20120 E. Mainstreet
Parker, CO 80138
Voice 303-840-95

CONTRACT DOCUMENTS

AND

CONSTRUCTION SPECIFICATIONS

FOR

PUBLIC WORKS OPERATION CENTER DECANT FACILITY EXPANSION

PROJECT NUMBER CIP 25-025

NOTICE TO BIDDERS

Separate sealed bids for the **CIP25-025 – Public Works Operation Center Decant Facility Expansion** as described in the CONTRACT DOCUMENTS, will be received by electronic bid through Rocky Mountain E-Purchasing System until **10:00 AM** local time, **November 10, 2026,** and then publicly opened and read aloud via an online Zoom conference. The Zoom conference information will be added to BidNet via a Communication prior to the bid date.

Electronic construction plans, specifications and forms for preparing bids may be obtained on Rocky Mountain E-Purchasing System on or after 9:00 a.m. on **October 13, 2026**.

All bids must be accompanied by a Bid Bond in an amount of at least five percent (5%) of the Bid. The vendors can upload their bid bond when responding online. The bond will be retained by the Town as liquidated damages if the successful bidder refuses or fails to enter into a Contract and Performance, Payment and Maintenance bond in accordance with his bid when notified of the award.

The Town shall issue a written addendum if substantial changes which impact the technical submission of Bids are required. Addenda will be posted on the Rocky Mountain E-Purchasing System. Plan Holders are responsible for either revisiting website prior to the due date to ensure that they have any addenda which may have been issued after the initial download.

The Plan Holder shall certify its acknowledgment of the addendum by signing the addendum and returning it with its Bid. In the event of conflict with the original contract documents, addenda shall govern all other contract documents to the extent specified. Subsequent addenda shall govern over prior addenda only to the extent specified.

The extent of the work is approximately as follows:

This work consists of the expansion of an existing decant facility, including subgrade preparation, cast-in-place concrete, drilled pier foundations, structural steel erection, metal roofing, and minor electrical work.

Bids may not be withdrawn for a period of forty-five (45) days after the time fixed for closing them. The Owner reserves the right to waive irregularities, to waive technical defects accordingly as the best interest of the Town may be served, may reject any and all bids, and shall award the contract to the lowest responsible bidder as determined by the Owner.

All bidders questions and inquiries shall be directed to the Town of Parker's Project Manager, **Alex Mestdagh, amestdagh@parkerco.gov, 303-805-3204. The question deadline is October 29, 2026 at 5:00 PM.**

Tom Williams, PE, Director of Engineering/Public Works

This Notice to Bidders is not valid without the above signature.

NOTICE TO NONRESIDENT BIDDERS

The purpose of this notice is to comply with C.R.S. § 8-19-104(3). If a nonresident bidder is from a state that provides a bidding preference to bidders from that state, then a comparable percentage disadvantage will be applied to the bid of that nonresident bidder. Nonresident bidders may obtain additional information from the Web site for the Colorado Department of Labor and Employment.

TOWN OF PARKER CONTRACTOR AGREEMENT COVER SHEET

Contractor Information

Contractor Name	Click or tap here to enter text.
Entity Type (corporation, LLC, etc.)	Click or tap here to enter text.
Contact Person	Click or tap here to enter text.
Address (City/State/Zip)	Click or tap here to enter text.
Phone	Click or tap here to enter text.
Email	Click or tap here to enter text.

Project Information

Solicitation No.	CIP25-025
Solicitation Date	November 10, 2026
Brief Description of the Work	**This work consists of the expansion of an existing decant facility, including subgrade preparation, cast-in-place concrete, drilled pier foundations, structural steel erection, metal roofing, and minor electrical work.**
Completion Date	August 27, 2027

Financial Information

Contract Price	Click or tap here to enter text.
Liquidated Damages (if applicable)	$100 Per Day
Bonds Required	☒Yes ☐No

Authorized Representatives (if known)

Town Representative	Alex Mestdagh, Engineering Services Manager
Contractor Representative	Click or tap here to enter text.

CONTRACTOR AGREEMENT

CIP NO. 25-025

THIS CONTRACTOR AGREEMENT (this "Contract") is made this _____, by and between the Town of Parker, Colorado, a Colorado home rule municipality (the "Town") and the entity specified on the Cover Sheet (the "Contractor").

RECITALS

A. The Town distributed a Request for Bids, as described on the Cover Sheet for the work described in the Bid Package (the "Project"). The bid documents and all addenda and attachments, including all plans and specifications shall be collectively referred to as the "Bid Package."

B. The Contractor submitted the bid determined to be the most responsive and advantageous to the Town and the Contractor is capable and willing to perform the work in accordance with the terms and conditions of this Contract.

AGREEMENT

NOW, THEREFORE, for and in consideration of the mutual covenants, agreements, conditions and undertakings hereinafter specified, the Town and Contractor agree as follows:

1. **CONTRACT DOCUMENTS**. "Contract Documents," which comprise the entire agreement between the Town and Contractor, consist of the items indicated below:

   ☒ This Contract;

   ☐ The Cover Sheet;

   ☒ The Bid Package;

   ☐ The Contractor's Bid Sheet dated _____;

   ☐ The Contractor's Proposal dated _____;

   ☒ The Construction Plans for Project No. CIP25-025;

   ☒ The Special Provisions and Specifications for Project No. CIP25-025;

   ☒ Colorado Department of Transportation Standard Specifications for Road and Bridge Construction, most recent version;

   ☒ Colorado Department of Transportation Standard Plans, most recent version;

   ☒ Town of Parker Roadway Design and Construction Criteria, most recent version;

   ☒ Town of Parker Storm Drainage and Environmental Criteria, most recent version;

☒ The Notice of Award;

☒ The Notice to Proceed;

☒ The Advertisement and Final Acceptance Form, attached hereto as **Exhibit A**;

☒ Bonds issued pursuant to this Contract, including the bid bond and performance and payment bond in the form provided in **Exhibit B**;

☒ The Town's insurance requirements, attached hereto as **Exhibit C**;

☒ General conditions, special conditions, general specifications, special specifications, measurement, payment, and technical specifications and drawings;

☒ Any modifications, Change Orders, or other such revisions properly authorized after the execution of this Contract.

The Contract Documents are incorporated by reference as though set forth in full herein, whether or not attached hereto, and shall form an integral part of this Contract. Any terms and conditions included in documents provided by the Contractor, including any proposal, bid, or otherwise, are expressly rejected by the parties and shall not form a part of this Contract.

2. **REVIEW AND INTERPRETATION**.

(a) Conflicts Within the Contract Documents. If there is any conflict between this Contract and the other Contract Documents, this Contract shall control. In case of conflict between the drawings and any specifications, the drawings will govern. In case of conflict between the special conditions and the specifications, the special conditions shall govern. Figure dimension on drawings will govern over scale dimensions, and detailed drawings will govern over general drawings. In the case of a conflict between the special conditions and the drawings, the special conditions shall govern. Notwithstanding the foregoing, a document which is more restrictive or requires greater responsibility or increased compliance by the Contractor shall govern.

(b) Discrepancies. The Contractor shall carefully study and compare the Contract Documents and shall at once report to the Town any error, inconsistency, or omission that may be discovered and shall obtain specific written instructions from the Town to resolve such discrepancies in the Contract Documents before proceeding with the Work. Work done by the Contractor after its discovery of such discrepancies, inconsistencies, or ambiguities without resolution by the Town shall be done at the Contractor's risk. The Contractor shall perform no portion of the Work at any time without Contract Documents or, where required, approved drawings, specifications, instructions, shop drawings, product data, or samples for such portion of the Work.

(c) Variance with the Law. If the Contractor or any of its subcontractors of any tier observes that any of the Contract Documents are at variance with applicable laws, statutes, building codes, ordinances, rules, or regulations in any respect, the Contractor shall promptly notify the Town in writing, and any necessary changes shall be accomplished by appropriate

Change Order or other means of resolution. If the Contractor or any of its subcontractors of any tier perform any Work with knowledge or reason to know that it is contrary to applicable laws, statutes, building codes, ordinances, rules, or regulations, and does not notify the Town as required in this Paragraph, the Contractor shall assume full responsibility for such Work and shall bear all costs attributable to such Work.

(d) Implied Materials, Labor and Equipment. If labor, materials, or equipment, although not described by the Contract Documents, are required to successfully complete the Work and can reasonably be inferred by competent contractors by virtue of common knowledge or customary practice in the construction industry from the Contract Documents as being necessary to produce the intended result, the Contractor shall perform that work or provide the materials or equipment as if they were specified at no additional cost.

(e) Verification. The Contractor, before commencing the Work, shall verify all governing dimensions, and shall examine all adjoining work on which its Work is in any way dependent. No disclaimer of responsibility for defective or non-conforming adjoining work will be considered unless written notice of the same has been filed by the Contractor and agreed to in writing by the Town Representative before the Contractor begins any part of the affected Work.

3. **AUTHORIZED REPRESENTATIVES**.

(a) Authorized Representatives. The Town and the Contractor shall each designate in writing an authorized representative within fourteen (14) days of the Town's issuance of the notice to proceed (each, the "Town Representative" and "Contractor Representative"). The Town Representative shall also be the "Project Manager." The Contractor Representative shall have the authority to speak on the Contractor's behalf with respect to the Work and shall be present at the Work site as necessary to assure the Contractor's satisfactory performance. The Contractor Representative shall also be responsible for advising the Town Representative of the status of the Work, for assuring frequent and effective communication with the Town, and attending such meetings as may be required to coordinate with the Town. The Contractor Representative further shall take direction only from the Town Representative or his/her/their designee and to comply promptly and fully with the reasonable requests and directives issued by the Town Representative or their designee from time to time. The Contractor Representative shall be responsible to the Town Representative concerning any changes in the scheduling of the Work and closures of public facilities required to complete the Work. The Town may change its representative at any time by notice to the Contractor. The Contractor shall not replace the Contractor Representative unless: (a) The Town requests a replacement; (b) the Contractor terminates the employment of the Contractor Representative and provides a satisfactory substitute; or (c) the Contractor proposes a satisfactory substitute Contractor Representative, which the Town accepts in writing. In the event the Town Representative is not satisfied with the management, supervision, or other performance of the Contractor Representative, the Town Representative may require that the Contractor designate another individual to serve as the Contractor Representative. The Town must approve a substitute Contractor Representative, and, if no substitute is acceptable, the Town may terminate this Contract.

(b) Deviations from Contract Documents. Failure of the Town's on-site representative to call

to the attention of the Contractor any defective work or deviations from the Contract Documents shall not constitute acceptance of such work by the Town or relieve the Contractor of its obligation to perform the Work in strict accordance with the Contract Documents.

4. **DESCRIPTION OF WORK**.

(a) Scope of Work. Except as otherwise stated in the Contract, Contractor shall furnish all the labor, equipment, materials, power, transportation, temporary construction, and supervision necessary for or incidental to the complete and timely performance of everything described in or reasonably implied from the Contract Documents (the "Work"). The Contractor shall be responsible for the Work, including supervision of the construction, until completion and Final Acceptance. The Contractor warrants that it is fully qualified to perform the Work in accordance with the professional standards of the industry and shall perform the Work in a first-class, workmanlike manner to the satisfaction of the Town and in strict accordance with the provisions of the Contract Documents.

(b) Knowledge of the Work. Before executing this Contract, the Contractor has become fully informed regarding the Work and any materials or equipment required, including the amount or quantity thereof. No adjustment or modification shall be allowed for any misunderstanding of the Work or of equipment or material requirements, or of the provisions contained in the Contract and in the other Contract Documents. The selection of materials and equipment for the Work shall be in accordance with the Contract Documents and the laws of Colorado.

(c) Site Clean-Up.

i. On a daily basis, the Contractor shall maintain the work Site free from accumulation of waste materials or rubbish caused by performance of the Work and shall keep the Site, partially-finished structures, and materials stockpiles in a reasonable state or orderliness and cleanliness. The Contractor shall remove all rubbish, tools, construction equipment, machinery, and surplus material from the work site. If the Contractor fails to maintain the work Site in an appropriate condition, the Town may, after notice to the Contractor, perform any necessary clean-up and charge the clean-up costs to the Contractor.

ii. Upon completion and before Final Acceptance of the Work, the Contractor shall, at its expense, remove from the work site and property of the Town, all machinery, equipment, surplus or unused materials, rubbish, concrete forms and other like material, barricades, signs and temporary structures, and shall leave the premises in a condition which is satisfactory to the Town. In the event of the Contractor's failure to do so, the same may be removed by the Town and the Contractor and its surety or sureties shall be liable for the cost thereof.

(d) Utilities. If utility location is required for the Work, the Contractor shall fully comply with the provisions of Article 1.5 of Title 9 of the Colorado Revised Statutes including, but not limited to, providing notices to the notification association. Unless otherwise provided in the Contract Documents, the Contractor shall be responsible for communicating and

coordinating with all utilities affected by the Work, as necessary. The Contractor shall cooperate with utilities and the Town as provided in the Contract Documents and as required by law. The Contractor shall be responsible for determining the exact location of the utilities that may interfere with construction of the Work by exploratory excavation sufficiently in advance of beginning construction in an area so that potential conflicts may be resolved. Relocation or repair of utilities encountered, even if not shown on the Contract Documents, shall be the responsibility of the Contractor. The Town shall not be responsible to the Contractor for the existence of utilities not shown on the drawings and the Contractor remains obligated under this subparagraph for all hidden utilities. The Contractor will consider in the Contract Price all of the utility appurtenances within the Project; and the Contractor shall not make a claim for delay or additional compensation due to any relocation operations by the utility(ies).

(e) Noise Abatement. At all times through the performance of this Contract, the Contractor shall be familiar with and comply with all local noise ordinances and construction working hours, as provided in Section 6.03.060 of the Town of Parker Municipal Code, in the performance of the Work. The Contractor shall not conduct the Work in excess of the permissible decibel levels provided by local noise ordinances. The Contractor shall provide the Town Representative with prior notice of any Work that may result in such excessive noise levels. The Town shall consider surrounding neighbors and Town customers in determining permissible time and conduct of any Work that may be in excess of local noise ordinances.

(f) Traffic Control. The Contractor shall, at all times, conduct the Work in such a manner as to cause the least inconvenience and greatest protection to the general public. The Contractor shall furnish and maintain all signs, barricades, lights, two-way radios, flaggers, and traffic control personnel as necessary to control traffic and provide for the safety of the public, in accordance with the Colorado Department of Transportation specifications/standards, current edition, the Manual on Uniform Traffic Control Devices, current edition, and the Federal Highway Administration. Additionally, the Contractor shall construct and adequately maintain suitable and safe crossings over trenches and such detours as are necessary to address public and private traffic affected by the Work. The cost of furnishing and maintaining the above facilities shall be incidental to the contract and no extra compensation for it will be allowed.

5. **ACCESS AND REVIEW**.

(a) Access and Inspection. The Town and its representatives will, at all times, have access to the Work and to locations where materials or equipment are being manufactured, stored, or prepared for use under these Contract Documents. The Contractor shall provide proper facilities for access to and inspection of the Work for the purpose of determining compliance with this Contract and the quality of workmanship and material. The Town Representative may order that portions of the Work be uncovered, exposed, or made available for observation, inspection, or testing as more particularly set forth in the Paragraph titled Uncovering of Work. The Contractor shall provide all labor, tools, materials, equipment, and supplies necessary to comply with the request of the Town Representative. If any portion of the Work is determined to be defective, the Contractor shall bear all costs involved to bring the Work into compliance with the Contract

Documents, including without limitation the cost to replace any materials, to re-perform, or to reconstruct as more particularly set forth in the Paragraph titled Correction of Work. The Contractor shall remove from the work Site all work or materials rejected by the Town for failure to comply with the Contract Documents whether incorporated into the Work or not at no additional cost to the Town.

(b) Interpretation. Whenever, in the drawings or Contract Documents, the terms "as ordered," "as directed," or the adjectives "reasonable," "suitable," "acceptable," "proper" or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review or judgment of the Town as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the Work for compliance with the Contract Documents. The use of any such term or adjective shall not be effective to assign to the Town any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility for the Work.

(c) Inspection Hours. The Contractor shall perform the Work during a regular 5-day, 40-hour work week, Monday through Friday.

6. **UNCOVERING OF WORK**. If any portion of the Work should be covered contrary to the request of the Town or contrary to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Town, be uncovered for its observation and shall be replaced at the Contractor's expense.

7. **SURVEYS, PERMITS, AND EASEMENTS**.

(a) Surveys. The Contractor shall furnish all required surveying.

(b) Permits and Licenses. The Contractor shall secure and pay for all necessary permits, fees and licenses in connection with the performance of the Work and shall pay all municipal and other fees in connection therewith, except those expressly provided by the specifications as being the responsibility of the Town or waived by the Town, and shall furnish at its expense any and all bonds and cash or other deposits required by law or required by any lawful body having the right to make demand therefor.

(c) Easements. The Town will provide rights-of-way and easements as shown on the drawings for construction purposes. Any additional land actually needed by the Contractor for the performance of the Work, proper location of its plant and equipment, or the storage of materials and supplies for the Work, shall be furnished by the Contractor.

8. **PROTECTION OF WORK, PROPERTY AND PERSONS**.

(a) Safety Precautions. The Contractor shall be responsible for initiating and maintaining all safety precautions and programs in connection with the Work, including erecting and maintaining all necessary safeguards at the work site. The Town will not be responsible for Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto. The Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to

prevent damage, injury or loss to all employees on the Work who may be affected thereby, all the Work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

(b) Placement of Materials Off-Site. The Contractor shall, at all times, consult with and obtain the approval of the Town for the storage of material, operation of equipment, placing of temporary structures or dispositions of any surplus or waste materials upon property of the Town anywhere outside the limits of construction. The Contractor shall comply with all state, federal and local laws related to the storage or placement of any supplies, equipment, structures, or any other materials.

(c) Emergency Situations. In emergencies affecting the safety of persons, the Work, or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the Town, shall act to prevent threatened damage, injury or loss.

(d) Protection of Property. The Contractor shall be responsible for the preservation of all private and public property along and adjacent to the Work and shall take all necessary precautions to prevent damage or injury thereto. Such preservation and protection shall include, but not be limited to, trees, stone walls, fences, mailboxes, monuments, irrigation ditches, driveways, road access culverts, underground pipelines and structures. Such preservation and protection shall apply to all underground pipelines and utilities whether publicly, privately or individually owned that are in or adjacent to the right-of-way. When direct or indirect damage is done to public or private property by reason of the Contractor's operation on the property, the Contractor shall replace or restore such property to its pre-existing condition to the satisfaction of the Town at the Contractor's sole expense, including costs that are incidental to such restoration work.

9. **CONTRACTOR'S RESPONSIBILITY**.

(a) Employees. The Contractor shall employ on the Work only such persons who are competent and skilled in their assignments. Any employee who obstructs the progress of the Work through incompetence or other means or conducts themself improperly shall be discharged or removed from the Work when so requested by the Town**.** This section shall not create a duty for the Town to evaluate or assess the competence or skills of the Contractor's employees, contractors, or agents.

(b) Tools. Specialty tools furnished with any equipment used for erection purposes shall be turned over to the Town after completion of the erection in a condition acceptable to the Town. In case of rejection by the Town, the Contractor shall replace the tool or tools at no extra cost to the Town.

10. **TOWN'S RIGHT TO CARRY OUT THE WORK**. If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within three (3) days after receipt of written notice from the Town to commence and continue correction of such default or neglect with diligence and promptness, the Town may, without prejudice to any other remedy it may have, make good such deficiencies. In such case an appropriate Change

Order shall be issued deducting from payments then or thereafter due to Contractor, the cost of correcting such deficiencies, including compensation for any additional services or work made necessary by such default, neglect, or failure. If payments then or thereafter due to Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Town.

11. **CORRECTION OF WORK**.

(a) Correction of Documents. The Contractor shall be responsible for the professional quality, technical accuracy, timely completion, and the coordination of all designs, plans, reports, drawings, and any other services rendered by the Contractor; and shall, without additional compensation, promptly remedy and correct any errors, omissions, or other deficiencies which may occur.

(b) Correction of Defective Work. The Contractor shall promptly correct all Work rejected by the Town as defective or as failing to conform to the Contract Documents observed before Final Acceptance and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected Work, including compensation for the Town's additional services made necessary thereby. This obligation shall survive termination of the Contract. The Town shall give such notice promptly after discovery of the condition.

(c) Removal of Defective Work. The Contractor shall remove from the site all portions of the Work which are defective or non-conforming and which have not been corrected, unless the Town waives removal.

(d) Failure to Correct Defective Work. If the Contractor fails to correct defective or non-conforming Work, the Town may correct it in accordance with the Paragraph titled Town's Right to Carry Out the Work.

(e) Town's Right to Remove and/or Replace Defective Work. If the Contractor does not proceed with the correction of such defective or non-conforming Work within a reasonable time fixed by written notice from the Town, the Town may remove it, replace it with conforming Work, and may store the materials or equipment at the expense of the Contractor. If the Contractor does not pay the cost of such removal, replacement, and storage within fourteen (14) days thereafter, the Town, upon fourteen (14) additional days' written notice, may sell such non-conforming Work, including the materials and other components of such Work, at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs that should have been borne by the Contractor, including compensation for the Town's additional services made necessary thereby. If such proceeds of sale do not cover all costs that the Contractor should have borne, the difference shall be charged to the Contractor, and an appropriate Change Order shall be issued. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Town.

(f) Contractor to Bear Mitigation Costs. The Contractor shall bear the cost of making good all work of the Town or separate contractors destroyed or damaged by such correction or removal and replacement, unless in the Town's sole discretion, the Town agrees to a

percentage deduction of the total Contract payment, in lieu of said correction or removal of Work.

12. **CHANGES IN THE WORK**.

(a) Change Orders. The Town Representative, by written instructions issued to the Contractor, may extend the Start Date or the Completion Date or make such changes to the Contract Documents as may be necessary to accomplish the purposes intended to be provided under this Contract, including an increase in the Contract Price. If such changes increase or decrease the amount due under the Contract Documents, or in the time required for performance of the Work, an equitable adjustment will be authorized by Change Order.

(b) Amendments. All other changes to this Contract must be made by contract amendments, which must be in writing and approved by the duly authorized representatives of each party. The Contractor shall not commence any changed or increased work prior to receipt of a duly executed Change Order or contract amendment unless directed by the Town as provided herein. Except as provided below, the Town shall have no duty or obligation whatsoever to compensate or to reimburse the Contractor for additional work not specifically authorized as provided herein. In the event (i) the Town requires additional compensable work to be performed by the Contractor prior to the execution or other finalization of a Change Order or contract amendment, and (ii) the Contractor has submitted to the Town an estimate of the cost for the additional compensable work, then the Town shall reimburse the Contractor for the costs associated with such additional work on a periodic basis in accordance with the terms of this Contract.

13. **PERIOD OF PERFORMANCE**.

(a) Notice to Proceed. Within fourteen (14) calendar days of receipt of the fully-executed Notice of Award, the Contractor shall provide the Town acceptable bonds (if applicable) and certificates of insurance. The Town shall issue a Notice to Proceed upon the Town's approval of the bonds (if applicable), insurance and full execution of the Contract. No Work shall be performed by the Contractor until a Notice to Proceed for the Project is given by the Town Representative. The Contractor acknowledges that a Notice to Proceed will not be issued until the Town has received acceptable certificates of insurance and bonds, if applicable.

(b) Contract Time. The Contractor shall commence the Work on the date specified in the Notice to Proceed, or if no date is specified, within seven (7) calendar days after receipt of the Notice to Proceed (the "Start Date") and shall fulfill all of its obligations on or before the date set forth as the Completion Date on the Cover Sheet (the "Completion Date" and together with the Start Date, the "Contract Time"), except as the Completion Date is modified as permitted by this Contract. All time limits are of the essence in this Contract.

(c) Completion Schedule. The Contractor shall submit, prior to commencement of the Work, a completion schedule in accordance with the Project special provisions and shall update the schedule monthly for approval by the Town Representative. No time extensions will be granted for delays in the schedule approval. Failure by the Contractor to comply with the project schedule, other than for approved time extensions granted by the Town, shall

constitute a material breach of this Contract. The initial progress payment shall not be made to the Contractor until the Town Representative approves the completion schedule. No subsequent payments shall be made until the Town Representative approves a schedule update for each monthly payment.

14. **TIME EXTENSIONS AND COMPENSATION FOR DELAY**.

(a) Remedy. If the Contractor is delayed or disrupted in the performance of the Work, the Contractor's exclusive remedy with respect to such delay or disruption shall be as stated in this Paragraph.

(b) Time Extensions. Evaluation of all time extension requests shall be based upon the project schedule submitted to the Town by the Contractor prior to commencement of Work for approval (if any).

(c) Definitions. The following words shall have the meaning set forth below:

i. "Contractor Delay" is defined as delay on a particular date resulting from acts or omissions within the control of the Contractor or its subcontractors, agents, or suppliers, including any delay within their joint control.

ii. "No-Fault Delay" is defined as delay on a particular date resulting from events beyond the reasonable control of and without the fault or negligence of either the Contractor or the Town or their agents, employees, contractors, subcontractors, sub-subcontractors, or suppliers.

iii. "Owner Delay" is defined as delay on a particular date resulting from acts or omissions within the control of the Town, its agents, employees, or contractors, including the Town Representative.

iv. "Concurrent Delay" is defined as the occurrence on a particular date of one or more instances of Owner Delay and Contractor Delay, Owner Delay and No-Fault Delay, or Contractor Delay and No-Fault Delay.

(d) Completion Date Adjustment. An adjustment in the Completion Date for delay on a particular date shall be made under this subparagraph if any delay on such date is classified as either Owner, No-Fault, or Concurrent Delay. The adjustment in the Completion Date shall only be in proportion to the amount of the delay, which is attributable to Owner or No-Fault Delay. No adjustment in the Completion Date shall be allowed for the portion of the delay that is attributable to Contractor Delay, including but not limited to, that portion of a Concurrent Delay which includes Contractor Delay.

(e) Notification of Delay and Recovery. The Contractor shall notify the Town in writing as soon as practicable regarding the nature and starting date of a delay, and the activities affected, but in no case later than seven (7) calendar days after the event giving rise to the delay. In the case of a continuing delay, only one notification shall be necessary. Any claim for an extension of time for delay shall be made in writing to the Town not more than ten (10) calendar days after the end of the delay; otherwise, such claim shall be waived.

15. **CONTRACT PRICE**. The Town has appropriated the money necessary to fund this Project. The Town shall pay the Contractor in current funds for the satisfactory performance of the Work, subject to any additions and deletions, by written Change Order, the total sum not to exceed the Contract Price set forth on the Cover Sheet (the "Contract Price") in accordance with the Contractor's Bid Sheet and the schedule set forth in the Contract Documents. Notwithstanding anything to the contrary contained in this Contract, the Town shall not issue a Change Order or other form of directive requiring additional compensable work to be performed, which causes the aggregate amount payable under this Contract to exceed the amount appropriated for the Contract Price, unless the Contractor is given written assurance by the Town that lawful appropriations have been made by the Town to cover the cost of the additional work.

16. **TIMES AND METHODS OF PAYMENT**.

(a) Payment. Payment shall be made upon Final Acceptance of the Work and satisfactory compliance with the Paragraph titled Final Inspection and Payment.

(b) Progress Payments. If the Contractor is satisfactorily performing the Work, and provided any required schedule updates have also been submitted and approved, the Town shall make partial monthly payments in accordance with the provisions of subparagraph (d) of ninety-five percent (95%) of the Contract Price based on the calculated value of the Work completed (the "Progress Payments") and shall retain five percent (5%) of the amount due to the Contractor (the "Retained Amount") until the Work is complete. If applicable, the Contractor shall make payments to its subcontractors in accordance with C.R.S. §24-91-103. Progress payments will not occur more than once per month unless approved in writing by the Engineering/Public Works Director.

(c) Retained Amount. The Town shall retain the Retained Amount until Final Acceptance, as defined below. If the Contractor has completed the Work in a manner finally acceptable to the Town, the Town may authorize final payment from the Retained Amount upon written request by invoice of the Contractor (the "Final Payment"). Before the Final Payment is made, the Town and the Contractor, as applicable, shall comply with the Paragraph titled Final Inspection and Payment.

(d) Invoicing. The Contractor shall, as soon as practicable after the end of each calendar month during performance of the Work, submit an itemized invoice for services performed, stating the percentage of the Work that has been completed and the type of services performed. The Contractor shall prepare the invoices at its sole cost and shall include sufficient detail to enable the Town to verify the appropriateness of the invoice. Each invoice shall be subject to review and approval by the Town Representative. The Town shall pay all undisputed invoices within thirty (30) days after review and approval of the invoice. If the Town objects to any invoices submitted by the Contractor, the Town will so advise the Contractor in a writing providing the reason within fourteen (14) days of receipt of such invoice. The Town shall not be required to pay disputed items until the dispute is resolved. Payment of any invoice shall not act as a waiver of the Town's right to recover in full any over-payment revealed by any subsequent audit or inspection or seek any claim for damages or other remedy provided herein. Acceptance or payment of an invoice shall not be construed as acceptance of the Work. No air travel, car rental, entertainment,

education expense, meals or similar or related costs shall be payable without prior written approval of the Town.

(e) Early Payment of Retained Amount. Upon written request from the Contractor, the Town may pay all or a portion of the Retained Amount to the Contractor before Final Acceptance if, in the Town's sole and absolute discretion, the Contractor is making satisfactory progress in any phase of the performance of the Work, the Contractor is otherwise in compliance with the terms of the Contract, and substantial reasons exist for the release of the Retained Amount. In addition, before any payment is made to the Contractor pursuant to this subparagraph, the Town shall receive written approval from any surety furnishing bonds for the Work that the release of the requested Retained Amount is acceptable.

(f) Incorrect Payments. Incorrect payments to the Contractor due to omission, error, fraud, or defalcation may be recovered from the Contractor by deduction from subsequent payments due the Contractor under this Contract or other contracts between the Town and the Contractor.

(g) Remedies for Nonpayment. If the Town fails to make payments due Contractor within sixty (60) days after receipt and acceptance of Contractor's invoice, Contractor may, after giving seven (7) days' written notice to the Town, suspend services under this Contract until Contractor's outstanding undisputed invoices have been paid in full.

17. **FINAL ACCEPTANCE AND PAYMENT**.

(a) Final Inspection. The Contractor shall notify the Town when the Work is complete and ready for final inspection by means of a letter of completion (the "Letter of Completion"), including the Contractor's final invoice for payment. Within fourteen (14) calendar days of the Town's receipt of the Letter of Completion, they shall make a final inspection to determine whether the Work has been completed in accordance with this Contract and shall submit a written list of any defects to the Contractor (the "Punch List"). The Contractor shall promptly correct all Punch List items without additional cost to the Town within fourteen (14) calendar days after receipt of the Punch List. If any defects cannot be corrected within fourteen (14) calendar days, the Contractor shall correct such defects promptly and with due diligence. If any Punch List item cannot be corrected within fourteen (14) calendar days, the Contractor shall submit a letter to the Town Representative for approval requesting an extension of time to complete such item (the "Request for Extension"). The Request for Extension must be received by the Town Representative within seven (7) calendar days of the Contractor's receipt of the Punch List and shall include the Contractor's justification for the request and a schedule for completion of the Punch List item.

(b) Required Documentation. Neither Final Payment nor the remaining Retained Amount shall become due until the Contractor submits to the Town an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Work have been paid or otherwise satisfied. The Contractor shall deliver to the Town all statements to support state sales and use tax refunds and any as-built drawings. The Contractor shall provide the Town with a letter of approval for contract closure from any surety furnishing bonds for the Work provided on AIA Form G707 ("Consent of Surety Letter") or equivalent form.

The Consent of Surety Letter must state that the performance bonds will remain in effect through the expiration of the Guarantee Period as defined in the Paragraph titled Guarantee. If required by the Town, the Contractor shall also provide such other data establishing payment or satisfaction of all obligations, including releases, lien waivers, and receipts and warranties, if any, have been provided to the Town.

(c) Final Payment. Upon the Town's finding that the Work has been satisfactorily completed per the Contract Documents, including all Punch List items, the Town will provide the Contractor with a written acceptance of the Work (the "Final Acceptance"). Final Payment, including the Retained Amount, shall not be made until the Town Representative has approved the payment and a notice of contractor's settlement has been published in accordance with C.R.S. § 38-26-107. The Town shall condition publication and final settlement upon receipt of any duly-executed Consent of Surety Letter(s). Such final settlement shall be advertised as provided by statute at least twice, the last publication appearing at least ten (10) days prior to the date of final settlement. On the date of final settlement (or such later date as may be permitted by statute if claims are asserted or litigation is commenced alleging nonpayment of funds due for labor, materials, supplies, etc.), Final Payment shall be made in full.

(d) Final Payment Does Not Operate as a Waiver. Notwithstanding anything else to the contrary contained herein, Final Payment by the Town shall not be construed as a waiver of any claims affecting or arising from:

i. Unsettled liens/claims;

ii. Faulty or defective work appearing after Substantial Completion;

iii. Failure of the Work to comply with the requirements of the Contract Documents;

iv. Terms of any special warranties required by the Contract Documents.

For purposes of this Paragraph, "Substantial Completion" shall mean the date certified by the Town when construction is sufficiently complete, in accordance with the Contract Documents, so that the Town can occupy or utilize the Work or designated portion thereof for the use for which it is intended.

(e) Release by Contractor. The acceptance by the Contractor of Final Payment shall be and shall operate as a release to the Town from all claims and all liability to the Contractor for all things done or furnished in connection with the Work and for every act and neglect of the Town and others relating to or arising out of the Work other than claims in stated amounts as may be specifically expected by the Contractor with the consent of the Town. Any payment, however, final or otherwise, will not release the Contractor or its sureties from any obligations under the Contract Documents, including any bonds required by this Contract.

18. **DEFAULT AND DAMAGES**. The Town will not be responsible for the acts or omissions of Contractor or any subcontractor, any supplier, or of any other person or organization performing or furnishing any of the Work. If the Contractor fails to comply with any provision

of the Contract Documents, the Contractor shall be liable for any and all damages, including without limitation, the cost of procuring similar supplies and services and all other costs and expenses incurred by the Town because of such failure. If the Contractor fails or refuses to perform the Work on schedule, or to complete the Work in a timely and satisfactory manner, the Town may terminate this Contract and the Contractor's right to proceed hereunder. If the Contractor, its subcontractors, or their respective employees or agents, cause any damage, injury, or loss to any person or property, the Contractor shall remedy such damage or injury at its sole expense. If the Town terminates this Contract under this Paragraph, the Contractor may, at the option of the Town, be required to cease any or all Work provided for under this Contract and shall be liable for any additional cost to the Town for services acceptable to the Town from another contractor as well as any damages associated with such failure to perform. The cost to complete the Work or any portion thereof which remains unperformed at the time of such termination, together with any other damages, shall be deducted from any sum payable hereunder before Final Payment to the Contractor.

19. **LIQUIDATED DAMAGES**. Time is of the essence in completing the Work. In the event of delay in the completion of the Work as specified beyond the Completion Date, it would be difficult to determine the exact amount of the loss or damages suffered by the Town due to delays in completion of the Work. However, the Town has attempted to forecast a reasonable daily amount as compensation for damages incurred due to late completion caused by the Contractor, based upon considerations which include, but are not limited to, departmental and public inconvenience and additional contract administration costs. Therefore, the Contractor will be liable to the Town, as liquidated damages (and not as a penalty), in the amount set forth on the Cover Sheet for each and every calendar day beyond the Completion Date for which the Contractor is at fault for the delay. The Town reserves the right to deduct said liquidated damages directly from the Contractor or its surety. The Town reserves the right to recover its actual damages in lieu of recovery of liquidated damages under this paragraph.

20. **INDEMNIFICATION**.

(a) Indemnification. The Contractor agrees to and does indemnify, defend, and hold the Town and its officials, agents, and employees harmless from and against any and all claims, damages, losses, injuries, costs, and expenses (including reasonable attorneys' fees), relating to or arising out of: (1) any act or omission of the Contractor and its employees, agents, or subcontractors in connection with the performance of the Work; (2) any breach of any covenant, representation, or warranty made by the Contractor under this Contract; (3) use by the Contractor of any intellectual property in connection with the Work (whether such intellectual property is owned by the Contractor or a third party) or the incorporation by the Contractor of intellectual property into the Work; and (4) any workers' compensation claims brought by any officer, employee, subcontractor, or agent of the Contractor relating to or arising out of such person's performance of the Work. Contractor need not indemnify or save harmless the Town, its mayor and town council, its officers, agents and employees, from damages resulting from the negligence of the Town's mayor and town council, officials, officers, directors, agents, and their insurers, and employees. The Town cannot and by this Contract does not agree to indemnify, hold harmless, exonerate or assume the defense of the Trade Contractor or any other person or entity whatsoever, for any purpose whatsoever.

(b) Compliance with C.R.S. §13-21-111.5(6). This indemnification provision is intended to comply with C.R.S. § 13-21-111.5(6), as amended, and shall be read as broadly as permitted to satisfy that intent. If this Paragraph or any portion hereof is invalidated on any ground by any court of competent jurisdiction, then the Contractor shall nevertheless indemnify and hold harmless the Town and each person indemnified pursuant to this Paragraph as to costs, charges and expenses (including reasonable attorneys' fees), judgments, fines and amounts paid in settlement with respect to any such proceeding, appeal, inquiry or investigation to the full extent permitted by any applicable portion of this Paragraph that shall not have been invalidated and to the fullest extent permitted by C.R.S. § 13-21-111.5(6), as amended.

21. **INSURANCE**.

(a) Generally. The Contractor shall purchase and maintain such insurance in a company or companies licensed to do business in the State of Colorado as will protect it from claims which may arise out of or result from operations under the Agreement, whether such operations be by themselves or by any subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. The insurance required in this paragraph shall be written for not less than the amounts set forth in the Insurance Requirements attached hereto as **Exhibit C**. The Contractor shall not be relieved of any liability pursuant to the paragraph titled Indemnification by reason of its failure to procure or maintain insurance in sufficient amounts, durations, or types. The Contractor shall provide certificates evidencing such coverage to the Risk Manager prior to commencing the Work and during the term of this Agreement shall provide the Town written evidence of continuing insurance coverage prior to the expiration of the current coverage term. Should the Town request written evidence of continuing insurance coverage, such shall be provided to the Town within three (3) business days of its receipt of the request. The Contractor shall provide the Town no less than thirty (30) days' prior written notice of any proposed change to, or cancellation of the insurance coverage, including all policy renewal information. Any proposed change to the insurance coverage shall comply with the terms of this Agreement. Any deviations below the insurance standards set forth above must be approved by the Town of Parker Risk Manager. Should the Contractor not have prior notice of a change or cancellation to the insurance coverages, the Contractor shall notify the Town no later than two (2) business days after the Contractor receives notice of a change in or cancellation of coverage.

(b) Endorsement. The Contractor shall request that its Commercial General Liability insurance policy be endorsed to the Town. If requested by the Town, the Contractor shall request from its insurance company an endorsement to any other insurance policy for this Agreement, in a form approved by the Town Attorney's Office, which will require the insurance company to provide the Town with notice of cancellation of the policy. The Contractor shall promptly comply with all terms of the endorsement and shall pay the cost of the endorsement.

(c) Certificate of Insurance. All certificates of insurance and guarantees required by this Agreement shall be submitted by the Contractor to the Town prior to commencement of the Work. Within a reasonable time after submittal, the Town shall either approve the certificates of insurance or notify the Contractor of any unacceptable conditions stating the

specific reasons therefor. The Contractor shall promptly re-submit an acceptable certificate of insurance, which the Town shall review within a reasonable time. The Contractor shall not commence any of the Work until all required certificates of insurance have been accepted by the Town. Should the Contractor's certificate of insurance expire or terminate during the term of the Agreement, the Contractor is responsible for providing the Town with an updated and current certificate.

(d) Breach. Failure on the part of the Contractor to procure or maintain policies providing the required coverages, conditions and minimum limits shall constitute a material breach of contract upon which the Town may immediately terminate this Agreement or, at its discretion, the Town may procure or renew any such policy or any extended reporting period thereto and may pay any and all premiums in connection therewith, and all monies so paid by the Town shall be repaid by Contractor to the Town upon demand, or the Town may offset the cost of the premiums against any monies due to Contractor from the Town. Any termination of this Agreement does not relieve the Contractor from indemnification during the period this Agreement was in effect.

(e) Governmental Immunity. Notwithstanding any other provision to the contrary, no term or condition of this contract shall be construed or interpreted as a waiver, express or implied, of any of the immunities, rights, benefits, protection or other provisions of the Colorado Governmental Immunity Act, Section 24-10-101 et seq., C.R.S., as now or hereafter amended. The parties understand and agree that liability for claims for injuries to persons or property arising out of negligence of the Town, its officials and employees is controlled and limited by the provisions of Section 2-10-101 et seq., C.R.S., as now or hereafter amended.

22. **PERFORMANCE, PAYMENT AND MAINTENANCE BONDS**.

(a) Bond Requirements. Pursuant to C.R.S. §38-26-105, if the Contract Price exceeds the sum of fifty thousand dollars ($50,000.00), the Contractor shall, within ten (10) days after the receipt of a Notice of Award, furnish the Town, at the Contractor's expense, with a performance bond and a payment bond acceptable to the Town in the amount of not less than 100% of the Contract Price, including provisions for any adjustment thereof in accordance with the terms of this Contract. Whenever in the specifications a guarantee or maintenance bond is required to be furnished for any item of equipment, material or portion of the Work, such guarantee shall be submitted to the Town and a written approval will be issued to the Contractor before any such equipment, material or construction is ordered and incorporated in work by the Contractor. Such bonds shall be executed by the Contractor and a qualified corporate surety licensed to transact such business in Colorado and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570.

(b) Replacement of Surety. If at any time during performance of the Work, a surety on any such bond is declared bankrupt, is disqualified from doing business in Colorado, or is removed from the list of Surety Companies accepted on Federal Bonds, the Contractor shall, at its expense, substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Town within ten (10) days after the event triggering the surety's disqualification pursuant to this subparagraph.

No further payments will be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable bond to the Town.

(c) Term. The bonds shall remain in effect until completion of all Warranty Work, as defined in the paragraph titled Guarantee, and shall be delivered to the Town prior to the commencement of the Work. The Contractor shall secure an increase in the bonds in an amount equal to the cost of any additional work authorized pursuant to a duly executed Change Order or contract amendment.

23. **GUARANTEE**.

(a) Guarantee of Work. The Contractor warrants that it will perform the Work in a timely, accurate, and complete manner in accordance with the provisions of the Contract Documents. The Contractor warrants that the materials and/or workmanship will conform to the Contract Documents and that the materials used will be of good quality and new and that the Work shall be free from defects. The Contractor shall guarantee the Work against defects in workmanship and materials for a period of seven hundred thirty (730) days, or longer if a longer period is set forth elsewhere in the Contract Documents, commencing on the date of Final Acceptance of the Work by the Town Representative (the "Guarantee Period"). The Contractor shall promptly replace any materials or re-perform any portion of the Work found to be defective within the Guarantee Period in accordance with this Contract and without expense to the Town. The time allowed for such corrective action shall be mutually agreed upon by the Town and the Contractor. If the Contractor fails to proceed promptly in accordance with these guarantees, the Town reserves the right to place the Contractor in default of its contractual obligations and may have the Work performed at the expense of the Contractor. The provision shall survive the completion of the Work and the termination of this Contract. The Contractor shall also assign to the Town any longer-term guarantee of materials used by the Contractor as may be provided by the manufacturer. The above guarantee does not limit any claims that the Town may otherwise have against the Contractor.

(b) Warranty Work. At least sixty (60) calendar days prior to the expiration of the Guarantee Period, the Town Representative shall have the option to make an inspection to determine whether the Work has been completed in accordance with this Contract and may submit a written list of any defects to the Contractor (the "Warranty Work"). In the event the Town chooses this option, the Contractor shall promptly correct all Warranty Work without additional cost to the Town within the Guarantee Period. If any Warranty Work cannot be corrected within the Guarantee Period, the Contractor shall submit a letter to the Town Representative for approval requesting an extension of time to complete such item (the "Request for Extension of Warranty Work"). The Request for Extension of Warranty Work must be received by the Town Representative within fourteen (14) calendar days of the Contractor's receipt of the Warranty Work and shall include the Contractor's justification for the request and a schedule for completion of the Warranty Work.

(c) Removal of Rejected Work. During the life of the Contract and the Guarantee Period, the Contractor shall promptly remove from the premises all work rejected by the Town for failure to comply with the Contract Documents, whether incorporated in the construction or not, and the Contractor shall promptly replace and re-execute the Work in accordance

with the Contract Documents and without expense to the Town, and shall bear the expense of making good all work of other trade contractors destroyed or damaged by such removal or replacement. However, the Town may, at its discretion, elect to accept an equitable reduction in the Contract Price or a refund instead of correction of the condemned work. If the Trade Contractor does not take action to remove such rejected work within fourteen (14) days after receipt of written notice, the Town may remove such work and store the materials all at the expense of the Trade Contractor.

