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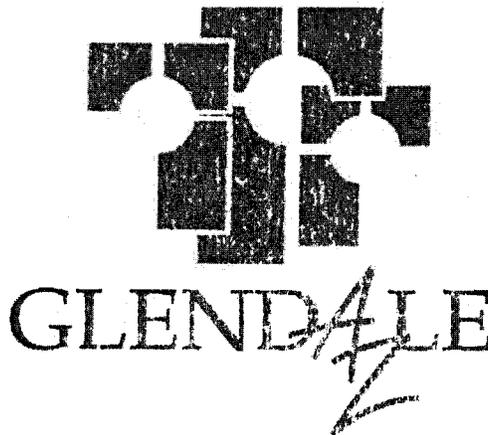
C-7751
08/01/2011

**PROJECT SPECIFICATIONS AND
CONTRACT DOCUMENTS**

PROJECT 101106

FUEL MONITORING SYSTEM UPGRADE

JUNE 2011



Handwritten signature
EXPIRES 9/30/12

CITY OF GLENDALE

ENGINEERING DEPARTMENT

5850 W. Glendale Avenue, Glendale, Arizona 85301 (623) 930-3630

PROJECT SPECIFICATIONS AND CONTRACT DOCUMENTS

MAYOR

Elaine M. Scruggs

VICE-MAYOR

Manuel D. Martinez

COUNCIL MEMBERS

Norma S. Alvarez

Joyce V. Clark

Steven E. Frate

Yvonne J. Knaack

H. Philip Lieberman

CITY MANAGER

Ed Beasley

CITY CLERK

Pamela Hanna

CITY ATTORNEY

Craig D. Tindall

CITY ENGINEER

Larry J. Broyles





Engineering Department

Memorandum

DATE: June 13, 2011
TO: All Plan and Specification Holders
FROM: Engineering
SUBJECT: PROJECT NO. 101106 – FUEL MONITORING SYSTEM UPGRADE

ADDENDUM NO. 1

In accordance with the contract documents "Notice to Contractors," Page 1, Paragraph 2, the Bid date has been changed FROM 10:00 A.M., JUNE 17, 2011 TO 10:00 A.M. JUNE 20, 2011. The BID SCHEDULE, Page 7 adds Alternate 1. The following revisions to the plans and specifications shall become a part of the contract documents and the bidder shall acknowledge receipt thereof as directed in Paragraph 11 of the Information for Bidders.

Specifications E002, E101 and E201 are added to these Project Specifications and Contract Documents.



Mark D. Palston
EXPIRES 9/30/12

THIS ADDENDUM CONSISTS OF THIS COVER PAGE, REVISED BID SCHEDULE AND DRAWINGS E002, E101 AND E202

ADDENDUM NO. 1 BID SCHEDULE

**PROJECT: 101106 - PUBLIC SAFETY FACILITY FUEL TANK MONITORING
SYSTEM UPGRADE**

ITEM NO.	DESCRIPTION	QTY.	UNIT	UNIT COST	TOTAL COST
1	Allowance for Construction Contingency	1	LS	\$ 5,000.00	\$ 5,000.00
2	Mobilization/Demobilization	1	LS	_____	_____
3	BASE BID - ILS-450 Fuel Monitoring Controller and All Misc. Equipment per Plans and Specifications	1	LS	_____	_____
4	Support work required to Interface Probes at the existing Fuel Tanks per Plans and Specification	1	LS	_____	_____
5	Support Infrastructure (Conduit, Trenching, Patch/Repair, etc.) per Plans & Specifications	1	LS	_____	_____
TOTAL BASE BID:				_____	_____
ALTERNATE					
6	ALTERNATE BID - ILS-350 Fuel Monitoring Controller and All Misc. Equipment per Plans and Specifications. Refer to Sheet E002 for Additional Information.	1	LS	_____	_____
TOTAL ALTERNATE BID:				_____	_____
TOTAL BASE BID & ALTERNATE:				_____	_____

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NOTICE TO CONTRACTORS

Sealed bids shall be either mailed to the City of Glendale Engineering Department, 5850 West Glendale Avenue, Glendale, Arizona, 85301, or hand-delivered to the Engineering Department office, third floor, 5850 West Glendale Avenue, Glendale, Arizona, for furnishing all plant, material, equipment and labor, and to complete construction of: **PROJECT NO. 101106 FUEL MONITORING SYSTEM UPGRADE.**

Bids must be received by the Engineering Department of the City of Glendale no later than 10:00 A.M., JUNE 17, 2011. Any bid received after that time will not be considered and will be returned to the bidder.

Each bid shall be in accordance with the plans, specifications and contract documents, and shall be set forth and submitted on the BID DOCUMENTS included with the project specifications book. The BID DOCUMENTS may be removed from the project specifications book and submitted independently of such book.

The City of Glendale reserves the right to reject any or all bids or waive any informality or irregularity in a bid. No bidder may withdraw his bid for a period of fifty (50) days after opening and reading of the bids.

The City of Glendale is an equal opportunity employer and minority business enterprises and women's business enterprises are encouraged to submit bids.

CITY OF GLENDALE, ARIZONA

INFORMATION FOR BIDDERS

1. **ELIGIBILITY OF CONTRACTORS:** When calling for bids for contracts for public work to be performed on behalf of the State or any political subdivision thereof, which will be paid for from public funds, no bid shall be considered for performance of a contract, including construction work which is not submitted by a bidder duly licensed as a contractor in this State. No bid shall be awarded to any contractor or entity not authorized to do business in the State of Arizona by the Arizona Corporation Commission, as required by statute.

2. **PROPOSAL:** Bids to receive consideration shall be made in accordance with the following instructions:

(a) Before submitting a bid, bidders shall carefully examine the plans and specifications and contract documents, visit the site of the work, fully inform themselves as to all existing conditions and limitations.

(b) Bids shall be submitted on the "PROPOSAL" forms provided and delivered to the City of Glendale Engineering Department on or before the day and hour set in the "NOTICE TO CONTRACTORS," as published. Bids shall be enclosed in a sealed envelope marked on the outside lower right-hand corner indicating:

1. The bidder's name and address.
2. The project number.
3. The title of the project.
4. The time and date the bids are to be received.

(c) It is the sole responsibility of the bidder to see that his bid is received in proper time. Any bids received after the scheduled closing time for receipt of bids will be returned to the bidder unopened.

(d) The signatures of all persons shall be in longhand. Any interlineations, alterations, or erasures must be initialed by the signer of the bid.

(e) Bids shall not contain any recapitulations of the work to be done. No oral, telegraphic, telephonic, or modified proposals will be considered.

3. **WITHDRAWAL OF BID:** Any bidder may withdraw his bid, either personally, by telegram or by written request, at any time prior to the scheduled closing time for receipt of bids. No bid may be withdrawn by telephone. Any bid withdrawn will not be opened and will be returned to the bidder. After opening and reading of the bids, no bidder may withdraw his bid for a period of fifty (50) days from the date of opening and reading.

4. **LATE BIDS:** Bids received after the scheduled closing time for receipt of bids, as contained in the "Notice to Contractors," will not be considered and will be returned to the bidder.

5. **AWARD OR REJECTION OF BIDS:** The contract will be awarded to the lowest and best qualified responsive bidder complying with these instructions and with the "NOTICE TO CONTRACTORS." The City of Glendale, Arizona, however, reserves the right to accept or reject any or all bids or to waive any or all informalities or irregularities in the bid. Alternates may be accepted depending upon the availability of City funds. Accepted alternates will be considered in determining the lowest responsive and responsible bidder.

6. BIDDERS INTERESTED IN MORE THAN ONE BID: No person, firm or corporation shall be allowed to make, file, or be interested in more than one (1) bid for the same work unless alternate bids are called for in the specifications or any addenda. A person, firm, or corporation who has submitted a sub-proposal to a bidder, or who has quoted prices on materials to a bidder is not thereby disqualified from submitting a sub-proposal or quoting prices to other bidders.

7. CONTRACT AND INSURANCE: The form of contract, which the successful bidder as Contractor will be required to execute, and insurance form which he will be required to furnish are included in the contract documents and should be carefully examined by the bidder. The successful bidder shall use the forms provided or such other forms as are acceptable by the City. The contract and insurance form will be executed in FOUR (4) original counterparts.

8. SUBCONTRACTORS LISTING AND CERTIFICATION OF CONTRACT COMPLIANCE: The contractor will be required to furnish the form of subcontractors listing and certification of contract compliance with the executed contract documents. This information is requested for tracking and insurance purposes only.

9. INTERPRETATION OF PLANS AND DOCUMENTS: If any person contemplating a bid for proposed contract is in doubt as to the true meaning of any part of the plans, specifications, or other proposed contract documents, or finds discrepancies in or omissions from the plans and specifications, he may submit to the Engineering Department, a written request for an interpretation or correction thereof. The person submitting the request will be responsible for its prompt delivery. Questions received less than ninety-six (96) hours before the bid opening time may not be answered. Any interpretation or correction of the documents will be made only by Addendum, duly issued and a copy of such Addendum will be mailed or delivered to each person receiving a set of such documents. The City of Glendale will not be responsible for any other explanations or interpretations of the proposed documents.

10. CHANGES TO PLANS AND DOCUMENTS: Any changes to the plans and documents shall be made only by Addendum. No verbal or other changes to the plans and documents will be valid. A copy of each Addendum will be mailed or delivered as provided in Section 12 below.

11. ADDENDUM: Any addenda will be faxed, mailed or delivered to all who are known by the City to have received a complete set of bid documents, and to offices where bid documents have been filed for review purposes. It is the responsibility of each bidder to ascertain that he has received all addenda issued by telephoning the office identified in the NOTICE TO CONTRACTORS as the location where bid documents are available prior to submitting his bid.

Bidders shall acknowledge all addenda in the appropriate location on the "PROPOSAL" form. Failure to acknowledge receipt of Addenda shall render the bid proposal non-responsive and it will be rejected.

12. ASSIGNMENT OF CONTRACT: No assignment by the Contractor of any contract to be entered into hereunder, or any part thereof, or of funds to be received thereunder by the Contractor, will be recognized by the Owner by the Owner unless such assignment has had prior approval of the Owner and consented thereto in writing.

13. PLANS AND SPECIFICATIONS TO SUCCESSFUL BIDDER: The successful bidder may

obtain five (5) sets of plans and specifications for this project from the City.

14. **TIME OF COMPLETION:** The Contractor shall commence work under this project on or before the tenth day following receipt of the Notice to Proceed for that project from the City of Glendale and shall fully complete all work under the project within SIXTY (60) consecutive calendar days from and including the date of receipt of such Notice to Proceed. Time is of the essence in the completion of all work required under this contract. The Contractor shall, at all times, during the continuance of the contract, prosecute the work with such force and equipment as is sufficient to complete all work within the time specified.

15. **CITY OF GLENDALE TRANSACTION PRIVILEGE TAX:** The City of Glendale transaction privilege tax shall **NOT** be waived under the provisions of this contract. The current privilege tax rate can be obtained from the City of Glendale Sales Tax and Licenses Department. The Contractor shall be responsible for reporting and payment of all city, county, state or federal taxes.

16. **PRE-BID CONFERENCE:** A pre-bid conference will be held on JUNE 9, 2011, at 10:00 A.M., in the Engineering Department Conference Room, 5850 West Glendale Avenue, Glendale, Arizona. Bidders, contractors, and other interested parties are invited to attend this conference which will be conducted by the Owner and Engineer to answer any questions.

17. **ALTERNATES:** Alternate proposals will not be considered unless called for in the documents or any addenda thereto. When alternates are requested, all requested alternates or alternate bid items, unless otherwise stated, shall be bid. If no change in the base bid will occur with the alternate, enter "No Change."

18. **APPROVAL OF SUBSTITUTIONS:** The materials, products and equipment described in the Documents and Addenda establish a standard or required function, dimension, appearance and quality to be met by any proposed substitution. No substitute will be considered, before bid opening, unless written request for approval has been received by the City Engineer at least ten (10) working days prior to the scheduled closing time for receipt of bids. Each such request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including any drawings, cuts, performance and test data and any other information necessary for evaluation of the substitute. Bidder shall not be entitled to approval of a substitute.

If a substitute is approved, the approval shall be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.

19. **USE OF "EQUALS":** When the specifications for materials, articles, products and equipment state "or equal," contractor may bid upon, and use materials, articles, products and equipment which will perform equally the duties imposed by the general design. The City Engineering Department will have the final approval of all materials, articles, products and equipment proposed to be used as an "equal." It shall not be purchased or installed without the prior written approval from the City Engineering Department.

Approvals for "equals," before bid opening, may be requested in writing to the City Engineering Department for approval. Requests must be received at least ten (10) days prior to the date set for opening the Bid Proposals. The request shall state the name of the material, article, product or equipment for which the item is sought to be considered an equal and a complete description of the

proposed equal including any drawings, cuts, performance and test data and any other information necessary for approval of the equal. All approvals will be issued in the form of an addendum.

20. EXAMINATION OF CONTRACT DOCUMENTS AND VISIT SITE: Before submitting a Bid Proposal, bidders should carefully examine the Contract Documents, visit the site of the work, fully inform themselves as to all existing conditions and limitations. No consideration will be granted for any alleged misunderstanding of the material, articles or piece of equipment to be furnished or work to be done. It is understood that the tender of the Bid Proposal carries with it the agreement to all items and conditions referred to herein or indicated in the Contract Documents.

21. BIDDERS IN DEFAULT: No bid will be awarded to any person, firm or corporation that is not authorized by the Arizona Corporation Commission to do business in the State of Arizona, in arrears or is in default to the City of Glendale upon any debt or contract, or that is a defaulter as surety or otherwise upon any obligation to the City of Glendale, or has failed to faithfully perform any previous contract with the City of Glendale.

END OF INFORMATION FOR BIDDERS

PROPOSAL

Place #101106 PUBLIC SAFETY FACILITY FUEL MONITORING SYSTEM UPGRADE

Date 6-20-11

Proposal of Cochise Contractors, Inc. a Corporation organized and existing under the laws of the State of Arizona. a partnership consisting of _____; or an individual trading as _____.

TO THE HONORABLE MAYOR AND COUNCIL
CITY OF GLENDALE
GLENDALE, ARIZONA

Gentlemen:

The undersigned hereby proposes and agrees to furnish any and all required labor, materials, construction equipment, transportation and services for the construction of: **PROJECT 101106-FUEL MONITORING SYSTEM UPGRADE**, in strict conformity with the plans and specifications for the following unit prices:

(Extension of these unit prices on the basis of estimated quantities and the totaling of these extensions are for the purpose of comparing bids only. The mathematics of such extensions and totaling will be checked and corrected by the Public Works/Engineering Department, before evaluating the bids, and the lowest of such corrected and checked totals will determine the lowest bids.)

ADDENDUM NO. 1 BID SCHEDULE

**PROJECT: 101106 - PUBLIC SAFETY FACILITY FUEL TANK MONITORING
SYSTEM UPGRADE**

ITEM NO.	DESCRIPTION	QTY.	UNIT	UNIT COST	TOTAL COST
1	Allowance for Construction Contingency	1	LS	\$ 5,000.00	\$ 5,000.00
2	Mobilization/Demobilization	1	LS	<u>2100.00</u>	<u>2100.00</u>
3	BASE BID - ILS-450 Fuel Monitoring Controller and All Misc. Equipment per Plans and Specifications	1	LS	<u>11,438.00</u>	<u>11,438.00</u>
4	Support work required to Interface Probes at the existing Fuel Tanks per Plans and Specification	1	LS	<u>5003.00</u>	<u>5003.00</u>
5	Support Infrastructure (Conduit, Trenching, Patch/Repair, etc.) per Plans & Specifications	1	LS	<u>14,560.00</u>	<u>14,560.00</u>
TOTAL BASE BID:				<u>\$ 38,101.00</u>	

ALTERNATE

6	ALTERNATE BID - ILS-350 Fuel Monitoring Controller and All Misc. Equipment per Plans and Specifications. Refer to Sheet E002 for Additional Information.	1	LS	<u>11,438.00</u>	<u>11,438.00</u>
TOTAL ALTERNATE BID:				<u>11,438.00</u>	

TOTAL BASE BID & ALTERNATE: \$ 38,101.00
(Less 450 system)

The undersigned hereby declares that he has visited the site(s) and has carefully examined the contract documents relating to the work covered by the above bid or bids.

Upon receipt of notice of the acceptance of this bid, we will execute the formal contract attached within ten (10) days, and will deliver the Certificate of Insurance.

The undersigned has checked carefully all the above figures and understands that the City of Glendale, Arizona, will not be responsible for any errors or omissions on the part of the undersigned in making up this bid.

The undersigned understands that the Mayor and Council of the City of Glendale, Arizona, reserves the right to reject any or all bids or to waive any informalities or irregularities in the bid.

Respectfully submitted,

Arizona Contractor's
Classification and
License No.

Coctise Contractors INC
Contractor

ROC 073119

By Cliff Cogswell

333 N. Black Canyon Hwy
P42 A2 85009
(Complete business address)

Telephone Number: 602-272-0911
Fax Number 480-717-6480

Bidder shall signify receipt of all Addenda here (if any):

ADDENDUM No. 1 6-13-11

Failure to acknowledge receipt of all Addenda shall render the bid proposal non-responsive and will be rejected.

Acknowledged by Cliff Cogswell

CONSTRUCTION AGREEMENT

This Construction Agreement ("Agreement") is entered into and effective between the CITY OF GLENDALE, an Arizona municipal corporation ("City"), and Cochise Contractors, Inc., an Arizona corporation ("Contractor") as of the 1st day of August, 2011.

RECITALS

- A. City intends to undertake a project for the benefit of the public and with public funds that is more fully set forth in the **Notice to Contractors** and the attached **Exhibit A** ("Project");
- B. City desires to retain the services of Contractor to perform those specific duties and produce the specific work as set forth in the Project, the plans and specifications, the **Information for Bidders**, and the **Maricopa Association of Governments ("MAG") General and Supplemental Conditions and Provisions**;
- C. City and Contractor desire to memorialize their agreement with this document.

AGREEMENT

In consideration of the Recitals, which are confirmed as true and correct and incorporated by this reference, the mutual promises and covenants contained in this Agreement, and other good and valuable consideration, City and Contractor agree as follows:

1. Project.

- 1.1 Scope.** Contractor will provide all services and material necessary to assure the Project is completed timely and efficiently consistent with Project requirements, including, but not limited to, working in close interaction and interfacing with City and its designated employees, and working closely with others, including other contractors, providers or consultants retained by City.
- 1.2 Documents.** The following documents are, by this reference, entirely incorporated into this Agreement and attached Exhibits as though fully set forth herein:

- (A) Notice to Contractors;
- (B) Information for Bidders;
- (C) MAG General Conditions, Supplemental General Conditions, Special and Technical Provisions;
- (D) Proposal;
- (E) Bid Bond;
- (F) Payment Bond;
- (G) Performance Bond;
- (H) Certificate of Insurance;
- (I) Appendix; and
- (J) Plans and Addenda thereto.

Should a conflict exist between this Agreement (and its attachments), and any of the incorporated documents as listed above, the provisions of this Agreement shall govern.

1.3 Project Team.

- (A) Project Manager. Contractor will designate an employee as Project Manager with sufficient training, knowledge, and experience to, in the City's opinion, to complete the project and handle all aspects of the Project such that the work produced by Contractor is consistent with applicable standards as detailed in this Agreement.

(B) Project Team.

- (1) The Project manager and all other employees assigned to the project by Contractor will comprise the "Project Team."
- (2) Project Manager will have responsibility for and will supervise all other employees assigned to the project by Contractor.

(C) Sub-contractors.

- (1) Contractor may engage specific technical contractor (each a "Sub-contractor") to furnish certain service functions.
- (2) Contractor will remain fully responsible for Sub-contractor's services.
- (3) Sub-contractors must be approved by the City, unless the Sub-contractor was previously mentioned in the response to the solicitation.
- (4) Contractor shall certify by letter that contracts with Sub-contractors have been executed incorporating requirements and standards as set forth in this Agreement.

2. **Schedule.** The Project will be undertaken in a manner that ensures it is completed in a timely and efficient manner. If not otherwise stated in **Exhibit A**, the Project shall be completed by no later than within 60 consecutive calendar days from and including the date of the Notice to Proceed.

3. **Contractor's Work.**

3.1 **Standard.** Contractor must perform services in accordance with the standards of due diligence, care, and quality prevailing among contractors having substantial experience with the successful furnishing of services and materials for projects that are equivalent in size, scope, quality, and other criteria under the Project and identified in this Agreement.

3.2 **Licensing.** Contractor warrants that:

- (A) Contractor and Sub-contractors will hold all appropriate and required licenses, registrations and other approvals necessary for the lawful furnishing of services ("Approvals"); and
- (B) Neither Contractor nor any Sub-contractor has been debarred or otherwise legally excluded from contracting with any federal, state, or local governmental entity ("Debarment").
 - (1) City is under no obligation to ascertain or confirm the existence or issuance of any Approvals or Debarments or to examine Contractor's contracting ability.
 - (2) Contractor must notify City immediately if any Approvals or Debarment changes during the Agreement's duration and the failure of the Contractor to notify City as required will constitute a material default of this Agreement.

3.3 **Compliance.** Services and materials will be furnished in compliance with applicable federal, state, county and local statutes, rules, regulations, ordinances, building codes, life safety codes, or other standards and criteria designated by City.

