2. Dig trenches straight and true to line and grade, with bottom clear of any rock points. Support conduit for entire length on undisturbed original earth. Minimum conduit depth of pipe crown shall be 30” below finished or natural grade, unless otherwise noted.

E. Forming, cutting and patching

1. In new construction, General Contractor shall provide any special forming, recesses, chased, etc., and provide wood blocking, backing and grounds as necessary for the proper installation of electrical work. Be responsible for notifying General Contractor that such provision is necessary; layout work and check to see that it suits his requirements.

    a. Provide metal backing plates, anchor plates and such that are required for anchorage of electrical work under Division 26; securely weld or bolt to metal framing. Wood blocking or backing will not be permitted in combination with metal framing.

2. Be responsible for proper placement of pipe sleeves, hangers, inserts and supports for this Work.

F. Concrete work

1. Provide concrete work related solely to electrical work. Concrete work, including forming and reinforcing steel installed for all electrical work.

3.4 REPAIR/RESTORATION

A. Cutting, patching and repairing of existing construction to permit installation of work under Division 26 is the responsibility of Contractor. Repair or replace all damage to existing work in kind to City's satisfaction.

B. Obtain City's approval prior to performing any cutting or patching of concrete, masonry, wood or steel structure within building.

3.5 FIELD QUALITY CONTROL

A. Inspection of work

1. Working parts shall be readily accessible for inspection, repair and renewal. The right is reserved to make reasonable changes in equipment location shown on Drawings prior to rough in without additional costs to the City.
2. During construction all work will be subject to observation by the Engineer and his representatives. Assist in ascertaining any information that maybe required.
3. Do not allow or cause any work installed hereunder to be covered up or enclosed before it has been inspected and approved. Should any work be enclosed or covered prior to approval, uncover work, and after it has been inspected and approved, restore work of all others to the condition in which it was found at the time of cutting, all without additional costs to City.

B. Furnish all testing equipment as maybe required.

C. Test all wiring and connections for continuity and grounds; where such tests indicate faulty insulation or other defects, locate, repair and re-test.

D. Check rotation of all motors and correct if necessary.

3.6 CLEANING

A. Repair or replace all broken, damaged or otherwise defective parts without additional cost to City, and leave entire work in a condition satisfactory to Engineer. At completion, carefully clean and adjust all equipment, fixtures and trim installed as part of this work; leave systems and equipment in satisfactory operating condition.

B. Clean out and remove from the site all surplus materials and debris resulting from this work; this includes surplus excavated materials.

3.7 DEMONSTRATION

A. At project completion, Contractor shall allot a period of not less than 2 hours for instruction of operating and maintenance personnel in the use of all systems installed under this Division. This time is in addition to any instruction time stated in the Specifications of other sections for other equipment (i.e., Irrigation controller etc.). All personnel shall be instructed at one time, the Contractor shall make all necessary arrangements with manufacturer's representatives as may be required. Contractor, if any, for the above services shall pay all costs.

3.8 PROTECTION

A. In performance of work, protect work of other trades as well as work under this Division from damage.

B. Protect electrical equipment, stored and installed, from dust, water or other damage.

END OF SECTION

SECTION 260519 – CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

1. Section includes:

   a. Conductors and cabling.

2. Provide all labor, materials and equipment necessary for the installation of all conductors and cables under this Section related to lighting, power, mechanical, control and signal systems.

B. Related sections

1. Where items specified in other Division 26 sections conflict with the requirements of this Section, the most stringent requirement shall govern.
2. The requirements of this Section apply to all Division 26 work, as applicable.
3. Consult all other sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.

1.2 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:

1. ASTM -American Society for Testing and Materials

   a. B3; Standard Specification for Soft or Annealed Copper Wire
   b. B8; Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
   c. B787/B787M; Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation
   d. D1000; Standard Test Method for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications

2. CCR –California Code of Regulations, Title 24

   a. Part 3 -California Electrical Code(CEC); NFPA 70 National Electrical Code (NEC) with California amendments

3. UL -Underwriters Laboratories, Inc.

   a. UL 83; Thermoplastic-Insulated Wire and Cables
   b. UL 486A 486B; Wire Connectors
   c. UL 486C; Splicing Wire Connectors
   d. UL 486D; Standard for Insulated Wire Connector Systems For Underground Use Or In Damp Or Wet Locations

e. UL 486E; Standard for Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors
f. UL 493; Thermoplastic-Insulated Underground Feeders and Branch Circuit Cables
g. UL 510; Standard for Polyvinyl Chloride, Polyethylene and Rubber Insulating Tape
h. UL 854; Service-Entrance Cables

4. NEMA –National Electrical Manufacturer's Association

a. WC 70-1999; Nonshielded Power Cables Rated 2000 Volts or less for the Distribution of Electrical Energy

5. IEEE –Institute of Electrical and Electronic Engineers

a. 82; Standard Test Procedure for Impulse Voltage Tests on Insulated Conductors

1.3 DELIVERY

A. Wire shall be in original unbroken package. Obtain approval of Inspector or Engineer before installation of wires.

PART 2 - PRODUCTS

2.1 BUILDING WIRE

A. Conductor material

1. Provide annealed copper for all wire, conductor and cable of not less than 98% conductivity.
2. Wire #8 AWG and larger shall be stranded.
3. Wire #10 AWG and smaller shall be solid.

B. Insulation material

1. All insulated wire, conductor and cable shall be 600 Vac rated.
2. Feeder and branch circuits larger than #6 AWG shall be type THW, XHHW or THHN/THWN.
3. Feeder and branch circuits #6 AWG and smaller shall be type TW, THW, XHHW or THHN/THWN.
4. Control circuits shall be type THW or THHN/THWN.
5. Wires shall bear the UL label, be color-coded and marked with gauge, type and manufacturer's name on 24" centers.

2.2 FLEXIBLE CORDS AND CABLES

A. Provide flexible cords and cables of size, type and arrangement as indicated on Drawings.

B. Type S flexible cords and cable shall be manufactured in accordance with CEC Article 400 and composed of two or more conductors and a full sized green insulated grounding conductor with an outer rubber or neoprene jacket.

C. Flexible cords and cables shall be fitted with wire mesh strain relief grips either as a integral connector component or an independently supported unit.

D. Suspended flexible cords and cables shall incorporate safety spring(s).

2.3 WIRE CONNECTIONS AND TERMINATIONS

A. Electrical spring wire connectors

1. Provide multi-part construction incorporating a non-restricted, zinc coated square cross-sectional steel spring enclosed in a steel sheet with an outer jacket of plastic and insulating skirt.
2. Self-striping pigtail and tap U-contact connectors are not acceptable.

B. Compression type terminating lugs

1. Provide tin-plated copper high compression type lugs for installation with hand or hydraulic crimping tools as directed by manufacturer. Notch or single point type crimps are not acceptable.
2. Two hole, long barrel lugs shall be provided for size #4/O AWG and larger wire where terminated to bus bars. Use minimum of three crimps per lug where possible.

C. Splicing and insulating tape

1. Provide black, UV resistant, self-extinguishing, 7 mil thick vinyl general purpose electrical tape per UL 510 and ASTM D1000. 3M Scotch 33 or equal.

D. Insulating putty

1. Provide pads or rolls of non-corrosive, self-fusing, 125 mil thick rubber putty with PVC backing sheet per UL 510 and ASTM D1000. 3M Scotchfil or equal.

E. Insulating resin

1. Provide two-part liquid epoxy resin with resin and catalyst in pre-measured, sealed mixing pouch. 3M Scothcast 4 or equal.
2. Use resin with thermal and diaelectric properties equal to the cable's insulating properties.

F. Terminal strips

1. Provide box type terminal strips in the required quantities plus 25% spare. Install in continuous rows.
2. Use the box type terminal strips with barrier open backs and with ampere ratings as required.
3. Identify all terminals strips and circuits.

G. Crimp type connectors

1. Provide insulated fork or ring crimp terminals with tinned electrolytic copper-brazed barrel with funnel wire entry and insulation support.
2. Fasten crimp type connectors or terminals using a crimping tool recommended by the manufacturer.
3. Provide insulated overlap splices with tinned seamless electrolytic copper-brazed barrel with funnel wire entry and insulation support.
4. Provide insulated butt splices with tinned seamless electrolytic copper-brazed barrel with center stop, funnel wire entry and insulation support.

H. Cable ties

1. Provide harnessing and point-to-point wire bundling with nylon cable ties. Install using tool supplied by manufacturer as required.

I. Wire lubricating compound

1. UL listed for the wire insulation and conduit type, and shall not harden or become adhesive.
2. Shall not be used on wire for isolated type electrical power systems.

J. Bolt termination hardware

1. Bolts shall be plated, medium carbon steel heat-treated, quenched and tempered equal to ASTM A-325 or SAE Grade 5; or silicon bronze alloy ASTM B-9954 Type B.
2. Nuts shall be heavy semi-finished hexagon, conforming to ANSI B18.2.2, threads to be unified coarse series (UNC), class 2B steel or silicon bronze alloy.
3. Flat washers shall be steel or silicon bronze, Type A plain standard wide series, conforming to ANSI B27.2. SAE or narrow series shall be used.
4. Belleville conical spring washers shall be hardened steel, cadmium plated or silicon bronze.

    a. Each bolt connecting lug(s) to a terminal or bus shall not carry current exceeding the following values:
    b. 1/4” bolt – 125 A
    c. 5/16” bolt – 175 A
    d. 3/8” bolt – 225 A
    e. 1/2” bolt – 300 A
    f. 5/8” bolt – 375 A
    g. 3/4” bolt – 450 A

PART 3 - EXECUTION

3.1 EXAMINATION

A. Thoroughly examine site conditions for acceptance of wire and cable installation to verify conformance with manufacturer and specification tolerances. Do not commence with work until all conditions are made satisfactory.

3.2 INSTALLATION

A. All wire, conductor, and cable with their respective connectors, fittings and supports shall be UL listed for the installed application and ambient conditions.

B. Feeders and branch circuits in wet locations shall be rated 75°C minimum.

C. Feeders and branch circuits in dry locations shall be rated 90°C minimum.

D. Minimum conductor size

1. #12 AWG copper for all power and lighting branch circuits.
2. #14 AWG copper for all line voltage signal and control wiring, unless otherwise indicated.
3. Aluminum conductors may be substituted on the basis of equal performance for sizes greater than #10 AWG with the approval of Engineer.

E. Remove and replace conductors under the following conditions at no additional costs to the City:

1. Installed within wrong specified conduit or raceway.

2. Damaged during installation.
3. Of insufficient length to facilitate proper splice of conductors

3.3 WIRING METHODS

A. Install wires and cable in accordance with manufacturer's written instructions, as shown on Drawings and as specified herein.

B. Install all single conductors within raceway system, unless otherwise indicated.

C. Parallel circuit conductors and terminations shall be equal in length and identical in all aspects.

D. Provide adequate length of conductors within electrical enclosures and neatly train to termination points with no excess. Terminate such that there is no bare conductor at the terminal.

E. Splice cables and wires only in junction boxes, outlet boxes, pull boxes, manholes or handholes.

F. Group and bundle with tie wrap each neutral with its associated phase conductors where more than one neutral conductor is present within a conduit.

G. Install cable supports for all vertical feeders in accordance with CEC Article 300. Provide split wedge type fittings, which firmly clamp each individual cable and tighten due to cable weight.

H. Seal cable where exiting a conduit from an exterior underground raceway with a non-hardening compound (i.e., duct seal or equal).

I. Provide UL listed factory fabricated, solder-less metal connectors of size, ampacity rating, material, type and class for applications and for services indicated. Use connectors with temperature ratings equal or greater than the conductor or cable being terminated.

J. Stranded wire shall be terminated using fittings, lugs or devices listed for the application. Under no circumstances shall stranded wire be terminated solely by wrapping it around a screw or bolt.

K. Flexible cords and cables supplied as part of a pre-manufactured assembly shall be installed according to manufacturer's published instructions.

3.4 WIRING INSTALLATION IN RACEWAYS

A. Install wire in raceway after interior of building has been physically protected from weather, and all mechanical work likely to injure conductors has been completed.

B. Pull all conductors into raceway at the same time.

C. Use UL listed, non-petroleum base and insulating type pulling compound as needed.

D. Completely mandrel all underground or concrete encased conduits prior to installation.

E. Completely and thoroughly swab raceway system prior to installation

F. Do not use block and tackle, power driven winch or other mechanical means for pulling conductors smaller than #1 AWG.

G. Wire pulling

1. Provide installation equipment that will prevent cutting or abrasion of insulation during installation.

2. Maximum pull tension shall not exceed manufacturer's recommended value during installation for cable being measured with tension dynometer.
3. Use rope made of non-metallic material for pulling.
4. Attach pulling lines by means of either woven basket grips or pulling eyes attached directly to the conductors.
5. Pull multiple conductors simultaneously within same conduit.

3.5 WIRE SPLICES, JOINTS AND TERMINATIONS

A. Join and terminate wire, conductors and cables in accordance with UL 486, CEC and manufacturer's instructions.

B. Thoroughly clean wires before installing lugs and connectors.

C. Make splices, taps and terminations to carry full conductor ampacity without perceptible temperature rise, and shall be made mechanically and electrically secure.

D. Terminate wires in terminal cabinets using terminal strips, unless otherwise indicated.

E. Insulate spare conductors with electrical tape and leave sufficient length to terminate anywhere within panel or cabinet.

F. Encapsulate splices in wet locations using specified insulating resin kits.

G. Make up all splices and taps in accessible junction or outlet boxes with connectors as specified herein. Pigtails and taps shall be the same color as feed conductor with at least 6 inches of tail, all neatly packed within box.

H. Where conductors are to be connected to metallic surfaces, coated surfaces shall be cleaned to base metal surface before installing connector. Remove lacquer coating of conduits where ground clamps are to be installed.

I. Branch circuits (#10 AWG and smaller) connectors shall comply with 2.01.D.2 and 2.01.D.2 above.

J. Branch circuits (#8 AWG and larger)

1. Join or tap conductors using insulated mechanical compression taps with pre-molded, snap-on insulating boots or specified conformable insulating pad and over-wrapped with two half-lapped layers of vinyl insulating tape starting and ending at the middle of joint.
2. Terminate conductors using mechanical compression lugs in accordance with manufacturer's recommendation or as specified elsewhere.
3. Field installed compression connectors for 250 MCM and larger shall have not less than two clamping elements or compression indents per wire.
4. Insulate splices and joints with materials approved for the particular use, location, voltage and temperature.

K. Termination hardware assemblies

1. Al/Cu lugs connected to aluminum plated or copper bus shall be secured with steel bolt, flat washer (two per bolt), Belleville washer and nut.
2. Copper lugs connected to copper buss shall bus shall be secured using silicon bronze alloy bolt, flat washer (two per bolt), Belleville washer and nut.
3. The crown of Belleville washers shall be under the nut.
4. Bolt assemblies shall be torque to manufacturer's recommendations. Where manufacturer recommendation is not obtainable, the following shall be used:

a. 1/4” -20 bolt at 80 inch-pound torque
b. 5/16” -18 bolt at 180 inch-pound torque
c. 3/8” -20 bolt at 20 inch-pound torque
d. 1/2” -20 bolt at 40 inch-pound torque
e. 5/8” -20 bolt at 55 inch-pound torque
f. 3/4” -20 bolt at 158 inch-pound torque

3.6 IDENTIFICATION

A. Securely tag all branch circuits. Mark conductors with specified vinyl wrap-around markers. Where more than two conductors run through a single outlet, mark each conductor with the corresponding circuit number.

B. Provide all terminal strips with each individual terminal identified using specified vinyl markers.

C. In manholes, pullboxes and handholes provide tags of embossed brass type with cable type and voltage rating. Attach tags to cable with slip-free plastic cable lacing units.

D. Color coding

1. For 120/208 Volt (or 120/240 Volt), 1 phase, 3 wire systems:

   a. Phase A – Black
   b. Phase B – Red
   c. Neutral – White
   d. Ground – Green

2. For 120/208 Volt, 3 phase, 4 wire systems:

   a. Phase A – Black
   b. Phase B – Red
   c. Phase C – Blue
   d. Neutral – White
   e. Ground – Green

3. For 277/480 Volt, 3 phase, 4 wire systems:

   a. Phase A – Brown
   b. Phase B – Orange
   c. Phase C – Yellow
   d. Neutral – Gray
   e. Ground – Green

4. Switch leg individually installed shall be the same color as the branch circuit to which they originate, unless otherwise indicated.
5. Travelers for 3-way and 4-way switches shall be a distinct color and pulled with the circuit switch leg or neutral.

3.7 FIELD QUALITY CONTROL

A. Supply labor, materials and test equipment required to perform continuity and ground tests.

B. Electrical testing

1. Perform feeder and branch circuit insulation test after installation and prior to connection to device.
2. Tests shall be performed by 600 Vdc megger for a continuous 10 seconds from phase-to-phase and phase-to-ground.
3. Torque test conductor connections and terminations for conformance to Specifications.
4. If any failure is detected, locate failure, determine cause and replace or repair cable to Engineer's satisfaction at no additional costs.
5. Furnish test results in type written report form for review by Engineer.

END OF SECTION

SECTION 260526 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes

1. Provide all labor, materials and equipment necessary to complete the installation required for the item specified under this Section, including but not limited to power system and equipment grounding.

B. Related sections

1. Where items specified in other Division 26 sections conflict with the requirements of this Section, the most stringent requirement shall govern.
2. The requirements of this Section apply to all Division 26 work, as applicable.
3. Consult all other sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.

1.2 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:

1. CCR –California Code of Regulations, Title 24

a. Part 3 -California Electrical Code (CEC); NFPA 70 National Electrical Code (NEC) with California amendments

2. IEEE –Institute of Electrical and Electronics Engineers

a. 142; Recommend Practices for Grounding of Industrial and Commercial Power Systems

3. NFPA –National Fire Protection Association

a. 780; Lightning Protection Code

4. UL –Underwriters Laboratories, Inc.

a. 467; Grounding and Bonding Equipment

1.3 SYSTEM DESCRIPTION

A. This Section provides for the grounding and bonding of all electrical and communication apparatus, machinery, appliances, components, fittings and accessories where required to provide a permanent, continuous, low impedance, grounded electrical system and equipment.

B. Ground the electrical service system neutral at service entrance equipment as shown on the Drawings.

C. Ground each separately derived system, as defined in CEC 250.5 (D) and on the Drawings, unless specifically noted otherwise.

D. Except as otherwise indicated, the complete electrical installation including the neutral conductor, equipment and metallic raceways, boxes and cabinets shall be completely and effectively grounded in accordance with all CEC requirements, whether or not such connections are specifically shown or specified.

1.4 SUBMITTALS

A. Submit manufacturer's data for equipment and materials specified within this Section in accordance to Section 16050.

1.5 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the materials specified herein shall be new and unused, bearing UL labels where applicable.

PART 2 - PRODUCTS

2.1 CONCRETE ENCASED GROUNDING ELECTRODE (UFER GROUND)

A. #3/O AWG minimum bare stranded copper conductor.

2.2 DRIVEN (GROUND) RODS

A. Copper clad steel, minimum ¾" diameter by 10'-0" length, sectional type with copper alloy couplings and carbon steel driving stud; Weaver, Cadweld or equal.

2.3 INSULATED GROUNDING BUSHINGS

A. Plated malleable iron body with 150°C molded plastic insulated throat and lay-in ground lug; OZ/Gedney BLG, Thomas & Betts #TIGB series or equal.

2.4 CONNECTION TO PIPE

A. Cable to pipe connections; OZ/Gedney G-100B series, Thomas & Betts #290X series or equal.

2.5 CONNECTIONS TO STRUCTURAL STEEL, GROUND RODS OR SPICES

A. Where required by the Drawings, grounding conductors shall be spliced together, connected to ground rods or connected to structural steel using exothermic welds, Cadweld or equal, or high pressure compression type connectors, Cadweld, Thomas & Betts or equal.

2.6 BONDING JUMPERS

A. OZ/Gedney Type BJ, Thomas & Betts #3840 series or equal.

2.7 GROUND CONDUCTOR

A. Ground conductor shall be code size UL labeled, Type THWN insulated copper wire, green in color.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Grounding electrodes

1. Concrete encased grounding electrode (Ufer ground)

a. Provide a #3/O AWG minimum bare copper conductor encased along the bottom of concrete foundation, footing or trench which is in direct contact with the earth and where there is no impervious waterproofing membrane between the footing and soil. The electrode shall extend through a horizontal length of 30’ minimum and shall be encased in not less than 2” or more than 5” of concrete separating it from surrounding soil. The electrode shall emerge from the concrete slab through a protective non-metallic sleeve and shall be extended to BGB or as shown on Drawings.

2. Supplementary grounding electrode (ground ring, grid and driven rod)

a. Provide as shown driven ground rod(s). Interconnect ground rod with structural steel and adjacent rods with code size bare copper conductor. Ground rods shall be space no less than 6’-0” on centers from any other electrode or electrodes of another electrical system.

B. Grounding electrode conductor

1. Provide grounding electrode conductors per CEC Table 250-94 or as shown on Drawings, whichever is greater.

C. Equipment Bonding/Grounding

1. Provide a code sized copper ground conductor, whether indicated or noted on the drawings, in each of the following:

a. All power distribution conduits and ducts
b. Distribution feeders
c. Motor and equipment branch circuits
d. Device branch circuits

2. Provide a separate grounding bus at distribution panelboards, loadcenters, switchboards and motor control centers. Connect all metallic enclosed equipment so that with maximum fault current flowing, shall be maintained at not more than 35V above ground.
3. Metallic conduits terminating in concentric, eccentric or oversized knockouts at panelboards, cabinets, gutters, etc. shall have grounding bushings and bonding jumpers installed interconnecting all such conduits.
4. Provide bonding jumpers across expansion and deflection coupling in conduit runs, pipe connections to water meters and metallic cold water dielectric couplings.
5. Provide ground wire in flexible conduit connected at each end via grounding bushing.
6. Provide bonding jumpers across all cable tray joints.
7. Bond each end of metallic conduit longer than 36” in length to grounding conductor using a #6 AWG pigtail.

3.2 FIELD QUALITY CONTROL

A. Contractor using test equipment expressly designed for that purpose shall perform all ground resistance tests in conformance with IEEE guidelines. Contractor shall submit typewritten records of measured resistance values to City for review and approval prior to energizing the system.

B. Obtain and record ground resistance measurements both from electrical equipment ground bus to the ground electrode and from the ground electrode to earth. Furnish and install additional bonding and add grounding electrodes as required to comply with the following resistance limits:

1. Resistance from ground bus to ground electrode and to earth shall not exceed 5 ohms unless otherwise noted.
2. Resistance from the farthest panelboard, loadcenter, switchboard or motor control center ground bus to the ground electrode and to earth shall not exceed 20 ohms maximum.

C. Inspection

1. The City or Inspector prior to encasement, burial or concealment thereto shall review the grounding electrode and connections.

END OF SECTION

SECTION 260533 – RACEWAYS AND BOXES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes

1. Provide all labor, materials and equipment necessary to complete the installation required for the items specified under this Section, including but not limited to electrical conduits; outlet, junction and pull boxes; and related supports.

B. Related sections

1. Where items specified in other Division 26 sections conflict with the requirements of this Section, the most stringent requirement shall govern.

   a. 260526 – Grounding and Bonding for Electrical Systems

2. The requirements of this Section apply to all Division 26 work, as applicable.
3. Consult all other sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.

1.2 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:

1. ANSI –American National Standards Institute

   a. C33.91; Specification for Rigid PVC Conduit
   b. C80.1; Specification Rigid Steel Conduit, Zinc-Coated
   c. C80.3; Specification for Electrical Metallic Tubing, Zinc-Coated
   d. C80.6; Intermediate Metal Conduit (IMC), Zinc-Coated

2. CCR –California Code of Regulations, Title 24

   a. Part 2 -California Building Code (CBC); International Building Code (IBC) with California amendments
   b. Part 3 -California Electrical Code(CEC); NFPA 70 National Electrical Code (NEC) with California amendments

3. NECA –National Electrical Contractors Association

   a. 101, Standard for Installing Steel Conduit (Rigid, IMC, EMT)
   b. 111, Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC) (ANSI)

4. NEMA –National Electrical Manufacturer's Association

a. FB 1; Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable
b. FB 2.10; Selection and Installation Guidelines for Fittings for Use with Non-flexible Electrical Metal Conduit or Tubing (Rigid Metal Conduit, Intermediate Metal Conduit, and Electrical Metallic Tubing)
c. FB 2.20; Selection and Installation Guidelines For Fittings for Use With Flexible Electrical Conduit and Cable
d. OS 1; Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports
e. OS 3; Selection and Installation Guidelines for Electrical Outlet Boxes
f. RN 1; Polyvinyl-Chloride Externally Coated Galvanized Rigid Steel Conduit and Electrical Metallic Tubing
g. TC 2; Electrical Plastic Tubing and Conduit
h. TC 3; PVC Fittings for Use with Rigid PVC Conduit and Tubing
i. TC 14; Reinforced Thermosetting Resin Conduit (RTRC) and Fittings

5. OSHPD Anchorage Pre-approvals

a. OPA-0003; Superstrut Seismic Restraint System
b. OPA-0114; B-Line Seismic Restraints
c. OPA-0120; Unistrut Seismic Bracing System
d. OPA-0242; Power-Strut Seismic Bracing System

6. UL –Underwriter's Laboratories, Inc.

a. 1; Standard for Flexible Metal Conduit
b. 6; Rigid Metal Electrical Conduit
c. 360; Standard for Liquid-Tight Flexible Steel Conduit
d. 514A; Metallic Outlet Boxes, Electrical
e. 514B; Fittings for Conduit and Outlet Boxes
f. 651; Schedule 40 & 80 PVC Conduit
g. 797; Electrical Metallic Tubing
h. 1242; Intermediate Metal Conduit
i. 1684; Reinforced Thermosetting Resin Conduit (RTRC) and Fittings

1.3 SYSTEM DESCRIPTION

A. Furnish, assemble, erect, install, connect and test all electrical conduits and related raceway apparatus required and specified to form a complete installation.

1.4 SUBMITTALS

A. Submit manufacturer's data for materials specified within this Section in accordance to Section 260500.

1.5 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the materials specified herein shall be new and unused, bearing UL labels where applicable.

B. Installation shall conform to the NECA installation guidelines unless otherwise indicated within this Section

PART 2 - PRODUCTS

2.1 MATERIALS

A. Conduits and Fittings

1. Rigid steel conduit (RMC)

   a. Conduit: Standard weight, mild steel pipe, and zinc coated on both inside and outside by a hot dipping or sherardizing process manufactured in accordance with UL 6 and ANSI C80.1 specifications.
   b. Fittings (couplings, elbows, bends, etc.)

      1) Shall be steel or malleable iron.
      2) Coupling and unions shall be threaded type, assembled with anti-corrosion, conductive and anti-seize compound at joints made absolutely tight to exclude water.

   c. Bushings

      1) Insulating bushings: Threaded polypropylene or thermosetting phenolic rated at 150°C minimum.
      2) Insulating grounding bushing: Threaded cast body with insulating throat and steel "lay-in" ground lug.
      3) Insulating metallic bushing: Threaded cast body with plastic insulated throat rated at 150°C minimum.

2. Coated rigid steel conduit (CRMC)

   a. Conduit: Equivalent to RMC with a Polyvinyl chloride (PVC) coated bonded to the galvanized outer surface of the conduit. The bonding between the PVC coating and conduit surface shall be ETL PVC-001 compliant. The coating thickness shall be a minimum of 40mil.
   b. Fittings (couplings, elbows, bends, etc.)

      1) Equivalent to RMC above with bonded coating same as conduit.
      2) The PVC sleeve over fittings shall extend beyond hub or coupling approximately one diameter or 1 1/2" whichever is smaller.

   c. Bushing equivalent to RMC above.

3. Intermediate metallic conduit(IMC)

   a. Conduit: Intermediate weight, mild steel pipe, meeting the same requirements for finish and material as rigid steel conduit manufactured in accordance with UL 1242 and ANSI C80.6 specifications.
   b. Fittings (couplings, elbows, bends, etc.) equivalent to RMC above.
   c. Bushing equivalent to RMC above.

4. Electrical metallic tubing (EMT)

   a. Conduit: Cold rolled steel tubing with zinc coating on outside and protective enamel on inside manufactured in accordance with UL 797 and ANSI C80.3 specifications.
   b. Couplings: Steel or malleable iron with compression type fastener via a nut.

c. Connectors: Steel or malleable iron with compression type fastener via a nut with plastic insulated throat rated at 150°C minimum.

5. Rigid non-metallic conduit (PVC)

a. Conduit: PVC composed Schedule 40, 90°C manufactured in accordance with NEMA TC 2 and UL 651 specifications.
b. Fittings: Molded PVC, slip on solvent welded type in accordance to NEMA TC 3.

6. Reinforced thermosetting resin conduit (RTRC)

a. Conduit: Fiber impregnated with a cured thermosetting resin compound in accordance with NEMA TC 14 and UL1684.
b. Fittings: Molded resin with glass reinforcement manufactured in the same process as the conduit bonded with an epoxy adhesive.

7. Flexible metallic conduit (FMC)

a. Conduit: Continuous, flexible steel spirally wound with zinc coating on both inside and outside in accordance with UL 1.
b. Connectors: Steel or malleable iron with compression type fastener via a nut with plastic insulated throat rated at 150°C minimum.

8. Liquidtight flexible metallic conduit (LFMC)

a. Conduit: PVC coated, continuous, flexible steel spirally wound with zinc coating on both inside and outside in accordance with UL 360.
b. Connectors: Steel or malleable iron with compression type fastener via a nut with plastic insulated throat rated at 150°C minimum.

9. Miscellaneous Fittings and Products

a. Conduit sealing bushings: Steel or cast malleable iron body and pressure clamps with PVC sleeve, neoprene sealing grommets and PVC coated steel pressure rings. Supplied with neoprene sealing rings between body and PVC sleeve.
b. Watertight cable terminators: One piece, compression molded sealing ring with PVC coated steel pressure disks, stainless steel screws and zinc plated cast iron locking collar.
c. Watertight cable/cord connectors: Liquidtight steel or cast malleable iron body with sealing neoprene bushing and stainless steel retaining ring.
d. Expansion fittings: Multi-piece unit of hot dip galvanized malleable iron or steel body and outside pressure bussing design to allow a maximum of 4” movement (2” in either direction). Furnish with external braid tinned copper bonding jumper. UL listed for both wet and dry locations.
e. Expansion/deflection couplings: Multi-piece unit comprised of a neoprene sleeve, internal flexible tinned copper braid attached to bronze end couplings with stainless steel bands. Coupling to provide minimum of 3/4” movement and 30 degrees deflection from normal. UL listed for both wet and dry locations.
f. Conduit bodies: Raintight, malleable iron, hot-dip galvanized body with threaded hubs, stamped steel cover, stainless steel screws and neoprene gasket.
g. Other couplings, connectors and fittings shall be equal in quality, material and construction to items specified herein.

B. Boxes

1. Outlet boxes

   a. Standard: Galvanized one-piece of welded pressed steel type in accordance with NEMA OS 1 and UL 514. Boxes shall not be less than 4" square and at least 1 1/2" deep.
   b. Concrete: Galvanized steel, 4" octagon ring with mounting lug, backplate and adapter ring type in accordance with NEMA OS 1 and UL 514. Depth as required by application.
   c. Masonry: Galvanized steel, 3.75" high gang box in accordance with NEMA OS 1 and UL 514.
   d. Surface cast metal: Cast malleable iron body, surface mounted box with threaded hubs and mounting lugs as required in accordance with NEMA OS 1 and UL 514. Furnish with ground flange, steel cover and neoprene gasket.

2. Pull and junction boxes

   a. Sheet metal boxes: Standard or concrete outlet box wherever possible; otherwise use 16 gauge galvanized sheet metal, NEMA 1 box sized per CEC with machine screwed cover.
   b. Cast metal boxes: Install standard cast malleable iron outlet or device box when possible.
   c. Flush mounted boxes: Install overlapping cover with flush head screws.
   d. In-ground mounted pull holes/boxes: Install pre-cast concrete box, sized per Drawing or CEC with pre-cast or traffic rated locking lid.

3. Floor boxes

   a. Floor boxes shall be adjustable, cast metal body with threaded conduit openings, adjustable rings, brass flange or Lexan ring and cover plate with threaded plug. Include provisions to accommodate surface mounted telephone or receptacle outlet, or flush floor mounted telephone or receptacle outlet where shown on Drawings.

C. Pull line/cord

1. Polypropylene braided line or Let-line #232 or equal of 1/8" diameter with a minimum break strength of 200 pounds.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Thoroughly examine site conditions for acceptance of wire and cable installation to verify conformance with manufacturer and specification tolerances. Do not commence with work until all conditions are made satisfactory.

3.2 PREPARATION

A. Conduit

1. Provide all necessary conduit fittings, connectors, bushings, etc. required to complete conduit installation to meet the CEC and intended application whether noted, shown or specified within.
2. Location of conduit runs shall be planned in advance of the installation and coordinated with other trades.
3. Where practical, install conduits in groups in parallel vertical or horizontal runs that avoid unnecessary offsets.
4. All conduits shall be parallel or at right angles to columns, beams and walls whether exposed or concealed.

5. Conduits shall not be placed closer than 12” to a flue, parallel to hot water, steam line or other heat sources; or 3” when crossing perpendicular to the above said lines when possible.
6. Install exposed conduit as high as practical to maintain adequate headroom. Notify City if headroom will be less than 102”.
7. Do not obstruct spaces required by Code in front of electrical equipment, access doors, etc.
8. The largest trade size conduit in concrete floors and walls shall not exceed 1/3 thickness or be spaced a less than three conduit diameters apart unless permitted by Tulare County. All conduits shall be installed in the center of slab or wall, and never between reinforcing steel and bottom of floor slab.
9. Install additional pull boxes, not shown on Drawings, in sufficient quantities to facilitate pulling of conductors and cables such that total spacing does not exceed 150 feet or 270 degrees, total; and maximum pulling tension will not be exceeded.
10. When installing underground conduits to specified depth; depth shall be taken from finished grade as it will be at project completion. Should finish grade be above existing grade by an amount equal to or greater than specified depth, conduit shall be installed not less than 6” below existing grade.
11. Verify that information concerning finish grade is accurate, for should the underground run be less than the specified depth, Contractor may be required to re-install conduit to meet the required depth.
12. Unless otherwise specified, underground conduits shall be installed with top side not less than 24” below finished grade; this depth applies to all conduits outside of building foundations including those under walks, open corridors or paved areas.
13. Utility company service conduits installation depth shall be as directed by their respective specifications and requirements.

B. Boxes

1. Before locating outlet boxes, check Drawings for type of construction and make sure that there is no conflict with other equipment. Locate outlet boxes as shown and locate so as not to interfere with other Work or equipment.
2. Install all outlet boxes flush within walls, ceiling and floors except where installed within non-finished rooms, cabinetry, attic spaces or as indicated on Drawings.
3. Locate pull boxes and junction boxes within concealed, accessible locations where possible.
4. Do not install outlet boxes back-to-back with same stud space. Where shown back-to-back, offset as required, and fill void with sound dampening material where requested by City.
5. In fire rated walls separate boxes by 24” minimum and with stud member.
6. Adjust position of outlet boxes within masonry wall to accommodate course lines.

3.3 INSTALLATION

A. Conduit

1. Minimum conduit size shall be 1” unless otherwise indicated on Drawings.
2. All conduit work shall be concealed unless otherwise indicated. Exposed conduits shall be permitted within unfinished rooms/spaces to facilitate installation.
3. Install conduit in complete runs prior to installing conductors or cables.
4. Make long radius conduits bends free from kink, indentations or flattened surfaces. Make bends carefully to avoid injury or flattening. Bends 1 1/4” size and larger shall be factory made ells, or be made with a manufactured mechanical bender. Heating of steel conduit to facilitate bending or that damage galvanized coating will not be permitted.
5. Remove burrs and sharp edges at end of conduit with tapered reamer.
6. Protect and cover conduits during construction with metallic bushings and bushing “pennies” to seal exposed openings.

7. Assemble conduit threads with anti-corrosion, conductive, anti-seize compound and tighten securely.
8. Install conduits shall that no traps to collect condensation exist.
9. Fasten conduit securely to boxes with locknuts and bushings to provide good grounding continuity.
10. Install pull cords/line within any spare or unused conduits of sufficient length to facilitate future cable installation.
11. Penetrations

    a. Should it be necessary to notch any framing member, make such notching only at locations and in a manner as approved by City.
    b. Do not chase concrete or masonry to install conduit unless specifically approved by City.
    c. Cutting or holes

        1) Install sleeves for cast-in-place concrete floors and walls. After installing conduit through penetration, seal using dry-pack grouting compound (non-iron bearing, chloride free and non-shrinking) or fire rated assembly if rated floor or wall. Use escutcheon plate on floor underside to contain compound as necessary.
        2) Cut holes with a hole saw for penetrations through non-concrete or non-masonry members.
        3) Provide chrome plated escutcheon plates at all publicly exposed wall, ceiling and floor penetrations.

    d. Sealing

        1) Non-rated penetration openings shall be packed with non-flammable insulating material and sealed with gypsum wallboard taping compound.
        2) Fire rated penetration shall be sealed using a UL classified fire stop assembly suitable to maintain the equivalent fire rating prior to the penetration.
        3) Use escutcheon plates to hold sealing or fire rated compound as necessary.

    e. Waterproofing

        1) Make penetrations through any damp-proofed/waterproofed surfaces within damp/wet locations as such as to maintain integrity of surface.
        2) Install specified watertight conduit entrance seals at all below grade wall and floor penetrations.
        3) At roof penetrations furnish roof flashing, counter flashing and pitch-pockets compatible to roof assembly.
        4) Where possible conduits that horizontally penetrate a waterproof membrane shall fall away from and below the penetration's exterior side.
        5) Make penetrations through floors watertight with mastic, even when concealed within walls or furred spaces.

12. Supports

    a. Conduits shall be support and braced per OSHPD pre-approved anchorage systems when those methods are implemented and installed.
    b. Sizes of rods and cross channels shall be capable of supporting 4 times and 5 times actual load, respectively. Anchorage shall support the combined weight of conduit, hanger and conductors.
    c. Support individual horizontal conduit 1 1/2" and smaller by means of 2 hole straps or individual hangers.

d. Galvanized iron hanger rods sizes 1/4" diameter and larger with spring steel fasteners, clips or clamps specifically design for that purpose for 1 1/2" conduits and larger.
e. Support multi-parallel horizontal conduits runs with trapeze type hangers consisting of 2 or more steel hanger rods, preformed cross channels, 'J' bolts, clamps, etc.
f. Support conduit to wood structures by means of bolts or lag screws in shear, to concrete by means of insert or expansion bolts and to brickwork by means of expansion bolts.
g. Support multi-parallel vertical conduits runs with galvanized Unistrut, Power-Strut or approved equal type supports anchored to wall. Where multi-floored conduits pass through floors, install riser clamps at each floor.
h. Maximum conduit support spacing shall be in accordance with NECA Standard of Installation:

1) Horizontal runs:

a) 3/4" and smaller at 60" on centers, unless building construction prohibits otherwise, then 84" on centers.
b) 1" and larger at 72" on centers, unless building construction prohibits otherwise or any other condition, then 120" on centers.

2) Vertical runs:

a) 3/4" and smaller @ 84" on centers.
b) 1" and 1 1/4" @ 96" on centers.
c) 1 1/2" and larger @ 120" on centers.
d) Any vertical condition such as shaftways and concealed locations for any sized conduit, 120" on centers.

i. Anchorage for RMC/IMC supports unless otherwise specified:

1) < 1" IMC/RMC = #10 bolt/screw.
2) 1" IMC/RMC = 1/4" bolt/screw.
3) 1 1/2" and 2" IMC/RMC = 3/8" bolt/screw.
4) 3" IMC/RMC, 4" EMT = 1/2" bolt/screw.
5) > 3"IMC/RMC = 5/8" bolt/screw.

j. Anchorage for EMT supports unless otherwise specified:

1) < 1 1/2" EMT = #10 bolt/screw.
2) 1 1/2" EMT = 1/4" bolt/screw.
3) 2, 2 1/2" and 3" EMT = 3/8" bolt/screw.
4) 4" EMT = 1/2" bolt/screw.
5) > 4"EMT = 5/8" bolt/screw.

B. Boxes

1. Install boxes as shown on Drawings and as required for splices, taps, wire pulling, equipment connections and Code compliance.
2. Install additional pull boxes, not shown on Drawings, in sufficient quantities to facilitate pulling of conductors and cables such that total spacing does not exceed 150 feet or 270 degrees, total; and maximum pulling tension will not be exceeded.
3. Install plaster rings on all outlet boxes in stud walls or in furred, suspended or exposed ceilings. Covers shall be of a depth suited for installation.
4. Provide gasketed cast metal cover plates where boxes are exposed in damp or wet locations

5. Install access door for boxes installed within concealed locations without access.
6. Install approved factory made knockout seal where knockouts are not present.
7. In general, locate outlets as shown or specific and complies with Americans with Disabilities Act:

    a. Convenience outlets: +18”AFF or +6” above counter or splash.
    b. Local switches: +48”AFF or +6” above counter or splash.
    c. Telecommunication outlets: +18”AFF or +48”AFF for wall telephone or intercom device.
    d. Verify all mounting heights with Drawings, and where heights are not suited for construction or finish consult City.

8. Use conduit bodies to facilitate pulling of conductor or cables or change conduit direction. Do not splice within conduit bodies.
9. Enclose pull box with additional rated gypsum board as necessary to maintain wall’s original fire rating.
10. Install galvanized steel coverplates on all open boxes within dry listed areas.
11. Install in-ground pull holes/boxes flush to grade finish at finished areas or 1” above finished landscaped grade. Seal all conduits terminating in pull hole/box watertight. Install and grout around bell ends where shown. Cover and lids shall be removable without damage to adjacent finish surfaces.
12. Support

    a. Accurately place boxes for finish, independently and securely supported by adequate blocking or manufacturer channel type heavy-duty box hangers for stud walls. Do not use nails to support boxes.
    b. Support boxes independent of conduit system.
    c. Mount boxes installed within ceilings to 16 gauge metal channel bars attached to main runners or joists.
    d. Support boxes within suspended acoustical tile ceilings directly from structure above when light fixture are to be installed from box.
    e. Use auxiliary plates, bar or clips and grouted in place for masonry, block or pour-in-place concrete construction.

3.4 APPLICATION

A. Conduit

1. RMC/IMC suitable for all damp, dry and wet locations except when in contact with earth. IMC not suitable for hazardous locations as stated within CEC.
2. CRMC suitable for damp or wet locations, concealed within concrete or in contact with earth.
3. EMT suitable for exposed or concealed dry, interior locations.
4. PVC/RTRC suitable for beneath ground floor slab, except when penetrating, and direct earth burial. Do not run exposed within concrete walls or in floor slab unless indicated on Drawings or per City’s permission.
5. FMC suitable for dry locations only for connections to motors, transformers, vibrating equipment/machinery, controllers, valves, switches and light fixtures in less than 6 foot lengths.
6. LFMC application same as FMC above but for damp or wet locations.

B. Termination and joints

1. Use raceway fittings compatible with associated raceway and suitable for the location.
2. Raceways shall be joined using specified couplings or transitions where dissimilar raceway systems are joined.

3. Conduits shall be securely fastened to cabinets, boxes and gutters using (2) two locknuts and insulating bushing or specified insulated connector. Where joints cannot be made tight and terminations are subject to vibration, use bonding jumpers, bonding bushings or wedges to provide electrical continuity of the raceway system. Use insulating bushings to protect conductors where subjected to vibration or dampness. Install grounding bushings or bonding jumpers on all conduits terminating at concentric or eccentric knockouts.
4. Terminations exposed at weatherproof enclosures and cast outlet boxes shall be made watertight using specified connectors and hubs.
5. Stub freestanding equipment conduits through concrete floors for connections with top of coupling set flush with finished floor. Install plugs to protect threads and entrance of debris.
6. Install specified cable sealing bushings on all conduits originating outside the building walls and terminating within interior switchboard, panel, cabinet or gutters. Install cable sealing bushings or raceway seal for conduit terminations in all grade level or below grade exterior pull, junction or outlet boxes.
7. Where conduits enter building from below grade inject into filled raceways pre-formulated rigid 2 lbs. density polyurethane foam suitable for sealing against water, moisture, insects and rodents.
8. Install expansion fitting or expansion/deflection couplings per manufacturer's recommendations where:
9. Any conduit that crosses a building structure expansion joint; secure conduit on both sides to building structure and install expansion fitting at joint.
10. Any conduit that crosses a concrete expansion joint; install expansion/deflection at joint.
11. Any conduit greater than 1-1/4" is routed along roof top in runs greater than 100 feet; install expansion fittings every 100 feet.
12. City may allow FMC or LFMC in lieu of expansion fitting or expansion/deflection couplings on conduits 2" and smaller within accessible locations upon further review and written consent.

C. Boxes

1. Standard type suitable for all flush installations and all dry concealed locations.
2. Concrete type suitable for all flush concrete installations.
3. Masonry type suitable for all flush concrete and block installations.
4. Surface cast metal type suitable for all exposed damp and wet surface mounted locations, and dry surface mounted locations less than 96" from finished floor.

END OF SECTION

SECTION 262200 – DISTRIBUTION DRY-TYPE TRANSFORMERS (600VAC AND LESS)

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes

1. Provide all labor, materials and equipment necessary to complete the installation required for the items specified under this Section, including but not limited to transformers

B. Related sections

1. Where items specified in other Division 26 sections conflict with the requirements of this Section, the most stringent requirement shall govern.

   a. 26 05 26 – Grounding and Bonding for Electrical Systems

2. The requirements of this Section apply to all Division 26 work, as applicable.

3. Consult all other sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:

1. ANSI - American National Standards Institute

   a. C57; Distribution and Power Transformers, Guide for Loading Dry-Type

2. CCR –California Code of Regulations, Title 24

   a. Part 3 -California Electrical Code(CEC); NFPA 70 National Electrical Code (NEC) with California amendments

3. NECA –National Electrical Contractors Association

   a. 409; Recommended Practices for Installing and Maintaining Dry-Type Transformers

4. NEMA –National Electrical Manufacturer's Association

   a. ST20; Dry Type Transformers for General Applications

   b. TP1; Guide for Determining Energy Efficiency for Distribution Transformers

   c. TP2; Standard Test Method for Measuring the Energy Consumption of Distribution Transformers

   d. TP3; Standard for the Labeling of Distribution Transformer Efficiency

   e. TR1; Transformers, Regulators, and Reactors

5. UL -Underwriters Laboratories, Inc.

   a. 1561; Dry-Type General Purpose and Power Transformers

1.03 SUBMITTALS

A. Submit manufacturer's data for materials specified within this Section in accordance to Section 26 05 00.

B. Include outline and support point dimensions of enclosures and accessories; unit weights; voltage; kVA rating; impedance rating and characteristics; loss and efficiency data at 25%, 50%, 75% and 100% rated load; sound level, tap configurations; insulation system type; and rated temperature raised.

1.04 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the materials specified herein shall be new and unused, bearing UL labels where applicable.

B. Installation shall conform to NECA 409-2002, Recommended Practice for Installing and Maintaining Dry-Type Transformers.

1.05 DELIVERY, STORAGE AND HANDLING

A. Store in a warm, dry location with uniform temperature. Protect unit if handled in inclement weather (i.e., rain, sleet, snow, etc.). Cover ventilating opening to keep out dust and foreign materials prior to startup.

B. Handle transformer using only lifting eyes and brackets provided for that purpose; see manufacturer's installation instructions.

PART 2 - PRODUCTS

2.01 GENERAL PURPOSE

A. Manufacturers

1. Square D, Cutler-Hammer or approved equal.

B. Rating Information

1. All insulating materials are to exceed NEMA ST20 standards and be rated for 220°C UL component recognized insulation system.

2. Capable of meeting daily overload requirements of ANSI C57.96.

3. Transformers 15kVA and larger shall be 150°C temperature rise above 40°C ambient. Transformers 25kVA and larger shall have a minimum of 4 - 2.5% full capacity primary taps.

4. The maximum temperature of the top of the enclosure shall not exceed 50°C rise above a 40°C ambient.

5. Sound levels shall be warranted by the manufacturer not to exceed NEMA ST20 requirements.

C. Construction

1. Transformer coils shall be of the continuous wound construction and shall be impregnated with nonhygroscopic, thermosetting varnish.

2. All cores to be constructed with low hysteresis and eddy current losses. Magnetic flux densities are to be kept well below the saturation point to prevent core overheating. Cores for transformers greater than 500kVA shall be clamped utilizing insulated bolts through the core laminations to ensure proper pressure throughout the length of the core. The completed core and coil shall be bolted to the base of the enclosure but isolated by means of rubber vibration-absorbing mounts. There shall be no metal-to-metal contact between the core and coil and the enclosure except for a flexible safety ground strap. Sound isolation systems requiring the complete removal of all fastening devices will not be acceptable.
3. The core of the transformer shall be visibly grounded to the enclosure by means of a flexible grounding conductor sized in accordance with applicable UL and NEC standards.
4. The transformer enclosures shall be ventilated and be fabricated of heavy gauge, sheet steel construction. The entire enclosure shall be finished utilizing a continuous process consisting of degreasing, cleaning and phosphatizing, followed by electrostatic deposition of polymer polyester powder coating and baking cycle to provide uniform coating of all edges and surfaces. The coating shall be UL recognized for outdoor use.
5. Manufacturer shall provide the optional accessories where required and noted on the Drawings:
   a. Weathershields for all models.
   b. Wall mounting brackets for 75kVA units and smaller.
   c. Ceiling mounting brackets for 150kVA units and smaller.

2.02 ENERGY EFFICIENT, GENERAL PURPOSE

A. Manufacturers
   1. Square D, Cutler-Hammer or approved equal.

B. Rating Information
   1. Same as General Purpose above except:
      a. Transformers shall be low loss type with minimum efficiencies per NEMA TP1 when operated at 35% of full load capacity. Efficiency shall be tested in accord with NEMA TP2.

C. Construction
   1. Same as General Purpose above.

2.03 PREMIUM GRADE

A. Manufacturers
   1. Square D, Cutler-Hammer or approved equal.

B. Rating Information
   1. Same as General Purpose above except:

a. Transformers 10kVA and larger shall have the following temperature rise above 40°C ambient capable of maintaining a continuous load without exceeding a 150°C rise in a 40°C ambient:

1) 115°C rise with 115% rated load.

2) 80°C rise with 130% rated load.

b. The maximum temperature of the top of the enclosure shall not exceed 35°C rise above a 40°C ambient.

C. Construction

1. Same as General Purpose above.

2.04 NON-LINEAR

A. Manufacturers

1. Square D, Cutler-Hammer or approved equal.

B. Rating Information

1. Same as General Purpose above except:

a. Neither the primary nor the secondary temperature shall exceed 220°C at any point in the coils while carrying their full rating of non-sinusoidal load. Transformers are to be UL listed and as defined as the sum of fundamental and harmonic $I_h(pu)^2h^2$ per UL 1561. Transformers evaluated by the UL K-Factor evaluation shall be listed for either 115°C or 80°C average temperature rise as noted on the Drawings. K-Factor listed transformers rated at 150°C rise shall not be acceptable.

b. K-Factor rated transformers shall have an impedance range of 3% to 5%, and shall have a minimum reactance of 2% in order to help reduce neutral current when supplying loads with large amounts of third harmonic current.

C. Construction

1. Same as General Purpose above except:

a. Transformers shall be supplied with quality, full width electrostatic shields resulting in a maximum effective coupling capacitance between primary and secondary of 33 picofarads. With transformers connected under normal, loaded operating conditions, the attenuation of line noise and transients shall equal or exceed the following limits:

1) Common Mode: 0 to 1.5kHz - 120dB; 1.5kHz to 10kHz - 90dB; 10kHz to 100kHz - 65dB; 100kHz to 1MHz - 40dB

2) Transverse Mode: 1.5kHz to 10kHz - 52dB; 10kHz to 100kHz - 30dB; 100kHz to 1MHz - 30dB

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine transformer to provide adequate clearances for installation.

B. Check that concrete pads are level and free of irregularities for floor mounted installations.

C. Begin work only after unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Read and follow manufacturer's bulletin included with unit prior to installation.

B. Installation shall conform to NECA 409 where not specified under this Division.

C. Transformers not specifically designed for wall mounting, shall be spaced a minimum of 6" from adjacent walls, ceiling and all other equipment.

D. Mount to resist seismic forces and brace to 0.56g. Submit calculations and mounting details for review and approval.

E. Terminations

1. Provide all transformers with lugs for both primary and secondary conductors shown on Drawings. Connect lug to termination point with appropriate size bolt, nut and washers.

2. Use flexible conduit indoors in dry locations or liquid-tight flexible conduit in damp/wet locations for primary and secondary connections to transformer case when less than 48" in length. Connection shall be to enclosure's side panels only unless fed directly below from ground mounted installation or as shown on Drawings.

F. Grounding

1. Provide a dual rated four-barrel solderless grounding lug with a 5/8"-11 threaded hole. Drill transformer enclosure with 11/16" bit and attach lug to enclosure using a torque bolt and T&B Dragon Tooth transition washer with the following connections:

a. Primary feeder ground

b. Secondary feeder ground

c. Grounding electrode per CEC/NEC 250-30.

d. Main bond jumper to neutral (when present)

3.03 FIELD QUALITY CONTROL

A. Check for damage and tight connections prior to energizing transformer.

B. Measure primary and secondary voltages, and make appropriate tap adjustments to within 2% of rated voltage

3.04 CLEANING

A. Touch up scratched or marred surfaces to match original finish.

END OF SECTION

SECTION 262413– SWITCHBOARDS

PART 1 -– GENERAL

1.1 SUMMARY

A. Section includes

1. Provide all labor, materials and equipment necessary to complete the installation required for the items specified under this Section, including but not limited to switchboards and large distribution panels.

B. Related sections

1. Where items specified in other Division 26 sections conflict with the requirements of this Section, the most stringent requirement shall govern.

   a. 260526 – Grounding and Bonding for Electrical Systems
   b. 262811 – Overcurrent Protection Devices

2. The requirements of this Section apply to all Division 26 work, as applicable.

3. Consult all other sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.

1.2 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:

1. ANSI - American National Standards Institute

   a. C12.16; Solid State Electricity Metering
   b. C57.13; Instrument Transformers

2. CCR –California Code of Regulations, Title 24

   a. Part 3 -California Electrical Code(CEC); NFPA 70 National Electrical Code (NEC) with California amendments

3. Federal Specification

   a. W-C-37; Circuit Breakers, Molded Case, Branch Circuit And Service

4. NECA –National Electrical Contractors Association

   a. 400, Recommended Practice for Installing and Maintaining Switchboards

5. NEMA –National Electrical Manufacturer's Association

   a. AB 1; Molded Case Circuit Breakers and Molded Case Switches
   b. KS; Fused and Non-fused Switches
   c. PB 2; Deadfront Distribution Switchboards, File E8681
   d. PB 2.1; Proper Handling, Installation, Operation and Maintenance of Deadfront Switchboards Rated 600 Volts or Less
   e. PB 2.2; Application Guide for Ground Fault Protective Devices for Equipment

6. UL -Underwriters Laboratories, Inc.

   a. UL 50; Cabinets and Boxes
   b. UL 98; Enclosed and Dead Front Switches

c. UL 489; Molded Case Circuit Breakers
d. UL 891; Dead-Front Switchboards
e. UL 943; Ground Fault Circuit Interrupters
f. UL 977; Fused Power Circuit Devices

1.3 SUBMITTALS

A. Submit manufacturer's data for materials specified within this Section in accordance to Section 16050.

B. Shop Drawings shall indicate front and side enclosure elevations with overall dimensions shown; conduit entrance locations and requirements; nameplate legends; one-line diagrams; equipment schedule; and switchboard instrument details.

1.4 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the materials specified herein shall be new and unused, bearing UL labels where applicable.

B. The manufacturing facility shall be registered by Underwriters Laboratories Inc. to the International Organization for Standardization ISO 9002 Series Standards for quality.

C. Installation shall conform to NECA 400-1998, Recommended Practice for Installing and Maintaining Switchboards unless otherwise specified.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect, and handle products in conformance with manufacturer's recommended practices as outlined in applicable Installation and Maintenance Manuals.

B. Each switchboard section shall be delivered in individual shipping splits for ease of handling. They shall be individually wrapped for protection and mounted on shipping skids.

C. Store in a clean, dry space. Maintain factory protection and/or provide an additional heavy canvas or heavy plastic cover to protect structure from dirt, water, construction debris, and traffic. Where applicable, provide adequate heating within enclosures to prevent condensation.

D. Handle in accordance with NEMA PB 2.1 and manufacturer's written instructions. Lift only by lifting means provided for this express purpose. Handle carefully to avoid damage to switchboard internal components, enclosure, and finish.

PART 2 -– PRODUCTS

2.1 MANUFACTURERS

A. Square D, Cutler-Hammer, General Electric, or approved equal.

2.2 MATERIAL

A. General

1. Utility Metering Compartment: The utility current transformer compartment shall be connected for hot sequence metering. The compartment shall comply with EUSERC and/or the local utility company specifications.
2. Switchboards shall be rated with a minimum short circuit current rating at listed voltage as shown on Drawings.
3. All unused spaces provided, unless otherwise specified, shall be fully bussed and equipped for future devices, including all appropriate connectors and mounting hardware.
4. Enclosure shall be of NEMA type shown on Drawings.
5. Sections shall be aligned front and rear.
6. The switchboard(s) shall be of deadfront construction.
7. The switchboard frame shall be of formed steel rigidly bolted together to support all cover plates, bussing and component devices during shipment and installation.
8. Each switchboard section shall have an open bottom and an individually removable top plate for installation and termination of conduit.
9. The switchboard enclosure shall be painted on all exterior surfaces. The paint finish shall be a medium gray, ANSI #49, applied by the electro-deposition process over an iron phosphate pre-treatment.
10. All front covers shall be screw removable with a single tool and all doors shall be hinged with removable hinge pins.
11. Top and bottom conduit areas shall be clearly indicated on shop drawings.
12. Provide 1” high by 3” wide engraved laminated nameplates for each device. Furnish black letters on a white background for all voltages.
13. Bus composition shall be plated copper. Plating shall be applied continuously to all bus work. The switchboard bussing shall be of sufficient cross-sectional area to meet UL 891 temperature rise requirements. The phase and neutral through-bus shall have an ampacity as shown in the plans. For 4-wire systems, the neutral shall be of equivalent ampacity as the phase bus bar. Tapered bus is not acceptable. Full provisions for the addition of future sections shall be provided. Bussing shall include all necessary hardware to accommodate splicing for future additions.
14. Bus connections shall be bolted with Grade 5 bolts and conical spring washers.
15. Ground Bus shall be sized per CEC/NEC and UL 891 Tables 25.1 and 25.2 and shall extend the entire length of the switchboard. Provisions for the addition of future sections shall be provided.
16. Square-D I-Line or equivalent distribution bussing with the following characteristics where so noted on Drawings.
    a. Circuit breaker(s) shall be group mounted plug-on with mechanical restraint on a common pan or rail assembly, facilitating ease of installation of future devices.
    b. The interior shall have three bus bars stacked and aligned vertically with glass reinforced polyester insulators laminated between phases. The molded polyester insulators shall support and provide phase isolation to the entire length of bus., providing side-by-side mounting of breakers.
    c. Circuit breaker(s) equipped with line terminal jaws shall not require additional external mounting hardware. Circuit breaker(s) shall be held in mounted position by a self-contained bracket secured to the mounting pan by fasteners. Circuit breaker(s) of different frame sizes shall be capable of being mounted across from each other.
    d. Line-side circuit breaker connections are to be jaw type, whereby clamping forces are increased under faulted conditions.
    e. All unused spaces provided, unless otherwise specified, shall be fully equipped for future devices, including all appropriate connectors and mounting hardware.

B. Incoming main devices shall of type and accessories as shown on Drawings.

1. Circuit Breakers
    a. Circuit breaker shall be of type, rating and poles shown on Drawings per Section 16490 – Overcurrent Protection Devices.

2. Fusible Switches
   a. Single main group mounted through 800 A.
   b. Fusible main switch shall be group mounted plug-on with mechanical restraint. No additional hardware shall be required to mount the fusible switch into the switchboard.
   c. Switch shall have dual cover interlocks designed to prevent the opening of the cover when the switch is ON. The cover interlock shall prevent the switch from being turned ON with the cover open. Interlock may be manually overridden for testing purposes. Switch cover shall include a means by which the cover can be padlocked in the closed position. The operating handle shall feature positive lock-off means by providing provisions for (3) 0.375” padlocks.
   d. Load side fusible switch connections shall be jaw type.
3. Incoming Lug Only (Distribution only, non-service entrance)
   a. Incoming conductors shall terminate at lug landing pads rated per Drawings.
   b. All lugs shall be UL Listed to accept solid and/or stranded copper conductors only. Lugs shall be suitable for 90° C rated wire, sized according to the 75° C temperature rating in the NEC.
   c. Provide compression type lugs to accommodate the conductor shown on the associated drawings.

C. Distribution section devices shall be of type and accessories as shown on Drawings.
   1. Group mounted or individually mounted as shown on Drawings.
   2. All circuit breakers shall be installed in a twin mount configuration where allowed by the manufacturer with prepared space unless otherwise noted.
   3. All distribution circuit breakers shall be thermal-magnetic molded case, unless otherwise noted on Drawings.
   4. Circuit breaker shall be of type, rating and poles shown on Drawings per Section 16490 – Overcurrent Protection Devices.

PART 3 -– EXECUTION

3.1 EXAMINATION

A. Examine switchboard to provide adequate clearances for installation.

B. Check that concrete pads are level and free of irregularities.

C. Begin work only after unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Install switchboard in location shown on Drawings, in accordance with manufacturer’s written instructions and NEMA PB 2.1. Anchor to resist seismic forces as inidicated on Drawings and in accordance with OSHPD’s anchorage requirements. Provide all testing and inspections requirements by inspecting authority.

B. Installation shall conform to NECA 400 where not specified under this Division.

C. Tighten accessible bus connection and mechanical fasteners after placing switchboard.

3.3 FIELD QUALITY CONTROL

A. Obtain the services of an independent testing company who shall provide quality control and adjustments as well as tests.

B. Inspect complete installation for physical damage, proper alignment, anchorage and grounding prior to energizing.

C. Measure the insulation resistance of each bus section phase-to-phase and phase-to-ground for one minute each at 1000Vdc; acceptable insulation resistance is 1 megaohms. Also, refer to manufacturer's specifications for specific testing procedures and values.

D. Check tightness of accessible bolted bus joints using a calibrated torque wrench per manufacturer's specifications.

E. Physically test key interlock systems to check for proper functionality.

F. Test ground fault systems by push-to-test button.

G. Check and set where required all protective device settings in accordance with approved coordination study settings and conduct ground fault acceptance tests.

3.4 ADJUSTING

A. Adjust all operating mechanisms for free mechanical movement per manufacturer's specifications.

B. Tighten bolted bus connections in accordance with manufacturer's instructions.

C. Adjust circuit breaker trip and time delay settings to values indicated by City.

D. Main circuit breaker ground fault setting shall be per CEC/NEC 230-95(a).

3.5 CLEANING

A. Touch up scratched or marred surfaces to match original finish.

END OF SECTION

SECTION 262416 – PANELBOARDS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes

1. Provide all labor, materials and equipment necessary to complete the installation required for the items specified under this Section, including but not limited to panelboards.

