



COLLIN COUNTY

Construction, Modification to Sheriff's Office Lobby

IFB 2018-068

**J. D. Griffin, CPPB
Jack Hatchell Administration Building
2300 Bloomdale Road, Ste. 3160
McKinney, TX 75071**

**(P) 972-548-4116 (F) 972-548-4694
jgriffin@collincountytx.gov**

Collin County exclusively uses IonWave Technologies, Inc. ([Collin County eBid](#)) for the notification and dissemination of all solicitations. The receipt of solicitations through any other means may result in your receipt of incomplete specifications and/or addendums which could ultimately render your bid/proposal non-compliant. Collin County accepts no responsibility for the receipt and/or notification of solicitations through any other means.

LEGAL NOTICE

By order of the Commissioners' Court of Collin County, Texas, sealed bids will be received by the Purchasing Agent, 2300 Bloomdale, Suite 3160, McKinney, TX 75071, until **2:00 P.M., Thursday, February 1, 2018**, for Invitation For Bid **Construction, Modifications to Sheriff's Office Lobby (IFB No. 2018-068)**. A **Pre-Bid** conference will be held **Tuesday, January 23, 2018 at 10:00 a.m.** at Collin County Sheriff's Office Lobby, 4300 Community Ave., McKinney, TX 75071. Bidders shall use lump sum pricing. All Bidders must submit, prior to the bid opening time, a Cashier's Check or acceptable Bid Bond payable without recourse to Collin County in the amount of not less than five percent (5%) of the total bid plus alternates as submitted. Contractor must furnish a performance and payment bond within ten (10) consecutive calendar days following award of contract. Funds for payment have been provided through the Collin County budget approved by the Commissioner's Court for this fiscal year only. Bidders may obtain detailed specifications and other documents at Office of the Purchasing Agent: Collin County Administration Building, 2300 Bloomdale, Suite 3160, McKinney, TX 75071, 972-548-4165, or by going to: <https://collincountytx.ionwave.net>. Sealed bids will be opened on **Thursday, February 1, 2018 at 2:00 P.M.** by the Purchasing Agent, 2300 Bloomdale, Suite 3160, McKinney, TX 75071. The Commissioners' Court reserves the right to reject any and all bids.

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ATTENTION:	CLASSIFIEDS
BILL TO:	ACCOUNT NO 06100315-000
	COMMISSIONER'S COURT

NOTICE TO PUBLISHERS: Please publish in your issue on **Thursday, January 11, 2018** and **Thursday, January 18, 2018**. A copy of this notice and the publisher's affidavit must accompany the invoice when presented for payment.

NEWSPAPER:	<u>Plano Star Courier</u>
DATE:	<u>January 9, 2018</u>
FAX:	<u>972-529-1684</u>



MODIFICATIONS TO

SHERIFF'S OFFICE LOBBY

**COLLIN COUNTY SHERIFF'S OFFICE
4300 COMMUNITY AVENUE
MCKINNEY, TEXAS 75071**

**CONSTRUCTION DOCUMENTS
PROJECT MANUAL**

**PROJECT NUMBER: 1628
COLLIN COUNTY IFB NO: 2018-068
ISSUE DATE: DECEMBER 2017
SET NUMBER: _____**





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4300 COMMUNITY AVENUE
MCKINNEY, TEXAS 75071**

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**PROJECT NUMBER: 1628
COLLIN COUNTY IFB NO: 2018-068
ISSUE DATE: DECEMBER 2017
SET NUMBER: _____**



12/13/17

**00 01 08
PROJECT DIRECTORY**

Owner: **COLLIN COUNTY, TEXAS**
Attn: David Dooley, Building Projects Coordinator
Collin County Building Projects
4600 Community Avenue
McKinney, Texas 75071

Architect: **SPURGIN & ASSOCIATES ARCHITECTS**
Attn: Kent Spurgin
103 W. Louisiana Street
McKinney, Texas 75069-4413

Structural Engineer: **RTN DESIGN ASSOCIATES**
Attn: R.T. (Tom) Nowakowski
1029 English Road
Rockwall, Texas 75032

Mechanical/Electrical
Engineer: **ROOT ENGINEERING SERVICES**
Attn: Adam Harris, P.E.
106 Sunnydale Court
Howe, Texas 75459

END OF PROJECT DIRECTORY

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END OF LIST OF DRAWINGS

SECTION 001116 - ADVERTISEMENT FOR BIDS

BY ORDER OF the Collin County Commissioners Court, Collin County, Texas, bids will be received electronically through Collin County eBid located at <https://collincountytx.ionwave.net>. Bidders are encouraged to submit bids electronically by utilizing Collin County eBid. However, you may submit a sealed hard copy paper bid to the Office of the Collin County Purchasing Agent. All bids, both electronic or hard copy paper form must be submitted as stated below:

**SUBMIT BIDS HARD COPY PAPER
BIDS TO:**

**Office of the Purchasing Agent
Collin County Administration Building
2300 Bloomdale Road, Suite 3160
McKinney, Texas 75071**

****NOTE:**

**All Correspondence must include suite
number to assist in proper delivery.****

SUBMIT NO LATER THAN:

2:00 P.M., Thursday, February 1, 2018

MARK ENVELOPE:

IFB 2018-068

**Project: Construction, Modifications to
Sheriff's Office Lobby**

***ALL BIDS MUST BE RECEIVED IN THE OFFICE OF THE PURCHASING AGENT
BEFORE OPENING DATE AND TIME***

SCOPE OF WORK INCLUDES all materials, labor, equipment and services to produce or be incorporated in such construction. Contract will be a general contract for modifications to the Lobby, Vestibule and Reception areas of the Sheriff's Office including new bullet-resistant partitions, doors and windows, new millwork, room finishes, MEP modifications and selective demolition. Payment for the contract work shall be made pursuant to the terms of the Contract Documents.

Collin County uses Collin County eBid for the notification and dissemination of all solicitations for commodities and services. The receipt of solicitations through any other company may result in your receipt of incomplete specifications and/or addendums which could ultimately render your bid non-compliant. Collin County accepts no responsibility for the receipt and/or notification of solicitations through any other company.

COLLIN COUNTY APPRECIATES your time and effort in preparing a bid. Hard copy paper bid must be in a separate sealed envelope, manually signed in ink by a person having the authority to bind the firm in a contract and marked clearly on the outside as outlined above. Please note that all bids must be received at the designated location by the deadline shown. Bids received after deadline shall be considered void and unacceptable. Collin County is not responsible for lateness of mail, carrier, etc. and time/date stamp clock in the Collin County Purchasing Department shall be the official time of receipt. All bid forms provided in this Invitation for Bid must be completed prior to submission. Failure to complete the forms shall render your bid null and void. We would appreciate you indicating on your "NO BID" response any requirements of this bid request which may have influenced your decision to "NO BID".

BIDS WILL BE publicly opened in the Office of the Purchasing Agent, 2300 Bloomdale Rd, Suite 3160, McKinney, TX 75071, at the date and time indicated above.

A PRE-BID CONFERENCE will be held by Collin County in the **Sheriff's Office Lobby** located at **4300 Community Ave, McKinney, TX 75071** on **Tuesday, January 23, 2018**, at **10:00 AM** in order for bidders to ask questions regarding the proposed work.

No oral, telegraphic, telephonic or facsimile bids will be considered. IFB's, RFP's, RFQ's and RFI's may be submitted in electronic format via Collin County eBid at <https://collincountytx.ionwave.net>

BID SECURITY: All Bidders must submit, prior to the bid opening time, a Cashier's Check or acceptable Bid Bond payable without recourse to Collin County in the amount of not less than five percent (5%) of the total bid plus alternates as submitted.

1. Bid Bond or Cashier's Check may be mailed or hand delivered to the Office of the Collin County Purchasing Agent, Collin County Administration Building, 2300 Bloomdale Road, Ste 3160, McKinney, TX 75071 and shall be delivered in an envelope, marked plainly on the outside with the Bid Name and Number.
2. Bid Bond may be faxed to the Purchasing Department at 972-548-4694.
3. Bid Bond may be e-mailed to: jgriffin@co.collin.tx.us

Regardless of delivery method, all Bid Bonds shall be received prior to the bid opening time to be considered.

The original Bid Bond shall be received in the Collin County Purchasing Department **no later than** close of business on the third working day after the bid opening. Late receipt of original Bid Bond shall be cause for rejection of bid.

BONDS: Contractor must furnish a performance bond and payment bond within ten (10) consecutive calendar days following award of contract. The bonds shall be issued by a corporate surety in accordance with all Texas Law, including but not limited to, Chapter 2253 of the Texas Government Code and Chapter 3503 of the Texas Insurance Code, for public works projects.

INFORMATION AND BIDDING DOCUMENTS: Drawings, specifications, instructions to bidders, and bidding and contract documents may be examined without charge at the following locations:

Spurgin & Associates Architects
103 W. Louisiana Street
McKinney, TX 75069
Phone: (972) 562-5368
Fax: (972) 562-5368

FW Dodge McGraw Hill
9155 Sterling Drive, Suite 160
Irving, TX 75063
Phone: (972) 819-1310
Fax: (775) 429-0593

iSqFt
14109 Inwood Road
Dallas, TX 75244
Phone: (888) 601-5761
Fax: (866) 570-8187

North Texas Construction Report
2828 Trinity Mills Parkway, Suite 330
Carrrollton, TX 75006
Phone: (972) 820-9020
Fax: (972) 920-8910

BIDDERS MAY SECURE copies of the Bidding Documents from the office of the Architect, Spurgin & Associates Architects, 103 W. Louisiana St., McKinney, TX 75069, (972) 562-5368:

1. Single sets of Drawings and Specifications, upon payment of One Hundred Dollars (\$100.00) (nonrefundable).
2. Partial sets of Drawings and Specifications will not be available.

SECTION 002113 - INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL REQUIREMENTS

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

- A. All definitions set forth in the General Conditions of the Contract for Construction or in other Contract Documents are applicable to these Bidding Documents.
- B. Bidding Documents include the Advertisement or Invitation for Bids, Instructions to Bidders, the bid form, other sample bidding and contract forms and the proposed Contract Documents including any Addenda issued prior to receipt of bids.
- C. Addenda are written or graphic instruments issued prior to the opening of the Bidding Documents, which modify or interpret the Bidding Documents, including Drawings and Specifications, by additions, deletions, clarifications or corrections. Addenda will become part of the Contract Documents when the Construction Contract is executed.
- D. "Spurgin & Associates Architects" will be hereafter referred to in the Project Manual as "Architect" and all correspondence shall be addressed to: Kent Spurgin, Spurgin & Associates Architects, 103 W. Louisiana St., McKinney, TX 75069.
- E. "Bill Burke" will be hereinafter referred to in this Project Manual as "Project Manager".
- F. "Collin County" will be hereafter referred to in this Project Manual as "Owner".
- G. A Bid is a complete and properly signed submittal to do the Work for designated portion thereof for the sums stipulated therein, submitted in accordance with the Bidding Documents.
- H. The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which work may be added or from which work may be deleted for sums stated in Alternate Bids.
- I. An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid in the corresponding change in the Work, as described in the Bidding Documents or in the proposed Contract Documents.
- J. A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials or service as described in the Bidding Documents or in the proposed Contract Documents.
- K. A Bidder is a person or entity who submits a Bid.
- L. A Sub-Bidder is a person or entity who submits a bid to a Bidder for materials or labor for a portion of the work.
- M. A Contractor is a person or entity who is determined to be the lowest responsible and responsive bidder to whom Owner (on the basis of Owner's evaluation as hereinafter provided) makes an award.

- N. The Bid Requirements and Other General Conditions, as provided under the Division of the North Central Texas Council of Governments Standard Specifications for Public Works Construction will be applicable to this project, unless noted otherwise in the Contract Documents

1.3 EXAMINATION OF DOCUMENTS AND SITE

- A. Each bidder, by making his/her Bid, represents that he/she has read and understands the Bidding Documents.
- B. Each Bidder, by making his/her Bid, represents that he/she has visited the site, performed investigations and verifications as he/she deems necessary, and familiarized himself/herself with the local conditions under which the Work is to be performed and will be responsible for any and all errors in his/her bid resulting from his/her failure to do so.
- C. The location and elevations of the various utilities and pipe work included within the scope of the work are offered as a general guide only, without guarantee as to accuracy. The Contractor shall verify and investigate to his/her own satisfaction the location and elevation of all utilities, pipe work, and the like and shall adequately inform himself/herself of their relation to the work before submitting a bid.
- D. Before submitting a bid each bidder will, at bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests and studies and obtain any additional information (surface, subsurface, and underground facilities) at or contiguous to the site, or otherwise which may affect cost, progress, performance or furnishing of the work and which bidder deems necessary to determine its bid for performing and furnishing the work in accordance with the time, price and other terms and conditions of the Contract Documents. Bidder will rely solely on its own site investigation and assumes the risk of any site conditions not discovered that may result in additional costs and all errors in the bid.
- E. On request in advance, Owner will provide each bidder access to the site to conduct explorations and tests as each bidder deems necessary for submission of a bid. Bidder shall fill all holes, clean up and restore the site to its former condition upon completion of such explorations.
- F. The lands upon which the work is to be performed, right-of way and easement for access thereto and other lands designated for use by Contractor in performing the work are identified in the Contract Documents.
- G. Each bidder by making his/her bid represents that his/her bid is based upon the materials, systems, and equipment required by the Bidding Documents without exception.

1.4 BIDDING DOCUMENTS

- A. Complete sets of Bidding Documents shall be used in preparing bids; neither County, nor Architect assume any responsibility for errors or misinterpretations resulting from use of incomplete sets of Bidding Documents.
- B. County or the Architect, in making copies of the Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.

1.5 BIDDING PROCEDURES

- A. All bids shall be prepared on the forms provided by the Architect and submitted in accordance with the Instruction to Bidders. The Architect or owner will furnish bidders with

bid forms which will provide for the following bid items. Bidders shall provide all requested information. Prices bid/proposed shall *only* be considered if they are provided in the appropriate space(s) on the Collin County bid form(s). For consideration, any additions or deductions to the bid/proposal prices offered must be shown under the exceptions section of the bid/proposal in the case of electronic submittal, ONLY in the case of a hard copy submittal will an additional attachment be allowed. Extraneous numbers, prices, comments, etc. or bidder/offeror generated documents appearing elsewhere on the bid or as an additional attachment shall be deemed to have no effect on the prices offered in the designated locations.

1. A single contract price for each bid item as detailed and described in these specifications.
 2. Acknowledgment of Addenda.
 3. Number of consecutive calendar days to complete project.
 4. Alternate bids.
 5. Unit prices.
- B. A bid (electronic or hard copy) is invalid if it has not been deposited at the designed location prior to the time and date for receipt of bids indicated in the Advertisement or Invitation For Bid, or prior to any extension thereof issued to the bidders. Bids received in County Purchasing Department after submission deadline shall be returned unopened and will be considered void and unacceptable. Owner is not responsible for lateness of mail, carrier, etc. and time/date stamp clock in County Purchasing Department shall be the official time of receipt.
- C. Unless otherwise provided in any supplement to these Instructions to Bidders, no bidder shall modify, withdraw or cancel his/her bid or any part thereof for ninety (90) consecutive calendar days after the time designated for the receipt of bids in the Advertisement or Invitation For Bid.
- D. Bids shall not contain any recapitulation of the Work to be done.
- E. The Bidder shall make no additional stipulations on the Bid Form nor limit or qualify his/her bid in any other manner. Bids so qualified will be subject to disqualification.
- F. Collin County is by statute exempt from the State Sales Tax and Federal Excise Tax; therefore, the prices submitted shall not include taxes.

1.6 DISCREPANCIES AND AMBIGUITIES

Any interpretations, corrections and/or changes to an Invitation For Bid and related Specifications or extensions to the opening/receipt date will be made by addenda to the respective document by the Collin County Purchasing Department. Questions and/or clarification requests must be submitted no later than seven (7) days prior to the opening/receipt date. Those received at a later date may not be addressed prior to the public opening. Sole authority to authorize addenda shall be vested in Collin County Purchasing Agent as entrusted by the Collin County Commissioners' Court. Addenda may be transmitted electronically via Collin County eBid, by facsimile, E-mail transmission or mailed via the US Postal Service.

- 1.6.1 Addenda will be transmitted to all that are known to have received a copy of the IFB and related Specifications. However, it shall be the sole responsibility of the Bidder to verify issuance/non-issuance of addenda and to check all avenues of document availability (i.e. Collin County eBid at <https://collincountytx.ionwave.net>; telephoning Purchasing

Department directly, etc.) prior to opening/receipt date and time to insure Bidder's receipt of any addenda issued. Bidder shall acknowledge receipt of all addenda.

1.7 SUBSTITUTIONS

- A. Each bidder represents that his/her bid is based upon the materials and equipment described in the Bidding Documents.
- B. No substitution will be considered unless written request has been submitted to the Architect for approval at least seven (7) consecutive calendar days prior to the date for receipt of bids.
- C. If the Architect and Owner approves a proposed substitution, such approval will be set forth in an Addendum.

1.8 QUALIFICATION OF BIDDERS

- A. Within seven (7) consecutive calendar days following bid opening, the apparent low bidder shall submit with a properly executed Contractor's Qualification Statement as evidence to establish bidder's financial responsibility, experience and possession of such equipment as may be needed to prosecute the work in an expeditious, safe and satisfactory manner. This Statement shall include:
 - 1. List of current projects.
 - 2. List of projects completed within the past five years.
 - 3. Experience of key individuals of the organization.
 - 4. Trade and Bank references.
 - 5. A recent financial statement to confirm that the bidder has suitable financial status to meet obligations incidental to performing the work. Audited financial statements are not mandatory. Unaudited financial statements will be accepted. If bidder's firm does, however, have audited statements, please include a copy with your bid.
 - 6. A statement of cost for each major item of Work included in the Bid.
 - 7. A designation of the Work to be performed by the Bidder with his/her own forces.
 - 8. A list of names of the Subcontractors or other persons or organizations (including those who are to furnish materials or equipment fabricated to a special design) proposed for each portion of the Work. The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the proposed Subcontractors. Prior to the award of the Contract, the Architect will notify the Bidder in writing if either the County or the Architect, after due investigation, has reasonable and substantial objection to any person or organization on such lists. If Owner or Architect 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 Bidder may, at his/her option, withdraw his/her Bid without forfeiture of Bid Security or provide an acceptable substitute. Subcontractors and other persons and organizations proposed by the Bidder and accepted by Owner and Architect must be used on the Work for which they were proposed and accepted, and shall not be changed except with the written approval of Owner and the Architect.
- B. Bidders may be disqualified and their bids not considered for any of the following specific reasons:
 - 1. Reason for believing collusion exists among bidders.
 - 2. The bidder being interested in any litigation against Owner.
 - 3. The bidder being in arrears on any existing contract or having defaulted on a previous contract.
 - 4. Lack of competency as revealed by the financial statement, experience and equipment, questionnaires, or qualification statement.

5. Uncompleted work which in the judgment of Owner will prevent or hinder the prompt completion of additional work if awarded.
- C. Minimum Standards For Responsible Prospective Bidders: A prospective Bidder must meet the following minimum requirements:
1. have adequate financial resources, or the ability to obtain such resources as required;
 2. be able to comply with the required or proposed delivery/ completion schedule;
 3. have a satisfactory record of performance;
 4. have a satisfactory record of integrity and ethics; and
 5. be otherwise qualified and eligible to receive an award.

Collin County may request representation and other information sufficient to determine Bidder's ability to meet these minimum standards listed above.

- D. In determining to whom to award the contract, the Owner may consider;
1. the purchase price;
 2. the reputation of the bidder/contractor/vendor and of the bidder/contractor/vendor's goods or services;
 3. the quality of the bidder/contractor/vendor's goods or services;
 4. the extent to which the goods or services meet the Owner's needs;
 5. the bidder/contractor/vendor's past relationship with the Owner;
 6. the total long-term cost to the Owner to acquire the bidder/contractor/vendor's goods or services; and
 7. any other relevant factors specifically listed in the Instruction to Bidders..

1.9 PREPARATION OF BID

- A. Bidder shall submit his/her bid on the forms furnished by the Architect. All blank spaces in forms shall be correctly filled in and the bidder shall state the prices, written in words and in figures. Where there is discrepancy between the price written in words and the price written in figures, the price written in words shall govern. If bid is submitted by an individual, his/her name must be signed by him/her or his/her duly authorized agency. If the bid is submitted by a firm, association or partnership, the name and address of each member must be given, and the bid must be signed by an official or duly authorized agent. Powers of attorney authorizing agents or others to sign bids must be properly certified and must be in writing and submitted with the bid.
- B. Bidder shall bear any/all costs associated with it's preparation of any bid, proposal or submittal.
- C. Public Information Act: Collin County is governed by the Texas Public Information Act, Chapter 552 of the Texas Government Code. All information submitted by prospective bidders during the bidding process is subject to release under the Act.

- D. The Bidder shall comply with Commissioners' Court Order No. 2004-167-03-11, County Logo Policy.

1.10 BID SECURITY

- A. Each bid must be accompanied by Bid Security (in accordance with instructions set forth in section 00100-Advertisement For Bids) made payable to Owner in an amount of five percent (5%) of the bidder's maximum bid price and in the form of a Cashier's Check or a Bid Bond, duly executed by bidder as principal and having as surety thereon, a corporate surety authorized and admitted to do business in the State of Texas and licensed to issue such bond, as a guarantee that the bidder will enter into a Contract and execute required Performance, Payment, and one (1) year Maintenance Bonds within ten (10) consecutive calendar days of Collin County Commissioners' Court award of Contract.
- B. The Bid Security of the contractor will be retained until such bidder has executed the Contract Agreement and furnished the required Contract Security, whereupon, the Bid Security will be returned. If the contractor fails to execute and deliver the Agreement and furnish the required Contract Security within ten (10) consecutive calendar days of Collin County Commissioners' Court award of Contract, Owner may annul the award of contract and the Bid Security of that bidder will be forfeited. The Bid Security of the other bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of the seventh (7th) consecutive calendar day after the effective date of the Agreement or the ninety-fifth (95th) consecutive calendar day after the bid opening, whereupon, the Bid Security furnished by such bidders will be returned. Bid Security with bids which are not competitive will be returned within seven (7) consecutive calendar days after the contract award.
- C. Should the bidder to whom the Contract is awarded refuse or neglect to execute and file the contract and bonds within ten (10) consecutive calendar days of Collin County Commissioners' Court award of Contract, Owner may annul award of Contract and the Bid Security filed with the bid shall become the property of Owner, not as a penalty, but as liquidated damages. Owner reserves the right to award canceled Contract to next responsible, lowest and best bidder as it deems to be in the best interest of the County.
- D. Owner will have the right to retain the bid security of all bidders until either:
 - 1. the Contract has been executed and the bonds have been furnished, or
 - 2. the specified time has elapsed so that bids may be withdrawn, or
 - 3. all bids have been rejected.

1.11 PERFORMANCE BOND, LABOR & MATERIAL PAYMENT BOND

- A. The Contractor shall post with Owner, not later than ten (10) consecutive calendar days of Collin County Commissioners' Court award of Contract, a Performance Bond in the amount of one hundred percent (100%) of the total contract price in such form as is satisfactory to Owner, in compliance with Chapter 2253 of the Texas Government Code and all other applicable Texas Law, and on the form specified in the Contract Documents. This bond shall be executed by a corporate surety company duly authorized and admitted to do business in the State of Texas and licensed to issue such a bond in the State of Texas. The Contractor shall notify its corporate surety of any Contract changes.
- B. The Contractor shall post with Owner, not later than ten (10) consecutive calendar days of Collin County Commissioners' Court award of Contract, a Payment Bond in the amount of one hundred percent (100%) of the total contract price in such form as is satisfactory to Owner, in compliance with Chapter 2253 of the Texas Government Code and all other

applicable Texas Law, and on the form specified in the Contract Documents. This bond shall be executed by a corporate surety company duly authorized and admitted to do business in the State of Texas and licensed to issue such a bond in the State of Texas. The Contractor shall notify its corporate surety of any Contract changes.

- C. The Contractor must demonstrate to Owner that it can secure the required performance and payment bonds, issued by a corporate surety company authorized and admitted to do business in the State of Texas and licensed to issue such a bond in the State of Texas. Contractor must also demonstrate that the bond is not in excess of ten percent (10%) of the corporate surety company's capital and surplus. To the extent the amount of the bond exceeds ten percent (10%) of the corporate surety company's capital and surplus, such bond will not be accepted unless bidder provides written certification that the corporate surety company has reinsured the portion of the risk that exceeds ten percent (10%) of the corporate surety company's capital and surplus with one or more insurers who are duly authorized, accredited or trusted to do business in the State of Texas. The amount reinsured by any reinsurer must not exceed ten percent (10%) of the reinsurer's capital and surplus.
- D. The Contractor must file with the performance bond and payment bond, all documents and information necessary to establish that the agent signing the bond is authorized to write the bond in the amount requested, and if applicable, that reinsurance requirements, have been met, including limits and ratings or other evidence of company solvency.
- E. If the corporate surety company on any bond furnished by Contractor to Owner is declared bankrupt or becomes insolvent or such corporate surety company's right to do business in the State of Texas is revoked, the Contractor shall within five (5) consecutive calendar days thereafter substitute another bond and corporate surety company, both of which shall be acceptable to Owner.

1.12 FILING BID

- A. All Bids, proposals, or submittals submitted in hard copy paper form shall be submitted in a sealed envelope, plainly marked on the outside with the Invitation for Bid (IFB) number and name. A hard copy paper form bid, proposal, or submittal shall be manually signed in ink by a person having the authority to bind the firm in a contract. Submittals, bids or proposals shall be mailed or hand delivered to the Collin County Purchasing Department.
- B. No oral, telegraphic or telephonic submittals will be accepted. Bids, proposals, or submittals may be submitted in electronic format via Collin County eBid at <https://collincountytx.ionwave.net>.
- C. All Bids, submittals or proposals submitted electronically via Collin County eBid at <https://collincountytx.ionwave.net> shall remain locked until official date and time of opening as stated in the Special Terms and Conditions of the IFB.
- D. For hard copy paper form bids, proposals, or submittals, any alterations made prior to opening date and time must be initialed by the signer of the bid, proposal, or submittal, guaranteeing authenticity. Bids, proposals, or submittals cannot be altered or amended after submission deadline.
- E. No bid, proposal, or submittal will be considered unless it is filed with the Owner Purchasing Department within the time limit for receiving bids as stated in the Advertisement for Bids or IFB. Each hard copy paper bid shall be in a sealed envelope plainly marked with the word "BID", and the name and bid number of the project as designated in the Advertisement for Bids or IFB.

1.13 MODIFICATION AND WITHDRAWAL OF BID

- A. No bid, proposal, or submittal may be withdrawn or modified after the bid opening except where the award of the contract has been delayed beyond ninety (90) consecutive calendar days after date of bid opening or as per Texas Local Government Code, Title 8, Chapter 262, Subchapter C., Section 262.0305. Modifications after Award.

1.14 IRREGULAR BID

- A. It is understood that Collin County, Texas reserves the right to accept or reject any and/or all Bids, proposals, or submittals for any or all products and/or services covered in an Invitation For Bid (IFB) and to waive informalities or defects in submittals or to accept such submittals as it shall deem to be in the best interest of Collin County.

1.15 REJECTION OF BID

- A. The bidder acknowledges the right of Owner to reject any or all bids and to waive any informality or irregularity in any bid received. In addition, the bidder recognizes the right of Owner to reject a bid if the bidder failed to furnish any required Bid Security, or to submit the data required by the Bidding Documents, or if the bid is in any way incomplete or irregular.

1.16 METHOD OF AWARD

- A. In evaluating bids, Owner will consider whether or not the bids comply with the prescribed requirements, base prices, any alternates, unit pricing, completion time, bidder's qualifications, bidder's proposed subcontractors, suppliers, etc., and other data as may be requested in the Bid Documents.
- B. Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any bid and to establish the responsibility, qualifications and financial ability of bidder, proposed subcontractors, suppliers and other persons and organizations to perform and furnish the Work in accordance with the Bidding Documents to Owner's satisfaction within the prescribed time.
- C. If the contract is to be awarded, it will be awarded to the lowest and best responsible bidder whose evaluation, by Owner, indicates to be in the best interests of the project. If no alternates are selected by Owner, the Owner may award the contract to a responsible bidder who submits the lowest and best bid.
- D. Evaluation of Alternates - Any and/or all or none of the alternates may be considered in evaluation. Owner may award Contract on base bid plus any and/or all or none of the alternates.
- E. Owner anticipates award within ninety (90) consecutive calendar days after bid opening.
- F. The bid, when properly accepted by the County, shall constitute a Contract equally binding between the contractor and Owner. No different or additional terms will become part of this Contract with the exception of a written Change Order, signed by both parties.
- G. No oral statement of any person shall modify or otherwise change, or affect the terms, conditions or specifications stated in the resulting contract. All change orders to the contract will be made in writing by Collin County Purchasing Agent.

1.17 EXECUTION OF CONTRACT

- A. The person or persons, partnership, company, firm, association or corporation to whom a contract is awarded shall within ten (10) consecutive calendar days after such award, sign the necessary contract agreements and submit the required bonds entering into the required Contract with Owner. No contract shall be binding on Owner until it has been executed by Owner or his/her duly authorized representative, and delivered to the Contractor.

1.18 FAILURE TO EXECUTE CONTRACT

- A. The failure of the Bidder to execute the required bonds or to sign the required Contract within ten (10) consecutive calendar days after the Contract is awarded, shall be considered by Owner as abandonment of his/her Bid, and Owner may annul the award, at the Owner's sole discretion.

1.19 PURCHASE ORDER

- A. A purchase order(s) shall be generated by Owner to the contractor. The purchase order number **must** appear on all itemized invoices. Collin County will not be responsible for any orders placed or delivered without a valid purchase order number.

1.20 NOTICE TO PROCEED

- A. Upon the execution and delivery of Bonds, Executed Contract by Contractor, progress schedule, proof of insurance, and all other documents required prior to commencing work herein, Owner will issue a written Notice to Proceed to the Contractor requesting that he/she proceed with construction, and the Contractor shall commence work within ten (10) consecutive calendar days after the date of Notice to Proceed.

1.21 PAYMENT PROCEDURES

- A. Contractor shall submit Applications for Payment in accordance with the Contract, and payments shall be made in accordance with the Contract Documents.
- C. Final Payment: Upon final completion and acceptance of the work, Owner shall pay the remainder of the contract price as recommended by Architect, in accordance with Texas Government Code, Title 10, Subtitle F., Chapter 2251. Contractor(s) is required to pay subcontractors within ten (10) days after the contractor has received payment from the County.
- D. The Contractor understands, acknowledges and agrees that if the Contractor subcontracts with a third party for services and/or material, the primary Contractor (awardee) accepts responsibility for full and prompt payment to the third party. Any dispute between the primary Contractor and the third party, including any payment dispute, will be promptly remedied by the Contractor. Failure to promptly render a remedy or to make prompt payment to the third party (subcontractor) may result in the withholding of funds from the primary Contractor by Collin County for any payments owed to the third party.

1.22 AFFIDAVIT OF BILLS PAID

- A. Prior to final acceptance of this project by Owner, the Contractor shall execute an affidavit that all bills for labor, materials, and incidentals incurred in the project construction have been paid in full, and that there are no claims pending.

1.23 EXEMPTION FROM STATE OF TEXAS AND LOCAL SALES TAX ON MATERIALS

- A. Owner qualifies for exemption from State and Local Sales Tax pursuant to the provisions of Chapter 151, Section 151.309 of the Texas Limited Sales, Excise and Use Tax Act. The Contractor performing this Contract may purchase all materials, supplies, equipment consumed in the performance of this Contract by issuing to his/her suppliers an exemption certificate in lieu of the tax. .

1.24 CONFLICT OF INTEREST

- A. No public official shall have interest, direct or indirect, in this contract, in accordance with Texas Local Government Code Title 5, Subtitle C, Chapter 171.

1.25 ETHICS

- A. The bidder/contractor shall comply with Commissioners Court Order No. 96-680-10-28, Establishment of Guidelines & Restrictions Regarding The Acceptance of Gifts by County Officials & County employees.

1.26 BID COMPLIANCE

- A. Bid must comply with all federal, state, county and local laws concerning this type of project and the fulfillment of all ADA (Americans With Disabilities Act) requirements.
- B. Design, strength, quality of materials and workmanship must conform to the highest standards of manufacturing and engineering practice.
- C. All products must be new and unused, unless otherwise specified, in first-class condition and of current manufacture.

1.27 DRUG FREE

- A. All bidders shall provide any and all notices as may be required under the Drug-Free Work Place Act of 1988, 41 U.S.C. 701, and Collin County Commissioners' Court Order No. 90-455-06-11, to its employees and all sub-contractors to insure that Owner maintains a drug-free work place. The use, possession or being under the influence of drugs and/or alcohol while working on this bid project or while on County property is prohibited and may result in removal of an individual from the project and/or immediate termination of contract. The County reserves the right to review drug testing records of any personnel involved in this bid project. The County may require, at contractor's expense, drug testing of contractor's personnel if no drug testing records exists or if such test results are older than six (6) months.
- B. Substances and cut-off levels are as follows:

<u>SUBSTANCE</u>	<u>MAXIMUM LEVEL</u>
Amphetamines	1000 NG/ML
Barbiturates	300 NG/ML
Benzodiazepines	300 NG/ML
Cocaine Metabolite	300 NG/ML
Opiates	300 NG/ML
Phencyclidine (PCP)	25 NG/ML
THC (Marijuana) Metabolite	100 NG/ML
Methadone, Urinary	300 NG/ML
Methaquaone, Urine	300 NG/ML
Propoxyphene	300 NG/ML

1.28 INDEMNIFICATION

A. To the fullest extent permitted by law, the CONTRACTOR and his sureties shall indemnify, defend and hold harmless the OWNER and all of its, past, present and future, officers, agents and employees from all suits, cause of action, claims, liabilities, losses, fines, penalties, liens, demands, obligations, actions, proceedings, of any kind, character, name and description brought or arising, on account of any injuries or damages received or sustained by any person, destruction or damage to any property on account of, in whole or part, the operations of the CONTRACTOR, his agents, employees or subcontractors; or on account of any negligent act or fault of the CONTRACTOR, his agents, employees or subcontractors in the execution of said Contract; failing to comply with any law, ordinance, regulation, rule or order of any governmental or regulatory body including those dealing with health, safety, welfare or the environment; on account of the failure of the CONTRACTOR to provide the necessary barricades, warning lights or signs; and shall be required to pay any judgment, with cost, which may be obtained against the OWNER growing out of such injury or damage. In no event shall OWNER be liable to CONTRACTOR for indirect or consequential damages or loss of income or profit irrespective of the cause, fault or reason for same. CONTRACTOR'S duty to indemnify herein shall not be limited by any limitation on the type or amount of damages payable by or for CONTRACTOR or any Subcontractor under workman's compensation acts, disability benefit acts or any other employee benefit acts.

In addition, the CONTRACTOR likewise covenants and agrees to, and does hereby, indemnify and hold harmless the OWNER from and against any and all injuries, loss or damages to property of the OWNER during the performance of any of the terms and conditions of this Contract, arising out of or in connection with or resulting from, in whole or in part, any and all alleged acts or omissions of officers, agents, servants, employees, contractors, subcontractors, licenses or invitees of the CONTRACTOR.

The rights and responsibilities provided in this indemnification provision shall survive the termination or completion of this Contract.

1.29 CONSTRUCTION SCHEDULE

- A. The time for completion is set forth herein and will be included in the Contract. All work shall be completed within the consecutive calendar day count shown in the Contractor's bid. The calendar day count shall commence ten (10) consecutive calendar days after the date of the Notice to Proceed.
- B. Prior to the issuance of the Notice to Proceed by Owner, the Contractor shall submit a detailed progress and schedule chart to Owner for review. This chart will be used to assure completion of the job within the number of consecutive calendar days stated in bid documents.

1.30 DELAYS AND EXTENSIONS OF TIME

- A. If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control, or by delay authorized by the Owner pending mediation and arbitration, or by other causes which the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.
- B. If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period

of time and could not have been reasonably anticipated, and that the weather conditions had an adverse effect on the scheduled construction.

- C. Contractor's sole remedy for any delays in the project, which are not the fault of the Contractor, shall be an equitable extension of time to perform the work, required by the Contract. In no event shall the Contractor be entitled to make a claim for delay, impact or acceleration damages against the Owner.

1.31 DAMAGES

A. Should the contractor fail to complete the project within the specified completion schedule the sum of \$200.00 per calendar day will be deducted from the moneys due the contractor for the work. This sum shall not be considered as a penalty, but rather as reasonable liquidated damages, since it would be impracticable or extremely difficult to fix the actual damages. An extension of time may be allowed for delays beyond the control of the contractor at the discretion of Owner.

1.32 TERMINATION

This contract shall remain in effect until any of the following occurs:

- A. completion of project;
- B. acceptance of work ordered; or
- C. termination by either party pursuant to the terms of the Contract with a thirty (30) days written notice prior to cancellation that must state therein the reasons for such cancellation.
- D. Breach of the contract by the Contractor for failure
 1. to meet completion schedules, or
 2. otherwise perform in accordance with these specifications.

Breach of contract or default authorizes the County to purchase elsewhere and charge the full increase in cost and handling to the defaulting Contractor.

1.33 PATENTS - COPYRIGHTS

- A. The contractor agrees to protect Owner from any claims involving infringements of patents and/or copyrights. In no event shall Owner be liable to a contractor for any/all suits arising on the grounds of patent(s) or copyright(s) infringement.

1.34 VENUE; GOVERNING LAW

- A. This contract will be governed by the laws of the State of Texas. Should any portion of this contract be in conflict with the laws of the State of Texas, the State laws shall invalidate only that portion. The remaining portion of the contract shall remain in effect. This contract is performable in Collin County, Texas.

1.35 ASSIGNMENT

- A. The contractor shall not sell, assign, transfer or convey this contract, in whole or in part, without the prior written approval from Collin County Commissioners' Court.

1.36 SILENCE OF SPECIFICATION

- A. The apparent silence of any part of the specification as to any detail or to the apparent omission from it of a detailed description concerning any point, shall be regarded as meaning that only the best commercial practices are to prevail. All interpretations of the specification shall be made on the basis of this statement.

1.37 PROVISION CONCERNING ESCALATOR CLAUSES

- A. Bid(s) containing any condition which provides for changes in the stated bid prices due to increase or decrease in the costs of materials, labor, or other items required for this project, will be rejected and returned to the bidder without being considered.

1.38 ESTIMATES OF QUANTITIES

- A. The quantities listed in the Bid Form will be considered as approximate and will be used for the comparison of bids. Payments will be made to the Contractor only for the actual quantities of work performed or materials furnished in accordance with the contract. The quantity of work to be done and the materials may be increased or decreased as provided for in the Contract Documents.

1.39 TREE PROTECTION OUTSIDE LIMITS OF WORK

- A. The Contractor will be required to obtain written authorization from Owner for the removal of any tree three inches (3") in diameter or greater for any area outside the limits of the street right-of-way or slope easement. It is the intent of Owner to preserve as much as possible the natural condition of the floodplains.

1.40 EXCAVATION/TRENCH SAFETY

A. TRENCH SAFETY

The CONTRACTOR shall be responsible for complying with state laws and federal regulations relating to trench safety, including those which may be enacted during the performance under this contract. The CONTRACTOR shall be responsible for selecting an appropriate method of providing trench safety after due consideration of the job conditions, location of utilities, pavement conditions and other relevant factors. Slope-back methods which may result in unnecessary displacement of utilities and/or destruction of pavement may not be used without permission from the OWNER. The CONTRACTOR shall be responsible for providing to the OWNER an acceptable trench safety plan signed and sealed by a Professional Architect qualified to do such work and registered in Texas. Devices used to provide trench safety such as trench shields and shoring systems will be likewise certified by professional Architects registered in the State of Texas or by a professional Engineer registered in the state of manufacture of the shield.

B. PAYMENT FOR TRENCH SAFETY

Payment for trench safety shall be by the lineal feet of trench exceeding a depth of five (5) ft. Excavation for slope-back methods shall be subsidiary to the trench safety pay item including replacement and recompaction. Excess excavation for other trench safety methods is also subsidiary to the trench safety pay item. Costs relating to the preparation of the trench safety plan including geotechnical investigation, testing and report preparation fees are all subsidiary to the pay item for trench safety. Should trench safety measures be required

during contract performance where no pay item has been provided, then the CONTRACTOR shall immediately notify the OWNER and, if directed to do so, provide trench safety under the provisions of the contract. Should the OWNER fail to authorize the work, then the CONTRACTOR shall proceed under the provisions of the Contract. Trench safety requirements are mandatory and may not be waived.

C. PAYMENT FOR SPECIAL SHORING

Payment for special shoring, if any, shall be based on the square feet of shoring used.

D. The Contractor must be made aware that on construction projects in which trench excavation will exceed a depth of five feet (5'), the uniform set of general conditions must require that the bid documents and the contract include detailed plans and specifications for adequate safety systems that meet Occupational Safety and Health Administration standards that will be in effect during the period of construction of the project. The Contractor shall provide a separate pay item for trench excavation safety in accordance with the Texas Health & Safety Code Chapter 756. The Contractor shall verify that these plans and specifications include a pay item for these same trench excavation safety systems, in accordance with Texas Government Code, Title 10, Section 2166.303, Uniform Trench Safety Conditions. The contractor shall insure that drainage from adjacent properties is not blocked by his/her excavations. Measurement and payment for excavation/trench safety systems will not be made directly, but considered subsidiary to the work.

E. The Contractor shall be responsible for obtaining and paying for all surveys and testing, including geotechnical surveys and testing, necessary to insure it can comply with all laws regarding adequate trench excavation safety.

1.41 CONSTRUCTION STAKING

A. Architect will provide the Contractor with primary horizontal and vertical control to consist of one construction baseline and two benchmarks.

B. The Contractor shall take all necessary precautions to preserve any and/or all markings and staking. Payment for costs of restaking shall be the responsibility of the Contractor.

1.42 PERMITS

A. Contractor shall be responsible for obtaining all necessary permits.

1.43 MATERIALS TESTING

A. Owner will be responsible for all materials testing.

1.44 WAGE SCALE

A. In accordance with Texas Government Code, Title 10, Section 2258, Prevailing Wage Rates, the general prevailing wage rate has been determined for this locality for the craft or type of workman needed to execute work of a similar character of the project listed herein. The Contractor shall pay the prevailing wage rate in this locality to all his/her employees and subcontractors performing work on this project, and in no event shall the Contractor pay less than the rate shown in the following schedule.

Superseded General Decision Number: TX20160289

State: Texas

Construction Type: Building

County: Collin County in Texas.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.20 for calendar year 2017 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.20 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2017. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/06/2017
1	01/27/2017
2	04/07/2017
3	04/14/2017
4	08/25/2017
5	09/08/2017
6	11/03/2017

ASBE0021-011 06/01/2016

	Rates	Fringes
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ASBESTOS WORKER/HEAT & FROST INSULATOR (Duct, Pipe and Mechanical System Insulation)....	\$ 24.32	7.52
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BOIL0074-003 01/01/2017

	Rates	Fringes
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BOILERMAKER.....	\$ 28.00	22.35
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CARP1421-002 04/01/2016

	Rates	Fringes
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MILLWRIGHT.....	\$ 26.60	8.65
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ELEV0021-006 01/01/2017

Rates Fringes

ELEVATOR MECHANIC.....\$ 38.77 31.585+a+b

FOOTNOTES:

A. 6% under 5 years based on regular hourly rate for all hours worked. 8% over 5 years based on regular hourly rate for all hours worked.

B. New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Day, and Veterans Day.

ENGI0178-005 06/01/2014

Rates Fringes

POWER EQUIPMENT OPERATOR

(1) Tower Crane.....\$ 29.00 10.60

(2) Cranes with Pile

Driving or Caisson

Attachment and Hydraulic

Crane 60 tons and above.....\$ 28.75 10.60

(3) Hydraulic cranes 59

Tons and under.....\$ 27.50 10.60

IRON0263-005 06/01/2017

Rates Fringes

IRONWORKER (ORNAMENTAL AND

STRUCTURAL).....\$ 23.25 7.32

* PLUM0100-005 11/01/2017

Rates Fringes

HVAC MECHANIC (HVAC Unit
Installation Only).....\$ 30.84 11.51

PIPEFITTER (Excludes HVAC
Pipe Installation).....\$ 30.84 11.51

SUTX2014-015 07/21/2014

Rates Fringes

BRICKLAYER.....	\$ 21.06	0.00
CARPENTER, Excludes Drywall Hanging, Form Work, and Metal Stud Installation.....	\$ 15.78	0.00
CAULKER.....	\$ 15.16	0.00
CEMENT MASON/CONCRETE FINISHER...	\$ 13.04	0.00
DRYWALL HANGER AND METAL STUD INSTALLER.....	\$ 13.00	0.00
ELECTRICIAN (Alarm Installation Only).....	\$ 20.93	3.86
ELECTRICIAN (Communication Technician Only).....	\$ 15.35	1.39
ELECTRICIAN (Low Voltage Wiring Only).....	\$ 17.04	1.39
ELECTRICIAN, Excludes Low Voltage Wiring and Installation of Alarms/Sound and Communication Systems.....	\$ 20.01	2.69
FORM WORKER.....	\$ 11.89	0.00
GLAZIER.....	\$ 16.46	3.94
HIGHWAY/PARKING LOT STRIPING: Operator (Striping Machine).....	\$ 10.04	2.31
INSTALLER - SIDING (METAL/ALUMINUM/VINYL).....	\$ 14.74	0.00
INSTALLER - SIGN.....	\$ 15.50	0.00
INSULATOR - BATT.....	\$ 13.00	0.00
IRONWORKER, REINFORCING.....	\$ 12.29	0.00
LABORER: Common or General.....	\$ 10.52	0.00
LABORER: Mason Tender - Brick...	\$ 10.54	0.00
LABORER: Mason Tender -		

Cement/Concrete.....	\$ 10.93	0.00
LABORER: Pipelayer.....	\$ 13.00	0.35
LABORER: Plaster Tender.....	\$ 12.22	0.00
LABORER: Roof Tearoff.....	\$ 11.28	0.00
LABORER: Landscape and Irrigation.....	\$ 10.55	0.00
LATHER.....	\$ 16.00	0.00
OPERATOR: Backhoe/Excavator/Trackhoe.....	\$ 12.83	0.00
OPERATOR: Bobcat/Skid Steer/Skid Loader.....	\$ 13.93	0.00
OPERATOR: Bulldozer.....	\$ 18.29	1.31
OPERATOR: Drill.....	\$ 15.69	0.50
OPERATOR: Forklift.....	\$ 13.21	0.81
OPERATOR: Grader/Blade.....	\$ 13.03	0.00
OPERATOR: Loader.....	\$ 13.46	0.85
OPERATOR: Mechanic.....	\$ 17.52	3.33
OPERATOR: Paver (Asphalt, Aggregate, and Concrete).....	\$ 18.44	0.00
OPERATOR: Roller.....	\$ 15.04	0.00
PAINTER (Brush, Roller and Spray), Excludes Drywall Finishing/Taping.....	\$ 13.35	5.10
PAINTER: Drywall Finishing/Taping Only.....	\$ 14.24	3.83
PIPEFITTER (HVAC Pipe Installation Only).....	\$ 20.45	4.00
PLASTERER.....	\$ 16.58	0.00

PLUMBER, Excludes HVAC Pipe Installation.....	\$ 22.46	4.06
ROOFER.....	\$ 17.19	0.00
SHEET METAL WORKER (HVAC Duct Installation Only).....	\$ 21.13	4.79
SHEET METAL WORKER, Excludes HVAC Duct Installation.....	\$ 24.88	5.97
SPRINKLER FITTER (Fire Sprinklers).....	\$ 37.50	0.00
TILE FINISHER.....	\$ 11.22	0.00
TILE SETTER.....	\$ 14.25	0.00
TRUCK DRIVER: 1/Single Axle Truck.....	\$ 16.00	0.81
TRUCK DRIVER: Dump Truck.....	\$ 12.39	1.18
TRUCK DRIVER: Flatbed Truck.....	\$ 19.65	8.57
TRUCK DRIVER: Semi-Trailer Truck.....	\$ 12.50	0.00
TRUCK DRIVER: Water Truck.....	\$ 12.00	4.11

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====

END OF GENERAL DECISION

- B. Except for work on legal holidays, the “General Prevailing Rate of Per Diem Wage” for the various crafts or type of workers or mechanics is the product of (a) the number of hours worked per day, except for overtime hours, times (b) the above respective rate per hour.
- C. For legal holidays, the “General Prevailing Rate of Per Diem Wage” for the various crafts or type of workers or mechanics is the product of (a) one and one-half times the above respective rate per hour, times (b) the number of hours worked on the legal holiday.
- D. For overtime work, the “General Prevailing Rate of Per Diem Wage” for the various crafts or type of workers or mechanics is the product of (a) one and one-half times the above respective rate per hour, times (b) the number of hours worked on overtime.
- E. Under the provisions of Texas Government Code, Title 10, Section 2258, Prevailing Wage Rates, the contractor or subcontractor of the contractor shall forfeit as a penalty to the entity on whose behalf the contract is made or awarded, sixty dollars (\$60.00) for each calendar day, or portion thereof, that the worker is paid less than the wage rates stipulated in the contract.
- F. If the construction project involves the expenditure of Federal funds in excess of \$2,000, the minimum wages to be paid various classes of laborers and mechanics will be based upon the wages that will be determined by the Secretary of Labor to be prevailing for the corresponding classes of laborers and mechanics employed on the project of a character similar to the contract work.

- 1.45 Collin County Purchasing Department shall serve as Contract Administrator or shall supervise agents designated by Collin County.
- 1.46 All warranties shall be stated as required in the Uniform Commercial Code.
- 1.47 The Contractor and Collin County agree that both parties have all rights, duties, and remedies available as stated in the Uniform Commercial Code.
- 1.48 Contractor shall not fraudulently advertise, publish or otherwise make reference to the existence of a contract between Collin County and Contractor for purposes of solicitation. As exception, Contractor may refer to Collin County as an evaluating reference for purposes of establishing a contract with other entities.
- 1.49 Contractor shall provide Collin County with diagnostic access tools at no additional cost to Collin County, for all Electrical and Mechanical systems, components, etc., procured through this contract.
- 1.50 **CRIMINAL HISTORY BACKGROUND CHECK:** If required, ALL individuals may be subject to a criminal history background check performed by the Collin County's Sheriff's Office prior to access being granted to Collin County property or facilities. Upon request, Contractor shall provide list of individuals to Collin County Purchasing Department within five (5) working days.

1.51 Vendors/Contractors/Providers must be in compliance with the Immigration and Reform Act of 1986 and all employees specific to this solicitation must be legally eligible to work in the United States of America.

1.52 **CERTIFICATION OF ELIGIBILITY:** This provision applies if the anticipated Contract exceeds \$100,000.00 and as it relates to the expenditure of federal grant funds. By submitting a bid or proposal in response to this solicitation, the Bidder/Quoter/Offeror certifies that at the time of submission, he/she is not on the Federal Government's list of suspended, ineligible, or debarred contractors. In the event of placement on the list between the time of bid/proposal submission and time of award, the Bidder/Quoter/Offeror will notify the Collin County Purchasing Agent. Failure to do so may result in terminating this contract for default.

1.53 **NOTICE TO CONTRACTORS:** The Collin County Detention Facility houses persons who have been charged with and/or convicted of serious criminal offenses. When entering the Detention Facility, you could: (1) hear obscene or graphic language; (2) view partially clothed male inmates; (3) be subjected to verbal abuse or taunting; (4) risk physical altercations or physical contact, which could be minimal or possibly serious; (5) be exposed to communicable or infectious diseases; (6) be temporarily detained or prevented from immediately leaving the Detention Facility in the case of an emergency or "lockdown; and (7) subjected to a search of your person or property. While the Collin County Sheriff's Office takes every reasonable precaution to protect the safety of visitors to the Detention Facility, because of the inherently dangerous nature of a Detention Facility and the type of the persons incarcerated therein, please be advised that the possibility of such situations exist and you should carefully consider such risks when entering the Detention Facility. By entering the Collin County Detention Facility, you acknowledge that you are aware of such potential risks and willingly and knowingly choose to enter the Collin County Detention Facility.

1.54 Contractors doing business with OWNER agree to comply with Federal Executive Order 13465 E-Verify. It is OWNER's intention and duty to comply and support the Immigration and Nationality Act (INA) which includes provisions addressing employment eligibility, employment verification and non-discrimination. According to the INA, contractors/employers may hire only persons who may legally work in the United States. Subsequently, contractors and subcontractors doing business with OWNER must confirm their enrollment in the E-Verify system which verifies employment eligibility through completion and checking of I-9 forms. OWNER reserves the right to audit contractors process to verify enrollment compliance.

1.55 INSURANCE REQUIREMENTS

A. CONTRACTOR'S INSURANCE

1. Before commencing work, the CONTRACTOR and each subcontractor shall be required, at its own expense, to furnish the Collin County Purchasing Agent with certified copies of all insurance certificate(s) required by Texas Law, and the coverages required herein, indicating the coverage is to remain in force throughout the term of this Contract. Without limiting any of the other obligations or liabilities of the CONTRACTOR, during the term of the Contract the CONTRACTOR and each subcontractor at their own expense shall purchase and maintain the herein stipulated minimum insurance with companies duly approved to do business in the State of Texas and satisfactory to the OWNER. Certificates of each policy shall be delivered to the OWNER before any work is started, along with a written statement from the issuing company stating that said policy shall not be canceled, nonrenewed or materially changed without 30 days advance written notice being given to the OWNER.

2. In addition to any coverage required by Texas Law, the CONTRACTOR shall provide the following coverages at not less than the specified amounts:

B. Workers Compensation insurance required by Texas Law at statutory limits, including employer's liability coverage of not less than \$1,000,000. In addition to these, the CONTRACTOR must comply with all the requirements of the Texas Department of Insurance, Division of Workers' Compensation; (Note: If you have questions concerning these requirements, you are instructed to contact the DWC.)

1. By signing this contract or providing or causing to be provided a certificate of coverage, the CONTRACTOR is representing to the OWNER that all employees of the CONTRACTOR and its subcontractors who will provide services on the Project will be covered by workers compensation coverage for the duration of the Project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the CONTRACTOR to administrative penalties, criminal penalties, civil penalties, or other civil actions.

2. The CONTRACTOR'S failure to comply with any of these provisions is a breach of Contract by the Contractor which entitles the OWNER to declare the Contract void if the CONTRACTOR does not remedy the breach within ten (10) days after receipt of notice of breach from the OWNER.

C. Broad form commercial general liability insurance, including independent contractor's liability, completed operations and contractual liability, written on an occurrence form, covering, but not limited to, the liability assumed under the indemnification provisions of this contract, fully insuring CONTRACTOR'S (or subcontractor's) liability for injury to or death of OWNER'S employees and third parties, extended to include personal injury liability coverage with damage to property, with minimum limits as set forth below:

General Aggregate \$2,000,000

Products — Components/Operations Aggregate \$2,000,000

Personal and Advertising Injury \$ 1,000,000

Each Occurrence \$ 2,000,000

1. The policy shall include coverage extended to apply to completed operations, asbestos hazards (if this project involves work with asbestos) and XCU (explosion, collapse and underground) hazards. The completed operations coverage must be maintained for a minimum of one year after final completion and acceptance of the work, with evidence of same filed with OWNER.

C. D. Comprehensive automobile and truck liability insurance, covering owned, hired and non-owned vehicles, with a combined bodily injury and property damage minimum limit of \$1,000,000 per occurrence; or separate limits of \$1,000,000 for bodily injury (per person), \$1,000,000 for bodily injury (per accident) and

\$1,000,000 for property damage. Such insurance shall include coverage for loading and unloading hazards.

E. OWNER'S PROTECTIVE LIABILITY INSURANCE

CONTRACTOR shall obtain, pay for and maintain at all times during the prosecution of the work under this contract an OWNER'S protective liability insurance policy naming the OWNER as insured for property damage and bodily injury, which may arise in the prosecution of the Work or CONTRACTOR'S operations under this Contract. Coverage shall be on an "occurrence" basis, and the policy shall be issued by the same insurance company that carries the CONTRACTOR'S liability insurance with a combined bodily injury and property damage minimum limit of \$1,000,000 per occurrence and \$2,000,000 aggregate.

F. "UMBRELLA" LIABILITY INSURANCE

CONTRACTOR shall obtain, pay for and maintain umbrella liability insurance during the contract term, insuring CONTRACTOR for an amount of not less than \$1,000,000 per occurrence combined limit for bodily injury and property damage that follows from and applies in excess of the primary liability coverages required hereinabove. The policy shall provide "drop down" coverage where underlying primary insurance coverage limits are insufficient or exhausted. OWNER shall be named as an additional insured.

G. RAILROAD PROTECTIVE INSURANCE

When required in the Special Provisions, CONTRACTOR shall obtain, maintain and present evidence of railroad protective insurance (RPI). The policy shall be in the name of the railroad company having jurisdiction over the right-of-way involved. The minimum limit of coverage shall meet the specifications provided by the railroad company. The OWNER shall specify the amount of RPI necessary.

H. POLICY ENDORSEMENTS AND SPECIAL CONDITIONS

1. Each insurance policy to be furnished by CONTRACTOR shall include the following conditions by endorsement to the policy:

(a) each policy shall name the OWNER as an additional insured as to all applicable coverage;

(b) each policy shall require that 30 days prior to the cancellation, nonrenewal or any material change in coverage, a notice thereof shall be given to OWNER by certified mail;

(c) the term "OWNER" shall include all past, present or future, authorities, boards, bureaus, commissions, divisions, departments and offices of the OWNER and individual members, elected official, officers, employees and agents thereof in their official capacities and/or while acting on behalf of the OWNER;

(d) the policy phrase "other insurance" shall not apply to the OWNER where the OWNER is an additional insured on the policy;

(e) all provisions of the contract concerning liability, duty and standard of care together with the indemnification provision, shall be underwritten by

contractual liability coverage sufficient to include such obligations within applicable policies;

(f) each policy shall contain a waiver of subrogation in favor of OWNER, and its, past, present and future, officials, employees, and volunteers; and,

(g) each certificate of insurance shall reference the Project and Contract number, contain all the endorsement required herein, and require a notice to the OWNER of cancellation.

2. Insurance furnished by the CONTRACTOR shall be in accordance with the following requirements:

(a) any policy submitted shall not be subject to limitations, conditions or restrictions deemed inconsistent with the intent of the insurance requirements to be fulfilled by the CONTRACTOR. The OWNER'S decision thereon shall be final;

(b) all policies are to be written through companies duly licensed to transact that class of insurance in the State of Texas with a financial ratings of A+ VII or better as assigned by BEST Rating Company or equivalent; and

(c) All liability policies required herein shall be written with an "occurrence" basis coverage trigger.

3. CONTRACTOR agrees to the following:

(a) CONTRACTOR hereby waives subrogation rights for loss or damage to the extent same are covered by insurance. Insurers shall have no right of recovery or subrogation against the OWNER, it being the intention that the insurance policies shall protect all parties to the Contract and be primary coverage for all losses covered by the policies;

(b) Companies issuing the insurance policies and CONTRACTOR shall have no recourse against the OWNER for payment of any premiums or assessments for any deductibles, as all such premiums and deductibles are the sole responsibility and risk of the CONTRACTOR;

(c) Approval, disapproval or failure to act by the OWNER regarding any insurance supplied by the CONTRACTOR (or any subcontractors) shall not relieve the CONTRACTOR of full responsibility or liability for damages and accidents as set forth in the Contract Documents. Neither shall the bankruptcy, insolvency or denial of liability by the insurance company exonerate the CONTRACTOR from liability; and

(d) No special payments shall be made for any insurance that the CONTRACTOR and subcontractors are required to carry; all are included in the Contract Price and the Contract unit prices. Any of such insurance policies required under this section may be written in combination with any of the others, where legally permitted, but none of the specified limits may be lowered thereby.

1.56 Vendors/Contractors/Providers must be in compliance with the provisions of Section 2270.001 of the Texas Government Code which states a governmental entity may not enter into a contract with a company for goods or services unless the contract contains a written verification from the company that it: (1) does not boycott Israel; and, (2) will not boycott Israel during the term of the contract. By submitting a

response to a Collin County solicitation, the vendor will be required to sign the Chapter 2270 Verification form prior to a recommendation of the contract. This Act is effective September 1, 2017.

1.57 Vendors/Contractors/Providers must be in compliance with the provisions of Section 2252.152 and Section 2252.153 of the Texas Government Code which states, in part, contracts with companies engaged in business with Iran, Sudan, or Foreign Terrorist Organizations are prohibited. A governmental entity may not enter into a contract with a company that is listed on the Comptroller of the State of Texas website identified under Section 806.051, Section 807.051 or Section 2253.253 which do business with Iran, Sudan or any Foreign Terrorist Organization. This Act is effective September 1, 2017.

Section 004100-Bid Forms Collin County, Texas

Bid Information

Bid Owner JD Griffin, CPPB Buyer II
 Email jgriffin@co.collin.tx.us
 Phone (972) 548-4116
 Fax (972) 548-4694
 Bid Number 2018-068
 Title Construction, Modifications to Sheriff's Office Lobby
 Bid Type IFB
 Issue Date 01/09/2018
 Close Date 2/1/2018 02:00:00 PM (CT)

Contact Information

Address 2300 Bloomdale Rd.
 Ste. 3160
 McKinney, TX 75071
 Contact JD Griffin, CPPB Buyer II
 Department Purchasing
 Building Admin. Building
 Floor/Room Ste.3160
 Telephone (972) 548-4116
 Fax (972) 548-4694
 Email jgriffin@co.collin.tx.us

Ship to Information

Address 4300 Community Ave.
 McKinney, TX 75071
 Contact
 Department Sheriff's Office
 Building Sheriff's Office
 Floor/Room
 Telephone
 Fax
 Email

Supplier Information

Company Name _____
 Contact Name _____
 Address _____

 Telephone _____
 Fax _____
 Email _____

Supplier Notes

The undersigned hereby certifies the foregoing bid submitted by the company listed below hereinafter called "bidder" is the duly authorized agent of said company and the person signing said bid has been duly authorized to execute same. Bidder affirms that they are duly authorized to execute this contract; this company; corporation, firm, partnership or individual has not prepared this bid in collusion with any other bidder or other person or persons engaged in the same line of business; and that the contents of this bid as to prices, terms and conditions of said bid have not been communicated by the undersigned nor by any employee or agent to any other person engaged in this type of business prior to the official opening of this bid.

Signature _____ Date ____ / ____ / ____

Bid Notes

Please log in to view bid documents.

Bid Activities

Date	Name	Description
1/23/2018 10:00 AM (CT)	Pre-Bid Conference	A PRE-BID CONFERENCE will be held by Collin County in the Sheriff's Office Lobby located at 4300 Community Ave, McKinney, TX 75071 on Tuesday, January 23, 2018, at 10:00 AM in order for bidders to ask questions regarding the proposed work.
1/26/2018 05:00 PM (CT)	Intent to Bid	Do you intend to submit a bid?

Bid Messages

Bid Attachments

The following attachments are associated with this opportunity and will need to be retrieved separately

#	Filename	Description
Header	LEGAL NOTICE-2018-068.doc	Legal Notice

Header Spec Book.docx Specifications

Header Drawings.docx Drawings

Bid Attachments Requested

The following attachments are requested with this opportunity

#	Required	Specified Attachment
1	YES	Bid Bond : All Bidders must submit, prior to the bid opening time, a cashier's check or acceptable Bid Bond payable without recourse to Collin County in the amount of not less than five percent (5%) of the total bid plus alternates as submitted. 1.Bid Bond or Cashier's Check may be mailed or hand delivered to the Office of the Collin County Purchasing Agent, Collin County Administration Building, 2300 Bloomdale Road, Ste 3160, McKinney, TX 75071 and shall be delivered in an envelope, marked plainly on the outside with the Bid Name and Number. 2.Bid Bond may be faxed to the Purchasing Department at 972-548-4694. 3.Bid Bond may be e-mailed to: jgriffin@co.collin.tx.us 4.Bid Bond may be uploaded to Collin County eBid. Regardless of delivery method, all Bid Bonds shall be received prior to the bid opening time to be considered.
2	NO	W-9
3	NO	Conflict of Interest Questionnaire

Bid Attributes

Please review the following and respond where necessary

#	Name	Note	Response
1	Calendar Days Bid	Please state the consecutive calendar days bid.	_____ (Required)
2	Exceptions	Do you take exceptions to the specifications. If so, by separate attachment, please state your exceptions. Valid Responses: [Please Select], Yes, No	_____ (Required)
3	Insurance	I understand that the insurance requirements of this solicitation are required and a certificate of insurance shall be submitted to the Purchasing department if I am awarded all or a portion of the resulting contract. Please initial.	_____ (Required)
4	Subcontractors	State the business name of all subcontractors and the type of work they will be performing under this contract. If you are fully qualified to self-perform the entire contract, please respond with "Not Applicable-Self Perform".	_____ (Required)
5	Reference No. 1	List a company or governmental agency where these same/like products /services, as stated herein, have been provided. Include the following: Company/Entity, Contact, Address, City/State/Zip, Phone, and E-Mail.	_____ (Required)
6	Reference No. 2	List a company or governmental agency where these same/like products /services, as stated herein, have been provided. Include the following: Company/Entity, Contact, Address, City/State/Zip, Phone, and E-Mail.	_____ (Required)
7	Reference No. 3	List a company or governmental agency where these same/like products /services, as stated herein, have been provided.	_____ (Required)

Include the following: Company/Entity, Contact, Address, City/State/Zip, Phone, and E-Mail.

- 8 Preferential Treatment _____ (Required)
- The County of Collin, as a governmental agency of the State of Texas, may not award a contract to a nonresident bidder unless the nonresident's bid is lower than the lowest bid submitted by a responsible Texas resident bidder by the same amount that a Texas resident bidder would be required to underbid a nonresident bidder to obtain a comparable contract in the state in which the nonresident's principal place of business is located (Government Code, Title 10, V.T.C.A., Chapter 2252, Subchapter A).
1. Is your principal place of business in the State of Texas?
 2. If your principal place of business is not in Texas, in which State is your principal place of business?
 3. If your principal place of business is not in Texas, does your state favor resident bidders (bidders in your state) by some dollar increment or percentage?
 4. If your state favors resident bidders, state by what dollar amount or percentage.
- 9 Debarment Certification _____ (Required)
- I certify that neither my company nor an owner or principal of my company has been debarred, suspended or otherwise made ineligible for participation in Federal Assistance programs under Executive Order 12549, "Debarment and Suspension," as described in the Federal Register and Rules and Regulations.
- Please initial.
- 10 Immigration and Reform Act _____ (Required)
- I declare and affirm that my company is in compliance with the Immigration and Reform Act of 1986 and all employees are legally eligible to work in the United States of America.
- I further understand and acknowledge that any non-compliance with the Immigration and Reform Act of 1986 at any time during the term of this contract will render the contract voidable by Collin County.
- Please initial.
- 11 Disclosure of Certain Relationships _____ (Required)
- Chapter 176 of the Texas Local Government Code requires that any vendor considering doing business with a local government entity disclose the vendor's affiliation or business relationship that might cause a conflict of interest with a local government entity. Subchapter 6 of the code requires a vendor to file a conflict of interest questionnaire (CIQ) if a conflict exists. By law this questionnaire must be filed with the records administrator of Collin County no later than the 7th business day after the date the vendor becomes aware of an event that requires the statement to be filed. A vendor commits an offense if the vendor knowingly violates the code. An offense under this section is a misdemeanor.
- By submitting a response to this request, the vendor represents that it is in compliance with the requirements of Chapter 176 of the Texas Local Government Code.
- Please send completed forms to the Collin County County Clerk's Office located at 2300 Bloomdale Rd., Suite 2104,

McKinney, TX 75071.

Please initial.