(d) Guarantee of Materials. The Contractor warrants that all materials and equipment furnished and incorporated by it in the Work shall be new, unless otherwise specified, and that all Work under this Contract shall be of good quality, free from fault and defects and in conformity with the Contract Documents. Only first-class materials and materials which conform to the requirements of the specifications shall be incorporated into the Work. All Work not conforming to these standards shall be considered defective. The warranty provided herein shall be in addition to and not in limitation of any other warranty or remedy required by law or by the Contract Documents.

24. **WARRANTIES**. The Contractor represents and warrants that:

(a) It is fully qualified to perform the Work and will perform the Work in a timely, accurate, and competent manner in accordance with the professional standards of the industry provided that this warranty shall not abrogate any independent duty of care owed by the Contractor to the Town.

(b) Any methodologies or programs or other intellectual property utilized under this Contract were independently developed by it or duly licensed from third parties and shall neither infringe upon nor violate any patents, copyrights, trade secrets, or other proprietary intellectual property rights of a third party.

(c) If it is an entity, it is duly organized, validly existing, and in good standing under the laws of the State of Colorado.

(d) The execution, delivery, and performance of this Contract by the Contractor does not and will not: (i) require the consent of any undisclosed person or entity; (ii) violate any legal requirement; or (iii) conflict with, or constitute a breach or violation of (a) its entity's organizational documents, if any, or (b) the terms or provisions of any other agreement, instrument, or understandings by which the Contractor is bound or affected.

25. **TERMINATION**.

(a) Termination for Convenience. This Contract may be terminated in whole or in part in writing by the Town for its convenience upon written notice to the Contractor.

(b) Termination for Cause. This Contract may be terminated in whole or in part in writing by either party, in the event of substantial failure by the other party to fulfill its obligations under this Contract, through no fault of the terminating party. Termination for cause shall only be effective if the breaching party has been given:

i. Not less than ten (10) calendar days' written notice of the non-breaching party's

intent to terminate; and

ii. An opportunity for consultation with the terminating party prior to termination.

(c) Effect of Termination. Upon receipt of a notice of termination, the Contractor shall promptly discontinue all Work affected (unless the notice directs otherwise), and the Town may take over the Work and prosecute the same to completion by agreement with another party or otherwise. The Town shall pay the Contractor for all Work performed in conformity with the Contract Documents up to the effective date of termination.

26. **WORK BY OWNER AND COORDINATION**.

(a) Additional Contractors. The Town reserves the right to perform work related to the Work with its own forces, and to award separate contracts in connection with other portions of the Work on the Site that are outside the scope of this Contract. The Town will provide for the coordination of the work of its own forces and of each separate contractor, as applicable, with the Work of the Contractor, who shall cooperate with the Town in coordinating all of the work, including by affording other contractors reasonably opportunity for the introduction and storage of their materials and the execution of their work. The Contractor shall coordinate with the other contractors in order to ensure detailed execution of the Work in conformance with the Contract Documents. The Contractor shall properly connect its Work with work performed by the other contractors. All materials and labor shall be furnished at such times as shall be for the best interest of all contractors concerned, to the end that the combined work of all may be properly and fully completed within the Contract Time. The Contractor shall indemnify and hold harmless the Town from claims by other contractors that the Contractor interfered with work performed by other contractors or caused damage to property or work of other contractors.

(b) Inspection. If the proper execution or results of any part of the Contractor's work depends upon the work of any other contractor, the Contractor shall inspect and promptly report to the Town any defects in such work that render it unsuitable for such proper execution and results. Failure of the Contractor to so inspect and report defects shall constitute an acceptance of the other contractors' work as fit and proper for the addition into the Work except as to defects which may develop in the other contractors' work after the execution of the Work.

27. **SUBCONTRACTING**. The Contractor may utilize the services of specialty subcontractors on those parts of the Work which, under normal contracting practices, are performed by specialty subcontractors. Within fourteen (14) days after the Town issues the Notice to Proceed, the Contractor shall submit the names of all subcontractors to the Town. The Contractor's subcontracts shall give the Contractor the same power to terminate any subcontract that the Town may exercise over the Contractor under any provision of the Contract Documents. Nothing contained in this Agreement will create any contractual relation between any subcontractor and the Town. The Contractor shall be responsible for the acts and omissions of its agents, employees, and subcontractors. The Contractor shall bind each subcontractor to the terms of this Agreement, and require or provide insurance coverage for each subcontractor as will protect them from claims which may arise out of or result from operations under this Agreement, including but not limited to additional insurance and waiver

of subrogation requirements in favor of the Town, and workers' compensation coverage.

28. **NON-ASSIGNMENT**. Contractor shall not assign this Contract without the prior written consent of the Town Representative. This Contract is voidable by the Town and the Town may terminate this Contract if the Contractor assigns its performance of this Contract without the prior written consent of the Town Representative, which may be denied or conditioned in the sole discretion of the Town Representative. Any such assignment without the Town Representative's prior written consent shall be a material breach of this Contract. Subject to these limitations, this Contract will inure to the benefit of and be binding upon the parties and their respective successors and assigns.

29. **INDEPENDENT CONTRACTOR STATUS; PAYMENT OF TAXES AND UNEMPLOYMENT INSURANCE**. The Contractor is an independent contractor and is not an agent, servant, or employee of the Town. The Contractor and its employees are not entitled to workers' compensation benefits through the Town. The Contractor is solely responsible for necessary and adequate workers' compensation insurance and shall be responsible for withholding and paying all federal and state taxes. The Contractor and its employees are not entitled to unemployment insurance benefits unless unemployment coverage is provided by the Contractor or an entity other than the Town. The Contractor hereby acknowledges full and complete liability for and timely payment of all local, state, and federal taxes imposed including, without limitation, taxes on self-employment income, unemployment taxes, and income taxes.

30. **ENTIRE AGREEMENT**. This Contract contains the entire agreement of the parties relating to the subject matter hereof. The Contractor's rights and obligations shall be solely governed by the terms and conditions of this Contract and the Contract Documents. The terms and conditions of any Contractor invoice, Contractor time sheet, or other form, including but not limited to indemnification, limitation of liability, or cancellation fees, shall be void and of no effect against the Town notwithstanding any signatures on such form by a Town employee. Any Town employee's signature on Contractor's forms shall be effective only to establish receipt of services. This Contract may only be modified or amended by a writing signed by the authorized signatories of the parties, or as otherwise provided in this Contract.

31. **CONFIDENTIALITY**. During the course of Contractor's performance of the Work, the Contractor may have access to certain confidential and proprietary information owned or controlled by the Town that may be disclosed to the Contractor and the Contractor's employees, agents, representatives, assigns, or subcontractors orally, in writing, or by observation. All such information disclosed to the Contractor or the Contractor's employees shall be maintained in strict confidence, shall not be used except as necessary for the performance of the Contract, and shall not be disclosed to any third party without prior written approval of the Town unless required by the Colorado Open Records Act or other law.

32. **APPROPRIATION**.

    (a) Appropriation of Funds. For the express purpose of complying with the Town's financial obligations hereunder, the Town will appropriate funds equal to or in excess of the Contract Price. The Town will not issue a Change Order or other order resulting in compensable work by the Contractor that causes the aggregate amount payable under this Contract to

exceed the amount appropriated, unless an appropriation has been made to cover the costs of the additional work. The Contractor will be provided written verification of such appropriation upon a request sent to the Town Representative.

(b) Subsequent Fiscal Years. The payment of Town obligations in fiscal years subsequent to the current year are contingent upon funds for this Contract being appropriated and budgeted. If funds for this Contract are not appropriated and budgeted in any year subsequent to the fiscal year of execution of this Contract, this Contract shall terminate. The Town's fiscal year is currently the calendar year.

33. **NOTICES**.

(a) Key Notices. "Key Notices" under this Contract are notices regarding Contract default, contractual dispute, or termination of the Contract. Key Notices shall be given in writing and shall be deemed received if given by: (i) electronic mail (as set forth in subparagraph (b) below) when transmitted, if transmitted on a business day and during normal business hours of the recipient, and otherwise o the next business day following transmission; (ii) certified mail, return receipt requested, postage prepaid, three (3) business days after being deposited in the United States mail; or (iii) overnight carrier service or personal delivery, when received. For Key Notices, the parties will follow up any electronic mail with a hard copy of the communication by the means described in subparagraph (a)(ii) or (a)(iii) above. The requirement for following up a Key Notice made by electronic mail with a hard copy shall be deemed waived by the receiving party upon acknowledgement, via electronic mail, within three business days of transmission of the Key Notice, that the Key Notice has been received. All other communications or notices between the parties that are not Key Notices may be done via electronic mail. Notice shall be given to the parties at the following addresses:

To the Town:	Town of Parker Attn: Engineering/Public Works 20120 E. Mainstreet Parker, Colorado 80138 pubwks@parkerco.gov
with a copy to:	Town of Parker Attn: Legal/Town Attorney 20120 E. Mainstreet Parker, Colorado 80138 contracts@parkerco.gov
To the Contractor:	As set forth on the Cover Sheet

All Key Notices to the Town shall include a reference to the Contract, including the Contractor's name and the date of the Contract.

(b) Electronic Mail. The parties agree that: (i) any notice or communication transmitted by electronic mail shall be treated in all manner and respects as an original written document; (ii) any such notice or communication shall be considered to have the same binding and

legal effect as an original document; and (iii) at the request of either party, any such notice or communication shall be re-delivered or re-executed, as appropriate, by the party in its original form. The parties further agree that they shall not raise the transmission of a notice or communication, except for Key Notices, by electronic mail as a defense in any proceeding or action in which the validity of such notice or communication is at issue and hereby forever waives such defense. For purposes of this Contract, the term "electronic mail" means email.

34. **MISCELLANEOUS PROVISIONS**.

(a) Governing Law and Venue. This Contract shall be governed by the laws of the State of Colorado, excluding conflicts of laws provisions, and the Charter of the Town of Parker. To the extent any provision hereof is inconsistent with said laws and Charter, said laws and Charter shall control. Venue for any and all actions shall be in the County of Douglas, State of Colorado.

(b) Compliance With Laws. The Contractor shall comply with all federal and state laws, local ordinances regulations, and orders and decrees of bodies or tribunals having jurisdiction over the Contractor which affect the Contractor, those employed or engaged by it, the materials or equipment used, and the performance of the Work. The Contractor shall procure all necessary approvals, licenses, and permits at its own expense. Compliance with laws shall include, but not be limited to, the following:

(i) Equal Employment Opportunity. The Contractor shall not refuse to hire, discharge, promote or demote, or discriminate in matters of compensation against any person otherwise qualified solely because of race, creed, sex, color, national origin or ancestry, religion, disability, age, sexual orientation, gender identity, veteran status, or any other basis prohibited by federal, state, or local law.

(ii) Safety. The Contractor shall perform the Work in compliance with the requirements of the United States Occupational Safety and Health Act.

(iii) Use of Colorado Labor. Pursuant to C.R.S. §8-17-101, et seq., Colorado labor shall be employed to perform the Work to the extent of not less than eighty percent (80%) of each type or class of skilled and common labor employed by Contractor, as calculated on the total taxable wages and fringe benefits paid to workers employed directly on the Site of the Work. The term "Colorado labor" means any person who is a resident of the State of Colorado at the time of employment.

(c) Severability. In the event any provision of this Contract is held invalid and unenforceable by a court of competent jurisdiction, the remaining provisions shall be valid and binding upon the parties.

(d) Waiver. No term or condition of this Contract shall be deemed to have been waived by either party unless the waiver is in writing and signed by both parties or their duly-authorized representatives. The failure of a party to enforce any right arising under this Contract on one or more occasions will not operate as a waiver of that or any other right on that or any other occasion.

(e) No Third-Party Beneficiaries. The enforcement of this Contract and all rights of action relating to such enforcement shall be strictly reserved to the Town and the Contractor. Nothing contained in this Contract shall give or allow any claim or right of action whatsoever by any other third person, nor shall anything contained in this Contract be construed as a waiver of any provision of the Colorado Governmental Immunity Act, C.R.S. §24-10-101, et seq., as amended. It is the express intention of the Town and the Contractor that any such person or entity, other than the Town or the Contractor, receiving services or benefits under this Contract shall be deemed an incidental beneficiary only. Nothing herein shall be construed as creating any personal liability on the part of any officer or agent of any public body which may be a party hereto.

(f) Remedies. The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law, including, but not limited to, tort remedies. The Contractor agrees that the economic loss rule, as set forth in the *Town of Alma v. Azco Construction, Inc.*, 10 P.3d 1256 (Colo. 2000), shall not serve as a limitation on the Town's right to pursue tort remedies in addition to other remedies it may have against the Contractor. Such rights and remedies shall survive the acceptance of the Work or any termination of the Contract. Contractor further specifically waives all the provisions of Chapter 8 of Article 20 of Title 13, Colorado Revised Statutes, regarding defects in the work under the Contract.

(g) Survival. Notwithstanding anything to the contrary, the parties understand and agree that all terms and conditions of this Contract which may require continued performance or compliance beyond the termination date of this Contract shall survive such termination date and shall be enforceable as provided herein in the event of a failure to perform or comply by a party to this Contract.

(h) Officials Not to Benefit. No elected or employed member of the Town government shall be paid or receive, directly or indirectly, any share or part of this Contract or any benefit that may arise therefrom.

(i) Town's Ownership of Documents. Any data, documents, or other things or information provided by the Town to the Contractor or to which the Contractor has access during the performance of the Work and any reports, Drawings, results, conclusions of the Work or other writings or products produced by the Contractor (the "Deliverables") shall be and remain the sole property of the Town at all times; and the Contractor shall not use any of the Deliverables for any other purpose. The Contractor shall provide to the Town all of the Deliverables required to be produced by the Completion Date or earlier termination of this Contract. All Deliverables shall be deemed confidential. The Contractor shall not disclose to any person or entity any Deliverable without the prior written consent of the Town unless required to do so by law.

(j) Conflict of Interest. The Contractor will not knowingly perform any act which would conflict in any manner with the performance of Work required to be performed hereunder. By acceptance of this Contract, Contractor certifies that it is engaged in no current project or business transaction, directly or indirectly, nor has it any interest, direct or indirect, with

any person or business which might result in a conflict of interest in the performance of the Work under this Contract.

(k) Sales Tax Exemption. The Contractor and its subcontractors, consultants, and suppliers will not be required to pay Colorado state or Town of Parker sales and use taxes on property incorporated into the Work. The Contractor and all of its subcontractors must make application to the Colorado State Department of Revenue for a certificate of exemption to permit the purchase of building materials for the construction of the Work without payment of the sales tax. Prior to the start of construction, the Contractor shall furnish copies of such certificates to the Town. Applications and certificates must be on forms provided by the Department of Revenue.

(l) Public Health Orders. The Contractor shall observe all rules and regulations of the health department having jurisdiction and shall take precautions to avoid creating unsanitary conditions. Additionally, the Contractor shall abide by any local, state, and federal health orders in effect or instituted during the term of this Contract. Failure to abide by the requirements of the local public health department or applicable public health orders may result in termination of this Contract.

(m) Headings. The section headings provided herein are for convenience only and shall have no force or effect upon the construction or interpretation of any provision hereof.

(n) Proper Execution. Each party represents that all procedures necessary to authorize such party's execution of this Contract have been performed and that the person signing for such party has been authorized to do so.

(o) Execution by Counterparts; Electronic Signatures. This Contract may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. The parties approve the use of electronic signatures for execution of this Contract. All documents must be properly notarized, if a notary block appears on the signature page. All use of electronic signatures shall be governed by the Uniform Electronic Transactions Act, C.R.S. §§24-71.3-101 to -121.

[*Remainder of the page intentionally left blank*]

IN WITNESS WHEREOF, the parties have executed this Contract on the day and year first above written.

TOWN OF PARKER, COLORADO

By: _____
Michelle Kivela, Town Manager

Date: _____

ATTEST:

_____
Chris Vanderpool, Town Clerk

APPROVED AS TO FORM:

_____
Town Attorney's Office

APPROVED FOR CONTENT:

_____
Chris A. Hudson, PE, Deputy Director Engineering

APPROVED FOR CONTENT AS TO PARAGRAPHS 20 & 21 AND EXHIBIT C:

_____
Risk Management

CONTRACTOR: Click or tap here to enter text.

By: _____
Click or tap here to enter text.

Date: _____

EXHIBIT A

ADVERTISEMENT AND FINAL ACCEPTANCE FORM

(In Triplicate)

CONTRACTOR:
DATE:
RE: CONTRACT NO. _____

You are hereby notified that the Notice of Final Settlement for the Contract was advertised in the manner required, as provided by law. The Town did not receive any verified notices of claim from any subcontractors or suppliers related to the Contract.

The Final Payment for this Contract has been sent in the amount of _____ Dollars ($_____). Your acceptance of payment, as provided by the Contract, is your warranty that all persons doing work upon or furnishing materials for work under the Contract have been paid in full and further constitutes proof of approval and acceptance by you of the final amount due under the Contract.

In the event you disagree with the amount of the Final Payment, you may protest by signing the bottom of the page in the place provided and returning this letter along with the Final Payment to the Town to my attention, within ten (10) days of the date of this letter as provided by the Contract. If the Town does not receive your protest within the time frame specified herein, you will be deemed to have accepted the Final Payment amount.

Contractor Protest

By: _____

EXHIBIT B

FORM OF BONDS

BID BOND

KNOW ALL MEN BY THESE PRESENTS, THAT _____ as Contractor, and _____ as Surety, are held and firmly bound unto the Town of Parker (hereinafter called "Owner") in the penal sum of _____ Dollars ($_____) lawful money of the United States, for payment of which sum, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally by these presents.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH THAT: WHEREAS, the Contractor has submitted the accompanying bid, dated _____, 2026.

WHEREAS, the Owner has required the Contractor to furnish either a Certified Check, equivalent to not less than five percent (5%) of the amount of said bid, or a Bid Bond in the same amount, conditioned that, in event of failure to execute the proposed Contract and the Performance, Payment and Maintenance Bond within the time specified, if the Contract is awarded to him, that said sum be paid immediately to the Owner as liquidated damages and not as a penalty for the Contractor's failure to perform for the reason that it is impossible to determine the actual damages caused by the delay.

NOW, THEREFORE, if the Contractor shall, within the period specified therein, and on the attached prescribed forms presented to him for signature, enter into a written Contract with the Owner, in accordance with his bid as accepted, and give a Performance, Payment and Maintenance Bond with good and sufficient surety, or sureties, as may be required, upon the forms prescribed by the Owner, for the faithful performance and the proper fulfillment of said Contract, or in the event of the withdrawal of said bid within the time specified, or upon the payment of the Owner of the sum determined upon herein as liquidated damages, and not as a penalty in the event of the failure of the Contractor to enter into said Contract, and shall give such Performance, Payment and Maintenance Bond within the time specified, then this obligation shall be void and of no effect, otherwise to remain in full force and effect.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several seals this _____ day of _____, 2026, the name and corporate seal of each corporate party being affixed hereto and these presents duly signed by its undersigned representatives pursuant to the authority of its governing board.

_____	_____
CONTRACTOR	ADDRESS
BY: _____	ATTEST:
_____	_____
SURETY	ADDRESS
BY: _____	ATTEST:
Attorney-in-Fact	

PERFORMANCE, PAYMENT AND MAINTENANCE BOND

KNOW ALL MEN BY THESE PRESENTS, That we, the undersigned ___ _____ _____ of _____, hereinafter referred to as the "Contractor", and _____, a Corporation organized under the laws of the State of _____ and authorized to transact business in the State of _____ as Surety, are held and firmly bound unto the Town of Parker, hereinafter referred to as "Owner," 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 and our heirs, executors, administrators, successors, and assigns, jointly and severally by these presents.

THE CONDITIONS OF THE FOREGOING OBLIGATION IS SUCH THAT:

WHEREAS, the above bounden Contractor has, on the _____ day of _____, 2026, entered into a written Contract with the aforesaid Owner for the CIP25-025 – Public Works Operation Center Decant Facility Expansion Specifications No. CIP25-025, which shall include furnishing all materials, equipment, tools, superintendence, and other facilities and accessories, for the construction of certain improvements as designated, defined and described in the said Contract and the conditions thereof, and in accordance with the specifications and plans therefor; a copy of said Contract being attached hereto and made a part hereof:

NOW, THEREFORE, if the said Contractor shall and will, in all particulars, well, duly and faithfully observe, perform and abide by each and every covenant, condition, and part of the said Contract, and the Conditions, Specifications, Plans and other Contract Documents thereto attached or, by reference, made a part thereof, according to the true intent and meaning in each case, then this obligation shall be and become null and void; otherwise it shall remain in full force and effect.

This obligation shall be in full force and effect for the full guarantee period provided in the specifications contained herein.

PROVIDED FURTHER, that if the said Contractor fails to duly pay for any labor, materials, sustenance, gasoline, lubricating oils, fuel oils, greases, or any other supplies or materials used or consumed by such Contractor or his, their, or its subcontractors in performance of the work contracted to be done, the Surety will pay the same together with interest as provided by law.

PROVIDED FURTHER, that the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract, or the work to be performed thereunder, or the specifications accompanying the same, shall in any way affect its obligation on this bond and it does hereby waive notice of any change, extension of time, alteration, or addition to the terms of the Contract, or to the work or to the specifications.

PROVIDED FURTHER, that the said Surety, for value received, hereby stipulates and agrees that he will indemnify and save harmless the said Owner to the extent of any and all payments in connection with the carrying out of said Contract which said Owner may be required to make under the law by any reason of such failure or default by the said Contractor and any such Contractor.

PROVIDED FURTHER, that the said Surety and Contractor shall protect, defend, indemnify and save harmless the Owner and the Owner's officers, including its engineers and their employees

providing service agents, servants, and employees, relative to the "Owner" contract, from and against all claims and actions and all expenses incidental to the defense of such claims or actions, including reasonable attorney fees, based upon or arising out of default under this Contract or the consequences thereof, and on request of the Owner will assume the defense of any claim or action brought against the Owner.

IN TESTIMONY WHEREOF, the said Contractor has hereunto set his hand, and the said Surety has caused these presents to be executed in its name, and its corporate seal to be hereunto affixed, by its attorney-in-fact authorized on this _____ day of _____, 2026.

(SEAL)

_____
CONTRACTOR

By: _____

ATTEST:

_____
SECRETARY

_____
SURETY COMPANY

(SEAL)

By: _____
ATTORNEY-IN-FACT

By: _____
STATE REPRESENTATIVE

(Accompanying this bond with Attorney-in-Fact's authority form the Surety Company certified to include the date of the bond.)

EXHIBIT C
Insurance Requirements

I	**Prior to the commencement of any Services, the Contractor shall forward their certificate of insurance to the Town's Risk Manager at RiskManagement@parkerco.gov**
II	**The Certificate Holder must be:** Town of Parker, Colorado 20120 E. Mainstreet Parker, Colorado 80138
III	**The Town of Parker must be added as an additional insured to general liability, automotive liability, and any excess liability policies.**
IV	**Minimum Insurance Requirements**
	Worker's Compensation ▪ Statutory limits provided by an insurance carrier that is licensed to do business in Colorado. ▪ This policy shall contain a Waiver of Subrogation on behalf of the Town of Parker. ▪ Evidence of qualified self-insured status may be substituted for the workers' compensation requirements. **Employer's Liability** shall have the following minimum coverages: ▪ $500,000 each accident ▪ $500,000 disease policy limit ▪ $500,000 disease each employee
	Commercial General Liability ▪ Must be on an Occurrence Form. ▪ This policy must not exclude or reduce coverage for mobile equipment, personal injury, property damage, blanket contractual, independent contractor, and death. ▪ Personal injury coverage must have the employee exclusion deleted. ▪ This policy shall contain a Waiver of Subrogation on behalf of the Town of Parker. **Commercial General Liability** shall have the following minimum coverages: ▪ $1 million each occurrence ▪ $2 million general aggregate
	Commercial Automobile Liability ▪ Includes hired and non-owned vehicles, if automobiles are used in the performance of Services under this Agreement. ▪ Must have a combined single limit for bodily injury and property damage. Minimum coverages: ▪ $1 million combined single limit per accident.
V	**Additional Terms**
	All deductibles or self-insured retentions ("SIRs") in excess of $5,000 must be listed on the certificate of insurance. The insurance requirements specified by the Town shall remain in effect for the full term of the Agreement and any extension thereof. Updated certificates of insurance shall be sent to the Town as necessary during the term of the Agreement and prior to any extension thereof.
	The Town reserves the right to reject any insurer it deems not financially acceptable on insurance industry resources. Property and liability insurance companies shall be licensed or approved to do business in Colorado and shall have an A.M. Best rating of not less than A-/VIII. Additionally, the Town reserves the right to reject any insurance with relatively large deductibles or SIRs, deemed by the Town to pose too high of a risk based on the size of the Contractor, financial status or rating of the Contractor, or based on the size or type of the project and exposure.
	Any deviations below the standards given above must be approved by the Town of Parker's Risk Manager.
VI	**Any subcontractors must meet the same insurance requirements for the Agreement unless the Risk Manager has approved a deviation in writing.**

CIP25-025 – Public Works Operation Center Decant Facility Expansion

BID SCHEDULE

DESCRIPTION	QUANTITY	UNIT	UNIT COST	COST
Mobilization	1	LS		
Unclassified Excavation and Site Work	1	LS		
Structural Concrete	1	LS		
Structural Steel	1	LS		
Steel Decking	1	LS		
Electrical and Lighting	1	LS		
F/A MINOR CONTRACT REVISIONS	1	F/A	$15,000	$15,000

TOTAL PROJECT BID =

TOTAL PROJECT BID WRITTEN IN WORDS:

THIS BID IS SUBMITTED BY:

BY (TITLE):

ADDRESS:

PHONE NUMBER:

Project Special Conditions

MEETINGS: Contractor shall conduct progress meetings with Owner. Frequency to be decided upon at project kickoff meeting. Contractor shall lead meeting and provide meeting agenda and minutes. Agenda should include items such as schedule updates, submittal logs, RFI logs, change management logs and any information necessary to administrate the project. Meeting shall be held on-site unless otherwise discussed.

ELECTRONIC DOCUMENTATION: All project RFIs, submittals, shop drawings, reports/logs, change order requests, change orders and payment applications shall be prepared and processed electronically.

PERMITS: The necessary building permit will be obtained by the Owner. No grading permit will be required for this project.

COORDINATION DURING CONSTRUCTION: This project is located within the laydown yard of the Town's Public Works Operations Center. Town employees will be using the surrounding areas as part of their daily work, so this construction site should be delinated and secured as necessary. While this site will be secured nightly along with the yard, the contractor is ultimately responsible for securing the work area as needed.

WORK HOURS: Permitted work hours for this project are as follows: Monday-Friday – 7:00 a.m. to 5:00 p.m. Extended hours or weekend hours will be considered on a case-by-case basis. Town will coordinate access to the site for any work hours approved outside of normal business hours.

CONTRACTOR'S SCHEDULE: The contractor shall prepare and submit a project schedule within ten (10) calendar days of being awarded the project. Contractor shall provide schedule updates at the regular meetings and with every monthly payment application.

SUBMITTALS AND SAMPLES: Contractor shall prepare and submit all product data, shop drawings and samples to the owner for their review and approval.

RFIs: Questions and clarifications concerning scope, drawings and specifications shall be submitted electronically to the owner's representative.

RECORD DRAWINGS: Contractor shall maintain a current set of construction drawings at the site at all times, and the drawings shall be red-lined during construction to reflect any field changes to the work. Contractor is responsible for creation of as-built drawings, for Town record, based on on-site red-lined drawings.

PUNCH LIST PROCESS: The contractor shall inspect and correct the work before requesting a formal punch walk by the Owner. Contractor will expeditiously correct punch list and notify the Owner when the rework is ready for re-inspection.

STAGING AREA: All materials, equipment, storage containers, port-o-lets shall be stored inside the construction fence and in a location approved by the owner.

PROTECTION OF EXISTING CONDITIONS: Contractor shall protect all elements within and adjacent to the project limits not scheduled for disturbance.

METHOD OF HANDLING TRAFFIC PLANS (MHTs) AND PUBLIC COORDINATION: All MHT's shall be submitted to the Town for review and written approval prior to implementing the plan. The MHT shall be updated if changes are necessary. The contractor is responsible to coordinate and receive approval from the Town of Parker Police and Parker Fire District for all MHTs if the roadway is to be closed for any length of time. The contractor is required to notify affected properties and meet with property owners and interested neighbors. Discussions with the property owners should include information regarding the work schedule and local impacts. Impacts including traffic, parking, dust, noise and landscaping should be discussed along with mitigation plans.

PUBLIC WORKS OPERATIONS CENTER – DECANT FACILITY EXPANSION
TOWN OF PARKER, COLORADO
CIP PROJECT NO. CIP25-025

The Colorado Department of Transportation's Standard Specifications for Road and Bridge Construction, dated 2025, controls construction of this project, except where non-standard specifications are provided for Section 033000 through Section 265619. The following Special Provisions supplement or modify the Standard Specifications and take precedence over the Standard Specifications and Plans.

PROJECT SPECIAL PROVISIONS

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NOTICE TO BIDDERS

The proposal guaranty shall be a certified check or cashier's check in the amount of 5% of the Contractor's total bid, or a bid bond in the same amount.

Pursuant to Subsections 102.04 and 102.05, it is recommended that bidders on this project review the work sites and plan details. Prospective bidders shall contact the following authorized Town of Parker representatives with any project specific questions.

Bid Questions:		Alex Mestdagh amestdagh@parkerco.gov
Town of Parker Project Manager:		Alex Mestdagh amestdagh@parkerco.gov
	Office Phone:	303-805-3204
	Address:	20120 E. Mainstreet Parker, CO 80138-7335
On-Site Project Manager:		TBD
	Cell Phone:	TBD

The above referenced individuals are the only representatives with authority to provide any information, clarification, or interpretation regarding the plans, specifications, and any other contract documents or requirements. Contact with any other employee of the Town of Parker or any other individuals regarding this project is not authorized. Any information obtained from anyone other than the authorized Town of Parker representatives shall be considered invalid in the preparation of a proposal for this project.

All references to the Colorado Division of Highways, Colorado Department of Transportation, and/or Department or Division shall also mean the Town of Parker.

COMMENCEMENT AND COMPLETION OF WORK

The Contractor shall commence work in accordance with the "Notice to Proceed" unless such time for beginning the work is changed by the Engineer in the "Notice to Proceed." The anticipated date of Notice to Proceed is November 18, 2026.

The Contractor shall complete all work on or before August 27, 2027, in accordance with the "Notice Proceed."

The Contractor shall develop and manage a CPM Project Schedule to plan, schedule, and report the progress of the work. The Project Schedule shall include all salient work items; salient work items shall be agreed to by the Town. The Project Schedule shall be submitted a minimum of two weeks prior to the Preconstruction meeting. The Town will not allow use of bar charts for the Project Schedule. An electronic copy of the Project Schedule in its original format as well as PDF shall be given to the Project Engineer. An updated schedule shall be included with each Pay Application.

REVISION OF SECTION 101 – DEFINITION OF TERMS

Technical Specifications related to construction materials and methods for the Work embraced under this Contract shall consist of the "Colorado Department of Transportation, Standard Specifications for Road and Bridge Construction" dated 2025.

Certain terms utilized in the Specifications referred to in the paragraph above shall be interpreted to have different meanings within the scope of this Contract. A summary of redefinitions follows:

Subsection 101.02:

"*Department*" shall mean the Town of Parker, Colorado.

"*Engineer*" or *"Owner"* shall mean the Engineer, Parker, Colorado or their designated

representative.

"*Laboratory*" shall mean Parker, Colorado or their designated representative.

"*Project Engineer*" shall mean the Engineer, Parker, Colorado, or their designated representative.

"*State*" shall mean Parker, Colorado (where applicable).

"Day" shall be interpreted as calendar day if is used without the reference "calendar" or "working" preceding it.

REVISION OF SECTION 102 – BIDDING REQUIREMENTS AND CONDITIONS

Section 102 of the Standard Specifications is hereby revised for this project as follows:

Subsection 102.03 shall include the following:

The bid price for all items quantified as Lump Sum (LS) shall include all work and materials, including any ancillary items not described in the plans, necessary to complete the work. All such items shall be considered subsidiary to the listed bid items, and no direct payment shall be made for these items.

Subsection 102.05 shall include the following:

After the proposals have been opened, the successful bidder may obtain from the Town of Parker, Project Engineer, at no cost: three (3) sets of half-size plans (11" by 17") and special provisions and updated electronic (pdf) plans and specifications (with addenda). Additional sets of plans and other available data may be purchased on a cash sale basis from the Town of Parker at current reproduction prices. Subcontractors and suppliers may obtain plans and other data from the successful bidder, or they may purchase copies on a cash sale basis from the Town of Parker at current reproduction prices.

The following information and data are available:

- "Geotechnical Engineering Study – Parker Maintenance Facility, Tammy Lane and Hess Road, Parker, Colorado", dated April 5, 2014, completed by HP Geotech, is available electronically (pdf) upon request.

REVISION OF SECTION 107 – LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

Section 107 of the Standard Specifications is hereby revised as follows:

107.02 Permits, Licenses, and Taxes.

Subsection 107.02 shall include the following:

Unless otherwise specified, the Contractor shall procure all permits and licenses; pay all charges, fees, and taxes, including permits procured for this project by others; and give all notices necessary and incidental to the due and lawful prosecution of the work. The costs of these permits will not be paid separately but shall be included in the work.

The Contractor and all subcontractors shall have an application to the Colorado State Department of Revenue for a certificate of exemption to permit the purchase of building materials for the construction of this project without payment of sales tax. Prior to the start of construction, the Contractor shall furnish copies of such certificates to the Town. Applications and certificates shall be on forms provided by the Department of Revenue.

The Contractor shall be responsible for obtaining a Storm Water Discharge permit from the State of Colorado, and any other permits required for this project.

The Contractor will be required to obtain a Town of Parker building permit and electrical permit prior to construction. These permits will be at no cost to the contractor.

107.07 Performance of Safety Critical Work.

The Contractor shall submit, for record purposes only, an initial detailed construction plan that addresses safe construction of each of the safety critical elements. When the specifications already require an erection plan, a bridge removal plan, or a removal of portion of bridge plan, it shall be included as a part of this plan. The detailed Construction Plan shall be submitted two weeks prior to the safety critical element conference described below. The construction plan shall be stamped "Approved for Construction" and signed by the Contractor. The construction plan will not be approved by the Engineer.

The Construction Plan shall include the following:

1. Safety Critical Element for which the plan is being prepared and submitted.
2. Contractor or subcontractor responsible for the plan preparation and the work.
3. Schedule, procedures, equipment, and sequence of operations, that comply with the working hour limitations
4. Temporary works required: falsework, bracing, shoring, etc.
5. Additional actions that will be taken to ensure that the work will be performed safely.
6. Names and qualifications of workers who will be in responsible charge of the work:

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LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

A. Years of experience performing similar work.

B. Training taken in performing similar work.

C. Certifications earned in performing similar work.

7. Names and qualifications of workers operating cranes or other lifting equipment

   A. Years of experience performing similar work.

   B. Training taken in performing similar work.

   C. Certifications earned in performing similar work.

8. The construction plan shall address how the Contractor will handle contingencies such as:

   A. Unplanned events (storms, traffic accidents, etc.)

   B. Structural elements that don't fit or line up.

   C. Work that cannot be completed in time for the roadway to be reopened to traffic.

   D. Replacement of workers who don't perform the work safely.

   E. Equipment failure

   F. Other potential difficulties inherent in the type of work being performed.

9. Name and qualifications of Contractor's person designated to determine and notify the Engineer in writing when it is safe to open a route to traffic after it has been closed for safety critical work.

10. Erection plan or bridge removal plan when submitted as required elsewhere by the specifications. Plan requirements that overlap with the above requirements may be submitted only once.

A safety critical element conference shall be held two weeks prior to beginning construction on each safety critical element. The Engineer, the Contractor, the safety critical element subcontractors, and the Contractor's Engineer shall attend the conference.

After the safety critical element conference and prior to beginning work on the safety critical element, the Contractor shall submit a final construction plan to the Engineer for record purposes only. The final construction plan shall be stamped "Approved for Construction" and signed by the Contractor.

The Contractor shall perform safety critical work only when the Engineer is on the project site. The Contractor's Engineer shall be on site to inspect and provide written approval of safety critical work for which he provided signed and sealed construction details. Unless otherwise directed or approved, the Contractor's Engineer need not be on site during the actual performance of safety critical work but shall be present to conduct inspection for written approval of the safety critical work.

When ordered by the Engineer, the Contractor shall immediately stop safety critical work that is being performed in an unsafe manner or will result in an unsafe situation for the traveling public. Prior to stopping work, the Contractor shall make the situation safe for work stoppage. The Contractor shall submit an

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REVISION OF SECTION 107
LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

acceptable plan to correct the unsafe process before the Engineer will authorize resumption of the work.

When ordered by the Engineer, the Contractor shall remove workers from the project that are performing the safety critical work in a manner that creates an unsafe situation for the public in accordance with subsection 108.06.

Should an unplanned event occur, or the safety critical operation deviate from the submitted plan, the Contractor shall immediately cease operations on the safety critical element, except for performing any work necessary to ensure worksite safety, and provide proper protection of the work and the traveling public. If the Contractor intends to modify the submitted plan, he shall submit a revised plan to the Engineer prior to resuming operations.

Nothing in the section shall be construed to relieve the Contractor from ultimate liability for unsafe or negligent acts or to be a waiver of the Colorado Governmental Immunity Act on behalf of the Department.

107.08 Public Convenience and Safety.

Subsection 107.08 shall include the following:

The Contractor shall provide information to the following public information services on a daily basis and throughout the duration of the project as follows:

The Contractor, at the pre-construction meeting, shall designate a contact person for the project. This individual shall be primarily responsible for maintaining communications with the Engineer and local businesses; providing detailed information regarding construction phasing on a regular basis to public agencies and private businesses potentially affected by the project; and provide weekly construction activity information for posting on the Town of Parker's website.

It is the Contractor's responsibility to be in contact daily with the organizations that provide emergency services that would be impacted during construction. At a minimum, the following agencies shall be coordinated with on a weekly basis (providing updated information related to traffic delays, road closures, and detours throughout the project duration).

Fire District: South Metro Fire Rescue Authority, Community Safety Services, Phone: (720) 989-2000

Police: Town of Parker Police, Attn: Joe Degenhart, Phone: (303) 841-9800

Agencies: Town of Parker Engineering/Public Works, Attn: Tracy Dersch, Phone: (303) 805-3332

A letter of introduction shall be delivered to the entities listed within this PSP or as directed by the Engineer a minimum of two (2) weeks before any revisions to public access due to phasing changes throughout the project duration. These letters shall include the following, at a minimum:

1. Contractor's name, address, phone number.
2. Field Superintendent's name and mobile phone number.

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REVISION OF SECTION 107
LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

3. Schedule of work including a schedule of phasing, detour plan and road closures.

The contractor shall be responsible for coordination with key stakeholder contacts within the project area that should be included in this distribution. The contractor shall also be responsible for updating and maintaining contact information.

The Contractor shall prepare a press release before commencing with construction activities that notifies the public of the project aspects including, but not limited to, the construction start date, construction activities, lane closures, etc.

The Contractor shall deliver monthly updates to the entities listed within this project special or as directed by the Engineer at each phase of the project throughout the construction period. These updates should contain information concerning temporary lane closures, cross street work, paving schedule, and other pertinent information that the landowners may need to know.

The Contractor shall coordinate with the Town in providing monthly updates regarding construction activities for the project to be posted on the Town of Parker website.

The Contractor shall not cut off access to any landowner or business for an extended period. The Contractor shall submit such access plans to the Engineer for approval and the Contractor is encouraged to obtain written agreements with the individual businesses and property owners regarding access.

All information shall be submitted to the Town for review a minimum of two (2) days prior to release. All costs incidental to the foregoing requirements will not be paid separately but shall be included in the work.

107.13 Protection and Restoration of Property and Landscape

Subsection 107.13 shall include the following:

The Contractor shall save all existing vegetation (including trees, shrubs, ground covers, grasses, wetlands & riparian) in this area, except for that vegetation, which must be removed to accommodate construction of the project, per the plans. Specific areas of vegetation to be protected shall be as directed by the Engineer and shall be protected by using orange construction fencing, wire fencing with metal posts or silt fence. Fencing for trees shall be installed at the drip line of the tree or as approved by the Engineer. Equipment shall not be installed or stockpiled material within 15 feet of existing trees to remain.

The Contractor shall perform all the work in such a manner that the least environmental damage will result. All questionable areas or items shall be brought to the attention of the Engineer for approval prior to removal or any damaging activity.

The Contractor shall promptly report any vegetation damaged or scarred during construction to the Engineer for assessment of damages. If vegetation within fenced areas is damaged or destroyed, it shall be replaced at the expense of the Contractor. Vegetation of replaceable size shall be replaced. The determination as to whether a plant is of replacement size or beyond will be made by the Engineer. When trees, shrubs beyond replaceable size or wetlands have been damaged or destroyed, the Contractor shall be liable for the appraised value based upon the official current publications. For trees and shrubs use the International Society of Arboriculture, Guide for Plant Appraisals. The Contractor shall pay any fines or jail time should a wetland

be damaged, at no cost to the project. A consulting Arborist retained by the Town will determine the value of the trees and shrubs. A consulting Wetland Specialist shall determine the value of the wetland or wetland species. This value and the arborist fee will be deducted from any money due to the Contractor. The value of such trees or shrubs will be based upon actual size, species, location, and condition.

If the fence is knocked down or destroyed by the Contractor, the Engineer will suspend the work, wholly or in part, until the fence is repaired to the Engineer's satisfaction at the Contractor's expense. Time lost due to such suspension will not be considered a basis for adjustment of time charges but will be charged as contract time.

PROJECT SPECIAL CONDITIONS

This project is subject to the following special conditions:

MEETINGS: Contractor shall conduct progress meetings with Owner. Frequency to be decided upon at project kickoff meeting. Contractor shall lead meeting and provide meeting agenda and minutes. Agenda should include items such as schedule updates, submittal logs, RFI logs, change management logs and any information necessary to administrate the project. Meeting shall be held on-site at the Public Works Operations Center.

ELECTRONIC DOCUMENTATION: All project RFIs, submittals, shop drawings, reports/logs, change order requests, change orders and payment applications shall be prepared and processed electronically.

PERMITS: The necessary building permit and electrical permit shall be obtained by the Contractor. No grading permit will be required for this project.

COORDINATION DURING CONSTRUCTION: This project is located within the laydown yard of the Town's Public Works Operations Center. Town employees will be using the surrounding areas as part of their daily work, so this construction site should be delineated and secured as necessary. While this site will be secured nightly along with the yard, the contractor is ultimately responsible for securing the work area as needed.

WORK HOURS: Permitted work hours for this project are as follows: Monday-Friday – 7:00 a.m. to 5:00 p.m. Extended hours or weekend hours will be considered on a case-by-case basis. Town will coordinate access to the site for any work hours approved outside of normal business hours.

CONTRACTOR'S SCHEDULE: The contractor shall prepare and submit a project schedule within ten (10) calendar days of being awarded the project. Contractor shall provide schedule updates at the regular meetings and with every monthly payment application.

SUBMITTALS AND SAMPLES: Contractor shall prepare and submit all product data, shop drawings and samples to the Owner for their review and approval.

RFIs: Questions and clarifications concerning scope, drawings and specifications shall be submitted electronically to the Owner.

RECORD DRAWINGS: Contractor shall maintain a current set of construction drawings at the site at all times, and the drawings shall be red-lined during construction to reflect any field changes to the work. Contractor is responsible for creation of as-built drawings, for Town record, based on on-site red- lined drawings.

PUNCH LIST PROCESS: The contractor shall inspect and correct the work before requesting a formal punch walk by the Owner. Contractor will expeditiously correct the punch list and notify the Owner when the rework is ready for re-inspection.

STAGING AREA: All materials, equipment, storage containers, port-o-lets shall be stored inside the construction fence and in a location approved by the Owner.

PROTECTION OF EXISTING CONDITIONS: Contractor shall protect all elements within and adjacent to the project limits not scheduled for disturbance.

REVISION OF SECTION 202 – REMOVAL OF STRUCTURES AND OBSTRUCTIONS

Section 202 of the Standard Specifications is hereby revised as follows:

Subsection 202.12 is hereby revised to include the following additional items:

No direct payment will be made for this item. All necessary removals shall be subsidiary to other items.

REVISION OF SECTION 203 – EXCAVATION AND EMBANKMENT

Section 203 of the Standard Specifications is hereby revised for this project as follows:

Subsection 203.02 (c) shall include the following:

(c) Material that is free of organics but has excessive moisture shall not be classified as unsuitable for embankment material due to the presence of excessive water. The classification of material as unsuitable for embankment material shall be made by the Engineer. It shall be the Contractor's responsibility to satisfy the moisture condition specified in the Contract Documents for embankment material.