B. Related sections

1. Where items specified in other Division 26 sections conflict with the requirements of this Section, the most stringent requirement shall govern.

   a. 26 05 26 – Grounding and Bonding for Electrical Systems

   b. 26 28 11 – Overcurrent Protection Devices

2. The requirements of this Section apply to all Division 26 work, as applicable.

3. Consult all other sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:

1. CCR –California Code of Regulations, Title 24

   a. Part 3 -California Electrical Code(CEC); NFPA 70 National Electrical Code (NEC) with California amendments

2. Federal Specification

   a. W-C-375; Circuit Breakers, Molded Case, Branch Circuit and Service

3. NECA –National Electrical Contractors Association

   a. 407, Recommended Practice for Installing and Maintaining Panelboards

4. NEMA –National Electrical Manufacturer's Association

   a. AB 1; Molded Case Circuit Breakers

   b. PB 1; Panelboards

   c. PB 1.1; Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less

5. UL -Underwriters Laboratories, Inc.

   a. 50; Cabinets and Boxes

   b. 67; Panelboards

c. 98; Enclosed and Dead Front Switches

d. 489; Molded-Case Circuit Breakers and Circuit Breaker Enclosures

e. 891; Dead-Front Switchboards

f. 943; Ground Fault Circuit Interrupters

g. 977; Fused Power Circuit Devices50; Enclosures for Electrical Equipment

1.03 SUBMITTALS

A. Submit manufacturer's data for materials specified within this Section in accordance to Section 26 05 00.

B. Submittal shall show the following information: circuit breaker numbering, circuit breaker type and short circuit rating, provisions for future circuit breakers, bussing, including neutral and ground, ratings and enclosure dimensions and trims.

1.04 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the materials specified herein shall be new and unused, bearing UL labels where applicable.

1.05 DELIVERY, STORAGE AND HANDLING

A. Handle carefully to avoid damage to internal components, enclosure and finish.

B. Store in a clean, dry environment. Maintain factory packaging and, if required, provide an additional cover to protect enclosure in harsh environments.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Square D, Cutler-Hammer or approved equal.

2.02 MATERIALS

A. Panelboards

1. Interior

a. Shall be factory-assembled with voltage, ampacity, and short circuit rating as shown in Drawings.

b. Provide 1 continuous copper bus bar per phase. Each bus bar shall have sequentially phase branch circuit connectors suitable for plug-on or bolt-on branch circuit breakers. The bussing shall be fully rated. Panelboard bus current rating shall be determined by heat-rise tests conducted in accordance with UL 67. Panelboards shall be suitable for use as Service Equipment when application requirements comply with UL 67 and CEC/NEC 230.F and 230.G.

c. All current-carrying parts shall be insulated from ground and phase-to-phase by high dielectric strength material.

d. Interior trim shall be of dead-front construction to shield user from energized parts. Dead-front trims shall have pre-formed twist-out covering unused mounting spaces.

e. Nameplates shall contain system information and catalog number or factory order number. Interior wiring diagram, neutral wiring diagram, UL Listed label and short circuit current rating shall be displayed on the interior.

f. Main and sub-feed circuit breakers shall be vertical mounted. Interior leveling provisions shall be provided for flush mounted applications.

2. Main Circuit Breaker

a. Circuit breaker shall be of type, rating and poles shown on Drawings per Section 26 28 11 – Overcurrent Protection Devices.

3. Branch Circuit Breakers

a. Circuit breakers shall be of type, rating and poles shown on Drawings per Section 26 28 11 – Overcurrent Protection Devices.

4. Enclosures

a. Type NEMA 1 Boxes

1) Boxes shall be galvanized steel constructed in accordance with UL 50 requirements. Galvanealed steel will not be acceptable.

2) Boxes shall have removable endwalls with knockouts located on one end. Boxes shall have welded interior mounting studs. Interior mounting brackets are not required.

3) Box width shall be 20 in wide.

b. Type NEMA 1 Fronts

1) Front shall meet strength and rigidity requirements per UL 50 standards. Front shall have ANSI 49 gray enamel electrodeposited over cleaned phosphatized steel.

2) Fronts shall be hinged 1-piece with door. Mounting shall be as indicated in Drawings.

3) Panelboards rated 225 amperes and below shall flat fronts with concealed door hinges and trim screws. Front shall not be removable with the door locked. Panelboards rated above 225 amperes shall have fronts with trim clamps and concealed door hinges. Front doors shall have rounded corners and edges shall be free of burrs.

4) Front shall have cylindrical tumbler type lock with catch and spring-loaded stainless steel door pull. All lock assemblies shall be keyed alike. Two (2) keys shall be provided with each lock. A clear plastic directory cardholder shall be mounted on the inside of door.

c. Type NEMA 3R, 5, and 12

1) Enclosures shall be constructed in accordance with UL 50 requirements. Enclosures shall be painted with ANSI 49 gray enamel electrodeposited over cleaned phosphatized steel.
2) All doors shall be gasketed and equipped with a tumbler type vault lock. All lock assemblies shall be keyed alike. 2 keys shall be provided with each lock. A clear plastic directory cardholder shall be mounted on the inside of door.
3) Maximum enclosure dimensions shall not exceed 20 in wide and 6.5 in deep.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's written instructions and NEMA PB 1.1.

B. Installation shall conform to NECA 407 where not specified under this Division.

C. Anchor panelboards to structural members and as shown on Drawings. Provide additional support as required. Anchor freestanding distribution panels to concrete pad.

D. Mount panelboards level and plumb.

E. Install flush mounted panel backbox front edges flush with finished wall. Where flush panel backbox is deeper than wall depth, install closing trim of wood or metal to provide a finished trim.

F. Where panelboard is flush in wall, provide one ¾" conduit stub into accessible ceiling above for every 5 spare circuit breaker or available space.

G. After installation, make all feeder connections to circuit breaker load side lugs and incoming secondary feeders.

3.02 FIELD QUALITY CONTROL

A. Inspect complete installation prior to energizing for physical damage, proper alignment, anchorage and grounding.

B. Check tightness of bolted connections and circuit breaker connections using a calibrated torque wrench or torque screwdriver per manufacturer's written specifications.

3.03 ADJUSTING

A. Measure steady state load line currents at each panelboard feeder; rearrange panelboard circuits to balance the phase loads with 20% of each other. Maintain proper phasing for multi-wire branch circuits.

3.04 SCHEDULES

A. Fill out panelboard circuit identification card, typewritten, with list of circuits in use. Identification shall be specific with room designation and other information as necessary. For distribution panels, use engraved laminated phenolic plates showing load served.

END OF SECTION

SECTION 262811 – OVERCURRENT PROTECTION DEVICES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes

1. Provide all labor, materials and equipment necessary to complete the installation required for the items specified under this Section, including but not limited to overcurrent protection devices.

B. Related sections

1. Where items specified in other Division 26 sections conflict with the requirements of this Section, the most stringent requirement shall govern.
2. The requirements of this Section apply to all Division 26 work, as applicable.
3. Consult all other sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:

1. CCR –California Code of Regulations, Title 24

   a. Part 3 -California Electrical Code(CEC); NFPA 70 National Electrical Code (NEC) with California amendments

2. Federal Specification

   a. W-C-375; Circuit Breakers, Molded Case, Branch Circuit And Service

3. NEMA –National Electrical Manufacturer's Association

   a. AB 1; Molded-Case Circuit Breakers, Molded Case Switches, and Circuit-Breaker Enclosures
   b. PB 2.2; Application Guide for Ground Fault Protective Devices for Equipment

4. UL -Underwriters Laboratories, Inc.

   a. 248; Low Voltage Fuses
   b. 468; Wire Connectors
   c. 508E; IEC Type "2" Coordination Short Circuit Tests
   d. 489; Molded-Case Circuit Breakers and Circuit Breaker Enclosures
   e. 943; Standard for Ground-Fault Circuit-Interrupters

1.03 SUBMITTALS

A. Submit manufacturer's data for materials specified within this Section in accordance to Section 260500.

B. Production test of circuit breakers upon request of City.

C. Submittal shall show the following information: circuit breaker numbering, circuit breaker type and short circuit rating, provisions for future circuit breakers, bussing, including neutral and ground, ratings and enclosure dimensions and trims.

1.04 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the materials specified herein shall be new and unused, bearing UL labels where applicable.

B. The manufacturing facility shall be registered by Underwriters Laboratories Inc. to the International Organization for Standardization ISO 9002 Series Standards for quality.

1.05 DELIVERY, STORAGE AND HANDLING

A. Handle carefully to avoid damage to internal components, enclosure and finish.

B. Store in a clean, dry environment. Maintain factory packaging and, if required, provide an additional cover to protect enclosure in harsh environments.

PART 2 - PRODUCTS

2.01 FUSES

A. All power distribution fuses shall be time-delay, high interrupting (200kAIC minimum) and current limiting type, unless otherwise indicated. All fuses shall be of same manufacturer and model.

1. Motor branch circuit fuses (0 – 600A): UL Class RK5 dual element, time delay type shall be size for UL 508E “Type 2” coordination for the motor controller. Coordinate fuse selection with motor starter overload relay heaters as required.
2. General purpose feeder fuses (0 – 600A): UL Class RK1 dual element, time delay type shall be size per Drawings.

B. Control and instrumentation fuses shall of type and rating as recommended by equipment manufacturer, suitable for fuse blocks or holders installation.

2.02 MOLDED CASE CIRCUIT BREAKERS

A. General

1. Circuit breakers shall be constructed using glass reinforced insulating material. Current carrying components shall be completely isolated from the handle and the accessory mounting area.
2. Circuit breakers shall have an over center, trip free, toggle operating mechanism which will provide quick-make, quick-break contact action. The circuit breaker shall have common tripping of all poles.
3. The circuit breaker handle shall reside in a tripped position between ON and OFF to provide local trip indication.
4. The maximum ampere rating and UL, IEC, or other certification standards with applicable voltage systems and corresponding interrupting ratings shall be clearly marked on face of circuit breaker after installation.
5. Circuit breakers shall have an RMS interrupting capacity not less than shown on Drawings, or if not shown shall not be less than:

   a. 25kA for 480V systems
   b. 22kA for 240V (or less) systems

6. Each circuit breaker shall be equipped with a push-to-trip button, located on the face of the circuit breaker to mechanically operate the circuit breaker tripping mechanism for maintenance and testing purposes.
7. Circuit breakers shall be equipped with UL Listed electrical accessories as noted on Drawing. Circuit breaker handle accessories shall provide provisions for locking handle in the ON and OFF position.
8. All circuit breakers shall be UL Listed for reverse connection without restrictive line and load markings and be suitable for mounting in any position.

9. Circuit breakers shall be constructed with factory installed mechanical lugs. All circuit breakers shall be UL Listed to accept field installable/removable mechanical type lugs. Lug body shall be bolted in place; snap in design not acceptable. All lugs shall be UL Listed to accept solid (not larger than #8 AWG) and/or stranded copper and aluminum conductors. Lugs shall be suitable for 90°C rated wire, sized according to the 75°C temperature rating in the CEC.
10. All circuit breakers shall be capable of accepting bus connections.

B. Thermal-Magnetic Circuit Breakers

1. Circuit breakers shall have a permanent trip unit containing individual thermal and magnetic trip elements in each pole.
2. Thermal trip elements shall be factory preset and sealed. Circuit breakers shall be true RMS sensing and thermally responsive to protect circuit conductor(s) in a 40°C ambient temperature.
3. Circuit breaker frame sizes above 100 amperes shall have a single magnetic trip adjustment located on the front of the circuit breaker.
4. Provide equipment ground fault protection where shown on Drawing with the following features.

   a. Ground fault sensing system shall be modified zero sequence sensing type and not require any external power to trip the circuit breaker.
   b. The ground fault sensing system shall be suitable for use on grounded systems. The ground fault sensing system shall be suitable for use on three-phase, three-wire circuits where the system neutral is grounded but not carried through the system or on three-phase, four-wire systems.
   c. Ground fault pickup current setting and time delay shall be field adjustable. A switch shall be provided for setting ground fault pickup point. A means to seal the pickup and delay adjustments shall be provided.
   d. The ground fault sensing system shall include a ground fault memory circuit to sum the time increments of intermittent arcing ground faults above the pickup point.
   e. A means of testing the ground fault system to meet the on-site testing requirements of CEC/NEC 230-95(c) shall be provided.
   f. Local visual ground fault trip indication shall be provided.
   g. The ground fault sensing system shall be provided with Zone Selective Interlocking (ZSI) communication capabilities compatible with other thermal magnetic circuit breakers equipped with ground fault sensing, electronic trip circuit breakers with integral ground fault sensing and external ground fault sensing systems as noted on Drawings.

C. Electronic Trip Circuit Breakers

1. Circuit breaker trip system shall be a microprocessor-based true RMS sensing design with sensing accuracy through the thirteenth (13th) harmonic. Sensor ampere ratings shall be as indicated on Drawings.
2. The integral trip system shall be independent of any external power source and shall contain no less than industrial grade electronic components.
3. The ampere rating of the circuit breaker shall be determined by the combination of an interchangeable rating plug, the sensor size and the long-time pickup adjustment on the circuit breaker. The sensor size, rating plug and adjustment positions shall be clearly marked on the face of the circuit breaker. Circuit breakers shall be UL Listed to carry 80% (or 100% where noted on Drawings) of their ampere rating continuously.
4. The following time/current response adjustments shall be provided. Each adjustment shall have discrete settings and shall be independent of all other adjustments.

   a. Instantaneous Pickup
   b. Long Time Pickup
   c. Long Time Delay
   d. Short Time Pickup
   e. Short Time Delay
   f. Ground Fault Pickup (when specified with ground fault protection)
   g. Ground Fault Delay (when specified with ground fault protection)

5. A means to seal the trip unit adjustments in accordance with CEC/NEC 240-6(b) shall be provided.
6. Local visual trip indication for overload, short circuit and ground fault trip occurrences shall be provided.
7. An ammeter to individually display all phase currents flowing through the circuit breaker shall be provided. All current values shall be displayed in true RMS with 2% accuracy.
8. Long Time Pickup indication to signal when loading approaches or exceeds the adjusted ampere rating of the circuit breaker shall be provided.
9. The trip system shall include a Long Time memory circuit to sum the time increments of intermittent overcurrent conditions above the pickup point. Means shall be provided to reset Long Time memory circuit during primary injection testing.
10. An ammeter to individually display all phase currents flowing through the circuit breaker shall be provided. Indication of inherent ground fault current flowing in the system shall be provided on circuit breakers with integral ground fault protection. All current values shall be displayed in true RMS with 2% accuracy.
11. Circuit breakers shall be equipped with back-up thermal and magnetic trip system.
12. Equipment Ground Fault Protection shall be provided where noted on Drawings.
    a. Circuit breakers shall be provided with integral equipment ground fault protection for grounded systems. The circuit breaker shall be suitable for use on three-phase, three-wire circuits where the system neutral is grounded but not carried through the system or on three-phase, four-wire systems.
    b. A separate neutral current transformer shall be provided for three-phase, four-wire systems.
    c. Ground fault sensing system shall be residual sensing type.
    d. The trip system shall include a ground fault memory circuit to sum the time increments of intermittent ground faults above the pickup point.
    e. A means of testing the ground fault system to meet the on-site testing requirements of CEC/NEC 230-95(c) shall be provided.
    f. Local visual trip indication for a ground fault trip occurrence shall be provided.
    g. The ground fault sensing system shall be provided with Zone Selective Interlocking (ZSI) communication capabilities compatible with other thermal magnetic circuit breakers equipped with ground fault sensing, electronic trip circuit breakers with integral ground fault sensing and external ground fault sensing systems as noted on Drawings.
13. Circuit breaker trip system shall be equipped with an externally accessible test port. Disassembly of the circuit breaker shall not be required for testing. Test set shall be capable of verifying the operation of all trip functions with or without tripping the circuit breaker.

2.03 INSULATED CASE CIRCUIT BREAKERS

A. Circuit breaker trip system shall be a microprocessor-based true RMS sensing design with sensing accuracy through the thirteenth (13th) harmonic. Sensor ampere ratings shall be as indicated on Drawings.

B. The integral trip system shall be independent of any external power source and shall contain no less than industrial grade electronic components.

C. Circuit breakers shall be equipped with back-up thermal and magnetic trip system.

D. Circuit breakers shall have an RMS interrupting capacity not less than shown on Drawings, or if not shown shall not be less than:
    1. 100kA for all frame sizes at 208V
    2. 65kA for all 800A - 2,000A frames at 480V
    3. 100kA for all 3,000A - 4,000A frames at 480V

E. The ampere rating of the circuit breaker shall be determined by the combination of an interchangeable rating plug, the sensor size and the long-time pickup adjustment on the circuit breaker. The sensor size, rating plug and switch adjustments shall be clearly marked on the face of the circuit breaker. Circuit breakers shall be UL Listed to carry 100% of their ampere rating continuously.

F. The following time/current response adjustments shall be provided. Each adjustment shall have discrete settings and shall be independent from all other adjustments.

   a. Instantaneous Pickup
   b. Long Time Pickup
   c. Long Time Delay
   d. Short Time Pickup
   e. Short Time Delay
   f. Ground Fault Pickup (when specified with ground fault protection)
   g. Ground Fault Delay (when specified with ground fault protection)

G. Circuit breakers with adjustable short-time function shall be provided with defeatable instantaneous adjustment and 30 cycle short-time withstand ratings. Short-time withstand ratings shall be specified in RMS symmetrical amperes, as shown on the [drawings] [schedules].

H. A means to seal the rating plug and trip unit adjustments in accordance with CEC/NEC 240-6(b) shall be provided.

I. Local visual trip indication for overload, short circuit and ground fault trip occurrences shall be provided.

J. An ammeter to individually display all phase currents flowing through the circuit breaker shall be provided. [Indication of inherent ground fault current flowing in the system shall be provided on circuit breakers with integral ground fault protection]. All current values shall be displayed in True RMS with 2% accuracy.

K. Long Time Pickup indication to signal when loading approaches or exceeds the adjusted ampere rating of the circuit breaker shall be provided.

L. The trip system shall include a Long Time memory circuit to protect against intermittent overcurrent conditions above the long time pickup point. Means shall be provided to reset Long Time memory circuit during primary injection testing.

M. True two-step stored energy mechanism with five (5) cycle closing time shall be provided. All circuit breakers shall have multiple CHARGE/CLOSE provisions allowing the following sequence: CHARGE, CLOSE, RECHARGE, OPEN/CLOSE/OPEN

N. Local control pushbuttons to OPEN and CLOSE circuit breaker shall be provided. Color coded visual indication of contact position (OPEN or CLOSED) shall be provided on the face of the circuit breaker. Local manual charging following CLOSE operation shall be provided. Color coded visual indication of mechanism CHARGED and DISCHARGED position shall be provided on the face of the circuit breaker. Visual indicator shall indicate CHARGED only when closing springs are completely charged.

O. Each circuit breaker shall be electrically operated to permit remote CHARGE, CLOSE, and OPEN capabilities. Electrically operated circuit breaker shall be equipped with charge contact switch for remote indication of mechanism charge status.

P. An ammeter to individually display all phase currents flowing through the circuit breaker shall be provided. [Indication of inherent ground fault current flowing in the system shall be provided on circuit breakers with integral ground fault protection]. All current values shall be displayed in True RMS with 2% accuracy.

Q. All circuit breakers shall be equipped with electrical accessories as noted on Drawings.

R. Provide the following interlocking capabilities:

1. key interlock for main-tie-main
2. lock off

S. Circuit breaker trip system shall be equipped with an externally accessible test port. Disassembly of the circuit breaker shall not be required for testing. Test set shall be capable of verifying the operation of all trip functions with or without tripping the circuit breaker.

T. Equipment Ground Fault Protection shall be provided where noted on Drawings.

1. Circuit breakers shall be provided with integral equipment ground fault protection for grounded systems. The circuit breaker shall be suitable for use on three-phase, three-wire circuits where the system neutral is grounded but not carried through the system or on three-phase, four-wire systems.
2. A separate neutral current transformer shall be provided for three-phase, four-wire systems.
3. Ground fault sensing system shall be residual sensing type.
4. The trip system shall include a ground fault memory circuit to sum the time increments of intermittent ground faults above the pickup point.
5. A means of testing the ground fault system to meet the on-site testing requirements of CEC/NEC 230-95(c) shall be provided.
6. Local visual trip indication for a ground fault trip occurrence shall be provided.
7. The ground fault sensing system shall be provided with Zone Selective Interlocking (ZSI) communication capabilities compatible with other thermal magnetic circuit breakers equipped with ground fault sensing, electronic trip circuit breakers with integral ground fault sensing and external ground fault sensing systems as noted on Drawings.

2.04 DRAWOUT INSULATED CASE CIRCUIT BREAKERS

A. Main circuit breaker shall meet the same requirements of insulated case circuit breakers and be individually draw out mounted where shown on Drawings.

B. Sturdy draw out rails shall be permanently attached to the sides of the breaker compartment and retract into the compartment when not in use.

C. When fully withdrawn, the circuit breaker shall permit access for inspection and testing. Circuit breaker(s) shall also be removable from the rails completely.

D. When the circuit breaker is in the Connected, Test, or Disconnected positions, or when the circuit breaker is removed from the compartment, the compartment door shall be able to be fully closed and secured.

E. A removable crank shall be supplied for racking the circuit breaker between the Connected, Test, or Disconnected positions.

PART 3 -EXECUTION

3.01 PREPARATION

A. Notify City no later than 10 working days for adjustable circuit breaker settings not shown within Drawings. Submit to City the following information:

1. Panel, switchboard name/ID
2. Circuit breaker identifier (i.e., main circuit breaker, load served, etc.)

3. List of necessary settings (i.e., trip settings, time delays, etc.)

3.02 INSTALLATION

A. Install equipment and their accessories in to manufacturer's instructions, pertinent Codes, and with recognized industry practices to insure device operates properly.

B. Tighten electrical connectors and terminals in accordance to manufacturer's requirements. Where the manufacturer does not have published torque tightening values, comply with the requirements of UL 468.

3.03 FIELD QUALITY CONTROL

A. Check tightness of circuit breaker connections using a calibrated torque wrench or torque screwdriver per manufacturer's written specifications.

B. Obtain the services of an independent testing company who shall provide quality control and adjustments as well as tests for

1. Check each circuit breaker above 100A on a 225A frame for long-time and short-time delay pickup and instantaneous pickup.
   a. Instantaneous pickup current shall be determined by 4 cycles or less.
   b. Perform timing test with 300% of breaker trip unit rated current.
   c. Adjust unit if required, so that the tripping characteristics are within the limits of the published time-current characteristic curves for that particular trip unit.
2. Test and calibrate ground fault protection trip and pickup time on 225A frame breakers and larger.

C. Physically test key interlock systems to check for proper functionality.

D. Check and set where required all protective device settings in accordance with approved coordination study settings and conduct ground fault acceptance tests.

3.04 ADJUSTING

A. Adjust all operating mechanisms for free mechanical movement per manufacturer's specifications.

B. Adjust circuit breaker trip and time delay settings to values indicated as instructed by City.

1. Check each circuit breaker above 100A, long-time and short-time delay pickup and instantaneous pickup. Instantaneous pickup current shall be determined by 4 cycles or less. Perform timing test with 300% of breaker trip unit rated current. Adjust unit if required, so that the tripping characteristics are within the limits of the published time-current characteristic curves for that particular trip unit.
2. Main circuit breaker ground fault setting shall be per CEC/NEC 230-95(a) or as directed by City.

3.05 PROTECTION

A. When directed by City provide physical means to "permanently fix" settings for rotary and DIP type switches with a thin coat of clear lacquer.

3.06 CLEANING

A. Remove marks, dirt and debris from installed equipment surfaces for "new like" appearance.

END OF SECTION

SECTION 265600 - EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Exterior Lighting
2. Timeclock

1.3 DEFINITIONS

A. CCT: Correlated color temperature.

B. CRI: Color-rendering index.

C. LER: Luminaire efficacy rating.

D. Luminaire: Complete lighting fixture, including ballast housing if provided.

E. Pole: Luminaire support structure, including tower used for large area illumination.

F. Standard: Same definition as "Pole" above.

1.4 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.

B. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Comply with IEEE C2, "National Electrical Safety Code."

E. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 EXTERIOR LIGHTING

A. Basis-of-Design Product: Subject to compliance with requirements, provide from the following company:

1. Manufacturer: As indicated on Drawings or approved equal.

2. Model: As indicated on Drawings or approved equal.

2.2 TIMECLOCK (AS APPLICABLE)

A. Basis-of-Design Product: Subject to compliance with requirements, provide from the following company:

1. Manufacturer: Intermatic or approved equal.

2. Model: ET8415CR (R=NEMA 34, ELSE NEMA I)

2.3 GENERAL REQUIREMENTS FOR LUMINAIRES

A. Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.

1. LER Tests Incandescent Fixtures: Where LER is specified, test according to NEMA LE 5A.

B. Lateral Light Distribution Patterns: Comply with IESNA RP-8 for parameters of lateral light distribution patterns indicated for luminaires.

C. Metal Parts: Free of burrs and sharp corners and edges.

D. Sheet Metal Components: Corrosion-resistant aluminum unless otherwise indicated. Form and support to prevent warping and sagging.

E. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.

F. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit re-lamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during re-lamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses. Designed to disconnect ballast when door opens.

G. Exposed Hardware Material: Stainless steel.

H. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.

I. Light Shields: Metal baffles, factory installed and field adjustable, arranged to block light distribution to indicated portion of normally illuminated area or field.

J. Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:

1. White Surfaces: 85 percent.
2. Specular Surfaces: 83 percent.
3. Diffusing Specular Surfaces: 75 percent.

K. Lenses and Refractors Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

L. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.

M. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and ballasts. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.

1. Label shall include the following lamp and ballast characteristics:

a. "USES ONLY" and include specific lamp type.
b. CCT and CRI for all luminaires.

PART 3 - EXECUTION

3.1 CORROSION PREVENTION

A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.

B. Steel Conduits: Comply with Section 260533 "Raceways and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch- thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

3.2 GROUNDING

A. Ground metal poles and support structures according to Section 260526 "Grounding and Bonding for Electrical Systems."

1. Do not install grounding electrode for each pole.
2. Install grounding conductor pigtail in the base for connecting luminaire to grounding system.

B. Ground nonmetallic poles and support structures according to Section 260526 "Grounding and Bonding for Electrical Systems."

1. Do not install grounding electrode for each pole.
2. Install grounding conductor and conductor protector.
3. Ground metallic components of pole accessories and foundations.

END OF SECTION

SECTION 311000 - SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Stripping and stockpiling rock.
6. Removing above- and below-grade site improvements.
7. Disconnecting, capping or sealing, and removing site utilities and abandoning site utilities in place.
8. Temporary erosion and sedimentation control.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for temporary erosion- and sedimentation-control measures.

1.3 DEFINITIONS

A. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil," but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow.

D. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil;

reasonably free of subsoil, clay lumps, gravel, and other objects larger than 2 inches in diameter; and free of weeds, roots, toxic materials, or other nonsoil materials.

E. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.

F. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and indicated on Drawings and as indicated according to requirements in Section 015639 "Temporary Tree and Plant Protection.".

G. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 MATERIAL CITYSHIP

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

1.6 INFORMATIONAL SUBMITTALS

A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.

1. Use sufficiently detailed photographs or video recordings.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plant designated to remain.

B. Topsoil stripping and stockpiling program.

C. Rock stockpiling program.

D. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

E. Burning: Documentation of compliance with burning requirements and permitting of authorities having jurisdiction. Identify location(s) and conditions under which burning will be performed.

1.7 QUALITY ASSURANCE

A. Topsoil Stripping and Stockpiling Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and

equipment during the Work. Include dimensioned diagrams for placement and protection of stockpiles.

B. Rock Stockpiling Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work. Include dimensioned diagrams for placement and protection of stockpiles.

1.8 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from City and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed trafficways if required by City or authorities having jurisdiction.

B. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on City's premises where indicated.

C. Utility Locator Service: Notify 811 USA for area where Project is located before site clearing.

D. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.

E. Tree- and Plant-Protection Zones: Protect according to requirements in Section 015639 "Temporary Tree and Plant Protection."

F. Soil Stripping, Handling, and Stockpiling: Perform only when the soil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

B. Antirust Coating: Fast-curing, lead- and chromate-free, self-curing, universal modified-alkyd primer complying with SSPC-Paint 20 or SSPC-Paint 29 zinc-rich coating.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Verify that trees, shrubs, and other vegetation to remain or to be relocated have been flagged and that protection zones have been identified and enclosed according to requirements in Section 015639 "Temporary Tree and Plant Protection."

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to City.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

A. Protect trees and plants remaining on-site according to requirements in Section 015639 "Temporary Tree and Plant Protection."

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.4 EXISTING UTILITIES

A. City will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.

1. Verify that utilities have been disconnected and capped before proceeding with site clearing.

B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.

1. Arrange with utility companies to shut off indicated utilities.
2. City will arrange to shut off indicated utilities when requested by Contractor.

C. Locate, identify, and disconnect utilities indicated to be abandoned in place.

D. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by City or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify City not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Architect's written permission.

E. Excavate for and remove underground utilities indicated to be removed.

F. Removal of underground utilities is included in earthwork sections; in applicable fire suppression, plumbing, HVAC, electrical, communications, electronic safety and security, and utilities sections; and in Section 024116 "Structure Demolition" and Section 024119 "Selective Demolition."

3.5 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
2. Grind down stumps and remove roots larger than 2 inches in diameter, obstructions, and debris to a depth of 18 inches below exposed subgrade.
3. Use only hand methods or air spade for grubbing within protection zones.
4. Chip removed tree branches and stockpile in areas approved by City.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

3.6 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to depth in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects larger than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil away from edge of excavations without intermixing with subsoil or other materials. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

1. Limit height of topsoil stockpiles to 72 inches.
2. Do not stockpile topsoil within protection zones.
3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.
4. Stockpile surplus topsoil to allow for respreading deeper topsoil.

3.7 STOCKPILING ROCK

A. Remove from construction area naturally formed rocks that measure more than 1 foot across in least dimension. Do not include excavated or crushed rock.

B. Stockpile rock away from edge of excavations without intermixing with other materials. Cover to prevent windblown debris from accumulating among rocks.

1. Limit height of rock stockpiles to 36 inches.
2. Do not stockpile rock within protection zones.
3. Dispose of surplus rock. Surplus rock is that which exceeds quantity indicated to be stockpiled or reused.
4. Stockpile surplus rock to allow later use by the City.

3.8 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw- cut faces vertically.
2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.9 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off City's property.

B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials, and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION 311000

SECTION 312000 - EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Excavating and filling for rough grading the Site.
2. Preparing subgrades for slabs-on-grade, walks, pavement, turf, and grasses and plants.
3. Excavating and backfilling for buildings and structures.
4. Drainage course for concrete slabs-on-grade.
5. Subbase course for concrete pavements.
6. Subbase course and base course for asphalt paving.
7. Subsurface drainage backfill for walls and trenches.
8. Excavating and backfilling trenches for utilities and pits for buried utility structures.
9. Excavating well hole to accommodate elevator-cylinder assembly.

B. Related Requirements:

1. Section 311000 "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
2. Section 329200 "Soil Preparation" for finish grading in turf, grass, and planting areas, including preparing and placing planting soil for turf and planting areas.
3. Section 329200 "Turf and Grasses" for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.
4. Section 329300 "Plants" for finish grading in planting areas and tree and shrub pit excavation and planting.

1.3 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by City, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

K. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct preexcavation conference at Project site.

1. Review methods and procedures related to earthmoving, including, but not limited to, the following:

a. Personnel and equipment needed to make progress and avoid delays.
b. Coordination of Work with utility locator service.
c. Coordination of Work and equipment movement with the locations of tree- and plant-protection zones.
d. Extent of trenching by hand or with air spade.
e. Field quality control.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of the following manufactured products required:
   1. Controlled low-strength material, including design mixture.
   2. Warning tapes.

B. Samples for Verification: For the following products, in sizes indicated below:
   1. Warning Tape: 12 inches long; of each color.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Material Test Reports: For each on-site soil material proposed for fill and backfill as follows:

   1. Classification according to ASTM D2487.
   2. Laboratory compaction curve according to ASTM D1557.

C. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth-moving operations. Submit before earth moving begins.

1.7 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E329 and ASTM D3740 for testing indicated.

1.8 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.

   1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from City and authorities having jurisdiction.
   2. Provide alternate routes around closed or obstructed traffic ways if required by City or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining City's property will be obtained by City before award of Contract.

   1. Do not proceed with work on adjoining property until directed by Architect.

C. Utility Locator Service: Notify 811 USA for area where Project is located before beginning earth-moving operations.

D. Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures specified in Section 015000 "Temporary Facilities and Controls" and Section 311000 "Site Clearing" are in place.

E. Do not commence earth-moving operations until plant-protection measures specified in Section 015639 "Temporary Tree and Plant Protection" are in place.

F. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

G. Do not direct vehicle or equipment exhaust towards protection zones.

H. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D2487, or a combination of these groups; free of rock or gravel larger than 1 inch in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

1. Liquid Limit: <40.
2. Plasticity Index: <20.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487, or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.

F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and zero to 5 percent passing a No. 8 sieve.

I. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and zero to 5 percent passing a No. 4 sieve.

J. Sand: ASTM C33/C33M; fine aggregate.

K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.

B. Protect and maintain erosion and sedimentation controls during earth-moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

A. Provide dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

B. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

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

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

D. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

B. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Architect. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; and soil, boulders, and other materials not classified as rock or unauthorized excavation.

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Pile Foundations: Stop excavations 6 to 12 inches above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.
3. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

B. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: As indicated on drawings.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. For pipes and conduit less than 6 inches in nominal diameter, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
2. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe or conduit circumference. Fill depressions with tamped sand backfill.
3. For flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support conduit on an undisturbed subgrade.
4. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

E. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
3. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.8 SUBGRADE INSPECTION

A. Notify City when excavations have reached required subgrade.

B. If City determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.9 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Architect.

1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

3.10 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.11 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring, bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.12 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Trenches under Footings: Backfill trenches excavated under footings and within 12 inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Section 033000 "Cast-in-Place Concrete."

D. Backfill voids with satisfactory soil while removing shoring and bracing.

E. Initial Backfill:

1. Soil Backfill: Place and compact initial backfill of subbase material, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.

a. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

2. Controlled Low-Strength Material: Place initial backfill of controlled low-strength material to a height of 12 inches over the pipe or conduit. Coordinate backfilling with utilities testing.

F. Final Backfill:

1. Soil Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.
2. Controlled Low-Strength Material: Place final backfill of controlled low-strength material to final subgrade elevation.

G. Warning Tape: Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.13 SOIL FILL

A. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.
3. Under steps and ramps, use engineered fill.
4. Under building slabs, use engineered fill.
5. Under footings and foundations, use engineered fill.

B. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.14 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.

2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.15 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D698:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 95 percent.
3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 85 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at 90 percent.

3.16 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1 inch.
3. Pavements: Plus or minus 1/2 inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.17 SUBSURFACE DRAINAGE

A. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches of filter material, placed in compacted layers 6 inches thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches.

1. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D698.

B. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches of final subgrade, in compacted layers 6 inches thick. Overlay drainage backfill with one layer of subsurface drainage geotextile, overlapping sides and ends at least 6 inches.

1. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D698.
2. Place and compact impervious fill over drainage backfill in 6-inch- thick compacted layers to final subgrade.

3.18 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:

1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
2. Place base course material over subbase course under hot-mix asphalt pavement.
3. Shape subbase course and base course to required crown elevations and cross-slope grades.
4. Place subbase course and base course 6 inches or less in compacted thickness in a single layer.
5. Place subbase course and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
6. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D698.

3.19 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

A. Place drainage course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:

1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
2. Place drainage course 6 inches or less in compacted thickness in a single layer.
3. Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
4. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D698.

3.20 FIELD QUALITY CONTROL

A. Special Inspections: City will engage a qualified special inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
2. Determine that fill material classification and maximum lift thickness comply with requirements.
3. Determine, during placement and compaction, that in-place density of compacted fill complies with requirements.
4. **<**Insert special inspections**>.**

B. Testing Agency: City will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.

E. Testing agency will test compaction of soils in place according to ASTM D1556, ASTM D2167, ASTM D2937, and ASTM D6938, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab but in no case fewer than three tests.
2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet or less of wall length but no fewer than two tests.
3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length but no fewer than two tests.

F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.21 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.22 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off City's property.

B. Transport surplus satisfactory soil to designated storage areas on City's property. Stockpile or spread soil as directed by Architect.

1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off City's property.

END OF SECTION 312000

SECTION 313213.16 – FDR-C PROCESS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. ASTM Testing Methods (latest revisions):
1. ASTM C136
2. ASTM C150
3. ASTM D1557
4. ASTM D1633
5. ASTM D2216
6. ASTM D6938

C. Caltrans Testing Methods (latest revisions):
1. CT 373
2. CT 417
3. CT 422

1.2 SUMMARY

A. This specification shall govern the process known as Stabilized Soil using Full Depth Reclamation-Cement (FDR-C). Stabilized soil consists of thoroughly blending any pulverized asphalt concrete, aggregate base, subgrade soil and, if specified, supplementary aggregate to the specified treatment depth. Thoroughly mixing the blended material with water and cement. Mixture shall then be compacted, finished, and cured in such a manner that the mixture forms a dense, uniform mass conforming to the lines, grades, and cross sections as indicated on the Drawings.

1.3 DEFINITIONS

A. Cement: Type II Portland cement for general use specified in ASTM C150

B. Spreader: Motorized vane fed spreader which can control cement application rate to measure lbs/ft^2 ± 5%

C. Mixer: Cross-shafted mixer with a mixing depth of 1.5 feet and capable of controlled introduction of water.

D. Drop Pan: Rectangular metal box with minimum area of 3 square feet and height which allow passage of spreader.

E. Optimum Moisture: Moisture content associated with maximum dry density determined by ASTM D1557

F. Relative Compaction: In-place compacted dry density divided by ASTM D1557 maximum dry density.

G. Unconfined Compressive Strength: Strength determined from ASTM D1633, Method A, using a 7-day over cure per CT 373 H(2), (3). For curing only, test specimen must be tightly wrapped with two layers of plastic with minimum thickness of 4-mil, seal all seams with duct tape to prevent moisture loss.

1.4 ACTION SUBMITTALS

A. Product Data: At least 30 days prior to work, submit product data and certificates of compliance for all materials proposed under this section.

B. Mix Design: After review of the Owner's mix design, the Contractor may either concur with the design or submit a mix design to optimize the cement content or adjust materials. Any proposed mix design must be submitted for approval at least 20 days before the start of work. The mix design process should be consistent with construction procedure (e.g. 30 to 60 minute period between initial mixing and compaction). Each mix design submittal must be signed and sealed by a civil or geotechnical engineer who is registered in the State of California.

Each mix design submittal must include:

1. Area represented by sample by stationing
2. Gradation of mixture before addition of cement
3. Cement content percentage by dry weight
4. Maximum dry density and optimum moisture of FDR-C mix
5. Mixing moisture and relative compaction of test specimens
6. Unconfined compressive strength of test specimens (3 minimum)
7. Completed test results, with time at start of mixing, compaction, over-curing and compression testing and any worksheets, photographs and graphs

1.5 QUALITY CONTROL AND ASSURANCE

A. Quality Assurance

1. The Owner will employ and pay for the services of an independent testing laboratory to perform testing to verify compliance with the contract documents.
2. Daily testing of the constructed materials and work of the Contractor will be made during construction.
3. Cement application rate, mixing uniformity, mixing depth, moisture and relative compaction tests will be made at locations determined by the Owner's representative. When tests indicated the specified requirements have not been achieved or work has not been performed within the allowable time, that portion of the work shall be reworked until the specified requirements have been attained.

4. Relative compaction will be determined based on dry density using the maximum dry density at optimum moisture content determined by ASTM D1557. Compacted field in-place density and moisture will be determined by ASTM D6938. Mixing moisture, and nuclear gauge or direct source heating (ASTM D4959) moisture content corrections will be made periodically by ASTM D2216.
5. The uniformity of the mix and mixing depth with be confirmed by visual observation and sprayed phenolphthalein alcohol indicator solution.

B. Field Quality Control, Sampling and Testing
1. The Owner will retain the services of an independent testing agency to perform field quality control testing.
2. The testing agency shall perform sampling and testing, as a minimum, in accordance with the following table. Additional testing may be performed as necessitated by field conditions or as determined by the Owner's representative.

Quality Control Testing Requirements

Quality Characteristic	Tested Method	Minimum Frequency	Sampling Location
Water Sulfates (ppm)	CT 417[a]	1 per source	Source
Water Chlorides (ppm)	CT 422[a]	1 per source	Source
Maximum Dry Density (pcf)	ASTM D1557[b, c, f]	60,000 ft^2	Loose Completed Mix
In-Place Dry Density (pcf)	ASTM D6938[d]	7,500 ft^2	Compacted Mix
In-Place Dry Moisture (%)	ASTM D6938[d]	7,500 ft^2	Compacted Mix
Moisture Bias (%)	ASTM D2216[e]	Weekly	ASTM D6938 and Composite Moisture
Composite Mix Moisture (%)	ASTM D2216 [b, f] or ASTM D4959	15,000 ft^2	Loose Completed Mix

Cement Application (lbs/ft^2)	Drop Pan[g]	60,000 ft^2	Working Spread
Mix Thickness Verification (in)	Phenolphthalein[h,i]	15,000 ft^2	Loose Completed Mix
Mix Uniformity	Visual and Phenolphthaelein[i]	15,000 ft^2	Loose Completed Mix

[a] Only required for non-potable water sources
[b] Sample immediately after mixing is completed
[c] Test to be completed within 2 hours of sampling
[d] If lift thickness exceeds 1-foot, at least one-third of tests shall be a depth of 0.5 foot to designated treatment depth
[e] For bias to nuclear gauge, test at beginning of each work week on sample obtained from ASTM D6938 test location. For bias to direct heat source, test on composite sample of loose mix
[f] Direct heat source must have temperature control to allow for repeatable procedure
[g] At least one test per day
[h] Initial thickness verification to be taken in loose mix and at the same location in compacted mix to provide correlation for required loose mix thickness to result in specified compacted mix thickness. At least one comparison between loose and compacted mix thickness shall be made at the beginning of each work week or with any change to mixing and/or compaction procedures.
[i] At least two per day (one beginning of shift and one at mid-shift), thickness and uniformity at same location.

C. Acceptance Criteria
1. FDR Acceptance shall be based on:
a. Compliance with the quality characteristics shown in the following table:

Quality Characteristic	**Requirement**
Cement Application (lb/ft^2)	Mix Design (-5%, +10%)
Relative Compaction (min)	95%
Moisture Content (min)	4% above optimum
Thickness (ft)	Design (-0.05’, +0.10’)

b. Visual inspection of the following:
1) Uniformity of soil/cement mix
2) Segregation, raveling or loose material

3) Uniform surface texture and consistency

c. Finish grade ±0.05 foot of design and within 0.05 foot of bottom edge of a 12-foot straight edge.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cement: Cement must be normal Type II/V portland cement for general use as specified in ASTM C150.

B. Water: If available, potable water shall be used for mixing the FDR-C. The Engineer shall be notified if a water source other than potable water is to be used. Water, other than potable water, shall:

1. Contain no more than 500 ppm chlorides as Cl and no more than 1000 ppm sulfates as SO_4.
2. Not contain an amount of impurities that will cause a reduction in the strength of the FDR-C.

Prior to approval of a non-potable water source, a mix design shall be submitted which utilizes the non-potable water source.

C. Supplemental Aggregate/Soil: Any aggregate or soil proposed to supplement the on-site asphalt concrete, aggregate base, aggregate subbase, or subgrade within the specified treatment depth shall be free of organics or deleterious matter. A mix design shall be provided, which utilized the supplemental materials in the same proportion to on-site materials proposed for construction.

D. Cure Seal: Curing seal shall comply with Section 94 of the Caltrans Standard Specification for asphaltic emulsions Grade SS1h or CSS1h.

PART 3 - EXECUTION

3.1 CONSTRUCTION

A. General: Do not start FDR-C activities if the ambient air temperature is below 40°F or if the road or ground surface is below 35°F. If the ambient air temperature drops below 40°F during the FDR-C activities, the Contractor may only complete compaction and finishing of FDR-C already mixed.

Deliver cement in full loads unless it is the last load of the work shift.

FDR-C treatment shall be to the design depth below the specified subgrade elevation. Treatment shall extend to the outer edge of the proposed pavement, unless otherwise specified on the approved plans or directed by the Owner’s representative.

B. Utility Preparation: Prior to mixing, positively identify the horizontal and vertical location of utilities within the proposed FDR-C area. At a minimum, pothole each utility at the crossing with the proposed or existing lip of gutter and at 100-foot intervals for lines running parallel to the roadway. Any conflicts with existing utilities and a theoretical surface 12 inches below the bottom of the FDR-C limits shall be reported to the Engineer immediately and prior to the mixing process. Coordinating the relocation of any utilities as a result of these findings, as deemed necessary by the Engineer, shall be the responsibility of the Contractor.

Grates, covers, grates of existing sewer/storm drain manholes, water valve boxes and other utility boxes shall be lowered or raised to final grade of finished asphalt in accordance with the provisions in Section 71-58.013B, "Frames, Covers, Grates, and Manholes," of the State Standard Specifications. The use of raising devices will not be permitted.

This shall include removal and protection of the existing water valve boxes and sewer frames and covers, and concrete collars. Grade adjustments shall be made in accordance with the City of Merced Standard Designs S-1, W-2, or requirements of the governing utility owner. Contractor shall replace any water utility boxes and/or sewer frame and covers that are damaged during the construction to current City Standards. Contractor shall coordinate all work with the governing utility company.

Upon completion of placement of final pavement on the street, all utility covers (sewer/storm drain manhole, water valve, other utility manhole, and detector handhole covers, etc.) shall be clean and free of any hot mix asphalt and shall seat securely in their frames.

At all times, the Contractor must maintain access to water valves. When the water valves are adjusted below grade, the Contractor shall provide swing ties, located outside the FDR-C section, identifying the exact location of the water valves. If requested by the Engineer, Owner or the City Water Department Specialist, the Contractor shall expose the valve for service.

C. Surface/Treatment Zone Preparation: Before FDR-C activities start, prepare the surface and treatment zone by:

1. Existing asphalt shall be sawcut to provide a smooth transition. Nothing herein shall be construed as relieving the Contractor of his responsibility for final clean up as provided in Section 4-1.13, "Cleanup," of the State Standard Specifications.
2. Clear foreign matter including vegetation.
3. Remove standing water.
4. Referencing the profile and cross slope.
5. Marking the proposed longitudinal cut lines on the existing pavement as follows:
   a. Cut lines must coincide with points where the existing cross slope changes, approximately at the centerline and edge of traveled way.
   b. Cut lines must indicate the sequence of the cuts.
6. The FDR-C material to be treated shall be essentially free of irreducible particles greater than 6 inches in maximum dimension, contain less than about 10% irreducible particles greater than 3 inches in maximum dimensions and be determined by the Contractor to be satisfactory to not damage the mixer.
7. Provide a rough grade within ±0.1 foot of the specified finish subgrade elevation.

8. Clear and dispose of any vegetation, debris or other deleterious matter from any area used to store excess material.

D. Pulverizing: Do not pulverize more material than can be mixed with cement, uniformly moisture conditioned, compacted and finish graded within one work shift.

No unpulverized material shall be left in-place. The 1st cut width must be the full width of the pulverizing drum. Subsequent cuts must overlap previous cuts at least 4 inches, but not more than 12 inches.

Where the pulverizing drum stops in a longitudinal cut, the position of the drum shall be marked and a subsequent cut on that longitudinal alignment shall start at least 2 feet behind the mark.

If the pulverization encounters unstable conditions, notify the Engineer. The Engineer, with the Contractor's assistance, will determine the extent of the problem area and the correction measures to be taken.

E. Applying Cement: Cement shall be applied in dry form.

Cement shall be uniformly spread over the work area. The design spread rate is ***6.3 pounds/square foot***, which is based on a dry soil weight of ***124.8 pcf*** and a mix design of ***5%*** cement.

Spreader speed shall be controlled based on the pan test speed to maintain an application rate of ***6.0 to 6.9*** pounds/square foot.

The spread area should not exceed the area which can be initially mixed, uniformly moisture conditioned and compacted within 2 hours.

F. Mixing: The FDR-C material shall be uniformly mixed at least twice to the specified treatment depth. Mix until the mixture is visibly uniform with no streaks or pockets of cement. The mixed material shall have a uniform color reaction with sprayed phenolphthalein alcohol indicator for the full specified treatment depth.

Water must be injected through the mixer. The injection rate of mixing water must be sufficient to produce a workable FDR-C material moisture content that is at least 4% above the optimum moisture content determined by ASTM D1557. A composite sample from 5 random locations shall be taken after initial mixing and tested under ASTM D2216 or D4959 (calibrated to ASTM D2216) to confirm the moisture prior to compaction.

Mixing shall occur in a series of parallel lanes of convenient width and length. Mixing of adjoining lanes shall overlap the previous lane by at least 4 inches, but not more than 1 foot, to provide continuity. Where the mixing drum stops at the end of the lane, the position of the drum shall be marked and a subsequent lane on that longitudinal alignment shall start at least 2 feet behind the mark.

G. Compaction: Begin compaction within 0.5 hour of initial mixing.

Compact using equipment capable of uniform compaction throughout the thickness of the treated zone. For treatment depths greater than 0.65 feet, use an open hub/ring wheel compactor (e.g. Rex 760). Complete compaction with non-vibrating steel drum rollers or pneumatic-tired rollers. Compact to at least 95% relative compaction.

Use other compaction methods, as necessary, in areas not accessible to heavy equipment (e.g. around manholes or drain inlets).

The total time from final mixing of the pulverized material with dement to completion of compaction shall not exceed 2 hours.

H. Finishing Grading: Maintain the moisture of the FDR-C surface at, or above, the optimum moisture throughout the entire finish grading operation.

The finish grade of the FDR-C surface shall be ±0.05 foot of the bottom edge of a 12-foot straight edge laid in directions parallel and perpendicular with the centerline.

If the FDR-C surface is above the allowable tolerance, trim, remove and dispose of excess material.

If the FDR-C surface is below the allowable tolerance, or is damaged prior to placing HMA, the low or damaged area shall be repaired with minor HMA. Any necessary leveling HMA is considered part of the FDR-C bid item and no separate payment will be made.

The finish FDR-C surface shall be free of ruts, bumps, indentations, segregation, raveling and any loose materials and shall be rolled with at least one complete coverage of non-vibrating smooth-drum or pneumatic tired roller.

Finish grading shall be completed within 2 hours of completion of FDR-C compaction.

I. Curing: Curing shall consist of a water cure or curing seal. Curing shall begin the same day as finish grading.

Water curing shall keep the finished FDR-C surface at, or above, the optimum moisture content until paving with HMA begins.

Curing seal shall be applied to the finished FDR-C surface in conformance with Section 94 of the California Standard Specifications. Apply the curing seal:

1. At a rate of 0.1 to 0.2 gallon per square yard
2. When the ambient temperature is above 40°F and rising

J. Microcracking: During the period from 48 to 72 hours after completion of compaction, microcrack the FDR-C surface by applying 3 single passes with a 12-ton vibratory smooth steel drum roller at maximum amplitude traveling from 2 to 3 mph.

K. Traffic: Traffic may be placed onto the finished FDR-C surface after final grading. Any damage prior to placing HMA shall be repaired with minor HMA.

PART 4 - PAYMENT

4.1 Measurement & Payment

A. The contract price paid per square foot for “FDR Process” includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the Full Depth Reclamation Cement, including utility work or leveling HMA as described in this section, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

END OF SECTION

SECTION 313213.16 – STABILIZED SOIL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This specification shall govern the process known as Stabilized Soil. Stabilized soil consists of mixing the existing base, subbase and subgrade materials and uniformly mixing with a specialized acrylic polymer and water. Mixture shall then be compacted, finished, and cured in such a manner that the mixture forms a dense, uniform mass conforming to the lines, grades, and cross sections as indicated on the Drawings.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Design Mixtures: For each stabilized soil mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mixing water to be withheld for later addition at Project site.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A manufacturer experienced in producing a ready-mixed soil stabilization polymer product and that complies with ASTM requirements for production facilities and equipment.

C. Mockups: Prepare the following stabilized soil sections to demonstrate consistency of installation, texture and standard of workmanship. Prepare mockup sections in a relatable site location per the Drawings.

1. 6 FT x 6 FT x 6 IN depth stabilized soil roadway (vehicular)
2. 4 FT x 4 FT x 4 IN depth stabilized soil pathway (pedestrian)

PART 2 - PRODUCTS

2.1 MATERIALS

A. Existing materials shall be scarified to a depth as indicated on Drawings.

B. Acrylic co-polymer super concentrate. Source as indicated on Drawings or approved equal.

C. Water – Water shall be free from oils, acids, organic matter or other substances. The water shall not contain more than 1000 parts per million of chlorides nor more than 1000 parts per million of sulfates as SO4. Water shall be clean and potable and shall be added as needed during mixing, compacting, and finishing operations and during the curing period, as required.

2.2 STABILIZED SOIL POLYMER APPLICATION RATE

A. The stabilized soil polymer application rate is based on the laboratory mix design per the manufacturer indicated on the Drawings or an approved equal.

B. For bidding purposes, the Contractor shall use an application rate of 1 GAL per 20 SF for vehicular roadways indicated on the Drawings and an application rate of 1 GAL per 25 SF for pedestrian pathways as indicated on the Drawings. The application rate will be expressed in lbs. per sq. ft. of cement. The final application rate shall be determined by a mix design confirmation performed by the Contractor and reviewed and approved by the manufacturer for the specific project site.

2.3 CONTRACTORS QUALIFICATION

A. The contractor performing the soil stabilization shall document experience performing similar stabilized soil work. The contractor shall submit a list of equipment to be utilized in performance of the stabilization process. The contractor shall submit a detailed description of work procedures for approval by the City prior to beginning stabilized soil work.

B. The contractor performing stabilized soil installation shall have a representative on site with the necessary experience to properly complete the job per the manufacturer's instruction. All personnel should be properly trained in the stabilized soil treatment process, including quality control and safety procedures. The contractor shall coordinate with other contractors and workers on site.

2.4 EQUIPMENT

A. Stabilized soil section shall be constructed utilizing a combination of equipment per the stabilized soil polymer's instructions that will produce results that meet all the requirements herein. The City prior to use shall approve such machines.

1. Motor grader
2. Steel drum
3. Rubber tire roller

4. Water truck

PART 3 - EXECUTION

3.1 CONSTRUCTION

A. The contractor shall use the existing prepared soil on site and the mix design in accordance with the stabilized soil polymer manufacturer as set forth in the plans and specifications.

B. The soil materials shall be graded to conform to the lines and grade shown on the Drawings prior to application of the stabilized soil polymer. Grading operations will require some movement of material along the grade and/or relocated on site to conform to the lines and elevations shown on the Plans and to allow for the subsequent construction activities to proceed.

C. Installation of the stabilized soil polymer shall be per manufacturer's instruction for site specific installation.

3.2 REPAIR

A. If the prepared stabilized soil section is damaged, the contractor shall remove and replace the entire damaged area and repair it per manufacturer's recommendations and as set forth in the plans and specifications. Feathering will not be permitted for repair of low areas.

END OF SECTION

SECTION 315000 - EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes temporary excavation support and protection systems.

B. Related Requirements:
   1. Section 312000 "Earth Moving" for excavating and backfilling, for controlling surface-water runoff and ponding, and for dewatering excavations.

1.3 ACTION SUBMITTALS

A. Delegated-Design Submittal: For excavation support and protection systems, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For the following:

   1. Land surveyor.
   2. Professional Engineer: Experience with providing delegated-design engineering services of the type indicated, including documentation that engineer is licensed in the State of California in which Project is located.

B. Contractor Calculations: For excavation support and protection system. Include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 CLOSEOUT SUBMITTALS

A. Record Drawings: Identify locations and depths of capped utilities, abandoned-in-place support and protection systems, and other subsurface structural, electrical, or mechanical conditions.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design excavation support and protection systems to resist all lateral loading and surcharge, including but not limited to, retained soil, groundwater pressure, adjacent building loads, adjacent traffic loads, construction traffic loads, material stockpile loads, and seismic loads, based on the following:

1. Compliance with OSHA Standards and interpretations, 29 CFR 1926, Subpart P.
2. Compliance with AASHTO Standard Specification for Highway Bridges or AASHTO LRFD Bridge Design Specification, Customary U.S. Units.
3. Compliance with requirements of authorities having jurisdiction.
4. Compliance with utility company requirements.
5. Compliance with railroad requirements.

2.2 MATERIALS

A. Structural Steel: ASTM A36/A36M, ASTM A690/A690M, or ASTM A992/A992M.

B. Steel Sheet Piling: ASTM A328/A328M, ASTM A572/A572M, or ASTM A690/A690M; with continuous interlocks.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.

1. Shore, support, and protect utilities encountered.

3.2 INSTALLATION - GENERAL

A. Locate excavation support and protection systems clear of permanent construction, so that construction and finishing of other work is not impeded.

B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.

2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

C. Install excavation support and protection systems without damaging existing buildings, structures, and site improvements adjacent to excavation.

3.3 SOLDIER PILES AND LAGGING

A. Install steel soldier piles before starting excavation.

1. Extend soldier piles below excavation grade level to depths adequate to prevent lateral movement.
2. Space soldier piles at regular intervals not to exceed allowable flexural strength of wood lagging.
3. Accurately align exposed faces of flanges to vary not more than 2 inchesfrom a horizontal line and not more than 1:120 out of vertical alignment.

B. Install wood lagging within flanges of soldier piles as excavation proceeds.

1. Trim excavation as required to install lagging.
2. Fill voids behind lagging with soil, and compact.

C. Install wales horizontally at locations indicated on Drawings and secure to soldier piles.

3.4 SHEET PILING

A. Before starting excavation, install one-piece sheet piling lengths and tightly interlock vertical edges to form a continuous barrier.

B. Accurately place the piling using templates and guide frames unless otherwise recommended in writing by the sheet piling manufacturer.

1. Limit vertical offset of adjacent sheet piling to 60 inches.
2. Accurately align exposed faces of sheet piling to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.

C. Cut tops of sheet piling to uniform elevation at top of excavation.

3.5 BRACING

A. Locate bracing to clear columns, floor framing construction, and other permanent work. If necessary to move brace, install new bracing before removing original brace.

1. Do not place bracing where it will be cast into or included in permanent concrete work unless otherwise approved by Architect.
2. Install internal bracing if required to prevent spreading or distortion of braced frames.

3. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.6 MAINTENANCE

A. Monitor and maintain excavation support and protection system.

B. Prevent surface water from entering excavations by grading, dikes, or other means.

C. Continuously monitor vibrations, settlements, and movements to ensure stability of excavations and constructed slopes and to ensure that damage to permanent structures is prevented.

3.7 FIELD QUALITY CONTROL

A. Survey-Work Benchmarks: Resurvey benchmarks regularly during installation of excavation support and protection systems, excavation progress, and for as long as excavation remains open.

1. Maintain an accurate log of surveyed elevations and positions for comparison with original elevations and positions.
2. Promptly notify Architect if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.

B. Promptly correct detected bulges, breakage, or other evidence of movement to ensure that excavation support and protection system remains stable.

C. Promptly repair damages to adjacent facilities caused by installation or faulty performance of excavation support and protection systems.

3.8 REMOVAL AND REPAIRS

A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and earth and hydrostatic pressures.

1. Remove in stages to avoid disturbing underlying soils and rock or damaging structures, pavements, facilities, and utilities.

END OF SECTION 315000

SECTION 321216 - ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Hot-mix asphalt paving.

B. Related Requirements:
1. Section 312000 "Earth Moving" for subgrade preparation, fill material, separation geotextiles, unbound-aggregate subbase and base courses, and aggregate pavement shoulders.
2. Section 321313 "Concrete Paving" for concrete pavement and for separate concrete curbs, gutters, and driveway aprons.
3. Section 321373 "Concrete Paving Joint Sealants" for joint sealants and fillers at pavement terminations.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:

a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
b. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include technical data and tested physical and performance properties.
2. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For paving-mix manufacturer and testing agency.

B. Material Certificates: Include statement that mixes containing recycled materials will perform equal to mixes produced from all new materials.

1. Aggregates.
2. Asphalt binder.
3. Asphalt cement.
4. Cutback prime coat.
5. Emulsified asphalt prime coat.
6. Tack coat.
7. Fog seal.
8. Undersealing asphalt.

C. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by authorities having jurisdiction or the DOT of state in which Project is located.

B. Testing Agency Qualifications: Qualified in accordance with ASTM D3666 for testing indicated.

C. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the City for asphalt paving work.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:

1. Prime Coat: Minimum surface temperature of 60 deg F.
2. Tack Coat: Minimum surface temperature of 60 deg F.
3. Slurry Coat: Comply with weather limitations in ASTM D3910.
4. Asphalt Base Course and Binder Course: Minimum surface temperature of 40 deg F and rising at time of placement.
5. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Coarse Aggregate: ASTM D692/D692M, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.

2.2 ASPHALT MATERIALS

A. Asphalt Binder: ASTM D6373 binder designation

B. Retain "Asphalt Cement" Paragraph below with option for viscosity- or penetration-graded asphalt cement if these materials are available and required. Viscosity testing measures properties more accurately than penetration testing. Insert viscosity or penetration grades below if required.

C. Asphalt Cement: ASTM D3381/D3381M for viscosity-graded material.

D. Cutback Prime Coat: ASTM D2027/D2027M, medium-curing cutback asphalt,.

E. Emulsified Asphalt Prime Coat: ASTM D977 emulsified asphalt, or ASTM D2397/D2397M cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

F. Tack Coat: ASTM D977 emulsified asphalt, or ASTM D2397/D2397M cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

G. Water: Potable.

H. Undersealing Asphalt: ASTM D3141/D3141M; pumping consistency.

2.3 MIXES

A. Hot-Mix Asphalt: Dense-graded, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction; designed in accordance with procedures in AI MS-2, "Asphalt Mix Design Methods"; and complying with the following requirements:

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
2. Base Course: As indicated on plans.
3. Binder Course: As indicated on plans .
4. Surface Course: As indicated on plans .

B. Emulsified-Asphalt Slurry: ASTM D3910

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to begin paving.

B. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protection: Provide protective materials, procedures, and worker training to prevent asphalt materials from spilling, coating, or building up on curbs, driveway aprons, manholes, and other surfaces adjacent to the Work.

B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction. Limit vehicle speed to 3 mph.
2. Proof-roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

3.3 SURFACE PREPARATION

A. Ensure that prepared subgrade has been proof-rolled and is ready to receive paving. Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces.

B. Cutback Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gal./sq. yd.. Apply enough material to penetrate and seal, but not flood, surface. Allow prime coat to cure.

1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
2. Protect primed substrate from damage until ready to receive paving.

C. Emulsified Asphalt Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.10 to 0.30 gal./sq. yd. per inch depth. Apply enough material to penetrate and seal, but not flood, surface. Allow prime coat to cure.

