FCI08FLE

TYPE OF RECORD:	NON-PERMANENT
CATEGORY OF RECORD:	CONTRACT
NAME OF CONTRACTOR:	FCI CONSTRUCTORS, INC.
SUBJECT/PROJECT:	FLEET BUILDING ADDITION
CITY DEPARTMENT:	ADMINISTRATION
YEAR:	2008
EXPIRATION DATE:	10/31/~~2008~~ 2058
DESTRUCTION DATE:	~~01/01/2015~~

CITY OF Grand Junction COLORADO

NOTICE TO PROCEED

Date: May 20, 2008

Contractor: FCI Constructors, Inc.

Project: Fleet Building Addition IFB-2702-SDH

Congratulations on the contract award. You are hereby authorized to proceed with the Work covered by the Contract Documents titled and numbered Fleet Building Addition IFB-2702-SDH for the sum of One Million Seventy Nine Thousand Five Hundred & Nineteen Dollars and Seven Cents ($1,079,519.07), including the following:

Base Bid	$1,106,824.07
Deduct Voluntary Delete Site Trailer & City to Provide Office Space	$ (2,100.00)
Deduct Alternate to Use Wayne Dalton in lieu of Overhead Door Co.	$ (20,000.00)
Deduct Alternate Hollow Metal Door/Jamb Package	$ (1,830.00)
Deduct Alternate to EFCO 6750 Window Package	$ (4,775.00)
Add Upgrade Lift from TR-19 to TR-25	$ 1,400.00
Total	$1,079,519.07

The project is scheduled to be completed by October 31, 2008.

Please notify Jim Stavast, City of Grand Junction Facilities Manager 970-270-7367 before starting work and return to the Purchasing Division an acknowledged copy of this Notice to Proceed, Payment & Performance Bond, and Proof of Insurance.

CITY OF GRAND JUNCTION, COLORADO

Scott Hockins, Purchasing Supervisor

CONTRACTOR ACKNOWLEDGEMENT

Receipt of this Notice to Proceed is hereby acknowledged:

Contractor: FCI CONSTRUCTORS, INC.

Name: MARC LITZEN

Title: PROJECT MANAGER

Date: 5/23/08

CITY OF
Grand Junction
COLORADO

PURCHASING

CONTRACT 2707-08-SDH

This CONTRACT made and entered into this **20th day of May, 2008**, by and between the **City of Grand Junction, Colorado,** a Municipal Corporation in the County of Mesa, State of Colorado, hereinafter in the Contract Documents referred to as the "City" and **FCI Constructors, Inc.**, hereinafter in the Contract Documents referred to as the "Contractor."

WHEREAS, the City advertised that sealed Bids would be received for furnishing all labor, tools, supplies, equipment, materials, and everything necessary and required for the Project described by the Contract Documents and known as No. **IFB-2702-08-SDH "Fleet Building Addition"**; and

WHEREAS, the Contract has been awarded to the above named Contractor by the City, and said Contractor is now ready, willing and able to perform the Work specified, in accordance with the Contract Documents;

NOW, THEREFORE, in consideration of the compensation to be paid the Contractor, the mutual covenants hereinafter set forth and subject to the terms hereinafter stated, it is mutually covenanted and agreed as follows:

ARTICLE 1

Contract Documents: It is agreed by the parties hereto that the following list of instruments, drawings, and documents which are attached hereto, bound herewith, or incorporated herein by reference constitute and shall be referred to either as the "Contract Documents" or the "Contract", and all of said instruments, drawings, and documents taken together as a whole constitute the Contract between the parties hereto, and they are fully a part of this agreement as if they were set out verbatim and in full herein:

- Contract Documents for the Project;
  - Addendum No. 1
  - Addendum No. 2
  - IFB-2702-08-SDH including:
  - Instruction to Bidders
  - General Contract Documents
  - Statement of Work
  - Johnson-Carter Specifications 0801G
  - Johnson-Carter Drawing Set 0801G-04-16-08
  - Bidder's Proposal
  - Work Change Requests (directing that changed work be performed);
- Field Orders;
- Change Orders.

ARTICLE 2

2549 RIVER ROAD, GRAND JUNCTION, CO 81501 P [970] 244-1533 F [970] 244-1427 www.gjcity.org

Definitions: The definitions provided in the General Contract Conditions apply to the terms used in the Contract and all the Contract Documents.

ARTICLE 3

Contract Work: The Contractor agrees to furnish all labor, tools, supplies, equipment, materials, and all that is necessary and required to complete the tasks associated with the Work described, set forth, shown, and included in the Contract Documents as indicated.

ARTICLE 4

Contract Time: Time is of the essence with respect to this Contract. The Contractor hereby agrees to commence Work under the Contract upon award and to achieve Substantial Completion and Final Completion of the Work by October 31, 2008.

ARTICLE 5

Contract Price and Payment Procedures: The Contractor shall accept as full and complete compensation for the performance and completion of all of the Work specified in this Contract and the Contract Documents, the sum of **One Million Seventy Nine Thousand Five Hundred and Nineteen Dollars & Seven Cents ($1,079,519.07)** (the "Contract Price). The amount of the Contract Price is and has heretofore been appropriated by the City Council of the City of Grand Junction for the use and benefit of this Project. The Contract Price shall not be modified except by Change Order or other written directive of the City. The City shall not issue a Change Order or other written directive which requires additional work to be performed, which work causes the aggregate amount payable under this Contract to exceed the amount appropriated for this Project, unless and until the City provides Contractor written assurance that lawful appropriations to cover the costs of the additional work have been made.

Unless otherwise provided in the Special Conditions, monthly partial payments shall be made as the Work progresses. Applications for partial and Final Payment shall be prepared by the Contractor and approved by the City in accordance with the General Contract Conditions.

Upon Final Completion of the Work under the Contract and before the Contractor shall receive final payment, the City shall publish at least twice in a newspaper of general circulation published in the City a notice that: 1. the City has accepted such Work as completed according to the Contract Documents; 2. the Contractor is entitled to final payment; 3. thirty days after the first publication, specifying the exact date, the City shall pay the full balance due under the Contract; and 4. persons having claims for labor, materials, team hire, sustenance, provisions, provender, or other supplies used or consumed by the Contractor or a subcontractor shall file a verified statement of the amount due and unpaid on account of such claim prior to the date specified for such payment. Nothing herein shall be construed as relieving the Contractor and the Sureties on the Contractor's Bonds

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from any claim or claims for work or labor done or materials or supplies furnished in the execution of the Contract.

ARTICLE 6

Bonds: The Contractor shall furnish currently herewith the Bonds required by the Contract Documents, such Bonds being attached hereto. The Performance Bond shall be in an amount not less than one hundred percent (100%) of the Contract Price set forth in Article 5. The Payment Bond shall be in an amount not less than one hundred (100%) of the Contract Price set forth in Article 5. Bonds in the amounts of $1,000 or less will be made in multiples of $100; in amounts exceeding $5,000, in multiples of $1,000; provided that the amount of the Bonds shall be fixed by the City at the lowest sum that fulfills all conditions of the Contract.

ARTICLE 7

Contract Binding: The City and the Contractor each binds itself, its partners, successors, assigns and legal representatives to the other party hereto in respect to all covenants, agreements and obligations contained in the Contract Documents. The Contract Documents constitute the entire agreement between the City and Contractor and may only be altered, amended or repealed by a duly executed written instrument. Neither the City nor the Contractor shall, without the prior written consent of the other, assign or sublet in whole or in part its interest under any of the Contract Documents and specifically, the Contractor shall not assign any moneys due or to become due without the prior written consent of the City.

ARTICLE 8

Severability: If any part, portion of provision of the Contract shall be found or declared null, void or unenforceable for any reason whatsoever by any court of competent jurisdiction or any governmental agency having the authority there over, only such part, portion or provision shall be effected thereby and all other parts, portions and provisions of the Contract shall remain in full force and effect.

IN WITNESS WHEREOF, the City of Grand Junction, Colorado, has caused this Contract to be subscribed by its City Council. The Contractor has signed this Contract the day and the year first mentioned herein.

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CITY OF
Grand Junction
COLORADO

PURCHASING

The Contract is executed in four counterparts.

THE CITY OF GRAND JUNCTION, COLORADO

By: _____ 5/23/08
Jay Valentine, Purchasing Manager — Date

Witness:

By: _____
Scott Hockins, Purchasing Supervisor

FCI CONSTRUCTORS, INC.

By: _____ 5/23/08
Date

Title: President

Witness:

By: Laura Watkins

Title: Marketing Coordinator

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CITY OF
Grand Junction
COLORADO

Purchasing Division

Invitation for Bid

IFB-2702-08-SDH
Fleet Building Addition

Responses Due:
May 13, 2008 at 2:00pm
2549 River Road
Grand Junction, CO 81501

Purchasing Representative:
Scott Hockins
Purchasing Supervisor
scotth@gjcity.org
Phone (970) 244-1484

Technical/Scope of Work Questions:
Johnson Carter Architects, PC
Jeff Johnson
jjarch@rof.net
Phone (970) 625-0580

April 23, 2008

This solicitation has been developed specifically to solicit competitive responses for the Fleet Building Addition, and may not be the same as previous City of Grand Junction solicitations. All offerors are urged to thoroughly review this solicitation prior to submitting. Submittal by **FAX IS NOT ACCEPTIBLE** for this solicitation.

Invitation for Bids

Fleet Building Addition

Table of Contents

1. Instructions to Bidders

The City of Grand Junction is soliciting competitive bids from qualified and interested companies for all labor, equipment, and materials required to construct the Fleet Building Addition according to the Plans and Specifications. All dimensions and scope of work should be verified by Contractors prior to submission of bids.

1.1. Site Visit/Briefing: Prospective bidders are encouraged to attend a site visit by appointment by contacting **Jim Stavast, Facilities Superintendant, at 970-270-7367**. The purpose of this visit will be to inspect and to clarify the contents of this Invitation for Bids (IFB).

1.2. Delivery of Bids: Contractor shall submit a copy of their bid in a sealed envelope marked **IFB-2702-08-SDH, due date, and the bidders name** clearly indicated on the envelope. The due date, time, and address are listed on the front page of this IFB. Late bids will not be considered. Bids will be received and publicly acknowledged at the location, date and time stated. Bidders, their representatives and interested persons may be present. Bids shall be received and acknowledged only so as to avoid disclosure of process. However, all bids shall be open for public inspection after the contract is awarded. Trade secrets and confidential information contained in the bid so identified by Offeror as such will be treated as confidential by the City of Grand Junction (City) to the extent allowable in the Open Records Act.

1.3. Printed form for Price Proposal: All Price Bids must be made upon the Contractor's Bid Form attached, and should give the amounts both in words and in figures, and must be signed and acknowledged by the bidder.

1.4. Exclusions: No oral, telephonic, emailed, or facsimile bid will be considered

1.5. Contract Documents: The complete IFB and bidder's response compose the Contract Documents. Copies of these documents can be obtained from the Purchasing Division, **2549 River Road, Grand Junction, CO 81501, 970-244-1533.**

1.6. Examination of Specifications: Bidders shall thoroughly examine and be familiar with the project Statement of Work. The failure or omission of any Offeror to receive or examine any form, addendum, or other document shall in no way relieve any Offeror from any obligation with respect to his bid. The submission of a bid shall be taken as evidence of compliance with this section.

1.7. Questions regarding Statement of Work: Any information relative to interpretation of Scope of Work or specifications shall be requested of the Purchasing Representative, in writing, in ample time prior to the response time.

1.8. Addenda & Interpretations: If it becomes necessary to revise any part of this solicitation, a written addendum will be sent to all known to have received plans & Specifications. The City is not bound by any oral representations, clarifications, or changes made in the written specifications by City employees, unless such clarification or change is provided to bidders in written addendum form from the City Purchasing Representative. Bidders shall acknowledge receipt of addenda on Contractor's Bid Form & Bidder's Proposal.

1.9. Taxes: The City is exempt from State retail and Federal tax. The bid price must be net, exclusive of taxes.

1.10. Prices: In the event of a discrepancy between the prices stated in words and those in figures, the words shall control.

1.11. Offers Binding 60 Days: Unless otherwise specified, all formal offers submitted shall be binding for sixty (60) calendar days following opening date, unless the Offeror, upon request of the Purchasing Representative, agrees to an extension.

1.12. Assignment: The bidder shall not sell, assign, transfer or convey any contract resulting from this IFB, in whole or in part, without prior written approval from the City.

1.13. Collusion Clause: Each bidder by submitting a bid certifies that it is not party to any collusive action or any action that may be in violation of the Sherman Antitrust Act. Any and all bids shall be rejected if there is evidence or reason for believing that collusion exists among bidders. The City may, or may not, at the discretion of the City's Purchasing Representative, accept future bids for the same services or commodities from participants in such collusion.

1.14. Public Disclosure Record: If the bidder has knowledge of their employee(s) or sub-contractors having an immediate family relationship with a City employee or elected official, the bidder must provide the Purchasing Representative with the name(s) of these individuals. These individuals are required to file an acceptable "Public Disclosure Record", a statement of financial interest, before conducting business with the City.

2. General Contract Conditions for City Construction Projects

2.1. The Contract: The Contract Documents for the Contract. The contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral, including the Proposal documents. The contract may be amended or modified with Change Orders, Field Orders, or Addendums.

2.2. The Work: The term Work includes all labor necessary to produce the construction required by the Contract Documents, and all materials and equipment incorporated or to be incorporated in such construction.

2.3. Execution, Correlation, Intent, and Interpretations: The Contract Documents shall be signed in not less than triplicate by the Owner (City) and Contractor. City will provide the contract. By executing the contract, the Contractor represents that he/she has visited the site, familiarized himself with the local conditions under which the Work is to be performed, and correlated his observations with the requirements of the Contract Documents. The Contract Documents are complementary, and what is required by any one, shall be as binding as if required by all. The intention of the documents is to include all labor, materials, equipment and other items necessary for the proper execution and completion of the scope of work as defined in the technical specifications and drawings contained herein. All drawings, specifications and copies furnished by the City are, and shall remain, City property. They are not to be used on any other project, and with the exception of one contract set for each party to the contract, are to be returned to the owner on request at the completion of the work.