In Subsection 203.02, add the following subsection:

(g) *Subgrade* is defined as follows:
- Top of embankment material in areas not receiving aggregate base course.
- Bottom of aggregate base course where designated.

Subsection 203.05 Excavation, is hereby revised to include the following:

Ground surfaces shall be scarified to a depth of 12 inches, moisture conditioned and compacted prior to placement of fill. After compaction of scarified surfaces, a proof roll shall be conducted.

(c) The Engineer shall determine if excavated material shall be considered unsuitable for embankment material. Mitigation for unsuitable materials shall be evaluated by the Contractor and submitted for approval by the engineer before work begins. Alternative stabilization methods may be considered. Alternative stabilization must be approved by the Engineer prior to work.

In Subsection 203.05, (f) *Potholing*, add the following to the second paragraph:

Electronic (pdf) records of the potholed and surveyed utilities shall be submitted to the Engineer.

Subsection 203.12 shall include the following:

It is the Contractor's responsibility to construct the project to the lines and grades as shown on the plans. Additional embankment and excavation may be necessary and shall include import, export or hauling required to complete the work. This additional work will not be paid for separately but shall be included in the cost of the Unclassified Excavation and Site Work.

Unsuitable Materials shall include all stabilization labor and materials needed to complete the work.

The contract unit price for Unclassified Excavation and Site Work shall be full compensation for all work necessary to complete the item including construction of embankments, unclassified excavation, compaction, moisture control, subgrade preparation, proof rolling, loading and exporting excess and unsuitable materials, hauling, dumping, any fees associated with such activities, finish grading, and restoration of disturbed areas where necessary.

Payment will be made under:

Pay Item	**Pay Unit**
Unclassified Excavation and Site Work	Lump Sum

REVISION OF SECTION 208 – EROSION CONTROL

Section 208 of the Standard Specifications is hereby revised for this project to include the following:

Subsection 208.01 is hereby revised to include the following:

When a provision of Section 208 or as directed by the Engineer requires that an action be "immediate" or "initiated / taken immediately", it shall be understood that the Contractor shall at once begin effecting completion of the action and pursue it to completion in a manner acceptable to the Engineer and in accordance with the Town of Parker Construction Best Management Practices (CBMP), General Notes and Details and associated Grading Permit and the Colorado Discharge Permit System (CDPS) Stormwater Construction Permit (SCP) as required.

Subsection 208.02 is hereby revised to include the following:

Materials used for the construction of all erosion and sediment control measures (CM) shall conform to the materials specified in the Town "CBMP General Notes and Details," as shown in the plans and available online.

Subsection 208.03 is hereby revised to include the following:

Prior to construction, an on-site Preconstruction Conference shall be held. The Conference shall be attended by the Engineer, Town Inspector, Project Superintendent, the Contractor's Erosion Control Supervisor (ECS) and any subcontractor involved in the initial work on the Project that could adversely affect water quality.

Prior to construction, the Contractor shall initiate the initial erosion control measures in accordance with the CBMP Plans. The Town will conduct all CBMP inspections. The Town will allow work to proceed based on successful implementation determined by the Town CBMP Inspector of the necessary initial CM's. A CBMP plan provided by the Contractor shall be updated by the Contractor throughout construction to reflect current site conditions.

The Contractor shall anticipate the need to accommodate surface water flowing into and out of the project site during construction and the need to provide dewatering for excavation operations. Any equipment or excavation required for dewatering shall be located within the Project limits unless otherwise approved by the Owner.

The work of this section includes controlling groundwater, site drainage and storm flows during construction. All work required accommodating surface water, ground water and control erosion shall be in conformance with the requirements of all applicable federal, State, and local regulations and permits, including any applicable permits listed in Section 107.25 of these special provisions.

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REVISION OF SECTION 208
EROSION CONTROL

This Project is subject to a permit with the CDPHE for Stormwater Discharges Associated with Construction Activities. The permit shall be obtained by the Contractor. The Contractor shall prepare all applications and supporting documentation required and submit them to the Town for application compliance review and approval prior to submitting to CDPHE. The Town will be a co-permittee on the CDPS SCP from the CDPHE. The Contractor is responsible for all application permit fees. Surface water control generally falls into the following categories:

(1) Normal low flows along the channel.
(2) Storm/flood flows along the channel.
(3) Flows from existing storm drain pipelines.
(4) Local surface inflows not conveyed by pipelines.

At a minimum, the Contractor shall be responsible for diverting the quantity of surface flow around the construction area, so that the excavations will remain free of surface water for the time it takes to install these materials and the time required for curing of any concrete or grout.

The Contractor is cautioned that the minimum quantity of water to be diverted is for erosion control and construction purposes and not for general protection of the construction site. It shall be the Contractor's responsibility to determine the quantity of water which shall be diverted and control measures needed to protect the work from damage caused by storm water.

The Contractor shall conduct operations in such a manner that storm or other waters may proceed uninterrupted along their existing drainage courses. By submitting a bid, the Contractor acknowledges that they have investigated the risk arising from such waters, has prepared their bid accordingly and assumes all of said risk.

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REVISION OF SECTION 208
EROSION CONTROL

This Project may be subject to a "Construction Dewatering Permit" with the CDPHE for dewatering associated with construction activities. The permit shall be obtained by the Contractor. The Contractor shall prepare all applications and supporting information required and submit them to the Town for application compliance review and approval prior to submittal to the CDPHE. The Contractor shall submit a copy of certification of the permit to the Engineer at least three (3) days prior to the start of any dewatering activities. The Contractor is responsible for all application permit fees. The Contractor shall install adequate measures to maintain the level of groundwater a minimum of two (2) feet below the foundation subgrade elevation and maintain sufficient bearing capacity for all structures, pipelines, utilities, earthwork and rock work. Such measures may include, but are not limited to, installation of perimeter subdrains, pumping from drilled holes or by pumping from sumps excavated below the subgrade elevation. Dewatering from within the foundation excavations shall not be allowed. The foundation bearing surfaces are to be kept dewatered and stable until the structures or other types of work are complete and backfilled. Disturbance of foundation subgrade by Contractor operations shall not be considered as originally unsuitable foundation subgrade and shall be repaired at Contractor's expense. Any temporary dewatering trenches, settlement ponds or well points shall be restored following dewatering operations to reduce permeability in those areas as approved by the Engineer.

All excavations made as part of dewatering operations shall be backfilled with the same type of material as was removed and compacted to ninety five percent (95%) of Maximum Standard Proctor Density (ASTM D698), except where replacement by other materials and/or methods are required and have been approved by the Engineer.

At no time during construction shall the Contractor affect existing surface or subsurface drainage patterns of adjacent property. Any damage to adjacent property resulting from the Contractor's alteration of surface or subsurface drainage patterns shall be the Contractor's responsibility and shall be repaired by the Contractor at no additional cost to owner.

The Contractor shall remove all temporary water control facilities when they are no longer needed or at the completion of the Project. Pumps and generators used for dewatering and water control shall be quiet equipment enclosed in sound deadening devices, unless the Engineer agrees that the quieter equipment isn't needed in isolated instances.

The ECS shall read, be familiar with, and use the information provided in the Town's Construction Best

Subsection 208.03(c) is hereby revised to include the following:

The first paragraph shall include the following:

The ECS shall read, be familiar with, and use the information provided in the Town's Construction Best Management Practices General Notes and Details and the CDPS-SCP.

Delete Item (14) and replace with the following:

(14) The ECS shall cross out all CMs that do not apply or highlight those details and notes on the Town's CBMP General Notes and Details that apply to the Project. The ECS shall write an explanation as to why the detail has been removed or what is being used instead as a CM ("not applicable" is not an acceptable explanation).

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REVISION OF SECTION 208
EROSION CONTROL

Delete the paragraphs following item (16) and replace with the following:

Spills, leaks or overflows that result in the discharge of pollutants shall be documented and records maintained by the ECS. The ECS shall record the time and date, weather conditions, reasons for spill, etc. The ECS shall immediately report any spills, leaks or overflows to the Engineer. Some spills may need to be reported to the CDPHE Water Quality Control Division immediately.

The ECS shall report to CDPHE Water Quality Division and the Engineer the following instances of noncompliance:

1. Noncompliance which may endanger health or the environment;
2. Spills or discharge of hazardous substance or oil, which may cause pollution of the waters of the State;
3. Discharge of stormwater, which may cause an exceedance of a water quality standard.

For all instances of noncompliance based on environmental hazards and chemical spills and releases, all needed information shall be provided orally to the CDPHE and on the Environmental Spill Reporting Line (1.877.518.5608) within 24 hours from the time the permittee becomes aware of the circumstance. For all instances of noncompliance identified here, a written submission shall also be provided within five calendar days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of:

1) The noncompliance and its cause;
2) The period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue;
3) Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

After measures to properly correct any deficiencies have been completed and properly recorded, or when a report does not identify incidents of noncompliance, the report shall be signed indicating the site is in compliance.

Subsection 208.03(d), first paragraph, is hereby revised to include the following:

Should discrepancies arise among the CDOT Erosion Control and Stormwater Quality Guide, the CDOT Erosion Control and Stormwater Quality Field Guide and the Towns CBMP General Notes and Details, the Town's CBMP General Notes and Details shall take precedence.

Subsection 208.03(d) is hereby revised to include the following:

1) Reference Materials shall include the following:

    (4) Town of Parker Construction Best Management Practices (CBMP) General Notes and Details

Subsection 208.04(b) is hereby revised to include the following:

The Project is subject to inspections by the Town, CDPHE, U.S. Army Corps of Engineers (USACE) and the Environmental Protection Agency (EPA) at any time. The Contractor shall immediately notify the Engineer when an inspection is scheduled. If and when the Town, the CDPHE, the USACE or the EPA reviews the project site and requires additional measures to prevent and control erosion, sediment or pollutants, then the Contractor shall cease and desist activities resulting in pollutant discharge; and the

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REVISION OF SECTION 208
EROSION CONTROL

Contractor shall immediately inform the Engineer of what transpired and ask for additional direction on implementing the additional measures requested by one or more of these agencies mentioned above.

Subsection 208.04(f) is hereby revised to include the following:

Streets, highways and other paved areas shall be kept clean throughout the life of the Project. In the event of accidental tracking of mud on streets, the ECS shall notify the Engineer immediately, and the mud shall be removed immediately using a vacuum-type street sweeper, a brush-type street sweeper with dust control, or manually using shovels and brooms. If a large quantity of mud needs to be removed, initial removal may take place using a small road grader or loader, but care shall be exercised to avoid damage to the roadway. Any damage shall be repaired at the Contractor's expense. Streets shall not be washed with water under any circumstance. Streets and roads with gravel surfaces shall be free from mud and debris from construction sites, and any mud or debris will be removed manually using shovels. Street cleaning will not be paid for separately but shall be included in the work.

Where CMs have failed, resulting in noncompliance, including CMs that have been identified as noncompliant during Town CBMP inspections, the ECS shall contact the Engineer immediately in order to (1) discuss the ECS recommendations to ensure the failed CMs are repaired or replaced as soon as possible (immediately in most cases) in order to minimize the discharge of pollutants; and (2) for the Engineer to authorize any additional expenditures. Following the implementation, in addition to completing the daily log, the ECS shall update both the CBMP Plans and SWMP Notebook by describing and recording new and replacement CMs.

The Contractor shall be responsible for the control of noxious weeds throughout the life of the Project in accordance with the Town's CBMP General Notes and Details. The Contractor shall follow all maintenance requirements in accordance with Town CBMP General Notes and Details.

Subsection 208.05 is hereby revised to include the following:

CMs shall be constructed in accordance with the Town CBMP General Notes and Details.

Delete Subsection 208.11 and replace with the following:

The CBMP CMs for this project, including replacements as approved by the Engineer, will not be paid directly and will be considered subsidiary to other items.

In the case of repeated failures on the part of the Contractor in controlling erosion, sedimentation, and/or water pollution, the Engineer reserves the right to employ outside assistance or to use Town forces to provide the necessary corrective measures. Such incurred direct costs, plus Engineering cost, will be charged to the Contractor, and appropriate deduction will be made from the Contractor's monthly progress estimate.

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REVISION OF SECTION 208
EROSION CONTROL

Subsection 208.12 is hereby revised to include the following:

No direct payment will be made for Erosion Control items. All necessary work shall be subsidiary to other items.

After Final Acceptance, payment for monthly inspections, removal of temporary CMs and re-seeding and mulching will not be paid for separately but shall be included in the work. The Contractor is responsible for removal of temporary erosion control features as directed by the Engineer. The Contractor shall anticipate this removal work to likely occur after the minimum growth requirements are met. All sediment removal is incidental to this work.

Inspections for the Erosion control measures shall be made according to Town CBMP, required Town permits and CDPHE SCP with the Town CBMP Inspector, the Engineer, and the Contractor. Once a deficiency report is issued by the Engineer, the Contractor must address the repairs/replacement and additional erosion control measures within two days in preparation for re-inspection.

REVISION OF SECTION 209 – WATERING & DUST PALLIATIVES

Section 209 of the Standard Specifications is hereby revised for this project as follows:

In Subsection 209.07, delete the first paragraph and replace with the following:

Water will not be measured but shall be included in the work.

In Subsection 209.08, delete the third paragraph and replace with the following:

Water required for all items of work, including dust control, will not be paid for separately, but shall be included in the work.

Any irrigation disruptions to existing landscaped areas shall be hand watered by the Contractor at the Contractor's expense. This will not be measured or paid for separately but included in the work.

REVISION OF SECTION 625 – CONSTRUCTION SURVEYING

Subsection 625 of the Standard Specifications shall include the following:

Subsection 625.11 shall include the following:

The Contractor shall maintain on the project a current set of "as constructed" plans. Upon completion of the work, the "as constructed" plans shall be turned over to the Engineer.

"As constructed" plans shall be electronic submittal, both AutoCAD and pdf, and files shall be in the same coordinate system as the project survey.

These "as constructed" plans shall show the actual location and dimensions of all work items on modified plan sheets. All modifications shall also be shown on the "As Constructed" plans. Locations will be indicated by ties to property lines.

Locations will be indicated by ties to features easily identified in the field, such as curb lines, edge of pavement, pole lines, etc. Location ties shall be of an accuracy suitable to field locate pipes in the future, typically ± 12 inches.

"As constructed" plans for storm sewer work shall be sealed by a Colorado Registered Professional Engineer (P.E.) or Professional Land Surveyor (L.S.).

Subsection 625.13 shall include the following:

Payment for the above requirements will not be made separately but shall be subsidiary to other items.

REVISION OF SECTION 626 – MOBILIZATION

Section 626 of the Standard Specifications is hereby revised for this project as follows:

Subsection 626.01 is hereby revised to include the following:

Multiple mobilizations may be necessary to complete the various disciplines included in the project.

No separate measurement and payment shall be made for additional mobilization(s) required to complete the work.

FORCE ACCOUNT ITEMS

DESCRIPTION

This Special Provision contains the Town's estimate for force account item included in the Contract. The estimated amount marked with an asterisk will be added to the total bid to determine the amount of the performance and payment bonds. Force Account work shall be performed as directed by the Owner.

BASIS OF PAYMENT

Payment will be made in accordance with Subsection 109.04. Payment will constitute full compensation for all work necessary to complete the item.

Item No.	Force Account Item Quantity		Est. Amount
7	F/A Minor Contract Revisions	F/A	$ 15,000*

Force Account Descriptions:

F/A Minor Contract Revisions – This work consists of minor work authorized and approved by the Engineer, which is not included in the Contract drawings or specifications and is necessary to accomplish the scope of work of this Contract.

UTILITIES

GENERAL

Utilities are depicted on these plans in accordance with their achieved "Quality Levels" as defined in the American Society of Civil Engineers' document ASCE 38, "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data." The Contractor's attention is directed to subsection 105.11 of the Standard Specifications concerning utilities.

The locations of utility facilities, as shown on the plan and profile sheets, were obtained from the best available information. No warranty is made for the adequacy or accuracy of the subsurface information provided. The Contractor shall cooperate with the utility owners in their relocation operations.

The Contractor shall comply with Article 1.5 of Title 9, CRS ("Excavation Requirements") when excavating or grading is planned around underground utility facilities. The Contractor shall contact UNCC at **811** or **1-800-922-1987**, to have locations of UNCC registered lines marked by member companies. All other underground facilities shall be located by contacting the respective owner. Utility service laterals shall also be found before beginning excavation or grading.

The Contractor shall notify all affected utilities at least two (2) business days before commencing such operations, not including the actual day of notice, unless otherwise noted, so that the utility company can provide an inspector and complete any necessary adjustments or relocations.

All costs incidental to the preceding requirements will not be paid separately but shall be included in the work. Known utilities within the limits of this project are:

UTILITY ADDRESS	CONTACT NAME EMAIL	TELEPHONE
CORE Electric 5496 US-85, Sedalia, CO 80135	Brooks Kaufman BKaufman@core.coop	(303)-912-0765
Parker Water and Sanitation District 18100 E. Woodman Drive Parker, CO 80134	Robert Ramsey RRamsey@pwsd.org	(720) 842-4260
Town of Parker 20120 E. Mainstreet Parker, CO 80138	Michael Grabczyk mgrabczyk@parkerco.gov	(303) 805-3209
Xcel Energy – Gas 2070 S Valentia St Denver 80231	Denise Gabaldon Denise.cartahena@xcelenergy.com	(303)-671-3830

In no way shall the contents of this utility specification contradict the Town of Parker Standards and Criteria. Any discrepancies identified by the Contractor shall be brought to the attention of the Project Engineer for clarification and resolution. All construction work shall adhere to the best practices and guidelines mandated by the Town of Parker.

If a need for utility work by either the Contractor or a utility company arises, the following shall apply: The Contractor shall coordinate the adjustment of utilities on this project. The Contractor shall keep each utility company advised of any work being performed in the vicinity of their facilities so that each utility company can coordinate any needed locates, adjustments, or inspections. The contractor shall provide the appropriate utility company ample notice, but not less than two (2) weeks, before commencing activities in the vicinity of their facilities. Any additional work performed by the Contractor on behalf of the impacted

utility company shall not be paid for by the Town of Parker but shall be paid by the utility company requiring the work unless otherwise agreed to in writing by the Engineer.

Project Limits – All Utility Owners
The Contractor shall identify existing utilities by potholing and protecting the existing buried utilities when constructing the project, including sub-excavation work. If existing utilities are within close proximity horizontally or vertically, the Contractor shall alter the sub-excavation work limits, construction methods, or equipment to avoid impacting existing utilities.

All new underground facilities, including laterals up to the structure or building being served, installed as part of this project must be electronically locatable when installed, in compliance with Colorado Revised Statutes, Title 9, Article 1.5.

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.2 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. W/C Ratio: The ratio by weight of water to cementitious materials.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
   1. Contractor's superintendent.
   2. Independent testing agency responsible for concrete design mixtures.
   3. Ready-mix concrete manufacturer.
   4. Concrete Subcontractor.

B. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, methods for achieving specified floor and slab flatness and levelness, concrete repair procedures, and concrete protection.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Steel Reinforcement Shop Drawings: Placing 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. Construction Joint Layout: Indicate proposed construction joints required to construct the structure. Location of construction joints is subject to approval of the Architect.

E. Buy America Product Compliance Documentation

1. Certificates or Proof of Compliance.

1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Form materials and form-release agents.
4. Steel reinforcement and accessories.
5. Waterstops.
6. Curing compounds.
7. Vapor retarders.
8. Semirigid joint filler.
9. Joint-filler strips.

B. Material Test Reports: For the following, from a qualified testing agency:
1. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

C. Minutes of preinstallation conference.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

B. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

1.8 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301 (ACI 301M).
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. 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 (ACI 301M) and ACI 305.1 (ACI 305.1M), and as follows:

1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
   1. ACI 301 (ACI 301M).
   2. ACI 117 (ACI 117M).

2.2 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
   1. Plywood, metal, or other approved panel materials.
   2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
      a. High-density overlay, Class 1 or better.
      b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
      c. Structural 1, B-B or better; mill oiled and edge sealed.
      d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

D. Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to resist plastic concrete loads without detrimental deformation.

E. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.

F. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.

G. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

H. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
   1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

I. Form Ties: Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
   1. Furnish units that leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
   2. Furnish ties that, when removed, leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.
   3. Furnish ties with integral water-barrier plates to walls indicated to receive damp-proofing or waterproofing.

2.3 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.

C. Epoxy-Coated Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), epoxy coated, with less than 2 percent damaged coating in each 12-inch (300-mm) bar length.

D. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from as-drawn steel wire into flat sheets.

2.4 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut true to length with ends square and free of burrs.

B. Epoxy-Coated Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, ASTM A 775/A 775M epoxy coated.

C. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating; compatible with epoxy coating on reinforcement and complying with ASTM A 775/A 775M.

D. Zinc Repair Material: ASTM A 780/A 780M.

E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
   1. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
   2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
   3. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

2.5 CONCRETE MATERIALS

A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

B. Cementitious Materials:
   1. Portland Cement: ASTM C 150/C 150M, Type I/II
   2. Fly Ash: ASTM C 618, Class F or C.

3. Slag Cement: ASTM C 989/C 989M, Grade 100 or 120.
4. Blended Hydraulic Cement: Type IL, portland-limestone Cement.
5. Silica Fume: ASTM C 1240, amorphous silica.

C. Normal-Weight Aggregates: ASTM C 33/C 33M, or as specified in contract documents.

D. Air-Entraining Admixture: ASTM C 260/C 260M.

E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
1. Retarding Admixture: ASTM C 494/C 494M, Type B.
2. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
3. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
4. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
5. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

F. 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 C 494/C 494M, Type C.

G. 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.

H. Water: ASTM C 94/C 94M

2.6 WATERSTOPS

A. Flexible PVC Waterstops: CE CRD-C 572, with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

B. Reference Structural Drawings for additional types of waterstops.

2.7 VAPOR RETARDERS

A. Sheet Vapor Retarder: Polyethylene sheet, ASTM D 4397, not less than 10 mils (0.25 mm) thick, unless otherwise specified on the contract documents.

2.8 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. (305 g/sq. m) when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.

G. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

2.9 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, 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 according to ASTM D 2240.

C. Bonding Agent: ASTM C 1059/C 1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements.

2.10 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, according to ACI 301 (ACI 301M).
1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

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. Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
1. Fly Ash: 25 percent.
2. Combined Fly Ash and Pozzolan: 25 percent.
3. Slag Cement: 50 percent.
4. Combined Fly Ash or Pozzolan and Slag Cement: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
5. Silica Fume: 10 percent.
6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
7. Combined Fly Ash or Pozzolans, Slag Cement, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

C. Admixtures:
1. Use water-reducing, high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
2. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

D. 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.

2.11 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Drilled-Piers: Normal-weight concrete.
   1. Minimum Compressive Strength: As indicated.
   2. Maximum W/C Ratio: As indicated.
   3. Slump Limit: As required.
   4. Air Content: As indicated.

B. Foundation Walls: Normal-weight concrete.
   1. Minimum Compressive Strength: As indicated.
   2. Maximum W/C Ratio: As indicated.
   3. Slump Limit: As required.
   4. Air Content: As indicated.

C. Slabs-on-Grade: Normal-weight concrete.
   1. Minimum Compressive Strength: As indicated.
   2. Maximum W/C Ratio: As indicated.
   3. Slump Limit: As required.
   4. Air Content: As indicated.

2.12 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.13 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M, and furnish batch ticket information.
   1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301 (ACI 301M), to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 (ACI 117M).

C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
   1. Class A, 1/8 inch for smooth-formed finished surfaces.
   2. Class B, 1/4 inch for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
   1. Install keyways, reglets, recesses, and the like, for easy removal.
   2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEM INSTALLATION

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. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
   2. 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. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.
   1. Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
   2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material are not acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 VAPOR-RETARDER INSTALLATION

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
   1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.

B. Bituminous Vapor Retarders: Place, protect, and repair bituminous vapor retarder according to manufacturer's written instructions.

3.5 STEEL REINFORCEMENT INSTALLATION

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
   1. Do not cut or puncture vapor retarder. 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.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
   1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded-wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

F. Epoxy-Coated Reinforcement: Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.

G. Zinc-Coated Reinforcement: Repair cut and damaged zinc coatings with zinc repair material according to ASTM A 780/A 780M. Use galvanized-steel wire ties to fasten zinc-coated steel reinforcement.

3.6 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. 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. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
   2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
   3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
   4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.

5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: 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.
2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) 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: 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.

3.7 WATERSTOP INSTALLATION

A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.

B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.8 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301 (ACI 301M).
1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. 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. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
   1. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
   2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301 (ACI 301M).
   3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. 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.

E. 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. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
   2. Maintain reinforcement in position on chairs during concrete placement.
   3. Screed slab surfaces with a straightedge and strike off to correct elevations.
   4. Slope surfaces uniformly to drains where required.
   5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

3.9 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
   1. Apply to concrete surfaces where indicated on Architectural drawings.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
   1. Apply to concrete surfaces where indicated on Architectural drawings.

C. Rubbed Finish: Apply the following to smooth-formed-finished as-cast concrete where indicated:
   1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
   2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix 1 part portland cement to 1-1/2 parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces. 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.
   3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix 1 part portland cement and 1 part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches, so color of dry

grout matches adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.10 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch (6 mm) in one direction.
1. Apply scratch finish to surfaces indicated.

C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.
1. Apply float finish to surfaces indicated.

D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
1. Apply a trowel finish to surfaces indicated and exposed to view.
2. Finish surfaces to the following tolerances, according to ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface:
   a. Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.
3. Finish and measure surface, so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- (3.05-m-) long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/4 inch.

E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated. While concrete is still plastic, slightly scarify surface with a fine broom.
1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.11 MISCELLANEOUS CONCRETE ITEM INSTALLATION

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. 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, and extend base not less than 6 inches (150 mm) in each direction beyond the maximum dimensions of supported equipment unless otherwise.
3. Minimum Compressive Strength: 3000 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. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
7. Cast anchor-bolt insert into bases. Install anchor bolts to elevations required for proper attachment to supported equipment.

3.12 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 305.1 (ACI 305.1M) for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:.
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 (300-mm) lap over adjacent absorptive covers.
2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
   a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.

b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies does not interfere with bonding of floor covering used on Project.

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.

3.13 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
1. Defer joint filling until concrete has aged at least one month. 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 (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.14 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

3.15 FIELD QUALITY CONTROL.

A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

C. Inspections:
1. Steel reinforcement placement.
2. Steel reinforcement welding.
3. Headed bolts and studs.
4. Verification of use of required design mixture.
5. Concrete placement, including conveying and depositing.
6. Curing procedures and maintenance of curing temperature.
7. Verification of concrete strength before removal of shores and forms from beams and slabs.

D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.
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.

3. Slump: ASTM C 143/C 143M; 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.
4. Air Content: ASTM C 231/C 231M, pressure method, for normal-weight concrete; ASTM C 173/C 173M, volumetric method, for structural lightweight concrete; 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 C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below or 80 deg F (27 deg C) and above, and one test for each composite sample.
6. Unit Weight: ASTM C 567/C 567M, fresh unit weight of structural lightweight concrete; 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 C 31/C 31M.
    a. Cast and field cure or laboratory cure two sets of two standard cylinder specimens for each composite sample.
8. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
    a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
    b. 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 (3.4 MPa).
11. 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.
12. 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.
13. 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. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

END OF SECTION 033000

SECTION 051200 - STRUCTURAL STEEL FRAMING

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. Structural steel.
2. Grout.

B. Related Requirements:

1. Section 053100 "Steel Decking" for field installation of shear connectors through deck.

1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

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: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include embedment Drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.

C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint whether prequalified or qualified by testing.

D. Delegated-Design Submittal: For structural-steel connections indicated to comply with design loads, include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, fabricator, shop-painting applicators, professional engineer, and testing agency, if applicable.

B. Welding certificates.

C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

D. Mill test reports for structural steel, including chemical and physical properties.

E. Product Test Reports: For the following:

1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
2. Direct-tension indicators.
3. Shop primers.
4. Nonshrink grout.

F. Source quality-control reports.

G. Field quality-control and special inspection reports.

1.7 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.

B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE, unless pre-approved otherwise.

C. Shop-Painting Applicators: Qualified according to AISC's Sophisticated Paint or to SSPC-QP 3, "Standard Procedure for Evaluating Qualifications of Shop Painting Applicators."

D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.

E. Comply with applicable provisions of the following specifications and documents:

1. AISC 303.
2. AISC 341 and AISC 341s1.

3. AISC 360.
4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
2. Clean and relubricate bolts and nuts that become dry or rusty before use.
3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator.

1. Select and complete connections using schematic details indicated and AISC 360.

B. Moment Connections: as shown on the structural documents.

2.2 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A 992/A 992M

B. Channels, Angles , M-Shapes: ASTM A 36/A 36M.

C. Plate and Bar: ASTM A 36/A 36M, unless noted otherwise.

D. Corrosion-Resisting Structural-Steel Shapes, Plates, and Bars: ASTM A 588/A 588M, Grade 50 (345).

E. Cold-Formed Hollow Structural Sections: ASTM A 500/A 500M, Grade C, structural tubing.

F. Corrosion-Resisting, Cold-Formed Hollow Structural Sections: ASTM A 847/A 847M, structural tubing.

G. Steel Pipe: ASTM A 53/A 53M, Type E or Type S, Grade B.

1. Weight Class: as noted.
2. Finish: Galvanized.

H. Steel Castings: ASTM A 216/A 216M, Grade WCB with supplementary requirement S11.

I. Steel Forgings: ASTM A 668/A 668M.

J. Welding Electrodes: Comply with AWS requirements.

2.3 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 3, heavy-hex steel structural bolts; ASTM A 563, Grade C3, (ASTM A 563M, Class 8S3) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers; all with plain finish.

1. Direct-Tension Indicators: ASTM F 959, Type 325 (ASTM F 959M, Type 8.8), compressible-washer type with plain finish.

B. High-Strength Bolts, Nuts, and Washers: ASTM A 490 (ASTM A 490M), Type 3, heavy-hex steel structural bolts or tension-control, bolt-nut-washer assemblies with splined ends; ASTM A 563, Grade DH3, (ASTM A 563M, Class 10S3) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 3, hardened carbon-steel washers with plain finish.

1. Direct-Tension Indicators: ASTM F 959, Type 490 (ASTM F 959M, Type 10.9), compressible-washer type with plain finish.

C. Zinc-Coated High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade DH (ASTM A 563M, Class 10S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers.

1. Finish: Hot-dip or mechanically deposited zinc coating.
2. Direct-Tension Indicators: ASTM F 959, Type 325 (ASTM F 959M, Type 8.8), compressible-washer type.

D. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex or round head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.

1. Finish: Plain, unless noted otherwise.

E. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.

F. Anchor Rods: ASTM F 1554, Grade 36 or ASTM F 1554, Grade 55, weldable as indicated on the structural documents.

1. Configuration: Straight.
2. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
3. Plate Washers: ASTM A 36/A 36M carbon steel.
4. Washers: ASTM F 436 (ASTM F 436M), Type 3, hardened carbon steel.
5. Finish: Plain, unless noted otherwise.

G. Threaded Rods: ASTM A 36/A 36M.

1. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
2. Washers: ASTM A 36/A 36M carbon steel.
3. Finish: Plain, unless noted otherwise.

H. Clevises and Turnbuckles: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1035.

I. Eye Bolts and Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1030.

J. Sleeve Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1018.

2.4 PRIMER

A. Galvanizing Repair Paint: ASTM A 780/A 780M.

2.5 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, non-metallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.6 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.

1. Camber structural-steel members where indicated.
2. Fabricate beams with rolling camber up.
3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
4. Mark and match-mark materials for field assembly.
5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 1, "Solvent Cleaning", SSPC-SP 2, "Hand Tool Cleaning", or SSPC-SP 3, "Power Tool Cleaning". Clean surfaces to primer and/or paint manufacturer requirements.

F. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

G. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.

3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.7 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened, unless noted otherwise.

B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M where applicable for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.8 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.

1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
2. Galvanize all steel elements.

2.9 SOURCE QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform shop tests and inspections.

1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.

B. Bolted Connections: Inspect shop-bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

C. Welded Connections: Visually inspect shop-welded connections according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

1. Liquid Penetrant Inspection: ASTM E 165.
2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
3. Ultrasonic Inspection: ASTM E 164.
4. Radiographic Inspection: ASTM E 94.

D. In addition to visual inspection, test and inspect shop-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:

1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
2. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.

E. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

B. Baseplates and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Weld plate washers to top of baseplate.
3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated.

F. Do not use thermal cutting during erection, unless pre-approved.

G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

B. Weld Connections: Comply with AWS D1.1/D1.1M, and AWS D1.8/D1.8M where indicated, for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or runoff tabs where indicated, back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," for mill material.

3.5 PREFABRICATED BUILDING COLUMNS

A. Install prefabricated building columns to comply with AISC 360, manufacturer's written recommendations, and requirements of testing and inspecting agency that apply to the fire-resistance rating indicated.

3.6 FIELD QUALITY CONTROL

A. Special Inspections: Engage a qualified special inspector to perform the following special inspections:

1. Verify structural-steel materials and inspect steel frame joint details.
2. Verify weld materials and inspect welds.
3. Verify connection materials and inspect high-strength bolted connections.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

C. Bolted Connections: Inspect bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

D. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.

1. In addition to visual inspection, test and inspect field welds according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

a. Liquid Penetrant Inspection: ASTM E 165.
b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
c. Ultrasonic Inspection: ASTM E 164.
d. Radiographic Inspection: ASTM E 94.

3.7 REPAIRS AND PROTECTION

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 051200

SECTION 053100 - STEEL DECKING

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. Roof deck.

B. Related Requirements:

1. Section 051200 "Structural Steel Framing" for shop- and field-welded shear connectors.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of deck, accessory, and product indicated.

B. Shop Drawings:

1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

1.4 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Product Certificates: For each type of steel deck.

C. Product Test Reports: For tests performed by a qualified testing agency, indicating that each of the following complies with requirements:

1. Power-actuated mechanical fasteners.

D. Evaluation Reports: For steel deck, from ICC-ES.

E. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

2.2 ROOF DECK

A. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:

B. Galvanized Steel Sheet: ASTM A 1008/A 1008M, Structural Steel (SS), Grade 50 minimum, galvanized in accordance with ASTM A 653/A 653M, with coating designation G60.

a. Color: Manufacturer's standard
b. Deck Finish: Galvanized.
c. Deck Profile: As indicated.
d. Profile Depth: As indicated.
e. Design Uncoated-Steel Thickness: As indicated.
f. Span Condition: Triple span or more.
g. Side Laps: Overlapped or interlocking seam at Contractor's option.

2.3 ACCESSORIES

A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.

C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 (4.8-mm) minimum diameter.

D. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, 0.0598 inch (1.52 mm) thick, with factory-punched hole of 3/8-inch (9.5-mm) minimum diameter.

E. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.

B. Install temporary shoring before placing deck panels if required to meet deflection limitations.

C. Locate deck bundles to prevent overloading of supporting members.

D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.

E. Align cellular deck panels over full length of cell runs and align cells at ends of abutting panels.

F. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

G. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

H. Coordinate reinforcing requirements of openings in first paragraph below with applicable Sections.

I. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.

J. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

K. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

3.3 ROOF-DECK INSTALLATION

A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches (38 mm) long, and as follows:

1. Weld Diameter: 5/8 inch (16 mm), nominal.
2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds as indicated.
3. Weld Washers: Install weld washers at each weld location.
4. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of one-half of the span or 12 inches, and as follows:

5. Mechanically fasten with self-drilling, No. 10 (4.8-mm-) diameter or larger, carbon-steel screws.
6. Mechanically clinch or button punch.
7. Fasten with a minimum of 1-1/2-inch- (38-mm-) long welds.

B. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm), with end joints as follows:

1. End Joints: Lapped 2 inches (51 mm) minimum or butted at Contractor's option.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Field welds will be subject to inspection.

C. Prepare test and inspection reports.

3.5 PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.

END OF SECTION 053100

SECTION 260519

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

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.

B. Section 260010 "Supplemental Requirements for Electrical" for additional abbreviations, definitions, submittals, qualifications, testing agencies, and other Project requirements applicable to Work specified in this Section.

1.2 SUMMARY

A. Section Includes:
1. Copper building wire rated 600 V or less.
2. Aluminum building wire rated 600 V or less.
3. Metal-clad cable, Type MC, rated 600 V or less.
4. Connectors, splices, and terminations rated 600 V and less.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of NETA.
1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. RoHS compliant.
3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

C. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.

D. Conductor Insulation:
1. Type USE-2: Comply with UL 854.
2. Type TC-ER: Comply with NEMA WC 70/ICEA S-95-658 and UL 1277.
3. Type THHN and Type THWN-2: Comply with UL 83.
4. Type THW and Type THW-2: Comply with NEMA WC-70/ICEA S-95-658 and UL 83.
5. Type XHHW-2: Comply with UL 44.

E. Shield:
1. Type TC-ER: Cable designed for use with VFCs, with oversized crosslinked polyethylene insulation and sunlight- and oil-resistant outer PVC jacket.

2.2 ALUMINUM BUILDING WIRE

A. Description: Flexible, insulated and uninsulated, drawn aluminum current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. Standards:
1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. RoHS compliant.
3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

C. Conductors: Aluminum, complying with ASTM B 800 and ASTM B 801.

D. Conductor Insulation:
1. Type USE-2 and Type SE: Comply with UL 854.
2. Type TC-ER: Comply with NEMA WC 70/ICEA S-95-658 and UL 1277.
3. Type THHN and Type THWN-2: Comply with UL 83.
4. Type THW and Type THW-2: Comply with NEMA WC-70/ICEA S-95-658 and UL 83.
5. Type XHHW-2: Comply with UL 44.

2.3 METAL-CLAD CABLE, TYPE MC

A. Description: A factory assembly of one or more current-carrying insulated conductors in an overall metallic sheath.

B. Standards:
1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. Comply with UL 1569.
3. RoHS compliant.
4. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

C. Circuits:
   1. Single circuit and multicircuit with color-coded conductors.
   2. Power-Limited Fire-Alarm Circuits: Comply with UL 1424.

D. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.

E. Ground Conductor: Bare.

F. Conductor Insulation:
   1. Type TFN/THHN/THWN-2: Comply with UL 83.
   2. Type XHHW-2: Comply with UL 44.

G. Armor: Steel or Aluminum, interlocked.

2.4 CONNECTORS AND SPLICES

A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with set screws, designed to connect conductors specified in this Section.

C. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.
   1. Material: Copper.
   2. Type: One hole with standard barrels.
   3. Termination: Compression.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders:

   1. Copper for feeders smaller than No. #2/0 AWG; copper or aluminum for feeders No. #2/0 AWG and larger. Conductors must be solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Branch Circuits:

   1. Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Service Entrance: Type USE, single conductor in raceway.

B. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway.

C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type THHN/THWN-2, single conductors in raceway.

D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.

E. Feeders Installed below Raised Flooring: Type THHN/THWN-2, single conductors in raceway.

F. Exposed Branch Circuits, Including in Crawlspaces: Type THHN/THWN-2, single conductors in raceway.

G. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway. Metal-clad cable, Type MC may be used in limited applications including single-circuit dead-end feeds, 6’-0” flexible whips, and areas considered tight within millwork.

H. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.

I. Branch Circuits Installed below Raised Flooring: Type THHN/THWN-2, single conductors in raceway or Metal-clad cable, Type MC. All installations in raised floor areas shall be approved for environmental air plenum use.

J. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.

K. VFC Output Circuits: Type TC-ER cable with braided shield.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.

C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

G. Complete cable tray systems installation according to Section 260536 "Cable Trays for Electrical Systems" prior to installing conductors and cables.

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

B. Make splices, terminations, and taps that are compatible with conductor material.
   1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.5 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."

B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078413 "Penetration Firestopping."

3.8 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

D. Perform tests and inspections.
   1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
   2. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors and conductors feeding the following critical equipment and services for compliance with requirements:
      a. Generator.
      b. Transfer switches.
      c. UPS.
      d. Fire pump.
   3. Perform each of the following visual and electrical tests:

a. Inspect exposed sections of conductor and cable for physical damage and correct connection according to the single-line diagram.
b. Test bolted connections for high resistance using one of the following:
   1) A low-resistance ohmmeter.
   2) Calibrated torque wrench.
   3) Thermographic survey.
c. Inspect compression-applied connectors for correct cable match and indentation.
d. Inspect for correct identification.
e. Inspect cable jacket and condition.
f. Insulation-resistance test on each conductor for ground and adjacent conductors. Apply a potential of 500-V dc for 300-V rated cable and 1000-V dc for 600-V rated cable for a one-minute duration.
g. Continuity test on each conductor and cable.
h. Uniform resistance of parallel conductors.

4. Initial Infrared Scanning: After Substantial Completion, but before Final Acceptance, perform an infrared scan of each splice in conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner. Correct deficiencies determined during the scan.
   a. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
   b. Record of Infrared Scanning: Prepare a certified report that identifies switches checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.
5. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switch 11 months after date of Substantial Completion.

E. Cables will be considered defective if they do not pass tests and inspections.

F. Prepare test and inspection reports to record the following:
1. Procedures used.
2. Results that comply with requirements.
3. Results that do not comply with requirements, and corrective action taken to achieve compliance with requirements.

END OF SECTION

SECTION 26 05 33

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

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. Metal conduits and fittings.
2. Nonmetallic conduits and fittings.
3. Metal wireways and auxiliary gutters.
4. Nonmetal wireways and auxiliary gutters.
5. Surface raceways.
6. Boxes, enclosures, and cabinets.
7. Handholes and boxes for exterior underground cabling.

B. Related Requirements:

1. Section 078413 "Penetration Firestopping" for firestopping at conduit and box entrances.
2. Section 260543 "Underground Ducts and Raceways for Electrical Systems" for exterior ductbanks, manholes, and underground utility construction.
3. Section 270528 "Pathways for Communications Systems" for conduits, wireways, surface pathways, innerduct, boxes, faceplate adapters, enclosures, cabinets, and handholes serving communications systems.

1.3 DEFINITIONS

A. ARC: Aluminum rigid conduit.

B. GRC: Galvanized rigid steel conduit.

C. IMC: Intermediate metal conduit.

1.4 ACTION SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:

1. Structural members in paths of conduit groups with common supports.
2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.

B. Qualification Data: For professional engineer.

C. Seismic Qualification Data: Certificates, for enclosures, cabinets, and conduit racks and their mounting provisions, including those for internal components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
4. Detailed description of conduit support devices and interconnections on which the certification is based and their installation requirements.

D. Source quality-control reports.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

A. Metal Conduit:

1. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. GRC: Comply with ANSI C80.1 and UL 6.
3. ARC: Comply with ANSI C80.5 and UL 6A.
4. IMC: Comply with ANSI C80.6 and UL 1242.
5. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.

    a. Comply with NEMA RN 1.
    b. Coating Thickness: 0.040 inch (1 mm), minimum.

6. EMT: Comply with ANSI C80.3 and UL 797.
7. FMC: Comply with UL 1; zinc-coated steel.
8. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

B. Metal Fittings:

1. Comply with NEMA FB 1 and UL 514B.
2. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. Fittings, General: Listed and labeled for type of conduit, location, and use.
4. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 1203 and NFPA 70.

5. Fittings for EMT:

    a. Material: Steel.
    b. Type: Setscrew.

6. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
7. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch (1 mm), with overlapping sleeves protecting threaded joints.

C. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS AND FITTINGS

A. Nonmetallic Conduit:

1. Listing and Labeling: Nonmetallic conduit shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Fiberglass:

    a. Comply with NEMA TC 14.
    b. Comply with UL 2515 for aboveground raceways.
    c. Comply with UL 2420 for belowground raceways.

3. ENT: Comply with NEMA TC 13 and UL 1653.
4. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
5. LFNC: Comply with UL 1660.
6. Rigid HDPE: Comply with UL 651A.
7. Continuous HDPE: Comply with UL 651A.
8. Coilable HDPE: Preassembled with conductors or cables, and complying with ASTM D 3485.
9. RTRC: Comply with UL 2515A and NEMA TC 14.

B. Nonmetallic Fittings:

1. Fittings, General: Listed and labeled for type of conduit, location, and use.
2. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.

    a. Fittings for LFNC: Comply with UL 514B.

3. Solvents and Adhesives: As recommended by conduit manufacturer.

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

A. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 3R unless otherwise indicated, and sized according to NFPA 70.

1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

C. Wireway Covers: Screw-cover type unless otherwise indicated.

D. Finish: Manufacturer's standard enamel finish.

2.4 NONMETALLIC WIREWAYS AND AUXILIARY GUTTERS

A. Listing and Labeling: Nonmetallic wireways and auxiliary gutters shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Description: Fiberglass polyester, extruded and fabricated to required size and shape, without holes or knockouts. Cover shall be gasketed with oil-resistant gasket material and fastened with captive screws treated for corrosion resistance. Connections shall be flanged and have stainless-steel screws and oil-resistant gaskets.