1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
2. Protect primed substrate from damage until ready to receive paving.

D. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd..

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.4 HOT-MIX ASPHALT PLACEMENT

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in 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 hot-mix asphalt base course and binder course in number of lifts and thicknesses indicated.
2. Place hot-mix asphalt surface course in single lift.
3. Spread mix at a minimum temperature of 250 deg F.
4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
5. 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 unless infill edge strips of a lesser width are required.

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Overlap mix placement about 1 to 1-1/2 inches from strip to strip to ensure proper compaction of mix along longitudinal joints.
2. Complete a section of asphalt base course before placing asphalt surface course.

C. 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.

3.5 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.

3.6 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 with vibratory- plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

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:

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.7 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2 inch.
2. Surface Course: Plus 1/4 inch, no minus.

B. Pavement Surface Smoothness: Compact each course to produce surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:

1. Base Course:1/4 inch.
2. Surface Course: 1/8 inch.
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.8 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined in accordance with ASTM D3549/D3549M.

C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

D. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement in accordance with ASTM D979/D979M.

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared in accordance with ASTM D2041/D2041M, and compacted in accordance with job-mix specifications.
2. In-place density of compacted pavement will be determined by testing core samples in accordance with ASTM D1188 or ASTM D2726/D2726M.

a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than three cores taken.
b. Field density of in-place compacted pavement may also be determined by nuclear method in accordance with ASTM D2950/D2950M and coordinated with ASTM D1188 or ASTM D2726/D2726M.

E. Replace and compact hot-mix asphalt where core tests were taken.

F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.9 WASTE HANDLING

A. General: Handle asphalt-paving waste in accordance with approved waste management plan required in Section 017419 "Construction Waste Management and Disposal."

END OF SECTION 321216

SECTION 321313 - CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes Concrete Paving.

1. Driveways.
2. Curbs and gutters.
3. Walks.

B. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for general building applications of concrete.
2. Section 321373 "Concrete Paving Joint Sealants" for joint sealants in expansion and contraction joints within concrete paving and in joints between concrete paving and asphalt paving or adjacent construction.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash, slag cement, and other pozzolans.

B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to concrete paving, including but not limited to, the following:

a. Concrete mixture design.
b. Quality control of concrete materials and concrete paving construction practices.

2. Require representatives of each entity directly concerned with concrete paving to attend, including the following:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixtures.
c. Ready-mix concrete manufacturer.
d. Concrete paving Subcontractor.
e. Manufacturer's representative of stamped concrete paving system used for stamped detectable warnings.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Initial Selection: For each type of product, ingredient, or admixture requiring color selection.

C. Samples for Verification: For each type of product or exposed finish, prepared as Samples of size indicated below:

1. (See Mockups)

D. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified ready-mix concrete manufacturer and testing agency.

B. Material Certificates: For the following, from manufacturer:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Fiber reinforcement.
4. Admixtures.
5. Curing compounds.
6. Applied finish materials.
7. Bonding agent or epoxy adhesive.
8. Joint fillers.

C. Material Test Reports: For each of the following:

1. Aggregates:

D. Field quality-control reports.

1.7 QUALITY ASSURANCE

A. Stamped Detectable Warning Installer Qualifications: An employer of workers trained and approved by manufacturer of stamped concrete paving systems.

B. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").

C. Testing Agency Qualifications: Qualified according to ASTM C1077 and ASTM E329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

D. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockups of full-thickness sections of concrete paving to demonstrate typical joints; surface finish, texture, and color; curing; and standard of workmanship.
2. Build mockups of concrete paving in the location and of the size indicated or, if not indicated, build mockups where directed by Architect and not less than 96 inches by 96 inches.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified independent testing agency to perform preconstruction testing on concrete paving mixtures.

1.9 FIELD CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

B. Cold-Weather Concrete Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

C. Hot-Weather Concrete Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap, so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 unless otherwise indicated.

2.2 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet or less. Do not use notched and bent forms.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.3 STEEL REINFORCEMENT

A. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, fabricated from galvanized-steel wire into flat sheets.

B. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.

C. Epoxy-Coated Welded-Wire Reinforcement: ASTM A884/A884M, Class A, plain steel.

D. Reinforcing Bars: ASTM A615/A615M, Grade 60; deformed.

E. Galvanized Reinforcing Bars: ASTM A767/A767M, Class II zinc coated, hot-dip galvanized after fabrication and bending; with ASTM A615/A615M, Grade 60 deformed bars.

F. Epoxy-Coated Reinforcing Bars: ASTM A775/A775M or ASTM A934/A934M; with ASTM A615/A615M, Grade 60 deformed bars.

G. Steel Bar Mats: ASTM A184/A184M; with ASTM A615/A615M, Grade 60 deformed bars; assembled with clips.

H. Plain-Steel Wire: ASTM A1064/A1064M, galvanized.

I. Deformed-Steel Wire: ASTM A1064/A1064M.

J. Epoxy-Coated-Steel Wire: ASTM A884/A884M, Class A; coated,.

K. Joint Dowel Bars: ASTM A615/A615M, Grade 60 plain-steel bars; zinc coated (galvanized) after fabrication according to ASTM A767/A767M, Class I coating. Cut bars true to length with ends square and free of burrs.

L. Epoxy-Coated, Joint Dowel Bars: ASTM A775/A775M; with ASTM A615/A615M, Grade 60 plain-steel bars.

M. Tie Bars: ASTM A615/A615M, Grade 60; deformed.

N. Hook Bolts: ASTM A307, Grade A, internally and externally threaded. Design hook-bolt joint assembly to hold coupling against paving form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

O. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded-wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

P. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating, compatible with epoxy coating on reinforcement.

Q. Zinc Repair Material: ASTM A780/A780M.

2.4 CONCRETE MATERIALS

A. Cementitious Materials: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: ASTM C150/C150M, gray portland cement.
2. Fly Ash: ASTM C618,.
3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
4. Blended Hydraulic Cement: ASTM C595/C595M, Type IS, portland blast-furnace slag cement.

B. Normal-Weight Aggregates: ASTM C33/C33M,, uniformly graded. Provide aggregates from a single source with documented service-record data of at least 10 years' satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Coarse-Aggregate Size: 1 inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Exposed Aggregate: Selected, hard, and durable; washed; free of materials with deleterious reactivity to cement or that cause staining; from a single source, with gap-graded coarse aggregate as follows:

1. Aggregate Sizes: 3/4 to 1 inch nominal.
2. Aggregate Source, Shape, and Color: Per drawings .

D. Air-Entraining Admixture: ASTM C260/C260M.

E. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.

F. Color Pigment: ASTM C979/C979M, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.
1. Color: As indicated on plans and approved by City from manufacturer's full range.

G. Water: Potable and complying with ASTM C94/C94M.

2.5 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that comply with or exceed requirements.

B. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent. Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash or Pozzolan: 25 percent.
2. Slag Cement: 50 percent.
3. Combined Fly Ash or Pozzolan, and Slag Cement: 50 percent, with fly ash or pozzolan not exceeding 25 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

D. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

E. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

F. Concrete Mixtures: Normal-weight concrete.

1. Compressive Strength (28 Days): 4500 psi.
2. Maximum W/C Ratio at Point of Placement: 0.45.
3. Slump Limit: 4 inches, plus or minus 1 inch.

2.6 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C94/C94M and ASTM C1116/C1116M. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C94/C94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For concrete batches of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
2. For concrete batches larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd..

3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixing time, quantity, and amount of water added.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph.
2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch according to requirements in Section 312000 "Earth Moving."

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 INSTALLATION OF STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, 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 welded-wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

E. Zinc-Coated Reinforcement: Use galvanized-steel wire ties to fasten zinc-coated reinforcement. Repair cut and damaged zinc coatings with zinc repair material.

F. Epoxy-Coated Reinforcement: Use epoxy-coated steel wire ties to fasten epoxy-coated reinforcement. Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D3963/D3963M.

G. 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 of adjacent mats.

3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
2. Provide tie bars at sides of paving strips where indicated.
3. Butt Joints: Use bonding agent at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
4. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
5. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

1. Locate expansion joints at intervals of 24 feet unless otherwise indicated.
2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.

5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
6. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate grooving-tool marks on concrete surfaces.

   a. Tolerance: Ensure that grooved joints are within 3 inches either way from centers of dowels.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

   a. Tolerance: Ensure that sawed joints are within 3 inches either way from centers of dowels.

3. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.

B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

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. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. 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 reinforcement and joint devices.

H. Screed paving surface with a straightedge and strike off.

I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleedwater appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

J. Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.

K. Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.

1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.

3.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleedwater sheen has disappeared and 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 planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Burlap Finish: Drag a seamless strip of damp burlap across float-finished concrete, perpendicular to line of traffic, to provide a uniform, gritty texture.
2. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface, perpendicular to line of traffic, to provide a uniform, fine-line texture.
3. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

3.8 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by moisture curing as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven 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 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, 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 occurring during installation or 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 written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating, and repair damage during curing period.

3.9 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. Elevation: 3/4 inch.
2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-feet- long; unleveled straightedge not to exceed 1/2 inch.
4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches of tie bar.
5. Lateral Alignment and Spacing of Dowels: 1 inch.
6. Vertical Alignment of Dowels: 1/4 inch.
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches of dowel.
8. Joint Spacing: 3 inches.

9. Contraction Joint Depth: Plus 1/4 inch, no minus.
10. Joint Width: Plus 1/8 inch, no minus.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Engagea qualified testing agency to perform tests and inspections.

B. Testing Services: Testing and inspecting of composite samples of fresh concrete obtained according to ASTM C172/C172M shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.

   a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C143/C143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C231/C231M, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C1064/C1064M; one test hourly when air temperature is 40 deg F and below and when it is 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C31/C31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C39/C39M; test one specimen at seven days and two specimens at 28 days.

   a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

G. Concrete paving will be considered defective if it does not pass tests and inspections.

H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

I. Prepare test and inspection reports.

3.11 REPAIR AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for 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 paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313

SECTION 321373 - CONCRETE PAVING JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cold-applied joint sealants.
2. Hot-applied joint sealants.
3. Primers.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Concrete pavement joint sealants.
2. Joint-sealant backer materials.

B. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of joint sealant.

C. Samples for Verification: Actual sample of finished products for each kind and color of joint sealant required.

1. Size: Joint sealants in 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Paving-Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Statements: For Installer and testing agency.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Installers: Entity that employs installers and supervisors who are trained and approved by manufacturer.

1.6 PRECONSTRUCTION TESTING

A. Preconstruction Testing: Performed by a qualified testing agency.

1.7 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain joint sealants from single manufacturer for each sealant type.

2.2 JOINT SEALANTS, GENERAL

A. Compatibility: Provide joint sealants, backer materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

2.3 COLD-APPLIED JOINT SEALANTS

A. Single-Component, Nonsag, Silicone Joint Sealant: ASTM D5893/D5893M, Type NS.

B. Single-Component, Self-Leveling, Silicone Joint Sealant: ASTM D5893/D5893M, Type SL.

C. Multicomponent, Nonsag, Urethane, Elastomeric Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use T.

D. Single Component, Pourable, Urethane, Elastomeric Joint Sealant: ASTM C920, Type S, Grade P, Class 25, for Use T.

E. Multicomponent, Pourable, Urethane, Elastomeric Joint Sealant: ASTM C920, Type M, Grade P, Class 25, for Use T.

2.4 HOT-APPLIED JOINT SEALANTS

A. Hot-Applied, Single-Component Joint Sealant, Type I: ASTM D6690.

B. Hot-Applied, Single-Component Joint Sealant, Type I or Type II: ASTM D6690.

C. Hot-Applied, Single-Component Joint Sealant, Type I, II, or III: ASTM D6690.

D. Hot-Applied, Single-Component Joint Sealant, Type IV: ASTM D6690.

2.5 PRIMERS

A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Before installing joint sealants, clean out joints immediately to comply with joint-sealant manufacturer's written instructions.

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

A. Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.

B. Joint-Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions.

C. Install joint-sealant backers to support joint sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of joint-sealant backer materials.
2. Do not stretch, twist, puncture, or tear joint-sealant backer materials.
3. Remove absorbent joint-sealant backer materials that have become wet before sealant application and replace them with dry materials.

D. Install joint sealants immediately following backer material installation, using proven techniques that comply with the following:

1. Place joint sealants so they fully contact joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Joint Sealants: Immediately after joint-sealant application and before skinning or curing begins, tool sealants in accordance with the following requirements to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint:

1. Remove excess joint sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.

F. Provide joint configuration to comply with joint-sealant manufacturer's written instructions unless otherwise indicated.

3.4 CLEANING AND PROTECTION

A. Clean off excess joint sealant as the Work progresses, by methods and with cleaning materials approved in writing by joint-sealant manufacturers.

B. Protect joint sealants, during and after curing period, from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations in repaired areas are indistinguishable from the original work.

3.5 PAVING-JOINT-SEALANT SCHEDULE

A. Joints within concrete paving:

1. Joint Location:

a. Expansion and isolation joints in concrete paving.
b. Contraction joints in concrete paving.
c. Other joints as indicated.

2. Joint Sealant: Single-component, nonsag, silicone joint sealant.
3. Joint-Sealant Color: .

B. Joints within concrete paving and between concrete and asphalt paving:

1. Joint Location:

a. Joints between concrete and asphalt paving.
b. Joints between concrete curbs and asphalt paving.
c. Other joints as indicated.

2. Joint Sealant: Hot-applied, single-component joint sealant.
3. Joint-Sealant Color: Manufacturer's standard.

C. Fuel-resistant joints within concrete paving:

1. Joint Location:

a. Expansion and isolation joints in concrete paving.
b. Contraction joints in concrete paving.
c. Other joints as indicated.

2. Joint Sealant: Fuel-resistant, single-component, pourable, modified-urethane, elastomeric joint sealant.
3. Joint-Sealant Color: Manufacturer's standard.

END OF SECTION 321373

SECTION 321723 - PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Painted markings applied to asphalt paving.
2. Painted markings applied to concrete surfaces.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to marking asphalt paving or concrete surfaces including, but not limited to, the following:

a. Asphalt-paving or concrete-surface aging period before application of pavement markings.
b. Review requirements for protecting pavement markings, including restriction of traffic during installation period.

1.4 ACTION SUBMITTALS

A. Product Data: Include technical data and tested physical and performance properties.

1. Pavement-marking paint, alkyd.
2. Pavement-marking paint, solvent-borne.
3. Pavement-marking paint, acrylic.
4. Pavement-marking paint, latex.

B. Samples: For each exposed product and for each color and texture specified; on rigid backing, 8 inches square.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of City for pavement-marking work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for alkyd materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain pavement-marking paints from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design".

2.3 PAVEMENT-MARKING PAINT

A. Pavement-Marking Paint, Alkyd: Alkyd-resin type, lead and chromate free, ready mixed, complying with AASHTO M 248,; colors complying with FS TT-P-1952F.

1. Color: As indicated on plans.

B. Pavement-Marking Paint, Solvent-Borne: MPI #32, solvent-borne traffic-marking paint.

1. Color: As indicated on plans.

C. Pavement-Marking Paint, Acrylic: Acrylic, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952F, Type II, with drying time of less than [**three**] [**45**] minutes.

1. Color: As indicated on plans.

D. Pavement-Marking Paint, Latex: MPI #97, latex traffic-marking paint.

1. Color: As indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that pavement-marking substrate is dry and in suitable condition to begin pavement marking in accordance with manufacturer's written instructions.

B. Proceed with pavement marking only after unsatisfactory conditions have been corrected.

3.2 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Allow asphalt paving or concrete surfaces to age for a minimum of 30 days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to asphalt paving or concrete surface. Mask an extended area beyond edges of each stencil to prevent paint application beyond stencil. Apply paint so that it cannot run beneath stencil.
2. Broadcast glass beads uniformly into wet markings at a rate of 6 lb/gal..

3.3 PROTECTING AND CLEANING

A. Protect pavement markings from damage and wear during remainder of construction period.

B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 321723

SECTION 321726 - TACTILE WARNING SURFACING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Cast-in-place detectable warning tiles.
2. Surface-applied detectable warning tiles.

B. Related Requirements:

1. Section 321313 "Concrete Paving" for concrete walkways serving as substrates for tactile warning surfacing.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Initial Selection: For each type of exposed finish requiring color selection.

C. Samples for Verification: For each type of tactile warning surface, in manufacturer's standard sizes unless otherwise indicated, showing edge condition, truncated-dome pattern, texture, color, and cross section; with fasteners and anchors.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For tactile warning surfacing, to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

1. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.7 PROJECT CONDITIONS

A. Cold-Weather Protection: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit paver work damaged by frost or freezing.

B. Weather Limitations for Adhesive Application:

1. Apply adhesive only when ambient temperature is above 50 deg F and when temperature has not been below 35 deg F for 12 hours immediately before application. Do not apply when substrate is wet or contains excess moisture.

C. Weather Limitations for Mortar and Grout:

1. Cold-Weather Requirements: Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
2. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602. Provide artificial shade and windbreaks, and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg F and higher.

a. When ambient temperature exceeds 100 deg F, or when wind velocity exceeds 8 mph and ambient temperature exceeds 90 deg F, set unit pavers within 1 minute of spreading setting-bed mortar.

1.8 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of tactile warning surfaces that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Deterioration of finishes beyond normal weathering and wear.
b. Separation or delamination of materials and components.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 TACTILE WARNING SURFACING, GENERAL

A. Accessibility Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities for tactile warning surfaces.

1. For tactile warning surfaces composed of multiple units, provide units that when installed provide consistent side-to-side and end-to-end dome spacing that complies with requirements.

B. Source Limitations: Obtain each type of tactile warning surfacing, joint material, setting material, anchor, and fastener from single source with resources to provide materials and products of consistent quality in appearance and physical properties.

2.2 DETECTABLE WARNING MATS

A. Surface-Applied Detectable Warning Mats: Accessible truncated-dome detectable warning resilient mats, UV resistant, manufactured for adhering to existing concrete walkway surfaces, with slip-resistant surface treatment on domes, field of mat, and beveled outside edges.
1. Material: Modified rubber compound, UV resistant.
2. Color: As indicated by drawings and approved by City.
3. Shapes and Sizes:

a. Rectangular panel, as indicated on drawings

4. Dome Spacing and Configuration: Manufacturer's standard compliant spacing, in manufacturer's standard pattern.
5. Mounting: Adhered to pavement surface with adhesive.

2.3 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of tactile warning surfaces, noncorrosive and compatible with each material joined, and complying with the following:

1. Furnish stainless-steel fasteners for exterior use.
2. Fastener Heads: For nonstructural connections, use flathead or oval countersunk screws and bolts with tamper-resistant heads, colored to match tile.

B. Adhesive: As recommended by manufacturer for adhering tactile warning surfacing unit to pavement.

C. Sealant: As recommended by manufacturer for sealing perimeter of tactile warning surfacing unit.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that pavement is in suitable condition to begin installation according to manufacturer's written instructions. Verify that installation of tactile warning surfacing will comply with accessibility requirements upon completion.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF TACTILE WARNING SURFACING

A. General: Prepare substrate and install tactile warning surfacing according to manufacturer's written instructions unless otherwise indicated.

B. Place tactile warning surfacing units in dimensions and orientation indicated. Comply with location requirements of AASHTO MP 12.

3.3 INSTALLATION OF DETECTABLE WARNING MATS

A. Lay out detectable warning mats as indicated and mark concrete pavement at edges of mats.

B. Prepare existing paving surface by grinding and cleaning as recommended by manufacturer.

C. Apply adhesive to back of mat in amounts and pattern recommended by manufacturer, and set mat in place. Firmly seat mat in adhesive bed, eliminating air pockets and establishing full adhesion to pavement. If necessary, temporarily apply weight to mat to ensure full contact with adhesive.

D. Install anchor devices through face of mat and into pavement using anchors located as recommended by manufacturer. Set heads of anchors flush with mat surface.

E. Mask mat perimeter and adjacent concrete, and apply sealant in continuous bead around perimeter of mat.

F. Remove masking, adhesive, excess sealant, and soil from exposed surfaces of detectable warning mat and surrounding concrete pavement using cleaning agents recommended in writing by manufacturer.

G. Protect installed mat from traffic until adhesive has set.

3.4 CLEANING AND PROTECTION

A. Remove and replace tactile warning surfacing that is broken or damaged or does not comply with requirements in this Section. Remove in complete sections from joint to joint unless

otherwise approved by Architect. Replace using tactile warning surfacing installation methods acceptable to Architect.

B. Protect tactile warning surfacing from damage and maintain free of stains, discoloration, dirt, and other foreign material.

END OF SECTION 321726

SECTION 321816.13 - PLAYGROUND PROTECTIVE SURFACING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Unitary, textured acrylic color surfacing. (Basketball Court Surfacing)
2. Unitary, seamless play surfacing. (Poured-in-place Rubberized Play Surfacing)
3. Inorganic loose-fill surfacing. (Volleyball Court Sand)

1.3 DEFINITIONS

A. Definitions in ASTM F2223 apply to Work of this Section.

B. Critical Height: Standard measure of shock attenuation according to ASTM F2223; same as "critical fall height" in ASTM F1292. According to ASTM F1292, this approximates "the maximum fall height from which a life-threatening head injury would not be expected to occur."

C. SBR: Styrene-butadiene rubber.

D. Unitary Surfacing: A protective surfacing of one or more material components bound together to form a continuous surface; same as "unitary system" in ASTM F2223.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each type of protective surfacing.

1. Include plans, sections, placement and penetration details, and attachment to substrates.
2. Include accessories and edge terminations.
3. Include patterns made by varying colors of surfacing and details of graphics.
4. Include fall heights and use zones for equipment and structures specified in Section 116800 "Play Field Equipment and Structures," coordinated with the critical heights for protective surfacing.

C. Samples for Initial Selection: For each type of exposed finish.

1. Include Samples of accessories involving color selection.

D. Samples for Verification: For each type of protective surfacing and exposed finish.

1. Include Samples of accessories to verify color and finish selection.
2. Unitary, Seamless Surfacing: Minimum 6 by 6 inches.
3. Loose-Fill Surfacing: Minimum 1 quart.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and testing agency.

B. Material Certificates: For each type of loose-fill surfacing.

C. Product Certificates: For each type of unitary surfacing product.

D. Field quality-control reports.

E. Sample Warranty: For manufacturer's special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For playground and sport protective surfacing to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Loose Fill: Coordinate with City for required amounts and storage.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Mockups: Build mockups to verify selections made under Sample submittals and to set quality standards for materials and execution.

1. Build mockups for play and sport protective surfacing including accessories.

a. Size: 48 inches by 48 inches.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 WARRANTY

A. Special Warranty: Manufacturer and Installer agree to repair or replace components of protective surfacing that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Reduction in impact attenuation as measured by reduction of critical fall height.
b. Deterioration of protective surfacing and other materials beyond normal weathering.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain protective surfacing materials, including loose-fill accessories, from single source from single manufacturer.

1. Provide geosynthetic accessories of each type from source recommended by manufacturer of protective surfacing materials.

2.2 PERFORMANCE REQUIREMENTS

A. Impact Attenuation: Critical fall height tested according to ASTM F1292.

B. Accessibility Standard: Minimum surfacing performance according to ASTM F1951.

2.3 UNITARY, TEXTURED ACRYLIC COLOR SURFACING- Basketball Courts-Per Drawings

A. Description: Manufacturer's standard, site-mixed and applied, textured acrylic material with color, with combined, overall thickness as required. Product shall be installed, inspected, and tested per manufacturer’s specifications. Testing shall conform to the guidelines of the ASBA for planarity. All surface coatings products shall be supplied by a single manufacturer. The contractor shall record the batch number of each product used on the site and maintain it through the warranty period. The contractor shall provide the inspector, upon request, an estimate of the volume of each product to be used on the site. The installer shall be an

authorized applicator of the specified system. The manufacturer's representative shall be available to help resolve material questions.

1. Acrylic Color Playing Surface (Plexichrome Ultra Performance/Plexipave Color Base) – for use as the finish color and texture. Plexichrome and Plexipave Color Base are blended at the job site to achieve the correct surface texture. *Factory Fortified Plexipave may be used as an alternative material. (Product per plan or City approved equal.)

2. Line Paint (California Line Paint) – for use as the line marking on the court/play surface.

2.4 UNITARY, DUAL-DENSITY, SEAMLESS SURFACING- Play Areas-Per drawings

A. Description: Manufacturer's standard, site-mixed and applied, two-layer material with wearing layer over cushioning layer, with combined, overall thickness as required, tested for impact attenuation according to ASTM F1292 and for accessibility according to ASTM F1951.
   1. Wearing Layer: Formulation of EPDM rubber particles or polyurethane granules, binder, and other organic and inorganic components.
   2. Cushioning Layer: Formulation of recycled SBR particles and binder.
   3. Binder: Weather-resistant, UV-stabilized, flexible, nonhardening, 100 percent solids polyurethane.
   4. Critical Height: As indicated on Drawings.
   5. Overall Thickness: Not less than as indicated on the drawings.
   6. Primer/Adhesive: Manufacturer's standard primer and weather-resistant, moisture-cured polyurethane adhesive suitable for unit, substrate, and location.
   7. Wearing Layer Color(s): As indicated of drawings.
      a. Design: Where colored pattern is required, provide as indicated on Drawings.

B. Leveling and Patching Material: Portland cement-based grout or epoxy- or polyurethane-based formulation suitable for exterior use and approved by protective surfacing manufacturer.

2.5 INORGANIC LOOSE-FILL SURFACING- Volleyball Courts

A. Inorganic Aggregate Materials: Clean, washed, and free of loam, clay, organic matter, debris, and other foreign substances. Must be naturally weathered, be sub angular/ rounded, and not be acquired from a crushed rock source.

   1. Beach Volleyball Sand: Complying with ASTM for the following sieve analysis test results:

a. Sieve Sizes and Percent Passing through Screen: No. 5 passing 100 percent, No. 10 passing 98 percent, No. 18 passing 85 percent, No. 35 passing 55 percent, No. 60 passing 15 percent and No. 120 passing zero to 3 percent.

2. Critical Height: As indicated on Drawings.
3. Uncompressed Material Depth: Not less than as indicated on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for subgrade elevations, slope, and drainage and for other conditions affecting performance of the Work.

1. Verify that substrates are sound and without high spots, ridges, holes, and depressions.

B. Hard-Surface Substrates: Verify that substrates are satisfactory for unitary, protective surfacing installation and that substrate surfaces are dry, cured, and uniformly graded per drawings within recommended tolerances according to protective surfacing manufacturer's written requirements for cross-section profile.

1. Asphalt Substrates: Verify that substrates are dry, sufficiently cured to bond with adhesive, and free from surface defects, dust, dirt, loose particles, grease, oil, and other contaminants incompatible with protective surfacing or that may interfere with adhesive bond.
2. Concrete Substrates: Verify that substrates are dry and free from surface defects, laitance, glaze, efflorescence, curing compounds, form-release agents, hardeners, dust, dirt, loose particles, grease, oil, and other contaminants incompatible with protective surfacing or that may interfere with adhesive bond. Determine adhesion, dryness, and acidity characteristics by performing procedures recommended in writing by protective surfacing manufacturer.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates to receive surfacing products according to protective surfacing manufacturer's written instructions.

B. Hard-Surface Substrates: Clean surface free of laitance, efflorescence, curing compounds, and other contaminants incompatible with protective surfacing.

1. Repair: Fill holes and depressions in unsatisfactory surfaces with leveling and patching material.

2. Treatment: Mechanically abrade or otherwise prepare concrete substrates according to protective surfacing manufacturer's written instructions to achieve adequate roughness.
3. Treat control joints and other nonmoving substrate cracks to prevent telegraphing through protective surfacing.

3.3 INSTALLATION OF SEAMLESS ACRYLIC SURFACING

A. Mix and apply components of seamless surfacing according to manufacturer's written instructions to produce uniform, monolithic, and protective surfacing of required overall thickness.

1. Substrate Primer: Apply over prepared substrate at manufacturer's standard spreading rate for type of substrate.
2. Intercoat Primer: Over cured layer, apply primer at manufacturer's standard spreading rate.
3. Wearing Layer: Spread over primed base course to form a uniform layer applied at manufacturer's standard spreading rate in one continuous operation and, except where color changes, with no cold joints. Finish surface to produce manufacturer's standard wearing-surface texture.

   a. Design: Where colored pattern is required, place colored, design material as soon as previously placed material is sufficiently cured, using primer or adhesive if required by manufacturer's written instructions.
4. Edge Treatment: As indicated on Drawings. Fully adhere edges to substrate with full coverage of substrate. Maintain fully cushioned thickness required to comply with performance requirements.
5. Install per manufacturer’s specifications.

3.4 INSTALLATION OF SEAMLESS CUSHIONED SURFACING

A. Mix and apply components of seamless surfacing according to manufacturer's written instructions to produce uniform, monolithic, and impact-attenuating protective surfacing of required overall thickness.

1. Substrate Primer: Apply over prepared substrate at manufacturer's standard spreading rate for type of substrate.
2. Poured Cushioning Layer: Spread evenly over primed substrate to form a uniform layer applied at manufacturer's standard spreading rate in one continuous operation, with a minimum of cold joints.
3. Intercoat Primer: Over cured cushioning layer, apply primer at manufacturer's standard spreading rate.
4. Wearing Layer: Spread over primed base course to form a uniform layer applied at manufacturer's standard spreading rate in one continuous operation and, except where color changes, with no cold joints. Finish surface to produce manufacturer's standard wearing-surface texture.

a. Design: Where colored pattern is required, place colored, design material as soon as previously placed material is sufficiently cured, using primer or adhesive if required by manufacturer's written instructions.

5. Edge Treatment: As indicated on Drawings. Fully adhere edges to substrate with full coverage of substrate. Maintain fully cushioned thickness required to comply with performance requirements.
6. Install per manufacturer's specifications.

3.5 INSTALLATION OF LOOSE-FILL SURFACING

A. Apply components of loose-fill surfacing according to manufacturer's written instructions to produce a uniform surface.

B. Edging: Place and permanently secure edging in place, as indicated on the drawings.

C. Loose Fill: Place loose-fill materials to required depth after installation of sport equipment support posts and foundations. Include manufacturer's recommended amount of additional material to offset natural compaction over time.

D. Finish Grading: Hand rake to a uniformly smooth finished surface and to required elevations.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests.

B. Perform the following tests with the assistance of a factory-authorized service representative:

1. Perform "Installed Surface Performance Test" according to ASTM F1292 for each protective surfacing type and thickness in each playground and sports area.

C. Playground and sport protective surfacing will be considered defective if it does not pass tests.

D. Prepare test reports.

3.7 PROTECTION

A. Prevent traffic over seamless surfacing for not less than 48 hours after installation. Protect per manufacturer's recommendations.

END OF SECTION 321816.13

SECTION 323113 - CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Chain-link fences.
2. Swing gates.

B. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for cast-in-place concrete equipment bases/pads for gate operators and controls and post footings.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Inspect and discuss roughing-in, equipment bases, and other preparatory work specified elsewhere.
2. Review required testing, inspecting, and certifying procedures.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:

a. Fence and gate posts, rails, and fittings.
b. Chain-link fabric, reinforcements, and attachments.
c. Accessories: Per plan.
d. Gates and hardware.
e. Gate operators, including operating instructions and motor characteristics.

B. Shop Drawings: For each type of fence and gate assembly.

1. Include plans, elevations, sections, details, and attachments to other work.
2. Include accessories, hardware, gate operation, and operational clearances.

C. Samples for Initial Selection: For each type of factory-applied finish.

D. Samples for Verification: For each type of component with factory-applied finish, prepared on Samples of size indicated below:

1. Polymer-Coated Components: In 6-inch lengths for components and on full-sized units for accessories.

E. Delegated-Design Submittal: For structural performance of chain-link fence and gate frameworks, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer.

B. Product Certificates: For each type of chain-link fence, and gate.

C. Product Test Reports: For framework strength according to ASTM F1043, for tests performed by manufacturer and witnessed by a qualified testing agency or a qualified testing agency.

D. Field quality-control reports.

E. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For gate operators to include in emergency, operation, and maintenance manuals.

1.7 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing fence grounding; member company of NETA or an NRTL.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

B. Emergency Access Requirements: According to requirements of authorities having jurisdiction for gates with automatic gate operators serving as a required means of access.

C. Mockups: Build mockups to set quality standards for fabrication and installation.

1. Build mockup for typical chain-link fence and gate, including accessories.

a. Size: 10-foot length of fence.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

1.9 WARRANTY

A. Special Warranty: Manufacturer agrees and/ or Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Failure to comply with performance requirements.
b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
c. Faulty operation of gate operators and controls.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design chain-link fence and gate frameworks.

B. Structural Performance: Chain-link fence and gate frameworks shall withstand the design wind loads and stresses for fence height(s) and under exposure conditions indicated according to ASCE/SEI 7.

1. Design Wind Load: As indicated on Drawings.

a. Minimum Post Size: Determine according to ASTM F1043 for post spacing not to exceed 10 feet for Material Group IA, ASTM F1043, Schedule 40 steel pipe.
b. Minimum Post Size and Maximum Spacing: Determine according to CLFMI WLG 2445, based on mesh size and pattern specified.

C. Lightning Protection System: Maximum resistance-to-ground value of 25 ohms at each grounding location along fence under normal dry conditions.

2.2 FENCE FRAMEWORK

A. Posts and Rails: ASTM F1043 for framework, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F1043 or ASTM F1083 based on the following:

1. Fence Height: As indicated on Drawings.
2. Light-Industrial-Strength Material: Group IC-L, round steel pipe, electric-resistance-welded pipe.

   a. Line Post: 2.375 inches in diameter.
   b. End, Corner, and Pull Posts: 4.0 inches.

3. Horizontal Framework Members: Intermediate, top, and bottom rails according to ASTM F1043.

   a. Top Rail: Per plan.

4. Brace Rails: ASTM F1043.
5. Metallic Coating for Steel Framework:

   a. Type A: Not less than minimum 2.0-oz./sq. ft. average zinc coating according to ASTM A123/A123M or 4.0-oz./sq. ft. zinc coating according to ASTM A653/A653M.
   b. Type B: Zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film.
   c. External, Type B: Zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film. Internal, Type D, consisting of 81 percent, not less than 0.3-mil- thick, zinc-pigmented coating.
   d. Type C: Zn-5-Al-MM alloy, consisting of not less than 1.8-oz./sq. ft. coating.
   e. Coatings: Any coating above.

6. Polymer coating over metallic coating.

   a. Color: Per Drawings., according to ASTM F934.

2.3 TENSION WIRE

A. Metallic-Coated Steel Wire: 0.177-inch- diameter, marcelled tension wire according to ASTM A817 or ASTM A824, with the following metallic coating:

1. Type I: Aluminum coated (aluminized).
2. Type II: Zinc coated (galvanized) by hot-dip process, with the following minimum coating weight:

   a. Class 3: Not less than 0.8 oz./sq. ft. of uncoated wire surface.

b. Class 4: Not less than 1.2 oz./sq. ft. of uncoated wire surface.
c. Class 5: Not less than 2 oz./sq. ft. of uncoated wire surface.
d. Matching chain-link fabric coating weight.

3. Type III: Zn-5-Al-MM alloy with the following minimum coating weight:

a. Class 60: Not less than 0.6 oz./sq. ft. of uncoated wire surface.
b. Class 100: Not less than 1 oz./sq. ft. of uncoated wire surface.
c. Matching chain-link fabric coating weight.

B. Polymer-Coated Steel Wire: 0.177-inch- diameter, tension wire according to ASTM F1664, Class 1 over aluminum-coated steel wire.

1. Color: Match chain-link fabric, according to ASTM F934.

C. Aluminum Wire: 0.192-inch- diameter tension wire, mill finished, according to ASTM B211, Alloy 6061-T94 with 50,000-psi minimum tensile strength.

2.4 SWING GATES

A. General: ASTM F900 for gate posts and single or double swing gate types.

1. Gate Leaf Width: As indicated.
2. Framework Member Sizes and Strength: Based on gate fabric height as indicated.

B. Pipe and Tubing:

1. Zinc-Coated Steel: ASTM F1043 and ASTM F1083; protective coating and finish to match fence framework.
2. Aluminum: ASTM B429/B429M; manufacturer's standard finish.
3. Gate Posts: Round tubular steel Round tubular aluminum.
4. Gate Frames and Bracing: Round tubular steel.

C. Frame Corner Construction: Welded or assembled with corner fittings.

D. Extended Gate Posts and Frame Members: Fabricate gate posts and frame end members to extend as indicated above top of chain-link fabric at both ends of gate assemblies.

E. Hardware:

1. Hinges: 180-degree outward swing.
2. Latch: Permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.
3. Lock: Manufacturer's standard internal device.
4. Closer: As indicated..

2.5 FITTINGS

A. Provide fittings according to ASTM F626.

B. Post Caps: Provide for each post.

1. Provide line post caps with loop to receive tension wire or top rail.

C. Rail and Brace Ends: For each gate, corner, pull, and end post.

D. Rail Fittings: Provide the following:

1. Top Rail Sleeves: Pressed-steel or round-steel tubing not less than 6 inches long.
2. Rail Clamps: Line and corner boulevard clamps for connecting intermediate and bottomrails to posts.

E. Tension and Brace Bands: Pressed steel.

F. Tension Bars: Steel, length not less than 2 inches shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.

G. Truss Rod Assemblies: Steel, hot-dip galvanized after threading rod and turnbuckle or other means of adjustment.

H. Tie Wires, Clips, and Fasteners: According to ASTM F626.

1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, according to the following:

a. Hot-Dip Galvanized Steel: 0.148-inch- diameter wire; galvanized coating thickness matching coating thickness of chain-link fence fabric.

I. Finish:

1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz./sq. ft. of zinc.

a. Polymer coating over metallic coating.

2. Aluminum: Mill finish.

2.6 GROUT AND ANCHORING CEMENT

A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout, recommended in writing by manufacturer, for exterior applications.

B. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring,

patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating, and that is recommended in writing by manufacturer for exterior applications.

2.7 GROUNDING MATERIALS

A. Comply with requirements in Section 260526 "Grounding and Bonding for Electrical Systems."

B. Connectors and Grounding Rods: Listed and labeled for complying with UL 467.

1. Connectors for Below-Grade Use: Exothermic welded type.
2. Grounding Rods: Copper-clad steel, 5/8 by 96 inches.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.

1. Do not begin installation before final grading is completed unless otherwise permitted by Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.3 CHAIN-LINK FENCE INSTALLATION

A. Install chain-link fencing according to ASTM F567 and more stringent requirements specified.

1. Install fencing on established boundary lines inside property line.

B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.

C. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.

1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.

2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.

   a. Exposed Concrete: Extend 2 inches above grade; shape and smooth to shed water.
   b. Concealed Concrete: Place top of concrete below grade as indicated on Drawings to allow covering with surface material.

D. Terminal Posts: Install terminal end, corner, and gate posts according to ASTM F567 and terminal pull posts at changes in horizontal or vertical alignment of as indicated on Drawings. For runs exceeding 500 feet, space pull posts an equal distance between corner or end posts.

E. Line Posts: Space line posts uniformly at as indicated on drawings but not to exceed 10 feet o.c.

F. Post Bracing and Intermediate Rails: Install according to ASTM F567, maintaining plumb position and alignment of fence posts. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.

   1. Locate horizontal braces at midheight of fabric 72 inches or higher, on fences with top rail, and at two-third fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.

G. Tension Wire: Install according to ASTM F567, maintaining plumb position and alignment of fence posts. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch- diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches o.c. Install tension wire in locations indicated before stretching fabric. Provide horizontal tension wire at the following locations:

   1. Extended along top and bottom of fence fabric. Install top tension wire through post cap loops. Install bottom tension wire within 6 inches of bottom of fabric and tie to each post with not less than same diameter and type of wire.

H. Top Rail: Install according to ASTM F567, maintaining plumb position and alignment of fence posts. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.

I. Intermediate and Bottom Rails: Secure to posts with fittings.

J. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 1-inch bottom clearance between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

K. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts, with tension bands spaced not more than 15 inches o.c.

L. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric according to ASTM F626. Bend ends of wire to minimize hazard to individuals and clothing.

1. Maximum Spacing: Tie fabric to line posts at 12 inches o.c. and to braces at 24 inches o.c.

M. Fasteners: Install nuts for tension bands and carriage bolts on the side of fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

3.4 GATE INSTALLATION

A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation.

3.5 GATE-OPERATOR INSTALLATION

A. Install gate operators according to manufacturer's written instructions, aligned and true to fence line and grade.

B. Excavation: Hand-excavate holes for posts, pedestals, and equipment bases/pads, in firm, undisturbed soil to dimensions and depths and at locations according to gate-operator component manufacturer's written instructions and as indicated.

C. Ground electric-powered motors, controls, and other devices according to NFPA 70 and manufacturer's written instructions.

3.6 GROUNDING AND BONDING

A. Comply with requirements in Section 260526 "Grounding and Bonding for Electrical Systems."

B. Fence and Gate Grounding:

1. Ground for fence and fence posts shall be a separate system from ground for gate and gate posts.
2. Install ground rods and connections at maximum intervals of 1500 feet.
3. Fences within 100 Feet of Buildings, Structures, Walkways, and Roadways: Ground at maximum intervals of 750 feet.
4. Ground fence on each side of gates and other fence openings.

    a. Bond metal gates to gate posts.

b. Bond across openings, with and without gates, except openings indicated as intentional fence discontinuities. Use No. 2 AWG wire and bury it at least 18 inches below finished grade.

C. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at a ground rod located a maximum distance of 150 feet on each side of crossing.

D. Fences Enclosing Electrical Power Distribution Equipment: Ground according to IEEE C2 unless otherwise indicated.

E. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at grounding location.

1. Make grounding connections to each barbed wire strand with wire-to-wire connectors designed for this purpose.
2. Make grounding connections to each barbed tape coil with connectors designed for this purpose.

F. Connections:

1. Make connections with clean, bare metal at points of contact.
2. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
3. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
4. Make above-grade ground connections with mechanical fasteners.
5. Make below-grade ground connections with exothermic welds.
6. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

G. Bonding to Lightning Protection System: Ground fence and bond fence grounding conductor to lightning protection down conductor or lightning protection grounding conductor according to NFPA 780.

H. Comply with requirements in Section 264113 "Lightning Protection for Structures."

3.7 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests.

B. Grounding Tests: Comply with requirements in Section 264113 "Lightning Protection for Structures."

C. Prepare test reports.

3.8 ADJUSTING

A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Automatic Gate Operator: Energize circuits to electrical equipment and devices, start units, and verify proper motor rotation and unit operation.

1. Hydraulic Operator: Purge operating system, adjust pressure and fluid levels, and check for leaks.
2. Test and adjust operators, controls[**, alarms,**] and safety devices. Replace damaged and malfunctioning controls and equipment.
3. Lubricate operator and related components.

C. Lubricate hardware and other moving parts.

3.9 DEMONSTRATION

A. Engage a factory-authorized service representative to train City's maintenance personnel to adjust, operate, and maintain chain-link fences and gates.

END OF SECTION 323113

SECTION 323119 - DECORATIVE METAL FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Swing gates.
   2. Gate operators, including controls.

B. Related Requirements:

   1. Section 033000 "Cast-in-Place Concrete" for concrete bases for gate operators, drives, and controls and post concrete fill.
   2. Division 26 Sections for electrical service and connections for system disconnect switches and powered devices including, but not limited to, motor operators, controls, and limit switches.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Gates.

   1. Include plans, elevations, sections, gate locations, post spacing, and mounting attachment details, and grounding details.
   2. Gate Operator: Show locations and details for installing operator components, switches, and controls. Indicate motor size, electrical characteristics, drive arrangement, mounting, and grounding provisions.
   3. Wiring Diagrams: Include diagrams for power, signal, and control wiring.

C. Samples: For each fence material and for each color specified.

   1. Provide Samples 12 inches in length for linear materials.

1.5 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

B. Product Test Reports: For decorative metallic-coated-steel tubular picket fences, including finish, indicating compliance with referenced standard and other specified requirements.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For gate operators to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Include 10-foot length of fence complying with requirements.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Lightning-Protection System: Maximum grounding-resistance value of 25 ohms under normal dry conditions.

2.2 SWING GATES

A. Gate Configuration: As indicated.

B. Gate Frame Height: As indicated.

C. Gate Opening Width: As indicated.

D. Automated vehicular gates shall comply with ASTM F2200,.

E. Galvanized-Steel Frames and Bracing: Fabricate members from square tubes 2 by 2 inches formed from 0.108-inch nominal-thickness, metallic-coated steel sheet or formed from 0.105-inch nominal-thickness steel sheet and hot-dip galvanized after fabrication.

F. Frame Corner Construction: Welded or assembled with corner fittings and 5/16-inch-diameter, adjustable truss rods for panels 5 feet wide or wider.

G. Additional Rails: Provide as indicated, complying with requirements for fence rails.

H. Infill: Comply with requirements for adjacent fence.

I. Picket Size, Configuration, and Spacing: Comply with requirements for adjacent fence.

1. Treillage: Provide iron castings of pattern indicated between each pair of pickets. Finish as specified for adjacent fence.

J. Hardware: Latches permitting operation from both sides of gate, hinges, and keepers for each gate leaf more than 5 feet wide. Provide cane bolts for pairs of gates. Fabricate latches with integral eye openings for padlocking; padlock accessible from both sides of gate.

K. Spring Hinges: BHMA A156.17, Grade 1, suitable for exterior use.

1. Function: 320 - Gate spring pivot hinge. Adjustable tension.
2. Material: Malleable iron; galvanized.

L. Hinges: BHMA A156.1, Grade 1, suitable for exterior use.

1. Function: 39 - Full surface, triple weight, antifriction bearing.
2. Material: Wrought steel, forged steel, cast steel, or malleable iron; galvanized.

M. Rim Locks: BHMA A156.5, Grade 1, suitable for exterior use.

1. Function: 626 - Interlocking deadbolt operated by key from either side.
2. Material: Cast, forged, or extruded brass or bronze.
3. Mounting Plate: Configuration necessary for mounting locks. Fabricate from 1/8-inch-thick, steel plate; galvanized.

N. Cane Bolts: Provide for inactive leaf of pairs of gates. Fabricated from 1/2-inch- diameter, round steel bars, hot-dip galvanized after fabrication. Finish to match gates. Provide galvanized-steel pipe strikes to receive cane bolts in both open and closed positions.

O. Finish exposed welds to comply with NOMMA Guideline 1, Finish #2 - completely sanded joint, some undercutting and pinholes okay.

P. Galvanizing: For items other than hardware that are indicated to be galvanized, hot-dip galvanize to comply with ASTM A123/A123M. For hardware items, hot-dip galvanize to comply with ASTM A153/A153M.

Q. Metallic-Coated-Steel Finish: High-performance coating.

R. Steel Finish: High-performance coating.

S. Aluminum Finish: Baked enamel or powder coating.

2.3 GATE OPERATORS

A. Gate Operators:

B. Provide factory-assembled automatic operating system designed for gate size, type, weight, and operation frequency. Provide operation control system with characteristics suitable for Project conditions, with remote-control stations, safety devices, and weatherproof enclosures; coordinate electrical requirements with building electrical system.

1. Provide operator designed so motor may be removed without disturbing limit-switch adjustment and without affecting auxiliary emergency operator.
2. Provide operator with UL approval.
3. Provide electronic components with built-in troubleshooting diagnostic feature.
4. Provide unit designed and wired for both right-hand/left-hand opening, permitting universal installation.

C. Comply with NFPA 70.

D. UL Standard: Manufacturer and label gate operators to comply with UL 325.

E. Emergency Access Requirements: Comply with requirements of authorities having jurisdiction for automatic gate operators on gates that must provide emergency access.

F. Motor Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, within installed environment, with indicated operating sequence, and without exceeding nameplate rating or considering service factor. Comply with NEMA MG 1.

G. Gate Operators: Gate In-ground mounted and as follows:

1. Hydraulic Swing Gate Operators:

a. Duty: Heavyduty, commercial/industrial.
b. Gate Speed: Minimum 60 feet per minute.
c. Maximum Gate Weight: As indicated on drawings.
d. Frequency of Use: Continuous duty.
e. Operating Type: Wheel-and-rail drive with manual release.
f. Hydraulic Fluid: Of viscosity required for gate operation at ambient temperature range for Project.
g. Locking: Hydraulic in both directions.
h. Heater: Manufacturer's standard track and roller heater with thermostatic control.

H. Remote Controls: Electric controls separated from gate and motor and drive mechanism, with NEMA ICS 6, Type 1 enclosure for concrete base mounting, and with space for additional optional equipment. Provide the following remote-control device(s):

1. Control Station: Keyed, two-position switch with open, stop, and close function; located remotely from gate. Provide two keys per station.

I. Vehicle Loop Detector: System includes automatic closing timer with adjustable time delay, timer cutoff switch, and loop detector designed to open and close gate, hold gate open until traffic clears, and reverse gate. System includes electronic detector with adjustable detection patterns, adjustable sensitivity and frequency settings, and panel indicator light designed to detect presence or transit of a vehicle over an embedded loop of wire and to emit a signal activating the gate operator. System includes number of loops consisting of multiple strands of wire, number of turns, loop size, and method of placement, as recommended in writing by detection system manufacturer for function indicated, at location indicated on Drawings.

J. Vehicle Presence Detector: System includes automatic closing timer with adjustable time delay, timer cutoff switch, and presence detector designed to open and close gate hold gate open until traffic clears reverse gate. System includes retroreflective detector with adjustable detection zone pattern and sensitivity, designed to detect the presence or transit of a vehicle in gate pathway when infrared beam in zone pattern is interrupted, and to emit a signal activating the gate operator.

K. Obstruction Detection Devices: Provide each motorized gate with automatic safety sensor(s). Activation of sensor(s) causes operator to immediately function as follows:

1. Action: Reverse gate in both opening and closing cycles, and hold until clear of obstruction.
2. Action: Stop gate in opening cycle and reverse gate in closing cycle, and hold until clear of obstruction.
3. Internal Sensor: Built-in torque or current monitor senses gate is obstructed.
4. Sensor Edge: Contact-pressure-sensitive safety edge, profile, and sensitivity designed for type of gate and component indicated, in locations as follows. Connect to control circuit using gate edge transmitter and operator receiver system.
   a. Where indicated on Drawings.

L. Limit Switches: Adjustable switches, interlocked with motor controls and set to automatically stop gate at fully retracted and fully extended positions.

M. Emergency Release Mechanism: Quick-disconnect release of operator drive system of the following type, permitting manual operation if operator fails. Design system so control-circuit power is disconnected during manual operation.

2.4 STEEL AND IRON

A. Plates, Shapes, and Bars: ASTM A36/A36M.

B. Bars (Pickets): Hot-rolled, carbon steel complying with ASTM A29/A29M, Grade 1010.

C. Tubing: ASTM A500/A500M, cold-formed steel tubing.

D. Bar Grating: NAAMM MBG 531.

1. Bars: Hot-rolled steel strip, ASTM A1011/A1011M, Commercial Steel, Type B.

2. Wire Rods: ASTM A510/A510M.

E. Galvanized-Steel Sheet: ASTM A653/A653M, structural quality, Grade 50, with G90 coating.

F. Castings: Either gray or malleable iron unless otherwise indicated.

1. Gray Iron: ASTM A48/A48M, Class 30.
2. Malleable Iron: ASTM A47/A47M.

2.5 COATING MATERIALS

A. Shop Primers for Steel: Provide primers that comply with Section 099600 "High-Performance Coatings."

B. Shop Primer for Steel: Manufacturer's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

C. Epoxy Primer for Galvanized Steel: Epoxy primer recommended in writing by topcoat manufacturer.

1. Products: Subject to compliance with requirements, per drawings.

2.6 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

1. For aluminum, provide type and alloy as recommended by producer of metal to be welded and as required for strength and compatibility in fabricated items.

B. Concrete: Normal-weight, air-entrained, ready-mix concrete complying with requirements in Section 033000 "Cast-in-Place Concrete" with a minimum 28-day compressive strength of 3000 psi, 3-inch slump, and 1-inch maximum aggregate size or dry, packaged, normal-weight concrete mix complying with ASTM C387/C387M mixed with potable water according to manufacturer's written instructions.

C. Nonshrink Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M and specifically recommended by manufacturer for exterior applications.

2.7 GROUNDING MATERIALS

A. Comply with requirements of Section 260526 "Grounding and Bonding for Electrical Systems."

B. Grounding Conductors: Size as indicated on Drawings. Bare, solid wire for No. 6 AWG and smaller; stranded wire for No. 4 AWG and larger.

1. Material above Finished Grade: Aluminum.
2. Material on or below Finished Grade: Copper.
3. Bonding Jumpers: Braided copper tape, 1-5/8 inch wide and 1/16 inch thick, woven of No. 30 AWG bare copper wire, terminated with copper ferrules.

C. Grounding Connectors and Grounding Rods: Comply with UL 467.

1. Connectors for Below-Grade Use: Exothermic-welded type.
2. Grounding Rods: Copper-clad steel.

a. Size: 5/8 by 96 inches.

2.8 STEEL FINISHES

A. Surface Preparation: Clean surfaces according to SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning." After cleaning, apply a conversion coating compatible with the organic coating to be applied over it.

B. Powder Coating: Immediately after cleaning, apply manufacturer's standard two-coat finish consisting of epoxy primer and TGIC polyester topcoat to a minimum total dry film thickness of not less than 8 mils. Comply with coating manufacturer's written instructions.

1. Color and Gloss: As indicated on drawings.

C. Primer Application: Apply zinc-rich epoxy primer immediately after cleaning, to provide a minimum dry film thickness of 2 mils per applied coat, to surfaces that are exposed after assembly and installation, and to concealed surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, construction layout, and other conditions affecting performance of the Work.

B. Do not begin installation before final grading is completed unless otherwise permitted by Architect.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

1. Construction layout and field engineering are specified in Section 017300 "Execution."

3.3 DECORATIVE FENCE INSTALLATION

A. Install fences according to manufacturer's written instructions.

B. Install fences by setting posts as indicated and fastening rails and infill panels to posts. Peen threads of bolts after assembly to prevent removal.

C. Post Excavation: Drill or hand-excavate holes for posts in firm, undisturbed soil. Excavate holes to a diameter of not less than 4 times post size and a depth of not less than 24 inches plus 3 inches for each foot or fraction of a foot that fence height exceeds 4 feet.

D. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.

1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.

2. Posts Set in Concrete: Extend post to within 6 inches of specified excavation depth, but not closer than 3 inches to bottom of concrete.
3. Space posts uniformly at as indicated on the drawings. 6 feet 8 feet Insert dimension o.c.

3.4 GATE INSTALLATION

A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

3.5 GATE OPERATOR INSTALLATION

A. General: Install gate operators according to manufacturer's written instructions, aligned and true to fence line and grade.

B. Excavation for Support Posts, Pedestals, Concrete Bases: Hand-excavate holes for bases in firm, undisturbed soil to dimensions and depths and at locations as required by gate operator component manufacturer's written instructions and as indicated.

C. Concrete Bases: Cast-in-place or precast concrete, depth not less than 12 inches, dimensioned and reinforced according to gate operator component manufacturer's written instructions and as indicated on Drawings.

D. Vehicle Loop Detector System: Cut grooves in pavement and bury and seal wire loop according to manufacturer's written instructions. Connect to equipment operated by detector.

E. Comply with NFPA 70 and manufacturer's written instructions for grounding of electric-powered motors, controls, and other devices.

3.6 GROUNDING AND BONDING

A. Comply with Section 260526 "Grounding and Bonding for Electrical Systems."

B. Fence Grounding: Install at maximum intervals of 1500 feet except as follows:

1. Fences within 100 Feet of Buildings, Structures, Walkways, and Roadways: Ground at maximum intervals of 750 feet.

a. Gates and Other Fence Openings: Ground fence on each side of opening.

1) Bond metal gates to gate posts.
2) Bond across openings, with and without gates, except at openings indicated as intentional fence discontinuities. Use No. 2 AWG wire and bury it at least 18 inches below finished grade.

C. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at a maximum distance of 150 feet on each side of crossing.

D. Fences Enclosing Electrical Power Distribution Equipment: Ground as required by IEEE C2 unless otherwise indicated.

E. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at grounding location.

F. Bonding Method for Gates: Connect bonding jumper between gate post and gate frame.

G. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.
2. Make connections with clean, bare metal at points of contact.
3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
4. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

H. Bonding to Lightning-Protection System: If fence terminates at lightning-protected building or structure, ground the fence and bond the fence grounding conductor to lightning-protection down conductor or lightning-protection grounding conductor, complying with NFPA 780.

3.7 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

1. Grounding-Resistance Tests: Subject completed grounding system to a megger test at each grounding location. Measure grounding resistance not less than two full days after last trace of precipitation, without soil having been moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural grounding resistance. Perform tests by two-point method according to IEEE 81.
2. Excessive Grounding Resistance: If resistance to grounding exceeds specified value, notify Architect promptly. Include recommendations for reducing grounding resistance and a proposal to accomplish recommended work.
3. Report: Prepare test reports of grounding resistance at each test location certified by a testing agency. Include observations of weather and other phenomena that may affect test results.

3.8 ADJUSTING

A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Automatic Gate Operators: Energize circuits to electrical equipment and devices. Adjust operators, controls, safety devices, alarms, and limit switches.

1. Hydraulic Operators: Purge operating system, adjust pressure and fluid levels, and check for leaks.
2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
3. Test and adjust controls, alarms, and safeties. Replace damaged and malfunctioning controls and equipment.

C. Lubricate hardware, gate operators, and other moving parts.

3.9 DEMONSTRATION

A. Train City's personnel to adjust, operate, and maintain gates.

END OF SECTION 323119

SECTION 323300 - SITE FURNISHINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Seating.
2. Tables.
3. Bicycle racks.
4. Trash receptacles.
5. Bollards.
6. Dogi-Pot Waste Station
7. Tree Grates
8. Drinking Fountain
9. Restroom Building
10. Concession/Restroom/Storage Building

B. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for installing pipe sleeves cast in concrete footings.
2. Section 312000 "Earth Moving" for excavation for installing concrete footings.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified.

C. Samples for Initial Selection: For units with factory-applied finishes.

D. Samples for Verification: For each type of exposed finish, not less than 6-inch- long linear components and 4-inch- square sheet components.

1. Include full-size Samples of bench, table, bicycle rack, trash receptacle. Approved samples may be incorporated into the Work.

E. Product Schedule: For site furnishings. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Material Certificates: For site furnishings manufactured with preservative-treated wood.

1. Indicate type of preservative used and net amount of preservative retained. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For site furnishings to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Bench Replacement Slats: No fewer than two full-size units for each size indicated.
2. Trash Receptacle Inner Containers: Five full-size units for each size indicated, but no fewer than two units.
3. Anchors: 1 per unit.

PART 2 - PRODUCTS

2.1 SEATING

A. Unit: As indicated on drawings and per manufacturer’s specifications.

2.2 TABLES

A. Unit: As indicated on drawings and per manufacturer’s specifications.

2.3 BICYCLE RACKS

A. Unit: As indicated on drawings and per manufacturer’s specifications.

2.4 TRASH RECEPTACLES

A. Unit: As indicated on drawings and per manufacturer’s specifications.

2.5 BOLLARDS

A. Unit: As indicated on drawings and per manufacturer’s specifications.

2.6 DOGI-POT PET WASTE STATION

A. Unit: As indicated on drawings and per manufacturer's specifications.

2.7 TREE GRATES

A. Unit: As indicated on drawings and per manufacturer's specifications.

2.8 DRINGKING FOUNTAIN

A. Unit: As indicated on drawings and per manufacturer's specifications.

2.9 RESTROOM BUILDING

A. Unit: As indicated on drawings and per manufacturer's specifications.

2.10 CONCESSIONS/RESTROOM/STORAGE BUILDING

A. Unit: As indicated on drawings and per manufacturer's specifications.

2.11 MATERIALS

A. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated; free of surface blemishes and complying with the following:

1. Rolled or Cold-Finished Bars, Rods, and Wire: ASTM B211.
2. Extruded Bars, Rods, Wire, Profiles, and Tubes: ASTM B221.
3. Structural Pipe and Tube: ASTM B429/B429M.
4. Sheet and Plate: ASTM B209.
5. Castings: ASTM B26/B26M.

B. Steel and Iron: Free of surface blemishes and complying with the following:

1. Plates, Shapes, and Bars: ASTM A36/A36M.
2. Steel Pipe: Standard-weight steel pipe complying with ASTM A53/A53M, or electric-resistance-welded pipe complying with ASTM A135/A135M.
3. Tubing: Cold-formed steel tubing complying with ASTM A500/A500M.
4. Mechanical Tubing: Cold-rolled, electric-resistance-welded carbon or alloy steel tubing complying with ASTM A513/A513M, or steel tubing fabricated from steel complying with ASTM A1011/A1011M and complying with dimensional tolerances in ASTM A500/A500M; zinc coated internally and externally.
5. Sheet: Commercial steel sheet complying with ASTM A1011/A1011M.
6. Perforated Metal: From steel sheet not less than 0.075-inch nominal thickness; manufacturer's standard perforation pattern.

7. Expanded Metal: Carbon-steel sheets, deburred after expansion, and complying with ASTM F1267.
8. Malleable-Iron Castings: ASTM A47/A47M, grade as recommended by fabricator for type of use intended.
9. Gray-Iron Castings: ASTM A48/A48M, Class 200.

C. Stainless Steel: Free of surface blemishes and complying with the following:

1. Sheet, Strip, Plate, and Flat Bars: ASTM A240/A240M or ASTM A666.
2. Pipe: Schedule 40 steel pipe complying with ASTM A312/A312M.
3. Tubing: ASTM A554.

D. Wood: Surfaced smooth on four sides with eased edges; kiln dried, free of knots, solid stock of species indicated.

1. Wood Species: Manufacturer's standard.

E. Fiberglass: Multiple laminations of glass-fiber-reinforced polyester resin with UV-light stable, colorfast, nonfading, weather- and stain-resistant, colored polyester gel coat, and with manufacturer's standard finish.

F. Plastic: Color impregnated, color and UV-light stabilized, and mold resistant.

1. Polyethylene: Fabricated from virgin plastic HDPE resin.

G. Anchors, Fasteners, Fittings, and Hardware: Galvanized steel; commercial quality, tamperproof, vandal and theft resistant, concealed, recessed, and capped or plugged.

1. Angle Anchors: For inconspicuously bolting legs of site furnishings to on-grade substrate; one per leg or extent as indicated.
2. Antitheft Hold-Down Brackets: For securing site furnishings to substrate; extent as indicated on Drawings.

H. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M; recommended in writing by manufacturer, for exterior applications.

I. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound; resistant to erosion from water exposure without needing protection by a sealer or waterproof coating; recommended in writing by manufacturer, for exterior applications.

J. Galvanizing: Where indicated for steel and iron components, provide the following protective zinc coating applied to components after fabrication:

1. Zinc-Coated Tubing: External, zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. of zinc after welding, a chromate conversion coating, and a clear, polymer

film. Internal, same as external or consisting of 81 percent zinc pigmented coating, not less than 0.3 mil thick.

2. Hot-Dip Galvanizing: According to ASTM A123/A123M, ASTM A153/A153M, or ASTM A924/A924M.

2.12 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment: Pressure-treat wood according to AWPA U1, Use Category UC3b, and the following:

1. Use preservative chemicals acceptable to authorities having jurisdiction and containing no arsenic or chromium. Use chemical formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.
2. Kiln-dry lumber and plywood after treatment to a maximum moisture content, respectively, of 19 and 15 percent. Do not use materials that are warped or do not comply with requirements for untreated materials.