- 12 Anti-Collusion Statement _____ (Required)
- Bidder certifies that its Bid/Proposal is made without prior understanding, agreement, or connection with any corporation, firm, or person submitting a Bid/Proposal for the same materials, services, supplies, or equipment and is in all respects fair and without collusion or fraud.
- No premiums, rebates or gratuities permitted; either with, prior to, or after any delivery of material or provision of services. Any such violation may result in Agreement cancellation, return of materials or discontinuation of services and the possible removal from bidders list.
- Please initial.
- 13 Disclosure of Interested Parties _____ (Required)
- Section 2252.908 of the Texas Government Code requires a business entity entering into certain contracts with a governmental entity to file with the governmental entity a disclosure of interested parties at the time the business entity submits the signed contract to the governmental entity. Section 2252.908 requires the disclosure form (Form 1295) to be signed by the authorized agent of the contracting business entity, acknowledging that the disclosure is made under oath and under penalty of perjury. Section 2252.908 applies only to a contract that requires an action or vote by the governing body of the governmental entity before the contract may be signed or has a value of at least \$1 million. Section 2252.908 provides definitions of certain terms occurring in the section.
- Section 2252.908 applies only to a contract entered into on or after January 1, 2016.
- Please initial.
- 14 Notification Survey _____ (Required)
- In order to better serve our offerors, the Collin County Purchasing Department is conducting the following survey. We appreciate your time and effort expended to submit your bid. Should you have any questions or require more information please call (972) 548-4165.
- How did you receive notice of this request?
Valid Responses: [Please Select], Plano Star Courier, Plan Room, Collin County eBid Notification, Collin County Website, Other
- 15 Bid Bond Acknowledgement _____ (Required)
- Accompanying this bid, is a certified check, cashier's check or Bid Bond in the amount of five percent (5%) of the total amount bid. Also accompanying this bid, all the information required in Section 00200 – Instructions to Bidders.
- Please initial.
- 16 Construction Acknowledgement _____ (Required)
- Bidder, declares that the only person or parties interested in this bid are those principals named herein, that his/her bid is made without collusion with any other person, firm or corporation, that he/she has carefully examined the Contract Documents including the Advertisement for Bids, Instruction to Bidders, Construction Agreement, Specifications and the Drawings, therein referred to and has carefully examined the locations, conditions and classes of materials for the proposed work, and agrees that he/she will provide all the necessary labor,

machinery, tools, equipment, apparatus and other items incidental to construction and will do all the work and furnish all the materials called for in the Contract Documents in the manner prescribed therein.

Bidder hereby declares that he/she has visited the site of the Work and has carefully examined the Contract Documents pertaining to the Work covered by the above Bid, and he/she further agrees to commence work within ten (10) consecutive calendar days after date of written Notice to Proceed and to substantially complete the work on which he/she has bid within the number of days specified subject to such extensions of time allowed by Specifications.

Bidder certifies that the bid prices contained in this bid have been carefully checked and are submitted as correct and final. The prices have been shown in words and figures for each item listed in this bid and it is understood that in the event of a discrepancy, the words shall govern.

Please initial.

Line Items

#	Qty	UOM	Description	Response
1	1	lump sum	Base Bid Grand Total	\$ _____ (Required) Price

Supplier Notes: _____

Item Attributes: Please review the following and respond where necessary

#	Name	Note	Response
1	Bid Grand Total- Written in Words	The contract award will be based on the total bid price.	_____ (Required)
2	Total Material Cost Incorporated in Project		\$ _____ (Required)
3	Total Material Cost Incorporated in Project- Written in Words		_____ (Required)
4	Total Labor Cost Incorporated in Project		\$ _____ (Required)
5	Total Labor Cost Incorporated in Project- Written in Words		_____ (Required)

2	1	lump sum	Alternative No. One-Deduct from Base Bid Amount: Above the ceiling, between the termination of gypsum wall board (GWB) and the roof deck, provide and install Level 3 Bullet-Resistant panels in lieu of Level 7 Bullet-Resistant panels as detailed, typical at all locations.	\$ _____ (Required) Price
---	---	----------	---	---------------------------------

Item Notes: Please enter a negative dollar amount.
Alternate Bid Amount Should Not Include the Base Bid Amount.
Refer to Section 012300-Alternates.

Supplier Notes: _____

004313 BID BOND

STATE OF TEXAS §
COUNTY OF COLLIN §

KNOW ALL MEN BY THESE PRESENTS:

THAT _____, a corporation organized and existing under the laws of the State of _____, and fully authorized to transact business in the State of Texas, whose address is _____ of the City of _____ County of _____, and State of _____, (hereinafter referred to as "Principal"), and _____ (hereinafter referred to as "Surety", a corporation organized under the laws of the State of _____ and authorized under the laws of the State of Texas to act as surety on bonds for principals, are held and firmly bound unto _____ (hereinafter referred to as "Owner") and unto all persons, firms and corporations who may furnish materials for or perform labor upon the buildings, structures or improvements referred to in the attached Contract, in the penal sum of _____ Dollars (\$ _____) in lawful money of the United States, for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors, and assigns, jointly and severally, firmly by these presents:

SIGNED, SEALED and DATED this _____ day of _____ 20 _____.

WHEREAS, the Principal is herewith submitting its proposal for IFB 2018-068, Construction, Modifications to Sheriff's Office Lobby

The condition of the above obligations are such that if the aforesaid Principal shall be awarded the Contract, the said Principal will, within the time required, enter into a Contract and give Bonds, if required, for the faithful performance of the Contract and the prompt payment for labor and materials in the prosecution thereof, then this obligation shall be null and void; otherwise the Principal and Surety will pay unto the OWNER the full penal sum hereof, as liquidated damages, it being difficult and impractical to determine accurately the actual amount of damages occurring to OWNER by reason of Principal's failure to execute said Contract and Bonds.

PROVIDED FURTHER, that if any legal action be filed on this Bond, venue shall lie in _____ County, Texas.

The Resident Agent of the Surety for delivery of notice and service of process is:
Name: _____
Address: _____
Phone Number: _____

WITNESS

PRINCIPAL

Printed/Typed Name _____

Title: _____

Company: _____

Address: _____

SURETY

Printed/Typed Name _____

Title: _____

Company: _____

Address: _____

WITNESS

NOTE: CERTIFIED COPY OF POWER-OF-ATTORNEY SHOULD BE ATTACHED HERETO.

SECTION 004548-CHAPTER 2270 VERIFICATION

I, _____, the undersigned representative
of

(PRINT NAME)

(COMPANY)

do hereby verify that the company named-above, under the provisions of Subtitle F, Title 10, Government Code Chapter 2270:

1. Does not boycott Israel currently; and
2. Will not boycott Israel during the term of the contract.

Pursuant to Section 2270.001, Texas Government Code:

1. *“Boycott Israel” means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes; and*
2. *“Company” means a for-profit sole proprietorship, organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or any limited liability company, including a wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of those entities or business associations that exist to make a profit.*

DATE

SIGNATURE OF COMPANY REPRESENTATIVE

TITLE

005213 CONSTRUCTION AGREEMENT

THIS CONSTRUCTION AGREEMENT is made and entered into by and between _____, a _____ corporation (hereinafter referred to as “Contractor”), and **COLLIN COUNTY, TEXAS**, a political subdivision of the State of Texas (hereinafter referred to as “County” or “OWNER”), to be effective from and after the date hereinafter provided.

For and in consideration of the covenants and agreements contained herein, and for the mutual benefits to be obtained hereby, the parties hereto agree as follows:

CONTRACT SUM

The County shall pay the Contractor in current funds for the performance of the work, subject to additions and deductions by Change orders as provided in the Contract Documents. The contract sum shall be the amount of (\$ _____).

EFFECTIVE DATE

This Construction Agreement, having been previously approved by the Commissioners’ Court of Collin County, Texas, shall be effective upon the date of delivery and execution by Contractor, provided the County executes the same within five (5) consecutive calendar days after said delivery and execution by Contractor.

I. CONTRACT GENERAL PROVISIONS

1.1 DEFINITIONS

Words which have well-known technical or construction industry meanings shall have their commonly understood meanings in the Contract Documents, unless a different meaning is stated in the Contract Documents. The following words and expressions, or pronouns used in their place, shall wherever they appear in this contract be construed as follows, unless a different meaning is clear from the context:

Addendum, Bulletin or Letter of Clarification: Any additional contract provisions, or change, revisions or clarification of the Contract Documents issued in writing by the OWNER, to prospective bidders prior to the receipt of bids.

Contract or Contract Documents: The written agreement covering the performance of the work. The Contract and Contract Documents include this written Construction Agreement between OWNER and CONTRACTOR, Advertisement for Bids, Instructions to Bidders, Requests for Proposal, all Addenda, the Specifications, including the general and supplemental special and technical conditions, Drawings, provisions, plans or working drawings — and any supplemental changes or agreements pertaining to the Work or materials therefor; and bonds and any additional documents incorporated by reference in the above.

CONTRACTOR: The person, persons, partnership, firm, corporation, association or organization, or any combination thereof, entering into the contract for the execution of the work, acting directly or through a duly authorized representative.

Other CONTRACTORS: Any contractor, other than the CONTRACTOR or his subcontractors, who has a direct contact with the OWNER for work on or adjacent to the site of the work.

Contract Work or Work: Everything expressly or impliedly required to be furnished and done by the CONTRACTOR by the Contract Documents.

Architect: The term “Architect” means the Architect or his duly authorized representative. The Architect shall be understood to be the Architect of the OWNER, and nothing contained in the Contract Documents shall create any contractual or agency relationship between the Architect and the CONTRACTOR.

Extra Work: Work other than that which is expressly or impliedly required by the Contract Documents at the time of the execution of the contract.

Change Order: A written order to the CONTRACTOR authorizing and directing an addition, deletion or revision in the work within the general scope of the Contract Documents, or authorizing an adjustment in the Contract Price or the Contract time.

Contract Price: The total amount of money payable to the CONTRACTOR under the terms and conditions of the Contract Documents. When used in such context, it may also mean the unit price of an item of work under the Contract terms.

OWNER’S Representative: The Architect or other duly authorized assistant, agent, engineer, inspector or superintendent acting within the scope of their particular duties.

Drawings or Contract Drawings: Those drawings that are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, including but not limited to, the plans, elevations, sections, details, schedules, diagrams, any bulletin, or any detailed drawing furnished by the OWNER, pertaining or supplemental thereto.

Specifications: Those portions of the Contract Documents that specify the requirements for materials, equipment, systems, standards and workmanship for performance of the Work, and related services.

Inspector: Any representative of the OWNER designated to inspect the work.

Materialman or Supplier: Any subcontractor contracting with the CONTRACTOR, or any of his subcontractors, to fabricate or deliver or who actually fabricates or delivers materials, supplies or equipment to be consumed or incorporated into the Work.

Notice: Written notice effective the date of the postmark thereon, or if hand delivered, effective the date of hand delivery.

OWNER: COLLIN COUNTY, TEXAS, a political subdivision of the State of Texas. The term OWNER means the OWNER or its authorized representative.

Payment Bond: A bond in the amount of the Contract executed by a corporate surety in accordance with all Texas Law, including but not limited to, Chapter 2253 of the Texas Government Code and Chapter 3503 of the Texas Insurance Code, for public works projects as security furnished by the CONTRACTOR and his sureties solely for the protection of payment bond beneficiaries supplying labor and materials in the prosecution of the Contract Work.

Performance Bond: A bond in the amount of the Contract executed by a corporate surety in accordance with all Texas Law, including but not limited to, Chapter 2253 of the Texas Government Code and Chapter 3503 of the Texas Insurance Code, for public works projects as security furnished by the CONTRACTOR and his sureties solely for the protection of the Owner, conditioned on the faithful performance of the Contract Work in accordance with the plans, specification, and Contract Documents.

Maintenance Bond: A bond executed by a corporate surety for 10% of the Contract Price that complies with all Texas Laws, including but not limited to, Chapter 3503 of the Texas Insurance Code, guaranteeing the prompt, full and faithful performance of the general guaranty and warranty contained in the Contract Documents, and Texas Law.

Project: The total construction of the work described in the Contract Documents performed by the Contractor, Other Contractor or the Owner in whole or part.

Proposal: The written statement or statements duly submitted to the OWNER by the person, persons, partnership, company, firm, association or corporation proposing to do the Work contemplated, including the approved form on which the formal bids for the Work are to be proposed.

Plan, or Plans: The plans are the drawings or reproductions therefrom made by the Owner or Owner's Representative and approved by the Owner showing the dimensions, location, design and position of the various elements of the Project and Work, including plans, elevations, sections, details, schedules, diagrams, working drawings, preliminary drawings, and such supplemental drawings as the Owner may issue to clarify other drawings or for the purpose of showing changes in the Contract Work authorized by the Owner, or for showing details not shown therein.

Special Provisions or Conditions: The special clauses of the Contract, or Contract Documents, setting forth conditions or requirements peculiar to the specific Project involved, supplementing the standard or general specifications and taking precedence over any

conditions or requirements of the standard or general specifications with which they are in conflict.

Specifications or Contract Specifications: All of the general, special and technical conditions or provisions, and all addendum or supplements thereto consisting of written requirements for materials, equipment, systems, standards and performance of the work.

Site: The area upon or in which the CONTRACTOR'S operations are carried on, and such other areas adjacent thereto as may be designated as such by the OWNER.

Subcontractors: Any persons, firm or corporation, other than employees of the CONTRACTOR, who or which contracts with the CONTRACTOR to furnish, or who actually furnishes, labor and/or materials and equipment at or about the site.

Sureties: The corporate bodies which are bound by such bonds as are required with and for the CONTRACTOR. The sureties engaged to be responsible for the entire and satisfactory fulfillment of the Contract and for any and all requirements as set out in the specifications, Contract or plans.

The Work: All work including the furnishing of all labor, materials, tools, equipment, required submittals and incidentals to be performed by the CONTRACTOR under the terms of the Contract.

Directed, Required, Approved and Words of Like Import: Whenever they apply to the Work or its performance, the words "directed," "required," "permitted," "ordered," "designated," "established," "prescribed" and words of like import used in the Contract, specifications or upon the drawings shall imply the direction, requirement, permission, order, designation or prescription of the OWNER; and "approved," "acceptable," "satisfactory" and words of like import shall mean approved by, acceptable to or satisfactory to the OWNER.

Equal: Materials, articles or methods which are of equal or higher quality than those specified or shown on the drawings and as further defined in the "or equal" clause. Substitution of Materials shall be determined by the Architect at his or her discretion, and approved by the Owner.

Working Time, Completion Time or Contract Time: The time set forth in the Contract for the performance and completion of the Work contracted for. The time may be expressed as calendar days, working days or a specific date.

Calendar Day or Days: Any successive days of the week or month, no days being excepted.

Working Day: A working day is defined as a calendar day not including Saturdays, Sundays or those legal holidays as specified in the list prepared by the OWNER for contract purposes. Nothing in this definition shall be construed as prohibiting the CONTRACTOR from working on Saturdays if he so desires, however permission of the OWNER shall be necessary if the

CONTRACTOR chooses to work on Saturday. Work on Sundays shall not be permitted without the written permission of the OWNER. If Saturday or Sunday work is permitted, working time shall be charged on the same basis as week days. Where the working time is expressed as calendar days or a specific date, the concept of working days shall no longer be relevant to the contract.

CONTRACT DOCUMENTS

1.2 The parties agree that the Contract Documents shall consist of the following documents in addition to any other documents referenced or incorporated herein:

- A. This written Construction Agreement, including any changes or modifications;
- B. All addenda including the following listed and numbered addenda:
Addendum No. 1 dated _____ Received _____
Addendum No. 2 dated _____ Received _____
Addendum No. 3 dated _____ Received _____
- C. Advertisement for Bids, Instructions to Bidder, the Invitation to Bid and Bid Form;
- D. The Special/Supplemental Conditions;
- E. The Specifications and the Project Drawings (if any);
- F. The Construction Details shown on plans;
- G. The Standard Specifications and Standard Drawings from the Public Works Construction Standards-North Central Texas Council of Governments, 2004 edition and all subsequent addendums;
- H. The Performance Bond in the sum of ONE HUNDRED PERCENT (100%) of the total Contract Price;
- I. The Payment Bond in the sum of ONE HUNDRED PERCENT (100%) of the total Contract Price; and,

1.2.1 PRIORITY OF THE CONTRACT DOCUMENTS

These Contract Documents (A through I above) form the Construction Agreement and are a part of this Construction Agreement as if fully set forth herein. In the event of an inconsistency in any of the provisions of the Contract Documents, the inconsistency shall be resolved by giving precedence to the Contract Documents in the order in which they are listed above.

1.2.2 THE CONTRACT

The Contract Documents form the Contract. The Contract represents the entire integrated agreement between the OWNER and the CONTRACTOR and supercedes all prior negotiations, and representations by either party.

1.3 CORRELATION AND INTENT OF DOCUMENTS

The Contract Documents are complementary and what is called for by any one shall be as binding as if called for by all. The intent of the documents, unless otherwise specifically provided, is to produce complete and finished work, which the CONTRACTOR undertakes to do in full compliance with the Contract Documents. It is not intended to mention every

item of work in the specifications which can be adequately shown on the drawings nor to show on the drawings all items of work described or required by the specifications. All materials or labor for work shown on the drawings or reasonably inferable therefrom as being necessary to produce a finished job shall be provided by the CONTRACTOR whether or not same is expressly covered in the specifications. No verbal conversation, understanding or agreement with any officer or employee or agent of the OWNER, either before or after the execution of the Contract, shall affect or modify any of the terms, conditions or obligations contained in the Contract Documents.

1.3.1 CONTRACT DRAWINGS AND SPECIFICATIONS

The OWNER shall furnish the CONTRACTOR one copy of the Contract Drawings and any supplemental drawings and specifications reasonably necessary for the proper execution of the work. At least one copy of all drawings and specifications shall be accessible at all times to the OWNER at the job site.

1.3.2 SUPPLEMENTAL DRAWINGS AND SPECIFICATIONS

In order to carry out the intent of the Contract Documents and to assist the CONTRACTOR in performing its work, the OWNER, after the execution of the Contract, may, by supplemental drawings, specifications or otherwise, furnish additional information or instructions as may be necessary for construction purposes.

All such supplemental drawings, specifications or instructions are intended to be consistent with the Contract Documents and reasonably inferable therefrom. Therefore, no extra costs shall be allowed by the OWNER on a claim that particular supplemental drawings, specifications or instructions differ from the requirements of the Contract Documents, incurring extra costs, unless the CONTRACTOR has first brought the matter, in writing, to the OWNER'S attention for adjustment before proceeding with the work covered by such.

If the OWNER decides that there is no departure from the requirements of the Contract Documents, the CONTRACTOR shall then proceed with the work as shown, specified or directed. If the OWNER shall decide that extra work is involved, he shall so modify the supplemental drawings, specifications or instructions to eliminate the extra work, or cause a written Change Order to be issued in accordance with the Contract Documents.

1.3.3 ERRORS AND CORRECTIONS IN DRAWINGS AND SPECIFICATIONS

The CONTRACTOR shall not take advantage of any apparent errors, omissions or discrepancies in the drawings or specifications; and the Architect or Engineer shall be permitted to make such corrections or interpretations as may be necessary for the fulfillment of the intent of the Contract Documents. In case of any errors, omissions

or discrepancies in the drawings or specifications, the CONTRACTOR shall promptly submit the matter to the OWNER or OWNER'S Representative in writing who, in turn, shall promptly make a determination and issue the necessary instructions in writing. Any adjustment by the CONTRACTOR without this determination and instructions shall be at the CONTRACTOR'S own risk and expense. The Work is to be made complete as intended by the Contract Documents.

1.3.4 EXISTING STRUCTURES

The plans show the general locations of some known surface and subsurface structures. The locations of many gas mains, water mains, conduits, sewers, other utilities, etc., however, are unknown, and the OWNER assumes no responsibility for failure to show any or all of these structures on the plans or to show them in their exact locations. It is mutually agreed that such failure shall not be considered sufficient basis for claims for additional compensation for Extra Work or for increasing the pay quantities in any manner whatsoever. The CONTRACTOR shall be solely responsible for locating all gas mains, water mains, conduits, sewers, other utilities etc., so as to perform the Work without damaging the same.

II. THE WORK

2.1 SCOPE OF WORK

Contractor shall provide all labor, supervision, materials, and equipment necessary to perform all work required by the Contract Documents in connection with **IFB 2018-068, Construction, Modifications to Sheriff's Office Lobby.**

2.2 CHANGE OR MODIFICATION OF CONTRACT

2.2.1 ALTERATION OF PLANS AND SPECIFICATIONS

The OWNER reserves the right to make such changes in the plans and specifications and in the character of the work as may be necessary or desirable to insure completion in the most satisfactory manner, provided such changes do not materially alter the original plans and specifications or change the general nature of the Work as a whole. Such changes shall not be considered as waiving or invalidating any condition or provision of the Contract or bonds. Such changes shall be issued by the Architect.

2.2.2 INCREASED OR DECREASED QUANTITIES OF WORK

The OWNER reserves the right and may from time to time, by written order, and without notice to any surety, make changes in the quantity or time of performance of the Work, as may be considered necessary or desirable and such changes shall not be considered as waiving or invalidating any conditions or provisions of the Contract or bonds. The CONTRACTOR shall perform all the Contract Work in

strict compliance with the Contract Documents, and shall not make any changes to the Work without prior written authorization from the OWNER, in the form of a written Change Order. If such changes increase or decrease either the cost or the time necessary for the performance of the Work, then the parties will mutually agree upon an equitable adjustment to the price or time to perform the Work pursuant to the terms of the Contract.

2.2.3 EXTRA WORK/CHANGE ORDERS

When any work is necessary to the proper completion of the Project and for which no prices are provided for in the Bid or Proposal and Contract, the CONTRACTOR shall do such work, but only when and as ordered in writing by the OWNER. The OWNER may order changes in the Work without invalidating Contract. Payment for Extra Work shall be made as provided herein. Contractor agrees that overhead and profit for Extra Work shall not exceed 10% of the total cost of the Extra Work. The Contractor shall not be entitled to any additional funds for any work or extra work performed on the Project, unless a Change Order is issued and signed by the Owner. The CONTRACTOR shall perform the work as altered, whether increased or decreased, and no allowances shall be made for anticipated profits. Nothing in this section shall give rise to any claims for any delay or acceleration damages, and the CONTRACTORS sole remedy for any delays in the Project shall remain an equitable extension of time as provided for in the Contract Documents. CONTRACTOR acknowledges and agrees to waive all rights or claims for compensation for any additional or other work not specifically authorized by the OWNER.

2.3 DISPUTED WORK AND CLAIMS FOR ADDITIONAL COMPENSATION

If the CONTRACTOR is of the opinion that (a) the work necessary or required to accomplish the result intended by this Contract, or (b) any work ordered to be done as Contract Work by the OWNER is extra work or additional work and not Contract Work, or (c) any determination or order of the OWNER violates the terms and provisions of this Contract, the CONTRACTOR shall promptly, either before proceeding with such work or complying with such order or determination, notify the OWNER in writing of his contentions with respect thereto and request a final determination thereof.

Such determination of the OWNER shall be given in writing to the CONTRACTOR. If the OWNER determines that the work in question is Extra Work and not Contract Work, or that the order complained of requires performance by the CONTRACTOR beyond that required by the Contract or violates the terms and provisions of the Contract, thereupon the OWNER shall cause either (a) the issuance of a written Change Order covering the Extra Work as provided herein, or (b) the determination or order complained of to be rescinded or so modified so as to not require performance beyond that required by the terms and provisions of the Contract.

If the OWNER determines that the work in question is Contract Work and not Extra Work, or that the determination or order complained of does not require performance by the CONTRACTOR beyond that required by the Contract or violate the terms and provisions of the Contract, he shall direct the CONTRACTOR to proceed, and the CONTRACTOR must promptly comply. In order to reserve his right to claim compensation for such work resulting from such compliance, however, the CONTRACTOR must, within 20 calendar days after receiving the OWNER'S determination and direction, notify the OWNER in writing that the work is being performed, or that the determination and direction is being complied with, under protest.

If the CONTRACTOR fails to so appeal to the OWNER for a determination or, having so appealed, should the CONTRACTOR thus fail to notify the OWNER in writing of his protest, the CONTRACTOR shall be deemed to have waived any claim for extra compensation or damages therefore. No oral appeals or oral protests, no matter to whom made, shall be deemed even substantial compliance with the provisions of this item.

In addition to the foregoing requirements, the CONTRACTOR shall, upon notice from the OWNER, for a minimum period of three (3) years following final payment or termination of contract, produce for examination and audit at the CONTRACTOR'S office, by the representatives of the OWNER, all his books and records showing all of his acts and transactions in connection with contractual performance as well as relating to or arising by reason of the matter in dispute. At such examination a duly authorized representative of the CONTRACTOR may be present.

Unless the aforesaid requirements and conditions are complied with by the CONTRACTOR, the OWNER shall be released from all claims arising under, relating to or by reason of disputed work or extra work. It is further stipulated and agreed that no conduct on the part of the OWNER or any agent or employee of the OWNER shall ever be construed as a waiver of the requirements of this section, when such requirements constitute an absolute condition precedent to any approval of any claim for extra compensation, notwithstanding any other provisions of the Contract Documents; and in any action against the OWNER to recover any sum in excess of the contract amount, the CONTRACTOR must allege and prove strict compliance with the provisions of this section. The CONTRACTOR ASSUMES THE RISK OF NONPAYMENT, for failing to comply with any of the requirements of this section.

III. CONTRACTORS RESPONSIBILITIES

3.1 CONTRACTOR'S REPRESENTATIONS, WARRANTIES AND ASSURANCES.

In consideration of, and to induce the award of this contract to him, the CONTRACTOR represents and warrants: (a) That he is financially solvent, and sufficiently experienced and competent to perform the work; (b) That the facts stated in the proposal and the information given by him pursuant to the bidding documents are true and correct in all respects; (c) That he has read, understood and complied with all the requirements set forth in the bidding documents; (d) That he is familiar with and understands all laws and regulations applicable

to the work; and (e) unless otherwise specifically provided for in the Contract Documents, the CONTRACTOR shall do all the Work and shall furnish all the tools, equipment, machinery, materials, labor and appliances, except as herein otherwise specified, necessary or proper for performing and completing the work required by this Contract, in the manner and within the time herein prescribed.

By executing the contract, the CONTRACTOR represents that he has visited the site of Work, has fully familiarized himself with the local and on-site conditions under which the work is to be performed and has correlated his observation with the requirements of the Contract Documents. In addition, the CONTRACTOR represents that he has satisfied himself as to subsurface conditions at the site of the Work. Information, data and representations contained in the Contract Documents pertaining to the conditions at the site, including subsurface conditions, are for information only and are not warranted or represented in any manner to accurately show the conditions at the site of the Work. The CONTRACTOR agrees that he shall make no claims for damages, additional compensation or extension of time against the OWNER because of encountering actual conditions in the course of the Work which vary or differ from conditions or information contained in the Contract Documents. All risks of differing subsurface conditions shall be borne solely by the CONTRACTOR.

The CONTRACTOR shall carefully study and compare the Contract Documents and shall at once report to the OWNER any error, inconsistency or omission he may discover. The CONTRACTOR shall perform no portion of the Work at any time without Contract Documents or, where required, approved shop drawings, product data or samples for such portion of the work.

3.1.1 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

A. Shop drawings are drawings, diagrams, schedules and other data specially prepared for the work by the CONTRACTOR or any subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

B. Product data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the CONTRACTOR to illustrate a material, product or system for some portion of the work.

C. Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the work shall be judged.

D. the CONTRACTOR shall provide, review, approve and submit to the Architect with reasonable promptness and in such sequence as to cause no delay in the Work or in the work of the OWNER or any separate contractor, all shop drawings, product data and samples required by the Contract Documents. The Work will be performed in accordance with submittals approved by the Architect. The CONTRACTOR shall

not be relieved responsibility for deviations from the requirements of the Contract Documents by errors or omissions by the OWNER or Architect in approving Shop Drawings, Product Data, samples or any other submittals.

E. By approving and submitting shop drawings, product data and samples, the CONTRACTOR represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or shall do so, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

F. As the Architect's review is only for general conformance with the requirements of the Contract Documents, the CONTRACTOR shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Architect's approval of shop drawings, product data or samples unless the CONTRACTOR has specifically informed the Architect in writing of such deviation at the time of submission and the Architect have given written approval to the specific deviation. The CONTRACTOR shall not be relieved from responsibility for errors or omissions in the shop drawings, product data or samples by the Architect's approval thereof. The CONTRACTOR shall direct specific attention, in writing or on resubmitted shop drawings, product data or samples, to revisions other than those requested by the Architect on previous submittals.

G. the CONTRACTOR shall be responsible for delays caused by rejection of the submittal of inadequate or incorrect shop drawings, product data or samples. The CONTRACTOR shall be responsible for seeing that any "approved" copies of shop drawings bearing the approval of the Architect are allowed on the job site. The CONTRACTOR shall be responsible for providing all copies of approved shop drawings necessary for the construction operations.

H. the CONTRACTOR shall keep adequate records of submittal and approvals so that an accurate up-to-date record file is maintained at the job site at all times.

I. No portion of the work requiring submission of a shop drawing, product data or sample shall be commenced until the submittal has been approved by the Architect. All such portions of the work shall be in accordance with approved submittals.

3.1.2 SURETY BONDS

With the execution and delivery of the contract, the CONTRACTOR shall furnish and file with the OWNER in the amounts herein required, the surety bonds specified hereunder. Without exception, the OWNER'S bond forms, attached hereto as Section 00610 must be used, and exclusive venue for any lawsuit in connection with such bonds shall be specified as the county in which the OWNER'S principal office is located. Such surety bonds shall be in accordance with Texas Law, including but not limited to, the provisions of Chapter 2253 of the Texas

Government Code and Chapter 3503 of the Texas Insurance Code. These bonds shall automatically be increased by the amount of any change order or supplemental agreement which increases the contract price with or without notice to the surety, but in no event shall a change which reduces the contract amount reduce the penal amount of such bonds.

A. Performance Bond. A good and sufficient bond in an amount not less than 100 percent of the total amount of the Contract Price guaranteeing the full and faithful execution of the Work and performance of the Contract in accordance with the plans, specifications and Contract Documents, including any extensions thereof, for the protection of the OWNER. This bond shall provide for the repair and/or replacement of all defects due to faulty materials and workmanship that appear within a period of one year from the date of completion and acceptance of the improvement by the OWNER or such lesser or greater period as may be designated in the Contract Documents.

B. Payment Bond. A good and sufficient bond in an amount not less than 100 percent of the total amount of the Contract Price guaranteeing the full and proper protection of all payment bond beneficiaries and claimants supplying labor and material in the prosecution of the work provided for in said Contract and for the use of each claimant.

C. Maintenance Bond. A good and sufficient bond in an amount not less than ten percent (10%) of the total amount of the Contract Price guaranteeing the project against defects.

D. Sureties. No sureties shall be accepted by the OWNER who are now in default or delinquent on any bonds or who are interested in any litigation against the OWNER. All bonds shall be made on forms furnished by the OWNER and shall be executed by not less than one corporate surety authorized to do business in the State of Texas and acceptable to the OWNER. The sureties shall be listed in the most current Federal Register Treasury List. Each bond shall be executed by the CONTRACTOR and surety. Each surety shall designate an agent resident in the OWNER'S jurisdictional area acceptable to the OWNER to whom any requisite notices may be delivered and on whom service of process may be had in matters arising out of such suretyship. The OWNER reserves the right to reject any and all sureties.

E. Additional or Substitute Bonds. If at any time the OWNER is or becomes dissatisfied with any surety, then upon the performance or payment bond, the CONTRACTOR shall, within five days after notice from the OWNER to do so, substitute an acceptable bond (or bonds), or provide an additional bond, in such form and sum and signed by such other surety or sureties as may be satisfactory to the OWNER. The premiums on such bonds shall be paid by the CONTRACTOR without recourse to the OWNER. No further payments under the contract shall be

deemed due or payable until the substitute or additional bonds shall have been furnished and accepted by the OWNER.

3.1.3 PERMITS AND FEES

The CONTRACTOR shall secure and pay for all building permits and other permits and governmental fees, licenses and inspections necessary for proper execution and completion of the Work which are normally and legally required for the construction of similar projects in the State of Texas. The CONTRACTOR will give all notices required by laws, ordinances, rules, regulations and lawful orders of authorized public authorities required for the proper and legal performance of the Work.

3.14 CONTRACT DOCUMENTS AT SITE

The CONTRACTOR shall keep and maintain at the Project site one record copy of the Contract Documents, including but not limited to, the Drawings, Specifications, addenda, Change Orders, submittals, Product Data, Samples and other modifications, in good order and marked to show the current construction of the Project. These documents shall be available to the OWNER or Architect to review at any time and shall be submitted to the OWNER upon completion of the Project, along with a complete set of as built drawings.

3.2 CONTRACTOR'S RESPONSIBILITIES

3.2.1 PERFORMANCE OF THE WORK

In addition to those matters elsewhere expressly made the responsibility of the CONTRACTOR, the CONTRACTOR shall have the full and direct responsibility for the performance and completion of the Work under this Contract and for any act or neglect of the CONTRACTOR, his agents, employees or subcontractors. He shall bear all losses, if any, resulting on account of the amount and character of the Work, or because the conditions under which the work must be done are different from what were estimated or anticipated by him, or because of weather, floods, elements or other causes.

3.2.2 MEANS AND METHODS OF CONSTRUCTION

Unless otherwise expressly provided in the contract drawings, specifications or bulletins, the means and methods of construction shall be such as the CONTRACTOR may choose; subject, however, to the OWNER'S right to prohibit means and methods proposed by the CONTRACTOR which in the OWNER'S judgment:

- A. shall constitute a hazard to the Work, or to persons or property, or shall violate express requirements of applicable laws or ordinances; or
- B. shall cause unnecessary or unreasonable inconvenience to the public; or
- C. shall not produce finished work in accordance with the requirements of the Contract Documents; or
- D. shall not assure the Work to be completed within the time allowed by the contract.

The OWNER'S approval of the CONTRACTOR'S means or methods of construction, or the OWNER'S failure to exercise his right to prohibit such means or methods, shall not relieve the CONTRACTOR of his responsibility for the Work or of his obligation to accomplish the result intended by the Contract Documents; nor shall the exercise or non-exercise of such rights to prohibit create a cause of action for damages or provide a basis for any claim by the CONTRACTOR against the OWNER. The CONTRACTOR shall be solely responsible for, the construction means and methods, techniques, sequences, procedures, and for the safety precautions and programs in connection with the Work or the Project.

If the Contract Documents specify any means, methods, techniques, sequences or procedures, the CONTRACTOR shall evaluate said specifications and determine that they are safe for the proper prosecution of the Work. The CONTRACTOR shall be solely responsible for the job site safety of such means, methods, techniques, sequences or procedures. If the CONTRACTOR determines the specified means, methods, techniques, sequences or procedures may not be safe, the CONTRACTOR shall immediately notify the OWNER and Architect and shall not proceed without further instructions.

3.2.3 CONSTRUCTION SCHEDULE

The CONTRACTOR, immediately after being awarded the contract, shall prepare and submit for the OWNER or Architect's information 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 and shall provide for expeditious and reasonable execution of the work, not to exceed the time limits for completion provided in the Contract Documents. The progress schedule shall be updated as the Work proceeds or the schedule changes and immediately upon request by the OWNER. The CONTRACTOR shall also prepare a schedule of submittals that allows for a reasonable time for the OWNER or Architect to review the submittals so as not to delay the Project.

3.2.4 TIME OF PERFORMANCE OF THE WORK

The CONTRACTOR shall begin the work to be performed under this Contract not later than 10 days from the date specified in the purchase or work order and shall

conduct the work in such a manner and with sufficient equipment, material and labor as is necessary to insure its completion within the working time. It is the intent of this specification to provide a continuous construction operation without delay except as occasioned by unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, and it shall be the CONTRACTOR's responsibility to execute the work in the most expeditious manner.

Work shall be done only during the regular and commonly accepted and prescribed working hours. No work shall be done on nights, Sundays or regular holidays unless permission is given by the OWNER

Time is of the Essence for the performance of the Work by the CONTRACTOR. CONTRACTOR agrees that the time allotted for the performance of the Work is reasonable.

3.2.5 PERFORMANCE OF EXTRA OR DISPUTED WORK

While the CONTRACTOR or his subcontractor is performing Extra Work in accordance with the OWNER'S written order, the cost of which is to be determined on a time and material basis, or is performing disputed work or complying with a determination or order under protest, the CONTRACTOR shall, on the Monday following the performance of the work, furnish the OWNER'S representative at the site with three copies of verified statements showing:

- A. the name and number of each workman employed on such extra work or engaged in complying with such determination or order, the character of extra work each is doing and the wages paid to him, including the rate and amount of payroll taxes, contributions for insurance, and federal social security; and
- B. the nature, cost and quantity of any materials, plant equipment or construction equipment furnished or used in connection with the performance of such extra work or in complying with such determination or order, and from who purchased or rented.

The CONTRACTOR and his subcontractors, when required by the OWNER, must also produce for inspection and audit by designated OWNER representatives for a minimum period of three (3) years following final payment or termination of contract any and all of his books, vouchers, records, daily job diaries and reports, canceled checks, etc. showing the nature and quantity of labor, materials and equipment actually used in the performance of the extra work; the amounts expended therefore; and the costs incurred for insurance premiums and other items of expense directly chargeable to such extra work. The CONTRACTOR must permit the OWNER'S representatives to make extracts therefrom or copies thereof as may be desired.

Failure of the CONTRACTOR to comply strictly with the requirements of this section shall constitute a waiver of any claim for extra compensation on account of the performance of such extra work.

3.3 QUALITY OF WORK

3.3.1 INSPECTION AND TESTS

The CONTRACTOR shall furnish the OWNER with every reasonable accommodation and opportunity to ascertain whether or not the work performed is in accordance with the requirements and intent of the plans and specifications. Any work done or materials used without suitable inspection by the OWNER may be ordered removed and replaced at the CONTRACTOR'S expense. The CONTRACTOR shall not be relieved from his obligations to perform the Work in accordance with the Contract Documents either by the activities or duties of the OWNER in his administration of the contract, or by inspections, tests or approvals required or performed by persons other than the CONTRACTOR.

Unless otherwise provided, the CONTRACTOR shall make arrangements for all tests, inspections and approvals with an independent testing laboratory or entity required by the Contract Documents or by laws, ordinances, rules, regulations or orders of public authorities having jurisdiction over the Work or items to be tested, inspected or approved. If additional testing or inspection is required they shall be performed at the CONTRACTOR'S expense.

3.3.2 REMOVAL OF DEFECTIVE AND UNAUTHORIZED WORK

All work which has been rejected or condemned shall be repaired, or if it cannot be repaired satisfactorily, it shall be removed and replaced at the CONTRACTOR'S expense. Defective materials shall be immediately removed from the site of the work. Work done without line and grade having been given, work done beyond the lines or not in conformity with the grades shown on the plans or as given, save as herein provided, work done without written authority and prior agreement in writing as to process, shall be done at the CONTRACTOR'S risk and shall be considered unauthorized and at the option of the OWNER may be ordered removed at the CONTRACTOR'S expense.

Upon failure of the CONTRACTOR to repair satisfactorily or to remove and replace, if so directed, rejected, unauthorized or condemned work or materials immediately after receiving notice from the OWNER, the OWNER shall, after giving written notice to the CONTRACTOR, have the authority to cause defective work to be remedied or removed and replaced, or to cause unauthorized work to be removed and to deduct the cost thereof from any monies due or to become due the

CONTRACTOR. Alternatively, the OWNER may, at its option, declare the CONTRACTOR in default.

3.3.3 WORKING AREA; COORDINATION WITH OTHER CONTRACTORS; FINAL CLEANUP

The CONTRACTOR shall confine his equipment, storage of materials and construction operations to the area shown on the contract drawings or stated in the specifications, prescribed by ordinance, laws, or permits or as may be directed by the OWNER, and shall not unreasonably encumber the site or public right-of-way with his construction equipment, plant or materials.

Such area shall not be deemed for the exclusive use of the CONTRACTOR. Other contractors of the OWNER may enter upon and use such portions of the area and for such items as determined by the OWNER are necessary for all purposes required by their contracts. The CONTRACTOR shall give to such other contractors all reasonable facilities and assistance to the end that the work on this and other contracts shall not be unduly or unreasonably delayed. Any additional areas desired by the CONTRACTOR for his use shall be provided by him at his own cost and expense.

The CONTRACTOR is responsible for cutting, fitting or patching any parts of the Work where such work is necessary to make the Work complete, for parts to fit together, or for any damage to the Work prior to Final Acceptance.

The CONTRACTOR shall keep the Project and the surrounding area clean and free from the accumulation of waste materials or trash. Upon completion of the work and before final acceptance and final payment shall be made, the CONTRACTOR shall completely clean and remove from the site of the work surplus and discarded materials, temporary structures and debris of every kind. He shall leave the site of the work in a neat and orderly condition equal to that which originally existed, or as called for in the Contract Documents. Surplus and waste materials removed from the site of the work shall be disposed of at locations satisfactory to the OWNER, and at the CONTRACTOR'S sole cost.

3.4 LEGAL RESPONSIBILITIES

3.4.1. PATENTS AND COPYRIGHTS

The CONTRACTOR shall pay all royalties and license fees and shall provide, by suitable legal agreement with the patentee or owner, for the use of any design, device, material or process covered by letters, patent or any copyright. The CONTRACTOR shall indemnify, defend, hold and save the OWNER and its officers, employees and agents harmless from all liability and claims for infringement of any patent or copyright.

In the event that any claims, suit or action at law or in equity of any kind whatsoever is brought against the OWNER, or its officers, employees or agents involving any such patents, copyrights or license rights, then the OWNER shall have the right to and may retain from any money due or to become due to the CONTRACTOR such sum deemed necessary by the OWNER for its protection until such claim or suit shall have been settled and satisfactory evidence to that effect shall have been furnished the OWNER.

3.4.2 INDEMNIFICATION

To the fullest extent permitted by law, the CONTRACTOR and his sureties shall indemnify, defend and hold harmless the OWNER and all of its, past, present and future, officers, agents and employees from all suits, cause of action, claims, liabilities, losses, fines, penalties, liens, demands, obligations, actions, proceedings, of any kind, character, name and description brought or arising, on account of any injuries or damages received or sustained by any person, destruction or damage to any property on account of, in whole or part, the operations of the CONTRACTOR, his agents, employees or subcontractors; or on account of any negligent act or fault of the CONTRACTOR, his agents, employees or subcontractors in the execution of said Contract; failing to comply with any law, ordinance, regulation, rule or order of any governmental or regulatory body including those dealing with health, safety, welfare or the environment; on account of the failure of the CONTRACTOR to provide the necessary barricades, warning lights or signs; and shall be required to pay any judgment, with cost, which may be obtained against the OWNER growing out of such injury or damage. In no event shall OWNER be liable to CONTRACTOR for indirect or consequential damages or loss of income or profit irrespective of the cause, fault or reason for same. CONTRACTOR'S duty to indemnify herein shall not be limited by any limitation on the type or amount of damages payable by or for CONTRACTOR or any Subcontractor under workman's compensation acts, disability benefit acts or any other employee benefit acts.

In addition, the CONTRACTOR likewise covenants and agrees to, and does hereby, indemnify and hold harmless the OWNER from and against any and all injuries, loss or damages to property of the OWNER during the performance of any of the terms and conditions of this Contract, arising out of or in connection with or resulting from, in whole or in part, any and all alleged acts or omissions of officers, agents, servants, employees, contractors, subcontractors, licenses or invitees of the CONTRACTOR.

The rights and responsibilities provided in this indemnification provision shall survive the termination or completion of this Contract.

3.5 SUPERVISION AND CONSTRUCTION PROCEDURES

3.5.1. SUPERVISION BY CONTRACTOR

The status of the CONTRACTOR is that of an independent CONTRACTOR under Texas law and the work under this Contract shall be under the direct charge and superintendence of the CONTRACTOR. Except where the CONTRACTOR is an individual and gives his personal superintendence to the work, the CONTRACTOR shall provide a competent superintendent or general foreman on the work site at all times during progress with full authority to act for the CONTRACTOR. The CONTRACTOR shall also provide an adequate staff for the coordination and expediting of the Work.

The superintendent and staff shall be satisfactory to the OWNER. The superintendent or general foreman shall not be changed during this Contract except with the written consent of the OWNER or unless the superintendent or general foreman proves unsatisfactory to the CONTRACTOR and ceases to be in his employ.

If the superintendent should be or become unsatisfactory to the OWNER, he shall be replaced by the CONTRACTOR upon written direction of the OWNER, and in such event, the CONTRACTOR shall not be entitled to file a claim for any additional working time or money from the OWNER.

3.5.2 EMPLOYEES

The CONTRACTOR shall employ only competent, efficient workmen and shall not use on the work any unfit person or one not skilled in the work assigned to him and shall at all times maintain good order among its employees. Whenever the OWNER shall inform the CONTRACTOR in writing that, in his opinion, any employee is unfit, unskilled, disobedient, or is disrupting the orderly progress of the work, such employee shall be removed from the work and shall not again be employed on it. Under urgent circumstances, the OWNER may orally require immediate removal of an employee for cause, to be followed by written confirmation.

The CONTRACTOR shall supervise and direct all the work, using his best skill and attention. He shall be solely responsible for all construction means, methods, techniques, sequences, procedures and safety procedures and for coordinating all portions of the Work under the Contract. The CONTRACTOR shall be responsible to the OWNER for the acts and omissions of his employees, subcontractors and their agents, employees and subcontractors performing any of the work under a contract with the CONTRACTOR.

3.5.3 LABOR AND MATERIALS

Unless otherwise provided in the Contract Documents, the CONTRACTOR shall provide and pay for all labor, materials, equipment, tools, construction equipment

and machinery, water, heat, utilities, transportation and other facilities and services necessary for the proper execution and completion of the work, whether temporary or permanent and whether or not incorporated or to be incorporated into the work.

The CONTRACTOR shall at all times enforce strict discipline and good order among his employees and shall not employ on the work site any unfit person or anyone not skilled in the task assigned to him.

The rate of progress shall be such that the whole work shall be performed and the premises cleaned up in accordance with the Contract within the working time established in the Contract, unless an extension of time is made in the manner hereinafter specified.

3.5.4 WAGE SCALE

In accordance with The Texas Government Code, Title 10, Chapter 2258, Prevailing Wage Rates, the general prevailing wage rate has been determined for this locality for the craft or type of workman needed to execute work of a similar character of the project listed herein. The Contractor shall pay the prevailing wage rate in this locality to all his/her employees and subcontractors performing work on this project, and in no event shall the Contractor pay less than the rate shown in the following schedule.

General Decision Number: TX170289 11/03/2017 TX289

Superseded General Decision Number: TX20160289

State: Texas

Construction Type: Building

County: Collin County in Texas.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.20 for calendar year 2017 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.20 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2017. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number Publication Date

0 01/06/2017

1 01/27/2017

2	04/07/2017
3	04/14/2017
4	08/25/2017
5	09/08/2017
6	11/03/2017

ASBE0021-011 06/01/2016

Rates Fringes

ASBESTOS WORKER/HEAT & FROST
INSULATOR (Duct, Pipe and
Mechanical System Insulation)....\$ 24.32 7.52

BOIL0074-003 01/01/2017

Rates Fringes

BOILERMAKER.....\$ 28.00 22.35

CARP1421-002 04/01/2016

Rates Fringes

MILLWRIGHT.....\$ 26.60 8.65

ELEV0021-006 01/01/2017

Rates Fringes

ELEVATOR MECHANIC.....\$ 38.77 31.585+a+b

FOOTNOTES:

A. 6% under 5 years based on regular hourly rate for all hours worked. 8% over 5 years based on regular hourly rate for all hours worked.

B. New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Day, and Veterans Day.

ENGI0178-005 06/01/2014

Rates Fringes

POWER EQUIPMENT OPERATOR

(1) Tower Crane.....	\$ 29.00	10.60
(2) Cranes with Pile Driving or Caisson Attachment and Hydraulic Crane 60 tons and above.....	\$ 28.75	10.60
(3) Hydraulic cranes 59 Tons and under.....	\$ 27.50	10.60

IRON0263-005 06/01/2017

Rates Fringes

IRONWORKER (ORNAMENTAL AND STRUCTURAL).....	\$ 23.25	7.32
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* PLUM0100-005 11/01/2017

Rates Fringes

HVAC MECHANIC (HVAC Unit Installation Only).....	\$ 30.84	11.51
PIPEFITTER (Excludes HVAC Pipe Installation).....	\$ 30.84	11.51

SUTX2014-015 07/21/2014

Rates Fringes

BRICKLAYER.....	\$ 21.06	0.00
CARPENTER, Excludes Drywall Hanging, Form Work, and Metal Stud Installation.....	\$ 15.78	0.00
CAULKER.....	\$ 15.16	0.00
CEMENT MASON/CONCRETE FINISHER...	\$ 13.04	0.00
DRYWALL HANGER AND METAL STUD INSTALLER.....	\$ 13.00	0.00
ELECTRICIAN (Alarm Installation Only).....	\$ 20.93	3.86
ELECTRICIAN (Communication		

Technician Only).....	\$ 15.35	1.39
ELECTRICIAN (Low Voltage Wiring Only).....	\$ 17.04	1.39
ELECTRICIAN, Excludes Low Voltage Wiring and Installation of Alarms/Sound and Communication Systems.....	\$ 20.01	2.69
FORM WORKER.....	\$ 11.89	0.00
GLAZIER.....	\$ 16.46	3.94
HIGHWAY/PARKING LOT STRIPING: Operator (Striping Machine).....	\$ 10.04	2.31
INSTALLER - SIDING (METAL/ALUMINUM/VINYL).....	\$ 14.74	0.00
INSTALLER - SIGN.....	\$ 15.50	0.00
INSULATOR - BATT.....	\$ 13.00	0.00
IRONWORKER, REINFORCING.....	\$ 12.29	0.00
LABORER: Common or General.....	\$ 10.52	0.00
LABORER: Mason Tender - Brick...	\$ 10.54	0.00
LABORER: Mason Tender - Cement/Concrete.....	\$ 10.93	0.00
LABORER: Pipelayer.....	\$ 13.00	0.35
LABORER: Plaster Tender.....	\$ 12.22	0.00
LABORER: Roof Tearoff.....	\$ 11.28	0.00
LABORER: Landscape and Irrigation.....	\$ 10.55	0.00
LATHER.....	\$ 16.00	0.00
OPERATOR:		

Backhoe/Excavator/Trackhoe.....	\$ 12.83	0.00
OPERATOR: Bobcat/Skid Steer/Skid Loader.....	\$ 13.93	0.00
OPERATOR: Bulldozer.....	\$ 18.29	1.31
OPERATOR: Drill.....	\$ 15.69	0.50
OPERATOR: Forklift.....	\$ 13.21	0.81
OPERATOR: Grader/Blade.....	\$ 13.03	0.00
OPERATOR: Loader.....	\$ 13.46	0.85
OPERATOR: Mechanic.....	\$ 17.52	3.33
OPERATOR: Paver (Asphalt, Aggregate, and Concrete).....	\$ 18.44	0.00
OPERATOR: Roller.....	\$ 15.04	0.00
PAINTER (Brush, Roller and Spray), Excludes Drywall Finishing/Taping.....	\$ 13.35	5.10
PAINTER: Drywall Finishing/Taping Only.....	\$ 14.24	3.83
PIPEFITTER (HVAC Pipe Installation Only).....	\$ 20.45	4.00
PLASTERER.....	\$ 16.58	0.00
PLUMBER, Excludes HVAC Pipe Installation.....	\$ 22.46	4.06
ROOFER.....	\$ 17.19	0.00
SHEET METAL WORKER (HVAC Duct Installation Only).....	\$ 21.13	4.79
SHEET METAL WORKER, Excludes HVAC Duct Installation.....	\$ 24.88	5.97

SPRINKLER FITTER (Fire Sprinklers).....	\$ 37.50	0.00
TILE FINISHER.....	\$ 11.22	0.00
TILE SETTER.....	\$ 14.25	0.00
TRUCK DRIVER: 1/Single Axle Truck.....	\$ 16.00	0.81
TRUCK DRIVER: Dump Truck.....	\$ 12.39	1.18
TRUCK DRIVER: Flatbed Truck.....	\$ 19.65	8.57
TRUCK DRIVER: Semi-Trailer Truck.....	\$ 12.50	0.00
TRUCK DRIVER: Water Truck.....	\$ 12.00	4.11

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the

particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION

Except for work on legal holidays, the “General Prevailing Rate of Per Diem Wage” for the various crafts or type of workers or mechanics is the product of (a) the number of hours worked per day, except for overtime hours, times (b) the above respective rate per hour.

For legal holidays, the “General Prevailing Rate of Per Diem Wage” for the various crafts or type of workers or mechanics is the product of (a) one and one-half times the above respective rate per hour, times (b) the number of hours worked on the legal holiday.

For overtime work, the “General Prevailing Rate of Per Diem Wage” for the various crafts or type of workers or mechanics is the product of (a) one and one-half times the above respective rate per hour, times (b) the number of hours worked on overtime.

Under the provisions of Texas Government Code, Title 10, Chapter 2258, Prevailing Wage Rates, the contractor or subcontractor of the contractor shall forfeit as a penalty to the entity on whose behalf the contract is made or awarded, sixty dollars (\$60.00) for each calendar day, or portion thereof, that the worker is paid less than the wage rates stipulated in the contract.

If the construction project involves the expenditure of Federal funds in excess of \$2,000, the minimum wages to be paid various classes of laborers and mechanics will be based upon the wages that will be determined by the Secretary of Labor to be prevailing for the corresponding classes of laborers and mechanics employed on the project of a character similar to the Contract Work.

- 3.5.5 Contractors doing business with OWNER agree to comply with Federal Executive Order 13465 E-Verify. It is OWNER’S intention and duty to comply and support the Immigration and Nationality Act (INA) which includes provisions addressing employment eligibility, employment verification and non-discrimination. According to the INA, contractors/employers may hire only persons who may legally work in the United States. Subsequently, contractors and subcontractors doing business with OWNER must confirm their enrollment in the E-Verify system which verifies employment eligibility through completion and checking of I-9 forms. OWNER reserves the right to audit contractor’s process to verify enrollment compliance.

3.5.6 COMPLIANCE WITH LAWS

The CONTRACTOR shall fully comply with all local, state and federal laws, including all codes, ordinances and regulations applicable to this Contract and the Work to be done thereunder, which exist or which may be enacted later by governmental bodies having jurisdiction or authority for such enactment.

All work required under this Contract is intended to comply with all requirements of law, regulation, permit or license. If the CONTRACTOR finds that there is a variance, he shall immediately report this to the OWNER for resolution.

3.5.6.1 EQUAL EMPLOYMENT OPPORTUNITY

The CONTRACTOR shall comply with all local, state and federal employment and discrimination laws and shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, age, national origin or any other class protected by law.

3.5.7 RAILWAY CROSSINGS

Where the Work encroaches upon any right-of-way of any railway, the OWNER shall secure the necessary easement for the work. Where railway tracks are to be crossed, the CONTRACTOR shall observe all the regulations and instructions of the railway company as to methods of doing the work or precautions for safety of property and the public. All negotiations with the railway company, except for right-of-way, shall be made by the CONTRACTOR. The railway company shall be notified by the CONTRACTOR not less than five days prior to commencing the work. The CONTRACTOR shall not be paid separate compensation for such railway crossing but shall receive only the compensation as set out in the proposal.

3.5.8 OTHER CONTRACTORS; OBLIGATION TO COOPERATE

The OWNER reserves the right to perform construction on the Project with its own forces or may award other contracts for additional work on this Project, and the CONTRACTOR shall fully cooperate with such other contractors and shall coordinate and fit his work to be done hereunder to such additional work as may be contracted by the OWNER. The CONTRACTOR shall not commit or permit any act which shall interfere with the performance of work by any other contractor.

Upon receiving written notice from the CONTRACTOR that the OWNER or another contractor is failing to coordinate his work with the Work under this Contract as directed by the OWNER, the OWNER shall promptly investigate the charge and take such necessary action as the situation may require. However, the OWNER shall not be liable to the CONTRACTOR for damages suffered by the CONTRACTOR due to the fault or negligence of another contractor or through failure of another contractor to carry out the directions of the OWNER. Should any interference occur between contractors, the Architect may furnish the CONTRACTOR with written instructions designating priority of effort, whereupon the CONTRACTOR shall immediately comply with such direction. In such event, the CONTRACTOR shall be entitled to an extension of working time only for

unavoidable delays verified by the Architect; however, no increase in the Contract Price shall be due the CONTRACTOR.

3.5.9 SUBCONTRACTS

The CONTRACTOR shall not make any subcontract for performing any portion of the Work included in the contract without written notice to the OWNER. This contract having been made pursuant to the bid submitted by the CONTRACTOR and in reliance with the CONTRACTOR'S personal qualifications and responsibility, the OWNER reserves the right to withhold approval of any subcontractor which the OWNER may deem would not be in the OWNER'S best interest.

The CONTRACTOR shall, as soon as practicable after signing the Contract, submit a separate written notice to the OWNER identifying each proposed subcontractor. Upon request of the OWNER, the CONTRACTOR shall promptly furnish additional information tending to establish that any proposed subcontractor has the necessary facilities, skill, integrity, past experience and financial resources to perform the work in accordance with the terms and conditions of this Contract.

If the OWNER determines that any proposed subcontractor is unacceptable, he shall so notify the CONTRACTOR, who may thereupon submit another proposed subcontractor unless the CONTRACTOR decides to do the work himself. Disapproval by the OWNER of any proposed subcontractor shall not provide a basis for any claim by the CONTRACTOR.

If an approved subcontractor fails to properly perform the work undertaken, he shall be removed from the job upon request of the OWNER, following notification to the CONTRACTOR in writing of the request for removal and the reasons therefore.

Each subcontract entered into shall provide that the provisions of this Contract shall apply to such subcontractor and his officers and employees in all respects as if he and they were employees of the CONTRACTOR. The OWNER'S decision not to disapprove of any subcontract shall not relieve the CONTRACTOR of any of his responsibilities, duties and liabilities hereunder. The CONTRACTOR shall be solely responsible for the acts, omissions, negligence or defaults of his subcontractors and of such subcontractor's officers, agents and employees, each of whom shall, for this purpose, be deemed to be the agent or employee of the CONTRACTOR to the extent of his subcontract.

The CONTRACTOR agrees to bind each subcontractor and each subcontractor agrees to be bound by the terms of the Contract Documents insofar as applicable to his work. The CONTRACTOR and each subcontractor jointly and severally agree that nothing in the Contract Documents or otherwise shall create or be deemed to create any rights in favor of a subcontractor against the OWNER; nor shall be

deemed or construed to impose upon the OWNER any obligation, liability or duty to a subcontractor; or to create any contractual relation whatsoever between a subcontractor and the OWNER.

The provisions contained herein shall likewise apply to any sub-subcontracts.

3.6 PROTECTION OF WORK AND OF PERSONS AND PROPERTY

3.6.1 PROTECTION OF WORK

During performance and up to date of final acceptance, the CONTRACTOR shall be under the absolute obligation to protect the finished work against any damage, loss or injury. In the event of such damage, loss or injury, the CONTRACTOR shall promptly replace or repair such work, whichever the OWNER shall determine to be preferable. The obligation to deliver finished work in strict accordance with the Contract prior to final acceptance shall be absolute and shall not be affected by the OWNER'S approval of or failure to prohibit means and methods of construction used by the CONTRACTOR. All risk of loss or damage to the work shall be borne solely by the CONTRACTOR until final completion and acceptance of all work by the OWNER, as evidenced by the OWNER'S issuance of a certificate of acceptance.

3.6.2 PROTECTION OF PERSONS AND PROPERTY

The CONTRACTOR shall have the responsibility to provide and maintain all warning devices and take all precautionary measures required by law or otherwise to protect persons and property while said persons or property are approaching, leaving or within the work site or any area adjacent to said work site. No separate compensation shall be paid to the CONTRACTOR for the installation or maintenance of any warning devices, barricades, lights, signs or any other precautionary measures required by law or otherwise for the protection of persons or property.

The CONTRACTOR shall assume all duties owed by the OWNER to the general public in connection with the general public's immediate approach to and travel through the work site and the area adjacent to said work site.

Where the work is carried on in or adjacent to any street, alley, sidewalk, public right-of-way or public place, the CONTRACTOR shall at his own cost and expense provide such flagmen and watchmen and furnish, erect and maintain such warning devices, barricades, lights, signs and other precautionary measures for the protection of persons or property as may be prudent or necessary, or as are required by law. The CONTRACTOR'S responsibility for providing and maintaining flagmen, watchmen, warning devices, barricades, signs and lights and other precautionary measures shall not cease until the project shall have been completed and accepted

by the OWNER, and shall cease when the certificate of acceptance is issued by the OWNER pursuant to the Contract Documents.

If the OWNER discovers that the CONTRACTOR has failed to comply with the applicable federal and state law (by failing to furnish the necessary flagmen, warning devices, barricades, lights, signs or other precautionary measures for the protection of persons or property), the OWNER may order the CONTRACTOR to take such additional precautionary measures as required by law to be taken to protect persons and property.

In addition, the CONTRACTOR shall be held responsible for all damages to the work and other public or private property due to the failure of warning devices, barricades, signs, lights or other precautionary measures in protecting said property; and whenever evidence is found of such damage, the OWNER may order the damaged portion immediately removed and replaced by and at the cost and expense of the CONTRACTOR.

3.6.3 SAFETY; TRENCH SAFETY; UNDERGROUND UTILITY SAFETY; PUBLIC CONVENIENCE AND SAFETY;

The CONTRACTOR shall be responsible for complying with state laws and federal regulations relating to safety, trench safety, and underground utility safety, including those which may be enacted during the performance under this Contract. The CONTRACTOR shall comply with the provisions of the The Standard Specifications and Standard Drawings from the Public Works Construction Standards-North Central Texas Council of Governments, 2004 edition and all subsequent addendums and the Instructions to Bidders regarding trench safety, public convenience and safety, and sanitary provisions. The CONTRACTOR shall be solely responsible for, the construction means and methods, techniques, sequences, or procedures, or for the safety precautions and programs in connection with the Work and the Project.

3.7 MATERIALS AND WORKMANSHIP; WARRANTIES AND GUARANTEES

Unless otherwise expressly provided in the contract drawings or specifications, the work shall be performed in accordance with the best modern practice with materials and workmanship of the highest quality and suitable for their purpose. The OWNER shall judge and determine the CONTRACTOR'S compliance with these requirements.

3.7.1 MATERIALS AND EQUIPMENT

The CONTRACTOR shall be free to secure the approved materials, equipment and articles from sources of his own selection. However, if the OWNER finds that the work shall be delayed or adversely affected in any way because a selected source of supply cannot furnish a uniform product in sufficient quantity and at the time required and a suitable source does exist, or the product is not suitable for the Work,

the OWNER shall have the right to require the original source of supply changed by the CONTRACTOR. The CONTRACTOR shall have no claim for extra cost or damage because of this requirement.

The CONTRACTOR warrants to the OWNER that all materials and equipment furnished under this contract shall be new unless otherwise specified in the Contract Documents and that same shall be of good quality and workmanship, free from faults and defects and in conformance with the Contract Documents. All materials and equipment not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective and shall be promptly repaired or replaced by the CONTRACTOR at the CONTRACTOR's sole cost upon demand of the OWNER. If required by the OWNER, the CONTRACTOR shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

3.7.1.1 "OR EQUAL" CLAUSE

A. Whenever a material or article required is specified or shown on the plans, by using the name of a proprietary product or of a particular manufacturer or vendor, any material or article which the Architect determines shall perform adequately the duties imposed by the general design or which the Architect deems to be of similar appearance (in cases where appearance is of importance) shall be considered equal and satisfactory, provided the material or article so proposed is of equal substance and function. Authorization for any substitution of materials or articles must be obtained by the CONTRACTOR from the Architect before proceeding with such substitution.

B. Should an authorized substitution require redesign of a portion of the work or alterations to the plans or specifications in order for the materials or articles which are to be substituted to properly fit or in other ways to be satisfactory, the Architect shall accomplish such redesigns and alterations. The CONTRACTOR shall bear all reasonable costs associated with redesign and alteration efforts performed by the Architect.

3.7.2 WORKMANSHIP

The CONTRACTOR shall promptly correct or replace 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 completed. The CONTRACTOR shall bear all costs of correcting such rejected work, including costs incurred for additional services made necessary thereby.

3.8 WARRANTIES

3.8.1 SPECIAL WARRANTY

If within one year after final acceptance of the work by the OWNER, as evidenced by the final certificate of acceptance or within such longer or shorter period of time as may be prescribed by law or by the terms of any other applicable special warranty on designated equipment or portions of work as required by the Contract Documents, any of the work is 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. This obligation shall survive termination or completion of the Contract. The OWNER shall give such notice promptly after discovery of the condition.

The CONTRACTOR shall remove from the site all portions of the work which are defective or nonconforming and which have not been corrected unless removal is waived in writing by the OWNER.

3.8.2 SUBCONTRACTORS' AND MANUFACTURERS' WARRANTIES

All subcontractors', manufacturers' and suppliers' warranties and guarantees, express or implied, respecting any part of the work and any materials used therein, shall be obtained and enforced by the CONTRACTOR for the benefit of the OWNER without the necessity of separate transfer or assignment thereof.

3.8.3 CORRECTED WORK WARRANTY

Any work repaired or replaced, pursuant to this section, shall be subject to the provisions of this section to the same extent as work originally performed.

3.8.4 RIGHTS AND REMEDIES

The rights and remedies of the OWNER provided in this section are in addition to, and do not limit, any rights or remedies afforded to the OWNER by law or any other provision of the Contract Documents, or in any way limit the OWNER'S right to recovery of damage due to default under the Contract. No action or inaction by the OWNER shall constitute a waiver of a right or duty afforded it under the Contract.

IV. INSURANCE

4.1 CONTRACTOR'S INSURANCE

Before commencing work, the CONTRACTOR and each subcontractor shall be required, at its own expense, to furnish the Collin County Purchasing Agent with certified copies of all insurance certificate(s) required by Texas Law, and the coverages required herein, indicating the coverage is to remain in force throughout the term of this Contract. Without

limiting any of the other obligations or liabilities of the CONTRACTOR, during the term of the Contract the CONTRACTOR and each subcontractor at their own expense shall purchase and maintain the herein stipulated minimum insurance with companies duly approved to do business in the State of Texas and satisfactory to the OWNER. Certificates of each policy shall be delivered to the OWNER before any work is started, along with a written statement from the issuing company stating that said policy shall not be canceled, nonrenewed or materially changed without 60 days advance written notice being given to the OWNER.

In addition to any coverage required by Texas Law, the CONTRACTOR shall provide the following coverages at not less than the specified amounts:

- 4.2 Workers Compensation insurance required by Texas Law at statutory limits, including employer's liability coverage at \$1,000,000. In addition to these, the CONTRACTOR must comply with all the requirements of the Texas Department of Insurance, Division of Workers' Compensation; (Note: If you have questions concerning these requirements, you are instructed to contact the DWC.)

By signing this contract or providing or causing to be provided a certificate of coverage, the CONTRACTOR is representing to the OWNER that all employees of the CONTRACTOR and its subcontractors who will provide services on the Project will be covered by workers compensation coverage for the duration of the Project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the CONTRACTOR to administrative penalties, criminal penalties, civil penalties, or other civil actions.

The CONTRACTOR'S failure to comply with any of these provisions is a breach of Contract by the Contractor which entitles the OWNER to declare the Contract void if the CONTRACTOR does not remedy the breach within ten (10) days after receipt of notice of breach from the OWNER.

- 4.3 Broad form commercial general liability insurance, including independent contractor's liability, completed operations and contractual liability, written on an occurrence form, covering, but not limited to, the liability assumed under the indemnification provisions of this contract, fully insuring CONTRACTOR'S (or subcontractor's) liability for injury to or death of OWNER'S employees and third parties, extended to include personal injury liability coverage with damage to property, with minimum limits as set forth below:

General Aggregate \$2,000,000
Completed Products — Components/Operations Aggregate \$2,000,000
Personal and Advertising Injury \$ 1,000,000
Each Occurrence \$ 2,000,000

4.3.1 The policy shall include coverage extended to apply to completed operations, asbestos hazards (if this project involves work with asbestos) and XCU (explosion, collapse and underground) hazards. The completed operations coverage must be maintained for a minimum of one year after final completion and acceptance of the work, with evidence of same filed with OWNER.

4.4 Comprehensive automobile and truck liability insurance, covering owned, hired and non-owned vehicles, with a combined bodily injury and property damage minimum limit of \$1,000,000 per occurrence; or separate limits of \$1,000,000 for bodily injury (per person), \$1,000,000 for bodily injury (per accident) and \$1,000,000 for property damage. Such insurance shall include coverage for loading and unloading hazards.

4.5 OWNER'S PROTECTIVE LIABILITY INSURANCE

CONTRACTOR shall obtain, pay for and maintain at all times during the prosecution of the work under this contract an OWNER'S protective liability insurance policy naming the OWNER as insured for property damage and bodily injury, which may arise in the prosecution of the Work or CONTRACTOR'S operations under this Contract. Coverage shall be on an "occurrence" basis, and the policy shall be issued by the same insurance company that carries the CONTRACTOR'S liability insurance with a combined bodily injury and property damage minimum limit of \$1,000,000 per occurrence and \$2,000,000 aggregate.

4.6 "UMBRELLA" LIABILITY INSURANCE

CONTRACTOR shall obtain, pay for and maintain umbrella liability insurance during the contract term, insuring CONTRACTOR for an amount of not less than \$1,000,000 per occurrence combined limit for bodily injury and property damage that follows from and applies in excess of the primary liability coverages required hereinabove. The policy shall provide "drop down" coverage where underlying primary insurance coverage limits are insufficient or exhausted. OWNER shall be named as an additional insured.

4.7 RAILROAD PROTECTIVE INSURANCE

When required in the Special Provisions, CONTRACTOR shall obtain, maintain and present evidence of railroad protective insurance (RPI). The policy shall be in the name of the railroad company having jurisdiction over the right-of-way involved. The minimum limit of coverage shall meet the specifications provided by the railroad company. The OWNER shall specify the amount of RPI necessary.