C. Description: PVC, extruded and fabricated to required size and shape, and having snap-on cover, mechanically coupled connections, and plastic fasteners.

D. Fittings and Accessories: Couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings shall match and mate with wireways as required for complete system.

E. Solvents and Adhesives: As recommended by conduit manufacturer.

2.5 SURFACE RACEWAYS

A. Listing and Labeling: Surface raceways and tele-power poles shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Surface Metal Raceways: Galvanized steel with snap-on covers complying with UL 5. Manufacturer's standard enamel finish in color selected by Architect.

C. Surface Nonmetallic Raceways: Two- or three-piece construction, complying with UL 5A, and manufactured of rigid PVC with texture and color selected by Architect from manufacturer's standard colors. Product shall comply with UL 94 V-0 requirements for self-extinguishing characteristics.

D. Tele-Power Poles:

1. Material: Aluminum with clear anodized finish.
2. Fittings and Accessories: Dividers, end caps, covers, cutouts, wiring harnesses, devices, mounting materials, and other fittings shall match and mate with tele-power pole as required for complete system.

2.6 BOXES, ENCLOSURES, AND CABINETS

A. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy Type FD, with gasketed cover.

D. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.

E. Metal Floor Boxes:

1. Material: Cast metal.
2. Type: Fully adjustable.
3. Shape: Rectangular.
4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

F. Nonmetallic Floor Boxes: Nonadjustable, round.

1. Listing and Labeling: Nonmetallic floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

G. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb (23 kg). Outlet boxes designed for attachment of luminaires weighing more than 50 lb (23 kg) shall be listed and marked for the maximum allowable weight.

H. Paddle Fan Outlet Boxes: Nonadjustable, designed for attachment of paddle fan weighing 70 lb (32 kg).

1. Listing and Labeling: Paddle fan outlet boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

I. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

J. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.

K. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

L. Device Box Dimensions: 4 inches square by 2-1/8 inches deep (100 mm square by 60 mm deep.

M. Gangable boxes are prohibited.

N. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 3R with continuous-hinge cover with flush latch unless otherwise indicated.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
2. Nonmetallic Enclosures: Plastic.

3. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

O. Cabinets:

1. NEMA 250, Type 3R galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.
6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.7 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

A. General Requirements for Handholes and Boxes:

1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.

1. Standard: Comply with SCTE 77.
2. Configuration: Designed for flush burial with closed bottom unless otherwise indicated.
3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
5. Cover Legend: Molded lettering, "ELECTRIC.".
6. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
7. Handholes 12 Inches Wide by 24 Inches Long (300 mm Wide by 600 mm Long) and Larger: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

C. Fiberglass Handholes and Boxes: Molded of fiberglass-reinforced polyester resin, with frame and covers of polymer concrete.

1. Standard: Comply with SCTE 77.
2. Color of Frame and Cover: Gray.
3. Configuration: Designed for flush burial with closed bottom unless otherwise indicated.
4. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
6. Cover Legend: Molded lettering, "ELECTRIC."
7. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
8. Handholes 12 Inches Wide by 24 Inches Long (300 mm Wide by 600 mm Long) and Larger: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

2.8 SOURCE QUALITY CONTROL FOR UNDERGROUND ENCLOSURES

A. Handhole and Pull-Box Prototype Test: Test prototypes of handholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.

1. Tests of materials shall be performed by an independent testing agency.
2. Strength tests of complete boxes and covers shall be by either an independent testing agency or manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
3. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012 and traceable to NIST standards.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed Conduit: GRC.
2. Concealed Conduit, Aboveground: GRC.
3. Underground Conduit: RNC, Type EPC-40-PVC.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

B. Indoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed, Not Subject to Severe Physical Damage: EMT.
3. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:

    a. Loading dock.
    b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
    c. Mechanical rooms.

4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
6. Damp or Wet Locations: GRC.
7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 in institutional and commercial kitchens and damp or wet locations.

C. Minimum Raceway Size: 3/4-inch (21-mm) trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing

conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.

3. EMT: Use setscrew, steel fittings. Comply with NEMA FB 2.10.
4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

E. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.

F. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

G. Install surface raceways only where indicated on Drawings.

H. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F (49 deg C).

3.2 INSTALLATION

A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

B. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

C. Do not install raceways or electrical items on any "explosion-relief" walls or rotating equipment.

D. Do not fasten conduits onto the bottom side of a metal deck roof.

E. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

F. Complete raceway installation before starting conductor installation.

G. Arrange stub-ups so curved portions of bends are not visible above finished slab.

H. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches (300 mm) of changes in direction.

I. Make bends in raceway using large-radius preformed ells. Field bending shall be according to NFPA 70 minimum radii requirements. Use only equipment specifically designed for material and size involved.

J. Conceal conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

K. Support conduit within 12 inches (300 mm) of enclosures to which attached.

L. Raceways Embedded in Slabs:

1. Run conduit larger than 1-inch (27-mm) trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot (3-m) intervals.

2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
3. Arrange raceways to keep a minimum of 2 inches (50 mm) of concrete cover in all directions.
4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
5. Change from ENT to GRC before rising above floor.

M. Stub-Ups to Above Recessed Ceilings:

1. Use EMT, IMC, or RMC for raceways.
2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

N. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

O. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.

P. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

Q. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch (35mm) trade size and insulated throat metal bushings on 1-1/2-inch (41-mm) trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

R. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

S. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.

T. Cut conduit perpendicular to the length. For conduits 2-inch (53-mm) trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

U. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

V. Surface Raceways:

1. Install surface raceway with a minimum 2-inch (50-mm) radius control at bend points.
2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches (1200 mm) and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

W. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.

X. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where an underground service raceway enters a building or structure.
3. Conduit extending from interior to exterior of building.
4. Conduit extending into pressurized duct and equipment.
5. Conduit extending into pressurized zones that are automatically controlled to maintain different pressure set points.
6. Where otherwise required by NFPA 70.

Y. Comply with manufacturer's written instructions for solvent welding RNC and fittings.

Z. Expansion-Joint Fittings:

1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F (17 deg C) and that has straight-run length that exceeds 25 feet (7.6 m). Install in each run of aboveground RMC and EMT conduit that is located where environmental temperature change may exceed 100 deg F (55 deg C) and that has straight-run length that exceeds 100 feet (30 m).
2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:

    a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F (70 deg C) temperature change.
    b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F (86 deg C) temperature change.
    c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F (70 deg C) temperature change.
    d. Attics: 135 deg F (75 deg C) temperature change.

3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F (0.06 mm per meter of length of straight run per deg C) of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F (0.0115 mm per meter of length of straight run per deg C) of temperature change for metal conduits.
4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

AA. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches (1830 mm) of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

1. Use LFMC in damp or wet locations subject to severe physical damage.
2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.

BB. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

CC. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.

DD. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

EE. Locate boxes so that cover or plate will not span different building finishes.

FF. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

GG. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

HH. Set metal floor boxes level and flush with finished floor surface.

II. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Section 312000 "Earth Moving" for pipe less than 6 inches (150 mm) in nominal diameter.
2. Install backfill as specified in Section 312000 "Earth Moving."
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches (300 mm) of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Section 312000 "Earth Moving."
4. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.

    a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches (75 mm) of concrete for a minimum of 12 inches (300 mm) on each side of the coupling.
    b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches (1500 mm) from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.

6. Warning Planks: Bury warning planks approximately 12 inches (300 mm) above direct-buried conduits but a minimum of 6 inches (150 mm) below grade. Align planks along centerline of conduit.
7. Underground Warning Tape: Comply with requirements in Section 260553 "Identification for Electrical Systems."

3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.

B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch (12.5-mm) sieve to No. 4 (4.75-mm) sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch (25 mm) above finished grade.

D. Install handholes with bottom below frost line, below grade.

E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables but short enough to preserve adequate working clearances in enclosure.

F. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.6 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.7 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

SECTION 265619

LED 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 solid-state luminaires that are designed for and exclusively use LED lamp technology.
2. Luminaire supports.
3. Luminaire-mounted photoelectric relays.

B. Related Requirements:
1. Section 260923"Lighting Control Devices" for automatic control of lighting, including time switches, photoelectric relays, occupancy sensors, and multipole lighting relays and contactors.
2. Section 260933"Central Dimming Controls".

1.3 DEFINITIONS

A. CCT: Correlated color temperature.

B. CRI: Color rendering index.

C. Fixture: See "Luminaire."

D. IP: International Protection or Ingress Protection Rating.

E. Lumen: Measured output of lamp and luminaire, or both.

F. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of luminaire.
1. Arrange in order of luminaire designation.
2. Include data on features, accessories, and finishes.
3. Include physical description and dimensions of luminaire.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For luminaires to include in operation and maintenance manuals.
   1. Provide a list of all lamp types used on Project. Use ANSI and manufacturers' codes.
   2. Provide a list of all photoelectric relay types used on Project; use manufacturers' codes.

1.6 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Luminaire manufacturers' laboratory that is accredited under the NVLAP 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 1910.7, accredited under the NVLAP for Energy Efficient Lighting Products and complying with applicable IES testing standards.

C. Provide luminaires from a single manufacturer for each luminaire type.

D. Each luminaire type shall be binned within a three-step MacAdam Ellipse to ensure color consistency among luminaires.

E. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

F. Mockups: For exterior luminaires, complete with power and control connections.
   1. Obtain Architect's approval of luminaires in mockups before starting installations.
   2. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed work.
   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.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering prior to shipping.

1.8 FIELD CONDITIONS

A. Verify existing and proposed utility structures prior to the start of work associated with luminaire installation.

B. Mark locations of exterior luminaires for approval by Architect prior to the start of luminaire installation.

1.9 WARRANTY

A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures, including luminaire support components.
      b. Faulty operation of luminaires and accessories.
      c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
   2. Warranty Period: 2 year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 LUMINAIRE REQUIREMENTS

A. 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.

B. NRTL Compliance: Luminaires shall be listed and labeled for indicated class and division of hazard by an NRTL.

C. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.

D. UL Compliance: Comply with UL 1598 and listed for wet location.

E. Lamp base complying with ANSI C81.61 or IEC 60061-1.

F. Bulb shape complying with ANSI C79.1.

G. CRI of minimum 80. CCT of 3000 K.

H. L70 lamp life of 50,000 hours.

I. Lamps dimmable from 100 percent to 0 percent of maximum light output.

J. Internal driver.

K. Nominal Operating Voltage: 120 V ac through 277 V ac.

L. In-line Fusing: Separate in-line fuse for each luminaire.

M. Lamp Rating: Lamp marked for outdoor use and in enclosed locations.

N. Source Limitations: Obtain luminaires from single source from a single manufacturer.

O. Source Limitations: For luminaires, obtain each color, grade, finish, type, and variety of luminaire from single source with resources to provide products of consistent quality in appearance and physical properties.

2.2 LUMINAIRE-MOUNTED PHOTOELECTRIC RELAYS

A. Comply with UL 773 or UL 773A.

B. Contact Relays: Factory mounted, single throw, designed to fail in the on position, and factory set to turn light unit on at 1.5 to 3 fc and off at 4.5 to 10 fc with 15-second minimum time delay. Relay shall have directional lens in front of photocell to prevent artificial light sources from causing false turnoff.
   1. Relay with locking-type receptacle shall comply with ANSI C136.10.
   2. Adjustable window slide for adjusting on-off set points.

2.3 MATERIALS

A. Metal Parts: Free of burrs and sharp corners and edges.

B. Sheet Metal Components: Corrosion-resistant aluminum. Form and support to prevent warping and sagging.

C. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses.

D. Diffusers and Globes:
   1. Acrylic Diffusers: 100 percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
   2. Glass: Annealed crystal glass unless otherwise indicated.
   3. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.

E. Lens and Refractor Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

F. 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.

G. Housings:
   1. Rigidly formed, weather- and light-tight enclosure that will not warp, sag, or deform in use.
   2. Provide filter/breather for enclosed luminaires.

H. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. 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 characteristics:
      a. "USE ONLY" and include specific lamp type.
      b. Lamp diameter, shape, size, wattage and coating.
      c. CCT and CRI for all luminaires.

2.4 FINISHES

A. Variations in Finishes: 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.

B. 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.

C. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
   1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
   2. Natural Satin Finish: Provide fine, directional, medium satin polish (AA-M32); buff complying with AA-M20 requirements; and seal aluminum surfaces with clear, hard-coat wax.
   3. Class I, Clear-Anodic Finish: AA-M32C22A41 (Mechanical Finish: Medium satin; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.
   4. Class I, Color-Anodic Finish: AA-M32C22A42/A44 (Mechanical Finish: Medium satin; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker), complying with AAMA 611.
      a. Color: Dark bronze.

D. Factory-Applied Finish for Steel Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
   1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1 or SSPC-SP 8.
   2. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.
      a. Color: As selected from manufacturer's standard catalog of colors.
      b. Color: Match Architect's sample of manufacturer's standard color.
      c. Color: As selected by Architect from manufacturer's full range.

2.5 LUMINAIRE SUPPORT COMPONENTS

A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.

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. Examine roughing-in for luminaire electrical conduit to verify actual locations of conduit connections before luminaire installation.

C. Examine walls, roofs, and canopy ceilings and overhang ceilings for suitable conditions where luminaires will be installed.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 TEMPORARY LIGHTING

A. If approved by the Architect, use selected permanent luminaires for temporary lighting. When construction is substantially complete, clean luminaires used for temporary lighting and install new lamps.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Comply with NECA 1.

B. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.

C. Install lamps in each luminaire.

D. Fasten luminaire to structural support.

E. Supports:
1. Sized and rated for luminaire weight.
2. Able to maintain luminaire position after cleaning and relamping.
3. Support luminaires without causing deflection of finished surface.
4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.

F. Wall-Mounted Luminaire Support:
1. Attached to structural members in walls.

G. Wiring Method: Install cables in raceways. Conceal raceways and cables.

H. Install luminaires level, plumb, and square with finished grade unless otherwise indicated.

I. Coordinate layout and installation of luminaires with other construction.

J. Adjust luminaires that require field adjustment or aiming. Include adjustment of photoelectric device to prevent false operation of relay by artificial light sources, favoring a north orientation.

K. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" and Section 260533 "Raceways and Boxes for Electrical Systems" for wiring connections and wiring methods.

3.4 BOLLARD LUMINAIRE INSTALLATION:

A. Align units for optimum directional alignment of light distribution.

1. Install on concrete base with top 4 inches above finished grade or surface at luminaire location. Cast conduit into base, and shape base to match shape of bollard base. Finish by troweling and rubbing smooth. Concrete materials, installation, and finishing are specified in Section 033000 "Cast-in-Place Concrete."

3.5 INSTALLATION OF INDIVIDUAL GROUND-MOUNTED LUMINAIRES

A. Aim as indicated on Drawings.

B. Install on concrete base with top 4 inches above finished grade or surface at luminaire location. Cast conduit into base, and finish by troweling and rubbing smooth. Concrete materials, installation, and finishing are specified in Section 033000 "Cast-in-Place Concrete."

3.6 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.

3.7 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.8 FIELD QUALITY CONTROL

A. Inspect each installed luminaire for damage. Replace damaged luminaires and components.

B. Perform the following tests and inspections:
1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
2. Verify operation of photoelectric controls.

C. Illumination Tests:
1. Measure light intensities at night. Use photometers with calibration referenced to NIST standards. Comply with the following IES testing guide(s):
   a. IES LM-5.
   b. IES LM-50.
   c. IES LM-52.
   d. IES LM-64.
   e. IES LM-72.
2. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.

D. Luminaire will be considered defective if it does not pass tests and inspections.

E. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

3.9 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain luminaires and photocell relays.

3.10 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting the direction of aim of luminaires to suit occupied conditions. Make up to two visits to Project during other-than-normal hours for this purpose. Some of this work may be required during hours of darkness.
   1. During adjustment visits, inspect all luminaires. Replace lamps or luminaires that are defective.
   2. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
   3. Adjust the aim of luminaires in the presence of the Architect.

END OF SECTION

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TAMMY LANE AND HESS ROAD
PARKER, COLORADO

JOB NUMBER: 212191A

January 15, 2013

Revised April 5, 2014
Updated Seismic Design Considerations
Per Town of Parker Comment S-5

PREPARED FOR:

TOWN OF PARKER
20120 EAST MAINSTREET
PARKER, COLORADO 80134

ATTN: MR. BOB EXSTROM

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PURPOSE AND SCOPE

This report presents the results of a Geotechnical Engineering Study for the proposed Parker Maintenance Facility located at the northwest corner of the intersection of Tammy Lane and Hess Road in Parker, Colorado. The approximate site location is shown on Figure 1. The study was conducted to develop recommendations for foundations and other geotechnical considerations. The study was conducted in accordance with our proposal for professional engineering services, dated May 16, 2012.

A field exploration program consisting of 20 borings and a site reconnaissance was conducted to obtain information on subsurface and site conditions. Samples of the subsoils obtained during the field exploration were tested in the laboratory to determine their classification and other engineering characteristics. Results of the field exploration and laboratory testing were analyzed to develop recommendations for foundation types, depths and allowable pressures for the proposed building foundations and floor support. Pavement design recommendations are also included. This report summarizes the data obtained during this study and presents our conclusions, design recommendations and other geotechnical engineering considerations based on the proposed construction and the subsoil conditions encountered.

PROPOSED CONSTRUCTION

It is our understanding that the proposed Parker Public Works Facility will likely consist of an office building, materials storage barn, equipment storage yards, magnesium chloride tank farm, and a parking area on a 14-acre site. At the time of our investigation, no final grading plan has been developed. It is our understanding that 2 to 3 feet of new fill will be placed in the area of the proposed maintenance facility.

It is our understanding that construction will primarily utilize concrete masonry units (CMU) walls, as well as reinforced concrete and/or wood or steel frames supported by reinforced concrete foundations. Although a variety of building types will likely be

considered, it is our understanding that they will be single-story structures, and will impart relatively light foundation loads to the subgrade. It is our understanding that the paved areas of the site will be a mix of asphalt and concrete.

SITE CONDITIONS

The site is located at the northwest corner of the intersection of Tammy Lane and Hess Road in Parker, Colorado. The south end of the site is currently being used as a construction equipment storage area, and crushed concrete gravel has been placed at the surface covering an area of approximately 200 feet by 200 feet. During the time of our site investigation, a large area containing buried concrete and other construction debris was noted, and is shown on the attached Figure 2A. Vegetation primarily consists of grass and weeds, with planted conifer trees near the site perimeter. The south side of the site is bordered by Hess Road, and the east side of the site is bordered be Tammy Lane. Occupied Single Family residential lots border the north and west sides of the site. The site is relatively flat with gentle slopes down to the southeast on the order of 1 to 5 percent. Steeper slopes down towards the site were noted along the north and west sides, where a 15 to 20 foot high embankment was noted. Two drainage swales exist on the south and east side of the site. These swales slope down to the east and south to a concrete basin on the southeast corner of the site. The concrete basin had water in it at the time of our field exploration, but the swales were dry. No bedrock outcrops were noted on the site.

FIELD EXPLORATION

Field exploration for the project was conducted on May 24th and 25th, 2012. Twenty borings were drilled at the approximate locations indicated on Figure 2. Four-inch diameter continuous flight augers powered by a truck-mounted CME 55 drill rig equipped with an automatic hammer were used to advance the borings. The borings were logged by a representative of H-P Geotech.

Samples of the soil and bedrock were taken with a 2-inch I.D. California spoon and a 1-3/8 inch split spoon sampler. The samplers were driven into the subsoils at various depths with blows from a 140-pound hammer falling 30 inches. These tests are similar to the standard penetration test described by ASTM D-1586. Penetration resistance values are an indication of the relative density or consistency of the subsoils. Depths at which the samples were taken and the penetration resistance values are shown on the Boring Logs, Figures 3 thru 7. The samples were returned to our laboratory for review by the project engineer and testing.

SUBSURFACE CONDITIONS

The overburden materials encountered in the exploratory borings generally consisted of a thin veneer of clayey sand to sandy clay topsoil overlying discontinuous sand and clay fill, and natural sand and clay with concrete construction debris in some areas. Fill was encountered in 19 of the 20 borings to depths ranging from 3 feet to 23 feet below the ground surface at the time of our investigation. Sandy clay was encountered under the man-placed fill in Borings B-3 and B-5 from depths of 3 to 7 feet below the ground surface, and 14½ to 17 feet below the ground surface, respectively. The clay was found to have a relatively low swell potential as indicated by a vertical expansion of 1.3 percent when wetted under a 1 ksf surcharge on the sample tested. Clayey sand was encountered under the man-placed fill in borings B-8 and B-10 from depths of 15 to 26 feet below the ground surface, and 3 to 16 feet below the ground surface, respectively.

Bedrock consisted of sandstone and claystone. Interbedded sandstone and claystone lenses were found in several of the borings, and weathered claystone zones were found to range from 2 to 6 feet thick in 4 of the borings drilled. In general, the bedrock was found to have a relatively low swell potential as indicated by vertical expansion ranging from 1.1 to 1.5 percent when wetted under a 1 ksf surcharge on the samples tested.

Graphic logs of the exploratory borings and a legend of symbols and explanatory notes are presented on Figures 3 through 7.

Groundwater was found in Boring B-9 at a depth of 31 feet when measured immediately after drilling. Groundwater was found in all borings, and ranged from depths of 4½ to 27 feet when measured 1 to 2 days later. The groundwater level at the site can be expected to vary based on future irrigation, precipitation and seasonal changes.

LABORATORY TESTING

Laboratory testing performed on samples obtained during the field exploration included natural moisture content, unit weight, percent fines, Atterberg limits, gradation analyses, water soluble sulfates, and swell-compression under a 1 ksf surcharge. A summary of the laboratory test results are shown in Table 1.

ENGINEERING ANALYSIS

Subsurface data and laboratory testing indicate that loose to medium dense sand and clay fill will be the predominant soil type encountered beneath foundations, floor slabs, and pavements.

Based on the penetration resistance data, laboratory testing, and subsurface conditions encountered during our field exploration, the sand and clay fill found at the anticipated foundation level has been determined to have relatively erratic support characteristics and may be prone to excessive differential movement. One method of reducing the risk of differential movement that is commonly used in this area is the construction of drilled pier foundations. Because groundwater was encountered, and caving soils were present in the borings, drilled piers will be more difficult to construct, and will likely require casing. If an increased risk of movement can be tolerated, footings can be constructed on an over-excavated area prepared in accordance with the recommendations provided in the "SITE GRADING" section of this report. Alternatively, driven pile, screw pile, or helical pier

foundations would be an acceptable foundation type. We should be contacted to provide additional recommendations if these foundation types are desired.

DESIGN RECOMMENDATIONS

The design and construction criteria presented below should be observed for the civil design, structural design, and construction portion of this project.

SITE GRADING

General

The following recommendations should be followed for grading, site preparation, and fill compaction.

1. All organic material and other debris should be removed prior to the placement of new fill.
2. All import fill and onsite backfill should be approved by the Geotechnical Engineer. Where fill is to be placed, loose or otherwise unsuitable material should be removed prior to placement of new fill. Soils should be compacted with appropriate equipment for the lift thickness placed. Slopes of 4 horizontal to 1 vertical or steeper should be benched to provide a level surface for compaction.
3. The table on the following page shows the moisture contents and the minimum relative compactions as determined by ASTM D-698 (standard Proctor) that are recommended for the onsite granular and clay soils encountered during our investigation:

RECOMMENDED COMPACTION SPECIFICATIONS

TYPE OF FILL PLACEMENT	MOISTURE CONTENT	SOIL TYPE - Compaction Percent (ASTM D698 – Standard Proctor)
Pavement Subgrade	± 2% Optimum 0 to +3 Optimum	Suitable Granular Onsite or Import Fill – 95% Suitable Cohesive Onsite Soil – 95%
Retaining Wall Backfill	± 2% Optimum 0 to +3 Optimum	Suitable Granular Onsite or Import Fill – 95% Suitable Cohesive Onsite Soil – 95%
Below Floor Slabs	± 2% Optimum 0 to +3 Optimum	Suitable Granular Onsite or Import Fill – 95% Suitable Cohesive Onsite Soil – 95%
Below Footing Foundation	± 2% Optimum 0 to +3 Optimum	Suitable Granular Onsite or Import Fill – 98% Suitable Cohesive Onsite Soil – 98%
Below Exterior Concrete Flatwork	± 2% Optimum 0 to +3 Optimum	Suitable Granular Onsite or Import Fill – 95% Suitable Cohesive Onsite Soil – 95%
Landscape Areas	± 2% Optimum 0 to +3 Optimum	Processed Granular Onsite Soil – 90% Processed Cohesive Onsite Soil – 90%
Utility Trenches	As they apply to the finished area	

Suitability of On-Site Soil

The on-site sand and sandy clay are suitable for use as retaining wall backfill, below floor slabs, pavement subgrade, below exterior concrete flatwork, and landscape areas, provided that the above compaction and moisture content specifications are followed. Onsite material with a swell potential less than 1 percent when wetted under a 1-ksf load is acceptable for placement under footing foundation elements. The on-site sand and clay fill found during our investigation is only suitable for backfill material if all rock or concrete debris encountered is processed so that no fragments larger than 4 inches are contained within the material. If organic debris is discovered within the fill material (e.g. timber, branches, etc.) it is unsuitable for backfill material. Claystone and weathered claystone were encountered near the ground surface at boring B-13. This material is unsuitable as backfill material except for landscape areas.

Import or Select Fill

The Geotechnical engineer should approve any proposed import or select fill materials. All soils shall be approved by the Geotechnical engineer for the intended use. Import soil should be non-expansive (less than 1 percent under a 200-psf surcharge) under floor slabs, concrete pavements, and concrete flatwork. Import soils placed under parking lot and drive lane pavements should have a swell potential less than 2 percent under a 200-psf surcharge (Town of Parker Specifications) when remolded at the compaction requirements

for its intended use. All import and select fill material should consist of minus 2-inch material having less than 40 percent passing the No. 200 sieve, a liquid limit less than 40, a plasticity index less than 20, and a minimum dry unit weight of 100 pcf when placed at the required compaction.

Fill Areas

Fill areas should be prepared prior to fill placement. Vegetation and any debris should be removed from areas to receive fill.

Drainage

Good surface drainage should be provided around all cuts and fills to direct surface runoff away from these areas. Slopes and other stripped areas should be protected against erosion by paving, re-vegetation or other means.

FOUNDATIONS

As discussed above, the erratic consistency of the fill will present difficulty in the construction of a facility on this site because of the potential for differential settlement. If shallow foundations are desired, all existing fill should be removed and re-compacted in accordance with the specifications listed in the "SITE GRADING" section. Because of the depth of fill encountered during our site investigation, this will likely be an impractical foundation option in areas where deep fill was encountered, particularly in the areas where material storage bins have been proposed. In our opinion, a drilled pier foundation will perform adequately for the types of structures proposed. Alternatively, if additional risk of movement can be tolerated, shallow foundations constructed over at least 3 feet of fill placed in accordance to the recommendations provided in the "SITE GRADING" section of this report. Also, helical piers or screw piles may be used.

Drilled Pier Foundations

The design and construction criteria presented below should be observed for this foundation type.

1) Piers drilled into bedrock should be designed for an allowable end bearing pressure of 35,000 psf and an allowable skin friction value of 3,500 psf. Skin friction should be neglected for the upper 5 feet of bedrock penetration when determining bearing capacity.

2) Piers should also be designed for a minimum dead load pressure of 5,000 psf based on pier end area only. If the minimum dead load requirement cannot be achieved, the pier length should be extended beyond the minimum penetration to make up the dead load deficit. This can be accomplished by assuming one-half the allowable skin friction value given above acts in the direction to resist uplift.

3) To develop the capacity of a deep foundation, drilled piers should penetrate into competent bedrock at least 3 times the cross sectional diameter, or 5 feet, whichever is greater. A minimum pier diameter of 12 inches is recommended. It is anticipated that pier lengths will reach on the order of 30 feet.

4) Due to the variable consistency of the fill encountered during our investigation, an additional load should be added to the designed pier load to account for potential down drag associated with fill settlement. The additional load, in kips can be determined by multiplying the pier diameter in feet by 14.

5) Piers should be designed to resist lateral loads assuming a modulus of horizontal subgrade reaction of 300 tcf in the bedrock. The modulus values given are for a long, 1 foot wide pier and must be corrected for pier size.

6) Piers should be reinforced their full length to resist tension caused by the expansive soils. The uplift force, in kips, can be calculated by multiplying the pier diameter in feet by 25.

7) Concrete utilized in the piers should be a fluid mix with sufficient slump so that concrete will fill the void between the reinforcing steel and the pier hole.

8) Pier holes should be properly cleaned prior to the placement of concrete.

9) The drilling contractor should mobilize equipment of sufficient size to effectively drill through possible cemented bedrock zones and concrete debris.

10) Free water was encountered in the borings drilled at the site, and seepage in the pier holes will be encountered during drilling. Dewatering equipment may be

required to reduce water infiltration into the pier holes. If water cannot be removed prior to placement of concrete, the tremie method should be used after the hole has been cleaned of spoil. In no case should concrete be placed in more than 3 inches of water unless the tremie method is used.

11) Care should be taken to prevent the forming of mushroom-shaped tops of the piers which can increase uplift force on the piers from swelling soils.

12) A representative of the geotechnical engineer should observe pier drilling operations on a full-time basis.

Footing Foundations

As discussed above, several feet of fill was found throughout the site. In order for shallow footing foundations to perform adequately, all fill material encountered during excavation should be removed and replaced with suitable material. Alternatively, if increased risk of foundation movement can be tolerated, a footing foundation system bearing on at least 3 feet of re-compacted fill can be used. The design and construction criteria below should be followed for a spread footing foundation system.

1) Footings bearing on at least 3 feet of suitable over-excavated, moisture conditioned, and re-compacted should be designed for maximum allowable soil bearing pressure of 3,000 psf. Footings should be designed to achieve a minimum dead load of 1,000 psf. Based on the field and laboratory investigations and our experience, we expect that the risk of foundation settlement or heave of greater than 1 inch to be low. If excessive wetting occurs near the foundation elevation, the movement could be more.

2) Any topsoil, fill, or disturbed soils should be removed and replaced with suitable onsite or import fill and compacted according to the specifications listed in the "SITE GRADING" section of this report.

3) Footings should have a minimum width of 16 inches for continuous walls and 24 inches for isolated pads, consistent with the maximum allowable bearing pressure and minimum dead load specified above.

4) Exterior footings and footings beneath unheated areas should be provided with adequate soil cover above the bearing elevation for frost protection. Placement of foundations at least 36 inches below exterior grade is typically used in this area.

5) Continuous foundation walls should be reinforced top and bottom to span local anomalies, such as by assuming an unsupported length of at least 12 feet.

6) Foundation excavations should not be wetted or dried excessively. The foundation soils should be moistened and loose soil tamped prior to placing forms for footings.

7) A representative of the geotechnical engineer should observe the footing excavations prior to forming to evaluate bearing conditions and to ensure that all fill material has been removed.

EXCAVATIONS

Based on our field and laboratory investigations, the overburden soils will likely consist of Type C soils according to OSHA criteria. Excavation slopes no steeper than 1½ horizontal to 1 vertical are required for this soil type. Areas above the cut slopes should be kept clear of any heavy or vibratory loads until backfill operations begin.

SEISMIC CONSIDERATIONS

This area is considered to have low seismic activity. The following acceleration parameters are based on the 2012 International Building Code, which utilizes USGS hazard data available in 2008. Based on the Site coordinates of 39.495 N and 104.785 W, and the soil and bedrock properties, at the site, the following parameters have been assigned:

0.2 second spectral response acceleration,	S_S	= 0.175 g, USGS 2008
1.0 second spectral response acceleration,	S_1	= 0.058 g, USGS, 2008
Site Class,		= E
Site coefficient,	F_a	= 2.5, Table 1613.3.3(1)
Site coefficient,	F_v	= 3.5, Table 1613.3.3(2)

RETAINING AND FOUNDATION WALLS

Foundation walls and retaining structures which are laterally supported and can be expected to undergo only a slight amount of deflection should be designed for a lateral earth pressure computed on the basis of an equivalent fluid unit weight of 60 pcf for backfill consisting of the on-site soils. Cantilevered retaining structures which are separate from the building and can be expected to deflect sufficiently to mobilize the full active

earth pressure condition should be designed for a lateral earth pressure computed on the basis of an equivalent fluid unit weight of 45 pcf for backfill consisting of the on-site clay soil.

All foundation and retaining structures should be designed for appropriate hydrostatic and surcharge pressures such as adjacent footings, traffic, construction materials and equipment. The pressures recommended above assume drained conditions behind the walls and a horizontal backfill surface. The buildup of water behind a wall or an upward sloping backfill surface will increase the lateral pressure imposed on a foundation wall or retaining structure. An underdrain or weep holes should be provided to prevent hydrostatic pressure buildup behind walls.

Care should be taken not to over-compact the backfill or use large equipment near the wall, since this could cause excessive lateral pressure on the wall. Some settlement of deep foundation wall backfill should be expected, even if the material is placed correctly, and could result in distress to facilities constructed on the backfill.

The lateral resistance of foundation or retaining wall footings will be a combination of the sliding resistance of the footing on the foundation materials and passive earth pressure against the side of the footing. Resistance to sliding at the bottoms of the footings can be calculated based on a coefficient of friction of 0.3. Passive pressure of compacted backfill against the sides of the footings can be calculated using an equivalent fluid unit weight of 250 pcf. The coefficient of friction and passive pressure values recommended above assume ultimate soil strength. Suitable factors of safety should be included in the design to limit the strain which will occur at the ultimate strength, particularly in the case of passive resistance.

FLOOR SLABS

Though the only positive method to control differential floor movement is to construct a structural floor system above a crawlspace, this may not be a practical option for areas

such as the proposed material storage facility. Although there is an increased risk of movement associated with slabs built on deep fill, it is our opinion that floor slabs constructed on at least 6 feet of fill, placed in accordance with the recommendations given in the "SITE GRADING" section of this report, will provide a low risk of slab movement beyond about 1 inch. New fill placed during site grading can be included in the 6 feet required. To reduce the effects of some differential movement, floor slabs should be separated from all bearing walls and columns with expansion joints which allow unrestrained vertical movement. Floor slab control joints should be used to reduce damage due to shrinkage cracking. The requirements for joint spacing and slab reinforcement should be established by the designer based on experience and the intended slab use. The evaluation of mold hazards is beyond the scope of this study and H-P Geotech does not provide recommendations regarding mold mitigation.

UNDERDRAIN SYSTEM

It is our understanding that no below grade space will be constructed as part of this project. If this is the case, no underdrain system is required. We should be contacted to provide recommendations for the use of an underdrain system if below grade space is desired.

SURFACE DRAINAGE

The success of foundation and floor slab systems is contingent on keeping the bearing soils at a more or less constant moisture content and by not allowing surface water a path to the subsurface. The following drainage precautions should be observed during construction and maintained at all times after the structure has been completed:

1) Inundation of the foundation excavations and underslab areas should be avoided during construction.
2) Exterior backfill should be adjusted to near optimum moisture and compacted to at least 95 percent of the maximum standard Proctor density in pavement and slab areas and to at least 90 percent of the maximum standard Proctor density in landscape areas.

3) The ground surface surrounding the exterior of the building should be sloped to drain away from the foundation in all directions. We recommend a minimum slope of 12 inches in the first 10 feet in unpaved areas and a minimum slope of 3 inches in the first 10 feet in paved areas. The positive sloping ground surface recommendations are exclusive of any code or regulations in accordance with current ADA Standards for Accessible Design.

4) Roof downspouts and drains should discharge well beyond the limits of all backfill. It is our understanding drainage from downspouts may be conveyed in buried pipes to a storm sewer inlet or manhole. This is acceptable provided that cleanouts are provided near the building and the drains are periodically checked for clogging.

5) Landscaped areas should be designed and built such that surface water will be collected and carried away from the foundation elements. Irrigation within ten feet of the structure should be carefully controlled and minimized.

PAVEMENTS

A pavement section is a layered system designed to distribute concentrated traffic loads to the subgrade. Performance of the pavement structure is directly related to the physical properties of the subgrade soils, pavement section and traffic loadings. Soils are represented for pavement design purposes by means of a soil support value for flexible pavements. This value is empirically related to strength. The number and magnitude of wheel loads are major factors for pavement design.

Subgrade Soils

Laboratory testing of the soil samples near the proposed subgrade indicate that the fill material encountered during our field investigation ranges from a classification of A-2-6 to A-7-6 according to the American Association of State Highway and Transportation Officials (AASHTO) classification system. In general, the soils encountered are classified by AASHTO as fair to poor subgrade material. It is assumed that at least 3 feet of the existing material will be removed and replaced with suitable material in accordance to the

specifications outlined in the "SITE GRADING" section of this report. For design purposes, an “R” value of 5 corresponding to a resilient modulus of 3,000 psi was assumed to represent the subgrade strength for flexible pavements.

Traffic Estimates

For the pavement areas subjected to both automobile and heavy truck traffic, we have estimated ESALs (Equivalent 18-kip Single Axle Load) of 250,000 for a 20-year design life based on an average of 50 automobiles, and 30 heavy trucks per day. For areas subjected to automobile traffic only, we have estimated ESALs of 44,000 for a 20-year design life. If these estimates do not reflect the actual anticipated traffic loads for this site we should be contacted to re-evaluate the recommendations given.

Pavement section recommendations for drive lanes and parking areas are presented for asphaltic concrete (AC) over a granular base, and alternatively as a full depth layer of asphaltic concrete. We recommend that Portland Cement Concrete (PCC) pavement be used in the construction of drive and drainage aprons, garbage dumpster areas, entry areas, and other areas that will receive concentrated truck turning movements.

Asphaltic Concrete Pavement Section

The following parameters were used for the asphalt thickness design.

Design Serviceability Loss	2.2
Drainage Coefficient	0.9
Resilient Modulus	3,000 psi
Reliability	80%
Overall Deviation	0.45
Asphaltic Concrete Strength Coefficient	0.40
Aggregate Base Course Strength Coefficient	0.12

Using the WinPAS Pavement Thickness Design program, which is based on the AASHTO Guide for Design of Pavement Structures, a required structural number of 3.06 was calculated for the paved areas subjected to both automobile and heavy truck traffic. To meet or exceed the structural number based on the design parameters outlined above, we

recommend a 6 inch thick layer of asphaltic concrete pavement placed over a 12 inch thick layer of ABC be used for drive and parking lanes.

A required structural number of 2.44 was calculated for the paved areas only subjected to automobile traffic. To meet or exceed the structural number based on the design parameters outlined above, we recommend a 5 inch thick layer of asphaltic concrete pavement placed over a 8 inch thick layer of ABC be used for drive and parking lanes in these light duty areas.

Asphalt should consist of a mixture of aggregate, filler and asphalt cement established by a qualified engineer. Aggregate Base Course (ABC) should conform to the requirements of AASHTO M147 and to Section 703.03 of the CDOT Standard Specifications for Road and Bridge Construction. The ABC should meet Class 6 grading and quality as defined by the CDOT specifications. The ABC should have a minimum R-value of 78 and a minimum dry unit weight of 120 pcf when placed at the required compaction. The ABC must also meet all other appropriate Town of Parker and/or CDOT specifications.

Portland Cement Concrete Pavement Section

For concrete pavements, we recommend a minimum of 8-inches of Portland cement concrete (PCC). Concrete pavement underlain by 6 inches Class 6 ABC is recommended 1) to create a uniform subbase/base, 2) to develop a stable base below the pavement, 3) provide a working platform for construction, and 4) to help control frost heave and swelling soils.

All concrete should be based on a mix design established by a qualified engineer. A CDOT Class P mix would be acceptable. The design mix should consist of aggregate, Portland cement, water, and additives which will meet the requirements contained in this section. The concrete should have a modulus of rupture of third point loading of 650 psi. Normally, concrete with a 28-day compressive strength of 4,200 psi will meet this

requirement. Concrete should contain approximately 6 percent entrained air. Maximum allowable slump should not exceed 4 inches.

The concrete should contain joints not greater than 10 feet on centers. Joints should be sawed or formed by premolded filler. The joints should be at least 1/3 of the slab thickness. Joints should be reinforced with dowels to provide load transfer between slabs. Concrete pavement joints should meet the requirements of CDOT Standard Plan No. M-412-1 and CDOT Standard Specifications Section 412.13. Expansion joints should be provided at the end of each construction sequence and between the concrete slab and adjacent structures. Expansion joints, where required, should be filled with a ½-inch thick asphalt impregnated fiber. Concrete should be cured by protecting against loss of moisture, rapid temperature changes and mechanical injury for at least three days after placement. After sawing joints, the saw residue shall be removed and the joint sealed.

Gravel Section

It is our understanding that gravel roads and storage areas will be constructed on the north site of the site. Due to the likelihood that heavy equipment will periodically be travelling on these roadway sections, we recommend that the gravel roads consist of 12 inches of CDOT Class 6 aggregate base course (ABC) overlying compacted subgrade that has been scarified and moisture conditioned to a depth of at least 12 inches. Both the base course and the subgrade should be compacted to at least 98 percent of the maximum standard proctor density as defined by ASTM standard D698. The moisture content of the material placed should be within 2 percent of optimum for granular materials, and within 0 to 3 percent above optimum for cohesive materials.

The CDOT Class 6 aggregate base course should conform to the requirements of AASHTO M147 and to section 703.3 of the Colorado Department of Transportation (CDOT) Standard Specifications for Road and Bridge Construction. The aggregate base course should meet class 6 grading and quality as defined by the CDOT specifications.

The aggregate should have a minimum R-value of 78, and have a minimum dry unit weight of 120 pcf when placed at the required compaction.

Drainage should be designed to provide for the removal of water from the gravel-surfaced areas and prevent the wetting of subgrade soils.

Periodic maintenance is critical to the performance of the gravel road sections during the service life of the roads. Surface grades should be maintained by periodically re-grading the gravel surface. New base course material will also be necessary to replace eroded material. Potholes or other distressed areas that develop should be repaired as they occur.

Subgrade Preparation

Due to the deep fill areas encountered throughout the site, it is our opinion that over-excavation of the paved areas is required for satisfactory performance of the paved areas. The site soils at their in-situ moisture content and density generally have a low swell potential, therefore swell mitigation is not recommended. After clearing and grubbing, and rough grading, the exposed material should be excavated to a depth of 3 feet, and replaced according to the specifications outlined in the "SITE GRADING" section of this report

Proof Roll

Before paving, the subgrade should be proof-rolled with a heavily loaded, pneumatic-tired vehicle. The vehicle should have gross vehicle weight of at least 50,000 pounds with a loaded single axle weight of 18,000 pounds and a tire pressure of 100 psi. Areas which deform excessively under heavy wheel loads are not stable and should be removed and replaced to achieve a stable subgrade prior to paving or placement of base course.

Drainage

The collection and diversion of surface drainage away from paved areas is extremely important for the satisfactory performance of pavement. Drainage design should provide for the removal of water from paved areas and prevent wetting of the subgrade soils.

Maintenance

Periodic maintenance of paved areas is critical to achieve the design pavement life. Crack sealing should be performed annually as new cracks appear. Joint seals in concrete should be replaced as they deteriorate. Chip seals, fog seals, or slurry seals applied at approximate intervals of 3 to 5 years are usually necessary for asphalt. As conditions warrant, it may be necessary to perform patching and structural overlays at approximate 10-year intervals.

WATER SOLUBLE SULFATES

The concentration of water soluble sulfates measured in samples obtained from the exploratory borings ranges from less than 0.01 percent to approximately 0.16 percent. This concentration of water soluble sulfates represents a positive degree of sulfate attack on concrete exposed to these materials, and requires the use of type II cement. The criteria above is based on the rankings presented in "Design and Control of Concrete Mixtures" by the Portland Cement Association. In this area, Type I & II cement are commonly used. Type V cement is not readily available.

CONTINUING SERVICES

Two additional elements of geotechnical engineering service are important for the successful completion of this project.

1) Consultation with design professionals during the design phases. This is important so the intentions of our recommendations are properly incorporated in the design, and that any changes in the design concept properly consider geotechnical aspects.
2) Observation and monitoring during construction. A geotechnical engineer from our firm should observe the excavation, earthwork, and foundation phases of the work to judge that subsurface conditions are compatible with those used in the analysis and design.

LIMITATIONS

This report has been prepared in accordance with generally accepted geotechnical engineering principles and practices in this area at this time. We make no warranty either express or implied. The conclusions and recommendations submitted in this report are based upon the data obtained from the exploratory borings drilled at the locations indicated on Figure 2, the proposed type of construction and our experience in the area. Our findings include interpolation and extrapolation of the subsurface conditions identified at the exploratory borings and variations in the subsurface conditions may not become evident until excavation is performed. If conditions encountered during construction appear different from those described in this report, we should be notified so that revaluation of the recommendations may be made.