2.4. The Owner: The Owner is the City of Grand Junction, Colorado and is referred to throughout the Contract Documents. The term Owner means the Owner or his authorized representative. The Owner shall, at all times, have access to the work wherever it is in preparation and progress. The Contractor shall provide facilities for such access. The Owner will make periodic visits to the site to familiarize himself generally with the progress and quality of work and to determine, in general, if the work is proceeding in accordance with the contract documents. Based on such observations and the Contractor's Application for Payment, the Owner will determine the amounts owing to the Contractor and will issue Certificates for Payment in such amounts, as provided in the contract. The Owner will have authority to reject work which does not conform to the Contract documents. Whenever, in his reasonable opinion, he considers it necessary or advisable to insure the proper implementation of the intent of the Contract Documents, he will have authority to require the Contractor to stop the work or any portion, or to require special inspection or testing of the work, whether or not such work can be then be fabricated, installed, or completed. The Owner will not be responsible for the acts or omissions of the Contractor, and sub-Contractor, or any of their agents or employees, or any other persons performing any of the work.

2.5. Contractor: The Contractor is the person or organization identified as such in the Agreement and is referred to throughout the Contract Documents. The term Contractor means the Contractor or his authorized representative. The Contractor shall carefully study and compare the General Contract Conditions of the Contract, Specification and Drawings, Scope of Work, Addenda and Modifications and shall at once report to the Owner any error, inconsistency or omission he may discover. Contractor shall not be liable to the Owner for any damage resulting from such

errors, inconsistencies or omissions. The Contractor shall not commence work without clarifying Drawings, Specifications, or Interpretations.

2.6. Sub-Contractors: A sub-contractor is a person or organization who has a direct contract with the Contractor to perform any of the work at the site. The term sub-contractor is referred to throughout the contract documents and means a sub-contractor or his authorized representative.

2.7. Award of Sub-Contractors & Other Contracts for Portions of the Work: As soon as practicable after bids are received and prior to the award of the contract, the successful Offeror shall furnish to the Owner, in writing for acceptance, a list of the names of the sub-contractors or other persons or organizations proposed for such portions of the work as may be designated in the proposal requirements, or, if none is so designated, the names of the sub-contractors proposed for the principal portions of the work. Prior to the award of the contract, the owner shall notify the successful Offeror in writing if, after due investigation, has reasonable objection to any person or organization on such list. Failure of the Owner to make an objection to any person or organization on the list prior to the award shall constitute acceptance of such person or organization. If, prior to the award of the contract, the Owner has a reasonable and substantial objection to any person or organization on such list, and refuses in writing to accept such person or organization, the successful Offeror may, prior to the award, withdraw their proposal without forfeiture of proposal security. If the successful Offeror submits an acceptable substitute with an increase in the proposed price to cover the difference in cost occasioned by the substitution, the Owner may, at their discretion, accept the increased proposal or may disqualify the Offeror. If, after the award, the Owner refuses to accept any person or organization on such list, the Contractor shall submit an acceptable substitute and the contract sum shall be increased or decreased by the difference in cost occasioned by such substitution and an appropriate Change Order shall be issued. However, no increase in the contract sum shall be allowed for any such substitution unless the Contractor has acted promptly and responsively in submitting a name with respect thereto prior to the award.

2.8. Supervision and Construction Procedures: The Contractor shall supervise and direct the work, using his best skill and attention. He shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the work under the contract.

2.9. Warranty: The Contractor warrants to the Owner that all materials and equipment furnished under this contract will be new unless otherwise specified, and that all work will be of good quality, free from faults and defects and in conformance with the Contract Documents. All work not so conforming to these standards may be considered defective. If required by Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. If within ten (10) days after written notice to the Contractor requesting such repairs or replacement,

the Contractor should neglect to make or undertake with due diligence to the same, the City may make such repairs or replacements. All indirect and direct costs of such correction or removal or replacement shall be at the Contractor's expense. The Contractor will also bear the expenses of making good all work of others destroyed or damaged by the correction, removal or replacement of his defective work.

2.10. Permits, Fees, & Notices: The Contractor shall secure and pay for all permits, governmental fees and licenses necessary for the proper execution and completion of the work. The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations and orders of any public authority bearing on the performance of the work. If the Contractor observes that any of the Contract Documents are at variance in any respect, he shall promptly notify the Owner in writing, and any necessary changes shall be adjusted by approximate modification. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Owner, he shall assume full responsibility and shall bear all costs attributable.

2.11. Responsibility for those Performing the Work: The Contractor shall be responsible to the Owner for the acts and omissions of all his employees and all sub-contractors, their agents and employees, and all other persons performing any of the work under a contract with the Contractor.

2.12. Bid Bond: Each Bid shall as a guaranty of good faith on the part of the Bidder be accompanied by a Bid Guaranty consisting of: a certified or cashier's check drawn on an approved national bank or trust company in the state of Colorado, and made payable without condition to the City; or a **Bid Bond** written by an approved corporate surety in favor of the City. The amount of the Bid Guaranty shall not be less than 5% of the total Bid amount. Once a Bid is accepted and a Contact is awarded, the apparent successful bidder has ten calendar days to enter into a contractor in the form prescribed and to furnish the bonds with a legally responsible and approved surety. Failure to do so will result I forfeiture of the Bid Guaranty to the City as Liquidated Damages.

2.13. Performance & Payment Bonds: Contractor shall furnish a Performance and a Payment Bond, each in an amount at least equal to that specified for the contract amount as security for the faithful performance and payment of all Contractor's obligations under the Contract Documents. These bonds shall remain in effect for the duration of the Warranty Period (as specified in the Special Conditions). Contractor shall also furnish other bonds that may be required by the Special Conditions. All bonds shall be in the forms prescribed by the Contract Documents and be executed by such sureties as (1) are licensed to conduct business in the State of Colorado and (2) are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the

Audit Staff, Bureau of Accounts, U.S. Treasury Department. All bonds singed by an agent must be accompanied by a certified copy of the Authority Act. If the surety on any bond furnished by the Contractor is declared bankrupt, or becomes insolvent, or its rights to do business in Colorado are terminated, or it ceases to meet the requirements of clauses (1) and (2) of this section, Contractor shall within five (5) days thereafter substitute another bond and surety, both of which shall be acceptable to the City.

2.14. Progress Schedule: The Contractor, if required, immediately after being awarded the contract, shall prepare and submit for the Owner's approval an estimated progress schedule for the work. The progress schedule shall be related to the entire project to the extent required by the contract documents. This schedule shall indicate the dates for the starting and completion of the various stages of construction and shall be revised as required by the conditions of the work, subject to the Owner's approval.

2.15. Use of the Site: The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents, and shall not unreasonably encumber the site with any materials or equipment.

2.16. Cleanup: The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations. At the completion of work he shall remove all his waste materials and rubbish from and about the project, as well as all his tools, construction equipment, machinery and surplus materials.

2.17. Insurance Requirements: The Contractor agrees to procure and maintain, at his own cost, a policy or policies of insurance sufficient to insure against all liability, claims, demands, and other obligations assumed by the Contractor pursuant to this section. Such insurance shall be in addition to any other requirements imposed by this contract or by law. The Contractor shall not be relieved of any liability, claims, demands, or other obligations assumed pursuant to this section by reason of his failure to procure or maintain insurance in sufficient amounts, durations, or types.

2.17.1. Commercial General Liability Insurance Policy with minimum combined single limits of $1,000,000 per occurrence and $1,000,000 general aggregate for bodily injury and property damage, which coverage shall include products/completed operations, independent contractors and contractual liability each at $1,000,000 per occurrence. Coverage must be written on an occurrence form.

2.17.2. Comprehensive Automobile Liability Insurance, which includes coverage of all, owned, non-owned and rented vehicles with a minimum of $1,000,000 combined single limit for each occurrence.

2.17.3. Required limits may be satisfied by any combination of primary, excess or umbrella liability insurances, provided the primary policy complies with the above requirements and the excess umbrella is following form.

2.17.4. All insurance shall be purchased from an insurance company licensed to do business in Colorado that has a financial rating of B+ VII or better as assigned by the BEST Rating Company or equivalent.

2.18. Indemnification: The Offeror shall defend, indemnify and save harmless the City of Grand Junction, State of Colorado, and all it's officers, employees, insurers, and self-insurance pool, from and against all liability, suits, actions, or other claims of any character, name and description brought for or on account of any injuries or damages received or sustained by any person, persons, or property on account of any negligent act or fault of the Offeror, or of any Offeror's agent, employee, sub-contractor or supplier in the execution of, or performance under, any contract which may result from proposal award. Offeror shall pay any judgment with cost which may be obtained against the City growing out of such injury or damages.

2.19. Miscellaneous Conditions: Material Availability: Bidders must accept responsibility for verification of material availability, production schedules, and other pertinent data prior to submission of bid. It is the responsibility of the bidder to notify the City immediately if materials specified are discontinued, replaced, or not available for an extended period of time. OSHA Standards: All bidders agree and warrant that services performed in response to this invitation shall conform to the standards declared by the US Department of Labor under the Occupational Safety and Health Act of 1970 (OSHA). In the event the services do not conform to OSHA standards, the City may require the services to be redone at no additional expense to the City.

2.20. Time: The Contract Time is the period of time allotted in the Contract Documents for completion of the work. The date of commencement of the work is the date established in a Notice to Proceed. If there is no Notice to Proceed, it shall be the date of the Contract or such other date as may be established therein, or as established as entered on the Price Proposal Form. The Date of Substantial Completion of the work or designated portions thereof is the date certified by the Owner when construction is sufficiently complete, in accordance with the Contract Documents.

2.21. Progress & Completion: The Contractor shall begin work on the date of commencement as defined in the Contract, and shall carry the work forward expeditiously with adequate forces and shall complete it within the contract time.

2.22. Delays & Extensions of Time: If the contract is delayed at any time in the progress of the work by any act or neglect of the Owner, by any employee of the Owner, by any separate contractor employed by the Owner, by changes ordered in the work, by labor disputes, fire, unusual delay in transportation, unavoidable

casualties, or any cause beyond the Contractor's control, or by delay authorized by the Owner pending arbitration, or by any cause which the Owner determines may justify the delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Owner may determine. All claims for extension of time shall be made in writing to the Owner no more than fifteen (15) days after the occurrence of the delay otherwise they shall be waived. In the case of the continuing cause of delay only one claim is necessary.

2.23. Payment & Completion: The Contract Sum is stated in the Contract and is the total amount payable by the Owner to the Contractor for the performance of the work under the Contract Documents. Upon receipt of written notice that the work is ready for final inspection and acceptance and upon receipt of application for payment, the City of Grand Junction's Project Manager will promptly make such inspection and, when he finds the work acceptable under the Contract Documents and the Contract fully performed, the Owner shall make payment in the manner provided in the Contract Documents. Partial payments will be based upon estimates, prepared by the Contractor, of the value of Work performed and materials placed in accordance with the Contract Documents.

2.24. Retention: The City will deduct money from the partial payments in amounts considered necessary to protect the interest of the City and will retain this money until after completion of the entire contract. The amount to be retained from partial payments will be ten (10) percent of the value of the completed work, but not greater than five (5) percent of the amount of the Contract. When the retainage has reached five (5) percent of the amount of the Contract no further retainage will be made and this amount will be retained until such time as final payment is made.

2.25. Protection of Persons & Property: The Contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss. He shall erect and maintain, as required by existing safeguards for safety and protection, and all reasonable precautions, including posting danger signs or other warnings against hazards promulgating safety regulations and notifying owners and users of adjacent utilities. When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct by the Contractor in the execution of the work, or in consequence of the non-execution thereof by the Contractor, he shall restore, at his own expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, rebuilding, or otherwise restoring as may be directed, or it shall make good such damage or injury in an acceptable manner.

2.26. Changes in the Work: The Owner, without invalidating the contract, may order changes in the work within the general scope of the contract consisting of additions, deletions or other revisions, the contract sum and the contract time being adjusted

accordingly. All such changes in the work shall be authorized by Change Order and shall be executed under the applicable conditions of the contract documents. A Change Order is a written order to the Contractor signed by the Owner issued after the execution of the contract, authorizing a change in the work or an adjustment in the contract sum or the contract time. The contract sum and the contract time may be changed only by Change Order.

2.27. Claims for Additional Cost or Time: If the Contractor wishes to make a claim for an increase in the contract sum or an extension in the contract time, he shall give the Owner written notice thereof within a reasonable time after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute the work, except in an emergency endangering life or property in which case the Contractor shall precede in accordance with the regulations on safety. No such claim shall be valid unless so made. Any change in the contract sum or contract time resulting from such claim shall be authorized by Change Order.

2.28. Minor Changes in the Work: The Owner shall have authority to order minor changes in the work not involving an adjustment in the contract sum or an extension of the contract time and not inconsistent with the intent of the contract documents.

2.29. Field Orders: The Owner may issue written Field Orders which interpret the Contract Documents in accordance with the specifications, or which order minor changes in the work in accordance with the agreement, without change in the contract sum or time. The Contractor shall carry out such Field Orders promptly.