3.4 **Coordination; Interaction.**

- (A) If the City determines that the Project requires the coordination of professional services or other providers, Contractor will work in close consultation with City to proactively interact with any other contractors retained by City on the Project ("Coordinating Entities").
- (B) Subject to any limitations expressly stated in the budget, Contractor will meet to review the Project, schedules, budget, and in-progress work with Coordinating Entities and the City as often and for durations as City reasonably considers necessary in order to ensure the timely work delivery and Project completion.

- (C) If the Project does not involve Coordinating Entities, Contractor will proactively interact with any other contractors when directed by City to obtain or disseminate timely information for the proper execution of the Project.

- 3.5 **Hazardous Substances.** Contractor is responsible for the appropriate handling, disposal of, and if necessary, any remediation and all losses and damages to the City, associated with the use or release of hazardous substances by Contractor in connection with completion of the Project.
- 3.6 **Warranties.** At any time within two years after completion of the Project, Contractor must, at Contractor's sole expense and within 20 days of written notice from the City, uncover, correct and remedy all defects in Contractor's work. City will accept a manufacturer's warranty on approved equipment as satisfaction of the Contractor's warranty under this subsection.
- 3.7 **Bonds.** Upon execution of this Agreement, and if applicable, Contractor must furnish Payment and Performance bonds as required under A.R.S. § 34-608.

4. **Compensation for the Project.**

- 4.1 **Compensation.** Contractor's compensation for the Project, including those furnished by its Sub-contractors will not exceed \$38,101.00, as specifically detailed in the Contractor's bid and set forth in Exhibit B ("Compensation").
- 4.2 **Change in Scope of Project.** The Compensation may be equitably adjusted if the originally contemplated scope of services as outlined in the Project is significantly modified by the City.
 - (A) Adjustments to the Scope or Compensation require a written amendment to this Agreement and may require City Council approval.
 - (B) Additional services which are outside the scope of the Project and not contained in this Agreement may not be performed by the Contractor without prior written authorization from the City.

5. **Billings and Payment.**

5.1 **Applications.**

- (A) The Contractor will submit monthly invoices (each, a "Payment Application") to City's Project Manager and City will remit payments based upon the Payment Application as stated below.
- (B) The period covered by each Payment Application will be one calendar month ending on the last day of the month.

5.2 **Payment.**

- (A) After a full and complete Payment Application is received, City will process and remit payment within 30 days.
- (B) Payment may be subject to or conditioned upon City's receipt of:
 - (1) Completed work generated by Contractor and its Sub-contractors; and
 - (2) Unconditional waivers and releases on final payment from Sub-contractors as City may reasonably request to assure the Project will be free of claims arising from required performances under this Agreement.

5.3 **Review and Withholding.** City's Project Manager will timely review and certify Payment Applications.

- (A) If the Payment Application is rejected, the Project Manager will issue a written listing of the items not approved for payment.
- (B) City may withhold an amount sufficient to pay expenses that City reasonably expects to incur in correcting the deficiency or deficiencies rejected for payment.

- (C) Contractor will provide, by separate cover, and concurrent with the execution of this Agreement, all required financial information to the City, including City of Glendale Transaction Privilege License and Federal Taxpayer identification numbers.
- (D) City will temporarily withhold Compensation amounts as required by A.R.S. 34-221(C).

6. Termination.

6.1 For Convenience. City may terminate this Agreement for convenience, without cause, by delivering a written termination notice stating the effective termination date, which may not be less than 15 days following the date of delivery.

- (A) Contractor will be equitably compensated any services and materials furnished prior to receipt of the termination notice and for reasonable costs incurred.
- (B) Contractor will also be similarly compensated for any approved effort expended and approved costs incurred that are directly associated with Project closeout and delivery of the required items to the City.

6.2 For Cause. City may terminate this Agreement for cause if Contractor fails to cure any breach of this Agreement within seven days after receipt of written notice specifying the breach.

- (A) Contractor will not be entitled to further payment until after City has determined its damages. If City's damages resulting from the breach, as determined by City, are less than the equitable amount due but not paid Contractor for Service and Repair furnished, City will pay the amount due to Contractor, less City's damages.
- (B) If City's direct damages exceed amounts otherwise due to Contractor, Contractor must pay the difference to City immediately upon demand; however, Contractor will not be subject to consequential damages more than \$1,000,000 or the amount of this Agreement, whichever is greater.

7. Insurance.

7.1 Requirements. Contractor must obtain and maintain the following insurance ("Required Insurance"):

- (A) Contractor and Sub-contractors. Contractor, and each Sub-contractor performing work or providing materials related to this Agreement must procure and maintain the insurance coverages described below (collectively, "Contractor's Policies"), until each Parties' obligations under this Agreement are completed.
- (B) General Liability.
 - (1) Contractor must at all times relevant hereto carry a commercial general liability policy with a combined single limit of at least \$1,000,000 per occurrence and \$2,000,000 annual aggregate.
 - (2) Sub-contractors must at all times relevant hereto carry a general commercial liability policy with a combined single limit of at least \$1,000,000 per occurrence.
 - (3) This commercial general liability insurance must include independent contractors' liability, contractual liability, broad form property coverage, products and completed operations, XCU hazards if requested by the City, and a separation of insurance provision.
 - (4) These limits may be met through a combination of primary and excess liability coverage.
- (C) Auto. A business auto policy providing a liability limit of at least \$1,000,000 per accident for Contractor and 1,000,000 per accident for Sub-contractors and covering owned, non-owned and hired automobiles.
- (D) Workers' Compensation and Employer's Liability. A workers' compensation and employer's

liability policy providing at least the minimum benefits required by Arizona law.

- (E) Equipment Insurance. Contractor must secure, pay for, and maintain all-risk insurance as necessary to protect the City against loss of owned, non-owned, rented or leased capital equipment and tools, equipment and scaffolding, staging, towers and forms owned or rented by Contractor or its Sub-contractors.
- (F) Notice of Changes. Contractor's Policies must provide for not less than 30 days' advance written notice to City Representative of:
- (1) Cancellation or termination of Contractor or Sub-contractor's Policies;
 - (2) Reduction of the coverage limits of any of Contractor or and Sub-contractor's Policies; and
 - (3) Any other material modification of Contractor or Sub-contractor's Policies related to this Agreement.
- (G) Certificates of Insurance.
- (1) Within 10 business days after the execution of the Agreement, Contractor must deliver to City Representative certificates of insurance for each of Contractor and Sub-contractor's Policies, which will confirm the existence or issuance of Contractor and Sub-contractor's Policies in accordance with the provisions of this section, and copies of the endorsements of Contractor and Sub-contractor's Policies in accordance with the provisions of this section.
 - (2) City is and will be under no obligation either to ascertain or confirm the existence or issuance of Contractor and Sub-contractor's Policies, or to examine Contractor and Sub-contractor's Policies, or to inform Contractor or Sub-contractor in the event that any coverage does not comply with the requirements of this section.
 - (3) Contractor's failure to secure and maintain Contractor Policies and to assure Sub-contractor policies as required will constitute a material default under this Agreement.
- (H) Other Contractors or Vendors.
- (1) Other contractors or vendors that may be contracted by Contractor with in connection with the Project must procure and maintain insurance coverage as is appropriate to their particular agreement.
 - (2) This insurance coverage must comply with the requirements set forth above for Contractor's Policies (e.g., the requirements pertaining to endorsements to name the parties as additional insured parties and certificates of insurance).
- (I) Policies. Except with respect to workers' compensation and employer's liability coverages, the City must be named and properly endorsed as additional insureds on all liability policies required by this section.
- (1) The coverage extended to additional insureds must be primary and must not contribute with any insurance or self insurance policies or programs maintained by the additional insureds.
 - (2) All insurance policies obtained pursuant to this section must be with companies legally authorized to do business in the State of Arizona and acceptable to all parties.

7.2 Sub-contractors.

- (A) Contractor must also cause its Sub-contractors to obtain and maintain the Required Insurance.
- (B) City may consider waiving these insurance requirements for a specific Sub-contractor if City is satisfied the amounts required are not commercially available to the Sub-contractor and the

insurance the Sub-contractor does have is appropriate for the Sub-contractor's work under this Agreement.

- (C) Contractor and Sub-contractors must provide to the City proof of Required Insurance whenever requested.

7.3 Indemnification.

- (A) To the fullest extent permitted by law, Contractor must defend, indemnify, and hold harmless City and its elected officials, officers, employees and agents (each, an "Indemnified Party," collectively, the "Indemnified Parties"), for, from, and against any and all claims, demands, actions, damages, judgments, settlements, personal injury (including sickness, disease, death, and bodily harm), property damage (including loss of use), infringement, governmental action and all other losses and expenses, including attorneys' fees and litigation expenses (each, a "Demand or Expense"; collectively, "Demands or Expenses") asserted by a third-party (i.e. a person or entity other than City or Contractor) and that arises out of or results from the breach of this Agreement by the Contractor or the Contractor's negligent actions, errors or omissions (including any Sub-contractor or other person or firm employed by Contractor), whether sustained before or after completion of the Project.
- (B) This indemnity and hold harmless provision applies even if a Demand or Expense is in part due to the Indemnified Party's negligence or breach of a responsibility under this Agreement, but in that event, Contractor shall be liable only to the extent the Demand or Expense results from the negligence or breach of a responsibility of Contractor or of any person or entity for whom Contractor is responsible.
- (C) Contractor is not required to indemnify any Indemnified Parties for, from, or against any Demand or Expense resulting from the Indemnified Party's sole negligence or other fault solely attributable to the Indemnified Party.

- 7.4 **Waiver of Subrogation.** Contractor waives, and will require any Subcontractor to waive, all rights of subrogation against the City to the extent of all losses or damages covered by any policy of insurance.

8. Immigration Law Compliance.

- 8.1 Contractor, and on behalf any subcontractor, warrants, to the extent applicable under A.R.S. § 41-4401, compliance with all federal immigration laws and regulations that relate to their employees as well as compliance with A.R.S. § 23-214(A) which requires registration and participation with the E-Verify Program.
- 8.2 Any breach of warranty under subsection 8.1 above is considered a material breach of this Agreement and is subject to penalties up to and including termination of this Agreement.
- 8.3 City retains the legal right to inspect the papers of any Contractor or subcontractor employee who performs work under this Agreement to ensure that the Contractor or any subcontractor is compliant with the warranty under subsection 8.1 above.
- 8.4 City may conduct random inspections, and upon request of City, Contractor shall provide copies of papers and records of Contractor demonstrating continued compliance with the warranty under subsection 9.1 above. Contractor agrees to keep papers and records available for inspection by the City during normal business hours and will cooperate with City in exercise of its statutory duties and not deny access to its business premises or applicable papers or records for the purposes of enforcement of this section 9.
- 8.5 Contractor agrees to incorporate into any subcontracts under this Agreement the same obligations imposed upon Contractor and expressly accrue those obligations directly to the benefit of the City. Contractor also agrees to require any subcontractor to incorporate into each of its own subcontracts under this Agreement the same obligations above and expressly accrue those obligations to the benefit of the City.
- 8.6 Contractor's warranty and obligations under this section to the City is continuing throughout the term of this Agreement or until such time as the City determines, in its sole discretion, that Arizona law has been modified in that compliance with this section is no longer a requirement.

8.7 The "E-Verify Program" above means the employment verification program administered by the United States Department of Homeland Security, the Social Security Administration, or any successor program.

9. **Conflict.** Contractor acknowledges this Agreement is subject to A.R.S. § 38-511, which allows for cancellation of this Agreement in the event any person who is significantly involved in initiating, negotiating, securing, drafting, or creating the Agreement on City's behalf is also an employee, agent, or consultant of any other party to this Agreement.
10. **Prohibitions.** Contractor certifies under A.R.S. §§ 35-391 *et seq.* and 35-393 *et seq.*, that it does not have, and during the term of this Agreement will not have "scrutinized" business operations, as defined in the preceding statutes, in the countries of Sudan or Iran.
11. **Non-Discrimination Policies.** Contractor must not discriminate against any employee or applicant for employment on the basis of race, religion, color sex or national origin. Contractor must develop, implement and maintain non-discrimination policies and post the policies in conspicuous places visible to employees and applicants for employment. Contractor will require any Sub-contractor to be bound to the same requirements as stated within this section.

12. **Notices.**

12.1 A notice, request or other communication that is required or permitted under this Agreement (each a "Notice") will be effective only if:

- (A) The Notice is in writing, and
- (B) Delivered in person or by private express overnight delivery service (delivery charges prepaid), certified or registered mail (return receipt requested).
- (C) Notice will be deemed to have been delivered to the person to whom it is addressed as of the date of receipt, if:
 - (1) Received on a business day, or before 5:00 p.m., at the address for Notices identified for the Party in this Agreement by U.S. Mail, hand delivery, or overnight courier on or before 5:00 p.m.; or
 - (2) As of the next business day after receipt, if received after 5:00 p.m.
- (D) The burden of proof of the place and time of delivery is upon the Party giving the Notice.
- (E) Digitalized signatures and copies of signatures will have the same effect as original signatures.

12.2 **Representatives.**

- (A) Contractor. Contractor's representative ("Contractor's Representative") authorized to act on Contractor's behalf with respect to the Project, and his or her address for Notice delivery is:

Brent Erekson
Cochise Contractors, Inc.
333 N. Black Canyon Highway
Phoenix, AZ 85009

- (B) City. City's representative ("City's Representative") authorized to act on City's behalf, and his or her address for Notice delivery is:

City of Glendale
Attn: Mike Johnson
5850 West Glendale Avenue
Glendale, Arizona 85301

With required copies to:

City of Glendale

City of Glendale

City Manager
5850 West Glendale Avenue
Glendale, Arizona 85301

City Attorney
5850 West Glendale Avenue
Glendale, Arizona 85301

(C) Concurrent Notices.

- (1) All notices to City's representative must be given concurrently to City Manager and City Attorney.
- (2) A notice will not be considered to have been received by City's representative until the time that it has also been received by City Manager and City Attorney.
- (3) City may appoint one or more designees for the purpose of receiving notice by delivery of a written notice to Contractor identifying the designee(s) and their respective addresses for notices.

(D) **Changes.** Contractor or City may change its representative or information on Notice, by giving Notice of the change in accordance with this section at least ten days prior to the change.

13. **Financing Assignment.** City may assign this Agreement to any City-affiliated entity, including a non-profit corporation or other entity whose primary purpose is to own or manage the Project.

14. **Entire Agreement; Survival; Counterparts; Signatures.**

14.1 **Integration.** This Agreement contains, except as stated below, the entire agreement between City and Contractor and supersedes all prior conversations and negotiations between the parties regarding the Project or this Agreement.

- (A) Neither Party has made any representations, warranties or agreements as to any matters concerning the Agreement's subject matter.
- (B) Representations, statements, conditions, or warranties not contained in this Agreement will not be binding on the parties.
- (C) Any solicitation, addendums and responses submitted by the Contractor are incorporated fully into this Agreement as Exhibit A. Any inconsistency between Exhibit A and this Agreement will be resolved by the terms and conditions stated in this Agreement.

14.2 **Interpretation.**

- (A) The parties fairly negotiated the Agreement's provisions to the extent they believed necessary and with the legal representation they deemed appropriate.
- (B) The parties are of equal bargaining position and this Agreement must be construed equally between the parties without consideration of which of the parties may have drafted this Agreement.
- (C) The Agreement will be interpreted in accordance with the laws of the State of Arizona.

14.3 **Survival.** Except as specifically provided otherwise in this Agreement each warranty, representation, indemnification and hold harmless provision, insurance requirement, and every other right, remedy and responsibility of a Party, will survive completion of the Project, or the earlier termination of this Agreement.

14.4 **Amendment.** No amendment to this Agreement will be binding unless in writing and executed by the parties. Any amendment may be subject to City Council approval.

14.5 **Remedies.** All rights and remedies provided in this Agreement are cumulative and the exercise of any one or more right or remedy will not affect any other rights or remedies under this Agreement or applicable law.

14.6 Severability. If any provision of this Agreement is voided or found unenforceable, that determination will not affect the validity of the other provisions, and the voided or unenforceable provision will be reformed to conform to applicable law.

14.7 Counterparts. This Agreement may be executed in counterparts, and all counterparts will together comprise one instrument.

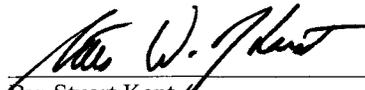
15. Dispute Resolution. Each claim, controversy and dispute ("Dispute") between Contractor and City will be resolved in accordance with Exhibit C. The final determination will be made by the City.

16. Exhibits. The following exhibits, with reference to the term in which they are first referenced, are incorporated by this reference.

- Exhibit A Project
- Exhibit B Compensation
- Exhibit C Dispute Resolution

The parties enter into this Agreement as of the date shown above.

City of Glendale,
an Arizona municipal corporation


By: Stuart Kent
Its: Executive Director, Public Works

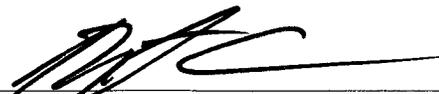
ATTEST:


City Clerk (SEAL)

APPROVED AS TO FORM:


City Attorney

COCHISE CONTRACTORS, INC.
an Arizona corporation


By: Brent Erikson
Its: President

WOMEN-OWNED/MINORITY BUSINESS [] YES [] NO
CITY OF GLENDALE TRANSACTION PRIVILEGE TAX NO. _____
FEDERAL TAXPAYER IDENTIFICATION NO. _____

**EXHIBIT A
CONSTRUCTION AGREEMENT**

Project 101106 - Fuel Monitoring System Upgrade

· Provide labor, materials and equipment to remove the current fuel monitoring system and replace it with a new Veeder Root TL450 monitoring system with printer for Fire Station #155 at the Foothills Public Safety Facility.

**EXHIBIT B
CONSTRUCTION AGREEMENT**

COMPENSATION

METHOD AND AMOUNT OF COMPENSATION

By bid, including all services, materials and costs.

NOT-TO-EXCEED AMOUNT

The total amount of compensation paid to Contractor for full completion of all work required by the Project during the entire term of the Project must not exceed \$38,101.00

DETAILED PROJECT COMPENSATION

Per Page 7 of the Bid Schedule.

**EXHIBIT C
CONSTRUCTION AGREEMENT**

DISPUTE RESOLUTION

1. Disputes.

- 1.1 Commitment. The parties commit to resolving all disputes promptly, equitably, and in a good-faith, cost-effective manner.
- 1.2 Application. The provisions of this Exhibit will be used by the parties to resolve all controversies, claims, or disputes ("Dispute") arising out of or related to this Agreement-including Disputes regarding any alleged breaches of this Agreement.
- 1.3 Initiation. A party may initiate a Dispute by delivery of written notice of the Dispute, including the specifics of the Dispute, to the Representative of the other party as required in this Agreement.
- 1.4 Informal Resolution. When a Dispute notice is given, the parties will designate a member of their senior management who will be authorized to expeditiously resolve the Dispute.
- (A) The parties will provide each other with reasonable access during normal business hours to any and all non-privileged records, information and data pertaining to any Dispute in order to assist in resolving the Dispute as expeditiously and cost effectively as possible;
- (B) The parties' senior managers will meet within 10 business days to discuss and attempt to resolve the Dispute promptly, equitably, and in a good faith manner, and
- (C) The Senior Managers will agree to subsequent meetings if both parties agree that further meetings are necessary to reach a resolution of the Dispute.

2. Arbitration.

- 2.1 Rules. If the parties are unable to resolve the Dispute by negotiation within 30 days from the Dispute notice, and unless otherwise informal discussions are extended by the mutual agreement, the Dispute will be decided by binding arbitration in accordance with Construction Industry Rules of the AAA, as amended herein. Although the arbitration will be conducted in accordance with AAA Rules, it will not be administered by the AAA, but will be heard independently.
- (A) The parties will exercise best efforts to select an arbitrator within 5 business days after agreement for arbitration. If the parties have not agreed upon an arbitrator within this period, the parties will submit the selection of the arbitrator to one of the principals of the mediation firm of Scott & Skelly, LLC, who will then select the arbitrator. The parties will equally share the fees and costs incurred in the selection of the arbitrator.
- (B) The arbitrator selected must be an attorney with at least 15 years experience with commercial construction legal matters in Maricopa County, Arizona, be independent, impartial, and not have engaged in any business for or adverse to either Party for at least 10 years.
- 2.2 Discovery. The extent and the time set for discovery will be as determined by the arbitrator. Each Party must, however, within ten (10) days of selection of an arbitrator deliver to the other Party copies of all documents in the delivering party's possession that are relevant to the dispute.
- 2.3 Hearing. The arbitration hearing will be held within 90 days of the appointment of the arbitrator. The arbitration hearing, all proceedings, and all discovery will be conducted in Glendale, Arizona unless otherwise agreed by the parties or required as a result of witness location. Telephonic hearings and other reasonable arrangements may be used to minimize costs.
- 2.4 Award. At the arbitration hearing, each Party will submit its position to the arbitrator, evidence to support that position, and the exact award sought in this matter with specificity. The arbitrator must select the award sought by one of the parties as the final judgment and may not independently alter or modify the awards sought by the parties, fashion any remedy, or make any equitable order. The arbitrator has no

authority to consider or award punitive damages.

2.5 Final Decision. The Arbitrator's decision should be rendered within 15 days after the arbitration hearing is concluded. This decision will be final and binding on the Parties.

2.6 Costs. The prevailing party may enter the arbitration in any court having jurisdiction in order to convert it to a judgment. The non-prevailing party shall pay all of the prevailing party's arbitration costs and expenses, including reasonable attorney's fees and costs.