This report has been prepared for the exclusive use by our client for design purposes. We are not responsible for technical interpretations by others of our information. As the project evolves, we should provide continued consultation and field services during construction to review and monitor the implementation of our recommendations, and to verify that the recommendations have been appropriately interpreted. Significant design changes may require additional analysis or modifications to the recommendations presented herein. We recommend onsite observation of excavations and foundation bearing strata and testing of structural fill by a representative of the geotechnical engineer.

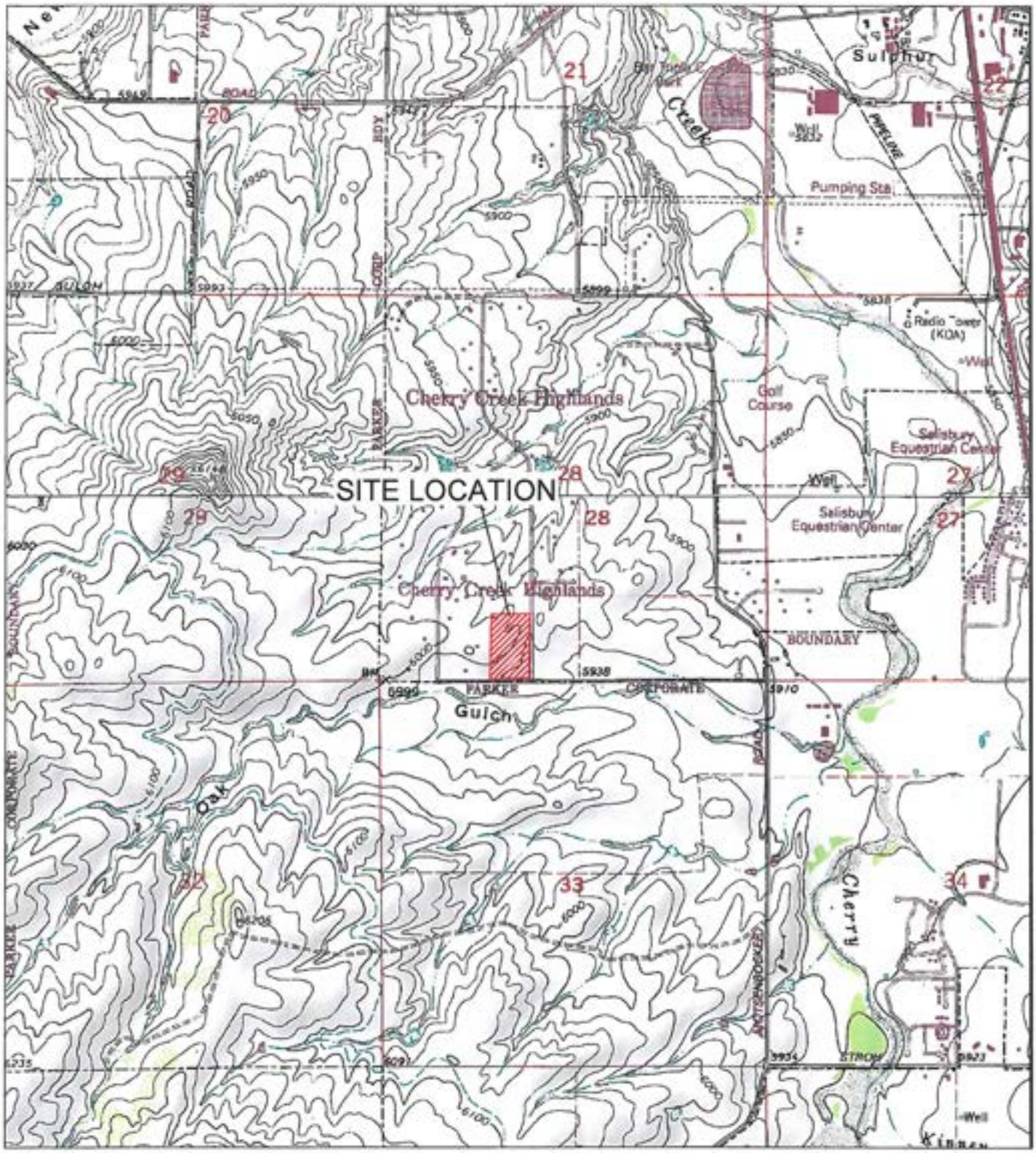
If there are any questions or if we can be of further service, please call our office.

HEPWORTH-PAWLAK GEOTECHNICAL, INC.

Arben Kalaveshi, P.E.

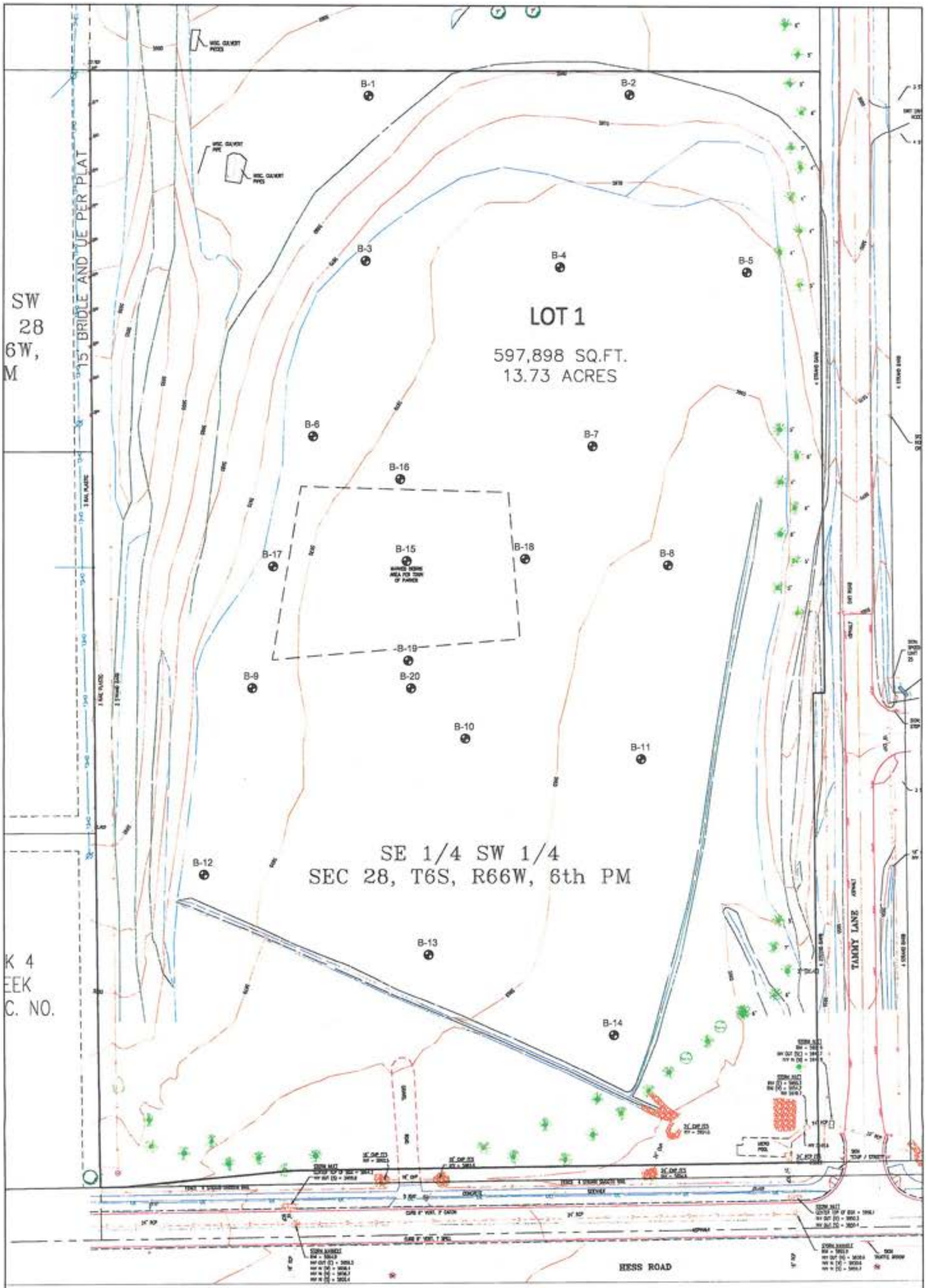
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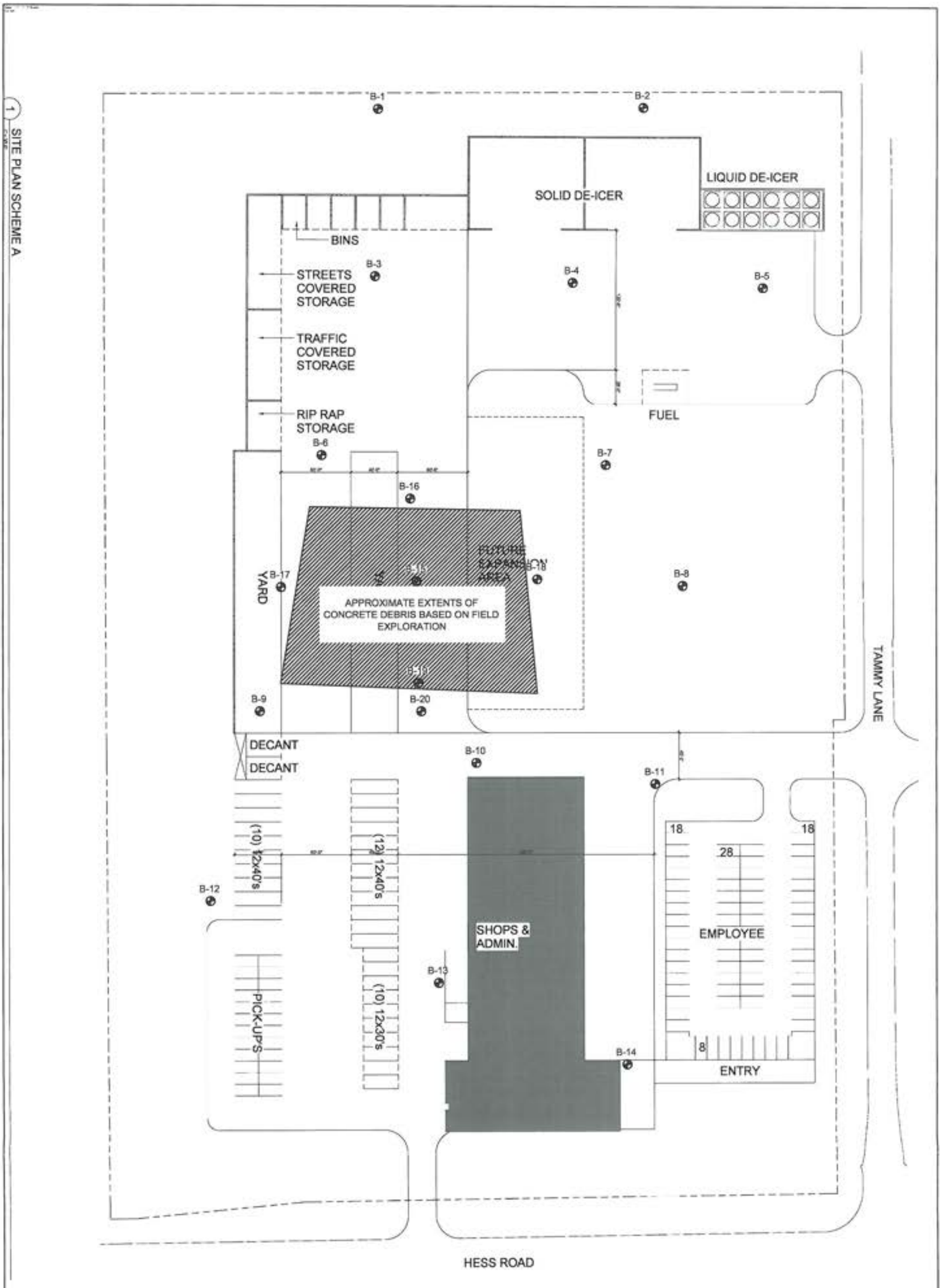


Adapted from DeLorme TopoQuads

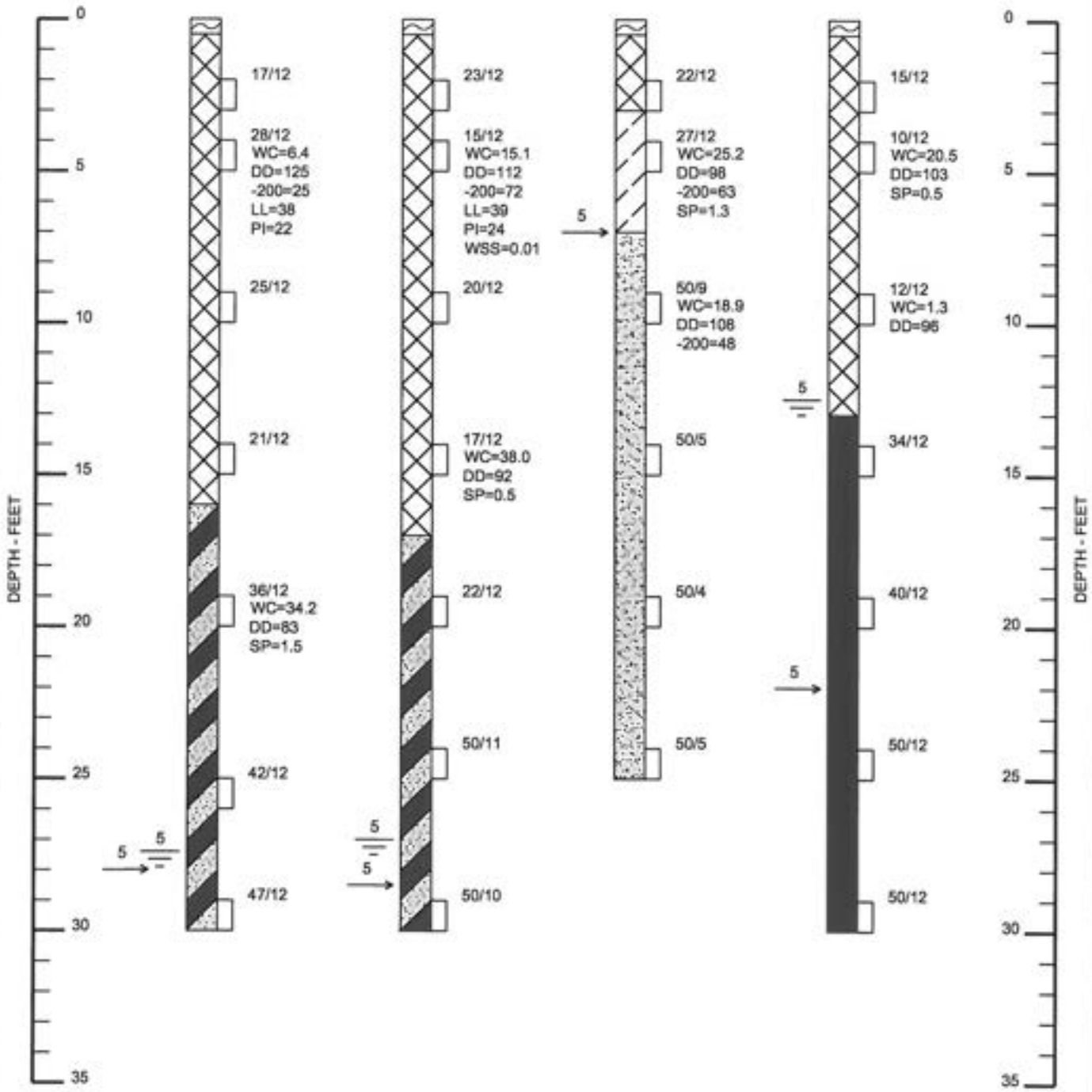
212191A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	PARKER MAINTENANCE FACILITY SITE LOCATION	FIG. 1



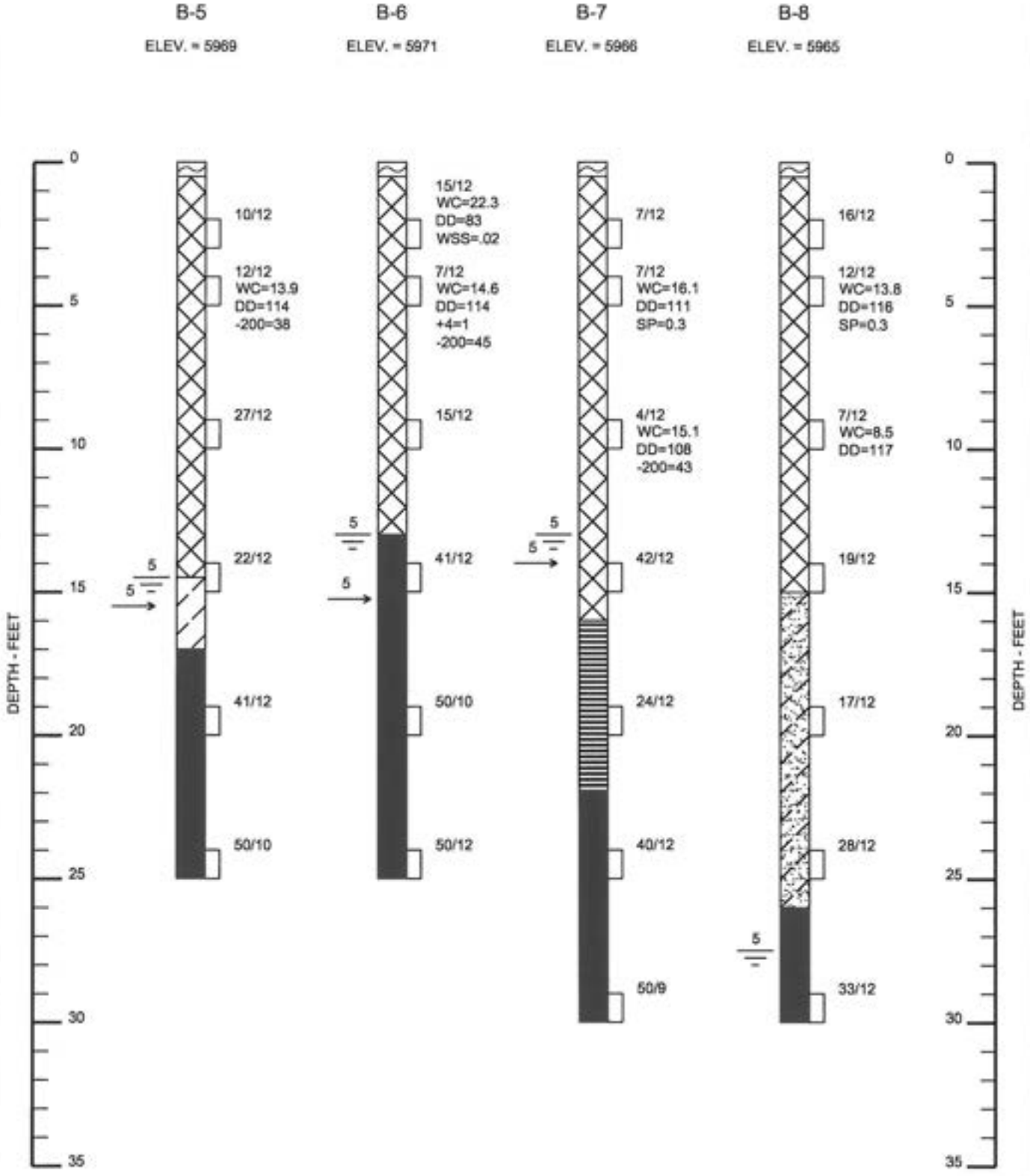
212191A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	PARKER MAINTENANCE FACILITY PROPOSED BORING LOCATION	FIG. 2



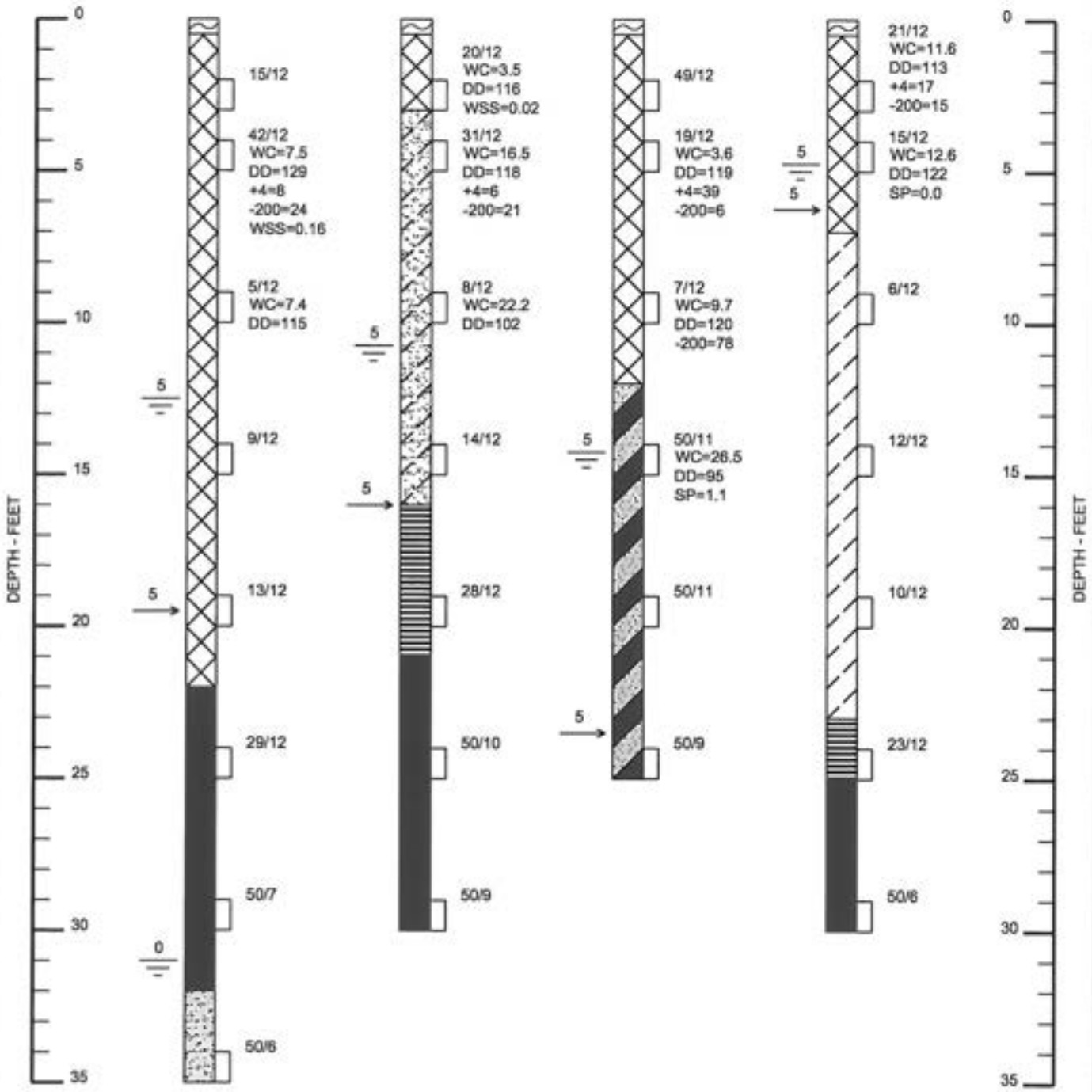
212191A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	PARKER MAINTENANCE FACILITY APPROXIMATE CONCRETE DEBRIS EXTENTS	FIG. 2A



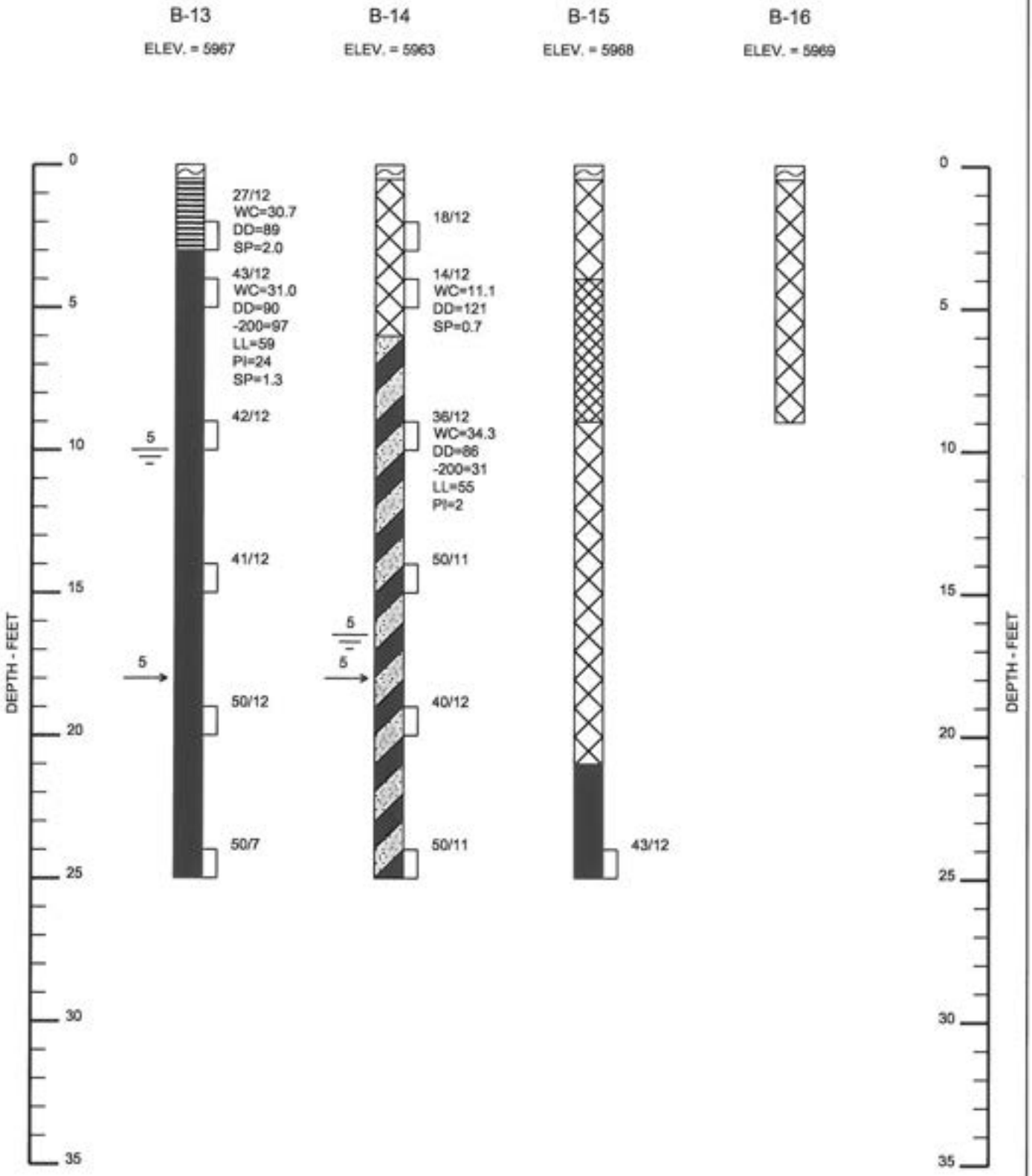
212191A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	PARKER MAINTENANCE FACILITY BORING LOGS	FIG. 3



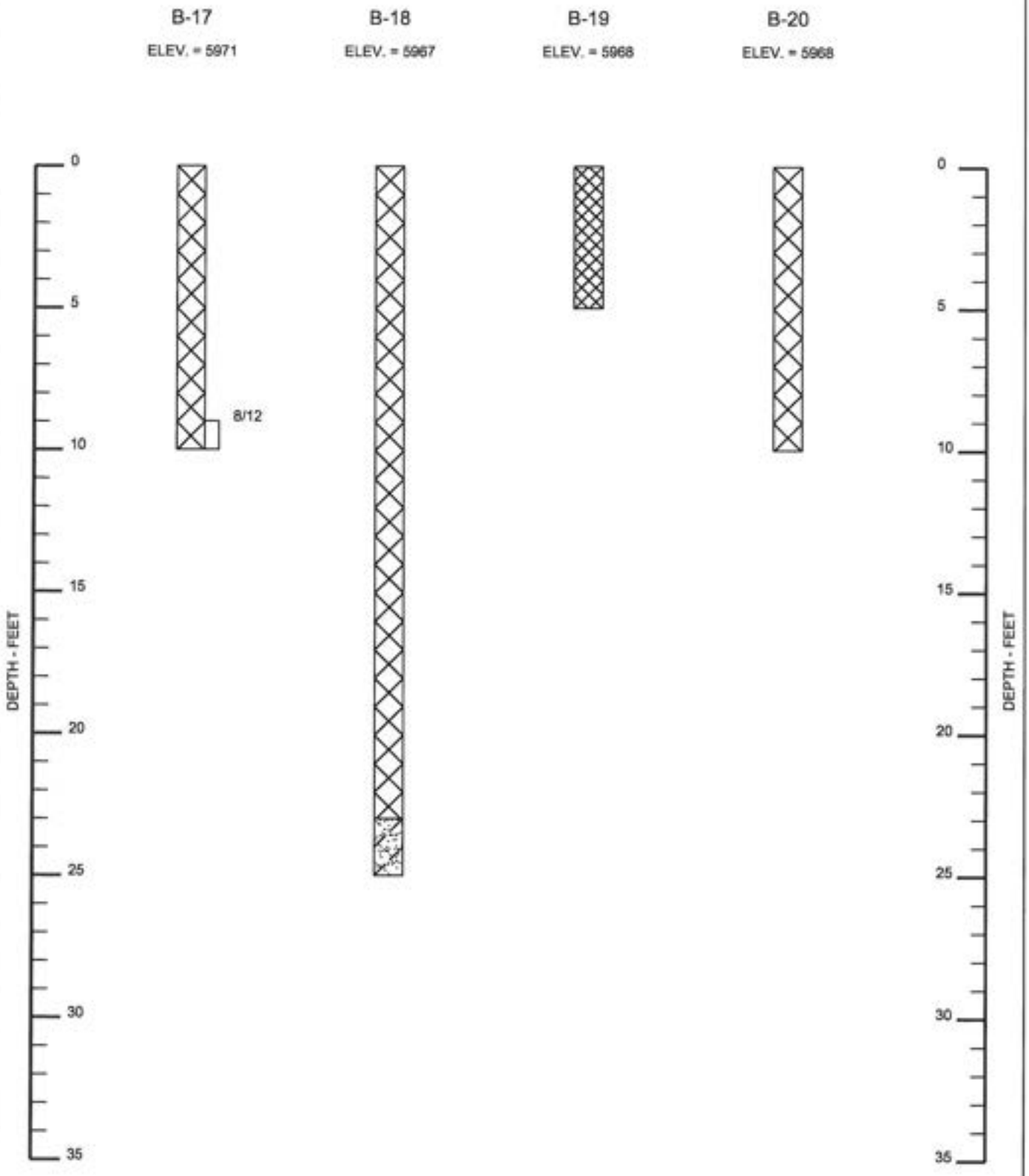
212191A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	PARKER MAINTENANCE FACILITY BORING LOGS	FIG. 4



212191A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	PARKER MAINTENANCE FACILITY BORING LOGS	FIG. 5



212191A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	PARKER MAINTENANCE FACILITY BORING LOGS	FIG. 6



212191A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	PARKER MAINTENANCE FACILITY BORING LOGS	FIG. 7

LEGEND


Topsoil, SAND (SC), clayey, moist, stiff, fine to coarse grained, with gravel, brown..


Fill, SAND (SC), clayey, to CLAY (CL), sandy, loose to medium dense, moist, mottled brown.


Fill with concrete debris, SAND (SC), clayey, to CLAY (CL), sandy, loose to medium dense, moist, mottled brown.


SAND (SC), clayey, medium dense, moist, fine to coarse grained, brown.


SANDSTONE, silty to clayey, hard to very hard, moist, fine to coarse grained, brown.


CLAYSTONE, very hard, fine grained, moist, high plasticity, brown.


Interbedded sandstone/claystone, silty to clayey, hard to very hard, moist, fine to medium grained, brown.


WEATHERED CLAYSTONE, firm, fine grained, moist, high plasticity, brown.



Indicates 2-inch I.D. California sampler. 17/12 indicates 17 blows of a 140-pound hammer falling 30 inches were required to drive the sampler 12 inches.



Indicates depth of free water and number of days after drilling measurement was made.

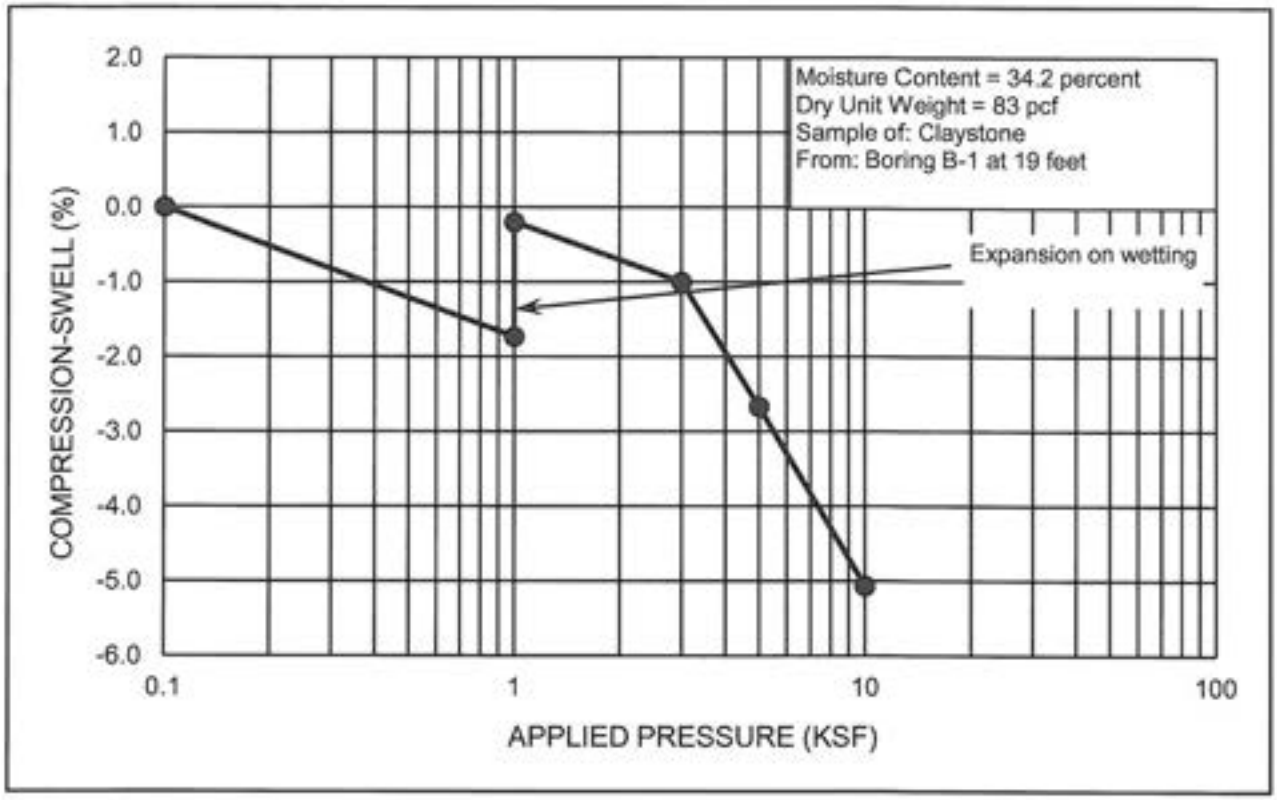


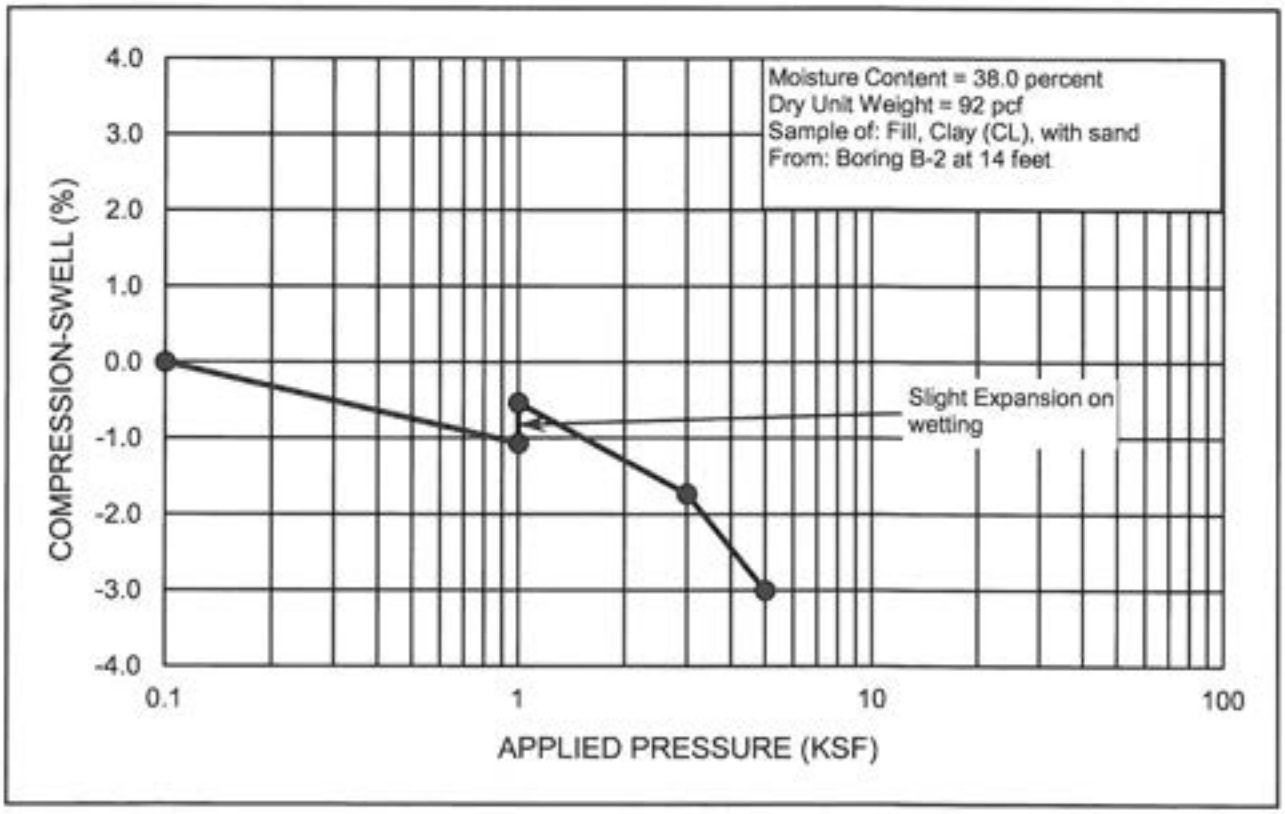
Indicates depth to which hole caved and number of days after drilling measurement was made.

NOTES:

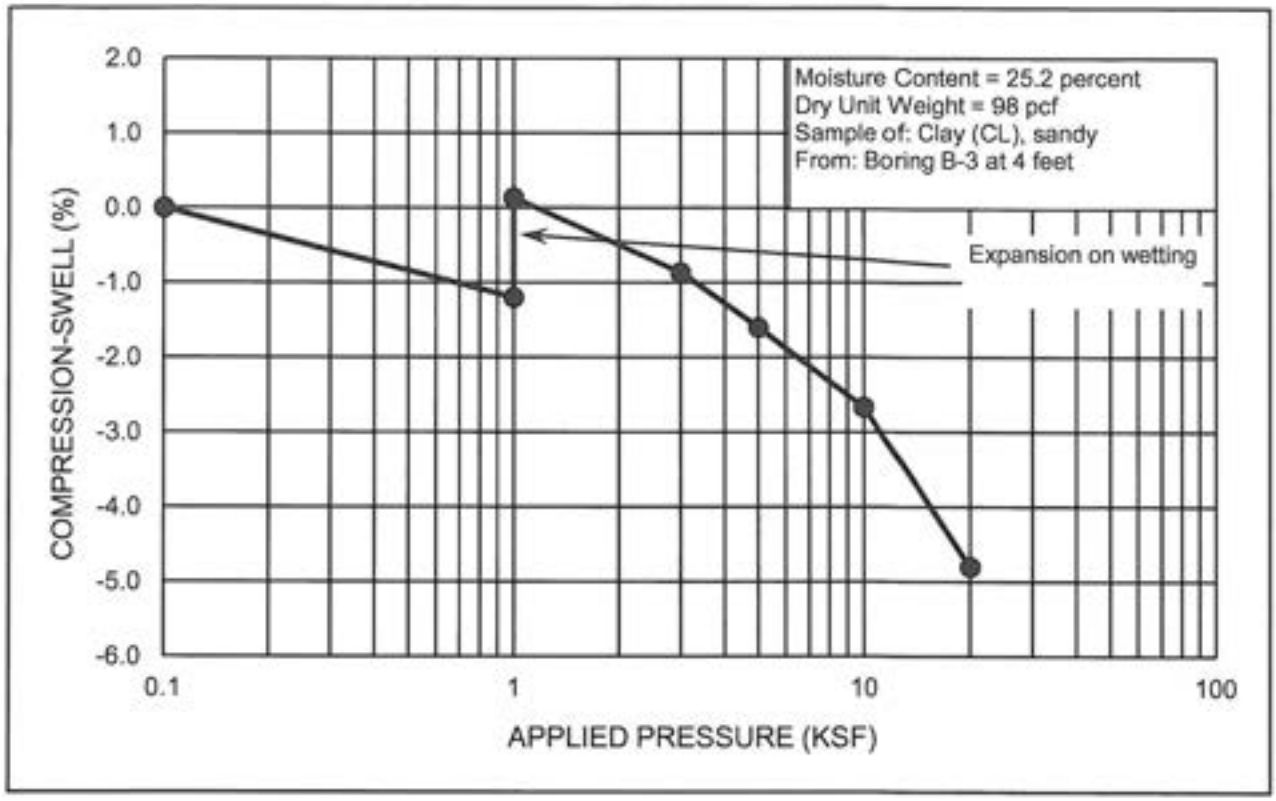
1. Borings were drilled on May 23, and May 24, 2012 with a truck mounted CME55 drill rig powering 4-inch diameter, continuous fligh augers.
2. Locations of borings were taped from features shown on the site plan provided. The boring locations should be considered accurate only to the degree implied by the method used.
3. Elevations of the borings were determined using site plan provided by client.
4. Water was encountered in the borings both at the time of excavation and when measured several days later. Fluctuations in water elevation may occur over time.
5. Laboratory Test Results:
   - WC = Moisture content (%).
   - DD = Dry density (pcf).
   - +4 = Percent retained on the no.4 sieve.
   - -200 = Percent passing the no. 200 sieve.
   - LL = Liquid limit.
   - PI = Plastic index.
   - WSS = Water soluble sulfates (%).
   - SP = Swell; under 1ksf surcharge pressure (%).