2.30. Uncovering & Correction of Work: The Contractor shall promptly correct all work rejected by the Owner as defective or as failing to conform to the contract documents whether observed before or after substantial completion and whether or not fabricated installed or competed. The Contractor shall bear all costs of correcting such rejected work, including the cost of the Owner's additional services thereby made necessary. If within one (1) year after the date of completion or within such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the contract documents, any of the work found to be defective or not in accordance with the contract documents, the Contractor shall correct it promptly after receipt of a written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discover of condition. All such defective or non-conforming work under the above paragraphs shall be removed from the site where necessary and the work shall be corrected to comply with the contract documents without cost to the Owner. The Contractor shall bear the cost of making good all work of separate Contractors destroyed or damaged by such removal or correction. If the Owner prefers to accept defective or non-conforming work, he may do so instead of requiring its removal and correction, in which case a Change Order will be issued to reflect an appropriate reduction in

the payment or contract sum, or, if the amount is determined after final payment, it shall be paid by the Contractor.

3. Scope of Work/Special Conditions

3.1. General: The City of Grand Junction is soliciting competitive bids from licensed, qualified and interested companies for all labor, equipment, and materials required to construct the Fleet Building Addition according to the Plans and Specifications.

3.2. Plans & Specifications: See Johnson-Carter Architect Plan and Specification Set #0801G. Plans will be available at the City of Grand Junction Purchasing Division. Plan sets require a $75 deposit per plan set. Bidders are welcome, at their own cost, to make copies of the plan sets.

3.3. Project Schedule:

• Bid Documents Available	April 23, 2008
• Last Day for Questions	May 8, 2008
• Bid Opening	May 13, 2008
• City Council Approval	May 19, 2008
• Notice to Proceed	May 20, 2008
• Begin Construction	June 2, 2008
• Substantial Completion	October 31, 2008
• Final Completion	November 7, 2008

3.4. Site Visit by Appointment: Jim Stavast, Facilities Superintendent 270-7367.

3.5. Bidding Submittal Documents: Include the following completed documents with your submission.

- ✓ **Contractor's Bid Form**
- ✓ **Bid Schedule**
- ✓ **Bidder's Proposal**
- ✓ **Bid Bond**

4. Contractor's Bid Form

Proposal Date: _____

City of Grand Junction Project: Fleet Building Addition

Bidding Company: _____

Name of Authorized Agent: _____

Telephone_____ **Address**_____

City_____**State**_____**Zip**_____

The undersigned Bidder, in compliance with the Invitation for Bids, having examined the Instruction to Bidders, General Contract Conditions, Statement of Work, Specifications, and any and all Addenda thereto, having investigated the location of, and conditions affecting the proposed work, hereby proposes to furnish all labor, materials and supplies, and to perform all work for the Project in accordance with Contract Documents, within the time set forth and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the Contract Documents, of which this Contractor's Bid Form is a part.

The undersigned Offeror does hereby declare and stipulate that this offer is made in good faith without collusion or connection to any person(s) providing an offer for the same work, and that it is made in pursuance of, and subject to, all terms and conditions of the Instructions to Bidders, the Specifications, and all other Solicitation Documents, all of which have been examined by the undersigned.

The Offeror also agrees that if awarded the Contract, to provide insurance certificates within ten (10) working days of the date of Notification of Award. Submittal of this offer will be taken by the Owner as a binding covenant that the Offeror will be prepared to complete the project in its entirety.

The City of Grand Junction reserves the right to make the award on the basis of the offer deemed most favorable, to waive any formalities or technicalities and to reject any or all offers. It is further agreed that this offer may not be withdrawn for a period of sixty (60) calendar days after closing time. Submission of clarifications and revised offers automatically establish a new thirty day (30) period.

RECEIPT OF ADDENDA: the undersigned Offeror acknowledges receipt of the following Addenda to the Solicitation, Specifications, Drawings and other Contract Documents.

Addendum No._____ Dated: _____ By: _____

Addendum No._____ Dated: _____ By: _____

Addendum No._____ Dated: _____ By: _____

BID SCHEDULE:

BIDDER'S PROPOSAL:

CITY OF
Grand Junction
COLORADO

PURCHASING DIVISION

Contact:
Scott Hockins, Purchasing Supervisor
(970) 244-1484

LEGAL NOTICE

Acct. No. 205712
Published: ***The Daily Sentinel***
DATE: April 23, 27, May 4, 2008

INVITATION FOR BIDS

IFB-2702-08-SDH
Fleet Building Addition

The City of Grand Junction is inviting competitive sealed bids for the construction of Fleet Building Addition. Construction proposals will be received for one prime contract, including general, mechanical, and electrical work.

IFB Solicitation documents are available by contacting the City Purchasing Division, 2549 River Road, Grand Junction CO. 81501, telephone (970) 244-1484. Drawings will be available at the City of Grand Junction Purchasing Division for a deposit of $75 per plan set and specification book.

The City of Grand Junction will receive sealed bids at the Purchasing Division Office located at 2549 River Road, Grand Junction, CO. 81501, until 2:00 p.m. local prevailing time, May 13, 2008. The bids will be received and be publicly opened and read aloud. No bids shall be received after the specified hour and bids which are not prepared and filed strictly in accordance with the "Contract Documents" may be rejected.

The City reserves the right to waive irregularities and to reject any or all bids.

Scott Hockins
Purchasing Supervisor

End of Public Notice

BID BOND

KNOW ALL MEN BY THESE PRESENTS,

that we, _____ (___ an individual, ___ a partnership, ___ a corporation incorporated in the State of _____ _____) as Principal, and _____ _____ (incorporated in the State of _____) as Surety, are held and firmly bound unto the City of Grand Junction, Colorado, (hereinafter called "City") in the penal sum of _____ dollars ($ ____ _____), lawful money of the United States, for the payment of which sum we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that WHEREAS the Principal has submitted the accompanying Bid dated _____for construction of _____ _____ (the Project) for the City and

WHEREAS, the City has required as a condition for receiving said Bid that the Principal deposit with the City either a cashier's check or a certified check equivalent to not less than five percent of the amount of said Bid or in lieu thereof furnish a Bid Bond for said amount conditioned that in event of a failure to execute the proposed Contract for such construction and to provide the required Performance and Payment Bonds and Insurance Certificates if the Contract be awarded to the Bidder, that said sum be paid immediately to the City as Liquidated Damages and not as a penalty for the Principal's failure to perform.

NOW, THEREFORE, if the Principal shall, within the period specified therefore, on the attached prescribed forms presented to the Bidder for signature, enter into a written Contract with the City in accordance with said Bid as accepted, and give Performance and Payment Bonds with good and sufficient Surety, or Sureties, as may be required upon the forms prescribed by the City, for the faithful performance and the proper fulfillment of said Contract, provide Certificates of Insurance as required by said Contract, and provide all other information and documentation required by the Contract Documents, then this obligation shall be void and of no effect, otherwise to remain in full force and effect. In the event suit is brought upon this bond by the City and the City prevails, the principal and surety shall pay all costs incurred by the City in such suit, including reasonable attorneys' fees and costs to be fixed by the Court.

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

Dated this _____ day of _____, 20___.

Principal: _____

Address: _____

_____

Signed: _____ (seal)

Title: _____

Surety: _____

Address: _____

_____

Signed: _____ (seal)

Title: _____

INSTRUCTIONS FOR COMPLETING BID BOND

1. The full legal name and residence of each individual executing this Bond as Principal must be inserted in the first paragraph.

2. If the Principal is a partnership, the full name of the partnership and all individuals must be inserted in the first paragraph which must recite that individuals are partners composing the partnership, and all partners must execute the Bond as individuals.

3. The State of incorporation of each corporate Principal or Surety to the Bond must be inserted in the first paragraph and the Bond must be executed under the corporate seal of said party attested by its secretary or other appropriate officer.

Attach a copy of the power-of-attorney for the Surety's agent.

BIDDER'S PROPOSAL

In compliance with the Invitation for Bid of Johnson-Carter Architects, P.C., on behalf of The City of Grand Junction, dated May 13, 2008, and subject to all the conditions thereof, the undersigned:

_____

Name of Bidder

Organized and existing under the laws of the State of _____, doing business as:

_____

Corporation/Partnership/Individual

1 Hereby proposes to perform all work for the construction of the Grand Junction Fleet Addition, in Grand Junction, Colorado, as depicted in construction documents, specifications, and addenda.

2 The undersigned Bidder does hereby declare and stipulate that this Proposal is made in good faith, without collusion or connection with any other person or persons bidding for the same work, and that it is made in pursuance of and subject to all the terms and conditions of the Invitation for Bid, Instruction to Bidders, the Construction Contract, the detailed Specifications and the Plans pertaining to the work to be done, all of which have been examined by the undersigned.

3 All the various phases of work enumerated in the detailed Specifications with their individual jobs and overhead, whether specifically mentioned, included by implication or appurtenant thereto, are to be by the Contract under one of the items listed in the Bid Schedule, irrespective of whether it is named in said list.

4 Payment for work performed will be in accordance with the Bid Schedule, subject to changes as provided for in the Construction Contract.

5 Contractor has taken into consideration coordination and scheduling requirements in regard to other Prime Contractors involved in the Project, recognizes the certification requirements of The City of Grand Junction, and understands that construction phasing will be necessary to ensure continuous operation of the existing facility, as outlined by the Owner.

6 Contractor has reviewed document Instructions to Bidders and has included a signed AIA A312 document "Performance Bond" and included the cost of said bond under General Requirements on the Bid Schedule.

7 The bidder acknowledges receipt of the following Addenda:

_____

(list Addenda by number; if none, so state)

(Continued on next page)

8 Base Bid is for General Construction:

THE TOTAL BASE BID IS:

_____($_____)

Contractor: _____

By: _____

Title: _____

Address: _____

Phone: _____

Fax: _____

Contractor License No.: _____

Addendum #1

- Date: Monday, May 05, 2008
- Re: Addendum No.1
- Project: Grand Junction Fleet Addition
- Drawings Issued: April 16, 2008
- To: All bidders
- From: Jeff Johnson Architectural, PC
  634 Main, Suite 2
  Grand Junction, CO 81501
  (970)257-1970

- This Addendum forms part of and modifies Bidding and Contract Documents for the project named above. Acknowledge receipt of this Addendum on the Bid Form.

- Where any original item called for in the Project Manual or indicated on the Drawings is supplemented by this addendum, the supplemental requirements shall supersede the previous item.

- Where any original item is amended, voided, or superseded hereby, the other provisions of such items not specifically amended, voided, or superseded shall remain in effect.

- This addendum consists of this document and the following attachments:

  Lintel Detail

1. Clarification
General Information, Existing shed and on site storage will be removed by owner prior to construction.

2. Clarification
General Information, an existing swamp cooler on the South wall of the existing building shall be removed by the contractor and returned to the Owner ass salvage.

3. Clarification
General Information, Contractor shall, upon site review, determine what portions of existing fence screen is salvageable, a new gate, however, shall be provided.

4. Clarification
General Information, Owner is responsible for fees associated with expanded utilities such as gas, water, sewer and electric services. Owner is responsible for fees required by City Planning.

5. Clarification
Sheet C10, Construction Note #367 indicating a 500 Gallon oil/water separator, is correct. Sheet P1-1 Flag Note #1 indicates a 1,500 Gallon two compartment sand/oil interceptor. This Note shall indicate a 500 Gallon oil/water separator.

6. Clarification
Sheet C10, Bid is to be based on the scaled area for the asphalt patch that is depicted on the drawings.

7. Change
Sheet A2.1, Plan 2/A2.1, the thickened slab under the lift does not have to be isolated.

8. Clarification
Sheet A2.1, Plan 2/A2.1, The concrete aprons are 6" thick and receive the same reinforcing as the internal slab

9. Addition
Sheet A41, New overhead doors shall have a high headroom kit, similar to existing.

10. Addition
Sheet A5.1, The perimeter expansion joint receives joint sealant above non compressible fill.

11. Change
Sheet A6.1, Assembly Detail PE6, Provide 5/8" exterior grade gypsum for parapet backing, attached to HSS 2 x 2 x 1/8" horiz. at 16" o.c. min.

12. Clarification
Sheet S1, The control joints in the slab are not to receive joint sealant.

13. Addition/ Clarification
Sheet S1, Detail 1/S1, What is the size and count for the bottom rebar: (4) #5 continuous; slab on grade is reinforced with #5 @ 18" O.C.E.W.

14. Clarification
Sheet S1, Detail 2/S1, The mono edge through the overhead doors is not doweled to the concrete aprons, there is no angle iron edge indicated.

15. Clarification
Sheet S1, Detail 3/S1, Parapet outside of steel to outside of steel width = 9 1/4"; no attachment to brick.

16. Change
17. Sheet S1, details 3/S1 & 5/S1, embed plate sizes shall be changed to 6" x 8" x 1/4" w/ (2) 3/8" x 4" H.A.S.

18. Clarification
Sheet S1, Detail 6/S1, The CMU is not attached to the steel columns, maintain a 7/8" gap between the column flanges and the CMU.

19. Clarification
Sheet S1, Detail 7/S1, W-beam headers have 6" bearing at each endon fully grouted CMU cells w/ (1) 5/8" dia. X 7" expansion anchor in slotted hole at each end of beam on opposite sides of web.

20. Addition
Sheet S3, Dimensions of center to center for the columns is 26'-0 3/4"

21. Clarification
Sheet S3, The 8" thickened slab under the bathroom perimeter walls is 12" min. width at base and 45 degree taper to 6" slab.

22. Clarification
Sheet S4, Top of CMU wall slopes with the roof at bearing height for the joists. The joists bear on masonry embed plates (similar to detail 3/S1) @ 6'-0" o.c., HSS 2.5 between each joist welded at each end to embed plates, and 1 1/2" steel deck attached to HSS and joists.

23. Addition
See attached structural detail, Lintel section for personnel doors, windows & louvers.

24. Clarification
Sheet P1-1, The bathroom vent pipes above the deck are to be left exposed.

25. Change
Sheet P1-1, The waste line from the bathroom groups will connect downstream of the sand oil interceptor.

26. Clarification
Sheet P1-1, TD-1 drain troughs shall be JR Smith #9812 pre-sloped fiberglass, 8" width, 72" long with load class "C" slotted cast iron grates, flush with concrete slab.