3. **Services to Continue Pending Dispute**. Unless otherwise agreed to in writing, Contractor must continue to perform and maintain progress of required services during any Dispute resolution or arbitration proceedings, and City will continue to make payment to Contractor in accordance with this Agreement.

4. **Exceptions**.

4.1 Third Party Claims. City and Contractor are not required to arbitrate any third-party claim, cross-claim, counter claim, or other claim or defense of a third-party who is not obligated by contract to arbitrate disputes with City and Contractor.

4.2 Liens. City or Contractor may commence and prosecute a civil action to contest a lien or stop notice, or enforce any lien or stop notice, but only to the extent the lien or stop notice the Party seeks to enforce is enforceable under Arizona Law, including, without limitation, an action under A.R.S. § 33-420, without the necessity of initiating or exhausting the procedures of this Exhibit.

4.3 Governmental Actions. This Exhibit does not apply to, and must not be construed to require arbitration of, any claims, actions or other process filed or issued by City of Glendale Building Safety Department or any other agency of City acting in its governmental permitting or other regulatory capacity.

CITY OF GLENDALE, ARIZONA
ENGINEERING DEPARTMENT CERTIFICATE OF INSURANCE

The _____
Certifies that the following insurance policies have been issued on behalf of:

Name of Insured _____
Address of Insured _____

Name and Address of Additional Named Insured:
City of Glendale, Arizona
Attention Engineering Dept.
5850 West Glendale Avenue
Glendale, Arizona 85301

Type of Insurance	Carrier Name	Policy No.	Effective Date	Expiration Date	Minimum Limits of Liability
(1) Workmen's Compensation and Employers Liability					Statutory \$100,000 per occurrence
(2) Commercial General Liability including: - Explosion, Collapse & Underground - Blanket contractual - Personal Injury - Broad Form Property Damage - Products/Completed Operations					\$1,000,000 Each Occurrence Bodily Injury \$500,000 Each Occurrence Property Damage \$2,000,000 annual aggregate products/completed operations
(3) Owners & Contractor(s) Protective Liability Insurance					1,000,000 Each Occurrence Bodily Injury \$500,000 Each Occurrence Property Damage
(4) Commercial Auto Liability including owned, non-owned and hired vehicles					1,000,000 Each Occurrence Bodily Injury \$500,000 Each Occurrence Property Damage
(5) Other					Each Occurrence

When the project includes construction of a new, or modification of an existing building (**in addition to the above coverage**) property coverage shall be maintained in the full amount of the contract naming City of Glendale as a loss payee as their interests may appear.

Type of Insurance	Carrier Name	Policy No.	Effective Date	Expiration Date	Policy Limit
(6) Fire, extended coverage, vandalism and malicious mischief					

All policies shall remain in effect after until all work has been completed, the City has issued final acceptance and until the time limit for filing against the project has passed. If any policy expires during the life of the Contract, a renewal Certificate of the required coverage shall be sent to the City of Glendale not less than five (5) days prior to expiration date. Failure of the Contractor to provide renewal certificates or the failure of the City to request renewal of certificates shall not waive the requirement and the City shall retain all rights to coverage as if the policy(ies) had not expired or been non-renewed.

It is agreed that none of these policies will be canceled or changed so as to affect this certificate until ten (10) days written notice of such cancellation or change has been delivered to the City of Glendale.

It is further agreed that:

This certificate is not valid unless countersigned by an authorized representative of the Insurance Company.

Date:

Countersigned by:

Signature

Agency Address

Contact Name: _____

Telephone # _____

CITY OF GLENDALE, ARIZONA
PUBLIC WORKS/ENGINEERING DEPARTMENT

CONTRACTOR'S AFFIDAVIT
REGARDING
SETTLEMENT OF CLAIMS

PROJECT 101106 - FUEL MONITORING SYSTEM UPGRADE

To the City of Glendale, Arizona

Gentlemen:

This is to certify that all lawful claims for materials, rental of equipment and labor used in connection with the construction of the above project, whether by subcontractor or claimant in person, have been duly discharged.

The undersigned, for the consideration of \$ _____, as set out in the final pay estimate, as full and complete payment under the terms of the contract, hereby waives and relinquishes any and all further claims or right of lien under, in connection with, or as a result of the above described project. The undersigned further agrees to indemnify and save harmless the City of Glendale against any and all liens, claims of liens, suits, actions, damages, charges, costs, litigation expenses, attorneys' fees and any other and expenses whatsoever, which said City may suffer arising out of the failure of the undersigned to pay for all labor performance and materials furnished for the performance of said installation.

Signed and dated at _____, this ____ day of _____, 20__.

Contractor

By _____

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

The foregoing instrument was subscribed and sworn to before me this ____ day of _____, 20

Notary Public

My Commission Expires: _____

SUPPLEMENTAL GENERAL CONDITIONS

1. GENERAL: By Ordinance No. 1110 New Series, the City of Glendale adopted the "Uniform Standard Specifications for Public Works Construction," which are sponsored and distributed by the Maricopa Association of Governments. Copies of these documents, with revisions, are on file in the office of the City Engineer of the City of Glendale, and are hereby made a part of these Contract Documents.

Whenever in the Uniform Standard Specifications, the words "The Contracting Agency" are used, the meaning shall be the City of Glendale.

In all cases where ASTM, AASHTO, AWWA, USAG, Federal, City of Phoenix, MAG Specifications, Maricopa County, Arizona State Highway, or other standard specifications are referred to, unless otherwise stated, revisions, supplements or addenda issued on or before the date of this contract, shall prevail. In the event of any conflict between these project specifications and the requirements of the plans, detail drawings, MAG Standard Details and Specifications, these project specifications shall prevail.

2. DEFINITIONS: The following terms, as used in or pertaining to the Contract Documents, are defined as follows:

CITY: The word "City" refers to the City of Glendale, Arizona. The official representative of said City in these proceedings shall be the City Engineer.

CONTRACTOR: The word "Contractor" means the person, firm, or corporation with whom the Contract is made by the City.

MATERIALS: The term "Materials" includes, in addition to materials incorporated in the project, equipment and other material used and/or consumed in the performance of the work.

SUBCONTRACTOR: The word "Subcontractor" includes those having a direct contract with the Contractor and those who furnish material worked to a special design according to the plans and/or specifications for this work, but does not include those who merely furnish materials not so worked.

ENGINEER: The word "Engineer" means a person, firm or corporation duly authorized by the City, to act for the City in staking out the work, inspecting materials and construction, and interpreting plans and specifications.

CONTRACT DOCUMENTS: The words "Contract Documents" mean the Notice to Contractors, Information for Bidders, "Uniform Standard Specifications for Public Works Construction," MAG General Conditions, Supplemental General Conditions, Special Provisions, Supplemental Specifications, Proposal, Contract, Certificates of Insurance, Plans and Addenda thereto.

3. PROPOSAL QUANTITIES: It is expressly understood and agreed by the parties hereto that the quantities of the various classes of work to be done and material to be furnished under this Contract, which have been estimated as stated in the Proposal, are only approximate and are to be used SOLELY for the purpose of comparing, on a consistent basis, the proposals offered for the work under this Contract; and the Contractor further agrees that the City will not be held responsible if any of the quantities shall be found incorrect; and the Contractor will not make any claim for damages or for loss of profits because of a difference between the quantities of the various classes of work as estimated and the work actually done. If any error, omission, or mis-statement is found to occur in the estimated quantities, the same shall not invalidate this Contract or release the Contractor from the execution and completion of the whole or any part of the work in accordance with the specifications and the plans herein mentioned, or for the prices herein agreed upon and fixed therefore, or excuse him from any of the obligations or liabilities hereunder, or entitle him to any damages or compensation except as may be provided for in this Contract.

4. WITHDRAWAL OF PROPOSALS: No proposal shall be withdrawn following the opening and reading of the bids for a period of 50 days from the date of opening without the consent of the

contracting agency through the body or agent duly authorized to accept or reject the proposal.

5. **LOSSES AND DAMAGES:** All loss or damage arising out of the nature of the work to be done or from the action of the elements, or from any unforeseen circumstances in the prosecution of the same, or from any unusual obstructions or difficulties which may be encountered in and/or during the prosecution of the work, or from any casualty whatsoever of every description, shall be sustained and borne by the Contractor at his own cost and expense except as otherwise provided by the contract documents or the laws of the State of Arizona.

6. **DUST PREVENTION:** The Contractor shall take whatever steps, procedures or means required to prevent abnormal dust conditions due to his construction operations in connection with this contract. The dust control measures shall be maintained at all times during construction of the project, to the satisfaction of the Engineer, in accordance with the requirements of the "Maricopa County Health Department Air Pollution Control Regulations" which have been adopted pursuant to A.R.S. § 36-779.

The Contractor shall be required to obtain the necessary permit from the Maricopa County Air Pollution Control Bureau, 1001 N. Central Ave., Phoenix, Arizona 85004 - telephone (602) 506-6727.

7. **EXCESS MATERIAL:** Excess material shall be removed from the work site and wasted at a location approved by the Engineer. Broken concrete and asphalt may be delivered to the Glendale Sanitary Landfill located at 115th Avenue and Glendale Avenue. The prevailing regulations and fee schedule will not be waived for work under this project. All materials, to be disposed of at the landfill, shall be weighed and disposed of at the prevailing rate.

8. **STOCKPILE OF MATERIALS:** The Contractor may place or stockpile materials in the public right-of-way, if approved by the Engineer, provided they do not prevent access to adjacent properties or prevent compliance with traffic regulations.

Traffic shall not be required to travel over stockpiled materials, and proper dust control shall be maintained.

9. **REFUSE COLLECTION ACCESS:** At any time the project construction shall require the closure or disruption of traffic in any roadway, alley, or refuse collection easement such that normal refuse collection will be interfered with, the Contractor shall, at least 48 hours prior to causing such closure or disruption, make arrangements with the Field Operations Department in order that refuse collection service can be maintained.

10. **CLEAN-UP:** After all work under this contract is completed, the Contractor shall remove all loose concrete, lumber, wire, reinforcing, debris, and other materials not incorporated in the work, from the site of the work. Clean-up shall include the removal of all excess pointing mortar materials within pipes and removal of over-size rocks and boulders left after finish grading. The contractor shall provide for the legal disposal of all waste products, debris, etc., and shall make necessary arrangements for such disposal.

11. **SHOP DRAWINGS:** The Contractor shall provide shop drawings as may be necessary for the prosecution of the work as required by the contract documents. The Engineer shall promptly review all shop drawings. The Engineer's approval of any shop drawing shall not release the Contractor from responsibility for deviations from the contract documents. The approval of any shop drawing which substantially deviates from the requirements of the contract documents shall be evidenced by a change order.

When submitted for the Engineer's review, shop drawings shall bear the contractor's certification that he has reviewed, checked, and approved the shop drawings and that they are in conformance with the requirements of the contract documents.

Portions of the work requiring a shop drawing or sample submission shall not begin until the shop drawing or sample submission has been approved by the Engineer. A copy of each approved shop drawing and each approved sample shall be kept in good order by the Contractor at the site and shall

12. PROTECTION OF FINISHED OR PARTIALLY FINISHED WORK: The Contractor shall properly guard and protect all finished or partially finished work, and shall be responsible for the same until the entire contract is completed and accepted, in writing, by the City. The Contractor shall turn over the entire work in full accordance with the specifications before final settlement shall be made.

13. STATUS OF EMPLOYEES: Contractor shall be responsible for assuring the legal working status of its employees and its subcontractor's employees.

14. LAWS AND REGULATIONS: This Contract shall be governed by and constructed in accordance with the laws of the State of Arizona. The Contractor shall keep himself fully informed of all existing and future City and County Ordinances and Regulations and State and Federal Laws and Occupational Safety and Health Standards (OSHA) in any manner affecting the work herein specified. He shall at all times observe and comply with said Ordinances, Regulations, or Laws.

15. PERMITS: The City has obtained certain required permits which are included in the project specifications, but it will be the duty of the Contractor to determine that all the necessary permits have been obtained. The Contractor shall, at his own expense, obtain all required permits which have not been furnished by the City. A no-fee permit will be issued for work in the City of Glendale right-of-way and easement. (Also see Paragraph 7. Dust Prevention.)

16. ELECTRIC POWER AND WATER: The Contractor shall make his own arrangements for electric power and water. Subject to the convenience of the City, he may be permitted to connect to existing facilities where available, but he shall meter and bear the cost of such power or water. Fire hydrant meters may be obtained from the City of Glendale. Installation and removal of meters should be scheduled at least forty-eight (48) hours in advance through the Public Works/Utilities Division at 930-2700. A \$325 deposit is required for each meter. The cost of the water is at the prevailing rate.

17. SURVEY CONTROL POINTS AND MONUMENTS: Existing survey monuments indicated on the plans or found during construction shall be protected by the Contractor, and in the event removal is necessary, removal and replacement shall be performed by permission of the Engineer, under direct supervision of the Engineer or his authorized representative. Survey monuments shall be constructed to conform to the requirements of MAG Specifications, Section 405, and Standard Details.

18. EXISTING UTILITIES: The Contractor is hereby advised that the location of all utilities, as shown on the plans, may not be complete nor exact and the Contractor shall satisfy himself as to the exact location of the utilities by contacting Blue Stake or the utility companies before proceeding with the work. After the underground utilities are located by Blue Stake or the utility company, the contractor shall excavate in a careful and prudent manner to prevent unwillful damage to the underground utilities.

In the event the Contractor or its Subcontractor damages an existing, properly identified underground City of Glendale water or sewer line, the Contractor shall be responsible for the repairs at its expense.

The exact location of all existing underground service utilities, whether or not indicated on the plans, shall be determined by the Contractor at no expense to the City, and he shall conduct his work so as to prevent interruption of service or damage to them.

The Contractor shall protect existing utility services and be responsible for their replacement if damaged by him, or to make necessary adjustment in their location, if required, in order to complete the work for his Contract.

Utility companies and other interested parties have been provided with construction plans and the construction schedule for this project. The Contractor shall comply with MAG Specifications 105.6 to cooperate with the utility companies.

19. MAINTENANCE OF IRRIGATION FACILITIES: Where irrigation facilities interfere with

construction, the Contractor shall remove and replace the affected irrigation facilities to its original condition. Final acceptance of replaced facilities will depend upon final approval of the Engineer.

20. OVERHEAD UTILITY LINES AND POLES: Contractor is advised that when work around overhead lines and poles is required on a project the Contractor is required to coordinate with Utility Companies who own and operate overhead lines and poles. The coordination may include, but not be limited to the following activities: pole bracing, de-energizing of lines, and temporary relocations. Contractor is responsible to contact the applicable Utility Company representative and discuss his proposed construction methods; in order to determine what actions the Utility Company must take and the costs related to those actions. The Contractor shall include these costs in the applicable bid items for this project.

The primary and the backup representatives for this review and cost determinations are as follows:

Arizona Public Service:	Mr. Bobby Garza	602-371-7989
Qwest:	Mr. Ron Floyd	602-630-1932
Salt River Power:	Mr. Al Baizel	602-236-0840
Cox Communications:	Mr. Randy Sims	623-694-9593
Cox Communications:	Ms. Suzanne Holzer	623-328-3522

21. SOUTHWEST GAS FACILITIES EXPOSED DURING CONSTRUCTION: The Contractor, upon exposing a gas line during construction, shall call SOUTHWEST GAS at 602-271-4277. The Southwest Gas patrolman will respond, usually within an hour, to inspect the line. Minor cuts or abrasions to the pipe coating will be rewrapped and tracer wire will be reconnected at no cost to the City.

22. UNDERGROUND UTILITIES' BEDDING: All water, sewer, storm drain, irrigation and other conduits installed within the City of Glendale shall be bedded from bottom of excavation to one foot above the pipe with granular bedding material meeting the requirements of Section 601.4.6 of MAG Uniform Standard Specifications. The initial bedding under the pipe is required for pipe having an inside diameter of 12 inches or larger, and in all cases where rock larger than 1-1/2" is encountered in the trench bottom.

23. SEWER SERVICE LINES: The Contractor shall be responsible for locating, and protecting from damage during construction, all sewer service lines within the project which are not owned by the City. Contractor will be permitted to review the "as-builts" to assist Contractor in locating the non-City owned sewer service lines. These "as-builts" were prepared, and supplied to the City, by private developers or contractors who installed the non-City owned sewer service lines. Therefore, the City does not guarantee or warranty the accuracy of such "as-builts" and the contractor, as a condition for being allowed to review such "as-builts", hereby agrees to hold the City harmless for any and all damages or other expenses contractor may incur as a result of any inaccuracies or incorrect information in these "as-builts".

24. RIGHTS-OF-WAY: The City will provide rights-of-way and easements for all work specified in this Contract, and the Contractor shall not enter or occupy with man, tools, equipment or materials any private ground outside the property of the City of Glendale, Maricopa County, Arizona, without the consent of the owner of such property.

25. SUBCONTRACTS: Subcontracts shall be in accordance with, and the Contractor shall be bound by, the following provisions:

All subcontracts shall be subject to the approval of the City.

All subcontracts shall be in writing and shall provide that all work to be performed thereunder shall be performed in accordance with the terms of the Contract.

Certified copies of any and all subcontracts shall be furnished to the City Engineering Department; however, prices may be omitted.

Subcontracts shall conform to the regulations governing employment of labor.

The subcontracting of any part of the work will in no way relieve the Contractor of his responsibility under the Contract.

26. **PRE-CONSTRUCTION CONFERENCE:** After completion of the Contract Documents, to include bonds, insurance and signatures, and prior to the commencement of any work on the project, the Engineer will schedule a Pre-Construction Conference. This will be held at the City of Glendale, 5850 West Glendale Avenue, Glendale, Arizona.

The purpose of this Conference is to establish a working relationship between the Contractor, Utility Companies, and the Engineer. The agenda will include critical elements of the construction schedule, procedures for handling shop drawings and other submittals, cost breakdown of major lump sum items, payment application and processing, coordination with the involved utility companies, emergency telephone numbers for all representatives involved in the course of construction, and establishment of the Notice to Proceed date.

Minimum attendance by the Contractor shall be a responsible official of the company/corporation, who is authorized to execute and sign documents on behalf of the company/corporation.

27. **OVERTIME:**

Regular Work Hours: The work required to be performed by the Plans and Specifications for the Project shall be performed only during regular working hours, unless the City has authorized overtime work in accordance with the procedures set forth below. Regular working hours shall be defined as one 8-1/2 hour shift per day, Monday through Friday, or, upon prior approval of the City, one 10-1/2 hour shift per day on a compressed four day work week during Monday through Friday. Regular working hours shall not include Saturdays, Sundays or City of Glendale recognized legal holidays.

Authorization and Costs: If the Contractor desires to schedule work for times other than regular work hours (overtime), the Contractor shall make a written request to the City at least two business days prior to the scheduled overtime. The City reserves the right to deny the request to work overtime based on the best interest and needs of the City. If an overtime request is denied, the City may, at its sole discretion, extend the contract time at no additional costs to the City.

In the event the Contractor does perform work overtime, with or without the prior approval of the City, the Contractor shall be responsible to the City for all additional costs that may be incurred by the City as a result of the Contractor's overtime work, including costs for engineering, inspections, testing, surveying and construction administration, all in accordance with MAG Section 108.5. However, the Contractor shall not be responsible for City's costs incurred as a result of overtime work requested by the City or overtime work resulting from an emergency which is not the responsibility of the Contractor or its employees, subcontractors or suppliers. The City's cost will be billed directly to the Contractor or may, at the City's option, be deducted from monies due the Contractor.

28. **CONTRACTOR'S CONSTRUCTION SCHEDULE:** Concurrently, with the execution of the contract and prior to the pre-construction conference, the Contractor shall submit a preliminary schedule for the Engineer's acceptance. The schedule shall be in sufficient detail to allow the Engineer to determine if the proposed schedule will conform to an approved program of construction operations, as determined by the contracting agency. Within ten calendar days after the preliminary schedule, described above, has been approved by the Engineer, the Contractor shall submit a progress schedule, utilizing the critical path method scheduling technique, showing the order in which he proposes to carry out the work, the dates on which he will start each phase of the work, and the contemplated date for completion of each phase. The Contractor shall not be permitted to commence construction until the schedule complying with this paragraph has been submitted to the City. The Contractor will not be granted any extension to the contract time or compensation for any damages as a result of the City's refusal to allow Contractor to commence construction until the critical path method progress schedule has been submitted and approved by the Engineer.

The critical path method (CPM) scheduling technique requires a breakdown of the entire work into

individual tasks and an analysis of the number of days required to perform each task. The schedule submitted to the City should highlight and identify the critical path for the project. After the work is in progress, the Contractor shall submit supplementary progress schedules, using the critical path method technique, of the progress to date and projection for completion. The supplementary progress schedules shall be submitted with each pay request in accordance with the paragraph, "Payments to Contractors," of these Supplemental General Conditions. The progress schedules shall be subject to the approval of the Engineer. In the event the Contractor fails to submit a supplementary progress schedule acceptable to the Engineer, the City may withhold further progress payments to the Contractor until the Contractor submits an acceptable supplementary progress schedule, which is approved by the Engineer, to the City. Schedule changes requiring an increase in the City's engineering personnel on the project shall not be put into effect until the Engineer has approved such increase and made arrangements for the required additional personnel.

29. CHARACTER OF WORKMEN: None but skilled foremen and workmen shall be employed on work requiring special qualifications. When required by the Engineer, the Contractor shall discharge any person who is, in the opinion of the Engineer, disorderly, dangerous, insubordinate, incompetent, or otherwise objectionable. The Contractor shall keep the City harmless from damages or claims for compensation that may occur in the enforcement of this section of the specifications.