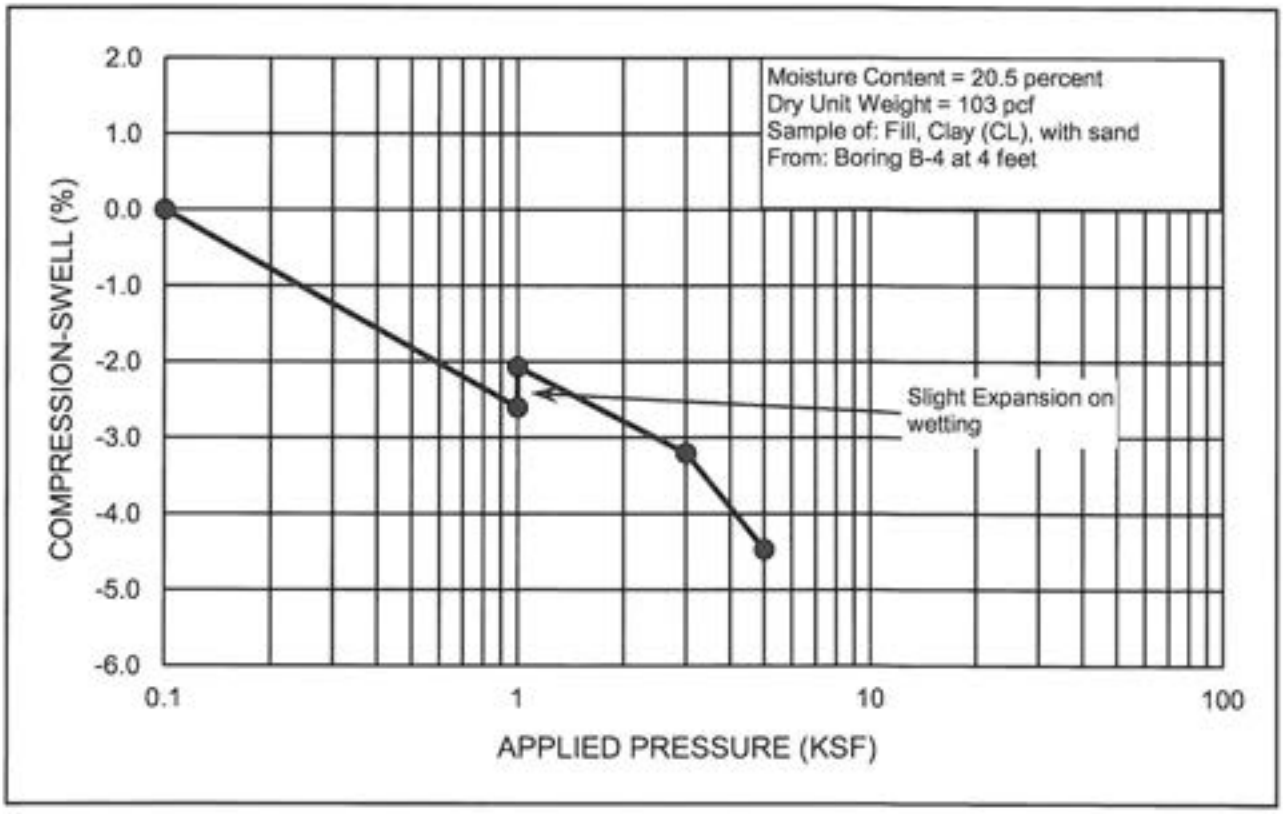
212191A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	PARKER MAINTENANCE FACILITY BORING LEGEND AND NOTES	FIG. 8



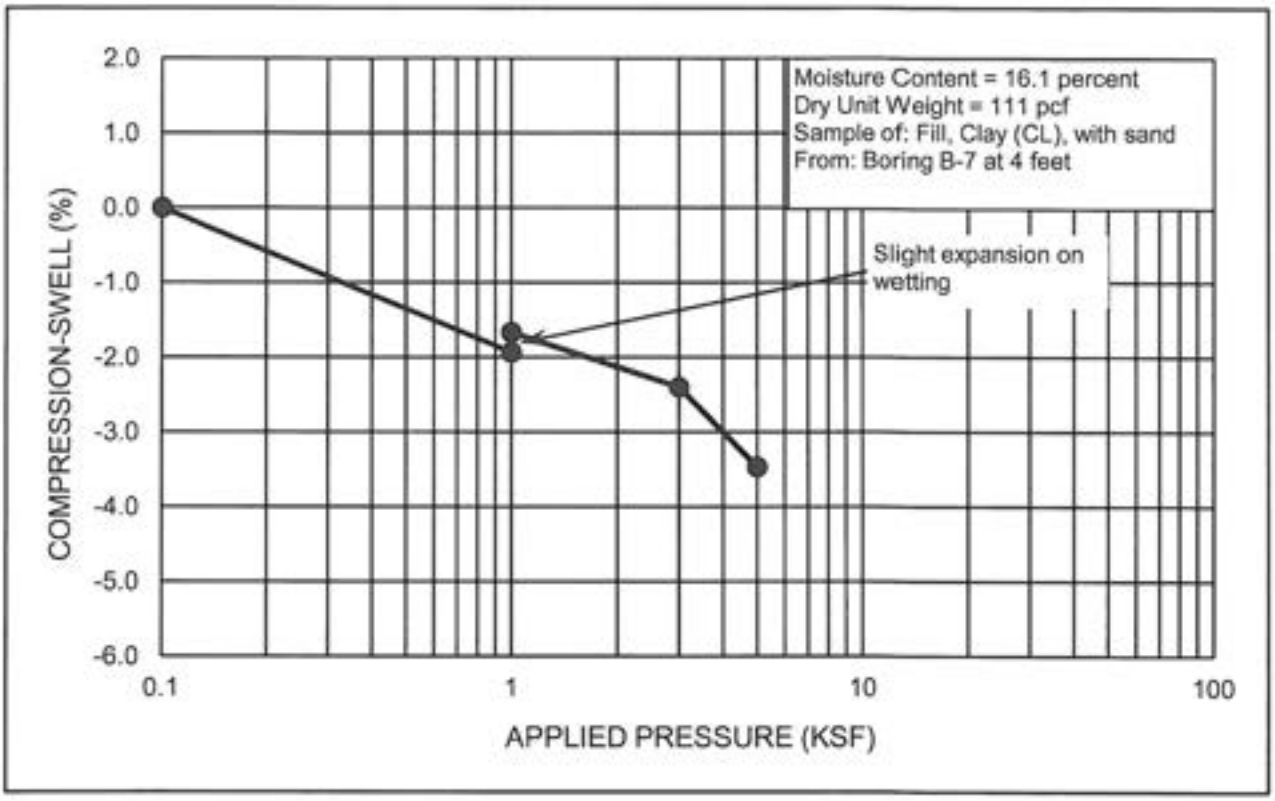


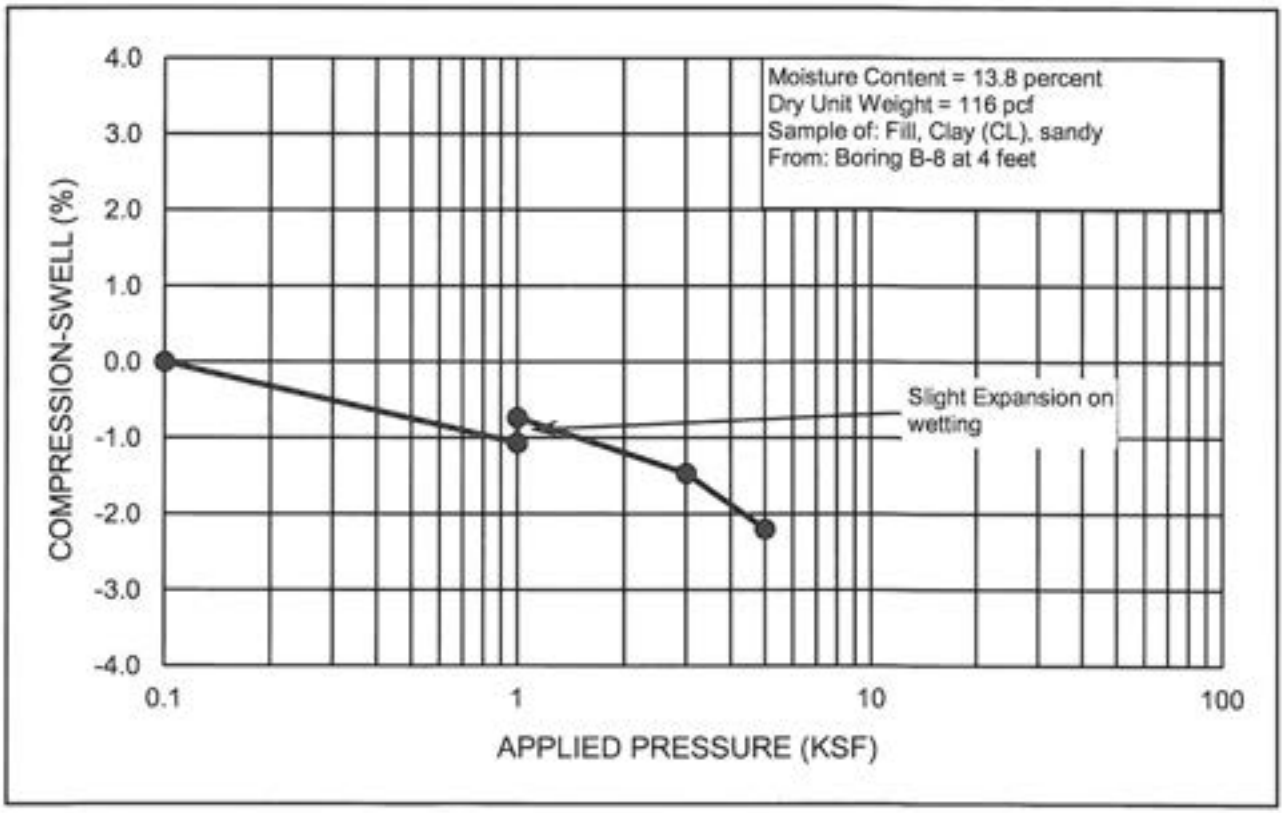
212191A	HEPWORTH-PAWLAK GEOTECHNICAL, INC.	PARKER MAINTENANCE FACILITY SWELL-COMPRESSION TEST RESULTS	FIG. 9



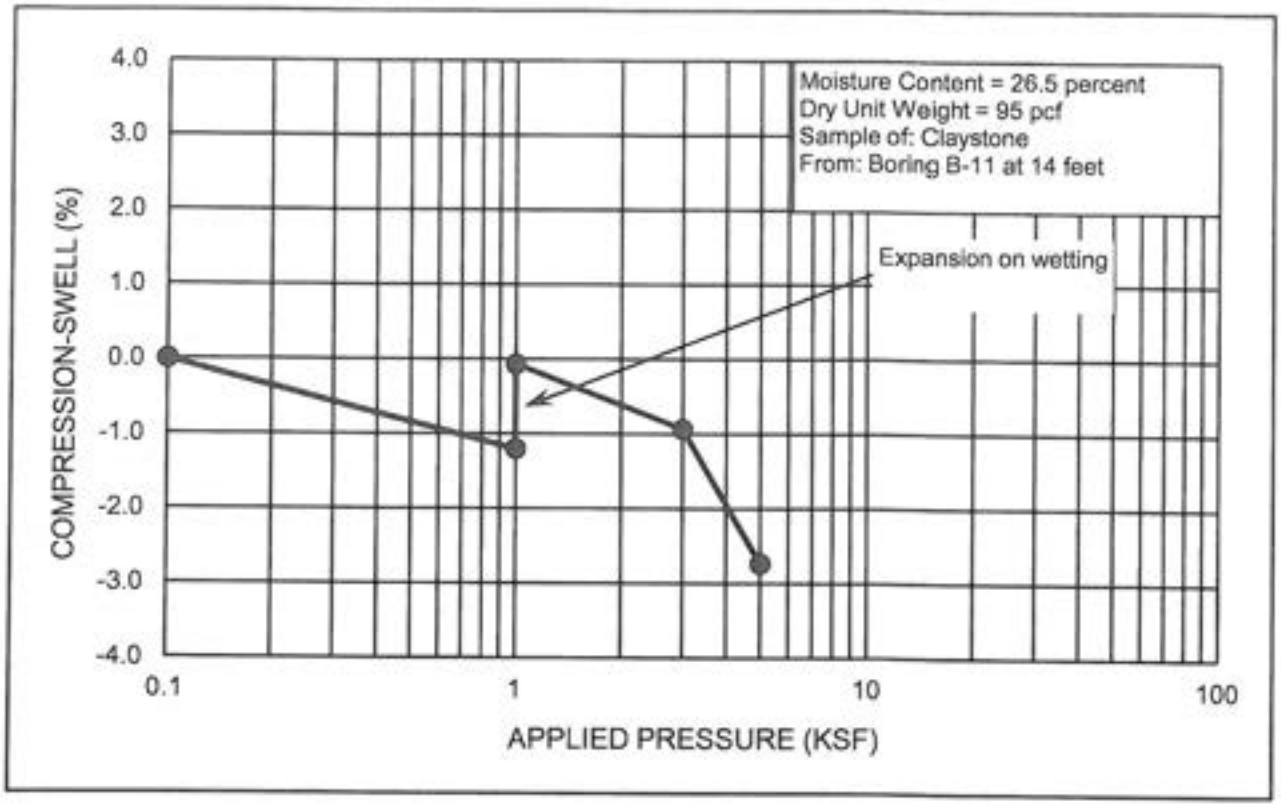


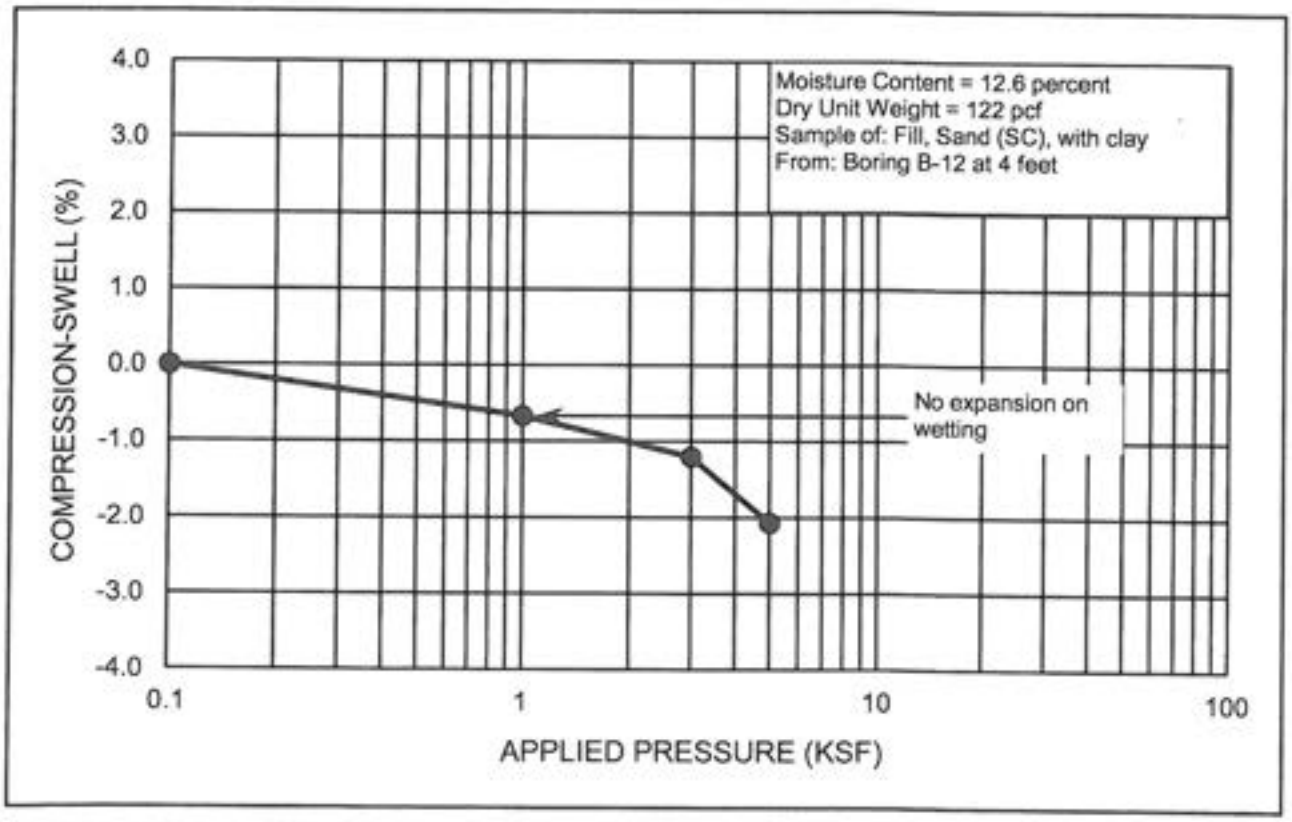
212191A	HEPWORTH-PAWLAK GEOTECHNICAL, INC.	PARKER MAINTENANCE FACILITY SWELL-COMPRESSION TEST RESULTS	FIG. 10



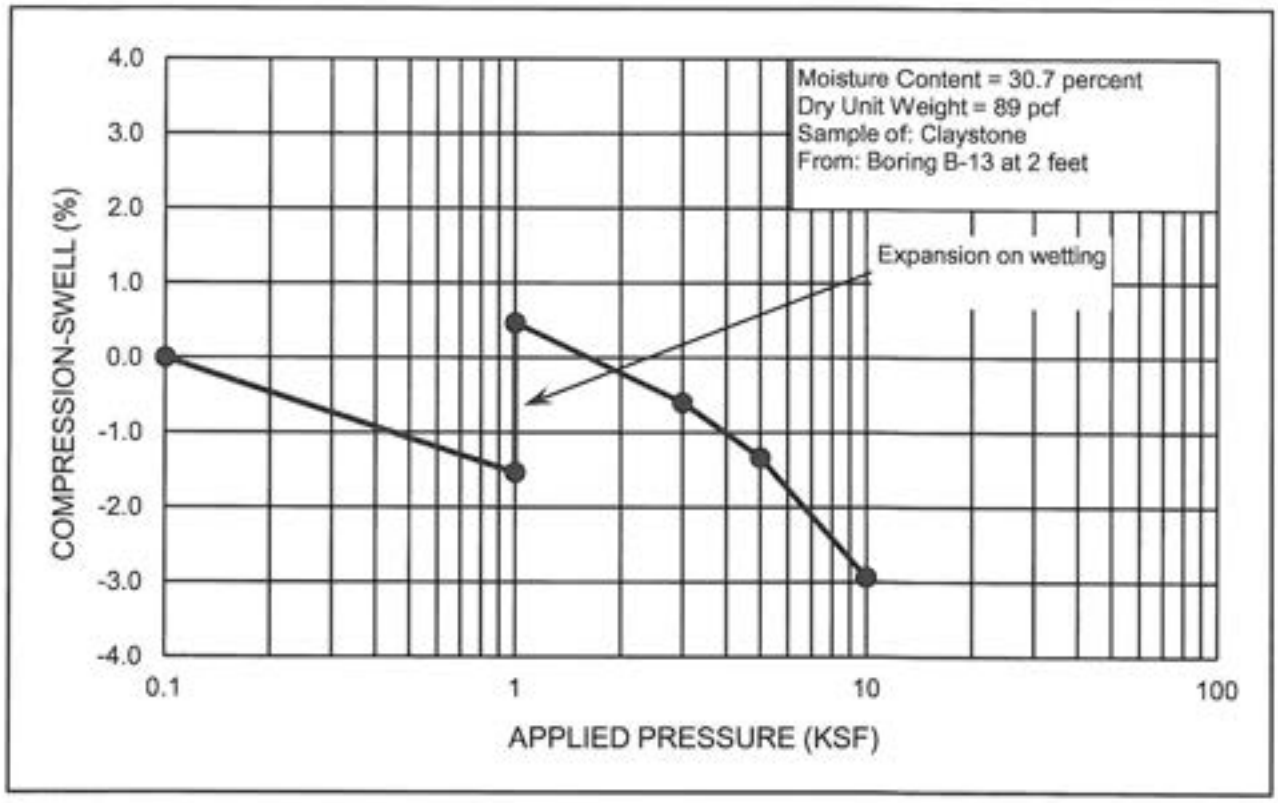


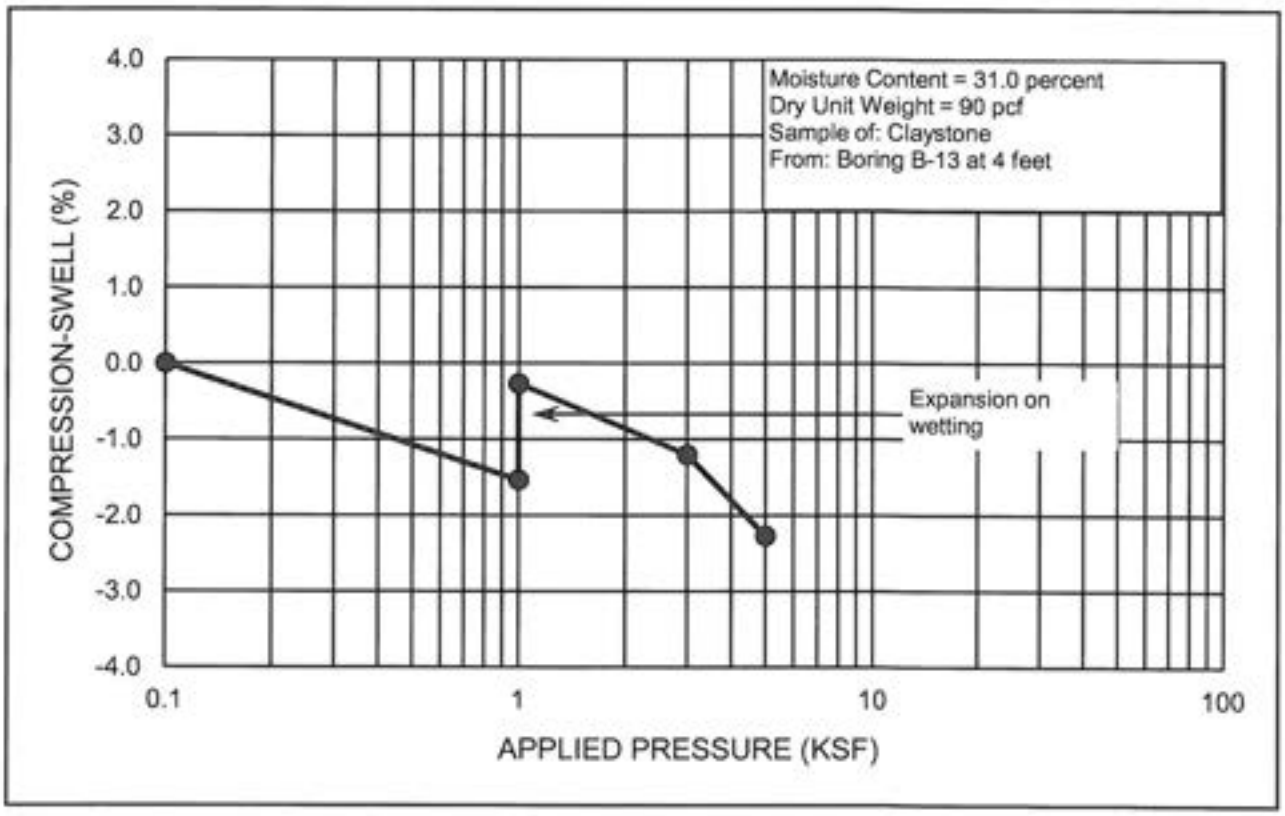
212191A	HEPWORTH-PAWLAK GEOTECHNICAL, INC.	PARKER MAINTENANCE FACILITY SWELL-COMPRESSION TEST RESULTS	FIG. 11



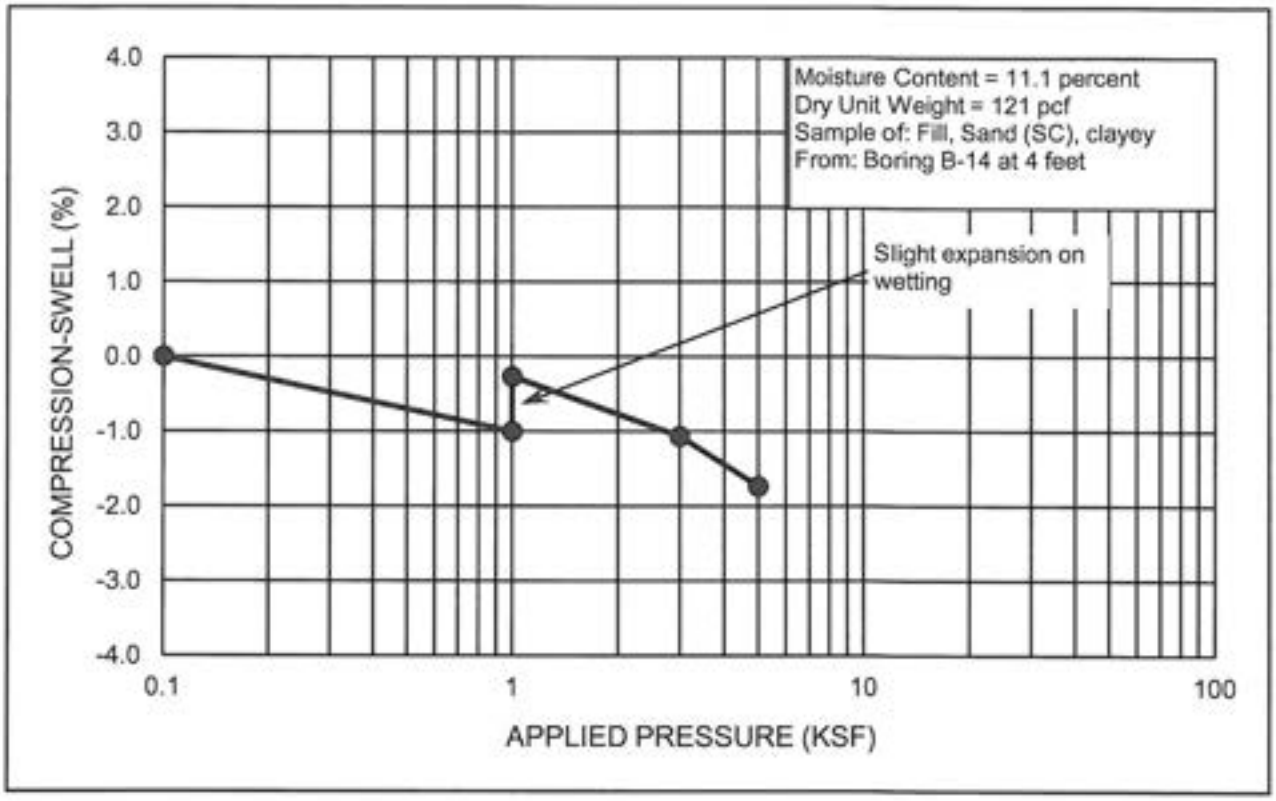


212191A	HEPWORTH-PAWLAK GEOTECHNICAL, INC.	PARKER MAINTENANCE FACILITY SWELL-COMPRESSION TEST RESULTS	FIG. 12

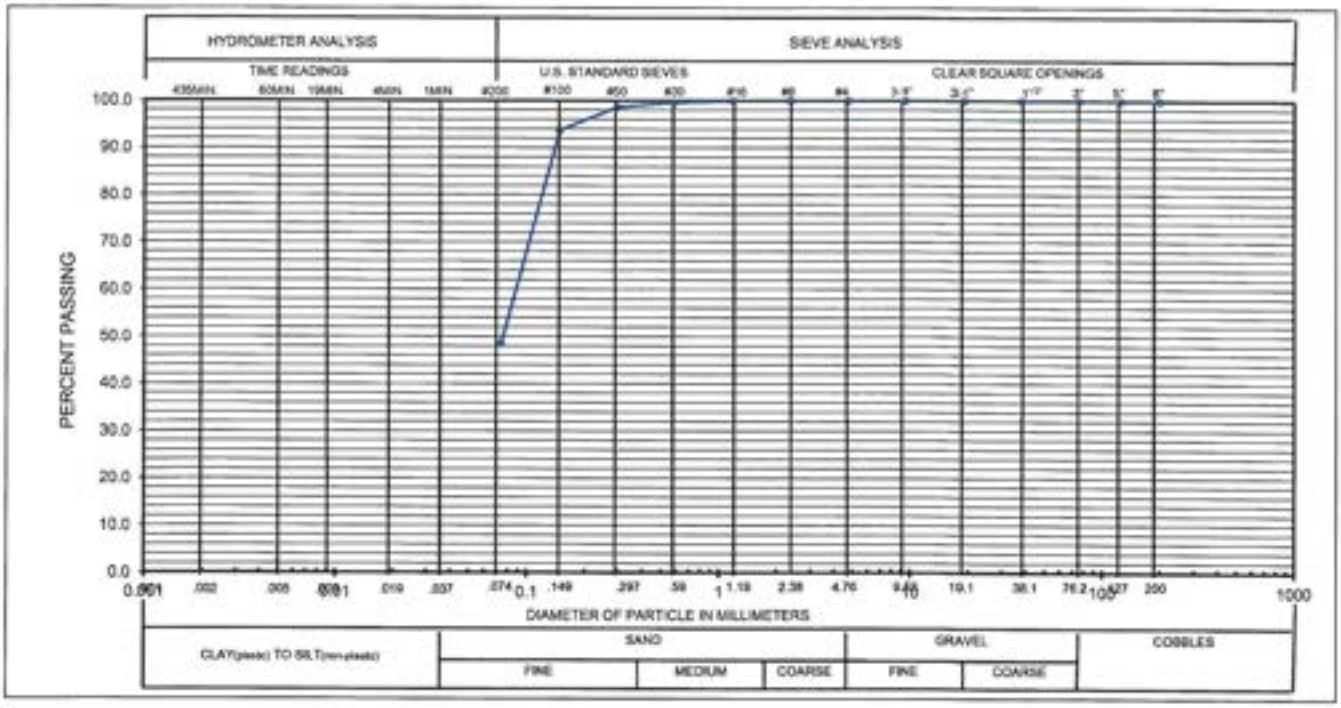




212191A	HEPWORTH-PAWLAK GEOTECHNICAL, INC.	PARKER MAINTENANCE FACILITY SWELL-COMPRESSION TEST RESULTS	FIG. 13



212191A	HEPWORTH-PAWLAK GEOTECHNICAL, INC.	PARKER MAINTENANCE FACILITY SWELL-COMPRESSION TEST RESULTS	FIG. 14



GRAVEL: 0%
LIQUID LIMIT: -
SAMPLE OF: Sandstone

SAND: 52%

SILT AND CLAY: 48%
PLASTICITY INDEX: -
BORING: B-3 @ 9'

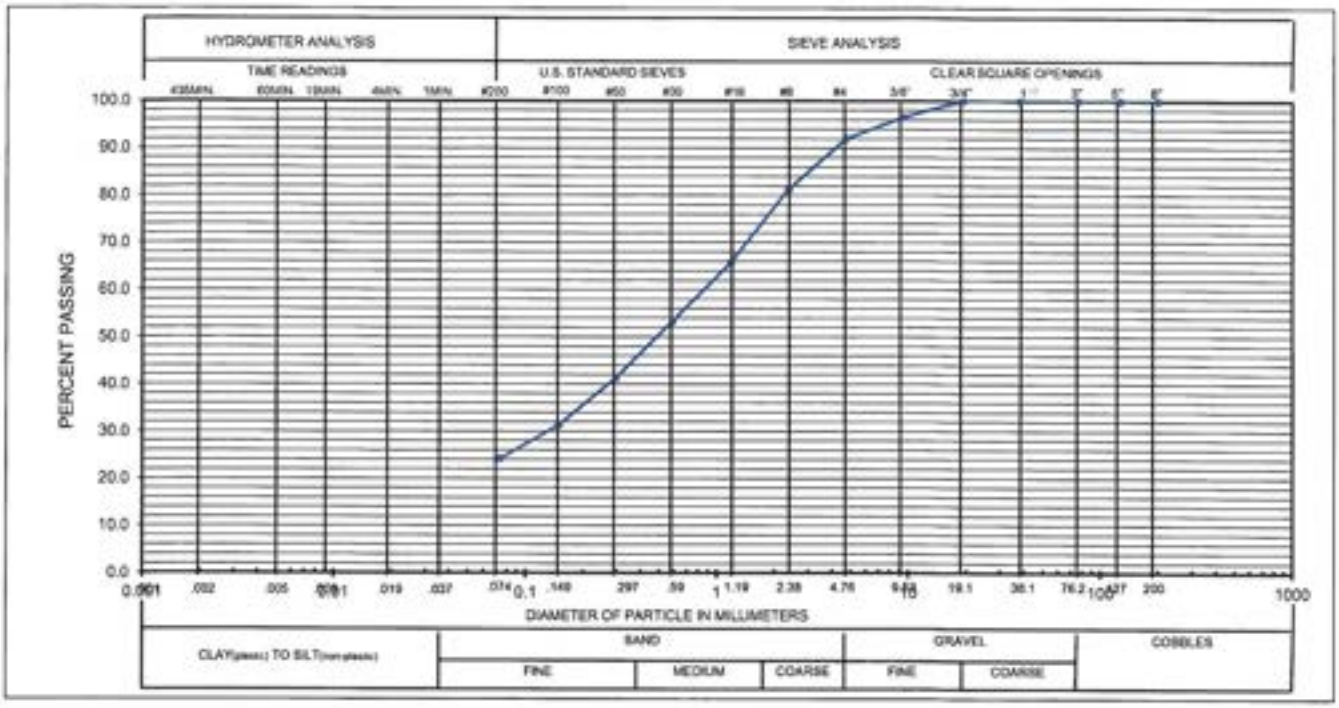


GRAVEL: 1%
LIQUID LIMIT: -
SAMPLE OF: Fill, Sand (SC), clayey

SAND: 54%

SILT AND CLAY: 45%
PLASTICITY INDEX: -
BORING: B-6 @ 4'

212191A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	PARKER MAINTENANCE FACILITY GRADATION ANALYSIS	FIG. 15



GRAVEL: 8% SAND: 68% SILT AND CLAY: 24%

LIQUID LIMIT: - PLASTICITY INDEX: -

SAMPLE OF: Fill, Sand (SC), clayey BORING: B-9 @ 4'

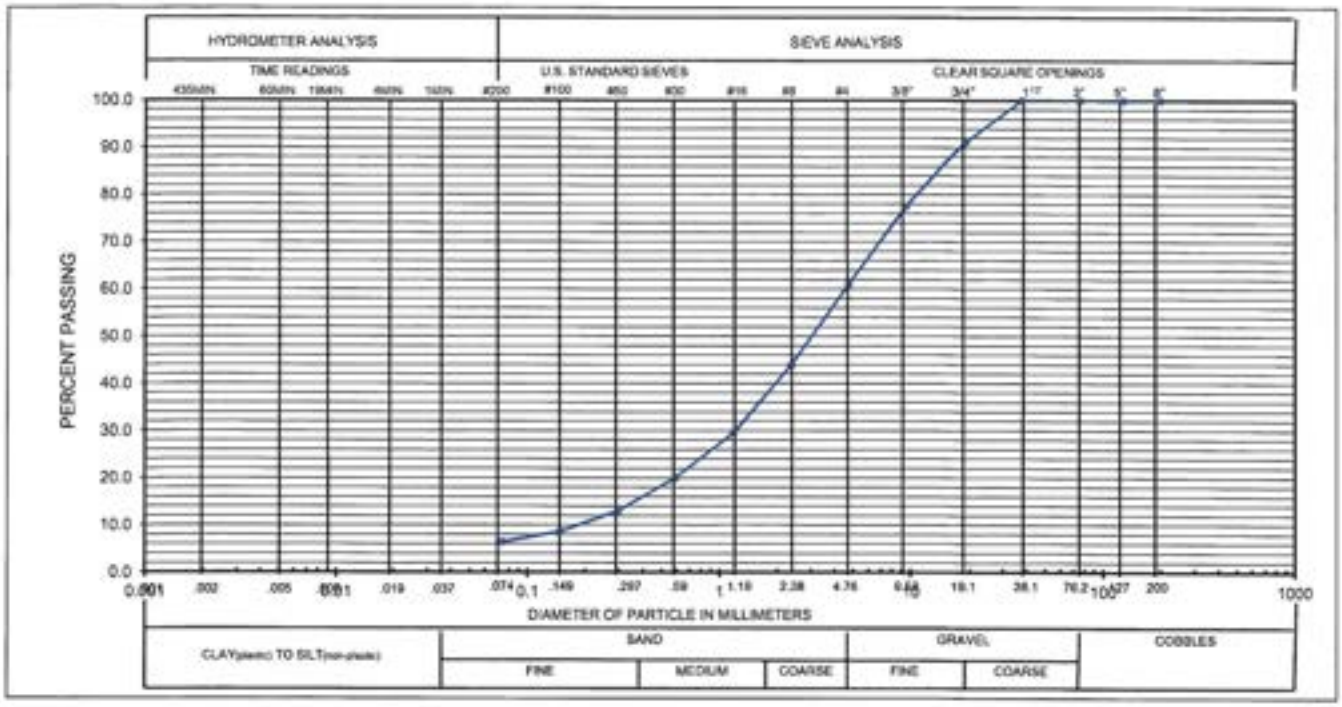


GRAVEL: 6% SAND: 73% SILT AND CLAY: 21%

LIQUID LIMIT: - PLASTICITY INDEX: -

SAMPLE OF: Sand (SC), clayey BORING: B-10 @ 4'

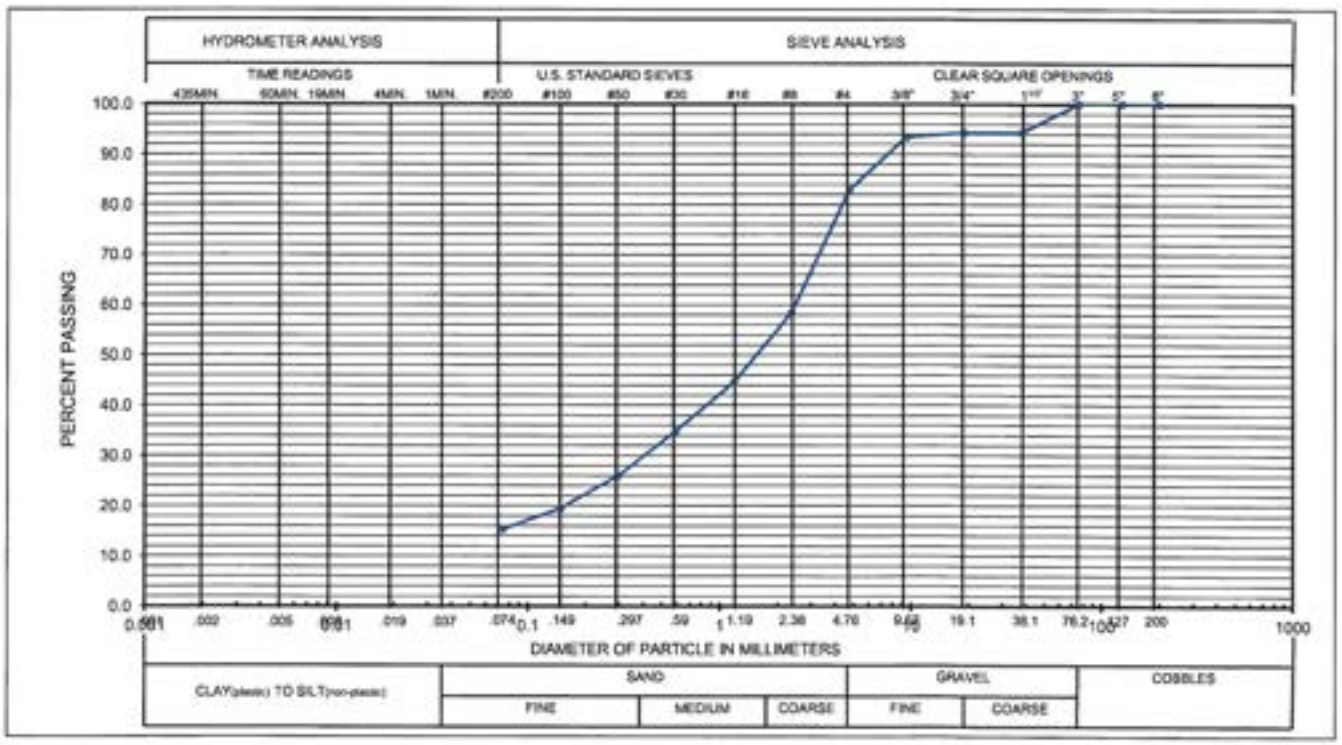
212191A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	PARKER MAINTENANCE FACILITY GRADATION ANALYSIS	FIG. 16



GRAVEL: 39% SAND: 55% SILT AND CLAY: 6%

LIQUID LIMIT: - PLASTICITY INDEX: -

SAMPLE OF: Fill, Sand (SW-SC), gravelly with clay BORING: B-11 @ 4'

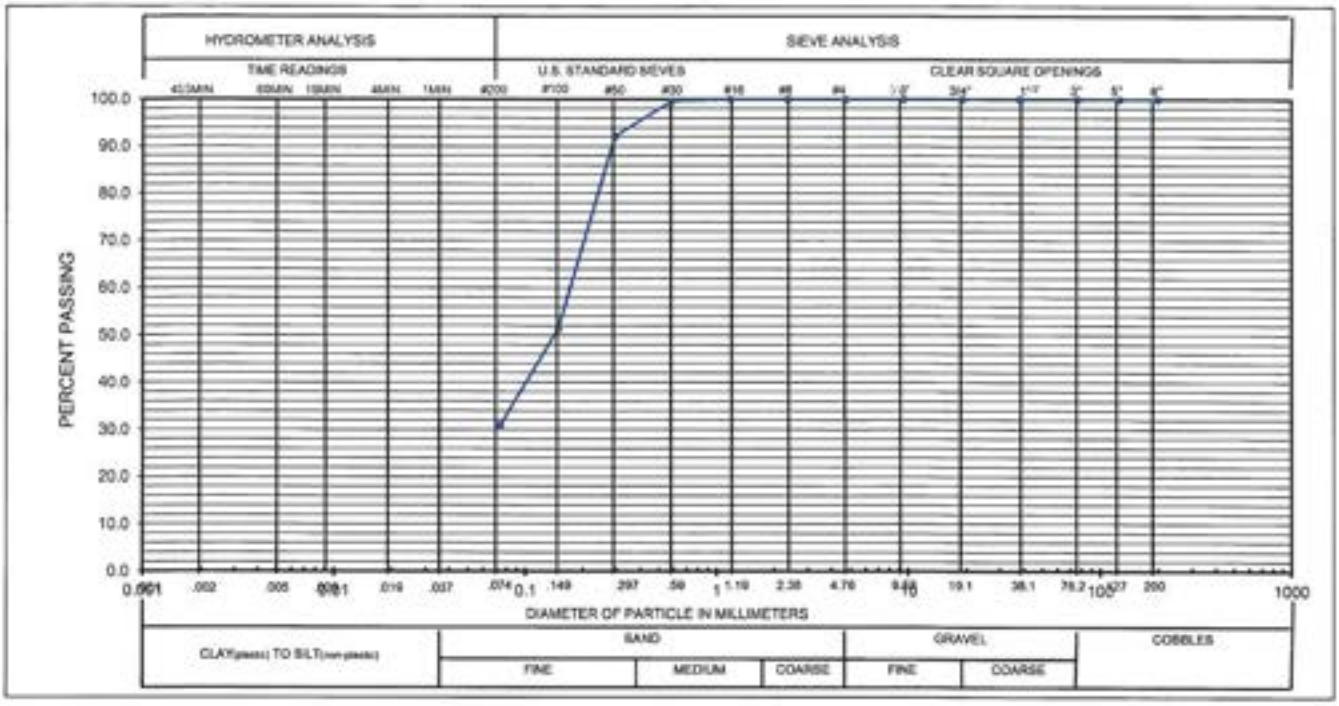


GRAVEL: 17% SAND: 68% SILT AND CLAY: 15%

LIQUID LIMIT: - PLASTICITY INDEX: -

SAMPLE OF: Fill, Sand (SC), with clay and gravel BORING: B-12 @ 2'

212191A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	PARKER MAINTENANCE FACILITY GRADATION ANALYSIS	FIG. 17



GRAVEL: 0%
SAND: 69%
SILT AND CLAY: 31%
LIQUID LIMIT: 55
PLASTICITY INDEX: 2
SAMPLE OF: Sandstone
BORING: B-14 @ 9'

212191A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	PARKER MAINTENANCE FACILITY GRADATION ANALYSIS	FIG. 18

HEPWORTH-PAWLAK GEOTECHNICAL, INC.

JOB NO. 212191A

TABLE 1

SUMMARY OF LABORATORY TEST RESULTS

SAMPLE LOCATION		NATURAL MOISTURE CONTENT (%)	NATURAL DRY UNIT WEIGHT (PCF)	GRADATION			ATTERBERG LIMITS		WATER SOLUBLE SULFATES, (%)	SWELL-COMPRESSION, 1000 PSF SURCHARGE, (%)	R-VALUE (#)	UNCONFINED COMPRESSION (PSF)	SOIL OR BEDROCK TYPE
BORING	DEPTH (feet)			GRAVEL (%)	SAND (%)	SILT & CLAY (%)	LIQUID LIMIT	PLASTIC INDEX					
B-1	4	6.4	125			25	38	22					Sand (SC), clayey
B-1	19	34.2	84							1.5			Claystone
B-2	2	15.1	112			72	39	24	0.01				Fill, Clay (CL), with sand
B-2	14	38.0	92							0.5			Fill, Clay (CL), with sand
B-3	4	25.2	98			63				1.3			Clay (CL), sandy
B-3	9	18.9	108	0	52	48							Sandstone
B-4	4	20.5	103							0.5			Fill, Clay (CL), with sand
B-4	9	1.3	96										Fill, Sand (SC), clayey
B-5	4	13.9	114			38							Fill, Sand (SC), clayey
B-6	2	22.3	83						0.02				Fill, Sand (SC), clayey
B-6	4	14.6	114	1	54	45							Fill, Sand (SC), clayey
B-7	4	16.1	111							0.3			Fill, Clay (CL), with sand
B-7	9	15.1	108			43							Fill, Sand (SC), clayey
B-8	4	13.8	116							0.3			Fill, Clay (CL), sandy
B-8	9	8.5	117										Fill, Sand (SC), clayey
B-9	4	7.5	129	8	68	24			0.16				Fill, Sand (SC), clayey, with gravel
B-9	9	7.4	115										Fill, Sand (SC), clayey
B-10	2	3.5	116						0.02				Fill, Sand (SC), clayey
B-10	4	16.5	118	6	73	21							Sand (SC), clayey, with gravel
B-10	9	22.2	102										Sand (SC), clayey
B-11	4	3.6	119	39	55	6							Fill, Sand (SW-SC), gravelly with clay
B-11	9	9.7	120			78							Fill, Clay (CL), with sand
B-11	14	26.5	95							1.1			Claystone
B-12	2	11.6	113	17	68	15							Fill, Sand (SC), clayey, with gravel

NS = No Swell

HEPWORTH-PAWLAK GEOTECHNICAL, INC.