27. Clarification
Specification Section 02455, Contractor shall bid a 10'-0" length per helical. Refer to addendum letter, included with original specifications, from Soils engineer regarding helical piers.

28. Change
Specification Section 03300, expansion joint material is 1/2" thick.

29. Deletion
Specification Section 03300, delete all references to vapor barrier.

30. Approved Equal
Specification Section 03300, Class 6 road base, 4" layer; is an acceptable alternative to screened rock. The 4" layer is included in the 30" section recommended by the Soils Report.

31. Deletion
Specification Section 07140, waterproofing application is not necessary on the grade beam.

32. Clarification
Specification Section 07191, penetrating sealer will not be placed on the grade beam. This section is for concrete floor treatment.

33. Approved Equal
Specification Section 07210, Insulfoam Type IV EPS insulation for foundation and exterior wall.

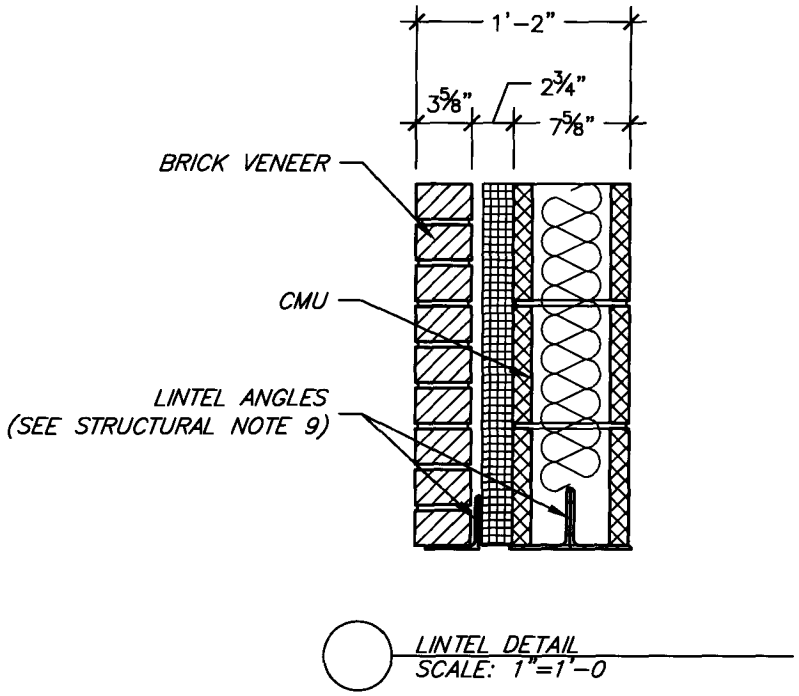
34. Approved Equal
Specification Section 07600, Manufacturers MBCI and Metal Sales; as approved flashing and the metal panels.

35. Deletion
Specification Section 07600, remove all references to white liner panel.

36. Clarification
Specification Section 08710, Contractor is responsible for re-keying the locksets.

37. Clarification
4 Post Lift, bid with extended track option, otherwise standard.

END OF DOCUMENT



LINTEL DETAIL
SCALE: 1"=1'-0

Grand Junction Fleet Addition Johnson Carter Architects, PC

Grand Junction, Colorado 0801G

Addendum #2

- Date: Friday, May 08, 2008
- Re: Addendum No.2
- Project: Grand Junction Fleet Addition
- Drawings Issued: April 16, 2008
- To: All bidders
- From: Jeff Johnson Architectural, PC
  634 Main, Suite 2
  Grand Junction, CO 81501
  (970)257-1970

- This Addendum forms part of and modifies Bidding and Contract Documents for the project named above. Acknowledge receipt of this Addendum on the Bid Form.
- Where any original item called for in the Project Manual or indicated on the Drawings is supplemented by this addendum, the supplemental requirements shall supersede the previous item.
- Where any original item is amended, voided, or superseded hereby, the other provisions of such items not specifically amended, voided, or superseded shall remain in effect.
- This addendum consists of this document and the following attachments:

Additional Architectural Detail
Detail 7/A51

Additional Electrical Specifications

Section 13851	Fire Alarm
Section 16051	Basic Elec. Matls. & Methods
Section 16060	Grounding & Bonding
Section 16075	Identification
Section 16100	Wiring Methods
Section 16140	Wiring Devices
Section 16141	Floor Boxes
Section 16150	Wiring Connections
Section 16400	Low Voltage Distribution
Section 16461	Dry Type Transformers
Section 16500	Lighting
Section 16700	Communications

Note to Bidders: due to size of additional specification sections, PDF files will be e-mailed to all plan holders on file with Grand junction. Architect will verify receipt of addendum #2 e-mail with each plan holder. This addendum will not be faxed to plan holders.

1. Addition
Specifications for Civil items such as for earthwork, underground utilities, site concrete, asphalt paving and landscaping shall follow City of Grand Junction Standard Contract Document parameters, which can be found on the following website:

http://www.gjcity.org/CityDeptWebPages/PublicWorksAndUtilities/Engineering/StandardContractDocuments.htm

2. Addition
General Information, Legs of overhead doors to be framed with 1/4" plate and 2" x 2" x 1/4" angle iron at each edge.

3. Clarification
Sheet C10, drainage pan is a V pan. The pan will be 6" thick with a 1.5" center flow line depression. There is no reinforcement in the pan.

4. Clarification
Sheet C10, construction note 636 indicates 4" concrete at the entrance to the fenced lot. The 100 note refers to reusing the existing gravel. It also refers to the reuse of existing gravel in the new landscaped areas. The existing gravel "washed rock" may not be sufficient to complete the landscaping requirements. If this is the case, the City will furnish the balance of the landscaping rock.

5. Clarification
Sheet C10, Irrigation: Irrigation water will be supplied from the building. A new irrigation line needs to be run from the landscaping area on the west side of the new building to the landscaping area at the north west corner of the existing building. This line shall be 1" in dia. and be sheaved inside a 4" PVC sheave. This additional irrigation work shall be included in the landscaping lump sum.

6. Clarification
Soils Report, Geo textile is not to be included in the bid. Contractor is responsible for removal of unstable or unsuitable soils.

7. Deletion
Sheet detail 2/A21, door schedule, door hardware: There shall be no door openings at the common wall between the existing building and this addition. Therefore door numbers M14 and M16 along with the hardware group associated with them, will be deleted

8. Addition
Sheet detail 2/A21, because the above doors are now deleted, additional infill wall will be required at existing openings. Use wall type "MIN" to close these openings.

9. Change
Sheet detail 1/A21, upper right corner, a section tag marked "8/A51" shall read "4/A51"

10. Change
Sheet A51, all references to RF1 roof assembly, "R-40 min." shall read "R-37 min."

11. Clarification
Sheet P1-1, The drainage areas should slope to the drains at about 1%. Drawings indicate a distance of approx. 8-'7" from the upper part of the drainage area to the trench drain lip, this would mean the top of the drain would be about 1" lower than the "grade" height.

12. Approved Equal
Specification Section 07500- Roofing Membrane; thermal plastic polyolefin (TPO), 45 mil, white exposure, fully adhered. Contractor and Manufacturer warranty to remain.

13. Approved Equal/ Change
Specification Section 07220, Other manufacturers may provide roof deck insulation if provided as an integral system with a TPO roof.
R Value: Minimum R-37, provide staggered layers to 6" thickness.

14. Addition
Specification Section 07410, Manufacturer Berridge, Deep Deck Panel; is approved for wall panel. Color, gauge, and flashing to match existing building's wall panel.

15. Deletion
Specification Section 13900; no fire sprinkler system

16. Clarification
4 Post Lift, extended track option to be added as indicated on the drawings (to the East). Contractor to provide a model TR-19, specification documentation indicates a different model.

END OF DOCUMENT

SECTION 13851

FIRE ALARM

PART 1 GENERAL

1.1 SUMMARY

A. Section includes fire alarm control panels, manual fire alarm stations, automatic smoke and heat detectors, fire alarm signaling appliances, and auxiliary fire alarm equipment and power and signal wire and cable.

B. Related Sections:
1. Section 13930 - Wet-Pipe Fire Suppression Sprinklers: Flow detection and alarm devices.
2. Section 16060 - Grounding and Bonding for Electrical Systems.
3. Section 16077 - Identification for Electronic Safety and Security.
4. Section 16123 - Building Wire and Cable.

1.2 REFERENCES

A. National Fire Protection Association:
1. NFPA 72 - National Fire Alarm Code.

1.3 SYSTEM DESCRIPTION

A. Fire Alarm System: NFPA 72, manual and automatic local fire alarm system with connections to municipal system. with connections to central station.

B. Alarm Sequence of Operation: Actuation of initiating device causes the following system operations:
1. Local fire alarm signaling devices sound and display with signal.
2. Non-coded signal transmits to central station.
3. Location of alarm zone indicates on fire alarm control panel and on remote annunciator panel.
4. Signal transmits to release door hold-open devices.
5. Signal releases electric door locks.

C. Drill Sequence of Operation: Manual drill function causes alarm mode sequence of operation.

D. Trouble Sequence of Operation: System or circuit trouble causes the following system operations:
1. Visual and audible trouble alarm indicates by zone at fire alarm control panel.
2. Visual and audible trouble alarm indicates at remote annunciator panel.
3. Trouble signal transmits to central station.

E. Zoning: As indicated on Drawings.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures:

B. Shop Drawings: Indicate system wiring diagram showing each device and wiring connection; indicate annunciator layout, and.

C. Product Data: Submit catalog data showing electrical characteristics and connection requirements.

D. Test Reports: Indicate procedures and results for specified field testing and inspection.

E. Manufacturer's Field Reports: Indicate activities on site, adverse findings, and recommendations.

1.5 CLOSEOUT SUBMITTALS

A. Section 01700 - Execution Requirements: Closeout procedures.

B. Project Record Documents: Record actual locations of fire alarm equipment.

C. Operation and Maintenance Data: Submit manufacturer's standard operating and maintenance instructions.

1.6 QUALITY ASSURANCE

A. Provide wiring materials located in plenums with peak optical density not greater than 0.5, average optical density not greater than 0.15, and flame spread not greater than 5 feet (1.5 m) when tested in accordance with NFPA 262.

B. Perform Work in accordance with NFPA standards.

C. Maintain one copy of each document on site.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience, and with service facilities within 100 miles of project.

B. Installer: Certified fire alarm installer with service facilities within 100 miles of Project.

1.8 MAINTENANCE SERVICE

A. Section 01700 - Execution Requirements: Maintenance service.

B. Furnish service and maintenance of fire alarm equipment for one year from Date of Substantial Completion.

1.9 MAINTENANCE MATERIALS

A. Section 01700 - Execution Requirements: Spare parts and maintenance products.

B. Furnish ten manual station break-glass rods.

C. Furnish six keys of each type.

1.10 EXTRA MATERIALS

A. Section 01700 - Execution Requirements: Spare parts and maintenance products.

B. Furnish three of each type of automatic smoke detector without base.

PART 2 PRODUCTS

2.1 CONTROL PANEL

A. Manufacturers:
   1. Notifier Model AFP 200.
   2. Substitutions: Section 01600 - Product Requirements.

B. Product Description: Modular fire alarm control panel with surface wall-mounted enclosure.

C. Power supply: Adequate to serve control panel modules, remote detectors, remote annunciators, relays, and alarm signaling devices. Include battery-operated emergency power supply with capacity for operating system in standby mode for 24 hours followed by alarm mode for 5 minutes.

D. System Supervision: Component or power supply failure places system in trouble mode.

E. Initiating Device Circuits: Supervised zone module with alarm and trouble indication; occurrence of single ground or open condition places circuit in trouble mode but does not disable circuit from initiating alarm.

F. Indicating Appliance Circuits: Supervised signal module, sufficient for signal devices connected to system; occurrence of single ground or open condition places circuit in trouble mode but does not disable circuit from signaling alarm.

G. Remote Station Signal Transmitter: Electrically supervised digital alarm communicator transmitter, capable of transmitting alarm and trouble signals over telephone lines to central station receiver.

H. Auxiliary Relays: Sufficient SPDT auxiliary relay contacts for each detection zone to provide accessory functions specified.

2.2 MANUAL FIRE ALARM STATIONS

A. Manufacturers:
   1. Notifier.
   2. Substitutions: Section 01600 - Product Requirements

B. Product Description: Manual double-action station with break-glass rod.

C. Mounting: Semi-Flush.

D. Type: Non-coded.

E. Backbox: Manufacturer's standard.

2.3 CEILING SMOKE DETECTOR

A. Manufacturers:
   1. Notifier Model.
   2. Substitutions: Section 01600 - Product Requirements.

B. Product Description: NFPA 72, photoelectric type ceiling smoke detector with the following features:
   1. Adjustable sensitivity.
   2. Plug-in base.
   3. Auxiliary relay contact.
   4. Integral thermal element rated 135 degrees F.
   5. Visual indication of detector actuation.

C. Mounting: 4 inch outlet box.

D. Furnish four-wire detector with separate power supply and signal circuits.

2.4 DUCT-MOUNTED SMOKE DETECTOR

A. Manufacturers:
   1. Notifier Model.
   2. Substitutions: Section 01600 - Product Requirements.

B. Product Description: NFPA 72, photoelectric type with the following features:
   1. Auxiliary SPDT relay contact.
   2. Key-operated normal-reset-test switch.
   3. Duct sampling tubes extending width of duct.
   4. Visual indication of detector actuation.
   5. Duct-mounted housing.

C. Furnish four-wire detector with separate power supply and signal circuits.

2.5 ALARM LIGHTS

A. Manufacturers:
   1. Notifier.
   2. Substitutions: Section 01600 - Product Requirements.

B. Product Description: NFPA 72, strobe lamp and flasher with red lettered "FIRE" on white lens.

2.6 ALARM HORN

A. Manufacturers:
   1. Notifier.
   2. Substitutions: Section 01600 - Product Requirements.

B. Product Description: NFPA 72, flush type fire alarm horn with the following features:
   1. Sound Rating: 87 dB at 10 feet.
   2. Integral strobe lamp and flasher with red lettered "FIRE" on white lens.