30. HINDRANCES AND DELAYS: Except as otherwise provided herein, no charge shall be made by the Contractor for hindrances or delays from any cause during the progress of the work embraced in this Contract; but such delays, if due to no fault or neglect of the Contractor, shall entitle the Contractor to an extension of time allowed for completing the work, sufficient to compensate for the delay, the amount of the delay to be determined by the Engineer, provided the Contractor shall give said Engineer immediate notice in writing of the cause of such delay.

30.1 Delay: In the event of a delay for which the City is solely responsible, which is unreasonable under the circumstances and which was not within the contemplation of City and Contractor at the time this Contract is executed, City and Contractor shall negotiate, in good faith, a payment by the City to Contractor for the expenses incurred by Contractor as a result of such delay, in accordance with the City of Glendale Engineering Department's POLICY STATEMENT FOR CALCULATING DELAYS AND DAMAGES. This provision shall not be construed to void any provision in the contract which requires notice of delay or provides for liquidated damages. However, if the delay is the result of any act or neglect of a third party, including the architect, engineer or other contractor employed by the City, or by labor disputes, fire, unusual delay in transportation, adverse weather conditions not reasonably foreseeable, unavoidable casualties, or any causes beyond the Contractor's control, the Contractor shall not be entitled to any payments or compensation for expenses incurred as a result of such delay, but the Contract Time shall be extended by Change Order for such reasonable time as the Engineer may determine. No extension or compensation will be granted for any delay which is the result, wholly or partially, of any act or neglect of Contractor or any Subcontractor hired by Contractor.

31. LIQUIDATED DAMAGES:

31.1 Should the contractor fail to substantially complete the work under this contract within the time for completion stated in the paragraph "Time of Completion," in the Information for Bidders, then the contractor shall pay the City of Glendale, Arizona, liquidated damages, pursuant to the provisions of Section 108.9, Standard Specifications for Public Works Construction, Maricopa Association of Governments, until the work is substantially complete.

31.2 Should the contractor fail to fully and finally complete the work under this contract within the time for completion set forth in the paragraph "Time of Completion," in the Information for Bidders, even though the contractor has achieved substantial completion of the work within such time, then the contractor shall pay the City of Glendale, liquidated damages (pursuant to the provisions of Section 108.9, Standard Specifications for Public Works Construction, Maricopa Association of Governments), in an amount equal to 100% of the applicable liquidated damage rate set forth in MAG Section 108.9 for each and every calendar day of delay until the work is fully and finally complete and accepted.

31.3 The date of substantial completion shall be the date when the work is sufficiently complete, in

accordance with the contract documents, so the owner can fully occupy and utilize the work or designated portion thereof for the use for which it is intended, with all the project's parts and systems operable as required by the contract documents and all the work is complete, accessible, operable, and usable by the owner for its intended purpose(s), and all parts, systems and sitework are 100% complete and cleaned for the owner's use. Only incidental corrective work and final cleaning (if required), beyond cleaning needed for the owner's full use, may remain for final completion.

31.4 Full and final completion shall be that date when all work under the project, including incidental corrective work under punch list and final cleaning, has been completed and the entire project is accepted by the owner.

32. PAYMENTS TO CONTRACTOR: The measurements of quantities and the payments to the Contractor shall be in accordance with MAG Uniform Standard Specifications for Public Works Construction, Part 100 - General Conditions, Section 109 - Measurements and Payments.

Payments will be made on the basis of itemized, monthly statements prepared by the City and signed by the Contractor. The Contractor shall submit an itemized, duly certified and approved estimate for work completed through the last day of the preceding month in accordance with MAG Specifications, as amended by these Supplemental General Conditions. Upon approval of the pay estimate, the City will mail the check directly to the Contractor.

The pay estimate shall be accompanied by an updated progress schedule as required by these Supplemental General Conditions and a cash flow report when required by the Special Provisions. Approval of progress payments shall be conditional upon submittal of progress schedules and cash flow reports, when required, which are acceptable to the Engineer.

Upon 100% completion and acceptance of the project, and with the request for final payment, the Contractor shall complete and submit the "Contractor's Affidavit Regarding Settlement of Claims" form which is included in these specifications. Before final payment and release of retention, Contractor must arrange for its Surety to provide the City with a fully executed AIA Consent of Surety form. To avoid delays in the final payment, the Surety may send the Consent of Surety directly to the City via fax at (623) 915-2689, and mail the original to the City of Glendale Engineering Department, 5850 West Glendale Avenue, Glendale, Arizona 85301. Should any ambiguity arise between the Contract and these Conditions, the provisions of the Contract shall prevail.

END OF SUPPLEMENTAL GENERAL CONDITIONS

SPECIAL PROVISIONS

1. **SCOPE OF WORK:** Provide labor, materials, and equipment to remove the current fuel monitoring system and replace it with a new Veeder Root TL450 monitoring system with printer for Fire Station #155 at the Foothills Public Safety Facility.
2. **DEFINITIONS:**
 - A. **Section:** Reference to a Section on the plans or in these Specifications shall mean a Section of the Uniform Standard Specifications for Public Works Construction, sponsored and distributed by Maricopa Association of Governments (MAG), latest revision. The provisions of MAG Uniform Standard Specifications and Details for Public Works Construction, which are not altered or modified by the drawings or by these Special Provisions or by any subsequently issued Addendum, shall apply to the contract even though the Contractor's attention is not specifically drawn to such provisions.
 - B. **Standard Detail:** Reference to a MAG Standard Detail (MAG S.D.) on the plans or in these specifications shall mean a standard detail drawing in the latest revision of the Uniform Standard Specifications for Public Works Construction, sponsored and distributed by Maricopa Association of Governments. City of Glendale Standard Detail (C.O.G. S.D.) shall mean a standard detail drawing in the City of Glendale's Engineering Design and Construction Standards, latest revision. City of Phoenix Standard Detail (C.O.P. S.D.) shall mean a standard detail drawing in the Phoenix Supplemental Standard Details for Public Works Construction, latest revision.
3. **SUSPENSION OF WORK:** The Engineer reserves the right to suspend the work wholly or in part if deemed necessary for the best interest of the City. This suspension will be without compensation to the Contractor, other than to adjust the contract time in accordance with MAG Section 108.
4. **COMPLIANCE WITH MANUFACTURER'S INSTRUCTIONS:** In all instances wherein the item and/or specifications require installation or construction in accordance with either manufacturer's or supplier's recommendations and/or instructions, said recommendations and/or instructions shall be submitted with the applicable portions clearly marked for approval prior to the commencement of work on that item or portion of the contract.
5. **ENERGIZED AERIAL ELECTRICAL POWER LINES:** The utility company maintains energized aerial electrical power lines in the immediate vicinity of this project. Do not consider these lines to be insulated. Construction personnel working in proximity to these lines are exposed to an extreme hazard from electrical shock. Contractors, their employees, and all other construction personnel working on this project must be warned of the danger and instructed to take adequate protective measures, including maintaining a minimum ten (10) feet clearance between the lines and all construction equipment and personnel. (See: OSHA Standard 1926.550(a)15.) As an additional safety precaution, Contractors should also be instructed to call the utility company to arrange, if possible, to have these lines de-energized or relocated when the work reaches their immediate vicinity. The cost of such temporary arrangements would be borne by the Contractor. The utility company can often respond to such requests if two days advance notice is given, but some situations may require up to sixty (60) days lead time for relocation or other arrangements.
6. **RECORD DRAWINGS:** The Contractor shall maintain one set of contract drawings with all changes, deviations, additions and deletions clearly marked thereon. Upon completion of the work, this set of drawings, shall be marked "RECORD DRAWINGS," dated, and delivered to the Engineer prior to approval of the Contractor's final payment request.
7. **ALLOWANCE FOR CONSTRUCTION CONTINGENCIES:** Bid schedule includes a lump sum contingency allowance. This allowance is at all times the property of the City and is for the sole purpose of reimbursing Contractor for any unforeseen work not apparent at the time of bidding or additional work requested by the CITY OF GLENDALE.

No work anticipated for reimbursement under this Bid Item shall be initiated by Contractor until

Contractor, City of Glendale Representative and City of Glendale agree on the scope and cost to perform the additional work. The Contractor shall prepare and submit to City of Glendale Representative a cost itemization and summary for the additional work. City of Glendale Representative and City of Glendale shall review and approve prior to Contractor proceeding with any additional work. Any portion of the stated sum not expended remains the property of the City of Glendale.

Work under this section shall consist of any additional work identified by the owner and contractor due to construction activity. All work under this item shall be itemized as per MAG requirements and deducted from the set amount of \$5,000.00. All work under this section shall include but is not limited to all necessary materials, tools, layout, survey and labor required to complete each task.

Measurement and payment for this item shall be made on an individual basis per task and as described above. Limit for this item is set at \$5,0000.00 on the bid form, under line item ALLOWANCE FOR CONSTRUCTION CONTINGENCY.

END OF SPECIAL PROVISIONS

DIVISION 26

ELECTRICAL

26 05 00	Common Work Results for Electrical
26 05 00	General Provisions
26 05 01	Scope of Work
26 05 02	Temporary and Remodeling Work
26 05 19	Low Voltage Electrical Power Conductors and Cables
26 05 26	Grounding and Bonding of Electrical Equipment
26 05 33	Raceway and Boxes for Electrical Systems
26 05 44	Underground Pull Boxes and Handholes
26 05 53	Identification for Electrical Systems

SECTION 26 05 00
GENERAL PROVISIONS

PART 1 GENERAL

1.1 SCOPE

- A. Provisions of this section apply to all work specified in all sections under Division 26.
- B. In addition, work in Division 26 is governed by the provisions of the Bidding Requirements, Contract Forms, General Conditions, and all sections under Division 01.

1.2 DEFINITIONS

- A. Exposed, not concealed.
- B. Finished Spaces: Spaces other than mechanical, electrical, and communication equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspace, and utility tunnels.
- C. Exposed, Interior Installations: Exposed to view indoors. Examples include unfinished spaces, mechanical, electrical, and communication equipment rooms.
- D. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations and equipment yards.
- E. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.
- F. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.
- G. Unfinished Space: A room or space that is ordinarily accessible only to building maintenance personnel, a room noted on the "Finish Schedule" with exposed and unpainted construction for walls, floor or ceilings, or specifically mentioned as "unfinished."

1.3 EXAMINATION OF PREMISES

- A. Visit the site, verify all measurements and job conditions, and pay all costs necessary to perform the work.

1.4 ELECTRICAL CONTRACTOR

- A. The Electrical Contractor shall be licensed and hold a current contracting license that has been valid for a minimum of two years in the State of Arizona as an electrical contractor.

1.5 REGULATIONS, PERMITS, FEES, CHARGES, INSPECTIONS

- A. Regulations: Comply with all applicable codes, rules and regulations.
- B. Fees and Permits: Pay all connection, installation, use, development, etc., fees and/or charges. Obtain and pay for all required permits and licenses. Refer to Division 01.
- C. Inspections: All work must be inspected and approved by local authorities. Prior to final approval, furnish the Engineer with certificates of inspections and approvals by the local authorities in accordance with Division 01.

1.6 DRAWINGS AND SPECIFICATIONS

- A. If a conflict exists on the drawings or between the drawings and specifications, promptly notify the Engineer.

1.7 SUBMITTALS

- A. Submittals are for information and coordination only. The Engineer will diligently review the submittals and attempt to verify compliance with the project requirements. Such review, however, does not constitute approval or disapproval of obligation to comply with all project requirements. The submittals are not to be construed to be contract documents. Any failure by the Engineer to note a point of non-compliance shall not be construed to be acceptance or approval of the discrepancy.
- B. Product Information Sheets: Provide manufacturer's literature which includes the information required by the Product Data paragraph of the applicable Specification Section. Where Product Information Sheets show multiple models or options, clearly mark the model and options to be provided.
- C. Assembly: Assemble all required submittal information for each specification section and submit in PDF format.
 - 1. Assemble PDF submittals in one PDF file for each Division. Separate and order sections within each file by corresponding specification number. Provide bookmarks at the first page of each section and label each bookmark with the specification number and name to allow for easy navigation of the submittal.
 - 2. Partial submittals will be returned without review.
- D. Identification and Information:

1. Name the PDF file with the Project name, Division number and sequential submittal number. (I.E. The first submittal shall be No. 1, the second submittal shall be No. 2.
2. Provide a cover sheet at the front of each submittal with the following information:
 - a. Project name.
 - b. Date.
 - c. Name of Engineer.
 - d. Name of Contractor.
 - e. Name of subcontractor.
3. Provide a cover sheet at the front of each submittal section with the following information:
 - a. Name of supplier.
 - b. Name of manufacturer.
 - c. Number and title of appropriate Specification Section.
 - d. Drawing number and detail references, as appropriate.
 - e. Other necessary identification.

E. Options:

1. Identify options requiring selection by the Engineer.
2. Identify options included with submittal item.

F. Deviations: Identify deviations from the Contract Documents on submittals

1.8 MATERIAL SAFETY DATA SHEETS

- A. Provide current, Material Safety Data Sheets (MSDS), for all hazardous chemicals that are proposed for use at the project site.
1. Provide one complete set to the Owner for review and approval a minimum of one week prior to the delivery of any hazardous chemicals to the site.
 2. Maintain a second complete set at the project location, readily accessible by both the Owner's personnel and the contractor's personnel.

1.9 REQUEST FOR INFORMATION

A. Request for Information:

1. A document submitted by the Contractor requesting clarification of a portion of the Contract Documents, hereinafter referred to as RFI.
2. A properly prepared request for information shall include a detailed written statement of the clarification, apparent conflict, or information requested that indicates the specific drawings or specification in need of clarification and the nature of the clarification requested.

- a. Drawings shall be identified by drawing number and location on the drawing sheet.
 - b. Specifications shall be identified by section number, page, and paragraph.
3. Include a proposed solution, where appropriate, based upon the field conditions and best knowledge of the Contractor.
- B. Improper or Frivolous RFIs: RFIs which are not properly prepared or that request information which is clearly shown in the contract documents will be returned unanswered. Processing time for multiple submissions of improper or frivolous RFIs will be billed at the Engineer's standard hourly rate to the Owner who may deduct an equal amount from the monies due the Contractor.

1.10 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings, Submittals and Shop Drawings.
1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Include underground and overhead piping. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Include dimensions both horizontally and vertically to permanent points of reference accurate within 6 inches. Include descriptors such as "below slab", "above ceiling", etc.
 - c. Record data daily or as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 2. Mark the Contract Drawings, Submittals and Shop Drawings completely and accurately. Utilize personnel proficient at recording graphic information in production of marked-up record prints.
 3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.

2. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Engineer.
 - e. Name of Contractor.
3. Remove or obscure Engineer's seal from Record Drawings.

1.11 OPERATION AND MAINTENANCE MANUAL

- A. Prior to completion of the project, compile a complete equipment, operation and maintenance manual for all equipment supplied under Division 26.
- B. Schedule:
 1. Submit a preliminary copy of the manual not less than 30 days prior to substantial completion for review and comment.
 2. Submit the final version the manual not more than four weeks after substantial completion of the project.
- C. Format: Submit manuals in both of the following formats:
 1. PDF electronic file. Assemble each manual into a composite electronically-indexed file. Submit on digital media acceptable to Engineer.
 - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically-linked operation and maintenance directory.
 - b. Enable inserted reviewer comments on draft submittals.
 - c. Provide one final copy to Engineer and two copies to Owner.
 2. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Engineer will return three copies.
- D. Provide operating and maintenance manuals for all systems, subsystems, and equipment that requires operation and regular maintenance, or has replaceable parts.
- E. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, product data, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below. In addition to requirements in this Section, include operation and maintenance data required in individual Specification Sections.

- F. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- G. Product Data: Include the following information:
1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 2. Approved submittals.
 3. Include the following if not shown on approved submittals:
 - a. Product name and model number. Use designations for products indicated on Contract Documents.
 - b. Manufacturer's name.
 - c. Equipment identification with serial number of each component.
 - d. Equipment function.
 - e. Operating characteristics.
 - f. Limiting conditions.
 - g. Performance curves.
 - h. Engineering data and tests.
- H. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
 2. Equipment or system break-in procedures.
 3. Routine and normal operating instructions.
 4. Regulation and control procedures.
 5. Instructions on stopping.
 6. Normal shutdown instructions.
 7. Seasonal and weekend operating instructions.
 8. Required sequences for electric or electronic systems.
 9. Special operating instructions and procedures. Including precautions against improper use.
 10. Operating logs.
- I. Wiring Diagrams: Diagram of factory installed wiring including any options as well as any field modifications.
- J. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- K. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
1. Standard maintenance instructions and bulletins.
 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.

3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- L. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
 2. Troubleshooting guide.
 3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training video recording, if available.
- M. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- N. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- O. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- P. Licenses: Include copies of any licenses with requirements including inspection and renewal dates.
- Q. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
- R. Test and Balance Report: Include a final, approved copy of the Test and Balance Report.

1.12 WORK AND MATERIALS

- A. Unless otherwise specified, all materials must be new and of the quality specified. The workmanship shall be of a quality that is acceptable to the Architect, Engineer, and Owner, and is equal to the standards of the trades. Contractor must staff the project with sufficient skilled workmen, including a fully qualified construction superintendent, to complete the work in the time allotted. The superintendent must be qualified to supervise all of the work in his work category.
- B. Uniformity: Unless otherwise specified, provide all equipment and products of same type or classification by the same manufacturer.

1.13 APPROVALS OF MATERIALS AND EQUIPMENT

- A. Refer to Division 01 for description of material and equipment for prior approvals

and substitutions.

1.14 COOPERATIVE WORK

- A. Correct without charge any work requiring alteration due to lack of proper supervision or failure to make proper provision in time. Correct without charge any damage to adjacent work caused by the alteration. See Division 01 for additional requirements.
- B. Cooperative Work Includes:
 - 1. General supervision and responsibility for proper location, rough-in, and size of work related to Division 26 but provided under other divisions of these specifications.
 - 2. Installation of sleeves, inserts and anchors bolts for work under sections in Division 26.

1.15 EXISTING MATERIALS AND EQUIPMENT

- A. Disposition: With the exception of items that are to be reused or retained by the Owner, all other materials indicated to be removed shall be removed and disposed of by the Contractor. Items that are indicated to be retained or returned to the Owner and shall be delivered to a storage area designated by the Owner.
- B. Unused Materials: All unused raceways, conductors, boxes, equipment, and miscellaneous materials shall be removed by the Contractor except where located within walls, below or above existing construction which is not being altered and would require removal and replacement of this existing construction. All visible raceways, conductors, boxes, equipment, and miscellaneous materials shall be removed and sealed or capped within wall, below floor unless noted otherwise.
- C. Exterior Services: The Contractor shall be responsible for maintaining electrical and control service to the existing building during the construction period. Existing services are to be retained until such a time that the new services, if any, are completely installed and ready for use. Scheduling of service interruptions is to be coordinated with the Engineer and Owner.
- D. Disconnect, demolish, and remove electrical systems, equipment, and components that are indicated to be removed.
 - 1. Conduit to be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material. Patch insulation, as required, to match adjacent areas.
 - 2. Conduit to be Abandoned In Place: Drain piping and cap or plug piping with same or compatible piping material.
 - 3. Equipment to be Removed: Disconnect services and remove equipment.
 - 4. Equipment to be Removed and Reinstalled: Disconnect and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.

5. Equipment to be Removed and Salvaged: Disconnect and remove equipment and deliver to Owner.
- E. Continuity of Services in Existing Building: Contractor shall permanently reroute existing electrical and control services or provide temporary connection as required to maintain service to existing fixtures in building which are to remain in service.
- F. Rerouting and Relocation of Existing Electrical Equipment and Services in Existing Building:
 1. General: Contractor shall reroute, relocate all existing materials which are in conflict with the building alterations and which are required to be maintained in use.
 2. Existing Raceways and Conductors: Where applicable, existing material may be reused in their original location unless otherwise indicated.
- G. Testing: All existing services affected by the new construction and which are to remain in operation shall be returned to their original condition. The existing services shall be tested as new, as described in other sections of these specifications. If for any reason these requirements cannot be met, the Contractor shall immediately notify the Engineer.

1.16 CONSTRUCTION FACILITIES

- A. General: Under this division of the specifications, execute all work in a manner to provide safe and lawful ingress and egress to the Owner's establishment and such facilities shall be kept clear of materials or equipment. Refer to Division 01 for additional requirements.
- B. Furnish and maintain from the beginning to the completion of all work all lawful and necessary guards, railings, fences, canopies, lights, and warning signs. Take all necessary precautions required by city and state laws to avoid injury or damage to any and all persons and property.

1.17 GUARANTEE

- A. Guarantee all material, equipment, installation and workmanship for all sections under Division 26 in writing to be free from defects of material and workmanship for one year from date of final acceptance as outlined in Division 01. Equipment warranties shall be a minimum of two year from date of substantial completion or as specified elsewhere. Replace without charge any material or equipment proving defective during this period. The guarantee shall include performance of the equipment under all conditions of load, installing any additional items of control and/or protective devices as required and the replacing of any refrigerant lost.