4.8 POLICY ENDORSEMENTS AND SPECIAL CONDITIONS

Each insurance policy to be furnished by CONTRACTOR shall include the following conditions by endorsement to the policy:

- A. each policy shall name the OWNER as an additional insured as to all applicable coverage;
- B. each policy shall require that 60 days prior to the cancellation, nonrenewal or any material change in coverage, a notice thereof shall be given to OWNER by certified mail;
- C. the term "OWNER" shall include all past, present or future, authorities, boards, bureaus, commissions, divisions, departments and offices of the OWNER and individual members, elected official, officers, employees and agents thereof in their official capacities and/or while acting on behalf of the OWNER;
- D. the policy phrase "other insurance" shall not apply to the OWNER where the OWNER is an additional insured on the policy;
- E. all provisions of the contract concerning liability, duty and standard of care together with the indemnification provision, shall be underwritten by contractual liability coverage sufficient to include such obligations within applicable policies;
- F. all policies shall contain a waiver of subrogation in favor of OWNER, and its, past, present and future, officials, employees, and volunteers; and,
- G. each certificate of insurance shall reference the Project and Contract number, contain all the endorsement required herein, and require a notice to the OWNER of cancellation.

Insurance furnished by the CONTRACTOR shall be in accordance with the following requirements:

- A. any policy submitted shall not be subject to limitations, conditions or restrictions deemed inconsistent with the intent of the insurance requirements to be fulfilled by the CONTRACTOR. The OWNER'S decision thereon shall be final;
- B. all policies are to be written through companies duly licensed to transact that class of insurance in the State of Texas with a financial ratings of A+VII or better as assigned by BEST Rating Company or equivalent; and
- C. All liability policies required herein shall be written with an "occurrence" basis coverage trigger.

CONTRACTOR agrees to the following:

- A. CONTRACTOR hereby waives subrogation rights for loss or damage to the extent same are covered by insurance. Insurers shall have no right of recovery or subrogation against the OWNER, it being the intention that the insurance policies shall protect all parties to the Contract and be primary coverage for all losses covered by the policies;
- B. Companies issuing the insurance policies and CONTRACTOR shall have no recourse against the OWNER for payment of any premiums or assessments for any deductibles, as all such premiums and deductibles are the sole responsibility and risk of the CONTRACTOR;
- C. Approval, disapproval or failure to act by the OWNER regarding any insurance supplied by the CONTRACTOR (or any subcontractors) shall not relieve the

CONTRACTOR of full responsibility or liability for damages and accidents as set forth in the Contract Documents. Neither shall the bankruptcy, insolvency or denial of liability by the insurance company exonerate the CONTRACTOR from liability; and

D. No special payments shall be made for any insurance that the CONTRACTOR and subcontractors are required to carry; all are included in the Contract Price and the Contract unit prices. Any of such insurance policies required under this section may be written in combination with any of the others, where legally permitted, but none of the specified limits may be lowered thereby.

V. OWNERS RIGHTS AND RESPONSIBILITIES

MONTHLY ESTIMATE, PARTIAL PAYMENTS AND FINAL PAYMENTS

5.1 Progress and final payments shall be paid to the Contractor based upon the progress of the Project as indicated by the approved Applications for Payment, certificates of acceptance, or Certificates for Payment, that include an approved Schedule of Values that will be submitted by the CONTRACTOR to the OWNER prior to the commencement of the Work and in accordance with the following:

5.2 MONTHLY ESTIMATES

The CONTRACTOR shall deliver to the OWNER an itemized Application for Payment that shall include the work completed, materials stored at the Project site but not incorporated into the work, materials ready to be installed and stored at another agreed location, and the percentage of Work completed, through the 20th day of each month, on an Application for Payment with a schedule of values previously submitted by the Contractor and approved by the Owner. Prior to release of funds in connection with any Application for Payment, the Owner may request, and the Contractor must provide, properly executed statements of full or partial releases of claims acceptable to Owner in form and content, for all persons or entities supplying labor or materials to the Project.

5.2.1 The Application for Payment is a representation by the CONTRACTOR to the OWNER that the construction has progressed to the point indicated, the quality of the Work covered by the application is in accordance with the Contract Documents, and the Contractor is entitled to payment in the amount requested.

5.2.2 INSPECTION AND PARTIAL PAYMENTS

Whenever the CONTRACTOR shall submit an Application for Payment to the OWNER for work performed by the CONTRACTOR, the CONTRACTOR shall notify the Architect that the improvement is ready for inspection. The Architect shall then make such inspection, and will have the authority to reject work that does not conform to the Contract Documents. If the work is satisfactory and in accordance with the specifications and Contract Documents, the Architect shall issue a Certificate for Payment.

- 5.2.3 Within thirty (30) days of the Owner's receipt of a properly submitted and correct Application for Payment, and the issuance of a Certificate for Payment, the Owner shall make payment to the Contractor, in the amount approved by the Owner less 5% retainage. Such payment shall be adjusted for work that is incomplete or not in accordance with the Contract Documents or that is the subject of a separate contract, or subcontract or supplier claim or lien against the Contractor or the payment bonds for the project.
- 5.2.4 No partial or final payment or the entire use or occupancy of the Project by the OWNER shall be considered acceptance of work that does not strictly comply with the Contract Documents or release the CONTRACTOR of any of his responsibilities under the Contract.

5.2.5 PAYMENT FOR LABOR AND MATERIAL; NO LIENS

The CONTRACTOR for himself or any of his subcontractors shall pay all indebtedness which may become due to any person, firm or corporation having furnished labor, material or both in the performance of this Contract. It shall be the responsibility of each person, firm or corporation claiming to have furnished labor, materials or both, in connection with this Contract, to protect his or its interest in the manner prescribed by applicable laws of the State of Texas, provided, however, that as this Contract provides for a public works project, no lien of any kind shall ever exist or be placed against the Work or any portion thereof, or any public funds or retainage held by the OWNER; and any subcontractor shall look solely to the CONTRACTOR and the payment bond surety, and not the OWNER, for payment of any outstanding amounts due for labor, materials or any other indebtedness in connection with the Work. However, the OWNER may, at any time prior to making final payment, require the CONTRACTOR to furnish a Consent of Surety to any payment due the CONTRACTOR for completed work and may, at the discretion of the OWNER or the request of the Surety, make the check jointly payable to the CONTRACTOR and the Surety. The Owner shall have no obligation under this Agreement to pay or to be responsible in any way for payment to any, Architect, another design professional, contractor, subcontractor or supplier performing portions of the Work, pursuant to a contract with the Contractor.

5.2.6 PAYMENT WITHHELD

In addition to express provisions elsewhere contained in the contract, the OWNER may withhold from any payment otherwise due the CONTRACTOR such amount as determined necessary to protect the OWNER'S interest, or, if it so elects, may withhold or retain all or a portion of any progress payment or refund payment on account of:

A. unsatisfactory progress of the Work not caused by conditions beyond the CONTRACTOR'S control,

- B. defective work not corrected,
- C. CONTRACTOR'S failure to carry out instructions or orders of the OWNER or his representative,
- D. a reasonable doubt that the Contract can be completed for the balance then unpaid,
- E. work or execution thereof not in accordance with the Contract Documents,
- F. claim filed by or against the CONTRACTOR or reasonable evidence indicating probable filing of claims,
- G. failure of the CONTRACTOR to make payments to subcontractor or for material or labor,
- H. damage to another contractor,
- I. unsafe working conditions allowed to persist by the CONTRACTOR,
- J. failure of the CONTRACTOR to provide work schedules as required by the OWNER,
- K. use of subcontractors without the OWNER'S approval or,
- L. failure of the CONTRACTOR to keep current as-built record drawings at the job site or to turn same over in completed form to the OWNER.

When the above grounds are removed, payment shall be made for amounts withheld because of them, and OWNER shall never be liable for interest on any delayed or late payment.

5.2.7 PAYMENT FOR EXTRA WORK

The extra work done by the CONTRACTOR as authorized and approved by the Architect shall be paid for in the manner hereinafter described, and the compensation thus provided shall be accepted by the CONTRACTOR as payment in full for all labor, materials, tools, equipment and incidentals and all superintendents' and timekeepers' services, all insurance, bond and all other overhead expense incurred in the performance of the extra work.

Payment for extra work shall be made by one of the following methods:

A. Method "A" — by unit prices agreed on in writing by the OWNER and CONTRACTOR before said extra work is commenced, subject to all other conditions of the contract.

B. Method "B" — by lump sum price agreed on in writing by the OWNER and the CONTRACTOR before said extra work is commenced, subject to all other conditions of the contract.

5.2.8 SUBSTANTIAL COMPLETION

The Project will be considered substantially complete when the OWNER can utilize the Project for its intended purpose and the Work is in conformance with the Contract Documents.

5.3 APPLICATION FOR FINAL PAYMENT.

Upon full performance of all the Contract Work and the full performance of all the provisions of the Contract, the CONTRACTOR shall submit a final application for payment to the OWNER, the CONTRACTOR shall notify the Architect that the improvement is ready for inspection. All warranties and guaranties required of the CONTRACTOR by the Contract Documents shall be assembled and delivered by the CONTRACTOR to the OWNER as Part of the final Application for Payment. The Contractor will assign to the Owner all manufacturer's warranties relating to materials and labor used in the work and will perform the Work in such a manner as to preserve all such manufacturer's warranties. The CONTRACTOR will deliver a certificate evidencing that insurance and bonds required by the Contract Documents will remain in full force and effect pursuant to the requirements of the Contract. The final Certificate for Payment will not be issued until all such warranties and guaranties have been received and accepted by the Owner, and a Certificate of Acceptance is issued by the or Architect.

5.3.1 FINAL INSPECTION AND ACCEPTANCE

Whenever the improvements provided for by the Contract shall have been completely performed on the part of the CONTRACTOR, the CONTRACTOR shall notify the OWNER, and Architect that the improvement is ready for final inspection. The Architect shall then make such final inspection, and if the work is satisfactory and in accordance with the specifications and Contract Documents, the CONTRACTOR shall be issued a certificate of acceptance.

5.3.2 FINAL PAYMENT

Whenever the improvements provided for by the Contract shall have been completely performed on the part of the CONTRACTOR, as evidenced in the certificate of acceptance, and all required submissions provided to the OWNER, a final estimate showing the value of the work shall be prepared by the Architect as soon as the necessary measurements and computations can be made. All prior estimates upon which payments have been made are subject or necessary corrections or revisions in the final payment. The amount of this final estimate, less any sums that have been previously paid, or deducted under the provisions of the Contract, shall be paid the CONTRACTOR within 30 days after the final acceptance, provided that the CONTRACTOR has furnished to the OWNER a consent of surety and an affidavit or other satisfactory evidence that all indebtedness connected with the Work and all sums of money due for any labor, materials, apparatus, fixtures or machinery furnished for and used in the performance of the work have been paid or otherwise satisfied, or that the person or persons to whom the same may respectively be due have consented to such final payment.

The acceptance by the CONTRACTOR of the final payment as aforesaid shall operate as and shall be a release to the OWNER from all claims or liabilities under

the Contract, including all subcontractor claims, for anything done or furnished or relating to the Work under the Contract or for any act or neglect of said OWNER relating to or connected with the Contract.

All warranties and guarantees shall commence from the date of the certificate of acceptance. No interest shall be due the CONTRACTOR on any partial or final payment or on the retainage.

5.3 MODIFICATIONS TO CONTRACT WORK OR TIME OF PERFORMANCE

5.3.1 OWNER'S RIGHT TO TEMPORARILY SUSPEND WORK

5.3.2 REASONS FOR SUSPENSION

The OWNER shall have the right by written order to temporarily suspend the work, in whole or in part, whenever, in the judgment of the OWNER, such temporary suspension is required:

- A. in the interest of the OWNER generally,
- B. due to government or judicial controls or orders which make performance of this contract temporarily impossible or illegal,
- C. to coordinate the work of separate contractors at the job site,
- D. to expedite the completion of a separate contract even though the completion of this particular Contract may be thereby delayed,
- E. because of weather conditions unsuitable for performance of the Work, or
- F. because the CONTRACTOR is proceeding contrary to contract provisions or has failed to correct conditions considered unsafe for workmen.

The written order of the OWNER to the CONTRACTOR shall state the reasons for suspending the work and the anticipated periods for such suspension. Upon receipt of the OWNER'S written order, the CONTRACTOR shall suspend the work covered by the order and shall take such means and precautions as may be necessary to properly protect the finished and partially finished work, the unused materials and uninstalled equipment, including the providing of suitable drainage about the work and erection of temporary structures where necessary. The CONTRACTOR shall not suspend the Work without written direction from the OWNER and shall proceed with the work promptly when notified by the OWNER to resume operations.

5.3.3 NO ADDITIONAL COMPENSATION

No additional compensation shall be paid to the CONTRACTOR for a temporary suspension of the Work by the OWNER or otherwise where same is caused by the fault of the CONTRACTOR. Where such temporary suspension is not due to the fault of the CONTRACTOR, he shall be entitled to:

A. an equitable extension of working time for the completion of the work, not to exceed the delay caused by such temporary suspension, as determined by the OWNER; and

B. the actual and necessary costs of properly protecting the finished and partially finished work, unused materials and uninstalled equipment during the period of the ordered suspension as determined by the OWNER as being beyond the Contract requirements, such costs, if any, to be determined pursuant to the terms of the Contract; and

C. where the CONTRACTOR elects to move equipment from the job site and then return it to the site when the work is ordered resumed, the actual and necessary costs of these moves, in an amount determined by the OWNER pursuant to the terms of the Contract.

5.3.4 USE OF COMPLETED PORTIONS OF WORK

The OWNER may, after written notice to the CONTRACTOR, and without incurring any liability for increased compensation to the CONTRACTOR, take over and use any completed portion of the Work prior to the final completion and acceptance of the entire work included in the Contract, and notwithstanding that the time allowed for final completion has not expired. The OWNER and CONTRACTOR agree that occupancy of portions of the Work by the OWNER shall not in any way evidence the substantial completion of the entire work or signify the OWNER's acceptance of the Work.

The CONTRACTOR shall not object to, nor interfere in any way with, such occupancy or use after receipt of the OWNER'S written notice. Immediately prior to such occupancy and use, the OWNER shall inspect such portion of the Work to be taken over and shall furnish the CONTRACTOR a written statement of the work, if any, still to be done on such part. The CONTRACTOR shall promptly thereafter complete such unfinished work to permit occupancy and use on the date specified in the OWNER'S written order, unless the OWNER shall permit specific items of work to be finished after the occupancy and use by the OWNER.

In the event the CONTRACTOR is unreasonably delayed by the OWNER exercising its rights under this section, the CONTRACTOR may submit a request for an extension of time; CONTRACTOR'S sole remedy for an unreasonable delay shall be an extension of time and shall not be entitled to any additional compensation.

5.4 COMMENCEMENT; TIME OF COMPLETION; DELAYS; EXTENSION OF TIME; LIQUIDATED DAMAGES

5.4.1 COMMENCEMENT; TIME OF COMPLETION

Contractor shall commence work within ten (10) consecutive calendar days after receiving from County a notice to proceed. Contractor agrees and covenants that the number of consecutive calendar days allowed to complete all work following a notice to proceed shall be as follows:

5.4.2. LIQUIDATED DAMAGES FOR FAILURE TO COMPLETE ON TIME

Time is of the essence in the progress and completion of this Contract. For each calendar day that any Work shall remain uncompleted after the time specified in the proposal and the Contract, or the increased time granted by the OWNER, or as equitably increased by additional work or materials ordered after the Contract is signed, the sum per day given in the following schedule, unless otherwise specified in the special provisions, shall be deducted from the monies due the CONTRACTOR:

Two Hundred Dollars and Zero Cents (\$200.00)

The sum of money thus deducted for such delay, failure or noncompletion is not to be considered as a penalty, but shall be deemed, taken and treated as reasonable liquidated damages, per calendar day that the CONTRACTOR shall be in default after the time stipulated in the Contract for completing the Work. The said amounts are fixed and agreed upon by and between OWNER and CONTRACTOR because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the OWNER in such event would sustain; and said amounts are agreed to be the amount of damages which the OWNER would sustain and which shall be retained from the monies due, or that may become due, the CONTRACTOR under this Contract; and if said monies be insufficient to cover the amount owing, then the CONTRACTOR or his surety shall pay any additional amounts due.

5.4.3 EXTENTIONS OF TIME

The CONTRACTOR shall be entitled to an extension of working time under this Contract only when claim for such extension is submitted to the OWNER in writing by the CONTRACTOR within seven days from and after the time when any alleged cause of delay shall occur, and then only when such time is approved by the OWNER. In adjusting the Contract working time for the completion of the Project, unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including, acts of God or the public enemy, acts of the OWNER, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, or delays of subcontractors due to such causes beyond their control shall be taken into consideration.

If the satisfactory execution and completion of the Contract should require work and materials in greater amounts or quantities than those set forth in the Contract, requiring more time for completion than the anticipated time, then the contract working time shall be equitably increased, but not more than in the same proportion as the cost of the additional work bears to the cost of the original work contracted for. No allowances shall be made for delays or suspension of the performance of the Work due to the fault of the CONTRACTOR.

No adjustment to working time shall be made if, concurrently with the equitable cause for delay, there existed a cause for delay due to the fault or negligence of the CONTRACTOR, his agents, employees or subcontractors; and no adjustment shall be made to the Contract Price and the CONTRACTOR shall not be entitled to claim or receive any additional compensation as a result of or arising out of any delay resulting in adjustment to the working time hereunder, including delays caused by the acts or negligence of the OWNER. Notwithstanding any other provision of the Contract Documents, all claims for extension of working time must be submitted in accordance with the provisions of this Contract, and no act of the OWNER shall be deemed a waiver or entitlement of such extension.

5.5 TERMINATION FOR CONVENIENCE OF THE OWNER

5.5.1 NOTICE OF TERMINATION

The performance of the Work under this Contract may be terminated by the OWNER in whole or from time to time in part, in accordance with this section, whenever the OWNER shall determine that such termination is in the best interest of the OWNER. Any such termination shall be effected by mailing a notice of termination to the CONTRACTOR specifying the extent to which performance of work under the Contract is terminated, and the date upon which such termination becomes effective. Receipt of the notice shall be deemed conclusively presumed and established when the letter is placed in the United States Mail by the OWNER. Further, it shall be deemed conclusively presumed and established that such termination is made with just cause as therein stated; and no proof in any claim, demand or suit shall be required of the OWNER regarding such discretionary action.

5.5.2 CONTRACTOR ACTION

After receipt of a notice of termination, and except as otherwise directed by the OWNER or Architect, the CONTRACTOR shall:

- A. stop work under the Contract on the date and to the extent specified in the notice of termination;

- B. place no further orders or subcontracts for materials, services or facilities except as may be necessary for completion of such portion the Work under the Contract as is not terminated;
- C. terminate all orders and subcontracts to the extent that they relate to the performance of work terminated by the notice of termination;
- D. transfer title to the OWNER and deliver in the manner, at the times, and to the extent, if any, directed by the OWNER or Architect:
 - 1. the fabricated or unfabricated parts, work in process, completed work, supplies and other material produced as a part of, or acquired in connection with the performance of, the work terminated by the notice of termination; and
 - 2. the completed or partially completed plans, drawings, information and other property which, if the Contract had been completed, would have been required to be furnished to the OWNER.
- E. complete performance of such part of the work as shall not have been terminated by the notice of termination; and
- F. take such action as may be necessary, or as the Architect may direct, for the protection and preservation of the property related to its Contract which is in the possession of the CONTRACTOR and in which the OWNER has or may acquire an interest.

At a time not later than 30 days after the termination date specified in the notice of termination, the CONTRACTOR may submit to the OWNER a list, certified as to the quantity and quality, of any or all items of termination inventory not previously disposed of, exclusive of items the disposition of which has been directed or authorized by the Architect. Not later than 15 days thereafter, the OWNER shall accept title to such items and remove them or enter into a storage agreement covering the same, provided that the list submitted shall be subject to verification by the Architect upon removal of the items, or, if the items are stored, within 45 days from the date of submission of the list, and provided that any necessary adjustments to correct the list as submitted shall be made prior to final settlement.

5.5.3 TERMINATION CLAIM

Within 60 days after notice of termination, the CONTRACTOR shall submit his termination claim to the Architect in the form and with the certification prescribed by the OWNER. Unless one or more extensions in writing are granted by the OWNER upon request of the CONTRACTOR, made in writing within such 60-day period or authorized extension thereof, any and all such claims shall be conclusively deemed waived.

5.5.4 AMOUNTS

The CONTRACTOR and OWNER may agree upon the whole or any part of the amount or amounts to be paid to the CONTRACTOR by reason of the total or

partial termination of work pursuant hereto, provided that such agreed amount or amounts shall never exceed the total contract price as reduced by the amount of payments otherwise made and as further reduced by the Contract Price of work not terminated. The contract shall be amended accordingly, and the CONTRACTOR shall be paid the agreed amount. No amount shall be due for lost or anticipated profits. Nothing prescribing the amount to be paid to the CONTRACTOR in the event of failure of the CONTRACTOR and the OWNER to agree upon the whole amount to be paid to the CONTRACTOR by reason of the termination of work pursuant to this section, shall be deemed to limit, restrict or otherwise determine or affect the amount or amounts which may be agreed upon to be paid to the CONTRACTOR pursuant to this paragraph.

5.5.5 FAILURE TO AGREE

In the event of the failure of the CONTRACTOR and the OWNER to agree, as provided herein, upon the whole amount to be paid to the CONTRACTOR by reason of the termination of work pursuant to this section, the OWNER shall determine, on the basis of information available to it, the amount, if any, due to the CONTRACTOR by reason of the termination and shall pay to the CONTRACTOR the amounts determined. No amount shall be due for lost or anticipated profits.

5.5.6 DEDUCTIONS

In arriving at the amount due the CONTRACTOR under this section, there shall be deducted (a) all unliquidated advance or other payments on account theretofore made to the CONTRACTOR, applicable to the terminated portion of this contract; (b) any claim which the OWNER may have against the CONTRACTOR in connection with this Contract; and (c) the agreed price for or the proceeds of sale of any materials, supplies or other things kept by the CONTRACTOR or sold, pursuant to the provisions of this clause, and not otherwise recovered by or credited to the OWNER.

5.5.7 ADJUSTMENT

If the termination hereunder be partial prior to the settlement of the terminated portion of this Contract, the CONTRACTOR may file with the Owner a request in writing for an equitable adjustment of the price or prices specified in the Contract relating to the continued portion of the Contract (the portion not terminated by the notice of termination), and such equitable adjustment as may be agreed upon shall be made in such price or prices; nothing contained herein, however, shall limit the right of the OWNER and the CONTRACTOR to agree upon the amount or amounts to be paid to the CONTRACTOR for the completion of the continued portion of the Contract when said contract does not contain an established contract price for such continued portion.

5.5.8 NO LIMITATION OF RIGHTS

Nothing contained in this section shall limit or alter the rights which the OWNER may have for termination of this Contract under any other provision of this Contract or any other right which OWNER may have for default or breach of contract by CONTRACTOR.

5.6 CONTRACTOR DEFAULT: OWNER'S RIGHT TO SUSPEND WORK AND ANNUL CONTRACT

The Work or any portion of the Work under contract shall be suspended immediately on written order of the OWNER declaring the CONTRACTOR to be in default. A copy of such notice shall be served on the CONTRACTOR'S surety. The contract may be annulled by the OWNER for any good cause or causes, among others of which special reference is made to the following:

- A. failure of the CONTRACTOR to start the work within 10 days from date specified in the written work order issued by the OWNER to begin the work;
- B. evidence that the progress of the work being made by the CONTRACTOR is insufficient to complete the work within the specified working time;
- C. failure of the CONTRACTOR to provide sufficient and proper equipment, materials or construction forces for properly executing the Work;
- D. evidence that the CONTRACTOR has abandoned the Work or discontinuance of the performance of the Work or any part thereof and failure to resume performance within a reasonable time after notice to do so;
- E. evidence that the CONTRACTOR has become insolvent or bankrupt, or otherwise financially unable to carry on the Work;
- F. deliberate failure on the part of the CONTRACTOR to observe any requirements of the specifications or to comply with any orders given by the Architect as provided for in the specifications;
- G. failure of the CONTRACTOR to promptly make good any defects in materials or workmanship, or any defects of any nature, the correction of which has been directed in writing by the OWNER;
- H. evidence of collusion for the purpose of illegally procuring a contract or perpetrating fraud on the OWNER in the construction of work under contract;
- I. repeated violations of safe working procedures;
- J. the filing by the CONTRACTOR of litigation against the OWNER prior to final completion of the Work. When the Work is suspended for any of the causes itemized above, or for any other cause or causes, the CONTRACTOR shall discontinue the Work or such part thereof as the OWNER shall designate, whereupon the surety may either at its option assume the Contract or that portion thereof which the OWNER has ordered the CONTRACTOR to discontinue and perform the same or, with the written consent of the OWNER, sublet the same, provided, however, that the surety shall exercise its option within two weeks after the written notice to discontinue the work has been served upon the

CONTRACTOR and upon the surety or its authorized agents. The surety in such event shall assume the CONTRACTOR'S place in all respects and shall be paid by the OWNER for all work performed by it in accordance with the terms of the Contract, but in no event shall such payments exceed the contract amount, regardless of the cost to the surety to complete the Work.

In the event that the surety assumes the CONTRACTOR'S place, duties and responsibilities in the Contract, all monies remaining due the CONTRACTOR at the time of his default shall thereupon become due and payable to the surety as the work progresses, subject to all terms of the Contract. In case the surety does not, within the hereinabove specified time, exercise its obligation to assume the Contract or that portion thereof which the OWNER has ordered the CONTRACTOR to discontinue, then the OWNER shall have the power to complete by contract or otherwise, as it may determine, the Work herein described or such part thereof as it may deem necessary; and the CONTRACTOR hereto agrees that the OWNER shall have the right to take possession of or use any or all of the materials, plans, tools, equipment, supplies and property of every kind provided by the CONTRACTOR for the purpose of the Work and to procure other tools, equipment and materials for the completion of the same and to charge to the account of the CONTRACTOR the expense of said contract for labor, materials, tools, equipment and expenses incident thereto. The expense so charged shall be deducted by the OWNER out of such monies as may be due or may at any time thereafter become due the CONTRACTOR under and by virtue of the Contract or any part thereof.

The OWNER shall not be required to obtain the lowest bid for the work of completing the Contract, but the expenses to be deducted shall be the actual cost of such work. In case such expense is less than the sum which would have been payable under the contract if the same had been completed by the CONTRACTOR, then in such case the OWNER may pay the CONTRACTOR the difference in the cost, provided that the CONTRACTOR shall not be entitled to any claim for damages or for loss of anticipated profits.

In case such expense shall exceed the amount which would have been payable under the Contract if the same had been completed by the CONTRACTOR, the CONTRACTOR and his surety shall pay the amount of the excess to the OWNER on notice from the OWNER for excess due including any costs incurred by the OWNER, such as inspection, legal fees and liquidated damages. When any particular part of the Work is being carried out by the OWNER by contract or otherwise under the provisions of this section, the CONTRACTOR shall continue the remainder of the Work in conformity with the terms of the contract and in such manner as not to hinder or interfere with the performance of workmen employed as above provided by the OWNER or surety.

5.7 SUSPENSION BY COURT ORDER AGAINST THE OWNER

The CONTRACTOR shall suspend such part or parts of the Work pursuant to a court order issued against the OWNER and shall not be entitled to additional compensation by virtue of such court order; neither shall the CONTRACTOR be liable to the OWNER in the event

the Work is suspended by such court order, unless such suspension is due to the fault or negligence of the CONTRACTOR. A delay of the CONTRACTOR due to a court order against the OWNER, or due to the OWNER'S failure to secure right-of-way at the time required or because of a conflict of a utility with the Work, shall not be cause for additional compensation for damages sustained by the CONTRACTOR, but may be a cause for extension of contract working time only. The CONTRACTOR'S sole remedy for any suspensions of the Work is an equitable extension of time to perform the Work.

5.8 NO WAIVER OF RIGHTS OR ESTOPPEL

The OWNER, or any officer or agent thereof, shall not be precluded at any time, either before or after final completion and acceptance of the Work and final payment therefore from:

A. showing the true and correct amount, classifications, quality and character of the Work done and materials furnished by the CONTRACTOR or any other person under this Contract, or from showing at any time that any determination, return, decision, approval, order, letter, payment or certification is untrue and incorrect or improperly made in any particular, or that the Work or the materials or any parts thereof do not in fact conform to the contract requirements; and (b) demanding the recovery from the CONTRACTOR of any overpayments made to him, or such damages as the OWNER may sustain by reason of the CONTRACTOR'S failure to perform each and every part of this Contract in strict accordance with its terms; or both.

VI. AUTHORITY OF THE ARCHITECT

6.1 All work shall be performed in a good and workmanlike manner and to the satisfaction of the Architect. The Architect shall decide all questions which arise as to the quality and acceptability of materials furnished, work performed, manner of performance, rate of progress of the work, sequence of the construction, interpretation of the plans and specifications, acceptable fulfillment of the Contract, compensation, mutual rights between contractors under these specifications and suspension of the Work. He shall determine the amount and quality of work performed and materials furnished, and his decisions and estimates shall be final. His estimate in such event shall be a condition precedent to the right of the CONTRACTOR to receive money due him under the Contract.

6.2 OWNER'S REPRESENTATIVES

Where the Contract Documents indicate that determinations, directions or approvals shall be made by the OWNER or "Owner's representatives," this shall mean the OWNER acting directly, or through duly authorized persons acting within the limit of authority delegated to them. Any determination, direction or approval of such authorized representatives shall be subject to review by the OWNER. For purposes of administering the schedule or the payment provisions of this Contract the Architect may act as the Owner's representative for

purposes of approving payments, changes, scheduling, or acceptance of the Work, at the OWNER'S discretion.

6.3 INSPECTIONS OF WORK PROGRESS

The Architect shall visit the site at during construction of the Project as necessary as the Owner's Representative to verify that the Work is being performed in compliance with the Contract Documents and shall be given total access to the Project by the CONTRACTOR. Site visits or inspections by the Architect shall in no way relieve the CONTRACTOR of any of its responsibilities or duties pursuant to the Contract Documents. The Architect will neither have control over, nor be responsible for, the construction means and methods, techniques, sequences, or procedures, or for the safety precautions and programs in connection with the Work or the Project. The CONTRACTOR shall be solely responsible for, the construction means and methods, techniques, sequences, or procedures, or for the safety precautions and programs in connection with the Work or the Project.

6.4 CONSTRUCTION STAKES

Architect will provide the Contractor with primary horizontal and vertical control to consist of one construction baseline and two benchmarks.

The Contractor shall take all necessary precautions to preserve any and/or all markings and staking. Payment for costs of restaking shall be the responsibility of the Contractor.

6.5 APPROVAL OF SUBMITTALS

The Architect shall review and approve or take other appropriate action the CONTRACTOR's submittals such as Shop Drawings, Product Data and Samples, for the purpose of checking for conformance with the Contract Documents. The Architects review of the submittals shall not relieve the CONTRACTOR of any of its obligations to perform the Work in strict compliance with the Contract Documents. The Architect's review shall not be considered approval of safety precautions, means and methods, techniques, sequences or procedures that are the responsibility of the CONTRACTOR.

VII. CLAIMS OR DISPUTES

7.1 CLAIMS AGAINST OWNER AND ACTION THEREON.

No claim against the OWNER under the Contract or for breach of the Contract or additional compensation for extra or disputed work shall be made or asserted against the OWNER under the Contract or in any court action, unless the CONTRACTOR shall have strictly complied with all requirements relating to the giving of notice and information with respect to such claim as required by the Contract.

7.2 CLAIM AGAINST OFFICERS, EMPLOYEES OR AGENT OF THE OWNER.

No claim whatsoever shall be made by the CONTRACTOR against any, past, present or future, officer, employee or agent of the OWNER for or on account of, anything done or omitted to be done in connection with this Contract.

VIII. MISCELLANEOUS PROVISIONS

8.1 FINANCIAL INTEREST IN ANY CONTRACT BY OWNER'S OFFICERS, EMPLOYEES OR AGENTS

No officer, employee or agent of the OWNER shall have a financial interest, direct or indirect, in any contract with the OWNER or be financially interested, directly or indirectly, in the sale to the OWNER of any land, materials, supplies or services, except on behalf of the OWNER as an officer or employee. Any willful violation of this article shall constitute malfeasance in office, and any officer or employee guilty thereof shall thereby forfeit his office or position. Any violation of this article with the knowledge, expressed or implied, of the persons, partnership, company, firm, association or corporation contracting with the OWNER shall render the contract involved voidable by the OWNER.

8.2 SERVICE OF NOTICES

The OWNER and the CONTRACTOR shall each designate addresses where all notices, directions or other communication may be delivered or to which they may be mailed.

Notices to the surety or sureties on contract bonds shall be directed or delivered to the home office, or to the agent or agents who executed the bonds on behalf of the surety or sureties, or to their designated agent for delivery of notices.

Actual delivery of any such notice, direction or communication to the aforesaid places or depositing it in a postpaid wrapper addressed thereto in any post office regularly maintained by the United States Postal Service shall be conclusively deemed to be sufficient service thereof upon the above persons as of the date of such delivery or deposit.

The designated addresses may be changed at any time by an instrument in writing executed by the party changing the addresses and delivered to the other party.

Nothing herein contained shall, however, be deemed to preclude or tender inoperative the service of any notice, direction or communication upon the above parties personally or, if the CONTRACTOR be a corporation, upon any officer or director thereof.

8.3 UNLAWFUL PROVISIONS DEEMED STRICKEN

In the event a term, condition, or provision of this Agreement is determined to be void, unenforceable, or unlawful by a court of competent jurisdiction, then that term, condition, or provision shall be deleted and the remainder of the Agreement shall remain in full force and effect.

8.4 ALL LEGAL PROVISIONS INCLUDED

It is the intent and agreement of the parties to this contract that all legal provisions of law required to be inserted herein shall be and are inserted herein. If through mistake or oversight, however, any such provision is not herein inserted, or is not inserted in proper form, then upon application of either party, the contract shall be amended so as to strictly comply with the law and without prejudice to the rights of either party hereunder.

8.5 ASSIGNMENTS

The CONTRACTOR shall not assign, transfer, convey or otherwise dispose of this contract, or his right to execute it, or his right, title or interest in it or any part thereof without the previous written consent of the surety company and the written approval of the OWNER.

The CONTRACTOR shall not assign, either legally or equitably, by power of attorney or otherwise, any of the monies due or to become due under this Contract or its claim thereto without the prior written consent of the surety company and the written approval of the OWNER.

The approval of the OWNER of a particular assignment, transfer or conveyance shall not dispense with such approval to any further or other assignments.

The approval by the OWNER of any assignment, transfer or conveyance shall not operate to release the CONTRACTOR or surety hereunder from any of the Contract and bond obligations, and the CONTRACTOR shall be and remain fully responsible and liable for the defaults, negligent acts and omissions of his assignees, their agents and employees, as if they were his own.

8.6 STATE AND LOCAL SALES AND USE TAXES

The OWNER qualifies for exemption from the state and local sales and use taxes, pursuant to the provisions of Section 151.309 of the Texas Limited Sales, Excise and Use Tax Act. Therefore, the CONTRACTOR shall not pay such taxes which would otherwise be payable in connection with the performance of this Contract.

The CONTRACTOR shall issue an exemption certificate in lieu of the tax on the purchase, rental or lease of:

- A. all materials, supplies, equipment and other tangible personal property incorporated into the real property being improved; and
- B. all materials, supplies, equipment and other tangible personal property used or consumed by the CONTRACTOR in performing the Contract with the OWNER. Materials and supplies "used in the performance of a contract" include only those materials actually incorporated into the property being improved and those supplies

directly used to incorporate such materials into the property being improved. Overhead supplies and supplies used indirectly or only incidental to the performance of the Contract with the OWNER are not included in the exemption.

Under “reasons said purchaser is claiming this exemption” in the exemption certificate, the CONTRACTOR must name the OWNER and the project for which the equipment, material and supplies are being purchased, leased or rented.

8.7 VENUE AND GOVERNING LAW

The parties agree that the laws of the State of Texas shall govern the interpretation, validity, performance and enforcement of this Construction Agreement, and that the exclusive venue for any legal proceeding involving this Construction Agreement shall be in Collin County, Texas.

8.8 NO WAIVER OF LEGAL RIGHTS

Inspection by the Architect, or OWNER; any order, measurement, quantity or certificate by the Architect; any order by the OWNER for payment of money; any payment for or acceptance of any work; or any extension of time or any possession taken by the OWNER shall not operate as a waiver of any provisions of the contract or any power therein reserved to the OWNER of any rights or damages therein provided. Any waiver of any breach of contract shall not be held to be a waiver of any other or subsequent breach. The OWNER reserves the right to correct any error that may be discovered in any estimate that may have been paid and to adjust the same to meet the requirements of the Contract Documents. The OWNER reserves the right to recover by process of law sums as may be sufficient to correct any error or make good any deficiency in the Work resulting from such error, dishonesty or collusion by the CONTRACTOR or his agents, discovered in the Work after the final payment has been made.

Neither final acceptance of the Work, nor final payment shall relieve the CONTRACTOR of responsibility for faulty materials or workmanship, and the CONTRACTOR shall promptly remedy any defects due thereto and pay for any damage to other work resulting therefrom. Likewise, neither final acceptance nor final payment, nor partial or entire use or occupancy of the work by the OWNER shall constitute acceptance of work not done in accordance with the Contract Documents or relieve CONTRACTOR of liability with respect to any expressed or implied warranties or responsibility for faulty materials or workmanship, whether same be patently or latently defective.

8.9 OBLIGATION TO PERFORM FUNCTIONS

Any failure or neglect on the part of OWNER, Architect or inspectors to enforce provisions herein dealing with supervision, control, inspection, testing or acceptance and approval of the work shall never operate to relieve CONTRACTOR from full compliance with the Contract Documents nor render OWNER liable to CONTRACTOR for money damages, extensions of time or increased compensation of any kind.

8.10 **SUCCESSORS AND ASSIGNS**

Subject to the limitations upon assignment and transfer herein contained, this contract shall be binding upon and inure to the benefit of the parties hereto, their respective successors and assigns.

8.11 **HEADINGS**

The title and headings contained in the Contract Documents and the subject organization are used only to facilitate reference, and in no way define or limit the scope of intent of any of the provisions of this Contract.

8.12 **ENTIRE AGREEMENT; AMENDMENTS; BINDING EFFECT**

This Construction Agreement, including the Contract Documents and all the documents incorporated therein represents the entire and integrated agreement between the OWNER, Collin County, and the CONTRACTOR, and supersedes all prior negotiations, representations, or agreements, either written or oral. This Construction Agreement may be amended only by written instrument signed by both, the OWNER, Collin County, and the CONTRACTOR.

8.13 **INTERPRETATION**

Although this Agreement is drafted by the OWNER, Collin County, should any part be in dispute, the parties agree that this Construction Agreement shall not be construed more favorable for either party. No rule of construction requiring that ambiguities in this Contract shall be construed more favorably for either party shall apply.

8.14 **EXPENSES FOR ENFORCEMENT**

In the event either Party hereto is required to employ an attorney to enforce the provisions of this Agreement or is required to commence legal proceedings to enforce the provisions hereof, the prevailing Party shall be entitled to recover from the other, reasonable attorney's fees and court costs incurred in connection with such enforcement, including collection.

IN WITNESS WHEREOF, the parties have executed this Construction Agreement upon the year and date indicated beneath their signatures hereto.

CONTRACTOR:

By: _____

Date: _____

ATTEST:

Secretary

COLLIN COUNTY, TEXAS:

By: _____
Michalyn Rains, CPPO, CPPB, Purchasing Agent

Date: _____

Collin County Commissioners' Court Order No.

ATTEST:

Secretary

APPROVED AS TO FORM:

ACKNOWLEDGMENTS

STATE OF TEXAS §

COUNTY OF _____ §

BEFORE ME, _____ on this day personally appeared _____, of _____, a _____ corporation, known to me (or proved to me on the oath of) _____ or through _____ (description of identity card or other document) to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he/she executed the same as the act and deed of the corporation, for the purposes and consideration therein expressed and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the ___ day of _____, 20__

Notary Public, State of Texas

Printed Name

My Commission expires on the ____ day of _____, _____.

STATE OF TEXAS §

COUNTY OF COLLIN §

BEFORE ME, _____ on this day personally appeared _____, Purchasing Agent of COLLIN COUNTY, TEXAS, a political subdivision of the State of Texas, known to me (or proved to me on the oath of) _____ or through _____ (description of identity card or other document) to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he/she executed the same as the act and deed of COLLIN COUNTY, TEXAS, for the purposes and consideration therein expressed and in the capacity therein stated.

GIVEN under my hand and seal of office this the _____ day of _____, 20__.

Notary Public, State of Texas

Printed Name

My Commission expires on the ____ day of _____, _____.

SECTION 005423-CONFLICT OF INTEREST
INFORMATION REGARDING
CONFLICT OF INTEREST QUESTIONNAIRE

During the 79th Legislative Session, House Bill 914 was signed into law effective September 1, 2015, which added Chapter 176 to the Texas Local Government Code. Recent changes have been made to Chapter 176 pursuant to HB23, which passed the 84th Legislative Session. Chapter 176 mandates the public disclosure of certain information concerning persons doing business or seeking to do business with Collin County, including family, business, and financial relationships such persons may have with Collin County officers or employees involved in the planning, recommending, selecting and contracting of a vendor for this procurement.

For a copy of Form CIQ and CIS:

http://www.ethics.state.tx.us/filinginfo/conflict_forms.htm

The vendor acknowledges by doing business or seeking to do business with Collin County that he/she has been notified of the requirements under Chapter 176 of the Texas Local Government Code and that he/she is solely responsible for complying with the terms and conditions therein. Furthermore, any individual or business entity seeking to do business with Collin County who does not comply with this practice may risk award consideration of any County contract.

For a listing of current Collin County Officers:

<http://www.collincountytexas.gov/government/Pages/officials.aspx>

The following County employees will be involved in the planning, recommending, selecting, and contracting for the attached procurement:

Department/Evaluation Team:

Bill Burke – Director of Building Projects

David Dooley - Building Projects Coordinator

Purchasing:

Michalyn Rains – Purchasing Agent

Michelle Charnoski – Asst. Purchasing Agent

J. D. Griffin – Buyer II

Commissioners' Court:

Keith Self – County Judge

Susan Fletcher – Commissioner Precinct No. 1

Cheryl Williams – Commissioner Precinct No. 2

John Thomas – Commissioner Precinct No. 3

Duncan Webb – Commissioner Precinct No. 4

CONFLICT OF INTEREST QUESTIONNAIRE

For vendor doing business with local governmental entity

FORM CIQ

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. See Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

OFFICE USE ONLY

Date Received

1 Name of vendor who has a business relationship with local governmental entity.

2 Check this box if you are filing an update to a previously filed questionnaire. (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 Name of local government officer about whom the information is being disclosed.

Name of Officer

4 Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?

Yes No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?

Yes No

5 Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.

6 Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).

7

Signature of vendor doing business with the governmental entity

Date

CONFLICT OF INTEREST QUESTIONNAIRE

For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at <http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.176.htm>. For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

- (A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;
- (B) a transaction conducted at a price and subject to terms available to the public; or
- (C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):

(a) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds \$2,500 during the 12-month period preceding the date that the officer becomes aware that

- (i) a contract between the local governmental entity and vendor has been executed;
- or
- (ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than \$100 in the 12-month period preceding the date the officer becomes aware that:

- (i) a contract between the local governmental entity and vendor has been executed; or
- (ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

- (1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);
- (2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or
- (3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:

- (A) begins discussions or negotiations to enter into a contract with the local governmental entity; or
- (B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:

- (A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);
- (B) that the vendor has given one or more gifts described by Subsection (a); or
- (C) of a family relationship with a local government officer.

006111 PERFORMANCE BOND

STATE OF TEXAS §
COUNTY OF COLLIN §

KNOW ALL MEN BY THESE PRESENTS:

That _____, a corporation organized and existing under the laws of the State of _____, and fully authorized to transact business in the State of Texas, whose address is _____ of the City of _____ County of _____, and State of _____, (hereinafter referred to as "Principal"), and _____ (hereinafter referred to as "Surety", a corporation organized under the laws of the State of _____ and authorized under the laws of the State of Texas to act as surety on bonds for principals, are held and firmly bound unto _____ (hereinafter referred to as "Owner") and unto all persons, firms and corporations who may furnish materials for or perform labor upon the buildings, structures or improvements referred to in the attached Contract, in the penal sum of _____ Dollars (\$ _____) (not less than 100% of the approximate total amount of the Contract as evidenced in the proposal plus 10-percent of the stated penal sum as an additional sum of money representing additional court expenses, attorneys' fees, and liquidated damages arising out of or connected with the below identified Contract) in lawful money of the United States, for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors, and assigns, jointly and severally, firmly by these presents:

WHEREAS, the Principal has entered into a certain written contract with the Owner, dated the _____ day of _____, 201____, to which said Contract is hereby referred to and made a part hereof and as fully and to the same extent as if copied at length herein for the construction of IFB 2018-068, CONSTRUCTION, MODIFICATIONS TO SHERIFF'S OFFICE LOBBY

CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal fully and faithfully executes the work and performance of the Contract in accordance with the plans specifications, and Contract Documents, including any extensions thereof which may be granted with or without notice to Surety, during the original term thereof, and during the life of any guaranty required under the Contract, and according to the true intent and meaning of said Contract and the plans and specifications hereto annexed, if the Principal shall repair and/or replace all defects due to faulty materials or workmanship that appear within a period of one year from the date of final completion and final acceptance of the work by OWNER; and if the Principal shall fully indemnify and save harmless the OWNER from all costs and damages which OWNER may suffer by reason of failure to so perform herein and shall fully reimburse and repay OWNER all outlay and expense which the OWNER may incur in making good any default or deficiency, then this obligation shall be void; otherwise, to remain in full force and effect; and in case said CONTRACTOR shall fail to do so, it is agreed that the OWNER may do said work and supply such materials and charge the same against said CONTRACTOR and Surety on this obligation. Provided further, that if any legal action be filed on this Bond, venue shall lie in Collin County, Texas.

"PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions Texas Government Code, Chapter 2253, as amended, and Chapter 3503 of the Texas Insurance Code, as amended, and all liabilities on this bond shall be determined in accordance with the provisions of said articles to the same extent as if they were fully copied at length herein.

Surety, for value received, stipulates and agrees that the bond shall automatically be increased by the amount of any Change Order or supplemental agreement which increases the Contract price with or without notice to the Surety, but in no event shall a Change Order or Supplemental Agreement which reduces the Contract price decrease the penal sum of the Bond. And further that no change, extension of time, alteration, or addition to the terms of the Contract, or to the work performed thereunder, or the plans, specifications, or drawings accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract or to the work to be performed thereunder.

Surety agrees that the bond provides for the repairs and/or replacement of all defects due to faulty materials and workmanship that appear within a period of one (1) year from the date of completion and acceptance of the improvement by the OWNER.

The undersigned and designated agent is hereby designated by Surety herein as the agent resident to whom any requisite notice may be delivered and on whom service of process may be had in matters arising out of such suretyship.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____ 201____.

WITNESS

PRINCIPAL

Printed/Typed Name _____

Title: _____

Company: _____

Address: _____

WITNESS

SURETY

Printed/Typed Name _____

Title: _____

Company: _____

Address: _____

The Resident Agent of the Surety for delivery of notice and service of process is:

Name: _____

Address: _____

Phone Number: _____

Note: Date of Bond must NOT be prior to date of contract.

006113 PAYMENT BOND

STATE OF TEXAS §
COUNTY OF COLLIN §

KNOW ALL MEN BY THESE PRESENTS:

That _____, a corporation organized and existing under the laws of the State of _____, and fully authorized to transact business in the State of Texas, whose address is _____ of the City of _____ County of _____, and State of _____, (hereinafter referred to as "Principal"), and _____ (hereinafter referred to as "Surety", a corporation organized under the laws of the State of _____ and authorized under the laws of the State of Texas to act as surety on bonds for principals, are held and firmly bound unto _____ (hereinafter referred to as "Owner") and unto all persons, firms and corporations who may furnish materials for or perform labor upon the buildings, structures or improvements referred to in the attached Contract, in the penal sum of _____ Dollars (\$ _____) (not less than 100% of the approximate total amount of the Contract as evidenced in the proposal) in lawful money of the United States, for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors, and assigns, jointly and severally, firmly by these presents:

WHEREAS, the Principal has entered into a certain written contract with the Owner, dated the _____ day of _____, 201____, to which said Contract is hereby referred to and made a part hereof and as fully and to the same extent as if copied at length herein for the construction of IFB 2018-068, CONSTRUCTION, MODIFICATIONS TO SHERIFF'S OFFICE LOBBY

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that the bond guarantees the full and proper protection of all claimants supplying labor and material in the prosecution of the work provided for in said Contract and for the use of each claimant, and that conversely should the Principal faithfully perform said Contract and in all respects duly and faithfully observe and perform all and singular the covenants, conditions, and agreements in and by said Contract, agreed to by the Principal, and according to the true intent and meaning of said Contract and the claims and specifications hereto annexed, and any and all duly authorized modifications of said Contract that may hereafter be made, notice of which modification to Surety being hereby waived, then this obligation shall be void; otherwise, to remain in full force and effect. Provided further, that if any legal action be filed on this Bond, venue shall lie in Collin County, Texas.

"PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions Texas Government Code, Chapter 2253, as amended, and Chapter 3503 of the Texas Insurance Code, as amended, and all liabilities on this bond shall be determined in accordance with the provisions of said articles to the same extent as if they were fully copied at length herein.

Surety, for value received, stipulates and agrees that the bond shall automatically be increased by the amount of any Change Order or supplemental agreement which increases the Contract price with or without notice to the Surety and that no change, extension of time, alteration or addition to the terms of the Contract, or to the work performed thereunder, or the plans, specifications, or drawings accompanying the same, shall in anyway affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract, or to the work to be performed thereunder.

The undersigned and designated agent is hereby designated by Surety herein as the agent resident to whom any requisite notice may be delivered and on whom service of process may be had in matters arising out of such suretyship.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____ 201_____.

WITNESS

PRINCIPAL

Printed/Typed Name _____
Title: _____
Company: _____

Address: _____

WITNESS

SURETY

Printed/Typed Name _____
Title: _____
Company: _____

Address: _____

The Resident Agent of the Surety for delivery of notice and service of process is:
Name: _____
Address: _____
Phone Number: _____

Note: Date of Bond must NOT be prior to date of contract.

01 11 00
SUMMARY OF WORK

1.0 GENERAL

1.01 SUMMARY

- A. The Project is located at the Collin County Sheriff's Office at 4300 Community Avenue, west of US Highway 75 and north of Bloomdale Road, in McKinney, Texas.
- B. The Work is composed of modifications to existing office space, including selective demolition, general construction, HVAC, electrical and fire sprinkler systems.
- C. The Work of this Contract will be performed under a single prime contract.
- D. Contractor's duties:
 - 1. Provide all labor, materials, equipment, tools, machinery, facilities, and services necessary for proper execution and completion of the work.
 - 2. Give required notices.
 - 3. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities which bear on performance of work.
 - 4. Promptly submit written notice to Architect of observed variance of Contract Documents from legal requirements. It is Contractor's responsibility to make certain that construction complies with applicable codes and regulations.
 - 5. Verify all conditions at the site and dimensions in the field prior to starting work. Architect shall be notified in writing of any discrepancies found.
 - 6. The Drawings and Specifications represent the work to be completed, not the method of construction.
 - 7. Obtain and pay for any inspections, permits, or licenses required. The required fees cost shall be included in the bid.
 - 8. Use every precaution to prevent damage to roads, adjacent property, buildings, and utilities above and below ground that are adjacent to or included in the area under contract. Repair and replace, at Contractor's expense, any material or item damaged or destroyed because of Contractor's operations.

1.02 CONTRACTOR USE OF PREMISES

- A. Confine operations at site to areas permitted by law, ordinances, permits and as designated by Owner.
 - 1. Contractor and his personnel shall park their vehicles and trailers only in areas designated by the Owner.
- B. Owner will continue to occupy the existing facility during construction of the addition and remodel to specific areas of the existing facility. Contractor shall carry out his work in such a way as to minimize interference with the Owner's work and use of site and parking areas specifically.
- C. Do not unreasonably encumber site with materials or equipment.
- D. Maintain required fire exits and fire lanes during construction in accordance with Fire Department regulations. Provide signage, barricades, walkways, and fences as may be required.

1.03 PARTIAL OWNER OCCUPANCY

- A. The Owner reserves the right to occupy and to place and install equipment in completed areas of the building prior to Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placing of equipment and partial occupancy shall not constitute acceptance of the total Work.
 - 1. The Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner occupancy.
 - 2. Contractor shall obtain a Certificate of Occupancy from local building officials prior to Owner occupancy.
 - 3. Prior to partial Owner occupancy, mechanical and electrical systems shall be fully operational. Required inspections and tests shall have been successfully completed. Upon occupancy, the Owner will operate and maintain mechanical and electrical systems serving occupied portions of the building.
 - 4. Upon occupancy, the Owner will assume responsibility for maintenance and custodial service for occupied portions of the building.

1.04 CORRELATION OF DOCUMENTS

- A. Anything mentioned in the Specifications and not shown on the Drawings, or shown on the Drawings and not mentioned in the Specifications, is of like effect as if shown or mentioned in both. In case of difference between Drawings and Specifications, the Specifications will govern.
- B. Figures given on Drawings govern scale measurements, and large scale drawings and details govern small scale drawings. Schedules on any contract drawing will take precedence over conflicting information on that or any other contract drawing.
- C. Specifications determine nature and setting, workmanship and quality of materials; Drawings establish design, quantities, dimensions and details; Schedules give locations.
- D. Similar conditions may be illustrated by a single detailed drawing. The drawing may be subject to minor adjustments as directed by the Architect to satisfy exact and specific conditions. If discrepancies appear, Contractor shall request interpretation from the Architect prior to proceeding with the Work. Contractor shall not make such interpretations by himself, except at his own risk, responsibility and expense.

1.05 EXISTING CONDITIONS

- A. The Architect assumes no responsibility for the accuracy of the information on existing drawings. It is the intent of the Contract Drawings to integrate new work with existing work and the Contractor shall verify actual conditions.
- B. Prior to commencement of work, visit and examine the site verifying all existing conditions, control points, principal lines and elevations, presence of underground utilities, at or related to the site and existing buildings. In the event of any inconsistency or conflict between existing conditions and the bidding documents, immediately notify the Architect. Do not undertake any phase of the work affected by such inconsistency or conflict, pending the issuance of instructions by the Architect.
- C. Locations of utilities shown on the Drawings have been obtained from the existing site utility plans and utility companies. Contractor shall examine the site and verify to his own satisfaction the location and elevation of all utilities and shall adequately inform himself as to their relationship to the Work.
- D. Specifications and Drawings in no way imply as to the condition of the soil encountered. When excavation is required in execution of the Work, Contractor agrees that he has informed himself regarding conditions affecting the Work, labor, and materials required, without recourse to any representations as to soil conditions that may appear, or seem to be implied in any portion of the Contract Documents.

2.0 PRODUCTS

Not Applicable to this Section.

3.0 EXECUTION

Not Applicable to this Section.

END OF SUMMARY OF WORK

**01 23 00
ALTERNATES**

1.0 GENERAL

1.01 SUMMARY

- A. This Section includes administrative and procedural requirements governing Alternative Bids.

1.02 PROCEDURES

- A. General:
1. Alternative Bid sums shall be added to or deducted from the Base Bid sum if the Owner elects to accept the corresponding change in either the scope of the Work, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 2. Include as part of each Alternative Bid all costs, including materials, installation and fees.
 3. Include as part of each Alternative Bid, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not mentioned as part of the Alternative Bid.
 4. Show the proposed Alternative Bid sums opposite their proper description on the Bid Form.
- B. Coordination: Modify or adjust affected adjacent Work as necessary to completely and fully integrate that Work into the Project.
- C. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each Alternative Bid. Indicate whether Alternative Bids have been accepted, rejected, or deferred for consideration at a later date. Include a complete description of negotiated modifications to Alternative Bids.
- D. Execute accepted Alternative Bids under the same conditions as other Work of this Contract.
- E. Schedule: A Schedule of Alternative Bids is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials necessary to achieve the Work described under each Alternative Bid.

2.0 PRODUCTS

Not Applicable to this Section.

3.0 EXECUTION

3.01 SCHEDULE OF ALTERNATIVE BIDS

- A. DEDUCT Alternative Bid No. One: Above the ceiling, between the termination of gypsum wall board (GWB) and the roof deck, provide and install Level 3 Bullet-Resistant panels in lieu of Level 7 Bullet-Resistant panels as detailed, typical at all locations.

END OF ALTERNATES

01 26 00
CONTRACT MODIFICATION PROCEDURES

1.0 GENERAL

1.01 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
 - 2. General Conditions: Changes in the Work.
 - 3. Section 01 21 00: Allowances.
 - 4. Section 01 29 00: Payment Procedures.
 - 5. Section 01 33 00: Submittal Procedures.
 - 6. Section 01 62 00: Product Options.

1.02 MINOR CHANGES IN THE WORK

- A. The Architect will issue supplemental instructions authorizing minor changes in the Work, not involving an adjustment to the Contract Sum or Contract Time, on AIA Form G710, Architect's Supplemental Instructions.

1.03 CHANGE ORDER PROPOSAL REQUESTS

- A. Owner-initiated proposal requests: The Architect will issue a detailed description of proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time. If necessary the description will include supplemental or revised Drawings and Specifications.
 - 1. Proposal requests issued by the Architect are for information only. Do not consider them as an instruction either to stop work in progress or to execute the proposed change.
 - 2. Unless otherwise indicated in the proposal request, within fifteen (15) days of receipt of a proposal request, submit an estimate of cost necessary to execute the change to the Architect for the Owner's review.
 - a. Include a list of quantities of products required and unit costs, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include a statement indicating the effect the proposed change in the Work will have on the Contract Time.
- B. Contractor-initiated proposal requests: When latent or unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Architect.
 - 1. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
 - 2. Include a list of quantities of products required and unit cost, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
 - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - 4. Comply with requirements of Section 01630 Products Options and Substitutions if the proposed change requires substitution of one product or system for a product or system specified.

1.04 ALLOWANCES

- A. Allowance adjustment: For allowance-cost adjustment, base each Change Order Proposal on the difference between the actual purchase amount and the allowance, multiplied by the final measurement of work-in-place. Where applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
1. Include installation costs in the purchase amount only where indicated as part of the allowance.
 2. When requested, prepare explanations and documentation to substantiate the margins claimed.
 3. Submit substantiation of a change in scope of work claimed in the Change Orders related to unit-cost allowances.
 4. The Owner reserves the right to establish the actual quantity of work-in-place by independent quantity survey, measure, or count.

1.05 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction change directive: When the Owner and the Contractor disagree on the terms of a Change Order Proposal Request, the Architect may issue a Change Order Directive on AIA Form G714. The Construction Change Directive instructs the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
1. The Construction Change Directive contains a complete description of the change in the Work. It also designates the method to be followed to determine change in the Contract Sum or Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
1. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.06 CHANGE ORDER PROCEDURES

- A. Upon the Owner's approval of a Change Order Proposal Request, the Architect will issue a Change Order for signatures of the Owner and the Contractor on AIA Form G701.
1. Change Orders will be numbered in sequence, and dated.
 2. Change Orders will describe the change or changes and will refer to the Proposal Requests or Supplemental Instructions involved.
 3. The Architect will issue four (4) copies of each Change Order to the Contractor.
 - a. The Contractor promptly shall sign all four (4) copies and return three (3) copies to the Architect.
 - b. The Architect will retain one (1) signed copy in his file and will forward two (2) signed copies to the Owner.

2.0 PRODUCTS

Not Applicable to this Section.

3.0 EXECUTION

Not Applicable to this Section.

END OF CONTRACT MODIFICATION PROCEDURES

01 29 00
PAYMENT PROCEDURES

1.0 GENERAL

1.01 SUMMARY

- A. This Section specifies administrative and procedural requirements governing the Contractor's Schedule of Values and Applications for Payment.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
 - 2. Form of Agreement: Contract Sum, schedule for payments.
 - 3. Section 01 33 00: Submittal Procedures: Construction Schedule.
 - 4. Section 01 77 00: Closeout Procedures: Payments upon Substantial Completion and Completion of the Work.

1.02 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of Schedule of Values with preparation of the Contractor's Construction Schedule.
- B. Approval: Submit and obtain the Architect's approval of the Schedule of Values at the earliest feasible date, but in no case later than ten (10) days before the date scheduled for submittal of the initial Application for Payment.
- C. Format and content: Use the Table of Contents in this Project Manual as a guide to establish the format for the Schedule of Values.
 - 1. Identification: Include the following Project identification on the Schedule of Values:
 - a. Project name and location.
 - b. Name of the Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal
 - 2. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Table of Contents in this Project Manual. Break principal subcontract amounts down into several line items (i.e. Concrete shall be broken down into walks, paving, piers, grade beams, slabs, etc. as a minimum).
 - 3. Round amounts to nearest whole dollar; the total shall equal the Contract Sum.
 - 4. Provide separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. Include requirements for insurance and bonded warehousing, if required.
 - 5. Margins of Cost: Show line items for indirect costs and margins on actual costs only when such items are listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete. Include the total cost and proportionate share of general overhead and profit margin for each item.
 - 6. Temporary facilities and other major cost items that are not direct cost of actual work-in-place shall be shown as separate line items in the Schedule of Values.
 - 7. Schedule updating: List Change Orders as a separate line item when Change Orders or Construction Change Directives result in a change in the Contract Sum.
 - 8. Overhead and profit: Show separate line item values for overhead and profit. Percent draw each month to coincide with percent of job completion.

1.03 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by the Architect and paid for by the Owner.
 - 1. The initial Application for Payment, the Application for Payment at the time of Substantial Completion, and the final Application for Payment involve additional requirements.
- B. Payment application forms: Use AIA Form G702 Application and Certificate for Payment and AIA Form G703 Continuation Sheet.
- C. Application preparation: Complete every entry on the form. Include notarization and execution by a person authorized to sign legal documents on behalf of the Contractor. The Architect will return incomplete applications without action.
 - 1. Entries shall match data on the Schedule of Values and the Contractor's Construction Schedule. Use updated schedules if revisions are made.
 - 2. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.
- D. Transmittal: Submit four (4) signed and notarized original copies of each Application for Payment to the Architect. At least one copy shall be complete, including waivers of lien and similar attachments, when required.
- E. Waivers of mechanics lien: With each Application for Payment, submit waivers of mechanics lien from every entity who is lawfully entitled to file a mechanics lien arising out of the Contract or a Contractor's Certificate of Release of Liens for the construction period covered by the previous application.
- F. Payment application period: The period of construction Work covered by each Application for Payment is the period from the previous Application to the 20th day of the current month. Applications shall not include dates projected beyond the date of the Application.
- G. Payment application times:
 - 1. Informal submittal: Make an informal submittal of the Application for Payment to the Architect at the last regularly scheduled project meeting of each month.
 - a. Revise the informal submittal of the Application for Payment as agreed at the Project meeting, initialing all copies.
 - 2. Formal submittal: Make a formal submittal of the Application for Payment by the 25th day of the month based on the revised informal submittal.
 - a. By the end of the month, the Architect will compare the formal submittal with the approved informal submittal and, when approved, will sign the Application and Certificate for Payment and will distribute:
 - 1) One (1) copy to Contractor.
 - 2) One (1) copy to Architect's file.
 - 3) Two (2) copies to Owner.
- H. Payment to Contractor: Upon approval, Owner will disburse progress payments directly to the Contractor within thirty (30) days of receipt of the Application for Payment.
 - 1. Basis for payment shall be ninety five percent (95%) of the total labor and materials less the aggregate total of all previous payments. The aggregate total of all progress payments shall not exceed ninety five percent (95%) of the Contract Sum.
- I. Initial Application for Payment: Administrative actions and submittals, that must precede or coincide with submittal of the first Application for Payment, include the following:
 - 1. List of subcontractors.
 - 2. List of principal suppliers and fabricators.
 - 3. Schedule of Values.
 - 4. Contractor's Construction Schedule (preliminary if not final).
 - 5. List of Contractor's staff assignments.
 - 6. List of Contractor's principal consultants.
 - 7. Copies of building permit.
 - 8. Copies of authorizations and licenses from governing authorities for performance of the Work.
 - 9. Initial progress report.
 - 10. Report of preconstruction meeting.

- J. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.
1. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
 2. Administrative actions and submittals that shall precede or coincide with the application include:
 - a. Occupancy permits and similar approvals.
 - b. Warranties (guarantees) and maintenance agreements.
 - c. Test/adjust/balance records.
 - d. Change of door locks to Owner's access.
 - e. Maintenance instructions.
 - f. Meter readings.
 - g. Startup performance reports.
 - h. Changeover information related to Owner's occupancy, use, operation, and maintenance.
 - i. Final cleaning.
 - j. Application for reduction of retainage and consent of surety.
 - k. Advice on shifting insurance coverages.
 - l. List of incomplete Work, recognized as exceptions to Architect's Certificate of Substantial Completion.
- K. Final Application for Payment: Administrative actions and submittals that shall precede or coincide with submittal of the final Application for Payment include:
1. Completion of Project closeout requirements.
 2. Completion of items specified for completion after Substantial Completion.
 3. Assurance that unsettled claims will be settled.
 4. Assurance that Work not complete and accepted will be completed without undue delay.
 5. Transmittal of required Project construction records to the Owner.
 6. Proof that taxes, fees and similar obligations have been paid.
 7. Removal of temporary facilities and services.
 8. Removal of surplus materials, rubbish, and similar elements.
- Upon approval, Owner will disburse final payment directly to the Contractor within thirty (30) days of receipt of the Final Application for Payment.

2.0 PRODUCTS
Not Applicable to this Section.

3.0 EXECUTION
Not Applicable to this Section.

END OF PAYMENT PROCEDURES

01 31 00
PROJECT MANAGEMENT & COORDINATION

1.0 GENERAL

1.01 SUMMARY

- A. This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:
 - 1. Coordination.
 - 2. Administrative and supervisory personnel.
 - 3. General installation provisions.
 - 4. Cleaning and protection.
- B. Related work:
 - 1. Section 01 31 19: Project Meetings.
 - 2. Section 01 33 00: Submittal Procedures: Construction Schedule.
 - 3. Section 01 77 00: Closeout Procedures.

1.02 COORDINATION

- A. Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of these Specifications that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
 - 3. Make provisions to accommodate items scheduled for later installation.
- B. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
 - 1. Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.
- C. Administrative procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the Work. Such administrative activities include, but are not limited to:
 - 1. Preparation of schedules.
 - 2. Installation and removal of temporary facilities.
 - 3. Delivery and processing of submittals.
 - 4. Progress meetings.
 - 5. Project closeout activities.
- D. Conservation: Coordinate construction operations to assure that operations are carried out with consideration given to conservation of energy, water, and materials.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.03 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

- A. Project supervision: Maintain an experienced and capable superintendent on the project full time when work is being accomplished.
- B. Staff Names: Within fifteen (15) days of Notice to Proceed, submit a list of the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities; list their addresses and telephone numbers.
 - 1. Post copies of the list in the Project meeting room and the temporary field office where applicable.

2.0 PRODUCTS

Not Applicable to this Section.

3.0 EXECUTION

3.01 GENERAL COORDINATION PROVISIONS

- A. Inspection of conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until satisfactory conditions have been corrected in an acceptable manner.
- B. Manufacturer's instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in the Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Visual effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- F. Recheck measurements and dimensions, before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.
- I. Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision.

3.02 CLEANING AND PROTECTION

- A. Clean and protect construction in progress and adjoining materials in place, during handling and installation. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- B. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- C. Limiting exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to:
 - 1. Excessive static or dynamic loading.
 - 2. Excessive internal or external pressures.
 - 3. Excessively high or low temperatures.
 - 4. Excessively high or low humidity.
 - 5. Thermal shock.
 - 6. Air contamination or pollution.
 - 7. Water or ice.
 - 8. Solvents.
 - 9. Chemicals.
 - 10. Light.
 - 11. Radiation.
 - 12. Puncture.
 - 13. Abrasion.
 - 14. Heavy traffic.
 - 15. Soiling, staining or corrosion.
 - 16. Bacteria.
 - 17. Rodent and insect infestation.
 - 18. Combustion.
 - 19. Electrical current.
 - 20. High speed operation.
 - 21. Improper lubrication.
 - 22. Unusual wear or other misuse.
 - 23. Contact between incompatible materials.

24. Destructive testing.
25. Misalignment.
26. Excessive weathering.
27. Unprotected storage.
28. Improper shipping or handling.
29. Theft.
30. Vandalism.