C. Product Description: Exterior mounted horn with the following features:
   1. Sound Rating: 96 dB at 10 feet.

2.7 REMOTE ANNUNCIATOR

A. Manufacturers:
   1. Notifier.
   2. Substitutions: Section 01600 - Product Requirements.

B. Product Description: Supervised remote annunciator including audible and visual indication of fire alarm by zone, and audible and visual indication of system trouble.

C. Mounting: Factory mounted in flush wall-mounted enclosure.

2.8 DOOR RELEASE

A. Manufacturers:
   1. Model.
   2. Substitutions: Section 01600 - Product Requirements.

B. Product Description: Magnetic door holder with integral diodes to reduce buzzing.

C. Coil voltage: 24 VDC

2.9 WIRE AND CABLE

A. Product Description: Power limited fire-protective signaling cable, copper conductor, 300 volts insulation rated 105 degrees C.

B. Cable Located Exposed in Plenums: Power limited fire-protective signaling cable classified for fire and smoke characteristics, copper conductor, 300 volts insulation rated 105 degrees C, suitable for use in air handling ducts, hollow spaces used as ducts, and plenums.

C. Fire alarm circuit conductors have insulation color or code as follows:
   1. Power Branch Circuit Conductors: Black, red, white.
   2. Initiating Device Circuit: Black, red.
   3. Detector Power Supply: Violet, brown.
   4. Signal Device Circuit: Blue (positive), white (negative).
   5. Door Release: Gray, gray.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01300 - Administrative Requirements: Coordination and project conditions.

B. Verify products and systems receiving devices are ready for installation.

3.2 INSTALLATION

A. Install manual station with operating handle 4 feet 6 inches feet above floor.

B. Install audible and visual signal devices 7 feet 6 inches feet above floor.

C. Install 14 AWG minimum size conductors for fire alarm detection and signal circuit conductors in cable.

D. Mount end-of-line device box with last device or separate box adjacent to last device in circuit.

E. Mount outlet box for electric door holder to withstand 80 pounds pulling force.

F. Connect conduit and wire to door release devices, sprinkler flow switches, sprinkler valve tamper switches, fire suppression system control panels, duct smoke detectors.

G. Automatic Detector Installation: Conform to NFPA 72.

H. Install engraved plastic nameplates in accordance with Section 16077.

I. Ground and bond fire alarm equipment and circuits in accordance with Section 16060.

3.3 FIELD QUALITY CONTROL

A. Section:Field inspecting, testing, adjusting, and balancing.

B. Test in accordance with NFPA 72 and local fire department requirements.

3.4 MANUFACTURER'S FIELD SERVICES

A. Section 01400 - Quality Requirements: Manufacturer's field services.

B. Include services of certified technician to supervise installation, adjustments, final connections, and system testing.

3.5 DEMONSTRATION AND TRAINING

A. Furnish 1 hours of instruction each for two persons, to be conducted at project site with manufacturer's representative.

END OF SECTION

SECTION 16050

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes grounding electrodes and conductors; bonding methods and materials; conduit and equipment supports, anchors and fasteners; and nameplates and wire markers.

1.2 SYSTEM DESCRIPTION

A. Grounding systems use metal underground pipe metal frame of building and driven ground rod as grounding electrodes. Grounding system connections use exothermic welds.

B. Select materials, sizes, and types of anchors, fasteners, and supports to carry loads of equipment and raceway, including weight of wire and cable in raceway. Anchor and fasten electrical products to building elements and finishes as follows:
   1. Concrete Structural Elements: Expansion anchors and preset inserts.
   2. Steel Structural Elements: Beam clamps, and welded fasteners.
   3. Concrete Surfaces: Self-drilling anchors and expansion anchors.
   4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Toggle bolts and hollow wall fasteners.
   5. Solid Masonry Walls: Expansion anchors and preset inserts.
   6. Sheet Metal: Sheet metal screws.
   7. Wood Elements: Wood screws.

C. Identify Electrical components as follows:
   1. Nameplate for each electrical distribution and control equipment enclosure.
   2. Wire marker for each conductor at panelboard gutters, pull boxes, and outlet and junction boxes.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's catalog data for grounding electrodes and connections; for fastening components; and nameplates, labels, and markers.

PART 2 PRODUCTS

2.1 ROD ELECTRODES

A. Manufacturers:
   1. Cooper Power Systems.
   2. Substitutions: Permitted.

B. Product Description: Copper or copper-clad steel, 3/4 inch diameter rod electrode, 10 feet in length.

2.2 NAMEPLATES

A. Product Description: Engraved three-layer laminated plastic nameplate, black letters on white background.

B. Letter Size:
1. 1/8 inch letters for identifying individual equipment and loads.
2. 1/4 inch letters for identifying grouped equipment and loads.

2.3 WIRE MARKERS

A. Product Description: tubing type wire markers with circuit or control wire number permanently stamped or printed.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install 3/4" x 10' rod electrodes at locations indicated.

B. Fabricate supports from structural steel or formed steel members.

C. Install sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

D. Install nameplate parallel to equipment lines. Secure nameplate to equipment front using screws or rivets.

END OF SECTION

SECTION 16060

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Rod electrodes.
   2. Wire.
   3. Mechanical connectors.
   4. Exothermic connections.

B. Related Sections:
   1. Concrete Reinforcement: Bonding or welding bars when reinforcing steel is used for electrodes.
   2. Section 13100 - Lightning Protection: Grounding of lightning protection system.

1.2 REFERENCES

A. Institute of Electrical and Electronics Engineers:
   1. IEEE 142 - Recommended Practice for Grounding of Industrial and Commercial Power Systems.
   2. IEEE 1100 - Recommended Practice for Powering and Grounding Electronic Equipment.

B. International Electrical Testing Association:
   1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

C. National Fire Protection Association:
   1. NFPA 70 - National Electrical Code.

1.3 SYSTEM DESCRIPTION

A. Grounding systems use the following elements as grounding electrodes:
   1. Metal underground water pipe.
   2. Metal building frame.
   3. Concrete-encased electrode.
   4. Rod electrode.

1.4 PERFORMANCE REQUIREMENTS

A. Grounding System Resistance: 5 ohms maximum.

1.5 SUBMITTALS

A. Section 01330 - Submittal Procedures:.

B. Product Data: Submit data on grounding electrodes and connections.

C. Test Reports: Indicate overall resistance to ground and resistance of each electrode.

D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.6 CLOSEOUT SUBMITTALS

A. Section 01700 - Execution Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of components and grounding electrodes.

1.7 QUALITY ASSURANCE

A. Provide grounding materials conforming to requirements of NEC, IEEE 142, and UL labeled.

B. Perform Work in accordance with State Municipality of Highways Public Work's standard.

C. Maintain one copy copies of each document on site.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing work of this section with minimum years documented experience approved by manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Section 01600 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

C. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

D. Do not deliver items to project before time of installation. Limit shipment of bulk and multiple-use materials to quantities needed for immediate installation.

1.10 COORDINATION

A. Section 01300 - Administrative Requirements: Requirements for coordination.

B. Complete grounding and bonding of building reinforcing steel prior concrete placement.

PART 2 PRODUCTS

2.1 ROD ELECTRODES

A. Manufacturers:
1. Apache Grounding/Erico Inc.
2. Copperweld, Inc.
3. Erico, Inc.
4. O-Z Gedney Co.
5. Thomas & Betts, Electrical.
6. Substitutions: Are Permitted.

B. Product Description:
1. Material: Copper-clad steel Copper.
2. Diameter: 3/4 inch.
3. Length: 10 feet.

C. Connector: U-bolt clamp.

2.2 WIRE

A. Material: Stranded copper.

B. Foundation Electrodes: 2 AWG.

C. Grounding Electrode Conductor: Copper conductor bare.

D. Bonding Conductor: Copper conductor bare.

2.3 MECHANICAL CONNECTORS

A. Manufacturers:
1. Apache Grounding/Erico Inc.
2. Copperweld, Inc.
3. Erico, Inc. Model.
4. ILSCO Corporation Model
5. O-Z Gedney Co.
6. Thomas & Betts, Electrical
7. Substitutions: Are Permitted.

B. Description: Bronze connectors, suitable for grounding and bonding applications, in configurations required for particular installation.

2.4 EXOTHERMIC CONNECTIONS

A. Manufacturers:
1. Apache Grounding/Erico Inc.
2. Cadweld, Erico, Inc.
3. Copperweld, Inc.
4. ILSCO Corporation
5. O-Z Gedney Co.
6. Thomas & Betts, Electrical
7. Substitutions: Are Permitted

B. Product Description: Exothermic materials, accessories, and tools for preparing and making permanent field connections between grounding system components.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01300 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify final backfill and compaction has been completed before driving rod electrodes.

3.2 PREPARATION

A. Remove paint, rust, mill oils, surface contaminants at connection points.

3.3 INSTALLATION

A. Install rod electrodes at locations as indicated on Drawings. Install additional rod electrodes to achieve specified resistance to ground.

B. Install grounding and bonding conductors concealed from view.

C. Install grounding electrode conductor and connect to reinforcing steel in foundation footing. Electrically bond steel together.

D. Bond together metal siding not attached to grounded structure; bond to ground.

E. Install grounding and bonding in patient care areas to meet requirements of NFPA 99.

F. Equipment Grounding Conductor: Install separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.

G. Bond to lightning protection system. Refer to Section 13100.

H. Install continuous grounding using underground cold water system and building steel as grounding electrode. Where water piping is not available, install artificial station ground by means of driven rods or buried electrodes.

I. Permanently ground entire light and power system in accordance with NEC, including service equipment, distribution panels, lighting panelboards, switch and starter enclosures, motor frames, grounding type receptacles, and other exposed non-current carrying metal parts of electrical equipment.

J. Install branch circuits feeding isolated ground receptacles with separate insulated grounding conductor, connected only at isolated ground receptacle, ground terminals, and at ground bus of serving panel.

K. Accomplish grounding of electrical system by using insulated grounding conductor installed with feeders and branch circuit conductors in conduits. Size grounding conductors in accordance with NEC. Install from grounding bus of serving panel to ground bus of served panel, grounding screw of receptacles, lighting fixture housing, light switch outlet boxes or metal enclosures of service equipment. Ground conduits by means of grounding bushings on terminations at panelboards with installed number 12 conductor to grounding bus.

L. Grounding electrical system using continuous metal raceway system enclosing circuit conductors in accordance with NEC.

M. Permanently attach equipment and grounding conductors prior to energizing equipment.

3.4 FIELD QUALITY CONTROL

A. Field inspecting, testing, adjusting, and balancing.

B. Inspect and test in accordance with NETA ATS, except Section 4.

C. Grounding and Bonding: Perform inspections and tests listed in NETA ATS, Section 7.13.

D. Perform ground resistance testing in accordance with IEEE 142.

E. Perform leakage current tests in accordance with NFPA 99.

F. Perform continuity testing in accordance with IEEE 142.

G. When improper grounding is found on receptacles, check receptacles in entire project and correct. Perform retest.

END OF SECTION

SECTION 16075

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Nameplates.
   2. Labels.
   3. Wire markers.
   4. Conduit markers.
   5. Stencils.
   6. Underground Warning Tape.
   7. Lockout Devices.

1.2 SUBMITTALS

A. Section 01330 - Submittal Procedures:

B. Product Data:
   1. Submit manufacturer's catalog literature for each product required.
   2. Submit electrical identification schedule including list of wording, symbols, letter size, color coding, tag number, location, and function.

C. Manufacturer's Installation Instructions: Indicate installation instructions, special procedures, and installation.

1.3 CLOSEOUT SUBMITTALS

A. Section 01700 - Execution Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of tagged devices; include tag numbers.

1.4 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Section 01600 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept identification products on site in original containers. Inspect for damage.

C. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

D. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Section 01600 - Product Requirements: Environmental conditions affecting products on site.

B. Install labels nameplates only when ambient temperature and humidity conditions for adhesive are within range recommended by manufacturer.

PART 2 PRODUCTS

2.1 NAMEPLATES

A. Manufacturers:
   1. Brady.
   2. Substitutions: Are Permitted.

B. Product Description: Laminated three-layer plastic with engraved black letters on white contrasting background color.

C. Letter Size:
   1. 1/8 inch high letters for identifying individual equipment and loads.
   2. 1/4 inch high letters for identifying grouped equipment and loads.

D. Minimum nameplate thickness: 1/8 inch.

2.2 LABELS

A. Manufacturers:
   1. Brady.
   2. Substitutions: Are Permitted.

B. Labels: Embossed adhesive tape, with 3/16 inch white letters on black background.

2.3 WIRE MARKERS

A. Manufacturers:

   1. Brady.
   2. Substitutions: Are Permitted.

B. Description: tubing type wire markers.

C. Legend:
   1. Power and Lighting Circuits: Branch circuit or feeder number as indicated on Drawings.
   2. Control Circuits: Control wire number as indicated on shop drawings.
   3. :

2.4 UNDERGROUND WARNING TAPE

A. Manufacturers:
   1. Brady.
   2. Substitutions: Are Permitted.

B. Description: 4 inch wide plastic tape, colored yellow with suitable warning legend describing buried electrical lines.