2.13 FABRICATION

A. Metal Components: Form to required shapes and sizes with true, consistent curves, lines, and angles. Separate metals from dissimilar materials to prevent electrolytic action.

B. Welded Connections: Weld connections continuously. Weld solid members with full-length, full-penetration welds and hollow members with full-circumference welds. At exposed connections, finish surfaces smooth and blended, so no roughness or unevenness shows after finishing and welded surface matches contours of adjoining surfaces.

C. Pipes and Tubes: Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.

D. Preservative-Treated Wood Components: Complete fabrication of treated items before treatment if possible. If cut after treatment, apply field treatment complying with AWPA M4 to cut surfaces.

E. Exposed Surfaces: Polished, sanded, or otherwise finished; all surfaces smooth, free of burrs, barbs, splinters, and sharpness; all edges and ends rolled, rounded, or capped.

F. Factory Assembly: Factory assemble components to greatest extent possible to minimize field assembly. Clearly mark units for assembly in the field.

2.14 GENERAL FINISH REQUIREMENTS

A. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.15 ALUMINUM FINISHES

A. Powder-Coat Finish: Manufacturer's standard polyester powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

2.16 STEEL AND GALVANIZED-STEEL FINISHES

A. Powder-Coat Finish: Manufacturer's standard polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

B. PVC Finish: Manufacturer's standard, UV-light stabilized, mold-resistant, slip-resistant, matte-textured, dipped or sprayed-on, PVC-plastisol finish, with flame retardant added; complying with coating manufacturer's written instructions for pretreatment, application, and minimum dry film thickness.

2.17 IRON FINISHES

A. Powder-Coat Finish: Manufacturer's standard polyester powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

2.18 STAINLESS STEEL FINISHES

A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

1. Run directional finishes with long dimension of each piece.
2. Directional Satin Finish: ASTM A480/A480M, No 4.
3. Dull Satin Finish: ASTM A480/A480M, No. 6.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.

B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.

C. Install site furnishings level, plumb, true, and securely anchored and positioned at locations indicated on Drawings.

D. Post Setting: Set cast-in support posts in concrete footing with smooth top, shaped to shed water. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at correct angle and are aligned and at correct height and spacing. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.

E. Posts Set into Voids in Concrete: Form or core-drill holes for installing posts in concrete to depth recommended in writing by manufacturer of site furnishings and 3/4 inch larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with non-shrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions, with top smoothed and shaped to shed water.

F. Pipe Sleeves: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with non-shrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions, with top smoothed and shaped to shed water.

END OF SECTION 323300

SECTION 328400 - PLANTING IRRIGATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pipes, tubes, and fittings.
2. Encasement for piping.
3. Manual valves.
4. Pressure-reducing valves.
5. Automatic control valves.
6. Transition fittings.
7. Miscellaneous piping specialties.
8. Sprinklers.
9. Quick couplers.
10. Drip irrigation specialties.
11. Controllers.
12. Boxes for automatic control valves.

1.2 DEFINITIONS

A. Circuit Piping: Downstream from control valves to sprinklers, specialties, and drain valves. Piping is under pressure during flow.

B. Drain Piping: Downstream from circuit-piping drain valves. Piping is not under pressure.

C. ET Controllers: EvapoTranspiration Controllers. Irrigation controllers, which use some method of weather-based adjustment of irrigation. These adjusting methods include use of historical monthly averages of ET, broadcasting of ET measurements, or use of on-site sensors to track ET.

D. Main Piping: Downstream from point of connection to water distribution piping to, and including, control valves. Piping is under water-distribution-system pressure.

E. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories.

B. Wiring Diagrams: For power, signal, and control wiring.

C. Delegated Design Submittal: For irrigation systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Zoning Chart: Indicate each irrigation zone and its control valve.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For sprinklers, controllers,and automatic control valves to include in operation and maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of maintenance material items.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and entrance of dirt, debris, and moisture.

B. Store plastic piping protected from direct sunlight. Support piping to prevent sagging and bending.

1.8 FIELD CONDITIONS

A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by City or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:

1. Notify City no fewer than two days in advance of proposed interruption of water service.
2. Do not proceed with interruption of water service without City's written permission.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Irrigation Zone Control: Automatic operation with controller and automatic control valves.

B. Location of Sprinklers and Specialties: Design location is approximate. Make minor adjustments necessary to avoid plantings and obstructions, such as signs and light standards. Maintain 100 percent irrigation coverage of areas indicated.

C. Delegated Design: Design 100 percent coverage irrigation system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

D. Minimum Working Pressures: The following are minimum pressure requirements for piping, valves, and specialties unless otherwise indicated:

1. Irrigation Main Piping: Per plan.
2. Circuit Piping: Per plan.

2.2 IPES, TUBES, AND FITTINGS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.

B. PVC Pipe: ASTM D1785, PVC 1120 compound, Schedule 40.

1. PVC Socket Fittings: ASTM D2466, Schedule 40.
2. PVC Threaded Fittings: ASTM D2464, Schedule 80.
3. PVC Socket Unions: Construction similar to that of MSS SP-107, except both headpiece and tailpiece shall be PVC with socket ends.

2.3 PIPING JOINING MATERIALS

A. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8 inch thick unless otherwise indicated; full-face or ring type unless otherwise indicated.

B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

C. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general- duty brazing unless otherwise indicated.

D. Solder Filler Metals: ASTM B32, lead-free alloys. Include water-flushable flux in accordance with ASTM B813.

E. Solvent Cements for Joining PVC Piping: ASTM D2564. Include primer in accordance with ASTM F656.

F. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

2.4 ENCASEMENT FOR PIPING

A. Standard: ASTM A674 or AWWA C105.

2.5 MANUAL VALVES

A. Bronze Gate Valves:
1. Description: Per plan.

2.6 PRESSURE-REDUCING VALVES

A. Water-Control Valves:
1. Description: Pilot-operation, diaphragm-type, single-seated main water-control valve. Include small pilot control valve, restrictor device, specialty fittings, and sensor piping. Per plan.

2.7 AUTOMATIC CONTROL VALVES

A. Plastic, Automatic Control Valves:
1. Description: Molded-plastic body, normally closed, diaphragm type with manual-flow adjustment, and operated by 24 V ac solenoid. Per plan.

2.8 TRANSITION FITTINGS

A. General Requirements: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.

2.9 MISCELLANEOUS PIPING SPECIALTIES

A. Water Hammer Arresters: ASSE 1010 or PDI WH 201, with bellows or piston-type pressurized cushioning chamber and in sizes complying with PDI WH 201, Sizes A to F.

B. Pressure Gages: ASME B40.1. Include 4-1/2-inch- diameter dial, dial range of two times system operating pressure, and bottom outlet.

2.10 SPRINKLERS

A. General Requirements: Designed for uniform coverage over entire spray area indicated at available water pressure.

B. Plastic, Exposed, Impact-Drive Rotary Sprinklers:
1. Description: Per plan.

C. Plastic, Pop-up, Gear-Drive Rotary Sprinklers:

1. Description: Per plan.

2.11 QUICK COUPLERS

A. Description: Factory-fabricated, bronze or brass, two-piece assembly. Include coupler water-seal valve; removable upper body with spring-loaded or weighted, rubber-covered cap; hose swivel with ASME B1.20.7, 3/4-11.5NH threads for garden hose on outlet; and operating key.

1. Locking-Top Option: Vandal-resistant locking feature. Include two matching key(s).

2.12 DRIP IRRIGATION SPECIALTIES

A. Freestanding Emitters: Device to deliver water at approximately 20 psi.

1. Body Material: PE or vinyl, with flow control.
2. Riser to Emitter: PE or PVC flexible tubing.

B. Drip Tubes with Direct-Attached Emitters:

1. Tubing: Flexible PE or PVC with plugged end.
2. Emitters: Devices to deliver water at approximately 20 psig.

a. Body Material: PE or vinyl, with flow control.
b. Mounting: Inserted into tubing at set intervals.

C. Off-Ground Supports: Per plan details.

2.13 CONTROLLERS

A. Description:

1. Controller Stations for Automatic Control Valves: Each station is variable from approximately 5 to 60 minutes. Include switch for manual or automatic operation of each station.
2. Exterior Control Enclosures: NEMA 250, Type 4, weatherproof, with locking cover and two matching keys; include provision for grounding.

a. Body Material: Stainless steel sheet metal.
b. Mounting: Freestanding type for concrete base.

3. Control Transformer: 24 V secondary, with primary fuse.

4. Moisture Sensor: Adjustable from one to seven days, to shut off water flow during rain.
5. Smart Controllers: Use ET, tested in accordance with IA SWAT Climatological Based Controllers 8th Draft Testing Protocol and compliant with ASHRAE 189.1.
6. Wiring: UL 493, Type UF multiconductor, with solid-copper conductors; insulated cable; suitable for direct burial.

a. Feeder-Circuit Cables: No. 12 AWG minimum, between building and controllers.
b. Low-Voltage, Branch-Circuit Cables: No. 14 AWG minimum, between controllers and automatic control valves; color-coded different from feeder-circuit-cable jacket color; with jackets of different colors for multiple-cable installation in same trench.
c. Splicing Materials: Manufacturer's packaged kit consisting of insulating, spring-type connector or crimped joint and epoxy resin moisture seal; suitable for direct burial.

7. Concrete Base: Reinforced precast concrete not less than 36 by 24 by 4 inches thick, and 6 inches greater in each direction than overall dimensions of controller. Include opening for wiring.

2.14 BOXES FOR AUTOMATIC CONTROL VALVES

A. Plastic Boxes:
1. Description: Box and cover, with open bottom and openings for piping; designed for installing flush with grade. Per plan.

B. Polymer-Concrete Boxes:
1. Description: Box and cover, with open bottom and openings for piping; designed for installing flush with grade. Per plan.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Section 312000 "Earth Moving."

B. Install warning tape directly above pressure piping, 12 inches below finished grades, except 6 inches below subgrade under pavement and slabs.

C. Provide minimum cover over top of underground piping according to the following:

1. Irrigation Main Piping: Minimum depth below finished grade, or not less than 18 inches below average local frost depth, whichever is deeper. Per plan.
2. Circuit Piping: Per plan.
3. Drain Piping: Per plan.
4. Sleeves: Per plan.

3.2 PREPARATION

A. Set stakes to identify locations of proposed irrigation system. Obtain Architect's approval before excavation.

3.3 INSTALLATION OF PIPING

A. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved on Coordination Drawings.

B. Install piping at minimum uniform slope of 0.5 percent down toward drain valves.

C. Install piping free of sags and bends.

D. Install groups of pipes parallel to each other, spaced to permit valve servicing.

E. Install fittings for changes in direction and branch connections.

F. Install unions adjacent to valves and to final connections to other components with NPS 2 or smaller pipe connection.

G. Install flanges adjacent to valves and to final connections to other components with NPS 2-1/2 or larger pipe connection.

H. Install underground thermoplastic piping in accordance with ASTM D2774 and ASTM .

I. Install expansion loops in control-valve boxes for plastic piping.

J. Lay piping on solid subbase, uniformly sloped without humps or depressions.

K. Install ductile-iron piping in accordance with AWWA C600.

L. Install PVC piping in dry weather when temperature is above 40 deg F. Allow joints to cure at least 24 hours at temperatures above 40 deg F before testing.

M. Install water regulators with shutoff valve and strainer on inlet and pressure gage on outlet. Install shutoff valve on outlet. Install aboveground or in control-valve boxes.

N. Water Hammer Arresters: Install between connection to building main and circuit valves aboveground or in control-valve boxes.

O. Install piping in sleeves under parking lots, roadways, and sidewalks.

P. Install sleeves made of Schedule 40, PVC pipe and socket fittings, and solvent-cemented joints.

Q. Install transition fittings for plastic-to-metal pipe connections according to the following:

1. Underground Piping:

   a. NPS 1-1/2 and Smaller: Plastic-to-metal transition fittings.
   b. NPS 2 and Larger: AWWA transition couplings.

2. Aboveground Piping:

   a. NPS 2 and Smaller: Plastic-to-metal transition fittings and unions.

b. NPS 2 and Larger: Use dielectric flange kits with one plastic flange.

3.4 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Threaded Joints: Thread pipe with tapered pipe threads in accordance with ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

D. Flanged Joints: Select rubber gasket material of size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

E. Ductile-Iron Piping Gasketed Joints: Comply with AWWA C600 and AWWA M41.

F. Copper-Tubing Brazed Joints: Construct joints in accordance with CDA's "Copper Tube Handbook," using copper-phosphorus brazing filler metal.

G. Copper-Tubing Soldered Joints: Apply ASTM B813 water-flushable flux to tube end unless otherwise indicated. Construct joints in accordance with ASTM B828 or CDA's "Copper Tube Handbook," using lead-free solder alloy (0.20 percent maximum lead content) complying with ASTM B32.

H. PE Piping Fastener Joints: Join with insert fittings and bands or fasteners in accordance with piping manufacturer's written instructions.

I. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join in accordance with ASTM D2657.

1. Plain-End PE Pipe and Fittings: Use butt fusion.
2. Plain-End PE Pipe and Socket Fittings: Use socket fusion.

J. PVC Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings in accordance with the following:

1. Comply with ASTM F402 for safe-handling practice of cleaners, primers, and solvent cements.
2. PVC Pressure Piping: Join schedule number, ASTM D1785, PVC pipe and PVC socket fittings in accordance with ASTM D2672. Join other-than-schedule-number PVC pipe and socket fittings in accordance with ASTM D2855.

3. PVC Nonpressure Piping: Join in accordance with ASTM D2855.

3.5 INSTALLATION OF VALVES

A. Underground Curb Valves: Install in curb-valve casings with tops flush with grade.

B. Underground Iron Gate Valves, Resilient Seat: Comply with AWWA C600 and AWWA M44. Install in valve casing with top flush with grade.

1. Install valves and PVC pipe with restrained, gasketed joints.

C. Aboveground Valves: Install as components of connected piping system.

D. Pressure-Reducing Valves: Install in boxes for automatic control valves or aboveground between shutoff valves.

E. Throttling Valves: Install in underground piping in boxes for automatic control valves.

F. Drain Valves: Install in underground piping in boxes for automatic control valves.

3.6 INSTALLATION OF SPRINKLERS

A. Install sprinklers after hydrostatic test is completed.

B. Install sprinklers at manufacturer's recommended heights.

C. Locate part-circle sprinklers to maintain a minimum distance of 4 inches from walls and 2 inches from other boundaries unless otherwise indicated.

3.7 INSTALLATION OF DRIP IRRIGATION SPECIALTIES

A. Install freestanding emitters on pipe riser to mounting height indicated.

B. Install manifold emitter systems with tubing to emitters. Plug unused manifold outlets. Install emitters on off-ground supports at height indicated.

C. Install multiple-outlet emitter systems with tubing to outlets. Plug unused emitter outlets. Install outlets on off-ground supports at height indicated.

D. Install drip tubes with direct-attached emitters on ground.

E. Install drip tubes with remote discharge on ground with outlets on off-ground supports at height indicated.

F. Install off-ground supports of length required for indicated mounted height of device.

3.8 INSTALLATION OF AUTOMATIC IRRIGATION CONTROL SYSTEM

A. Equipment Mounting, Exterior: Install exterior freestanding controllers on precast concrete bases.

1. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor bolts to elevations required for proper attachment to supported equipment.

B. Install control cable in same trench as irrigation piping and at least 2 inches below[**or beside**] piping. Provide conductors of size not smaller than recommended by controller manufacturer. Install cable in separate sleeve under paved areas.

3.9 CONNECTIONS

A. Comply with requirements for piping specified in Section 221113 "Facility Water Distribution Piping" for water supply from exterior water service piping, water meters, protective enclosures, and backflow preventers. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment, valves, and devices to allow service and maintenance.

C. Connect wiring between controllers and automatic control valves.

3.10 IDENTIFICATION

A. Identify system components. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment."

B. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplates and signs on each automatic controller.

1. Text: In addition to identifying unit, distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

C. Warning Tapes: Arrange for installation of continuous, underground, detectable warning tapes over underground piping during backfilling of trenches. See Section 312000 "Earth Moving" for warning tapes.

3.11 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

B. Perform tests and inspections.

1. Manufacturer's Field Service with Test Assistance: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

C. Tests and Inspections:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
4. Irrigation system will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.12 STARTUP SERVICE

A. Perform startup service.

1. Complete installation and startup checks in accordance with manufacturer's written instructions.
2. Verify that controllers are installed and connected in accordance with the Contract Documents.
3. Verify that electrical wiring installation complies with manufacturer's submittal.

3.13 ADJUSTING

A. Adjust settings of controllers.

B. Adjust automatic control valves to provide flow rate at rated operating pressure required for each sprinkler circuit.

C. Adjust sprinklers and devices, except those intended to be mounted aboveground, so they will be flush with, or not more than 1/2 inch above, finish grade.

3.14 CLEANING

A. Flush dirt and debris from piping before installing sprinklers and other devices.

END OF SECTION 328400

SECTION 329113 - SOIL PREPARATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes planting soils and layered soil assemblies specified by composition of the mixes.

B. Related Requirements:
1. Section 323300 "Site Furnishings" for placing planting soil in exterior unit planters.
2. Section 311000 "Site Clearing" for topsoil stripping and stockpiling.
3. Section 329200 "Turf and Grasses" for placing planting soil for turf and grasses.
4. Section 329300 "Plants" for placing planting soil for plantings.

1.3 ALLOWANCES

A. Preconstruction and field quality-control testing are part of testing and inspecting allowance.

1.4 DEFINITIONS

A. AAPFCO: Association of American Plant Food Control Officials.

B. Backfill: The earth used to replace or the act of replacing earth in an excavation. This can be amended or unamended soil as indicated.

C. CEC: Cation exchange capacity.

D. Compost: The product resulting from the controlled biological decomposition of organic material that has been sanitized through the generation of heat and stabilized to the point that it is beneficial to plant growth.

E. Duff Layer: A surface layer of soil, typical of forested areas, that is composed of mostly decayed leaves, twigs, and detritus.

F. Imported Soil: Soil that is transported to Project site for use.

G. Layered Soil Assembly: A designed series of planting soils, layered on each other, that together produce an environment for plant growth.

H. Manufactured Soil: Soil produced by blending soils, sand, stabilized organic soil amendments, and other materials to produce planting soil.

I. NAPT: North American Proficiency Testing Program. An SSSA program to assist soil-, plant-, and water-testing laboratories through interlaboratory sample exchanges and statistical evaluation of analytical data.

J. Organic Matter: The total of organic materials in soil exclusive of undecayed plant and animal tissues, their partial decomposition products, and the soil biomass; also called "humus" or "soil organic matter."

K. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified as specified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

L. RCRA Metals: Hazardous metals identified by the EPA under the Resource Conservation and Recovery Act.

M. SSSA: Soil Science Society of America.

N. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

O. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

P. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil"; but in disturbed areas such as urban environments, the surface soil can be subsoil.

Q. USCC: U.S. Composting Council.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include recommendations for application and use.
2. Include test data substantiating that products comply with requirements.
3. Include sieve analyses for aggregate materials.
4. Material Certificates: For each type of imported soil and soil amendment and fertilizer before delivery to the site, according to the following:

    a. Manufacturer's qualified testing agency's certified analysis of standard products.

b. Analysis of fertilizers, by a qualified testing agency, made according to AAPFCO methods for testing and labeling and according to AAPFCO's SUIP #25.
c. Analysis of nonstandard materials, by a qualified testing agency, made according to SSSA methods, where applicable.

B. Samples: For each bulk-supplied material, 1-quart volume of each in sealed containers labeled with content, source, and date obtained. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of composition, color, and texture.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For each testing agency.

B. Preconstruction Test Reports: For preconstruction soil analyses specified in "Preconstruction Testing" Article.

C. Field quality-control reports.

1.8 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent, state-operated, or university-operated laboratory; experienced in soil science, soil testing, and plant nutrition; with the experience and capability to conduct the testing indicated; and that specializes in types of tests to be performed.

1. Laboratories: Subject to compliance with requirements, provide testing by one of the laboratories approved by the City.

2. Multiple Laboratories: At Contractor's option, work may be divided among qualified testing laboratories specializing in physical testing, chemical testing, and fertility testing.

1.9 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction soil analyses on existing, on-site soil, and imported soil.

1. Notify City 7 days in advance of the dates and times when laboratory samples will be taken.

B. Preconstruction Soil Analyses: For each unamended soil type, perform testing on soil samples and furnish soil analysis and a written report containing soil-amendment and fertilizer recommendations by a qualified testing agency performing the testing according to "Soil-Sampling Requirements" and "Testing Requirements" articles.

1. Have testing agency identify and label samples and test reports according to sample collection and labeling requirements.

1.10 SOIL-SAMPLING REQUIREMENTS

A. General: Extract soil samples according to requirements in this article.

B. Sample Collection and Labeling: Have samples taken and labeled by Contractor in presence of Architect soil classifier (CPSC) certified by SSSA or state-certified, -licensed, or -registered soil scientist under the direction of the testing agency.

1. Number and Location of Samples: Minimum of three representative soil samples from varied locations where required by the City. Insert requirement for each soil to be used or amended for landscaping purposes.
2. Procedures and Depth of Samples: According to USDA-NRCS's "Field Book for Describing and Sampling Soils."
3. Division of Samples: Split each sample into two, equal parts. Send half to the testing agency and half to City for its records.
4. Labeling: Label each sample with the date, location keyed to a site plan or other location system, visible soil condition, and sampling depth.

1.11 TESTING REQUIREMENTS

A. General: Perform tests on soil samples according to requirements in this article.

B. Physical Testing:

1. Soil Texture: Soil-particle, size-distribution analysis by one of the following methods according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods":

a. Sieving Method: Report sand-gradation percentages for very coarse, coarse, medium, fine, and very fine sand; and fragment-gradation (gravel) percentages for fine, medium, and coarse fragments; according to USDA sand and fragment sizes.
b. Hydrometer Method: Report percentages of sand, silt, and clay.

2. Total Porosity: Calculate using particle density and bulk density according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
3. Water Retention: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
4. Saturated Hydraulic Conductivity: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods"; at 85% compaction according to ASTM D698 (Standard Proctor).

C. Chemical Testing:

1. CEC: Analysis by sodium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."

2. Clay Mineralogy: Analysis and estimated percentage of expandable clay minerals using CEC by ammonium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 1- Physical and Mineralogical Methods."
3. Metals Hazardous to Human Health: Test for presence and quantities of RCRA metals including aluminum, arsenic, barium, copper, cadmium, chromium, cobalt, lead, lithium, and vanadium. If RCRA metals are present, include recommendations for corrective action.
4. Phytotoxicity: Test for plant-available concentrations of phytotoxic minerals including aluminum, arsenic, barium, cadmium, chlorides, chromium, cobalt, copper, lead, lithium, mercury, nickel, selenium, silver, sodium, strontium, tin, titanium, vanadium, and zinc.

D. Fertility Testing: Soil-fertility analysis according to standard laboratory protocol of SSSA NAPT NCR-13, including the following:

1. Percentage of organic matter.
2. CEC, calcium percent of CEC, and magnesium percent of CEC.
3. Soil reaction (acidity/alkalinity pH value).
4. Buffered acidity or alkalinity.
5. Nitrogen ppm.
6. Phosphorous ppm.
7. Potassium ppm.
8. Manganese ppm.
9. Manganese-availability ppm.
10. Zinc ppm.
11. Zinc availability ppm.
12. Copper ppm.
13. Sodium ppm and sodium absorption ratio.
14. Soluble-salts ppm.
15. Presence and quantities of problem materials including salts and metals cited in the Standard protocol. If such problem materials are present, provide additional recommendations for corrective action.
16. Other deleterious materials, including their characteristics and content of each.

E. Organic-Matter Content: Analysis using loss-by-ignition method according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."

F. Recommendations: Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated to produce satisfactory planting soil suitable for healthy, viable plants indicated. Include, at a minimum, recommendations for nitrogen, phosphorous, and potassium fertilization, and for micronutrients.

1. Fertilizers and Soil Amendment Rates: State recommendations in weight per 1000 sq. ft. for 6-inchdepth of soil.
2. Soil Reaction: State the recommended liming rates for raising pH or sulfur for lowering pH according to the buffered acidity or buffered alkalinity in weight per 1000 sq. ft. for 6-inchdepth of soil.

1.12 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and compliance with state and Federal laws if applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Do not move or handle materials when they are wet or frozen.
4. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

PART 2 - PRODUCTS

2.1 PLANTING SOILS SPECIFIED BY COMPOSITION

A. General: Soil amendments, fertilizers, and rates of application specified in this article are guidelines that may need revision based on testing laboratory's recommendations after preconstruction soil analyses are performed.

B. Planting-Soil Type: Existing, on-site surface soil, with the duff layer, if any, retained; and stockpiled on-site; modified to produce viable planting soil. Blend existing, on-site surface soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

C. Planting-Soil Type: Imported, naturally formed soil from off-site sources and consisting of sandy loam soil according to USDA textures; and modified to produce viable planting soil.

1. Sources: Take imported, unamended soil from sources that are naturally well-drained sites where topsoil occurs at least 4 inches deep, not from agricultural land, bogs, or marshes; and that do not contain undesirable organisms; disease-causing plant pathogens; or obnoxious weeds and invasive plants including, but not limited to, quackgrass, Johnsongrass, poison ivy, nutsedge, nimblewill, Canada thistle, bindweed, bentgrass, wild garlic, ground ivy, perennial sorrel, and bromegrass.
2. Unacceptable Properties: Clean soil of the following:

a. Unacceptable Materials: Concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.

b. Unsuitable Materials: Stones, roots, plants, sod, clay lumps, and pockets of coarse sand that exceed a combined maximum of 8 percent by dry weight of the imported soil.
c. Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding 2 inches in any dimension.

3. Amended Soil Composition: Blend imported, unamended soil with the following soil amendments and fertilizers in the following quantities to produce planting soil: Per Soils Report recommendations.

D. Planting-Soil Type: Manufactured soil consisting of manufacturer's basic soil per soils report, blended in a manufacturing facility with sand, stabilized organic soil amendments, and other materials to produce viable planting soil.
1. Unacceptable Properties: Manufactured soil shall not contain the following:

a. Unacceptable Materials: Concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
b. Unsuitable Materials: Stones, roots, plants, sod, clay lumps, and pockets of coarse sand that exceed a combined maximum of 5 percent by dry weight of the manufactured soil.
c. Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding 1-1/2 inches in any dimension.

2. Blend manufacturer's basic soil with the following soil amendments and fertilizers in the following quantities to produce planting soil: per soils report recommendations.

2.2 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:

1. Class: T, with a minimum of 99 percent passing through a No. 8 sieve and a minimum of 75 percent passing through a No. 60 sieve.
2. Class: O, with a minimum of 95 percent passing through a No. 8 sieve and a minimum of 55 percent passing through a No. 60 sieve.

B. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent elemental sulfur, with a minimum of 99 percent passing through a No. 6 sieve and a maximum of 10 percent passing through a No. 40 sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Perlite: Horticultural perlite, soil amendment grade.

E. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through a No. 50 sieve.

F. Sand: Clean, washed, natural or manufactured, free of toxic materials, and according to ASTM C33/C33M.

2.3 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter produced by composting feedstock, and bearing USCC's "Seal of Testing Assurance," and as follows:

1. Feedstock: Limited to leaves.
2. Reaction: pH of 5.5 to 8.
3. Soluble-Salt Concentration: Less than 4 dS/m.
4. Moisture Content: 35 to 55 percent by weight.
5. Organic-Matter Content: 30 to 40 percent of dry weight.
6. Particle Size: Minimum of 98 percent passing through a 1-inch sieve.

B. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, debris, and material harmful to plant growth.

2.4 FERTILIZERS

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition: Per soils report recommendations.

B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition: Per the soils report recommendations.

PART 3 - EXECUTION

3.1 GENERAL

A. Place planting soil and fertilizers according to requirements in other Specification Sections.

B. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in planting soil.

C. Proceed with placement only after unsatisfactory conditions have been corrected.

3.2 PREPARATION OF UNAMENDED, ON-SITE SOIL BEFORE AMENDING

A. Excavation: Excavate soil from designated area(s) to a depth of 6 inches and stockpile until amended.

B. Unacceptable Materials: Clean soil of concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.

C. Unsuitable Materials: Clean soil to contain a maximum of 8 percent by dry weight of stones, roots, plants, sod, clay lumps, and pockets of coarse sand.

D. Screening: Pass unamended soil through a 2-inch sieve to remove large materials.

3.3 PLACING AND MIXING PLANTING SOIL OVER EXPOSED SUBGRADE

A. General: Apply and mix unamended soil with amendments on-site to produce required planting soil. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.

B. Subgrade Preparation: Till subgrade to a minimum depth of 12 inches. Remove stones larger than 1-1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off City's property.

1. Apply, add soil amendments, and mix approximately half the thickness of unamended soil over prepared, loosened subgrade according to "Mixing" Paragraph below. Mix thoroughly into top 4 inches of subgrade. Spread remainder of planting soil.

C. Mixing: Spread unamended soil to total depth of 12 inches indicated on Drawings Insert dimension, but not less than required to meet finish grades after mixing with amendments and natural settlement. Do not spread if soil or subgrade is frozen, muddy, or excessively wet.

1. Amendments: Apply soil amendments and fertilizer, if required, evenly on surface, and thoroughly blend them with unamended soil to produce planting soil.

a. Mix lime and sulfur with dry soil before mixing fertilizer.
b. Mix fertilizer with planting soil no more than seven days before planting.

2. Lifts: Apply and mix unamended soil and amendments in lifts not exceeding 12 inches in loose depth for material compacted by compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

D. Compaction: Compact each blended lift of planting soil to 75 to 82 percent of maximum Standard Proctor density according to ASTM D698 and tested in-place except where a different compaction value is indicated on Drawings.

E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.4 PLACING MANUFACTURED PLANTING SOIL OVER EXPOSED SUBGRADE

A. General: Apply manufactured soil on-site in its final, blended condition. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.

B. Subgrade Preparation: Till subgrade to a minimum depth of 12 inches. Remove stones larger than 1-1/2 inches 3 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off City's property.

1. Apply approximately half the thickness of planting soil over prepared, loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil.

C. Application: Spread planting soil to total depth of 12 inches, but not less than required to meet finish grades after natural settlement. Do not spread if soil or subgrade is frozen, muddy, or excessively wet.

1. Lifts: Apply planting soil in lifts not exceeding 8 inches in loose depth for material compacted by compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

D. Compaction: Compact each lift of planting soil to 75 to 82 percent of maximum Standard Proctor density according to ASTM D698 except where a different compaction value is indicated on Drawings.

E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.5 BLENDING PLANTING SOIL IN PLACE

A. General: Mix amendments with in-place, unamended soil to produce required planting soil. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.

B. Preparation: Till unamended, existing soil in planting areas to a minimum depth of 12 inches . Remove stones larger than 1-1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off City's property.

C. Mixing: Apply soil amendments and fertilizer, if required, evenly on surface, and thoroughly blend them into full depth of unamended, in-place soil to produce planting soil.

1. Mix lime and sulfur with dry soil before mixing fertilizer.
2. Mix fertilizer with planting soil no more than seven days before planting.

D. Compaction: Compact blended planting soil to 75 to 82 percent of maximum Standard Proctor density according to ASTM D698 except where a different compaction value is indicated on Drawings.

E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.6 APPLYING COMPOST TO SURFACE OF PLANTING SOIL

A. Application: Apply compost component of planting-soil mix 6 inches of compost to surface of in-place planting soil. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.

B. Finish Grading: Grade surface to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.7 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform the following tests and inspections:

1. Compaction: Test planting-soil compaction after placing each lift and at completion using a densitometer or soil-compaction meter calibrated to a reference test value based on laboratory testing according to ASTM D698. Space tests at no less than one for each 2000 sq. ft. of in-place soil or part thereof.

C. Soil will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

E. Label each sample and test report with the date, location keyed to a site plan or other location system, visible conditions when and where sample was taken, and sampling depth.

3.8 PROTECTION

A. Protection Zone: Identify protection zones according to Section 015639 "Temporary Tree and Plant Protection."

B. Protect areas of in-place soil from additional compaction, disturbance, and contamination. Prohibit the following practices within these areas except as required to perform planting operations:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Vehicle traffic.
4. Foot traffic.
5. Erection of sheds or structures.
6. Impoundment of water.
7. Excavation or other digging unless otherwise indicated.

C. If planting soil or subgrade is overcompacted, disturbed, or contaminated by foreign or deleterious materials or liquids, remove the planting soil and contamination; restore the subgrade as directed by Architect and replace contaminated planting soil with new planting soil.

3.9 CLEANING

A. Protect areas adjacent to planting-soil preparation and placement areas from contamination. Keep adjacent paving and construction clean and work area in an orderly condition.

B. Remove surplus soil and waste material including excess subsoil, unsuitable materials, trash, and debris and legally dispose of them off City's property unless otherwise indicated.

1. Dispose of excess subsoil and unsuitable materials on-site where directed by City.

END OF SECTION 329113

SECTION 329200 - TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Hydroseeding.
   2. Sodding.

B. Related Requirements:

   1. Section 329300 "Plants" for trees, shrubs, ground covers, and other plants as well as border edgings and mow strips.

1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

D. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Section 329113 "Soil Preparation" Section 329115 "Soil Preparation (Performance Specification)" and drawing designations for planting soils.

E. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For landscape Installer.

B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1. Certification of each seed mixture for turfgrass sod and hydroseed. Include identification of source and name and telephone number of supplier.

C. Product Certificates: For fertilizers, from manufacturer.

D. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by City for maintenance of turf during a calendar year. Submit before expiration of required maintenance periods.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful turf establishment.

1. Professional Membership: Installer shall be a member in good standing of either the National Association of Landscape Professionals or AmericanHort.
2. Experience: Five years' experience in turf installation in addition to requirements in Section 014000 "Quality Requirements."
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Personnel Certifications: Installer's field supervisor shall have certification in all of the following categories from the National Association of Landscape Professionals:

   a. Landscape Industry Certified Technician - Exterior.
   b. Landscape Industry Certified Lawn Care Manager.
   c. Landscape Industry Certified Lawn Care Technician.

5. Pesticide Applicator: State licensed, commercial.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.

B. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" sections in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod within 24 hours of harvesting and in time for planting promptly. Protect sod from breakage and drying.

C. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

1.9 FIELD CONDITIONS

A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of planting completion.

1. Spring Planting: Coordinate with City.
2. Fall Planting: Coordinate with City.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 TURFGRASS SOD

A. Turfgrass Sod: Approved, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture that is strongly rooted and capable of vigorous growth and development when planted.

2.2 FERTILIZERS

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition: Per plan.

B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition: Per plan.

2.3 PESTICIDES

A. General: Pesticide, registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer. Do not apply pre-emergent herbicide to areas designated to receive hydroseed planting.

C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
3. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2 PREPARATION

A. Protect structures; utilities; sidewalks; pavements; and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
2. Protect grade stakes set by others until directed to remove them.

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

3.3 TURF AREA PREPARATION

A. General: Prepare planting area for soil placement and mix planting soil according to Section 329113 "Soil Preparation." Section 329115 "Soil Preparation (Performance Specification)."

B. Placing Planting Soil: Place and mix planting soil in place over exposed subgrade.

1. Reduce elevation of planting soil to allow for soil thickness of sod.

C. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

D. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 HYDROSEEDING

A. Hydroseeding: Mix specified seed, slow-release fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with fiber-mulch manufacturer's recommended tackifier.
2. Spray-apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 1500-lb/acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate.
3. Spray-apply slurry uniformly to all areas to be seeded in a two-step process. Apply first slurry coat at a rate so that mulch component is deposited at not less than 500-lb/acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate. Apply slurry cover coat of fiber mulch (hydromulching) at a rate of 1000 lb/acre.

3.5 SODDING

A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.

B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to soil or sod during installation. Tamp and roll lightly to ensure contact with soil, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

1. Lay sod across slopes exceeding 1:3.
2. Anchor sod on slopes exceeding 1:6 with wood pegs spaced as recommended by sod manufacturer but not less than two anchors per sod strip to prevent slippage.

C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

3.6 TURF MAINTENANCE

A. General: Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
2. Water turf with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.

C. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than one-third of grass height. Remove no more than one-third of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. slow-release fertilizer after initial mowing and when grass is dry.

1. Use fertilizer that provides actual nitrogen of at least 1 lb/1000 sq. ft. to turf area.

3.7 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Architect:

1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
2. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.

B. Use specified materials to reestablish turf that does not comply with requirements, and continue maintenance until turf is satisfactory.

3.8 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents according to requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with City's operations and others in proximity to the Work. Notify City before each application is performed.

B. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.9 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off City's property.

C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

D. Remove nondegradable erosion-control measures after grass establishment period.

3.10 MAINTENANCE SERVICE

A. Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in "Turf Maintenance" Article. Begin maintenance immediately after each area is planted and continue until acceptable turf is established, but for not less than the following periods:

1. Seeded Turf: 90 days from date of planting completion.

   a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

2. Sodded Turf: 90 days from date of planting completion.

END OF SECTION 329200

SECTION 329300 - PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Plants.
2. Tree stabilization.
3. Tree-watering devices.

B. Related Requirements:
1. Section 329200 "Turf and Grasses" for turf (lawn) and meadow planting, hydroseeding, and erosion-control materials.

1.3 ALLOWANCES

A. Allowances for plants are specified in Section 012100 "Allowances."

1. Perform planting work under quantity allowances and only as authorized. Authorized work includes work required by Drawings and the Specifications and only work authorized in writing by Architect.
2. Perform work that exceeds quantity allowances only as authorized by Change Orders.

B. Furnish trees as part of tree allowance.

1.4 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with a ball size not less than sizes indicated and diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

C. Balled and Potted Stock: Plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required.

D. Bare-Root Stock: Plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than the minimum root spread according to ANSI Z60.1 for type and size of plant required.

E. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

F. Fabric Bag-Grown Stock: Healthy, vigorous, well-rooted plants established and grown in- ground in a porous fabric bag with well-established root system reaching sides of fabric bag. Fabric bag size is not less than diameter, depth, and volume required by ANSI Z60.1 for type and size of plant.

G. Finish Grade: Elevation of finished surface of planting soil.

H. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.

I. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

J. Planting Area: Areas to be planted.

K. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Section 329113 "Soil Preparation" for drawing designations for planting soils.

L. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

M. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

N. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

O. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.5 COORDINATION

A. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.

1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.6 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.7 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
2. Plant Photographs: Include color photographs in digital format of each required species and size of plant material as it will be furnished to Project. Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph. For species where more than 20 plants are required, include a minimum of three photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.

B. Samples for Verification: For each of the following:
1. Mineral Mulch: 2 lb of each mineral mulch required, in sealed plastic bags labeled with source of mulch. Sample shall be typical of the lot of material to be delivered and installed on-site; provide an accurate indication of color, texture, and makeup of the material.

1.8 INFORMATIONAL SUBMITTALS

A. Qualification Data: For landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of Citys' contact persons.

B. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:

1. Manufacturer's certified analysis of standard products.
2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

C. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

D. Sample Warranty: For special warranty.

1.9 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by City for maintenance of plants during a calendar year. Submit before expiration of required maintenance periods.

1.10 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of plants.

1. Professional Membership: Installer shall be a member in good standing of either the National Association of Landscape Professionals or AmericanHort.
2. Experience: Five years' experience in landscape installation in addition to requirements in Section 014000 "Quality Requirements."
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Personnel Certifications: Installer's field supervisor shall have certification in all of the following categories from the National Association of Landscape Professionals:

a. Landscape Industry Certified Technician - Exterior.
b. Landscape Industry Certified Interior.
c. Landscape Industry Certified Horticultural Technician.

5. Pesticide Applicator: State licensed, commercial.

B. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.

1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container-grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.
2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

C. Plant Material Observation: Architect may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Architect may also observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and may reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1. Notify Architect of sources of planting materials seven days in advance of delivery to site.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws if applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

C. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

D. Handle planting stock by root ball.

E. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.

1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

F. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

G. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1. Heel-in bare-root stock. Soak roots that are in less than moist condition in water for two hours. Reject plants with dry roots.
2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
3. Do not remove container-grown stock from containers before time of planting.

4. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly wet condition.

1.12 FIELD CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

1. Spring Planting: Coordinate with City.
2. Fall Planting: Coordinate with City.

C. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

1.13 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by City.
b. Structural failures including plantings falling or blowing over.
c. Faulty performance of tree stabilization.
d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Periods: From date of planting completion.

a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.
b. Ground Covers, Biennials, Perennials, and Other Plants: 12 months.

3. Include the following remedial actions as a minimum:

a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.

c. A limit of one replacement of each plant is required except for losses or replacements due to failure to comply with requirements.
d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch in diameter; or with stem girdling roots are unacceptable.
2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. Labeling: Label at least one plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant.

E. If formal arrangements or consecutive order of plants is indicated on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

2.2 FERTILIZERS

A. Planting Tablets: Tightly compressed chip-type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots. Per plan details.

2.3 MULCHES

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Type: Per plan.
2. Applied to a 3” minimum depth.
3. Color: Natural.

2.4 WEED-CONTROL BARRIERS

A. Nonwoven Geotextile Filter Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. minimum, composed of fibers formed into a stable network so that fibers retain their relative position. Fabric shall be inert to biological degradation and resist naturally encountered chemicals, alkalis, and acids.

B. Composite Fabric: Woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, 4.8 oz./sq. yd..

2.5 PESTICIDES

A. General: Pesticide registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

2.6 TREE-STABILIZATION MATERIALS

A. Trunk-Stabilization Materials:

1. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal by length indicated, pointed at one end.
2. Flexible Ties: Wide rubber or elastic bands or straps of length required to reach stakes.

2.7 TREE-WATERING DEVICES

A. Watering Pipe: Per plan.

2.8 MISCELLANEOUS PRODUCTS

A. Wood Pressure-Preservative Treatment: AWPA U1, Use Category UC4a; acceptable to authorities having jurisdiction, and containing no arsenic or chromium.

B. Root Barrier: Black, molded, modular panels 24 inches high (deep), 85 mils thick, and with vertical root deflecting ribs protruding 3/4 inch out from panel surface; manufactured with minimum 50 percent recycled polyethylene plastic with UV inhibitors.

C. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.

D. Burlap: Non-synthetic, biodegradable.

E. Planter Drainage Gravel: Washed, sound crushed stone or gravel complying with ASTM D448 for Size No. 8.

F. Planter Filter Fabric: Woven geotextile manufactured for separation applications and made of polypropylene, polyolefin, or polyester fibers or combination of them.

G. Mycorrhizal Fungi: Dry, granular inoculant containing at least 5300 spores per lb of vesicular-arbuscular mycorrhizal fungi and 95 million spores per lb of ectomycorrhizal fungi, 33 percent hydrogel, and a maximum of 5.5 percent inert material.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants, with Installer present, for compliance with requirements and conditions affecting installation and performance of the Work.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Verify that plants and vehicles loaded with plants can travel to planting locations with adequate overhead clearance.
3. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

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

C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.

D. Lay out plants at locations directed by Architect. Stake locations of individual trees and shrubs and outline areas for multiple plantings.

3.3 PLANTING AREA ESTABLISHMENT

A. General: Prepare planting area for soil placement and mix planting soil according to Section 329113 "Soil Preparation." Section 329115 "Soil Preparation (Performance Specification)."

B. Placing Planting Soil: Place manufactured planting soil over exposed subgrade.

C. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

D. Application of Mycorrhizal Fungi: At time directed by Architect, broadcast dry product uniformly over prepared soil at application rate indicated on Drawings.

3.4 TREE, SHRUB, AND VINE PLANTING

A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Balled and Burlapped Stock: Set each plant plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.

1. Backfill: Planting soil.
2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.

3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.

    a. Quantity: As indicated on Drawings.

5. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. Balled and Potted and Container-Grown Stock: Set each plant plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.

1. Backfill: Planting soil with planting mix as specified on drawings.
   Carefully remove root ball from container without damaging root ball or plant.
2. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
3. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.

    a. Quantity: As indicated on Drawings.

4. Continue backfilling process. Water again after placing and tamping final layer of soil.

E. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.5 TREE, SHRUB, AND VINE PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Prune, thin, and shape trees, shrubs, and vines as directed by Architect.

C. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.

D. Do not apply pruning paint to wounds.

3.6 TREE STABILIZATION

A. Trunk Stabilization by Upright Staking and Tying: Install trunk stabilization as follows unless otherwise indicated:

1. Upright Staking and Tying:

a. Stake trees of 2- through 5-inch caliper. Stake trees of less than 2-inch caliper only as required to prevent wind tip out. Use a minimum of two stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend to the dimension indicated on Drawings above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.
b. Stake trees with two stakes for trees up to 12 feet high and 2-1/2 inches or less in caliper; three stakes for trees less than 14 feet high and up to 4 inches in caliper. Space stakes equally around trees.

2. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.
3. Support trees with two strands of tie wire, connected to the brass grommets of tree-tie webbing at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.

B. Trunk Stabilization by Staking and Guying: Install trunk stabilization as follows unless otherwise indicated on Drawings. Stake all trees.

1. Site-Fabricated, Staking-and-Guying Method: Install no fewer than three guys spaced equally around tree.

a. Securely attach guys to stakes 30 inches long, driven to grade. Adjust spacing to avoid penetrating root balls or root masses. Provide turnbuckle for each guy wire and tighten securely.
b. For trees more than 6 inches in caliper, anchor guys to wood deadmen buried at least 36 inches below grade. Provide turnbuckle for each guy wire and tighten securely.
c. Support trees with bands of flexible ties at contact points with tree trunk and reaching to turnbuckle. Allow enough slack to avoid rigid restraint of tree.
d. Attach flags to each guy wire, 30 inches above finish grade.
e. Paint turnbuckles with luminescent white paint.

2. Proprietary Staking and Guying Device: Install staking and guying system sized and positioned as recommended by manufacturer unless otherwise indicated and according to manufacturer's written instructions.

C. Root-Ball Stabilization: Install at- or below-grade stabilization system to secure each new planting by the root ball unless otherwise indicated.

1. Wood Hold-Down Method: Place vertical stakes against side of root ball and drive them into subsoil; place horizontal wood hold-down stake across top of root ball and screw at each end to one of the vertical stakes.

a. Install stakes of length required to penetrate at least to the dimension indicated on Drawings below bottom of backfilled excavation. Saw stakes off at horizontal stake.
b. Install screws through horizontal hold-down and penetrating at least 1 inch into stakes. Predrill holes if necessary to prevent splitting wood.
c. Install second set of stakes on other side of root trunk for larger trees.

2. Proprietary Root-Ball Stabilization Device: Install root-ball stabilization system sized and positioned as recommended by manufacturer unless otherwise indicated and according to manufacturer's written instructions.

D. Palm Bracing: Install bracing system at three or more places equally spaced around perimeter of trunk to secure each palm until established unless otherwise indicated.

1. Site-Fabricated Palm-Bracing Method:

a. Place battens over padding and secure battens in place around trunk perimeter with at least two straps, tightened to prevent displacement. Ensure that straps do not contact trunk.
b. Place diagonal braces and cut to length. Secure upper ends of diagonal braces with galvanized nails into battens or into nail-attached blocks on battens. Do not drive nails, screws, or other securing devices into palm trunk; do not penetrate palm trunk in any fashion. Secure lower ends of diagonal braces with stakes driven into ground to prevent outward slippage of braces.

2. Proprietary Palm-Bracing Device: Install palm-bracing system sized and positioned as recommended by manufacturer unless otherwise indicated and according to manufacturer's written instructions.

3.7 INSTALLATION OF ROOT BARRIER

A. Install root barrier where trees are planted within the distance indicated on the drawings and as require by local regulations, of paving or other hardscape elements, such as walls, curbs, and walkways, unless otherwise indicated on Drawings.

B. Align root barrier vertically, and run it linearly along and adjacent to the paving or other hardscape elements to be protected from invasive roots.

C. Install root barrier continuously for a distance of 60 inches in each direction from the tree trunk, for a total distance of 10 feet per tree. If trees are spaced closer, use a single continuous piece of root barrier.

1. Position top of root barrier flush with finish grade.
2. Overlap root barrier a minimum of 12 inches at joints.
3. Do not distort or bend root barrier during construction activities.
4. Do not install root barrier surrounding the root ball of tree.

3.8 GROUND COVER AND PLANT PLANTING

A. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated on Drawings in even rows with triangular spacing.

B. Use planting soil for backfill.

C. Dig holes large enough to allow spreading of roots.

D. For rooted cutting plants supplied in flats, plant each in a manner that minimally disturbs the root system but to a depth not less than two nodes.

E. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

F. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

G. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.9 PLANTING AREA MULCHING

A. Install weed-control barriers as indicated on the drawings before mulching according to manufacturer's written instructions. Completely cover area to be mulched, overlapping edges a minimum of 12 inches and secure seams with galvanized pins.

B. Mulch backfilled surfaces of planting areas and other areas indicated.

1. Trees and Treelike Shrubs in Turf Areas: Apply organic mulch ring of 3-inch average thickness, with 12-inch radius around trunks or stems. Do not place mulch within 3 inches of trunks or stems.
2. Organic Mulch in Planting Areas: Apply 3-inch average thickness of organic mulch extending 12 inches beyond edge of individual planting pit or trench and over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.
3. Mineral Mulch in Planting Areas: Apply 3-inch average thickness of mineral mulch extending 12 inches beyond edge of individual planting pit or trench and over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.

3.10 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.

B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.11 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents according to authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with City's operations and others in proximity to the Work. Notify City before each application is performed.

B. Pre-Emergent Herbicides (Selective and Nonselective): Apply to tree, shrub, and ground-cover areas according to manufacturer's written recommendations. Do not apply to seeded areas.

C. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.12 REPAIR AND REPLACEMENT

A. General: Repair or replace existing or new trees and other plants that are damaged by construction operations, in a manner approved by Architect.

1. Submit details of proposed pruning and repairs.
2. Perform repairs of damaged trunks, branches, and roots within 24 hours, if approved.
3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Architect.

B. Remove and replace trees that are more than 25 percent dead or in an unhealthy condition before the end of the corrections period or are damaged during construction operations that Architect determines are incapable of restoring to normal growth pattern.

1. Provide new trees of same size as those being replaced for each tree.
2. Provide new tree(s) of for each existing tree to be protected per Section 015639 "Temporary Tree and Plant Protection" being replaced with specimens approved by Landscape Architect and Owner.
3. Species of Replacement Trees: Same species being replaced with approval.

3.13 CLEANING AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off City's property.

C. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

D. After installation and before Substantial Completion, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

E. At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

3.14 MAINTENANCE SERVICE

A. Maintenance Service for Trees and Shrubs: Provide maintenance by skilled employees of landscape Installer. Maintain as required in "Plant Maintenance" Article. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:

1. Maintenance Period: As indicated on drawings and contracts.

B. Maintenance Service for Ground Cover and Other Plants: Provide maintenance by skilled employees of landscape Installer. Maintain as required in "Plant Maintenance" Article. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:

1. Maintenance Period: As indicated on drawings and contracts.

END OF SECTION 329300

SECTION 330500 - COMMON WORK RESULTS FOR UTILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Piping joining materials.
2. Transition fittings.
3. Sleeves.
4. Identification devices.
5. Grout.
6. Flowable fill.
7. Piped utility demolition.
8. Piping system common requirements.
9. Equipment installation common requirements.
10. Painting.
11. Concrete bases.
12. Metal supports and anchorages.

1.3 DEFINITIONS

A. Exposed Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions.

B. Concealed Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

C. ABS: Acrylonitrile-butadiene-styrene plastic.

D. CPVC: Chlorinated polyvinyl chloride plastic.

E. PE: Polyethylene plastic.

F. PVC: Polyvinyl chloride plastic.

1.4 ACTION SUBMITTALS

A. Product Data: For the following:

1. Dielectric fittings.
2. Identification devices.

1.5 INFORMATIONAL SUBMITTALS

A. Welding certificates.

1.6 QUALITY ASSURANCE

A. Steel Support Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Steel Piping Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

C. Comply with ASME A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

B. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

1.8 COORDINATION

A. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.

B. Coordinate installation of identifying devices after completing covering and painting if devices are applied to surfaces.

C. Coordinate size and location of concrete bases. Formwork, reinforcement, and concrete requirements are specified in Section 033000 "Cast-in-Place Concrete."

PART 2 - PRODUCTS

2.1 PIPING JOINING MATERIALS

A. Contractor to install in accordance with applicable City of Merced Standards.

2.2 TRANSITION FITTINGS

A. Transition Fittings, General: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined. Contractor to install in accordance with applicable City of Merced Standards.

2.3 GROUT

A. Description: ASTM C1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.

1. Characteristics: Post hardening, volume adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
2. Design Mix: 5000-psi, 28-day compressive strength.
3. Packaging: Premixed and factory packaged.

2.4 FLOWABLE FILL

A. Description: Low-strength-concrete, flowable-slurry mix.

1. Cement: ASTM C150, Type I, portland.
2. Density: 115- to 145-lb/cu. ft..
3. Aggregates: ASTM C33, natural sand, fine and crushed gravel or stone, coarse.
4. Aggregates: ASTM C33, natural sand, fine.
5. Admixture: ASTM C618, fly-ash mineral.
6. Water: Comply with ASTM C94/C94M.
7. Strength: 100 to 200 psig at 28 days.

PART 3 - EXECUTION

3.1 PIPED UTILITY DEMOLITION

A. Contractor to install in accordance with applicable City of Merced Standards.

3.2 PIPING INSTALLATION

A. Contractor to install in accordance with applicable City of Merced Standards.

3.3 PIPING JOINT CONSTRUCTION

A. Contractor to install in accordance with applicable City of Merced Standards.

END OF SECTION 330500

SECTION 331100 – WATER UTILITY DISTRIBUTION PIPING AND APPURTENANCES

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes furnishing all labor, material, equipment, tools and services required for pipe systems.

B. The contractor shall comply with the City of Modesto Standard Specifications, 2014, Chapter 6, except as modified or appended herein.

1.2 SUBMITTALS

A. Submittals shall be submitted in accordance with the Submittal Procedures section.

B. Prior to commencement of work, the contractor shall submit in full compliance with all aspects of this section, including but not limited to:

1. Material data
2. Fittings
3. Thrust restraint
4. Valves
5. Fire Hydrants
6. Accessories
7. Appurtenances

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

D. Instructions: Provide manufacturer's installation instructions for pipe, hydrants and valves.

E. Field Test Reports: Provide results for official hydrostatic and bacteriological tests.

1.3 RECORD DRAWINGS

A. Project Record Documents: Refer to City of Modesto Standard Specifications, 2014, General Provisions, Section 5.08

PART 2 - PRODUCTS

2.1 MATERIALS

A. All materials and components shall conform to the City of Modesto Standard Specifications, Chapter 6 with the exceptions noted below

1. Replace Part 6.07.B.7.d.2) with;
2. "An acceptable valve box manufacturer and product is Christy Concrete Products – G05TBOX "Traffic Valve Box" and G05CT "Cast Iron" lid, or equal. All valve boxes located within the right of way on Sisk Road shall be "Mark V" from Bingham & Taylor and include lids, paving adapters and rims from the same manufacturer."
3. Replace Part 6.07.C.2.a with;
4. "Water services pipe shall be High Density Polyethylene (HPDE) Pipe. The pipe shall be ultra-high molecular weight polyethylene flexible pipe constructed from either PE 3408/3608 or PE 4710 polyethylene for portable water systems. The minimum pressure class rating for 3408/3608 shall be 200 psi and for PE 4710 shall be 250 psi."
5. Replace Part 607.C.2.b with;
6. "For 1-inch services, the HDPE pipe diameter shall conform to inside diameter- controlled ID PE pipe size. The maximum standard inside dimension ration shall be SIDR 7.0."
7. City Ops Department will provide the Contractor with any ¾" service meter adapters, if needed by the Contractor.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Water Installation shall conform to City of Modesto Standard Specifications, Chapter 6, Part 6.08

1. In accordance with the Contract Documents, the contractor shall provide and install new water service lines from the new water mains from the street or alley onto each serviced property at the locations shown on the project plans, or as directed.
2. Contractor shall disconnect and reconnect existing customer's service connections to newly installed, active water mains under the direct supervision of City Forces. Provide minimum 48 hour notice.

END OF SECTION 331100

SECTION 334200 - STORMWATER CONVEYANCE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. PVC pipe and fittings.
2. Drains.
3. Manholes.
4. Stormwater inlets.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:

1. Manholes: Include plans, elevations, sections, details, frames, and covers.
2. Catch basins: Include plans, elevations, sections, details, frames, covers, and grates.
3. Stormwater Detention Structures: Include frames, covers, and concrete design-mix reports.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Show pipe sizes, locations, and elevations. Show other piping in same trench and clearances from storm drainage system piping. Indicate interface and spatial relationship between manholes, piping, and proximate structures.

B. Product Certificates: For each type of cast-iron soil pipe and fitting, from manufacturer.

C. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic manholes, pipe, and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

C. Handle manholes in accordance with manufacturer's written rigging instructions.

D. Handle catch basins and stormwater inlets in accordance with manufacturer's written rigging instructions.

1.7 FIELD CONDITIONS

A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by City or others unless permitted under the following conditions and then only after arranging to provide temporary service in accordance with requirements indicated:

1. Notify City no fewer than two days in advance of proposed interruption of service.
2. Do not proceed with interruption of service without City's written permission.

PART 2 - PRODUCTS

2.1 PVC PIPE AND FITTINGS

A. Source Limitations: Obtain PVC pipe and fittings from single manufacturer.

B. NSF Marking: Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-drain" for plastic storm drain and "NSF-sewer" for plastic storm sewer piping.

C. PVC Gravity Sewer Piping:

1. Polyvinyl chloride (PVC) pipe and fittings of 12-inch and 10-inch diameter for mains conforming to ASTM D3034-81 may be used under this standard with installation conforming to ASTM recommended practice D2321; ASTM D3034-81 and D2321. For 24-inch PVC Storm Drain, shall meet ASTM 3034/F679, SDR 35 specification and are subject to City Standards for trenching and backfill and the modifications listed in Section 3.2 below.

2.2 DRAINS

A. Cast-Iron Area Drains:
1. Source Limitations: Obtain cast-iron area drains from single manufacturer.
2. Description: ASME A112.6.3 gray-iron round body with anchor flange and round secured grate. Include bottom outlet with inside caulk or spigot connection, of sizes indicated.

2.3 MANHOLES

A. Standard Precast Concrete Manholes:
   1. Contractor shall install standard manholes in accordance with the current City of Merced Standard S-1 (Sewer Manhole Details) and T-1 – T-5 (Trench Excavation and Backfill, Trenching in Concrete Areas, and Trenching and Backfill Requirements), the Plans, and these Special Provisions.

2.4 STORMWATER INLETS

A. Stormwater inlets shall comply with the requirements of Section 51, “Concrete Structures”, Section 70, “Miscellaneous Drainage Facilities”, Section 75, “Miscellaneous Metal”, and Section 90, “Concrete” of the Caltrans Standard Specifications and the City of Merced Standards.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavation, trenching, and backfilling are specified in Section 312000 "Earth Moving."

3.2 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings in accordance with manufacturer's written instructions for use of lubricants, cements, and other installation requirements.

C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.

D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

E. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process of microtunneling.

A. Contractor installation of storm drain subject to City Standards for trenching and backfill and the modifications listed below:
   1. Elastomeric gasket joints are required (ASTM F477)
   2. A minimum SDR value of 26 is required for 10 and 12 inch pipe.

3. The storm drain main shall be shown to conform to specifications by a mandrel test, after subgrade and base compaction, and before streets are paved.
4. Maximum allowable deflections for installed PVC pipe is 5 percent of average inside diameter as follows:

Nominal	SDR-26 Average	Minimum Mandrel Diameter
8-inch	7.891	7.496
10-inch	9.864	9.371
12-inch	11.737	11.15
15-inch	14.374	13.655

5. The contractor shall take the necessary precautions required to prevent excavated or other foreign material from getting into the pipe during the laying operation. At all times, when laying operations are not in progress, at the close of the day's work, or whenever the workmen are absent from the job, close and block the open end of the last section of pipe placed to prevent entry of foreign material or creep of the gasketed joints.
6. Stubouts from manholes and for future connection by others shall be plugged or closed off with temporary plugs.
7. The contractor shall take all precautions necessary to prevent the "uplift" or floating of the line prior to the completion of the backfilling operation.
8. A standard pipe joint shall be located no more than 1.5 feet from the outside edge of the structure or manhole on each pipe connection to a structure or manhole.
9. PVC pipe is only allowed where sewer will carry flow from residential developments. Neither PVC pipe, nor any other flexible pipe accepted by City for particular appllications, shall be utilized in horizontal and/or vertical curve sections. These types of pies are only allowed where entire length, between to manholes, is straight.

3.3 MANHOLE INSTALLATION

A. General: Install manholes, complete with appurtenances and accessories indicated.

B. Install precast concrete manhole sections with sealants in accordance with ASTM C891.

C. Where specific manhole construction is not indicated, follow manhole manufacturer's written instructions.

D. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops **3** inches above finished surface elsewhere unless otherwise indicated on the Plans.

E. Manhole installation shall comply with the requirements of Section 51, "Concrete Structures," Section 70, "Miscellaneous Drainage Facilities", Section 75, "Miscellaneous Metal", and Section 90, "Concrete" of the Caltrans Standard Specifications and City of Merced Standards.

3.4 STORMWATER INLET INSTALLATION

A. As required, Contractor shall plug the existing pipe to be abandoned at the catch basin, after the new storm drain line is in place and accepted by the Engineer. Class "C" Portland cement concrete or better shall be used. This item shall be installed in accordance with the Plans, these Special Provisions, and to the satisfaction of the Engineer. Existing pipe to remain shall be preserved and connected to the new catch basin.

The existing pipe shall be cut to match the wall of the drop inlet and have a two-foot (2') sump.

3.5 CLEANING

A. Clean interior of piping of dirt and superfluous materials. Flush with water.

END OF SECTION 334200

EXHIBIT “C” – SPECIAL CONDITIONS

ARTICLE 1 BONDS

Within ten (10) calendar days from the date the Contractor is notified of award of the Contract, the Contractor shall deliver to the City four identical counterparts of the Performance Bond and Payment Bond on the forms supplied by the City and included as Exhibit “F” to the Contract. Failure to do so may, in the sole discretion of City, result in the forfeiture of Contractor’s bid security. The surety supplying the bond must be an admitted surety insurer, as defined in Code of Civil Procedure Section 995.120, authorized to do business as such in the State of California and satisfactory to the City. The Performance Bond and the Payment Bond shall be for one hundred percent (100%) of the Total Contract Price.

EXHIBIT "D" – CERTIFICATION LABOR CODE SECTION 1861

I, the undersigned Contractor, am aware of the provisions of Section 3700, et seq., of the California Labor Code which require every employer to be insured against liability for Worker's Compensation or to undertake self-insurance in accordance with the provisions of the Code, and I, the undersigned Contractor, agree to and will comply with such provisions before commencing the performance of the Work on this Contract.