END OF PROJECT MANAGEMENT & COORDINATION

01 31 19
PROJECT MEETINGS

1.0 GENERAL

1.01 SUMMARY

- A. This Section specifies administrative and procedural requirements for project meetings, including, but not limited to:
 - 1. Preconstruction conferences.
 - 2. Progress meetings.
 - 3. Coordination meetings.
- B. Related work:
 - 1. Section 01 29 00: Payment Procedures.
 - 2. Section 01 31 00: Project Management & Coordination.
 - 2. Section 01 33 00: Submittal Procedures.

1.02 PRECONSTRUCTION CONFERENCE

- A. Schedule a preconstruction conference before starting construction, at a time convenient to the Owner and the Architect, but no later than fifteen (15) days after execution of the Agreement. Hold the conference at the Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.
- B. Attendees: Authorized representatives of the Owner and the Architect; the Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.
- C. Agenda: Discuss items of significance that could affect progress including the following:
 - 1. Tentative construction schedule.
 - 2. Critical work sequencing.
 - 3. Designation of responsible personnel.
 - 4. Procedures for processing field decisions and Change Orders.
 - 5. Procedures for processing Applications for Payment.
 - 6. Distribution of Contract Documents.
 - 7. Submittal of Shop Drawings, Product Data and Samples.
 - 8. Preparation of Record Documents.
 - 9. Use of premises.
 - 10. Parking availability
 - 11. Office, work and storage areas.
 - 12. Equipment deliveries and priorities.
 - 13. Safety procedures.
 - 14. First aid.
 - 15. Security
 - 16. Housekeeping
 - 17. Schedule for progress meetings
 - 18. Working hours.

1.03 PROGRESS MEETINGS

- A. Conduct progress meetings at the Project site at regular intervals; approximately every two (2) weeks. Notify the Owner and the Architect of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment request.
- B. Attendees: In addition to representatives of the Owner and the Architect, each subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of future activities may be represented at these meetings. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.
- C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the status of the Project.

1. At the last regularly scheduled progress meeting of each month, review preliminary submittal of payment request in accordance with Section 01 29 00 of these Specifications.
2. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to insure that current and subsequent activities will be completed within the Contract Time.
3. Review the present and future needs of each entity present, including the following:
 - a. Interface requirements.
 - b. Time.
 - c. Sequences.
 - d. Status of submittals.
 - e. Deliveries.
 - f. Off-site fabrication problems.
 - g. Access.
 - h. Site utilization.
 - i. Temporary facilities and services.
 - j. Hours of work.
 - k. Hazards and risks.
 - l. Housekeeping.
 - m. Quality and work standards.
 - n. Change Orders.
 - o. Documentation of information for payment requests.
- D. Reporting: No later than three (3) days after each meeting, distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
 1. Schedule updating: Revise the Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.

1.04 COORDINATION MEETINGS

- A. Conduct project coordination meetings at regular intervals convenient to all parties involved. Project coordination meetings are in addition to specific meetings held for other purposes, such as regular progress meetings and special preinstallation meetings.
- B. Request representation at each meeting by every party currently involved in coordination or planning for the construction activities involved.
- C. Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

2.0 PRODUCTS

Not Applicable to this Section.

3.0 EXECUTION

Not Applicable to this Section.

END OF PROJECT MEETINGS

01 33 00
SUBMITTAL PROCEDURES

1.0 GENERAL

1.01 SUMMARY

- A. This Section includes administrative and procedural requirements for submittals required for performance of the Work, including the following:
 - 1. Contractor's Construction Schedule.
 - 2. Shop Drawings.
 - 3. Product Data.
 - 4. Samples.
 - 5. Quality assurance submittals.
- B. Related work:
 - 1. Section 01 29 00: Payment Procedures: Schedule of Values.
 - 2. Section 01 31 19: Project Meetings: Meeting minutes.
 - 3. Section 01 45 00: Quality Control: Inspection and test reports.
 - 4. Section 01 78 00: Closeout Submittals: Closeout documents.

1.02 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
 - a. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.
 - 3. Verify all dimensions and that each item and its submittal conforms in all respects with the specified requirements. Affix the Contractor's signature to each submittal certifying that this coordination has been performed.
 - 4. Processing: To avoid the need to delay installation as a result of the time required to process submittals, allow sufficient time for submittal review, including time for resubmittals.
 - a. Allow two (2) weeks for initial review. Allow additional time if the Architect must delay processing to permit coordination with subsequent submittals.
 - b. If an intermediate submittal is necessary, process the same as the initial submittal.
 - c. Allow two (2) weeks for processing each resubmittal.
 - d. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing.
- B. Submittal preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
 - 1. Provide a space approximately 4 x 5 IN on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
 - 2. Include the following information on the label for processing and recording action taken.
 - a. Project name.
 - b. Date.
 - c. Name and address of the Architect.
 - d. Name and address of the Contractor.
 - e. Name and address of the subcontractor.

- f. Name and address of the supplier.
 - g. Name of the manufacturer.
 - h. Number and title of appropriate Specification Section.
 - i. Drawing number and detail references, as appropriate.
- C. Submittal transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the Architect using a transmittal form. The Architect will not accept submittals received from sources other than the Contractor.
- 1. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including variations and limitations. Contractor's responsibility for deviations from Contract Document requirements is not relieved by Architect's review unless specific deviations are brought to the attention of the Architect in writing. Include Contractor's certification that information complies with Contract Document requirements.
 - 2. When material is resubmitted for any reason, transmit under a new letter of transmittal and identify as a resubmittal.

1.03 CONSTRUCTION SCHEDULE

- A. Bar-chart schedule: Prepare a fully developed, horizontal bar-chart type, contractor's construction schedule. Submit within thirty (30) days after the date established for "Commencement of the Work".
- 1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as indicated in the Schedule of Values.
 - 2. Within each time bar, indicate estimated completion percentage in 10 percent (10%) increments. As Work progresses, place a contrasting mark in each bar to indicate actual completion.
 - 3. Prepare the schedule on a sheet, or a series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.
 - 4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically the sequences necessary for completion of related portions of the Work.
 - 5. Coordinate the Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, progress reports, payment requests, and other schedules.
 - 6. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Architect's procedures necessary for certification of Substantial Completion.
- B. Phasing: On the schedule, where applicable, show how requirements for phased completion of the Work by separate Contractors and partial occupancy by the Owner affect the sequence of the Work.
- C. Work stages: Indicate important stages of construction for each major portion of the Work, including submittal review, testing, and installation.
- D. Cost correlation: At the head of the schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of Work performed as of the dates used for preparation of payment requests.
- E. Distribution: Following response to the initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.
- 1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.
- F. Schedule updating: Revise the schedule after each meeting, event, or activity where revisions have been recognized or made. Issue the updated schedule and submit with each month's Application for Payment.

1.04 SHOP DRAWINGS

- A. Submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.
- B. Shop Drawings include fabrication and installation Drawings, setting diagrams, schedules, patterns, templates and similar Drawings. Include the following information:
 - 1. Dimensions.
 - 2. Identification of products and materials included by sheet number and detail number.
 - 3. Compliance with specified standards.
 - 4. Notation of coordination requirements.
 - 5. Notation of dimensions established by field measurement.
 - 6. Sheet size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 x 11 IN but no larger than 36 x 48 IN.
 - 7. Submittal: Submit one (1) correctable, translucent, reproducible print and three (3) blue- or black-line prints for the Architect's review.
 - a. The Architect will return the reproducible print.
 - b. The blue- or black-line prints will be retained by the Architect for his use and distribution to his consultants and the Owner.
 - c. The Contractor may make and distribute such copies as are required for his purposes.
 - d. The Contractor shall provide and maintain one (1) copy as a Record Document.
 - e. The Contractor shall provide necessary final copies to be included in maintenance manuals.
 - 8. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.

1.05 PRODUCT DATA

- A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves. Where Product Data must be specially prepared because printed data is not suitable for use, submit as Shop Drawings.
 - 1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information. Include the following information:
 - a. Manufacturer's printed recommendations.
 - b. Compliance with trade association standards.
 - c. Compliance with recognized testing agency standards.
 - d. Application of testing agency labels and seals.
 - e. Notation of dimensions verified by field measurements.
 - f. Notation of coordination requirements.
 - 2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
 - 3. Submit the number of copies which are required for the Contractor's use, including maintenance manuals and Record Documents, PLUS three (3) copies. The Architect will retain three (3) copies for his use and distribution to his consultants and the Owner and will return the other copies marked with action taken and corrections or modifications required.
 - 4. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal form.
 - a. Do not proceed with installation until a copy of Product Data is in the Installer's possession.
 - b. Do not permit use of unmarked copies of Product Data in connection with construction.

1.06 SAMPLES

- A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.
 - 1. Mount or display Samples in the manner specified to facilitate review of qualities indicated. Prepare samples to match the Architect's Sample. Include the following:
 - a. Specification Section number and reference.
 - b. Generic description of the Sample.
 - c. Sample source.
 - d. Product name or name of the manufacturer.
 - e. Compliance with recognized standards.
 - f. Availability and delivery time.
 - 2. Submit Samples for review of size, kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
 - a. Where variation in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit at least three (3) multiple units that show approximate limits of the variations.
 - b. Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.
 - c. Refer to other Specification Sections for Samples to be returned to the Contractor for incorporation in the Work. Such Samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of Sample submittals.
 - 3. Preliminary submittals: Submit a full set of choices where Samples are submitted for selection of color, pattern, texture, or similar characteristics from a range of standard choices.
 - a. The Architect will review and return preliminary submittals with the Architect's notation, indicating selection and other action.
 - 4. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics, submit three (3) sets. The Architect will return one (1) set marked with the action taken.
 - 5. Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.
 - a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
 - b. Sample sets may be used to obtain final acceptance of the construction associated with each set.
- B. Distribution of Samples: Prepare and distribute additional sets of Samples to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.
 - 1. Field Samples are full-size examples erected on-site to illustrate finishes, coatings, or finish materials and to establish the Project standard.
 - a. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

1.07 QUALITY ASSURANCE SUBMITTALS

- A. Submit quality-control submittals, including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of these Specifications.
- B. Certifications: Where other Sections of these Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the manufacturer certifying compliance with specified requirements.
 - 1. Signature: Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the company.

- C. Inspection and test reports: Requirements for submittal of inspection and test reports from independent testing agencies are specified in Section 01 45 00 Quality Control.

1.08 ARCHITECT'S ACTION

- A. Except for submittals for the record or information, where action and return is required, the Architect will review each submittal, mark to indicate action taken, and return promptly.
- B. Action stamp: The Architect will stamp each submittal with a uniform, action stamp. The Architect will mark the stamp appropriately to indicate the action taken, as follows:
 - 1. Final unrestricted release: When the Architect marks a submittal "No Exceptions Taken", the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents. Final payment depends on that compliance.
 - 2. Final but restricted release: When the Architect marks a submittal "Make Corrections Noted", the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents. Final payment depends on that compliance.
 - 3. Returned for resubmittal: When the Architect marks a submittal "Revise and Resubmit", do not proceed with the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in according to the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
 - a. Do not use, or allow others to use, submittals marked "Revise and Resubmit" at the Project site or elsewhere where Work is in progress.
 - 4. Other action: Where a submittal is for information or record purposes or special processing or other activity, the Architect will return the submittal marked "No Exceptions Taken".
- C. Unsolicited submittals: The Architect will return unsolicited submittals to the sender without action.

2.0 PRODUCTS

Not Applicable to this Section.

3.0 EXECUTION

Not Applicable to this Section.

END OF SUBMITTAL PROCEDURES

01 42 00
REFERENCES

1.0 GENERAL

1.01 DEFINITIONS

- A. All definitions set forth in the General Conditions of the Contract for Construction or in other Contract Documents are applicable to the Bidding Documents.
- B. "Bidding Documents" include the Invitation to Bid, Instructions to Bidders, the Bid Form, other sample bidding and contract forms and the proposed Contract Documents including any Addenda issued prior to receipt of bids.
- C. "Addenda" are written or graphic instruments issued by the Architect prior to the execution of the Contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.
- D. A "Bid" is a complete and properly signed proposal to do the Work or designated portion thereof for the sums stipulated therein supported by data called for by the Bidding Documents.
- E. "Base Bid" is the sum stated in the Bid for which the Bidder offers to perform the Work described as the base, to which Work may be added or deducted for sums stated in Alternate Bids.
- F. An "Alternative Bid" is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in project scope or materials or methods of construction described in the Bidding Documents is accepted.
- G. A "Unit Price" is an amount stated in the Bid as a price per unit of measurement for materials or services as described in the Contract Documents.
- H. A "Bidder" is one who submits a Bid for a prime contract with the Owner for the Work described in the proposed Contract Documents.
- I. A "Sub-bidder" is one who submits a bid to a Bidder for materials or labor for a portion of the Work.
- J. "Indicated" refers to graphic representations, notes, or schedules on the Drawings, or other paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as "shown", "noted", "scheduled", and "specified" are used to help the reader locate the reference. Location is not limited.
- K. "Directed", "requested", "authorized", "selected", "approved", "required", and "permitted" mean directed by the Architect, requested by the Architect, and similar phrases.
- L. "Approved" when used conjunction with the Architect's action on the Contractor's submittals, applications and requests, is limited to the Architect's duties and responsibilities as stated in the Conditions of the Contract.
- M. "Regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
- N. "Furnish" means supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- O. "Install" describes operations at the Project site including the actual unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- P. "Provide" means to furnish and install a product, complete and ready for the intended use.
- Q. "Product" includes materials, systems, and equipment.
- R. "Similar" means in its general sense and not necessarily identical.
- S. "Building code" and "code" refers to regulations of governmental agencies having jurisdiction.
- T. An "Installer" is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.
 - 1. The term "experienced", when used with the term "installer", means having a minimum of five (5) previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of authorities having jurisdiction.

2. Trades: Using terms such as “carpentry” does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as “carpenter”. It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.
3. Assigning specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.
 - a. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.
- U. "Project site" is the space available to the Contractor for performing construction activities, either exclusively or in conjunction, with others performing other work as part of the Project. The extent of the Project site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.
- V. "Testing agencies" are independent entities engaged to perform specific inspections or tests, either at the Project site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.02 SPECIFICATION FORMAT AND CONTENT EXPLANATION

- A. Specification format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 2004 MASTERFORMAT format and numbering system.
- B. Specification content: This Specification uses certain conventions regarding the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:
 1. Abbreviated language: Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
 2. Streamlined language: The Specifications generally use the imperative mod and streamlined language. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.
 - a. The words “shall be” are implied where a colon (:) is used within a sentence or phrase.

1.03 INDUSTRY STANDARDS

- A. Applicability of standards: Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication dates: Where the date of issue of a referenced standard is not specified, comply with the standard in effect as of the date of the Contract Documents.
- C. Conflicting requirements: Where compliance with two (2) or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer to the Architect before proceeding for a decision on requirements that are different but apparently equal, and where it is uncertain which requirement is the most stringent.

1. Minimum quantity or quality levels: The quantity or quality level shown or specified shall be the minimum acceptable. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the Architect for a decision before proceeding.
- D. Copies of standards: Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
1. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source.
- E. Abbreviations and names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Gale Research Co.'s "Encyclopedia of Associations", available at most libraries.
- F. Abbreviations and names: Trade association names and titles of general standards are frequently abbreviated. The following acronyms or abbreviations, as referenced in the Contract Documents, are defined to mean the associated names.

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association
AAN	American Association of Nurserymen
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
ABMA	American Boiler Manufacturers Association
ACI	American Concrete Institute
ACIL	American Council of Independent Laboratories
ACPA	American Concrete Pipe Association
ADA	American's with Disabilities Act
ADC	Air Diffusion Council
AFBMA	Anti-Friction Bearing Manufacturers Association
AFPA	American Forest and Paper Association
AGA	American Gas Association
AHA	American Hardboard Association
AHAM	Association of Home Appliance Manufacturers
AI	Asphalt Institute
AIA	American Institute of Architects
AIA	American Insurance Association
AIHA	American Industrial Hygiene Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALI	Associated Laboratories Inc.
ALSC	American Lumber Standards Committee
AMCA	Air Movement and Control Association
ANSI	American National Standards Institute
AOAC	Association of Official Analytical Chemists
AOSA	Association of Official Seed Analysts
APA	American Plywood Association
APA	American Parquet Association
API	American Petroleum Institute
ARI	Air Conditioning and Refrigeration Institute
ARMA	Asphalt Roofing Manufacturers Association
ASA	Acoustical Society of America
ASC	Adhesive and Sealant Council

ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASPA	American Sod Producers Association
ASPE	American Society of Plumbing Engineers
ASSE	American Society of Sanitary Engineering
ASTM	American Society for Testing and Materials
ATIS	Alliance for Telecommunications Industry Solutions
AWCMA	American Window Covering Manufacturers Association
AWI	American Woodwork Institute
AWPA	American Wood Preservers Association
AWPB	American Wood Preservers Bureau
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders' Hardware Manufacturers Association
BIA	Brick Institute of America
BIFMA	Business and Institutional Furniture Manufacturers Association
BOCA	Building Officials and Code Administration
CAGI	Compressed Air and Gas Institute
CAUS	Color Association of the United States
CBM	Certified Ballast Manufacturers Association
CCC	Carpet Cushion Council
CDA	Copper Development Association Inc.
CFFA	Chemical Fabrics & Film Association Inc.
CGA	Compressed Gas Association
CISCA	Ceiling and Interior Systems Construction Association
CISPI	Cast Iron Soil Pipe Institute
CRI	Carpet and Rug Institute
CRSI	Concrete Reinforcing Steel Institute
CTI	Cooling Tile Institute of America
DHI	Door and Hardware Institute
DIPRA	Ductile Iron Pipe Research Association
DLPA	Decorative Laminate Products Association
ECSA	Exchange Carriers Standards Association
EIA	Electronic Industries Association
EIMA	Exterior Insulation Manufacturers Association
EJMA	Expansion Joint Manufacturers Association
ETL	ETL Testing Laboratories Inc.
FCI	Fluid Controls Institute
FCIB	Floor Covering Installation Board
FGMA	Flat Glass Marketing Association
FM	Factory Mutual Engineering and Research Organization
FTI	Facing Tile Institute
GA	Gypsum Association
HEI	Heat Exchange Institute
HI	Hydronics Institute
HI	Hydraulic Institute
HMA	Hardwood Manufacturers Association
HPMA	Hardwood Plywood Manufacturers Association
HPVA	Hardwood Plywood and Veneer Association
IBD	Institute of Business Designers
IBC	International Building Code
ICBO	International Conference of Building Officials
ICEA	Insulated Cable Engineers Association Inc.
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronic Engineers
IESNA	Illuminating Engineering Society of North America
IGCC	Insulating Glass Certification Council
ILI	Indiana Limestone Institute of America

IMSA	International Municipal Signal Association
IRI	Industrial Risk Insurers
ISA	Instrument Society of America
KCMA	Kitchen Cabinet Manufacturers Association
LIA	Lead Industries Association Inc.
LPI	Lightning Protection Institute
MBMA	Metal Building Manufacturers Association
MCAA	Mechanical Contractors Association of America
MFMA	Maple Flooring Manufacturers Association
MIA	Marble Institute of America
ML/SFA	Metal Lath/Steel Framing Association
MSS	Manufacturers Standardization Society
NAA	National Arborist Association
NAAMM	National Association of Architectural Metal Manufacturers
MAIMA	North American Insulation Manufacturers Association
NAPA	National Asphalt Pavement Association
NAPF	National Association of Plastic Fabricators (Now DLPA)
NBGQA	National Building Granite Quarries Association
NBS	National Bureau of Standards
NBHA	National Builders Hardware Association (Now DHI)
NCMA	National Concrete Masonry Association
NCRPM	National Council on Radiation Protection and Measurement
NEC	National Electrical Code (From NFPA)
NECA	National Electrical Contractors Association
NEII	National Elevator Industry Inc.
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NFPA	National Forest Products Association
NFRC	National Fenestration Rating Council
NHLA	National Hardwood Lumber Association
NKCA	National Kitchen Cabinet Association
NLGA	National Lumber Grades Authority
NOFMA	National Oak Flooring Manufacturers Association
NPA	National Particleboard Association
NPCA	National Paint and Coatings Association
NRCA	National Roofing Contractors Association
NSF	National Sanitation Foundation
NSSEA	National School Supply and Equipment Association
NTMA	National Terrazzo and Mosaic Association
NWMA	National Woodwork Manufacturers Association (Now NWWDA)
NWWDA	National Wood Window and Door Association (Formerly NWMA)
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PDI	Plumbing and Drainage Institute
PEI	Porcelain Enamel Institute
RFCI	Resilient Floor Covering Institute
RIS	Redwood Inspection Service
RMA	Rubber Manufacturers Association
SAMA	Scientific Apparatus Makers Association
SBCCI	Southern Building Code Congress International
SDI	Steel Deck Institute
SDI	Steel Door Institute
SGCC	Safety Glazing Certification Council
SHLMA	Southern Hardwood Lumber Manufacturers Association
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SPIB	Southern Pine Inspection Bureau
SPRI	Single Ply Roofing Institute

SSPC	Steel Structures Painting Council
SSPMA	Sump and Sewage Pump Manufacturers
SWI	Steel Window Institute
SWPA	Submersible Wastewater Pump Association
TAS	Texas Accessibility Standards
TCA	Tile Council of America
TIMA	Thermal Insulation Manufacturers Association
TPI	Truss Plate Institute
UBC	Uniform Building Code
UFC	Uniform Fire Code
UL	Underwriters Laboratories
UMC	Uniform Mechanical Code
UPC	Uniform Plumbing Code
WCLIB	West Coast Lumber Inspection Bureau
WCMA	Wallcovering Manufacturers Association
WIC	Woodwork Institute of California
WLPDIA	Western Lath Plaster Drywall Industries Association
WRI	Wire Reinforcement Institute
WSC	Water Systems Council
WSFI	Wood and Synthetic Flooring Institute
WWPA	Western Wood Products Association
WWPA	Woven Wire Products Association

- G. Federal government agencies: Names and titles of federal government standard- or Specification-producing agencies are often abbreviated. The following acronyms or abbreviations referenced in the Contract Documents indicate names of standard- or Specification-producing agencies of the federal government.

CE	Corps of Engineers (U.S. Dept. of the Army)
CFR	Code of Federal Regulations
CPSC	Consumer Product Safety Commission
CS	Commercial Standard (U.S. Dept. of Commerce)
DOC	Department of Commerce
DOT	Department of Transportation
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration (U.S. DOT)
FCC	Federal Communications Commission
FDA	Food and Drug Administration
FHA	Federal Housing Administration (U.S. Dept. of HUD)
FS	Federal Specification (From GSA)
GSA	General Services Administration
MIL	Military Standardization Documents (U.S. Dept. of Defense)
NIST	National Institute of Standards and Technology (U.S. Dept. of Agriculture)
OSHA	Occupational Safety and Health Administration (U.S. Dept. of Labor)
PS	Public Standard (U.S. Dept. of Commerce)
REA	Rural Electrification Administration (U.S. Dept. of Agriculture)
USDA	U.S. Department of Agriculture
USPS	U.S. Postal Service

2.0 PRODUCTS
Not Applicable to this Section.

3.0 EXECUTION
Not Applicable to this Section.

END OF REFERENCES

01 45 00
QUALITY CONTROL

1.0 GENERAL

1.01 SUMMARY

- A. This Section includes administrative and procedural requirements for quality control services, which include the following and as specified under each section:
 - 1. Structural steel.
- B. Quality control services include inspections, tests, and related actions, including reports performed by the Contractor, by independent agencies, and by governing authorities. They do not include contract enforcement activities performed by the Architect.
- C. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements.
- D. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.
 - 1. Specific quality control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified inspections, tests, and related actions do not limit the Contractor's quality control procedures that facilitate compliance with Contract Document requirements.
 - 3. Requirements for the Contractor to provide quality control services required by the Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
 - 4. The Owner will select an Independent Testing Laboratory to perform the specified testing and services scheduled in Part 3.0 of this Section.
 - a. The Owner shall pay the cost of initial testing and inspection services and one (1) retest if the retest passes. If the retest fails, the Contractor shall pay for the retest and all subsequent retesting. The cost of all other tests shall be borne solely by the Contractor.
 - b. Employment of Testing Laboratory shall in no way relieve the Contractor of his obligation to perform work in accordance with the Contract Documents.
- E. Related work:
 - 1. Section 01 21 00: Allowances: Testing and inspection allowance.
 - 2. Section 01 33 00: Submittal Procedures: Schedule of required tests and inspections.
 - 3. Section 01 73 29: Cutting & Patching: Repair and restoration of construction disturbed by inspection and testing activities.
 - 4. Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities.
- F. Definitions:
 - 1. Where terms "Inspector" and "Testing Laboratory" or "Testing Agency" are used, they mean and refer respectively to an officially designated and accredited Inspector of the Testing Laboratory and the Testing Laboratory selected by the Owner.

1.02 SUBMITTALS

- A. Unless the Contractor is responsible for this service, the independent testing agency shall submit a certified written report, in triplicate, of each inspection, test, or similar service to the Architect. If the Contractor is responsible for the service, submit a certified written report, in triplicate, of each inspection, test, or similar service through the Contractor.
 - 1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.
 - 2. Report data: Written reports of each inspection, test, or similar service include, but are not limited to, the following:
 - a. Date of issue.
 - b. Project title and number.
 - c. Name, address, and telephone number of testing agency.

- d. Date, time and location of samples and tests or inspections.
- e. Names of individuals making the inspection or test.
- f. Designation of the Work and test methods.
- g. Identification of product and Specification Section.
- h. Complete inspection or test data.
- i. Test results and an interpretation of test results.
- j. Record of temperature and weather conditions at the time of sample taking and testing.
- k. Comments or professional opinion on whether inspected or tested Work complies with Contract Document requirements.
- l. Name and signature of laboratory inspector.
- m. Recommendations on retesting.

1.03 REFERENCES

- A. ACI 214: Guide for Obtaining Cores and Interpreting Compressive Strength Results.
- B. ACI 318: Building Code Requirements for Structural Concrete.
- C. ASTM C31: Standard Practice for Making and Curing Concrete Test Specimens in the Field.
- D. ASTM C39: Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- E. ASTM C42: Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
- F. ASTM C94: Standard Specification for Ready-Mixed Concrete.
- G. ASTM C109: Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 IN Cube Specimens).
- H. ASTM C138: Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
- I. ASTM C143: Standard Test Method for Slump of Hydraulic-Cement Concrete.
- J. ASTM C172: Standard Practice for Sampling Freshly Mixed Concrete.
- K. ASTM C173: Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
- L. ASTM C231: Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
- M. ASTM E329: Standard Specification for Agencies Engaged in Construction Inspection and/or Testing.
- N. AWS D1.1: Structural Welding Code-Steel.

1.04 QUALITY ASSURANCE

- A. Qualifications for independent inspection and testing agencies:
 - 1. Meet "Recommended Requirements for Independent Laboratory Qualification", published by American Council of Independent Laboratories.
 - 2. Meet basic requirements of ASTM E329, "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction"
 - 3. Authorized by authorities having jurisdiction to operate in the state where the Project is located.
 - 4. Testing equipment shall be calibrated at reasonable intervals by devices of accuracy traceable to either:
 - a. National Bureau of Standards.
 - b. Accepted values of natural physical constants.

1.05 CONTRACTOR DUTIES AND RESPONSIBILITIES

- A. Unless otherwise indicated as the responsibility of the Owner or another identified entity, the Contractor shall provide inspections, tests, and other quality control services specified elsewhere in the Contract Documents and required by authorities having jurisdiction. Costs for these services shall be included in the Contract Sum.
 - 1. Where individual Sections specifically indicate that certain inspections, tests, and other quality control services are the Contractor's responsibility, the Contractor shall employ and pay a qualified independent testing agency to perform quality control services. Costs for these services shall be included in the Contract Sum.

2. Where individual Sections specifically indicate that certain inspections, tests, and other quality control services are the Owner's responsibility, payment for these services shall be made from the Inspection and Testing Allowance, as authorized by Change Orders.
- B. Retesting: The Contractor is responsible for retesting where results of inspections, tests, or other quality control services prove unsatisfactory and indicate noncompliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility.
 1. The cost of retesting construction, revised or replaced by the Contractor, is the Contractor's responsibility where required tests were performed on original construction.
 - C. Cooperate with Laboratory personnel, provide access to Work and to Manufacturer's operations. Contractor is to sign all Laboratory Inspection Reports when laboratory personnel arrive and leave jobsite. Times are to be noted on reports. Pay requests will not be accepted without Contractor signed work tickets.
 - D. Secure and deliver to the Laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.
 - E. Furnish the Laboratory with proposed concrete design mixes, and other material mixes which require evaluation by the Testing Laboratory, a minimum of 14 days prior to use on the project.
 - F. Notify Laboratory and Architect sufficiently in advance of operations to allow Laboratory assignment of personnel and scheduling of tests.
 1. When tests or inspections cannot be performed after such notice, reimburse Laboratory for personnel and travel expenses incurred due to Contractor's negligence.
 2. Make arrangements with Laboratory and pay for additional samples and tests required for Contractor's convenience.
 3. Make arrangements with Laboratory and pay for additional samples and tests required when initial tests indicate non-compliance with Contract Documents, including load tests.
 4. Pay the Testing Laboratory for such tests or inspections as are performed exclusively for the Contractor's convenience.
 - G. Furnish incidental labor and facilities necessary to facilitate inspections and tests including, but not limited to, the following:
 1. Provide access to Work to be tested.
 2. Obtain and handle samples at the project site or at the source of the product to be tested.
 3. Take adequate quantities of representative samples of materials that require testing or assist the agency in taking samples.
 4. Provide facilities for safe storage and proper curing of test samples.
 5. Provide security and protection of samples and test equipment at the Project site.

1.06 LABORATORY DUTIES AND RESPONSIBILITIES:

- A. The independent agency engaged to perform inspections, sampling, and testing of materials and construction specified in individual Sections shall cooperate with the Architect and the Contractor in performance of the agency's duties. The testing agency shall provide qualified personnel to perform required inspections and tests.
- B. Perform specified inspections, sampling and testing of materials and methods of construction scheduled in Part 3.0 of this Section.
 1. Comply with Specifications.
 2. Ascertain compliance of materials with requirements of Contract Documents.
 3. Furnish Architect with written evaluation of proposed concrete design mixes, and other material mixes, submitted by the Contractor for evaluation.
- C. Notify Architect, Engineer and Contractor immediately of observed work or materials which fail to meet the requirements of the Contract Documents to assure necessary retesting and replacement of materials with the least possible delay in progress of the Work.
- D. Promptly submit certified written report of each test and inspection complying with Paragraph 1.03 to the Owner, Architect, Structural or MEP Engineer as appropriate, and Contractor.

- E. Coordinate the sequence of activities to accommodate required services with a minimum of delay. Coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
 - 1. The Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities.
- F. Perform additional tests as required by Architect or Owner.
- G. Obtain signature from Contractor when arriving and leaving the jobsite. Times are to be noted on Laboratory Inspection Reports. Payment for work not having Contractor signature will not be accepted.
- H. Limitations of authority of testing agency:
 - 1. Laboratory is not authorized to:
 - a. Release, revoke, alter or enlarge on requirements of Contract Documents.
 - b. Approve or accept any portion of the Work.
 - c. Perform any duties of the Contractor.
 - 2. Work will be checked as it progresses, but failure to detect any defective work or materials shall not, in any way, prevent later rejection when such defect is discovered.

2.0 PRODUCTS
Not Applicable to this Section.

3.0 EXECUTION

3.01 SCHEDULE OF INDEPENDENT LABORATORY TESTING AND INSPECTION

A. Structural Steel:

- 1. The Contractor shall provide the Testing Laboratory with names of welder to be employed on work, during fabrication and erection, together with certification that each of these welders has passed qualifications tests within the last year, unless noted otherwise, in accordance with AWS Standards.
- 2. Inspect all structural steel during and after erection for conformance with Contract Documents and Shop Drawings. Any cases of insufficient bracing or guying, or other unsafe conditions shall be immediately called to attention of the Contractor and reported to the Architect.
 - a. No burning or other field correction of steel members is permitted without express permission of the Owner's representative. Immediately report violations.
 - b. Shop Inspection:
 - 1) Review Shop Drawings and shop procedures with fabricator's supervisory personnel.
 - 2) Request and obtain necessary mill certifications of steel and verify proper material throughout the duration of the job, as required.
 - 3) Review welding procedures and welder operator qualifications for conformance to the technical requirements of the Specifications.
 - 4) Check layout and dimensions of jigs and fixtures for multiple fabrication, joint preparation, fit-up, and runout plates.
 - 5) Verify welding electrodes to be used and other welding consumables as job progresses.
 - 6) Check preheating procedure for uniformity and thoroughness through the full thickness of material.
 - 7) Make visual inspection of welding in progress for size, length and quality.
 - 8) Check bolted connections as required by the technical requirements of the Specifications.
 - 9) Perform random dimensional checks of completed members.
 - 10) Provide inspection of surface preparation for coating and coating operations.
 - 11) Check shipping preparation schedules and obtain copies of shipping lists.

- c. Field inspection:
 - 1) Obtain planned erection procedure, and review with erector's supervisory personnel.
 - 2) Check installation of anchor bolts and base plates.
 - 3) Verify field welding procedures and welder qualifications to assure conformance with the Specifications.
 - 4) Check steel as received in field for possible shipping damage, workmanship and piece marking.
 - 5) Check plumbness, alignment and chamber as erection progresses including proper bracing.
 - 6) Check joint preparation, fit-up, backing strips and runout plates.
 - 7) Check preheating to assure proper temperature, uniformity, and thoroughness through the full material thickness.
 - 8) Review welding sequence.
 - 9) Visually inspect field welding for size, length, and quality.
- d. Inspection of High-Strength Bolted Construction shall be in accordance with the latest edition of AISC Specification for Structural Joints, and as follows:
 - 1) All high-strength bolted connections shall be visually inspected.
 - 2) At least two bolts of every third connection between beams and girders shall be checked with a calibrated torque wrench for proper torque.
 - 3) At least two bolts of every third connection between girders and columns shall be checked as above.
 - 4) All bolts in every connection in the primary exterior framing and braced framing shall be checked as above.
 - 5) All bolted connections that fail shall be corrected and all bolts in that connection shall be retested.
 - 6) Check calibration of impact wrenches at least twice daily.
- e. Inspection of all welds shall be in accordance with the latest edition of the AWS Structural Welding Code.
 - 1) Visually inspect all welds in accordance with AWS DI.1.
- f. Inspection of headed stud connector welding shall be in accordance with the latest edition of the AWS Structural Welding Code and as follows:
 - 1) Visual inspection of all studs shall indicate complete fusion and weld flush or fillet for 100 percent circumference. There will be no indication of lack of fusion or undercut weld.
 - 2) If visual inspection reveals that a sound weld or a full 360 degree fillet has not been obtained for a particular stud, such stud shall be struck with a hammer and bent 15 degrees off perpendicular to the nearest end of the beam. Studs failing under this test shall be replaced.

3.02 REPAIR AND PROTECTION

- A. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing, or similar services.
- B. Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes. Comply with Contract Document requirements for Section 01 73 29 Cutting & Patching.
- C. Protect construction exposed by or for quality control service activities, and protect repaired construction.

END OF QUALITY CONTROL

01 50 00
TEMPORARY FACILITIES & CONTROLS

1.0 GENERAL

1.01 SUMMARY

- A. This Section includes requirements for construction facilities and temporary controls, including temporary utilities, support facilities, and security and protection.
- B. Temporary utilities include, but are not limited to, the following:
 - 1. Water service and distribution.
 - 2. Temporary electric power and light.
 - 3. Telephone service.
 - 4. Storm and sanitary sewer.
- C. Support facilities include, but are not limited to, the following:
 - 1. Temporary heat.
 - 2. Field offices and storage sheds.
 - 3. Temporary roads and paving.
 - 4. Sanitary facilities, including drinking water.
 - 5. Dewatering facilities and drains.
 - 6. Temporary enclosures.
 - 7. Hoists and temporary elevator use.
 - 8. Temporary project identification signs and bulletin boards.
 - 9. Waste disposal services.
 - 10. Rodent and pest control.
 - 11. Construction aids and miscellaneous services and facilities.
- D. Security and protection facilities include, but are not limited to, the following:
 - 1. Temporary fire protection.
 - 2. Barricades, warning signs, and lights.
 - 3. Sidewalk bridge or enclosure fence for the site.
 - 4. Environmental protection.

1.02 SUBMITTALS

- A. Temporary utilities: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.
- B. Implementation and termination schedule: Within fifteen (15) days of the date established for commencement of the Work, submit a schedule indicating implementation and termination of each temporary utility.

1.03 REFERENCES

- A. ANSI A10 Series: Construction and Demolition Standards.
- B. NECA 200: Recommended Practice for Installing and Maintaining Temporary Electrical Power at Construction Sites.
- C. NFPA 10: Standard for Portable Fire Extinguishers.
- D. NFPA 70: National Electric Code.
- E. NFPA 241: Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.04 QUALITY ASSURANCE

- A. Regulations: Comply with industry standards and applicable laws and regulations if authorities having jurisdiction including, but not limited to, the following:
 - 1. Building Code requirements.
 - 2. Health and safety regulations.
 - 3. Utility company regulations.
 - 4. Police and Fire Department rules.
 - 5. Environmental protection regulations.

- B. Standards: Comply with NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations", ANSI A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities".
 - 1. Electrical service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service NFPA 70 "National Electrical Code".
- C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.05 PROJECT CONDITIONS

- A. Temporary utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of permanent service.
- B. Conditions of use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses. Do not overload facilities, or permit them to interfere with progress. Take necessary fire prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on the site.

2.0 PRODUCTS

2.01 MATERIALS

- A. General: Provide new materials. If acceptable to the Architect, the Contractor may use undamaged, previously used materials in serviceable condition. Provide materials suitable for use intended.
 - 1. Use only cleaning materials which are compatible with the surface being cleaned, as recommended by the manufacturer of the material, and as needed to maintain the specified standard of cleanliness.
- B. Lumber and plywood: Comply with requirements Section 06100 Rough Carpentry.
 - 1. For job-built temporary offices, shops, and sheds within the construction area, provide UL labeled, fire-treated lumber and plywood for framing, sheathing, and siding.
 - 2. For signs and directory boards, provide exterior-type, Grade B-B high-density concrete form overlay plywood of sizes and thicknesses indicated.
 - 3. For fences and vision barriers, provide minimum 3/8 IN thick exterior plywood.
 - 4. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8 IN thick exterior plywood.
- C. Gypsum wallboard: Provide gypsum wallboard on interior walls of temporary offices.
- D. Roofing materials: Provide UL Class A standard-weight asphalt shingles or LTL Class C mineral-surfaced roll; roofing on roofs of job-built temporary offices, shops, and sheds.
- E. Paint: Comply with requirements of Section 09900 Painting.
 - 1. For job-built temporary offices, shops, sheds, fences, and other exposed lumber and plywood, provide exterior-grade acrylic-latex emulsion over exterior primer.
 - 2. For sign panels and applying graphics, provide exterior-grade alkyd gloss enamel over exterior primer.
 - 3. For interior walls of temporary offices, provide two (2) coats interior latex-flat wall paint.
- F. Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.
- G. Water: Provide potable water approved by local health authorities.
- H. Open-mesh fencing: Provide 0.120 IN thick, galvanized 2 IN chain link fabric fencing 6 FT high with galvanized barbed-wire top strand and galvanized steel pipe posts, 1-1/2 IN I.D. for line posts and 2-1/2 IN I.D. for corner posts.

2.02 EQUIPMENT

- A. General: Provide new equipment. If acceptable to the Architect, the Contractor may use undamaged, previously used equipment in serviceable condition. Provide equipment suitable for use intended.
 - 1. Use only cleaning equipment which is compatible with the surface being cleaned, as recommended by the manufacturer of the material, and as needed to maintain the specified standard of cleanliness.
- B. Water hoses: Provide 3/4 IN, heavy-duty, abrasion-resistant, flexible rubber hoses 100 FT long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shut off nozzles at hose discharge.
- C. Electrical outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110 to 120 Volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.
- D. Electrical power cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
- E. Lamps and light fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered-glass enclosures where exposed to breakage. Provide exterior fixtures where exposed to moisture.
- F. Heating units: Provide temporary heating units that have been tested and labeled by LTL, FK or another recognized trade association related to the type of fuel being consumed.
- G. Temporary offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows, and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.
- H. Temporary toilet units: Provide self-contained, single-occupant toilet units of the chemical, aerated recirculation, or combustion type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- I. Fire extinguishers: Provide hand-carried, portable, UL rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA recommended classes for the exposures.
 - 1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

3.0 EXECUTION

3.01 INSTALLATION

- A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.02 TEMPORARY UTILITY INSTALLATION

- A. General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with company recommendations.
 - 1. Arrange with company and existing users for a time when service can be interrupted, if necessary, to make connections for temporary services.
 - 2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
 - 3. Obtain easements to bring temporary utilities to the site where the Owner's easements cannot be used for that purpose.

4. Use charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Architect. Neither the Owner nor Architect will accept cost or use charges as a basis of claims for Change Orders.
- B. Water service:
 1. Contractor may use existing water facilities at the site.
 - C. Electric power service:
 1. Contractor may use existing electrical service at the site.
 2. Provide all necessary temporary wiring, extensions, and temporary lighting devices.
 - D. Temporary lighting: When overhead floor or roof deck has been installed, provide temporary lighting with local switching.
 1. Install and operate temporary lighting that will fulfill security and protection requirements without operating the entire system. Provide temporary lighting that will provide adequate illumination for construction operations and traffic conditions.
 - E. Temporary heat: Provide temporary heat required by construction activities for curing or drying of completed installations or for protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.
 - F. Heating facilities: Except where the Owner authorizes use of the permanent system, provide vented, self-contained, LP gas or fuel-oil heaters with individual space thermostatic control.
 1. Use of gasoline-burning space heaters, open flame, or salamander heating units is prohibited.
 - G. Temporary telephones: Provide temporary telephone service throughout the construction period for all personnel engaged in construction activities. Install telephone on a separate line for each temporary office and first-aid station.
 1. Separate telephone lines: Provide additional telephone lines for the following:
 - a. Where an office has more than two (2) occupants, install a telephone for each additional occupant or pair of occupants.
 - b. Provide a dedicated telephone line for a fax machine in the field office.
 2. At each telephone, post a list of important telephone numbers.
 - H. Sanitary facilities include temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.
 1. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Provide covered waste containers for used material.
 - I. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.
 1. Provide separate facilities for male and female personnel.
 - J. Wash facilities: Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.
 1. Provide safety showers, eyewash fountains, and similar facilities for convenience, safety, and sanitation of personnel.
 - K. Drinking-water facilities: Provide containerized, tap-dispenser, bottled-water drinking-water units, including paper supply.
 1. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45° F to 55° F.
 - L. Sewers and drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds, and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off-site in a lawful manner.

1. Filter out excessive amounts of soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.
 2. Connect temporary sewers to the municipal system, as directed by sewer department officials.
 3. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. Following heavy use, restore normal conditions promptly.
- M. Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.

3.03 SUPPORT FACILITIES INSTALLATION

- A. Locate field offices, storage sheds, and other temporary construction and support facilities for easy access.
1. Maintain support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.
- B. Provide incombustible construction for offices, shops, and sheds located within the construction area or within 30 FT of building lines. Comply with requirements of NFPA 241.
- C. Field offices: Provide insulated, weathertight temporary offices of sufficient size to accommodate required office personnel at the Project site. Keep the office clean and orderly for use for small progress meetings. Furnish and equip offices as follows:
1. Furnish with a desk and chairs, a file cabinet, plan table, plan rack, and a bookcase.
 2. Equip with a water cooler and private toilet complete with water closet, lavatory, and medicine cabinet unit with a mirror.
- D. Storage and fabrication sheds: Install storage and fabrication sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on the site.
- E. Temporary paving: Construct and maintain temporary roads and paving to support the indicated loading adequately and to withstand exposure to traffic during the construction period. Locate temporary paving for roads, storage areas, and parking where the same permanent facilities will be located. Review proposed modifications to permanent paving with the Architect.
1. Paving: Comply with requirements of Division 2 grading specifications for construction and maintenance of temporary paving.
 2. Coordinate temporary paving development with subgrade grading, compaction, installation and stabilization of subbase, and installation of base and finish courses of permanent paving.
 3. Install temporary paving to minimize the need to rework the installations and to result in permanent roads and paved areas without damage or deterioration when occupied by the Owner.
 4. Extend temporary paving in and around the construction area as necessary to accommodate delivery and storage of materials, equipment usage, administration, and supervision.
- F. Dewatering facilities and drains: For temporary drainage and dewatering facilities and operations not directly associated with construction activities included under individual Sections, comply with dewatering requirements of applicable Division 2 Sections. Where feasible, utilize the same facilities. Maintain the site, excavations, and construction free of water.
- G. Temporary enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.

1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
 2. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 SF or less with plywood or similar materials.
 3. Close openings through floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.
 4. Where temporary wood or plywood enclosure exceeds 100 SF in area, use UL labeled, fire-retardant-treated material for framing and main sheathing.
- H. Temporary lifts and hoists: Provide facilities for hoisting materials and employees. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- I. Temporary elevator use (where applicable): Refer to Division 14 Sections for elevators.
- J. Project identification and temporary signs: Prepare project identification and other signs of size indicated. Install signs where indicated to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative-treated wood or steel. Do not permit installation of unauthorized signs.
1. Project identification signs: Engage an experienced sign painter to apply graphics. Submit sketch of sign to Architect for approval prior to fabrication. Include:
 - a. Project name: Modifications for District Clerk's Office.
 - b. Owner: Collin County.
 - c. Architect: Spurgin & Associates Architects.
 - d. Contractor: General Contractor awarded this Project.
 2. Temporary signs: Prepare signs to provide directional information to construction personnel and visitors.
- K. Temporary exterior lighting: Install exterior yard and sign lights so signs are visible when Work is being performed.
- L. Collection and disposal of waste: Collect waste from construction areas and elsewhere day. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 degrees F. Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material lawfully.
- M. Rodent and pest control: Before deep foundation work has been completed, retain a local exterminator or pest control company to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests. Employ this service to perform extermination and control procedures at regular intervals so the Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.
- N. Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate. Cover finished, permanent stairs with a protective covering of plywood or similar material so finishes will be undamaged at the time of acceptance.

3.04 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer, as requested by the Architect.
- B. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers" and NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations."
1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.
 2. Store combustible materials in containers in fire-safe locations.

3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for fighting fires. Prohibit smoking in hazardous fire-exposure areas.
 4. Provide supervision of welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
- C. Permanent fire protection: At the earliest feasible date in each area of the Project, complete installation of the permanent fire protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.
- D. Barricades, warning signs, and lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting, including flashing red or amber lights.
- E. Enclosure fence: Before excavation begins, install an enclosure fence with lockable entrance gates at the entrance to the site. Provide protective fencing where required around the site as determined by Contractor sufficient to accommodate and protect construction operations. Install in a manner that will prevent people, dogs, and other animals from easily entering the site, except by the entrance gates.
1. Provide open-mesh, chain link fencing with posts set in a compacted mixture of gravel and earth.
- F. Security enclosure and lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
1. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.
- G. Environmental protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful noise. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons or firms near the site.

3.05 CONSTRUCTION CLEANING

- A. General:
1. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.
 2. Do not allow accumulation of scrap, debris, waste material and other items not required for construction of this Work.
 3. At least twice each month, and more often if necessary, completely remove all scrap, debris and waste material from the job site.
 4. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.
- B. Site:
1. Daily, and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
 2. Maintain the site in a neat and orderly condition at all times.
- C. Structures:
1. Weekly, and more often if necessary, inspect the structure and pick up all scrap, debris and waste material. Remove such items to the place designated for their storage.
 2. Weekly, and more often if necessary, sweep interior spaces clean.
 - a. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and a hand-held broom.

3. As required preparatory to installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using equipment and materials required to achieve the necessary cleanliness.
4. Following the installation of finish floor materials, clean the finish floor daily (and more often if necessary) at all times while work is being performed in the space in which finish materials are installed.
 - a. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from foreign material which, in the opinion of the Architect, may be injurious to the finish floor material.

3.06 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
 2. Protection: Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Termination and removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 1. Materials and facilities that constitute temporary facilities are the Contractor's property. The Owner reserves the right to take possession of project identification signs.
 2. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where the area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil in the area. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at the temporary entrances, as required by the governing authority.
 3. At Substantial Completion, clean and renovate permanent facilities used during the construction period including, but not limited to, the following:
 - a. Replace air filters and clean inside of ductwork and housings.
 - b. Replace significantly worn parts and parts subject to unusual operating conditions.
 - c. Replace lamps burned out or noticeably dimmed by hours of use.

END OF TEMPORARY FACILITIES & CONTROLS

01 60 00
PRODUCT REQUIREMENTS

1.0 GENERAL

1.01 SUMMARY

- A. This Section includes administrative and procedural requirements governing the Contractor's selection of products for use in the Project.
- B. Related work:
 - 1. Section 01 33 00: Submittal Procedures: Specifies requirements for submittal of the Contractor's Construction Schedule.
 - 2. Section 01 42 00: References: Specifies the applicability of industry standards to products specified.
 - 3. Section 01 62 00: Product Options: Specifies administrative procedures for handling requests for substitutions made after award of the Contract.

1.02 DEFINITIONS

- A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties", "systems", "structure", "finishes", "accessories", and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.
 - 1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material", "equipment", "system", and terms of similar intent.
 - a. "Named Products" are items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer's published product literature, that is current as of the date of the Contract Documents.
 - b. "Foreign Products" as distinguished from "domestic products" are items substantially manufactured (50% or more of value) outside the United States and its possessions. Products produced or supplied by entities substantially owned (more than 50%) by persons who are not citizens of, nor living within, the United States and its possessions are also considered to be foreign products.
 - 2. "Materials" are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
 - 3. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

1.03 QUALITY ASSURANCE

- A. Source limitations: To the fullest extent possible, provide products of the same kind from a single source.
 - 1. When specified products are available only from sources that do not, or cannot, produce a quantity adequate to complete project requirements in a timely manner, consult with the Architect to determine the most important product qualities before proceeding. Qualities may include attributes, such as visual appearance, strength, durability, or compatibility. When a determination has been made, select products from sources producing products that possess these qualities, to the fullest extent possible.
- B. Compatibility of options: When the Contractor is given the option of selecting between two (2) or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
 - 1. Each prime contractor is responsible for providing products and construction methods that are compatible with products and construction methods of other prime of separate contractors.
 - 2. If a dispute arises between prime contractors over concurrently selectable, but incompatible products, the Architect will determine which products shall be retained and which are incompatible and must be replaced.

- C. Foreign product limitations: Except under one or more of the following conditions, provide domestic products, not foreign products, for inclusion in the Work:
 - 1. No available domestic product complies with the Contract Documents.
 - 2. Domestic products that comply with the Contract Documents are available only at prices or terms substantially higher than foreign products that comply with the Contract Documents.
- D. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on the exterior.
 - 1. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.
 - 2. Equipment nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
 - a. Name of product and manufacturer.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.
 - 1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
 - 3. Deliver products to the site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
 - 5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
 - 6. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.
 - 7. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

2.0 PRODUCTS

2.01 PRODUCT SELECTION

- A. General product requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, new at the time of installation.
 - 1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.
 - 2. Standard products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
- B. Product selection procedures: The Contract Documents and governing regulations govern product selection. Procedures governing product selection include the following:

1. Proprietary specification requirements: Where Specifications name only a single product or manufacturer, provide the product indicated. No substitutions will be permitted.
2. Semi-proprietary specification requirements: Where Specifications name two (2) or more products or manufacturers, provide one (1) of the products indicated. No substitutions will be permitted.
 - a. Where Specifications specify products or manufacturers by name, accompanied by the term "or equal" or "or approved equal," comply with Section 01630 Product Options and Substitutions to obtain approval for use of an unnamed product.
3. Nonproprietary specifications: When Specifications list products or manufacturers that are available and may be incorporated in the Work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with Contract requirements. Comply with Section 01630 Product Options and Substitutions to obtain approval for use of an unnamed product.
4. Descriptive specification requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.
5. Performance specification requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements and are recommended by the manufacturer for the application indicated.
 - a. Manufacturer's recommendations may be contained in published product literature or by the manufacturer's certification of performance.
6. Compliance with standards, codes, and regulations: Where Specifications only require compliance with an imposed code, standard, or regulation, select a product that complies with the standards, codes, or regulations specified.
7. Visual matching: Where Specifications require matching an established Sample, the Architect's decision will be final on whether a proposed product matches satisfactorily.
 - a. Where no product available within the specified category matches satisfactorily and complies with other specified requirements, comply with Section 01630 Product Options and Substitutions for selection of a matching product in another product category.
8. Visual selection: Where specified product requirements include the phrase "...as selected from the manufacturer's standard colors, patterns, textures ..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Architect will select the color, pattern, and texture from the product line selected.
9. Allowances: Refer to individual Specification Sections and Section 01020 Allowances for allowances that control product selection and for procedures required for processing such selections.

3.0 EXECUTION

3.01 INSTALLATION OF PRODUCTS

- A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.
 1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF PRODUCT REQUIREMENTS

01 62 00
PRODUCT OPTIONS

1.0 GENERAL

1.01 SUMMARY

- A. This Section includes administrative and procedural requirements for handling requests for substitutions made after award of the Contract.
- B. Related work:
 - 1. Section 01 33 00: Submittal Procedures: Specifies requirements for submittal of the Contractor's Construction Schedule.
 - 2. Section 01 42 00: References: Specifies the applicability of industry standards to products specified.
 - 3. Section 01 60 00: Product Requirements: Specifies requirements governing the Contractor's selection of products and product options.

1.02 DEFINITIONS

- A. Definitions in this Article do not change or modify the meaning of other terms used in the Contract Documents.
- B. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests for substitutions. The following are not considered to be requests for substitutions:
 - 1. Revisions to the Contract Documents requested by the Owner or Architect.
 - 2. Specified options of products and construction methods included in the Contract Documents.
 - 3. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

1.03 SUBMITTALS

- A. Substitution request submittal: The Architect will consider requests for substitution if received within sixty (60) days after commencement of the Work. Requests received more than sixty (60) days after commencement of the Work may be considered or rejected at the discretion of the Architect.
 - 1. Submit three (3) copies of each request for substitution for consideration. Submit requests on the form included at the end of this Section according to procedures required for change-order proposals.
 - 2. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers.
 - 3. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
 - a. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate contractors, that will be necessary to accommodate the proposed substitution.
 - b. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements, such as performance, weight, size, durability, and visual effect.
 - c. Product Data, including Drawings and descriptions of products and fabrication and installation procedures.
 - d. Samples, where applicable or requested.
 - e. A statement indicating the substitutions effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
 - f. Cost information, including a proposal of the net change, if any in the Contract Sum.
 - g. The Contractor's certification that the proposed substitution proposed is equal to or better in every significant respect to that required in the Contract Documents, and is appropriate for the applications indicated.

- h. The Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.
- 4. Architect's action: If necessary, the Architect will request additional information or documentation for evaluation. The Architect will notify the Contractor of acceptance or rejection of the substitution by return of the substitution request form.
 - a. Use the product specified if the Architect cannot make a decision on the use of a proposed substitute within the time allocated.
 - b. The Architect's decision of acceptance or non-acceptance of a proposed substitution shall be final.

2.0 PRODUCTS

2.01 SUBSTITUTIONS

- A. Conditions: The Architect will receive and consider the Contractor's request for substitution when one or more of the following conditions are satisfied, as determined by the Architect. If the following conditions are not satisfied, the Architect will return the requests without action except to record noncompliance with these requirements.
 - 1. Extensive revisions to the Contract Documents are not required.
 - 2. Proposed changes are in keeping with the general intent of the Contract Documents.
 - 3. The request is timely, fully documented, and properly submitted.
 - 4. The specified product or method of construction cannot be provided within the Contract Time. The Architect will not consider the request if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
 - 5. The request is directly related to an "or-equal" clause or similar language in the Contract Documents.
 - 6. The requested substitution offers the Owner a substantial advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities the Owner must assume. The Owner's additional responsibilities may include compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner, and similar considerations.
 - 7. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
 - 8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials and where the Contractor certifies that the substitution will overcome the incompatibility.
 - 9. The specified product or method of construction cannot be coordinated with other materials and where the Contractor certifies that the proposed substitution can be coordinated.
 - 10. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.
 - 11. Where a proposed substitution involves more than one prime contractor, each contractor shall cooperate with the other contractors involved to coordinate the Work, provide uniformity and consistency, and assure compatibility of products.
- B. The Contractor's submittal and the Architect's acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

- C. Failure of timely order: The Contractor is responsible for assuring the timely order of all materials specified. If a specified material, or color of material cannot be delivered by the contract completion date, due to failure to order the material in a timely manner, the Contractor shall be responsible for supplying an equal or better material. The Architect shall be the sole determinant of the approved substitute material. The Contractor shall also be charged an amount equal to five percent (5%) of the value of the specified material. This amount shall be credited to the Owner through a Change Order to the contract. The word "material", as used in this Section, includes all items specified in the Specifications or shown on the Drawings.

3.0 EXECUTION

3.01 SUBSTITUTION REQUEST FORMS

- A. The Contractor shall submit requests for substitutions on the form included on the following pages.

SUBSTITUTION REQUEST FORM

Date: _____

Architect's Project No.: _____

Project: _____

To: SPURGIN & ASSOCIATES ARCHITECTS
103 W. Louisiana Street
McKinney, Texas 75069-4413

From: _____

=====

Contractor hereby requests acceptance of the following product or system as substitution in accordance with provisions of Section 01 62 00 of the Specifications.

1. SPECIFIED PRODUCT OR SYSTEM:

Substitution request for: _____

Specification Section No.: _____ Article: _____

2. SUPPORTING DATA:

_____ Product data adequate for evaluation of the request for proposed

_____ Sample is attached.

_____ Sample will be sent upon Architect/Engineer's request.

3. QUALITY COMPARISON (Add additional sheets if necessary)

	SPECIFIED PRODUCT	SUBSTITUTION
Name, Brand:	_____	_____
Catalog No.:	_____	_____
Manufacturer:	_____	_____
Vendor:	_____	_____
Significant Variations:	_____	_____
Maintenance Service Available:	_____ Yes _____ No	
Spare Parts Source:	_____	

Warranty Provided: _____ Yes _____ Years _____ No

By Whom: _____

4. PREVIOUS INSTALLATIONS:

Identification of similar projects on which proposed substitution was used:

Project: _____ Architect: _____

Address: _____ Owner: _____

_____ Date Installed: _____

5. REASON FOR NOT GIVING PRIORITY TO SPECIFIED ITEM(S):

6. EFFECT OF SUBSTITUTION:

Does the proposed substitution affect other work (adverse or otherwise):

_____ No _____ Yes (if yes, explain) _____

Substitution Changes Contract Time:

_____ No _____ Yes (if yes, Add/Deduct _____ Days)

Substitution requires dimensional revisions or redesign of the work:

_____ No _____ Yes (if yes, attach explanation data)

7. CONTRACTOR'S STATEMENT OF CONFORMANCE OF PROPOSED SUBSTITUTION TO CONTRACT DOCUMENTS:

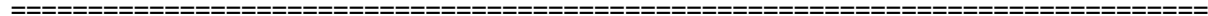
I/we have investigated the proposed substitution. I/we:

- * believe that it is equal or superior in all respects including function, appearance, and quality to specified product, except as stated above;
- * will provide same warranty and servicing requirements as specified for specified product;
- * have included complete implications of the substitution;
- * will pay for changes to the building design and special inspection costs caused by the use of this product;
- * will coordinate the incorporation of the proposed substitution in the work;
- * waive future claims for added cost to Contract caused by the substitution.

Contractor: _____

Date: _____ By: _____

Answer all questions and complete all blanks - use "NA" if not applicable. Unresponsive or incomplete request will be rejected.



ARCHITECT'S REVIEW AND ACTION

- _____ Resubmit substitution request
 - _____ Provide more information in the following areas:
 - _____
 - _____
 - _____ Sign Contractor's Statement of Conformance
- _____ Substitution is accepted.
- _____ Substitution is accepted, with the following comments:
 - _____
 - _____
- _____ Substitution is rejected.
- _____ Substitution Request received too late.

SPURGIN & ASSOCIATES ARCHITECTS Date

END OF PRODUCT OPTIONS

01 73 29
CUTTING & PATCHING

1.0 GENERAL

1.01 SUMMARY

- A. This Section includes administrative and procedural requirements for cutting and patching.
- B. Related work:
 - 1. In addition to other requirements specified, upon the Architect's request uncover work to provide for inspection of covered work, and remove samples of installed materials for testing.
 - 2. Do not cut or alter work performed under separate contracts without the Architect's written permission.
 - 3. Section 01 31 00: Project Management & Coordination.
 - 4. Section 02 41 19: Selective Structure Demolition.
 - 5. Refer to other Sections of these Specifications for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
 - a. Requirements of this Section apply to mechanical and electrical installations. Refer to Division 21-28 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.02 SUBMITTALS

- A. Cutting and patching proposal: Submit a proposal describing procedures well in advance of the time cutting and patching will be performed if the Owner requires approval of these procedures before proceeding. Request approval to proceed. Include the following information, as applicable, in the proposal:
 - 1. Describe the extent of cutting and patching required. Show how it will be performed and indicate why it cannot be avoided.
 - 2. Describe anticipated results in terms of changes to existing construction. Include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
 - 3. List products to be used and firms or entities that will perform Work.
 - 4. Indicate dates when cutting and patching will be performed.
 - 5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.
 - 6. Where cutting and patching involves adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with the original structure.
 - 7. Approval by the Architect to proceed with cutting and patching does not waive the Architect's right to later require complete removal and replacement of unsatisfactory work.

1.03 QUALITY ASSURANCE

- A. Requirements for structural work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.
 - 1. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:
 - a. Foundation construction.
 - b. Bearing and retaining walls.
 - c. Structural concrete.
 - d. Structural steel.
 - e. Lintels.
 - f. Timber and primary wood framing.
 - g. Structural decking.
 - h. Stair systems.
 - i. Miscellaneous structural metals.

- j. Exterior curtain-wall construction.
 - k. Equipment supports.
 - l. Piping, ductwork, vessels, and equipment.
 - m. Structural systems of special construction in Division 13 Sections.
- B. Operational limitations: Do not cut and patch operating elements or related components in a manner that would result in reducing their capacity to perform as intended. Do not cut and patch operating elements or related components in a manner that would result in increased maintenance or decreased operational life or safety.
 - 1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:
 - a. Primary operational systems and equipment.
 - b. Air or smoke barriers.
 - c. Water, moisture or vapor barriers.
 - d. Membranes and flashings.
 - e. Fire protection systems.
 - f. Noise and vibration control elements and systems.
 - g. Control systems.
 - h. Communication systems.
 - i. Conveying systems.
 - j. Electrical wiring systems.
 - k. Operating systems of special construction in Division 13 Sections.
- C. Visual requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities. Do not cut and patch construction in a manner that would result in visual evidence of cutting and patching. Remove and replace construction cut and patched in a visually unsatisfactory manner.
 - 1. If possible retain the original Installer or fabricator to cut and patch the exposed Work listed below. If it is impossible to engage the original Installer or fabricator, engage another recognized experienced and specialized firm.
 - a. Processed concrete finishes.
 - b. Stonework and stone masonry.
 - c. Ornamental metal.
 - d. Matched-veneer woodwork.
 - e. Preformed metal panels.
 - f. Firestopping.
 - g. Window wall system.
 - h. Stucco and ornamental plaster.
 - i. Acoustical ceilings.
 - j. Terrazzo.
 - k. Finished wood flooring.
 - l. Fluid-applied flooring.
 - m. Carpeting.
 - n. Aggregate wall coating.
 - o. Wall covering.
 - p. Swimming pool finishes.
 - q. HVAC enclosures, cabinets or covers.

1.04 WARRANTY

- A. Existing warranties: Replace, patch and repair material and surfaces cut or damaged by methods and with materials in such a manner s not to void any warranties required or existing.

2.0 PRODUCTS

2.01 MATERIALS

- A. Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible if identical materials are unavailable or cannot be used. Use materials whose installed performance will equal or surpass that of existing materials.

3.0 EXECUTION

3.01 INSPECTION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed before cutting. If unsafe or unsatisfactory conditions are encountered, take corrective action before proceeding.
 - 1. Before proceeding, meet at the Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.02 PREPARATION

- A. Temporary support: Provide temporary support of work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.
- C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Avoid cutting existing pipe, conduit, or ductwork serving the building but scheduled to be removed or relocated until provisions have been made to bypass them.

3.03 PERFORMANCE

- A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
 - 1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.
- B. Cutting: Cut existing construction using methods least likely to damage elements retained or adjoining construction. Where possible, review proposed procedures with the original Installer; comply with the original Installer's recommendations.
 - 1. In general, where cutting is required use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Cut through concrete and masonry using a cutting machine, such as a carborundum saw or diamond-core drill.
 - 4. Comply with requirements of applicable Division 2 Sections where cutting and patching requires excavating and backfilling.
 - 5. Where services are required to be removed, relocated or abandoned, by-pass utility services, such as pipe or conduit, before cutting. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
- C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
 - 1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
 - 2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - 3. Where removing walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

- a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing the patch after the area has received primer and second coat.
4. Patch, repair or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

3.04 CLEANING

- A. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar items. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing material. Restore damaged pipe covering to its original condition.

END OF CUTTING & PATCHING

01 77 00
CLOSEOUT PROCEDURES

1.0 GENERAL

1.01 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Final cleaning.
- B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 48.

1.02 SUBSTANTIAL COMPLETION

- A. Preliminary procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
 - 1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show one hundred percent (100%) completion for the portion of the Work claimed as substantially complete.
 - a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
 - b. If one hundred percent (100%) completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
 - 2. Advise the Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. Submit Record Drawings, Maintenance Manuals, damage or settlement surveys, property surveys, and similar final record information.
 - 6. Deliver tools, spare parts, extra stock, and similar items.
 - 7. Make final changeover of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of changeover in security provisions.
 - 8. Complete startup testing of systems and instruction of the Owner's operation and maintenance personnel.
 - 9. Discontinue and remove temporary facilities from the site, along with mockups, construction tools, and similar elements.
 - 10. Complete final cleanup requirements, including touchup painting.
 - 11. Touch up and otherwise repair and restore marred, exposed finishes.
- B. Inspection procedures: On receipt of a request for inspection, the Architect will either proceed with inspection or advise the Contractor of unfilled requirements. The Architect will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
 - 1. The Architect will repeat inspection when requested and assured that the Work is substantially complete.
 - 2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.03 FINAL ACCEPTANCE

- A. Preliminary procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
 - 1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.

- a. Submit Contractor's Affidavit of Payments of Debts and Claims (AIA Form G706).
- b. Submit Contractor's Affidavit of Release of Liens (AIA Form G706A).
2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
3. Submit a certified copy of the Architect's final inspection list of items to be completed or corrected, endorsed and dated by the Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Architect.
4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion or when the Owner took possession of and assumed responsibility for corresponding elements of the Work.
5. Submit Consent of Surety to Final Payment (AIA Form G707).
6. Submit a final liquidated damages settlement statement.
7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Reinspection procedure: The Architect will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Architect.
 1. Upon completion of reinspection, the Architect will prepare a certificate of final inspection. If the Work is incomplete, the Architect will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
 2. If necessary, reinspection will be repeated.

2.0 PRODUCTS

Not Applicable to this Section.

3.0 EXECUTION

3.01 CLOSEOUT PROCEDURES

- A. Operation and maintenance instructions: Arrange for each Installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. Provide instruction by manufacturer's representatives if Installers are not experienced in operation and maintenance procedures. Include a detailed review of the following items:
 1. Maintenance Manuals.
 2. Record Documents.
 3. Spare parts and materials.
 4. Tools.
 5. Lubricants.
 6. Fuels.
 7. Identification systems.
 8. Control sequences.
 9. Hazards.
 10. Cleaning.
 11. Warranties and bonds.
 12. Maintenance agreements and similar continuing commitments.
- B. As part of instruction for operating equipment, demonstrate the following procedures:
 1. Startup
 2. Shutdown.
 3. Emergency operations.
 4. Noise and vibration adjustments.
 5. Safety procedures.
 6. Economy and efficiency adjustments.
 7. Effective energy utilization.

3.02 FINAL CLEANING

- A. General: The General Conditions require general cleaning during construction. Regular cleaning is included in Section 01500 Construction Facilities and Temporary Controls.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Cleaning each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification for Substantial Completion.
 - a. Remove labels that are not permanent labels.
 - b. Clean transparent materials including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
 - c. Clean exposed exterior and interior hard-surfaced finishes to a dust-free conditions, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
 - d. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps. Replace all HVAC filters.
 - e. Clean the site, including landscape development areas, of rubbish, litter, and other foreign substances. Sweep paved areas broom clean; remove stains, spills, and other foreign deposits. Rake grounds that are neither paved or planted to a smooth, even-textured surface.
- C. Removal of protection: Remove temporary protection and facilities installed for protection of the Work during construction.
- D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of lawfully.
 - 1. Where extra materials of value remain after completion of associated Work, they become the Owner's property. Dispose of these materials as directed by the Owner.