JOB NO. 212191A

TABLE 1

SUMMARY OF LABORATORY TEST RESULTS

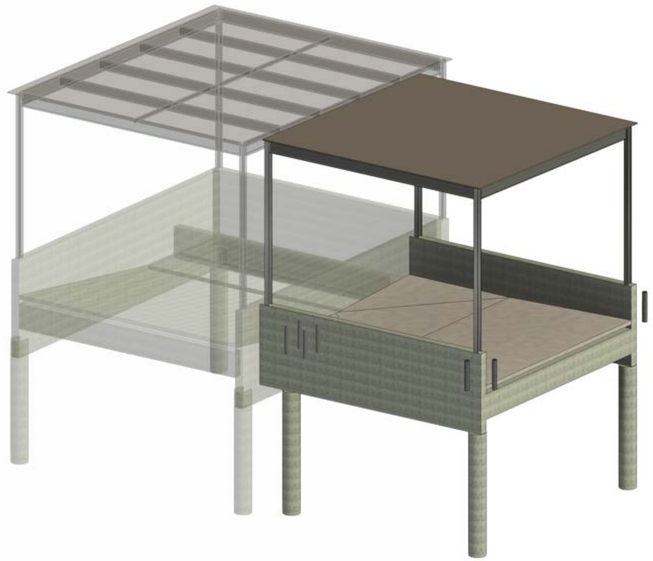
SAMPLE LOCATION		NATURAL MOISTURE CONTENT (%)	NATURAL DRY UNIT WEIGHT (PCF)	GRADATION			ATTERBERG LIMITS		WATER SOLUBLE SULFATES, (%)	SWELL-COMPRESSION, 1000 PSF SURCHARGE, (%)	R-VALUE (#)	UNCONFINED COMPRESSION (PSF)	SOIL OR BEDROCK TYPE
BORING	DEPTH (feet)			GRAVEL (%)	SAND (%)	SILT & CLAY (%)	LIQUID LIMIT	PLASTIC INDEX					
B-12	4	12.6	122							NS			Fill, Sand (SC), with clay
B-13	2	30.7	89							2.0			Claystone
B-13	4	31.0	90			97	59	34		1.3			Claystone
B-14	4	11.1	121							0.7			Fill, Sand (SC), clayey
B-14	9	34.3	86	0	69	31	55	2					Sandstone

NS = No Swell

TOWN OF PARKER

PARKER DECANT ADDITION

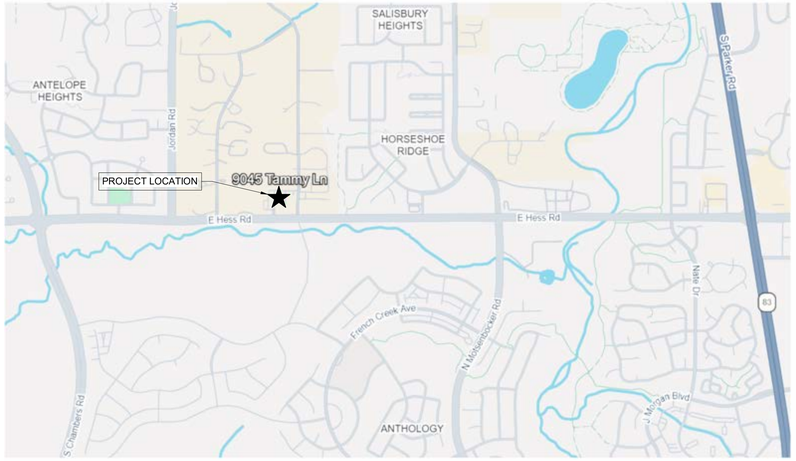
9045 TAMMY LANE, PARKER, COLORADO 80134



PROJECT DESCRIPTION

THE PROJECT CONSISTS OF AN ADDITION TO THE EXISTING COVERED DECONTAMINATION FACILITY LOCATED IN THE TOWN OF PARKER, COLORADO. THE EXISTING FACILITY CONSISTS OF A STRUCTURAL STEEL ROOF CANOPY OVER A CONCRETE FOUNDATION AND SLAB DECONTAMINATION BAY. THE PROPOSED ADDITION CONSISTS OF A NEW STRUCTURAL STEEL ROOF CANOPY, MATCHING THE EXISTING STRUCTURE, OVER A NEW CONCRETE FOUNDATION AND SLAB. THE NEW SLAB WILL BE GRADED TO DRAIN INTO THE EXISTING DECONTAMINATION BAY.

VICINITY MAP



PROJECT TEAM

OWNER:
TOWN OF PARKER
9045 TAMMY LANE
PARKER, CO 80134
TEL: 303-805-3204
E-MAIL: AMESTDAGH@PARKERCO.GOV
CONTACT: ALEX MESTDAGH, ENGINEERING SERVICES MANAGER

STRUCTURAL DESIGN:
CORBEL ENGINEERING
2850 MCCLELLAND DR., SUITE 2200
FORT COLLINS, CO 80525
TEL: 970-852-0951
E-MAIL: CASEY.WILSON@CORBELENG.COM
CONTACT: CASEY WILSON

ELECTRICAL DESIGN:
G2 CONSULTING ENGINEERS INC
5000 GOODMAN ST UNIT 100
TIMNATH, CO 80547
TEL: 970-460-7400
E-MAIL: DSMITH@G2CE.COM
CONTACT: DAVE SMITH

DRAWING INDEX

GENERAL

G0.1	COVER SHEET
G0.2	SITE AND AERIAL PLANS

STRUCTURAL

S0.1	GENERAL NOTES AND SPECIAL INSPECTIONS
S1.1	PLANS
S3.1	ELEVATIONS
S5.1	FOUNDATION DETAILS
S5.2	FRAMING DETAILS

ELECTRICAL

E1.00	ELECTRICAL INDEX, LEGEND, SCHEDULE, AND SITE PLAN

CORBEL ENGINEERING
STRUCTURAL ENGINEERING SERVICES
301 BOARDWALK DR. #273353, FORT COLLINS, CO 80527
WWW.CORBELENG.COM

COLORADO LICENSED
CASEY BRANDON WILSON
50764
9/21/2026
PROFESSIONAL ENGINEER

Parker Decant Addition
9045 Tammy Lane
Parker, Colorado 80134

No.	Description	Date

COVER SHEET

Project number	260086
Date	9/21/2026
Drawn by	IV
Checked by	CBW

SHEET NUMBER

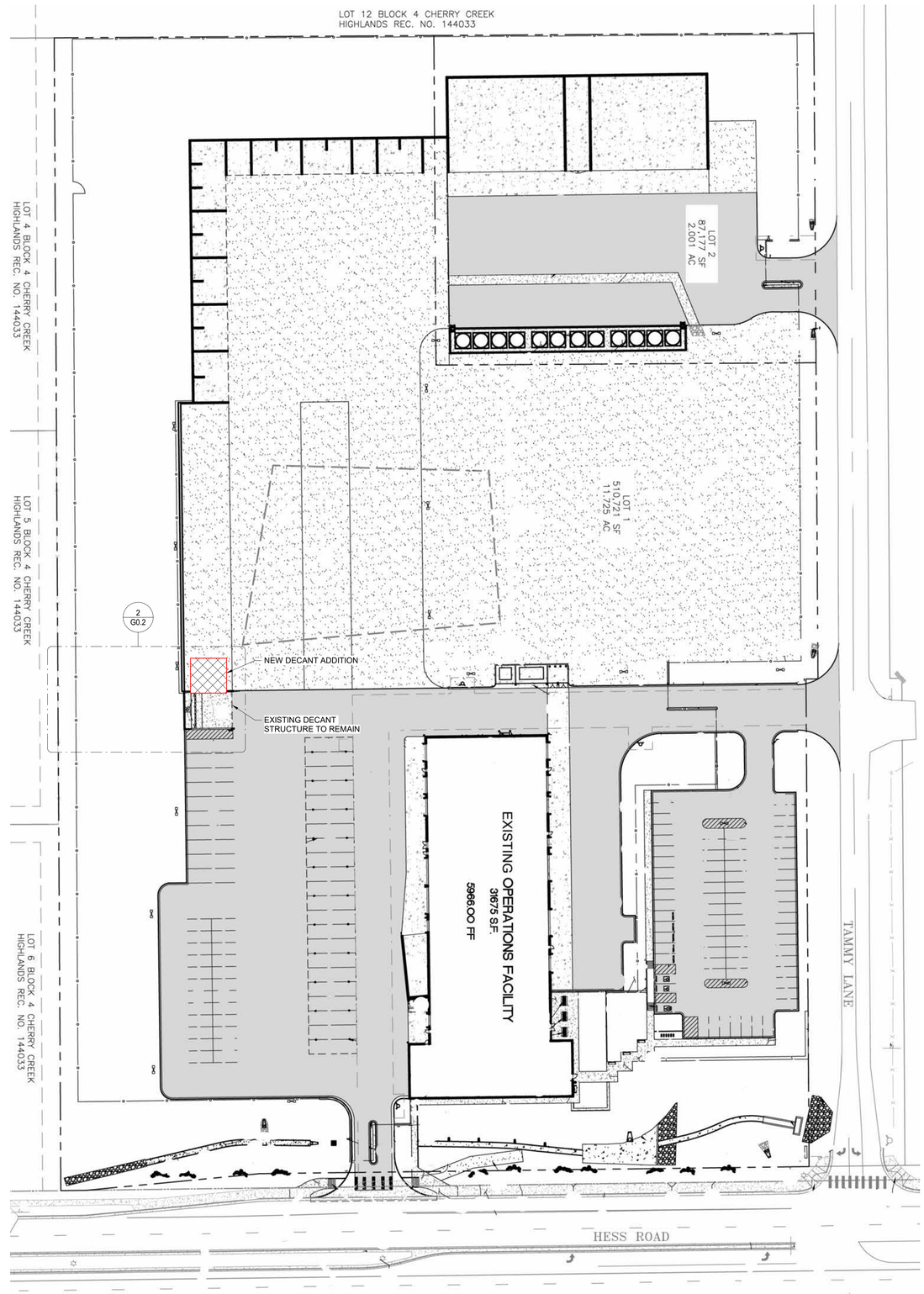
G0.1

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These site drawings were prepared by others. Corbel Engineering, LLC is providing only for purposes of locating the vicinity of new work. The structural engineer's seal applies solely to the structural elements shown for the new decant addition and does not imply review, approval, or responsibility for non-structural aspects of the drawings.

SITE ADDRESS: 9045 TAMMY LANE, PARKER, CO, 80134

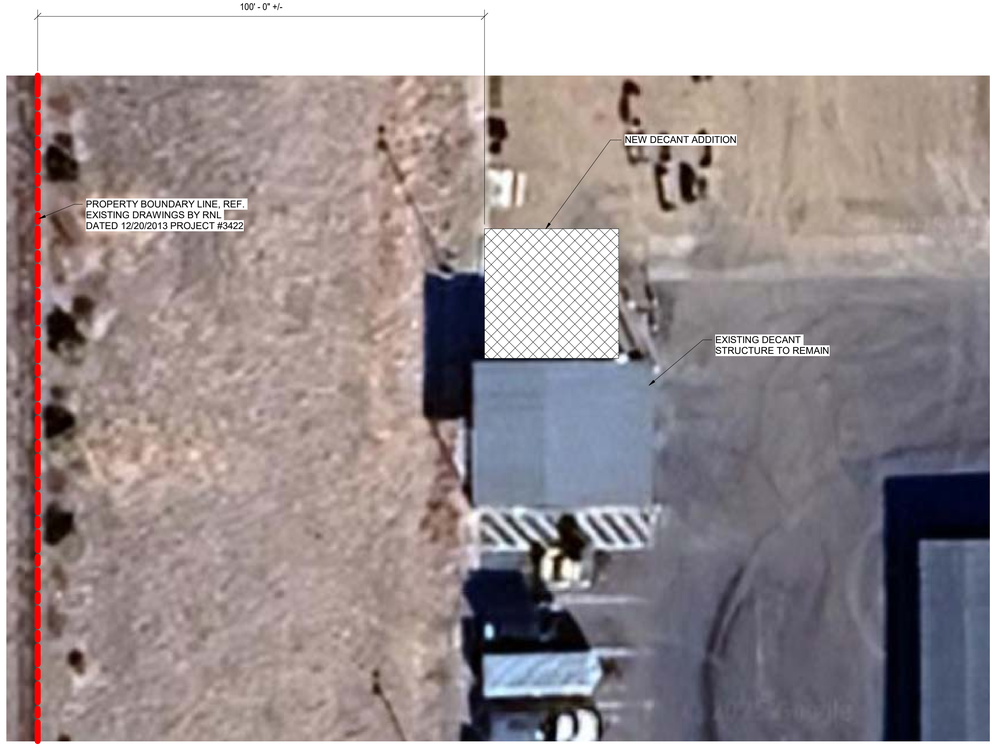
PROPERTY OWNER: TOWN OF PARKER
STATE PARCEL #: 2233-283-04-003
ZONING DISTRICT: PF, PUBLIC FACILITIES
SETBACKS: FRONT=10', SIDES=10' (25' ADJACENT PROTECTED LOTS), REAR=10' (25' ADJACENT PROTECTED LOTS)



1 SITE PLAN
1" = 50'-0"

PLAN NORTH

TRUE NORTH



2 AERIAL PLAN
1/16" = 1'-0"

PLAN NORTH

TRUE NORTH

CORBEL ENGINEERING
STRUCTURAL ENGINEERING SERVICES
301 BOARDWALK DR. #273353, FORT COLLINS, CO 80527
WWW.CORBELENG.COM

COLORADO LICENSED
CASEY BRANDON WEST
50764
9/21/2026
PROFESSIONAL ENGINEER

Parker Decant Addition

9045 Tammy Lane
Parker, Colorado 80134

No.	Description	Date
1	PERMIT SET	9/21/2025

SITE AND AERIAL PLANS

Project number	260086
Date	9/21/2026
Drawn by	IV
Checked by	CBW

SHEET NUMBER

G0.2

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GENERAL REQUIREMENTS

1. THESE DRAWINGS AND ASSOCIATED DOCUMENTS ARE THE INTELLECTUAL PROPERTY OF CORBEL ENGINEERING, LLC AND ARE INTENDED SOLELY FOR USE ON THE SPECIFIED PROJECT.
2. THE DOCUMENTS MAY NOT BE REPRODUCED IN WHOLE OR IN PART FOR USE ON PROJECTS OTHER THAN IDENTIFIED IN THE TITLE BLOCK.
3. DETAILS LABELED TYPICAL ARE INTENDED TO REPRESENT A CONDITION THAT OCCURS AT SEVERAL LOCATIONS IN THE PLANS WHETHER OR NOT THE DETAIL IS REFERENCED. DETAILS ON DRAWINGS TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS.
4. DO NOT SCALE THE PLANS AND DETAILS FOR THE PURPOSE OF ESTABLISHING DIMENSIONS.
5. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES AND/OR SPECIFICATION CONTACT THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION. THE MORE STRINGENT REQUIREMENT SHALL GOVERN FOR BIDDING AND PRICING.
6. STRUCTURAL DRAWINGS ARE NOT A STAND-ALONE DOCUMENT AND ARE INTENDED TO BE USED IN CONJUNCTION WITH CIVIL, ARCHITECTURAL, MECHANICAL, ELECTRICAL AND OTHER DISCIPLINES DRAWINGS. THE CONTRACTOR SHALL COORDINATE ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS.

CONSTRUCTION MEANS AND METHODS

1. THE CONSTRUCTION DOCUMENTS REPRESENT A STABLE STRUCTURE IN THE COMPLETED FORM. THE CONTRACTOR SHALL FURNISH ANY AND ALL TEMPORARY BRACING AND/OR SHORES TO SAFELY CONSTRUCT THE BUILDING AND PREVENT DAMAGE DURING CONSTRUCTION.
2. THE CONTRACTOR SHALL FIELD VERIFY ALL CONDITIONS, DIMENSIONS AND ELEVATIONS OF EXISTING CONSTRUCTION THAT MAY AFFECT THE PROJECT AND REPORT DISCREPANCIES TO THE ENGINEER.
3. WHEN THE CONTRACTOR BECOMES AWARE OF WHAT MAY BE AN UNFORESEEN CONDITION OR A VARIANCE WITH THE PROJECT DOCUMENTATION AFFECTING DESIGN ASSUMPTIONS, COST OR SCHEDULE, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND ARCHITECT.
4. NOTHING SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE CONSTRUED AS ELIMINATING THE CONTRACTOR'S OBLIGATION TO COMPLY WITH ALL OSHA REQUIREMENTS. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY ERECTION FRAMING AND AIDS TO ENSURE OSHA COMPLIANCE.

CODES AND STANDARDS

PERFORM ALL CONSTRUCTION IN CONFORMANCE WITH THE BUILDING AND DESIGN CODES REFERENCED WITHIN THESE DOCUMENTS. THE PROJECT DOCUMENTS REFER TO THE FOLLOWING CODES AND STANDARDS:
1. GOVERNING JURISDICTION: TOWN OF PARKER COLORADO
2. BUILDING CODES: IBC 2021, INTERNATIONAL BUILDING CODE
3. LOADS: ASCE 7-16
4. CONCRETE: ACI 318-19(22), BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
5. STEEL: AISC 360-22, SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, AISC 341-22

DESIGN CRITERIA

1. RISK CATEGORY: II
2. DEAD AND LIVE LOADS:

LOCATION	UNIFORM LIVE LOAD	CONCENTRATED LIVE LOAD	COLLATERAL DEAD LOAD*	CALCULATED SELF-WEIGHT
TYPICAL ROOF	20 PSF	300 LB	3 PSF	12 PSF

*COLLATERAL DEAD LOAD IS IN ADDITION TO THE STRUCTURE SELF-WEIGHT

3. SNOW LOADS:
   - GROUND SNOW LOAD, P_g: 30 PSF
   - FLAT ROOF SNOW LOAD, P_f: 25 PSF (USED FOR DRIFTING)
   - MINIMUM ROOF SNOW LOAD, P_{min}: 30 PSF
   - SNOW EXPOSURE FACTOR, C_e: 1.0
   - SNOW IMPORTANCE FACTOR, I_s: 1.0
   - THERMAL FACTOR, C_t: 1.2
   - ROOF SLOPE FACTOR, C_s: 1.0
4. WIND LOADS:
   - BASIC WIND SPEED, V: 115 MPH (3 SECOND GUST)
   - ALLOWABLE DESIGN WIND SPEED, V_{asd}: 90 MPH (3 SECOND GUST)
   - WIND EXPOSURE: C
   - INTERNAL PRESSURE COEF.: ±0.00 (OPEN)
   - GROUND ELEVATION FACTOR, K_e: 0.81 (5,960 FT)
5. SEISMIC LOADS:
   - SEISMIC DESIGN CATEGORY: C
   - SEISMIC IMPORTANCE FACTOR, I_e: 1.0
   - SOIL SITE CLASS: E
   - S_S: 0.204
   - S_1: 0.057
   - S_{DS}: 0.326
   - S_{D1}: 0.158
   - SEISMIC FORCE RESISTING SYSTEM: NOT SPECIFICALLY DETAILED FOR SEISMIC RESISTANCE
   - RESPONSE MODIFICATION COEF., R: 3
   - ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE
   - SEISMIC RESPONSE COEF., C_s: 0.109
   - SEISMIC BASE SHEAR, V: 1.3 KIPS
6. RAIN LOADS:
   - 15 MINUTE RAINFALL INTENSITY, i: 5.61 IN/HR

SUBMITTALS

1. AT A MINIMUM, THE FOLLOWING ITEMS REQUIRE SUBMITTALS FOR STRUCTURAL REVIEW. ADDITIONAL SUBMITTALS MAY BE OUTLINED IN THE SPECIFICATIONS.
   - A. CONCRETE REINFORCING LAYOUT
   - B. CONCRETE MIX DESIGNS
   - C. STRUCTURAL STEEL AND CALCULATIONS IF REQUIRED
   - D. STEEL DECK INCLUDING COMPOSITE DECK, FORM DECK, AND ROOF DECK
   - E. PILE LAYOUT, SIZE AND LENGTH
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING ALL SUB-CONTRACTOR SUBMITTALS AND NOTING ALL DEVIATIONS FROM THE CONSTRUCTION DOCUMENTS PRIOR TO SUBMITTING TO THE ENGINEER FOR REVIEW.
3. THE CONTRACTOR SHALL ENSURE THAT ALL SUBMITTALS COMPLY WITH THE SPECIAL INSPECTION REQUIREMENTS WHERE APPLICABLE.
4. THE STRUCTURAL ENGINEER' S REVIEW OF SUBMITTALS SHALL BE FOR GENERAL CONFORMANCE WITH THE DESIGN INTENT. NO WORK SHALL BE STARTED WITHOUT SUCH REVIEW.
5. SUBSTITUTION REQUESTS SHALL BE SUBMITTED IN WRITING. A COMPARISON OF THE DATA WITH THE MATERIAL SPECIFIED INCLUDING CODE APPROVALS SHALL BE PROVIDED.
6. REQUESTS FOR INFORMATION (RFI) SHALL BE SUBMITTED IN WRITING WITH SUGGESTED SOLUTION INCLUDED.
7. DEFECTIVE WORK REPORT (DWR) SHALL BE SUBMITTED WITH A PROPOSED REMEDIATION OF THE DEFECT.

FOUNDATIONS

1. THE FOUNDATION DESIGN IS BASED ON THE CRITERIA SPECIFIED IN THE GEOTECHNICAL REPORT BY HP GEOTECH, JOB NUMBER 212191A, DATED APRIL 5, 2014.
2. REFER TO THE GEOTECHNICAL REPORT FOR ADDITIONAL REQUIREMENTS AND INFORMATION. DESIGN VALUES AND BEARING MATERIALS SHALL BE FIELD VERIFIED BY QUALIFIED GEOTECHNICAL ENGINEER RETAINED BY THE OWNER. PREPARE THE BUILDING PAD IN ACCORDANCE WITH THE GEOTECHNICAL INVESTIGATION.
3. THE CONTRACTOR SHALL VERIFY FOUNDATION INSTALLATION AND CONSTRUCTION IS IN CONFORMANCE WITH THE RECOMMENDATIONS OUTLINED IN THE GEOTECHNICAL REPORT.
4. PROVIDE BRACING FOR ALL PINNED FOUNDATION WALLS PRIOR TO BACKFILLING. THIS BRACING SHALL REMAIN IN PLACE UNTIL ALL SLABS AND BEAMS FRAMING INTO WALL HAVE BEEN PLACED AND HAVE ATTAINED 100% OF THEIR DESIGN STRENGTH.
5. DO NOT BACKFILL AGAINST CANTILEVER RETAINING WALLS UNTIL THE CONCRETE HAS ATTAINED 100% OF ITS DESIGN STRENGTH.
6. ALL FOUNDATIONS SHALL EXTEND BELOW 36" BELOW GRADE FOR FROST PROTECTION.
7. EXTERIOR SLABS SHALL SLOPE AWAY FROM THE STRUCTURE A MINIMUM OF 1/4" PER FOOT FOR A MINIMUM OF 10 FEET.

SLAB ON GRADE

1. REFER TO PLAN FOR SLAB THICKNESS AND REINFORCING REQUIREMENTS.
2. PREPARE SUBGRADE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT.

DRILLED PIER DESIGN CRITERIA

1. DESIGN PIER END BEARING PRESSURE (NET) OF 35,000 PSF AND DESIGN PIER SIDE FRICTION OF 3,500 PSF. FOUNDATIONS ARE TO PENETRATE 12 FEET INTO BEDROCK. BEARING MATERIALS SHALL BE VERIFIED BY A LICENSED GEOTECHNICAL ENGINEER.
2. BID DEPTH FOR BOTTOM OF PIERS SHALL BE AT ELEVATION 5930.75'. BOTTOM OF PIER ELEVATION IS APPROXIMATE AND SHALL BE VERIFIED.
3. TEMPORARY CASINGS MAY BE REQUIRED WHILE PLACING DRILLED SHAFTS.
4. REINFORCING FOR ALL DRILLED SHAFTS SHALL BE PLACED PRIOR TO PLACING CONCRETE AND BE SPACED FROM THE SIDES WITH 3" SIDE SPACERS. CONCRETE SHALL BE PLACED WITH A TREMMIE. CONCRETE SHALL NOT BE PLACED IN FLOWING WATER. CONCRETE MAY BE PLACED IN STILL WATER PROVIDED THE TREMMIE END IS EMBEDDED IN THE WET CONCRETE A MINIMUM OF 2'-0" AT ALL TIMES.

CONCRETE

1. ALL WORK SHALL CONFORM WITH THE LATEST VERSION OF ACI 301.
2. CONCRETE MIX DESIGNS ARE A PERFORMANCE SPECIFIED ITEM DESIGNED BY THE CONTRACTOR. THE CONTRACTOR SHALL PROVIDE A CONCRETE MIX MEETING THE REQUIREMENTS SPECIFIED BELOW.
3. CONCRETE MIX REQUIREMENTS:
   A. MIX REQUIREMENTS ARE:

LOCATION	EXPOSURE CLASS	MIN. F'_C:	MAX. W/C	MAX. AGG.	AIR CONTENT
GRADE BEAMS	F2-S0-W0-C1	4,500	0.45	3/4"	6%±1.5%
DRILLED PIERS	F1-S0-W0-C1	4,000	0.50	1"	N/A
EXTERIOR SLAB	F3-S0-W1-C2	4,500	0.42	3/4"	6%±1.5%

   B. FOR CONCRETE MIXTURES ASSIGNED TO EXPOSURE CLASS F3, THE MAXIMUM PERCENTAGE OF CEMENTITIOUS MATERIAL WHICH IS CLASSIFIED AS SCM (INCLUDING FLY ASH, NATURAL POZZOLANS, SILICA FUME, AND SLAG CEMENT) SHALL BE AS FOLLOWS. THE INDIVIDUAL LIMITS SHOWN BELOW SHALL APPLY REGARDLESS OF THE NUMBER OF CEMENTITIOUS MATERIALS IN THE CONCRETE MIXTURE.
      a. FLY ASH OR NATURAL POZZOLANS CONFORMING TO ASTM C618 = 25%
      b. SLAG CEMENT CONFORMING TO ASTM C989 = 50%
      c. SILICA FUME CONFORMING TO ASTM C1240 = 10%
      d. TOTAL OF FLY ASH OR OTHER POZZOLANS AND SILICA FUME = 35%
      e. TOTAL OF FLY ASH OR OTHER POZZOLANS, SLAG CEMENT, AND SILICA FUME = 50%
   C. BASED ON THE SULFATE CLASSIFICATIONS LISTED THE FOLLOWING CEMENTS SHALL BE USED:
      a. S0 AND S1 SULFATE CLASSIFICATION: PORTLAND CEMENT ASTM C150 TYPE I/II OR BLENDED HYDRAULIC CEMENT ASTM C595 TYPE IL
      b. S2 AND S3 SULFATE CLASSIFICATIONS: PORTLAND CEMENT ASTM C150 TYPE V OR BLENDED HYDRAULIC CEMENT ASTM C595 TYPES WITH "HS" DESIGNATION. CALCIUM CHLORIDE ADMIXTURES NOT PERMITTED. MINERAL FILLERS DERIVED FROM CARBONATE AGGREGATE ARE PROHIBITED. AT CONTRACTOR'S OPTION, ACCEPTABLE IN LIEU OF TYPE V OR TYPE "HS" TO PROVIDE ALTERNATE CEMENTITIOUS MATERIALS FOR SULFATE EXPOSURE AND RESISTANCE CONFORMING TO ACI 318-19 26.4.2.2(C)
   D. FOR CONCRETE MIXTURES ASSIGNED TO W1 OR W2 CLASSES, EVIDENCE SHALL BE SUBMITTED THAT THE CONCRETE MIXTURE COMPLIES WITH THE FOLLOWING
      a. AGGREGATES ARE NOT ALKALI-SILICA REACTIVE OR MEASURES TO MITIGATE ALKALI-SILICA REACTIVITY HAVE BEEN ESTABLISHED
      b. AGGREGATES ARE NOT ALKALI-CARBONATE REACTIVE
   E. MAXIMUM CHLORIDE ION LIMITS (PERCENTAGE BY MASS OF CEMENTITIOUS MATERIALS INCLUDING SCM) ASSOCIATED WITH EXPOSURE CLASS ARE AS FOLLOWS;
      a. C0 = 1.00
      b. C1 = 0.30
      c. C2 = 0.15
   F. FINE AGGREGATE FOR NORMAL WEIGHT CONCRETE SHALL MEET ASTM C33. COARSE AGGREGATES FOR NORMAL WEIGHT CONCRETE SHALL CONFORM TO ASTM C33, GRADE #67 FOR 3/4" AND GRADE #57 FOR 1" OR LARGER. COARSE AGGREGATES SHALL BE NO LESS THAN 50% OF THE TOTAL AGGREGATE BY WEIGHT, UNLESS APPROVED BY THE ENGINEER PRIOR TO MIX DESIGN SUBMITTAL.
   G. ALL CONCRETE ADMIXTURES SHALL, WHEN MIXED INTO CONCRETE, BE NON-CHLORIDE AND NON-CHLORIDE FORMING. ALL ADMIXTURES MUST CONFORM TO ASTM C-494 AND C-260. CONCRETE CURING COMPOUND AND SEALERS SHALL MEET ASTM C-309 TYPE 1 OR 1D.
   H. CONTRACTOR MAY ADJUST SLUMP AS NECESSARY FOR FIELD CONDITIONS, INSTALLATION METHOD USED, AND WORKABILITY PROVIDED REMAINING REQUIREMENTS ARE MET. USE ADMIXTURES AS REQUIRED TO OBTAIN DESIRED RESULTS.
   I. FOR CONCRETE PLACED BY PUMPING, INCREASED ENTRAINED AIR MAY BE USED TO FACILITATE PUMPING PROVIDED CONTRACTOR CAN DEMONSTRATE CONCRETE WITH ENTRAINED AIR WILL HAVE A FINISH ACCEPTABLE TO THE ARCHITECT.
   J. CONTRACTOR SHALL PROVIDE CONCRETE WITH REDUCED WATER IN ORDER TO ACHIEVE SLAB VAPOR TRANSMISSION REQUIRED FOR THE SPECIFIED FLOORING MATERIALS, COORDINATE REQUIREMENTS WITH ARCHITECTURAL DRAWINGS AND SPECIFICATIONS
4. GROUT REQUIREMENTS:
   A. PROMPTLY PACK GROUT BETWEEN BEARING SURFACES AND PLATES SO NO VOIDS REMAIN. NEATLY FINISH EXPOSED SURFACES AND PROTECT GROUT TO ALLOW TO CURE.
   B. ALL GROUT PRODUCTS SHALL CONFORM TO ASTM C1107 AND BE NONSHRINK, NONMETALLIC, AND NONCORROSIVE.
   C. ACHIEVE A MINIMUM OF 8,000 PSI COMPRESSIVE STRENGTH AT 28 DAYS
   D. CLEAN ALL CONTACT SURFACES TO BE FREE OF OIL AND OTHER CONTAMINANTS. COMPLY WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR ALL OTHER SURFACE PREPARATION AND MIXING STANDARDS.
5. CONSTRUCTION/CONTROL JOINTS REQUIREMENTS:
   A. SLABS-ON-GRADE SHALL HAVE CONSTRUCTION JOINTS AND/OR CONTROL JOINTS TO DIVIDE THE SLAB INTO PANELS, NOT TO EXCEED 256 SQUARE FEET. THE LONG DIMENSION SHALL NOT EXCEED THE SHORT DIMENSION BY MORE THAN 20%. CONSTRUCTION AND CONTROL JOINT LOCATIONS SHOWN ON THE DRAWINGS IS SUGGESTED. CONTRACTOR TO SUBMIT DRAWINGS SHOWING PROPOSED CONSTRUCTION JOINT LOCATION AND CASTING SEQUENCE FOR APPROVAL.
   B. CONSTRUCTION JOINTS IN SLABS-ON-GRADE, AND STRUCTURAL SLABS SHALL BE LOCATED TO ACCOMMODATE THE MAXIMUM LENGTH AND AREA THE CONTRACTOR CAN REASONABLY POUR, FINISH, AND JOINT IN THE SAME DAY, BUT SHALL NOT EXCEED 150 FEET WITH A MAXIMUM AREA OF 15,000 SQUARE FEET UNLESS APPROVED BY THE ENGINEER.
   C. NO HORIZONTAL CONSTRUCTION JOINTS WILL BE PERMITTED IN BEAMS, UPTURNED BEAMS, GRADE BEAMS, WALLS AND STRUCTURAL SLABS UNLESS SPECIFICALLY SHOWN ON THE DRAWINGS OR APPROVED IN WRITING BY THE DESIGN PROFESSIONALS PRIOR TO CONSTRUCTION.
   D. PLACE VERTICAL CONSTRUCTION JOINTS IN FOUNDATION WALLS A MINIMUM OF 8 FT FROM ANY WALL INTERSECTION, PILASTER, PIER, OR WALL OPENING.
   E. PROVIDE CONTINUOUS WATERSTOPS AT ALL CONSTRUCTION JOINTS EXPOSED TO SOIL OR WATER.
   F. WHERE CONSTRUCTION JOINTS ARE LABELED AS "ROUGHENED" ON THE DRAWINGS, THE ENTIRE JOINT SURFACE SHALL BE MECHANICALLY ROUGHENED TO A 1/4" AMPLITUDE.
   G. CONCRETE CONSTRUCTION JOINT SURFACE SHALL BE CLEANED AND ALL LOOSE MATERIAL REMOVED PRIOR TO SECOND CONCRETE PLACEMENT.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF ALL FORMING AND SHORING.
7. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED OR TOOLED TO 3/4", UNLESS NOTED OTHERWISE.
8. NO ALUMINUM SHALL BE EMBEDDED IN CONCRETE. CONDUITS AND PIPING EMBEDDED IN CONCRETE WALLS, SLABS, OR BEAMS SHALL BE SPACED A MINIMUM OF FOUR DIAMETERS AND THE OUTSIDE DIAMETER SHALL BE LESS THAN 30% OF THE MEMBER THICKNESS AND PLACED BETWEEN LAYERS OF REINFORCING.
9. NO CONDUIT MAY BE EMBEDDED IN SLABS-ON-DECK OR SLABS-ON-GRADE, UNLESS SPECIFICALLY DETAILED OR NOTED OTHERWISE ON STRUCTURAL PLANS.

CONCRETE REINFORCING

1. DETAIL BARS IN ACCORDANCE WITH THE DRAWINGS, PROJECT SPECIFICATIONS, AND ACI PUBLICATION SP-66: "ACI DETAILING MANUAL"
2. REINFORCING MATERIALS:

	ASTM	GRADE
PLATE & ANGLE:	A36	---
REINFORCING STEEL:	A615	60
WELDABLE REINFORCING STEEL	A706	60
ANCHOR RODS (BOLTS):	F1554	55 W/S1 (WELDABILITY)

3. SHOP DRAWINGS SHALL BE SUBMITTED WITH REINFORCING STEEL IN ACCORDANCE WITH ACI 315. MAKE ALL REINFORCING BAR BENDS IN THE FABRICATOR'S SHOP UNLESS NOTED.
4. DETAILS:
   A. WELDING OF REINFORCING STEEL IS PROHIBITED UNLESS NOTED OTHERWISE. WHEN WELDING IS APPROVED, WELDING SHALL BE IN ACCORDANCE WITH AWS D1.4 "WELDING REINFORCING STEEL, ETC."
   B. NO SPLICING OF REINFORCEMENT PERMITTED EXCEPT AS NOTED ON DRAWINGS. MAKE BARS CONTINUOUS AROUND CORNERS WHERE DETAIL NOT PROVIDED. WHERE PERMITTED, SPLICES MAY BE MADE BY CONTACT LAPS OR MECHANICAL CONNECTORS. WHEN MECHANICAL CONNECTORS ARE INDICATED ON THE PLANS, THE CONNECTOR SHALL DEVELOP 125% OF THE SPECIFIED YIELD STRENGTH OF THE REINFORCING STEEL. REQUESTS BY THE CONTRACTOR FOR MECHANICAL SPLICES MUST BE SUBMITTED IN WRITING.
   C. REINFORCING STEEL SHALL BE LAPPED PER CONCRETE REINFORCEMENT LAP TABLE.
5. PLACEMENT:
   A. PROVIDE ACCESSORIES NECESSARY TO PROPERLY SUPPORT REINFORCING AND WELDED WIRE REINFORCEMENT AT POSITIONS SHOWN ON PLANS. PROVIDE ADDITIONAL BARS OR STIRRUPS REQUIRED TO SECURE REINFORCING IN PLACE. ALL REINFORCING, DOWELS, BOLTS, AND EMBEDDED PLATES SHALL BE SET AND TIED IN PLACE BEFORE THE CONCRETE IS POURED. "STABBING" INTO PREVIOUSLY PLACED CONCRETE IS NOT PERMITTED.
   B. PROVIDE ADDED REINFORCING TO TRIM ALL OPENINGS, NOTCHES, AND REENTRANT CORNERS AS NOTED IN TYPICAL DETAILS OR WITH (2)#5 MIN. ON ALL SIDES EXTENDING BEYOND OPENING 24" MIN.
   C. PROVIDE CORNER BARS OF THE SAME SIZE AND SPACING AS ADJACENT REINFORCING.
   D. MAINTAIN ACI CLEAR COVER ON REINFORCING AS LISTED BELOW UNLESS NOTED OTHERWISE.
      - CAST AGAINST EARTH (BOTTOM OR SIDES): 3"
      - FORMED - EXPOSED TO SOIL, WEATHER OR LIQUIDS: 2"
      - EXTERIOR PAVING (FROM TOP OF SLAB): 2"

STRUCTURAL STEEL

1. STRUCTURAL STEEL SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS UNLESS NOTED OTHERWISE ON THE DRAWINGS:

TYPE	ASTM	GRADE
W & WT SHAPES	A992	------
PLATES, CHANNELS, & ANGLES	A36	------
RECTANGULAR HSS SECTIONS	A500	C (F_y=50 KSI)

2. CONNECTION MATERIAL SHALL CONFORM TO THE FOLLOWING MINIMUM REQUIREMENTS UNLESS NOTED OTHERWISE ON THE DRAWINGS:

TYPE	ASTM
STRUCTURAL BOLTS	F3125 GR. F1852 OR F2280 (A325 OR A490)
ERECTION BOLTS	A307
NUTS	ASTM A563
WASHERS	ASTM F436
ANCHOR RODS	ASTM F1554 GR. 55 W/ WELDABILITY SUPPLEMENT S1
HEADED STUDS	ASTM A 108, GR. 1010/1025
WELD ELECTRODES	E70XX

3. ALL STEEL AND FASTENERS SHALL BE GALVANIZED MATERIAL.
4. WHERE NO CAMBER IS INDICATED, FABRICATE BEAMS SO THAT ANY NATURAL CAMBER IS UPWARD AFTER ERECTION.
5. SPLICES SHALL BE ALLOWED ONLY AT LOCATIONS SPECIFICALLY INDICATED ON THE STRUCTURAL DRAWINGS.
6. OPENINGS SHALL NOT BE CUT IN THE FLANGE OR WEBS OF STEEL MEMBERS UNLESS SPECIFICALLY SHOWN OTHERWISE.
7. SHOW ALL COPES, HOLES, OPENINGS AND MODIFICATIONS REQUIRED IN STRUCTURAL STEEL MEMBERS FOR ERECTION ON THE SHOP DRAWINGS FOR APPROVAL.
8. FIELD MODIFICATION OF SHOP FABRICATED STRUCTURAL STEEL IS PROHIBITED WITHOUT PRIOR APPROVAL.
9. ALL BOLTED CONNECTIONS SHALL BE STANDARD AISC BEARING TYPE FRAMING CONNECTIONS. BOLTS SHALL BE TENSION-INDICATING FOR INSPECTION PURPOSES. BOLTED MOMENT CONNECTIONS INDICATED ON DRAWINGS SHALL USE FRICTION TYPE PRETENSIONED BOLTS AND INDICATED AS SLIP CRITICAL (SC). SLIP CRITICAL (SC) CONNECTIONS SHALL HAVE UNCOATED CLASS A FAYING SURFACES, UNLESS NOTED OTHERWISE.
10. CONNECTIONS SHALL BE DETAILED TO USE THE MAXIMUM NUMBER OF BOLT ROWS THAT CAN FIT INTO THE SUPPORTED BEAM WEB PER AISC.
11. ALL CONNECTIONS NOT DETAILED OR OTHERWISE NOTED SHALL BE PROVIDED BY THE FABRICATOR AND HIGHLIGHTED FOR THE ENGINEER OF RECORD'S REVIEW.
12. ALL WELDING SHALL BE IN ACCORDANCE WITH LATEST AWS CODE.
13. GALVANIZED STRUCTURAL STEEL SHALL CONFORM TO ASTM A123 FOR MEMBERS AND ASTM A153 FOR CONNECTION ELEMENTS. REPAIR ANY DAMAGED GALVANIZING COATING IN ACCORDANCE WITH ASTM A780.
14. ALL STRUCTURAL STEEL TOLERANCES SHALL CONFORM TO AISC 303.
15. FABRICATOR AND ERECTOR SHALL BE EXPERIENCED IN FABRICATION AND ERECTION OF PROJECTS OF SIMILAR SIZE AND COMPLEXITY.

STEEL ROOF DECK

1. STEEL ROOF DECK SHALL CONFORM TO THE FOLLOWING STANDARDS AND MATERIAL PROPERTIES:
   - A. PROFILE: 1 1/2", TYPE B -STANDARD
   - GAUGE: 18 GA
   - MINIMUM F_Y: 50 KSI
   - MINIMUM I_P: 0.302 IN^4
   - MINIMUM S_P: 0.314 IN^3
   - MINIMUM I_N: 0.306 IN^4
   - MINIMUM S_N: 0.331 IN^3
2. ROOF DECK SHALL RECEIVE GALVANIZED FINISH AND SHALL CONFORM TO ASTM A653, G60.
3. ROOF DECK SHALL BE CONTINUOUS OVER A MINIMUM OF THREE SPANS.
4. ROOF DECK SHALL BE ATTACHED PER THE FOLLOWING MINIMUM FASTENING REQUIREMENTS:
   - A. ATTACHMENT PATTERN: 36/7
   - B. CONNECTION: BY HILTI X-ENP-19L15 WITH SEALING CAPS SPACED NOT MORE THAN 8 INCHES ON CENTER MAX.
   - C. SIDE LAPS: #12 SCREWS WITH SEALING CAPS SPACED 12 INCHES ON CENTER (MINIMUM (5) PER SPAN).
5. NO LOAD SHALL HANG DIRECTLY FROM STEEL ROOF DECK WITHOUT THE PRIOR APPROVAL.