1.18 CONSTRUCTION FACILITIES

- A. General: Under this section of the specifications, execute all work in a manner to provide safe and lawful ingress and egress to the Owner's establishment. Construction facilities shall be kept clear of materials or equipment as directed by the Architect.
- B. From the beginning to completion, furnish and maintain all lawful and necessary guards, railings, fences, canopies, lights, warning signs, etc. Take all necessary precautions required by city and state laws and OSHA to avoid injury or damage to any persons and property.
- C. Temporary toilet facilities are specified and furnished under another section.

PART 2 PRODUCTS

2.1 CONCRETE

- A. Where used for structures to be provided under the contract such as bases, etc., concrete work and associated reinforcing shall be as specified under that Division.
- B. See other sections for additional requirements for underground vaults, cable ducts, etc.

2.2 FRAMING CHANNEL

- A. The framing channel shall be a cold-rolled, high-quality, carbon steel channel with factory-applied, hot-dipped-after-fabrication finish. Utilize factory-built interconnecting components, mounting straps, connectors, etc., designed for use with the framing channel supplied. Channel nuts shall be spring type and shall utilize standard US threads. Provide heavy zinc paint for field touch-up. B-Line "B" series, Unistrut "P" series, or as accepted by the Architect.

2.3 ANCHORS

- A. Anchors shall be expandable lead type, as manufactured by Ackerman-Johnson, Pierce, Diamond, Hilti, or as accepted by the Architect.
- B. Adjustable concrete hanger inserts shall be as manufactured by Grinnell or as accepted by the Architect.

PART 3 EXECUTION

3.1 SUBMITTALS

- A. Prepare submittals as directed for review by the Contractor, Owner, and Engineer.
- B. Submit one copy of PDF submittals via email, project website or other electronic media.

3.2 RECORD DRAWINGS

- A. Recording: Post changes and modifications to project record documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Engineer's reference during normal working hours.

3.3 OPERATION AND MAINTENANCE MANUALS

- A. Prepare Operation and Maintenance Manuals as directed for review by the Contractor, Owner, and Engineer.
- B. Make corrections and resubmit as required.

3.4 VERIFICATION OF DIMENSIONS

- A. Scaled and figured dimensions are approximate only. Before proceeding with work, carefully check and verify dimensions at site, and be responsible for properly fitting equipment and materials together and to the structure in spaces provided.
- B. Drawings are diagrammatic and many offsets, bends, special fittings and exact locations are not indicated. Carefully study drawings and premises in order to determine best methods, exact locations, routes, building obstructions, and install apparatus and equipment in available locations. Install apparatus and equipment in manner and in locations to avoid obstructions, preserve headroom, and keep openings and passageways clear.

3.5 CUTTING AND PATCHING

- A. Cut work and patch per Division 01 as necessary to properly install the new work. As the work progresses, coordinate necessary openings, holes, chases, etc., in their correct location. If the required openings, holes and chases are not in their correct locations, make the necessary corrections at no cost to the Owner. Avoid excessive cutting and do not cut structural members without the consent of the Owner and Engineer. Include as a part of the work all structural framing required by penetrations through the roof and necessary steel to support ducts and pipes between structural steel unless shown on the structural drawings.

3.6 CLOSING-IN OF UNFINISHED WORK

- A. Cover no work until inspected, tested and approved. Where work is covered before inspection and test, uncover it, and when inspected, tested and approved, restore all work to original proper condition.

3.7 EXCAVATION AND BACKFILL

- A. Perform all necessary excavation, shoring and backfilling required for the proper laying of all raceways, ducts, and conduits inside the building and premises, and outside as may be necessary. Remove all excess excavated materials from the site or dispose of on site as directed by General Contractor.
- B. Excavate all trenches open cut, keep trench banks as nearly vertical as practicable, and sheet and brace trenches where required for stability and safety. Excavate trenches true to line and make bottoms not less than 18" wide but no wider than necessary to provide ample work room. Grade trench bottoms accurately to provide uniform bearing and support for each section of pipe on undisturbed soil along its entire length. Dig "bell" holes after the trench bottom has been graded. Machine grade only to the top line of the raceways, doing the balance by hand. Do not cut any trench near or under footings without first consulting the Owner and Engineer. Comply with OSHA requirements.
- C. Provide not less than 4 inches of granular material as pipe bedding prior to laying pipe in trench to continuously support pipe and maintain required slope. Granular material shall be pea gravel or sand per MAG Standards.
- D. Provide backfilling and compaction in accordance with provisions of these specifications and under the direction of the Owner and Engineer to the required density.
- E. Provide not less than 4 inches of granular material, same as piping bedding, all around pipe. Make the first 2 feet of fill in 6 inch layers, each thoroughly compacted as directed, and free from rocks, large clods of earth, leaves, branches, and debris. Compact the rest of the backfill as directed, using in the backfill no rocks larger than 4 inches in diameter, and using no rock in the top 12 inches.

3.8 ACCESSIBILITY

- A. Install all control devices or other specialties requiring reading, adjustment, inspection, repairs, removal or replacement conveniently and accessibly throughout the finished building. Where any of these devices are shown on the contract drawings to be installed above any inaccessible ceiling or behind any inaccessible wall, the Electrical Contractor shall furnish access doors or panels as required.
- B. All access doors or panels in walls and ceilings required for access to control devices, traps, valves and similar devices are to be furnished and installed as part of the work under this section. Provide type as specified under Division 08.
- C. Refer to architectural drawings for type of wall and ceiling in each area and for rated construction.
- D. Coordinate work of various sections to locate valves, traps, and dampers with others to avoid unnecessary duplication of access doors.

- E. The Contractor, along with the Owner's representative, shall complete the Electrical Accessibility/Clearance Checklist at the end of this section for all electrical equipment. The chart shall be submitted to the Engineer for approval prior to substantial completion. All conflicts shall be resolved to the Engineer's and Owner's satisfaction prior to submission.
- F. Provide doors that pierce a fire separation with the same fire rating as the separation.

3.9 PRODUCT AND EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

- A. All equipment, valves, sensors, dampers, detectors, etc., shall be installed in strict conformance with the manufacturer's recommendations and all codes.
- B. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.
- C. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.
- D. Install electrical equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations.
- E. Do not install any equipment in an application not recommended by the manufacturer.

3.10 EQUIPMENT ROUGH-IN

- A. Rough in all equipment and fixtures as designated on the drawings and in the specifications. The drawings indicate only the approximate location of rough-ins. The exact rough-in locations must be determined from large-scale certified drawings. The Contractor shall obtain all certified rough-in information before progressing with any work for rough-in final connections.
- B. Be responsible for providing all outlets and services of proper size at the required locations.
- C. Minor changes in the contract drawings shall be anticipated and provided for under this Division.
 - 1. Rough-in only (unless otherwise designated on the drawings) shall include providing all services as indicated and required, including all conduit and conductors. Cap all conduit stub-outs. Cap all conduits stub-outs in a manner suitable for future extension.

3.11 EQUIPMENT FINAL CONNECTIONS

- A. Provide all final connections for the following:

GENERAL PROVISIONS
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1. All equipment furnished under this Division.
2. Electrical equipment furnished under other sections of the specifications (except as otherwise designated).
3. Owner-furnished equipment as shown on the drawings.

3.12 OWNER-FURNISHED AND OTHER EQUIPMENT

- A. Rough-in only for all Owner-furnished equipment reference Division 01 and all equipment furnished under other sections of the specifications, except as otherwise specified and/or noted on the drawings.

3.13 EQUIPMENT SUPPORTS

A. Erection of Metal Supports and Anchorages:

1. Refer to Division 05 for structural steel.
2. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment. Neatly fabricate and erect steel work with burrs and welding spatter ground off. Paint after fabrication with a rust-inhibitive primer.
3. Field Welding: Comply with AWS D1.1.

B. Erection of Wood Supports and Anchorages:

1. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support and anchor electrical materials and equipment.
2. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.
3. Attach to substrates as required to support applied loads.

C. Concrete Inserts: Furnish and install all concrete inserts required for all materials and equipment specified and/or shown on the drawings for Division 26.

D. Concrete Bases: Work under this section includes coordination of construction of all concrete foundations indicated or required for equipment specified under Division 26. Materials and workmanship shall be described under Division 03. Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at project.

1. Construct concrete bases of dimensions indicated, but not less than 1 inch (25 mm) larger in both directions than supported unit footprint. Where servicing apparatus for draw-out circuit breakers requires a level surface in front of the switchboard or switchgear, coordinate pad front extension so as to allow service to occur using standard apparatus. Where utility meters occur, pads shall conform to the serving utility requirements.
2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around the full perimeter of the base.

3. Install epoxy-coated anchor bolts for supported equipment that extends through concrete base, and anchor into structural concrete floor.
4. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded. Install anchor bolts to elevations required for proper attachment to supported equipment.
5. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

E. Grouting:

1. Grout under all equipment after leveling, filling completely the space between machinery bed plate and foundation surface as specified in Division 03.
2. Mix and install grout for electrical equipment base bearing surfaces and other equipment base plates, and anchors.
3. Clean surfaces that will come into contact with grout.
4. Provide forms as required for placement of grout.
5. Avoid air entrapment during placement of grout.
6. Place grout, completely filling equipment bases.
7. Place grout on concrete bases and provide smooth bearing surface for equipment.
8. Place grout around anchors.
9. Cure placed grout.
10. Finish exposed surface of grout for a neat appearance.

3.14 CLEANUP

- A. In addition to cleanup specified under Division 01, thoroughly clean all parts of the equipment. Where exposed parts are to be painted, thoroughly clean off any splattered construction materials and remove all oil and grease spots. Wipe the surface carefully and scrape out all cracks and corners.
- B. During the progress of the work, keep the premises clean and free of debris.

3.15 PAINTING

- A. Except as otherwise specified or indicated in the architectural drawings and/or specifications, paint all exposed unfinished metal with one coat of rust-inhibiting primer. Galvanized ductwork and factory painted equipment shall be considered as having primed surface.
- B. Damage and Touch-Up: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.
- C. Finished painting is specified under Division 09.

3.16 OBJECTIONABLE NOISE AND VIBRATION

- A. Construct and brace the metal partitions, ducts and sheet metal housings to

prevent vibration or rattling when systems are in operation. Install connections to equipment so noise and vibration will not reach the conditioned area through ducts, piping, conduit, sheet metal work, or the building structure.

3.17 TESTING

- A. Upon completion of the electrical work, the entire installation shall be tested and demonstrated to be operating satisfactorily. Tests and documentation shall be in accordance with NETA Acceptance Testing Specifications for Electric Power Distribution Equipment and Systems.
- B. Tests, calibrations, and settings shall include the following:
 - 1. Wiring shall be tested for continuity, short circuits and/or accidental grounds. All systems shall be entirely free from grounds, short circuits, and any or all defects.
 - 2. Motors shall be operating in proper rotation and control devices shall be functioning properly. Check all motor controllers to determine that properly sized overload devices are installed. Check all electrical equipment for proper operation.
 - 3. Insulation resistance test for all switchboard buses, bus ducts, motor and feeder conductors, including neutrals, using a megohmmeter. Apply to each conductor and maintain for 15 seconds or until reading stabilizes. Minimum value for each conductor shall be 20 megohms at 30EC. This test shall be performed by an independent testing company.
 - 4. Test, calibrate, and set all relays, circuit breaker trip devices, and ground fault protection trip units after receipt of engineered settings. Circuit breaker setups shall be performed or witnessed by a qualified representative of the circuit breaker manufacturer. This representative shall be identified by name and initial related test report(s).
 - 5. Additional equipment-specific testing is described in the equipment's respective section of this Division.
- C. Furnish a written report of testing to the Architect. At a minimum, the report shall include:
 - 1. Testing Contractor's letterhead
 - 2. Testing technician's name and signature.
 - 3. Date and time that test was performed.
 - 4. Ambient temperature and weather conditions.
 - 5. Test equipment manufacturer, model number, and last calibration date.
 - 6. The manufacturer, model number, and, as applicable, trip unit model number and available adjustments of tested equipment.
 - 7. Statement of "As Left" conditions.
 - 8. Pass/Fail statement relative to NETA Chapter 10 recommendations.
 - 9. Recommendations if any.
- D. The Contractor shall submit the testing schedule to the Architect two weeks prior to initiation of testing activity.

- E. Upon placing an order for equipment, but in no case less than two weeks prior to energization, provide the following to the Architect:
 - 1. List of circuit breakers supplied on the project. The list shall include manufacturer and model number, trip unit model number, frame rating, trip plug rating, available adjustments, and proposed circuit breaker trip settings. Categorize the submission by plan electrical equipment name (switchboard, panelboard, MCC, etc.), then by frame ampere rating. The Contractor shall implement settings.
 - 2. List of ground fault protection trip units supplied on the project. The list shall include manufacturer and model number, trip unit model number, and available adjustments. Categorize the submission by plan electrical equipment name (switchboard, panelboard, MCC), then by frame ampere rating.
- F. Ground fault protection (GFP) trip units shall be calibrated and tested prior to energizing any equipment served by GFP devices.
- G. The Contractor shall furnish the necessary instruments and labor required for testing, calibration, and implementation of engineered settings.
- H. Tests and adjustments shall be made prior to acceptance of the electrical installation by the Architect, and a certificate of inspection and acceptance of the electrical installation shall be provided by local inspection authorities.
- I. Any equipment or wiring provided, which through testing proves to be defective or operating improperly, shall be corrected or replaced promptly, at no additional cost to the Owner.

END OF SECTION

SECTION 26 05 01

SCOPE OF WORK

PART 1 GENERAL

1.1 SUMMARY

- A. The work under this Division includes furnishing all labor, material and equipment necessary for the installation and placing into operation of the electrical systems as indicated on the drawings.
- B. The work shall also include the completion of such minor details of electrical work not mentioned or shown which are necessary for the successful operation of all electrical systems described on the drawings or required by these specifications.

1.2 SCOPE

- A. The work includes, but is not necessarily limited to, furnishing and installing the following:
 - 1. Complete power conductors, control cable, and all equipment for a complete fuel monitoring system.
 - 2. Install controls for all equipment.
 - 3. All equipment and materials specified in this Division.
 - 4. Empty conduit systems as indicated on the drawings.
 - 5. All other items and/or work indicated on the drawings.
 - 6. Equipment lists and maintenance manuals.

1.3 AS-BUILT DRAWINGS

- A. The Electrical Division shall maintain as-built drawings as specified in Division 1 requirements.
- B. Drawings shall show locations of all concealed and exposed conduit runs, giving the number and size of conduit and wire. Underground ducts shall be shown with cross-section elevations.
- C. Two sets of reproducible as-built drawings shall be delivered to the Engineer.
- D. See Division 1 for additional requirements.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 26 05 02

TEMPORARY AND REMODELING WORK

PART 1 GENERAL

1.1 SUMMARY

- A. Perform all temporary and remodeling work as shown on the drawings and described in the specifications including minor items of material or equipment necessary to meet the requirements and intent of the project.
- B. All temporary and remodeling work shall be considered a part of this contract and no extra charges will be allowed.
- C. Examine architectural, structural and mechanical drawings and specifications to determine the sequence of construction throughout the project, including existing, temporary, remodeled and new areas.
- D. Where drawings indicate existing conditions, an attempt has been made to show electrical equipment, buildings, site details, etc., but accuracy cannot be guaranteed. Verify exact location of all conduits, outlets, etc. and all building and site details.
- E. Branch circuits shall be reused where practical and shall, in addition, be revised as required.
- F. Existing electrical wiring intended to remain in use but which will be disturbed due to construction changes required by this contract shall be restored to operating condition, as required and/or directed. Where required, shown and/or directed, outlets and conduit runs shall be relocated. In some cases it may be necessary to extend conduits and pull in new wiring or install junction boxes and splice in new wiring, or replace old wiring with new.
- G. Where conduits extending through floors are to be abandoned, the Contractor shall cut and cap or plug conduit, so that it will not protrude above the floor.
- H. Where existing conduit is to be abandoned, the conduit shall be removed if it is exposed, in a crawl space or in an accessible ceiling. Where it is impossible to remove the conduit, it shall be cut off and capped or plugged.
- I. The Contractor shall be held fully responsible for the proper restoration of all existing surfaces requiring patching, plastering, painting and/or other repair due to the installation of electrical work under the terms of this specification. Close all openings, repair all surfaces, etc., as required.

- J. The Contractor shall employ qualified and experienced workmen for this work. All restoration work shall be subject to the approval of the Engineer and/or the Owner.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 SUMMARY

- A. Furnish and install wire and cable for branch circuits and feeders as specified herein and as shown on the drawings.

PART 2 PRODUCTS

2.1 WIRE AND CABLE

- A. All wire and cable shall be new, 600-volt insulated copper, of types specified below for different applications. All wire and cable shall bear the UL label and shall be brought to the project in unbroken packages. Wire and cable #4 AWG size and smaller shall be type THHN or THWN. Wire and cable larger than #4 AWG size and air conditioning feeders shall be type XHHW.
- B. Wire Pulling Lubricant: Richards "Gel Lube 7/5"; American Polywater A, C, G&J; Quelcor "Quelube"; American Colloid "Slip X-300"; Thomas/Jet Line "Slipry Loob"; Ideal "Wire Lube"; Mac "Wirepull"; Minerallac "Wire-Wax"; or Electro "Y-er Eas."
- C. Fire Rated Cable Assemblies shall be Draka Cableteq "Lifeline RHW" 600-volt copper, or as accepted.

2.2 TERMINATIONS, SPLICES, AND JOINTS

- A. Terminations at Circuit Breakers and Switches:
 - 1. #10 and #8 AWG wire, locking tongue lug, Buchanan "Termend," or as accepted.
 - 2. #6 AWG and larger wire, round flange solderless lug, Burndy "Quick-Lug" type QDA, or as accepted.
- B. Fixture Connections: Pressure-type solderless connectors, Buchanan, Scotchlok, Wing Nut, or accepted equal.
- C. Wire Splices:
 - 1. Joints in Wire:
 - a. #8 AWG and smaller wire, pressure-type solderless connectors, Buchanan, Scotchlok, Wing Nut, or as accepted.

2. Wire Taps: Solderless lug, solderless compression lug, each with Raychem Gtap, IlSCO GTA, or GTT with insulating cover, or as accepted.
3. Exterior Below Grade Joints in Wire (Specific, case by case approval by the Engineer is required): Solderless lug, solderless compression lug, each with Raychem GelCap or as accepted.

2.3 APPLIED INSULATION

- A. Insulating materials shall be listed for the application. Voltage rating shall be equal to or greater than the factory-applied wire insulation. Raychem, 3M, IlSCO, or as accepted.

2.4 MARKERS AND TAGS

- A. Plastic Wire Markers: T&B or Brady.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Conductors for branch circuit lighting, receptacle, power and miscellaneous systems must be a minimum of #12 AWG. Wire indicated to be larger than #12 AWG shall be increased the entire length of the circuit.
- B. Provide dedicated neutral conductors for all multiwire branch circuits except where the branch circuit supplies only one utilization equipment.
- C. Wire and cable shall be pulled into conduits without strain, using an approved lubricant.
- D. In no case shall wire be re-pulled if same has been pulled out of a conduit run for any purpose.
- E. No conductors shall be pulled into conduit until conduit system is complete, including junction boxes, pull boxes, etc. Wire sized #14 through #10 AWG shall be solid; wire sized #8 AWG and larger shall be stranded.
- F. All connections to circuit breakers, switches, fixtures, motors, and all joints in wires shall be made as noted below:
 1. Terminations at Circuit Breakers and Switches:
 - a. #12 AWG wire formed around binding post or screw.
 2. Joints in Wire:
 - a. #8 AWG and smaller wire, pressure-type solderless connectors.
 - b. #6 AWG and larger wire, irreversible compression type.

3. Wire Taps: Solderless lug, solderless compression lug.
 4. Exterior Below Grade Joints in Wire (Specific, case by case approval by the Engineer is required): Solderless lug, solderless compression lug.
 5. Solderless connectors not used for grounding shall be insulated. Applied wire insulation voltage rating shall be equal to or greater than the factory-applied wire insulation. Insulate by one of the following methods:
 - a. One or more layers of rubber tape, equal in thickness to the conductor insulation, followed by two layers of electrical vinyl tape.
 - b. Pre-manufactured insulating caps.
 - c. Heat shrink insulating sleeve or tape. Shrink in accordance with the manufacturer's recommendations.
- G. Wire compression type sleeves or lugs shall be installed with the manufacturer's recommended tool, in accordance with their published instructions.

3.2 COLOR CODING AND MARKING

- A. All wiring throughout shall be color-coded as follows:

	<u>208 Volt System</u>
A Phase	Black
B Phase	Red
C Phase	Blue
Neutral*	White
Ground	Green

*Where multiple neutrals are installed within the same raceway, each individual neutral shall be distinctly identified by one or more color stripes.

- B. All control wiring in a circuit shall be color-coded, each phase leg having a separate color, and with all segments of the control circuit, whether in apparatus or conduit, utilizing the same color-coding.
- C. Wiring must be color-coded throughout its entire length, except that feeders may have color-coded plastic tape at both ends and all accessible points.
- D. At all terminations of control wiring, the wiring shall have a numbered wire marker.

3.3 FIRE RATED CABLE ASSEMBLIES

- A. Fire rated cable assemblies shall be installed per the NEC and according to the listing requirements. Coordinate use with architectural code plan documents. Provide copy of listing requirements to local AHJ for inspection during construction.

3.4 GENERAL WIRING

- A. Drawings, in general, indicate location of items of equipment. Exact locations of motors and other devices are to be determined in the field by the Contractor. Provide an electrical feed for all equipment, not smaller than shown or NEC size where size is omitted from drawings, together with a suitable circuit protective device. Verify panel schedules and layout, maintaining number of spare branches indicated.