2.5 LOCKOUT DEVICES

A. Lockout Hasps:
   1. Manufacturers:
      a. Brady.
      b. Substitutions: Are Permitted.

PART 3 EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

B. Prepare surfaces in accordance with Section 09900 for stencil painting.

3.2 INSTALLATION

A. Install identifying devices after completion of painting.

B. Nameplate Installation:
   1. Install nameplate parallel to equipment lines.
   2. Install nameplate for each electrical distribution and control equipment enclosure with corrosive-resistant mechanical fasteners, or adhesive.
   3. Install nameplates for each control panel and major control components located outside panel with corrosive-resistant mechanical fasteners, or adhesive.
   4. Secure nameplate to equipment front using screws, rivets, or adhesive.
   5. Secure nameplate to inside surface of door on recessed panelboard in finished locations.
   6. Install nameplates for the following:
      a. Switchboards.
      b. Panelboards.
      c. Transformers.
      d. Service Disconnects.

C. Label Installation:
   1. Install label parallel to equipment lines.
   2. Install label for identification of individual control device stations.
   3. Install labels for permanent adhesion and seal with clear lacquer.

D. Wire Marker Installation:
   1. Install wire marker for each conductor at, pull boxes, outlet and junction boxes, and each load connection.
   2. Mark data cabling at each end. Install additional marking at accessible locations along the cable run.
   3. Install labels at data outlets identifying patch panel and port designation.

E. Underground Warning Tape Installation:
   1. Install underground warning tape along length of each underground conduit, raceway, or cable 6 to 8 inches below finished grade, directly above buried conduit, raceway, or cable.

END OF SECTION

SECTION 16100

WIRING METHODS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes building wire and cable, conduit and tubing, surface raceway, boxes, wiring devices, wiring connectors, and connections.

1.2 SYSTEM DESCRIPTION

A. Wiring Products:
   1. Solid conductor for feeders and branch circuits 10 AWG and smaller.
   2. Stranded conductors for control circuits.
   3. Conductor not smaller than 12 AWG for power and lighting circuits.
   4. Conductor not smaller than 16 AWG for control circuits.
   5. 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet.

B. Wiring Methods:
   1. Concealed Dry Interior Locations: Building wire, Type THHN/THWN insulation, in raceway.
   2. Exposed Dry Interior Locations: Building wire, Type THHN/THWN insulation, in raceway.
   3. Above Accessible Ceilings: Building wire, Type THHN/THWN insulation, in raceway.
   4. Wet or Damp Interior Locations: Building wire, Type THHN/THWN insulation, in raceway.
   5. Exterior Locations: Building wire, Type THHN/THWN insulation, in raceway.
   6. Underground Locations: Building wire, Type THHN/THWN insulation, in raceway.

C. Conductor sizes are based on copper.

D. Raceway and boxes are located as indicated on Drawings, and at other locations where required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements.

E. Raceway Products:
   1. Underground More than 5 Feet outside Foundation Wall: Use thin-wall nonmetallic conduit. Use cast metal boxes or nonmetallic handhole.
   2. Underground Within 5 Feet outside Foundation Wall: Use, thickwall nonmetallic conduit. Use cast metal boxes.
   3. In or Under Slab on Grade: Use thin-wall nonmetallic conduit. Use cast metal boxes.
   4. Outdoor Locations, Above Grade: Use rigid steel conduit. Use cast metal outlet, pull, and junction boxes.
   5. In Slab Above Grade: Use, electrical metallic tubing. Use sheet metal boxes.

6. Wet and Damp Locations: Use, electrical metallic tubing. Use cast metal or nonmetallic outlet, junction, and pull boxes. Use flush mounting outlet box in finished areas.
7. Concealed Dry Locations: Use, electrical metallic tubing. Use sheet-metal boxes. Use flush mounting outlet box in finished areas. Use hinged enclosure for large pull boxes.
8. Exposed Dry Locations: Use, electrical metallic tubing. Use sheet-metal boxes. Use flush mounting outlet box in finished areas. Use hinged enclosure for large pull boxes.

F. Minimum Raceway Size: 1/2 inch unless otherwise specified.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's catalog information for each wiring device.

1.4 QUALITY ASSURANCE

A. Provide wiring materials located in plenums with peak optical density not greater than 0.5, average optical density not greater than 0.15, and flame spread not greater than 5 feet (1.5 m) when tested in accordance with NFPA 262.

B. Maintain one copy of each document on site.

PART 2 PRODUCTS

2.1 SURFACE METAL RACEWAY

A. Manufacturers:
1. Wire Mold Model G4000.
2. Substitutions: Permitted.

B. Product Description: Sheet metal channel with fitted cover, suitable for use as surface metal raceway, with manufacturer's standard enamel finish. Furnish manufacturer's standard accessories; match finish on raceway.

2.2 WALL SWITCHES

A. Single Pole Switch:
1. Leviton Model 1221-2 .
2. Substitutions: Permitted.

B. Double Pole Switch:
1. Leviton Model 1222-2.
2. Substitutions: Permitted

C. Three-way Switch:
1. Leviton Model 1223-2.
2. Substitutions: Permitted.

D. Motion Switch:
   1. Leviton Model ODS10-ID.
   2. Substitutions: Permitted.

E. Pilot Light Switch:
   1. Leviton Model 1221-PL.
   2. Substitutions: Permitted

F. Color: by Architect.

2.3 WALL DIMMERS

A. Manufacturers:
   1. Lutron Model.
   2. Substitutions: Permitted.

B. Product Description: Semiconductor dimmer for incandescent lamps with ON-OFF switch independent of brightness setting.

C. Body and Handle: Plastic with linear slide. Color by Architect

D. Voltage: 120/ 277 volts.

2.4 RECEPTACLES

A. Single Convenience Receptacle:
   1. Leviton Model 5361.
   2. Substitutions: Permitted.

B. Duplex Convenience Receptacle:
   1. Leviton Model 5362.
   2. Substitutions: Permitted.

C. GFCI Receptacle:
   1. Leviton Model 6899.
   2. Substitutions: Permitted.

D. Color: by Architect.

2.5 WALL PLATES

A. Manufacturers:
   1. Leviton Model 8400.
   2. Substitutions: Permitted.

B. Decorative Cover Plate: Satin Finish stainless steel.

C. Jumbo Cover Plate: Satin Finish stainless steel.

D. Weatherproof Cover Plate: Stainless steel plate with hinged and gasketed device cover.

2.6 MULTIOUTLET ASSEMBLY

A. Manufacturers:
   1. Wiremold Model G4000.
   2. Substitutions: Permitted.

B. Multioutlet Assembly: Sheet metal channel with fitted cover, with pre-wired receptacles, suitable for use as multioutlet assembly. Furnish manufacturer's standard enamel finish.

C. Receptacles: NEMA WD 6, type 5-15R, single receptacle.

D. Receptacle Spacing: 18 inches on center.

E. Fittings: Furnish manufacturer's standard couplings, elbows, outlet and device boxes, and connectors.

PART 3 EXECUTION

3.1 INSTALLATION

A. Route raceway and cable to meet Project conditions.

B. Set wall mounted boxes at elevations to accommodate mounting heights indicated.

C. Adjust box location up to 10 feet prior to rough-in when required to accommodate intended purpose.

D. Do not install flush mounting box back-to-back in walls; install boxes with minimum 24 inches separation.

END OF SECTION

SECTION 16140

WIRING DEVICES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes wall switches; wall dimmers; receptacles; multioutlet assembly; and device plates and decorative box covers.

B. Related Sections:
   1. Section 16141 - Floor Boxes: Service fittings for receptacles installed on floor boxes.
   2. Section 16141 - Floor Boxes: Poke-through receptacles.

1.2 REFERENCES

A. National Electrical Manufacturers Association:
   1. NEMA WD 1 - General Requirements for Wiring Devices.
   2. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

1.3 SUBMITTALS

A. Section 01330 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit manufacturer's catalog information showing dimensions, colors, and configurations.

C. Samples: Submit two samples of each wiring device and wall plate illustrating materials, construction, color, and finish.

1.4 QUALIFICATIONS

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

PART 2 PRODUCTS

WALL SWITCHES

A. Manufacturers:
   1. Arrow Hart Wiring Devices
   2. Eagle Electric.
   3. Siemens Co..
   4. Leviton.
   5. Model.
   6. Substitutions: Section 01600 - Product Requirements.

B. Product Description: NEMA WD 1, Heavy-Duty, AC only general-use snap switch.

C. Body and Handle: Color by Architect, plastic with toggle handle.

D. Indicator Light: Lighted handle type switch; red color handle.

E. Locator Light: Lighted handle type switch; red color handle.

F. Ratings:
   1. Voltage: 120-277 volts, AC.
   2. Current: 20 amperes.

G. Ratings: Match branch circuit and load characteristics.

2.2 WALL DIMMERS

A. Manufacturers:
   1. Lutron.
   2. Eagle Electric.
   3. Siemens Co.
   4. Substitutions:Permitted.

B. Product Description: NEMA WD 1; Semiconductor dimmer for incandescent lamps, Type in schedule.

C. Body and Handle: Color by Architect, plastic with linear slide.

D. Voltage: 120/277 volts.

E. Power Rating: 1000 watts.

F. Accessory Wall Switch: Match dimmer appearance.

2.3 RECEPTACLES

A. Manufacturers:
   1. Arrow Hart Wiring Devices.
   2. Leviton.
   3. Siemens Co.
   4. Substitutions: Permitted.

B. Product Description: NEMA WD 1, Heavy-duty general use receptacle.

C. Device Body: Color by Architect, plastic.

D. Configuration: NEMA WD 6, type.

E. Convenience Receptacle: Type 5-20.

F. GFCI Receptacle: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements.

2.4 WALL PLATES

A. Manufacturers:
   1. Arrow Hart Wiring Devices Model.
   2. Leviton.
   3. Siemens Co. Model.
   4. Substitutions: Permitted.

B. Decorative Cover Plate: 302 stainless steel.

C. Jumbo Cover Plate: Satin Finish 302 stainless steel.

D. Weatherproof Cover Plate: Stainless steel plate with hinged and gasketed device cover.

2.5 MULTIOUTLET ASSEMBLY

A. Manufacturers:
   1. Arrow Hart Wiring Devices.
   2. Wiremold.
   3. Siemens Co. Model.
   4. Substitutions: Permitted.

B. Multi-outlet Assembly: Sheet metal channel with fitted cover, suitable for use as multi-outlet assembly.

C. Size:As indicated on Drawings.

D. Receptacles: Furnish covers and accessories to accept convenience receptacles specified in this Section.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01300 - Administrative Requirements: Coordination and project conditions.

B. Verify outlet boxes are installed at proper height.

C. Verify wall openings are neatly cut and completely covered by wall plates.

D. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

3.2 PREPARATION

A. Clean debris from outlet boxes.

3.3 INSTALLATION

A. Install devices plumb and level.

B. Install switches with OFF position down.

C. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.

D. Do not share neutral conductor on load side of dimmers.

E. Install receptacles with grounding pole on bottom.

F. Connect wiring device grounding terminal to branch circuit equipment grounding conductor.

G. Install decorative plates on switch, receptacle, and blank outlets in finished areas.

H. Connect wiring devices by wrapping solid conductor around screw terminal. Install stranded conductor for branch circuits 10 AWG and smaller. When stranded conductors are used in lieu of solid, use crimp on fork terminals for device terminations. Do not place bare stranded conductors directly under device screws.

I. Use jumbo size plates for outlets installed in masonry walls.

J. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.

3.4 INTERFACE WITH OTHER PRODUCTS

A. Install wall switch 48 inches above finished floor.

B. Install convenience receptacle 18 inches above finished floor.

C. Install convenience receptacle 6 inches above counter.

D. Install dimmer 48 inches above finished floor.

E. Coordinate installation of wiring devices with underfloor raceway service fittings provided under Section 16136.

F. Coordinate installation of wiring devices with floor box service fittings provided under Section 16141.

3.5 FIELD QUALITY CONTROL

A. Section: Field inspecting, testing, adjusting, and balancing.

B. Inspect each wiring device for defects.

C. Operate each wall switch with circuit energized and verify proper operation.

D. Verify each receptacle device is energized.

E. Test each receptacle device for proper polarity.

F. Test each GFCI receptacle device for proper operation.

3.6 ADJUSTING

A. Section 01700 - Execution Requirements:Testing, adjusting, and balancing.

B. Adjust devices and wall plates to be flush and level.

3.7 CLEANING

A. Section 01700 - Execution Requirements: Final cleaning.

B. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION

SECTION 16141

FLOOR BOXES

1. GENERAL

a. SUMMARY

i. Section includes floor boxes; floor box service fittings; and access floor boxes.

ii. Related Sections:
(1) Section 16140 - Wiring Devices: Receptacles for installation in floor boxes.

b. REFERENCES

i. National Electrical Manufacturers Association:
(1) NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.

c. SUBMITTALS

i. Product Data: Submit catalog data for floor boxes service fittings.

ii. Samples: Submit two of each service fitting illustrating size, material, configuration, and finish.

d. CLOSEOUT SUBMITTALS

i. Section 01700 - Execution Requirements: Closeout procedures.

ii. Project Record Documents: Record actual locations of each floor box.

e. QUALIFICATIONS

i. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

f. EXTRA MATERIALS

i. Section 01700 - Execution Requirements: Spare parts and maintenance products.

ii. Furnish two protective rings split nozzles.

iii. Furnish two carpet rings.

2. PRODUCTS

a. FLOOR BOXES

i. Manufacturers:
(1) Hubbel Model 3SFBSS.
(2) Substitutions:Permitted.

ii. Floor Boxes: NEMA OS 1, 3" inches deep.

iii. Adjustability: Fully adjustable semi-adjustable.

iv. Material: Formed steel.

v. Shape: Rectangular.

b. PEDESTAL-TYPE CONVENIENCE OUTLET SERVICE FITTING

i. Manufacturers:
(1) Hubbell Model FR480.
(2) Substitutions: Permitted.

ii. Housing: Gray Painted aluminum.

iii. Device Plate: Stainless steel.

iv. Configuration: Two duplex, side-to-side.