STATEMENT OF SPECIAL INSPECTIONS (SSI)

1. THIS STATEMENT OF SPECIAL INSPECTIONS (SSI) IS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE (IBC) AND IDENTIFIES THE MATERIALS, SYSTEMS, AND WORK SUBJECT TO SPECIAL INSPECTION AND TESTING.
2. SPECIAL INSPECTIONS SHALL BE PERFORMED FOR THE CONSTRUCTION OF STRUCTURAL SYSTEMS AND MATERIALS AS REQUIRED BY THE GOVERNING BUILDING CODE, PROJECT SPECIFICATIONS, AND APPROVED PLANS. THE OWNER, ENGINEER OF RECORD (EOR), OR BUILDING OFFICIAL MAY REQUIRE ADDITIONAL INSPECTIONS BEYOND THOSE LISTED HEREIN.
3. RESPONSIBILITY FOR INSPECTIONS:
   - A. OWNER: ENGAGES THE SPECIAL INSPECTION AGENCY AND ENSURES COMPLIANCE WITH INSPECTION REQUIREMENTS.
   - B. REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE (RDPIRC): COORDINATES INSPECTIONS WITH THE BUILDING OFFICIAL AND ENSURES COMPLIANCE WITH THE SSI.
   - C. CONTRACTOR: NOTIFIES THE SPECIAL INSPECTOR BEFORE WORK REQUIRING INSPECTIONS BEGINS AND CORRECTS DEFICIENCIES NOTED IN INSPECTION REPORTS.
   - D. SPECIAL INSPECTION AGENCY: PERFORMS INSPECTIONS AND PROVIDES REPORTS IN ACCORDANCE WITH THIS SSI.
   - E. BUILDING OFFICIAL: REVIEWS AND APPROVES REPORTS, CONDUCTING INSPECTIONS AS NECESSARY
4. SPECIAL INSPECTIONS SHALL BE CONDUCTED PER IBC CHAPTER 17 AND OTHER APPLICABLE STANDARDS FOR THE FOLLOWING:
   - A. CONCRETE CONSTRUCTION (ACI 318 & IBC 1705.3)
     - a. VERIFICATION OF MIX DESIGN, PLACEMENT, CURING, AND FIELD TESTING.
     - b. INSPECTION OF REINFORCEMENT PLACEMENT, FORMWORK, AND CONCRETE STRENGTH TESTING.
   - B. STEEL CONSTRUCTION (AISC 360 & IBC 1705.2)
     - a. STRUCTURAL STEEL BOLTING AND WELDING INSPECTIONS.
     - b. HIGH-STRENGTH BOLTING AND STEEL FRAME CONNECTION DETAILS.
   - C. SOILS AND FOUNDATIONS (IBC 1705.6 & IBC 1705.7)
     - a. VERIFICATION OF SOIL-BEARING CONDITIONS, FILL PLACEMENT, AND COMPACTION TESTING.
     - b. INSPECTION OF DEEP FOUNDATIONS, PILE DRIVING, AND DRILLED PIERS.
   - D. SEISMIC-RESISTANT COMPONENTS (IBC 1705.12)
     - a. INSPECTION OF DESIGNATED SEISMIC SYSTEMS AND BRACING.
5. REPORTING AND DOCUMENTATION
   - A. THE SPECIAL INSPECTION AGENCY SHALL SUBMIT INSPECTION REPORTS TO THE OWNER, ENGINEER OF RECORD, AND BUILDING OFFICIAL.
   - B. REPORTS MUST INCLUDE DEFICIENCIES OBSERVED AND CORRECTIVE ACTIONS TAKEN.
   - C. FINAL COMPLIANCE REPORTS SHALL BE SUBMITTED AT PROJECT COMPLETION, CONFIRMING THAT WORK REQUIRING SPECIAL INSPECTION CONFORMS TO APPROVED CONSTRUCTION DOCUMENTS.
6. CORRECTION OF NON-CONFORMING WORK
   - A. NON-CONFORMING WORK SHALL BE DOCUMENTED, REPORTED, AND CORRECTED BEFORE PROCEEDING WITH CONSTRUCTION. THE SPECIAL INSPECTOR SHALL VERIFY CORRECTIVE ACTIONS AND ISSUE FOLLOW-UP REPORTS.
7. QUALIFICATIONS OF SPECIAL INSPECTION PERSONNEL
   - A. SPECIAL INSPECTORS SHALL BE CERTIFIED IN ACCORDANCE WITH THE IBC, ICC, OR OTHER APPLICABLE STANDARDS.
   - B. MUST HAVE EXPERIENCE RELEVANT TO THE TYPE OF WORK BEING INSPECTED.
   - C. TESTING AGENCIES SHALL COMPLY WITH ASTM E329 FOR TESTING LABORATORY REQUIREMENTS.
   - D. MUST BE ACCREDITED AND APPROVED BY THE BUILDING OFFICIAL.
8. FINAL CERTIFICATION
   - A. AT THE CONCLUSION OF CONSTRUCTION, THE SPECIAL INSPECTION AGENCY SHALL PROVIDE A FINAL STATEMENT OF SPECIAL INSPECTIONS, CERTIFYING THAT ALL REQUIRED INSPECTIONS AND TESTS HAVE BEEN COMPLETED AND ALL DISCREPANCIES RESOLVED. THIS FINAL REPORT SHALL BE SUBMITTED TO THE BUILDING OFFICIAL FOR APPROVAL.

CORBEL ENGINEERING
STRUCTURAL ENGINEERING SERVICES
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COLORADO LICENSED
CASEY BRANDON WISE
50764
9/21/2026
PROFESSIONAL ENGINEER

Parker Decant Addition

9045 Tammy Lane
Parker, Colorado 80134

No.	Description	Date
1	PERMIT SET	9/24/2025

GENERAL NOTES & SPECIAL INSPECTIONS

Project number	260086
Date	9/21/2026
Drawn by	IV
Checked by	CBW

SHEET NUMBER

S0.1

9/21/2026 9:08:52 AM

PLAN NOTES

MARK	NOTES
A	EXISTING FIRE HYDRANT TO REMAIN. REMOVE EXISTING BOLLARDS AS REQUIRED FOR PLACEMENT OF NEW GRADE BEAM AND DRILLED PIERS
B	CORE (2) 6"Ø HOLES THRU EXISTING CONCRETE GRADE BEAM AND PROVIDE PVC PIPE SLEEVE THRU. CONTRACTOR SHALL FIELD LOCATE EXISTING FOUNDATION WALL REINFORCING TO AVOID CUTTING EXISTING BARS. REF. DETAIL 10/S5.1 FOR HOLE LAYOUT.

PLAN MARKS:

1 1/2", 18 GA. METAL ROOF DECK, REF. GENERAL NOTES.

DRILLED PIER, REF. DETAIL 6/S5.1

TOP OF WALL STEP LOCATION

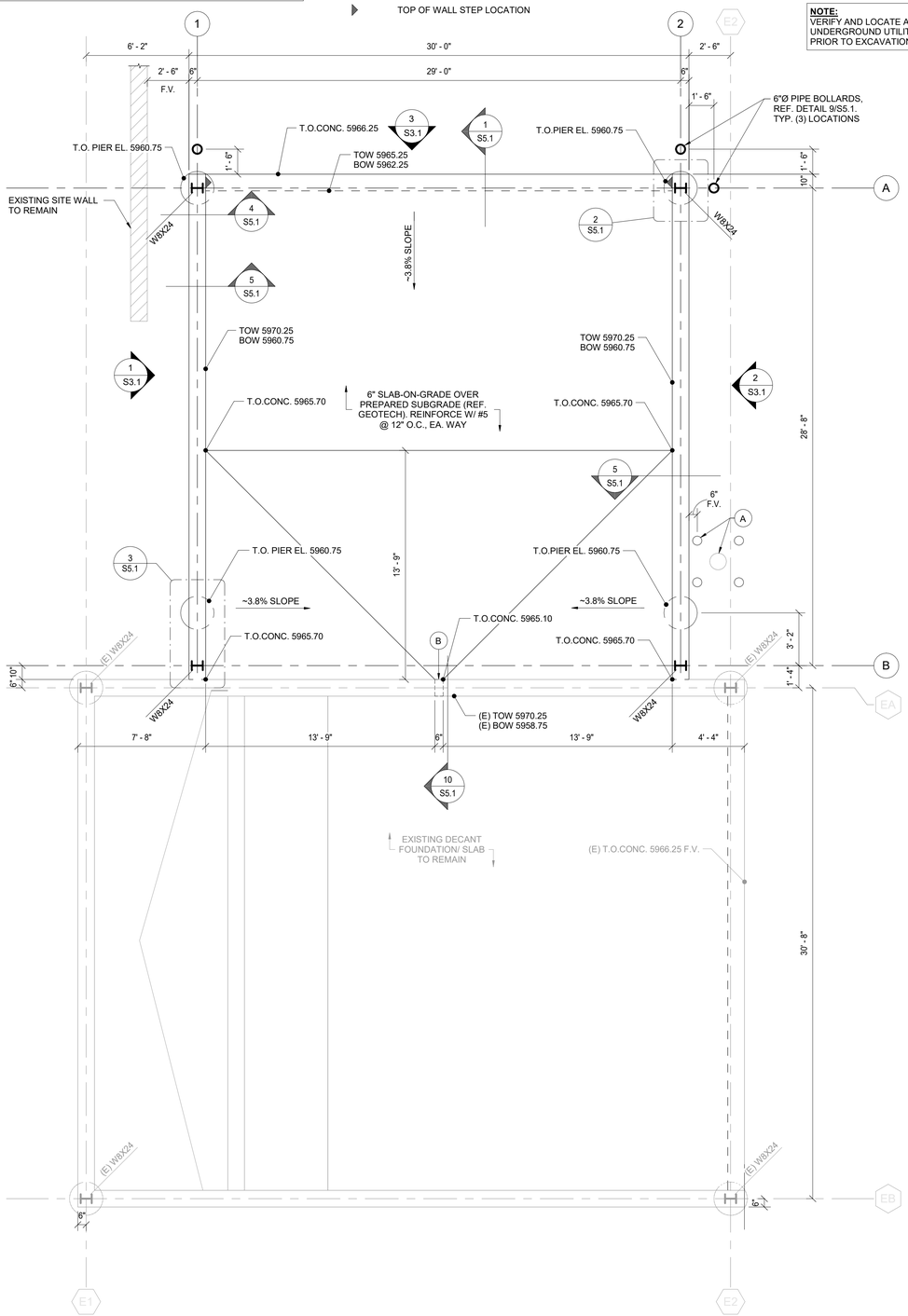
FOUNDATION NOTES:

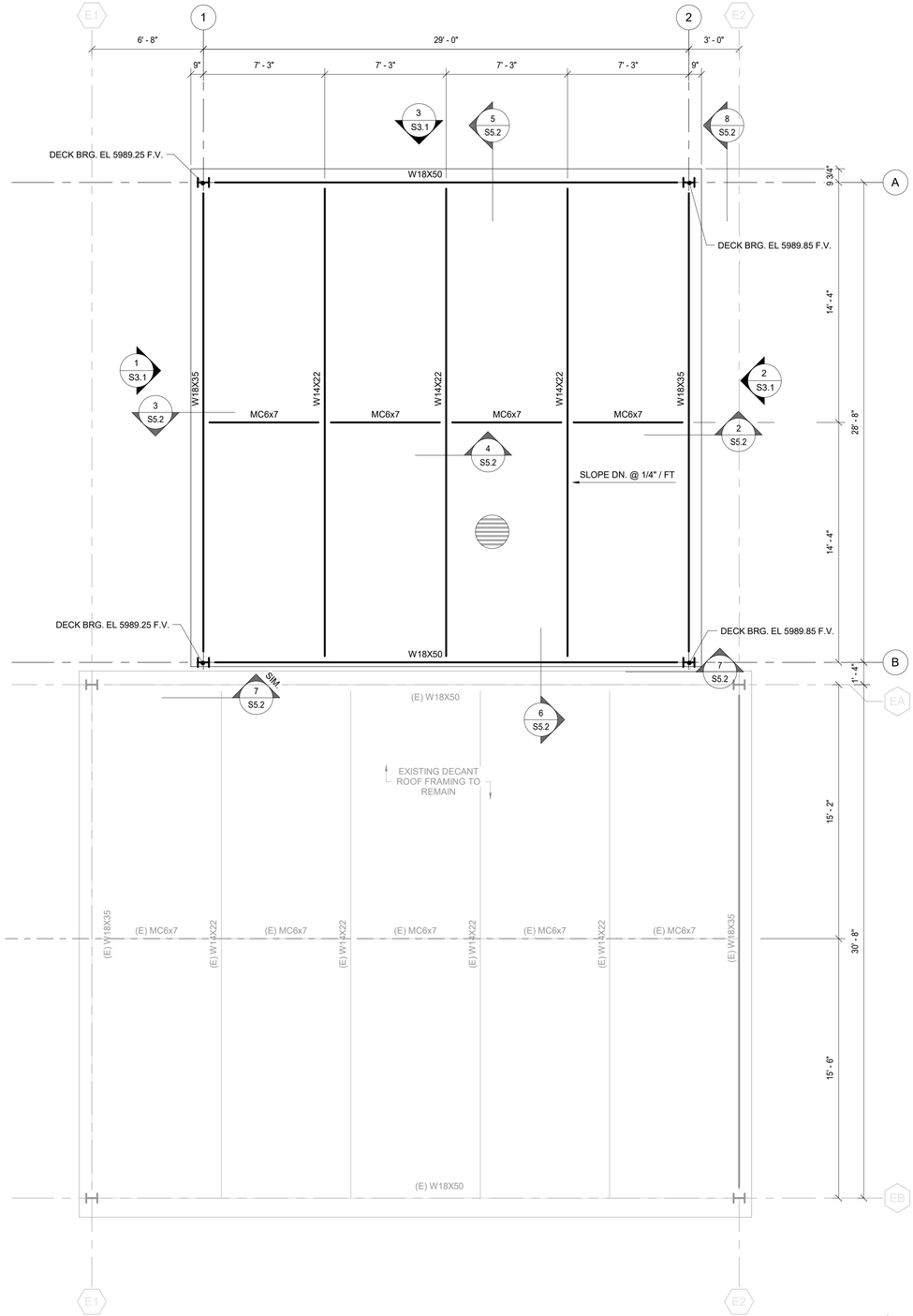
1. CENTER PIERS UNDER WALLS AND COLUMNS UNLESS DIMENSIONED OTHERWISE ON FOUNDATION PLAN.

NOTE:
VERIFY AND LOCATE ALL UNDERGROUND UTILITIES PRIOR TO EXCAVATION.

ROOF FRAMING NOTES:

1. ALL STEEL SHALL BE GALVANIZED.
2. LOCATE SIDE CAPS ON TOP HAT OF ROOF DECK AND NEST DECK 6".





1 FOUNDATION PLAN
1/4" = 1'-0"

PLAN NORTH TRUE NORTH

2 ROOF FRAMING PLAN
1/4" = 1'-0"

PLAN NORTH TRUE NORTH

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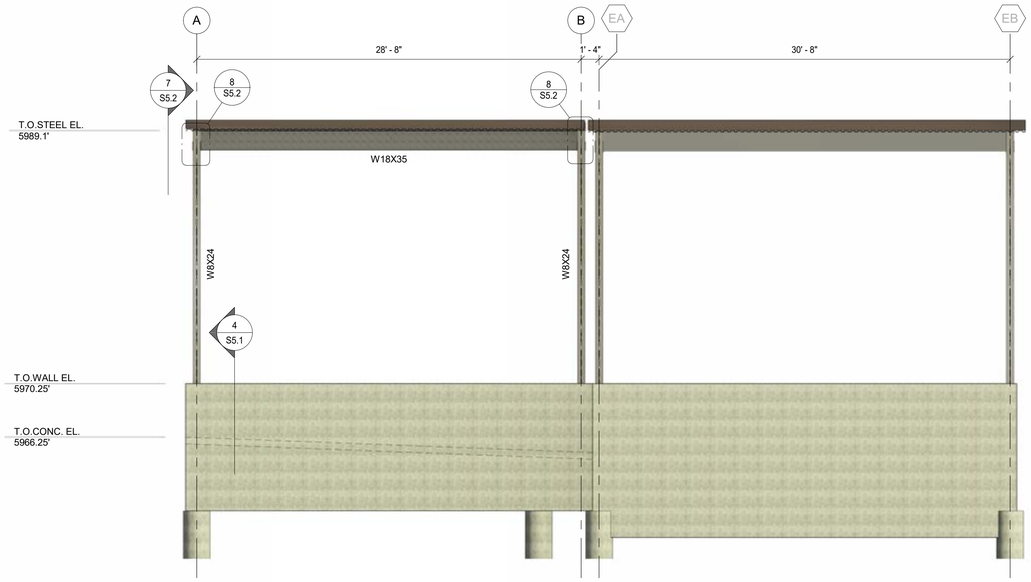
PLANS

Project number	260086
Date	9/21/2026
Drawn by	IV
Checked by	CBW

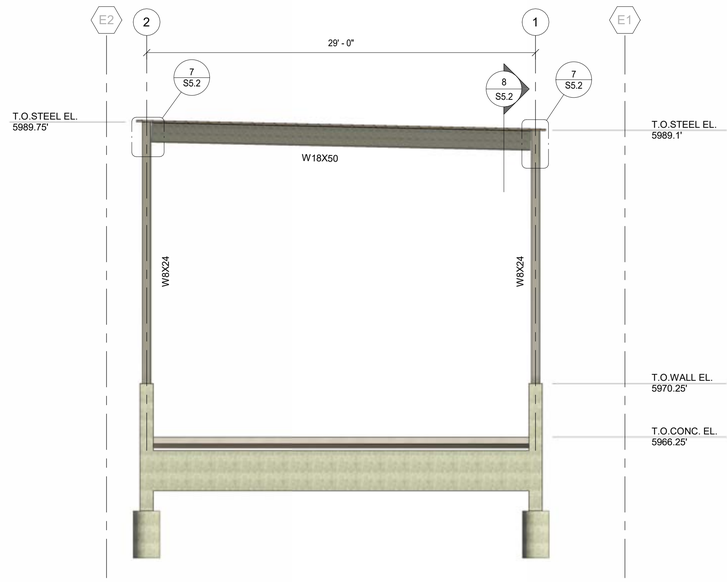
SHEET NUMBER

S1.1

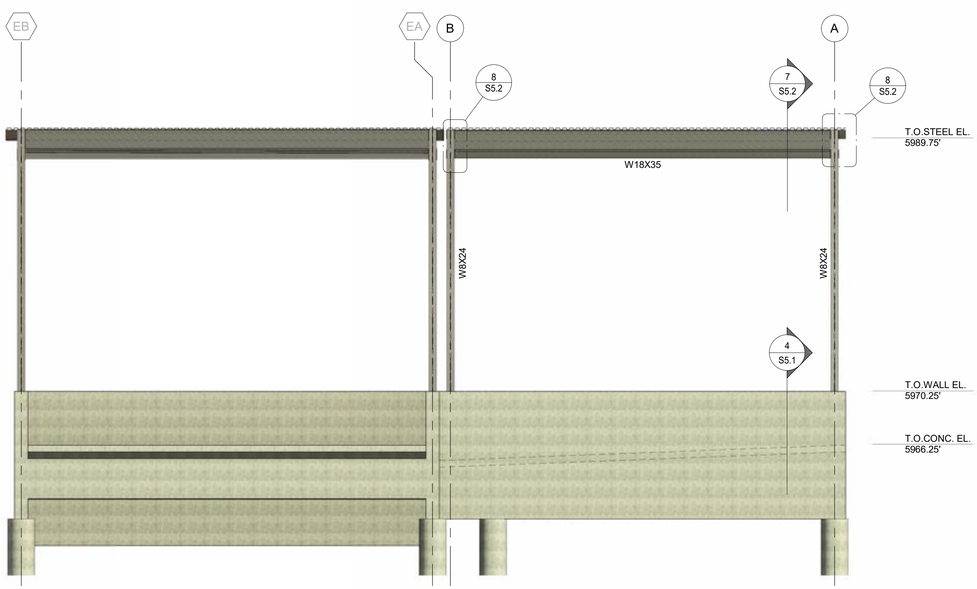
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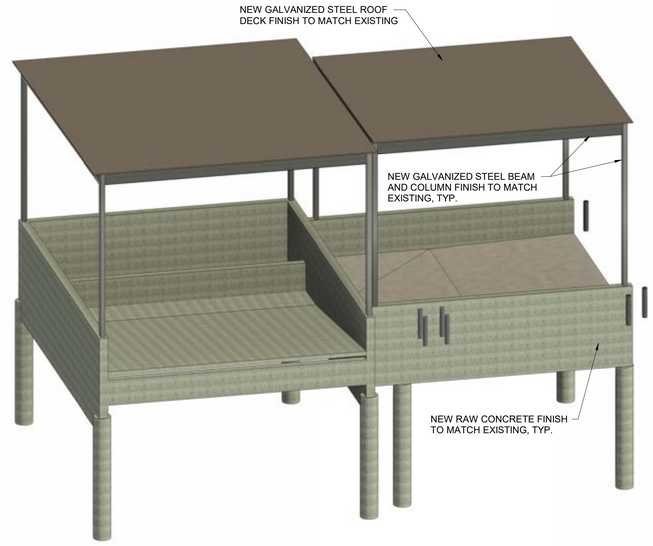
1 WEST ELEVATION
3/16" = 1'-0"



3 NORTH ELEVATION
3/16" = 1'-0"



2 EAST ELEVATION
3/16" = 1'-0"



4 ISOMETRIC VIEW

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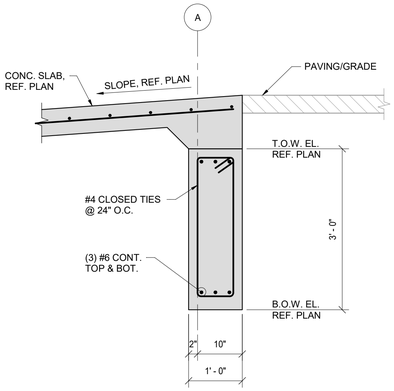
ELEVATIONS

Project number	260086
Date	9/21/2026
Drawn by	IV
Checked by	CBW

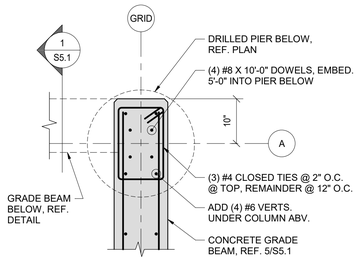
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S3.1

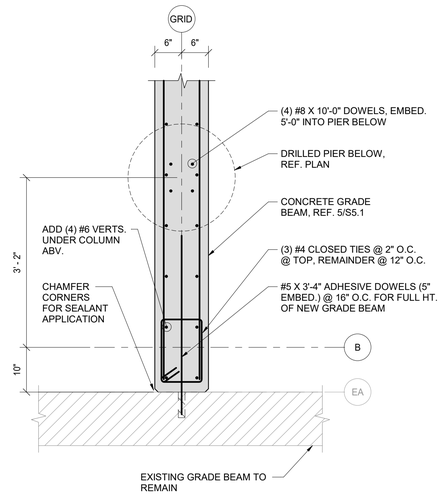
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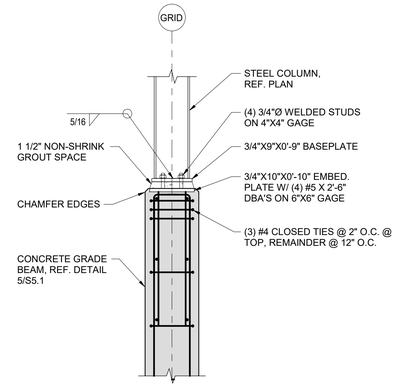
1 FOUNDATION DETAIL
3/4" = 1'-0"



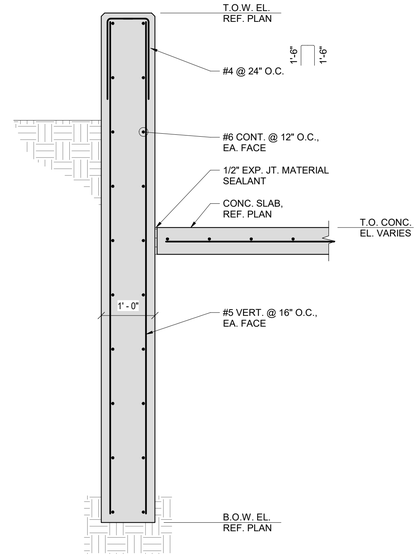
2 FOUNDATION DETAIL
3/4" = 1'-0"



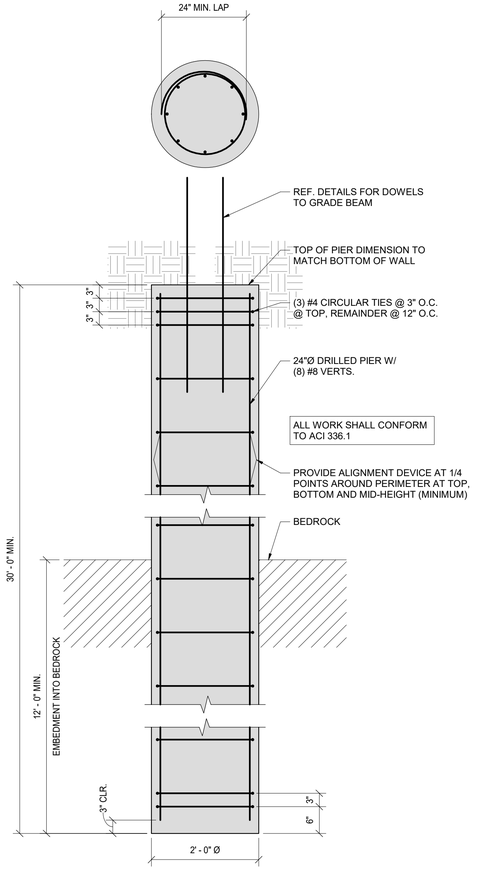
3 FOUNDATION DETAIL ADJACENT EXISTING
3/4" = 1'-0"



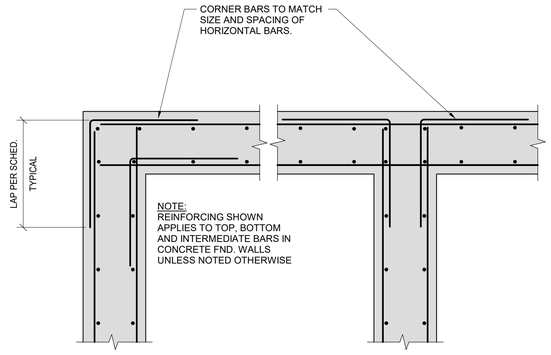
4 STEEL COLUMN FOUNDATION
3/4" = 1'-0"



5 TYPICAL GRADE BEAM FOUNDATION
3/4" = 1'-0"



6 TYPICAL DRILLED PIER
3/4" = 1'-0"



7 TYP. CORNER & INTERSECTION REINF.
3/4" = 1'-0"

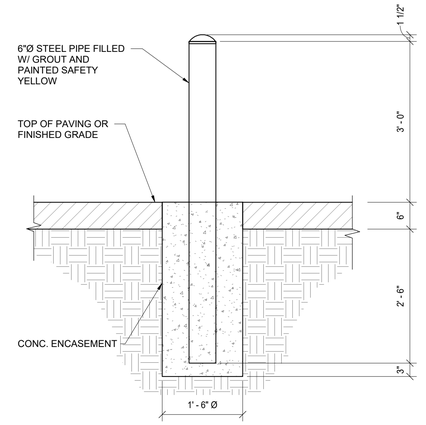
CONCRETE LAPS LENGTHS
fy = 60000 psi f'c = 4500 psi

BAR SIZE (d)	CLASS B LAP (in.)		HOOK EMBED (in.)
	TOP BAR	OTHER BARS	
3	23	17	8
4	31	23	10
5	38	29	12
6	46	35	14
7	67	51	16
8	76	58	18
9	86	66	21

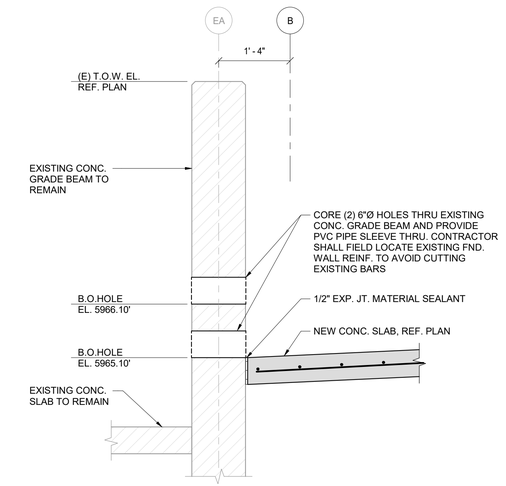
CONCRETE LAPS LENGTHS
fy = 60000 psi f'c = 4000 psi

BAR SIZE (d)	CLASS B LAP (in.)		HOOK EMBED (in.)
	TOP BAR	OTHER BARS	
3	24	18	8
4	33	25	10
5	40	31	12
6	48	37	15
7	71	54	17
8	81	62	19
9	91	70	22

8 REINFORCEMENT LAP TABLE
1/16" = 1'-0"



9 BOLLARD DETAIL
3/4" = 1'-0"



10 NEW DRAIN HOLE DETAIL
3/4" = 1'-0"

CORBEL ENGINEERING
STRUCTURAL ENGINEERING SERVICES
301 BOARDWALK DR. #273353, FORT COLLINS, CO 80527
WWW.CORBELENG.COM

COLORADO LICENSED
CASEY BRANDON WISE
50764
9/21/2026
PROFESSIONAL ENGINEER

Parker Decant Addition

9045 Tammy Lane
Parker, Colorado 80134

No.	Description	Date
1	PERMIT SET	9/24/2025

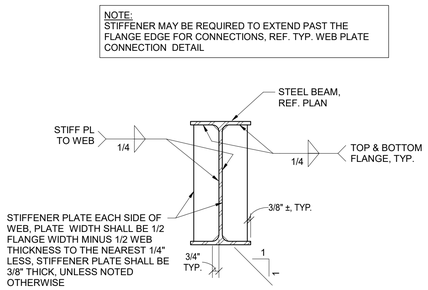
FOUNDATION DETAILS

Project number	260086
Date	9/21/2026
Drawn by	IV
Checked by	CBW

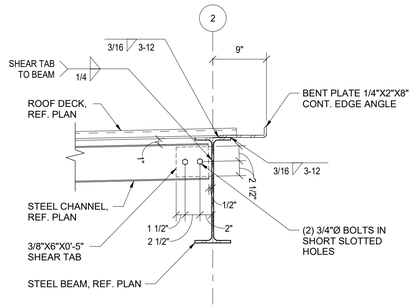
SHEET NUMBER

S5.1

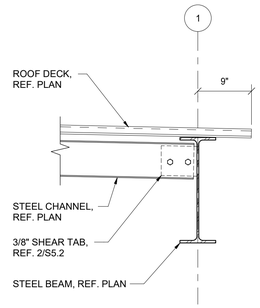
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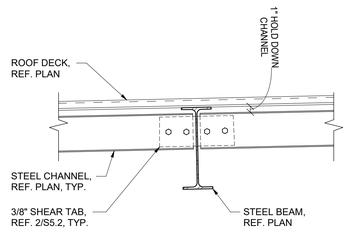
1 TYP. WEB STIFFENER PLATE DETAIL
NO SCALE



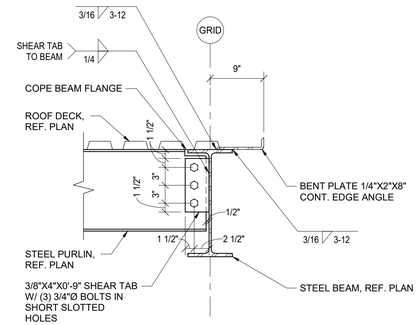
2 HIGH EAVE ROOF FRAMING DETAIL
1" = 1'-0"



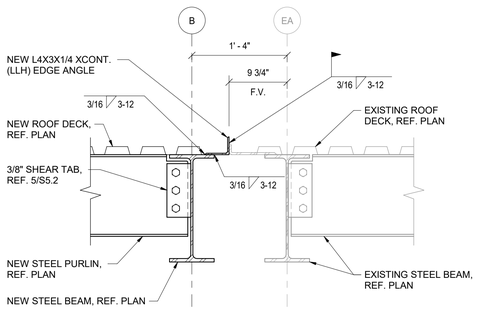
3 LOW EAVE ROOF FRAMING DETAIL
1" = 1'-0"



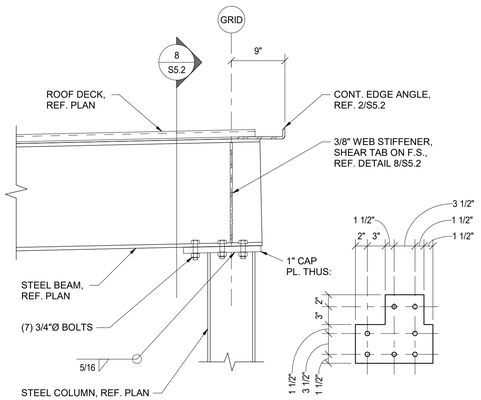
4 ROOF FRAMING DETAIL
1" = 1'-0"



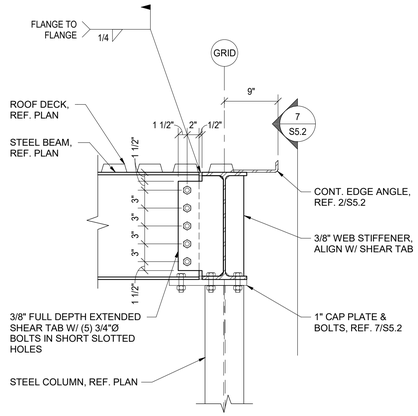
5 ROOF FRAMING DETAIL
1" = 1'-0"



6 ROOF FRAMING ADJACENT EXISTING DETAIL
1" = 1'-0"



7 BEAM/COLUMN FRAMING DETAIL
1" = 1'-0"



8 BEAM/COLUMN FRAMING DETAIL
1" = 1'-0"

CORBEL ENGINEERING
STRUCTURAL ENGINEERING SERVICES
301 BOARDWALK DR. #273353, FORT COLLINS, CO 80527
WWW.CORBELENG.COM



Parker Decant Addition

9045 Tammy Lane
Parker, Colorado 80134

No.	Description	Date
1	PERMIT SET	9/24/2025

FRAMING DETAILS

Project number	260086
Date	9/21/2026
Drawn by	IV
Checked by	CBW

SHEET NUMBER

S5.2

9/21/2026 9:09:06 AM

LIGHT FIXTURE SCHEDULE

FIXTURE DESIGNATION	DESCRIPTION	MANUFACTURER INFORMATION		MOUNTING	LAMP	WATTAGE	VOLTAGE	CONTROL TYPE	NOTES
		NAME	CATALOG NUMBER						
A	LED SURFACE MOUNT EXTERIOR FIXTURE. BLACK FINISH. LUMENS, 4000K COLOR TEMP, 70 CRI, DISTRIBUTION.	PHILLIPS	G3-CD-73LA-NW-UNIV-NP	SURFACE	LED	73	120-277	0-10V	

NOTES
A

PROJECT DESCRIPTION:

1. THE PROJECT CONSIST OF AN ADDITIONAL DECONTAMINATION STATION.
2. THE ELECTRICAL SCOPE INCLUDES ADDING A NEW SURFACE MOUNTED FIXTURE, AND EXTENDING THE EXISTING LIGHTING CIRCUIT TO THE NEW FIXTURE.
3. THE NEW FIXTURE SHALL MATCH THE EXISTING FIXTURE INSTALLED ON THE EXISTING DECONTAMINATION CANOPY.
4. REFERENCE WRITTEN SPECIFICATIONS FOR ADDITIONAL PROJECT REQUIREMENTS.

GENERAL NOTES:

1. CONTRACTOR SHALL INSPECT THE EXISTING FIELD CONDITIONS AT THE SITE AND THE CONTRACT DOCUMENTS PRIOR TO THE START OF ANY WORK TO DETERMINE WHAT EFFECT THE EXISTING CONDITIONS WILL HAVE ON THE WORK. CONTRACTOR SHALL REPORT DISCREPANCIES TO THE ENGINEER AND INCLUDE IN HIS BID ALL COSTS REQUIRED TO MAKE HIS WORK MEET EXISTING CONDITIONS. EXISTING CONDITIONS TAKEN FROM EXISTING DESIGN DOCUMENTS AND FIELD SURVEYS. REFER TO ARCHITECTURAL DEMOLITION DRAWINGS FOR LOCATION AND EXTENT OF DEMOLITION REQUIRED.
2. CONTRACTOR SHALL PROVIDE NECESSARY DEMOLITION TO REMOVE EXISTING UNUSED CONDUIT, WIRE, CABLE, JUNCTION BOXES, RECEPTACLES, SWITCHES, LIGHTS, FIRE ALARM DEVICES, ETC. COMPLETE WITH ASSOCIATED CIRCUIT TO SOURCE.

WORK NOTES:

1. INTERCEPT EXISTING LIGHTING CIRCUIT AND EXTEND TO NEW FIXTURE. ALL NEW CONDUIT SHALL BE RIGID METAL CONDUIT (RMC). ROUTE CONDUIT ALONG STRUCTURE.
2. LOCATE EXISTING UTILITY FEEDERS PRIOR TO CONSTRUCTION. VERIFY FEEDERS ARE OUTSIDE NEW AREA OF WORK.
3. EXISTING FIXTURE/DEVICE TO REMAIN.

ELECTRICAL DRAWING INDEX

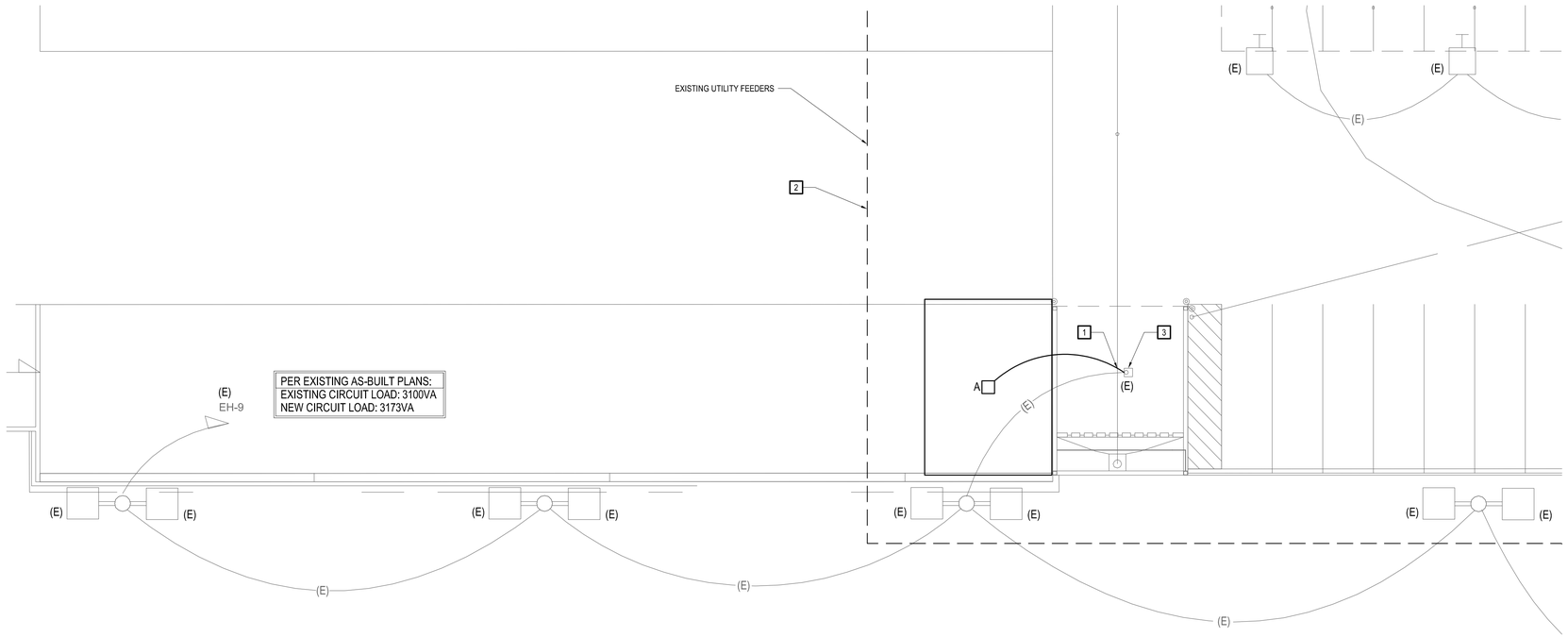
○ ISSUED FOR REFERENCE ONLY
● ISSUED FOR CONSTRUCTION

SHEET NUMBER	SHEET TITLE	PERMIT SET 08/21/2026	△	△	△	△
E1.00	ELECTRICAL INDEX, LEGEND, SCHEDULES, AND SITE PLAN	○				
	TOTAL:	1	.	.	.	.

ELECTRICAL SYMBOLS LIST

(NOT ALL SYMBOLS MAY APPEAR IN THESE DRAWINGS)

- RECESSED MOUNTED LINEAR
- SURFACE MOUNTED LINEAR
- FLANGED MOUNTED LINEAR
- SUSPENDED MOUNTED LINEAR
- LINEAR STRIP
- WALL MOUNTED LINEAR
- WALL BRACKET
- OPEN DOWNLIGHT, SURFACE OR RECESSED
- RECESSED ADJUSTABLE DOWNLIGHT
- IN-GRADE DOWNLIGHT
- POLE MOUNTED LIGHT
- BOLLARD LIGHT FIXTURE
- TRACK AND TRACK HEAD
- DECORATIVE FIXTURE
- LCS — LIGHTING CONTROL STATION
- EXIT SIGN, SINGLE FACE, CHEVRONS AS INDICATED
- EXIT SIGN, DUAL FACE, CHEVRONS AS INDICATED
- EXIT SIGN, SINGLE FACE, CHEVRONS AS INDICATED, INTEGRAL EMERGENCY LIGHT
- EXIT SIGN, LOW-LEVEL
- SHADING INDICATES WIRING DEVICES ON EMERGENCY POWER SOURCE
- TWIN-HEAD EMERGENCY LIGHT
- LA-1,3,5 — HOMERUN: (6) #12 AWG + (1) #12 AWG GRD, CU, TO PANEL 'LA' CIRCUITS 1, 3, 5 - 3/4"C
- CIRCUITING IN WALL OR ABOVE CEILING
- CIRCUITING IN FLOOR OR BELOW GRADE
- CIRCUITING WITH ISOLATED GROUND CONDUCTOR
- FCU 1 — MECHANICAL/PLUMBING EQUIPMENT DESIGNATION
- PANELBOARD, FLUSH MOUNT
- PANELBOARD, SURFACE MOUNT
- # — POWER/TELECOM RISER
- CTR — COUNTER
- GRD — GROUND
- (R) — RELOCATED
- (X) — EXISTING TO BE REMOVED
- HP — HORSEPOWER
- (E) — EXISTING TO REMAIN
- WP — WEATHER-PROOF
- ^{a} — SWITCH, SINGLE POLE
- $^{a}_{3}$ — SWITCH, THREE POLE
- ^{a} — DIMMER SWITCH, SINGLE POLE
- $^{a}_{3}$ — DIMMER SWITCH, THREE POLE
- ^{M} — SWITCH, MANUAL MOTOR STARTER
- ^{a} — OCCUPANCY SWITCH, SINGLE POLE, DUAL-TECHNOLOGY, UON
- OC — CEILING MOUNTED OCCUPANCY SWITCH, SINGLE POLE, DUAL-TECHNOLOGY, UON
- DS — CEILING MOUNTED DAYLIGHT SENSOR, 0-10V UON
- CONTROL STATION
- JUNCTION BOX
- DUPLEX RECEPTACLE
- DOUBLE DUPLEX RECEPTACLE
- DUPLEX RECEPTACLE, GFCI
- DUPLEX RECEPTACLE, HALF-SWITCHED
- DUPLEX RECEPTACLE, ISOLATED GROUND
- SPECIALTY RECEPTACLE (NEMA/IEC)
- DUPLEX RECEPTACLE - CEILING MOUNTED
- FLUSH FLOOR DUPLEX RECEPTACLE
- RECESSED CLOCK RECEPTACLE
- SIGN — ILLUMINATED SIGNAGE
- COMBINATION DISCONNECT/MOTOR STARTER, 30 AMP, SIZE "1" UON
- N — DISCONNECT SWITCH, NON-FUSED, HEAVY-DUTY, 30 AMP, UON
- F — DISCONNECT SWITCH, FUSED, HEAVY DUTY, 30 AMP, UON
- M — CONTACTOR
- PC — PHOTOCELL
- VFD — VARIABLE FREQUENCY DRIVE
- FSD — FIRE-SMOKE DAMPER
- T — DISTRIBUTION TRANSFORMER
- O/H — OVERHEAD
- TYP — TYPICAL
- UON — UNLESS OTHERWISE NOTED
- NL — NIGHT LIGHT (UNSWITCHED)
- FPEN — FUSE PER EQUIPMENT NAMEPLATE
- (E/R) — EXISTING TO BE RELOCATED
- FBO — FURNISHED BY OTHERS
- U/C — UNDERCOUNTER



1 / E1.00 ELECTRICAL SITE PLAN
SCALE: 1/16" = 1'-0"

N

FIRM NAME
G2 CONSULTING ENGINEERS, INC.
5000 GOODMAN STREET
UNIT 100
TIMNATH CO 80547
(970) 460-7400
G2CE.COM

CONSULTANT FIRM NAME

PROJECT DESCRIPTION

PARKER DECANT ADDITION

9045 TAMMY LANE
PARKER, COLORADO 80134

SEAL

COLORADO LICENSED
DAVID R. SMITH
0050028
PROFESSIONAL ENGINEER
08/21/2026

NO.	REVISION/ISSUE	DATE

PROJECT #
2025121.00

DATE 08/21/2026 | SCALE AS NOTED

DRAWN G2 | CHECKED G2

SHEET DESCRIPTION
ELECTRICAL INDEX, LEGEND, SCHEDULES, AND SITE PLAN

SHEET NUMBER
E1.00

E1.00.dwg
1/27/2026