American Paving Co.
[INSERT CONTRACTOR NAME]

By: _____
Signature

Stephen J. Poindexter
Name (Print)

President
Title (Print)

EXHIBIT "E" – PUBLIC WORKS CONTRACTOR REGISTRATION CERTIFICATION

Pursuant to Labor Code sections 1725.5 and 1771.1, all contractors and subcontractors that wish to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. See http://www.dir.ca.gov/Public-Works/PublicWorks.html for additional information.

No bid will be accepted nor any contract entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work.

Contractor hereby certifies that it is aware of the registration requirements set forth in Labor Code sections 1725.5 and 1771.1 and is currently registered as a contractor with the Department of Industrial Relations.[1]

Name of Contractor: American Paving Co.

DIR Registration Number: 1000001450

DIR Registration Expiration: 6/30/2025

Small Project Exemption: _____ Yes or __X__ No

Unless Contractor is exempt pursuant to the small project exemption, Contractor further acknowledges:

Contractor shall maintain a current DIR registration for the duration of the project.

- Contractor shall include the requirements of Labor Code sections 1725.5 and 1771.1 in its contract with subcontractors and ensure that all subcontractors are registered at the time of bid opening and maintain registration status for the duration of the project.
- Failure to submit this form or comply with any of the above requirements may result in a finding that the bid is non-responsive.

Name of Contractor American Paving Co.

Signature _____

Name and Title Stephen J. Poindexter, President

Dated _____

[1] If the Project is exempt from the contractor registration requirements pursuant to the small project exemption under Labor Code Sections 1725.5 and 1771.1, please mark "Yes" in response to "Small Project Exemption."

EXHIBIT “F” – PAYMENT AND PERFORMANCE BONDS

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS, the City of Merced (hereinafter referred to as "City") has awarded to _____, (hereinafter referred to as the "Contractor") _____ an agreement for _____ (hereinafter referred to as the "Project").

WHEREAS, the work to be performed by the Contractor is more particularly set forth in the Contract Documents for the Project dated _____, (hereinafter referred to as "Contract Documents"), the terms and conditions of which are expressly incorporated herein by reference; and

WHEREAS, the Contractor is required by said Contract Documents to perform the terms thereof and to furnish a bond for the faithful performance of said Contract Documents.

NOW, THEREFORE, we, _____, the undersigned Contractor and _____ as Surety, a corporation organized and duly authorized to transact business under the laws of the State of California, are held and firmly bound unto the City in the sum of _____ DOLLARS, ($_____), said sum being not less than one hundred percent (100%) of the total amount of the Contract, for which amount well and truly to be made, we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that, if the Contractor, his or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements in the Contract Documents and any alteration thereof made as therein provided, on its part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their intent and meaning; and shall faithfully fulfill all obligations including the one-year guarantee of all materials and workmanship; and shall indemnify and save harmless the City, its officers and agents, as stipulated in said Contract Documents, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

As a condition precedent to the satisfactory completion of the Contract Documents, unless otherwise provided for in the Contract Documents, the above obligation shall hold good for a period of one (1) year after the acceptance of the work by City, during which time if Contractor shall fail to make full, complete, and satisfactory repair and replacements and totally protect the City from loss or damage resulting from or caused by defective materials or faulty workmanship, Surety shall undertake and faithfully fulfill all such obligations. The obligations of Surety hereunder shall continue so long as any obligation of Contractor remains. Nothing herein shall limit the City's rights or the Contractor or Surety's obligations under the Contract, law or equity, including, but not limited to, California Code of Civil Procedure section 337.15.

Whenever Contractor shall be, and is declared by the City to be, in default under the Contract Documents, the Surety shall remedy the default pursuant to the Contract Documents, or shall promptly, at the City's option:

(1) Take over and complete the Project in accordance with all terms and conditions in the Contract Documents; or

(2) Obtain a bid or bids for completing the Project in accordance with all terms and conditions in the Contract Documents and upon determination by Surety of the lowest responsive and responsible bidder, arrange for a Contract between such bidder, the Surety and the City, and make available as work progresses sufficient funds to pay the cost of completion of the Project, less the balance of the contract price, including other costs and damages for which Surety may be liable. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable to Contractor by the City under the Contract and any modification thereto, less any amount previously paid by the City to the Contractor and any other set offs pursuant to the Contract Documents.

(3) Permit the City to complete the Project in any manner consistent with local, California and federal law and make available as work progresses sufficient funds to pay the cost of completion of the Project, less the balance of the contract price, including other costs and damages for which Surety may be liable. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable to Contractor by the City under the Contract and any modification thereto, less any amount previously paid by the City to the Contractor and any other set offs pursuant to the Contract Documents.

Surety expressly agrees that the City may reject any contractor or subcontractor which may be proposed by Surety in fulfillment of its obligations in the event of default by the Contractor.

Surety shall not utilize Contractor in completing the Project nor shall Surety accept a bid from Contractor for completion of the Project if the City, when declaring the Contractor in default, notifies Surety of the City's objection to Contractor's further participation in the completion of the Project.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract Documents or to the Project to be performed thereunder shall in any way affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract Documents or to the Project, including but not limited to the provisions of sections 2819 and 2845 of the California Civil Code.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 20__).

(Corporate Seal)

_____

Contractor/ Principal

By _____

Title _____

_____

(Corporate Seal) Surety

By _____
Attorney-in-Fact

Signatures of those signing for the Contractor and Surety must be notarized and evidence of corporate authority attached.

(Attach Attorney-in-Fact Certificate) Title _____

The rate of premium on this bond is _____ per thousand. The total amount of premium charges, $_____.
(The above must be filled in by corporate attorney.)

THIS IS A REQUIRED FORM
Any claims under this bond may be addressed to:

(Name and Address of Surety) _____
_____
_____

(Name and Address of Agent or Representative for service of process in California, if different from above) _____
_____
_____

(Telephone number of Surety and Agent or Representative for service of process in California) _____

NOTE: A copy of the Power-of-Attorney authorizing the person signing on behalf of the Surety to do so must be attached hereto.

Notary Acknowledgment

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
COUNTY OF _____

On _____, 20___, before me, _____, Notary Public, personally

appeared _____, who proved to me on the basis of satisfactory

evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

_____

Signature of Notary Public

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

☐ Individual
☐ Corporate Officer

Title(s)

☐ Partner(s) ☐ Limited ☐ General

☐ Attorney-In-Fact
☐ Trustee(s)
☐ Guardian/Conservator
☐ Other:

Signer is representing:
Name Of Person(s) Or Entity(ies)

_____

_____

DESCRIPTION OF ATTACHED DOCUMENT

_____
Title or Type of Document

_____
Number of Pages

_____
Date of Document

_____
Signer(s) Other Than Named Above

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS That

WHEREAS, the City of Merced (hereinafter designated as the "City"), by action taken or a resolution passed_____, 20____has awarded to _____ hereinafter designated as the "Principal," a contract for the work described as follows:

_____ (the "Project"); and

WHEREAS, the work to be performed by the Principal is more particularly set forth in the Contract Documents for the Project dated _____ ("Contract Documents"), the terms and conditions of which are expressly incorporated by reference; and

WHEREAS, said Principal is required to furnish a bond in connection with said contract; providing that if said Principal or any of its Subcontractors shall fail to pay for any materials, provisions, provender, equipment, or other supplies used in, upon, for or about the performance of the work contracted to be done, or for any work or labor done thereon of any kind, or for amounts due under the Unemployment Insurance Code or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of said Principal and its Subcontractors with respect to such work or labor the Surety on this bond will pay for the same to the extent hereinafter set forth.

NOW THEREFORE, we, the Principal and _____ as Surety, are held and firmly bound unto the City in the penal sum of _____ _____ Dollars ($_____) lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if said Principal, his or its subcontractors, heirs, executors, administrators, successors or assigns, shall fail to pay any of the persons named in Section 9100 of the Civil Code, fail to pay for any materials, provisions or other supplies, used in, upon, for or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or amounts due under the Unemployment Insurance Code with respect to work or labor performed under the contract, or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department or Franchise Tax Board from the wages of employees of the contractor and his subcontractors pursuant to Section 18663 of the Revenue and Taxation Code, with respect to such work and labor the Surety or Sureties will pay for the same, in an amount not exceeding the sum herein above specified.

This bond shall inure to the benefit of any of the persons named in Section 9100 of the Civil Code so as to give a right of action to such persons or their assigns in any suit brought upon this bond.

It is further stipulated and agreed that the Surety on this bond shall not be exonerated or released from the obligation of this bond by any change, extension of time for performance, addition, alteration or modification in, to, or of any contract, plans, specifications, or agreement pertaining or relating to any scheme or work of improvement herein above described, or pertaining or relating to the furnishing of labor, materials, or equipment therefore, nor by any change or modification of any terms of payment or extension of the time for any payment pertaining or relating to any scheme or work of improvement herein above described, nor by any rescission or

attempted rescission of the contract, agreement or bond, nor by any conditions precedent or subsequent in the bond attempting to limit the right of recovery of claimants otherwise entitled to recover under any such contract or agreement or under the bond, nor by any fraud practiced by any person other than the claimant seeking to recover on the bond and that this bond be construed most strongly against the Surety and in favor of all persons for whose benefit such bond is given, and under no circumstances shall Surety be released from liability to those for whose benefit such bond has been given, by reason of any breach of contract between the owner or City and original contractor or on the part of any obligee named in such bond, but the sole conditions of recovery shall be that claimant is a person described in Section 9100 of the Civil Code, and has not been paid the full amount of his claim and that Surety does hereby waive notice of any such change, extension of time, addition, alteration or modification herein mentioned and the provisions of sections 2819 and 2845 of the California Civil Code.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 20__.

(Corporate Seal)

_____
Contractor/ Principal

By _____

Title _____

_____
Surety

(Corporate Seal)

By _____
Attorney-in-Fact

Title _____

Signatures of those signing for the Contractor and Surety must be notarized and evidence of corporate authority attached. A Power-of-Attorney authorizing the person signing on behalf of the Surety to do so must be attached hereto.

NOTE: A copy of the Power-of-Attorney authorizing the person signing on behalf of the Surety to do so must be attached hereto.

Notary Acknowledgment

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
COUNTY OF _____

On _____, 20___, before me, _____, Notary Public, personally

appeared _____, who proved to me on the basis of satisfactory

evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

_____

Signature of Notary Public

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

☐ Individual
☐ Corporate Officer

Title(s)

☐ Partner(s) ☐ Limited ☐ General

☐ Attorney-In-Fact
☐ Trustee(s)
☐ Guardian/Conservator
☐ Other:

Signer is representing:
Name Of Person(s) Or Entity(ies)

_____

_____

DESCRIPTION OF ATTACHED DOCUMENT

_____
Title or Type of Document

_____
Number of Pages

_____
Date of Document

_____
Signer(s) Other Than Named Above

APPENDIX

CITY OF MERCED STANDARD DESIGNS

THE FOLLOWING STANDARDS ARE FOR REFERENCE ONLY
REFER TO THE CITY OF MERCED WEBSITE FOR THE COMPLETE LISTING OF STANDARD DETAILS

http://www.cityofmerced.org/depts/engineering_division/standard_designs/default.asp

STATE GENERAL PREVAILING WAGE RATES

General prevailing wage determination
Made by the Director of Industrial Relations

Pursuant to California Labor Code part 7,
Chapter 1, article 2, sections 1770, 1773, and 1773.1

State of California Department of Industrial Relations Website:
http://www.dir.ca.gov/OPRL/PWD/index.htm

AIR POLLUTION CONTROL

San Joaquin Valley
Air Pollution Control District

COMPLIANCE ASSISTANCE BULLETIN
August 2006

Regulation VIII – Fugitive PM10 Prohibitions Requirements on Paved and Unpaved Public Roads

District Rule 8061(*Paved and Unpaved Roads*) of Regulation VIII (*Fugitive PM10 Prohibitions*) specifies the design criteria for constructing new or modifying existing paved roads and the types of control measures required for limiting fugitive dust emissions from unpaved roads and shoulders. Several compliance dates and deadlines described in the rule apply specifically to city, county, and state agencies. The purpose of this bulletin is to summarize the new requirements for public agencies that own or maintain paved and unpaved roads. The entire rule may be found at www.valleyair.org/rules/1ruleslist.htm - reg8.

- **Constructing New Unpaved Roads:** Effective October 1, 2004, constructing a new unpaved road is prohibited in all urban areas unless the unpaved road is used for a temporary activity that does not exceed six months of use over a consecutive three-year period. Temporary activities may include construction access roads, special events, or traffic detours. The unpaved surface must be maintained in a stabilized condition at all times in order to control fugitive emissions.

- **PM10-Efficient Street Sweepers**: These requirements apply to the routine cleaning of existing paved public roads within urban areas. Effective July 1, 2005, an agency or its contractor may only purchase PM10-efficient street sweepers for their fleets and at least one sweeper must be placed into service by July 1, 2008. PM10-efficient street sweepers are to be used along routine street sweeper routes, which have been predetermined and prioritized by the agency as having paved curbs with the greatest actual or potential for dirt and silt loading. If an agency cannot meet these provisions due to budgetary constraints, a statement of financial hardship must be submitted to the District and the USEPA for review and approval.

- **Cleaning Paved Roads after a Storm Event:** Within 24 hours of discovery, the agency or contractor responsible for maintaining the roadway must remove the accumulated mud and dirt from the paved road or restrict vehicles from traveling over the mud and dirt until the materials can be removed. This requirement applies if the accumulated mud and dirt is a result of wind or water erosion and runoff, is at least one inch thick, and covers an area of at least 50 square feet. Cleanup may be performed manually with a shovel and broom, or with a conventional or PM10-efficient street sweeper, but must be performed in a manner that minimizes fugitive dust. Using a blowing device or a dry rotary brush or broom is prohibited. Redirecting traffic is one way to restrict vehicles from traveling over the mud and dirt. Upon agency notification, the District may approve an extension of the 24-hour cleanup requirement if restricting vehicles is deemed unsafe and removing the mud and dirt is not possible within 72 hours because crews are not available over a weekend or holiday.

Northern Region Office
4800 Enterprise Way
Modesto, CA 95356-8718
(209) 557-6400 ♦ FAX (209) 557-6475

Central Region Office
1990 East Gettysburg Avenue
Fresno, CA 93726-0244
(559) 230-6000 ♦ FAX (559) 230-6062

Southern Region Office
2700 "M" Street, Suite 275
Bakersfield, CA 93301-2373
(661) 326-6900 ♦ FAX (661) 326-6985

- **Posting Speed Limit Signs on Unpaved Roads:** Effective October 1, 2005, public agencies must establish a maximum speed limit of 25 miles per hour for the unpaved roads under their jurisdictions. This requirement applies to the unpaved road segments where vehicle traffic reaches or exceeds 26 annual average daily trips (AADT). At a minimum, agencies are to post at least one speed limit sign in each direction for every mile of unpaved road located within an urban area, and one sign in each direction for every two miles of unpaved road within a rural area. For example, an unpaved road located within an urban area that is ½ mile long and exceeds 26 AADT requires at least one sign posted in each direction. The unpaved surface must be maintained in a stabilized condition at all times in order to control fugitive emissions.

- **Paving Existing Unpaved Roads and Paving or Stabilizing Unpaved Shoulders:** On January 1, 2005, agencies provided the District with a report listing each unpaved road located within an urban area and each paved road with unpaved shoulders within urban and rural areas. On July 1, 2005, agencies provided a report listing each unpaved road located within a rural area. These reports include the length in miles and the AADT for each subject road and unpaved shoulder within the agency's jurisdiction.

  As of January 1, 2005, agencies are to pave an annual average of 20 percent of the unpaved roads listed in their urban area unpaved road report, thereby paving 100 percent of these unpaved roads by January 1, 2010. This requirement does not apply to rural unpaved roads.

  In urban areas, agencies are to pave or stabilize at least four-feet of unpaved shoulders on at least 50 percent of the existing paved roadways having the highest AADT. In rural areas, this is required on at least 25 percent of the existing paved roadways with the highest AADT. Compliance with these provisions must be complete by January 1, 2010.

  If an agency cannot meet these provisions due to budgetary constraints, a statement of financial hardship must be submitted to the District and the USEPA for review and approval.

- **Incremental Progress Reports:** Due on April 1 of each year, from 2006 through 2010, agencies must report their incremental progress to the District by reporting the total miles of urban unpaved roads that were paved over the previous calendar year, the total miles of unpaved shoulders that were paved or stabilized over the previous calendar year, and the percentage of cumulative miles treated relative to the original reports.

For more information please contact the Compliance Department of the District office nearest to you. Information on Regulation VIII is available on the District's website at:

www.valleyair.org

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

COMPLIANCE ASSISTANCE BULLETIN
April 2007

Fugitive Dust Control at Construction Sites: New Requirements

Regulation VIII, Fugitive PM10 Prohibitions, of the District's Rules and Regulations apply to many activities that generate fugitive dust, and particularly to construction sites.

Fugitive dust is emitted into the air by activities that disturb the soil, such as earthmoving and vehicular/equipment traffic on unpaved surfaces. Windblown dust is also of concern where soil has been disturbed at construction sites.

The District adopted Regulation VIII in 1993 and its most recent amendments became effective on October 1, 2004. This is a basic summary of the regulation's requirements as they apply to construction sites.

These regulations affect all workers at a regulated construction site, including everyone from the landowner to the subcontractors. Violations of Regulation VIII are subject to enforcement action including fines.

Visible Dust Emissions (VDE) may not exceed 20% opacity during periods when soil is being disturbed by equipment or by wind at any time. Visible Dust Emissions opacity of 20% means dust that would obstruct an observer's view of an object by 20%. District inspectors are state certified to evaluate visible emissions. Dust control may be achieved by applying water before/during earthwork and onto unpaved traffic areas, phasing work to limit dust, and setting up wind fences to limit wind blown dust.

Soil Stabilization is required at regulated construction sites after normal working hours and on weekends and holidays. This requirement also applies to inactive construction areas such as phased projects where disturbed land is left unattended. Applying water to form a visible crust on the soil and restricting vehicle access are often effective for short-term stabilization of disturbed surface areas. Long-term methods including applying dust suppressants and establishing vegetative cover.

Carryout and Trackout occur when materials from emptied or loaded vehicles falls onto a paved surface or shoulder of a public road or when materials adhere to vehicle tires and are deposited onto a paved surface or shoulder of a public road. Should either occur, the material must be cleaned up at least daily, and immediately if it extends more than 50 feet from the exit point onto a paved road. The appropriate clean-up methods require the complete removal and cleanup of mud and dirt from the paved surface and shoulder. Using a blower device or dry sweeping with any mechanical device other than a PM10-efficient street sweeper is a violation. Larger construction sites, or sites with a high amount of traffic on one or more days, must prevent carryout and trackout from occurring by installing gravel pads, grizzlies, wheel washers, paved interior roads, or a combination thereof at each exit point from the site. In many cases, cleaning up trackout with water is also prohibited as it may lead to plugged storm drains. Prevention is the best method.

Unpaved Access and Haul Roads, as well as unpaved vehicle and equipment traffic areas at construction sites must have dust control. Speed limit signs limiting vehicle speed to 15 mph or less at construction sites must be posted every 500 feet on uncontrolled and unpaved roads.

Northern Region Office
4800 Enterprise Way
Modesto, CA 95356-8718
(209) 557-6400 ♦ FAX (209) 557-6475

Central Region Office
1990 East Gettysburg Avenue
Fresno, CA 93726-0244
(559) 230-6000 ♦ FAX (559) 230-6062

Southern Region Office
2700 "M" Street, Suite 275
Bakersfield, CA 93301-2373
(661) 326-6900 ♦ FAX (661) 326-6985

Storage Piles and Bulk Materials have handling, storage, and transportation requirements that include applying water when handling materials, wetting or covering stored materials, and installing wind barriers to limit VDE. Also, limiting vehicle speeds, loading haul trucks with a freeboard of six inches or greater along with applying water to the top of the load, and covering the cargo compartments are effective measures for reducing VDE and carryout from vehicles transporting bulk materials.

Demolition activities require the application of water to the exterior of the buildings and to unpaved surfaces where materials may fall. A Dust Control Plan will be required for large demolition projects. Consider all structures slated for demolition as possibly being regulated due to potential asbestos, per District Rule 4002 - *National Emission Standards for Hazardous Air Pollutants*. Contact the District well before starting because a 10 working-day notice will likely be required before a demolition can begin.

Dust Control Plans identify the dust sources and describe the dust control measures that will be implemented before, during, and after any dust generating activity for the duration of the project. Owners or operators are required to submit plans to the District at least 30 days prior to commencing the work for the following:

- Residential developments of ten or more acres of disturbed surface area.
- Non-residential developments of five or more acres of disturbed surface area.
- The relocation of more than 2,500 cubic yards per day of materials on at least three days.

Operations may not commence until the District has approved the Dust Control Plan. A copy of the plan must be on site and available to workers and District employees. **All work on the site is subject to the requirements of the approved dust control plan. A failure to abide by the plan by anyone on site may be subject to enforcement action.**

Owners or operators of construction projects that are at least one acre in size and where a Dust Control Plan is not required, must provide written notification to the District at least 48 hours in advance of any earthmoving activity.

Record Keeping is required to document compliance with the rules and must be kept for each day any dust control measure is used. The District has developed record forms for water application, street sweeping, and "permanent" controls such as applying long term dust palliatives, vegetation, ground cover materials, paving, or other durable materials. Records must be kept for one year after the end of dust generating activities (Title V sources must keep records for five years).

Exemptions exist for several activities. Those occurring above 3,000 feet in elevation are exempt from all Regulation VIII requirements. Further, Rule 8021 – *Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities* exempts the following construction and earthmoving activities:

- Blasting activities permitted by California Division of Industrial Safety.
- Maintenance or remodeling of existing buildings provided the addition is less than 50% of the size of the existing building or less than 10,000 square feet (due to asbestos concerns, contact the District at least two weeks ahead of time).
- Additions to single family dwellings.
- The disking of weeds and vegetation for fire prevention on sites smaller than ½ acre.
- Spreading of daily landfill cover to preserve public health and safety and to comply with California Integrated Waste Management Board requirements.

Nuisances are prohibited at all times because District Rule 4102 – *Nuisance* applies to all construction sources of fugitive dust, whether or not they are exempt from Regulation VIII. It is important to monitor dust-generating activities and implement appropriate dust control measures to limit the public's exposure to fugitive dust.

For more information please contact the Compliance Division of the District office nearest to you. Information on Regulation VIII, where you may obtain copies of record keeping forms, the Dust Control Plan template, and the Construction Notification form, is available on the District's website at:

www.valleyair.org, under Compliance Assistance/Dust Control.

ADDENDA

January 19, 2023

CITY OF MERCED
DEPARTMENT OF ENGINEERING
678 W. 18th Street, Merced, CA 95340

ADDENDUM NO. 1

To **ALL PROSPECTIVE BIDDERS**
Under Specifications for the Construction of

COMMUNITY PARK 42
PROJECT NUMBER 122061

For which bids are to be received at the Office of the Purchasing Agent of the City of Merced, 2525 "O" St., Merced, California, until **2:00 PM on February 14, 2023**.

The following revision to the specifications shall be made:

Item 1: <u>NOTICE INVITING BIDS</u>

Add section:

N-12 LOCAL BUSINESS ENTERPRISE PARTICIPATION: The Local Business Enterprise (LBE) participation goal is five percent (5%).

Michael R. Beltran II, P.E.
City Engineer

Name of Bidder or Firm: American Paving Co.

THIS ADDENDUM MUST BE SIGNED AND RETURNED WITH BID PROPOSAL.

ADDENDUM NO. 1 has been received and incorporated into the bid proposal.

Received By: _____
Stephen J. Poindexter, President

Date : 2/28/23 Planholder : American Paving Co.

NOTE: RECEIPT OF THIS ADDENDUM MUST ALSO BE ACKNOWLEDGED IN THE CONTRACTOR'S BID PROPOSAL.

January 25, 2023

CITY OF MERCED
DEPARTMENT OF ENGINEERING
678 W. 18th Street, Merced, CA 95340

ADDENDUM NO. 2

To **ALL PROSPECTIVE BIDDERS**
Under Specifications for the Construction of

COMMUNITY PARK 42
PROJECT NUMBER 122061

For which bids are to be received at the Office of the Purchasing Agent of the City of Merced, 2525 "O" St., Merced, California.

The following revision to the specifications shall be made:

ITEM 1: <u>BID OPENING DATE</u>

Remove the bid opening date of February 14, 2023, and replace with **February 28, 2023**, at the following locations:

- Cover Page
- Notice Inviting Bids, Page II, Section N-1
- Notice Inviting Bids, Page III, Section N-11
- Bid, Page XIV

ITEM 2: <u>QUESTIONS SUBMITTAL DATE</u>

Remove the questions submittal date of February 3, 2023, and replace with **February 17, 2023**, at the following location:

- Instructions to Bidders, Page V, Section Addenda

ITEM 3: <u>WORKING DAYS</u>

Remove the working days of 120, and replace with **180** working days at the following locations:

- Construction Contract, Page 3, Section 3.3 Period of Performance and Liquidated Damages
- Exhibit A – Services/Schedule, Page 24

Michael R. Beltran II, P.E.
City Engineer

Name of Bidder or Firm: American Paving Co.

THIS ADDENDUM MUST BE SIGNED AND RETURNED WITH BID PROPOSAL.

ADDENDUM NO. 2 has been received and incorporated into the bid proposal.

Received By: _____
Stephen J. Poindexter, President

Date : 2/28/23 Planholder : American Paving Co.

NOTE: RECEIPT OF THIS ADDENDUM MUST ALSO BE ACKNOWLEDGED IN THE CONTRACTOR'S BID PROPOSAL.

February 10, 2023

CITY OF MERCED
DEPARTMENT OF ENGINEERING
678 W. 18th Street, Merced, CA 95340

ADDENDUM NO. 3

To **ALL PROSPECTIVE BIDDERS**
Under Specifications for the Construction of

COMMUNITY PARK 42
PROJECT NUMBER 122061

For which bids are to be received at the Office of the Purchasing Agent of the City of Merced, 2525 "O" St., Merced, California.

The following revisions to the specifications shall be made:

ITEM 1: SPECIFICATIONS: PAGE VI – BID GUARANTEE (BOND)

- Revise the first sentence to read as follows:

*Each bid shall be accompanied by: (a) cash; (b) a certified or cashier's check made payable to City of Merced; or (c) a Bid Bond secured from a surety company satisfactory to the City, the amount of which shall not be less than ten percent (10%) of the Total **Base** Bid Price, made payable to City of Merced as bid security.*

ITEM 2: SPECIFICATIONS: PAGE XI – BASIS OF AWARD

- Revise the first paragraph to read as follows:

*The City shall award the Contract to the lowest responsible Bidder submitting a responsive Bid. The lowest Bid will be determined on the basis of the Total **Base** Bid Price.*

ITEM 3: SPECIFICATIONS: PAGE XV TO PAGE XIX – BID ITEM LIST, BID SCHEDULE 'A' – BASE BID

- Remove Bid Schedule 'A' – Base Bid and replace with the revised Attachment 1: Bid Schedule 'A' – Base Bid.

ITEM 4: SPECIFICATIONS: PAGE 53 – TABLE OF CONTENTS, AND PAGE 252 TO PAGE 254 – SECTION 313213.16 STABILIZED SOIL

- Remove Section 313213.16 – Stabilized Soil.

ITEM 5: SPECIFICATIONS: PAGE 54 TO PAGE 76 – BID ITEM DESCRIPTIONS

- Remove Bid Item Descriptions and replace with the revised Attachment 2: Bid Item Descriptions.

The following revisions to the plans shall be made:

ITEM 1: PLANS: REMOVE PLAN SHEETS AND REPLACE WITH SHEETS OF THE SAME NUMBER (SEE ATTACHMENT 3)

- Civil:
  - Sheet C2.0 (16 of 75) – Utility Plan
  - Sheet C2.4 (20 of 75) – Utility Plan
  - Sheet C2.5 (21 of 75) – Utility Plan
- Landscape
  - Sheet L1.0 (23 of 75) – Site Features and Finished Legend and Notes
  - Sheet L1.3 (26 of 75) – Site Features and Finishes Plan
  - Sheet L1.8 (31 of 75) – Site Features and Finishes Plan - Additive Alternate #4
  - Sheet L4.0 (47 of 75) – Planting Legend and Notes
  - Sheet L5.2 (55 of 75) – Construction Details
  - Sheet L5.3 (56 of 75) – Construction Details
  - Sheet L5.6 (59 of 75) – Construction Details
  - Sheet L5.7 (60 of 75) – Construction Details
  - Sheet L7.0 (65 of 75) – Planting Details
- Electrical
  - Sheet E1.4 (71 of 75) – Area D - Partial Electrical Plan
  - Sheet E3.2 (73 of 75) – Partial Site Plan - Electrical Yard

Kristen Scheidt, P.E., QSD

Michael R. Beltran II, P.E.
City Engineer

Attachment 1: Bid Schedule 'A' – Base Bid
Attachment 2: Bid Item Descriptions
Attachment 3: Plan Sheets

Name of Bidder or Firm: American Paving Co.

THIS ADDENDUM MUST BE SIGNED AND RETURNED WITH BID PROPOSAL.

ADDENDUM NO. 3 has been received and incorporated into the bid proposal.

Received By: _____
Stephen J. Poindexter, President

Date : 2/28/23 Planholder : American Paving Co.

NOTE: RECEIPT OF THIS ADDENDUM MUST ALSO BE ACKNOWLEDGED IN THE CONTRACTOR'S BID PROPOSAL.

ATTACHEMENT 1

BID ITEM LIST

BID SCHEDULE 'A' - BASE BID					
ITEM NO.	ITEM	UNIT OF MEASURE	ESTIMATED QUANTITY	UNIT PRICE (IN FIGURES)	ITEM TOTAL (IN FIGURES)
1	Permits, Bonds, Licenses & Insurance	LS	1		
2	Public Convenience and Safety	LS	1		
3	Water Pollution Control	LS	1		
4	Street Sweeping	LS	1		
5	Surveying Services	LS	1		
6	Monumentation	LS	1		
7	Portable Changeable Message Signs	LS	1		
8	Site Preparation (Clearing, Grubbing & Disposal)	LS	1		
9	Soil Import	LS	1		
10	Site Grading (Rough/ Fine)	SF	406,375		
11	30" Storm Drain	LF	313		
12	24" Storm Drain	LF	778		
13	18" Storm Drain	LF	621		
14	12" Storm Drain	LF	320		
15	10" Storm Drain	LF	348		
16	8" Storm Drain	LF	1,202		
17	6" Storm Drain	LF	703		
18	Storm Drain Manholes	EA	4		
19	Type "C" Catch Basin	EA	4		
20	Storm Drain Area Drains	EA	19		
21	Storm Drain Outfall	EA	1		
22	4" Sewer	LF	440		
23	6" Sewer	LF	1,170		

24	Sewer Manhole	EA	3		
25	Sewer Cleanout	EA	2		
26	Connect to Existing Sewer Manhole	EA	1		
27	10” Water Line (Irrigation Main)	LF	60		
28	3” Water Line	LF	740		
29	1” Water Line	LF	370		
30	10” Water Meter	EA	1		
31	3” Water Meter	EA	1		
32	Connect to Existing Water Main	EA	2		
33	10” Water Line (Offsite)	LF	1,780		
34	Fire Hydrant Assembly	EA	1		
35	Electrical	LS	1		
36	Parking lot Light Pole w/ 4-head fixture (Site Feature ‘40’)	EA	2		
37	Parking Lot Light Pole w/ single-head fixture (Site Feature ‘33’)	EA	2		
38	Pedestrian Light Pole w/ fixture (Site Feature ‘15’)	EA	3		
39	Concrete Flatwork (Site Finish ‘A’)	SF	77,842		
40	Asphalt Parking Lot with striping (Site Finish ‘B’)	SF	75,619		
41	Plexipave Surfacing Tennis Court Field (Site Finish ‘C’)	SF	5,616		
42	Plexipave Surfacing Tennis Court Striping (Site Finish ‘D’)	LF	1,032		
43	Plexipave Surfacing Futsal Court Field (Site Finish ‘H’)	SF	9,695		
44	Plexipave Surfacing Futsal Court Striping (Site Finish ‘I’)	LF	629		
45	Sand Volleyball Courts (Site Finish ‘E’)	SF	8,631		
46	12” Concrete Mow Curb (Site Feature ‘1’)	LF	215		
47	12” Concrete Curb at Volleyball Courts (Site Feature ‘3’)	LF	215		

48	Thickened Sidewalk Edge at Playground (Site Feature ‘2’)	LF	115		
49	Parking Lot Curbs- Vertical/ Flush- (Site Feature ‘23’)	LF	2,491		
50	Parking Lot Curb & Gutter (Site Feature ‘23’)	LF	654		
51	Vertical Curb at Drop-Off Area (Site Feature ‘42’)	LF	250		
52	Truncated Domes (Site Feature ‘43’)	LF	198		
53	Parking Lot Rolled Curb (Site Feature ‘45’)	LF	60		
54	AC Dike	LF	425		
55	2x4 Header at Limit of Phase 1 (Site Feature ‘50’)	LF	1769		
56	Thickened Sidewalk Edge at Volleyball Courts (Site Feature ‘51’)	LF	164		
57	Directional Signage (Site Feature ‘5’)	EA	2		
58	Field Location Signage (Site Feature '6')	EA	2		
59	Removable Bollards (Site Feature '7')	EA	6		
60	Fixed Bollards (Site Feature '8')	EA	8		
61	Picnic Tables (Site Feature '9')	EA	2		
62	Accessible Picnic Tables (Site Feature '10')	EA	1		
63	Bench (Site Feature '11')	EA	12		
64	Drinking Fountain (Site Feature ‘12’)	EA	1		
65	Volleyball Poles, Ground Sleeves, and Net (Site Feature '13')	EA	4		
66	Dual Post Football Goal (Site Feature '14')	EA	2		
67	Soccer Goal and Net (Site Feature '16')	EA	4		
68	Restroom/Concessions Building (Site Feature '17')	LS	1		
69	ADA Ramp with Truncated Domes (Site Feature '18')	EA	16		
70	ADA Parking Stall Signage (Site Feature '19')	EA	8		

71	Tow-Away Signage (Site Feature '20')	EA	1		
72	No Parking Signage (Site Feature '21')	EA	1		
73	Drop-Off Signage (Site Feature '22')	EA	1		
74	Restroom Building (Site Feature '27')	LS	1		
75	Tree Grate (Site Feature '30')	EA	1		
76	Chain Link Fence at Tennis Court (Site Feature '31')	LF	476		
77	Chain Link Gates At Tennis Court (Site Feature '32')	EA	4		
78	Chain Link Fence at Futsal Court (Site Feature '34')	LF	280		
79	Chain Link Gates at Futsal Court (Site Feature '35')	EA	2		
80	Decorative Fence at Futsal Court (Site Feature ‘36’)	LF	140		
81	Bike Rack (Site Feature '37')	EA	6		
82	Tubular Steel Gates at Vehicular Entry (Site Feature '38')	EA	2		
83	Waste Receptacle Corrals (Site Feature '39')	EA	3		
84	Tennis Posts and Ground Sleeves (Site Feature '41')	EA	4		
85	No Camping/Over Night Parking Signage at Entry (Site Feature '44')	EA	1		
86	No Camping/Over Night Parking Signage at Restroom Buildings (Site Feature '46')	EA	2		
87	Park Welcome Signage (Site Feature '47')	EA	1		
88	Park Rules Signage (Site Feature '48')	EA	1		
89	Doggie-Pot Waste Station (Site Feature '49')	EA	5		
90	Futsal Goal and Net (Site Feature ‘54’)	EA	2		
91	Soil Preparation & Amendment	SF	295,170		
92	Turf Hydroseed – Sports Field Blend	SF	271,689		
93	NOT IN USE	---	---	----------	----------

94	1 Gallon Shrubs	EA	1,387		
95	24” Box Trees	EA	108		
96	Tree Root Barriers	LF	1,830		
97	Top Dressing - Decorative Bark Mulch	SF	23,484		
98	Irrigation System	LS	1		
99	Irrigation Controller	LS	1		
100	Irrigation Point of Connection (Water Meter, Backflow, Booster Pump)	LS	1		
101	Landscape Maintenance Period (180 Days)	LS	1		
102	FDR-C Process (1.0’)	LS	1		
			TOTAL SCHEDULE ‘A’ BID		

ATTACHEMENT 2

BID ITEM DESCRIPTIONS

BID ITEM DESCRIPTIONS
The descriptions below are general descriptions and do not include estimated quantities. See plans and bid summary for estimated quantities. Estimated quantities are provided as a courtesy only. Actual numbers and quantities of symbols on plans prevail.

Bid Schedule 'A' – Base Bid

Bid Item 1 - Permits, Bonds, Licenses & Insurance:
The lump sum bid for this item shall include all costs for permits, bonds, licenses and insurance. The item also includes all charges and fees, and give all notices necessary and incidental to the prosecution of the work as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 2 - Public Convenience and Safety:
The lump sum bid for this item shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 3 - Water Pollution Control:
The lump sum bid for this item shall also include preparation of storm water pollution prevention plan including all labor, materials, tools, equipment, and incidentals and for doing all the work involved in preparing, obtaining approval of, and amending the SWPPP and CSMP, inspecting water pollution control practices, as required by the Drawings and Specifications, and as directed by the Engineer. Item also includes implementation of water pollution prevention plan including all labor, materials, tools, equipment, and incidentals.

Bid Item 4 - Street Sweeping:
The lump sum bid for this item includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in street sweeping, including disposal of collected material, as required by the Drawings and Specifications, and as directed by the Engineer.

Bid Item 5 - Surveying Services:
The lump sum bid for this item includes shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item.

Bid Item 6 - Monumentation:
The lump sum bid for this item will be made only if monuments are affected within the proposed work and shall be at the contract unit price for two (2) items as set forth in the proposal and shall include all labor, materials, tools, equipment and all work necessary for the completion of this item.

Bid Item 7 - Portable Changeable Message Signs:

The lump sum bid for this item shall be at the contract unit price as set forth in the proposal and shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item.

Bid Item 8 - Site Preparation (Clearing, Grubbing, & Disposal):

The lump sum bid for this item shall include all costs for soil clearing, grubbing and removal. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 9 - Soil Import:

The lump sum bid for this item shall include all costs for soil import per landscape and civil plans. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 10 - Site Grading (Mass/Fine):

The square footage bid for this item shall include all costs for rough grading, fine grading, and if needed, soil removal and disposal. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 11 - 30" Storm Drainage Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage systems structures, solid and perforated piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 12 - 24" Storm Drain Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage systems structures, solid and perforated piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 13 - 18" Storm Drain Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage systems structures, solid and perforated piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 14 - 12" Storm Drain Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage systems structures, solid and perforated piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 15 - 10" Storm Drain Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage systems structures, solid and perforated piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 16 - 8" Storm Drain Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage systems structures, solid and perforated piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 17 - 6" Storm Drain Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage systems structures, solid and perforated piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 18 - Storm Drainage Manholes:

The unit price bid for this item shall include all costs for purchase and installation of storm drainage manholes, and related components and connections to storm drainage system, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 19 - Type "C" Catch Basins:

The unit price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage system inlet structures, and related components, as indicated on the Drawings as well as finish grading of landscape areas to meet rim and invert elevations. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 20 - Storm Drain Area Drains:

The unit price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage system inlet structures, and related components, as indicated on the Drawings as well as finish grading of landscape areas to meet rim and invert elevations. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 21 - Storm Drain Area Outfalls:

The unit price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage system outfall structures, and related components, as indicated on the Drawings as well as finish grading of landscape areas to meet rim and invert elevations. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 22 - 4" Sewer Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional sanitary sewer system structures, solid piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 23 - 6" Sewer Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully

functional sanitary sewer system structures, solid piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 24 - Sewer Manhole

The unit price bid for this item shall include all costs for purchase and installation of sanitary sewer manholes, and related components and connections to sanitary sewer system, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 25 - Sewer Cleanout

The unit price bid for this item shall include all costs for purchase and installation of sanitary sewer cleanout, and related components and connections to sanitary sewer system, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 26 - Connect to Existing Sewer Manhole

The unit price bid for this item shall include all costs for purchase, lane closure/road control, line trenching, placement, backfill, and connection to City Sewer System with traffic rated boxes as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid form as a pay item.

Bid Item 27 - 10” Water Line (Irrigation Main)

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional water system structures, solid piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 28 - 3” Water Line

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional water system structures, solid piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 29 - 1” Water Line

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional water system structures, solid piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 30 - 10” Water Meter

The unit price bid for this item shall include all costs for purchase and installation of water meters, reducer connections, and final connections to the water systems in locations indicated on the Drawings. The item also includes labor, materials, and all other work required by Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 31 - 3" Water Meter

The unit price bid for this item shall include all costs for purchase and installation of water meters, reducer connections, and final connections to the water systems in locations indicated on the Drawings. The item also includes labor, materials, and all other work required by Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 32 -Connect to Existing Water Main

The unit price bid for this item shall include all costs for purchase, lane closure/road control, line trenching, placement, backfill, and connection to City Water system with traffic rated boxes as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid form as a pay item.

Bid Item 33 -10" Water Line (Offsite)

The unit price bid for this item shall include all costs for purchase and installation of water meters, reducer connections, and final connections to the water systems in locations indicated on the Drawings. The item also includes labor, materials, and all other work required by Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 34 -Fire Hydrant Assembly:

The unit price bid for this item shall include all costs for purchase and installation of fire hydrant assembly, and related components and connections to water system, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 35 -Electrical:

The lump sum price bid for this item shall include all costs for purchase and installation of a fully functional electrical power and lighting system, including switchboard, panels, transformers, grounding, conduits, pullboxes, conductors, light fixtures (including poles), electrical utility yard (includes concrete pads, fencing, and gates), devices and equipment as indicated on the Drawings and Specifications within Division 26. For light poles and structures listed as bid alternate within this contract, the bidder shall provide a N16 pullbox at the termination point/location as part of base bid. This item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 36 - Parking Lot Light Pole – 4 head fixture (Site Feature '40'):

The unit price bid for this item shall include all costs for purchase and installation of parking lot light poles, 4- head fixtures, foundations, and power conductors in areas indicated on the Drawings (conduits & boxes are already part of the base bid). The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 37 - Parking Lot Light Pole – Single head fixture (Site Feature '33'):

The unit price bid for this item shall include all costs for purchase and installation of parking lot light poles, single head fixtures, foundations, and power conductors in areas indicated on the Drawings (conduits & boxes are already part of the base bid). The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 38 - Pedestrian Light Pole with Fixture (Site Feature '15'):

The unit price bid for this item shall include all costs for purchase and installation of pedestrian light poles,

conduits, conductors, and pullboxes as identified on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 39 - Concrete Flatwork (Site Finish 'A'):

The square foot price bid for this item shall include all costs for installation, soil preparation forming, sub-grade compaction, concrete additives, pigments and sealers, pouring concrete pavement, finishing, joints, and joint sealants in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 40 - Asphalt Parking Lot with Striping (Site Finish 'B'):

The square footage price bid for this item shall include all costs for purchase, installation, and preparation of asphalt surfacing in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 41 - Plexipave Surfacing Tennis Court Field (Site Finish 'C'):

The square footage price bid for this item shall include all costs for purchase, installation and preparation of Plexipave court including surfacing and the flatwork in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 42 - Plexipave Surfacing Tennis Court Striping (Site Finish 'D'):

The linear footage price bid for this item shall include all costs for purchase, installation and preparation of Plexipave court striping included on the surfacing in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 43 - Plexipave Surfacing Futsal Court Field (Site Finish 'H'):

The square footage price bid for this item shall include all costs for purchase, installation and preparation of Plexipave court including surfacing and the flatwork in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 44 - Plexipave Surfacing Futsal Court Striping (Site Finish 'I'):

The linear footage price bid for this item shall include all costs for purchase, installation and preparation of Plexipave court striping included on the surfacing in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 45 -Sand Volleyball Courts (Site Finish 'E'):

The square foot price bid for this item shall include all costs for installation and preparation of sand volleyball courts including sub-grade compaction and edging in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 46 - 12" Wide Concrete Mow Curb (Site Feature '1'):

The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, concrete additives, sealers, pouring concrete band, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 47 - 12" Wide Concrete Curb at Volleyball Courts (Site Feature '3'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, concrete additives, sealers, pouring concrete curb, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 48 - Thickened Sidewalk Edge at Playground (Site Feature '2'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, aggregate base, concrete additives, sealers, pouring thickened concrete curbs, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 49 - Parking Lot Curbs- Vertical/ Flush (Site Feature '23'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, aggregate base, concrete additives, sealers, pouring concrete curbs, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 50 - Parking Lot Curb & Gutter (Site Feature '23'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, aggregate base, concrete additives, sealers, pouring concrete curbs, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 51 - Vertical Curb at Drop-Off Area (Site Feature '42'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, aggregate base, concrete additives, sealers, pouring concrete curbs, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 52 - Truncated Domes (Site Feature '43'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, concrete additives, pigments and sealers, saw cutting, cast-in-place truncated domes, and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 53 - Parking Lot Rolled Curb (Site Feature '45'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, aggregate base, concrete additives, sealers, pouring concrete curbs, broom

finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 54 - AC Dike:

The linear footage price bid for this item shall include all costs for purchase, installation, and preparation of asphalt dike in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 55 - 2x4 Header at Limit of Phase 1 (Site Feature '50'):

The linear footage price bid for this item shall include all costs for purchase, installation, and preparation of header in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 56 - Thickened Sidewalk Edge at Volleyball Courts (Site Feature '51'):

The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, aggregate base, concrete additives, sealers, pouring thickened concrete curbs, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 57 - Directional Signage (Site Feature '5'):

The unit price bid for this item shall include all costs for material purchase and installation of directional signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 58 - Field Location Signage (Site Feature '6'):

The unit price bid for this item shall include all costs for material purchase and installation of field location signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 59 - Removable Bollards (Site Feature '7'):

The unit price bid for this item shall include all costs for purchase and installation of removable bollards, footings, and fasteners in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 60 - Fixed Bollards (Site Feature '8'):

The unit price bid for this item shall include all costs for purchase and installation of fixed bollards, footings, and fasteners in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 61 - Picnic Tables (Site Feature '9'):

The unit price bid for this item shall include all costs for purchase and installation of picnic tables, mounting

hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 62 - Accessible Picnic Tables (Site Feature '10'):
The unit price bid for this item shall include all costs for purchase and installation of ADA picnic tables, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 63 - Bench (Site Feature '11'):
The unit price bid for this item shall include all costs for purchase and installation of benches, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 64 - Drinking Fountain (Site Feature '12')
The unit price bid for this item shall include all costs for purchase and installation of a fully functioning bi-level drinking fountain with bottle filler in location shown on Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item. Water line, backflow preventer and sewer line shall be part of Bid Item 11.

Bid Item 65 - Volleyball poles, Ground Sleeves, and Net (Site Feature '13'):
The unit price bid for this item shall include all costs for purchase and installation of a volleyball pole equipment, footings, sleeves, and net as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 66 - Dual Post Football Goal (Site Feature '14'):
The unit price bid for this item shall include all costs for purchase and installation of a dual post football goal and footings sleeves as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 67 - Soccer Goal and Net (Site Feature '16'):
The unit price bid for this item shall include all costs for purchase and installation of a dual soccer goal and net as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 68 - Restroom / Concessions Building (Site Feature '17'):
The lump sum price bid for this item shall include all costs for pad preparation (sub-grade compaction, aggregate base), building connections to utilities 5 lineal feet outside of the building footprint (water, sewer, and electrical), utility connection backfill, and coordination with manufacturer of building as required and in location shown on Drawings. The Contractor will be responsible for coordinating any permit related requirements with the City and securing the applicable building permit/s before construction. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 69 - ADA Ramp with Truncated Domes (Site Feature '18'):

The unit price bid for this item shall include all costs for purchase and installation of ADA Ramp with truncated domes in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 70 - ADA Parking Signage (Site Feature '19'):

The lump sum price bid for this item shall include all costs for material purchase and installation of ADA parking signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 71 - Tow-Away Signage (Site Feature '20'):

The lump sum price bid for this item shall include all costs for material purchase and installation of tow-away signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 72 - No Parking Signage (Site Feature '21'):

The lump sum price bid for this item shall include all costs for material purchase and installation of no parking signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 73 - Drop-off Signage (Site Feature '22'):

The lump sum price bid for this item shall include all costs for material purchase and installation of drop-off signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 74 - Restroom Building (Site Feature '27'):

The lump sum price bid for this item shall include all costs for pad preparation (sub-grade compaction, aggregate base), building connections to utility connections 5 lineal feet outside of the building footprint (water, sewer, and electrical), utility connection backfill, and coordination with manufacturer of building as required and in location shown on Drawings. The Contractor will be responsible for coordinating any permit related requirements with the City and securing the applicable building permit/s before construction. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 75 - Tree Grate (Site Feature '30'):

The unit price bid for this item shall include all costs for purchase and installation of tree grates in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 76 - Chain Link Fence at Tennis Court (Site Feature '31'):

The linear foot price bid for this item shall include all costs for purchase and installation of chain link fence panels, rails, posts and footings, and all hardware and fasteners in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is

not specifically set forth in the Bid Form as a pay item.

Bid Item 77 - Chain Link Gate at Tennis Court (Site Feature '32'):
The linear foot price bid for this item shall include all costs for purchase and installation of chain link gate and panels, rails, posts and footings, and all hardware and fasteners in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 78 -Chain Link Fence at Futsal Court (Site Feature '34'):
The linear foot price bid for this item shall include all costs for purchase and installation of chain link fence panels, rails, posts and footings, and all hardware and fasteners in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 79 - Chain Link Gate at Futsal Court (Site Feature '35'):
The linear foot price bid for this item shall include all costs for purchase and installation of chain link gate and panels, rails, posts and footings, and all hardware and fasteners in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 80 -Decorative Fence at Futsal Court (Site Feature '36'):
The linear foot price bid for this item shall include all costs for purchase and installation of tubular steel fence panels and gate, rails, posts and footings, hinges, latches and all hardware and fasteners in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 81 -Bike Rack (Site Feature '37'):
The unit price bid for this item shall include all costs for purchase and installation of bike racks, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 82 - Tubular Steel Gates at Vehicular Entry (Site Feature '38'):
The unit price bid for this item shall include all costs for purchase and installation of tubular steel gates and mounting hardware per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 83 - Waste Receptacle Corrals (Site Feature '39'):
The unit price bid for this item shall include all costs for purchase and installation of waste receptacle corral, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 84 - Tennis Posts and Ground Sleeves (Site Feature '41')
The unit price bid for this item shall include all costs for purchase and installation of all pickleball posts, footing, and sleeves as indicated on the Drawings. The item also includes materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 85 - No Camping/Over Night Parking Signage at Park Entry (Site Feature '44'):
The unit price bid for this item shall include all costs for material purchase and installation of field marker identification signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 86 - No Camping/Over Night Parking Signage at Restroom Buildings (Site Feature '46'):
The unit price bid for this item shall include all costs for material purchase and installation of field marker identification signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 87 - Park Welcome Signage (Site Feature '47'):
The unit price bid for this item shall include all costs for material purchase and installation of park welcome signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 88 - Park Rules Signage (Site Feature '48'):
The unit price bid for this item shall include all costs for material purchase and installation of park rules signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 89 - Doggie-Pot Waste Station (Site Feature '49'):
The unit price bid for this item shall include all costs for material purchase and installation of doggie-pot waste station, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 90 - Futsal Goal and Net (Site Feature '54'):
The unit price bid for this item shall include all costs for purchase and installation of a dual soccer goal and net as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 91 -Soil Preparation & Amendment:
The square foot price bid for this item shall include all costs for soil testing, purchase and installation of fertilizers, organic material and soil conditioners as indicated by soil laboratory tests (contractor responsibility) and as indicated on the Drawings and Specifications. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 92 - Turf Hydroseed:
The square foot price bid for this item shall include all costs for soil testing, purchase and installation of fertilizers, organic material and soil conditioners as indicated by soil laboratory tests (contractor responsibility), and turf hydroseed as indicated on the planting plans, details and specifications. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not

specifically set forth in the Bid Form as a pay item.

Bid Item 93 - NOT IN USE:
REMOVED.

Bid Item 94 - 1 Gallon Shrubs:
The lump sum price bid for this item shall include all costs for purchase and installation of fertilizers, fertilizer packs, as indicated by soil laboratory tests (contractor responsibility), and purchase and installation of 1-gallon shrubs as indicated on the Drawings and Specifications. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 95 - 24" Box Trees:
The unit price bid for this item shall include all costs for purchase and installation of fertilizers, fertilizer packs, as indicated by soil laboratory tests (contractor responsibility), stakes, tree ties, and purchase and installation of 24" box trees as indicated on the Drawings and Specifications. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 96 - Tree Root Barriers:
The linear foot price bid for this item shall include all costs for purchase and installation of root barriers as indicated on planting plans and details. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 97 - Top Dressing- Decorative Bark Mulch:
The square foot price bid for this item shall include all costs for purchase and installation of a 3" depth of organic mulch as indicated on the Drawings and Specifications. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 98 - Irrigation System:
The lump sum price bid for this item shall include all costs for purchase and installation of irrigation pipe, equipment, heads, bubblers, wires, remote control valves, sensors, backflow preventer, fittings, and all other miscellaneous irrigation components for a fully functioning irrigation system as indicated on the Drawings and Specifications as required in the field. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 99 - Irrigation Controller:
The lump sum price bid for this item shall include all costs for purchase and installation of controller and pad as indicated on the Drawings and Specifications as required in the field. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 100 - Irrigation Point of Connection:
The lump sum price bid for this item shall include all costs for purchase and installation of new point of connection – water meter, backflow preventer, booster pump and all other miscellaneous irrigation components for a fully functioning irrigation point of connection as indicated on the Drawings and

Specifications as required in the field. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 101 - Landscape Maintenance Period (180 Days):
The lump sum price bid for this item shall include all costs for maintaining installed landscape areas for a period of 180 days as indicated on the Drawings as well as replacements for plants and equipment. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 102 - FDR-C Process (1.0'):
The square footage price bid for this item shall include all costs for installation and preparation of sub-grade using Full Depth Reclamation-Cement (FDR-C) in the areas indicated on the Drawings. This item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

BID ITEM DESCRIPTIONS – ADD ALTERNATES

Bid Schedule 'B' - Add Alternative #1

Bid Item 1 - Permits, Bonds, Licenses & Insurance
The lump sum bid for this item shall include all costs for permits, bonds, licenses and insurance. The item also includes all charges and fees, and give all notices necessary and incidental to the prosecution of the work as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 2 - Public Convenience and Safety
The lump sum bid for this item shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 3 - Site Grading (Mass/Fine):
The square footage bid for this item shall include all costs for rough grading, fine grading, and if needed, soil removal and disposal. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 4 - 6" Storm Drain Line:
The linear footage price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage systems structures, solid and perforated piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 5 - Storm Drain Area Drains:
The unit price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage system inlet structures, and related components, as indicated on the Drawings as well as finish grading of landscape areas to meet rim and invert elevations. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 6 - Pedestrian Light Poles w/Fixture (Add. Alt. #1 Site Feature '13'):
The unit price bid for this item shall include all costs for purchase and installation of pedestrian light poles, conduits, conductors, and pullboxes as identified on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 7 - Concrete Flatwork: (Add. Alt. #1 Site Finish '1'):
The square foot price bid for this item shall include all costs for installation, soil preparation forming, sub-grade compaction, concrete additives, pigments and sealers, pouring concrete pavement, finishing, joints, and joint sealants in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 8 - Rubberized Play Surfacing – 01 (2-5 Area) (Add. Alt. #1 Site Finish '2'):
The square foot price bid for this item shall include all costs for purchase and installation of rubberized play surfacing wear layer and cushion layer as indicated on the Drawings, in the construction details and with manufacturers' certifications. The item also includes labor, materials and all other work required by the Drawings and specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 9 - Rubberized Play Surfacing – 02 (2-5 Area) (Add. Alt. #1 Site Finish '3'):
The square foot price bid for this item shall include all costs for purchase and installation of rubberized play surfacing wear layer and cushion layer as indicated on the Drawings, in the construction details and with manufacturers' certifications. The item also includes labor, materials and all other work required by the Drawings and specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 10 - Rubberized Play Surfacing – 01 (5-12 Area) (Add. Alt. #1 Site Finish '4'):
The square foot price bid for this item shall include all costs for purchase and installation of rubberized play surfacing wear layer and cushion layer as indicated on the Drawings, in the construction details and with manufacturers' certifications. The item also includes labor, materials and all other work required by the Drawings and specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 11 - Rubberized Play Surfacing – 01 (5-12 Area) (Add. Alt. #1 Site Finish '5'):
The square foot price bid for this item shall include all costs for purchase and installation of rubberized play surfacing wear layer and cushion layer as indicated on the Drawings, in the construction details and with manufacturers' certifications. The item also includes labor, materials and all other work required by the Drawings and specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 12 - Play Area Base Preparation (Add. Alt. #1 Site Finishes '2' – '5'):
The square foot price bid for this item shall include all costs for installation, soil preparation forming, sub-grade compaction, and aggregate base (per grading plans) under all rubberized play surfacing areas as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 13 - Thickened Sidewalk Edge at Play Area (Add. Alt. #1 Site Feature '11'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, aggregate base, concrete additives, sealers, pouring thickened concrete curbs, broom finish and joints in the areas indicated on the Drawings. The item also includes labor,

materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 14 - 12" wide Concrete Mow Curb (Add. Alt. #1 Site Feature '12'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, concrete additives, sealers, pouring concrete band, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 15 - Chain Link Fence with concrete curb below fence behind Soccer Goals (Add. Alt. #1 Site Feature '19'):
The linear foot price bid for this item shall include all costs for purchase and installation of chain link fence panels, rails, posts, footings, concrete curb, and all hardware and fasteners in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 16 - Play Equipment (2-5) (Add. Alt. #1 Site Feature '7'):
The lump sum price bid for this item shall include all costs for purchase, shipment, and installation of all 2-5 play equipment, as indicated on the Drawings. The item also includes materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 17 - Play Equipment (5-12) (Add. Alt. #1 Site Feature '8'):
The lump sum price bid for this item shall include all costs for purchase, shipment, and installation of all 5-12 play equipment, as indicated on the Drawings. The item also includes materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 18 - Picnic Tables (Add. Alt. #1 Site Feature '9'):
The unit price bid for this item shall include all costs for purchase and installation of picnic tables, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 19 - Accessible Picnic Tables (Add. Alt. #1 Site Feature '10'):
The unit price bid for this item shall include all costs for purchase and installation of ADA picnic tables, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 20 - Bike Rack (Add. Alt. #1 Site Feature '17'):
The unit price bid for this item shall include all costs for purchase and installation of bike racks, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 21 - Waste Receptacle Corrals (Add. Alt. #1 Site Feature '15'):
The unit price bid for this item shall include all costs for purchase and installation of waste receptacle corral, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not

specifically set forth in the Bid Form as a pay item.

Bid Item 22 - Doggie-Pot Waste Station (Add. Alt. #1 Site Feature '16'):
The unit price bid for this item shall include all costs for material purchase and installation of doggie-pot waste station, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 23 - Removable Bollard (Add. Alt. #1 Site Feature '14'):
The unit price bid for this item shall include all costs for purchase and installation of removable bollards, footings, and fasteners in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 24 - Field Marker Identification Signage (Add. Alt. #1 Site Feature '20'):
The unit price bid for this item shall include all costs for material purchase and installation of field marker identification signage, and post and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 25 - Soil Preparation & Amendment:
The square foot price bid for this item shall include all costs for soil testing, purchase and installation of fertilizers, organic material and soil conditioners as indicated by soil laboratory tests (contractor responsibility) and as indicated on the Drawings and Specifications. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 26 - 1 Gallon Shrubs:
The lump sum price bid for this item shall include all costs for purchase and installation of fertilizers, fertilizer packs, as indicated by soil laboratory tests (contractor responsibility), and purchase and installation of 1-gallon shrubs as indicated on the Drawings and Specifications. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 27 - 24" Box Trees:
The unit price bid for this item shall include all costs for purchase and installation of fertilizers, fertilizer packs, as indicated by soil laboratory tests (contractor responsibility), stakes, tree ties, and purchase and installation of 24" box trees as indicated on the Drawings and Specifications. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 28 - Tree Root Barriers:
The linear foot price bid for this item shall include all costs for purchase and installation of root barriers as indicated on planting plans and details. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 29 - Top Dressing- Decorative Bark Mulch:
The square foot price bid for this item shall include all costs for purchase and installation of a 3" depth of

organic mulch as indicated on the Drawings and Specifications. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 30 - Irrigation System:

The lump sum price bid for this item shall include all costs for purchase and installation of irrigation pipe, equipment, heads, bubblers, wires, remote control valves, sensors, backflow preventer, fittings, and all other miscellaneous irrigation components for a fully functioning irrigation system as indicated on the Drawings and Specifications as required in the field. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 31 - Landscape Maintenance Period (180 Days):

The lump sum price bid for this item shall include all costs for maintaining installed landscape areas for a period of 180 days as indicated on the Drawings as well as replacements for plants and equipment. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 32 - FDR-C Process (1.0'):

The square footage price bid for this item shall include all costs for installation and preparation of sub-grade using Full Depth Reclamation-Cement (FDR-C) in the areas indicated on the Drawings. This item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Schedule 'C' - Add Alternative #2

Bid Item 1 - Permits, Bonds, Licenses & Insurance

The lump sum bid for this item shall include all costs for permits, bonds, licenses and insurance. The item also includes all charges and fees, and give all notices necessary and incidental to the prosecution of the work as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 2 - Public Convenience and Safety

The lump sum bid for this item shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 3 - Electrical at Shade Structure from Panel:

The unit price bid for this item shall include all costs for purchase and installation of light fixtures, receptacles, and conduit on the structure as well as all related conductors from the panel to structure. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 4 - Shade Structure 50'x100' (Add. Alt. #2 Site Feature '21'):

The lump sum price bid for this item shall include all costs for purchase, fabrication, and installation of a fully functioning prefabricated 50'x100'shade structure. The item also includes labor, materials and all other

work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item. Contractor shall also be responsible for the coordinating the structural engineering package with the County prior to installation and securing applicable building permit/s.

Bid Item 5 - Picnic Tables (Add. Alt. #2 Site Feature '22'):
The unit price bid for this item shall include all costs for purchase and installation of picnic tables, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 6 - Accessible Picnic Tables (Add. Alt. #2 Site Feature '23'):
The unit price bid for this item shall include all costs for purchase and installation of ADA picnic tables, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Schedule 'D' - Add Alternative #3

Bid Item 1 - Permits, Bonds, Licenses & Insurance
The lump sum bid for this item shall include all costs for permits, bonds, licenses and insurance. The item also includes all charges and fees and give all notices necessary and incidental to the prosecution of the work as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 2 - Public Convenience and Safety
The lump sum bid for this item shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 3 - Electrical at Shade Structure from Panel:
The unit price bid for this item shall include all costs for purchase and installation of light fixtures, receptacles, and conduit on the structure as well as all related conductors from the panel to structure. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 4 - Concrete Flatwork (Add. Alt. #3 Site Finish '24'):
The square foot price bid for this item shall include all costs for installation, soil preparation forming, sub-grade compaction, concrete additives, pigments and sealers, pouring concrete pavement, finishing, joints, and joint sealants in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 5 - Shade Structure 30'x30' (Add. Alt. #3 Site Feature '25'):
The lump sum price bid for this item shall include all costs for purchase, fabrication, and installation of a fully functioning prefabricated 30'x30'shade structure. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item. Contractor shall also be responsible for the coordinating the structural engineering package with the County

prior to installation and securing applicable building permit/s.