3. EXECUTION

a. EXAMINATION

i. Section 01300 - Administrative Requirements: Coordination and project conditions.

ii. Verify locations of floor boxes and outlets in offices, and work areas prior to rough-in.

iii. Verify openings in access floor are in proper locations.

b. INSTALLATION

i. Boxes and fittings are indicated on Drawings in approximate locations unless dimensioned. Adjust box location up to 10 feet to accommodate intended purpose.

ii. Floor Box Requirements: Use cast floor boxes for installations in slab on grade; formed steel boxes are acceptable for other installations.

iii. Set floor boxes level.

iv. Install boxes and fittings to preserve fire resistance rating of slabs and other elements, using materials and methods specified in Section 07840 16070.

v. Install protective rings split nozzle on active flush cover service fittings.

vi. Coordinate installation of access floor boxes with access floor system provided under Section. existing access floor system.

c. ADJUSTING

i. Section 01700 - Execution Requirements:Testing, adjusting, and balancing.

ii. Adjust floor box flush with finish flooring material.

d. CLEANING

i. Section 01700 - Execution Requirements: Final cleaning.

ii. Clean interior of boxes to remove dust, debris, and other material.

END OF SECTION

SECTION 16150

WIRING CONNECTIONS

1. GENERAL

a. SUMMARY

i. Section includes electrical connections to equipment.

b. REFERENCES

i. National Electrical Manufacturers Association:
(1) NEMA WD 1 - General Requirements for Wiring Devices.
(2) NEMA WD 6 - Wiring Devices-Dimensional Requirements.

c. SUBMITTALS

i. Section 01330 - Submittal Procedures: Submittal procedures.

ii. Product Data: Submit wiring device manufacturer's catalog information showing dimensions, configurations, and construction.

iii. Manufacturer's installation instructions.

d. CLOSEOUT SUBMITTALS

i. Section 01700 - Execution Requirements: Submittal procedures.

ii. Project Record Documents: Record actual locations, sizes, and configurations of equipment connections.

e. COORDINATION

i. Section 01300 - Administrative Requirements: Coordination and project conditions.

ii. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.

iii. Determine connection locations and requirements.

iv. Sequence rough-in of electrical connections to coordinate with installation of

equipment.

v. Sequence electrical connections to coordinate with start-up of equipment.

2. PRODUCTS

a. CORD AND PLUGS

i. Attachment Plug Construction: Conform to NEMA WD 1.

ii. Configuration: NEMA WD 6; match receptacle configuration at outlet furnished for equipment.

iii. Cord Construction: Type SO multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.

iv. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.

3. EXECUTION

a. EXAMINATION

i. Section 01300 - Administrative Requirements: Coordination and project conditions.

ii. Verify equipment is ready for electrical connection, for wiring, and to be energized.

b. INSTALLATION

i. Make electrical connections.

ii. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.

iii. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.

iv. Install receptacle outlet to accommodate connection with attachment plug.

v. Install cord and cap for field-supplied attachment plug.

vi. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.

vii. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.

viii. Install terminal block jumpers to complete equipment wiring requirements.

ix. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

x. Coolers and Freezers: Cut and seal conduit openings in freezer and cooler walls, floor, and ceilings.

c. ADJUSTING

i. Section 01700 - Execution Requirements: Testing, adjusting, and balancing.

ii. Cooperate with utilization equipment installers and field service personnel during checkout and starting of equipment to allow testing and balancing and other startup operations. Provide personnel to operate electrical system and checkout wiring connection components and configurations.

END OF SECTION

SECTION 16400

LOW-VOLTAGE DISTRIBUTION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes enclosed switches and circuit breakers; enclosed; panelboards; and fuses.

1.2 SUBMITTALS

A. Product Data: Submit catalog data showing products with specified features.

1.3 EXTRA MATERIALS

A. Furnish two of each panelboard key.

B. Furnish three spare fuses of each Class, size, and rating installed.

PART 2 PRODUCTS

2.1 ENCLOSED FUSIBLE SWITCH

A. Manufacturers:
   1. Square D.
   2. Siemens
   3. Substitutions: Permitted.

B. Product Description: NEMA KS 1, Type HD with externally operable handle interlocked to prevent opening front cover with switch in ON position, enclosed load interrupter knife switch. Handle lockable in OFF position.

C. Fuse clips: Designed to accommodate NEMA FU 1, Class R fuses.

D. Enclosure: NEMA KS 1, Type to meet conditions.

2.2 ENCLOSED NONFUSIBLE SWITCH

A. Manufacturers:
   1. Square D.
   2. Siemens
   3. Substitutions: Permitted.

B. Product Description: NEMA KS 1, Type GD with externally operable handle interlocked to prevent opening front cover with switch in ON position, enclosed load interrupter knife switch. Handle lockable in OFF position.

C. Enclosure: NEMA KS 1, Type to meet conditions.

2.3 MOLDED CASE CIRCUIT BREAKER

A. Manufacturers:
1. Square D.
2. Siemens
3. Substitutions: Permitted.

B. Product Description: Enclosed, molded-case circuit breaker conforming to NEMA AB 1.

C. Enclosure: NEMA AB 1, Type to meet conditions.

2.4 MANUAL MOTOR CONTROLLER

A. Manufacturers:
1. Square D.
2. Siemens
3. Substitutions: Permitted.

B. Product Description: NEMA ICS 2, AC general-purpose, Class A, manually operated, full-voltage controller with overload element, red pilot light, and push button operator.

C. Enclosure: NEMA ICS 6, Type to meet conditions of installation.

2.5 FRACTIONAL-HORSEPOWER MANUAL MOTOR CONTROLLER

A. Manufacturers:
1. Square D.
2. Siemens
3. Substitutions: Permitted.

B. Product Description: NEMA ICS 2, AC general-purpose, Class A, manually operated, full-voltage controller for fractional horsepower induction motors, with thermal overload unit, red pilot light, and toggle operator.

C. Enclosure: NEMA ICS 6, Type to meet conditions of installation.

2.6 AUTOMATIC MOTOR CONTROLLERS

A. Manufacturers:
1. Square D.
2. Siemens
3. Substitutions: Permitted.

B. Product Description: NEMA ICS 2, AC general-purpose Class A controller for induction motors rated in horsepower.

C. Control Voltage: 120 volts, 60 Hertz.

D. Product Options and Features:
   1. Cover Mounted Pilot Devices: NEMA ICS 5, standard duty type.
   2. Pilot Device Contacts: NEMA ICS 5, Form Z, rated A150.

E. Combination Controllers: Combine motor controllers with disconnect in common enclosure, using motor circuit protector conforming to NEMA AB 1, with integral instantaneous magnetic trip in each pole. Obtain IEC Class 2 coordinated component protection.

F. Enclosure: NEMA ICS 6, Type to meet conditions of installation.

2.7 GENERAL PURPOSE CONTACTORS

A. Manufacturers:
   1. Square D.
   2. Siemens
   3. Substitutions: Permitted.

B. Product Description: NEMA ICS 2, AC general purpose magnetic contactor.

C. Coil operating voltage: 120 volts, 60 Hertz.

D. Poles: To match circuit configuration and control function.

E. Cover Mounted Pilot Devices: NEMA ICS 5, standard-duty type with Form Z contacts, rated A150.

F. Combination Contactors: Combine contractors with thermal magnetic circuit breaker conforming to NEMA AB 1, with integral thermal and instantaneous magnetic trip in each pole.

G. Enclosure: NEMA ICS 6, Type to meet conditions.

2.8 LIGHTING CONTACTORS

A. Manufacturers:
   1. Douglas.
   2. Asco.
   3. Substitutions: Permitted.

B. Product Description: NEMA ICS 2, magnetic lighting contactor.

C. Configuration: Mechanically held, 2 wire control.

D. Coil operating voltage: 277 volts, 60 Hertz.

E. Poles: To match circuit configuration and control function.

F. Contact Rating: Match branch circuit overcurrent protection, considering derating for continuous loads.

G. Cover Mounted Pilot Devices: NEMA ICS 5, standard-duty type with Form Z contacts, rated A150.

H. Combination Contractors: Combine contractors with thermal magnetic circuit breaker conforming to NEMA AB 1, with integral thermal and instantaneous magnetic trip in each pole.

I. Enclosure: NEMA ICS 6, Type to meet conditions.

2.9 DISTRIBUTION PANELBOARDS

A. Manufacturers:
   1. Square D.
   2. Siemens
   3. Substitutions: Permitted.

B. Product Description: NEMA PB 1, circuit breaker type panelboard.

C. Minimum integrated short circuit rating: 100,000 amperes rms symmetrical.

D. Panelboard bus: Copper.

E. Fusible Switch Assemblies: NEMA KS 1, quick-make, quick-break, load interrupter enclosed knife switch with externally operable handle. Furnish interlock to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse clips: Designed to accommodate NEMA FU 1, Class R fuses.

F. Molded Case Circuit Breakers: NEMA AB 1, circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Furnish circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits.

G. Controllers: NEMA ICS 2, AC general-purpose Class A controller for induction motors rated in horsepower.
   1. Control Voltage: 120 volts, 60 Hertz.
   2. Cover Mounted Pilot Devices: NEMA ICS 5, standard duty type.
   3. Pilot Device Contacts: NEMA ICS 5, Form Z, rated A150.

H. Enclosure: NEMA PB 1, Type to meet conditions.

I. Cabinet Front: Surface type, fastened with hinge and latch, hinged door with flush lock, metal directory frame, finished in manufacturer's standard gray enamel.

2.10 BRANCH CIRCUIT PANELBOARDS

1. Square D.
2. Siemens
3. Substitutions: Permitted.

B. Product Description: NEMA PB1, circuit breaker type, lighting and appliance branch circuit panelboard.

C. Minimum Integrated Short Circuit Rating: 22,000 amperes rms symmetrical.

D. Panelboard Bus: Copper.

E. Molded Case Circuit Breakers: NEMA AB 1, bolt-on type thermal magnetic trip circuit breakers, with common trip handle for poles, listed as Type SWD for lighting circuits, Type HACR for air conditioning equipment circuits, Class A ground fault interrupter circuit breakers where scheduled. Do not use tandem circuit breakers.

F. Enclosure: NEMA PB 1, Type to meet conditions.

G. Cabinet Front: Surface cabinet front with concealed trim clamps, concealed hinge, metal directory frame, and flush lock keyed alike. Finish in manufacturer's standard gray enamel.

2.11 FUSES

A. Manufacturers:
1. Bussman.
2. Substitutions: Permitted.

B. Dimensions and Performance: NEMA FU 1, Class as specified or as indicated on Drawings.

C. Voltage: Rating suitable for circuit phase-to-phase voltage.

D. Power Load Feeder Switches Larger than 600 amperes: Class L (time delay).

E. Power Load Feeder Switches: Class RK1 (time delay). RK5. J (time delay).

F. Motor Load Feeder Switches: Class RK1 (time delay). RK5.

G. Motor Branch Circuits:Class RK1 (time delay). RK5. J (time delay).

PART 3 EXECUTION

3.1 INSTALLATION

A. Install distribution equipment plumb.

B. Select and install overload heater elements in motor controllers to match installed motor characteristics.

C. Install panelboards in accordance with NEMA PB 1.1.

D. Install recessed panelboards flush with wall finishes.

E. Provide typed or neatly handwritten circuit directory for each branch circuit panelboard.

END OF SECTION

SECTION 16461

DRY TYPE TRANSFORMERS

1. GENERAL

a. SUMMARY

i. Section includes two-winding transformers;

b. REFERENCES

i. National Electrical Manufacturers Association:
(1) NEMA ST 1 - Specialty Transformers (Except General Purpose Type).
(2) NEMA ST 20 - Dry Type Transformers for General Applications.

ii. International Electrical Testing Association:
(1) NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

c. SUBMITTALS

i. Section 01330 - Submittal Procedures: Submittal procedures.

ii. Product Data: Submit outline and support point dimensions of enclosures and accessories, unit weight, voltage, kVA, and impedance ratings and characteristics, tap configurations, insulation system type, and rated temperature rise.

iii. Test Reports: Indicate loss data, efficiency at 25, 50, 75 and 100 percent rated load, and sound level.

d. CLOSEOUT SUBMITTALS

i. Section 01700 - Execution Requirements: Closeout procedures.
ii. Project Record Documents: Record actual locations of transformers.

e. QUALIFICATIONS

i. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

f. DELIVERY, STORAGE, AND HANDLING

i. Section 01600 - Product Requirements: Product storage and handling requirements.

ii. Store in clean, dry space. Maintain factory wrapping or provide additional canvas or plastic cover to protect units from dirt, water, construction debris, and traffic.

iii. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided. Handle carefully to avoid damage to transformer internal components, enclosure, and finish.

2. PRODUCTS

a. TWO-WINDING TRANSFORMERS

i. Manufacturers:
(1) Siemens.
(2) Square D Watchdog.
(3) Substitutions: Permitted.

ii. Product Description: NEMA ST 20, factory-assembled, air-cooled, dry type transformers, ratings as indicated on Drawings.

iii. Primary Voltage: 480 volts, 3 phase.

iv. Secondary Voltage: 208Y/120 volts, 3 phase.

v. Insulation system and average winding temperature rise for rated kVA as follows:
(1) 1-15 kVA: Class 185 with 80 degrees C rise.
(2) 16-500 kVA: Class 220 with 80 degrees C rise.

vi. Case temperature: Do not exceed 35 degrees C rise above ambient at warmest point at full load.

vii. Winding Taps:
(1) Transformers Less than 15 kVA: Two 5 percent below rated voltage, full capacity taps on primary winding.
(2) Transformers 15 kVA and Larger: NEMA ST 20.

viii. Sound Levels: NEMA ST 20. Maximum sound levels are as follows:

(1) 1-5 kVA: 40 dB.
(2) 6-25 kVA: 45 dB.
(3) 26-150 kVA: 50 dB.
(4) 151-225 kVA: 55 dB.
(5) 226-300 kVA: 60 dB.
(6) 301-500 kVA: 65 dB.

ix. Basic Impulse Level: 10 kV.

x. Ground core and coil assembly to enclosure by means of visible flexible copper grounding strap.

xi. Mounting:
(1) 1-15 kVA: Suitable for wall mounting.
(2) 16-75 kVA: Suitable for wall, floor mounting.
(3) Larger than 75 kVA: Suitable for floor mounting.

xii. Coil Conductors: Continuous copper windings with terminations brazed or welded.

xiii. Enclosure: NEMA ST 20, Type 1. Furnish lifting eyes or brackets.

xiv. Isolate core and coil from enclosure using vibration-absorbing mounts.

xv. Nameplate: Include transformer connection data and overload capacity based on rated allowable temperature rise.