END OF CLOSEOUT PROCEDURES

01 78 00
CLOSEOUT SUBMITTALS

1.0 GENERAL

1.01 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout submittals required by the Contract Documents at the completion of the project including, but not limited to, the following:
 - 1. Project record documents, including operation and maintenance manuals.
 - 2. Warranties and bonds, including manufacturer's standard warranties on products and special warranties.
- B. Related work:
 - 1. Refer to General Conditions for terms of the Contractor's period for correction of the Work (one year from Date of Substantial Completion).
 - 2. Section 01 33 00: Submittal Procedures: Specifies procedures for submitting warranties.
 - 3. Section 01 77 00: Closeout Procedures: Specifies contract closeout procedures.
 - 4. Divisions 2 through 48 Sections for specific requirements for warranties on products and installations specified to be warranted.
 - 5. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
- C. Disclaimers and limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.02 DEFINITIONS

- A. Standard product warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.
- B. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.03 RECORD DOCUMENT SUBMITTALS

- A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the Architect's reference during normal working hours.
- B. Record Drawings: Maintain a clean, undamaged set of blue- or black-line prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
 - 1. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.
 - 2. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.
 - 3. Note related change order numbers where applicable.
 - 4. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.
- C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda. Include with the Project Manual one copy of other written construction documents, such as Change Orders and modifications issued in printed form during construction.

1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.
 2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.
 3. Note related record drawing information and Product Data.
 4. Upon completion of the Work, submit record Specifications to the Architect for the Owner's records.
- D. Record Product Data: Maintain one (1) copy of each Product Data submittal. Note related Change Orders and markup of Record Drawings and Specifications.
1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site and from the manufacturer's installation instructions and recommendations.
 2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.
 3. Upon completion of markup, submit complete set of record Product Data to the Architect for the Owner's records.
- E. Record Sample submittals: Immediately prior to Substantial Completion, the Contractor shall meet with the Architect and the Owner's personnel at the Project site to determine which Samples are to be transmitted to the Owner for record purposes. Comply with the Owner's instructions regarding delivery to the Owner's Sample storage area.
- F. Miscellaneous record submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work. Immediately prior to the date of Substantial Completion, complete miscellaneous records and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to the Architect for the Owner's records.
- G. Maintenance Manuals: Organize operation and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual, heavy-duty, 2 IN, 3-ring, vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:
1. List of subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends and holidays.
 2. Emergency instructions.
 3. Spare parts list.
 4. Copies of warranties.
 5. Wiring diagrams.
 6. Recommended "turn-around" cycles.
 7. Inspection procedures.
 8. Shop Drawings and Product Data.
 9. Fixture lamping schedule.

1.04 WARRANTY REQUIREMENTS

- A. Related damages and losses: When correcting warranted construction that has failed, remove and replace other construction that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted construction.
- B. Reinstatement of warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.

- D. Owner's recourse: Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.
 - 1. Rejection of warranties: The Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
- E. Where the Contract Documents require a special warranty, or similar commitment on the Work or part of the Work, the Owner reserves the right to refuse to accept the Work, until the Contractor presents evidence that entities required to countersign such commitments are willing to do so.

1.05 WARRANTY AND BOND SUBMITTALS

- A. Submit written warranties to the Architect prior to the date certified for Substantial Completion. If the Architect's Certificate for Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Architect.
 - 1. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect within fifteen (15) days of completion of that designated portion of the Work.
- B. When the Contract Documents require the Contractor, or the Contractor and a subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner, through the Architect, for approval prior to final execution.
- C. Forms for special warranties are included at the end of this Section. Prepare a written document utilizing the appropriate form, ready for execution by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Submit a draft to the Owner, through the Architect, for approval prior to final execution.
 - 1. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.
- D. Form of submittal: At Final Completion compile two (2) copies of each required warranty and bond properly executed by the Contractor, or by the Contractor and a subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
- E. Bind warranties and bonds in heavy duty, commercial quality, durable 3-ring, vinyl covered loose leaf binders, thickness as necessary to accommodate contents, and sized to receive 8 1/2 IN x 11 IN paper.
 - 1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address, and telephone number of the Installer.
 - 2. Identify each binder on the front and spine with the typed or printed title "WARRANTIES AND BONDS", Project title or name, and name of the Contractor.
 - 3. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

2.0 PRODUCTS

Not Applicable to this Section.

3.0 EXECUTION

3.01 WARRANTIES

- A. Provide warranties and bonds on products and installations as specified in other Sections of these Specifications.

END OF CLOSEOUT SUBMITTALS

02 41 19
SELECTIVE STRUCTURE DEMOLITION

1.0 GENERAL

1.01 SUMMARY

- A. In accordance with pertinent provisions of this Section, carefully demolish and remove from the site those items scheduled to be so demolished and removed.

1.02 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

2.0 PRODUCTS

Not applicable to this Section.

3.0 EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 DEMOLITION

- A. By careful study of the Contract Documents, determine the location and extent of selective demolition to be performed.
- B. In company with the Architect, verify the extent and location of selective demolition required.
1. Carefully identify limits of selective demolition.
 2. Mark interface surfaces as required to enable workmen also to identify items to be removed and items to be left in place intact.
- C. Prepare and follow an organized plan for demolition and removal of items.
1. Shut off, cap and otherwise protect existing public utility lines in accordance with the requirements of the public agency or utility having jurisdiction.
 2. Provide temporary utilities as may be required to maintain service to existing buildings.
 3. Completely remove items scheduled to be so demolished and removed, leaving surfaces clean, solid and ready to receive new materials specified elsewhere.
 4. Accomplish work in a careful manner to prevent damage to existing materials to remain.
 5. In all activities, comply with pertinent regulations of governmental agencies having jurisdiction.
- D. Demolished material shall be considered to be property of the Contractor and shall be completely removed from the job site or recycled in accordance with Paragraph 3.03 below, unless otherwise instructed in the Drawings.
- E. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors and to other work being performed on or near the site.
- F. Roofs of existing buildings shall be maintained waterproof. Contractor shall provide temporary roofing if required.

3.03 RECYCLING

- A. Items scheduled to be demolished and removed from the site shall be recycled or returned to manufacturers of similar products for recycling to the maximum extent practical, including but not necessarily limited to:
1. Metal ceiling grid.
 2. Metal studs.

3.04 REPLACEMENTS

- A. In the event of demolition of items not so scheduled to be demolished, promptly replace such items to the approval of the Architect and at no additional cost to the Owner.

END OF SECTION

05 41 00
STRUCTURAL METAL STUD FRAMING

1.0 GENERAL

1.01 SUMMARY

- A. Provide structural metal stud framing at all bullet-resistant panels and where shown on the Drawings, as specified herein and as needed for a complete and proper installation including, but not necessarily limited to:
 - 1. Studs.
 - 2. Bridging.
 - 3. Accessories.
- B. Related work:
 - 1. Section 09 29 00: Gypsum Board (including metal drywall studs).
 - 2. Section 10 26 41: Bullet-Resistant Panels.

1.02 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 00.
- B. Submit:
 - 1. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
 - 2. Shop Drawings in sufficient detail to show layout, sizes, spacings, thicknesses, and types of cold-formed steel framing; fabrication, installation, fastening and anchorage, bridging, bracing, splices, accessories, and interface of the work of this Section with the work of adjacent trades.

1.03 REFERENCES

- A. Conform to AISI Specifications for the Design of Cold Formed Steel Structural Members.

1.04 SYSTEM DESCRIPTION

- A. Design requirements: Design, fabricate, and install framing system to withstand a 20 PSF uniform windload with a maximum deflection not exceeding L/360.

1.05 QUALITY ASSURANCE

- A. Manufacturer qualifications: Member in good standing of the Steel Framing Industry Association (SFIA).
- B. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent provisions of Section 01 60 00.
- B. Protect and store cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage and handling as required by AISI's Code of Standard Practice.

2.0 PRODUCTS

2.01 MANUFACTURER

- A. Design basis: Contract documents are based on cold-formed metal framing products by ClarkDietrich Building Systems, Dallas, Texas, Tel. 214-350-1716, Web www.clarkdietrich.com.

2.02 COLD-FORMED STEEL FRAMING MATERIALS

- A. Studs: 18 gage C-shaped steel studs, 3-5/8 IN wide with 1-5/8 IN flange and 1/2 IN return, prime coat finish, equal to ClarkDietrich model CSJ.
- B. Runner tracks: U-shaped steel track, unpunched, with straight flanges, gage and width to match studs unless noted on the Drawings, prime coat finish.
- C. Bridging: 3/4 IN cold-formed 16 gage channels, pre-notched at 12, 16 and 24 IN OC, black finish.

2.03 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

2.04 FABRICATION

- A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
 - 1. Fabricate framing assemblies using jigs or templates.
 - 2. Cut framing members by sawing or shearing; do not torch cut.
 - 3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, with screws penetrating joined members by no fewer than three exposed screw threads.
 - 4. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies by means that prevent damage or permanent distortion.
- C. Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable variation of 1/8 IN in 10 FT and as follows:
 - 1. Spacing: Space individual framing members no more than plus or minus 1/8 IN from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
 - 2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of 1/8 IN.

3.0 EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION, GENERAL

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.
- B. Install structural metal stud framing at all new partitions containing bullet-resistant panels.
- C. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- D. Install cold-formed steel framing in accordance with ASTM C 1007 and AISI S200 "North American Standard for Cold-Formed Steel Framing – General Provisions," and manufacturer's written instructions unless more stringent requirements are indicated.
- E. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
 - 1. Cut framing members by sawing or shearing; do not torch cut.
 - 2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners, install according to Shop Drawings, and comply with requirements for spacing, edge distances, and screw penetration.

- F. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- G. Install temporary bracing and supports to secure framing and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- H. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
- I. Install insulation, specified in Section 07 21 00 "Thermal Insulation," in framing-assembly members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- J. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

3.03 INTERIOR NON-LOAD-BEARING WALL INSTALLATION

- A. Install continuous tracks sized to match studs unless noted on the Drawings. Align tracks accurately and securely anchor to supporting structure.
- B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs 12 IN OC.
- C. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
 - 1. Install single deep-leg deflection tracks and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced vertically in rows 3 FT OC maximum. Fasten at each stud intersection.
 - 1. Channel Bridging: Cold-formed steel channel, welded or mechanically fastened to webs of punched studs.
- F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.04 ERECTION TOLERANCES

- Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 IN in 10 FT and as follows:
- 1. Space individual framing members no more than plus or minus 1/8 IN from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.05 REPAIRS AND PROTECTION

- A. Galvanizing repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION

05 50 00
METAL FABRICATIONS

1.0 GENERAL

1.01 SUMMARY

- A. Provide miscellaneous metal work shown on the Drawings, as specified herein and as needed for a complete and proper installation.

1.02 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 00.
- B. Submit:
 - 1. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades.

1.03 REFERENCES

- A. ASTM A36: Standard Specification for Carbon Structural Steel.
- B. ASTM A153: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- C. ASTM A283: Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.
- D. ASTM A307: Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- E. ASTM A325: Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 KSI Minimum Tensile Strength.
- F. ASTM A500: Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- G. ASTM A501: Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- H. ASTM A575: Standard Specification for Steel Bars, Carbon, Merchant Quality, M-Grades.
- I. ASTM A663: Standard Specification for Steel Bars, Carbon, Merchant Quality, Mechanical Properties.
- J. ASTM C1107: Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

1.04 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Perform shop and/or field welding required in connection with the work of this Section in strict accordance with pertinent recommendations of the AWS.
- C. Fabrication of the work of this Section shall be in strict accordance with pertinent recommendations of the AISC.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent provisions of Section 01 60 00.

1.06 PROJECT CONDITIONS

- A. Field measurements: Check actual locations of walls and other construction to which metal fabrications must fit, by accurate field measurements before fabrication; show recorded measurements on final Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delay of Work.
 - 1. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabrication of products without field measurements. Coordinate construction to ensure that actual opening dimensions correspond to guaranteed dimensions. Allow for trimming and fitting.

2.0 PRODUCTS

2.01 MATERIALS

- A. General:
 - 1. In fabricating items which will be exposed to view, provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, rolled trade names, and roughness.
 - 2. Except as otherwise shown on the Drawings, directed by the Architect, or required by governmental agencies having jurisdiction, provide materials as required for the Work and complying with the following minimum standards.
- B. Steel sections: Comply with ASTM A36.
- C. Plates: Comply with ASTM A283.
- D. Steel pipe: Comply with ASTM A501.
- E. Steel tube: Comply with ASTM A500, Grade B.
- F. Steel bars and bar-size shapes:
 - 1. For hot-rolled carbon steel bars and bar size shapes, comply with ASTM A575 in grade as selected by the fabricator.
 - 2. For other steel bars and bar-size shapes, comply with ASTM A663 or ASTM A36.
- G. Miscellaneous steel shapes: Provide bent or otherwise custom fabricated angles, channels, plates, tubes, anchors, hangers, dowels, bolts and connections where detailed or required, complying with ASTM A36.
- H. Security wire mesh: Welded wire square mesh, galvanized after welding, 16 gage wire in 1/2 IN x 1/2 IN square pattern, 48 IN wide rolls or sheets as distributed by McNichols Company or Louis E. Page, Inc.
- I. Anchor bolts: Comply with ASTM A307, non-headed type with heavy hexagonal nuts unless otherwise indicated.
- J. Unfinished threaded fasteners:
 - 1. Comply with ASTM A307, grade A, regular low carbon steel bolts and nuts.
 - 2. Provide either hexagonal or square heads and nuts; except use only hexagonal units for exposed connections.
- K. High strength threaded fasteners: Provide heavy hexagonal structural bolts, heavy hexagonal nuts, and hardened washers, all from quenched and tempered medium carbon steel complying with ASTM A325, ASTM A153 for galvanized components.

2.02 OTHER MATERIALS

- A. Shop primer: Use 10-99 Tnemec Primer or equal product of other manufacturers approved in advance by the Architect.
- B. Electrodes for welding: Select in accordance with AWS specifications for the metal alloy to be welded.
- C. Grout: Provide nonshrink nonmetallic grout complying with ASTM C1107 equal to Master Builders "Masterflow 713".
- D. Fasteners: Provide bolts and nuts, lag or toggle bolts, machine or wood screws, plain or lock washers, and drilled expansion anchors as indicated or as appropriate.
- E. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

2.03 FABRICATION-GENERAL

- A. Except as otherwise shown on the Drawings or the approved Shop Drawings, use materials of size, thickness, and type required to produce reasonable strength and durability in the work of this Section. Work to dimensions indicated or accepted on Shop Drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.
- B. Fit and shop assemble components in largest practical sections, for delivery to site, and in strict accordance with the approved Shop Drawings and pertinent requirements of governmental agencies having jurisdiction.
- C. Fabricate components with joints tightly fitted and secured.
- D. Continuously seal joined pieces by continuous welds.
- E. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Fabricate joints which will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

- F. Ease exposed edges to small uniform radius.
- G. Exposed mechanical flashings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- H. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- I. Fabricate components accurately for anchorage to each other and to building structure.
- J. Cut, drill or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Remove burrs.
- K. Cut, reinforce, drill, and tap miscellaneous metal work as indicated to receive finish hardware, screws, and similar items.
- L. Fabricate rough hardware to sizes, shapes, and dimensions required. Furnish malleable iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

2.04 FINISHES-STEEL

- A. Exterior steel components and steel components in exterior walls: Galvanized.
- B. Prime paint all interior steel items:
 - 1. Exception: Galvanize items to be embedded in concrete or masonry.
 - 2. Exception: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with spray fireproofing.
- C. Prepare surfaces to be primed in accordance with Steel Structures Painting Council SP-3, "Power Tool Cleaning".
- D. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- E. Prime painting: One (1) coat, 2.0 dry film thickness minimum.
 - 1. Exception: On surfaces inaccessible after assembly or erection, apply two (2) coats of primer.
- F. Galvanizing of structural steel members: Galvanize after fabrication to ASTM A123. Provide minimum 1.3 OZ/SF galvanized coating.
- G. Galvanizing of non-structural items: Galvanize after fabrication to ASTM A123. Provide minimum 1.3 OZ/SF galvanized coating.

2.05 FABRICATION TOLERANCES

- A. Squareness: 1/8 IN maximum difference in diagonal measure.
- B. Maximum offset between faces: 1/16 IN.
- C. Maximum misalignment of adjacent members: 1/16 IN.
- D. Maximum bow: 1/8 IN in 48 IN.
- E. Maximum deviation from plane: 1/16 IN in 48 IN.

3.0 EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.

3.03 COORDINATION

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.
 - 1. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, including concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.
 - 2. Set sleeves in concrete with tops flush with finish surface elevations; protect sleeves from water and concrete entry.

3.04 INSTALLATION

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.
- B. Install components plumb and level, accurately fitted, free from distortion or defects.
- C. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- D. Field weld components indicated on Shop Drawings. Perform field welding in accordance with AWS D1.1.
- E. Field bolt and weld to match shop bolting and welding. Conceal bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.
- F. Mechanically fasten joints butted tight, flush, and hairline. Grind welds smooth and flush.
- G. Obtain approval prior to site cutting or creating adjustments not scheduled.
- H. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.05 ERECTION TOLERANCES

- A. Maximum variation from plumb: 1/4 IN per story, non-cumulative.
- B. Maximum offset from true alignment: 1/4 IN.
- C. Maximum out-of-position: 1/4 IN.

END OF SECTION

06 10 00
ROUGH CARPENTRY

1.0 GENERAL

1.01 SUMMARY

- A. Provide lumber, plywood, fasteners and anchors, wood treatment, blocking, nailers, furring strips and other items needed, and perform rough carpentry for the construction shown on the Drawings, as specified herein and as needed for a complete and proper installation.

1.02 REFERENCES

- A. ASTM A653: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- B. AWPA C2: Preservative Treatment by Pressure Processes; Lumber, timber, bridge ties and mine ties.
- C. AWPA C20: Fire Retardant Treatment by Pressure Processes; Structural lumber.
- D. NIST PS-1: Construction and Industrial Plywood.
- E. NIST PS-20: American Softwood Lumber Standard.

1.03 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Lumber: Comply with NIST PS-20 and approved grading rules and inspection agencies.
 - 1. Acceptable lumber inspection agencies: Any agency with rules approved by American Lumber Standards Committee.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent provisions of Section 01 60 00.
- B. Protection:
 - 1. Deliver materials to the job site and store, in a safe area, out of the way of traffic, and shored up off the ground surface.
 - 2. Identify framing lumber as to grades, and store each grade separately from other grades.
 - 3. Do not store seasoned or treated materials in damp location.
 - 4. Protect edges of panel materials from damage to corners.
 - 5. Protect metals with adequate waterproof outer wrapping.
 - 6. Use extreme care in off loading of lumber to prevent damage, splitting and breaking of materials.

2.0 PRODUCTS

2.01 DIMENSION LUMBER

- A. Sizes: Nominal sizes as indicated on the Drawings, S4S.
- B. Moisture content: S-dry or MC19.
- C. Miscellaneous blocking, furring and nailers:
 - 1. Lumber: S4S, No. 2 or Standard Grade.
 - 2. Boards: Standard or No. 3.

2.02 CONSTRUCTION PANELS

- A. APA rated subflooring:
 - 1. Exposure class: 1.
 - 2. Span rating: 32/16 IN.
- B. Plywood wall sheathing: NIST PS-1, Grade C-D, Exposure I.
- C. Miscellaneous panels:
 - 1. Concealed plywood: NIST PS-1, C-C plugged, exterior grade.
 - 2. Exposed plywood: NIST PS-1, A-D, interior grade.
 - 3. Electrical component mounting: APA rated sheathing, fire retardant treated.

2.03 FACTORY WOOD TREATMENT

- A. Fire retardant treatment: AWPA Treatment C20, Interior Type A Low Temperature (low hygroscopic), chemical treatment pressure impregnated; capable of providing a maximum flame spread/smoke developed rating of 25/450.
 - 1. Non-combustible wood shall be used in all locations required by codes and local authorities having jurisdiction, whether or not it is shown on the Drawings.
- B. Pressure treatment of lumber above grade: AWPA Treatment C2 using water-borne preservative to 0.25 LB/CF retention.
 - 1. Kiln dry after treatment to moisture content of 19% MAX.
 - 2. Treat wood in contact with roofing, flashing or waterproofing.
 - 3. Treat wood in contact with masonry or concrete.
 - 4. Treat wood less than 18 IN above grade.

2.04 ACCESSORIES

- A. Provide rough hardware and miscellaneous anchors, inserts, nails, bolts, screws, and other fastening devices of type, size and spacing required and in quantities needed for the Work shown on the Drawings.
- B. Fasteners and anchors:
 - 1. Fasteners: Hot-dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.
 - 2. Drywall screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing
 - 3. Anchors: type best suited for project conditions.
- C. Backer plates:
 - 1. Type: 14 gage uncoated metal thickness steel sheet, galvanized in accordance with ASTM A653 G60.
 - 2. Length: Sufficient to extend to nearest studs beyond maximum dimension of attached item and engage fasteners from attached item; span 3 studs minimum.
 - 3. Height: 6 IN minimum or higher where required to accommodate item being fastened.
 - 4. When manufacturer of attached item has ore rigorous mounting plate requirements, comply with manufacturer's requirements.

2.05 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

3.0 EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 DELIVERIES

- A. Stockpile materials sufficiently in advance of need to assure their availability in a timely manner for this Work.

3.03 COMPLIANCE

- A. Do not permit materials not complying with the provisions of this Section to be brought onto or to be stored at the job site.
- B. Promptly remove non-complying materials from the job site and replace with materials meeting the requirements of this Section.

3.04 WORKMANSHIP

- A. Produce joints which are tight, true and well nailed, with members assembled in accordance with the Drawings and with pertinent codes and regulations.
- B. Selection of lumber pieces:
 - 1. Carefully select the members.
 - 2. Select individual pieces so that knots and obvious defects will not interfere with placing bolts or proper nailing, and will allow making of proper connections.

- 3. Cut out and discard defects which render a piece unable to serve its intended function.
 - 4. Lumber may be rejected by the Architect, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting.
 - C. Do not shim any framing component.
- 3.05 PREPARATION
- A. Items which require backer plates or blocking:
 - 1. Coordinate sizes and locations.
 - 2. Install additional studs for attachment of backer plates and blocking in required locations to receive surface mounted accessories as indicated or as required by accessory manufacturer.
 - 3. Elimination of backer plates and blocking is not permitted.
 - 4. Direct attachment of items to studs is not permitted.
 - B. Blocking and backer plates:
 - 1. Provide concealed wood blocking or metal backer plates for securing wood trim, carpentry, woodwork, cabinets, millwork, casework, surface mounted equipment, surface mounted fittings, fixtures, accessories, and furnishings, including, but not limited to handrails, grab bars, toilet partitions, towel bars, wall mounted door stops, and similar screw- and bolt-fastened items.
- 3.06 BLOCKING
- A. Install blocking as required to support items of finish and to cut off concealed draft openings, both vertical and horizontal.
- 3.07 ALIGNMENT
- A. On framing members to receive a finished surface, align the finish subsurface to vary not more than 1/8 IN from the plane of surfaces of adjacent furring and framing members.
- 3.08 INSTALLATION OF BACKING PANELS
- A. Placement:
 - 1. Place plywood with face grain perpendicular to supports and continuously over at least two supports.
 - 2. Center joints accurately over supports.
 - 3. Leave 1/16 IN space at end joints and 1/8 IN space at edge joints. Fasten at 6 IN OC at panel edges and at 10 IN OC at intermediate supports with screws.
 - B. Protect plywood from moisture by use of waterproof coverings until the plywood in turn has been covered with the next succeeding component or finish.
- 3.09 FASTENING
- A. General:
 - 1. Install nails, bolts, metal connectors, powder-actuated fasteners, drive studs and miscellaneous anchors as required to properly fasten and support the work by recognized standards.
 - B. Nailing:
 - 1. Nails or spikes shall penetrate into the piece receiving the point not less than 1/2 the length of the nail or spike.
 - 2. Nail without splitting wood.
 - 3. Prebore as required.
 - 4. Remove split members and replace with members complying with the specified requirements.
 - C. Bolting:
 - 1. Drill holes 1/16 IN larger in diameter than the bolts being used.
 - 2. Drill straight and true from one side only.
 - 3. Do not bear bolt heads directly on wood, but use washers under head and nut where both bear on wood, and use washers under all nuts.
 - D. Screws:
 - 1. For lag screws and wood screws, prebore holes same diameter as root of threads, enlarging holes to shank diameter for length of shank.

- E. Powder-actuated fasteners:
 - 1. Install fasteners in accordance with manufacturer's recommendations, with minimum embed length as recommended by manufacturer, for each type of installation.

3.10 SITE APPLIED WOOD TREATMENT

- A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.
- B. Allow preservative to dry prior to erecting members.

END OF SECTION

06 41 16
PLASTIC LAMINATE CLAD ARCHITECTURAL CABINETS

1.0 GENERAL

1.01 SUMMARY

- A. Provide plastic laminate clad architectural cabinets where shown on the Drawings, as specified herein and as needed for a complete and proper installation including but not necessarily limited to:
1. Plastic laminate clad architectural cabinets.
 2. Wood furring, blocking, shims and hanging strips for installing plastic laminate clad architectural cabinets unless concealed within other construction before cabinet installation.

1.02 DEFINITIONS

- A. Exposed surfaces:
1. All surfaces visible when doors and drawers are closed.
 2. Door and drawer fronts and their edges.
 3. Exposed ends.
 4. Countertop and backsplash and their exposed edges.
 5. Face frames.
 6. Interior of open cabinets.
 7. Wall mounted adjustable shelves.
 8. Bottoms of cabinets 42 IN or more A.F.F.
 9. Tops of cabinets 78 IN or less A.F.F.
- B. Semi-exposed surfaces:
1. Surfaces which become visible when doors are open or drawers are extended.
 2. Bottoms of cabinets more than 30 IN and less than 42 IN A.F.F.
- C. Concealed surfaces:
1. Surfaces not visible after installation.
 2. Bottoms of cabinets less than 30 IN A.F.F.
 3. Tops of cabinets more than 78 IN A.F.F. and not visible from an upper level.
 4. Stretchers, blocking, and components concealed by drawers.

1.03 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 00.
- B. Submit:
1. Manufacturer' specifications and other data needed to prove compliance with the specified requirements for high pressure laminate, panel products, adhesives, and cabinet hardware and accessories.
 2. Shop Drawings, including dimensioned plans and elevations, and large scale details in sufficient detail to show materials, fabrication, installation, anchorage, accessory listings, hardware location, location and size of cutouts and holes, and interface of the work of this Section with the work of adjacent trades.
 3. Samples of plastic laminate and edge material for approval and color selection by the Architect.
 4. Samples of laminate clad panel products, 6 x 6 IN MIN, for each type of surface finish.

1.04 REFERENCES

- A. ANSI A208.1: Particleboard.
- B. ANSI A208.2: Medium Density Fiberboard (MDF) for Interior Applications.
- C. AWI P-200: Architectural Woodwork Institute Quality Standards Illustrated.
- D. NEMA LD3: High Pressure Decorative Laminates.
- E. NHLA G101: Rules for the Measurement & Inspection of Hardwood & Cypress.
- F. NIST PS-1: Construction and Industrial Plywood.
- G. NIST PS-20: American Softwood Lumber Standard.

1.05 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Perform work in accordance with AWI Architectural Woodwork Quality Standards Illustrated, Custom quality unless noted otherwise.
- C. Fabricator/Installer qualifications: Company specializing in manufacturing the products specified in this Section with minimum five (5) years of documented experience and is a certified participant in AWI's Quality Certification Program.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent provisions of Section 01 60 00.
- B. Protect cabinets during transit, delivery, storage, and handling to prevent damage, soilage, and deterioration.
- C. Do not deliver cabinets until painting, wet work, grinding, and similar operations that could damage, soil, or deteriorate cabinets have been completed in installation areas. If cabinets must be stored in other than installation areas, store only in areas whose environmental conditions meet requirements specified in paragraph 1.07 below.

1.07 PROJECT CONDITIONS

- A. Environmental conditions: Obtain and comply with cabinet manufacturer's and installer's coordinated advice for optimum temperature and humidity conditions for cabinetwork during its storage and installation. Do not install cabinets until these conditions have been attained and can be maintained from date of installation through remainder of construction period.
- B. Field measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by accurate field measurements before fabrication of cabinets and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking and reinforcements that support cabinets by field measurements before being enclosed, and indicate measurements on Shop Drawings.
- C. Established dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.08 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements and other related units of Work specified in other Sections to ensure that cabinets can be supported and installed as indicated.

2.0 PRODUCTS

2.01 PLASTIC LAMINATE CLAD ARCHITECTURAL CABINETS

- A. Quality standard: Unless otherwise indicated, comply with Architectural Woodwork Institute Quality Standards Illustrated for grades of architectural plastic laminate clad cabinets indicated for construction, finishes, installation and other requirements.
 - 1. Provide labels from AWI certification program indicating that woodwork, including installation, complies with requirements of grade specified.
- B. Grade: Custom.
- C. Type of construction: Face frame.
- D. Cabinet, door, and drawer front interface style: Flush overlay.
- E. High pressure decorative laminate: NEMA LD3, grades as indicated or if not indicated, as required by woodwork quality standard.
 - 1. Manufacturers: Nevamar, WilsonArt, Formica or Pionite Plastic.
- F. Laminate cladding for exposed surfaces: General purpose grade, HGS, 0.048 IN thick nominal.

- G. Materials for semi-exposed surfaces:
 - 1. Surfaces other than drawer bodies: Thermoset decorative panels.
 - 2. Edges of Thermoset decorative panel shelves: ABS/PVC extruded fabrication.
 - 3. For semi-exposed backs of panels with exposed plastic laminate surfaces, provide surface of high pressure decorative laminate, NEMA LD3, cabinet liner grade, CLS, 0.020 IN thick nominal.
 - 4. Drawer sides and backs: Solid hardwood lumber.
 - 5. Drawer bottoms: Hardwood plywood.
- H. Drawer construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
- I. Colors, patterns and finishes: As selected by the Architect from laminate manufacturer's full range of colors, patterns and finishes.

2.02 WOOD MATERIALS

- A. Wood products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
 - 1. Wood moisture content: 6% average.
- B. Softwood lumber: NIST PS-20; Graded in accordance with AWI Architectural Woodwork Quality Standards Illustrated.
- C. Hardwood lumber: NHLA graded in accordance with AWI Architectural Woodwork Quality Standards Illustrated.
- D. Softwood plywood: NIST PS-1; graded in accordance with AWI Architectural Woodwork Quality Standards Illustrated, type of glue recommended for application.
- E. Hardwood plywood: NIST PS-1; graded in accordance with AWI Architectural Woodwork Quality Standards Illustrated, core materials of veneer, type of glue recommended for application.
- F. Particleboard: ANSI A208.1, Grade M-2; type as specified in AWI Architectural Woodwork Quality Standards Illustrated, composed of wood chips, medium density, made with waterproof resin binders; of grade to suit application; sanded faces.
 - 1. Not allowed in countertops containing sinks.
- G. Medium density fiberboard (MDF): ANSI A208.2, Grade 130; type as specified in AWI Architectural Woodwork Quality Standards Illustrated, composed of wood particles reduced to fibers in a moderate pressure steam vessel, combined with resin, and bonded together under heat and pressure.
 - 1. Not allowed in countertops containing sinks.
- H. Thermoset decorative panels: Particleboard or medium density fiberboard finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD3, Grade VGL, for test methods 3.4, 3.4, 3.6,, 3.8 and 3.10.

2.03 CABINET HARDWARE

- A. Rough hardware: Type and size as required by conditions of use.
- B. Finish hardware: As scheduled below, or equal products of other manufacturers, with BHMA 619, US15, satin nickel or similar finish.
 - 1. Concealed cabinet door hinges: Blum or Grass 3000 series.
 - a. Provide 2 hinges for doors up to 48 IN high.
 - b. Provide 3 hinges for doors up to 60 IN high.
 - c. Provide 4 hinges for doors over 60 IN high.
 - 2. Door and drawer pulls: Liberty #P604DC-SN-C 4 IN long wire cabinet pull. Provide 1 pull per door and drawer.
 - 3. Magnetic catches: Liberty #C082M2L-AL-U aluminum, adjustable magnetic catch. Provide 1 catch per door.
 - 4. Keyboard drawer: Knappe & Vogt #KD-1020, 25.8 IN wide x 10 IN deep, height adjustable, 75 LB load rating, with integral mousing surface, palm rest and rear storage compartment.
 - 5. Box drawer slides: Knappe & Vogt #4400 box drawer slide with full extension, 65 LB load rating. Provide 1 set per drawer.
 - 6. File drawer slides: Knappe & Vogt #8505 box/file heavy duty drawer slide with 1 IN overtravel, 150 LB load rating. Provide 1 set per drawer.

7. Shelf supports: Knappe & Vogt #331 flat shelf support with 1/4 IN DIA x 3/8 IN long pins. Provide 4 pins for each shelf.
8. Grommets: Doug Mockett & Company Brava Grommet #BRV1 for 2-3/8 IN holes.
 - a. Provide 2 grommets in each countertop shown on the Drawings; exact location will be determined by the Owner.
9. Cabinet locks: CCL Security Products Company #CCL 0737 x STR 2540.
 - a. Provide 1 lock for each door and drawer shown on the Drawings.
 - b. Provide keying for doors and drawers to Owner's requirements; furnish 6 master keys for each lock to Owner.

2.04 OTHER MATERIALS

- A. Furring, blocking, shims and hanging strips: Softwood or hardwood lumber, kiln dried to less than 15% moisture content.
- B. Anchors: Select material, type, size and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.
- C. Adhesives: Waterproof, Type II, CS-35; do not use adhesives that contain urea formaldehyde.
- D. Adhesives for bonding plastic laminate: Water-based contact cements or polyvinyl acetate (PVA) as recommended by plastic laminate manufacturer.
- E. Sealant: As specified in Section 07 92 00.
- F. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

2.05 FABRICATION

- A. Fabricate cabinets to dimensions, profiles and details indicated.
- B. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming and fitting.
 1. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.
- C. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs. For decorative plastic laminates, comply with manufacturer's written fabrication instructions.
- D. Plastic laminate installation:
 1. Apply plastic laminate in full uninterrupted sheets; fit corners and joints to hairline. Slightly bevel arises. Apply laminate backing sheet to reversed side of laminate faced and veneer surfaces.
 2. Fit edges with matching plastic laminate or PVC tape edging.
 3. Plastic laminates shall be bonded to core material with adhesive in accordance with manufacturer's recommendations. The temperature of the materials and the area in which the fabrication is to be done shall not be less than 65°F with a relative humidity of not less than 35% and not more than 80%.
 4. Joints in plastic laminates shall be held to absolute minimum.

3.0 EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Verify adequacy of backing and support framing.
- C. Verify location and sizes of utility rough-in associated with work of this Section.

- 3.02 PREPARATION
- A. Before installation, condition cabinets to average prevailing humidity conditions in installation areas.
 - B. Before installing cabinets, examine shop-fabricated work for completion and complete work as required.
- 3.03 INSTALLATION
- A. Install the work of this Section in strict accordance with the approved Shop Drawings and the referenced standards.
 - B. Assemble cabinets and complete fabrication at project site to extent that it was not completed in the shop.
 - C. Install cabinets level, plumb, true, and straight with no distortions. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 IN in 8 FT (including tops) and with no variation in flushness of adjoining surfaces.
 - D. Scribe and cut cabinets to fit adjoining work with maximum gaps of 1/32 IN and refinish cut surfaces, and repair damaged finish at cuts.
 - E. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.
 - 1. Use filler matching finish of items being installed.
 - F. Install cabinets without distortion so that doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated.
 - 1. Install cabinets with no more than 1/8 IN in 8 FT sag, bow, or other variation from straight line.
 - 2. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 IN OC with fastening devices appropriate to backing and/or blocking.
 - G. Anchor countertops securely to base units and other support systems as indicated.
- 3.04 ADJUSTING AND CLEANING
- A. Repair damaged and defective cabinets where possible to eliminate functional and visual defects; where not possible to repair, replace cabinets. Adjust joinery for uniform appearance.
 - B. Clean, lubricate and adjust hardware.
 - C. Clean cabinets on exposed and semi-exposed surfaces. Clean plastic laminate surfaces according to manufacturer's written care and maintenance instructions.
 - D. Touch-up shop-applied finishes to restore damaged or soiled areas.
- 3.05 PROTECTION
- A. Maintain conditions and protect completed work from damage and deterioration for duration of construction period in a manner acceptable to manufacturer and installer.

END OF SECTION

07 21 00
THERMAL INSULATION

- 1.0 GENERAL
- 1.01 SUMMARY
 - A. Provide building insulation where shown on the Drawings, as specified herein and as needed for a complete and proper installation, including but not limited to:
 - 1. Acoustical batt insulation in walls.
- 1.02 SUBMITTALS
 - A. Comply with pertinent provisions of Section 01 33 00.
 - B. Submit:
 - 1. Manufacturer's specifications and other data needed to prove compliance with the specified requirements, including installation and maintenance instructions.
- 1.03 REFERENCES
 - A. ASTM E96: Standard Test Method for Water Vapor Transmission of Materials.
 - B. ASTM C665: Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
 - C. ASTM C1338: Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings.
 - D. ASTM D2020: Standard Test Method for Mildew (Fungus) Resistance of Paper and Paperboard.
- 1.04 QUALITY ASSURANCE
 - A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
 - B. Applicator qualifications: Utilize a qualified applicator with demonstrated experience in performing work comparable to the work of this Section, and who is trained and authorized by the manufacturer to install the product.
- 1.05 DELIVERY, STORAGE AND HANDLING
 - A. Comply with pertinent provisions of Section 01 60 00.
 - B. Delivery: Deliver materials to applicator/site in manufacturer's original, unopened, undamaged containers with identifications labels intact.
 - C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
- 1.06 SEQUENCING
 - A. Sequence work to ensure fireproofing and firestop materials are in place before beginning work of this Section.
- 2.0 PRODUCTS
- 2.01 MATERIALS
 - A. Provide the following building insulation where shown on the Drawings or otherwise needed to achieve the degree of insulation required under pertinent regulations of governmental agencies having jurisdiction.
 - 1. Acoustical insulation in walls: Unfaced, mold and mildew resistant Formaldehyde-free fiberglass insulation blanket 3-5/8 IN thick x 12 and 16 IN wide with R-13 thermal resistance value complying with ASTM C665, Type I and ASTM E136, equal to Johns Manville Unfaced Formaldehyde-Free Fiber Glass Insulation.
- 2.02 OTHER MATERIALS
 - A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

3.0 EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Conditions for batt insulation:
 - 1. Verify that substrate, adjacent materials and insulation materials are dry and that substrates are ready to receive insulation.
 - 2. Verify substrate surfaces are flat and construction framing is free of irregularities or projections which may damage or prevent proper insulation.

3.02 INSTALLATION

- A. General:
 - 1. Install the work of this Section in strict accordance with the original design, pertinent requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures as approved by the Architect, anchoring all components firmly into position for long life under hard use.
 - a. Install in wall spaces without gaps or voids.
 - b. Do not compress insulation.
 - c. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
 - d. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
 - e. Lap ends and side flanges of insulation over framing members.
 - f. Tape seal butt ends, lapped flanges, and tears or cuts in vapor barrier.
 - g. Extend vapor retarder tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the insulation. Tape seal in place.
 - h. Secure insulation as required to prevent displacement.
- B. Interior wall insulation:
 - 1. Install insulation in all stud walls scheduled, full height of walls.

3.03 PROTECTION

- A. Protect installed insulation and vapor retarders from damage from subsequent construction or harmful weather exposures.

END OF SECTION

07 84 00
FIRESTOPPING

1.0 GENERAL

1.01 SUMMARY

- A. Provide firestopping where shown on the Drawings, as specified herein and as needed for a complete and proper installation including, but not necessarily limited to:
 - 1. Penetrations by mechanical and electrical systems, including ducts, piping, and conduit.
 - 2. Miscellaneous openings in fire assemblies.

1.02 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 00.
- B. Submit:
 - 1. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
 - 2. Shop Drawings in sufficient detail to show systems, materials, installation methods, and interface of the work of this Section with the work of adjacent trades.
 - 3. Certification that the proposed materials are acceptable for the proposed use to the governmental agencies and insurance rating bureaus having jurisdiction.

1.03 REFERENCES

- A. ASTM E119: Standard Test Method for Fire Tests of Building Construction Materials.
- B. ASTM E814: Standard Test Method for Fire Tests of Penetration Firestop Systems.
- C. UL: Fire Resistance Directory; Underwriters Laboratories Inc.
- D. FM: Approval Guide; Factory Mutual Research Corporation.
- E. ITS: Directory of Listed Products; Intertek Testing Services NA, Inc.

1.04 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Listing in the current classification or certification books of UL, FM or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
- C. Firestopping systems shall maintain required ratings of assemblies when tested in accordance with ASTM E119 and ASTM E814.
- D. Procedures and methods shall comply with requirements of the IBC, latest edition and with requirements of the Owner.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent provisions of Section 01 60 00.

1.06 PROJECT CONDITIONS

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during and for 3 days after installation of materials.
- B. Provide ventilation in areas where solvent-cured materials are being installed.

2.0 PRODUCTS

2.01 MATERIALS

- A. Use any system listed by acceptable certification books or tested in accordance with ASTM E119 or ASTM E814 that has F Rating equal to fire rating of penetrated assembly and minimum T Rating equal to F Rating and that meets all other specified requirements.
- B. Provide any firestopping material meeting requirements including, but not limited to:
 - 1. Elastomeric silicone firestopping: Single component silicone-elastomeric compound and compatible silicone sealant.
 - 2. Foam firestopping: Single component foam compound.

3. Fibered compound firestopping: formulated compound mixed with incombustible non-asbestos fibers.
4. Fiber packing material: Mineral fiber packing insulation.
5. Firestop devices: Mechanical device with incombustible filler and sheet stainless steel jacket.
6. Intumescent putty: Compound which expands on exposure to surface heat gain.
7. Firestopping mortar.
8. Firestop pillows: Formed mineral fiber pillows.

2.02 OTHER MATERIALS

- A. Primers, sleeves, forms and accessories: Type required for tested assembly design.
- B. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

3.0 EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Verify openings are ready to receive the work of this Section.

3.02 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter which may affect bond of firestopping material.
- B. Remove incompatible materials which may affect bond.
- C. Install backing and damming materials to arrest liquid material leakage.

3.03 INSTALLATION

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.
- B. Apply the approved materials as needed to achieve the designated fire-resistivity, in strict accordance with the approved Shop Drawings, pertinent requirements of governmental agencies and insurance rating bureaus having jurisdiction, and the manufacturer's recommended installation procedures as approved by the Architect, completely closing the opening.

3.04 CLEANING AND PROTECTION

- A. Protect adjacent surfaces from damage by material installation.
- B. Clean adjacent surfaces of firestopping materials.

END OF SECTION

07 92 00
JOINT SEALANTS

1.0 GENERAL

1.01 SUMMARY

- A. Throughout the Work, seal and caulk joints where shown on the Drawings and elsewhere as required to provide a positive barrier against passage of moisture and passage of air, including but not necessarily limited to:
 - 1. Sealant at interior window, door and equipment openings.
 - 2. Other locations indicated on Drawings or required to produce a watertight building.
- B. Related work:
 - 1. Section 08 71 00: Door Hardware: Threshold sealant.
 - 2. Section 08 88 56: Bullet-Resistant Glazing: Glazing compound/sealant.
 - 3. Section 09 29 00: Gypsum Board: Acoustical sealant.

1.02 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 00.
- B. Submit:
 - 1. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
 - 2. Manufacturer's standard bead samples consisting of strips of actual products showing full range of colors available, for each product exposed to view, for color selection by Architect.

1.03 REFERENCES

- A. ASTM C834: Standard Specification for Latex Sealants.
- B. ASTM C920: Standard Specification for Elastomeric Joint Sealants.
- C. ASTM C1193: Standard Guide for Use of Joint Sealants.
- D. ASTM C1382: Standard Test Method for Determining Tensile Adhesion Properties of Sealants When Used in Exterior Insulation and Finish Systems Joints.
- E. ASTM D1667: Standard Specification for Flexible Cellular Materials-Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam).

1.04 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Materials shall be identified on the package with the manufacturer's name and type of material.
- C. Applicator qualifications: Firm experienced in performing the work of this Section with not less than three (3) years experience.

1.05 PROJECT CONDITIONS

- A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent provisions of Section 01 60 00.
- B. Do not retain at the job site material which has exceeded the shelf life recommended by its manufacturer.

1.07 WARRANTY

- A. Include coverage for installed sealants and accessories which fail to achieve airtight seal and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

2.0 PRODUCTS

2.01 SEALANTS

- A. Provide one component, acrylic latex caulk complying with ASTM C834, equal to 'AC-20' as manufactured by Pecora Corporation.
 - 1. Application:
 - a. Interior window, door and equipment openings.
 - b. Below metal stud track at interior sound insulated partitions.
- B. Colors for each sealant installation will be selected by the Architect from standard colors normally available from the approved manufacturer.

2.02 OTHER MATERIALS

- A. Primer: Non-staining primers which have been tested for durability on the surfaces to be sealed and as recommended by sealant manufacturer to suit application.
- B. Joint backing: Round foam backer rod and backup materials compatible with sealant and oversized 30% to 50% larger than joint width, as recommended by sealant manufacturer to suit application, and complying with ASTM D1667.
- C. Bond-breaker tape: Pressure sensitive polyethylene tape or other plastic tape as recommended by sealant manufacturer. Provide self-adhesive tape where applicable.
- D. Masking tape: Non-staining, non-absorbent masking tape which will effectively prevent application of sealant on surfaces not scheduled to receive it, and which is removable without damage to substrate.
- E. Joint cleaner: Non-corrosive and non-staining type cleaner compatible with sealant and joint forming materials, and as recommended by sealant manufacturer.
- F. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

3.0 EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Verify that substrate surfaces and joint openings are ready to receive work.
- C. Verify that joint backing and release tapes are compatible with sealant.

3.02 ENVIRONMENTAL CONDITIONS

- A. Do not apply sealant when temperature is below 40°F.
- B. Do not apply sealant when substrates are wet due to rain, frost, condensation, or other causes.

3.03 PREPARATION

- A. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- B. Remove all foreign material from joint substrate which could interfere with adhesion of joint sealer, including dust, paints (except for permanent protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealers, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
- C. Clean concrete, masonry, unglazed surfaces of ceramic tile and similar porous joint substrate surfaces, by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
- D. Remove laitance and form release agents from concrete.
- E. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile and other nonporous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealers.
- F. Prime joint substrates where recommended by sealant manufacturer for the particular installation, applying in strict accordance with the manufacturer's recommendations as approved by the Architect. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces. Do not prime backer-rod.

- G. Use masking tape where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears.

3.04 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions and ASTM C1193.
- B. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
 - 1. Keep face of sealant recessed 1/8 IN from surface of joint.
 - 2. Minimum joint size: 1/4 IN x 1/4 IN.
 - 3. Joints 1/4 IN to 1/2 IN wide: Depth equal to width.
 - 4. Joints over 1/2 IN wide: Depth equal to 1/2 width.
- C. Joint backing:
 - 1. When using backup of tube or rod stock, avoid lengthwise stretching of the material.
 - 2. Do not twist, braid, puncture, or tear joint fillers.
 - 3. Remove absorbent joint fillers which have become wet prior to sealant application and replace with dry material.
 - 4. For installation of backup material, provide a blunt-surfaced tool of wood or plastic, having shoulders designed to ride on the adjacent finished surface and a protrusion of the required dimensions to assure uniform depth of backup material below the sealant.
 - 5. Do not, under any circumstance, use a screwdriver or similar tool for this purpose.
 - 6. Using the approved tool, smoothly and uniformly place the backup material to the depth indicated on the Drawings or otherwise required, compressing the backup material 25% to 50% and securing a positive fit.
- D. Bond-breaker tape: Install tape where adhesion of sealant to surfaces at back of joints would result in sealant failure and other locations where recommended by the manufacturer of the sealant, adhering strictly to the manufacturers' installation recommendations.
- E. Sealant:
 - 1. Apply sealant under pressure with power-actuated hand gun or manually-operated hand gun, or by other appropriate means.
 - 2. Use guns with nozzle of proper size, and providing sufficient pressure to completely fill the joints as designed.
 - 3. Install sealant free of air pockets, foreign embedded matter, ridges and sags.
 - 4. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- F. Tooling:
 - 1. Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads with slightly concave surface, to eliminate air pockets and to ensure contact and adhesion of sealant with sides of joint.
 - 2. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

3.05 CLEANING

- A. Remove masking tape and protective coatings immediately after tooling joints without disturbing joint seal.
- B. Clean off excess sealants or sealant smears adjacent to joints as the installation progresses, using solvent or cleaning agent recommended by the manufacturer of the sealant used.
- C. Upon completion of the work of this Section, promptly remove from the job site all debris, empty containers, and surplus material derived from this portion of the Work.

3.06 PROTECTION

- A. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at the time of Substantial Completion.
- B. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new materials to produce joints sealer installation with repaired areas indistinguishable from original work.

END OF SECTION

08 11 77
BULLET-RESISTANT STEEL DOORS & FRAMES

1.0 GENERAL

1.01 SUMMARY

- A. Provide bullet-resistant steel door and frame assemblies where shown on the Drawings, as specified herein and as needed for a complete and proper installation.
- B. Related work:
 - 1. Section 08 56 67: Bullet-Resistant Steel Transaction Windows.
 - 2. Section 08 56 71: Bullet-Resistant Steel Windows.
 - 3. Section 08 71 00: Door Hardware.
 - 4. Section 09 91 00: Painting; Field finishing.

1.02 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 00.
- B. Submit:
 - 1. Manufacturer's specifications and other data needed to prove compliance with the specified requirements, including bullet resistant ratings.
 - 2. Shop Drawings showing door and frame profiles and sizes, type and spacing of frame anchors, reinforcement size and locations, details of joints and connections, and welding details.
 - 3. Schedule of doors and frames using same reference numbers for details and openings as those on the Contract Drawings.
- C. Closeout submittals:
 - 1. Maintenance data: Include instructions for cleaning of glazed panels.

1.03 REFERENCES

- A. ASTM A1008/A1008M: Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
- B. AWS D1.3/D1.3M: Structural Welding Code-Sheet Steel.
- C. UL 752: Bullet Resistant Equipment.

1.04 SYSTEM DESCRIPTION

- A. Design requirements: Provide door and frame assemblies of "non-ricochet type" intended to permit capture and retention of attacking projectile, lessening potential of random injury or lateral penetration.

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Provide hardware templates to door and frame assembly manufacturer for preparation of door and frame units to receive hardware other than hinges.

1.06 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Unless specifically otherwise approved by the Architect, provide all products of this Section from a single manufacturer.
- C. Door and frame assemblies: Ballistic Level 7, tested to UL 752.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent provisions of Section 01 60 00.
- B. Deliver steel door and frame assemblies cartoned or crated to provide protection during transit and site storage.
- C. Store door and frame assemblies upright in protected, dry area, off ground or floor, with at least 1/4 IN space between individual units.
- D. Do not cover with non-vented coverings that create excessive humidity.
- E. Remove wet coverings immediately.

2.0 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable products:
 - 1. As manufactured by Armortex, Schertz, Texas, Tel. 800-880-8306, Web www.armortex.com.
 - 2. Equal products of other manufacturers approved in advance by the Architect.

2.02 MATERIALS

- A. Steel sheet:
 - 1. ASTM A1008/A1008M, cold-rolled, free from scale, pitting, coil breaks, and other surface defects.
- B. Bullet-resistant composite (ballistic level 1-3 doors only): UL Listed bullet-resistant composite by ARMORTEX, of UL ballistic level equal to specified door and frame ballistic protection level.
- C. Ballistic steel (ballistic level 4-8 doors only): Hi-hard ballistic steel, of UL ballistic level equal to specified door and frame ballistic protection level.

2.03 OTHER MATERIALS

- A. Hinges: Provide an aluminum continuous gear type hinge for each door/frame.
- B. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

2.04 FABRICATION

- A. Doors:
 - 1. Fabricate with 16 gage steel face plates, foam insulation, and core of bullet-resistant composite for ballistic level 1-3 doors or ballistic steel for ballistic level 4-8 doors.
 - 2. Weld 16 gage rails and stiles to face plates with flush surface on all edges.
 - 3. Factory hang doors in frames using specified hinges.
 - 4. Mortise and reinforce doors and frames at factory to receive hardware in accordance with approved hardware schedule.
 - 5. Vision panels (where shown on Door Schedule): Clear glazing material of same ballistic level as door and frame assembly.
- B. Frames:
 - 1. Same ballistic protection as doors.
 - 2. Fabricate from 16 gage steel lined with bullet-resistant composite for ballistic level 1-3 frames or ballistic steel for ballistic level 4-8 frames.
 - 3. Weld frame corners; knock-down and mechanical joints are not acceptable.
- C. Welding: In accordance with AWS D1.3/D1.3M. Grind exposed welds flush and smooth.
- D. Finish work neat and free from defects.
- E. Allowable tolerances: +/-1/16 IN for frame opening width, height, diagonal dimensions, and overall width and height (outside to outside).

2.05 FINISHES

- A. Steel:
 - 1. Dress tool marks and surface imperfections to smooth surfaces.
 - 2. Clean and chemically treat steel surfaces.
 - 3. Apply manufacturer's standard rust inhibiting gray primer paint.

3.0 EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Verify that opening sizes and tolerances are acceptable.

3.02 INSTALLATION

- A. Install door and frame assemblies in accordance with manufacturer's instructions and approved Shop Drawings.
- B. Set plumb, square, and level.
- C. Secure to adjacent construction using fastener type best suited to application.
- D. Drill and tap for surface-mounted hardware in field. Install hardware in accordance with Section 08 71 00 Door Hardware.
- E. Field alterations to door and frame assemblies other than drilling and tapping for surface-mounted hardware is not permitted unless approved in advance by manufacturer and Architect.

3.03 TOUCHUP AND ADJUST

- A. Touch up minor scratches and abrasions in primer paint to match factory finish.
- B. Adjust doors to swing freely, without sticking or binding.

END OF SECTION

BULLET-RESISTANT STEEL TRANSACTION WINDOWS

- 1.0 GENERAL
- 1.01 SUMMARY
 - A. Provide bullet-resistant fixed steel transaction windows including passive voice speaker, counter and recessed deal tray where shown on the Drawings, as specified herein and as needed for a complete and proper installation.
 - B. Related work:
 - 1. Section 08 11 77: Bullet-Resistant Steel Doors & Frames.
 - 2. Section 08 88 56: Bullet-Resistant Glazing.
 - 3. Section 09 91 00: Painting; Field finishing.
- 1.02 SUBMITTALS
 - A. Comply with pertinent provisions of Section 01 33 00.
 - B. Submit:
 - 1. Manufacturer's specifications and other data needed to prove compliance with the specified requirements, including bullet resistant ratings.
 - 2. Shop Drawings showing window profiles and sizes, type and spacing of frame anchors, reinforcement size and locations, details of joints and connections, and welding details.
 - 3. Schedule of windows using same reference numbers for details and openings as those on the Contract Drawings.
 - C. Closeout submittals:
 - 1. Maintenance data: Include instructions for cleaning of glazed panels.
- 1.03 REFERENCES
 - A. ASTM A1008/A1008M: Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - B. AWS D1.3/D1.3M: Structural Welding Code-Sheet Steel.
 - C. UL 752: Bullet Resistant Equipment.
- 1.04 SYSTEM DESCRIPTION
 - A. Design requirements: Provide window frames of "non-ricochet type" intended to permit capture and retention of attacking projectile, lessening potential of random injury or lateral penetration.
 - B. Two-way 'natural voice' communication permitted by design of vertical side frames and glazing technique.
- 1.05 QUALITY ASSURANCE
 - A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
 - B. Unless specifically otherwise approved by the Architect, provide all products of this Section from a single manufacturer.
 - C. Transaction window assemblies: Ballistic Level 7, tested to UL 752.
- 1.06 DELIVERY, STORAGE AND HANDLING
 - A. Comply with pertinent provisions of Section 01 60 00.
 - B. Deliver transaction window assemblies cartoned or crated to provide protection during transit and site storage.
 - C. Store transaction window assemblies upright in protected, dry area, off ground or floor, with at least 1/4 IN space between individual units.
 - D. Do not cover with non-vented coverings that create excessive humidity.
 - E. Remove wet coverings immediately.

2.0 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable products:
 - 1. As manufactured by Armortex, Schertz, Texas, Tel. 800-880-8306, Web www.armortex.com.
 - 2. Equal products of other manufacturers approved in advance by the Architect.

2.02 MATERIALS

- A. Steel sheet:
 - 1. ASTM A1008/A1008M, cold-rolled, free from scale, pitting, coil breaks, and other surface defects.
- B. Bullet-resistant composite (ballistic level 1-3 windows): UL Listed bullet-resistant composite by ARMORTEX, of UL ballistic level equal to specified frame ballistic protection level.
- C. Ballistic steel (ballistic level 4-8 windows): Hi-hard ballistic steel, of UL ballistic level equal to specified frame ballistic protection level.
- D. Glazing:
 - 1. UL Listed laminated glass, glass/polycarbonate composite, glass-clad polycarbonate, multi-ply polycarbonate, or acrylic polycarbonate composite as required by ballistic level specified. See Section 08 88 56 of these Specifications.
 - 2. Bottom edge of glazing panel provided with 18 gage stainless steel cap.

2.03 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

2.04 FABRICATION

- A. Frames:
 - 1. Fabricate from 16 gage steel lined with cores of bullet-resistant composite for ballistic level 1-3 windows or ballistic steel for ballistic level 4-8 windows.
 - 2. Bullet-resistant rating equivalent to or greater than glazing.
 - 3. Weld frame corners; knock-down and mechanical joints are not acceptable.
 - 4. Vertical mullion: 3 IN wide x 1 IN deep with 1 x 1 IN glazing stops.
 - 5. Frame modules capable of being joined with other frame modules to form continuous line.
 - 6. Replacement of glazing from secure side of window, not requiring removal of frame from opening.
- B. Shelf: MIN 2 IN thick with recessed deal tray, full width of window x MIN 12 IN deep on threat side of window, deal tray centered under glazing, covered with high pressure laminate in color selected.
- C. Non-ricochet deal tray: Model RMDT 1016, 16 gage stainless steel, 10 x 16 IN to outside edge of flanges, clear 1-5/8 IN open depth under glazing.
- D. Passive voice speaker: Model SP-SS-PV-CB, 7 IN DIA stainless steel faceplate, offset plates of laminated polycarbonate for ballistic level 1-3 or prime painted Hi-Ballistic steel for ballistic level 4-8, contraband baffle, tamper-proof screws, for 4 IN DIA hole in glazing.
- E. Welding: In accordance with AWS D1.3/D1.3M. Grind exposed welds flush and smooth.
- F. Finish work neat and free from defects.
- G. Allowable tolerances: +/-1/16 IN for frame opening width, height, diagonal dimensions, and overall width and height (outside to outside).

2.05 FINISHES

- A. Steel:
 - 1. Dress tool marks and surface imperfections to smooth surfaces.
 - 2. Clean and chemically treat steel surfaces.
 - 3. Apply manufacturer's standard rust inhibiting gray primer paint.
- B. Stainless steel: No. 3 brushed finish.

3.0 EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Verify that opening sizes and tolerances are acceptable.

3.02 PREPARATION

- A. Coat inside of frames to be installed in masonry or concrete walls or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

- A. Install window assemblies in accordance with manufacturer's instructions and approved Shop Drawings.
- B. Set plumb, square, and level.
- C. Secure to adjacent construction using fastener type best suited to application.
- D. Field alterations to window assemblies are not permitted unless approved in advance by manufacturer and Architect.

3.04 TOUCHUP

- A. Touch up minor scratches and abrasions in primer paint to match factory finish.

END OF SECTION

08 71 00
DOOR HARDWARE

1.0 GENERAL

1.01 SUMMARY

- A. Furnish and install finish hardware specified herein and as needed for a complete and proper installation.
- B. Related work:
 - 1. Section 06 41 16: Plastic Laminate Clad Architectural Cabinets: Cabinet hardware.
 - 2. Section 08 11 77: Bullet Resistant Steel Doors & Frames.

1.02 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 00.
- B. Submit:
 - 1. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
 - 2. Hardware schedule:
 - a. Include complete hardware for each door opening.
 - b. Indicate door location, size, hand, bevel, thickness, swing, and other attributes.
 - c. Provide product data for each item.
 - d. Prepare schedule listing doors according to door and room numbers designated on the Drawings.
- C. Templates: In a timely manner to assure orderly progress of the Work, deliver templates or physical samples of the approved finish hardware items to pertinent manufacturers of interfacing items such as doors and frames.

1.03 REFERENCES

- A. ANSI A117.1: American National Standard for Accessible and Usable Buildings and Facilities.
- B. ANSI 156.10: Power Operated Pedestrian Doors.
- C. ANSI 156.19: Power Assist and Low-Energy Power-Operated Doors.
- D. ASTM C920: Standard Specification for Elastomeric Joint Sealants.
- E. DHI Processing Hardware for Custom Aluminum Entrances.
- F. DHI Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames.
- G. DHI Recommended Locations for Architectural Hardware for Flush Wood Doors.
- H. NFPA 80: Standard for Fire Doors and Other Opening Protectives.
- I. NFPA 101 Life Safety Code.
- J. Texas Civil Statutes, Article 9102, Architectural Barriers Act-Texas Accessibility Standards.
- K. UL: Building Materials Directory; Underwriters Laboratories Inc.

1.04 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Provide and locate finish hardware in accordance with Texas Civil Statutes, Article 9102, Architectural Barriers Act, Texas Accessibility Standards (TAS).

1.05 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent provisions of Section 01 60 00.
- B. Individually package each unit of finish hardware, complete with proper fastenings and appurtenances; label and identify each package with door opening code to match hardware schedule.

1.06 COORDINATION

- A. Check the hollow metal shop drawings to assure proper function and operation of the various openings.
- B. Furnish templates for door and frame preparation.
- C. Coordinate Owner's keying requirements during the course of the Work.

1.07 MAINTENANCE

- A. Provide special wrenches and tools applicable to each different or special hardware component.
- B. Provide maintenance manuals, tools and accessories supplied by hardware component manufacturer.
- C. Deliver to Owner upon Substantial Completion:
 - 1. Copy of approved hardware schedule.
 - 2. Keying list.
 - 3. Keys; tag and identify with mark corresponding with keying schedule.
- D. Maintenance service: Perform detailed inspection of door hardware approximately six (6) months after Substantial Completion.
 - 1. Re-adjust every item of hardware and function of doors.
 - 2. Consult with and instruct Owner's personnel in recommended modifications and additions to maintenance procedures.
 - 3. Replace deteriorated or failed hardware items.
 - 4. Prepare written report of current and predictable problems in performance of hardware.

2.0 PRODUCTS

2.01 GENERAL

- A. Fasteners:
 - 1. Furnish necessary screws, bolts, and other fasteners of suitable size and type to anchor the hardware in position for long life under hard use.
 - 2. Where necessary, furnish fasteners with toggle bolts, expansion shields, sex bolts, and other anchors approved by the Architect, according to the material to which the hardware is to be applied and according to the recommendations of the hardware manufacturer.
 - 3. Provide fasteners which harmonize with the hardware as to finish and material.
- B. Where butts are required to swing 180°, furnish butts of sufficient throw to clear the trim.
- C. Furnish silencers for door frames at the rate of three (3) for each single door and two (2) for each door in a pair of doors; except weatherstripped doors and doors with light seals or sound seals.

2.02 MATERIAL REQUIREMENTS FOR HANDICAP ACCESSIBILITY

- A. Thresholds at doorways: Thresholds at doorways shall not exceed 3/4 IN in height for exterior sliding doors or 1/2 IN for other types of doors. Raised thresholds and floor level changes at accessible doorways shall be beveled with a slope no greater than 1:2.
- B. Door hardware: Handles, pulls, latches, locks and other operating devices on accessible doors shall have a shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist to operate. Lever-operated mechanisms, push-type mechanisms, and U-shaped handles are acceptable designs. When sliding doors are fully open, operating hardware shall be exposed and usable from both sides. Hardware required for accessible door passage shall be mounted no higher than 48 IN AFF.
- C. Door closers: If a door has a closer, then the sweep period of the closer shall be adjusted so that from an open position of 70°, the door will take at least 3 seconds to move to a point 3 IN from the latch, measured to the leading edge of the door.
- D. Door opening force: The maximum force for pushing or pulling open a door shall be as follows:
 - 1. Fire doors shall have the minimum opening force allowable by the appropriate administrative authority.

2. Other doors:
 - a. Exterior hinged doors: Reserved.
 - b. Interior hinged doors 5 LBF
 - c. sliding or folding doors: 5 LBF

These forces do not apply to the force required to retract latch bolts or disengage other devices that may hold the door in a closed position.

- E. Automatic doors and power-assisted doors: If an automatic door is used, then it shall comply with ANSI/BHMA A156.10-1985. Slowly opening, low-powered, automatic doors shall comply with ANSI A156.19-1984. Such doors shall not open to back check faster than 3 seconds, and shall require no more than 15 LBF to stop door movement. If a power-assisted door is used, its door-opening force shall comply with Paragraph D above and its closing shall conform to the requirements in ANSI A156.19-1984.

2.03 KEYING

- A. All locks to be keyed and masterkeyed "Best" Hardware to match existing masterkey system.
- B. Furnish two (2) keys for each lock and twelve (12) masterkeys.
- C. Construction keying:
 1. Furnish a construction masterkey system with 15 keys for locks and cylinders.
 2. Use only the construction keys during construction.
 3. Upon Substantial Completion of the Work, as that Date is established by the Architect, void the construction key system and, in the presence of the Architect, demonstrate that the specified keying system is operating properly.

2.04 GENERAL REQUIREMENTS FOR HARDWARE PRODUCTS

- A. Provide products that comply with applicable provisions of the following:
 1. Federal, State and local codes.
 2. ANSI A117.1.
 3. NFPA 101.
 4. Fire rated doors; NFPA 80.
 5. All hardware on fire rated doors; listed and classified by UL as suitable for the purpose specified and indicated.
- B. Single source for items: To the maximum extent practicable, furnish similar items (such as "door butts") only as the product of a single manufacturer (such as "McKinney").
- C. For each of the required items of finish hardware, provide from the specified manufacturer or from an acceptable substitute approved in advance by the Architect.
- D. Finish: All hardware shall be US32D; satin chrome, aluminum or similar.

2.05 ACCEPTABLE PRODUCTS

- A. Butts/Hinges: Provided and installed by door/frame manufacturer.
- B. Locksets:
 1. Shall be Sargent 8200 series mortise lock with LN Rose and B or J Lever; function 89 Holdback.
- C. Cylinders:
 1. Shall be equal to Best, rim type where applicable.
- D. Electric strikes:
 1. Shall be equal to HES 8000/8300 series.
- E. Closers:
 1. Shall be equal to Sargent 1430/1431 series Powerglide, standard surface mount. Provide size and function required for each door. Provide additional features as scheduled.
- F. Overhead Stops:
 1. Shall be equal to ABH 4400 Series.
- G. Silencers:
 1. Shall be equal to Glenn-Johnson 64.

2.06 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

3.0 EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Verify that doors and frames are ready to receive work and dimensions are as indicated on shop drawings.

3.02 DELIVERIES

- A. Stockpile items sufficiently in advance to assure their availability, and make necessary deliveries in a timely manner to assure orderly progress of the total Work.

3.03 COORDINATION

- A. Coordinate as necessary with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.
- B. Secure templates from manufacturers as required, and distribute to suppliers of doors and other items as required to assure proper fit of mill-installed units.
- C. Distribute finish hardware components to other trades as required, and provide proper direction regarding correct installation and adjustment of all units.

3.04 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
- B. Use templates provided by hardware item manufacturer.
- C. Install hardware on fire-rated doors and frames in accordance with NFPA 80.
- D. Install hardware for barrier free access in accordance with Texas Accessibility Standards (TAS).
- E. Mounting heights for hardware from finished floor to center line of hardware item:
 - 1. For aluminum doors: Comply with Processing Hardware for Custom Aluminum Entrances, Door Hardware Institute.
 - 2. For steel doors: Comply with Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames, Door Hardware Institute.
 - 3. For wood doors: Comply with Recommended Locations for Architectural Hardware for Flush Wood Doors, Door Hardware Institute.

3.05 ADJUSTING AND REPAIR

- A. Upon completion of installation of finish hardware, and as a condition of its acceptance, make a complete inspection of all installed items.
- B. Adjust hardware for smooth operation.
- C. Tighten screws and fasteners as necessary.
- D. Test barrier free doors for maximum 5 LB opening force, make required adjustments and achieve optimum operation.
- E. Repair scratches and abrasions or if unrepairable, replace such damaged item with new identical item at no additional cost to the Owner.

3.06 PROTECTION

- A. Do not permit adjacent work to damage hardware or finish.