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING OF ELECTRICAL EQUIPMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Furnish and install grounding and grounding conductors as specified herein and as shown on the drawings.

PART 2 PRODUCTS

2.1 GROUNDING ELECTRODES

- A. Ground rods shall be copper or copper-clad steel, 3/4" diameter by 10-feet long, listed for the purpose.
- B. Plate electrodes shall be sized as noted on the plans, but not less than 2 foot round x 1/4" (6.35 mm) thick steel or iron. Where copper or bronze plates are used, thickness shall not be less than 1/16" (1.5875 mm).

PART 3 EXECUTION

3.1 GROUNDING

- A. All panelboard cabinets, equipment, enclosures, and conduit systems shall be grounded securely in accordance with pertinent sections of the NEC, as amended by any local codes. Conductors shall be copper. All electrically operated equipment shall be bonded to the grounded conduit system. All non-current carrying conductive surfaces that are likely to become energized and subject to personal contact shall be grounded by one or more of the methods detailed in the NEC. All ground connections shall have clean contact surfaces. Install all grounding conductors in conduit and make connections readily accessible for inspection. Furnish and install grounding electrodes as described on the drawings.
- B. Grounding of metal raceways shall be assured by means of grounding bushings on feeder conduit terminations at the service entrance, distribution switchboards and panelboards, and by means of a continuous, stranded, copper grounding wire extended from the ground bus in the enclosure to the conduit grounding bushings.
- C. A separate insulated grounding conductor, sized per the NEC, shall be installed in all electrical metallic tubing (EMT).

- D. Where the project includes cable tray, provide #6CU AWG ground conductor, 1/2"C between grounding electrode system and cable tray. Utilize listed grounding connectors.
- E. Install ground rods per the NEC.
- F. Install plate electrodes per the NEC..

END OF SECTION

SECTION 26 05 33

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

- A. Furnish and install conduit and fittings as shown on the drawings and as specified herein.

1.2 COORDINATION

- A. It shall be the responsibility of the Contractor to consult the other trades before installing conduit and boxes. Any conflict between the location of conduit and boxes, piping, ductwork, or structural steel supports shall be adjusted before installation. In general, large pipe mains, waste, drain, and steam lines which pitch, large air ducts, and all structural steel shall be given priority.
- B. Conduit size shall be such that the required number and sizes of wires can be easily pulled in and the Contractor shall be responsible for the selection of the conduit sizes. Conduit sizes shown on the drawings are minimum sizes in accordance with appropriate tables in the NEC. If, because of bends or elbows, a larger conduit size is required, the Contractor shall so furnish without further cost to the Owner.
- C. The Contractor shall be entirely responsible for the proper protection of this work from the other trades on the project. When conduit becomes bent, holes are punched through same, or outlets are moved after being roughed-in, the Contractor shall replace same, without additional cost to the Owner.

PART 2 PRODUCTS

2.1 GENERAL

- A. Conduit sizes for various numbers and sizes of wire shall be as required by the NEC Chapter 9, but shall not be smaller than 1/2" size except as otherwise noted.
- B. Each length of conduit shall be stamped with the name or trademark of the manufacturer and shall bear the UL label.
- C. All concrete inserts and pipe clamps shall be galvanized. All steel bolts, nuts, washers, and screw shall be galvanized or cadmium plated. Individual hangers, trapeze hangers, and rods shall be prime-coated.
- D. Calibrated pull string/measuring tape shall be Greenlee Part No. 435, or as accepted.

2.2 CONDUIT

- A. Intermediate metallic conduit (IMC), and electrical metallic tubing (EMT) shall be Allied Tube & Conduit, Republic Conduit, Western Tube & Conduit Corp., or as accepted.
- B. PVC coated RGS or IMC shall be Robroy Industries Inc., or as accepted.
- C. Polyvinyl chloride (PVC) conduit shall be Carlon, Cantex, or as accepted.
- D. Conduit systems shall be color coded. Reference Section 26 05 53 Identification for Electrical Systems for additional requirements.

2.3 FITTINGS

- A. Couplings and connectors for RGS or IMC conduit shall be steel or malleable iron, threaded, and rain- and concrete-tight. Couplings and connectors that are exposed, installed in hollow construction, or above ceilings shall be threaded, uncouple or compression type. Steel set-screw type or compression-type, steel, watertight fittings shall be used for EMT. Die-cast or pressure-cast EMT fittings shall not be allowed.
- B. Bushings and locknuts shall be malleable iron with sharp, clean-cut threads.
- C. Fittings shall be Appleton, Crouse-Hinds, Steel City, T & B, or as accepted.
- D. Expansion joint fittings on IMC conduit shall be Crouse-Hinds type XJ, or as accepted. Expansion joint fittings on PVC conduit shall be Carlon type E945, or as accepted.
- E. Entrance seals shall be O.Z. type FSK, or as accepted.
- F. Explosion-proof seals shall be listed for 40% fill application, vertical and horizontal, and shall be Appleton type EY, or as accepted.
- G. Couplings and connectors for PVC conduit shall be of the same manufacturer as the conduit to be coupled or connected. Fittings shall be provided in accordance with the manufacturer's recommendations.

2.4 BOXES

- A. All boxes must conform to the provisions of Article 314 of the NEC. All boxes shall be of the proper size to accommodate the quantity of conductors enclosed in the box. Boxes shall not be less than 4" square and 1-1/2" deep unless otherwise noted.

- B. Generally, boxes shall be hot-dipped galvanized steel with knockouts. Where recessed, boxes shall have square cut corners. Outlet, switch, and gang size junction boxes on exterior surfaces or in damp locations shall be corrosion-resistant, cast malleable iron. Boxes shall have threaded hubs for rigid conduit and neoprene gaskets for their covers. Boxes shall be Appleton type FS or FD, Crouse-Hinds, or as accepted. Conduit bodies shall be corrosion-resistant, cast malleable iron and shall have threaded hubs for rigid conduit and neoprene gaskets for their covers. Bodies shall be Appleton Unilets, Crouse-Hinds, or as accepted.
- C. Deep boxes shall be used in walls covered by wainscot acoustical wall panels or paneling and in walls of glazed tile, brick, or other masonry which will not be covered with plaster. The bottom of the box shall be located on the horizontal joint. Through-the-wall type boxes shall not be used unless specifically called for. All boxes shall be non-gangable. Boxes in concrete shall be of a type to allow the placing of conduit without displacing the reinforcing bars. All lighting fixture outlet boxes shall be equipped with the proper fittings to support and attach a light fixture.
- D. Pull and junction boxes shall be substantially-made code-gauge boxes with screw covers. Boxes shall be rigid under torsional and deflecting forces and shall be provided with angle-iron framing where required. Boxes shall be 4" square with a blank cover in unfinished areas and with a plaster ring and blank cover in finished areas, and shall be installed where required to pull cable or wire, but only in finished areas by approval of the Architect. Boxes shall be rigidly attached to the structure, independent of any conduit support. Boxes shall have their covers accessible. Covers shall be fastened to boxes with machine screws to ensure continuous contact all around. Covers for surface-mounted boxes shall line up evenly with the edges of boxes. Covers for flush-mounted oversize boxes shall extend 3/4" past the box all around. Covers for 4" square and 4" ganged boxes shall extend 1/4" past the box all around.
- E. Outlets are only approximately located on the plans and great care must be used in the actual location of outlets by consulting the various detailed drawings. Outlets shall be flush with finished wall or ceiling. Trim, cases, or other fixtures shall have their boxes installed symmetrically on such trim or fixture. Refer to drawings for location and orientation of all outlet boxes.
- F. Exterior gang type boxes shall be cast type. Where any box occurs within 12" of the earth, provide cast iron type.
- G. Boxes with unused punched-out openings shall have the openings filled with factory-made knockout seals.
- H. Construct pull boxes and rack space for future conduits equal to 25% of present runs. Provide required barriers. Attach a plastic label to each pull box cover listing the feeder numbers enclosed within and the source of current. Identify each conduit at pull box termination with voltage and feeder number in red. Provide sufficient cable slack at terminations and in junction and pull boxes to

allow for cable contraction and for future splicing. Fireproof cable in pull boxes where more than one feeder is enclosed.

- I. Boxes shall be as manufactured by Steel City, Appleton, Raco, or as accepted.

PART 3 EXECUTION

3.1 CONDUIT

A. Applications:

1. PVC conduit may be used for all exterior underground systems, in slab, below slab on grade, and in concrete or masonry walls. All plastic conduit shall be rigid, Schedule 40, heavy wall PVC. All PVC conduit shall be UL listed. Install bell ends at all conduit terminations in manholes and pull boxes. All bends over 30 degrees shall be made with wrapped intermediate metallic conduit. All plastic conduit, except that used for telephone, shall contain a code-sized bond wire.
2. Intermediate metallic conduit (IMC) shall be used for all conduit larger than 2", and for all underground or in-slab conduit, except where PVC is permitted or where rigid galvanized steel is specified. IMC conduit shall be used in explosion-proof areas.
3. All other conduit shall be electrical metallic tubing (EMT). A separate insulated grounding conductor, sized per the NEC, shall be installed in EMT.

- B. Conduit shall be continuous from outlet to outlet, cabinet or junction box, and shall be so arranged that wire may be pulled in with the minimum practical number of junction boxes.
- C. All conduit shall be concealed wherever possible. All conduit runs may be exposed in mechanical equipment rooms, electrical equipment rooms, and electrical closets, and where indicated on the drawings. No conduit shall be run exposed in finished areas without specific acceptance by the Architect.
- D. Exposed conduit shall be run in straight lines at right angles to or parallel with walls, beams, or columns. In no case shall conduit be supported or fastened to other pipes or installed to prevent the ready removal of other pipe.
- E. Where possible, all conduit for wiring within stud or moveable partitions shall enter the partition from above.
- F. Provide sleeves and chases where conduit passes through floors or walls as part of the work of this section. Core drilling will only be permitted where accepted by the Architect.

- G. Conduit stubbed up/down or through floor slabs shall be wrapped IMC with a minimum of 6" of conduit exposed out of slab for connection of threaded or compression fitting. Where conduit bends extend out of slab, the conduit shall be placed at the maximum allowable distance from the exit surface and shall have a bend radius as allowed by code to provide as true and square a conduit exit as possible. Conduit deck flanges will be used where conditions allow and where the flange can be tightly secured flush to the face of a concrete form.
- H. Openings through fire-rated floors and fire walls through which conduit passes shall be sealed by fire stop material to seal off cold smoke and toxic fumes. Fire-seal material shall have an hourly fire rating equal to or higher than the fire rating of the floor or wall through which the cable or conduit passes. Material used shall conform to the Authority Having Jurisdiction requirements. Openings through smoke walls through which cable or conduit passes shall be sealed with non-shrink, non-combustible material approved by the Authority Having Jurisdiction to seal off cold smoke and toxic fumes.
- I. Conduit above lay-in grid-type ceilings shall be installed in such a manner that it does not interfere with the "lift-out" feature of the ceiling system.
- J. Conduit runs shall be installed to maintain the following minimum spacing wherever practical:
 - 1. Water and Waste Piping: Not less than 3".
 - 2. Steam and Condensate Lines: Not less than 12".
 - 3. Radiation and Reheat Lines: Not less than 6".
- K. All underground conduit outside of any buildings shall be a minimum of 24" below finished grade, except where noted otherwise on the drawings.
- L. Provide corrosion protection for metallic conduit under concrete or in earth. Provide half-lap wrap of polyethylene 20-mil tape, factory PVC coating, or as accepted. Where PVC coating is provided, joints must be sealed in accordance with the coating manufacturer's published instructions.
- M. PVC-coated rigid galvanized steel (PVC-RGS) joints must be sealed in accordance with the coating manufacturer's published instructions.
- N. Empty conduit shall be provided with a nylon pull string installed in each.
- O. Bending: Changes in direction shall be made by bends in the conduit wherever possible, and these bends shall be made smooth and even without flattening the pipe or flaking the finish. Bends shall be of as long a radius as possible, but in no case less than shown in the NEC.
- P. Not more than four 90 degree bends will be allowed in one raceway run. Where more bends are necessary, a pull box shall be installed. All bends in 1" and smaller conduit shall be made with a conduit bender, and all larger conduit sizes shall have machine bends.

- Q. Plastic conduit joints shall be made up in accordance with the manufacturer's recommendations for the particular conduit and coupling selected. Conduit joint couplings shall be made watertight. Plastic conduit joints shall be made up by brushing a plastic solvent cement on the inside of a plastic coupling fitting and on the outside of the conduit ends. The conduit and fitting shall then be slipped together with a quick one-quarter turn twist to set the joint tightly. Transition from plastic to steel conduit shall be with PVC female threaded adaptors.
- R. Plastic conduit shall be stored on a flat surface and protected from the direct rays of the sun.
- S. The ends of all conduit shall be securely plugged, and all boxes temporarily covered to prevent foreign material from entering the conduit. All conduit shall be thoroughly swabbed out with a dry swab to remove moisture and debris before conductors are drawn into place.

3.2 FITTINGS

- A. Bushings and Locknuts: Where conduit enters boxes, panels, cabinets, etc., it shall be rigidly clamped to the box by locknuts on the outside and inside, and a bushing on the inside of the box. All conduit shall enter the box squarely.
- B. Provide insulated bushings per the NEC on all conduit. The use of insulated bushings does not exclude the use of double locknuts to fasten conduit to the box.
- C. Provide expansion fittings for all conduit where it crosses building expansion joints, or not to exceed 100 feet apart. Fittings shall be complete with bonding jumpers and clamps and shall be suitably bonded to conduit.
- D. Provide weatherproof fittings in exterior installations or as noted on the plans.

3.3 SUPPORTS

- A. All raceways that are not buried or embedded in concrete shall be supported by straps, clamps, or hangers to provide a rigid installation.
- B. Conduit shall be supported at intervals no greater than 8 feet, within 3 feet of any bend, and within 3 feet of every outlet, junction box, panel, etc. This shall apply to vertical runs as well as horizontal runs. Where conduit is run individually, it shall be supported by approved conduit straps or beam clamps. Straps shall be secured by means of toggle bolts on hollow masonry; expansion shields and machine screws or standard preset inserts on concrete or solid masonry; machine screws or bolts on metal surfaces; and wood screws on wood construction. No perforated straps or wire hangers of any kind will be permitted. Where individual conduits are suspended from the ceiling, or above ceiling, they shall be supported by hanger rods and hangers. Conduit installed exposed in damp locations shall be provided with clamp backs under each conduit clamp, to prevent accumulation of moisture around the conduit. Where a number of conduits are to be run exposed and parallel, one with another, they shall be

grouped and supported by trapeze hangers. Hanger rods shall be fastened to structural steel members with suitable beam clamps or to concrete inserts set through the opening provided in the concrete inserts. Beams clamps shall be suitable for structural members and conditions. Rods shall be galvanized steel, 3/8" diameter minimum. Each conduit shall be clamped to the trapeze hanger with conduit clamps.

3.4 GENERAL

- A. Install all boxes parallel and perpendicular to the finished floor. Adjust all flush mounting positions so as to compensate for wall material thickness. Where devices occur in the same horizontal viewing plane, align devices.
- B. Where outlet boxes occur on opposite sides of a common wall, do not place back-to-back or use through-the-wall boxes, so as to limit sound transmission between rooms.
- C. Where fire-rated walls occur, all membrane penetrations shall comply with the International Building Code (IBC) for walls/partitions, and for floor-ceilings/roof-ceilings. Outlet boxes in rated walls shall be steel. Outlet boxes on opposite sides of a rated wall shall be separated by a minimum of 24 inches horizontally.
- D. Support all boxes independently of conduit, except cast type which may be supported by rigid steel conduit only. Secure flush-mount boxes to wall and interior partition studs using stamped steel bridges as required to accurately position boxes. Secure ceiling-hung boxes to adjustable steel channel fasteners.
- E. All cabinets and boxes shall be secured by means of toggle bolts on hollow masonry; expansion shields and machine screws or standard precast inserts on concrete or solid masonry; machine screws or bolts on metal surfaces; and wood screws on wood construction. All wall- and ceiling-mounted outlet boxes shall be supported by bar supports extending from the studs or channels on either side of the box. Boxes mounted on drywall or plaster shall be secured to wall studs or adequate internal structure.
- F. Boxes with unused punched-out openings shall have the openings filled with factory-made knockout seals.
- G. Where emergency power and normal power are located in the same outlet box or a potential of 480 volts is present in a switch box, install partition barriers to separate the various systems.

3.5 SEPARATE CONDUIT SYSTEMS

- A. Each system shall be contained in a separate conduit system. This includes each power system, lighting system, signal system of whatever nature, data, emergency system, emergency subsystems, control system, etc.

- B. Each item of building equipment shall have its own run of power wiring. Control wiring may be included in properly sized conduit for equipment feeders of #6 AWG and smaller, but separate conduits shall be used for larger size feeders.

END OF SECTION

SECTION 26 05 44

UNDERGROUND PULL BOXES AND HANDHOLES

PART 1 GENERAL

1.1 SUMMARY

- A. Furnish and install underground pull boxes and handholes as specified herein and as required by the National Electrical Code, NFPA 70.

PART 2 PRODUCTS

2.1 CONCRETE

- A. The concrete for pull boxes and manholes shall be in accordance with MAG Specification No. 725, "Portland Cement Concrete," using 3/4" maximum size coarse aggregate. Concrete shall be Class 4,000 psi.

2.2 STEEL

- A. Reinforcing steel shall be deformed bars of intermediate grade meeting the requirements of MAG Specification No. 727, "Steel Reinforcement."

2.3 FRAMES AND COVERS

- A. Frames and covers shall be structural steel conforming to the requirements of MAG Specification No. 770. Frames and covers shall be hot-dip galvanized.

2.4 GROUNDING

- A. Ground rods shall be copper or copper-clad steel 1" diameter by 10-feet long. All non-current-carrying metallic components shall be bonded to the ground rods with minimum #6 copper wire.

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 26 05 53

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

1. Identification for raceways.
2. Identification of power and control cables.
3. Identification for conductors.
4. Underground line warning tape.
5. Warning labels and signs.
6. Instruction signs.
7. Equipment identification labels.
8. Miscellaneous identification products.

1.2 ACTION SUBMITTALS

- ###### A. Product Data: Fro each electrical identification product indicated.

1.3 QUALITY ASSURANCE

- ###### A. Comply with ANSI A13.1.
- ###### B. Comply with NFPA 70.
- ###### C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- ###### D. Comply with ANSI Z535.4 for safety signs and labels.
- ###### E. Adhesive attached labeling materials, including label stocks, laminating adhesives, and inks use by label printers, shall comply with UL 969.

PART 2 PRODUCTS

2.1 FACTORY RACEWAY IDENTIFICATION MATERIALS

- ###### A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.
- ###### B. Colors of raceways carrying circuits at 600 V or less:

1. Conduit shall be factory anodized in color as stated below. Where conduit system is painted, all junction boxes shall be required to be painted to match system color. On junction boxes that are larger than 16" square, only the cover of the box need be painted.

<u>System</u>	<u>Conduit color</u>
Power – Normal	Natural
Power – Emergency NEC 700 & Standby NEC 701	Orange
Communications / Data/ Voice/ Video	Yellow

- C. Self Adhesive vinyl labels for raceways carrying circuit at 600 V or less: Preprinted, flexible label laminated with a clear, weather and chemical resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- D. Snap around labels for raceways carrying circuits at 600 V or less: Slit, pre-tensioned, flexible, pre-printed, color coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- E. Snap around, color coding bands for raceways carrying circuits at 600 V or less: Slit, pre-tensioned, flexible, solid colored acrylic sleeve [2 inches] [50 mm] long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- F. Write-On Tags: Polyester tag, [0.015 inch] [0.38 mm] thick, with corrosion resistant grommet and cable tie for attachment to conductor or cable.
 1. Marker for tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
 2. Marker for tags: Machine printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.2 FACTORY RACEWAY IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
- B. Comply with power raceway identification materials for raceways color requirements in this section.
- C. Self adhesive vinyl labels: Pre-printed, flexible label laminated with a clear, weather and chemical resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- D. Self adhesive vinyl tape: Colored, heavy duty, waterproof, fade resistant [2 inches] [50 mm] wide; compounded for outdoor use.

2.3 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
- B. Self adhesive vinyl labels: Preprinted, flexible label laminated with a clear, weather and chemical resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- C. Write-On Tags: Polyester tag, [0.015 inch] [0.38 mm] thick, with corrosion resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Marker for tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
 - 2. Marker for tags: Machine printed, permanent, waterproof, black ink marker recommended by printer manufacturer.
- D. Snap around labels: Slit, pre-tensioned, flexible, pre-printed, color coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- E. Snap around, color coding bands: Slit, pre-tensioned, flexible, solid colored acrylic sleeve [2 inches] [50 mm] long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

2.4 CONDUCTOR IDENTIFICATION MATERIALS

- A. Color coding conductor tape: Colored, self adhesive vinyl tape not less than [3 mils] [0.08 mm] thick by [1 to 2 inches] [25 to 50 mm] wide.
- B. Self adhesive vinyl labels: Pre-printed, flexible label laminated with a clear, weather and chemical resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- C. Marker Tapes: Vinyl or vinyl cloth, self adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
- D. Write-On Tags: Polyester tag, [0.015 inch] [0.38 mm] thick, with corrosion resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Marker for tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
 - 2. Marker for tags: Machine printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.5 FLOOR MARKING TAPE

- A. [2 inch] [50 mm] wide, [5 mil] [0.125 mm] pressure sensitive vinyl tape, with black and white stripes and clear vinyl overlay.