Bid Item 6 - Picnic Tables (Add. Alt. #3 Site Feature '26'):
The unit price bid for this item shall include all costs for purchase and installation of picnic tables, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 7 - Accessible Picnic Tables (Add. Alt. #3 Site Feature '27'):
The unit price bid for this item shall include all costs for purchase and installation of ADA picnic tables, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 8 - Waste Receptacle Corrals (Add. Alt. #3 Site Feature '28'):
The unit price bid for this item shall include all costs for purchase and installation of waste receptacle corral, mounting hardware and adhesive, per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 9 - FDR-C Process (1.0'):
The square footage price bid for this item shall include all costs for installation and preparation of sub-grade using Full Depth Reclamation-Cement (FDR-C) in the areas indicated on the Drawings. This item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Schedule 'E' - Add Alternative #4

Bid Item 1 - Permits, Bonds, Licenses & Insurance
The lump sum bid for this item shall include all costs for permits, bonds, licenses and insurance. The item also includes all charges and fees, and give all notices necessary and incidental to the prosecution of the work as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 2 - Public Convenience and Safety
The lump sum bid for this item shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 3 - Water Pollution Control
The lump sum bid for this item shall also include preparation of storm water pollution prevention plan including all labor, materials, tools, equipment, and incidentals and for doing all the work involved in preparing, obtaining approval of, and amending the SWPPP and CSMP, inspecting water pollution control practices, as required by the Drawings and Specifications, and as directed by the Engineer. Item also includes implementation of water pollution prevention plan including all labor, materials, tools, equipment, and incidentals.

Bid Item 4 - Street Sweeping

The lump sum bid for this item includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in street sweeping, including disposal of collected material, as required by the Drawings and Specifications, and as directed by the Engineer.

Bid Item 5 - Surveying Services

The lump sum bid for this item includes shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item.

Bid Item 6 - Monumentation

The lump sum bid for this item will be made only if monuments are affected within the proposed work and shall be at the contract unit price for two (2) items as set forth in the proposal and shall include all labor, materials, tools, equipment and all work necessary for the completion of this item.

Bid Item 7 - Portable Changeable Message Signs

The lump sum bid for this item shall be at the contract unit price as set forth in the proposal and shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item.

Bid Item 8 - Site Grading (Mass/Fine):

The square footage bid for this item shall include all costs for rough grading, fine grading, and if needed, soil removal and disposal. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 9 - 6" Storm Drain Line:

The linear footage price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage systems structures, solid and perforated piping, fittings and components, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 10 - Storm Drain Manholes:

The unit price bid for this item shall include all costs for purchase and installation of storm drainage manholes, and related components and connections to storm drainage system, as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 11 - Type 'C' Catch Basins:

The unit price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage system inlet structures, and related components, as indicated on the Drawings as well as finish grading of landscape areas to meet rim and invert elevations. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 12 - Storm Drain Area Outfalls:

The unit price bid for this item shall include all costs for purchase and installation of fully functional storm water drainage system outfall structures, and related components, as indicated on the Drawings as well as finish grading of landscape areas to meet rim and invert elevations. The item also includes labor, materials

and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 13 - Parking Lot Light Poles (Add. Alt. #4 Site Feature '35'):
The unit price bid for this item shall include all costs for purchase and installation of conduits and pullboxes as identified on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 14 - Asphalt Parking Lot with Striping (Add. Alt. #4 Site Finish '30'):
The square footage price bid for this item shall include all costs for purchase, installation, and preparation of asphalt surfacing in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 15 - Parking Lot Curbs- Vertical/ Flush (Add. Alt. #4 Site Feature '33'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, aggregate base, concrete additives, sealers, pouring concrete curbs, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 16 -Parking Lot Curb & Gutter (Add. Alt. #4 Site Feature '36'):
The linear foot price bid for this item shall include all costs for purchase, installation, forming, sub-grade, reinforcement and compaction, aggregate base, concrete additives, sealers, pouring concrete curbs, broom finish and joints in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 17 - Park Sign (Add. Alt. #4 Site Feature '31'):
The unit price bid for this item shall include all costs for material purchase and installation of park monument sign and footing as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 18 - Fixed Bollard: (Add. Alt. #4 Site Feature '32'):
The unit price bid for this item shall include all costs for purchase and installation of fixed bollards, footings, and fasteners in locations indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 19 - Tubular Steel Gates at Vehicular Entry (Add. Alt #4 Site Feature '34'):
The unit price bid for this item shall include all costs for purchase and installation of tubular steel gates and mounting hardware per plan details and in locations as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 20 -FDR-C Process (1.0'):
The square footage price bid for this item shall include all costs for installation and preparation of sub-grade

using Full Depth Reclamation-Cement (FDR-C) in the areas indicated on the Drawings. This item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Schedule 'F' - Add Alternative #5

Bid Item 1 - Permits, Bonds, Licenses & Insurance

The lump sum bid for this item shall include all costs for permits, bonds, licenses and insurance. The item also includes all charges and fees, and give all notices necessary and incidental to the prosecution of the work as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 2 - Public Convenience and Safety

The lump sum bid for this item shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item as required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 3 - Surveying Services

The lump sum bid for this item includes shall include all labor, materials, tools, equipment, and all work necessary for the completion of this item.

Bid Item 4 - Parking Lot Light Poles – 4-head fixture (Site Feature '4'):

The unit price bid for this item shall include all costs for purchase and installation of parking lot light poles, 4- head fixtures, foundations, and power conductors in areas indicated on the Drawings (conduits & boxes are already part of the base bid). The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item 5 - Parking Lot Light Poles – single-head fixture (Site Feature '29'):

The unit price bid for this item shall include all costs for purchase and installation of parking lot light poles, single head fixtures, foundations, and power conductors in areas indicated on the Drawings (conduits & boxes are already part of the base bid). The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

END OF SECTION

ATTACHEMENT 3

UTILITY NOTES

1. STORM DRAIN MANHOLE PER DETAIL 8 & 10, SEE SHEET L5.9.
2. STORM DRAIN INLET PER DETAIL 9, SEE SHEET L5.8.
3. SANITARY SEWER MANHOLE PER DETAIL 5 & 10, SEE SHEET L5.9.
4. FIRE HYDRANT PER DETAIL 11, SEE SHEET L5.9
5. CONNECT TO EXISTING WATER LINE.
6. CONNECT TO EXISTING SANITARY SEWER.
7. REMOVE EXISTING BLOW OFF VALVE AND TIE INTO EXISTING 10" DUCTILE IRON WATER LINE. (A)
8. TYPE "C" CATCH BASIN PER DETAIL 7, SEE SHEET L5.9.
9. AREA DRAIN PER DETAIL 12, SEE SHEET L5.8.
10. PROTECT EXISTING UTILITY STRUCTURE IN PLACE.
11. TRENCH EXCAVATION AND BACKFILL PER DETAIL E, SEE SHEET L5.9.
12. SEE LANDSCAPE PLANS FOR WATER TIE IN.
13. BUBBLE-UP PER DETAIL 5, SEE SHEET L5.9.
14. SEWER CLEANOUT PER DETAIL 1, SEE SHEET L5.9.
15. SEDIMENT CONTROL DEVICE AT STORM DRAIN INLET PER DETAIL 3, SEE SHEET L5.9.
16. SEE LANDSCAPE PLANS FOR SEWER CONNECTION TO DRINKING FOUNTAIN.
17. SEE LANDSCAPE PLANS FOR IRRIGATION MAINLINE SIZE.

NOTES

1. SEE ELECTRICAL PLANS BY PEZZONI ENGINEERING FOR SITE LIGHTING.
2. SEE ROMTEC PRE-MANUFACTURED BUILDING VENDOR DRAWINGS ON SHEETS L5.6 & L5.7 FOR CONNECTIONS TO THE BUILDINGS. CONTACT ENGINEER OF RECORD FOR ANY CHANGES TO THE PRE-MANUFACTURED BUILDING PLUMBING LOCATION.

NOTICES

1. CALL UNDERGROUND SERVICE ALERT AT LEAST TWO WORKING DAYS NOTICE PRIOR TO EXCAVATING. DELINEATE THE AREA TO BE EXCAVATED BEFORE CALLING USA. DELINEATED AREAS SHOULD BE IDENTIFIED IN WHITE MARKINGS WITH THE REQUESTER'S COMPANY NAME OR LOGO WITHIN THE PRE-MARKED ZONES.
2. MAINTAIN A MINIMUM 3' SEPARATION BETWEEN JOINT TRENCH AND WET UTILITIES. SEPARATION IS MEASURED FROM THE CLOSEST EDGE OF THE JOINT TRENCH TO THE CLOSEST EDGE OF ANY WET FACILITY.

CONTRACTOR RESPONSIBILITIES

1. CONTRACTOR IS TO VERIFY ALL PROPOSED INSTALLATIONS, CONDITIONS, AND SPECIFICATIONS PRIOR TO COMMENCING WITH ANY PORTION OF WORK. ANY DISCREPANCIES, DELETIONS OR INCONSISTENCIES ARE TO BE REPORTED TO THE UTILITY COMPANY'S INSPECTOR BEFORE ORDERING MATERIAL OR COMMENCING WORK. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SPECIFICATIONS. ANY UNAUTHORIZED VARIATION FROM PLANS OR SPECIFICATION WILL BE CORRECTED BY CONTRACTOR PRIOR TO INSTALLATION AT CONTRACTOR'S EXPENSE.
2. CONTRACTOR IS RESPONSIBLE FOR PROVIDING FINAL GRADE OF ALL VAULTS, ENCLOSURES, AND PADS. DOCUMENTATION OF ABSOLUTE ELEVATION FOR STRUCTURES TO BE PROVIDED TO THE UTILITY COMPANY'S INSPECTOR BY SURVEYOR AT TIME OF STAKING. ANY VARIANCE FROM SPECIFIED FINAL GRADE SHALL BE CORRECTED BY CONTRACTOR PRIOR TO INSTALLATION.
3. CONTRACTOR IS TO PROVIDE AND INSTALL ALL UNDERGROUND FACILITIES SHOWN ON THIS DRAWING IN ACCORDANCE WITH THE UTILITY COMPANY'S STANDARDS.
4. CONTRACTOR IS TO PROVIDE ALL TRENCHING, SHADING, BACKFILL, COMPACTION, AND RESTORATION.
5. CONTRACTOR TO OBTAIN ALL ENCROACHMENT PERMITS FROM APPROPRIATE ENTITIES WITHIN PROJECT BOUNDARY.
6. CONTRACTOR TO VERIFY EXACT LOCATION, DEPTH, AND SIZE OF EXISTING UTILITY LINE PRIOR TO CONSTRUCTION.

O'DELL ENGINEERING

REGISTERED PROFESSIONAL ENGINEER KRISTEN SCHEUT No. 75665 CIVIL STATE OF CALIFORNIA

BID SUBMITTAL

NO.	DATE	BY	REVISION MADE
A	2/3/23	KS	ADDENDUM #3

Underground Service Alert
TWO DAYS BEFORE YOU DIG
Call: TOLL FREE 1 (800) 227 - 2600

NOTE: ALL REFERENCES AND WRITTEN DIMENSIONS SHALL TAKE PREFERENCE OVER SCALED DIMENSIONS AND SHALL BE VERIFIED ON THE SITE. ANY DISCREPANCY SHALL BE BROUGHT TO NOTICE OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF ANY WORK.

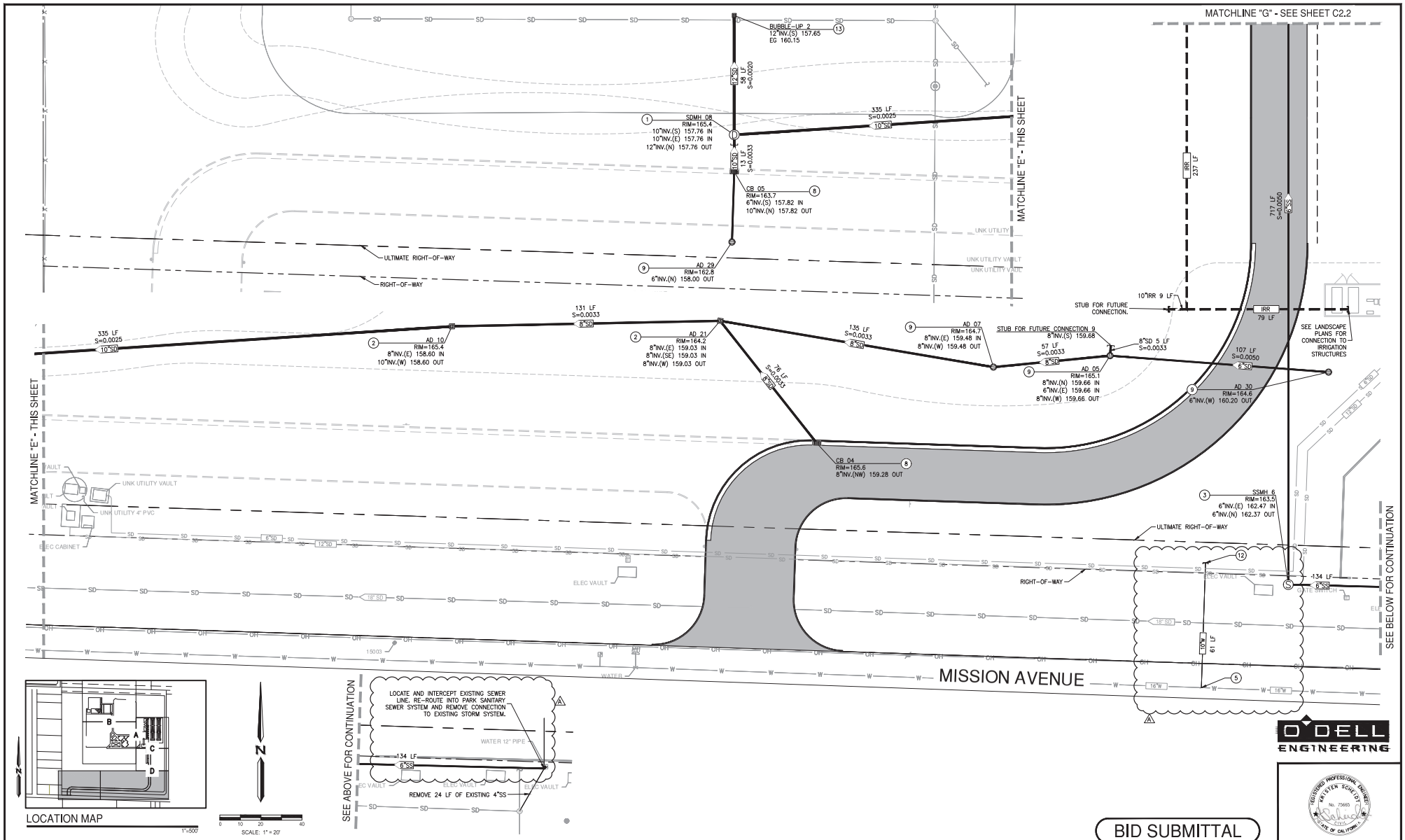
City of Merced
"Gateway to Yosemite"
ENGINEERING
ENGINEERING PROJECTS AND STANDARDS
678 W. 18th Street (209) 385-6846

UTILITY PLAN

PROJECT# 122061
LANDSCAPE IMPROVEMENT PLANS
COMMUNITY PARK-42
BID SUBMITTAL

DR. BY: TF / VC
DATE: 01/12/2023
CH. BY: SK/CK/JN
DATE: 01/12/2023
SCALE: AS SHOWN

File No. 40320-UP.DWG
Sheet
C2.0



BID SUBMITTAL

NO.	DATE	BY	REVISION MADE
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City of Merced
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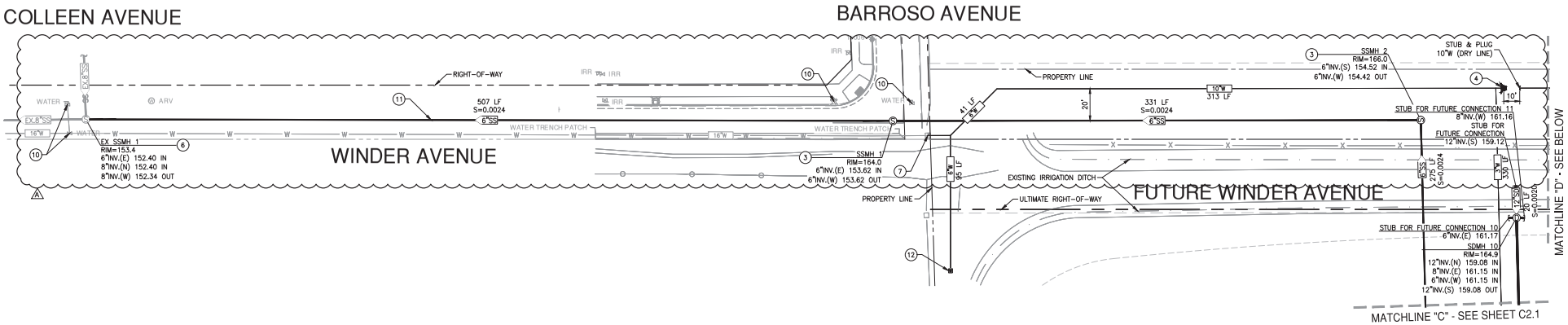
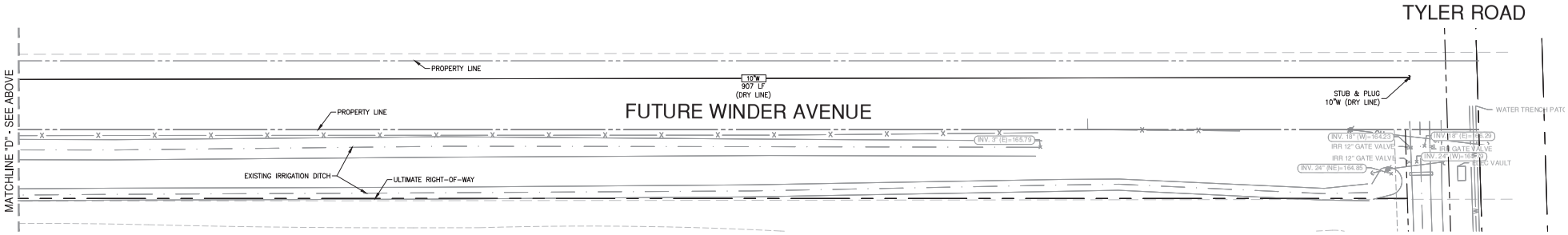
UTILITY PLAN

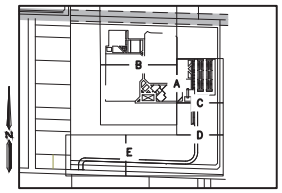
PROJECT# 122061
LANDSCAPE IMPROVEMENT PLANS
COMMUNITY PARK-42
BID SUBMITTAL

DR. BY: TF / YC
DATE: 01/12/2023
CH. BY: SK/CK/JN
DATE: 01/12/2023
SCALE: AS SHOWN

File No. 40320-UP.DWG
Sheet
C2.4
20 of 75







LOCATION MAP

1"=500'

N

SCALE: 1" = 30'

O'DELL ENGINEERING

BID SUBMITTAL

NO.	DATE	BY	REVISION MADE
1	2/3/23	KS	ADDENDUM #3

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UTILITY PLAN

PROJECT# 122061
LANDSCAPE IMPROVEMENT PLANS
COMMUNITY PARK-42
BID SUBMITTAL

DR. BY: TF / YC
DATE: 01/12/2023
CH. BY: SK/CK/JN
DATE: 01/12/2023
SCALE: AS SHOWN

File No. 40320-UP.DWG
Sheet
C2.5
21 of 75

GENERAL NOTES

1. COORDINATE INSTALLATION OF SITE FURNISHINGS, STRUCTURES, AND SPORT SURFACING WITH OTHER WORK OF GRADING, CONCRETE, AND ELECTRICAL.
2. ALL SITE FURNISHINGS SHALL BE LOCATED AS SHOWN ON THE DRAWINGS, AND ASSEMBLED AND INSTALLED PER THE MANUFACTURER'S SPECIFICATIONS. SITE FURNISHING INSTALLATION SCHEDULE SHALL BE COORDINATED WITH OTHER CONTRACTORS TO AVOID CONFLICT AND POSSIBLE DAMAGE.
3. MANUFACTURER NAMED ITEMS ARE FOR STANDARD OF REFERENCE AND DO NOT NECESSARILY LIMIT SUPPLY TO NAMED MANUFACTURERS.
4. CONTRACTOR SHALL EXAMINE RELATED WORK AND SURFACES BEFORE STARTING WORK OF THIS SECTION AND SHOULD REPORT TO THE LANDSCAPE ARCHITECT AND/OR CITY IN WRITING ANY CONDITIONS WHICH WILL PREVENT THE PROPER PROVISION OF WORK. BEGINNING THE WORK OF THIS SECTION WITHOUT REPORTING UNSUITABLE CONDITIONS CONSTITUTES ACCEPTANCE OF CONDITIONS. ANY REQUIRED REMOVAL, REPAIR OR REPLACEMENT OF WORK CAUSED BY UNSUITABLE CONDITIONS SHALL BE DONE AT NO ADDITIONAL COST TO THE CITY.
5. CONTRACTOR SHALL PROVIDE CONSTRUCTION STAKING.
6. CITY SHALL PROVIDE COMPACTION TESTING. REPORTS SHALL BE DELIVERED DIRECTLY FROM THE LAB TO THE CITY OR CITY'S REPRESENTATIVE.
7. ALL EARTHWORK, GRADING AND SOIL DELIVERY/REMOVAL SHALL BE PROVIDED BY THE CONTRACTOR.
8. SEE ADD ALTERNATE SHEETS L1.5 & L1.8 FOR SITE FINISHES AND SITE FEATURES SCHEDULES PERTAINING TO THOSE ALTERNATES.
9. ALL PRODUCTS AND MANUFACTURERS SHALL BE AS LISTED OR APPROVED EQUAL BY OWNER / LANDSCAPE ARCHITECT

SITE FINISH SCHEDULE

FINISH	DESCRIPTION	COLOR	QUANTITY	PATTERN / INFORMATION	DET REF.
A	CONCRETE FLATWORK	NATURAL	58,119 SF	MEDIUM BROOM FINISH / PERPENDICULAR TO PATH OF TRAVEL	1/L5.0 & 1&2/L5.8
B	ASPHALT – PARKING LOT & ROADWAY	BLACK	64,006 SF	PER CIVIL ENGINEER'S PLANS	3, 4, & 10/L5.8
C	PLEXIPAVE COURT SURFACING – TENNIS FIELD	SEE DETAIL	5,616 SF	CALIFORNIA SPORTS SURFACES / WWW.CALIFORNIASPORTSSURFACES.COM / 978-623-9980	1/L5.4
D	PLEXIPAVE COURT SURFACING – TENNIS STRIPING	SEE DETAIL	1,032 LF	CALIFORNIA SPORTS SURFACES / WWW.CALIFORNIASPORTSSURFACES.COM / 978-623-9980	1/L5.4
E	VOLLEYBALL SAND COURTS		8,631 SF		3&5/L5.0
F	PLANTING AREA – SEE PLANTING PLANS				
G	TURF AREA – SEE PLANTING PLANS				
H	PLEXIPAVE COURT SURFACING – FUTSAL – FIELD	SEE DETAIL	9,695 SF		2/L5.4
I	PLEXIPAVE COURT SURFACING – FUTSAL – STRIPING	SEE DETAIL	629 LF		2/L5.4

REFERENCE KEY

SCHEDULE KEY	SECTION CUT	CONCRETE JOINT LEGEND
SITE FURNISHINGS/ EQUIPMENT NUMBER; SURFACING NUMBER	SECTION NUMBER; SHEET NUMBER	EJ = EXPANSION JOINT SJ = TOOLED CONTROL JOINT CJ = CONTROL JOINT

SITE FEATURE SCHEDULE

ITEM	DESCRIPTION / MODEL	COLOR	QUANTITY	MANUFACTURER / SUPPLIER / INFORMATION	DET REF.
1	12" WIDE CONCRETE MOW CURB	NATURAL	215 LF	MEDIUM BROOM FINISH PERPENDICULAR TO PATH OF TRAVEL / TOOLED SCORE JOINTS AS SHOWN ON PLANS	2/L5.0
2	THICKENED SIDEWALK EDGE AT PLAY AREA	NATURAL	115 LF		7/L5.0
3	12" WIDE CONCRETE CURB AT VOLLEYBALL COURTS	NATURAL	215 LF	MEDIUM BROOM FINISH / TOOLED SCORE JOINTS AT ±10' O.C.	5/L5.0
4	FUTURE 4-HEAD PARKING LOT LIGHTING		6 EA	PER ELECTRICAL ENGINEER'S PLANS	----
5	DIRECTIONAL/WAYFINDING SIGNAGE		2 EA		1&4/L5.2
6	FIELD LOCATION SIGNAGE		2 EA		1&4/L5.2
7	REMOVABLE BOLLARDS / MODEL: 400/S-1SL OR EQUAL	BLACK	6 EA	DUMOR / WWW.DUMOR.COM / CASEY HILBERT – ROSS REC / 831-345-8113	9/L5.0 & 1/L5.5
8	FIXED BOLLARDS / MODEL: 400-36 OR EQUAL	BLACK	8 EA	DUMOR / WWW.DUMOR.COM / CASEY HILBERT – ROSS REC / 831-345-8113	1/L5.5
9	PICNIC TABLES / MODEL: 101FSS OR EQUAL	NATURAL	2 EA	OUTDOOR CREATIONS / WWW.OUTDOORCREATIONS.COM / CHAD SMITH / 530-365-6106	6/L5.1
10	ACCESSIBLE PICNIC TABLES / MODEL: 101FSS OR EQUAL	NATURAL	1 EA	OUTDOOR CREATIONS / WWW.OUTDOORCREATIONS.COM / CHAD SMITH / 530-365-6106	6/L5.1
11	BENCH / MODEL: 424 OR EQUAL	NATURAL	12 EA	OUTDOOR CREATIONS / WWW.OUTDOORCREATIONS.COM / CHAD SMITH / 530-365-6106	4/L5.1
12	DRINKING FOUNTAIN / MODEL: 440SMSS W/PET FOUNTAIN OR EQUAL	BLACK	1 EA	MOST DEPENDABLE FOUNTAIN / ANGELA HORNE / 901-867-0039 / INSTALL PLUMBING PER STATE AND LOCAL REQUIREMENTS / SIZE SEWER LINE PER MANUFACTURER'S RECOMMENDATIONS	9/L5.0
13	VOLLEYBALL POLES WITH NET AND GROUND SLEEVES / POLE MODEL: 2217-00G / GROUND SLEEVE MODEL: 8304-24 / NET MODEL: 8361-20 OR EQUAL	GALVANIZED	4 EA	PATTERSON WILLIAMS / WWW.PWATHLETIC.COM / 866-295-7028	5/L5.3
14	DUAL POST GOOSENECK FOOTBALL GOAL – MODEL: 2225-00 OR EQUAL	GALVANIZED	2 EA	PATTERSON WILLIAMS / WWW.PWATHLETIC.COM / 866-295-7028	6/L5.3
15	PEDESTRIAN LIGHTING		3 EA	PER ELECTRICAL ENGINEER'S PLANS	----
16	SOCCER GOAL / MODEL: 2239-00A OR EQUAL	GALVANIZED	4 EA	PATTERSON WILLIAMS / WWW.PWATHLETIC.COM / 866-295-7028	----
17	RESTROOM/CONCESSIONS BUILDING	GRAY	1 EA	CXT, INC / WWW.CXTINC.COM/ KURT MEE / 303-552-1843 / PROVIDED BY CITY OF MERCED / INSTALLED BY CONTRACTOR	1/L5.6
18	ADA ACCESS RAMP WITH TRUNCATED DOMES		5 EA	TRUNCATED DOMES TO MATCH CALLOUT #43	7/L5.8
19	ADA PARKING SIGN		8 EA		5/L5.8
20	ADA TOW-AWAY SIGN		1 EA		6/L5.8
21	NO PARKING SIGN		1 EA		5/L5.5
22	DROP-OFF SIGN		1 EA		4/L5.5
23	PARKING LOT CURB			PER CIVIL ENGINEER'S PLANS	4/L5.8
24	PARKING LOT STRIPING – WHITE	WHITE		PER CIVIL ENGINEER'S PLANS	8/L5.8
25	PARKING LOT STRIPING – BLUE	BLUE		PER CIVIL ENGINEER'S PLANS	8/L5.8
26	PARKING LOT STRIPING – ADA STALL	BLUE		PER CIVIL ENGINEER'S PLANS	8/L5.8
27	RESTROOM BUILDING	GRAY	1 EA	CXT, INC / WWW.CXTINC.COM/ KURT MEE / 303-552-1843 / PROVIDED BY CITY OF MERCED / INSTALLED BY CONTRACTOR	1/L5.7
28	FUTURE PEDESTRIAN LIGHTING		15 EA	PER ELECTRICAL ENGINEER'S PLANS	----
29	FUTURE SINGLE HEAD PARKING LOT LIGHTING		9 EA	PER ELECTRICAL ENGINEER'S PLANS	----
30	TREE GRATE / MODEL: 6' SQ. CASCADE OR EQUAL	CAST IRON GRAY	1 EA	URBAN ACCESSORIES / WWW.URBANACCESSORIES.COM / SPRUCE & GANDER / 760-690-4083 / GRATE FRAME PER MANUFACTURER	1&2/L5.3
31	CHAIN LINK FENCING AT TENNIS COURTS	BLACK	476 LF		1/L5.1
32	CHAIN LINK GATES AT TENNIS COURTS	BLACK	4 EA		5/L5.1
33	SINGLE HEAD PARKING LOT LIGHTING		2 EA	PER ELECTRICAL ENGINEER'S PLANS	----
34	CHAIN LINK FENCING AT FUTSAL COURT	BLACK	280 LF		1/L5.1
35	CHAIN LINK GATES AT FUTSAL COURT	BLACK	2 EA		5/L5.1
36	DECORATIVE FENCING AND GATE AT FUTSAL COURT	BLACK	140 LF / 1 GATE		7 & 8/L5.3
37	BIKE RACKS / MODEL: THE TILIKUM FLAT BAR BIKE RACK OR EQUAL	BLACK	6 EA	HUNTCO SITE FURNISHINGS / WWW.HUNTCO.COM / 800-547-5909	2/L5.1
38	TUBULAR STEEL GATES AT VEHICULAR ENTRY	BLACK	2 EA		3/L5.3 & 3&5/L5.4
39	WASTE RECEPTACLE ENCLOSURE / MODEL: #RC 2064PL OR EQUAL	CHARCOAL	3 EA	KETTLE CREEK / WWW.KETTLECREEK.COM / 800-527-7848	2/L5.2
40	4-HEAD PARKING LOT LIGHTING		2 EA	PER ELECTRICAL ENGINEER'S PLANS	----
41	TENNIS POSTS AND GROUND SLEEVES / MODEL: 2201-11P / GROUND SLEEVE MODEL: 8303-18 OR EQUAL / STRAPS / MODEL: 8371-30 / STRAP ANCHOR MODEL: 8371-20	BLACK	5 EA	PATTERSON WILLIAMS / WWW.PWATHLETIC.COM / 866-295-7028	5/L5.3
42	VERTICAL CURB AT DROP-OFF AREA	NATURAL	247 LF	PER CIVIL ENGINEER'S PLANS	----
43	24" WIDE CAST IRON TRUNCATED DOME STRIP / MODEL: #ADA-C-2424 OR EQUAL	IRON RAW	198 LF	ARMOR-TILE / WWW.ARMOR-TILE.COM / P: 800-682-2525	7/L5.8
44	NO CAMPING/OVER NIGHT PARKING SIGN AT ENTRY		1 EA		7/L5.5
45	PARKING LOT ROLLED CURB		46 LF	PER CIVIL ENGINEER'S PLANS	----
46	NO CAMPING/OVER NIGHT PARKING SIGN AT RESTROOM BUILDINGS		2 EA		6/L5.5
47	PARK WELCOME SIGNAGE		1 EA		4/L5.3
48	PARK RULES SIGNAGE		1 EA		4/L5.3
49	DOGGI-POT PET WASTE STATION	DISPENSER-BLACK BAGS-GREEN	4 EA	DOGGIE WALK BAGS, INC / WWW.DOGGIEWALKBAGS.COM / 877-364-2247	8/L5.0
50	2X4 REDWOOD HEADER BOARD AT LIMIT OF PHASE 1	NATURAL	1,340 LF		6/L5.0
51	THICKENED SIDEWALK EDGE AT VOLLEYBALL COURTS	NATURAL	164 LF		3/L5.0
52	SPORTS FIELD LIGHTING – FUTURE (N.I.C.)		8 EA	PER ELECTRICAL ENGINEER'S PLANS	----
53	ENTRY MONUMENT – FUTURE (N.I.C.)		1 EA		----
54	FUTSAL GOALS / MODEL: OFFICIAL FUTSAL GOAL / SKU: P-SG1710 OR EQUAL		2 EA	SOCCER INNOVATIONS / WWW.SOCCERINNOVATIONS.COM / 877-757-9255	----
55	SOCCER FIELD STRIPING			BY CITY OF MERCED	----
56	FOOTBALL FIELD STRIPING			BY CITY OF MERCED	----

O'DELL ENGINEERING

LICENSED LANDSCAPE ARCHITECT — STATE OF CALIFORNIA — Signature — Renewal Date: 01/12/2023 — Date

NO.	DATE	BY	REVISION MADE
A	2/3/23	TF	ADDENDUM #3 REVISIONS

Underground Service Alert — TWO DAYS BEFORE YOU DIG — Call: TOLL FREE 1 (800) 227-2600

NOTE: ALL REFERENCES AND WRITTEN DIMENSIONS SHALL TAKE PREFERENCE OVER SCALED DIMENSIONS AND SHALL BE VERIFIED ON THE SITE. ANY DISCREPANCY SHALL BE BROUGHT TO NOTICE OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF ANY WORK.

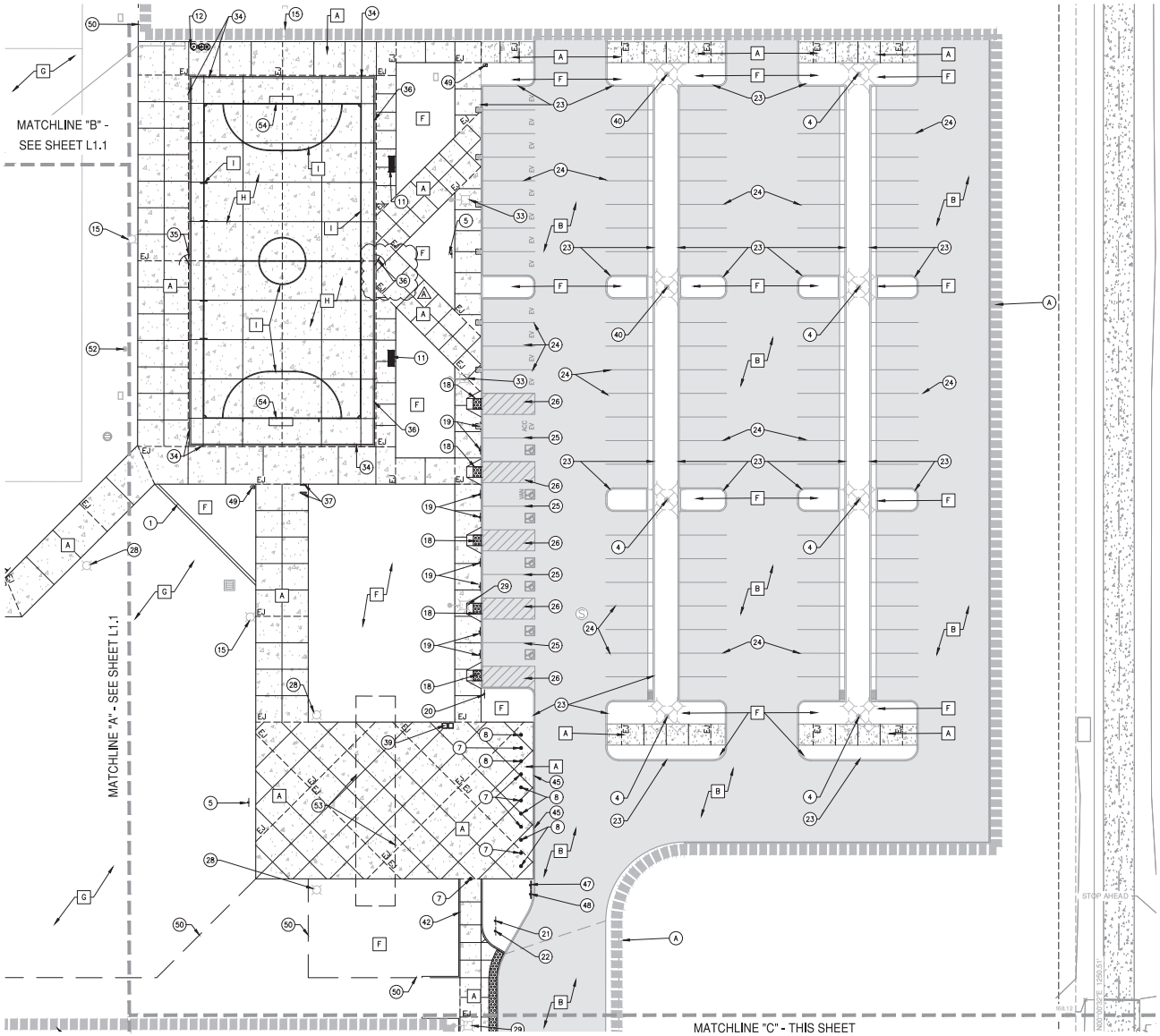
City of Merced — "Gateway to Yosemite" — ENGINEERING — ENGINEERING PROJECTS AND STANDARDS — 678 W. 18th Street (209) 385-6846

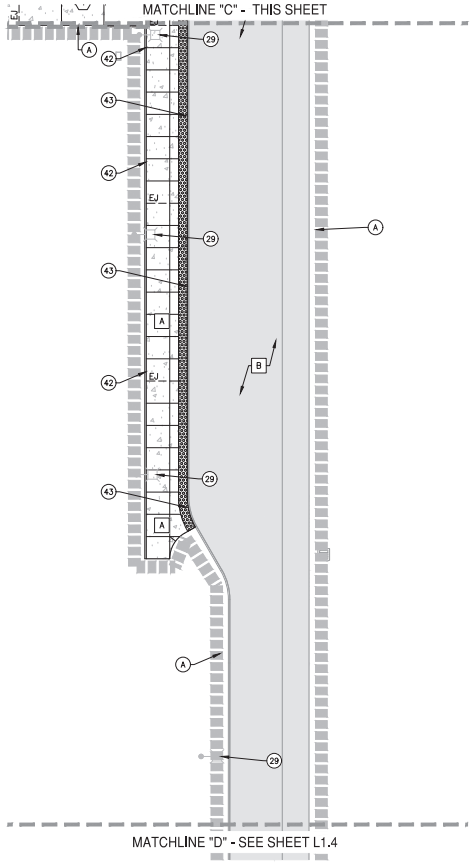
SITE FEATURES AND FINISHES LEGEND AND NOTES

PROJECT# 122061
LANDSCAPE IMPROVEMENT PLANS
COMMUNITY PARK-42
BID SUBMITTAL

DR. BY: TF / YC
DATE: 01/12/2023
CH. BY: SK/CK/JN
DATE: 01/12/2023
SCALE: NONE

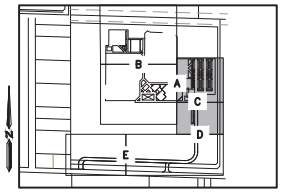
File No. 40320-SF.DWG
Sheet **L1.0**





SHEET NOTES

(A) LIMIT OF WORK FOR PHASE 1 IMPROVEMENT PLANS.



LOCATION MAP

1"=500'

N

SCALE: 1" = 20'

O'DELL ENGINEERING

LICENSED LANDSCAPE ARCHITECT — STATE OF CALIFORNIA

BID SUBMITTAL

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SITE FEATURES AND FINISHES PLAN

PROJECT# 122061
LANDSCAPE IMPROVEMENT PLANS
COMMUNITY PARK-42
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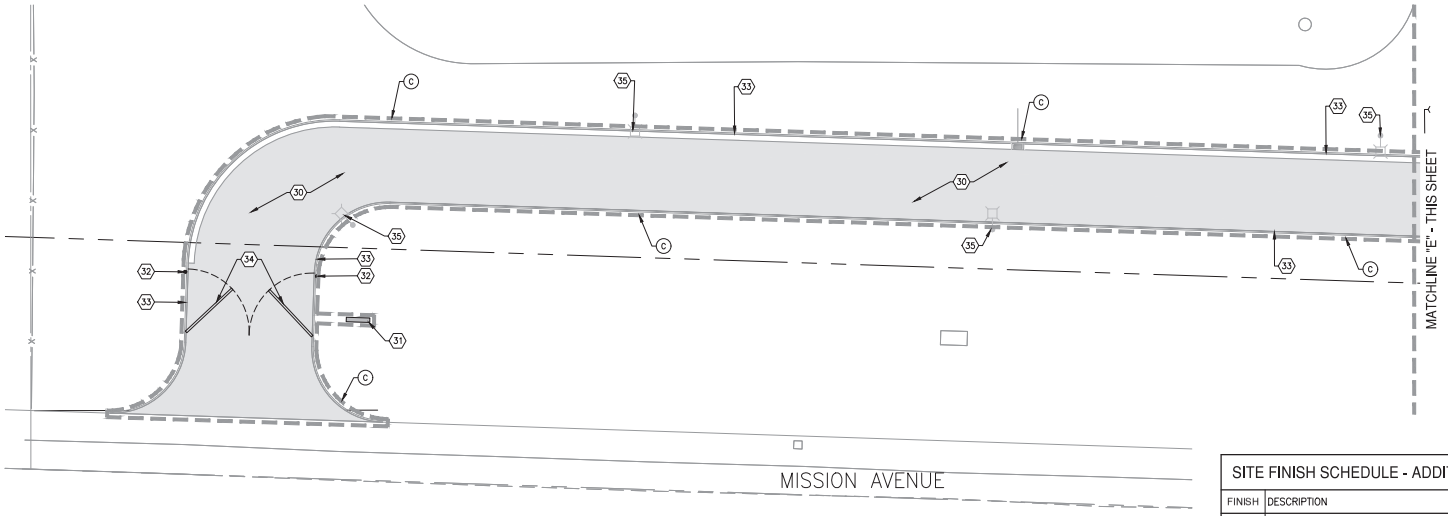
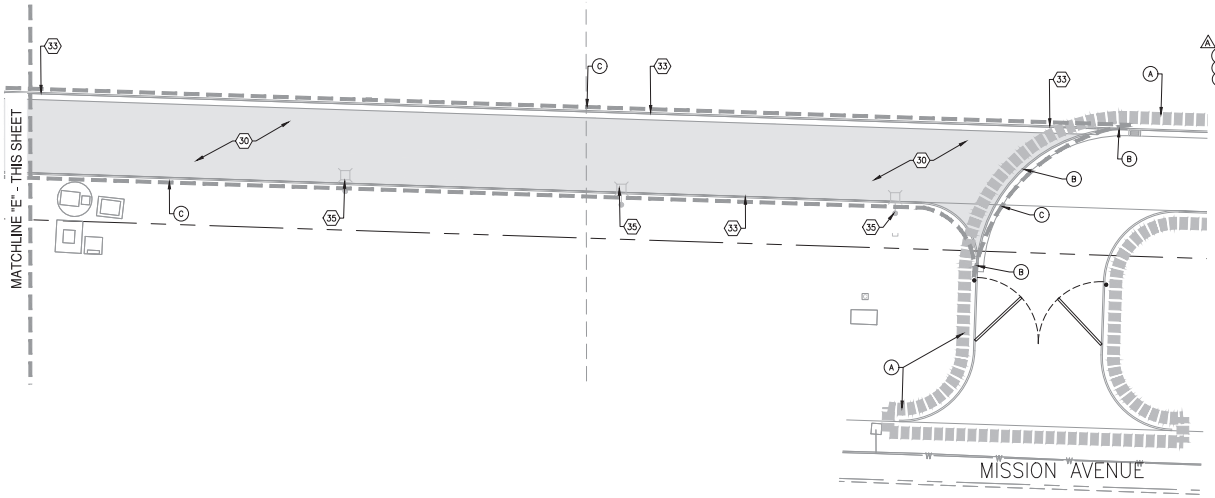




SITE FINISH SCHEDULE - ADDITIVE ALTERNATE #4

FINISH	DESCRIPTION	COLOR	QUANTITY	PATTERN / INFORMATION	DET REF.
30	ASPHALT – PARKING LOT & ROADWAY	BLACK	22,733 SF	PER CIVIL ENGINEER'S PLANS	3, 4, & 10/L5.8

SITE FEATURE SCHEDULE - ADDITIVE ALTERNATE #4

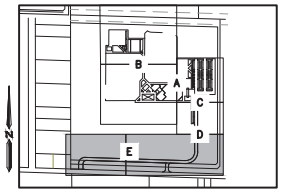
FINISH	DESCRIPTION	COLOR	QUANTITY	PATTERN / INFORMATION	DET REF.
31	PARK SIGN / MODEL: 121S-8' LONG OR EQUAL	SAND BUFF	1 EA	CONCRETE MOLD FINISH / UNIVERSAL PRECAST CONCRETE / WWW.UNIVERSALPRECAST.COM / ARTHUR TEMPLEMAN / 408-799-8888 / CITY TO PROVIDE SIGN INFORMATION	2&3/L5.5
32	FIXED BOLLARDS / MODEL: 400-36 OR EQUAL	BLACK	2 EA	DUMOR / WWW.DUMOR.COM / CASEY HILBERT – ROSS REC / 831-345-8113	1/L5.5
33	PARKING LOT CURB		599 LF	PER CIVIL ENGINEER'S PLANS	4/L5.8
34	TUBULAR STEEL GATES AT VEHICULAR ENTRY	BLACK	2 EA		3/L5.3 & 3&5/L5.4
35	PARKING LOT LIGHTING		7 EA	PER ELECTRICAL ENGINEER'S PLANS	----
36	PARKING LOT CURB AND GUTTER		806 LF	PER CIVIL ENGINEER'S PLANS	4/L5.8

SHEET NOTES

(A) LIMIT OF WORK FOR PHASE 1 IMPROVEMENT PLANS.

(B) NEW PAVEMENT AND CURBS SHALL MEET AND MATCH INLINE WITH PAVEMENT AND CURBS INSTALLED PER PHASE 1 IMPROVEMENT PLANS, SEE CIVIL PLANS.

(C) LIMIT OF WORK FOR ADDITIVE ALTERNATE #4 IMPROVEMENTS.



LOCATION MAP

1"=500'

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SCALE: 1" = 20'

O'DELL ENGINEERING

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SITE FEATURES AND FINISHES PLAN - ADDITIVE ALTERNATE #4

PROJECT# 122061
LANDSCAPE IMPROVEMENT PLANS
COMMUNITY PARK-42
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GENERAL PLANTING NOTES

1. ANY AND ALL PORTIONS OF THIS WORK ARE SHALL CONSTRUCTED IN COMPLIANCE WITH ALL APPLICABLE RULES AND REGULATIONS AS SET FORTH BY LOCAL MUNICIPALITIES, STATE AND NATIONAL AGENCIES. IN THE EVENT THERE IS A CONFLICT WITH THESE PLANS AND THE AGENCIES STATED ABOVE, THE GOVERNING BODY'S REGULATIONS SHALL PREVAIL.
2. PRIOR TO BIDDING AND COMMENCEMENT OF SITE WORK, THE CONTRACTOR SHALL BECOME FAMILIAR WITH AND EXAMINE CONDITIONS OF THE PROJECT SITE, VERIFYING LOCATIONS OF ALL EXISTING UTILITIES, STRUCTURES AND SERVICES. LOCATIONS OF ITEMS SHOWN ON THESE PLANS ARE ONLY APPROXIMATIONS. ANY DISCREPANCIES DISCOVERED SHALL BE REPORTED TO THE LANDSCAPE ARCHITECT/OWNER. FAILURE TO REPORT DISCREPANCIES TO THE LANDSCAPE ARCHITECT/OWNER BEFORE COMMENCEMENT OF SITE WORK IMPLIES ACCEPTANCE OF SITE CONDITIONS AND COSTS ASSOCIATED WITH CORRECTING PLANTING RELATED INSTALLATIONS.
3. CONTRACTOR TO PURCHASE AND PROVIDE ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY TO COMPLETE THE LANDSCAPE WORK (I.E. TREE PLANTING, LAWN HYDROSEEDING, ETC.) AS SHOWN ON THE DRAWINGS AND AS SPECIFIED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF THESE ITEMS UNTIL THE PROJECT IS COMPLETED.
4. ALL SCALED DIMENSIONS ARE APPROXIMATE. BEFORE PROCEEDING WITH ANY WORK, THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND QUANTITIES AND SHALL IMMEDIATELY INFORM THE LANDSCAPE ARCHITECT/OWNER OF ANY DISCREPANCY BETWEEN THE INFORMATION. NUMBERS PROVIDED ON THIS PLAN ARE FOR REFERENCE ONLY. THE NUMBER OF SYMBOLS SHOWN ON THE PLANS SHALL HAVE PRIORITY OVER THE NUMBERS GIVEN.

SOIL PREPARATION

1. THE LANDSCAPE CONTRACTOR SHALL INSPECT THE PLANTER AREAS FOR EXTREME COMPACTION PARTICULARLY AROUND CONSTRUCTION AREAS. PROVIDE MEANS FOR RIPPING TO A DEPTH OF TWELVE INCHES (12") ALL COMPACTED AREAS TO INSURE PROPER ROOT GROWTH OF NEW PLANTINGS.
2. CULTIVATE TOP SIX INCHES (6") OF SOIL IN ALL AREAS.
3. NO SOIL SHALL BE HANDLED OR WORKED WHEN IN A MUDDY CONDITION.
4. FINISH GRADE SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT/OWNER BEFORE ANY PLANTING BEGINS.
5. AN EVEN FINISHED GRADE WITH NO RIDGES OR DEPRESSIONS SHALL BE CAREFULLY MAINTAINED DURING OPERATIONS TO ENSURE PROPER SURFACE DRAINAGE.
6. LAWN AREAS SHALL BE FINE GRADED TO WITHIN ONE INCH (1") BELOW ADJACENT SURFACES.
7. CONTRACTOR TO PERFORM SOILS ANALYSIS AND OBTAIN AMENDMENT RECOMMENDATIONS FROM SOIL LABORATORY AND TO BE REVIEWED BY LANDSCAPE ARCHITECT; PRIOR TO BEGINNING WORK AND AFTER BACKFILL SOIL HAS BEEN PLACED. CONTRACTOR SHALL AMEND SOILS PER MOST RECENT RECOMMENDATIONS. THE FOLLOWING MINIMUM AMENDMENTS SHALL BE INCORPORATED INTO ALL PLANTED AREAS (FOR BID PURPOSES ONLY) AND TILLED INTO THE SOIL TO A DEPTH OF SIX TO TWELVE INCHES (6"–12"):

   –6–20–20 FERTILIZER AT 25 LBS PER 1,000 SF.
   –SOIL SULFUR AT 25 LBS PER 1,000 SF.
   –ORGANIC AMENDMENT AT 5 CUBIC YARDS PER 1,000 SF.
   –BACKFILL MIX, 1/3 NATIVE SOIL, MIXED WITH 2/3 SOIL AMENDMENT.

PLANT MATERIAL

1. SUBSTITUTIONS SHALL NOT BE PERMITTED UNLESS APPROVED BY THE LANDSCAPE ARCHITECT/OWNER.
2. PLANTS SHALL BE SOUND, HEALTHY, VIGOROUS, FREE FROM NOXIOUS WEEDS, PLANT DISEASE, INSECT PESTS, OR THEIR EGGS, AND SHALL HAVE HEALTHY, NORMAL ROOT SYSTEMS AND COMPLY WITH ALL STATE AND LOCAL REGULATIONS.
3. PLANTS SHALL NOT BE PRUNED PRIOR TO DELIVERY EXCEPT AS AUTHORIZED BY THE OWNER'S REPRESENTATIVE. DO NOT "TOP" TREES.
4. ALL PLANT MATERIAL IS SUBJECT TO REVIEW AND APPROVAL BY THE LANDSCAPE ARCHITECT/OWNER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING ANY REJECTED MATERIAL.
5. CONTRACTOR SHALL PROVIDE PLANT MATERIAL DELIVERY TO JOB SITE. CONTRACTOR SHALL BE RESPONSIBLE FOR STORAGE, CARE, INSTALLATION, AND GUARANTEE FROM TIME OF DELIVERY. DO NOT STORE PLANT MATERIAL ON CONCRETE OR ASPHALT SURFACES.

HYDROSEEDING FIBER MULCH, BINDER, FERTILIZER & MIX

1. PROVIDE HYDROMULCH COMPOSED OF WOOD CELLULOSE FIBER AND CONTAINING NO GERMINATIONS OR GROWTH–INHIBITING FACTORS. ENSURE A CONSISTENT TEXTURE WHICH DISPERSES EVENLY AND REMAINS SUSPENDED IN AGITATED WATER. PROVIDE WITH A TEMPORARY GREEN DYE.
2. PROVIDE ORGANIC BINDER SEEDING ADDITIVE OR EQUAL.
3. USE A BALANCED 15–15–15 BALANCED FERTILIZER.
4. INCORPORATE SEED UNIFORMLY IN HYDROMULCH AT THE SPECIFIED RATES PER ACRE. SEED SHALL BE OF THE LATEST CROP, LABELED IN ACCORDANCE WITH THE CALIFORNIA FOOD AND AGRICULTURE CODE. SUBSTITUTIONS OF THE SEED MIX ARE PERMISSIBLE ONLY WITH PRIOR APPROVAL OF THE LANDSCAPE ARCHITECT/OWNER. THE SEED MIX SHALL CONSIST OF THE FOLLOWING:

   –TURF TYPE: TIFFWAY 419 AND TIFWAY II HYBRID BERMUDA BLEND. AVAILABLE THROUGH DELTA BLUEGRASS CO., CONTACT NUMBER IS (800)637–8873.

HYDROSEEDING PROCEDURE

1. LAWN HYDROSEEDING SHALL BE ALLOWED ONLY DURING APPROPRIATE WEATHER CONDITIONS TO ASSURE GERMINATION. HYDROSEEDING SHALL BE COMPLETED BETWEEN MARCH 1 AND OCTOBER 31 UNLESS OTHERWISE APPROVED BY THE CITY OF MERCED.
2. SLURRY MIXTURE WHICH HAS NOT BEEN APPLIED WITHIN FOUR (4) HOURS OF MIXING SHALL NOT BE USED AND SHALL BE REMOVED FROM THE SITE.
3. AFTER APPLICATION, THE CONTRACTOR SHALL NOT OPERATE ANY EQUIPMENT OVER THE COVERED AREA.
4. APPLY IN A SLURRY FORM CONSISTING OF CELLULOSE FIBER, SEED, CHEMICAL ADDITIVES, COMMERCIAL FERTILIZER, AND WATER. WHEN HYDRAULICALLY SPRAYED ON SOIL, ENSURE THAT HYDROMULCH FORMS A BLOTTER–LIKE GROUNDCOVER IMPREGNATED UNIFORMLY WITH SEED AND FERTILIZER THAT ALLOWS THE ABSORPTION OF MOISTURE AND RAINFALL TO PERCOLATE TO THE UNDERLYING SOIL.
5. HYDRAULIC EQUIPMENT USED FOR THE APPLICATION OF SLURRY SHALL BE A COMMERCIAL TYPE HYDRO–SEEDER AND HAVE A BUILT–IN AGITATION SYSTEM WITH AN OPERATING CAPACITY SUFFICIENT TO AGITATE, SUSPEND, AND HOMOGENEOUSLY MIX SLURRY. DISTRIBUTION LINES SHALL BE LARGE ENOUGH TO PROVIDE EVEN DISTRIBUTION OF THE SLURRY OVER THE GROUND. THE SLURRY TANK SHALL HAVE A MINIMUM CAPACITY OF 1,000 GALLONS AND SHALL BE MOUNTED ON A TRAVELING UNIT WHICH WILL PLACE THE SLURRY TANK AND SPRAY NOZZLES WITHIN SUFFICIENT PROXIMITY TO THE AREAS TO BE SEEDED SO AS TO PROVIDE UNIFORM DISTRIBUTION WITHOUT WASTE.
6. SPRAY WITH A UNIFORM VISIBLE COAT BY USING THE GREEN COLOR OF THE MULCH AS A GUIDE. APPLY THE SLURRY IN A SWEEPING MOTION, IN AN ARCHED STREAM SO AS TO FALL LIKE RAIN, ALLOWING THE WOOD FIBERS TO BUILD ON EACH OTHER UNTIL A GOOD COAT IS ACHIEVED AND THE MATERIAL IS SPREAD AT REQUIRED RATES.
7. CLEAN UP SPILLED SLURRY ON SIDEWALKS, CONCRETE STRUCTURES, PLANTS, ARCHITECTURAL FEATURES, SITE AMENITIES AND STREETS.
8. MIX SLURRY COMPONENTS PER MANUFACTURER RECOMMENDATIONS PER ACRE.

WEED CONTROL

1. PRIOR TO HYDROSEEDING THE CONTRACTOR SHALL SPRAY A POST EMERGENT HERBICIDE TO KILL EXISTING WEEDS. ALLOW ONE (1) WEEK FOR WEEDS TO COMPLETELY DIE AND REMOVE FROM SITE.
2. FOLLOWING REMOVAL OF WEEDS, IRRIGATE THE SITE KEEPING SOIL MOIST UNTIL GERMINATION OF THE NEW CROP OF WEEDS IS A MINIMUM OF ONE INCH (1") TALL. REPEAT THE HERBICIDE TREATMENT. AFTER THE SECOND TREATMENT AND AFTER THE REQUIRED WAIT PERIOD (AS SPECIFIED BY HERBICIDE MANUFACTURER) HYDROSEEDING MAY BE PERFORMED.
3. THE CONTRACTOR SHALL APPLY A BROADLEAF HERBICIDE FORTY–FIVE (45) DAYS AFTER SEEDING BUT NOT BEFORE THE THIRD MOWING. THE HERBICIDE SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED DIRECTIONS.
4. AFTER PLANTING SHRUB BEDS AND PRIOR TO TOPDRESSING, APPLY RONSTAR–G (OR EQUAL) PRE–EMERGENT WEED CONTROL IN THE AMOUNTS SPECIFIED BY THE MANUFACTURER.

PLANTING OPERATIONS

1. ALL PLANTS SHALL BE PLANTED, STAKED, AND TIED ACCORDING TO THESE PLANS.
2. STAKE TREES AT THE LOWEST POINT WHERE THE TREE CAN SUPPORT ITSELF.
3. THOROUGHLY WATER TREES, SHRUBS, AND GROUNDCOVER IMMEDIATELY AFTER PLANTING.
4. RELOCATION OF TREES: IN THE EVENT THAT UNDERGROUND CONSTRUCTION WORK OR OBSTRUCTIONS ARE ENCOUNTERED IN EXCAVATION OF THE TREE HOLES, ALTERNATE LOCATIONS WILL BE SELECTED BY THE LANDSCAPE ARCHITECT/OWNER.
5. ALL TREES SHALL BE PRUNED TO REMOVE BROKEN AND DAMAGED LIMBS AND BRANCHES. NO OTHER PRUNING IS APPROVED.
6. ROOT BARRIERS SHALL BE REQUIRED FOR ALL TREES PLANTED WITHIN 10' OF A PAVED SURFACE. SEE DETAIL 5 ON SHEET L7.0 FOR MORE INFORMATION.
7. 3" TOPDRESSING OF DECORATIVE MULCH (BLACK) BY RECOLOGY ENVIRONMENTAL PRODUCTS (866)–764–5765 OR EQUAL (MAXIMUM 2 INCH LENGTHS) SHALL BE INSTALLED PER DETAILS. WASH EXCESS BARK OFF LEAVES AND DO NOT ENGULF STEMS OF PLANTS AND GROUNDCOVER.
8. FERTILIZER TABLETS SHALL BE BEST–PAKS (20–10–5) PLANTER PACKETS PLACED IN ALL PLANTING PITS PER DETAILS.

PLANT ESTABLISHMENT AND MAINTENANCE PERIODS

1. THE LANDSCAPE CONTRACTOR SHALL PROVIDE A PLANT ESTABLISHMENT PERIOD OF NINETY (90) DAYS COMMENCING AT COMPLETION OF PLANT MATERIAL INSTALLATION.
2. APPROXIMATELY 30 DAYS AFTER INITIAL PLANTING, APPLY A BALANCED FERTILIZER TO TURF AND SHRUB AREAS PER MANUFACTURER'S RECOMMENDED RATES.
3. FOLLOWING THE PLANT ESTABLISHMENT PERIOD, THE LANDSCAPE CONTRACTOR SHALL MAINTAIN THE INSTALLATION FOR NINETY (90) DAYS INCLUDING MOWING AND MAINTENANCE OF TURF, SHRUBS, TREES, FERTILIZATION, REMOVING CLIPPINGS FROM SITE, EDGING, AND THE CONTROL OF WEEDS. ADJUSTMENTS TO THE IRRIGATION SYSTEM FOR TIME AND DURATION OF FLOWS AND REPLACEMENT AND ADJUSTMENTS TO HEADS AND NOZZLES ARE ALSO REQUIRED.
4. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR DISEASE AND PEST CONTROL DURING THE ESTABLISHMENT AND MAINTENANCE PERIODS.

ACCEPTANCE

1. COMPLETED WORK WILL BE REVIEWED AND OBSERVED BY LANDSCAPE ARCHITECT/OWNER. ANY MODIFICATIONS REQUIRED TO MEET THE STANDARDS AS SET FORTH IN THESE LANDSCAPE DOCUMENTS SHALL BE SUBMITTED TO THE LANDSCAPE CONTRACTOR AND CORRECTED AT THE LANDSCAPE CONTRACTOR'S EXPENSE. CORRECTED ITEMS SHALL BE REVIEWED AND APPROVED BY OWNER.
2. UPON FINAL ACCEPTANCE, LANDSCAPE CONTRACTOR SHALL INSTRUCT MAINTENANCE PERSONNEL AS TO THE OPERATION AND MAINTENANCE OF ALL LANDSCAPING.

GUARANTEE

1. HYDROSEEDING CONTRACTOR SHALL GUARANTEE COMPLETE COVERAGE OF THE AREA TO BE HYDROSEEDED AND AT LEAST 85% GERMINATION OF THE SEED PRIOR TO BEGINNING 90 DAY MAINTENANCE PERIOD.
2. ALL TREES AND SHRUBS SHALL BE GUARANTEED BY THE LANDSCAPE CONTRACTOR TO LIVE AND GROW IN A HEALTHY UPRIGHT POSITION DURING THE ESTABLISHMENT AND MAINTENANCE PERIODS. REPLACEMENT MATERIAL WILL BE AT THE LANDSCAPE CONTRACTOR'S EXPENSE EXCEPT IF VANDALIZED OR STOLEN.