3.07 FINISH HARDWARE SCHEDULE

- A. Furnish the following hardware:
 - 1. Interior single doors 01, 02 and 03 each shall have:
 - 1 Lockset
 - 1 Cylinder
 - 1 Electric Strike
 - 1 Closer
 - 1 Overhead Stop

Note: Doors/frames 01, 02 and 03 include continuous gear hinges provided by bullet-resistant door manufacturer.

END OF SECTION

08 88 56
BULLET-RESISTANT GLAZING

1.0 GENERAL

1.01 SUMMARY

- A. Provide bullet-resistant glazing where shown on the Drawings, as specified herein and as needed for a complete and proper installation.
- B. Related work:
 - 1. Section 08 56 67: Bullet-Resistant Steel Transaction Windows.
 - 2. Section 08 56 71: Bullet-Resistant Steel Windows.

1.02 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 00.
- B. Submit:
 - 1. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
 - 2. Manufacturer's instructions for preparation, storage, installation and cleaning of bullet-resistant glazing.
 - 3. Shop Drawings indicating cuts and anchor spacing, reinforcement and location, test reports, and current UL Listing verification & UL 752 test results.
 - 4. Samples: Approximately 6 IN x 6 IN sample of bullet-resistant glazing with color and finish selected.

1.03 REFERENCES

- A. ASTM C1036: Standard Specification for Flat Glass.
- B. ASTM C1172: Standard Specification for Laminated Architectural Flat Glass.
- C. ASTM C1349: Standard Specification for Architectural Flat Glass Clad Polycarbonate.
- D. ANSI Z97.1: Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
- E. NIJ Standard 0108.1: Standard for Ballistic Resistant Protective Materials.
- F. UL 752: Standard for Bullet Resisting Equipment.

1.04 DESIGN PERFORMANCE

- A. Through the design, manufacturing techniques and material application, the bullet-resistant glazing shall be constructed of multiple layers of glass/polycarbonate sheets, and obtain a UL 752 Level 7 rating.
- B. Thickness of glazing shall range from 3/4 IN to 2.5 IN thick.

1.05 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Manufacturer qualifications: Company specializing in manufacturing products of the specified type with a minimum of five (5) years documented experience.
- C. Installer qualifications: Company specializing in performing the work of this Section with minimum five (5) years documented experience.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent provisions of Section 01 60 00.
- B. Delivery:
 - 1. Schedule delivery of materials to minimize job site storage and additional handling.
 - 2. Locate crated materials as close to the installation location as possible to reduce additional handling.
 - 3. Deliver the materials to the project with the manufacturer's UL Listed labels intact and legible.
- C. Handling:
 - 1. Handle the materials with care to prevent damage.
 - 2. Reduce handling by scheduling packaging by floors.

- D. Storage:
 - 1. Store crated materials in a cool, dry, shady, well-ventilated area where they will not be subjected to moisture or direct sun.
 - 2. Ensure that total weight of created materials does not exceed capacity of storage location.
 - 3. If not opened immediately, cover crates with waterproof plastic or canvas and allow air circulation under, across the top, and around the side between the containers to minimize risk of condensation.
 - 4. Ensure that crates are secured or positioned in locations that eliminate risk of heavy winds overturning crates.

- 1.07 PROJECT CONDITIONS
 - A. Project conditions (temperature, humidity and ventilation) shall be within the maximum limit recommendations set by the manufacturer. Do not install products that are under

- 1.08 WARRANTY
 - A. All materials shall be warranted against defects for a period of one (1) year from the date of Substantial Completion.
 - B. Certificates of manufacturer's standard limited warranty shall be provided at project completion.

- 2.0 PRODUCTS

- 2.01 MANUFACTURERS
 - A. Acceptable products:
 - 1. As manufactured by Total Security Solutions, Fowlerville, Michigan, Tel. 866-930-7807, Web www.tssbulletproof.com.
 - 2. Equal products of other manufacturers approved in advance by the Architect.

- 2.02 MATERIALS
 - A. Glazing shall be TSS Bullet-Resistant Glass-Clad Polycarbonate Security Glazing.
 - 1. Level 7/8 TSS008: 2.5 IN thick.
 - B. Silicone: Dow 795, Dow 999, GE Silpruf, GE 1200 or other products recommended by glazing manufacturer.
 - C. Glazing gaskets: Tremco Silicone (70D), Tremco EPDM (60, 70D), or other products recommended by glazing manufacturer.
 - D. Tape: Tremco 440 or other products recommended by glazing manufacturer.
 - E. Butyl tape: KPTI 303, Isocryl 5600, or other products recommended by glazing manufacturer.
 - F. Some PVC, EPDM, neoprene gaskets, sealants and setting blocks are NOT compatible with all glazing products and can cause cloudiness and/or delamination: verify compatibility of materials prior to ordering.

- 2.03 OTHER MATERIALS
 - A. Cleaners and detergents: Formula 409, Joy, Windex with Amonia D, Palmolive, VM&P Naphtha Grade, Isopropyl Alcohol, or other products recommended by glazing manufacturer.
 - B. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

- 3.0 EXECUTION

- 3.01 SURFACE CONDITIONS
 - A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
 - B. Prior to installation of glazing material, verify that all supports have been installed as required by the Contract Documents, the Drawings and approved Shop Drawings. Installer shall notify the Architect of any unsatisfactory preparation that is the responsibility of another Installer.

3.02 PREPARATION

- A. Clean and prepare all surfaces per the manufacturer's recommendations for achieving the best results for the substrate under the project conditions.

3.03 INSTALLATION

- A. Install glazing in accordance with manufacturer's instructions, Shop Drawings, and proper glazing techniques as set forth in the GANA Glazing Manual and Sealant Manual.
- B. Follow clearance recommendations to protect all products from excessive pressure or glass-to-metal contact which can cause breakage.
 - 1. Face clearance: 1/8 IN.
 - 2. Edge clearance: 3/8 IN.
 - 3. Bite clearance: 1 IN.
- C. Install setting blocks not less than 4 IN long and slightly wider than the glazing at quarter points.
- D. Incorporate a weep system into exterior glazing systems.
- E. During glazing, protect product surfaces from paint, plaster, chemical splash, or welding splatters.

3.04 INSPECTION AND CLEANING

- A. Verify installation is complete and complies with manufacturer's requirements.
- B. Clean glass/polycarbonate glazing and accessories promptly after installation in strict accordance with manufacturer's instructions.
 - 1. Uniformly apply a mild solution of soap and water or a non-abrasive commercial window washing solution to the surface using applicator methods.
 - 2. Remove all liquid from the surface with a soft flannel or cotton cloth immediately following the application of the cleaning solutions.
 - 3. Exercise care to ensure that no metal, sand or foreign particles become trapped between the cloth and the substrate which can mar and damage the glazing.
 - 4. Do not use abrasive or highly alkaline cleaners, Benzene, gasoline, acetone, MEK or carbon tetrachloride or methods that could damage glass/polycarbonate glazing.
 - 5. All cleaning solutions should be dried from the window gaskets and sealants to avoid the potential for deterioration as a result of the cleaning process.
- C. Remove excess sealant, labels from protective covers.
 - 1. Do not use razor blades or squeegees to clean hard to remove substances.
- D. Clean both faces of glazing again within 4 days of inspections intended to establish date of Substantial Completion.

3.05 PROTECTION

- A. Where polycarbonate surfaces are exposed to direct sunlight, remove masking to prevent staining or shadows, and recover with plastic film taped to frames.
- B. Protect installed glazing from damage during construction.
- C. Protect installed glazing from contact with contaminating substances resulting from construction operations.
- D. Remove and replace glazing which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents, and vandalism.

END OF SECTION

09 29 00
GYPSUM BOARD

1.0 GENERAL

1.01 SUMMARY

- A. Provide metal studs, gypsum board and accessories where shown on the Drawings, as specified herein and as needed for a complete and proper installation.
- B. Related work:
 - 1. Section 05 41 00: Structural Metal Stud Framing (at all bullet-resistant panels).
 - 2. Section 07 84 00: Firestopping.
 - 3. Section 07 92 00: Joint Sealants.
 - 4. Section 10 26 41: Bullet-Resistant Panels.

1.02 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 00.
- B. Submit:
 - 1. Materials list of items proposed to be provided under this Section.
 - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
 - 3. Manufacturer's instructions regarding applicable temperature and humidity ranges, special procedures, and perimeter conditions requiring special attention.

1.03 REFERENCES

- A. ASTM C475: Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
- B. ASTM C645: Standard Specification for Nonstructural Steel Framing Members.
- C. ASTM C754: Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- D. ASTM C840: Standard Specification for Application and Finishing of Gypsum Board.
- E. ASTM C919: Standard Practice for Use of Sealants in Acoustical Applications.
- F. ASTM C954: Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs.
- G. ASTM C1002: Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- H. ASTM C1396: Standard Specification for Gypsum Board.
- I. GA-216: Recommended Specifications for the Application and Finishing of Gypsum Board.
- J. GA-600: Fire Resistance Design Manual.

1.04 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Single source responsibility: Except where specified otherwise, obtain gypsum board products, trim, joint treatment, and accessories from single manufacturer or from manufacturers recommended by prime manufacturer of gypsum board products.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent provisions of Section 01 60 00.
- B. Deliver materials to site promptly without undue exposure to weather.
- C. Deliver materials in manufacturer's original unopened containers or bundles, fully identified with name, brand, type and grade.
- D. Store materials above ground in dry, ventilated space.
- E. Protect materials against soiling or damage from weather, direct sunlight, surface contamination, corrosion, construction traffic and other causes. Remove wet gypsum board from Project site.
- F. Store and support gypsum board in flat stacks to prevent sagging.
- G. Handle gypsum boards to prevent damage to edges, ends and surfaces. Do not bend or otherwise damage metal corner beads and trim.

1.06 PROJECT CONDITIONS

- A. In cold weather, the building should be heated to maintain a uniform temperature in the range of 50°F to 70°F for 48 HRS prior to commencing the application of the gypsum board and joint treatment, and until joint and finishing compounds have dried thoroughly.
- B. Ventilate building spaces to remove moisture in excess of that required for drying joint treatment materials after its application. Avoid drafts during hot, dry weather to prevent materials from drying too rapidly.

2.0 PRODUCTS

2.01 GYPSUM WALLBOARD AND ACCESSORIES

- A. General:
 - 1. Provide products and materials manufactured by United States Gypsum Company, Dallas, Texas, Tel. 214/490-0771, or equal products of other manufacturers approved in advance by the Architect.
 - 2. Provide gypsum board in 48 IN widths and maximum available lengths to minimize end-to-end butt joints, with tapered edges and square cut ends, complying with ASTM C1396.
- B. Gypsum board:
 - 1. Fire-retardant gypsum board (typical all locations): Provide 5/8 IN thick Firecode Core Type X Wallboard complying with ASTM C36.
 - 2. Moisture and mold-resistant gypsum board: Provide 5/8 IN thick moisture- and mold-resistant gypsum core wallboard complying with ASTM C630 on all walls in janitor closets, toilet rooms, drying areas, locker rooms, and similar damp locations.
- C. Accessories:
 - 1. Fastening devices:
 - a. Self-drilling, self-tapping, bugle head screws complying with ASTM C954 and ASTM C1002, length to suit application, cadmium plated for exterior locations.
 - b. Type S screws for 21 to 26 gage metal framing and furring.
 - c. Type S-12 screws for 12 to 20 gage metal framing and furring.
 - d. Type G screws for gypsum board to gypsum board.
 - e. Type W screws for wood framing; nails not permitted.
 - 2. Casing Bead: Provide USG 200 Series.
 - 3. Control Joints: Provide USG No. 093 zinc control joint.
 - 4. Corner Bead: Provide USG 100 Series Dur-A-Bead.
 - 5. Compressible filler: 3.5 PCF mineral wool insulation, compressed to 7.0 PCF MIN.

2.02 METAL STUDS AND ACCESSORIES

- A. General:
 - 1. Provide C-shaped studs, channel shaped runners, and furring channels complying with ASTM C645.
 - 2. Provide with galvanized coating complying with ASTM A525, G40 thickness unless otherwise specified; rolled channels used in ceilings may be finished with manufacturer's standard rust inhibitive paint.
 - 3. At exterior walls and showers, provide galvanized coating with G60 thickness.
 - 4. Provide bracing members of same size as studs.
- B. At all interior partitions unless otherwise specified below or noted on the Drawings, provide 3-5/8 IN x 25 gage standard punched steel studs.
- C. At all interior partitions that extend to roof deck, are scheduled to receive ceramic tile or FRP panels over backer board, or noted on the Drawings, provide 3-5/8 IN x 20 gage standard punched steel studs.
- D. At interior wall furrings adjacent to structural columns and roof drain piping, provide 2-1/2 IN or 3-5/8 IN x 25 gage standard punched steel studs.
- E. At all interior metal stud framed openings, provide 3-5/8 IN x 20 gage standard punched steel studs, double studs at jambs, boxed stud headers at openings greater than 40 IN wide.

- F. Wall stud runners: Provide channel shaped members with 1-1/4 IN flanges, solid web, and same sheet metal thickness as wall studs.
- G. Extended leg ceiling runners: Provide channel shaped members, with MIN 2 IN flanges, solid web, and same sheet metal thickness as wall studs.
- H. Accessories, plates, gussets, clips: Provide formed sheet steel, thickness as indicated on the Drawings or determined for conditions encountered; same finish as framing members.
- I. Fasteners:
 - 1. Provide fasteners of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel framing and furring members securely to substrates involved.
 - 2. Comply with the gypsum board manufacturer requirements for indicated applications.

2.03 JOINTING SYSTEM

- A. Provide a jointing system, including paper reinforcing tape and ready-mixed joint compound complying with ASTM C475, designed as a system to be used together and as recommended for this use by the manufacturer of the gypsum board approved for use on this Work.
- B. Jointing compound:
 - 1. Compounds specifically manufactured for topping coats are not permitted for first coat on metal trim and taping.
 - 2. Mix compounds in strict accordance with manufacturer's directions.
 - 3. Mix only enough compound at one time to be used during recommended pot life.

2.04 OTHER MATERIALS

- A. Backer plates:
 - 1. Type: 14 gage uncoated metal thickness steel sheet, galvanized in accordance with ASTM A525 G60.
 - 2. Length: Sufficient to extend to nearest studs beyond MAX dimension of attached item and engage fasteners from attached item; span 3 studs MIN.
 - 3. Height: 6 IN MIN or higher where required to accommodate item being fastened.
 - 4. When manufacturer of attached item has more rigorous mounting plate requirements, comply with manufacturer's requirements.
- B. Provide acoustical sealant for concealed locations equal to BA-98 Acoustical Sealant as manufactured by Pecora Corporation, and with the following attributes:
 - 1. Non-hardening, non-drying, non-skinning, non-staining, non-bleeding, non-sag synthetic rubber.
 - 2. Capable of maintaining air-tight seal.
 - 3. For use in concealed locations not exposed to view.
 - 4. Specifically manufactured as acoustical sealant.
- C. Galvanizing touchup paint: Provide paint complying with FS TT-P-641, zinc oxide type.
- D. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

3.0 EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Verify rough-in utilities and blocking are in proper position.

3.02 PREPARATION

- A. Items which require backer plates or blocking:
 - 1. Coordinate sizes and locations.
 - 2. Install additional studs for attachment of backer plates and blocking in required locations to receive surface mounted accessories as indicated or as required by accessory manufacturer.
 - 3. Elimination of backer plates and blocking is not permitted.
 - 4. Direct attachment of items to studs is not permitted.

3.03 FRAMING INSTALLATION

A. General:

1. Install framing in accordance with ASTM C754, manufacturer's printed instructions, the Drawings, local authorities having jurisdiction, and with requirements of ASTM C840 that apply to framing installation, except for more stringent requirements of these Specifications.
2. Accurately layout partition and wall lines from the dimensions shown on the Drawings.
3. Install framing plumb, level, square, and free from warp and twist while maintaining dimensional tolerances and alignment with surrounding construction.
4. At interior partitions indicated on the Drawings to receive batt insulation, install acoustical sealant in accordance with manufacturer's instructions and ASTM C919.
 - a. Place one bead continuously on substrate before installation of perimeter framing members.
 - b. Place continuous bead at perimeter of each layer of gypsum board.
 - c. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes.
5. Touchup damaged galvanized surfaces with touchup paint.

B. Studs and runners:

1. Stud spacing: Unless otherwise indicated, provide studs spaced 16 IN OC.
2. Runner tracks: Provide continuous tracks sized to match studs.
3. Terminate top of partitions 6 IN above ceiling construction and brace to structure unless otherwise indicated.
4. Where partitions are indicated to extend to roof deck, to prevent deflection transfer of structural loads or movements to partitions, provide slip joint between partition and structure using top runner nested within 3 IN long segment of extended leg ceiling runner positioned at stud spacing (or continuous extended leg ceiling runner) and fastened to overhead surface. Do not fasten top runner to extended leg ceiling runner.
5. Horizontally align openings in stud webs.
6. Use full length studs vertically positioned between runner tracks.
7. Minimum framing at openings:
 - a. Provide two 20 gage studs at each jamb.
 - b. Provide one additional stud not more than 6 IN from jamb studs.
 - c. Provide wall framing above and below openings to match wall framing adjoining the opening. Above door openings, provide cut-to-length studs adjacent to full-height jamb studs at each jamb.
 - d. At welded frames with fixed anchor clips, secure studs to jamb anchor clips with not less than two self tapping screws per clip.
 - e. Above welded frames, provide a horizontal cut-to-length section of runner track with a web-flange bend at each end, securely screw attached to the adjacent vertical studs. Provide built-up header composed of two horizontal boxed studs and additional runner tracks as required by width of opening to support weight of partition above opening.
8. Fabricate corners with a MIN of three studs.
9. Provide additional studs and framing to support wall intersections, termination of walls, at openings and cut-outs and to support built-in anchorage and attachment devices for other work.
10. Locate studs no more than 2 IN from abutting walls, wall corners and other construction. Start typical wall studs 6 IN either side of stud reinforcing or frames.
11. Install steel studs so that flanges point in the same direction and so that leading edges or ends of gypsum board can be attached to open (unsupported) edges of stud flanges first.

C. Backer plates:

1. Provide backer plate for securing surface mounted fittings, fixtures, accessories, and furnishings, including, but not limited to handrails, grab bars, toilet partitions, towel bars, wall mounted door stops, bumper guards, and similar screw- and bolt-fastened items.
2. Secure with sufficient quantity of self-tapping sheet metal screws to sustain loads imposed by items attached to backer plates.

- D. Blocking: Coordinate with Section 06 10 00 for installation of concealed wood blocking and furring required for securing wood trim, carpentry, woodwork, cabinets, millwork, casework, surface mounted equipment, and similar nail-fastened items.

3.04 GYPSUM BOARD INSTALLATION

A. General:

1. Install gypsum board in accordance with ASTM C840, manufacturer's instructions, the Drawings and these Specifications. MAX variation of finished gypsum board surface from true flatness shall be 1/8 IN in 10 FT in any direction.
2. Install gypsum board in accordance with GA-216, GA-600 for fire-rated assemblies.
3. Install gypsum board with face side out.
4. Use boards of maximum length to minimize end joints.
5. Abut boards without forcing; neatly fit ends and edges of board with gap between adjacent panels no greater than 1/16 IN.
6. Position boards so that like edges abut; tapered edges against tapered edges and field-cut or mill-cut edges against field-cut or mill-cut edges.
7. Hold bottom of board 1/4 IN above floor.
8. Support ends and edges of board directly on framing or furring members.
9. Joint staggering:
 - a. Ceilings: Stagger end joints not less than one framing member.
 - b. Walls: Stagger vertical joints on opposite side of walls to occur on alternate framing members.
 - c. Walls over bullet-resistant panels: Stagger vertical joints with vertical joints of bullet-resistant panels.
 - d. Fire-rated assemblies: Comply with fire-rated assembly design requirements for joint staggering.
10. Do not locate gypsum board joints within 12 IN of external corners of windows, doors, or other such openings, except when control joints are installed at corners.
11. Cut openings in board with no greater than 1/4 IN gap around electrical outlets, plumbing, light fixtures, piping and other similar penetration items and small enough to be covered by plates and escutcheons; coordinate size of gap around penetrations in fire-rated assemblies with firestop requirements of Section 07 84 00.
12. Do not install imperfect, damaged, or damp boards.
13. In concealed spaces above ceilings where designated walls extend full height to structure above, install boards in full coverage on both faces of framing system for fire, sound, air, and smoke-rated walls.
14. Fit gypsum board around ducts, pipes, and conduits.
15. Where walls intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum board to fit profile formed by structural member; allow 1/4 to 1/2 IN wide joints to install sealant.
16. In concealed spaces and chase walls where gypsum board occurs on outside face of walls only, fasten horizontal studs or 1-1/2 IN wide 20 gage galvanized steel straps to inside face of studs spaced 36 IN OC vertically with top strap no more than 6 IN from top of wall to prevent stud rotation.
17. Attach gypsum board to steel studs so that leading edge or end of each board is attached to open (unsupported) edges of stud flanges first.
18. Attach gypsum board to framing provided at openings and cutouts.
19. Terminate gypsum board on each side of control and expansion joints.

B. Fasteners:

1. Attachment methods:
 - a. Attach gypsum board to framing and furring with screws.
 - b. Attach gypsum board to gypsum board with screws.
2. Except where indicated otherwise or required for fire rated assemblies, space fasteners in compliance with more restrictive requirements of referenced installation standard or manufacturer's requirements.
3. Attach board to supplementary framing and blocking which provide additional support at openings and cutouts.

- C. Ceilings: Place gypsum board with long edge perpendicular to orientation of framing or furring members.
- D. Walls: Install gypsum board vertically in manner which will minimize end-butt joints, unless specific orientation is required by fire-rating design.

3.05 METAL TRIM

- A. General:
 - 1. Install trim flush using longest practical length; miter corners and intersections.
 - 2. Fasten flanges by screws, stapling, or clinching in accordance with manufacturer's instructions.
- B. Install casing beads where edge of gypsum board would be exposed or semi-exposed and where gypsum board abuts dissimilar materials.
- C. Install corner beads at visually-exposed external corners, unless otherwise indicated.
- D. Control joints: Coordinate placement and locations with Architect prior to commencement of work. Install control joints in accordance with the following:
 - 1. Locate at joints of MAX stress, at points of natural weak planes, such as at openings, changes in back-up material, and at corners of offsets in walls exceeding 30 FT in length.
 - 2. In interior partitions at 30 FT OC MAX.
 - 3. In exterior partitions at 20 FT OC MAX.
 - 4. Extend control joints from both corners of door frames to top of wall, vertically aligned with the outer edge of the frame.
 - 5. Extend control joints from both corners window frames to top of wall and bottom of wall, vertically aligned with the outer edge of the frame.
 - 6. Where gypsum board is vertically continuous, as at stairwells and other long vertical wall areas, provide horizontal control joints at each floor level.
 - 7. Locate in ceilings with area exceeding 900 SF, where framing or furring changes direction, and spaced apart not more than 30 FT.
- E. Other metal trim:
 - 1. The Drawings do not purport to show all locations and requirements for metal trim.
 - 2. Carefully study the Drawings and the installation, and provide all metal trim normally recommended by the manufacturer of the gypsum board approved for use in this Work.

3.06 JOINT TREATMENT

- A. General:
 - 1. Inspect areas to be joint treated, verifying that the gypsum board fits snugly against supporting framework.
 - 2. Apply joint treatment to gypsum board joints (both directions); flanges of corner beads, casing beads, and control joints; penetrations; fasteners; surface defects; and elsewhere to prepare surfaces for finishes indicated.
 - 3. Comply with manufacturer requirements for hardening and drying of joint treatment prior to application of succeeding coats.
- B. Internal corners: Treat as specified for joints, except fold the reinforcing tape lengthwise through the middle and fit neatly into the corner.
- C. Embedding compounds:
 - 1. Apply to gypsum board joints and fastener heads in a thin uniform layer.
 - 2. Spread the compound not less than 3 IN wide at joints, center the reinforcing tape in the joint, and embed the tape in the compound. Reinforcing tape shall be properly folded at interior corners and angles to provide a true angle. Then spread a thin layer of compound over the tape.
 - 3. After the treatment has dried, apply a second coat of embedding compound to joints and fastener heads, spreading a thin uniform coat of sufficient width to fill the board taper and feather edge.
 - 4. Sandpaper between coats as required.
 - 5. When thoroughly dry, sandpaper to eliminate ridges and high points.
- D. Finishing compounds:
 - 1. After embedding compound is thoroughly dry and has been completely sanded, apply a coat of finishing compound to joints and fastener heads.

2. Feather the finishing compound to not less than 12 IN wide.
3. When thoroughly dry, sandpaper to obtain a uniformly smooth surface, taking care to not scuff the paper surface of the gypsum board.

3.07 ADJUSTING

- A. Adjust and align metal framing to properly receive final finishes in accordance with required tolerances.
- B. Correct damages, defects, and leave work ready for decoration. Clean compounds from trim. Visible cracks, nail heads, tool marks, waves, distortions, or other similar defects shall not appear in finished work.

3.08 CLEANING

- A. Clean as recommended by manufacturer. Do not use materials or methods which may damage surface or surrounding construction.
- B. Promptly remove joint compound from surfaces not intended to receive compound.

3.09 PROTECTION

- A. Protect finished work.
- B. Protect metal framing so that it will be without any evidence of damage which would be detrimental to finished work.

END OF SECTION

09 30 13
CERAMIC TILING

1.0 GENERAL

1.01 SUMMARY

- A. Provide ceramic tile flooring and base where scheduled on the Drawings, as specified herein and as needed for a complete and proper installation, including selective demolition of existing ceramic tile flooring and base as required for installation of new partitions.

1.02 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 00.
- B. Submit:
 - 1. Samples of tile in the full range of colors available from the proposed manufacturer in the specified size and texture.
 - 2. Samples of grout in the full range of colors available from the proposed manufacturer in the specified grades.
- C. Maintenance data: Include recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.

1.03 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Maintain one (1) copy of "Handbook for Ceramic Tile Installation" published by the Tile Council of America, Inc. (TCA) and ANSI A108 Series/A118 Series on site.
- C. Materials shall be identified on the package with manufacturer's name, type of material, grade and color.
- D. Standards:
 - 1. Prepare surface, set, grout and clean tile in accordance with the following methods described in current edition of the Handbook for Ceramic Tile Installation published by the Tile Council of America, Inc.:
 - a. Walls (toilet and shower): W242 Organic adhesive.
 - 2. Work shall be executed and tested in accordance with current editions of the following standards:
 - a. ANSI A108.1A: Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar.
 - b. ANSI A108.4: Installation of Ceramic Tile with Organic Adhesive or Water Cleanable Tile-Setting Epoxy Adhesive.
 - c. ANSI A108.5: Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
 - d. ANSI A108.6: Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and –Grout Epoxy.
 - e. ANSI A108.10: Installation of Grout in Tilework.
 - f. ANSI A108.11: Interior Installation of Cementitious Backer Units.
 - g. ANSI A118.6: Standard Cement Grouts for Tile Installation.
 - h. ANSI A136.1: Organic Adhesives for Installation of Ceramic Tile.
 - 3. Ceramic tile shall comply with current edition of ANSI A137.1: Standard Specifications for Ceramic Tile.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent provisions of Section 01 60 00.
- B. Deliver to job site and store packaged material in original containers with labels intact.
- C. Prevent damage to materials by water, freezing, or other causes.

1.05 PROJECT CONDITIONS

- A. Maintain temperatures at not less than 50°F in tiled areas during installation, and for seven (7) days after completion unless higher temperatures are required by manufacturer's instructions.

- B. Protection:
 - 1. Protect adjacent surfaces during progress of the work of this Section.
 - 2. Close rooms and spaces to traffic of all types until mortar and grout have set for 72 HRS.
 - C. Observe the manufacturer's recommended safety precautions, including those pertaining to ventilation.
 - D. Illuminate the work area during installation, providing the same level and angle of illumination as will be available for final inspection.
- 1.06 EXTRA STOCK
- A. At completion of the project, deliver to the Owner an extra stock of tile and trim shapes of each type, color, pattern, and size used in the work of this Section, at the rate of approximately five percent (5%) of the amount used in the Work, packaging material securely to prevent damage, and clearly labeled.
- 2.0 PRODUCTS
- 2.01 CERAMIC TILE
- A. Provide Porcelain ceramic tile as manufactured by Fiandre Architectural Surfaces, Fiandre USA, Anaheim, California and Itasca, Illinois, where scheduled on the Drawings, in the following selections and colors.
 - B. Substitutions will not be approved as tile must match existing ceramic tile flooring and base to remain.
 - C. Provide standard trim shapes as required.
 - 1. Provide all caps, stops, returns, trimmers, and other shapes indicated or required to produce a completely finished installation.
 - 2. Except as may be shown otherwise on the Drawings, provide color and finish matching the adjacent tile.
 - D. Tile I-Porcelain ceramic floor field tile:
 - 1. Type: 'Graniti Porcelain Tile' #G-450 (match existing field tile).
 - 2. Pattern: Collezine Granite, unpolished.
 - 3. Size: 12 x 12 IN.
 - 4. Trim: 4 x 8 IN bullnose cove base.
- 2.02 SETTING MATERIALS
- A. Comply with pertinent recommendations contained in the current edition of the Tile Council of America "Handbook for Ceramic Tile Installation".
 - B. Organic Adhesive for wall and base tile:
 - 1. Provide a prepared organic material, ready to use with no further addition of liquid or powder, which cures or sets by evaporation.
 - 2. Comply with ANSI A136.1.
- 2.03 GROUT
- A. Provide grout in colors selected by the Architect from standard colors available from the approved manufacturers.
 - B. Provide grout complying with ANSI A118.6 appropriate to each type of ceramic tile used and type of exposure.
- 2.04 OTHER MATERIALS
- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.
- 3.0 EXECUTION
- 3.01 SURFACE CONDITIONS
- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
 - B. Coordinate with other trades as needed to assure that proper substrata are provided to receive the work of this Section.

- C. Condition of surfaces to receive tile:
 - 1. Verify that grounds, anchors, plugs, recess frames, bucks, electrical work, mechanical work, and similar items in or behind the tile have been installed before proceeding with installation of mortar bed or tile.
 - 2. Verify that surfaces to receive mortar setting bed and tile are firm, dry, clean, and free from oily or waxy films and curing compounds.
 - 3. Seal surface of taped joints on wall surfaces. Prime entire surface in accordance with adhesive manufacturer's recommendation.

3.02 PREPARATION

- A. Protect surrounding work from damage.

3.03 INSTALLATION-GENERAL

- A. General:
 - 1. Install tile, grout and thresholds in accordance with pertinent provisions of ANSI A108.1 through A108.13, manufacturer's instructions, and TCA Handbook recommendations.
 - 2. Maintain minimum temperature limits and installation practices recommended by materials manufacturers.
 - 3. Mix and use proprietary materials in strict accordance with the manufacturers' printed instructions.
 - 4. Do not install tile floors over membrane until the membrane has been tested and accepted.
 - 5. Sound tile after setting. Replace hollow sounding units.
 - 6. Provide tile surfaces clean and free from cracked, chipped, broken, unbonded and otherwise defective units.
 - 7. Allow tile to set MIN 48 HRS prior to grouting.
- B. Limits of tile:
 - 1. Extend tile into recesses, under and behind equipment and fixtures to form a complete covering without interruptions.
 - 2. Cut and fit tile to electrical outlets, piping, fixtures, and other penetrations so that plates, collars, or covers overlap tile; leave sealant joint space around penetration.
 - 3. Terminate tile neatly at obstructions, edges, and corners, without disruption of pattern or joint alignment.
 - 4. Form internal angles square and external angles bullnosed.
- C. Joining pattern:
 - 1. Lay tile in grid pattern unless otherwise indicated on the Drawings or directed by the Architect. Do not interrupt tile pattern through openings.
 - 2. Align joints when adjoining tiles on base, trim, and walls are the same size.
 - 3. Layout tile work, and center the tile fields both directions in each space or on each wall area.
 - 4. Lay out tiles so that all cut tiles occur at inside corners where possible.
 - 5. Adjust to minimize tile cutting.
 - 6. Provide uniform joint widths, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.
 - 7. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so that extent of each sheet is not apparent in finished work.
- D. Provide expansion and control joints where recommended by the current edition of the TCA Handbook.
 - 1. Verify exact locations of joints with the Architect prior to beginning the work of this Section.
- E. Grout tile to comply with referenced installation standards using grout materials specified.
- F. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

3.04 CLEANING

- A. Upon completion of placing and grouting, clean the work of this Section in accordance with recommendations of the manufacturers of the materials used.
- B. Protect metal surfaces, cast iron, and vitreous items from effects of acid cleaning.
- C. Flush surfaces with clean water before and after cleaning.

3.05 PROTECTION

- A. Provide required protection of tile surfaces to prevent damage and wear prior to acceptance of Work by the Owner.

END OF SECTION

09 51 00
ACOUSTICAL CEILINGS

1.0 GENERAL

1.01 SUMMARY

- A. Provide acoustical ceilings with exposed suspension systems where shown on the Drawings, as specified herein and as needed for a complete and proper installation, including modifying existing acoustical ceilings and suspensions systems as required for installation of new partitions.

1.02 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 00.
- B. Submit:
 - 1. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
 - 2. Samples of each type of acoustical material and metal suspension system for approval of the Architect.

1.03 REFERENCES

- A. ASTM C635: Standard Specification for the Manufacture, Performance, and Testing of metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
- B. ASTM C636: Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
- C. ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials.
- D. ASTM E1264: Standard Classification for Acoustical Ceiling Products.

1.04 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Installer qualifications: Installer shall have not less than three (3) years of successful experience in the installation of suspended ceiling systems on projects of similar size and complexity.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent provisions of Section 01 60 00.
- B. Delivery: Deliver materials in original unopened packages, clearly labeled with manufacturer's name, item description, specification number, type, and class as applicable.
- C. Inspection: Promptly inspect delivered materials, file freight claims for damage during shipment, and order replacement materials as required. Any damaged materials shall be promptly removed from the job site.
- D. Storage and protection: Store in manner that will prevent warpage, water damage, or damage of any kind. Prevent interference to/by other trades and any other adverse job conditions due to storage locations or methods.
- E. Handling: Handle in such a manner as to ensure against racking, distortion, or physical damage of any kind.

1.06 PROJECT CONDITIONS

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed.
- B. Locate materials onsite at least 24 HRS before beginning installation to allow materials to reach temperature and moisture content equilibrium.
- C. Maintain uniform temperature of 60-75°F and relative humidity of 65-75% 24 HRS prior to, during and after acoustical unit installation.

- 1.07 WARRANTY
- A. Provide manufacturer's standard ten (10) year panel/fifteen (15) year system warranty against sagging due to moisture contact and relative humidity up to 100%.
- 1.08 EXTRA STOCK
- A. At completion of the project, deliver to the Owner an extra stock of approximately five percent (5%) of each acoustical material installed under this Section, packaging each type of material separately, distinctly marked, and adequately protected against deterioration.
- 2.0 PRODUCTS
- 2.01 "T" GRID SUSPENSION SYSTEM
- A. Provide a complete system of main runners, cross tees, placement tees, wall angles, clips, splices and accessories of every type required for a complete suspended "T" grid system of the arrangements shown on the Drawings. System shall be manufactured of cold roll steel, electrozinc coated, conforming to heavy duty classification of ASTM C635. Exposed surfaces shall be factory painted in manufacturer's standard LoGloss White.
- B. Acceptable products:
1. USG Interiors, Inc. "Donn DX", Web www.usg.com.
 2. Equal products of other manufacturers approved in advance by the Architect.
- 2.02 ACOUSTICAL CEILING PANELS
- A. Provide lay-in acoustical ceiling panels in Reception and Corridor (west of Lobby) with the following attributes:
1. Material: Mineral fiber.
 2. Texture: Medium, non-directional.
 3. Pattern: Unscored.
 4. Dimensions: 24 x 24 x 5/8 IN.
 5. Edge: Angled tegular.
 6. NRC: 0.55.
 7. CAC: 33.
 8. Fire resistance/flame spread: Class A (UL).
 9. Light Reflectance: 0.82%.
 10. Humidity resistance: Standard.
 11. ASTM classification: Type III, Form 2, Pattern CD.
- B. Acceptable products:
1. Armstrong, '704 Cortega', Web www.armstrong.com.
 2. Substitutions will not be approved as selection is part of an Owner adopted Material Selections Building Standard.
- 2.03 OTHER MATERIALS
- A. Hanger wire: 12 gage galvanized steel wire.
- B. Support channels and hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.
- C. Touch-up paint: Type and color to match acoustical and grid units.
- D. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.
- 3.0 EXECUTION
- 3.01 SURFACE CONDITIONS
- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Examine substrates and structural framing to which ceiling systems attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage, and other conditions affecting performance of ceiling systems.
- C. Verify work above ceiling system is complete and installed in manner that will not affect layout and installation of system components.

3.02 INSTALLATION-SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C636 and manufacturer's instructions to pattern indicated on drawings.
- B. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling.
- C. Install hanger plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
- D. Where widths of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
- E. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eyescrews, or other devices that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
- F. Space hangers not more than 4 FT OC along each member supported directly from hangers, unless otherwise shown, and provide hangers not more than 8 IN from ends of each member.
- G. Install additional hangers at light fixtures, A.C. grilles and other ceiling accessories within 6 IN of each corner, or support components individually. Maximum deflection shall be limited to 1/360 of the span.
- H. Install edge moldings at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
- I. Screw-attach moldings to substrate at intervals not over 16 IN OC and not more than 3 IN from ends, leveling with ceiling suspension system.
 - 1. Use longest practical lengths.
 - 2. Miter corners.
- J. Make all grid level within a tolerance of one in 1000 and straight within a tolerance of one in 1000.

3.03 INSTALLATION-ACOUSTICAL UNITS

- A. Install panels in accordance with instructions and recommendations of the ceiling system manufacturer.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Install lay-in panels in grid system with grain of pattern (if any) in same direction.
- D. Scribe and cut panels to fit accurately at borders and penetrations. All edges of panels shall be supported by suspension system.
- E. Install acoustical units level, in uniform plane, and free from twist, warp and dents.
- F. Install acoustical units only after above-ceiling work is complete.
- G. Install hold-down clips for acoustical panels only when so required by governmental agencies having jurisdiction; space as recommended by panel manufacturer.

3.04 MODIFICATIONS TO EXISTING CEILING SYSTEM

- A. In Lobby and Vestibule (west of Lobby) modify existing lay-in acoustical ceiling panels and grid as required by installation of new bullet-resistant partitions and relocation of light fixtures, speakers, HVAC diffusers/grilles, etc. as shown on the Drawings. Existing ceiling system is thought to be Armstrong Cirrus Supratex 2200 #6409, 24 x 24 x 3/4 IN, 9 x 9 square appearance, with angled tegular edge and 9/16 IN Suprafine exposed tee grid.

3.05 ERECTION TOLERANCES

- A. Maximum variation from flat and level Surface: 1/8 IN in 10 FT.
- B. Maximum variation from Plumb of grid members caused by eccentric loads: Two (2) degrees.

3.06 CLEANING AND REPLACEMENT

- A. Suspension system: Remove infill material and perform any necessary cleaning maintenance with non-solvent based commercial cleaner.
- B. Touch up all minor scratches and spots, as acceptable, or replace damaged sections when touch up is not permitted.
- C. Painting: Repainting of suspension members shall be with a high-quality solvent base paint and applied as recommended by paint manufacturer.
- D. Removal of debris: Remove all debris resulting from work of this section.
- E. Clean exposed surfaces of ceiling systems. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.
- F. Remove and replace ceiling system components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage, including dented and deformed members.

3.07 PROTECTION

- A. Protect installed work from damage due to subsequent construction activity, including temperature and humidity limitations and dust control, so that the work will be without damage and deterioration at the time of acceptance by the Owner.

END OF SECTION

**09 68 00
CARPETING**

1.0 GENERAL

1.01 SUMMARY

- A. Provide modular carpet tile floor covering and base installation and carpet accessories where shown on the Drawings, as specified herein and as needed for a complete and proper installation, including patching existing modular carpet tile flooring and carpet base in areas shown on the Drawings adjacent to demo work.

1.02 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 00.
- B. Submit:
 - 1. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
 - 2. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.03 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent provisions of Section 01 60 00.
- B. Deliver materials with manufacturer's identification labels intact.

1.05 PROJECT CONDITIONS

- A. Install carpet after all other finishing operations are complete.

1.06 EXTRA STOCK

- A. Furnish minimum one percent (1%) additional modular carpet tile flooring of each pattern and color, separately bundled, wrapped and labeled, for maintenance purposes.

1.07 WARRANTY

- A. Furnish written twenty (20) year non-prorated warranty against excessive wear, delamination, edge ravel, zippering, resiliency loss, and static.

2.0 PRODUCTS

2.01 CARPET

- A. Existing modular carpet tile flooring is Aftermath II #03026, Color Tapestry #23512, 24 IN x 24 IN carpet tile as manufactured by Tandus Centiva.
- B. Substitutions will not be approved as new modular carpet tile flooring must match existing modular carpet tile flooring to remain.

2.02 OTHER MATERIALS

- A. Carpet base: Same as carpet above, 4 IN high, with sewed bead at top edge.
- B. Adhesive: As recommended by the carpet manufacturer.
- C. Leveling compound: Latex base, non-crumbling, non-staining type approved by the carpet manufacturer.
- D. Reducer strips: Provide rubber binding/reducing strips of thickness to match carpet in color selected by the Architect from the manufacturer's standard colors.
- E. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

3.0 EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Verify proper moisture content of substrate; do not install until moisture is within limits acceptable to manufacturer.

3.02 PREPARATION

- A. Immediately prior to installation of the work of this Section, thoroughly clean substrata and remove oil, grease, paint, varnish, hardeners, and other items which would adversely affect the bond of adhesive.
- B. Make substrata level and free from irregularities. Assure one constant floor height after modular carpet tile flooring is installed, filling low spots and grinding high spots as required.
- C. Fill all cracks, joints, holes or uneven areas with specified leveling compound and remove excess.
- D. Before commencing work, test an area with adhesive and carpet to determine "open-time" and bond.

3.03 INSTALLATION

- A. Install modular carpet tile flooring and carpet base in strict accordance with carpet manufacturer's recommendations.
- B. Scribe modular carpet tile flooring accurately to vertical surfaces. Use a template for any cuts for monuments or pattern, etc.
- C. Apply adhesive as recommended by carpet manufacturer.
- D. Do not mix dye lots in same area.
- E. Keep joint lines straight.
- F. Where carpet terminates at non-carpeted floor surface, install reducer strip.
- G. Install carpet base in strict accordance with carpet manufacturer's recommendations, in as long lengths as practicable.

3.04 CLEANING

- A. Remove any spillage of adhesive from carpet face or tile joints using remover provided by manufacturer.
- B. Clean carpet of all spots, remove all loose threads with sharp scissors.
- C. Completely and thoroughly vacuum carpet.

3.05 PROTECTION

- A. Provide a heavy non-staining paper or plastic walkway as required over carpeting in direction of traffic, maintaining intact until carpeted space is accepted by the Owner.

END OF SECTION

09 91 00
PAINTING

1.0 GENERAL

1.01 SUMMARY

- A. Paint and finish exposed surfaces using the combination of materials listed on Painting Schedule in Part 3 of this Section, as specified herein and as needed for a complete and proper installation including, but not necessarily limited to:
 - 1. Complete finishing and painting of all unfinished surfaces unless noted otherwise.
 - 2. Painting of exposed conduit and pipe/duct insulation.
- B. Related work:
 - 1. Section 09 29 00: Gypsum Board: Taping and bedding.
 - 2. Priming or priming and finishing of certain surfaces may be specified to be factory-performed or installer-performed under pertinent other Sections.
- C. Work not included: Painting is not required on prefinished items, finished metal surfaces, concealed surfaces, operating parts, and labels.
 - 1. Prefinished or factory-finished items not to be painted include:
 - a. Acoustic materials.
 - b. Architectural woodwork and casework.
 - c. Light fixtures.
 - d. Switchgear.
 - e. Distribution cabinets.
 - 2. Concealed surfaces not to be painted include wall or ceiling surfaces in the following generally inaccessible areas:
 - a. Foundation spaces.
 - b. Furred spaces.
 - c. Pipe chases.
 - d. Duct shafts.
 - 3. Finished metal surfaces not to be painted include:
 - a. Anodized aluminum.
 - b. Stainless steel.
 - c. Chromium plate.
 - d. Copper.
 - e. Bronze.
 - f. Brass.
 - 4. Operating parts not to be painted include moving parts of operating equipment including the following:
 - a. Valve and damper operators.
 - b. Linkages.
 - c. Sensing devices.
 - d. Motor and fan shafts.
 - 5. Do not paint over UL, FM, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.
- D. Definitions:
 - 1. "Paint", as used herein, means coating systems materials, primers, emulsions, epoxy, enamels, stains, sealers, fillers, and other applied materials whether used as prime, intermediate, or finish coats.

1.02 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 00.
- B. Submit:
 - 1. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
 - 2. Paint schedule indicating type and location of surface, paint materials and number of coats to be applied.
 - 3. Color charts of colors available from the approved manufacturer for selection by the Architect.

- C. Samples:
 - 1. Following the selection of colors and glosses by the Architect, prepare Samples of each color and texture at the job site for approval of the Architect.
 - 2. Revise each Sample as requested until the required gloss, color, and texture is achieved. Such Samples, when approved, will become standards of color and finish for accepting or rejecting the work of this Section.
 - 3. Do not commence finish painting until Samples are approved by the Architect.

1.03 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Paint coordination:
 - 1. Provide finish coats which are compatible with the prime coats actually used.
 - 2. Review other Sections of these Specifications as required, verifying the prime coats to be used and assuring compatibility of the total coating system for the various substrates.
 - 3. Upon request, furnish information on the characteristics of the specific finish materials to assure that compatible prime coats are used.
 - 4. Provide barrier coats over noncompatible primers, or remove the primer and reprime as required.
 - 5. Notify the Architect in writing of anticipated problems in using the specified coating systems over prime-coatings supplied under other Sections.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent provisions of Section 01 60 00.
- B. Delivery: Deliver materials to job site in the manufacturer's sealed containers with the manufacturer's labels intact indicating manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation and instructions for mixing and reducing.
- C. Storage: Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45°F and a maximum of 90°F. Maintain containers used in storage in a clean condition, free of foreign materials and residue.
- D. Protection: Protect materials from freezing. Keep storage area neat and orderly. Remove oily or solvent soaked rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.05 PROJECT CONDITIONS

- A. Apply solvent-thinned paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 45°F and 95°F.
- B. Apply water-based paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 50°F and 90°F.
- C. Weather conditions:
 - 1. Do not apply paint in snow, rain, fog, or mist; when the relative humidity exceeds 85%; at temperatures less than 5°F above the dew point; or to damp or wet surfaces.
 - 2. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

1.06 EXTRA STOCK

- A. Provide 1 GAL additional material of each type, color and gloss of material installed for use by Owner in building maintenance and repair.
- B. Provide sealed containers of extra materials, packaged with protective covering for storage and identified with appropriate labels.

2.0 PRODUCTS

2.01 PAINT MATERIALS

- A. Acceptable materials:
 - 1. The Painting Schedule in Part 3 of this Section is based, in general, on products of Sherwin-Williams Paint Co.
 - 2. Equal products of other manufacturers approved in advance by the Architect, may be substituted in accordance with provisions of the Contract.
 - 3. Where products are proposed other than those specified by name and number in the Painting Schedule, provide under the product data submittal required by Part 1 of this Section a new painting schedule compiled in the same format used for the Painting Schedule included in this Section.
- B. Undercoats and thinners:
 - 1. Provide undercoat paint produced by the same manufacturer as the finish coat.
 - 2. Use only the thinners recommended by the paint manufacturer, and use only to the recommended limits.
 - 3. Insofar as practicable, use undercoat, finish coat, and thinner material as parts of a unified system of paint finish.

2.02 COLOR SCHEDULES

- A. The Architect will prepare a color schedule with samples for guidance in painting.

2.03 APPLICATION EQUIPMENT

- A. For application of the approved paint, use only such equipment as is recommended for application of the particular paint by the manufacturer of the particular paint, and as approved by the Architect.
- B. Prior to use of application equipment, verify that the proposed equipment is actually compatible with the material to be applied, and that integrity of the finish will not be jeopardized by use of the proposed equipment.

2.04 OTHER MATERIALS

- A. Provide commercial quality linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified.
- B. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

3.0 EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 WALL TEXTURE

- A. Gypsum board surfaces shall be sound, firm and dry, clean and free of dust, dirt, grease or other foreign material.
- B. Prime gypsum board wall surfaces in accordance with texture manufacturer's recommendations.
- C. Texture on all new gypsum board surfaces shall be produced with paint roller and shall match roller texture on existing walls to remain.

3.03 MATERIALS PREPARATION

- A. General:
 - 1. Mix and prepare paint materials in strict accordance with the manufacturers' recommendations as approved by the Architect.
 - 2. When materials are not in use, store in tightly covered containers.
 - 3. Maintain containers used in storage, mixing, and application of paint in a clean condition, free from foreign materials and residue.

- B. Stirring:
 - 1. Stir materials before application, producing a mixture of uniform density.
 - 2. Do not stir into the material any film which may form on the surface, but remove the film and, if necessary, strain the material before using.

3.04 SURFACE CLEANING METHODS

- A. Solvent Cleaning, SSPC-SP1: Solvent cleaning is a method for removing all visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants. Solvent cleaning does not remove rust or mill scale. Change rags and cleaning solution frequently so that deposits of oil and grease are not spread over additional areas in the cleaning process. Be sure to allow adequate ventilation.
- B. Hand Tool Cleaning, SSPC-SP2: Hand tool cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Before hand tool cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP1.
- C. Power Tool Cleaning, SSPC-SP3: Power tool cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Before power tool cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP1.
- D. White Metal Blast Cleaning, SSPC-SP5 or NACE 1: A white metal blast cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP1 or other agreed upon methods.
- E. Commercial Blast Cleaning, SSPC-SP6 or NACE 3: A commercial blast cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining. Staining shall be limited to no more than 33% of each square inch of surface area and may consist of light shadows, slight streaks, or minor discoloration caused by stains of rust, stains of mill scale, or stains of previously applied paint. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP1 or other agreed upon methods.
- F. Brush-Off Blast Cleaning, SSPC-SP7 or NACE 4: A brush-off blast cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, loose mill scale, loose rust, and loose paint. Tightly adherent mill scale, rust, and paint may remain on the surface. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP 1 or other agreed upon methods.
- G. Power Tool Cleaning to Bare Metal, SSPC-SP11: Metallic surfaces that are prepared according to this specification, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxide corrosion products, and other foreign matter. Slight residues of rust and paint may be left in the lower portions of pits if the original surface is pitted. Prior to power tool surface preparation, remove visible deposits of oil or grease by any of the methods specified in SSPC-SP1, Solvent Cleaning, or other agreed upon methods.
- H. Near-White Blast Cleaning, SSPC-SP10 or NACE 2: A near white blast cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining. Staining shall be limited to no more than 5% of each square inch of surface area and may consist of light shadows, slight streaks, or minor discoloration caused by stains of rust, stains of mill scale, or stains of previously applied paint. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP1 or other agreed upon methods.
- I. High- and Ultra-High Pressure Water Jetting for Steel and Other Hard Materials SSPC-SP12 or NACE 5: This standard provides requirements for the use of high- and ultra-high pressure water jetting to achieve various degrees of surface cleanliness. This standard is limited in scope to the use of water only without the addition of solid particles in the stream.
- J. Water Blasting, NACE Standard RP-01-72: Removal of oil grease dirt, loose rust, loose mill scale, and loose paint by water at pressures of 2,000 to 2,500 PSI at a flow of 4 to 14 GAL per minute.

- K. Concrete, SSPC-SP13 or NACE 6: This standard gives requirements for surface preparation of concrete by mechanical, chemical, or thermal methods prior to the application of bonded protective coating or lining systems. The requirements of this standard are applicable to all types of cementitious surfaces including cast-in-place concrete floors and walls, precast slabs, masonry walls, and shotcrete surfaces. An acceptable prepared concrete surface should be free of contaminants, laitance, loosely adhering concrete, and dust, and should provide a sound, uniform substrate suitable for the application of protective coating or lining systems.

3.05 SURFACE PREPARATION

- A. General:
1. Perform preparation and cleaning procedures in strict accordance with the paint manufacturers' recommendations as approved by the Architect.
 2. Remove removable items which are in place and are not scheduled to receive paint finish; or provide surface-applied protection prior to surface preparation and painting operations.
 3. Following completion of painting in each space or area, reinstall the removed items by using workmen who are skilled in the necessary trades.
 4. Clean each surface to be painted prior to applying paint or surface treatment.
 5. Remove oil and grease with clean cloths and cleaning solvent of low toxicity and flash point in excess of 200° F, prior to start of mechanical cleaning.
 6. Remove mildew by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
 7. Schedule the cleaning and painting so that dust and other contaminants from the cleaning process will not fall onto wet newly painted surfaces.
- B. Preparation of wood surfaces:
1. Clean wood surfaces until free from dirt, oil, and other foreign substance.
 2. Seal knots, pitch streaks, and sappy sections with sealer.
 3. Smooth finished wood surfaces exposed to view, using the proper sandpaper. Where so required, use varying degrees of coarseness in sandpaper to produce a uniformly smooth and unmarred wood surface.
 4. After priming or stain coat has been applied, all nail holes and other holes and cracks shall be flush-filled with putty in a neat and workmanlike manner. Putty shall be colored to match that of the finish.
 5. Unless specifically approved by the Architect, do not proceed with painting of wood surfaces until the moisture content of the wood is 12% or less.
- C. Preparation of metal surfaces:
1. Thoroughly clean surfaces until free from dirt, oil, and grease.
 2. Sand and scrape to remove loose primer, mill scale, weld splatter, dirt and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Feather edges to make touchup patches inconspicuous.
 3. On galvanized surfaces, use solvent for the initial cleaning, and then treat the surface thoroughly with phosphoric acid etch. Remove etching solution completely before proceeding.
 4. Allow to dry thoroughly before application of paint.
- D. Preparation of block and concrete surfaces:
1. Remove loose mortar and foreign material.
 2. Remove efflorescence, chalk, dust, dirt, grease, oils, hardeners, curing compounds, and form release agents.
 3. Roughen as required to remove glaze.
 4. Fill bug holes, air pockets, and other voids with cement patching compound.
 5. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
 6. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
 7. The pH of the surface should be between 6 and 9, unless the products are designed to be used in high pH environments.
 8. On tilt-up and poured-in-place concrete, commercial detergents and abrasive blasting may be necessary to prepare the surface.

- E. Preparation of vinyl, plastic, and fiberglass surfaces:
 1. Clean thoroughly by scrubbing with a warm, soapy water solution. Rinse thoroughly.
 2. Do not paint vinyl siding with any color darker than the original color unless the product and colors are designed for such use. Painting with darker colors may cause siding to warp.
- F. Preparation of plaster surfaces:
 1. Allow to dry thoroughly for at least 30 days before painting, unless the products are designed to be used in high pH environments.
 2. Room must be ventilated while drying; in cold, damp weather, rooms must be heated.
 3. Repair damaged areas with an appropriate patching material.
 4. Bare plaster must be cured and hard.
 5. Textured, soft, porous, or powdery plaster should be treated with a solution of 1 PT household vinegar to 1 GAL of water. Repeat until the surface is hard, rinse with clear water and allow to dry.
- G. Preparation of cement composition siding/panels:
 1. Remove all surface contamination by washing with an appropriate cleaner, rinse thoroughly and allow to dry.
 2. Existing peeled or checked paint should be scraped and sanded to a sound surface.
 3. Pressure clean, if needed, with 2,100 PSI MIN pressure to remove all dirt, dust, grease, oil, loose particles, laitance, foreign material, and peeling or defective coatings. Allow the surface to dry thoroughly.
 4. The pH of the surface should be between 6 and 9, unless the products are designed to be used in high pH environments.

3.06 PAINT APPLICATION

- A. General:
 1. Touch-up shop-applied prime coats which have been damaged, and touch-up bare areas prior to start of finish coats application.
 2. Sand and dust between coats to remove defects visible to the unaided eye from a distance of 5 FT.
 3. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
 4. On removable panels and hinged panels, paint the back sides to match the exposed sides.
- B. Drying:
 1. Allow sufficient drying time between coats, modifying the period as recommended by the material manufacturer to suit adverse weather conditions.
 2. Consider oil-base and oleo-resinous solvent-type paint as dry for recoating when the paint feels firm, does not deform or feel sticky under moderate pressure of the thumb, and when the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
- C. Brush application:
 1. Brush out and work the brush coats onto the surface in an even film.
 2. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, and other surface imperfections will not be acceptable.
- D. Spray application:
 1. Except as specifically otherwise approved by the Architect, confine spray application to metal framework and similar surfaces where hand brush work would be inferior.
 2. Where spray application is used, apply each coat to provide the hiding equivalent of brush coats.
 3. Do not double back with spray equipment to build up film thickness of two coats in one pass.
- E. For completed work, match the approved Samples as to texture, color, and coverage. Remove, refinish, or repaint work not in compliance with the specified requirements.

- F. Miscellaneous surfaces and procedures:
 - 1. Exposed mechanical and electrical items:
 - a. Paint access doors, conduits, pipes, ducts, vents and items of similar nature to match the adjacent wall and ceiling surfaces, or as directed.
 - b. Paint all equipment, including that which is factory-finished, exposed to view outdoors and on the roof, and in finished areas.
 - c. Paint shop-primed items occurring in finished areas.
 - d. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
 - e. Paint visible duct surfaces behind vents, registers, and grilles flat black.
 - f. Wash metal with solvent, prime, and apply two coats of alkyd enamel.
 - 2. Exposed pipe and duct insulation:
 - a. Apply one (1) coat of latex paint on insulation which has been sized or primed under other Sections, apply two (2) coats on such surfaces when unprepared.
 - b. Match color of adjacent surfaces.
 - c. Remove band before painting, and replace after painting.
 - 3. Hardware:
 - a. Paint prime coated hardware to match adjacent surfaces.
 - b. Paint metal portions of head, jamb and astragal seals to match the color of the door frame unless otherwise directed by the Architect.
 - 4. Backboards:
 - a. Paint both sides and edges of plywood backboards for electrical and telephone equipment prior to installing equipment.
 - 5. Wet areas:
 - a. In janitor's closet, toilet rooms and contiguous areas, add an approved fungicide to paints.

3.07 LABELING FIRE AND SMOKE PARTITIONS

- A. Label fire and smoke partitions in plenum spaces and above ceiling in 2 IN high red letters spaced 20 FT OC MAX.
- B. Label fire rated partitions "FIRE PARTITION - DO NOT PENETRATE".
- C. Label smoke barrier partitions "SMOKE PARTITION - DO NOT PENETRATE".

3.08 PAINTING SCHEDULE

- A. Provide the following paint finishes.
- B. Interior metal, ferrous:
 - 1. First Coat: Touchup shop primer.
 - 2. Second Coat: S-W All Surface Enamel Latex Primer, 1.6 mils DFT.
 - 3. Third Coat: S-W ProMar 200 Latex Eg-Shel, 1.5 mils DFT.
 - 4. Fourth Coat: Same as third coat.
- C. Interior gypsum board walls:
 - 1. First Coat: S-W PrepRite High Build Latex Primer/Surfacer, 1.2 mils DFT.
 - 2. Second Coat: S-W ProMar 200 Latex Eg-Shel Enamel, 1.2 mils DFT.
 - 3. Third Coat: Same as second coat.
- D. Miscellaneous: Items not scheduled above shall be painted with like quality materials recommended by the manufacturer for the type of surface to be finished.

END OF SECTION

09 96 00
HIGH PERFORMANCE COATINGS

1.0 GENERAL

1.01 SUMMARY

- A. Provide abuse-resistant, mold/mildew-resistant textured acrylic coating where shown on the Drawings, as specified herein and as needed for a complete and proper installation.
- B. Related work:
 - 1. Section 09 29 00: Gypsum Board.
 - 2. Section 09 91 00: Painting.
- C. Work not included: Coating is not required on prefinished items, finished metal surfaces, concealed surfaces, operating parts, and labels.
 - 1. Prefinished or factory-finished items not to be coated include:
 - a. Acoustic materials.
 - b. Architectural woodwork and casework.
 - c. Light fixtures.
 - d. Switchgear.
 - e. Distribution cabinets.
 - 2. Concealed surfaces not to be coated include wall or ceiling surfaces in the following generally inaccessible areas:
 - a. Foundation spaces.
 - b. Furred spaces.
 - c. Pipe chases.
 - d. Duct shafts.
 - 3. Finished metal surfaces not to be coated include:
 - a. Anodized aluminum.
 - b. Stainless steel.
 - c. Chromium plate.
 - d. Copper.
 - e. Bronze.
 - f. Brass.
 - 4. Operating parts not to be coated include moving parts of operating equipment including the following:
 - a. Valve and damper operators.
 - b. Linkages.
 - c. Sensing devices.
 - d. Motor and fan shafts.
 - 5. Do not apply coating over UL, FM, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

1.02 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 00.
- B. Submit:
 - 1. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
 - 2. Manufacturer's technical information including installation instructions and product test data conforming to the test performances required herein.
 - 3. Color charts of colors available from the approved manufacturer for selection by the Architect (texture/CS# shall match existing).
- C. Samples:
 - 1. Prior to beginning work, Contractor shall make and submit three (3) 8 IN x 10 IN samples of the selected colors and textures for Architect's review. Provide for each sample a listing of materials and the application for each coat of material.
 - 2. In addition to the above, Contractor shall install on the jobsite one sample of each textured acrylic coating finish on each different typical jobsite substrate. Each sample shall be installed over an area of not less than 30 SF. Work on the balance of the areas to be coated shall commence after Contractor has received written approval of the installed jobsite samples from Architect or Owner.

- D. Quality standard: Final acceptance of Textured Acrylic Coating finish shall be based upon substantial duplication of jobsite samples produced in accordance with paragraph 1.02-C, 2 above.

1.03 REFERENCES

- A. ASTM D2583: Standard Method of Testing for Indentation Hardness of Plastics by Means of a Barcol Impressor.
- B. ASTM D3273: Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
- C. ASTM D4977: Standard Test Method for Granule Adhesion to Mineral Surfaced Roofing by Abrasion.
- D. ASTM D5420: Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact).
- E. ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials.
- F. ASTM E96/E96M: Standard Test Methods for Water Vapor Transmission of Materials.
- G. FAA Vertical Flammability Test FAR 25.853(b).
- H. University of Pittsburgh LC₅₀ for Thermal Toxicity.

1.04 DESCRIPTION

- A. Duroplex is a textured acrylic coating used as an interior wall finish.
- B. Design Requirements
 - 1. ACCEPTABLE SURFACES FOR DUROPLEX INCLUDE:
 - a. Drywall.
 - b. Cementitious substrates such as concrete, concrete block, cement plaster, etc.
 - c. Ferrous metals.
 - d. Galvanized surfaces.
 - e. Painted surfaces.
- C. Performance Requirements
 - 1. Standardized tests:

a.	ASTM D2583 Barcol Index:	38 or greater
b.	ASTM D3273 Surface Mold Resistance:	10 (no growth)
c.	ASTM D4977 Surface Abrasion:	Class 3 (5/8 IN drywall)
d.	ASTM D5420 Gardner Impact:	Class 3 (impact-resistant board)
e.	ASTM E84 Flame Spread:	15 or less
f.	ASTM E84 Smoke Developed:	5 or less
g.	ASTM E96 Water Vapor Permeability:	27.5 Perms or greater
h.	FAA VBT FAR 25.853(b):	0.1 seconds or less
i.	UPITT LC ₅₀ for Thermal Decomp:	150 grams or greater
 - 2. Solvent resistance: (1 hour soak)

a.	Water:	temporary slight softening*
b.	Detergent:	no change
c.	Ethanol:	no change
d.	Naphtha:	no change
e.	Ammonium Hydroxide:	temporary slight softening*
f.	Ethylene Glycol:	no change
g.	Bleach (household):	temporary slight softening*
h.	Mineral spirits:	no change

*Original hardness regained after drying.
 - 3. Stain resistance: (10 hour soak and wash with 409 Cleaner or bleach and water)

a.	Water:	no stain visible
b.	Blood:	no stain visible
c.	Urine:	no stain visible
d.	Coffee:	no stain visible
e.	Tea:	no stain visible
f.	Blueberry:	no stain visible
 - 4. Mildew resistance:
 - a. No visible mildew after incubation for ninety (90) days in 95°F band 90% relative humidity under high contamination conditions.

5. Color:
 - a. All pigments shall be free of heavy metals, fade resistant, and bleach resistant. All pigments shall be VOC and APEO free. Standard color selection provides 288 high performance colors. Custom coloration is also available using the same high performance pigments.

1.05 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Qualified applicator: All bidding applicators should have attended a factory product application session and otherwise be qualified to apply materials prior to submitting bid. Applicator shall submit a photocopy of factory certificate as proof of attendance at factory training session with the bid.
- C. Skilled workmanship: All work shall be done by skilled mechanics in accordance with the best standard practice in the industry. Work shall be uniform in appearance, free of visual defects, and complete.
- D. Compatibility: Provide primers and other substrate preparation materials that are produced or are specifically recommended by the same manufacturer as the finish materials to insure compatibility of the system. Use thinners approved by the coating manufacturer, and use only within recommended limits.
- E. Manufacturing facility shall comply with ISO 9001 and ISO 14001.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent provisions of Section 01 60 00.
- B. Delivery: Deliver materials to jobsite in the original, new and unopened packages and containers bearing manufacturer's name and label, and following information: Name or title of materials, manufacturer's stock and/or batch number, date of manufacture, contents of containers including color name and number.
- C. Storage and Protection: Store materials not in active use in active use in tightly covered containers. Maintain containers in a clean condition, free from foreign materials and residue. Protect from freezing and maintain temperatures below 100°F. Keep materials stored in an orderly and organized manner to reduce the risk of error. Do not stack materials more than three (3) containers high. Protect from fire hazards.

1.07 PROJECT CONDITIONS

- A. Apply materials only when surface temperature is between 60°F and 100°F and expected to remain so for 24 HRS. If conditions cause rapid drying of the materials before proper finishes can be completed, eliminate breezes, fans or other air movements which contribute to the problem, and, if necessary, dampen the substrate with finely misted water just prior to application.
- B. Protect finishes from casual impact and rain for a period of 48 HRS after installation. Protect from heavy traffic for a period of at least three (3) days. Protect all surfaces and adjacent areas not intended to be coated and clean immediately any spillage, droppings, or other extraneous contact of the materials with other surfaces.

1.08 EXTRA STOCK

- A. Provide 1 GAL MIN additional material of each type and color of material installed for use by Owner in building maintenance and repair.
- B. Provide sealed containers of extra materials, packaged with protective covering for storage and identified with appropriate labels.

1.09 WARRANTY

- A. Minimum factory material warranty requirements:
 1. Material & labor warranty-coating integrity: Ten (10) years from date of Substantial Completion.
 2. Mold & mildew material warranty: Ten (10) years from date of Substantial Completion.

2.0 PRODUCTS

2.01 MATERIALS

- A. Provide Duroplex Textured Acrylic Coating system as manufactured by Triarch Industries, Inc., West Warwick, Rhode Island, Tel. 800-537-6111, Web www.triarchinc.com.
1. Texture shall match existing walls to remain.
 2. CS number shall match existing walls to remain (12703.02-verify).
 3. Substitutions will not be acceptable as material must match existing textured acrylic coating system to remain in surrounding areas.

2.02 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

3.0 EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 GENERAL

- A. Description of the work:
1. Extent of wall/ceiling coating work is indicated on drawings and schedules, as herein specified.
 2. Work includes masking, protection of adjacent surfaces, priming, finishing, and cleanup of all Textured Acrylic Coated areas throughout the project as designated on the drawings and finish schedules, except as otherwise specifically indicated. 'Textured Acrylic Coating' as used herein means specialty texture acrylic coatings having a minimum thickness of 20 mils and meeting the minimum performance specifications stated herein.
 3. Work specified in other sections: Paint, stain, primer, other specialty coatings, fire proofing, tile, masonry, pre-finished panels, stains, preservative treatments, shop applied finishes, wall coverings, etc.
- B. Perform preparation and cleaning procedures in accordance with manufacturer's recommendations and as herein specified, for each particular substrate condition.
- C. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish coated, or provide masking or other protection prior to surface coating operations. Following completion of coating of each space or area, reinstall removed items.
- D. Clean surfaces to be coated before applying any materials. Remove oils and grease prior to mechanical cleaning. Program cleaning and coating so that contaminants from cleaning process will not fall into wet or newly coated surfaces.

3.03 SURFACE PREPARATION

- A. Drywall: Drywall shall be prepared to industry acceptable standard for hanging vinyl wall covering. Remove excess gypsum compound dust. Do not prime or seal the drywall except as specifically recommended by Texture Acrylic Coating manufacturer. For fast drying conditions, dampen surface slightly with a light spray mist of water just prior to application of acrylic wall coating materials. For damaged drywall, or after removal of old wall covering, patch/repair as needed to obtain a smooth surface and apply GARDZ High Performance Sealer by Zinsser www.zinsser.com following the manufacturer's label directions.