2.6 UNDERGROUND LINE WARNING TAPE

A. Tape:

1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
2. Printing on tape shall be permanent and shall not be damaged by burial operations.
3. Tape material and ink shall be chemically inert, and not subject to degrading when exposed to acids, alkalis, and other destructive substances commonly found in soils.

B. Color and printing:

1. Comply with ANSI Z535.1 through ANSI Z535.5.
2. Inscriptions for Red colored tapes: **ELECTRIC LINE, HIGH VOLTAGE.**
3. Inscriptions for Orange colored tapes: **TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE OR OPTICAL**

C. Type I:

1. Pigmented polyolefin, bright colored, compounded for direct burial service.
2. Thickness: [4 mils] [0.1 mm].
3. Weight: [18.5 lb/1000 sq.ft.] [9.0 kg/100 sq. m].
4. [3 inch] [75 mm] Tensile according to ASTM D 882: [30 lbf] [133.4 N], and [2500 psi] [17.2 MPa].

D. Type II:

1. Detectable three layer laminate, consisting of a printed pigmented polyolefin film, a solid aluminum foil core, and a clear protective film that allows inspection of the continuity of the conductive core, bright colored, compounded for direct burial service.
2. Overall thickness: [5 mils] [0.125 mm].
3. Foil Core Thickness: [0.35 mil] [0.00889].
4. Weight: [28 lb/1000 sq. ft.] [13.7 kg/100 sq. m].
5. [3 inch] [75 mm] Tensile According to ASTM D 882: [30 lbf] [133.4 N], and [2500 psi] [17.2 MPa].

2.7 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Self-Adhesive Warning Labels: Factory printed, multicolor, pressure sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.

C. Baked Enamel Warning Signs:

1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
2. [1/4-inch] [6.4-mm] grommets in corners for mounting.
3. Nominal size, [7 by 10 inches] [180 by 250 mm].

D. Metal Backed, Butyrate Warning Signs:

1. Weather-resistant, non-fading, preprinted, cellulose-acetate butyrate signs with [0.0396-inch] [1-mm] galvanized-steel backing; and with colors, legend, and size required for application.
2. [1/4-inch] [6.4-mm] grommets in corners for mounting.
3. Nominal size, [10 by 14 inches] [250 by 360 mm].

E. Warning label and sign shall include, but are not limited to, the following legends:

1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR [36 INCHES] [915 MM]".
3. [Insert names and wording of warning signs or labels; e.g., arc-flash, multiple services and voltages, and others].

2.8 INSTRUCTION SIGNS

- A. Engraved, laminated acrylic or melamine plastic, minimum [1/16 inch] [1.6 mm] thick for signs up to [20 sq. inches] [129 sq. cm] and [1/8 inch] [3.2 mm] thick for larger sizes.
1. Engraved legend with [black letters on white face] <Insert colors>.
 2. Punched or drilled for mechanical fasteners.
 3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.
- B. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be [3/8 inch] [10 mm].
- C. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be [3/8 inch] [10 mm]. Overlay shall provide a weatherproof and UV-resistant seal for label

2.9 EQUIPMENT IDENTIFICATION LABELS

- A. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be [3/8 inch] [10 mm]. Overlay shall provide a weatherproof and UV-resistant seal for label.

- B. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be [3/8 inch] [10 mm].

2.10 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- B. Apply identification devices to surfaces that require finish after completing finish work.
- C. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- D. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- E. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at [50-foot] [15-m] maximum intervals in straight runs, and at [25-foot] [7.6-m] maximum intervals in congested areas.
- F. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at [6 to 8 inches] [150 to 200 mm] below finished grade. Use multiple tapes where width of multiple lines installed in a common trench [or concrete envelope] exceeds [16 inches] [400 mm] overall.
- G. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.

3.2 IDENTIFICATION SCHEDULE

- A. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than [30 Insert number A], and [120 Insert number V] to ground: Install labels at [10-foot] [3-m] [insert number] maximum intervals.
- B. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:
 - 1. Emergency Power.
 - 2. Power.
 - 3. UPS.
- C. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
 - 1. Color-Coding for Phase [and Voltage Level] Identification, 600 V or Less: Use colors listed below for ungrounded [service] [feeder] [and] [branch-circuit] conductors.
 - a. Color shall be factory applied [or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit].
 - b. Colors for 208/120-V Circuits:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - c. Colors for 480/277-V Circuits:
 - 1) Phase A: Brown.
 - 2) Phase B: Orange.
 - 3) Phase C: Yellow.
 - d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of [6 inches] [150 mm] from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- D. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.
- E. Conductors to Be Extended in the Future: Attach [write-on tags] [marker tape] to conductors and list source.

- F. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
 2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.
- G. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.
1. Limit use of underground-line warning tape to direct-buried cables.
 2. Install underground-line warning tape for both direct-buried cables and cables in raceway.
- H. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- I. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: [Self-adhesive warning labels] [Baked-enamel warning signs] [Metal-backed, butyrate warning signs].
1. Comply with 29 CFR 1910.145.
 2. Identify system voltage with black letters on an orange background.
 3. Apply to exterior of door, cover, or other access.
 4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:
 - a. Power transfer switches.
 - b. Controls with external control power connections.
 - c. [Insert items].
- J. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
- K. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum [3/8-inch] [10-mm] high letters for emergency instructions at equipment used for [power transfer] [load shedding] [Insert emergency operations].

L. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:

- a. Indoor Equipment: [Adhesive film label] [Adhesive film label with clear protective overlay] [Self-adhesive, engraved, laminated acrylic or melamine label] [Engraved, laminated acrylic or melamine label]. Unless otherwise indicated, provide a single line of text with [1/2-inch] [13-mm] high letters on [1-1/2-inch] [38-mm] high label; where two lines of text are required, use labels [2 inches] [50 mm] high.
- b. Outdoor Equipment: [Engraved, laminated acrylic or melamine label] [Stenciled legend 4 inches (100 mm) high].
- c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
- d. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

END OF SECTION

GENERAL NOTES - MONITORING SYSTEM

17. MANDATORY SPECIFICATIONS

A. THE EQUIPMENT INSTALLED SHALL MEET THE FOLLOWING MANDATORY SPECIFICATIONS. ALL LOCAL AND STATE CODES AND ANY NON-COMPLIANCE OR VARIANCE FROM THESE SPECIFICATIONS WILL BE CONSIDERED NON-RESPONSIVE. THE FUEL MONITORING SYSTEM SHALL MEET ALL OF THE APPLICABLE PERFORMANCE SPECIFICATIONS AND REGULATORY AGENCY REQUIREMENTS SET FORTH BY THE FOLLOWING ORGANIZATION:

- AMERICAN PETROLEUM INSTITUTE (API)
- AMERICAN SOCIETY FOR TESTING AND MATERIAL (ASTM)
- ENVIRONMENTAL PROTECTION AGENCY (EPA)
- FEDERAL COMMUNICATIONS COMMISSION (FCC)
- NATIONAL ELECTRICAL CODES (NEC)
- NATIONAL FIRE PROTECTION AGENCY (NFPA)
- INTERNATIONAL BUILDING CODES (IBC).

GENERAL NOTES - MONITORING SYSTEM

1. THE PROJECT DOCUMENTS DESCRIBE THE INTRINSICALLY SAFE EQUIPMENT AND ASSOCIATED APPARATUS THAT TOGETHER FORM AN INTRINSICALLY SAFE SYSTEM.
 - A. A SINGLE TLS-450 CONSOLE AND ASSOCIATED EQUIPMENT IS REQUIRED FOR THIS PROJECT.
 - B. TLS-450 CONSOLES ARE IDENTIFIED BY FORM NUMBER 8600. A TLS-450 CONSOLE CANNOT BE CONNECTED IN PARALLEL WITH ANOTHER TLS-450 OR ANY OTHER ASSOCIATED APPARATUS. TLS-450 CONSOLES AND OPTIONAL EXPANSION BOXES MUST BE INSTALLED IN ROOMS NON-HAZARDOUS AREAS.
 - C. INSIDE THE MODULE AREA OF BOTH THE TLS-450 CONSOLE AND THE EXPANSION BOX, ANY COMBINATION OF UP TO FOUR MODULES MAY BE INSTALLED. 1/8" MODULES PROVIDE WIRING TERMINALS FOR THE CONNECTION OF EQUIPMENT INSTALLED IN NON-HAZARDOUS LOCATIONS. THE USM (UNIVERSAL SENSOR MODULE) PROVIDES WIRING TERMINALS FOR THE CONNECTION OF INTRINSICALLY SAFE APPARATUS.
 - D. THE ELECTRODES LOCATED IN THE BARBER OUTLET OF THE USM MODULE FORM AN INTRINSICALLY SAFE ENERGY LIMITED SYSTEM. PROBES AND SENSORS CONNECTED TO THE C/JUPIT TERMINALS OF THE USM MODULE ARE CONSIDERED INTRINSICALLY SAFE APPARATUS AND ARE APPROVED FOR USE IN CLASS I, GROUP D HAZARDOUS (CLASSIFIED) LOCATIONS.
 - E. WARNING: IN INSTALLATION AND USE OF THIS PRODUCT, CAREFULLY WITH ALL ELECTRICAL CODES. IN ADDITION, TURN OFF POWER AND DISCONNECT ALL CONNECTIONS TO THE EQUIPMENT DURING INSTALLATION, SERVICE AND REPAIR TO PREVENT PERSONAL INJURY, PROPERTY LOSS AND EQUIPMENT DAMAGE.
 - F. WARNING: DISCONNECT ALL POWER BEFORE MAKING ANY CONNECTIONS TO PREVENT DEATH, SERIOUS INJURY, EXPLOSION, OR ELECTRICAL SHOCK. CONSOLE MUST NEVER BE OPERATED UNLESS THE FRONT COVER IS CLOSED OVER THE BARBER TERMINALS IN THE INTRINSICALLY SAFE AREA.
2. WARNINGS:
 - A. SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
3. INTRINSICALLY SAFE (I.S.) WIRING MUST BE INSTALLED IN ACCORDANCE WITH ARTICLE 504-20 OF THE NEC (NATIONAL ELECTRICAL CODE), ANSI/NFPA 70 OR OTHER APPLICABLE LOCAL CODES. ALL OTHER WIRING MUST BE INSTALLED ACCORDING TO CITY OF GLENDALE ADOPTED CODES. THE MAXIMUM CABLE LENGTH ALLOWED, USED TO CONNECT ANY INTRINSICALLY SAFE DEVICE TO THE TLS-450 CONSOLE IS LIMITED TO A TOTAL OF 24,000 FEET PER USM (UNIVERSAL SENSOR MODULE).
4. EACH CABLE (OR I.S. WIRING) USED TO CONNECT INTRINSICALLY SAFE DEVICES TO THE TLS-450 CONSOLE, MUST BE RATED 100 PF/FOOT (OR LESS CAPACITANCE PER FOOT) AND MUST BE RATED 0.2 UNY/FOOT (OR LESS INDUCTANCE PER FOOT).
5. I.S. GROUNDING POINTS MUST BE CONNECTED TO A SEPARATE GROUND ELECTRODE THROUGH LESS THAN ONE OHM DC RESISTANCE TO THE EARTH-GROUND BUS AT THE DISTRIBUTION PANEL IN ACCORDANCE WITH THE NEC/IEEC OR OTHER LOCAL CODES.
6. CABLES (OR I.S. WIRING) USED TO CONNECT SEPARATE I.S. DEVICES TO THE ASSOCIATED APPARATUS MUST HAVE SUITABLE INSULATION AS REQUIRED BY ARTICLE 504-30(B) OF THE NEC.
7. ASSOCIATED APPARATUS MUST BE INSTALLED IN ACCORDANCE TO THIS CONTROL DRAWING AND ARTICLE 504 OF THE NEC OR EQUIVALENT TO THE LOCAL CODES. THE MAXIMUM CABLE LENGTH FOR THIS EQUIPMENT IS 24,000 FEET PER USM. FERRITE BEADS OR EQUIPMENT CONNECTED TO THE TLS-450 CONSOLE MUST NOT USE OR GENERATE MORE THAN 250V RMS OR 0.6V WITH RESPECT TO EARTH GROUND.
8. THE TOTAL ALLOWABLE CABLE LENGTH USED TO CONNECT UP TO 16 I.S. DEVICES TO EACH USM MODULE IS 7,315 METERS OR 24,000 FEET.
9. EACH CABLE (OR WIRING) USED TO CONNECT I.S. DEVICES TO THE CONSOLE MUST NOT EXCEED A CAPACITANCE OF 328 PF/METER OR 100 PF/FOOT.
10. THE TOTAL CABLE CAPACITANCE, REGARDLESS ALL OF THE CABLE USED TO CONNECT THE INTRINSICALLY SAFE DEVICES TO EACH USM MODULE, MUST NOT EXCEED 5.0UF.
11. EACH CABLE MUST NOT EXCEED AN INDUCTANCE OF 0.668H/METER OR 0.2UH/FOOT.
12. THE L/R RATIO OF THE CABLE MUST NOT EXCEED 200 H/OHM.
13. NON-HAZARDOUS ASSOCIATED APPARATUS IS AS SHOWN AND MUST NOT BE SUPPLIED FROM OR CONTAIN, UNDER NORMAL OR ABNORMAL CONDITIONS, A SOURCE OF POTENTIAL WITH RESPECT TO EARTH IN EXCESS OF 250V RMS OR 250V DC, UN = 205V.
14. CONNECT THE BARBER GROUND TO THE EARTH GROUND BUS AT THE POWER DISTRIBUTION PANEL WITH A 4MM2 (10 AWG) (OR LARGER) CONDUCTOR. GROUNDING MUST COMPLY WITH I, 700-14, CLAUSE 6.1.1.
15. SPECIAL CONDITIONS FOR SAFE USE, AS DEFINED IN THE CERTIFICATE OF CONFORMITY AND INSTALLATION INSTRUCTIONS MUST BE TAKEN INTO ACCOUNT.
16. SCOPE OF WORK:
 - A. THE CITY OF GLENDALE IS REQUESTING BIDS FROM QUALIFYING CONTRACTORS TO FURNISH AND INSTALL A TLS-450 VEEDEER ROOT FUEL MONITORING SYSTEM AT THE Foothills PUBLIC SAFETY FACILITY LOCATED AT 6255 UNION HILLS DRIVE, GLENDALE, AZ. OBTAIN AND PAY FOR ALL REQUIRED PERMITS BY AEEA, MARICOPA COUNTY, CITY OF GLENDALE, ETC.
 - B. RECONNECT THE NEW MONITORING SYSTEM TO THE EXISTING 120VAC POWER SOURCE.
 - C. THE CONTRACTOR MUST PROVIDE EQUIPMENT AND SERVICES TO THE CITY RELATIVE TO REMOVING THE CURRENT ILS VEEDEER ROOT FUEL MONITORING SYSTEM AND REPLACE IT WITH A NEW VEEDEER ROOT TLS-450 FUEL MONITORING SYSTEM. A PRIOR APPROVED EQUAL MANUFACTURER WHICH IS CERTIFIED COMPATIBLE TO THE VEEDEER ROOT SYSTEM SHALL ALSO BE CONSIDERED. THE NEW MONITORING SYSTEM SHALL BE CONNECTED TO ONE (1) EXISTING 12,000 GALLON GASOLINE IN-GROUND TANK AND ONE (1) EXISTING 12,000 GALLON DIESEL IN-GROUND TANK.
 - D. THE FUEL MONITORING SYSTEM CONTROL PANEL SHALL HAVE EMERGENCY MODULE CAPABILITY. THE CITY OF GLENDALE WILL PROVIDE, INSTALL, AND MAINTAIN DATA CABLES IN A 6" OUT RACEWAY SYSTEM PROVIDED AND INSTALLED BY THE CONTRACTOR.
 - E. INSTALLATION OF WORK SHALL BE PERFORMED DURING NORMAL BUSINESS WORKING HOURS.
 - F. THE CONTRACTOR SHALL MEET THE REQUIREMENTS OF CERTIFIED FUEL MONITORING INSTALLER.
 - G. THE CONTRACTOR MUST POSSESS AND PROVIDE A COPY OF A VALID ARIZONA CONTRACTOR'S LICENSE.
 - H. ALL WORK PERFORMED SHALL COMPLY WITH ARIZONA AND REGULATIONS. IN ADDITION, THE INSTALLER SHALL BE RESPONSIBLE FOR ALL OF THE REPORTING, NOTIFICATION, PERMITS, ETC. CONCERNING THE INSTALLATION AS REQUIRED BY LOCAL, STATE AND/OR FEDERAL STATUTES.
 - I. ALL INSTALLATION WORK SHALL BE COMPLETED WITHIN 45 WORKING DAYS OF THE ISSUANCE OF THE CITY OF GLENDALE PURCHASE ORDER TO THE AWARDED BIDDER.
 - J. TERMINATE CONTROL WIRING IN EXISTING CONDUIT TO AND CONFIRM THE CORRECT OPERATION OF THE FUEL MONITORING SYSTEM INTEGRATION WITH THE EXISTING EQUIPMENT.
 - K. THE CONTRACTOR MUST BE A FACTORY AUTHORIZED INSTALLER FOR THE EQUIPMENT PROVIDED. CERTIFICATION AUTHORIZATION MUST BE MADE AVAILABLE TO THE CITY WITHIN TWO (2) DAYS AFTER CONTRACT AWARD AND PRIOR TO ISSUANCE OF A PURCHASE ORDER.
 - L. UPON COMPLETION OF INSTALLATION, THE AWARDED BIDDER SHALL:
 - PROVIDE COMPLETE TRAINING TO THE CITY OF GLENDALE'S STAFF FOR THE OPERATION OF THE INSTALLED EQUIPMENT.
 - DEMONSTRATE THAT THE EQUIPMENT HAS BEEN CORRECTLY INSTALLED AND PROGRAMMED FOR THE TANKS THAT IT MONITORS. PROVIDE ALL SOFTWARE, CD'S, OPERATION MANUALS, ANY SCHEDULES, AND ANY DOCUMENTATION OF OPERATION, ANY CALIBRATIONS, MAINTENANCE AND SUPPORT OF THE INSTALLED SYSTEM. PROVIDE REPLACEMENT PARTS LIST WITH THE MOST CURRENT PUBLISHED LIST PRICE AND IF APPLICABLE, THE CITY'S DISCOUNT SCHEDULE OFF LIST PRICE. PROVIDE CONTACT INFORMATION FOR TECHNICAL SUPPORT.

GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED IN A WORKMAN LIKE MANNER IN ACCORDANCE WITH THE NEC AND AS AMENDED BY ALL.
2. PRIOR TO SUBMITTING PROPOSAL BIDDER SHALL EXAMINE ALL GENERAL CONSTRUCTION DRAWINGS AND VISIT THE CONSTRUCTION SITE TO BECOME FAMILIAR WITH EXISTING CONDITIONS UNDER WHICH THE CONTRACTOR WILL HAVE TO OPERATE AND WHICH WILL IN ANY WAY AFFECT THE WORK UNDER THIS CONTRACT. NO SUBSEQUENT ALLOWANCE WILL BE MADE FOR OMISSIONS, UNLESS THE CONTRACTOR CAN PROVE THAT THE OMISSIONS WERE NOT KNOWN AND EQUIPMENT NOTED OR SPECIFIED TO BE REMOVED WHICH IS NOT SCHEDULED TO BE RE-USED OR RELOCATED SHALL BE CAREFULLY REMOVED AND DELIVERED TO THE OWNER WHERE DIRECTED.
3. REFER TO ARCHITECTURAL PLANS TO CONFIRM ALL FIRE-RATED CEILINGS AND WALLS.
 - A. ALL PENETRATIONS OF FIRE-RESISTIVE FLOORS OR SHIRT WALLS SHALL BE PROTECTED BY MATERIALS AND INSTALLATION DETAILS THAT CONFIRM TO UNDERWRITERS' LABORATORIES LISTINGS FOR "THROUGH-PENETRATION FIRE STOP SYSTEMS". THE CONTRACTOR SHALL PROVIDE SUBMITTAL DRAWING DETAILS FURNISHED BY THE MANUFACTURER OF THE FIRE STOP MATERIAL. THE SUBMITTAL INFORMATION SHALL INDICATE COMPLETE CONFORMANCE TO THE APPLICABLE LISTING AND SHALL BE SPECIFIC FOR EACH PENETRATION. THE CONTRACTOR SHALL PROVIDE THE APPLICABLE LISTING AND DRAWINGS SHALL BE MADE AVAILABLE TO THE LOCAL INSPECTORS AT ALL TIMES AT THE PROJECT SITE.
4. GROUT AND SEAL ALL CONDUIT PENETRATIONS OF WALLS AND FLOOR SLABS TO PRESERVE FIRE RATING AND WATER-TIGHT INTEGRITY.
5. DO NOT INSTALL ANY EQUIPMENT WHICH WOULD LEAVE INADEQUATE OPERATION OR SERVICE SPACE FOR THE ENTIRE PROJECT. DRAWINGS ARE NOT INTENDED TO SHOW IN DETAIL ALL FEATURES OF WORK. CHECK LOCATION OF ELECTRICAL WORK TO DETERMINE IN ADVANCE THAT IT CLEARS ALL OBSTRUCTIONS.
6. ALL LINE VOLTAGE WIRING SHALL BE COVERED AND INSTALLED IN CONDUIT UNLESS OTHERWISE NOTED. INSULATION SHALL BE TYPE "THIN/THICK" UNLESS OTHERWISE NOTED. CONDUIT SHALL BE #12 AWG WITHIN 3" TRAIL SIZE CONDUIT. ALL CONDUITS USED FOR AIR CONDITIONING AND CONDUCTORS #2 AWG AND LARGER SHALL BE XHHW-2.
7. CONDUITS SHALL BE SUPPORTED BY FRAMING CHANNEL (UNISTRUT, B-LINE, OR AS ACCEPTED). INTERVALS OF SUPPORT SHALL COMPLY WITH NEC SECTION APPROPRIATE FOR CONDUIT MATERIAL USED.
8. PROVIDE IDENTIFICATION PER THE IDENTIFICATION OF ELECTRICAL SYSTEMS SPECIFICATION SECTION. CLEARLY INDICATE USE AND AREA SERVED FOR ALL DISJUNCTION DEVICES PER THE NEC.
9. UNLESS INDICATED IN SOME MANNER THAT ELECTRICAL EQUIPMENT IS EXISTING (EX), ALL OTHER EQUIPMENT SHALL BE NEW.
10. PROTECT ADJACENT AREAS FROM DAMAGE DURING THE PROGRESSION OF WORK. PROVIDE TEMPORARY SAFETY BARRIERS TO PREVENT DAMAGE TO EXISTING AREAS. PROVIDE REQUIRED DUST AND NOISE CONTROL MEASURES TO ENSURE CONTINUED OPERATION OF ADJACING BUILDING AREAS OR DEPARTMENTS WHERE APPLICABLE.
11. PROVIDE SEAL-OFF FITTINGS AT ALL CONDUITS ENTERING THE EXISTING BUILDING.
12. REMOVE ALL EXISTING WIRING PREVIOUSLY SERVING THE EXISTING MONITORING SYSTEM AS REQUIRED. **ADDITIONAL INFO:**

GENERAL NOTES - MONITORING EQUIPMENT SCHEDULE

1. THIS EQUIPMENT LIST IS NOT INTENDED TO BE ALL INCLUSIVE, BUT INTENDED TO BE A REFERENCE FOR THE BASE REQUIREMENTS. THE CONTRACTOR SHALL PROVIDE ADDITIONAL EQUIPMENT, MATERIALS, AND LABOR FOR A COMPLETE AND OPERATIONAL SYSTEM.
 - A. (1) VEEDEER ROOT #60000-100 TLS-450 CONSOLE WITH PRINTER, TOTAL ACCESS USB, ETHERNET DUAL INTERFACE MODULE & DIRECT ACCESS SOFTWARE, THREE (3) EXTENDED STORAGE, AND RES32E DUAL INTERFACE MODULE.
 - B. (2) VEEDEER ROOT #44330-107 8"-0" MAG PLUS PROBE.
 - C. (1) VEEDEER ROOT #44400-000 MAG PLUS GASOLINE PROBE INSTALLATION KIT.
 - D. (1) VEEDEER ROOT #44600-001 MAG PLUS DIESEL PROBE INSTALLATION KIT.
 - E. (2) DRY ANNUAL PROBE SENSORS, F EXISTING SENSORS ARE TESTED AND DETERMINED TO BE OPERATIONAL. CONNECT THE SYSTEM TO THE EXISTING PROBES.
 - F. (1) CONTINUOUS STATISTICAL LEAK DETECTION (CSLD) MODULE.
 - G. ALL TWO (2) & THREE (3) CONDUCTOR LOW VOLTAGE CABLING BETWEEN THE EXISTING TANKS AND MONITOR CONSOLE.
 - H. ALLOWANCE: OWNER'S CONTINGENCY LUMP SUM OF \$5,000.00 **ADDITIONAL INFO:**

GENERAL NOTES - MONITORING EQUIPMENT SCHEDULE - ALTERNATE BID

1. THIS EQUIPMENT LIST IS NOT INTENDED TO BE ALL INCLUSIVE, BUT INTENDED TO BE A REFERENCE FOR THE BASE REQUIREMENTS. THE CONTRACTOR SHALL PROVIDE ADDITIONAL EQUIPMENT, MATERIALS, AND LABOR FOR A COMPLETE AND OPERATIONAL SYSTEM.
 - A. (1) VEEDEER ROOT #60000-100 TLS-450 CONSOLE WITH PRINTER, TOTAL ACCESS USB, ETHERNET DUAL INTERFACE MODULE & DIRECT ACCESS SOFTWARE, THREE (3) EXTENDED STORAGE, AND RES32E DUAL INTERFACE MODULE.
 - B. (2) VEEDEER ROOT #44330-107 8"-0" MAG PLUS PROBE.
 - C. (1) VEEDEER ROOT #44400-000 MAG PLUS GASOLINE PROBE INSTALLATION KIT.
 - D. (1) VEEDEER ROOT #44600-001 MAG PLUS DIESEL PROBE INSTALLATION KIT.
 - E. (2) DRY ANNUAL PROBE SENSORS, IF EXISTING SENSORS ARE TESTED AND DETERMINED TO BE OPERATIONAL. CONNECT THE SYSTEM TO THE EXISTING PROBES.
 - F. (1) CONTINUOUS STATISTICAL LEAK DETECTION (CSLD) MODULE.
 - G. ALL TWO (2) & THREE (3) CONDUCTOR LOW VOLTAGE CABLING BETWEEN THE EXISTING TANKS AND MONITOR CONSOLE.
 - H. ALLOWANCE: OWNER'S CONTINGENCY LUMP SUM OF \$5,000.00

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ELECTRICAL GENERAL NOTES
CITY OF GLENDALE
FUEL MONITORING SYSTEM REPLACEMENT
 PROJECT LOCATION
 6255 WEST UNION HILLS DRIVE
 GLENDALE, AZ



DATE: 01-31-2011
 SHEET NO. 3 OF 3
 2011-004-000

E002

REV.	DATE	DESCRIPTION	BY	MR
-	6/9/2011	APPENDIX NO.1		

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ELECTRICAL SITE PLAN
CITY OF GLENDALE
FUEL MONITORING SYSTEM REPLACEMENT
 PROJECT LOCATION
 6265 WEST UNION HILLS DRIVE
 GLENDALE, AZ

APPROVED
 [Signature]
 ELECTRICAL ENGINEER

DATE: 01-31-2011
 JOB NO.: 2011-004.000
 SW/EC: MDR
 DEC. BY: MDR
 DEC. BY: MDR

SHEET NO. **E101**
 OF 6

KEYED NOTES (K)

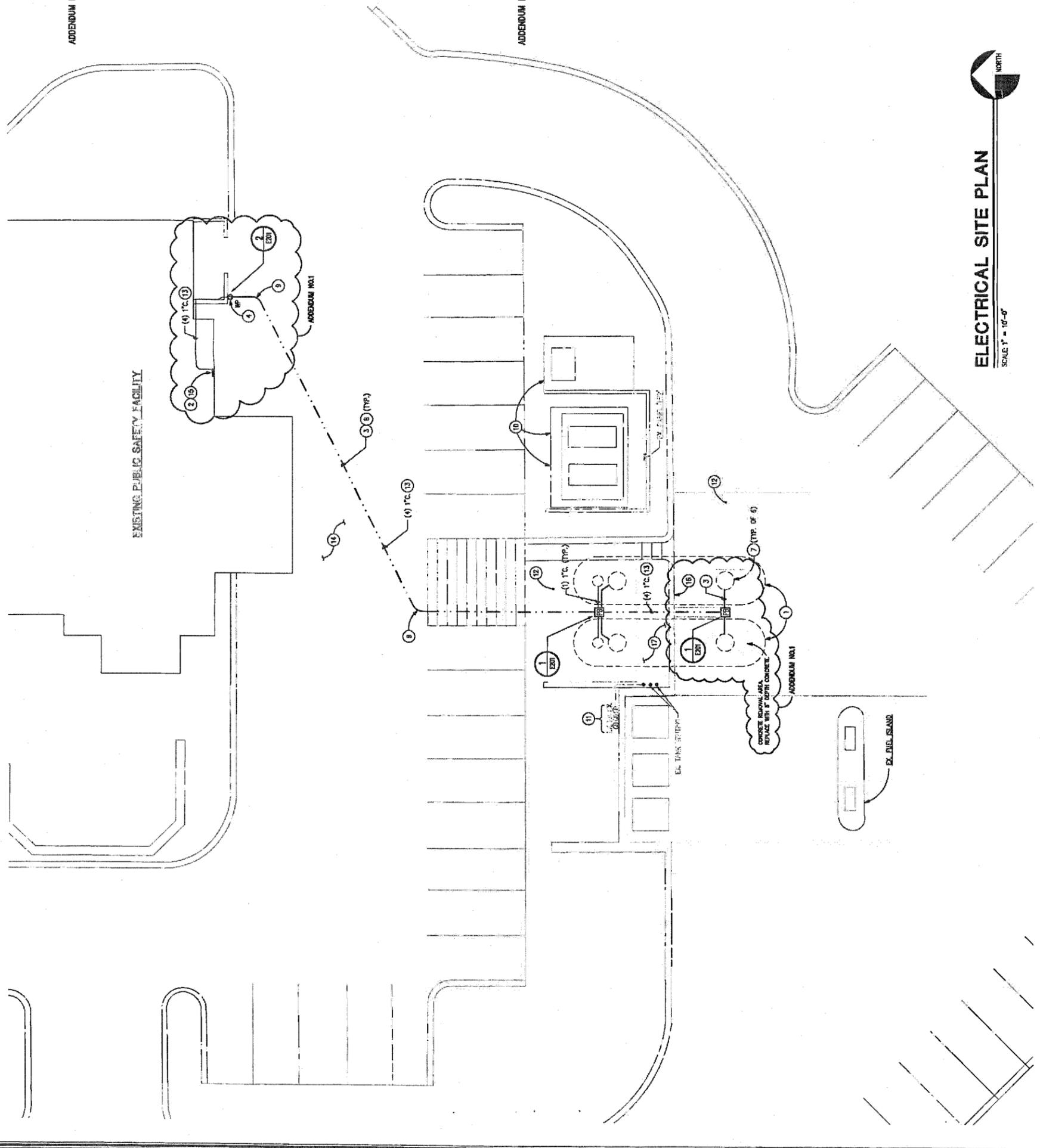
- EXISTING TO REMAIN BELOW GRADE FUEL TANKS. (1) UN-LEADED GASOLINE FUEL TANK AND (2) DIESEL FUEL TANK.
- REMOVE ALL EXISTING COMPONENTS OF THE VEEVER-ROOT # 115-350 AND REPLACE A NEW VEEVER-ROOT # 115-350 ASSEMBLY. DISCONNECT AND RECONNECT TO THE EXISTING TERN-19 BRANCH CIRCUIT SERVING THE CONTROL PANEL.
- INTRINSICALLY SAFE UNDERGROUND-LOW VOLTAGE-CABLE-IN-CONDUIT.
- UTILIZE AN LF FITTING ABOVE GRADE TO ENTER BUILDING AND FORM CONNECTION TO UNDERGROUND CABLE IN CONDUIT. CONDUIT SHALL BE 1/2" DIA. AND SHALL BE EXPOSED OUTSIDE WITH (1) 1/2" TO MONITORING PANEL IN-LEAD-OF (4) 1/2" REFER TO SHEET E201 FOR CONTROL PANEL SPECIFIC LOCATION.
- UTILIZE AN LF FITTING ABOVE GRADE TO ELEVATE TO HIGHER ELEVATION AT REARING WALL.
- ACCESS COVER PLATE AT GRADE.
- VERIFY TRENCH ROUTING WITH OWNER PRIOR TO ANY WORK BEING DONE. VERIFY VA AND DEPTH OF TRENCH. VERIFY TRENCH ROUTING AND DEPTH TO AVOID INTERFERENCE WITH EXISTING UTILITIES.
- UTILIZE LARGE SWEEP ELBOWS.
- EXISTING GENERATOR SET, FUEL TANK AND TRANSFORMER ENCLOSURE.
- EXISTING TO REMAIN FUEL SYSTEM CONTROL/MONITORING RACKWAYS.
- EXISTING CONCRETE APRON.
- UTILIZE (2) CONDUITS FOR LEAK DETECTION CABLING SYSTEM. (2) CONDUITS SHALL BE SPARE.
- EXISTING ASPHALT SURFACE.
- REFER TO SHEET E201 FOR ADDITIONAL INFORMATION.
- EXISTING TO REMAIN CONCRETE CURBING.
- EXISTING SLOPED ELEVATION GRADE CHANGE WITH GRAVEL COVERING.

APPENDIX NO.1

GENERAL NOTES

- SAWCUT ALL HARD SURFACES, TRENCH, INSTALL CONDUIT & PULL BOXES, COMPACT BACKFILL, AND PREPARE SURFACE ENDING FOR MATCHING REPLACEMENT MATERIAL. DO NOT OVER CUT STRAIGHT RUNS AT RAISED TURNS. NO SAW CUTS SHALL BE VISIBLE AFTER REPLACEMENT MATERIAL HAS BEEN INSTALLED.
- REPLACEMENT ASPHALT AND CONCRETE FINISH SHALL MATCH THE EXISTING DEPTH AND ADJACENT AREAS. REPLACEMENT MATERIAL SHALL MATCH THE EXISTING DEPTH AND FINISH.
- PROVIDE AND INSTALL EACH OF THE TANK PROBE FUEL SENSORS AT THE LOWER LEVEL ACCESS PORTS. PROVIDE AND INSTALL EACH OF THE SUMP SENSORS AT THE UPPER LEVEL ACCESS SUMPS. PROVIDE AND INSTALL EACH OF THE ANNUAL DRY SPACE TANK SENSORS AT THE UPPER LEVEL ACCESS SUMPS.

APPENDIX NO.1



ELECTRICAL SITE PLAN
 SCALE 1" = 10'-0"
 NORTH

REV.	DATE	DESCRIPTION	BY
-	6/9/2011	ADDENDUM NO.1	MDR

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PARTIAL ELECTRICAL PLAN
CITY OF GLENDALE
FUEL MONITORING SYSTEM REPLACEMENT
 PROJECT LOCATION
 6265 WEST UNION HILLS DRIVE
 GLENDALE, AZ

E201
 6 OF 6
 SHEET NO.

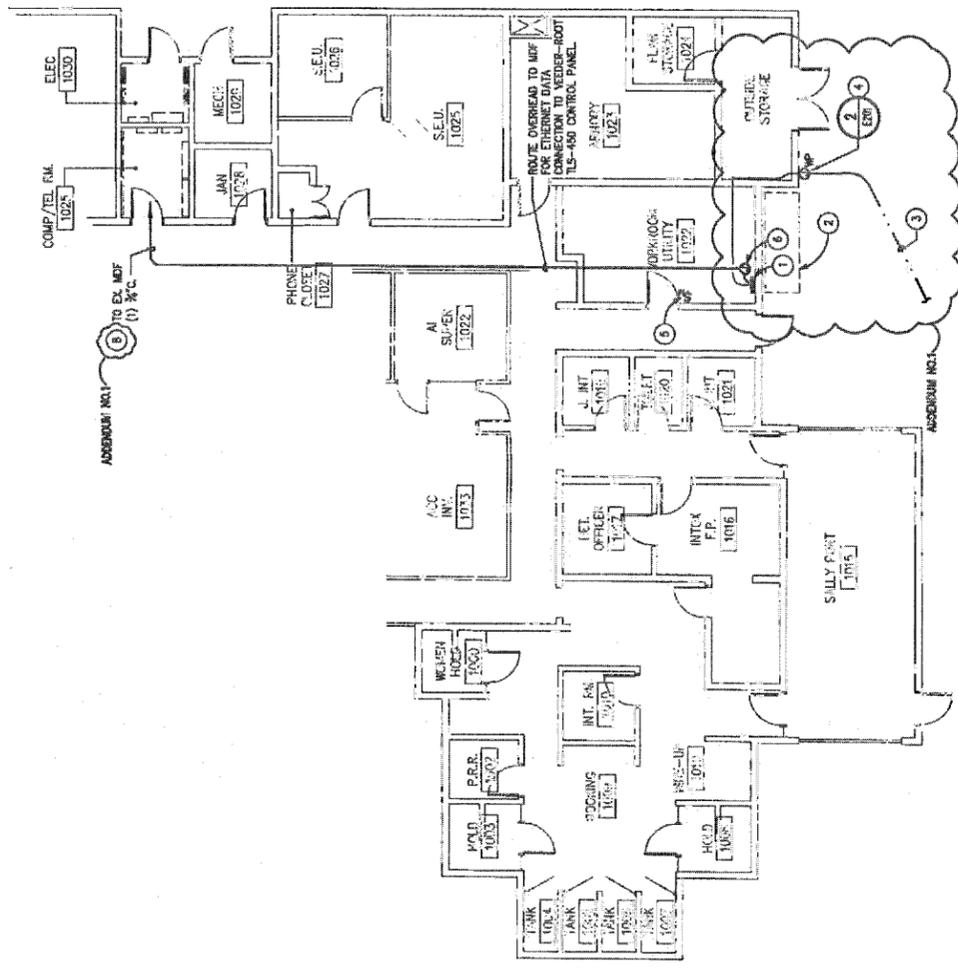
DATE: 01-31-2011
 JOB NO.: 2011-004-000

DESIGNED BY: MDR
 CHECKED BY: MDR
 DRAWN BY: MDR

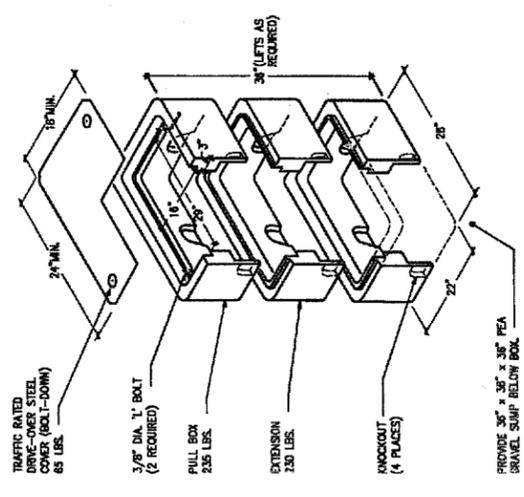
- KEYED NOTES (K)**
- CONTRACTOR SHALL REMOVE ALL EXISTING COMPONENTS OF THE VEEDER-ROOT ALS-300 AND REPLACE WITH A NEW VEEDER-ROOT ALS-450 ASSEMBLY. DISCONNECT AND RECONNECT TO THE EXISTING 120V-1Ø BRANCH CIRCUIT SERVING THE CONTROL PANEL.
 - EXISTING TO REMAIN SES AND DISTRIBUTION SECTIONS.
 - INTRINSICALLY SAFE UNDERGROUND LOW VOLTAGE CABLE IN CONDUIT REFER TO SHEET E101 FOR ROUTING.
 - UTILIZE AN "L" FITTING ABOVE GRADE TO ENTER BUILDING AND CONNECTION TO CONTROL PANEL.

- ADDENDUM NO.1**
- EXISTING FUEL PUMP SWITCH. PROVIDE A PROTECTIVE METAL FLIP-TOP COVER WITH TRIM FLANGE. HUBBELL #8222 OR EQUAL.
 - DATA/ETHERNET JUNCTION BOX AT CONTROL PANEL.
- ADDENDUM NO.2**
- TERMINATE ALL DATA/ETHERNET CABLES PER OWNER DIRECTION.
 - BOND CONDUIT TO EXISTING CABLE TRAY SYSTEM.

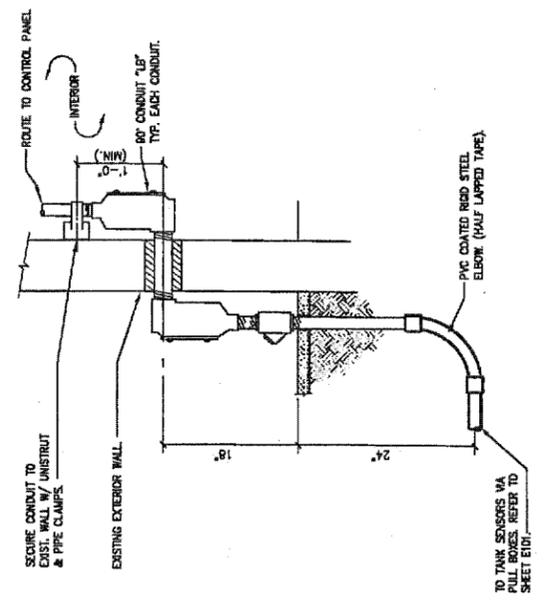
- GENERAL NOTES (SHEET SPECIFIC)**
- ALL CONDUIT INDICATED WITHIN THE BUILDING SHALL BE EMT. COORDINATE WITH ALL OTHER TRADES. VERIFY ALL EXISTING AND NEW CONDUIT ROUTING WITH THE OWNER. ADJUST ROUTING AND LOCATION AS NECESSARY. ALL ACCESSIBLE AREAS SHALL BE UNOCCUPIED.
 - ALL ENERGY DATA CABLEING BETWEEN THE EXISTING MIF AND THE NEW MONITORING PANEL SHALL BE THE RESPONSIBILITY OF THE CITY OF GLENDALE IT DEPARTMENT.



PARTIAL ELECTRICAL PLAN
 SCALE 1/8" = 1'-0"



1 PULL BOX DETAIL
 E201 NTS



2 CONDUIT PENETRATION DETAIL
 E201 NTS