WATER CONSERVATION STATEMENT

1. I HAVE COMPLIED WITH THE CRITERIA OF THE (STATE/CITY WATER CONSERVATION) ORDINANCE AND APPLIED THEM FOR THE EFFICIENT USE OF WATER IN THE LANDSCAPE DESIGN PLAN.

CLOSE–OUT DOCUMENTS

1. AT THE COMPLETION OF THE PROJECT THE CONTRACTOR SHALL SUPPLY A "CERTIFICATE OF COMPLETION" DOCUMENT. THE DOCUMENT SHALL INCLUDE:
   A. PROJECT INFORMATION SHEET THAT CONTAINS:
      1. DATE
      2. PROJECT NAME
      3. PROJECT APPLICANT NAME, TELEPHONE NUMBER, AND MAILING ADDRESS.
      4. PROJECT ADDRESS
      5. PROPERTY OWNER NAME, TELEPHONE NUMBER AND MAILING ADDRESS.
   B. CERTIFICATION BY EITHER THE SIGNER OF THE LANDSCAPE DESIGN PLAN, THE DESIGNER OF THE IRRIGATION DESIGN PLAN OR THE LICENSED LANDSCAPE CONTRACTOR THAT THE LANDSCAPE PROJECT HAS BEEN INSTALLED PER THE APPROVED LANDSCAPE DOCUMENTATION PACKAGE.
      1. WHERE THERE HAVE BEEN SIGNIFICANT CHANGES MADE IN THE FIELD DURING CONSTRUCTION THESE "AS–BUILT" OR RECORD DRAWINGS SHALL BE INCLUDED WITH THE CERTIFICATION.
      2. A DIAGRAM OF THE IRRIGATION PLAN SHOWING HYDROZONES SHALL BE KEPT WITH THE IRRIGATION CONTROLLER FOR SUBSEQUENT MANAGEMENT PURPOSES.
   C. IRRIGATION SCHEDULING PARAMETERS USED TO SET THE CONTROLLER.
   D. LANDSCAPE AND IRRIGATION MAINTENANCE SCHEDULE
   E. IRRIGATION AUDIT REPORT.
   F. SOILS ANALYSIS REPORT IF NOT SUBMITTED WITH LANDSCAPE DOCUMENTATION PACKAGE AND DOCUMENTATION VERIFYING IMPLEMENTATION OF SOILS REPORT RECOMMENDATIONS.

FULL DEPTH RECLAMATION REMOVAL IN LANDSCAPE PLANTERS

THE SUBGRADE UNDER ALL PARKING LOT AND SIDEWALK AREAS WILL BE TREATED WITH FULL DEPTH RECLAMATION (FDR). IF FDR IS APPLIED TO THE PLANTER AREAS, THEN ALL SOIL WITHIN THE PLANTER AREAS SHALL BE REMOVED TO 3" DEEPER THAN THE DEPTH OF FDR TREATMENT AND REPLACED WITH NEW TOP SOIL. FDR TREATED SOIL SHALL NOT BE ALLOWED IN ANY LANDSCAPE PLANERS. ALL OTHER GENERAL PLANTING NOTES REMAIN IN EFFECT.

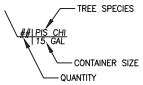
PLANT LEGEND

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	APPROX. SPACING	WATER USE	QTY.	REMARKS
TREES							
ACE GLO	ACER RUBRUM 'OCTOBER GLORY'	OCTOBER GLORY MAPLE	24" BOX	PER PLAN	MODERATE	30	F&B, FGR, MATCH
ACE AMS	ACER X FREEMANII 'ARMSTRONG'	ARMSTRONG FREEMAN MAPLE	24" BOX	PER PLAN	MODERATE	9	F&B, FGR, RED FLW, MATCH
CER DES	CERCIDIUM X 'DESERT MUSEUM'	DESERT MUSEUM PALO VERDE	24" BOX	PER PLAN	MODERATE	4	F&B, FGR, MATCH
GIN AUT	GINKGO BILOBA 'AUTUMN GOLD'	AUTUMN GOLD MAIDENHAIR TREE	24" BOX	PER PLAN	MODERATE	9	F&B, FGR, HI BR, MATCH
LAU SAR	LAURUS X 'SARATOGA'	SARATOGA HYBRID LAUREL	24" BOX	PER PLAN	LOW	9	F&B, FGR, HI BR, MATCH
PIS KEI	PISTACIA CHINENSIS 'KEITH DAVEY'	KEITH DAVEY CHINESE PISTACHE	24" BOX	PER PLAN	LOW	14	F&B, FGR, HI BR, MATCH
TIL COR	TILIA CORDATA	LITTLELEAF LINDEN	24" BOX	PER PLAN	MODERATE	13	F&B, FGR, HI BR, MATCH
ZEL GRE	ZELKOVA SERRATA 'GREEN VASE'	SAWLEAF ZELKOVA	24" BOX	PER PLAN	MODERATE	22	F&B, FGR, HI BR, MATCH
SHRUBS							
Ⓒ	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER'	FEATHER REED GRASS	1 GAL	48" O.C.	LOW	286	F&B, FGR, MATCH
Ⓙ	CALLISTEMON VIMINALIS 'LITTLE JOHN'	LITTLE JOHN WEEPING BOTTLEBRUSH	1 GAL	54" O.C.	LOW	15	F&B, FGR, RED FLW, MATCH
Ⓢ	COTONEASTER DAMMERI 'STREIBS FINDLING'	STREIBS FINDLING COTONEASTER	1 GAL	48" O.C.	LOW	122	F&B, FGR, WHITE FLW, MATCH
	DIETES BICOLOR	FORTNIGHT LILY	1 GAL	36" O.C.	LOW	211	F&B, FGR, WHITE FLW, MATCH
	ESCHSCHOLZIA CALIFORNICA	CALIFORNIA POPPY	1 GAL	30" O.C.	LOW	67	F&B, FGR, ORANGE FLW, MATCH
	HESPERALOE PARVIFLORA 'PERPA'	BRAKELIGHTS RED YUCCA	1 GAL	30" O.C.	LOW	29	F&B, FGR, RED FLW, MATCH
Ⓜ	MUHLENBERGIA CAPILLARIS	PINK MUHLY GRASS	1 GAL	48" O.C.	LOW	124	F&B, FGR, MATCH
Ⓝ	NANDINA DOMESTICA 'GULF STREAM' TM	GULF STREAM HEAVENLY BAMBOO	1 GAL	54" O.C.	LOW	85	F&B, FGR, MATCH
Ⓡ	ROSMARINUS OFFICINALIS 'HUNTINGTON CARPET'	HUNTINGTON CARPET ROSEMARY	1 GAL	48" O.C.	LOW	57	F&B, FGR, PURPLE FLW, MATCH
Ⓗ	SALVIA MICROPHYLLA 'HOT LIPS'	HOT LIPS GRAHAM SAGE	1 GAL	54" O.C.	LOW	135	F&B, FGR, RED FLW, MATCH
	SALVIA X SYLVESTRIS 'MAY NIGHT'	MAY NIGHT SAGE	1 GAL	30" O.C.	LOW	139	F&B, FGR, PURPLE FLW, MATCH
TURF							
	TIFWAY 419 & TIFWAY II	HYBRID BERMUDA BLEND	HYDROSEED		MODERATE	271,689 SF	
MISCELLANEOUS							
— — — —	ROOT BARRIER (DEEP ROOT UB24–2, OR EQUAL)					1,617 LF	DEEPROOT OR EQUAL. WWW.DEEPROOT.COM, P: (800) 458–7668.

PLANT LIST ABBREVIATIONS

BR GR	BRANCHED TO GROUND	MATCH	MATCHED SIZE, FORM, CALIPER, BRANCHING AND CULTIVAR. SELECT FROM ONE LOT, ONE GROWER, FOR GUARANTEED CONSISTENCY THROUGH LIFE OF PLANTS. IN GENERAL PLANTS WITHIN A GROUP OR AREA ARE TO BE MATCHED, UNLESS NOTED OTHERWISE
DV	DWARF VARIETY		
F&B	FULL DENSE, BUSHY, VIGOROUS PLANTS, WITH YOUNG GROWTH CLOSELY SPACED ON BRANCHES		
FGR	FREE OF GIRDLING ROOTS	MULTI	MULTI STEMMED
FLW	FLOWER	SL	SINGLE, STRAIGHT, DOMINANT LEADER
GAL	GALLON CAN	TRI SP	TRIANGULARLY SPACED
HI BR	HIGH BRANCHED	TTW	TRAIN TO WALL
LO BR	LOW BRANCHED	VAR	VARIEGATED SPECIES

TREE CALLOUT



O'DELL ENGINEERING

LICENSED LANDSCAPE ARCHITECT — STATE OF CALIFORNIA — Signature — Renewal Date 01/12/2023 — Date

BID SUBMITTAL

NO.	DATE	BY	REVISION MADE
A	2/3/23	TF	ADDENDUM #3 REVISIONS

Underground Service Alert — TWO DAYS BEFORE YOU DIG — Call: TOLL FREE 1 (800) 227-2600

NOTE: ALL REFERENCES AND WRITTEN DIMENSIONS SHALL TAKE PREFERENCE OVER SCALED DIMENSIONS AND SHALL BE VERIFIED ON THE SITE. ANY DISCREPANCY SHALL BE BROUGHT TO NOTICE OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF ANY WORK.

City of Merced — "Gateway to Yosemite" — ENGINEERING — ENGINEERING PROJECTS AND STANDARDS — 678 W. 18th Street (209) 385-6846

PLANTING LEGEND AND NOTES

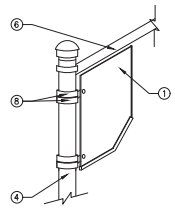
PROJECT# 122061
LANDSCAPE IMPROVEMENT PLANS
COMMUNITY PARK-42
BID SUBMITTAL

DR. BY: TF / VC
DATE: 01/12/2023
CH. BY: SK/CK/JN
DATE: 01/12/2023
SCALE: NONE

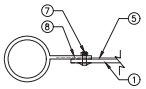
File No. 40320-PT.DWG
Sheet
L4.0

1. 1/4" STEEL FACE w/EXTERIOR GRADE DIGITAL PRINT, DESCRIPTIONS TO BE CONFIRMED WITH CITY PRIOR TO PLACING ORDER.
   GRAPHIC PANELS ARE TO BE SINGLE SIDED, MOUNTED OPPOSITE OF FIELD SIDE OF FENCE.
   IMPORTANT: SUBMIT DRAWINGS TO CITY FOR APPROVAL PRIOR TO FINAL ORDER. WAYFINDING SIGNAGE MUST BE REVIEWED FOR ACCURACY.
2. 1/2" THICK x 1/2" WIDTH SQUARE STEEL TRIM, POWDER COATED BLACK.
3. 1/2" THICK x 1" WIDTH RECTANGULAR STEEL TRIM, POWDER COATED BLACK.
4. 4" GALVANIZED STEEL TUBULAR END POST
5. CHAIN LINK FENCING, MOUNTED ON FIELD SIDE OF POSTS.
6. CHAIN LINK FENCING, TOP RAIL
7. CARRIAGE BOLT WITH LOCKING CAP/NUT
8. TENSION BAND

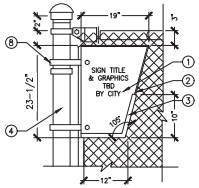
NOTE:
1. ALL VINYL GRAPHICS SHOULD ADHERE TO SURFACES WITHOUT BLEMISHED OR SURFACE BUBBLES.
2. WELDING JOINTS SHALL BE GRINDED SMOOTH SO THAT JOINT WELD LOCATIONS ARE NOT VISIBLE.
3. WELD BEADING SHOULD BE COMPLETED IN A MANOR THAT DOES NOT INTERFERE WITH VINYL GRAPHIC DISPLAY AND ALLOWS GRAPHICS TO COMPLETELY FILL THE DESIGNATED SPACE(S) WITHOUT GRAPHIC OR CONSTRUCTION SEAMS.



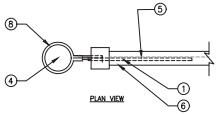
ISOMETRIC VIEW



SIGN MOUNT PLAN VIEW



ELEVATION



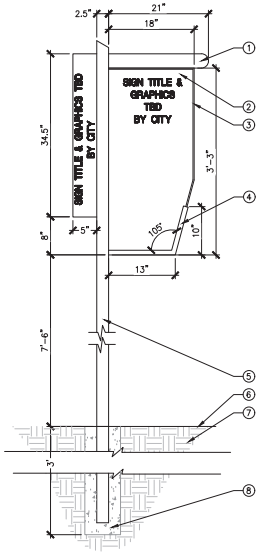
PLAN VIEW

7 FIELD MARKER WAYFINDING SIGN

NOT TO SCALE

1. 2.5" GALVANIZED STEEL TUBULAR BEAM
2. HIGH PRESSURE LAMINATE PANEL GRAPHICS AND DESCRIPTIONS TO BE CONFIRMED WITH ARCHITECT PRIOR TO PLACING ORDER. GRAPHIC PANELS ARE TO BE DOUBLE SIDED.
   IMPORTANT: SUBMIT SHOP DRAWINGS TO CITY FOR APPROVAL PRIOR TO FINAL ORDER. WAYFINDING SIGNAGE MUST BE REVIEWED FOR ACCURACY.
3. 1/2" x 1/2" STEEL TRIM
4. 1" x 1" STEEL TRIM
5. 2.5" GALVANIZED STEEL TUBULAR POST
6. FINISH GRADE
7. EARTH
8. INSTALL FOOTING PER MANUFACTURER RECOMMENDATIONS.

IMPORTANT: SUBMIT DRAWINGS TO LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO FINAL ORDER. WAYFINDING SIGNAGE MUST BE REVIEWED AND APPROVED BY CITY PRIOR TO FABRICATION FOR ACCURACY.

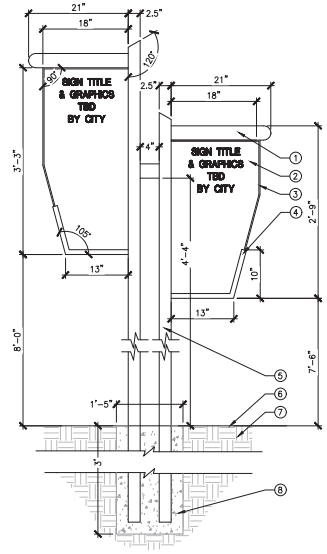


4 SINGLE POST WAYFINDING SIGN

NOT TO SCALE

1. 2.5" GALVANIZED STEEL TUBULAR BEAM
2. HIGH PRESSURE LAMINATE PANEL GRAPHICS AND DESCRIPTIONS TO BE CONFIRMED WITH ARCHITECT PRIOR TO PLACING ORDER. GRAPHIC PANELS ARE TO BE DOUBLE SIDED.
   IMPORTANT: SUBMIT DRAWINGS TO CITY FOR APPROVAL PRIOR TO FINAL ORDER. WAYFINDING SIGNAGE MUST BE REVIEWED FOR ACCURACY.
3. 1/2" x 1/2" STEEL TRIM
4. 1" x 1" STEEL TRIM
5. 2.5" GALVANIZED STEEL TUBULAR POST
6. FINISH GRADE
7. EARTH
8. INSTALL FOOTING PER MANUFACTURER RECOMMENDATIONS.

IMPORTANT: SUBMIT DRAWINGS TO LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO FINAL ORDER. WAYFINDING SIGNAGE MUST BE REVIEWED AND APPROVED BY CITY PRIOR TO FABRICATION FOR ACCURACY.



1 DOUBLE POST WAYFINDING SIGN

NOT TO SCALE

1. SHADE STRUCTURE

NOTES:
A. SEE SITE FEATURES PLAN/LEGEND FOR MODEL # OF SHADE STRUCTURE
B. IMAGE SHOWN FOR REFERENCE ONLY.

8 SMALL SHADE STRUCTURE

NOT TO SCALE

1. SHADE STRUCTURE

NOTES:
A. SEE SITE FEATURES PLAN/LEGEND FOR MODEL # OF SHADE STRUCTURE
B. IMAGE SHOWN FOR REFERENCE ONLY

6 LARGE SHADE STRUCTURE

NOT TO SCALE

5 NOT USED

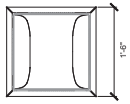
NOT TO SCALE

3 NOT USED

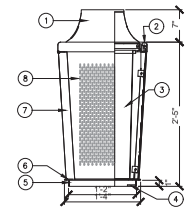
NOT TO SCALE

1. 10 GAUGE ALUMINUM
2. ALUMINUM EXTRUSION
3. 32 GALLON PLASTIC LINER
4. 1/4" ALUMINUM BAR WITH 11/16" DIAMETER ANCHOR HOLE
5. 1/4" X 1/2" ALUMINUM BAR
6. 1/4" ALUMINUM PLATE
7. 1/8" ALUMINUM PLATE
8. 14 GAUGE SLOTTED PERFORATION

NOTE:
A. ALL ALUM & STL. MEMBERS COATED W/ ZINC RICH EPOXY THEN FINISHED W/ POLYESTER POWDER COATING.
B. 1/2" X 3 3/4" EXPANSION ANCHOR BOLTS PROVIDED.
C. RECEPTACLE FULLY ASSEMBLED AT FACTORY.



PLAN VIEW



FRONT VIEW

2 DUMOR TRASH/RECYCLING RECEPTACLE

NOT TO SCALE

O'DELL ENGINEERING

LICENSED LANDSCAPE ARCHITECT — STATE OF CALIFORNIA — Signature — Renewal Date 01/12/2023

BID SUBMITTAL

NO.	DATE	BY	REVISION MADE

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City of Merced — "Gateway to Yosemite" — ENGINEERING — ENGINEERING PROJECTS AND STANDARDS — 678 W. 18th Street (209) 385-6846

CONSTRUCTION DETAILS

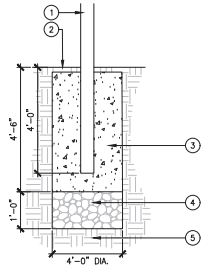
PROJECT# 122061
LANDSCAPE IMPROVEMENT PLANS
COMMUNITY PARK-42
BID SUBMITTAL

DR. BY: TF / VC
DATE: 01/12/2023
CH. BY: SK/CK/JN
DATE: 01/12/2023
SCALE: NO SCALE

File No. 40320-DT.DWG
Sheet
L5.2
55 of 75

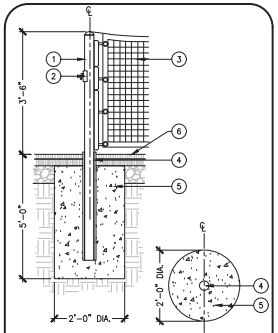
1. FOOTBALL GOAL POST, SEE SITE FEATURES LEGEND FOR MANUFACTURER AND MODEL INFORMATION. SEE SITE FEATURES PLANS FOR LOCATION
2. FINISH GRADE
3. CONCRETE FOOTING, SIZE AND PROVIDED FOR REFERENCE PURPOSES. FINAL SIZE AND REINFORCEMENT PER STRUCTURAL ENGINEERING.
4. 12" LAYER OF RECYCLED AGGREGATE BASE. COMPACT PER GEOTECHNICAL RECOMMENDATIONS.
5. PROCESS AND PREPARE SUBGRADE. COMPACT UPPER 12" PER GEOTECHNICAL RECOMMENDATIONS.

NOTES:
A. DIMENSIONS PROVIDED FOR REFERENCE PURPOSES ONLY. FINAL FOOTINGS SHALL BE PER STRUCTURAL ENGINEER PROVIDED BY CONTRACTOR.



6 FOOTBALL GOAL POST FOOTING

NOT TO SCALE



1. NET POST WITH OPTIONAL LACING ROD, SEE TENNIS COURT LAYOUT DETAIL AND SITE FEATURES PLANS FOR LOCATION
2. NET TIGHTENER
3. TENNIS NET
4. NET POST SET IN SLEEVE
5. 24" DIA. CONCRETE FOOTING
6. SPORTS COURT SURFACING, SEE DETAIL FOR THICKNESS AND MATERIAL

NOTES:
A. SEE SITE FEATURES LEGEND FOR MANUFACTURER AND MODEL OF NET, POSTS, AND NET TIGHTENER.
B. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
C. DIMENSIONS PROVIDED FOR REFERENCE PURPOSES ONLY. FINAL FOOTINGS SHALL BE PER STRUCTURAL ENGINEER PROVIDED BY CONTRACTOR.

5 TENNIS NET AND POST

NOT TO SCALE

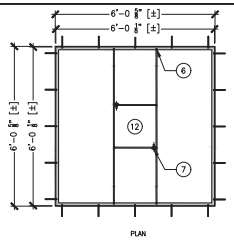
1. RECTANGULAR RIGID ALUMINUM SIGN.
2. 2" DIAMETER GALV STEEL SIGN POST. 5' ABOVE FINISH GRADE HEIGHT.
3. LOCK NUT (SIZE 2-1/2"X5/8")
4. CROWN TO DRAIN
5. LANDSCAPE AREA
6. CONCRETE FOOTING
7. 24"X24" SQUARE (.063 THICK) ALUMINUM "WELCOME TO YOUR COMMUNITY SPORTS PARK" SIGN.

NOTE: SIGN CONTENT TO BE COORDINATED WITH CITY OF MERCED. PRIOR TO FABRICATION

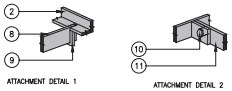
4 PARK WELCOME AND RULES SIGNAGE

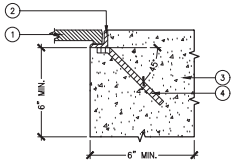
NOT TO SCALE

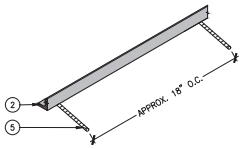
1. TREE GRATE
2. ANGLE STOCK PERIMETER FRAME, SIZED TO COORDINATE WITH GRATE THICKNESS.
3. CONCRETE SLAB
4. TYP. #3 REBAR EMBEDMENT ANCHOR 6" TYP. OVERALL LENGTH
5. TYP. #3 REBAR EMBEDMENT ANCHOR, EQUAL SPACING NOT TO EXCEED 18" O.C. TYP.
6. ATTACHMENT DETAIL 1
7. ATTACHMENT DETAIL 2
8. 3/8"X2" FLAT BAR REMOVABLE CROSS SUPPORT
9. 3/8"X2 1/2"X1/4" FLAT BAR SADDLE
10. 3/8"X2"X2" BOLTING TAB (BOLT ATTACHMENT ON ONE END, WELD ATTACHMENT ON OTHER.)
11. 3/8"X2" FLAT BAR
12. SQ. TYP., SIZED TO COORDINATE WITH TREE OPENING



NOTES:
A. TYPICAL 1/8" HORIZONTAL GAP BETWEEN GRATE AND FRAME.
B. ALL VISIBLE WELDS TO BE GROUND SMOOTH ON OUTSIDE EDGES.
C. FRAMES WILL BE TRUE TO SQUARE OR DIAMETER.
D. TOP OF GRATE FLUSH WITH GRADE OF SURROUNDING TOPPING MATERIAL (CONCRETE, ASPHALT, ETC.)





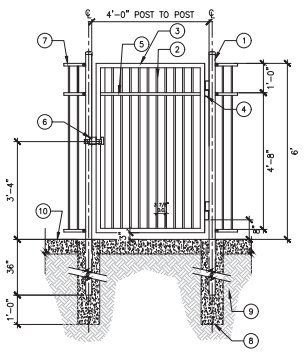


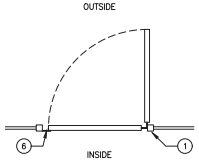
1 TREE GRATE FRAME – 6' SQUARE

NOT TO SCALE

1. 2 1/2" SQ GATE POST, W/CAP, TYP
2. 3/4" TUBULAR STEEL PICKETS AT 3 7/8" O.C., TYP
3. 2" SQ GATE FRAME, TYP
4. HEAVY DUTY SELF CLOSING HINGES
5. 1-1/2" SQ MIDDLE RAIL
6. LOCKING SYSTEM, PER OWNER
7. 6' HIGH TUBULAR FENCE, SEE DETAIL
8. CONCRETE FOOTING AT ALL POSTS. 3000 PSI CONCRETE MIN FOOTING DIMENSIONS FOR REFERENCE ONLY. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
9. COMPACT SUBGRADE PER GEOTECHNICAL RECOMMENDATIONS.
10. CONCRETE FLATWORK, SEE PLAN

NOTES:
1. ALL GATE PARTS TO BE TUBULAR STEEL.
2. GRIND SMOOTH ALL WELDS.
3. PRIME AND APPLY 2 COATS OF BLACK PAINT.
4. ALL PAINT AND PRIMER SHALL BE APPLIED TO CLEAN SURFACES IN 5 MIL. COATS.
5. ALL HORIZONTAL STEEL MEMBERS SHALL BE AT LEAST 48" APART BELOW 5'.
6. SEE PLAN FOR POSITION OF GATE HINGES.
7. CONTRACTOR TO PROVIDE FENCE AND GATE SHOP DRAWINGS AS A SUBMITTAL TO LANDSCAPE ARCHITECT PRIOR TO ORDERING MATERIALS.
8. CONTRACTOR TO SUBMIT SAMPLE AND MANUFACTURERS DATA TO LANDSCAPE ARCHITECT BEFORE ORDERING.
9. FIELD VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.



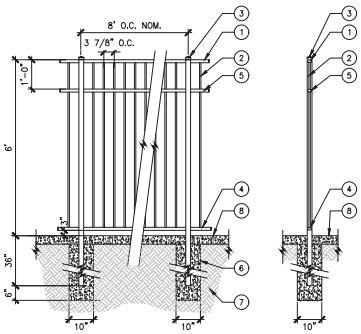


8 6' HIGH SINGLE SWING GATE

NOT TO SCALE

1. 1-1/2" SQ TOP RAIL
2. 3/4" TUBULAR STEEL PICKETS AT 3 7/8" O.C., TYP
3. 2" SQ POST AT 8' O.C., W/CAP, TYP
4. 1-1/2" SQ BOTTOM RAIL
5. 1-1/2" SQ MIDDLE RAIL
6. CONCRETE FOOTING AT ALL POSTS. 3000 PSI CONCRETE MIN FOOTING DIMENSIONS FOR REFERENCE ONLY. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
7. COMPACT SUBGRADE PER GEOTECHNICAL RECOMMENDATIONS.
8. CONCRETE FLATWORK, SEE PLAN

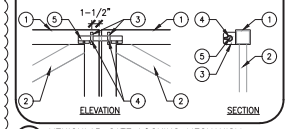
NOTES:
1. ALL FENCE PARTS TO BE TUBULAR STEEL. GRIND SMOOTH ALL WELDS.
2. PRIME AND APPLY 2 COATS OF BLACK PAINT. ALL PAINT AND PRIMER SHALL BE APPLIED TO CLEAN SURFACES IN 5 MIL. COATS.
3. CONTRACTOR TO PROVIDE FENCE AND GATE SHOP DRAWINGS AS A SUBMITTAL TO LANDSCAPE ARCHITECT PRIOR TO ORDERING MATERIALS.
4. CONTRACTOR TO SUBMIT SAMPLE AND MANUFACTURERS DATA TO LANDSCAPE ARCHITECT PRIOR TO ORDERING MATERIALS.
5. FIELD VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
6. BOTTOM AND MIDDLE RAIL SHALL BE AT LEAST 48" APART. TOP RAIL SHALL BE MIN 5' ABOVE ADJACENT FINISH GRADE.



7 6' HIGH TUBULAR STEEL FENCE

NOT TO SCALE

1. 3" SQ. TUBULAR STEEL GATE FRAME, SEE TUBULAR STEEL VEHICLE GATES DETAIL.
2. 1-1/2" SQ. TUBULAR STEEL BRACING, SEE TUBULAR STEEL VEHICLE GATES DETAIL.
3. 2-1/2" SQ. x 1/2" THICK LOCKING PLATE WITH 1/2" RADIUS ON EXPOSED CORNERS, WELD TO GATE FRAME, GRIND ALL WELDS SMOOTH.
4. 1-1/16" DIA. HOLE IN LOCKING PLATE.
5. 9" LONG x 1" DIA. LOCKING ROD WITH LOCK TAB.

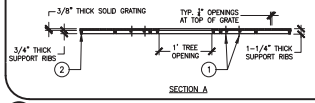


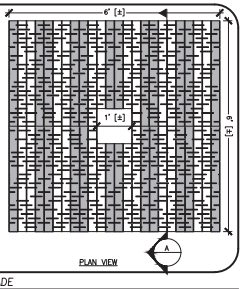
3 VEHICULAR GATE LOCKING MECHANISM

NOT TO SCALE

1. CENTER OPENING EXPANSION LINES
2. LEVELING FOOT

NOTES:
A. CAST IN FOUR PIECES.
B. GRATE IS 1-1/4" THICK AT EDGE.
C. CENTER OPENING EXPANSIONS AT 1'-6" AND 2' SQUARE.
D. NO OPENINGS GREATER THAN 1/2", IN CONFORMANCE WITH ADA ACCESSIBILITY GUIDELINES.





2 URBAN ACCESSORIES TREE GRATE – 6' SQUARE CASCADE

NOT TO SCALE

O'DELL ENGINEERING

LICENSED LANDSCAPE ARCHITECT
STATE OF CALIFORNIA
Signature
Renewal Date 01/12/2023
Date

BID SUBMITTAL

NO.	DATE	BY	REVISION MADE
A	2/3/23	TF	ADDENDUM #3 REVISIONS

Underground Service Alert
TWO DAYS BEFORE YOU DIG
Call: TOLL FREE 1 (800) 227 - 2600

NOTE:
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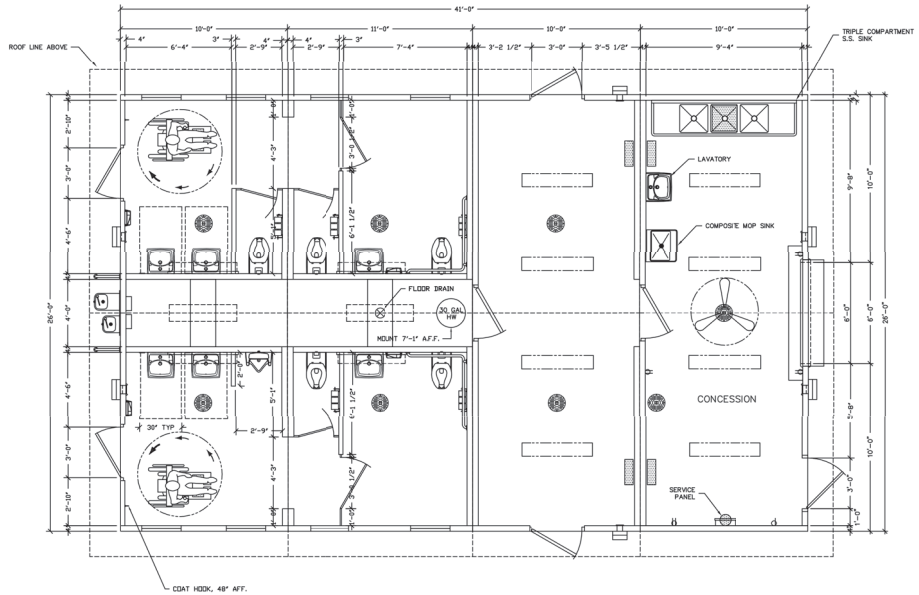
City of Merced
"Gateway to Yosemite"
ENGINEERING
ENGINEERING PROJECTS AND STANDARDS
678 W. 18th Street (209) 385-6846

CONSTRUCTION DETAILS

PROJECT# 122061
LANDSCAPE IMPROVEMENT PLANS
COMMUNITY PARK-42
BID SUBMITTAL

DR. BY: TF / VC
DATE: 01/12/2023
CH. BY: SK/CK/JN
DATE: 01/12/2023
SCALE: NO SCALE

File No. 40320-DT.DWG
Sheet
L5.3
56 of 75



3808 N. Sullivan Bldg. #7 Spokane, WA 99216

CXT Precast Products

901 N. Highway 77 Hillsboro, TX 76645

PROJECT TITLE
SANTIAGO
PROPOSAL NUMBER 15-200P

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CXT Incorporated

REV.	DESCRIPTION	APPROVAL	DATE
SCALE	1/4"=1'-0"	DATE	12-08-15
DRAWN	BB & WALDEE	FILE NO.	15-200P
CHECKED		PLOT	AB

FLOOR PLAN

DWG NO. S-03 | SHEET 3 | REV.

NOTES:
A. CONTRACTOR SHALL PROVIDE RECYCLED AGGREGATE BASE TO A DEPTH OF 6" OVER 12" COMPACTED SUBGRADE PER GEOTECHNICAL RECOMMENDATIONS PRIOR TO PLACEMENT OF BUILDING. BUILDING PLACEMENT BY OTHERS.

NOT FOR CONSTRUCTION
FOR BIDDING PURPOSES ONLY

O'DELL ENGINEERING

LICENSED LANDSCAPE ARCHITECT
LYLE S. PAYNE
Signature
Renewal Date 01/12/2023
Date
STATE OF CALIFORNIA

1 RESTROOM AND CONCESSIONS BUILDING

NOT TO SCALE

BID SUBMITTAL

NO.	DATE	BY	REVISION MADE

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File No. 40320-DT.DWG
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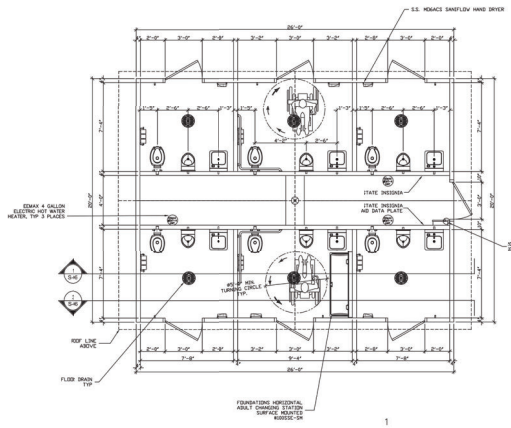
L5.6

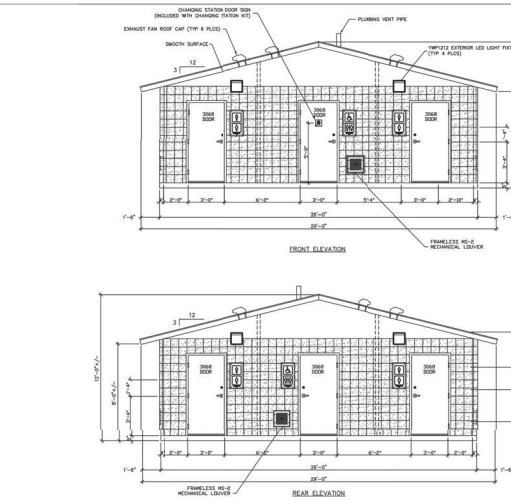


Precast Products

SANTIAGO
BUILDING NUMBER S-271

FLOOR PLAN

S-03 | 2



Precast Products

SANTIAGO
BUILDING NUMBER S-271

BUILDING ELEVATIONS

S-04 | 2

NOT FOR CONSTRUCTION FOR BIDDING PURPOSES ONLY

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1 RESTROOM BUILDING

NOT TO SCALE

O'DELL ENGINEERING

LICENSED LANDSCAPE ARCHITECT — STATE OF CALIFORNIA

Signature
Renewal Date 01/12/2023
Date

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NO.	DATE	BY	REVISION MADE

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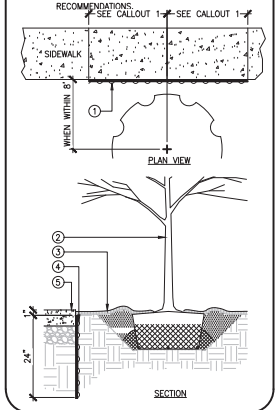
File No. 40320-DT.DWG
Sheet
L5.7
60 of 75

1. LINEAR ROOT BARRIER INSTALLATION. INSTALL 10' O.C.
2. SEE TREE PLANTING DETAIL 1, THIS SHEET
3. MULCH. SEE PLANTING NOTES
4. ROOT BARRIER: ROOT INHIBITOR IMPREGNATED NODULES OR FABRIC
5. BACK OF CURB OR WALK

NOTES:
A. ALL TREES WITHIN 10' OF A CURB OR SIDEWALK SHALL HAVE ROOT BARRIERS INSTALLED.
B. INSTALL ROOT BARRIERS PER MANUFACTURER'S RECOMMENDATIONS.

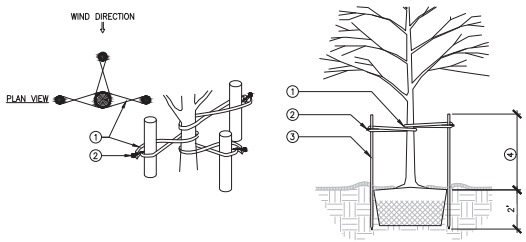


5 ROOT BARRIER DETAIL

NOT TO SCALE

1. GRO STRAIT-36" 'Z' STRAP OR EQUAL
2. SECURE WITH 1" GALVANIZED SCREW
3. 2" DIA. X 8' (15 GAL.-24" BOX), 3" DIA. X 10' (36"-48" BOX) HARDWOOD LODGEPOLE STAKES OR OTHER APPROVED STAKE MATERIAL. ALL STAKES SHALL BE DRIVEN OUTSIDE THE EDGE OF THE ROOTBALL.
4. SECURE TREE 6" TO 12" ABOVE LOWEST POINT NECESSARY TO KEEP TREE UPRIGHT AND TOP OF TAKE SHALL BE CUT OFF NO MORE THAN 3" ABOVE THE HIGHEST TIE.

NOTES:
A. FASTEN STRAP TIGHT ENOUGH TO KEEP FROM SLIPPING WHILE ALLOWING FOR SOME TRUNK MOVEMENT.
B. REMOVE ALL STAKING AS SOON AS THE TREE HAS GROWN SUFFICIENT ROOTS.
C. TREES WITH POOR QUALITY ROOT BALLS OR ROOT BALLS THAT HAVE BEEN CRACKED OR DAMAGED SHALL BE REJECTED.
D. TREES THAT HAVE GROWN TOO CLOSE TOGETHER IN THE NURSERY, RESULTING IN WEAK TRUNKS SHALL BE REJECTED.

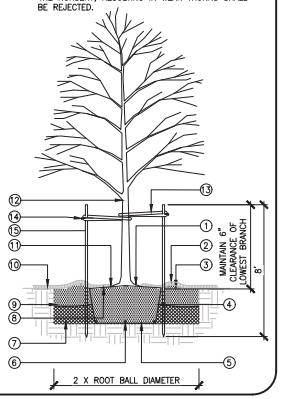


4 TREE STAKING

NOT TO SCALE

1. EACH TREE SHALL BE PLANTED SUCH THAT THE TRUNK FLARE IS VISIBLE AT THE TOP OF THE ROOT BALL. TREES WHERE THE TRUNK FLARE IS NOT VISIBLE SHALL BE REJECTED. DO NOT COVER THE TOP OF THE ROOT BALL WITH SOIL.
2. 3" HIGH EARTH BERM BEYOND EDGE OF ROOT BALL.
3. SEE PLANTING NOTES FOR SOIL AMENDMENT MIXTURE.
4. REMOVE ALL TWINE, ROPE, WIRE AND BURLAP FROM TOP HALF OF ROOT BALL.
5. PLACE ROOT BALL ON UNEXCAVATED OR TAMPED SOIL.
6. 21-GRAM FERTILIZER PLANT TABS: 5 PER 15 GAL TREE, 8 PER 24" BOX TREE, 12 PER 36" BOX TREE.
7. TAMP SOIL AROUND ROOT BALL BASE FIRMLY WITH FOOT PRESSURE IN 9" LIFTS SO THAT ROOT BALL DOES NOT SHIFT.
8. SET TOP OF ROOT BALL FLUSH TO GRADE OR (1"-2") HIGHER IN SLOWLY DRAINING SOILS.
9. NATIVE SOIL
10. MULCH RING, (3') DIA. MIN. (4') DIA. PREFERRED.
11. DO NOT PLACE MULCH IN CONTACT WITH TREE TRUNK. MAINTAIN THE MULCH WEED-FREE DURING THE MAINTENANCE PERIOD.
12. MARK THE NORTH SIDE OF THE TREE IN THE NURSERY, AND ROTATE TREE TO FACE NORTH AT THE SITE.
13. "GRO STRAIT" 36" 'Z' STRAP OR EQUAL
14. SECURE WITH 1-1/2" GALVANIZED NAIL OR SCREW
15. 2" DIA. X 8' (15 GAL.-24" BOX), 3" DIA. X 10' (36"-48" BOX) HARDWOOD LODGEPOLE STAKES OR OTHER APPROVED STAKE MATERIAL. ALL STAKES SHALL BE DRIVEN OUTSIDE THE EDGE OF THE ROOTBALL.

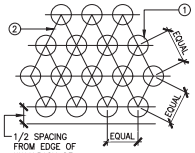
NOTES:
A. DO NOT HEAVILY PRUNE THE TREE AT PLANTING. PRUNE ONLY CROSSOVER LIMBS, CO-DOMINANT LEADERS, AND BROKEN OR DEAD BRANCHES. SOME INTERIOR TWIGS AND LATERAL BRANCHES MAY BE PRUNED; HOWEVER, DO NOT REMOVE THE TERMINAL BUDS OF BRANCHES THAT EXTEND TO THE EDGE OF THE CROWN.
B. SEE STAKING DETAIL FOR STAKING INFORMATION
C. AMENDED SOIL MUST NOT BE SO COMPACTED AS TO IMPEDE ROOT GROWTH OR DRAINAGE. THE SOIL STRUCTURE SHALL NOT BE PLATY OR MASSIVE.
D. TREES WITH POOR QUALITY ROOT BALLS OR ROOT BALLS THAT HAVE BEEN CRACKED OR DAMAGED SHALL BE REJECTED.
E. TREES THAT HAVE GROWN TOO CLOSE TOGETHER IN THE NURSERY, RESULTING IN WEAK TRUNKS SHALL BE REJECTED.



1 TREE PLANTING

NOT TO SCALE

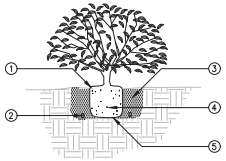
1. SHRUBS
2. SHRUBS SHALL BE TRIANGULAR SPACED PER O.C. SPACING ON PLANTING LEGEND AND/OR PLANTING PLAN.



3 SHRUB SPACING

NOT TO SCALE

1. CROWN 2" ABOVE GROUND
2. FERTILIZER PLANT TABS: 1 PER 1 GAL, 3 PER 5 GAL
3. BACKFILL MIX (SEE PLANTING NOTES)
4. ROOTBALL
5. SCARIFY BOTTOM OF HOLE



2 SHRUB PLANTING

NOT TO SCALE

IRRIGATED LANDSCAPE WATER EFFICIENCY TABLE

WATER BUDGET CALCULATIONS

MAXIMUM APPLIED WATER ALLOWANCE

MAWA=(ETo)(0.62)((0.45xLA)+((1.0-0.45)xSLA))	LOCAL ETo=	LA =	SLA =		MAWA TOTAL=
	51.5	296,124	271,689		9,026,124 GAL.

ESTIMATED TOTAL WATER USE

ETWU=(ETo)(0.62)(((PFxHA)/IE)+SLA)	LOCAL ETo=	PF =	LA =	SLA =	ETWU TOTAL=
	51.5	SEE BELOW	296,124	271,689	8,762,192 GAL.

HYDROZONE INFORMATION TABLE

HYDROZONE TAG	PLANT FACTOR (PF)	IRRIGATION METHOD	IRRIGATION EFFICIENCY (IE)	ETAF (PF/IE)	LANDSCAPE AREA (SF)	ETAF X AREA	ESTIMATED TOTAL WATER USE (ETWU)
LANDSCAPE AREAS							
2, 4, 19, 28, 35 (TREE/RWS/MODERATE)	0.50	RWS	0.81	0.62	3,222 SF	1,989	63,505 GAL
1, 3, 5, 25, 33 (SHRUB/BUBBLER/LOW)	0.24	BUBBLER	0.81	0.30	21,213 SF	6,364	203,199 GAL
					TOTAL AREA= 24,435 SF	TOTAL= 8,353	TOTAL = 266,705 GAL.
SPECIAL LANDSCAPE AREAS							
6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 26, 29, 30, 31, 32, 34, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46 (LAWN/ROTOR/MODERATE)				1	266,066 SF	266,066	8,495,487 GAL
27 (LAWN/ROTARY/MODERATE)				1	5,623 SF	5,623	179,542 GAL
					TOTAL AREA= 271,689 SF	TOTAL= 266,066	TOTAL = 8,495,487 GAL.

* THIS INFORMATION DERIVED FROM PLANT FACTOR DESIGNATIONS IN THE WUCOLS IV DOCUMENT.

IRRIGATION SCHEDULE

SCHEDULING NOTES & RUN TIMES

WATERING CYCLES AND DURATION DURING PRE-ESTABLISHMENT PERIODS SHOULD BE ADJUSTED PER PLANT PROVIDER'S RECOMMENDATIONS AND CURRENT WEATHER CONDITIONS.

POST ESTABLISHMENT IRRIGATION SCHEDULE CALCULATED USING AVERAGE CLIMATE CONDITIONS AND AVERAGE PLANT REQUIREMENTS. THIS SCHEDULE SERVES AS A BASE FOR CONTROLLER PROGRAMMING. EXTREME AND SITE SPECIFIC CONDITIONS WILL RESULT IN ETo ADJUSTMENTS AND MAY REQUIRE ADJUSTMENTS TO SCHEDULE FREQUENCY/DURATION.

IRRIGATION CONTROLLER SHALL BE CONFIGURED TO RUN ALL ZONES ON SOAK CYCLES.

STATION RUN-TIMES ARE SHOWN IN MINUTES PER DAY (MIN) AND DAYS PER WEEK (DW)

HYDROZONE TAG	WINTER PRE-EST.	WINTER POST-EST.	SPRING PRE-EST.	SPRING POST-EST.	SUMMER PRE-EST.	SUMMER POST-EST.	FALL PRE-EST.	FALL POST-EST.
LANDSCAPE AREAS								
2, 4, 19, 28, 35 (TREE/RWS/MODERATE)	6 MIN/2 DW	12 MIN/1 DW	21 MIN/2 DW	43 MIN/1 DW	22 MIN/2 DW	44 MIN/1 DW	11 MIN/2 DW	22 MIN/1 DW
1, 3, 5, 25, 33 (SHRUB/BUBBLER/LOW)	2 MIN/4 DW	5 MIN/2 DW	8 MIN/4 DW	16 MIN/2 DW	8 MIN/4 DW	16 MIN/2 DW	4 MIN/4 DW	8 MIN/2 DW
SPECIAL LANDSCAPE AREAS								
6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 26, 29, 30, 31, 32, 34, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46 (LAWN/ROTOR/MODERATE)	8 MIN/7 DW	19 MIN/3 DW	30 MIN/7 DW	70 MIN/3 DW	31 MIN/7 DW	73 MIN/3 DW	15 MIN/7 DW	36 MIN/3 DW
27 (LAWN/ROTARY/MODERATE)	8 MIN/7 DW	18 MIN/3 DW	28 MIN/7 DW	66 MIN/3 DW	29 MIN/7 DW	68 MIN/3 DW	14 MIN/7 DW	33 MIN/3 DW

O'DELL ENGINEERING

LICENSED LANDSCAPE ARCHITECT — STATE OF CALIFORNIA

BID SUBMITTAL

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PLANTING DETAILS

PROJECT# 122061
LANDSCAPE IMPROVEMENT PLANS
COMMUNITY PARK-42
BID SUBMITTAL

DR. BY: TF / YC
DATE: 01/12/2023
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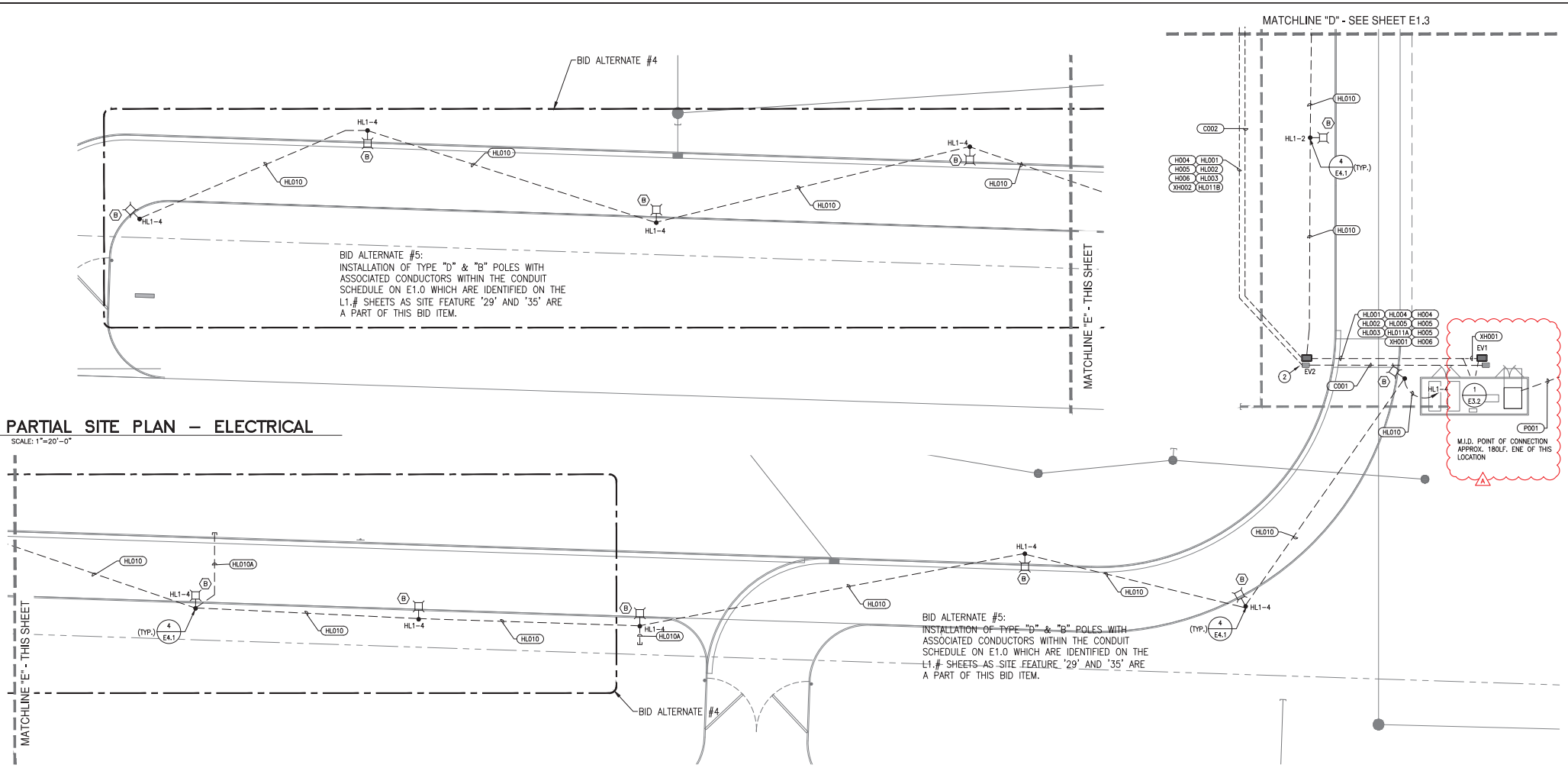
SCALE: NO SCALE

File No. 40320-DT.DWG
Sheet L7.0
65 of 75



PARTIAL SITE PLAN – ELECTRICAL

SCALE: 1"=20'-0"

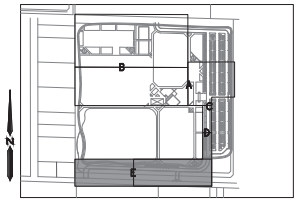
PARTIAL SITE PLAN – ELECTRICAL

SCALE: 1"=20'-0"

NOTES:

NOT ALL NOTES MAY BE USED ON THIS SHEET

1. (N) 4"C PG&E PRIMARY PER PG&E GREENBOOK –COORDINATE ROUTING TO (E) POLE
2. (N) N48 POWER & N36 COMM PULLBOXES PER DETAIL 2/E4.1.
3. (N) N36 POWER PULLBOX PER DETAIL 2/E4.1.
4. (N) POWER DUCT BANK PER DETAIL 3/E4.1.
5. (N) POWER & COMMUNICATION DUCT BANK PER DETAIL 3/E4.1.
6. (N) SPORT LIGHTING POLE LOCATION W/ (N) 1 1/2"C TO NEAREST POWER PULLBOX
7. (N) POWER & COMM FEEDS TO CONCESSION BUILDING
8. (N) POWER & COMM FEEDS TO RESTROOM BUILDING
9. (N) RESTROOM BUILDING W/(N) XFMER "TX-LR" & PANEL "LR"
10. (N) CONCESSION BUILDING W/(N) XFMER "TX-LC" & PANEL "LC"
11. (N) N48 POWER PULLBOX PER DETAIL 2/E4.1.



LOCATION MAP

1"=500'

PEZZONI ENGINEERING, INC.
CIVIL • ELECTRICAL • MECHANICAL
1150 9TH Street Suite #1475 Modesto, CA 95354
PHONE: 209. 556. 6602
HTTP://WWW.PEZZONIEI.COM

REGISTERED PROFESSIONAL ENGINEER KEVIN L. PEZZONI NO. 16269 EXP. 12/24 ELECTRICAL

NO.	DATE	BY	REVISION MADE
A	2/3/23	CCM	ADDENDUM #3 REVISIONS

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ENGINEERING
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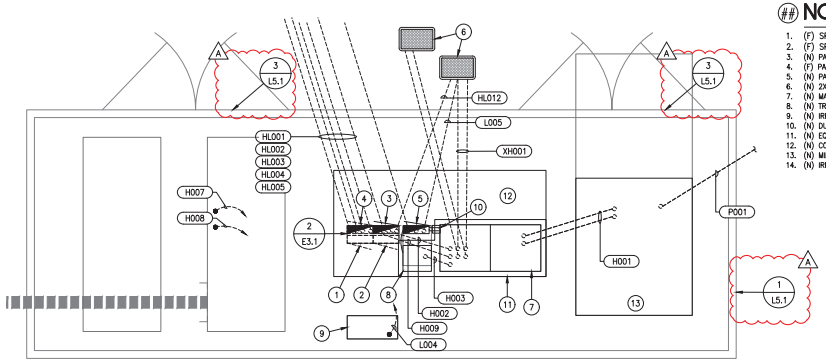
678 W. 18th Street (209) 385-6846

AREA D - PARTIAL ELECTRICAL PLAN

PROJECT# 40320
LANDSCAPE IMPROVEMENT PLANS
COMMUNITY PARK-42
BID SET

DR. BY: KP
DATE: 01/12/2023
CH. BY: KP
DATE: 01/12/2023
SCALE: AS SHOWN

File No. –
Sheet
E1.4

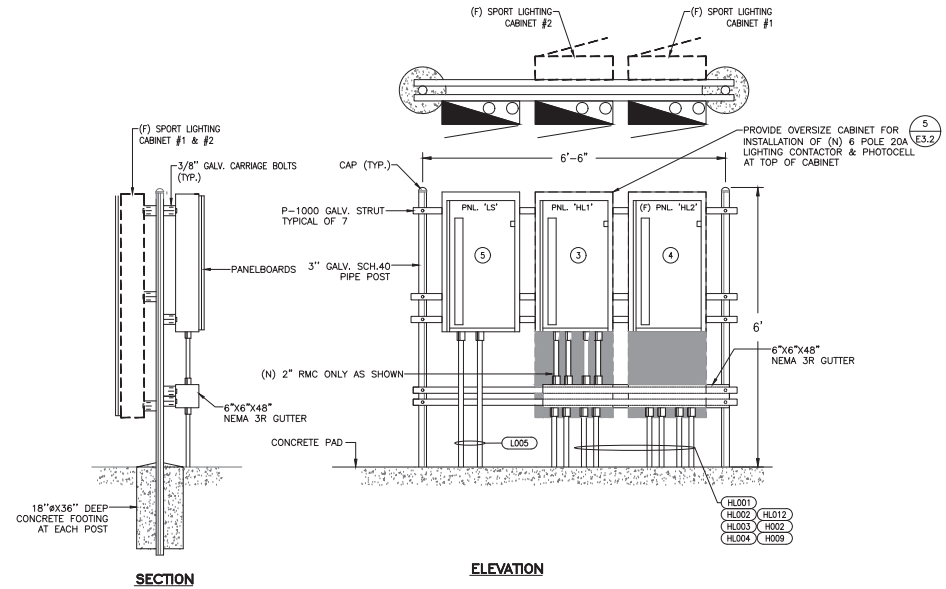


NOTES:

1. (F) SPORT LTG. CONTROL CABINET #1.
2. (F) SPORT LTG. CONTROL CABINET #2.
3. (N) PANEL 'HL1'.
4. (F) PANEL 'HL2'.
5. (N) PANEL 'LS'.
6. (N) 2X3 VAULT.
7. (N) MAIN DISTRIBUTION BOARD 'MSB' -DETAIL 3/E3.2.
8. (N) TRANSFORMER 'TX-LS'.
9. (N) IRRIGATION CONTROLLER -CONNECT 120V POWER.
10. (N) DUPLEX WEATHERPROOF GFCI RECEPTACLE W/20A CIRCUIT TO PANEL "LS."
11. (N) EQUIPMENT FOUNDATION PER DETAIL 4/E3.2.
12. (N) CONCRETE PAD 4" THICK MINIMUM.
13. (N) MID PAD MOUNTED TRANSFORMER PER MID REQUIREMENTS.
14. (N) IRRIGATION PUMP SKID -SEE LA SHEETS FOR REQUIREMENTS.

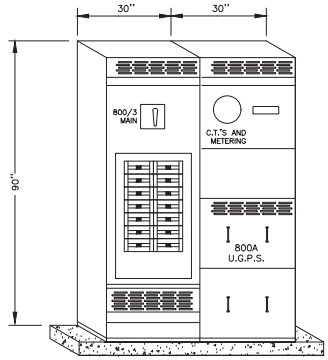
1 PARTIAL SITE PLAN – UTILITY YARD

SCALE: 1"=4'-0"



2 ELECTRICAL EQUIP. MOUNTING DETAIL

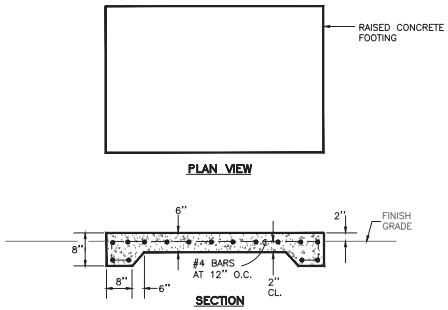
SCALE: NTS



ELEVATION

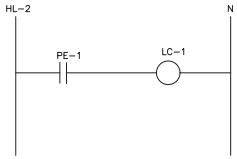
3 NEW MAIN SWITCHBOARD

SCALE: NTS



4 FOUNDATION DETAIL

SCALE: NTS



NOTE:
SEE PANEL SCHEDULE FOR EXACT NUMBER OF STREET LIGHTING CIRCUITS NEEDED AT SERVICE PEDESTAL-(POC's) THIS DIAGRAM SHOWS GENERAL REQUIREMENTS NEEDED AND EXACT LAYOUT FOR CONTROLS MAY VARY. VERIFY REQMTS. PRIOR TO CONSTRUCTION.

LC-1 : LTG. CONTACTOR -6 POLE -20A.- 277V.-SQ. #8903

P.E.: FISHER PIERCE :6660

5 LIGHTING CONTROL DIAGRAM

SCALE: NTS

PEZZONI ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
1150 9TH Street Suite #1215 Modesto, CA 95354
PHONE: 209. 556. 6602
HTTP://WWW.PEZZONI.COM

REGISTERED PROFESSIONAL ENGINEER KEVIN L. PEZZONI NO. 16369 EXP. 12/24 ELECTRICAL

NO.	DATE	BY	REVISION MADE
A	2/3/23	CCM	ADDENDUM #3 REVISIONS

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City of Merced
"Gateway to Yosemite"
ENGINEERING
ENGINEERING PROJECTS AND STANDARDS
678 W. 18th Street (209) 385-6846

PARTIAL SITE PLAN - ELECTRICAL YARD

PROJECT# 40320
LANDSCAPE IMPROVEMENT PLANS
COMMUNITY PARK-42
BID SET

DR. BY: KP
DATE: 01/12/2023
CH. BY: KP
DATE: 01/12/2023
SCALE: AS SHOWN

File No. –
Sheet E3.2

February 23, 2023

CITY OF MERCED
DEPARTMENT OF ENGINEERING
678 W. 18th Street, Merced, CA 95340

ADDENDUM NO. 4

To **ALL PROSPECTIVE BIDDERS**
Under Specifications for the Construction of

COMMUNITY PARK 42
PROJECT NUMBER 122061

For which bids are to be received at the Office of the Purchasing Agent of the City of Merced, 2525 "O" St., Merced, California.

The following revisions to the specifications shall be made:

ITEM 1: SPECIFICATIONS: PAGE XX TO PAGE XXIV – BID SCHEDULE 'B' – ADD ALTERNATE #1 TO BID SCHEDULE 'F' – ADD ALTERNATE #5

- Remove Bid Schedule 'B' – Add Alternate #1 through Bid Schedule 'F' – Add Alternate #5 and replace with the Attachment 1: Bid Schedule 'B' – Add Alternate #1 through Bid Schedule 'F' – Add Alternate #5.

The following revisions to the plans shall be made:

ITEM 1: PLANS: REMOVE PLAN SHEETS AND REPLACE WITH SHEETS OF THE SAME NUMBER (SEE ATTACHMENT 2)

- Civil:
  - Sheet C1.0 (9 of 75) – GRADING PLAN
  - Sheet C1.5 (14 of 75) – GRADING PLAN – ADDITIVE ALTERNATE #1
  - Sheet C1.6 (15 of 75) – GRADING PLAN – ADDITIVE ALTERNATE #4
  - Sheet C2.4 (20 of 75) – UTILITY PLAN
- Landscape
  - Sheet L5.4 (57 of 75) – CONSTRUCTION DETAILS
  - Sheet L5.8 (61 of 75) – CONSTRUCTION DETAILS
- Electrical
  - Sheet E1.0 (67 of 75) – CONDUIT AND LIGHTING SCHEDULES

Kristen Scheidt, P.E., QSD

Michael R. Beltran II, P.E.
City Engineer

Attachment 1: "Bid Schedule 'B' – Add Alternate #1" through "Bid Schedule 'F' – Add Alternate #5"
Attachment 2: Plan Sheets

Name of Bidder or Firm: American Paving Co.

THIS ADDENDUM MUST BE SIGNED AND RETURNED WITH BID PROPOSAL.

ADDENDUM NO. 4 has been received and incorporated into the bid proposal.