- B. Cementitious substrates: Prepare cementitious surfaces such as concrete, concrete block, cement plaster, etc. by cleaning to remove dust, grease, form release agents, etc.; then patch all major holes and honeycombs using structural grout manufactured for the purpose as specified in the concrete Division of these specifications. Then grind all projections above the planar surface until flush. Fill, and float smooth all recessed form seams and other minor imperfections using either SKIMM Acrylic Surfacing Compound, or REFORMIT™ as manufactured by Triarch Industries. Allow Surfacing Compound to dry at least 24 hours under nominal conditions. If necessary, dampen dry cementitious surfaces just prior to installation of acrylic surfacing compound materials. Wipe away any active condensation or surface water sufficient to cause a wet glaze prior to beginning installation. NOTE: Water sensitive materials such as gypsum based products are not recommended for skimming over concrete or CMU surfaces.
- C. Ferrous metals: Clean free of oil and surface contaminants with non-petroleum based solvent. Prime all bare metal surfaces with a good quality rust inhibiting primer prior to application of any Textured Acrylic Coating materials. Test adequacy of adhesion of primer to substrate prior to application of texture coating. Be sure to document results.
- D. Galvanized surfaces: Clean free of oil and surface contaminants with non-petroleum based solvent. Prime with good quality primer designed for galvanized metal surfaces. Test adequacy of adhesion of primer to substrate prior to application of texture coating. Be sure to document results.
- E. Existing painted surfaces: All previously painted surfaces must be sound with the paint firmly adhered. Test adhesion of existing paint in random locations prior to application of texture acrylic coating. Be sure to document test results. If surface is dusty or dirty, clean surface with a mix of household ammonia and water (1 part ammonia to 3 parts water) to remove oils, dust, etc. If a high gloss paint that will result in poor adhesion, lightly sand surface to improve adhesion (total removal of gloss is not necessary). Test adequacy of adhesion of primer to substrate prior to application of texture coating. Be sure to document results.

3.04 MATERIALS PREPARATION

- A. Stir materials before application with a power drill and a drywall compound paddle. Stir at approximately 350 RPM for 2 minutes while removing material from all sides and bottom of the container. Stir only as much material as will be used in 4 HR period or re-stir material left sitting in excess of four hours. Retain lid on containers until the material is in actual use. If hardened material accumulates on the sides of the container, carefully remove the hardened material, taking care to not allow any hardened material to fall into the wet material.
- B. Thinning: Thinning may be done with small amounts of clean water. See manufacturer's written instructions for thinning information.

3.05 APPLICATION

- A. General: Apply coating materials in accordance with the manufacturer's instructions and recommendations as required to achieve the appearance of the approved samples and performance as specified herein. Coating materials shall be used as a system that may include primers or under coatings as required by the manufacturer's installation directions.
- B. Final dry film thickness shall be a minimum average of 20 mils. Coat surfaces behind movable equipment and furniture same as similar exposed surfaces.
- C. For finishes which require primer: Apply acrylic coating manufacturer furnished primer with a 1/4 to 3/8 IN nap paint roller at a coverage rate of 240 SF/GAL. Allow to cure until firmly set (normally 1 to 2 HRS at 70°F).
- D. For finishes which require undercoat: Apply factory supplied undercoat at a rate of 250 SF/GAL per 65 LB net pail. Apply with a texture sprayer to achieve visible coverage. Wet film material should be a minimum of 20 mils thick. Apply undercoat to a uniform level finish without holidays or runs.
- E. Apply finish coat(s) in accordance with manufacturer's instructions and so that all finishes match quality samples previously approved by Architect.

3.06 CLEANUP AND PROTECTION

- A. Cleanup: During progress of work, remove from site discarded coating materials, rubbish, cans, and rags at the end of each work day in compliance with all local, state, and federal requirements.
- B. Protection: Protect work of other trades, whether to be coated or not, against damage by coating work. Correct any damage by cleaning, repairing or replacing, and refinishing, as acceptable to Architect. Provide signs, barricades, etc. as required to protect new Textured Acrylic Coating work from damage by others (see Section 1.07-B of this Section for protection times).
- C. After completion of work of all other trades, remove all protection materials (including other trades' if provided by them) and clean/touch up as necessary to restore coating work to new and unblemished condition.

END OF SECTION

10 26 41
BULLET RESISTANT PANELS

1.0 GENERAL

1.01 SUMMARY

- A. Provide bullet resistant fiberglass panels where shown on the Drawings, as specified herein and as needed for a complete and proper installation.
- B. Related work:
 - 1. Section 01 23 00: Alternates.
 - 2. Section 05 41 00: Structural Metal Stud Framing (at all bullet resistant panels).
 - 3. Section 07 84 00: Firestopping.
 - 4. Section 07 92 00: Joint Sealants.
 - 5. Section 09 29 00: Gypsum Board.

1.02 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 00.
- B. Submit:
 - 1. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
 - 2. Manufacturer's recommended installation instructions available in print and video.
 - 3. Certificates indicating product compliance with the following requirements:
 - a. UL LISTING Verification and UL752 Current Test Results as provided by Underwriters Laboratories.
 - b. ASTM E119 One-Hour Fire Rating of Building Construction and Materials.
 - c. ASTM F1233 Standard Test Method for Forced Entry Testing of Materials/Assemblies.
 - d. ASTM E90, E413, E13320 Classifications for Sound Transmission Loss.
 - e. Manufacturer's third party certificate of registration with ISO 9001:2008.
 - f. Manufacturer's US Dept. of State ITAR Statement of Registration.
 - g. Manufacturer's SBA Profile verifying small business status by the SBA.

1.03 REFERENCES

- A. ASTM E119 Standard Test for One-Hour Fire-Rating of Building Construction and Materials.
- B. ASTM F1233 Standard Test Method for Forced Entry Testing of Materials/Assemblies, body passage requirement, Class IV.
- C. ASTM E90 Standard Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions, STC 35.
- D. ASTM E413 Classification for Sound Insulation Rating.
- E. ASTM E1332 Classification for Determination of Outdoor-Indoor Transmission Class, OITC 34.
- F. International Organization for Standardization (ISO) 9001:2008 Quality Management System.
- G. National Institute of Justice (NIJ) Ballistic Standards 0108.01 - Type III.
- H. SBA Small Business Size Standard.
- I. UL752 Specifications and Ammunition, 11th Edition, Standard for Bullet Resisting Equipment published September 9, 2005, revised December 21, 2006, Level 7.
- J. US Department of State: International Traffic in Arms (ITAR) Regulations.

1.04 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent provisions of Section 01 60 00.
- B. Delivery: Deliver materials in manufacturer's original unopened containers or bundles, fully identified with name, brand, type, grade and UL Listed labels intact and legible.

- C. Handling: Handle material with care to prevent damage.
 - D. Storage: Store materials inside under cover, stacked flat and off the floor.
- 1.06 WARRANTY
- A. Warrant all materials and workmanship against defects for a period of ten (10) years from the date of Substantial Completion.
- 2.0 PRODUCTS
- 2.01 MANUFACTURER
- A. Acceptable products:
 - 1. ArmorCore as manufactured Waco Composites, Waco, Texas, Tel. 254-752-3622, Email sales@armorcore.com, Web www.armorcore.com.
 - 2. OF 700 as manufactured by Armortex, Schertz, Texas, Tel. 800-880-8306, Web www.armortex.com.
 - 3. Equal products of other manufacturers approved in advance by the Architect.
- 2.02 PERFORMANCE CRITERIA
- A. Bullet resistant fiberglass panels shall be 'non-ricochet type' to permit the encapture and retention of an attacking projectile lessening the potential of a random injury or lateral penetration.
 - B. Panel rating: UL752 Level 7 except as noted below.
 - 1. Under DEDUCT Alternate Bid One, provide UL752 Level 3 panels above ceiling, between termination of GWB and roof deck only, at all locations.
 - C. Bullet resistance of joints: equal to that of the panel.
- 2.03 MATERIALS
- A. Panels fabricated of multiple layers of woven roving ballistic grade fiberglass cloth impregnated with a thermoset polyester resin and compressed into flat rigid sheets.
 - B. Thickness:
 - 1. Level 7 panels: 1-1/8 IN nominal thickness.
 - 2. Level 3 panels: 7/16 IN nominal thickness (see paragraph 2.02 B 1 above).
 - C. Nominal weight:
 - 1. Level 7 panels: 11.7 PSF.
 - 2. Level 3 panels: 4.8 PSF (see paragraph 2.02 B 1 above).
 - D. Panel size: 3 FT, 4 FT or 5 FT wide x 8 FT, 9 FT or 10 FT high as selected by Contractor.
 - E. Panels manufactured in the USA with raw materials sourced from the USA for quality assurance purposes and to comply with any applicable 'Buy American' provisions.
- 2.04 OTHER MATERIALS
- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.
- 3.0 EXECUTION
- 3.01 SURFACE CONDITIONS
- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
 - B. Prior to starting installation, verify work of related trades required in contract documents and the Drawings is complete to the point where work of this Section may properly commence.
- 3.02 JOINTS
- A. Reinforce vertical joints in wall panels with a back-up layer of bullet resistive material with same rating as wall panel. Minimum width of reinforcing layer at joint shall be 4 IN, centered on panel joints and secured to both wall panels.

3.03 PENETRATIONS

- A. Protect all electrical device and similar penetrations in panel with a back-up layer of bullet resistive material with same rating as wall panel, placed as close to opening in wall panel as possible. Back-up material shall be 4 IN larger in all directions than wall penetration but in no case shall back-up panel be less than 12 IN x 12 IN.
- B. Larger penetrations in panels will be acceptable, without back-up layer of bullet resistive materials, in a few instances such as existing mechanical equipment, ductwork, and return air plenum openings when approved in advance by the Owner.

3.04 APPLICATION

- A. Install bullet resistive material in accordance with manufacturer's printed recommendations and as required by contract documents.
- B. Secure bullet resistive material panels using screws, bolts, or an industrial adhesive.
 - 1. Method of application shall install panels minimizing vulnerabilities by fitting tightly to adjacent surfaces including concrete floor slab, concrete roof slab, bullet resistive door frames, bullet resistive window frames, and the like.
 - 2. Large cuts in panels shall be made with diamond-grit 7 IN circular blade or similar blades approved by panel manufacturer.
 - 3. Small cuts for electrical boxes, etc. shall be made with diamond-grit reciprocating blade or similar blades approved by panel manufacturer.
 - 4. Fastening and drilling:
 - a. When screw attaching panels to steel studs, use self-tapping drywall screws.
 - b. Where gypsum drywall will be finish surface of the wall, use only enough screws to secure panel to steel studs and complete screw pattern to studs when hanging gypsum drywall over panels.
 - c. Where panels are 1-1/8 IN or thicker, pre-drill fastener holes in panels to prevent breakage of screw heads and facilitate installation. Use carbide or cobalt tip drill bit in accordance with panel manufacturer's recommendations.

END OF SECTION

DIVISION 21 – FIRE SUPPRESSION
SECTION 21 11 00: FIRE SUPPRESSION SPRINKLERS

1.1 GENERAL

- A. Related Documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section. Particular attention to design-build scope of work on the drawings.
- B. Summary: This section includes fire-suppression sprinklers, piping, and equipment for the following building systems:
 - 1. Wet-pipe, fire-suppression sprinklers, including piping, valves, specialties, and automatic sprinklers.
- C. Definitions:
 - 1. CPVC: Chlorinated polyvinyl chloride plastic.
 - 2. Working Plans: Documents, including drawings, calculations, and material specifications prepared according to NFPA 13 for obtaining approval from authorities having jurisdiction.
- D. System Performance Requirements:
 - 1. Design sprinklers and obtain approval from authorities having jurisdiction.
 - a. Minimum Density for Automatic-Sprinkler Piping Design: As follows:
 - 1) Light-Hazard Occupancy: 0.10 gpm over 1500-sq. ft. (6.3 mL/s over 139-sq. m) area.
 - 2) Ordinary-Hazard, Group 1 Occupancy: 0.15 gpm over 1500-sq. ft. (9.5 mL/s over 139-sq. m) area.
 - 3) Ordinary-Hazard, Group 2 Occupancy: 0.20 gpm over 1500-sq. ft. (12.6 mL/s over 139-sq. m) area.
 - 4) Extra-Hazard, Group 1 Occupancy: 0.30 gpm over 2500-sq. ft. (18.9 mL/s over 232-sq. m) area.
 - 5) Extra-Hazard, Group 2 Occupancy: 0.40 gpm over 2500-sq. ft. (25.2 mL/s over 232-sq. m) area.
 - 6) Special Occupancy Hazard: As determined by authorities having jurisdiction.
 - b. Maximum Protection Area per Sprinkler: As follows:
 - 1) Office Space: 225 sq. ft. (20.9 sq. m).
 - 2) Storage Areas: 130 sq. ft. (12.1 sq. m).
 - 3) Mechanical Equipment Rooms: 130 sq. ft. (12.1 sq. m).
 - 4) Electrical Equipment Rooms: 130 sq. ft. (12.1 sq. m).
 - 5) Other Areas: According to NFPA 13 recommendations, unless otherwise indicated.
 - 2. Components and Installation: Capable of producing piping systems with 175-psig (1200-kPa) minimum working-pressure rating, unless otherwise indicated.
- E. Submittals:
 - 1. Product Data: For the following:
 - a. Pipe and fitting materials and methods of joining for sprinkler piping.
 - b. Pipe hangers and supports.
 - c. Valves, including specialty valves, accessories, and devices.
 - d. Alarm devices. Include electrical data.

- e. Fire department connections. Include type; number, size, and arrangement of inlets; caps and chains; size and direction of outlet; escutcheon and marking; and finish.
 - f. Excess-pressure pumps. Include electrical data.
 - g. Sprinklers, escutcheons, and guards. Include sprinkler flow characteristics, mounting, finish, and other pertinent data.
- 2. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction. Include hydraulic calculations, if applicable.
 - 3. Hydraulic calculations. All as required by local authorities.
 - 4. Field Test Reports and Certificates: Indicate and interpret test results for compliance with performance requirements and as described in NFPA 13. Include "Contractor's Material and Test Certificate for Aboveground Piping" and "Contractor's Material and Test Certificate for Underground Piping."
 - 5. Maintenance Data: For each type of sprinkler specialty to include in maintenance manuals specified in Division 1.

F. Quality Assurance:

- 1. Installer Qualifications: An experienced installer who has designed and installed fire-suppression piping similar to that indicated for this Project and obtained design approval and inspection approval from authorities having jurisdiction.
- 2. Engineering Responsibility: Preparation of working plans, calculations, and field test reports by a qualified engineer. Base calculations on results of fire-hydrant flow test.
- 3. Manufacturer Qualifications: Firms whose equipment, specialties, and accessories are listed by product name and manufacturer in UL's "Fire Protection Equipment Directory" and FM's "Fire Protection Approval Guide" and that comply with other requirements indicated.
- 4. Sprinkler Components: Listing/approval stamp, label, or other marking by a testing agency acceptable to authorities having jurisdiction.
- 5. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
- 6. NFPA Standards: Equipment, specialties, accessories, installation, and testing complying with the following:
 - a. NFPA 13, "Installation of Sprinkler Systems."
 - b. NFPA 231, "General Storage."
 - c. NFPA 231C, "Rack Storage of Materials."

1.2. PRODUCTS

A. Manufacturers:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Specialty Valves and Devices:
 - 1) Badger Fire Protection, Inc.
 - 2) Central Sprinkler Corp.
 - 3) Firematic Sprinkler Devices, Inc.
 - 4) Globe Fire Sprinkler Corp.
 - 5) Grinnell Corp.
 - 6) Reliable Automatic Sprinkler Co., Inc.
 - 7) Star Sprinkler Corp.

- 8) Viking Corp.
- b. Water-Flow Indicators and Supervisory Switches:
 - 1) Gamewell Co.
 - 2) Grinnell Corp.
 - 3) Pittway Corp.; System Sensor Div.
 - 4) Potter Electric Signal Co.
 - 5) Reliable Automatic Sprinkler Co., Inc.
 - 6) Viking Corp.
 - 7) Watts Industries, Inc.; Water Products Div.
 - c. Sprinkler, Drain and Alarm Test Fittings:
 - 1) Central Sprinkler Corp.
 - 2) Fire-End and Croker Corp.
 - 3) Grinnell Corp.
 - 4) Victaulic Co. of America.
 - d. Sprinkler, Branch-Line Test Fittings:
 - 1) Elkhart Brass Mfg. Co., Inc.
 - 2) Fire-End and Croker Corp.
 - 3) Smith Industries, Inc.; Potter-Roemer Div.
 - e. Sprinkler, Inspector's Test Fittings:
 - 1) Fire-End and Croker Corp.
 - 2) G/J Innovations, Inc.
 - 3) Triple R Specialty of Ajax, Inc.
 - f. Fire Department Connections:
 - 1) Badger Fire Protection, Inc.
 - 2) Elkhart Brass Mfg. Co., Inc.
 - 3) Fire-End and Croker Corp.
 - 4) Firematic Sprinkler Devices, Inc.
 - 5) Grinnell Corp.
 - 6) Guardian Fire Equipment, Inc.
 - 7) Reliable Automatic Sprinkler Co., Inc.
 - 8) Smith Industries, Inc.; Potter-Roemer Div.
 - g. Sprinklers:
 - 1) Badger Fire Protection, Inc.
 - 2) Central Sprinkler Corp.
 - 3) Firematic Sprinkler Devices, Inc.
 - 4) Globe Fire Sprinkler Corp.
 - 5) Grinnell Corp.
 - 6) Reliable Automatic Sprinkler Co., Inc.
 - 7) Star Sprinkler Corp.
 - 8) Viking Corp.
 - h. Indicator Posts and Indicator-Post, Gate Valves:
 - 1) American Cast Iron Pipe Co.; Waterous Co.
 - 2) Grinnell Corp.
 - 3) McWane, Inc.; Clow Valve Co. Div.
 - 4) McWane, Inc.; Kennedy Valve Div.
 - 5) Nibco, Inc.
 - 6) Stockham Valves & Fittings, Inc.

- i. Indicator Valves:
 - 1) Central Sprink, Inc.
 - 2) Grinnell Corp.
 - 3) McWane, Inc.; Kennedy Valve Div.
 - 4) Milwaukee Valve Co., Inc.
 - 5) Nibco, Inc.
 - 6) Victaulic Co. of America.

- j. Fire-Protection-Service Valves:
 - 1) Central Sprink, Inc.
 - 2) Central Sprinkler Corp.
 - 3) Grinnell Corp.
 - 4) McWane, Inc.; Kennedy Valve Div.
 - 5) Nibco, Inc.
 - 6) Stockham Valves & Fittings, Inc.
 - 7) Victaulic Co. of America.

- k. Keyed Couplings for Steel Piping:
 - 1) Central Sprink, Inc.
 - 2) Ductilic, Inc.
 - 3) Grinnell Corp.
 - 4) National Fittings, Inc.
 - 5) Star Pipe Products, Inc.; Star Fittings Div.
 - 6) Victaulic Co. of America.

- l. Press-Seal Fittings for Steel Piping:
 - 1) Victaulic Co. of America.

- B. Piping Materials: Refer to 1.3 EXECUTION, "Piping Applications" Article for applications of pipe, tube, fitting, and joining materials.

- C. Pipes and Tubes:
 - 1. Standard-Weight Steel Pipe: ASTM A 53, ASTM A 135, or ASTM A 795; Schedule 40 in NPS 6 (DN150) and smaller, and Schedule 30 in NPS 8 (DN200) and larger.
 - 2. Schedule 10 Steel Pipe: ASTM A 135 or ASTM A 795, Schedule 10 in NPS 5 (DN125) and smaller and NFPA 13 specified wall thickness in NPS 6 to NPS 10 (DN150 to DN250).

- D. Pipe and Tube Fittings:
 - 1. Cast-Iron Threaded Fittings: ASME B16.4.
 - 2. Malleable-Iron Threaded Fittings: ASME B16.3.
 - 3. Steel, Threaded Couplings: ASTM A 865.
 - 4. Steel Welding Fittings: ASTM A 234/A 234M, ASME B16.9, or ASME B16.11.
 - 5. Steel Flanges and Flanged Fittings: ASME B16.5.
 - 6. Steel, Grooved-End Fittings: UL-listed and FM-approved, ASTM A 47 (ASTM A 47M), malleable iron or ASTM A 536, ductile iron; with dimensions matching steel pipe and ends factory grooved according to AWWA C606.

- E. Joining Materials: Refer to Division 23 Section "Common Work Results for HVAC" for pipe-flange gasket materials and welding filler metals.

- F. Fire-Protection-Service Valves:

1. General: UL listed and FM approved, with minimum 175-psig (1200-kPa) nonshock working-pressure rating. Valves for grooved-end piping may be furnished with grooved ends instead of type of ends specified.
 2. Gate Valves, NPS 2 (DN50) and Smaller: UL 262; cast-bronze, threaded ends; solid wedge; OS&Y; and rising stem.
 3. Gate Valves, NPS 2-1/2 (DN65) and Larger: UL 262, iron body, bronze mounted, taper wedge, OS&Y, and rising stem. Include replaceable, bronze, wedge facing rings and flanged ends.
 4. Indicator-Post, Gate Valves: UL 262, iron body, bronze mounted, solid-wedge disc, and nonrising stem with operating nut and flanged ends.
 5. Swing Check Valves, NPS 2 (DN50) and Smaller: UL 312 or MSS SP-80, Class 150; bronze body with bronze disc and threaded ends.
 6. Swing Check Valves, NPS 2-1/2 (DN65) and Larger: UL 312, cast-iron body and bolted cap, with bronze disc or cast-iron disc with bronze-disc ring and flanged ends.
 7. Split-Clapper Check Valves, NPS 4 (DN100) and Larger: UL 312, cast-iron body with rubber seal, bronze-alloy discs, and stainless-steel spring and hinge pin.
- G. Specialty Valves:
1. Alarm Check Valves: UL 193, 175-psig (1200-kPa) working pressure, designed for horizontal or vertical installation, with cast-iron flanged inlet and outlet, bronze grooved seat with O-ring seals, and single-hinge pin and latch design. Include trim sets for bypass, drain, electric sprinkler alarm switch, pressure gages, retarding chamber, and fill-line attachment with strainer.
 - a. Option: Grooved-end connections for use with keyed couplings.
 - b. Drip Cup Assembly: Pipe drain without valves, and separate from main drain piping.
 - c. Drip Cup Assembly: Pipe drain with check valve to main drain piping.
 2. Ball Drip Valves: UL 1726, automatic drain valve, NPS 3/4 (DN20), ball check device with threaded ends.
- H. Sprinklers:
1. Automatic Sprinklers: With heat-responsive element complying with the following:
 - a. UL 199, for applications except residential.
 - b. UL 1626, for residential applications.
 - c. UL 1767, for early suppression, fast-response applications.
 2. Sprinkler Types and Categories: Nominal 1/2" (12.7-mm) orifice for "Ordinary" temperature classification rating, unless otherwise indicated or required by application.
 3. Sprinkler types, features, and options include the following:
 - a. Concealed ceiling sprinklers, including cover plate.
 - b. Flow-control sprinklers, with automatic open and shut off feature.
 - c. Flush ceiling sprinklers, including escutcheon.
 - d. Pendent sprinklers.
 - e. Recessed sprinklers, including escutcheon.
 - f. Sidewall sprinklers.
 - g. Upright sprinklers.
 4. Sprinkler Finishes: Chrome-plated

5. Sprinkler Escutcheons: Materials, types, and finishes for the following sprinkler mounting applications. Escutcheons for concealed, flush, and recessed-type sprinklers are specified with sprinklers.
 - a. Ceiling Mounting: Chrome-plated steel, one piece, flat.
 - b. Sidewall Mounting: Chrome-plated steel, one piece, flat.
 6. Sprinkler Guards: Wire-cage type, including fastening device for attaching to sprinkler.
- I. Fire Department Connections:
1. Wall, Fire Department Connections: UL 405; cast-brass body with brass, wall, escutcheon plate; brass, lugged caps with gaskets and brass chains; and brass, lugged swivel connections. Include inlets with threads according to NFPA 1963 and matching local fire department sizes and threads, outlet with pipe threads, extension pipe nipples, check devices or clappers for inlets, and escutcheon plate with marking "AUTO SPKR."
 - a. Type: Flush mounting.
 - b. Escutcheon Plate: Rectangular.
 - c. Finish: Polished brass.
- J. Alarm Devices:
1. General: Types matching piping and equipment connections.
 2. Water-Flow Indicators: UL 346; electrical-supervision, vane-type water-flow detector; with 250-psig (1725-kPa) pressure rating; and designed for horizontal or vertical installation. Include two single-pole, double-throw, circuit switches for isolated alarm and auxiliary contacts, 7 A, 125-V ac and 0.25 A, 24-V dc; complete with factory-set, field-adjustable retard element to prevent false signals and tamperproof cover that sends signal if removed.
 3. Valve Supervisory Switches: UL 753; electrical; single-pole, double throw; with normally closed contacts. Include design that signals controlled valve is in other than fully open position.
- K. Pressure Gages:
1. Pressure Gages: UL 393, 3½"- to 4½"- (90- to 115-mm-) diameter dial with dial range of 0 to 250 psig (0 to 1725 kPa).

1.3. EXECUTION

- A. Piping Applications:
1. Do not use welded joints with galvanized steel pipe.
 2. Flanges, unions, and transition and special fittings with pressure ratings the same as or higher than system's pressure rating may be used in aboveground applications, unless otherwise indicated.
 3. Piping between Fire Department Connections and Check Valves: Use galvanized, standard-weight steel pipe with threaded ends; cast- or malleable-iron threaded fittings; and threaded joints.
 4. Piping between Fire Department Connections and Check Valves: Use galvanized, standard-weight steel pipe with grooved ends; steel, grooved-end fittings; steel, keyed couplings; and grooved joints.
 5. Underground Service-Entrance Piping: Use ductile-iron, push-on-joint pipe and fittings and restrained joints.
 6. Underground Service-Entrance Piping: Use ductile-iron, mechanical-joint pipe and fittings and restrained joints.

7. Underground Service-Entrance Piping: Use ductile-iron, grooved-end pipe and fittings; ductile-iron, keyed couplings; and grooved joints.
 8. Sprinkler Feed Mains and Risers: Use the following:
 - a. NPS 6 (DN100) and Smaller: Schedule 10 steel pipe with roll-grooved ends; steel, grooved-end fittings; and grooved joints.
 9. Wet-Pipe, Sprinkler Branch Piping: Use the following:
 - a. NPS 2 and Smaller: Standard-weight steel pipe with threaded ends, cast- or malleable-iron threaded fittings, and threaded joints.
- B. Valve Applications: Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
1. Fire-Protection-Service Valves: UL listed and FM approved for applications where required by NFPA 13.
 - a. Shutoff Duty: Use gate valves.
 2. General-Duty Valves: For applications where UL-listed and FM-approved valves are not required by NFPA 13.
 - a. Shutoff Duty: Use gate, ball, or butterfly valves.
 - b. Throttling Duty: Use globe, ball, or butterfly valves.
- C. Joint Construction:
1. Refer to Section "Common Work Results for HVAC" for basic piping joint construction.
 2. Ductile-Iron-Piping, Grooved Joints: Use ductile-iron pipe with radius-cut-grooved ends; ductile-iron, grooved-end fittings; and ductile-iron, keyed couplings. Assemble joints with couplings, gaskets, lubricant, and bolts according to coupling manufacturer's written instructions.
 3. Steel-Piping, Grooved Joints: Use Schedule 40 steel pipe with cut or roll-grooved ends and Schedule 30 or thinner steel pipe with roll-grooved ends; steel, grooved-end fittings; and steel, keyed couplings. Assemble joints with couplings, gaskets, lubricant, and bolts according to coupling manufacturer's written instructions. Use gaskets listed for dry-pipe service for dry piping.
- D. Service-Entrance Piping:
1. Refer to Section "Common Work Results for HVAC" for basic piping installation.
 2. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated, as far as practical.
 - a. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File written approval with Architect before deviating from approved working plans.
 3. Install underground service-entrance piping according to NFPA 24 and with restrained joints.
 4. Use approved fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.
 5. Install unions adjacent to each valve in pipes NPS 2 (DN50) and smaller. Unions are not required on flanged devices or in piping installations using grooved joints.
 6. Install flanges or flange adapters on valves, apparatus, and equipment having NPS 2-1/2 (DN65) and larger connections.
 7. Install "Inspector's Test Connections" in sprinkler piping, complete with shutoff valve, sized and located according to NFPA 13.
 8. Install sprinkler piping with drains for complete system drainage.

9. Install sprinkler zone control valves, test assemblies, and drain risers adjacent to sprinkler risers when sprinkler branch piping is connected to sprinkler risers.
 10. Install ball drip valves to drain piping between fire department connections and check valves. Drain to floor drain or outside building.
 11. Install alarm devices in piping systems.
 12. Hangers and Supports: Comply with NFPA 13 for hanger materials and installation.
 13. Earthquake Protection: Install piping according to NFPA 13 to protect from earthquake damage.
 14. Install piping with grooved joints according to manufacturer's written instructions. Construct rigid piping joints, unless otherwise indicated.
 15. Install pressure gages on riser or feed main and at each sprinkler test connection. Include pressure gages with connection not less than NPS 1/4 (DN8) and with soft metal seated globe valve, arranged for draining pipe between gage and valve. Install gages to permit removal, and install where they will not be subject to freezing.
- E. Specialty Sprinkler Fitting Installation: Install specialty sprinkler fittings according to manufacturer's written instructions.
- F. Valve Installation:
1. Gate Valves: Install fire-protection-service valves supervised-open, located to control sources of water supply except from fire department connections. Provide permanent identification signs indicating portion of system controlled by each valve.
 2. Install check valve in each water-supply connection. Install backflow preventers instead of check valves in potable-water supply sources.
 3. Alarm Check Valves: Install valves in vertical position for proper direction of flow, including bypass check valve and retard chamber drain-line connection.
- G. Sprinkler Applications:
1. General: Use sprinklers according to the following applications:
 - a. Rooms without Ceilings: Pendent sprinklers.
 - b. Rooms with Suspended Ceilings: Concealed sprinklers.
 - c. Wall Mounting: Sidewall sprinklers.
 - d. Sprinkler Finishes: Use sprinklers with the following finishes:
 - 1) Upright, Pendent, and Sidewall Sprinklers: Chrome-plated in finished spaces exposed to view; rough bronze in unfinished spaces not exposed to view.
 - 2) Concealed Sprinklers: Rough brass, with factory-painted white cover plate.
 - 3) Flush Sprinklers: Bright chrome, with painted white escutcheon.
 - 4) Recessed Sprinklers: Bright chrome, with bright chrome escutcheon.
- H. Sprinkler Installation: Do not install pendent or sidewall, wet-type sprinklers in areas subject to freezing. Use dry-type sprinklers with water supply from heated space.
- I. Connections:
1. Connect water supplies to sprinklers. Include backflow preventers.
 2. Install ball drip valves at each check valve for fire department connection. Drain to floor drain or outside building.
 3. Connect piping to specialty valves, specialties, fire department connections, and accessories.

4. Electrical Connections: Power wiring is specified in Division 26.
 5. Connect alarm devices to fire alarm.
- J. Labeling and Identification:
1. Install labeling & pipe markers on equipment & piping according to requirements in NFPA 13 and in Division 23 Section "Common Work Results for HVAC."
 2. Install labeling and pipe markers on equipment and piping according to requirements in NFPA 13 and in Division 23 Section "Mechanical Identification."
- K. Field Quality Control:
1. Flush, test, and inspect sprinkler piping according to NFPA 13, "System Acceptance" Chapter.
 2. Replace piping system components that do not pass test procedures and retest to demonstrate compliance. Repeat procedure until satisfactory results are obtained.
 3. Report test results promptly and in writing to Architect and authorities having jurisdiction.
- L. Cleaning:
1. Clean dirt and debris from sprinklers.
 2. Remove and replace sprinklers having paint other than factory finish.
- M. Protection: Protect sprinklers from damage until Substantial Completion.
- N. Commissioning:
1. Verify that specialty valves, trim, fittings, controls, and accessories are installed and operate correctly.
 2. Verify that specified tests of piping are complete.
 3. Verify that damaged sprinklers and sprinklers with paint or coating not specified are replaced with new, correct type.
 4. Verify that sprinklers are correct types, have correct finishes and temperature ratings, and have guards as required for each application.
 5. Verify that potable-water supplies have correct types of backflow preventers.
 6. Verify that fire department connections have threads compatible with local fire department equipment.
 7. Fill wet-pipe sprinkler piping with water.
 8. Energize circuits to electrical equipment and devices.
 9. Coordinate with fire alarm tests. Operate as required.
- O. Demonstration:
1. Demonstrate equipment, specialties, and accessories. Review operating and maintenance information.
 2. Schedule demonstration with Owner with at least seven days' advance notice.

END 21 11 00.

DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)
SECTION 23 05 00: COMMON WORK RESULTS FOR HVAC

1.1 GENERAL

- A. Related Documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Summary:
1. This Section includes the following basic mechanical materials and methods to complement other Division 23 Sections.
 - a. Piping materials and installation instructions common to most piping systems.
 - b. Escutcheons
 - c. Dielectric fittings.
 - d. Flexible connectors.
 - e. Equipment nameplate data requirements.
 - f. Labeling and identifying mechanical systems.
 - g. Field-fabricated metal and wood equipment supports.
 - h. Installation requirements common to equipment specification sections.
 - i. Mechanical demolition.
 - j. Cutting and patching.
 - k. Touchup painting and finishing.
- C. Definitions:
1. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawl spaces, and tunnels.
 2. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
 3. Exposed, Exterior Installations: Exposed to view outdoors, or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
 4. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.
 5. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants, but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.
 6. The following are industry abbreviations for plastic materials:
 - a. CPVC: Chlorinated polyvinyl chloride plastic.
 - b. NP: Nylon plastic.
 - c. PE: Polyethylene plastic.
 - d. PVC: Polyvinyl chloride plastic.
 7. The following are industry abbreviations for rubber materials:
 - a. CR: Chlorosulfonated polyethylene synthetic rubber.
 - b. EPDM: Ethylene propylene diene terpolymer rubber.
- D. Quality Assurance:

1. Comply with ASME A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.
 2. Equipment Selection: Equipment of higher electrical characteristics, physical dimensions, capacities, and ratings may be furnished provided such proposed equipment is approved in writing and connecting mechanical and electrical services, circuit breakers, conduit, motors, bases, and equipment spaces are increased. Additional costs shall be approved in advance by appropriate Contract Modification for these increases. If minimum energy ratings or efficiencies of equipment are specified, equipment must meet design and commissioning requirements.
- E. Delivery, Storage, and Handling:
1. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and prevent entrance of dirt, debris, and moisture.
 2. Protect stored pipes and tubes from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor, if stored inside.
 3. Protect flanges, fittings, and piping specialties from moisture and dirt.
- F. Sequencing and Scheduling:
1. Coordinate mechanical equipment installation with other building components.
 2. Arrange for pipe spaces, chases, slots, and openings in building structure during progress of construction to allow for mechanical installations.
 3. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components, as they are constructed.
 4. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Coordinate installation of large equipment requiring positioning before closing in building.
 5. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies.
 6. Coordinate requirements for access panels and doors if mechanical items requiring access are concealed behind finished surfaces. Access panels and doors are specified in Division 8 Section "Access Doors."
 7. Coordinate installation of identifying devices after completing covering and painting, if devices are applied to surfaces. Install identifying devices before installing acoustical ceilings and similar concealment.

1.2. PRODUCTS

- A. Manufacturers:
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Pipe and Pipe Fittings:
1. Refer to individual Sections for pipe and fitting materials and joining methods.
 2. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.
- C. Joining Materials:
1. Solder Filler Metals: ASTM B 32.

- a. Alloy Sn95 or Alloy Sn94: Approximately 95 percent tin and 5 percent silver, with 0.10 percent lead content.
 - b. Alloy E: Approximately 95 percent tin and 5 percent copper, with 0.10 percent maximum lead content.
 - c. Alloy HA: Tin-antimony-silver-copper zinc, with 0.10 percent maximum lead content.
 - d. Alloy HB: Tin-antimony-silver-copper nickel, with 0.10 percent maximum lead content.
 - e. Alloy Sb5: 95 percent tin and 5 percent antimony, with 0.20 percent maximum lead content.
2. Solvent Cements: Manufacturer's standard solvent cements for the following:
 - a. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
 3. Couplings: Iron-body sleeve assembly, fabricated to match OD of plain-end, pressure pipes.
 - a. Sleeve: ASTM A 126, Class B, gray iron.
 - b. Followers: Malleable iron or ASTM A 536 ductile iron.
 - c. Gaskets: Rubber
 - d. Bolts and Nuts: AWWA C111
 - e. Finish: Enamel paint.
- D. Dielectric Fittings:
1. General: Assembly or fitting with insulating material isolating joined dissimilar metals, to prevent galvanic action and stop corrosion.
 2. Description: Combination of copper alloy and ferrous; threaded, solder, plain, and weld-neck end types and matching piping system materials.
 3. Insulating Material: Suitable for system fluid, pressure, and temperature.
 4. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig (1725-kPa) minimum working pressure at 180 deg F (82 deg C).
 5. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150-psig (1035-kPa) minimum working pressure as required to suit system pressures.
 6. Dielectric-Flange Insulation Kits: Field-assembled, companion-flange assembly, full-face or ring type. Components include neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.
 - a. Provide separate companion flanges and steel bolts and nuts for 150 psig (1035-kPa) minimum working pressure as required to suit system pressures.
 7. Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig (2070-kPa) minimum working pressure at 225 deg F (107 deg C).
- E. Identifying Devices and Labels:
1. General: Manufacturer's standard products of categories and types required for each application as referenced in other Division 15 Sections. If more than one type is specified for application, selection is Installer's option, but provide one selection for each product category.
 2. Equipment Nameplates: Metal nameplate with operational data engraved or stamped; permanently fastened to equipment.
 - a. Data: Manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data.

- b. Location: Accessible and visible location.
3. Stencils: Standard stencils, prepared for required applications with letter sizes complying with recommendations of ASME A13.1 for piping and similar applications, but not less than 1-1/4-inch- (30-mm-) high letters for ductwork and not less than 3/4-inch- (19-mm-) high letters for access door signs and similar operational instructions.
- a. Stencil Paint: Standard exterior-type stenciling enamel; black, unless otherwise indicated; either brushing grade or pressurized spray-can form and grade.
 - b. Identification Paint: Standard identification enamel of colors indicated or, if not otherwise indicated for piping systems, comply with ASME A13.1 for colors.
4. Engraved Plastic-Laminate Signs: ASTM D 709, Type I, cellulose, paper-base, phenolic-resin-laminate engraving stock; Grade ES-2, black surface, black phenolic core, with white melamine subcore, unless otherwise indicated.
- a. Fabricate in sizes required for message.
 - b. Engraved with engraver's standard letter style, of sizes and with wording to match equipment identification.
 - c. Punch for mechanical fastening.
 - d. Thickness: 1/8 inch, unless otherwise indicated.
 - e. Fasteners: Self-tapping stainless-steel screws or contact-type permanent adhesive.
5. Plastic Equipment Markers: Color-coded, laminated plastic. Comply with the following color code:
- a. Green: Cooling equipment and components.
 - b. Yellow: Heating equipment and components.
 - c. Yellow/Green: Combination cooling and heating equipment and components.
 - d. Brown: Energy reclamation equipment and components.
 - e. Blue: Equipment and components that do not meet any criteria above.
 - f. For hazardous equipment, use colors and designs recommended by ASME A13.1.
 - g. Nomenclature: Include the following, matching terminology on schedules as closely as possible:
 - 1) Name and plan number.
 - 2) Equipment service.
 - 3) Design capacity.
 - 4) Other design parameters such as pressure drop, entering and leaving conditions, and rpm.
 - h. Size: Approximate 2-1/2 by 4 inches (65 by 100 mm) for control devices, dampers, and valves; and 4-1/2 by 6 inches (115 by 150 mm) for equipment.
6. Lettering and Graphics: Coordinate names, abbreviations, and other designations used in mechanical identification, with corresponding designations indicated. Use numbers, lettering, and wording indicated for proper identification and operation/maintenance of mechanical systems and equipment.
- a. Multiple Systems: If multiple systems of same generic name are indicated, provide identification that indicates individual system number

and service such as "Boiler No. 3," "Air Supply No. 1H," or "Standpipe F12."

1.3. EXECUTION

- A. Piping Systems – Common Requirements:
1. General Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated, unless deviations to layout are approved on Coordination Drawings.
 2. Install components with pressure rating equal to or greater than system operating pressure.
 3. Install piping free of sags and bends.
 4. Install piping to allow application of insulation plus 1-inch (25-mm) clearance around insulation.
 5. Locate groups of pipes parallel to each other, spaced to permit valve servicing.
 6. Install couplings according to manufacturer's written instructions.
 7. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.
 8. Piping Joint Construction: Join pipe and fittings as follows and as specifically required in individual piping specification Sections:
 - a. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
 - b. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
 - c. Soldered Joints: Construct joints according to AWS's "Soldering Manual," Chapter "The Soldering of Pipe and Tube"; or CDA's "Copper Tube Handbook."
 - d. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1) Note internal length of threads in fittings or valve ends, and proximity of internal seat or wall, to determine how far pipe should be threaded into joint.
 - 2) Apply appropriate tape or thread compound to external pipe threads, unless dry seal threading is specified.
 - 3) Align threads at point of assembly.
 - 4) Tighten joint with wrench. Apply wrench to valve end into which pipe is being threaded.
 - 5) Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
 9. Piping Connections: Make connections according to the following, unless otherwise indicated:
 - a. Install unions, in piping 2-inch NPS and smaller, adjacent to each valve and at final connection to each piece of equipment with 2-inch NPS or smaller threaded pipe connection.

- b. Install flanges, in piping 2-1/2-inch NPS and larger, adjacent to flanged valves and at final connection to each piece of equipment with flanged pipe connection.
 - c. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
 - d. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.
- B. Equipment Installation – Common Requirements:
- 1. Install equipment to provide maximum possible headroom, if mounting heights are not indicated.
 - 2. Install equipment according to approved submittal data. Portions of the Work are shown only in diagrammatic form. Refer conflicts to Architect.
 - 3. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.
 - 4. Install mechanical equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
 - 5. Install equipment giving right of way to piping installed at required slope.
 - 6. Install flexible connectors on equipment side of shutoff valves, horizontally and parallel to equipment shafts if possible.
- C. Labeling and Identifying:
- 1. Piping Systems: Install pipe markers on each system. Include arrows showing normal direction of flow.
 - a. Stenciled Markers: According to ASME A13.1.
 - b. Plastic markers, with application systems. Install on insulation segment if required for hot, uninsulated piping.
 - c. Locate pipe markers as follows if piping is exposed in finished spaces, machine rooms, and accessible maintenance spaces, such as shafts, tunnels, plenums, and exterior nonconcealed locations:
 - 1) Near each valve and control device.
 - 2) Near each branch, excluding short takeoffs for fixtures and terminal units. Mark each pipe at branch, if flow pattern is not obvious.
 - 3) Near locations if pipes pass through walls, floors, ceilings, or enter nonaccessible enclosures.
 - 4) At access doors, manholes, and similar access points that permit view of concealed piping.
 - 5) Near major equipment items and other points of origination and termination.
 - 6) Spaced at maximum of 50-foot (15-m) intervals along each run. Reduce intervals to 25 feet (7.5 m) in congested areas of piping and equipment.
 - 7) On piping above removable acoustical ceilings, except omit intermediately spaced markers.
 - 2. Equipment: Install engraved plastic-laminate sign or equipment marker on or near each major item of mechanical equipment.
 - a. Lettering Size: Minimum 1/4-inch- (6.4-mm-) high lettering for name of unit if viewing distance is less than 24 inches (610 mm), 1/2-inch- (12.7-mm-) high lettering for distances up to 72 inches (1800 mm), and

proportionately larger lettering for greater distances. Provide secondary lettering two-thirds to three-fourths of size of principal lettering.

- b. Text of Signs: Provide name of identified unit. Include text to distinguish between multiple units, inform user of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.
- 3. Adjusting: Relocate identifying devices as necessary for unobstructed view in finished construction.
- D. Concrete Bases: Construct concrete bases of dimensions indicated, but not less than 4 inches (100 mm) larger in both directions than supported unit. Follow supported equipment manufacturer's setting templates for anchor bolt and tie locations. Use 3000-psi (20.7-MPa), 28-day compressive-strength concrete and reinforcement as specified in Division 3 Section "Cast-in-Place Concrete."
- E. Cutting and Patching:
 - 1. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces necessary for mechanical installations. Perform cutting by skilled mechanics of trades involved.
 - 2. Repair cut surfaces to match adjacent surfaces.

END 23 05 00.

DIVISION 23 – HVAC

SECTION 23 05 93: TESTING, ADJUSTING AND BALANCING FOR HVAC

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Testing adjusting, and balancing of air systems.
 - 2. Testing adjusting, and balancing of hydronic systems.
 - 3. Measurement of final operating condition of HVAC systems.
 - 4. Sound measurement of equipment operating conditions.
 - 5. Vibration measurement of equipment operating conditions.

1.2 REFERENCES

- A. Associated Air Balance Council:
 - 1. AABC MN-1 - National Standards for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems.
- B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
 - 1. ASHRAE 111 - Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning and Refrigeration Systems.
- C. Natural Environmental Balancing Bureau:
 - 1. NEBB - Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Prior to commencing Work, submit proof of latest calibration date of each instrument.
- C. Test Reports: Indicate data on AABC MN-1 National Standards for Total System Balance forms.
- D. Field Reports: Indicate deficiencies preventing proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
- E. Prior to commencing Work, submit report forms or outlines indicating adjusting, balancing, and equipment data required. Include detailed procedures, agenda, sample report forms and Copy of NEBB Certificate of Conformance Certification.
- F. Submit draft copies of report for review prior to final acceptance of Project.
- G. Furnish reports in binder manuals, complete with table of contents page and indexing tabs, with cover identification at front and side. Include set of reduced

drawings with air outlets and equipment identified to correspond with data sheets, and indicating thermostat locations.

1.4 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of flow measuring stations balancing valves and rough setting.
- C. Operation and Maintenance Data: Furnish final copy of testing, adjusting, and balancing report inclusion in operating and maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with AABC MN-1 National Standards for Field Measurement and Instrumentation, Total System Balance ASHRAE 111 NEBB Procedural Standards for Testing, Balancing and Adjusting of Environmental Systems.
- B. Maintain one copy of each document on site.
- C. Prior to commencing Work, calibrate each instrument to be used.

1.6 QUALIFICATIONS

- A. Agency: Company specializing in testing, adjusting, and balancing of systems specified in this section with minimum three years experience.
- B. Perform Work under supervision of AABC Certified Test and Balance Engineer or NEBB Certified Testing, Balancing and Adjusting Supervisor.

1.7 SEQUENCING

- A. Sequence balancing between completion of systems tested and Date of Substantial Completion.

1.8 SCHEDULING

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify systems are complete and operable before commencing work. Verify the following:
 - 1. Systems are started and operating in safe and normal condition.
 - 2. Temperature control systems are installed complete and operable.
 - 3. Proper thermal overload protection is in place for electrical equipment.
 - 4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
 - 5. Duct systems are clean of debris.
 - 6. Fans are rotating correctly.
 - 7. Fire and volume dampers are in place and open.
 - 8. Air coil fins are cleaned and combed.
 - 9. Access doors are closed and duct end caps are in place.
 - 10. Air outlets are installed and connected.
 - 11. Duct system leakage is minimized.
 - 12. Hydronic systems are flushed, filled, and vented.
 - 13. Pumps are rotating correctly.
 - 14. Proper strainer baskets are clean and in place or in normal position.
 - 15. Service and balancing valves are open.

3.2 PREPARATION

- A. Furnish instruments required for testing, adjusting, and balancing operations.
- B. Make instruments available to Architect/Engineer to facilitate spot checks during testing.

3.3 INSTALLATION TOLERANCES

- A. Air Handling Systems: Adjust to within plus or minus 10 percent of design.
- B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.
- C. Hydronic Systems: Adjust to within plus or minus 10 percent of design.

3.4 ADJUSTING

- A. Section 01 70 00 - Execution and Closeout Requirements: Testing, adjusting, and balancing.
- B. Verify recorded data represents actual measured or observed conditions.

- C. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- D. After adjustment, take measurements to verify balance has not been disrupted. If disrupted, verify correcting adjustments have been made.
- E. Report defects and deficiencies noted during performance of services, preventing system balance.
- F. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
- G. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by Owner.
- H. Check and adjust systems approximately six months after final acceptance and submit report.

3.5 AIR SYSTEM PROCEDURE

- A. Adjust air handling and distribution systems to obtain required or design supply, return, and exhaust air quantities.
- B. Contractor shall verify motor loading (current draw) during full economizer, normal operation, and night operation. This applies to all fan motors supply, return, and power exhaust.
- C. Make air quantity measurements in main ducts by Pitot tube traverse of entire cross sectional area of duct.
- D. Measure air quantities at air inlets and outlets.
- E. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts.
- F. Use volume control devices to regulate air quantities only to extent adjustments do not create objectionable air motion or sound levels. Effect volume control by using volume dampers located in ducts.
- G. Vary total system air quantities by adjustment of fan speeds. Provide sheave drive changes to vary fan speed. Vary branch air quantities by damper regulation.
- H. Contractor shall replace motor sheaves as required to obtain balance. Contractor shall not be responsible for motor replacement.
- I. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.

- J. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across fan. Make allowances for 50 percent loading of filters.
- K. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
- L. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.
- M. At modulating damper locations, take measurements and balance at extreme conditions. Balance variable volume systems at maximum airflow rate, full cooling, and at minimum airflow rate, full heating.
- N. Measure building static pressure and adjust supply, return, and exhaust air systems to obtain required relationship between each to maintain approximately **0.05 inches (12.5 Pa)** positive static pressure near building entries.
- O. Check multi-zone units for motorized damper leakage. Adjust air quantities with mixing dampers set first for cooling, then heating, then modulating.
- P. For variable air volume system powered units set volume controller to airflow setting indicated. Confirm connections properly made and confirm proper operation for automatic variable-air-volume temperature control.
- Q. On fan powered VAV boxes, adjust airflow switches for proper operation.

3.6 WATER SYSTEM PROCEDURE

- A. Adjust water systems, after air balancing, to obtain design quantities.
- B. Use calibrated fittings and pressure gauges to determine flow rates for system balance. Where flow-metering devices are not installed, base flow balance on temperature difference across various heat transfer elements in system.
- C. Adjust systems to obtain specified pressure drops and flows through heat transfer elements prior to thermal testing. Perform balancing by measurement of temperature differential in conjunction with air balancing.
- D. Effect system balance with automatic control valves fully open or in normal position to heat transfer elements.
- E. Effect adjustment of water distribution systems by means of balancing cocks, valves, and fittings. Do not use service or shut-off valves for balancing unless indexed for balance point.
- F. Where available pump capacity is less than total flow requirements or individual system parts, simulate full flow in one part by temporary restriction of flow to other parts.

3.7 SCHEDULES

- A. Equipment Requiring Testing, Adjusting, and Balancing:
 - 1. Fire Pumps.
 - 2. Plumbing Pumps.
 - 3. HVAC Pumps.
 - 4. Air Cooled Water Chillers.
 - 5. Air Coils.
 - 6. Terminal Heat Transfer Units.
 - 7. Air Handling Units.
 - 8. Fans.
 - 9. Air Filters.
 - 10. Air Terminal Units.
 - 11. Air Inlets and Outlets.

- B. Report Forms
 - 1. Title Page:
 - a. Name of Testing, Adjusting, and Balancing Agency
 - b. Address of Testing, Adjusting, and Balancing Agency
 - c. Telephone and facsimile numbers of Testing, Adjusting, and Balancing Agency
 - d. Project name
 - e. Project location
 - f. Project Architect
 - g. Project Engineer
 - h. Project Contractor
 - i. Project altitude
 - j. Report date
 - 2. Summary Comments:
 - a. Design versus final performance
 - b. Notable characteristics of system
 - c. Description of systems operation sequence
 - d. Summary of outdoor and exhaust flows to indicate building pressurization
 - e. Nomenclature used throughout report
 - f. Test conditions
 - 3. Instrument List:
 - a. Instrument
 - b. Manufacturer
 - c. Model number
 - d. Serial number
 - e. Range
 - f. Calibration date
 - 4. Electric Motors:
 - a. Manufacturer
 - b. Model/Frame
 - c. HP/BHP and kW
 - d. Phase, voltage, amperage; nameplate, actual, no load

- e. RPM
 - f. Service factor
 - g. Starter size, rating, heater elements
 - h. Sheave Make/Size/Bore
5. V-Belt Drive:
- a. Identification/location
 - b. Required driven RPM
 - c. Driven sheave, diameter and RPM
 - d. Belt, size and quantity
 - e. Motor sheave diameter and RPM
 - f. Center to center distance, maximum, minimum, and actual
6. Pump Data:
- a. Identification/number
 - b. Manufacturer
 - c. Size/model
 - d. Impeller
 - e. Service
 - f. Design flow rate, pressure drop, BHP and kW
 - g. Actual flow rate, pressure drop, BHP and kW
 - h. Discharge pressure
 - i. Suction pressure
 - j. Total operating head pressure
 - k. Shut off, discharge and suction pressures
 - l. Shut off, total head pressure
7. Chillers:
- a. Identification/number
 - b. Manufacturer
 - c. Capacity
 - d. Model number
 - e. Serial number
 - f. Evaporator entering water temperature, design and actual
 - g. Evaporator leaving water temperature, design and actual
 - h. Evaporator pressure drop, design and actual
 - i. Evaporator water flow rate, design and actual
 - j. Condenser entering water temperature, design and actual
 - k. Condenser pressure drop, design and actual
 - l. Condenser water flow rate, design and actual
8. Cooling Coil Data:
- a. Identification/number
 - b. Location
 - c. Service
 - d. Manufacturer
 - e. Air flow, design and actual
 - f. Entering air DB temperature, design and actual
 - g. Entering air WB temperature, design and actual
 - h. Leaving air DB temperature, design and actual
 - i. Leaving air WB temperature, design and actual
 - j. Water flow, design and actual

- k. Water pressure drop, design and actual
 - l. Entering water temperature, design and actual
 - m. Leaving water temperature, design and actual
 - n. Saturated suction temperature, design and actual
 - o. Air pressure drop, design and actual
9. Heating Coil Data:
- a. Identification/number
 - b. Location
 - c. Service
 - d. Manufacturer
 - e. Air flow, design and actual
 - f. Water flow, design and actual
 - g. Water pressure drop, design and actual
 - h. Entering water temperature, design and actual
 - i. Leaving water temperature, design and actual
 - j. Entering air temperature, design and actual
 - k. Leaving air temperature, design and actual
 - l. Air pressure drop, design and actual
10. Return Air/Outside Air Data:
- a. Identification/location
 - b. Design air flow
 - c. Actual air flow
 - d. Design return air flow
 - e. Actual return air flow
 - f. Design outside air flow
 - g. Actual outside air flow
 - h. Return air temperature
 - i. Outside air temperature
 - j. Required mixed air temperature
 - k. Actual mixed air temperature
 - l. Design outside/return air ratio
 - m. Actual outside/return air ratio
11. Exhaust Fan Data:
- a. Location
 - b. Manufacturer
 - c. Model number
 - d. Serial number
 - e. Air flow, specified and actual
 - f. Total static pressure (total external), specified and actual
 - g. Inlet pressure
 - h. Discharge pressure
 - i. Sheave Make/Size/Bore
 - j. Number of Belts/Make/Size
 - k. Fan RPM
12. Duct Traverse:
- a. System zone/branch
 - b. Duct size
 - c. Area

- d. Design velocity
 - e. Design air flow
 - f. Test velocity
 - g. Test air flow
 - h. Duct static pressure
 - i. Air temperature
 - j. Air correction factor
13. Duct Leak Test:
- a. Description of ductwork under test
 - b. Duct design operating pressure
 - c. Duct design test static pressure
 - d. Duct capacity, air flow
 - e. Maximum allowable leakage duct capacity times leak factor
 - f. Test apparatus
 - 1) Blower
 - 2) Orifice, tube size
 - 3) Orifice size
 - 4) Calibrated
 - g. Test static pressure
 - h. Test orifice differential pressure
 - i. Leakage
14. Air Monitoring Station Data:
- a. Identification/location
 - b. System
 - c. Size
 - d. Area
 - e. Design velocity
 - f. Design air flow
 - g. Test velocity
 - h. Test air flow
15. Flow Measuring Station:
- a. Identification/number
 - b. Location
 - c. Size
 - d. Manufacturer
 - e. Model number
 - f. Serial number
 - g. Design Flow rate
 - h. Design pressure drop
 - i. Actual/final pressure drop
 - j. Actual/final flow rate
 - k. Station calibrated setting
16. Terminal Unit Data:
- a. Manufacturer
 - b. Type, constant, variable, single, dual duct
 - c. Identification/number
 - d. Location
 - e. Model number

- f. Size
 - g. Minimum static pressure
 - h. Minimum design air flow
 - i. Maximum design air flow
 - j. Maximum actual air flow
 - k. Inlet static pressure
17. Air Distribution Test Sheet:
- a. Air terminal number
 - b. Room number/location
 - c. Terminal type
 - d. Terminal size
 - e. Area factor
 - f. Design velocity
 - g. Design air flow
 - h. Test (final) velocity
 - i. Test (final) air flow
 - j. Percent of design air flow
18. Sound Level Report:
- a. Location
 - b. Octave bands - equipment off
 - c. Octave bands - equipment on
 - d. RC level - equipment on
19. Vibration Test:
- a. Location of points:
 - 1) Fan bearing, drive end
 - 2) Fan bearing, opposite end
 - 3) Motor bearing, center (when applicable)
 - 4) Motor bearing, drive end
 - 5) Motor bearing, opposite end
 - 6) Casing (bottom or top)
 - 7) Casing (side)
 - 8) Duct after flexible connection (discharge)
 - 9) Duct after flexible connection (suction)
 - b. Test readings:
 - 1) Horizontal, velocity and displacement
 - 2) Vertical, velocity and displacement
 - 3) Axial, velocity and displacement
 - c. Normally acceptable readings, velocity and acceleration
 - d. Unusual conditions at time of test
 - e. Vibration source (when non-complying)

END OF SECTION

**DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)
SECTION 23 07 00 HVAC INSULATION**

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. HVAC piping insulation, jackets and accessories.
 2. HVAC equipment insulation, jackets and accessories.
 3. HVAC ductwork insulation, jackets, and accessories.
- B. Related Sections:
1. Section 07 84 00 - Firestopping: Product requirements for firestopping for placement by this section.
 2. Section 09 90 00 - Painting and Coating: Execution requirements for painting insulation jackets and covering specified by this section.

1.2 REFERENCES

- A. ASTM International:
1. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 2. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 3. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric).
 4. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulating Cement.
 5. ASTM C449/C449M - Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement.
 6. ASTM C450 - Standard Practice for Prefabrication and Field Fabrication of Thermal Insulating Fitting Covers for NPS Piping, Vessel Lagging, and Dished Head Segments.
 7. ASTM C533 - Standard Specification for Calcium Silicate Block and Pipe Thermal Insulation.
 8. ASTM C534 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
 9. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation.
 10. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
 11. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
 12. ASTM C585 - Standard Practice for Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System).

13. ASTM C591 - Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
14. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
15. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel.
16. ASTM C921 - Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation.
17. ASTM C1071 - Standard Specification for Thermal and Acoustical Insulation (Glass Fiber, Duct Lining Material).
18. ASTM C1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
19. ASTM C1290 - Standard Specification for Flexible Fibrous Glass Blanket Insulation Used to Externally Insulate HVAC Ducts.
20. ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
21. ASTM D4637 - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane.
22. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
23. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
24. ASTM E162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source.

B. Sheet Metal and Air Conditioning Contractors':

1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

C. National Fire Protection Association:

1. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.

D. Underwriters Laboratories Inc.:

1. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
2. UL 1978 - Standard for Safety for Grease Ducts.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit product description, thermal characteristics and list of materials and thickness for each service, and location.
- C. Manufacturer's Installation Instructions: Submit manufacturers published literature indicating proper installation procedures.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

- A. Test pipe insulation for maximum flame spread index of 25 and maximum smoke developed index of not exceeding 50 in accordance with ASTM E84, and NFPA 255.
- B. Pipe insulation manufactured in accordance with ASTM C585 for inner and outer diameters.
- C. Factory fabricated fitting covers manufactured in accordance with ASTM C450.
- D. Maintain one copy of each document on site.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.
- B. Applicator: Company specializing in performing Work of this section with minimum three years experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.
- C. Protect insulation from weather and construction traffic, dirt, water, chemical, and damage, by storing in original wrapping.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.
- B. Install insulation only when ambient temperature and humidity conditions are within range recommended by manufacturer.
- C. Maintain temperature before, during, and after installation for minimum period of 24 hours.

1.8 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.9 WARRANTY

- A. Section 01 70 00 - Execution and Closeout Requirements: Product warranties and product bonds.
- B. Furnish five year manufacturer warranty for man made fiber.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Manufacturers for Glass Fiber and Mineral Fiber Insulation Products:
 - 1. CertainTeed.
 - 2. Knauf.
 - 3. Johns Manville.
 - 4. Owens-Corning.
 - 5. .
- B. Manufacturers for Closed Cell Elastomeric Insulation Products:
 - 1. Aeroflex. Aerocell.
 - 2. Armacell, LLC. Armaflex.
 - 3. Nomaco. K-flex.
 - 4. .
- C. Manufacturers for Polyisocyanurate Foam Insulation Products:
 - 1. Dow Chemical Company.
 - 2. .
- D. Manufacturers for Extruded Polystyrene Insulation Products:
 - 1. Dow Chemical Company.
 - 2. .

2.2 PIPE INSULATION

- A. TYPE P-1: ASTM C547, molded glass fiber pipe insulation.
 - 1. Thermal Conductivity: 0.23 at 75 degrees F (0.034 at 24 degrees C).
 - 2. Operating Temperature Range: 0 to 850 degrees F (minus 18 to 454 degrees C).
 - 3. Vapor Barrier Jacket: ASTM C1136, Type I, factory applied reinforced foil kraft with self-sealing adhesive joints.
 - 4. Jacket Temperature Limit: minus 20 to 150 degrees F (minus 29 to 66 degrees C).
- B. TYPE P-2: ASTM C547, molded glass fiber pipe insulation.
 - 1. Thermal Conductivity: 0.23 at 75 degrees F (0.034 at 24 degrees C).
 - 2. Operating Temperature Range: 0 to 850 degrees F (minus 18 to 454 degrees C).

- C. TYPE P-3: ASTM C552-07, Cellular glass insulation
 - 1. Thermal Conductivity: 0.29 at 75 degrees F (0.040 at 24 degrees C).
 - 2. Operating Temperature Range:-450 to 900 degrees F
 - 3. Vapor Barrier Jacket: VentureClad 1577CW-E, 6 mil, 0 permability, embossed natural aluminum finish
 - 4. Jacket Temperature Limit: minus 30 to 300 degrees F

- D. TYPE P-4: ASTM C612; semi-rigid, fibrous glass board noncombustible.
 - 1. Thermal Conductivity: 0.27 at 75 degrees F (0.040 at 24 degrees C).
 - 2. Operating Temperature Range: 0 to 650 degrees F (minus 18 to 343 degrees C).

- E. TYPE P-5: ASTM C534, Type I, flexible, closed cell elastomeric insulation, tubular.
 - 1. Thermal Conductivity: 0.27 at 75 degrees F (0.039 at 25 degrees C).
 - 2. Operating Temperature Range: Range: Minus 70 to 180 degrees F (minus 57 to 82 degrees C).

- F. TYPE P-6: ASTM C534, Type I, flexible, closed cell elastomeric insulation, tubular.
 - 1. Thermal Conductivity: 0.30 at 75 degrees F (0.043 at 24 degrees C).
 - 2. Maximum Service Temperature: 300 degrees F (149 degrees C).
 - 3. Operating Temperature Range: Range: Minus 58 to 300 degrees F (minus 50 to 149 degrees C).

- G. TYPE P-7: ASTM C534, Type I, flexible, nonhalogen, closed cell elastomeric insulation, tubular.
 - 1. Thermal Conductivity: 0.27 at 75 degrees F (0.039 at 24 degrees C).
 - 2. Maximum Service Temperature: 250 degrees F (120 degrees C).
 - 3. Operating Temperature Range: Range: Minus 58 to 250 degrees F (minus 50 to 120 degrees C).

- H. TYPE P-8: ASTM C547, Type I or II, mineral fiber preformed pipe insulation, noncombustible.
 - 1. Thermal Conductivity: 0.23 at 75 degrees F (0.034 at 24 degrees C).
 - 2. Maximum Service Temperature: 1200 degrees F (649 degrees C).
 - 3. Canvas Jacket: UL listed, 6 oz/sq yd (220 g/sq m), plain weave cotton fabric treated with fire retardant lagging adhesive.

- I. TYPE P-9: ASTM C591, Type IV, polyisocyanurate foam insulation, formed into shapes for use as pipe insulation.
 - 1. Density: 2.0 pounds per cubic foot (32 kg per cubic meter).
 - 2. Thermal Conductivity: 180 day aged value of 0.19 at 75 degrees F (0.027 at 24 degrees C).
 - 3. Operating Temperature Range: Range: Minus 297 to 300 degrees F (minus 183 to 149 degrees C).
 - 4. Vapor Barrier Jacket: ASTM C1136, Type I, factory applied film of 6 mils (0.15 mm) thickness and water vapor permeance of 0.02 perms.

- J. TYPE P-10: ASTM C578, Type XIII, extruded polystyrene insulation, formed into shapes for use as pipe insulation.
 - 1. Thermal Conductivity: 180 day aged value of 0.259 at 75 degrees F (0.037 at 24 degrees C).
 - 2. Operating Temperature Range: Range: Minus 297 to 165 degrees F (minus 183 to 74 degrees C).
 - 3. Vapor Barrier Jacket: ASTM C1136, Type I, factory applied film of 6 mils (0.15 mm) thickness and water vapor permeance of 0.02 perms.

- K. TYPE P-11: ASTM C533; Type I, hydrous calcium silicate pipe insulation, rigid molded white; asbestos free.
 - 1. Thermal Conductivity: 0.45 at 200 degrees F (0.0650 at 93 degrees C).
 - 2. Operating Temperature Range: 140 to 1200 degrees F (60 to 649 degrees C).

- L. TYPE P-12: ASTM C547, molded glass fiber pipe insulation.
 - 1. Thermal Conductivity: 0.23 at 75 degrees F (0.034 at 24 degrees C).
 - 2. Vapor Barrier Jacket: ASTM C1136, Type I, factory applied reinforced foil kraft with self-sealing adhesive joints.
 - 3. Operating Temperature Range: 0 to 850 degrees F (minus 18 to 454 degrees C).
 - 4. Canvas Jacket: UL listed, 6 oz/sq yd (220 g/sq m), plain weave cotton fabric treated with fire retardant lagging adhesive.

2.3 PIPE INSULATION JACKETS

- A. Vapor Retarder Jacket:
 - 1. white Kraft paper with glass fiber yarn, bonded to aluminized film.
 - 2. Moisture vapor transmission: ASTM E96; 0.02 perm-inches.

- B. PVC Plastic Pipe Jacket:
 - 1. Product Description: ASTM D1784, One piece molded type fitting covers and sheet material, off-white color.
 - 2. Thickness: 10 mil (0.25 mm).
 - 3. Connections: Brush on welding adhesive or Pressure sensitive color matching vinyl tape.

- C. ABS Plastic Pipe Jacket:
 - 1. Jacket: One piece molded type fitting covers and sheet material, off-white color.
 - 2. Minimum service temperature: -40 degrees F (-40 degrees C).
 - 3. Maximum service temperature of 180 degrees F (82 degrees C).
 - 4. Moisture vapor transmission: ASTM E96; 0.012 perm-inches.
 - 5. Thickness: 30 mil (0.76 mm).
 - 6. Connections: Brush on welding adhesive.

- D. Aluminum Pipe Jacket:
 - 1. ASTM B209.
 - 2. Thickness: 0.016 inch (0.40 mm) thick sheet.
 - 3. Finish: Smooth.
 - 4. Joining: Longitudinal slip joints and 2 inch (50 mm) laps.
 - 5. Fittings: 0.016 inch (0.4 mm) thick die shaped fitting covers with factory attached protective liner.
 - 6. Metal Jacket Bands: 3/8 inch (10 mm) wide;
 - 7. Stainless Steel Pipe Jacket: ASTM A167 Type 302 304 stainless steel.
 - 8. Thickness: 0.010 inch (0.25 mm) thick.
 - 9. Finish: Smooth.
 - 10. Metal Jacket Bands: 3/8 inch (10 mm) wide; 0.010 inch (0.25 mm) thick stainless steel.