3. EXECUTION

a. EXAMINATION

i. Section 01300 - Administrative Requirements: Coordination and project conditions.

ii. Verify mounting supports are properly sized and located including concealed bracing in walls.

b. INSTALLATION

i. Set transformer plumb and level.

ii. Use flexible conduit, in accordance with Section 16128, 2 feet minimum length, for connections to transformer case. Make conduit connections to side panel of enclosure.

iii. Support transformers in accordance with Section 16070.
   (1) Mount wall-mounted transformers using integral flanges or accessory brackets furnished by manufacturer.
   (2) Mount floor-mounted transformers on vibration isolating pads suitable for isolating transformer noise from building structure.
   (3) Mount trapeze-mounted transformers as indicated on Drawings.

iv. Provide seismic restraints.

v. Install grounding and bonding in accordance with Section 16060.

c. FIELD QUALITY CONTROL

i. Section:Field inspecting, testing, adjusting, and balancing.

ii. Inspect and test in accordance with NETA ATS, except Section 4.

iii. Perform inspections and tests listed in NETA ATS, Section 7.2.1.

d. ADJUSTING

i. Section 01700 - Execution Requirements: Testing, adjusting, and balancing.

ii. Measure primary and secondary voltages and make appropriate tap adjustments.

END OF SECTION

SECTION 16500

LIGHTING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes interior luminaires, lamps, ballasts, and accessories.

1.2 SUBMITTALS

A. Product Data: Submit dimensions, ratings, and performance data.

PART 2 PRODUCTS

2.1 LUMINAIRES

A. Product Description: Complete luminaire assemblies, with features, options, and accessories as indicated on Drawings.

B. Substitutions: Permitted.

2.2 EXIT SIGNS

A. Manufacturers:
   1. Cooper Industries.
   2. Leviton.
   3. Substitutions: Permitted.

B. Product Description: Exit sign fixture.

C. Stencil Face with green letters.

D. Input Voltage: 120/208 volts.

2.3 FLUORESCENT BALLASTS

A. Manufacturers:
   1. Cooper Industries Model.
   2. Duro-Test Corp. Model.
   3. General Electric Corp. Model.
   4. Hubbell Lighting Model.
   5. Magnetek Inc. Model.
   6. Pass & Seymour Model.
   7. Philips Electronic North America Model.
   8. Thomas Industries, Inc. Model.

9. Substitutions: Permitted.

B. Product Description: Electronic ballast, suitable for lamps specified, with voltage to match luminaire voltage.

2.4 HIGH INTENSITY DISCHARGE (HID) BALLASTS

A. Manufacturers:
1. Duro-Test Corp. Model.
2. General Electric Corp. Model.
3. Philips Electronic North America Model.
4. Radiant Lamp Co. Model.
5. Siemens Corp. Model.
6. Venture Lighting International Inc. Model.
7. Substitutions: Permitted.

B. Product Description: ANSI C82.4, mercury vapor lamp ballast, suitable for lamp specified, with voltage to match luminaire voltage.

2.5 INCANDESCENT LAMPS

A. Manufacturers:
1. Duro-Test Corp. Model.
2. General Electric Corp. Model.
3. Hanson Industries Model.
4. Lithonia Lighting Model.
5. Neo-Ray Products Model.
6. Philips Electronic North America Model.
7. RCS Industries Co. Model.
8. Radiant Lamp Co. Model.
9. Substitutions: Permitted.

2.6 FLUORESCENT LAMPS

A. Manufacturers:
1. Duro-Test Corp. Model.
2. General Electric Corp. Model.
3. Hubbell Inc. Model.
4. Lithonia Lighting Model.
5. Philips Electronic North America Model.
6. Siemens Corp. Model.
7. Substitutions: Permitted.

2.7 HID LAMPS

A. Manufacturers:
1. Duro-Test Corp. Model.
2. General Electric Corp. Model.

3. Philips Electronic North America Model.
4. RCS Industries Co. Model.
5. Siemens Corp. Model.
6. Substitutions: Permitted.

2.8 METAL POLES

A. Manufacturers:
1. Lithonia.
2. Substitutions: Permitted.

B. Material and Finish: steel with painted finish.

C. Section Shape and Dimensions: Square.

D. Height: As indicated on Drawings.

E. Base: Nonbreakaway,

F. Accessories:
1. Handhole.
2. Anchor bolts.
3. Duplex Outlet.

G. Loading Capacity Ratings:
1. Luminaire Weight: pounds
2. Luminaire and Bracket Effective Projected Area: square feet
3. Steady Wind: 100 miles per hour, minimum.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install suspended luminaires using pendants supported from swivel hangers.

B. Locate recessed ceiling luminaires as indicated on reflected ceiling plan.

C. Install surface mounted ceiling luminaires plumb and adjust to align with building lines and with each other. Secure to prevent movement.

D. Install concrete bases in accordance with Section 03050 for lighting poles at locations as indicated on Drawings.

E. Install poles plumb.

3.2 ADJUSTING

A. Aim and adjust luminaires.

B. Relamp luminaires, lighting units, and exit signs with failed lamps at Substantial Completion.

END OF SECTION

SECTION 16700

COMMUNICATIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes arrangement with Telephone Utility Company for service and premises telephone pathways, and premises wiring.

1.2 SYSTEM DESCRIPTION

A. Service entrance from Telephone Utility Company.

B. Telephone Utility Company: Qwest.

C. Service Entrance Pathway: Empty ducts and raceway from point of Telephone Utility connection at property line to building service terminal backboard.

D. Backbone Wiring: Conform to EIA/TIA 568A/569 and EIA/TIA TSB 72.

E. Horizontal Wiring: Conform to EIA/TIA 568A/569, using Cat. 6 cabling, bridle rings, backboards, and cabinets as indicated on Drawings.

F. Entrance Wiring: By Telephone Utility Company.

G. Backbone Wiring: Complete from entrance equipment to the lab closet using 6 strand multimode fiber and Cat 6 cable.

H. Horizontal Wiring: Complete from either telephone closet to each outlet using horizontal cables.

1.3 SUBMITTALS

A. Product Data: Submit catalog data for each termination device, cable, fiber, LIU and outlet device.

PART 2 PRODUCTS

2.1 TELEPHONE TERMINATION BACKBOARDS

A. Material: Plywood.

B. Size: 4 x 8 feet, 3/4 inch thick.

2.2 TELEPHONE OUTLET JACKS

A. Manufacturers:
   1. Siemon.
   2. Lucent
   3. Substitutions: Permitted.

B. Product Description: Conform to EIA/TIA 568A, 569 requirements for cable connectors for specific cable types.

2.3 BACKBONE FIBER AND CABLE

A. Manufacturers:
   1. Siemon 6 strand multimode.
   2. Siemon Cat 6 eight conductor.
   3. Substitutions: Permitted.

B. Product Description:
   1. Fiber Optic: 6 strand 62.5/125 micron , multimode fiber, terminated with connectors in a L.I.U..
   2. Twisted pair copper Category 6, 24 AWG ,4 pair, plenum rated, with (12)cables installed between the Lab closet and the Demark.

2.4 HORIZONTAL CABLE

A. Manufacturers:
   1. Siemon.
   2. Substitutions: Permitted.

B. Product Description: EIA/TIA 570, 100-ohm, unshielded twisted pair cable with 4 pairs, 24 AWG copper conductor. Install (2) cables per workstation.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install 4" diameter bridle rings at 4' intervals and in such a manner as will allow fire alarm wiring and access control wiring to be installed in the same rings.

B. Install wire and cable in accordance with EIA/TIA 569, 570.

C. Finish paint termination backboards with durable white enamel prior to installation of telephone equipment.

D. Install termination backboards plumb, and attach securely to building wall at each corner. Install cabinet trim plumb.

E. Install pull wire or polyethylene pulling string in each empty telephone conduit over 10 feet in length or containing bend.

3.2 TESTING

A. Multimode fiber attenuation shall be measured in one direction at either 850 nanometers (nm) or 1300 nm using an LED light source and power meter. Test set-up and performance shall be conducted in accordance with ANSI/EIA/TIA-526-14 Standard, Method B. One 2-meter patch cord shall be used for the test reference and two 2-meter patch cords shall be used for the actual test. This test method uses a one jumper reference, two jumper test to estimate the actual link loss of the installed cables plus the loss of two connectors. This measurement is consistent with the loss which network equipment will see under normal installation and use. Test evaluation for the panel to panel (backbone) shall be based on the values set forth in TIA/EIA-568

B. All cables and termination hardware shall be 100% tested by the installation contractor for defects in installation and to verify cable performance under installed conditions. All conductors of each installed cable shall be verified useable by the contractor prior to system acceptance. Any defect in the cabling system installation including but not limited to cable, connectors, feedthrough couplers, patch panels, and connector blocks shall be repaired or replaced in order to ensure 100% useable conductors in all cables installed.

C. All cables shall be tested in accordance with this document, and best industry practices. If any of these are in conflict, the Contractor shall be responsible to bring any discrepancies to the attention of the project team for clarification and/or resolution.

D. Each pair of each installed cable shall be tested using a continuity test set that shows opens, shorts, polarity and pair-reversals. The test shall be recorded as pass/fail as indicated by the test set in accordance with the manufacturers recommended procedures, and referenced to the appropriate cable identification number and circuit or pair number. Any faults in the wiring shall be corrected and the cable re-tested prior to final acceptance.

E. Each installed cable shall be tested for installed length using a TDR type device. The cables shall be tested from patch panel to patch panel, block to block, patch panel to outlet or block to outlet as appropriate. The cable length shall conform to the maximum distances set forth in the TIA/EIA-568-B Standard. Cable lengths shall be recorded, referencing the cable identification number and circuit or pair number.

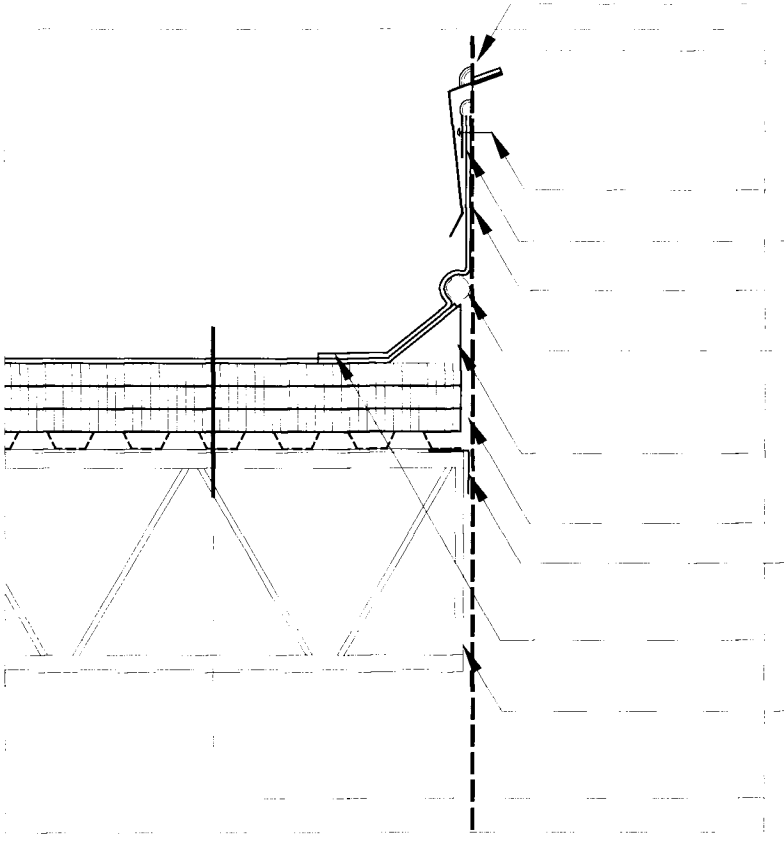
F. High speed unshielded twisted pair (UTP) data cable shall be performance verified using an automated test set. This test set shall be capable of testing for the continuity and length parameters defined above, and provide results for the following tests:

G. Near End Cross-Talk (NEXT)
Attenuation
Ambient Noise
Attenuation to Cross-Talk Ratio (ACR)

H. Test results shall be automatically evaluated by the equipment, using the most up-to-date criteria from the TIA/EIA-568-B Standard, and the result shown as pass/fail. Test results

shall be printed directly from the test unit or from a download file using an application from the test equipment manufacturer. The printed test results shall include all tests performed, the expected test result and the actual test result achieved.

END OF SECTION



counterflashing in sealed embed, existing brick wall

termination bar

fastener and sealing washer

termination bar

Single Ply Roof Membrane, fully adhered

wall expansion joint
1 1/2" foam rod, follow slope of roof, above cant, wrap membrane around, without adhesion

rigid insulation cant
follow slope of roof

non-compressible fill

metal angle, tight to metal deck
attached to exist. brick wall

overlap EDPM seam
fully adhered and seal all laps

cantilevered roof joist
no connection to exising wall

RF1

Non-skid pads, as shown on roof plan

Single Ply Roof Membrane, fully adhered

Roof Deck insul., multi layer, R-37 min.

1 1/2" metal deck

7
A51

Roof Detail

scale: 3/4" = 1'-0"