Received By: _____
Stephen J. Poindexter, President

Date : 2/28/23 Planholder : American Paving Co.

NOTE: RECEIPT OF THIS ADDENDUM MUST ALSO BE ACKNOWLEDGED IN THE CONTRACTOR'S BID PROPOSAL.

ATTACHEMENT 1

BID SCHEDULE ‘B’ - ADD ALTERNATE #1 BID					
ITEM NO.	ITEM	UNIT OF MEASURE	ESTIMATED QUANTITY	UNIT PRICE (IN FIGURES)	ITEM TOTAL (IN FIGURES)
1	Permits, Bonds, Licenses & Insurance	LS	1		
2	Public Convenience and Safety	LS	1		
3	Site Grading (Mass/Fine)	SF	31,864		
4	6” Storm Drain Line	LF	131		
5	Storm Drain Area Drains	EA	3		
6	Pedestrian Light Pole w/ fixture (Add. Alt. #1 Site Feature ‘13’)	EA	6		
7	Concrete Flatwork (Add. Alt. #1 Site Finish ‘1’)	SF	20,386		
8	Rubberized Play Surfacing – 01 (2-5 area) (Add. Alt. #1 Site Finish ‘2’)	SF	1,396		
9	Rubberized Play Surfacing – 02 (2-5 area) (Add. Alt. #1 Site Finish ‘3’)	SF	1,579		
10	Rubberized Play Surfacing – 01 (5-12 area) (Add. Alt. #1 Site Finish ‘4’)	SF	2,501		
11	Rubberized Play Surfacing – 02 (5-12 area) (Add. Alt. #1 Site Finish ‘5’)	SF	1,922		
12	Play Area Base Preparation (Add. Alt. #1 Site Finishes ‘2’ - ‘5’)	Sf	7,398		
13	Thickened Sidewalk Edge At Play Area (Add. Alt. #1 Site Feature ‘11’)	LF	138		
14	12” wide Concrete Mow Curb (Add. Alt. #1 Site Feature ‘12’)	LF	225		
15	Chain Link Fence with concrete curb below fence behind Soccer Goals (Add. Alt. #1 Site Feature ‘19’)	LF	542		
16	Play Equipment (2-5) (Add. Alt. #1 Site Feature ‘7’)	LS	1		
17	Play equipment (5-12) (Add. Alt. #1 Site Feature ‘8’)	LS	1		
18	Picnic Tables (Add. Alt. #1 Site Feature ‘9’)	EA	3		

19	Accessible Picnic Tables (Add. Alt. #1 Site Feature ‘10’)	EA	1		
20	Bike Rack (Add. Alt. #1 Site Feature ‘17’)	EA	4		
21	Waste Receptacle Corrals (Add. Alt. #1 Site Feature ‘15’)	EA	1		
22	Doggi-Pot Pet Waste Station (Add. Alt. #1 Site Feature ‘16’)	EA	1		
23	Removable Bollard (Add. Alt. #1 Site Feature ‘14’)	EA	2		
24	Field Marker Identification Signage (Add. Alt. #1 Site Feature ‘20’)	EA	4		
25	Soil Amendments and Conditioning	SF	20,386		
26	1-Gallon Shrubs	EA	94		
27	24” Box Trees	EA	4		
28	Tree Root Barriers	LF	90		
29	Top Dressing - Decorative Bark Mulch	SF	1,787		
30	Irrigation System	LS	1		
31	Landscape Maintenance Period (180 Days)	LS	1		
32	NOT IN USE	---	---	----------	----------
		TOTAL SCHEDULE ‘B’ BID			

BID SCHEDULE ‘C’ - ADD ALTERNATE #2 BID

ITEM NO.	ITEM	UNIT OF MEASURE	ESTIMATED QUANTITY	UNIT PRICE (IN FIGURES)	ITEM TOTAL (IN FIGURES)
1	Permits, Bonds, Licenses & Insurance	LS	1		
2	Public Convenience and Safety	LS	1		
3	Electrical Feeder to Shade Structure from Panel	LS	1		
4	50x100’ Shade Structure (Add. Alt. #2 Site Finish ‘21’)	LS	1		

5	Picnic Tables (Add. Alt. #2 Site Feature ‘22’)	EA	12		
6	Accessible Picnic Tables (Add. Alt. #2 Site Feature ‘23’)	EA	6		
		TOTAL SCHEDULE ‘C’ BID			

BID SCHEDULE ‘D’ - ADD ALTERNATE #3

ITEM NO.	ITEM	UNIT OF MEASURE	ESTIMATED QUANTITY	UNIT PRICE (IN FIGURES)	ITEM TOTAL (IN FIGURES)
1	Permits, Bonds, Licenses & Insurance	LS	1		
2	Public Convenience and Safety	LS	1		
3	Electrical Feeder to Shade Structure from Panel	LS	1		
4	Concrete Flatwork (Add. Alt. #3 Site Finish ‘24’)	SF	1,300		
5	30x30’ Shade Structure (Add. Alt. #3 Site Feature ‘25’)	EA	1		
6	Picnic Tables (Add. Alt. #3 Site Feature ‘26’)	EA	3		
7	Accessible Picnic Tables (Add. Alt. #3 Site Feature ‘27’)	EA	1		
8	Waste receptacle Corrals (Add. Alt. #3 Site Feature ‘28’)	EA	1		
9	NOT IN USE	---	---	----------	----------
		TOTAL SCHEDULE ‘D’ BID			

BID SCHEDULE ‘E’ - ADD ALTERNATE #4 BID

ITEM NO.	ITEM	UNIT OF MEASURE	ESTIMATED QUANTITY	UNIT PRICE (IN FIGURES)	ITEM TOTAL (IN FIGURES)
1	Permits, Bonds, Licenses & Insurance	LS	1		
2	Public Convenience and Safety	LS	1		

3	Water Pollution Control	LS	1		
4	Street Sweeping	LS	1		
5	Surveying Services	LS	1		
6	Monumentation	LS	1		
7	Portable Changeable Message Signs	LS	1		
8	Site Grading (Mass/Fine)	SF	22,733		
9	6” Storm Drain Line	LF	47		
10	Storm Drain Manholes	EA	1		
11	Type ‘C’ Catch Basin	EA	1		
12	Outfall	EA	1		
13	Parking lot Light Pole w/ single-head fixture (Add. Alt. #4 Site Feature ’35’)	EA	7		
14	Asphalt Parking Lot with striping (Add. Alt. #4 Site Finish ‘30’)	SF	22,733		
15	Parking Lot Curbs- Vertical/ Flush (Add. Alt. #4 Site Feature ‘33’)	LF	599		
16	Parking Lot Curb & Gutter (Add. Alt. #4 Site Feature ‘36’)	LF	806		
17	Park Sign (Add. Alt. #4 Site Feature ‘31’)	EA	1		
18	Fixed Bollard (Add. Alt. #4 Site Feature ‘32’)	EA	8		
19	Tubular Steel Gates at Vehicular Entry (Add. Alt. #4 Site Feature ’34’)	EA	2		
20	FDR-C Process (1.0’)	LS	1		
		TOTAL SCHEDULE ‘E’ BID			

BID SCHEDULE ‘F’ - ADD ALTERNATE #5 BID

ITEM NO.	ITEM	UNIT OF MEASURE	ESTIMATED QUANTITY	UNIT PRICE (IN FIGURES)	ITEM TOTAL (IN FIGURES)
1	Permits, Bonds, Licenses & Insurance	LS	1		
2	Public Convenience and Safety	LS	1		

3	Surveying Services	LS	1		
4	Parking Lot Light Pole w/ 4-head fixture (Site Feature ‘4’)	EA	6		
5	Parking Lot Light Pole w/ single-head fixture (Site Feature ‘29’)	EA	9		
		TOTAL SCHEDULE ‘F’ BID			

ATTACHEMENT 2

GRADING NOTES

1. TYPE A1-6 CURB PER DETAIL 11, SEE SHEET L5.8.
2. SAWCUT AND CONFORM IN A NEAT STRAIGHT LINE.
3. LAP JOINT PER DETAIL 10, SHEET L5.8.
4. CURB AND GUTTER PER DETAIL 6, SEE SHEET L5.9.
5. 6" AC DIKE PER DETAIL 2, SHEET L5.9.
6. REDWOOD HEADER BOARD PER DETAIL 3, SEE SHEET L5.8.
7. TEMPORARY GUTTER TO BE REMOVED DURING FULL BUILD OUT OR CONSTRUCTION OF ADDITIVE.

LEGEND

CONCRETE
6" P.C.C. PER DETAIL 1, SEE SHEET L5.8.

AC PAVEMENT
2.5" AC WEARING COURSE/ 12" FDR-C

SWALE
SEE SECTION A, THIS SHEET.

LIMITS OF WORK/MATCH EXISTING

ADA PATH OF TRAVEL NOTE

CONTRACTOR TO VERIFY THAT ALL SLOPES ALONG ADA PATH OF TRAVEL DO NOT EXCEED 1.5% CROSS SLOPE AND 5% RUNNING SLOPE (EXCEPT AT RAMP LOCATIONS, WHICH CANNOT EXCEED 7.5% RUNNING SLOPE). LANDINGS SHALL NOT EXCEED 1.5% IN ALL DIRECTIONS.

CLEANING NOTES

1. THE CONTRACTOR SHALL REVIEW SITE PRIOR TO BIDDING. ALL VEGETATION, STRUCTURES, TREES, DELETERIOUS MATERIAL, ETC. SHALL BE REMOVED FROM THE SITE AT THE EXPENSE OF THE CONTRACTOR AND SHALL BE INCLUDED IN THE LUMP SUM CLEARING COST. ALL WORK SHALL COMPLY WITH THE GEOTECHNICAL RECOMMENDATIONS.

DUST CONTROL NOTES

1. SPRAY WATER ON ALL EXPOSED EARTH SURFACES DURING CLEARING, GRADING, EARTH MOVING AND OTHER SITE PREPARATION ACTIVITIES THROUGHOUT THE DAY TO MINIMIZE DUST. USE TARPAULINS OR OTHER EFFECTIVE COVERS ON ALL STOCKPILED EARTH MATERIAL AND ON ALL HAUL TRUCKS TO MINIMIZE DUST. SWEEP THE ADJACENT STREET FRONTAGES AT LEAST ONCE A DAY OR AS NEEDED TO REMOVE SILT AND OTHER DIRT WHICH IS EVIDENT FROM CONSTRUCTION ACTIVITIES. ENSURE THAT CONSTRUCTION VEHICLES ARE CLEANED PRIOR TO LEAVING THE SITE TO PREVENT DUST AND DIRT FROM BEING TRACKED OFF SITE.
2. ALL EXPOSED SURFACES SHALL BE WATERED A MINIMUM OF TWICE DAILY UNLESS DEEMED UNNECESSARY DUE TO WEATHER. WATER SHALL BE APPLIED AS PROVIDED IN SECTION 17 OF CALTRANS STANDARD SPECIFICATIONS.
3. DUST PALLIATIVES MAY BE SUBSTITUTED FOR WATERING UPON THE APPROVAL OF THE CITY ENGINEER. DUST PALLIATIVES SHALL BE APPLIED AS PROVIDED IN SECTION 18 OF CALTRANS STANDARD SPECIFICATIONS.

GRADING NOTES

ALL GRADING ACTIVITIES SHALL BE COMPLETED IN STRICT ACCORDANCE WITH GEOTECHNICAL RECOMMENDATIONS.

1. THE GRADING AREAS SHOULD BE PREPARED FOR GRADING BY REMOVING EXISTING VEGETATION, LARGE ROOTS, DEBRIS, AND OTHER POTENTIALLY DELETERIOUS MATERIALS. THE SITE PREPARATION OPERATIONS SHOULD BE OBSERVED BY THE GEOTECHNICAL ENGINEER.
2. EXISTING UTILITY LINES THAT WILL NOT REMAIN IN SERVICE SHOULD BE EITHER REMOVED OR PROPERLY ABANDONED. THE APPROPRIATE METHOD OF UTILITY ABANDONMENT WILL DEPEND UPON THE TYPE, DEPTH, AND LOCATION OF THE UTILITY. RECOMMENDATIONS FOR ABANDONMENT CAN BE MADE AS NECESSARY.
3. THE CONTRACTOR SHALL REQUIRE WATER TRUCKS TO OPERATE IN CONJUNCTION WITH GRADING EQUIPMENT AND APPLICATION OF WATER SHALL BE MADE AS FREQUENTLY AS IS NECESSARY TO CONTROL DUST AT A MINIMUM OF THREE TIMES A DAY, IF THE DUST IS NOT ADEQUATELY CONTROLLED THROUGH THE APPLICATION OF WATER, GRADING ACTIVITIES WILL BE SUSPENDED AND AN HOURLY WATERING SCHEDULE AND/OR MAXIMUM LIMIT ON THE DAILY NUMBER OF CUBIC YARDS TO BE GRADED WILL BE IMPOSED PRIOR TO THE RESUMPTION OF GRADING. IN ADDITION, ALL GRADING ACTIVITIES DURING PERIODS OF HIGH WINDS (OVER 15 MPH) ARE PROHIBITED.

GEOTECHNICAL RECOMMENDATIONS

1. GEOTECHNICAL DATA PROVIDED TO CITY BY CRAWFORD & ASSOCIATES.
2. CITY ENGINEER PROVIDING GEOTECHNICAL RECOMMENDATIONS AS GEOTECHNICAL ENGINEER OF RECORD.
3. WHERE CONCRETE IS NOT ABUTTED BY LANDSCAPE, INSTALL 10ML POLYOLEFIN TO A DEPTH OF 18 INCHES BELOW THE BOTTOM OF CONCRETE AND 12 INCHES UNDER CONCRETE.
4. ALL CONCRETE POTENTIALLY BEING DRIVEN ON TO BE 4,000 PSI 6 SACK, 1 INCH ROCK. ADDITIONALLY, THERE SHOULD BE REBAR IN BOTH PRINCIPLE DIRECTIONS. ALL OTHER CONCRETE NOT POTENTIALLY BEING DRIVEN ON SHALL BE MINIMUM 3,000 PSI, 1 INCH ROCK.
5. THESE COMPACTION NOTES SUPERCEDE ANY OTHER COMPACTION NOTES ON THESE PLANS.
6. THE FOLLOWING REQUIREMENTS INCLUDE STRUCTURAL SECTIONS, INCLUDING BUT NOT LIMITED TO, SIDEWALKS, RAMPS, DRIVEWAYS, STREETS, CURB AND GUTTER.
7. NATIVE SUBGRADE (CLAY) – SUBGRADE, TO A DEPTH OF 12-INCHES, SHALL BE UNIFORMLY MOISTURE CONDITIONED TO AT LEAST 3% ABOVE THE OPTIMUM MOISTURE CONTENT AND COMPACTED TO AT LEAST 90%, BUT NOT MORE THAN 95%, RELATIVE COMPACTION, AS DETERMINED BY ASTM D1557.
8. AS ALTERNATIVE TO THE ABOVE, NATIVE SUBGRADE MAY BE REPLACED FOR THE FULL DEPTH WITH A CLASS III AGGREGATE SUBBASE (ASB). THE ASB SHALL COMPLY WITH THE CALTRANS STANDARD (LATEST REVISION) AND A CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED TO THE CITY PRIOR TO PLACEMENTS. ASB SHALL BE UNIFORMLY MOISTURE CONDITIONED TO AT LEAST THE OPTIMUM MOISTURE CONTENT AND COMPACTED TO AT LEAST 95% RELATIVE COMPACTION, AS DETERMINED BY ASTM D1557.
9. SLURRY IS NOT AN ACCEPTABLE BACKFILL EXCEPT WITH A FULL DEPTH RECLAMATION (FDR) ROAD SECTION. THE USE OF SLURRY SHALL BE APPROVED IN WRITING BY THE CITY ENGINEER PRIOR TO PLACEMENT. ALL SLURRY IN FDR SECTION SHALL BE 500 PSI AND SHALL BE TESTED AT THE CONTRACTOR'S EXPENSE.
10. ASPHALT CONCRETE (AC), OVER 1 FOOT BY 1 FOOT (POTHOLE) WILL REQUIRE COMPACTION TESTING. IF COMPACTION IS REQUIRED, THE AC SHALL BE SAW CUT TO MAINTAIN A MINIMUM OF 2 FEET BY 2 FEET TO ALLOW FOR PROPER COMPACTION AND TESTING. COMPACTION SHALL BE AT LEAST 91%, BUT NOT MORE THAN 97%. AC SHALL BE FLUSH WITH SURROUNDING STREETS.
11. CRUSHED ROCK SHALL NOT BE USED FOR ANY TYPE OF BACKFILL.
12. POTHOLES SHALL BE BACK FILLED AND CAPPED IN A MANNER SUCH THAT IT REMAINS FLUSH WITH THE EXISTING STREET. DEPRESSION OR PROTRUSION (HUMP) WILL NOT BE ACCEPTED, EVEN AFTER FINAL INSPECTION HAS BEEN GIVEN.
13. ENSURE ANY PLANTED AREAS ARE FREE OF FDR SPOILS AND MEDIA IS IN ACCORDANCE WITH LANDSCAPE PLANS AND SPECIFICATIONS.

MONUMENT PRESERVATION

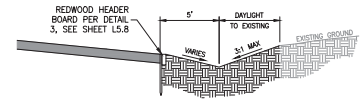
CONTRACTOR MUST ENSURE THAT MONUMENT CONSERVATION HAS BEEN PROPERLY ADDRESSED. PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ON THIS SITE, IT IS ADVISED THAT ALL INVOLVED PARTIES REVIEW SECTION 8771 AND SECTION 8725 OF THE CALIFORNIA BUSINESS AND PROFESSIONS CODE, AND SECTION 605 OF THE CALIFORNIA PENAL CODE REGARDING REFERENCING, PRESERVING, AND RECONSTRUCTING MONUMENTS, WHETHER OR NOT MONUMENTS ARE SHOWN IN PLANS.

ARCHEOLOGICAL FINDINGS

IN THE EVENT OF THE ACCIDENTAL DISCOVERY OR RECOGNITION OF ANY HUMAN REMAINS OR ITEMS OF CULTURAL SIGNIFICANCE, ALL CONSTRUCTION ACTIVITIES WITHIN ONE HUNDRED FEET (100') MUST STOP IMMEDIATELY. IMMEDIATELY CONTACT OWNER AND ENGINEER REGARDING FINDINGS. NO CONSTRUCTION ACTIVITIES SHALL COMMENCE UNTIL APPROPRIATE PARTIES HAVE PROVIDED CLEARANCE.

ABBREVIATIONS

±	PLUS OR MINUS	N.T.S.	NOT TO SCALE
AB	AGGREGATE BASE	P.C.C.	PORTLAND CEMENT CONCRETE
AC	ASPHALT CONCRETE	PCC	POINT OF COMPOUND CURVE
ADA	AMERICANS WITH DISABILITY ACT	℄	PROPERTY LINE
BC	BEGINNING OF CURVE	PP	POWER POLE
BDRY	BOUNDARY	PRC	POINT OF REVERSE CURVE
BM	BENCH MARK	PUE	PUBLIC UTILITY EASEMENT
BO	BLOW-OFF	PVC	POLYVINYL CHLORIDE PIPE
BOC	BACK OF CURB	P or PVMT	PAVEMENT
BVC	BEGIN VERTICAL CURVE	R	RADIUS
BSL	BUILDING SETBACK LINE	RCP	REINFORCED CONCRETE PIPE
BW	BACK OF WALK	RET	RETURN
C&G	CURB AND GUTTER	R/W	RIGHT OF WAY
CB	CATCH BASIN	S/W	SIDEWALK
CO	CLEANOUT	S or SS	SANITARY SEWER
℄	CENTER LINE	SD	STORM DRAIN
C or CONC.	CONCRETE	SHT	SHEET
D	STORM DRAIN	SNS	STREET NAME SIGN
D.I.P.	DUCTILE IRON PIPE	SP	STANDPIPE
EC	END OF CURVE	STA	STATION
ELEV.	ELEVATION	STD	STANDARD
EP	EDGE OF PAVEMENT	TBM	TEMPORARY BENCH MARK
EVC	END VERTICAL CURVE	TC	TOP OF CURB
ESMT	EASEMENT	TEMP	TEMPORARY
EX or EXIST	EXISTING	THRU	THROUGH
FF	FINISH FLOOR	TPE	TREE PLANTING EASEMENT
FH	FIRE HYDRANT	VC	VERTICAL CURVE
F	FLOW LINE	VCP	VITRIFIED CLAY PIPE
FS	FINISHED SURFACE	VERT	VERTICAL
FSS	FINISHED SUBSURFACE	W	WATER
GB	GRADE BREAK	U.N.O.	UNLESS NOTED OTHERWISE
HORIZ	HORIZONTAL	UP	UTILITY POLE
HP	HIGH POINT	TYP.	TYPICAL
INV.	INVERT		
IRR	IRRIGATION		
JP	JOINT POLE		
LF	LINEAL FEET		
MAX	MAXIMUM		
MH	MANHOLE		
MIN	MINIMUM		



A TYPICAL SWALE SECTION

NOT TO SCALE

O'DELL ENGINEERING

REGISTERED PROFESSIONAL ENGINEER KRISTEN SCHEUT No. 75665 CIVIL STATE OF CALIFORNIA

BID SUBMITTAL

NO.	DATE	BY	REVISION MADE
A	2/21/23	KS	ADDENDUM #4

Underground Service Alert
TWO DAYS BEFORE YOU DIG
Call: TOLL FREE 1 (800) 227 - 2600

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GRADING PLAN

PROJECT# 122061
LANDSCAPE IMPROVEMENT PLANS
COMMUNITY PARK-42
BID SUBMITTAL

DR. BY: TF / VC
DATE: 01/12/2023
CH. BY: SK/CK/JN
DATE: 01/12/2023
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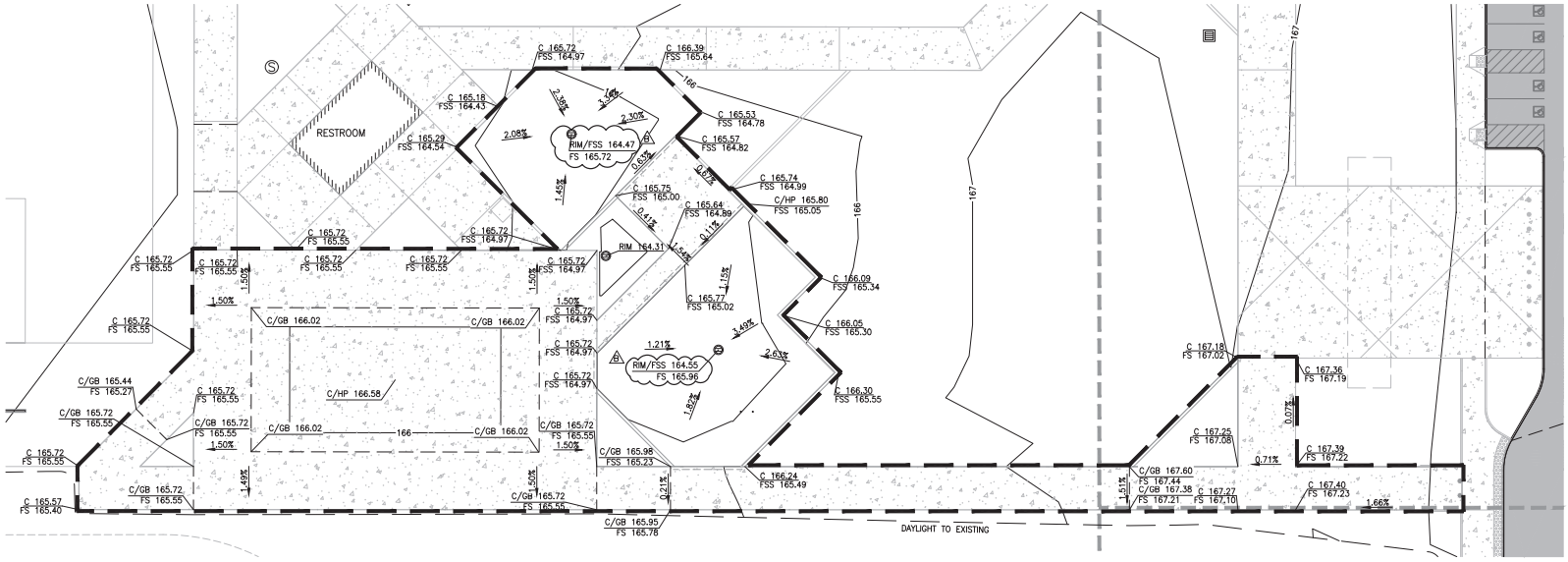
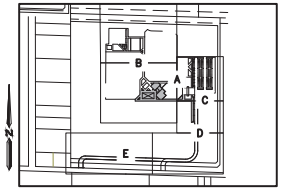
File No. 40320-GP.DWG
Sheet
C1.0





LOCATION MAP

1"=500'

N

SCALE: 1" = 10'

O'DELL ENGINEERING

BID SUBMITTAL

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GRADING PLAN - ADDITIVE ALTERNATE #1

PROJECT# 122061
LANDSCAPE IMPROVEMENT PLANS
COMMUNITY PARK-42
BID SUBMITTAL

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DATE: 01/12/2023
CH. BY: SK/CK/JN
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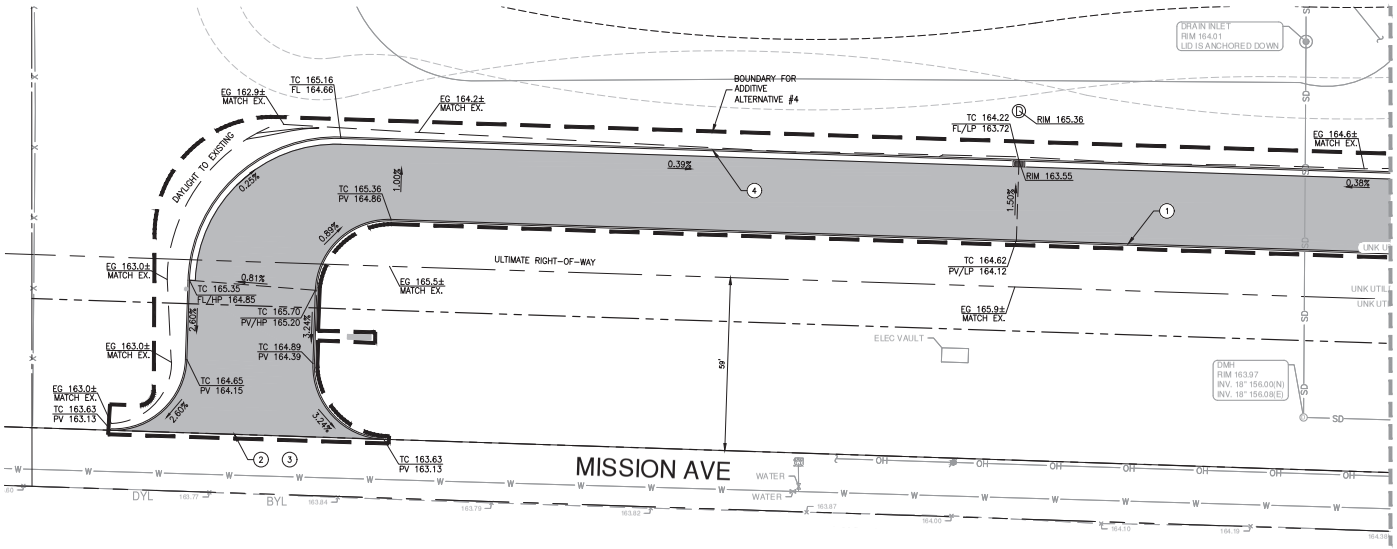

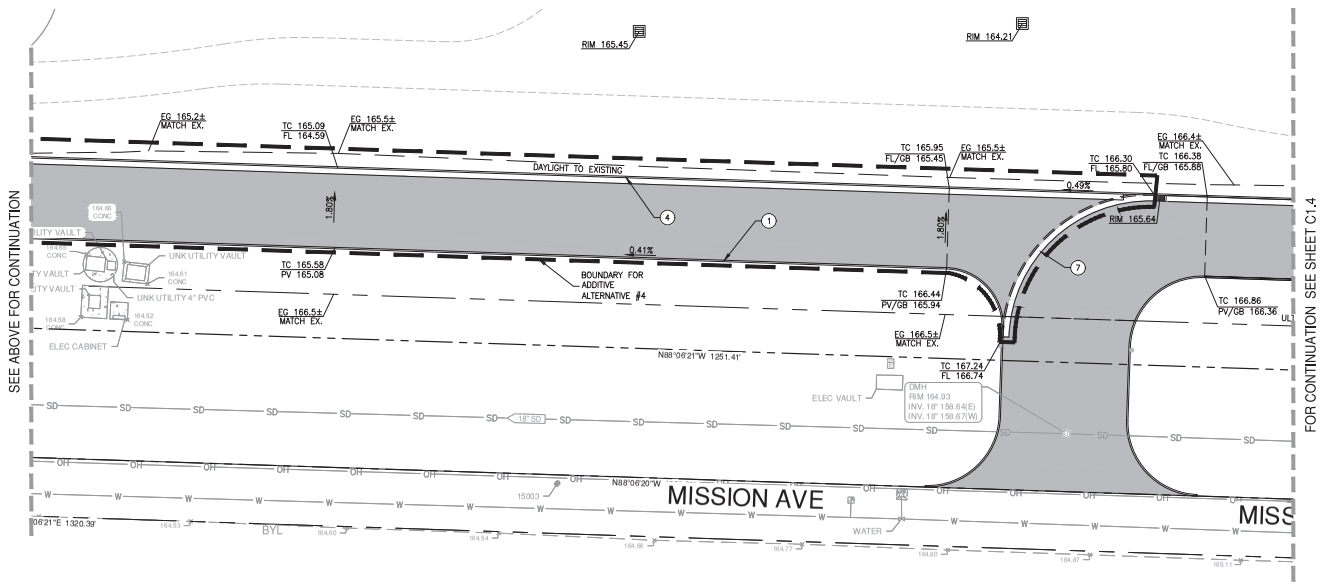

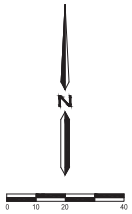

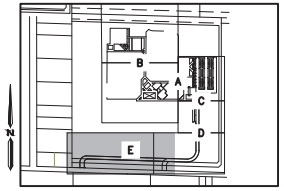

LOCATION MAP

1"=500'

O'DELL ENGINEERING

REGISTERED PROFESSIONAL ENGINEER
KRISTEN SCHEUT
No. 75665
CIVIL
STATE OF CALIFORNIA

BID SUBMITTAL

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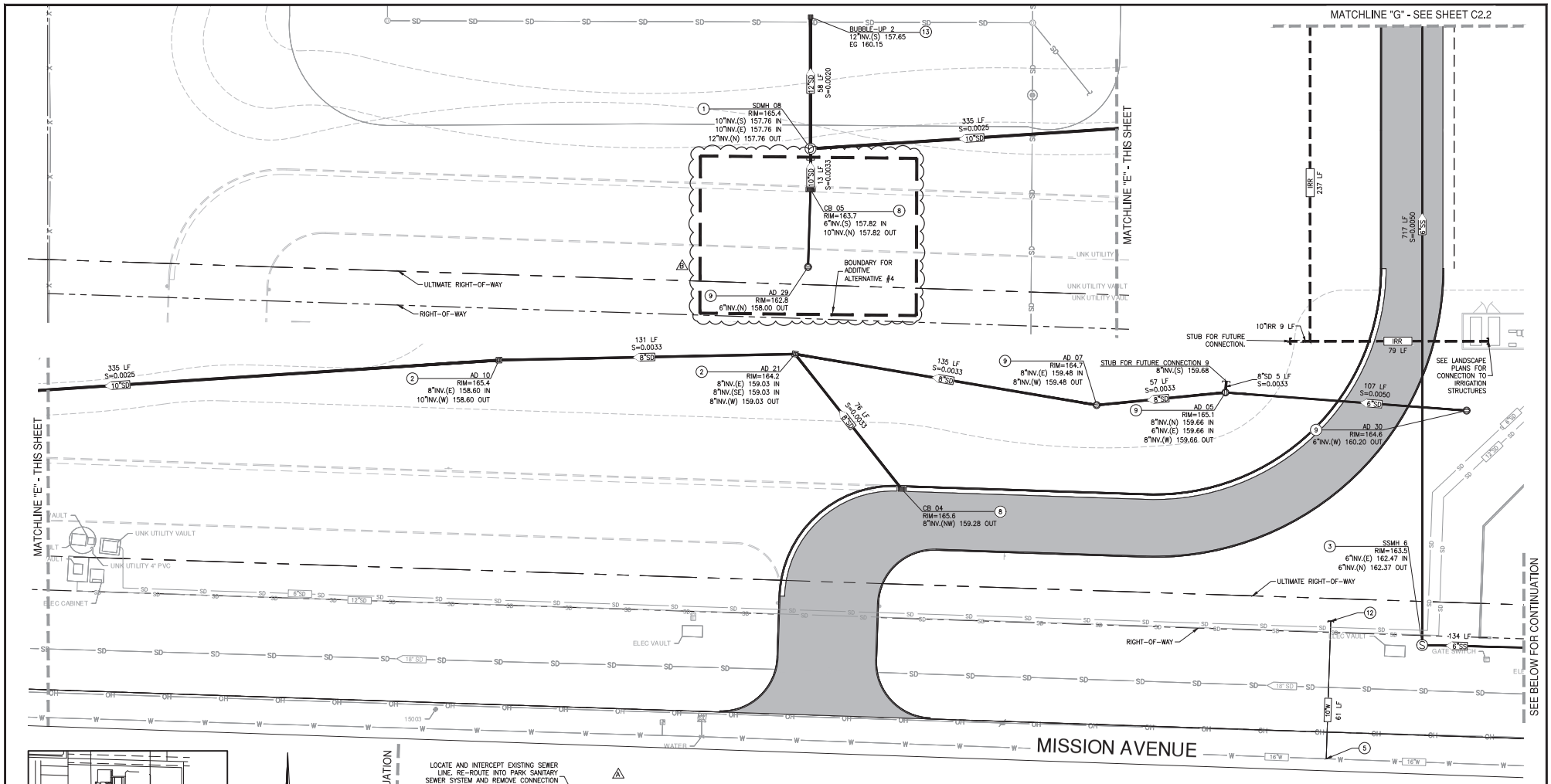

O'DELL ENGINEERING

REGISTERED PROFESSIONAL ENGINEER KRISTEN SCHEUT No. 75665 CIVIL STATE OF CALIFORNIA

BID SUBMITTAL

NO.	DATE	BY	REVISION MADE
2	2/3/23	KS	ADDENDUM #3
3	2/21/23	KS	ADDENDUM #4

Underground Service Alert
TWO DAYS BEFORE YOU DIG
Call: TOLL FREE 1 (800) 227 - 2600

NOTE:
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City of Merced
"Gateway to Yosemite"
ENGINEERING
ENGINEERING PROJECTS AND STANDARDS
678 W. 18th Street (209) 385-6846

UTILITY PLAN

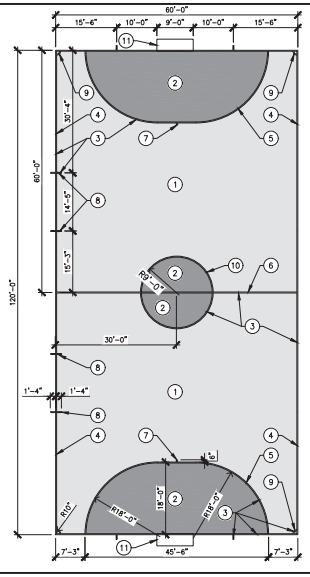
PROJECT# 122061
LANDSCAPE IMPROVEMENT PLANS
COMMUNITY PARK-42
BID SUBMITTAL

DR. BY: TF / VC
DATE: 01/12/2023
CH. BY: SK/CK/JN
DATE: 01/12/2023
SCALE: AS SHOWN

File No. 40320-UP.DWG
Sheet
C2.4
20 of 75

1. PAINTED CONCRETE – BLUE (FIELD)
2. PAINTED CONCRETE – ORANGE (PENALTY ZONE AND CENTER CIRCLE)
3. PAINTED CONCRETE – WHITE (STRIPING)
4. TOUCH/SIDE LINE
5. PENALTY ZONE LINE
6. HALFWAY LINE
7. PENALTY SPOT MARKER
8. SUBSTITUTION ZONE MARKER
9. CORNER
10. CENTER CIRCLE
11. FUTSAL GOAL, SEE SITE FEATURE LEGEND FOR MANUFACTURER AND MODEL

NOTE:
A. ALL STRIPING WIDTH 3" TYP.

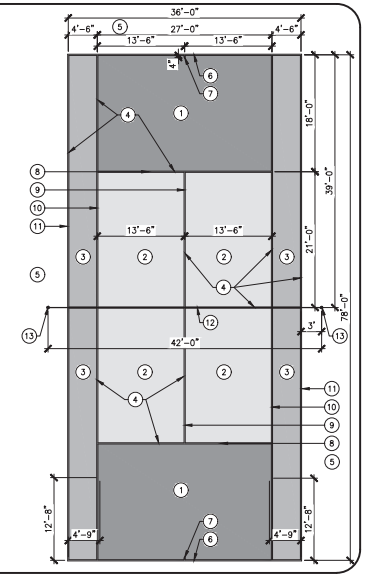


2 FUTSAL COURT LAYOUT PLAN

NOT TO SCALE

1. PAINTED ASPHALT – DARK BLUE ("NO MAN'S LAND" COURT)
2. PAINTED ASPHALT – LIME GREEN (SERVICE COURT)
3. PAINTED ASPHALT – BRIGHT RED (DOUBLE'S ALLEY)
4. PAINTED ASPHALT – WHITE (STRIPING)
5. PAINTED ASPHALT – GREY (AREA SURROUNDING COURT)
6. BASELINE
7. CENTER MARK
8. SERVICE LINE
9. CENTER SERVICE LINE
10. SINGLES SIDELINE
11. DOUBLES SIDELINE
12. TENNIS COURT NET, SEE SITE FEATURE LEGEND FOR MANUFACTURER AND MODEL
13. TENNIS NET POSTS, SEE DETAIL FOR ADDITIONAL INFORMATION

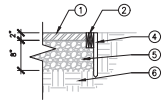
NOTE:
A. ALL STRIPING WIDTH 3" TYP.



1 TENNIS COURT LAYOUT PLAN

NOT TO SCALE

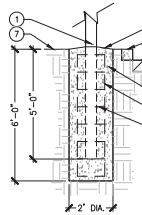
1. ASPHALT CONCRETE COMPACTED TO 95% MIN. RELATIVE COMPACTION.
2. (3) 1/4"X4" REDWOOD BENDER BOARD NAILED TOGETHER. STAGGER JOINTS TO PROVIDE SMOOTH AND CONTINUOUS RADIUS.
3. 1"X2"X12" REDWOOD STAKE AT ENDS AND AT @ 2' O.C.
4. AGGREGATE BASE COURSE. COMPACT TO 95% RELATIVE COMPACTION.
5. PROCESS AND PREPARE SUBGRADE TO 95% RELATIVE COMPACTION



4 ASPHALT PAVING BENDER BOARD HEADER

NOT TO SCALE

1. TUBULAR STEEL GATE POST, SEE TUBULAR STEEL VEHICULAR GATE DETAIL FOR ADDITIONAL INFORMATION.
2. (8) #4 HORIZONTAL REBAR, EQUALLY SPACED ON VERTICAL REBAR, WIRE TIE ALL CONNECTIONS. MAINTAIN 3" CLEAR OF EDGE OF FOOTING.
3. (8) #5 VERTICAL REBAR, EQUALLY SPACED AROUND FOOTING, WIRE TIE ALL CONNECTIONS. MAINTAIN 3" CLEAR OF EDGE OF FOOTING.
4. CONCRETE FOOTING, DIMENSIONS AND REINFORCEMENT PROVIDED FOR REFERENCE PURPOSES. FOOTING SIZE AND REINFORCEMENT TO BE DETERMINED BY STRUCTURAL ENGINEER.
5. VERTICAL CONCRETE CURB, SEE SITE FEATURES AND FINISHES PLAN FOR LOCATION.
6. ASPHALT DRIVE AISLE, SEE SITE FEATURES AND FINISHES PLAN.
7. FINISH GRADE OF LANDSCAPE PLANTER, SEE SITE FEATURES AND FINISHES PLAN.
8. TOP OF FOOTING TO SLOPE AWAY FROM POST FOR DRAINAGE.



NOTES:
A. DEFERRED SUBMITTAL: THIS DETAIL IS NOT PROVIDED FOR CONSTRUCTION PURPOSES, IT IS SHOWN FOR DESIGN INTENT PURPOSES ONLY. CONTRACTOR SHALL PROVIDE STRUCTURAL ENGINEERING FOR FOOTINGS.
B. SUBMIT SHOP DRAWINGS FOR APPROVAL.

5 TUBULAR STEEL GATE POST FOOTING

NOT TO SCALE

1. 3" SQ. x 3/16" WALL TUBULAR STEEL GATE FRAME, WELD ALL JOINTS AND GRIND SMOOTH.
2. 1-1/2" SQ. x 3/16" WALL TUBULAR STEEL BRACING, WELD ALL JOINTS AND GRIND SMOOTH.
3. 6" SQ. x 3/16" WALL TUBULAR STEEL POST, EMBEDDED INTO FOOTING, SEE TUBULAR STEEL GATE POST FOOTING FOR ADDITIONAL INFORMATION.
4. FLAT POST CAP, WELD TO TOP OF POST
5. HEAVY DUTY GATE HINGES, MIN. 400 POUND WEIGHT RATING PER HINGE. WELD TO POST AND GATE FRAME
6. LOCKING MECHANISM, SEE VEHICULAR GATE LOCKING MECHANISM DETAIL.
7. CONCRETE FOOTING, SEE TUBULAR STEEL GATE POST FOOTING FOR ADDITIONAL INFORMATION.
8. VERTICAL CONCRETE CURB, SEE SITE FEATURES AND FINISHES PLAN FOR LOCATION.
9. ASPHALT DRIVE AISLE, SEE SITE FEATURES AND FINISHES PLAN.
10. FINISH GRADE OF LANDSCAPE PLANTER, SEE SITE FEATURES AND FINISHES PLAN.
11. FIRE KEY 'KNOX BOX' TO MEET CITY OF MERCED FIRE DEPARTMENT STANDARDS, MOUNTED TO HINGE POST.

NOTES:
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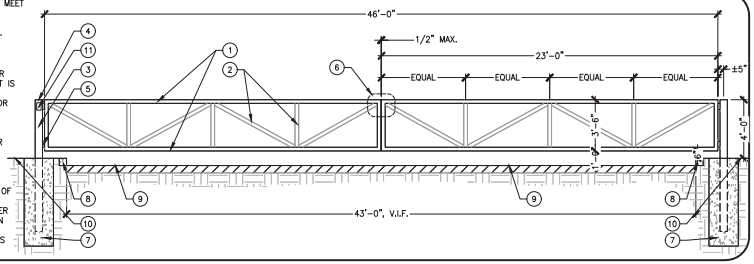
B. SUBMIT SHOP DRAWINGS FOR APPROVAL.
C. ALL GATE PARTS TO BE TUBULAR STEEL.
D. GRIND SMOOTH ALL WELDS.
E. PRIME AND APPLY 2 COATS OF BLACK POWDERCOAT.
F. ALL POWDERCOAT AND PRIMER SHALL BE APPLIED TO CLEAN SURFACES IN 5 MIL. COATS.
G. FIELD VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.



3 TUBULAR STEEL VEHICULAR GATES

NOT TO SCALE

O'DELL ENGINEERING

LICENSED LANDSCAPE ARCHITECT — STATE OF CALIFORNIA

BID SUBMITTAL

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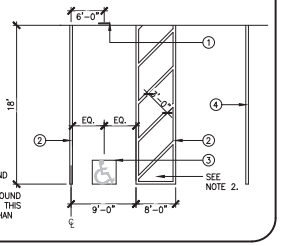
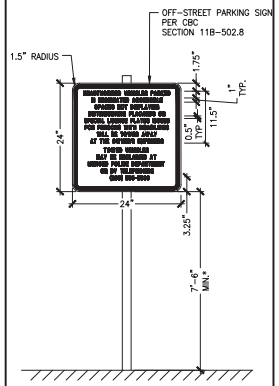
1. ACCESSIBILITY PARKING STALL SIGN
2. TRAFFIC LINE BLUE 4" WIDE STRIPPING
3. 36" SQUARE PAVEMENT SYMBOL. WHITE ON BLUE BACKGROUND HANDICAP SYMBOL PER CBC SEC. 11B-502.6
4. TRAFFIC LINE WHITE 4" WIDE STRIPPING



NOTE:
1. 1.5% MAX. SLOPE IN ANY DIRECTION @ PARKING SPACE AND ACCESS AISLE
2. THE WORDS "NO PARKING" SHALL BE PAINTED ON THE GROUND WITHIN FIVE FOOT LOADING AND UNLOADING ACCESS AISLE. THIS NOTICE SHALL BE PAINTED IN WHITE LETTERS NOT LESS THAN 12 INCHES HIGH AND LOCATED SO THAT IT IS VISIBLE TO TRAFFIC ENFORCEMENT OFFICIALS. (CBC 11B-502.3.3)

8 ACCESSIBLE PARKING STALL

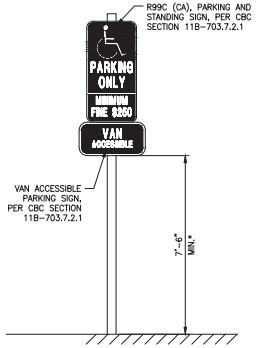
NOT TO SCALE



*MINIMUM HEIGHT TO BE MEASURED TO THE BOTTOM EDGE OF THE LOWEST SIGN ON THE POLE

6 TOW AWAY PARKING SIGN

NOT TO SCALE

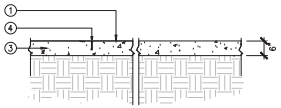


*MINIMUM HEIGHT TO BE MEASURED TO THE BOTTOM EDGE OF THE LOWEST SIGN ON THE POLE

5 VAN ACCESSIBLE PARKING SIGN

NOT TO SCALE

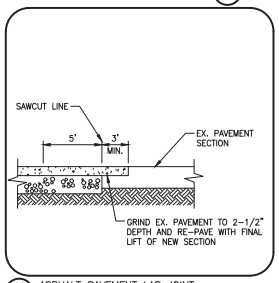
1. FINISH SURFACE OF CONCRETE
2. SEE SITE FEATURES SCHEDULE AND PLANS FOR CONCRETE COLOR & FINISH
3. 6" CONCRETE PAVING. PORTLAND CEMENT CONCRETE, 4,000 PSI 6" SLACK, 1" ROCK
4. EXPANSION JOINT. SEE DETAIL 1 ON SHEET L5.0.



*WHERE CONCRETE IS NOT ABUTTED BY HARDSCAPE, INSTALL 10 ML POLYOLEFIN TO A DEPTH OF 18 INCHES BELOW BOTTOM OF CONCRETE AND 12 INCEHS UNDER CONCRETE.

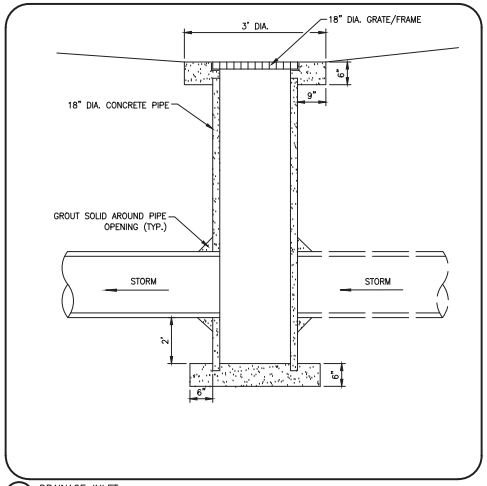
1 6" CONCRETE SIDEWALK

NOT TO SCALE



10 ASPHALT PAVEMENT LAP JOINT

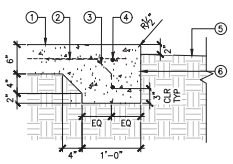
NOT TO SCALE



9 DRAINAGE INLET

NOT TO SCALE

1. CONCRETE PAVEMENT
2. WELDED WIRE MESH CENTERED IN CONCRETE, HOLD 3" CLEAR OF EDGE
3. #4 REBAR @ 24" O.C. (EXTEND INTO SLAB 12" MIN, BEND AND EXTEND TO 3" CLEAR FROM BOTTOM OF DEEPENED CURB)
4. 2-#4 REBAR, WITH MIN. OF 3" CLR. TYP.
5. ADJACENT FINISH GRADE (SOIL)
6. DEEPENED CURB WHERE SHOWN ON PLANS



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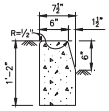
2 CONCRETE PAVEMENT WITH DEEPENED EDGE

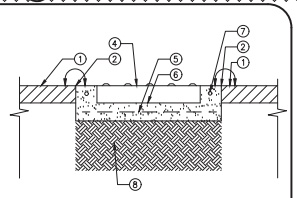
NOT TO SCALE



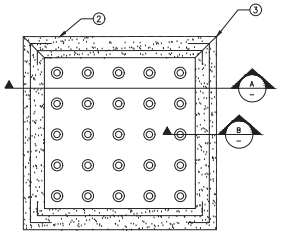
11 TYPE A1-6 CURB

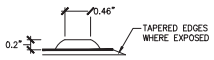
NOT TO SCALE

1. SURFACE PER PLAN
2. SAWCUT LINE
3. EXPANSION JOINT (TYP.)
4. CAST IN PLACE TRUNCATED DOME TILE INSTALLED PER MANUFACTURER RECOMMENDATIONS
5. 10X10 W.W.F OR #4 BARS AT 12" O.C. (BOTH WAYS)
6. 4" PCC
7. #4 E.W. TYP. (SEE PLAN VIEW)
8. PROCESS AND PREPARE SUBGRADE. COMPACT UPPER 12" PER GEOTECHNICAL RECOMMENDATIONS.



SECTION A





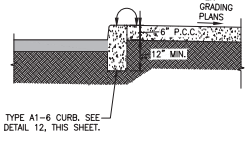
SECTION B

DIMENSION PER CBC GUIDELINES

NOTES:
12" X 12" SQUARE SHOWN FOR REFERENCE.
REFER TO PLANS FOR EXTENT OF USE.
DIMENSIONS PER TITLE 24 OF THE CALIFORNIA BUILDING CODE.

7 CAST IN PLACE TRUNCATED DOMES

NOT TO SCALE

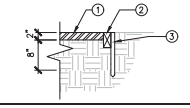


4 PARKING LOT PAVING

NOT TO SCALE

1. ASPHALT CONCRETE COMPACTED TO 91%-97% MIN. RELATIVE COMPACTION.
2. REDWOOD 2"X4" HEADER BOARD
3. 1"X2"X12" REDWOOD STAKE AT ENDS AND AT @ 2' O.C.

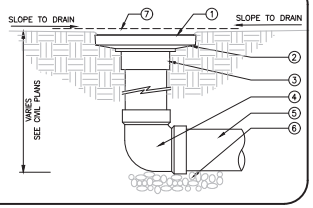
*WHERE CONCRETE IS NOT ABUTTED BY HARDSCAPE, INSTALL 10 ML POLYOLEFIN TO A DEPTH OF 18 INCHES BELOW BOTTOM OF CONCRETE AND 12 INCEHS UNDER CONCRETE.



3 ASPHALT PAVING HEADER BOARD

NOT TO SCALE

1. NDS POLYETHYLENE WITH U.V. INHIBITOR/ CAST IRON/GALVANIZED STEEL SQUARE GRATE
2. NDS 9", 12", 18" LOW PROFILE ADAPTER
3. NDS UNIVERSAL OUTLET
4. DRAIN ELBOW
5. DRAIN PIPE
6. CRUSHED STONE
7. WHERE RIM IS AT FINISH SUBGRADE SURFACE AND NOT AT FINISH SURFACE PROVIDE 8 OZ/SQ. YARD NON WOVEN GEO-TEXTILE FABRIC TO EXTEND AT LEAST 18" BEYOND DRAIN INLET GRATE.



12 NDS SQUARE GRATE WITH ADAPTER

NOT TO SCALE

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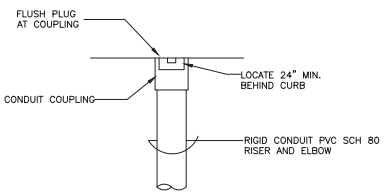

1 FUTURE EV CHARGER AT WALKWAY
SCALE: N.T.S.

B

LIGHTING FIXTURE SCHEDULE

SYMBOL	LABEL		MANUFACTURER	CATALOG NUMBER	NUMBER LAMPS	LUMENS PER LAMP	WATTAGE
	A		STERNBERG	FIXTURE: A882R "AUBURN" LAMP:VEGA #D4A-30-G-40K-T3M (30W 5100lm) POLE: "BIRMINGHAM" 7716-T	1	4112	39.6
	B		Leotek Electronics USA LLC	FIXTURE: AR13-48N-MV-NW-2-BK-100-MSL7 PTF1 POLE: AMERON "N" SERIES, 26' POLE, 11GA. W/TENON ADAPTER	1	10863	73
	C		Leotek Electronics USA LLC	FIXTURE: AR13-48N-MV-NW-4-BK-100-MSL7 PTF1 POLE: AMERON "N" SERIES, 26' POLE, 11GA. W/TENON ADAPTER	1	11023	73
	D		Leotek Electronics USA LLC	FIXTURE: (4X) AR13-48N-MV-NW-4-BK-100-MSL7 PTF4 POLE: AMERON "N" SERIES, 26' POLE, 11GA. W/TENON ADAPTER	1	11023	292
	F		KENALL	#MLHA12-48-F-LG-CP-45L40K -DCC-1-120-MS	1	5,300	45

ELECTRICAL VAULT SCHEDULE

LOCATION	POWER	COMM.
EV1	2X3	2X3
EV2	3X5	2X3
EV3	3X5	2X3
EV4	2X3	2X3
EV5	2X3	2X3
EV6	2X3	2X3
EV7	2X3	2X3
EV8	2X3	2X3
EV9	N48	N36
EV10	N16	N16

B

NOTE:
CONDUITS TYPES "H", "HL", & "L" TERMINATE IN POWER
CONDUITS TYPE "C" TERMINATE IN COMM.

CONDUIT & CABLE SCHEDULE

CONDUIT ID#	FROM	TO	CONDUIT QNTY	CONDUIT SIZE	CONDUIT TYPE	CONDUCTOR QNTY	CONDUCTOR SIZE	CONDUCTOR GND	CABLE QNTY	CABLE TYPE	NOTES
P 001	(E) MID VAULT	(N) MID XFMER PAD	1	4"	PVC 40				1	PULL ROPE	
H 001	(N) MID XFMER PAD	(N) MSB	2	4"	PVC 40	4	500MCM				
H 002	(N) MSB	(N) PANEL "HL1"	1	2"	RMC	4	#3/0	#6			[2]
H 003	(N) MSB	(N) XFMER "TX-LS"	1	1"	PVC 40	3	#6	#8			
H 004	(N) MSB	(N) XFMER "TX-LC"	1	3"	PVC 40	3	#3/0	#6			
H 005	(N) MSB	(N) XFMER "TX-LR"	1	2"	PVC 40	3	#1	#6			
H 006	(N) MSB	EV9/(F) EVC DISTRIB	1	3"	PVC 40				1	PULL ROPE	VIA EV2-EV3-EV4-EV5
H 007	(N) MSB	(N) IRRIG PUMP #1	1	1"	PVC 40	3	#4	#8			
H 008	(N) MSB	(F) IRRIG PUMP #2	1		PVC 40				1	PULL ROPE	[4]
H 009	(N) MSB	(F) PANEL "HL2"	1	2"	RMC				1	PULL ROPE	[4]
HL 001	(N) GUTTER	EV4/(F) FIELD #1 LTG	1	3"	RMC				1	PULL ROPE	[2] VIA EV2-EV3
HL 002	(N) GUTTER	EV5/(F) FIELD #2 LTG	1	3"	RMC				1	PULL ROPE	[2] VIA EV2-EV3-EV4
HL 003	(N) GUTTER	EV8/(F) FIELD #3 LTG	1	3"	RMC				1	PULL ROPE	[2] VIA EV2-EV3
HL 004	(N) GUTTER	EV2/(F) FIELD #4 LTG	1	2"	RMC				1	PULL ROPE	[2]
HL 005	(N) GUTTER	EV2/(F) FIELD #5 LTG	1	2"	RMC				1	PULL ROPE	[2]
HL 006	(F) FIELD #2 POLE	EV5									
HL 007	(F) FIELD #3 POLE	EV8									
HL 010	(N) PED POLE	(N) PED POLE/EV#	1	1"	PVC 40	2	#4	#8			PATHWAY CIRCUIT
HL 010 A	(N) PED POLE	STUB	1	1"	PVC 40						STUB& CAP 24" FROM FOOTING
HL 011 A	(N) PANEL "HL1"	EV2	1	2"	PVC 40	4	#4	#8			CKTS. HL1-1,2,3
HL 011 B	EV2	EV3	1	2"	PVC 40	6	#4	#8			CKTS. HL1-1,3
HL 012	(N) GUTTER	EV1	2	2"	RMC				1	PULL ROPE	[1][2]
L 001	(N) XFMER "TX-LS"	(N) PANEL "LS"	1	1 1/2"	LFMC	4	#2	#8			
L 002	(N) XFMER "TX-LC"	(N) PANEL "LC"	1	2 1/2"	LFMC	4	#3/0	#6			[3]
L 003	(N) XFMER "TX-LR"	(N) PANEL "LR"	1	1 1/2"	LFMC	4	#2	#8			[3]
L 004	(N) PANEL "LS"	IRRIG. CONTROLLER	1	3/4"	RMC	2	#12	#12			[2]
L 005	(N) PANEL "LS"	EV1	2	1 1/2"	RMC				1	PULL ROPE	[1][2]
L 020	(F) EV CHARGER	EV9/(F) EVC DISTRIB	1	1 1/2"	PVC 40				1	PULL ROPE	TERMINATE IN FIELD PER 1/E1.0
L 030 A	(N) PANEL "LC"	EV5	1	2"	PVC 40	8 2	#6 #10	#10			RECP CKTS (X4) LTG CKT
L 030 B	EV5	PICNIC SHELTER	1	1 1/4"	PVC 40	4 2	#6 #10	#10			RECP CKT (X2) LTG CKT
L 030 C	EV5	PICNIC SHELTER	1	1 1/4"	PVC 40	4	#6	#10			RECP CKT (X2)
L 031	(N) PANEL "LC"	EV5	2	2"	PVC 40				1	PULL ROPE	
L 032	EV5	EV10	1	2"	PVC 40				1	PULL ROPE	VIA EV8
L 040 A	(N) PANEL "LR"	EV7	1	2"	PVC 40	2 2	#6 #10	#10			RECP CKT LTG CKT
L 040 B	EV7	PICNIC SHELTER	1	1"	PVC 40	2 2	#6 #10	#10			RECP CKT LTG CKT
L 041	(N) PANEL "LR"	EV7	2	2"	PVC 40				1	PULL ROPE	
C 001	EV1	EV2	2	2"	PVC 40				1	PULL ROPE	[1]
C 002	EV2	EV3	2	2"	PVC 40				1	PULL ROPE	[1]
C 003	EV3	EV9	2	2"	PVC 40				1	PULL ROPE	[1]
C 004	EV3	EV4	2	2"	PVC 40				1	PULL ROPE	[1]
C 005	EV3	EV8	2	2"	PVC 40				1	PULL ROPE	[1]
C 006	EV4	EV5	2	2"	PVC 40				1	PULL ROPE	[1]
C 007	EV5	EV8	2	2"	PVC 40				1	PULL ROPE	[1]
C 008	EV8	EV10	2	2"	PVC 40				1	PULL ROPE	[1]
C 009	EV5	EV9	2	2"	PVC 40				1	PULL ROPE	[1]
C 010	(F) FIELD #2 POLE	EV5	1	1 1/2"	PVC 40				1	PULL ROPE	
C 011	(F) FIELD #3 POLE	EV8	1	1 1/2"	PVC 40				1	PULL ROPE	
C 012	EV6	EV7	2	2"	PVC 40				1	PULL ROPE	[1]
C 013	EV5	CONCESSION BLDG	2	2"	PVC 40				1	PULL ROPE	[1] STUB & CAP +6"AFF
C 014	EV7	RESTROOM BLDG	2	2"	PVC 40				1	PULL ROPE	[1] STUB & CAP +6"AFF
XH 001	(N) MSB	EV2	2	2"	PVC 40				1	PULL ROPE	[1] VIA EV1
XH 002	EV2	EV3	2	2"	PVC 40				1	PULL ROPE	[1]
XH 003	EV3	EV9	2	2"	PVC 40				1	PULL ROPE	[1]
XH 004	EV3	EV4	2	2"	PVC 40				1	PULL ROPE	[1]
XH 005	EV3	EV8	2	2"	PVC 40				1	PULL ROPE	[1]
XH 006	EV8	EV10	2	2"	PVC 40				1	PULL ROPE	[1]
XH 007	EV4	EV5	2	2"	PVC 40				1	PULL ROPE	[1]
XH 008	EV5	EV8	2	2"	PVC 40				1	PULL ROPE	[1]
XH 009	EV5	EV6	2	2"	PVC 40				1	PULL ROPE	[1]
XH 010	EV6	EV7	2	2"	PVC 40				1	PULL ROPE	[1]

NOTES:
[1] = PROVIDE CONDUCTOR/CABLES IN ALL CONDUITS
[2] = RACEWAY BELOW GRADE & NOT EXPOSED MAY BE PVC SCH 40
[3] = PROVIDE FLEXIBLE LFMC CONNECTION AT TRANSFORMER
[4] = CAP CONDUIT @ +6"AFG

PEZZONI ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
1150 3RD Street Suite #1475 Modesto, CA 95354
PHONE: 209. 556. 6602
HTTP://WWW.PEZZONI.COM

REGISTERED PROFESSIONAL ENGINEER
KEVIN L. PEZZONI
NO. 16269
EXP. 12/24
ELECTRICAL

NO.	DATE	BY	REVISION MADE
A	2/3/23	CCM	ADDENDUM #3 REVISIONS
B	2/22/23	KLP	ADDENDUM #4 REVISIONS

Underground Service Alert
TWO DAYS BEFORE YOU DIG
Call : TOLL FREE 1 (800) 227 - 2600

NOTE:
ALL REFERENCES AND WRITTEN DIMENSIONS SHALL TAKE PREFERENCE OVER SCALED DIMENSIONS AND SHALL BE VERIFIED ON THE SITE. ANY DISCREPANCY SHALL BE BROUGHT TO NOTICE OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF ANY WORK.

City of Merced
"Gateway to Yosemite"
ENGINEERING
ENGINEERING PROJECTS AND STANDARDS
678 W. 18th Street (209) 385-6846

CONDUIT AND LIGHITNG SCHEDULES

PROJECT# 40320
LANDSCAPE IMPROVEMENT PLANS
COMMUNITY PARK-42
BID SET

DR. BY: KP
DATE: 01/12/2023
CH. BY: KP
DATE: 01/12/2023
SCALE: AS SHOWN

File No. –
Sheet
E1.0