- E. Field Applied Glass Fiber Fabric Jacket System:
 - 1. Insulating Cement/Mastic: ASTM C195; hydraulic setting on mineral wool.
 - 2. Glass Fiber Fabric:
 - a. Cloth: Untreated; 9 oz/sq yd (305 g/sq m) weight.
 - b. Blanket: 1.0 lb/cu ft (16 kg/cu m) density.
 - c. Weave: 5 x 5.
 - 3. Indoor Vapor Retarder Finish:
 - a. Cloth: Untreated; 9 oz/sq yd (305 g/sq m) weight.
 - b. Vinyl emulsion type acrylic, compatible with insulation, color.

2.4 PIPE INSULATION ACCESSORIES

- A. Vapor Retarder Lap Adhesive: Compatible with insulation.
- B. Covering Adhesive Mastic: Compatible with insulation.
- C. Piping 1-1/2 inches (40 mm) diameter and smaller: Galvanized steel insulation protection shield. MSS SP-69, Type 40. Length: Based on pipe size and insulation thickness.
- D. Piping 2 inches (50 mm) diameter and larger: Wood insulation saddle, hard maple. Inserts length: not less than 6 inches (150 mm) long, matching thickness and contour of adjoining insulation.
- E. Closed Cell Elastomeric Insulation Pipe Hanger: Polyurethane insert with aluminum single piece construction with self-adhesive closure. Thickness to match pipe insulation.
- F. Tie Wire: 0.048 inch (1.22 mm) stainless steel with twisted ends on maximum 12 inch (300 mm) centers.
- G. Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement: ASTM C449/C449M.
- H. Insulating Cement: ASTM C195; hydraulic setting on mineral wool.

- I. Adhesives: Compatible with insulation.

2.5 EQUIPMENT INSULATION

- A. TYPE E-1: ASTM C553; glass fiber, flexible or semi-rigid, noncombustible.
 - 1. Thermal Conductivity: 0.24 at 75 degrees F (0.032 at 24 degrees C).
 - 2. Operating Temperature Range: 0 to 450 degrees F (minus 18 to 232 degrees C).
 - 3. Density: 1.5 pound per cubic foot (24 kilogram per cubic meter).
- B. TYPE E-2: ASTM C612; glass fiber, rigid board, noncombustible with factory applied kraft aluminum foil jacket.
 - 1. Thermal Conductivity: 0.24 at 75 degrees F (0.035 at 24 degrees C).
 - 2. Operating Temperature Range: 0 to 450 degrees F (minus 18 to 232 degrees C).
 - 3. Density: 3.0 pound per cubic foot (48 kilogram per cubic meter).
 - 4. Jacket Temperature Limit: minus 20 to 150 degrees F (minus 29 to 66 degrees C).
- C. TYPE E-3: ASTM C612; semi-rigid, fibrous glass board noncombustible, end grain adhered to jacket.
 - 1. Thermal Conductivity: 0.27 at 75 degrees F (0.040 at 24 degrees C).
 - 2. Operating Temperature Range: 0 to 650 degrees F (minus 18 to 343 degrees C).
 - 3. Vapor Barrier Jacket: ASTM C1136, Type II, factory applied reinforced foil kraft with self-sealing adhesive joints.
 - 4. Jacket Temperature Limit: minus 20 to 150 degrees F (minus 29 to 66 degrees C).
- D. TYPE E-4: ASTM C612; semi-rigid, fibrous glass board noncombustible.
 - 1. Thermal Conductivity: 0.27 at 75 degrees F (0.040 at 24 degrees C).
 - 2. Operating Temperature Range: 0 to 650 degrees F (minus 18 to 343 degrees C).
- E. TYPE E-5: ASTM C612; glass fiber, semi-rigid board, noncombustible.
 - 1. Thermal Conductivity: 0.23 at 75 degrees F (0.033 at 24 degrees C).
 - 2. Maximum Operating Temperature: 850 degrees F (450 degrees C).
 - 3. Density: 3.0 pound per cubic foot (48 kilogram per cubic meter).
- F. TYPE E-6: ASTM C553; mineral fiber blanket, Type I.
 - 1. Thermal Conductivity: 0.27 at 75 degrees F (0.039 at 24 degrees C).
 - 2. Maximum Operating Temperature: 1000 degrees F (538 degrees C).
 - 3. Density: 1.0 pound per cubic foot (16 kilogram per cubic meter).
- G. TYPE E-7: ASTM C533; Type II, hydrous calcium silicate block insulation, asbestos free.
 - 1. Thermal Conductivity: 0.45 at 200 degrees F (0.0650 at 93 degrees C).
 - 2. Operating Temperature Range: 140 to 1200 degrees F (60 to 649 degrees C).

- H. TYPE E-8: ASTM C534, Type II, flexible, closed cell elastomeric insulation, sheet.
 - 1. Thermal Conductivity: 0.27 at 75 degrees F (0.039 at 25 degrees C).
 - 2. Operating Temperature Range: Range: Minus 70 to 220 degrees F (minus 57 to 105 degrees C).
- I. TYPE E-9: ASTM C534, Type II, flexible, closed cell elastomeric insulation, sheet.
 - 1. Thermal Conductivity: 0.27 at 75 degrees F (0.039 at 25 degrees C).
 - 2. Operating Temperature Range: Range: Minus 70 to 220 degrees F (minus 57 to 105 degrees C).
 - 3. Vapor Barrier Jacket: VentureClad 1577CW-E, 6 mil, 0 permability, embossed natural aluminum finish
 - 4. Jacket Temperature Limit: minus 30 to 300 degrees F

2.6 EQUIPMENT INSULATION JACKETS

- A. PVC Plastic Equipment Jacket:
 - 1. Product Description: ASTM D1784, sheet material, off-white color.
 - 2. Minimum Service Temperature: -40 degrees F (-40 degrees C).
 - 3. Maximum Service Temperature: 150 degrees F (66 degrees C).
 - 4. Moisture Vapor Transmission: ASTM E96; 0.002 perm-inches.
 - 5. Thickness: 10 mil (0.25 mm).
 - 6. Connections: Brush on welding adhesive Pressure sensitive color matching vinyl tape.
- B. Aluminum Equipment Jacket:
 - 1. ASTM B209.
 - 2. Thickness: 0.016 inch (0.40 mm) thick sheet.
 - 3. Finish: Smooth.
 - 4. Joining: Longitudinal slip joints and 2 inch (50 mm) laps.
 - 5. Fittings: 0.016 inch (0.4 mm) thick die shaped fitting covers with factory attached protective liner.
 - 6. Metal Jacket Bands: 3/8 inch (10 mm) wide;
- C. Stainless Steel Equipment Jacket:
 - 1. ASTM A167 Type 302 304 stainless steel.
 - 2. Thickness: 0.010 inch (0.25 mm) thick.
 - 3. Finish: Smooth.
 - 4. Metal Jacket Bands: 3/8 inch (10 mm) wide; 0.010 inch (0.25 mm) thick stainless steel.
- D. Canvas Equipment Jacket: UL listed, 6 oz/sq yd (220 g/sq m), plain weave cotton fabric with fire retardant lagging adhesive compatible with insulation.
- E. Vapor Retarder Jacket:
 - 1. ASTM C921, white Kraft paper with glass fiber yarn, bonded to aluminized film.
 - 2. Moisture vapor transmission: ASTM E96; 0.02 perm-inches.

- F. Field Applied Glass Fiber Fabric Jacket System:
 - 1. Insulating Cement/Mastic: ASTM C195; hydraulic setting on mineral wool.
 - 2. Glass Fiber Fabric:
 - a. Cloth: Untreated; 9 oz/sq yd (305 g/sq m) weight.
 - b. Blanket: 1.0 lb/cu ft (16 kg/cu m) density.
 - c. Weave: 5 x 5.
 - 3. Indoor Vapor Retarder Finish:
 - a. Cloth: Untreated; 9 oz/sq yd (305 g/sq m) weight.
 - b. Vinyl emulsion type acrylic, compatible with insulation, black color.

2.7 EQUIPMENT INSULATION ACCESSORIES

- A. Vapor Retarder Lap Adhesive: Compatible with insulation.
- B. Covering Adhesive Mastic: Compatible with insulation.
- C. Tie Wire: 0.048 inch (1.22 mm) stainless steel with twisted ends on maximum 12 inch (300 mm) centers.
- D. Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement: ASTM C449/C449M.
- E. Adhesives: Compatible with insulation.

2.8 DUCTWORK INSULATION

- A. TYPE D-1: ASTM C1290, Type III, flexible glass fiber, commercial grade with factory applied reinforced aluminum foil jacket meeting ASTM C1136, Type II.
 - 1. Thermal Conductivity: 0.30 at 75 degrees F (0.043 at 24 degrees C).
 - 2. Maximum Operating Temperature: 250 degrees F (121 degrees C).
 - 3. Density: 0.75 pound per cubic foot (12 kilogram per cubic meter).
- B. TYPE D-2: ASTM C612, Type IA or IB, rigid glass fiber, with factory applied all service facing meeting ASTM C1136, Type II.
 - 1. Thermal Conductivity: 0.24 at 75 degrees F (at 24 degrees C).
 - 2. Density: 1.6 pound per cubic foot (26 kilogram per cubic meter).
- C. TYPE D-3: ASTM C612, Type IA or IB, rigid glass fiber, no facing.
 - 1. Thermal Conductivity: 0.24 at 75 degrees F (0.035 at 24 degrees C).
 - 2. Density: 1.6 pound per cubic foot (26 kilogram per cubic meter).
- D. TYPE D-4: ASTM C1071, Type I, flexible, glass fiber duct liner with coated air side.
 - 1. Thermal Conductivity: 0.28 at 75 degrees F (0.040 at 24 degrees C).
 - 2. Density: 1.5 pound per cubic foot (24 kilogram per cubic meter).
 - 3. Maximum Operating Temperature: 250 degrees F (121 degrees C).
 - 4. Maximum Air Velocity: 6,000 feet per minute (30.5 meter per second).
- E. TYPE D-5: ASTM C1071, Type II, rigid, glass fiber duct liner with coated air side.

1. Thermal Conductivity: 0.23 at 75 degrees F (0.033 at 24 degrees C).
 2. Density: 3.0 pound per cubic foot (48 kilogram per cubic meter).
 3. Maximum Operating Temperature: 250 degrees F (121 degrees C).
 4. Maximum Air Velocity: 4,000 feet per minute (20.3 meter per second).
- F. TYPE D-6: ASTM C534, Type II, flexible, closed cell elastomeric insulation, sheet.
1. Thermal Conductivity: 0.27 at 75 degrees F (0.039 at 24 degrees C).
 2. Service Temperature Range: Range: Minus 58 to 180 degrees F (minus 50 to 82 degrees C).
- G. TYPE D-7: ASTM C518, Owens Corning "Thermapink" Extruded Polystyrene insulation
1. Thermal Conductivity: 0.20 at 75 degrees F (0.039 at 24 degrees C).
 2. Service Temperature Range: Range: -10 to 150 degrees F
 3. Vapor Barrier Jacket: VentureClad 1577CW-E, 6 mil, 0 permability, embossed natural aluminum finish
 4. Jacket Temperature Limit: minus 30 to 300 degrees F
- H. TYPE D-8: Inorganic blanket encapsulated with scrim reinforced foil meeting UL 1978.
1. Thermal Conductivity: 0.42 at 500 degrees F
 2. Weight: 130 pound per 1000 square foot per inch
 3. Flame spread rating of 0 and smoke developed rating of 0 in accordance with ASTM E84.
- I. TYPE D-9: ASTM C1290, Type III, flexible glass fiber, commercial grade with factory applied reinforced aluminum foil jacket meeting ASTM C1136, Type II.
1. Thermal Conductivity: 0.30 at 75 degrees F (0.043 at 24 degrees C).
 2. Maximum Operating Temperature: 250 degrees F (121 degrees C).
 3. Density: 0.75 pound per cubic foot (12 kilogram per cubic meter).
 4. Canvas Jacket: UL listed, 6 oz/sq yd (220 g/sq m), plain weave cotton fabric treated with fire retardant lagging adhesive.

2.9 DUCTWORK INSULATION JACKETS

- A. Aluminum Duct Jacket:
1. ASTM B209.
 2. Thickness: 0.016 inch (0.40 mm) thick sheet.
 3. Finish: Smooth.
 4. Joining: Longitudinal slip joints and 2 inch (50 mm) laps.
 5. Fittings: 0.016 inch (0.4 mm) thick die shaped fitting covers with factory attached protective liner.
 6. Metal Jacket Bands: 3/8 inch (10 mm) wide;
- B. Vapor Retarder Jacket:

1. Kraft paper with glass fiber yarn and bonded to aluminized film 0.0032 inch (0.081 mm) vinyl.
 2. Moisture vapor transmission: ASTM E96; 0.02 perm.
 3. Secure with pressure sensitive tape.
- C. Canvas Duct Jacket: UL listed, 6 oz/sq yd (220 g/sq m), plain weave cotton fabric with fire retardant lagging adhesive compatible with insulation.
- D. Outdoor Duct Jacket: VentureClad self adhesive aluminum jacketing system.
- E. Membrane Duct Jacket: ASTM D4637; Type I, EPDM; non-reinforced, 0.045 inch (mm) thick, 48 inch (1220 mm) wide roll; white color.

2.10 DUCTWORK INSULATION ACCESSORIES

- A. Vapor Retarder Tape:
1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.
- B. Vapor Retarder Lap Adhesive: Compatible with insulation.
- C. Adhesive: Waterproof, ASTM E162 fire-retardant type.
- D. Liner Fasteners: Galvanized steel, self-adhesive pad with integral head.
- E. Tie Wire: 0.048 inch (1.22 mm) stainless steel with twisted ends on maximum 12 inch (300 mm) centers.
- F. Lagging Adhesive: Fire resistive to ASTM E84 NFPA 255 UL 723.
- G. Impale Anchors: Galvanized steel, 12 gage self-adhesive pad.
- H. Adhesives: Compatible with insulation.
- I. Membrane Adhesives: As recommended by membrane manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify piping, equipment and ductwork has been tested before applying insulation materials.
- C. Verify surfaces are clean and dry, with foreign material removed.

3.2 INSTALLATION - PIPING SYSTEMS

- A. Piping Exposed to View in Finished Spaces: Locate insulation and cover seams in least visible locations.
- B. Continue insulation through penetrations of building assemblies or portions of assemblies having fire resistance rating of one hour or less. Provide intumescent firestopping when continuing insulation through assembly. Finish at supports, protrusions, and interruptions. Refer to Section 07 84 00 for penetrations of assemblies with fire resistance rating greater than one hour.
- C. Piping Systems Conveying Fluids Below Ambient Temperature:
 - 1. Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
 - 2. Furnish factory-applied or field-applied vapor retarder jackets. Secure factory-applied jackets with pressure sensitive adhesive self-sealing longitudinal laps and butt strips. Secure field-applied jackets with outward clinch expanding staples and seal staple penetrations with vapor retarder mastic.
 - 3. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor retarder adhesive or PVC fitting covers.
- D. Glass Fiber Board Insulation:
 - 1. Apply insulation close to equipment by grooving, scoring, and beveling insulation. Fasten insulation to equipment with studs, pins, clips, adhesive, wires, or bands.
 - 2. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor retarder cement.
 - 3. Cover wire mesh or bands with cement to a thickness to remove surface irregularities.
- E. Polyisocyanurate Foam Insulation Extruded Polystyrene Insulation:
 - 1. Wrap elbows and fitting with vapor retarder tape.
 - 2. Seal butt joints with vapor retarder tape.
- F. Hot Piping Systems less than 140 degrees F (60 degrees C):
 - 1. Furnish factory-applied or field-applied standard jackets. Secure with outward clinch expanding staples or pressure sensitive adhesive system on standard factory-applied jacket and butt strips or both.
 - 2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
 - 3. Do not insulate unions and flanges at equipment, but bevel and seal ends of insulation at such locations.
- G. Hot Piping Systems greater than 140 degrees F (60 degrees C):

1. Furnish factory-applied or field-applied standard jackets. Secure with outward clinch expanding staples or pressure sensitive adhesive system on standard factory-applied jacket and butt strips or both.
 2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
 3. Insulate flanges and unions at equipment.
- H. Inserts and Shields:
1. Piping 1-1/2 inches (40 mm) Diameter and Smaller: Install galvanized steel shield between pipe hanger and insulation.
 2. Piping 2 inches (50 mm) Diameter and Larger: Install insert between support shield and piping and under finish jacket.
 - a. Insert Configuration: Minimum 6 inches (150 mm) long, of thickness and contour matching adjoining insulation; may be factory fabricated.
 - b. Insert Material: Compression resistant insulating material suitable for planned temperature range and service.
 3. Piping Supported by Roller Type Pipe Hangers: Install galvanized steel shield between roller and inserts.
- I. Insulation Terminating Points:
1. Coil Branch Piping 1 inch (25 mm) and Smaller: Terminate hot water piping at union upstream of the coil control valve.
 2. Chilled Water Coil Branch Piping: Insulate chilled water piping and associated components up to coil connection.
 3. Condensate Piping: Insulate entire piping system and components to prevent condensation.
- J. Closed Cell Elastomeric Insulation:
1. Push insulation on to piping.
 2. Miter joints at elbows.
 3. Seal seams and butt joints with manufacturer's recommended adhesive.
 4. When application requires multiple layers, apply with joints staggered.
 5. Insulate fittings and valves with insulation of like material and thickness as adjacent pipe.
- K. High Temperature Pipe Insulation:
1. Cover with aluminum jacket with seams located on bottom side of horizontal piping.
- L. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet (3 meters) above finished floor): Finish with PVC jacket and fitting covers.
- M. Piping Exterior to Building: Provide vapor retarder jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor retarder cement. Cover with aluminum jacket with seams located at 3 or 9 o'clock position on side of horizontal piping with overlap facing down to shed water or on bottom side of horizontal piping.

- N. Buried Piping: Insulate only where insulation manufacturer recommends insulation product may be installed in trench, tunnel or direct buried. Install factory fabricated assembly with inner all-purpose service jacket with self-sealing lap, and asphalt impregnated open mesh glass fabric, with 1 mil (0.025 mm) thick aluminum foil sandwiched between three layers of bituminous compound; outer surface faced with polyester film.
- O. Heat Traced Piping Interior to Building: Insulate fittings, joints, and valves with insulation of like material, thickness, and finish as adjoining pipe. Size large enough to enclose pipe and heat tracer.
- P. Heat Traced Piping Exterior to Building: Insulate fittings, joints, and valves with insulation of like material, thickness, and finish as adjoining pipe. Size insulation large enough to enclose pipe and heat tracer. Cover with aluminum jacket with seams located at 3 or 9 o'clock position on side of horizontal piping with overlap facing down to shed water.

3.3 INSTALLATION - EQUIPMENT

- A. Factory Insulated Equipment: Do not insulate.
- B. Exposed Equipment: Locate insulation and cover seams in least visible locations.
- C. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor retarder cement.
- D. Equipment Containing Fluids Below Ambient Temperature:
 - 1. Insulate entire equipment surfaces.
 - 2. Apply insulation close to equipment by grooving, scoring, and beveling insulation. Fasten insulation to equipment with studs, pins, clips, adhesive, wires, or bands.
 - 3. Furnish factory-applied or field-applied vapor retarder jackets. Secure factory-applied jackets with pressure sensitive adhesive self-sealing longitudinal laps and butt strips. Secure field-applied jackets with outward clinch expanding staples and seal staple penetrations with vapor retarder mastic.
 - 4. Finish insulation at supports, protrusions, and interruptions.
- E. Equipment Containing Fluids 140 degrees F (60 degrees C) Or Less:
 - 1. Do not insulate flanges and unions, but bevel and seal ends of insulation.
 - 2. Install insulation with factory-applied or field applied jackets, with or without vapor barrier. Finish with glass cloth and adhesive.
 - 3. Finish insulation at supports, protrusions, and interruptions.
- F. Equipment Containing Fluids Over 140 degrees F (60 degrees C):
 - 1. Insulate flanges and unions with removable sections and jackets.
 - 2. Install insulation with factory-applied or field applied jackets, with or without vapor barrier. Finish with glass cloth and adhesive.
 - 3. Finish insulation at supports, protrusions, and interruptions.

- G. Equipment in Mechanical Equipment Rooms or Finished Spaces: Finish with PVC jacket and fitting covers.
- H. Equipment Located Exterior to Building: Install vapor barrier jacket or finish with glass mesh reinforced vapor barrier cement. Cover with aluminum jacket with seams located on bottom side of horizontal equipment.
- I. Cover glass fiber cellular glass hydrous calcium silicate cellular foam insulation with aluminum jacket.
- J. Nameplates and ASME Stamps: Bevel and seal insulation around; do not cover with insulation.
- K. Equipment Requiring Access for Maintenance, Repair, or Cleaning: Install insulation for easy removal and replacement without damage.
- L. Prepare equipment insulation for finish painting. Refer to Section 09 90 00.

3.4 INSTALLATION - DUCTWORK SYSTEMS

- A. Duct dimensions indicated on Drawings are finished inside dimensions.
- B. Insulated ductwork conveying air below ambient temperature:
 1. Provide insulation with vapor retarder jackets.
 2. Finish with tape and vapor retarder jacket.
 3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
 4. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.
- C. Insulated ductwork conveying air above ambient temperature:
 1. Provide with or without standard vapor retarder jacket.
 2. Insulate fittings and joints. Where service access is required, bevel and seal ends of insulation.
- D. Ductwork Exposed in Mechanical Equipment Rooms or Finished Spaces (below 10 feet (3 meters) above finished floor): Finish with aluminum jacket.
- E. External Glass Fiber Duct Insulation:
 1. Secure insulation with vapor retarder with wires and seal jacket joints with vapor retarder adhesive or tape to match jacket.
 2. Secure insulation without vapor retarder with staples, tape, or wires.
 3. Install without sag on underside of ductwork. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift ductwork off trapeze hangers and insert spacers.
 4. Seal vapor retarder penetrations by mechanical fasteners with vapor retarder adhesive.
 5. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.

- F. External Elastomeric Duct Insulation:
1. Adhere to clean oil-free surfaces with full coverage of adhesive.
 2. Seal seams and butt joints with manufacturer's recommended adhesive.
 3. When application requires multiple layers, apply with joints staggered.
 4. Insulate standing metal duct seams with insulation of like material and thickness as adjacent duct surface. Apply adhesive at joints with flat duct surfaces.
 5. Lift ductwork off trapeze hangers and insert spacers.
- G. Duct Liner:
1. Adhere insulation with adhesive for 100 percent coverage.
 2. Secure insulation with mechanical liner fasteners. Comply with SMACNA Standards for spacing.
 3. Seal and smooth joints. Seal and coat transverse joints.
 4. Seal liner surface penetrations with adhesive.
 5. Cut insulation for tight overlapped corner joints. Support top pieces of liner at edges with side pieces.
- H. Kitchen Exhaust Ductwork:
1. Cover duct by wrapping with insulation using butt joint with collar method.
 2. Overlap seams of each method by 3 inches (76 mm).
 3. Attach insulation using steel banding or by welded pins and clips.
 4. Install insulation without sag on underside of ductwork. Use additional fasteners to prevent sagging.
- I. Ducts Exterior to Building:
1. Install insulation according to external duct insulation paragraph above.
 2. Provide external insulation with vapor retarder jacket. Cover with with caulked aluminum jacket with seams located on bottom side of horizontal duct section.
 3. Finish with mineral fiber outdoor duct jacket or aluminum duct jacket or membrane duct jacket.
 4. Calk seams at flanges and joints. Located major longitudinal seams on bottom side of horizontal duct sections.
- J. Prepare duct insulation for finish painting. Refer to Section 09 90 00.

3.5 SCHEDULES

A. Ductwork Insulation Schedule:

DUCTWORK SYSTEM	INSULATION TYPE	INSULATION THICKNESS inches (mm)
Indoor Supply Ducts (externally insulated)	D-1	2.0 (50)
Indoor Return Ducts (externally insulated)	D-1	2.0 (50)
Supply Air, Return Air, Exhaust Air duct exterior to building	D-6 (w/ VentureClad Jacket)	3.0 (75)

END OF SECTION

DIVISION 23 – HVAC
SECTION 23 08 00: COMMISSIONING OF HVAC

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. HVAC commissioning description.
 - 2. HVAC commissioning responsibilities.

1.2 REFERENCES

- A. Associated Air Balance Council:
 - 1. AABC - AABC Commissioning Guideline.
- B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
 - 1. ASHRAE Guideline 1 - The HVAC Commissioning Process.
- C. National Environmental Balancing Bureau:
 - 1. NEBB - Procedural Standards for Building Systems Commissioning.

1.3 COMMISSIONING DESCRIPTION

- A. HVAC commissioning process includes the following tasks:
 - 1. Testing and startup of HVAC equipment and systems.
 - 2. Equipment and system verification checks.
 - 3. Assistance in functional performance testing to verify testing and balancing, and equipment and system performance.
 - 4. Provide qualified personnel to assist in commissioning tests, including seasonal testing.
 - 5. Complete and endorse functional performance test checklists to assure equipment and systems are fully operational and ready for functional performance testing.
 - 6. Provide equipment, materials, and labor necessary to correct deficiencies found during commissioning process to fulfill contract and warranty requirements.
 - 7. Provide operation and maintenance information and record drawings to the Architect for review verification and organization, prior to distribution.
 - 8. Provide assistance to Engineer to develop, edit, and document system operation descriptions.
 - 9. Provide training for systems specified in this Section.
- B. Equipment and Systems to Be Commissioned:
 - 1. Chillers.
 - 2. Pumps.
 - 3. Piping systems.
 - 4. Ductwork.

5. Variable frequency drives.
6. Air handling units.
7. Hot water terminal heating equipment.
8. Variable volume terminal units.
9. Automatic temperature control system.
10. Testing, Adjusting and Balancing work.

1.4 COMMISSIONING SUBMITTALS

- A. Section 01 91 00 - Commissioning: Requirements for commissioning submittals.
- B. Draft Forms: Submit draft of system verification form and functional performance test checklist.
- C. Test Reports: Indicate data on system verification form for each piece of equipment and system as specified. Use AABC forms as guidelines.
- D. Field Reports: Indicate deficiencies preventing completion of equipment or system verification checks equipment or system to achieve specified performance.

1.5 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record revisions to equipment and system documentation necessitated by commissioning.
- C. Operation and Maintenance Data: Submit revisions to operation and maintenance manuals when necessary revisions are discovered during commissioning.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with AABC.

1.7 COMMISSIONING RESPONSIBILITIES

- A. Equipment or System Installer Commissioning Responsibilities:
 1. Provide instructions and demonstrations for Owner's personnel.
 2. Ensure participation of equipment manufacturers in appropriate startup, testing, and training activities when required by individual equipment specifications.
 3. Develop startup and initial checkout plan using manufacturer's startup procedures and functional performance checklists for equipment and systems to be commissioned.

4. Perform and document completed startup and system operational checkout procedures, providing copy to Engineer.
 5. Provide manufacturer's representatives to execute starting of equipment. Ensure representatives are available and present during agreed upon schedules and are in attendance for duration to complete tests, adjustments and problem-solving.
 6. Coordinate with equipment manufacturers to determine specific requirements to maintain validity of warranties.
- B. Temperature Controls Installer Commissioning Responsibilities:
1. Review design for ability of systems to be controlled including the following:
 - a. Confirm proper hardware requirements exists to perform functional performance testing.
 - b. Confirm proper safeties and interlocks are included in design.
 - c. Confirm proper sizing of system control valves and actuators and control valve operation will result capacity control identified in Contract Documents.
 - d. Confirm proper sizing of system control dampers and actuators and damper operation will result in proper damper positioning.
 - e. Confirm sensors selected are within device ranges.
 - f. Review sequences of operation and obtain clarification from Architect/Engineer.
 - g. Provide written sequences of operation for packaged controlled equipment. Equipment manufacturers' stock sequences may be included, when accompanied by additional narrative to reflect Project conditions.
 2. Inspect, check, and confirm proper operation and performance of control hardware and software provided in other HVAC sections.
 3. Submit proposed procedures for performing automatic temperature control system point-to-point checks to Architect/Engineer.
 4. Inspect check and confirm correct installation and operation of automatic temperature control system input and output device operation through point-to-point checks.
 5. Perform training sessions to instruct Owner's personnel in hardware operation, software operation, programming, and application in accordance with commissioning plan.
 6. Demonstrate system performance and operation to Engineer during functional performance tests including each mode of operation.
 7. Provide control system technician to assist during Engineering verification check and functional performance testing.
 8. Provide control system technician to assist testing, adjusting, and balancing agency during performance of testing, adjusting, and balancing work.
 9. Assist in performing operation and maintenance training sessions scheduled by Commissioning Authority.
- C. Testing, Adjusting, and Balancing Agency Commissioning Responsibilities:

1. Participate in verification of testing, adjusting, and balancing report for verification or diagnostic purposes.
2. Assist in performing operation and maintenance training sessions.

1.8 SCHEDULING

- A. 01 32 16 - Construction Progress Schedule: Requirements for scheduling.
- B. Prepare schedule indicating anticipated start dates for the following:
 1. Piping system pressure testing.
 2. Piping system flushing and cleaning.
 3. Ductwork cleaning.
 4. Ductwork pressure testing.
 5. Equipment and system startups.
 6. Automatic temperature control system checkout.
 7. Testing, adjusting, and balancing.
 8. HVAC system orientation and inspections.
 9. Operation and maintenance manual submittals.
 10. Training sessions.

1.9 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.
- B. Notify Architect minimum of two weeks in advance of the following:
 1. Scheduled equipment and system startups.
 2. Scheduled automatic temperature control system checkout.
 3. Scheduled start of testing, adjusting, and balancing work.
- C. Coordinate programming of automatic temperature control system with construction and commissioning schedules.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install additional balancing dampers, balancing valves, access doors, test ports, and pressure and temperature taps required by construction documents.
- B. Place HVAC systems and equipment into full operation and continue operation during each working day of commissioning.

- C. Install replacement sheaves and belts to obtain system performance, as requested by Engineer.
- D. Install test holes in ductwork and plenums as requested by Engineer for taking air measurements.
- E. Prior to start of functional performance test, install replacement filters in equipment.

3.2 COMMISSIONING

- A. Functional Performance Tests:
 - 1. Test heating equipment at winter design temperatures. (This test may be done by “falsifying” BAS OAT, Space temp, etc) Monitor system for proper operation.
 - 2. Test cooling equipment at summer design temperatures . (This test may be done by “falsifying” BAS OAT, Space temp, etc) Monitor system for proper operation.

END OF SECTION

**DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)
SECTION 23 33 00: AIR DUCT ACCESSORIES**

1.1 GENERAL

A. Summary:

1. Section Includes:
 - a. Back-draft dampers.
 - b. Combination fire-and-smoke dampers.
 - c. Duct access doors.
 - d. Dynamic fire dampers.
 - e. Static fire dampers.
 - f. Ceiling fire dampers.
 - g. Smoke dampers.
 - h. Volume control dampers.
 - i. Flexible duct connections.
 - j. Duct test holes.
 - k. Dial thermometers.
 - l. Static pressure gages.

B. References:

1. Air Movement and Control Association International, Inc.:
 - a. AMCA 500 - Test Methods for Louvers, Dampers, and Shutters.
2. ASTM International:
 - a. ASTM E1 - Standard Specification for ASTM Thermometers.
3. National Fire Protection Association:
 - a. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.
 - b. NFPA 92A - Recommended Practice for Smoke-Control Systems.
4. Sheet Metal and Air Conditioning Contractors:
 - a. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.
5. Underwriters Laboratories Inc.:
 - a. UL 555 - Standard for Safety for Fire Dampers.
 - b. UL 555C - Standard for Safety for Ceiling Dampers.
 - c. UL 555S - Standard for Safety for Smoke Dampers.

C. Submittals:

1. Section 01 33 00 - Submittal Procedures: Submittal procedures.
2. Product Data: Submit data for shop fabricated assemblies and hardware used.
3. Product Data: Submit for the following. Include where applicable electrical characteristics and connection requirements.
 - a. Fire dampers including locations and ratings.
 - b. Smoke dampers including locations and ratings.
 - c. Backdraft dampers.
 - d. Flexible duct connections.
 - e. Volume control dampers.
 - f. Duct access doors.
 - g. Duct test holes.

4. Product Data: For fire dampers smoke dampers combination fire and smoke dampers submit the following:
 - a. Include UL ratings, dynamic ratings, leakage, pressure drop and maximum pressure data.
 - b. Indicate materials, construction, dimensions, and installation details.
 - c. Damper pressure drop ratings based on tests and procedures performed in accordance with AMCA 500.
 5. Manufacturer's Installation Instructions: Submit for Fire and Combination Smoke and Fire Dampers.
 6. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
- D. Closeout Submittals:
1. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
 2. Operation and Maintenance Data: Submit for Combination Smoke and Fire Dampers.
- E. Quality Assurance:
1. Dampers tested, rated and labeled in accordance with the latest UL requirements.
 2. Damper pressure drop ratings based on tests and procedures performed in accordance with AMCA 500.
 3. Maintain one copy of each document on site.
- F. Qualifications:
1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.
- G. Delivery, Storage, and Handling:
1. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
 2. Protect dampers from damage to operating linkages and blades.
 3. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer and material.
 4. Storage: Store materials in a dry area indoor, protected from damage.
 5. Handling: Handle and lift dampers in accordance with manufacturer's instructions. Protect materials and finishes during handling and installation to prevent damage.
- H. Field Measurements: Verify field measurements prior to fabrication.
- I. Coordination:
1. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
 2. Coordinate Work where appropriate with building control Work.
- J. Warranty:
1. Section 01 70 00 - Execution and Closeout Requirements: Product warranties and product bonds.
 2. Furnish one year manufacturer warranty for duct accessories.

1.2. PRODUCTS

- A. Back-Draft Dampers:
 - 1. Product Description: Multi-Blade, back-draft dampers: Parallel-action, gravity-balanced, Galvanized 16 gage thick steel. Blades, maximum 6 inch width, center pivoted, with felt or flexible vinyl sealed edges. Blades linked together in rattle-free manner with 90-degree stop, steel ball bearings, and plated steel pivot pin. Furnish dampers with adjustment device to permit setting for varying differential static pressure.
- B. Static Fire Dampers: Product description. Multi Blade steel shutter gravity actuated, fusible link held, rated assembly.

1.3. EXECUTION

- A. Examination:
 - 1. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
 - 2. Verify rated walls are ready for fire damper installation.
 - 3. Verify ducts and equipment installation are ready for accessories.
 - 4. Check location of air outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.
- B. Installation:
 - 1. Install in accordance with NFPA 90A, and follow SMACNA HVAC Duct Construction Standards - Metal and Flexible. Refer to Section 23 31 00 for duct construction and pressure class.
 - 2. Install back-draft dampers on exhaust fans or exhaust ducts nearest to outside.
 - 3. Access Door Sizes: Install minimum 8 x 8 inch size for hand access, 18 x 18 inch size for shoulder access, and. Review locations prior to fabrication.
 - a. Mark access doors for fire and smoke dampers on outside surface, with minimum 1/2 inch high letters reading: FIRE/SMOKE DAMPER, SMOKE DAMPER, OR FIRE DAMPER.
 - 4. Install temporary duct test holes and required for testing and balancing purposes. Cut or drill in ducts. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

END 23 33 00.

**DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)
SECTION 23 89 00: METAL DUCTS**

1.1 GENERAL

- A. Related Documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Summary: This Section includes rectangular, round, and flat-oval metal ducts and plenums for heating, ventilating, and air-conditioning systems in pressure classes from minus 2- to plus 10-inch wg.
- C. Definitions:
 - 1. Thermal Conductivity and Apparent Thermal Conductivity (k-Value): As defined in ASTM C 168. In this Section, these values are the result of the formula $\text{Btu} \times \text{in./h} \times \text{sq. ft.} \times \text{deg F}$ or $\text{W/m} \times \text{K}$ at the temperature differences specified. Values are expressed as Btu or W.
 - a. Example: Apparent Thermal Conductivity (k-Value): 0.26 or 0.037.
- D. System Description: Duct system design, as indicated, has been used to select and size air-moving and -distribution equipment and other components of air system. Changes to layout or configuration of duct system must be specifically approved in writing by Architect. Accompany requests for layout modifications with calculations showing that proposed layout will provide original design results without increasing system total pressure.
- E. Submittals:
 - 1. Product Data: For duct liner and sealing materials.
 - 2. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.
 - 3. Record Drawings: Indicate actual routing, fitting details, reinforcement, support, and installed accessories and devices.
- F. Quality Assurance:
 - 1. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," unless otherwise indicated.
 - 2. Comply with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems," unless otherwise indicated.
- G. Delivery, Storage, and Handling:
 - 1. Deliver sealant materials to site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.
 - 2. Store and handle sealant materials according to manufacturer's written recommendations.

1.2. PRODUCTS

- A. Sheet Metal Materials:
1. Galvanized, Sheet Steel: Lock-forming quality; ASTM A 653/A 653M, G90 coating designation; mill-phosphatized finish for surfaces of ducts exposed to view.
 2. Reinforcement Shapes and Plates: Galvanized steel reinforcement where installed on galvanized, sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.
 3. Tie Rods: Galvanized steel, 1/4-inch (6-mm) minimum diameter for 36-inch (900-mm) length or less; 3/8-inch (10-mm) minimum diameter for lengths longer than 36 inches (900 mm).
 4. Aluminum Sheets: ASTM B 209 (ASTM B 209M), Alloy 3003, Temper H14, sheet form with standard, one-side bright finish for ducts exposed to view and with mill finish for concealed ducts.
 5. Carbon-Steel Sheets: ASTM A 366/A 366M, cold-rolled sheets; commercial quality; with oiled, exposed matte finish.
 6. Stainless Steel: ASTM A 480/A 480M, Type 316, sheet form with No. 4 finish for surfaces of ducts exposed to view; and Type 304, sheet form with No. 1 finish for concealed ducts.
- B. Duct Liner: not allowed
- C. Sealant Materials:
1. Joint and Seam Sealants, General: The term "sealant" is not limited to materials of adhesive or mastic nature but includes tapes and combinations of open-weave fabric strips and mastics.
 - a. Joint and Seam Tape: 2 inches wide; glass-fiber fabric reinforced.
 - b. Tape Sealing System: Woven-fiber tape impregnated with a gypsum mineral compound and a modified acrylic/silicone activator to react exothermically with tape to form a hard, durable, airtight seal.
 - c. Joint and Seam Sealant: One-part, nonsag, solvent-release-curing, polymerized butyl sealant, formulated with a minimum of 75 percent solids.
 - d. Flanged Joint Mastics: One-part, acid-curing, silicone, elastomeric joint sealants, complying with ASTM C 920, Type S, Grade NS, Class 25, Use O.
- D. Hangers and Supports:
1. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for building materials.
 - a. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
 - b. Exception: Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
 2. Hanger Materials: Galvanized, sheet steel or round, threaded steel rod.
 - a. Hangers Installed in Corrosive Atmospheres: Electrogalvanized, all-thread rod or galvanized rods with threads painted after installation.
 - b. Straps and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for sheet steel width and thickness and for steel rod diameters.

3. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
 4. Trapeze and Riser Supports: Steel shapes complying with ASTM A 36/A 36M.
 - a. Supports for Galvanized-Steel Ducts: Galvanized steel shapes and plates.
 - b. Supports for Stainless-Steel Ducts: Stainless-steel support materials.
 - c. Supports for Aluminum Ducts: Aluminum support materials, unless materials are electrolytically separated from ductwork.
- E. Rectangular Duct Fabrication:
1. General: Fabricate ducts, elbows, transitions, offsets, branch connections, and other construction with galvanized, sheet steel, according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible." Comply with requirements for metal thickness, reinforcing types and intervals, tie-rod applications, and joint types and intervals.
 - a. Lengths: Fabricate rectangular ducts in lengths appropriate to reinforcement and rigidity class required for pressure classification.
 - b. Materials: Free from visual imperfections such as pitting, seam marks, roller marks, stains, and discolorations.
 2. Fabricate range hood exhaust ducts with 0.0598-inch- (1.5-mm-) thick, carbon-steel sheet for concealed ducts and 0.0500-inch- (1.3-mm-) thick stainless steel for exposed ducts. Weld and flange seams and joints. Comply with NFPA 96.
 3. Static-Pressure Classifications: Unless otherwise indicated, construct ducts to the following:
 - a. Supply Ducts: 3-inch wg.
 - b. Return Ducts: 2-inch wg, negative pressure.
 - c. Exhaust Ducts: 2-inch wg, negative pressure.
 4. Cross Breaking or Cross Beading: Cross break or cross bead duct sides 19 inches and larger and 0.0359 inch thick or less, with more than 10 sq. ft. of unbraced panel area, unless ducts are lined.
- F. Round and Flat-Oval Supply and Exhaust Fitting Fabrication:
1. 90-Degree Tees and Laterals and Conical Tees: Fabricate to comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible," with metal thicknesses specified for longitudinal seam straight duct.
 2. Diverging-Flow Fittings: Fabricate with a reduced entrance to branch taps with no excess material projecting from body onto branch tap entrance.

1.3. EXECUTION

- A. Duct Installation, General:
1. Duct installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of ducts, fittings, and accessories.
 2. Construct and install each duct system for the specific duct pressure classification indicated.
 3. Install round and flat-oval ducts in lengths not less than eight feet, unless interrupted by fittings.
 4. Install ducts with fewest possible joints.

5. Install fabricated fittings for changes in directions, changes in size and shape, and connections.
 6. Install couplings tight to duct wall surface with a minimum of projections into duct.
 7. Install ducts, unless otherwise indicated, vertically and horizontally, parallel and perpendicular to building lines; avoid diagonal runs.
 8. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
 9. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.
 10. Conceal ducts from view in finished spaces. Do not encase horizontal runs in solid partitions, unless specifically indicated.
 11. Coordinate layout with suspended ceiling, fire- and smoke-control dampers, lighting layouts, and similar finished work.
- B. Ductwork Material Application:
1. Unless noted otherwise, galvanized ductwork shall be used. Refer to the drawings for rectangular, spiral round or other types.
 2. Exhaust ductwork in locker room areas (concealed and exposed) shall be fabricated from aluminum materials, in accordance with current Smacna standards. Refer to the drawings for rectangular, spiral round or other types.
- C. Seam and Joint Sealing:
1. General: Seal duct seams and joints according to the duct pressure class indicated and as described in SMACNA's "HVAC Duct Construction Standards--Metal and Flexible."
- D. Hanging and Supporting:
1. Install rigid round, rectangular, and flat-oval metal duct with support systems indicated in SMACNA's "HVAC Duct Construction Standards--Metal and Flexible."
 2. Support horizontal ducts within 24 inches of each elbow and within 48 inches of each branch intersection.
 3. Support vertical ducts at a maximum interval of 16 feet and at each floor.
 4. Install upper attachments to structures with an allowable load not exceeding one-fourth of failure (proof-test) load.
 5. Install concrete inserts before placing concrete.
 6. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
- E. Connections:
1. Connect equipment with flexible connectors.
 2. For branch, outlet and inlet, and terminal unit connections, comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible."
- F. Field Quality Control:
1. Disassemble, reassemble, and seal segments of systems as required to accommodate leakage testing and as required for compliance with test requirements.
 2. Maximum Allowable Leakage: Comply with requirements for Leakage Classification 3 for round and flat-oval ducts, Leakage Classification 12 for rectangular ducts in pressure classifications less than and equal to 2-inch wg (both positive and negative pressures), and Leakage Classification 6 for pressure classifications from 2- to 10-inch wg.

3. Remake leaking joints and retest until leakage is less than maximum allowable.
 4. Leakage Test: Perform tests according to SMACNA's "HVAC Air Duct Leakage Test Manual."
- G. Adjusting:
1. Adjust volume-control dampers in ducts, outlets, and inlets to achieve design airflow.
 2. Refer to Section "Testing, Adjusting, and Balancing" for detailed procedures.
- H. Cleaning: After completing system installation, including outlet fittings and devices, inspect the system. Vacuum ducts before final acceptance to remove dust and debris.

END 23 89 00.

**DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)
SECTION 23 93 00: DIFFUSERS, REGISTERS, AND GRILLES**

1.1 GENERAL

- A. Related Documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Summary: This Section includes ceiling- and wall-mounted diffusers, registers, and grilles.
- C. Definitions:
 - 1. Diffuser: Circular, square, or rectangular air distribution outlet, generally located in the ceiling and comprised of deflecting members discharging supply air in various directions and planes and arranged to promote mixing of primary air with secondary room air.
 - 2. Grille: A louvered or perforated covering for an opening in an air passage, which can be located in a sidewall, ceiling, or floor.
 - 3. Register: A combination grille and damper assembly over an air opening.
- D. Submittals:
 - 1. Product Data: For each model indicated, include the following:
 - a. Data Sheet: For each type of air outlet and inlet, and accessory furnished; indicate construction, finish, and mounting details.
 - b. Performance Data: Include throw and drop, static-pressure drop, and noise ratings for each type of air outlet and inlet.
- E. Quality Assurance:
 - 1. Product Options: Drawings and schedules indicate specific requirements of diffusers, registers, and grilles and are based on the specific requirements of the systems indicated. Other manufacturers' products with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions."
 - 2. NFPA Compliance: Install diffusers, registers, and grilles according to NFPA 90A, "Standard for the Installation of Air-Conditioning and Ventilating Systems."

1.2. PRODUCTS

- A. Manufactured Units: Diffusers, registers, and grilles are scheduled on Drawings.
- B. Source Quality Control:
 - 1. Testing: Test performance according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

1.3. EXECUTION

- A. Examination: Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting

performance of equipment. Do not proceed with installation until unsatisfactory conditions have been corrected.

- B. Installation:
 - 1. Install diffusers, registers, and grilles level and plumb, according to manufacturer's written instructions, Coordination Drawings, original design, and referenced standards.
 - 2. Install diffusers, registers, and grilles with airtight connection to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.
- C. Adjusting: After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.
- D. Cleaning: After installation of diffusers, registers, and grilles, inspect exposed finish. Clean exposed surfaces to remove burrs, dirt, and smudges. Replace diffusers, registers, and grilles that have damaged finishes.

END 23 93 00.

DIVISION 26 – ELECTRICAL
SECTION 26 05 00: COMMON WORK RESULTS FOR ELECTRICAL

1.1 GENERAL

- A. Related Documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

- B. Summary: This Section includes the following:
 - 1. Supporting devices for electrical components.
 - 2. Electrical identification.
 - 3. Electricity-metering components.
 - 4. Concrete equipment bases.
 - 5. Electrical demolition.
 - 6. Cutting and patching for electrical construction.
 - 7. Touchup painting.

- C. Definitions:
 - 1. EMT: Electrical metallic tubing.
 - 2. FMC: Flexible metal conduit.
 - 3. IMC: Intermediate metal conduit.
 - 4. LFMC: Liquidtight flexible metal conduit.
 - 5. RNC: Rigid nonmetallic conduit.
 - 6. RGSC: Rigid, heavywall, galvanized steel conduct.

- D. Submittals:
 - 1. Product Data: For electricity-metering equipment.
 - 2. Shop Drawings: Dimensioned plans and sections or elevation layouts of electricity-metering equipment.
 - 3. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

- E. Quality Assurance:
 - 1. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 - 2. Comply with NFPA 70.

- F. Coordination:
 - 1. Coordinate chases, slots, inserts, sleeves, and openings with general construction work and arrange in building structure during progress of construction to facilitate the electrical installations that follow.
 - a. Set inserts and sleeves in poured-in-place concrete, masonry work, and other structural components as they are constructed.
 - 2. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work. Coordinate installing large equipment requiring positioning before closing in the building.
 - 3. Coordinate electrical service connections to components furnished by utility companies.

- a. Coordinate installation and connection of exterior underground and overhead utilities and services, including provision for electricity-metering components.
 - b. Comply with requirements of authorities having jurisdiction and of utility company providing electrical power and other services.
4. Coordinate location of access panels and doors for electrical items that are concealed by finished surfaces. Access doors and panels are specified in Division 8 Section "Access Doors."
 5. Where electrical identification devices are applied to field-finished surfaces, coordinate installation of identification devices with completion of finished surface.
 6. Where electrical identification markings and devices will be concealed by acoustical ceilings and similar finishes, coordinate installation of these items before ceiling installation.

1.2. PRODUCTS

A. Supporting Devices:

1. Material: Cold-formed steel, with corrosion-resistant coating acceptable to authorities having jurisdiction.
2. Metal Items for Use Outdoors or in Damp Locations: Hot-dip galvanized steel.
3. Slotted-Steel Channel Supports: Flange edges turned toward web, and 9/16-inch- (14-mm-) diameter slotted holes at a maximum of 2 inches (50 mm) o.c., in webs.
4. Slotted-Steel Channel Supports: Comply with Division 5 Section "Metal Fabrications" for slotted channel framing.
 - a. Channel Thickness: Selected to suit structural loading.
 - b. Fittings and Accessories: Products of the same manufacturer as channel supports.
5. Nonmetallic Channel and Angle Systems: Structural-grade, factory-formed, glass-fiber-resin channels and angles with 9/16-inch- (14-mm-) diameter holes at a maximum of 8 inches (203 mm) o.c., in at least one surface.
 - a. Fittings and Accessories: Products of the same manufacturer as channels and angles.
 - b. Fittings and Accessory Materials: Same as channels and angles, except metal items may be stainless steel.
6. Raceway and Cable Supports: Manufactured clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring-steel clamps or click-type hangers.
7. Pipe Sleeves: ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.
8. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for nonarmored electrical cables in riser conduits. Plugs have number and size of conductor gripping holes as required to suit individual risers. Body constructed of malleable-iron casting with hot-dip galvanized finish.
9. Expansion Anchors: Carbon-steel wedge or sleeve type.
10. Toggle Bolts: All-steel springhead type.
11. Powder-Driven Threaded Studs: Heat-treated steel.

- B. Electrical Identification:
1. Identification Devices: A single type of identification product for each application category. Use colors prescribed by ANSI A13.1, NFPA 70, and these Specifications.
 2. Raceway and Cable Labels: Comply with ANSI A13.1, Table 3, for minimum size of letters for legend and minimum length of color field for each raceway and cable size.
 - a. Type: Pretensioned, wraparound plastic sleeves. Flexible, preprinted, color-coded, acrylic band sized to suit the diameter of the item it identifies.
 - b. Type: Preprinted, flexible, self-adhesive, vinyl. Legend is overlaminated with a clear, weather- and chemical-resistant coating.
 - c. Color: Black letters on orange background.
 - d. Legend: Indicates voltage.
 3. Colored Adhesive Marking Tape for Raceways, Wires, and Cables: Self-adhesive vinyl tape, not less than 1 inch wide by 3 mils thick (25 mm wide by 0.08 mm thick).
 4. Underground Warning Tape: Permanent, bright-colored, continuous-printed, vinyl tape with the following features:
 - a. Not less than 6 inches wide by 4 mils thick (150 mm wide by 0.102 mm thick).
 - b. Compounded for permanent direct-burial service.
 - c. Embedded continuous metallic strip or core.
 - d. Printed legend that indicates type of underground line.
 5. Tape Markers for Wire: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.
 6. Color-Coding Cable Ties: Type 6/6 nylon, self-locking type. Colors to suit coding scheme.
 7. Engraved-Plastic Labels, Signs, and Instruction Plates: Engraving stock, melamine plastic laminate punched or drilled for mechanical fasteners 1/16-inch (1.6-mm) minimum thickness for signs up to 20 sq. in. (129 sq. cm) and 1/8-inch (3.2-mm) minimum thickness for larger sizes. Engraved legend in black letters on white background.
 8. Interior Warning and Caution Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145. Preprinted, aluminum, baked-enamel-finish signs, punched or drilled for mechanical fasteners, with colors, legend, and size appropriate to the application.
 9. Exterior Warning and Caution Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch (1-mm), galvanized-steel backing, with colors, legend, and size appropriate to the application. 1/4-inch (6-mm) grommets in corners for mounting.
 10. Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws or No. 10/32 stainless-steel machine screws with nuts and flat and lock washers.
- C. Equipment for Utility Company's Electricity Metering:
1. not used
- D. Equipment for Electricity Metering by Owner: Not used.
- E. Concrete Bases:

1. Concrete Forms and Reinforcement Materials: As specified in Division 3 Section "Cast-in-Place Concrete."
 2. Concrete: 3000-psi (20.7-MPa), 28-day compressive strength as specified in Division 3 Section "Cast-in-Place Concrete."
- F. Touch-up Paint:
1. For Equipment: Equipment manufacturer's paint selected to match installed equipment finish.
 2. Galvanized Surfaces: Zinc-rich paint recommended by item manufacturer.

1.3. EXECUTION

- A. Electrical Equipment Installation:
1. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide the maximum possible headroom.
 2. Materials and Components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.
 3. Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.
 4. Right of Way: Give to raceways and piping systems installed at a required slope.
- B. Electrical Supporting Device Application:
1. Damp Locations and Outdoors: Hot-dip galvanized materials or nonmetallic, U-channel system components.
 2. Dry Locations: Steel materials.
 3. Support Clamps for PVC Raceways: Click-type clamp system.
 4. Selection of Supports: Comply with manufacturer's written instructions.
 5. Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four; minimum of 200-lb (90-kg) design load.
- C. Support Installation:
1. Install support devices to securely and permanently fasten and support electrical components.
 2. Install individual and multiple raceway hangers and riser clamps to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assemblies and for securing hanger rods and conduits.
 3. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.
 4. Size supports for multiple raceway installations so capacity can be increased by a 25 percent minimum in the future.
 5. Support individual horizontal raceways with separate, malleable-iron pipe hangers or clamps.
 6. Install 1/4-inch- (6-mm-) diameter or larger threaded steel hanger rods, unless otherwise indicated.
 7. Spring-steel fasteners specifically designed for supporting single conduits or tubing may be used instead of malleable-iron hangers for 1-1/2-inch (38-mm) and smaller raceways serving lighting and receptacle branch circuits above suspended ceilings and for fastening raceways to slotted channel and angle supports.

8. Arrange supports in vertical runs so the weight of raceways and enclosed conductors is carried entirely by raceway supports, with no weight load on raceway terminals.
9. Simultaneously install vertical conductor supports with conductors.
10. Separately support cast boxes that are threaded to raceways and used for fixture support. Support sheet-metal boxes directly from the building structure or by bar hangers. If bar hangers are used, attach bar to raceways on opposite sides of the box and support the raceway with an approved fastener not more than 24 inches (610 mm) from the box.
11. Install metal channel racks for mounting cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices unless components are mounted directly to structural elements of adequate strength.
12. Install sleeves for cable and raceway penetrations of concrete slabs and walls unless core-drilled holes are used. Install sleeves for cable and raceway penetrations of masonry and fire-rated gypsum walls and of all other fire-rated floor and wall assemblies. Install sleeves during erection of concrete and masonry walls.
13. Securely fasten electrical items and their supports to the building structure, unless otherwise indicated. Perform fastening according to the following unless other fastening methods are indicated:
 - a. Wood: Fasten with wood screws or screw-type nails.
 - b. Masonry: Toggle bolts on hollow masonry units and expansion bolts on solid masonry units.
 - c. New Concrete: Concrete inserts with machine screws and bolts.
 - d. Existing Concrete: Expansion bolts.
 - e. Instead of expansion bolts, threaded studs driven by a powder charge and provided with lock washers may be used in existing concrete.
 - f. Steel: Welded threaded studs or spring-tension clamps on steel.
 - 1) Field Welding: Comply with AWS D1.1.
 - g. Welding to steel structure may be used only for threaded studs, not for conduits, pipe straps, or other items.
 - h. Light Steel: Sheet-metal screws.
 - i. Fasteners: Select so the load applied to each fastener does not exceed 25 percent of its proof-test load.

D. Identification Materials and Devices:

1. Install at locations for most convenient viewing without interference with operation and maintenance of equipment.
2. Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations indicated in the Contract Documents or required by codes and standards. Use consistent designations throughout Project.
3. Self-Adhesive Identification Products: Clean surfaces before applying.
4. Identify raceways and cables with color banding as follows:
 - a. Bands: Pretensioned, snap-around, colored plastic sleeves or colored adhesive marking tape. Make each color band 2 inches (51 mm) wide, completely encircling conduit, and place adjacent bands of two-color markings in contact, side by side.
 - b. Band Locations: At changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (8-m) maximum intervals in congested areas.
 - c. Colors: As follows:

- 1) Fire Alarm System: Red
 - 2) Security System: Blue and yellow.
 - 3) Telecommunication System: Green and yellow.
5. Tag and label circuits designated to be extended in the future. Identify source and circuit numbers in each cabinet, pull and junction box, and outlet box. Color-coding may be used for voltage and phase identification.
 6. Install continuous underground plastic markers during trench backfilling, for exterior underground power, control, signal, and communication lines located directly above power and communication lines. Locate 6 to 8 inches (150 to 200 mm) below finished grade. If width of multiple lines installed in a common trench or concrete envelope does not exceed 16 inches (400 mm), overall, use a single line marker.
 7. Color-code 208/120-V system secondary service, feeder, and branch-circuit conductors throughout the secondary electrical system as follows:
 - a. Phase A: Black
 - b. Phase B: Red
 - c. Phase C: Blue
 - d. Neutral: White
 - e. Ground: Green
 8. Color-code 480/277-V system secondary service, feeder, and branch-circuit conductors throughout the secondary electrical system as follows:
 - a. Phase A: Yellow
 - b. Phase B: Brown
 - c. Phase C: Orange
 - d. Neutral: Grey
 - e. Ground: Green with white trace.
 9. Install warning, caution, and instruction signs where required to comply with 29 CFR, Chapter XVII, Part 1910.145, and where needed to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.
 10. Install engraved-laminated emergency-operating signs with white letters on red background with minimum 3/8-inch- (9-mm-) high lettering for emergency instructions on power transfer, load shedding, and other emergency operations.
- E. Utility Company Electricity-Metering Equipment: not used
- F. Firestopping: Apply firestopping to cable and raceway penetrations of fire-rated floor and wall assemblies to achieve fire-resistance rating of the assembly. Firestopping materials and installation requirements are specified in Division 7 Section "Firestopping."
- G. Concrete Bases: Construct concrete bases of dimensions indicated, but not less than 4 inches (100 mm) larger, in both directions, than supported unit. Follow supported equipment manufacturer's anchorage recommendations and setting templates for anchor-bolt and tie locations, unless otherwise indicated. Use 3000-psi (20.7-MPa), 28-day compressive-strength concrete and reinforcement as specified in Division 3 Section "Cast-in-Place Concrete."
- H. Cutting and Patching:

1. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces required to permit electrical installations. Perform cutting by skilled mechanics of trades involved.
 2. Repair and refinish disturbed finish materials and other surfaces to match adjacent undisturbed surfaces. Install new fireproofing where existing firestopping has been disturbed. Repair and refinish materials and other surfaces by skilled mechanics of trades involved.
- I. Field Quality Control: Inspect installed components for damage and faulty work, including the following:
1. Raceways
 2. Building wire and connectors.
 3. Supporting devices for electrical components.
 4. Electrical identification.
 5. Electricity-metering components.
 6. Concrete bases.
 7. Electrical demolition.
 8. Cutting and patching for electrical construction.
 9. Touchup painting.
- J. Refinishing and Touchup Painting: Refinish and touch up paint. Paint materials and application requirements are specified in Division 9 Section "Painting."
1. Clean damaged and disturbed areas and apply primer, intermediate, and finish coats to suit the degree of damage at each location.
 2. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.
 3. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 4. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.
- K. Cleaning and Protection:
1. On completion of installation, including outlets, fittings, and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.
 2. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

END 26 05 00.

DIVISION 26 – ELECTRICAL

**SECTION 26 05 19 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND
CABLES**

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes building wire and cable; nonmetallic-sheathed cable; direct burial cable; service entrance cable; armored cable; metal clad cable; and wiring connectors and connections.

1.2 REFERENCES

- A. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- B. National Fire Protection Association:
 - 1. NFPA 70 - National Electrical Code.
 - 2. NFPA 262 - Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.
- C. Underwriters Laboratories, Inc.:
 - 1. UL 1277 - Standard for Safety for Electrical Power and Control Tray Cables with Optional Optical-Fiber Members.

1.3 SYSTEM DESCRIPTION

- A. Product Requirements: Provide products as follows:
 - 1. Conductor not smaller than 12 AWG for power and lighting circuits.
 - 2. Conductor not smaller than 14 AWG for control circuits.
 - 3. Increase wire size in branch circuits to limit voltage drop to a maximum of 3 percent.
- B. Wiring Methods: Provide the following wiring methods:
 - 1. Concealed Dry Interior Locations: Use only building wire in raceway.
 - 2. Exposed Dry Interior Locations: Use only building wire in raceway.
 - 3. Above Accessible Ceilings: Use only building wire in raceway.
 - 4. Wet or Damp Interior Locations: Use only building wire in raceway.
 - 5. Exterior Locations: Use only building wire in raceway.

1.4 DESIGN REQUIREMENTS

- A. Conductor sizes are based on copper unless indicated as aluminum or "AL".
- B. When aluminum conductor is substituted for copper conductor, size to match circuit requirements, terminations, conductor ampacity and voltage drop.

1.5 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit for building wire and each cable assembly type.
- C. Design Data: Indicate voltage drop and ampacity calculations for aluminum conductors substituted for copper conductors.
- D. Test Reports: Indicate procedures and values obtained.

1.6 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of components and circuits.

1.7 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
- C. Maintain one copy of each document on site.

1.8 QUALIFICATIONS

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

1.9 FIELD MEASUREMENTS

- A. Verify field measurements are as indicated on Drawings.

1.10 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.
- B. Where wire and cable destination is indicated and routing is not shown, determine routing and lengths required.
- C. Wire and cable routing indicated is approximate unless dimensioned.

PART 2 PRODUCTS

2.1 BUILDING WIRE

- A. Manufacturers:
 - 1. AETNA
 - 2. American Insulated Wire Corp.
 - 3. Colonial Wire
 - 4. Encore Wire
 - 5. General Cable Co.
 - 6. Republic Wire
 - 7. Rome Cable
 - 8. Service Wire Co.
 - 9. Southwire Model
 - 10. Superior Essex
- B. Product Description: Single conductor insulated wire.
- C. Conductor: Copper.
- D. Insulation Voltage Rating: 600 volts.
- E. Insulation Temperature Rating: 75 degrees C.
- F. Insulation Material: Thermoplastic.

2.2 SERVICE ENTRANCE CABLE

- A. Manufacturers:
 - 1. Diamond Wire & Cable Co.
 - 2. Essex Group Inc.
 - 3. General Cable Co.
- B. Conductor: Copper.
- C. Insulation Voltage Rating: 600 volts.
- D. Insulation: Type.

2.3 TERMINATIONS

- A. Terminal Lugs for Wires 6 AWG and Smaller: Solderless, compression type copper.
- B. Lugs for Wires 4 AWG and Larger: Color keyed, compression type copper, with insulating sealing collars.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify interior of building has been protected from weather.
- C. Verify mechanical work likely to damage wire and cable has been completed.
- D. Verify raceway installation is complete and supported.

3.2 PREPARATION

- A. Completely and thoroughly swab raceway before installing wire.

3.3 EXISTING WORK

- A. Remove exposed abandoned wire and cable, including abandoned wire and cable above accessible ceiling finishes. Patch surfaces where removed cables pass through building finishes.
- B. Disconnect abandoned circuits and remove circuit wire and cable. Remove abandoned boxes when wire and cable servicing boxes is abandoned and removed. Install blank cover for abandoned boxes not removed.
- C. Provide access to existing wiring connections remaining active and requiring access. Modify installation or install access panel.
- D. Extend existing circuits using materials and methods as specified.
- E. Clean and repair existing wire and cable remaining or wire and cable to be reinstalled.

3.4 INSTALLATION

- A. Route wire and cable to meet Project conditions.
- B. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- C. Identify and color code wire and cable under provisions of Section 26 05 53. Identify each conductor with its circuit number or other designation indicated.
- D. Special Techniques--Building Wire in Raceway:
 - 1. Pull conductors into raceway at same time.
 - 2. Install building wire 4 AWG and larger with pulling equipment.
- E. Special Techniques - Cable:

1. Protect exposed cable from damage.
 2. Support cables above accessible ceiling, using spring metal clips or plastic cable ties to support cables from structure. Do not rest cable on ceiling panels.
 3. Use suitable cable fittings and connectors.
- F. Special Techniques - Wiring Connections:
1. Clean conductor surfaces before installing lugs and connectors.
 2. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
 3. Tape uninsulated conductors and connectors with electrical tape to 150 percent of insulation rating of conductor.
 4. Install split bolt connectors for copper conductor splices and taps, 6 AWG and larger.
 5. Install solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.
 6. Install insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
 7. Install suitable reducing connectors or mechanical connector adaptors for connecting aluminum conductors to copper conductors.
- G. Install stranded conductors for branch circuits 10 AWG and smaller. Install crimp on fork terminals for device terminations. Do not place bare stranded conductors directly under screws.
- H. Install terminal lugs on ends of 600 volt wires unless lugs are furnished on connected device, such as circuit breakers.
- I. Size lugs in accordance with manufacturer's recommendations terminating wire sizes. Install 2-hole type lugs to connect wires 4 AWG and larger to copper bus bars.
- J. For terminal lugs fastened together such as on motors, transformers, and other apparatus, or when space between studs is small enough that lugs can turn and touch each other, insulate for dielectric strength of 2-1/2 times normal potential of circuit.

3.5 WIRE COLOR

- A. General:
1. For wire sizes 10 AWG and smaller, install wire colors in accordance with the following:
 - a. Black and red for single phase circuits at 120/240 volts.
 - b. Black, red, and blue for circuits at 120/208 volts single or three phase.
 - c. Orange, brown, and yellow for circuits at 277/480 volts single or three phase.
 2. For wire sizes 8 AWG and larger, identify wire with colored tape at terminals, splices and boxes. Colors are as follows:

- a. Black and red for single phase circuits at 120/240 volts.
 - b. Black, red, and blue for circuits at 120/208 volts single or three phase.
 - c. Orange, brown, and yellow for circuits at 277/480 volts single or three phase.
- B. Neutral Conductors: White. When two or more neutrals are located in one conduit, individually identify each with proper circuit number.
- C. Branch Circuit Conductors: Install three or four wire home runs with each phase uniquely color coded.
- D. Feeder Circuit Conductors: Uniquely color code each phase.
- E. Ground Conductors:
- 1. For 6 AWG and smaller: Green.
 - 2. For 4 AWG and larger: Identify with green tape at both ends and visible points including junction boxes.

3.6 FIELD QUALITY CONTROL

- A. Section: Field inspecting, testing, adjusting, and balancing.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.3.1.

END OF SECTION

DIVISION 26 – ELECTRICAL

SECTION 26 05 26: GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

1.1 GENERAL

- A. Summary: This Section includes:
1. Rod electrodes.
 2. Mechanical connectors.
 3. Exothermic connections.
- B. References:
1. Institute of Electrical and Electronics Engineers:
 - a. IEEE 142 - Recommended Practice for Grounding of Industrial and Commercial Power Systems.
 - b. IEEE 1100 - Recommended Practice for Powering and Grounding Electronic Equipment.
 2. International Electrical Testing Association:
 - a. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
 3. National Fire Protection Association:
 - a. NFPA 70 - National Electrical Code.
 - b. NFPA 99 - Standard for Health Care Facilities.
- C. System Description:
1. Grounding systems use the following elements as grounding electrodes:
 - a. Metal underground water pipe.
 - b. Concrete-encased electrode.
 - c. Rod electrode.
- D. Performance Requirements:
1. Grounding System Resistance: 5 ohms maximum.
- E. Submittals:
1. Product Data: Submit data on grounding electrodes and connections.
 2. Test Reports: Indicate overall resistance to ground.
- F. Closeout Submittals:
1. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.
 2. Project Record Documents: Record actual locations of components and grounding electrodes.
- G. Quality Assurance:
1. Provide grounding materials conforming to requirements of NEC, IEEE 142, and UL labeled.
 2. Perform Work in accordance with
- H. Qualifications:
1. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.

2. Installer: Company specializing in performing work of this section with minimum years experience.
- I. Delivery, Storage, and Handling:
 1. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
 2. Accept materials on site in original factory packaging, labeled with manufacturer's identification.
 3. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.
 4. Do not deliver items to project before time of installation. Limit shipment of bulk and multiple-use materials to quantities needed for immediate installation.
 - J. Coordination:
 1. Section 01 30 00 - Administrative Requirements: Requirements for coordination.
 2. Complete grounding and bonding of building reinforcing steel prior concrete placement.

1.2. PRODUCTS

- A. Rod Electrodes:
 1. Manufacturers:
 - a. Erico, Inc.
 - b. O-Z Gedney Co.
 - c. Thomas & Betts, Electrical
 2. Product Description:
 - a. Material: Copper-clad steel or Copper.
 - b. Diameter: 3/4 inch.
 - c. Length: 10 feet.
 3. Connector: Connector for exothermic welded connection. or U-bolt clamp.
- B. Wire:
 1. Material: Stranded copper.
 2. Foundation Electrodes: 4 AWG.
 3. Grounding Electrode Conductor: Copper conductor bare.
 4. Bonding Conductor: Copper conductor insulated.
- C. Mechanical Connectors:
 1. Manufacturers:
 - a. Erico, Inc.
 - b. ILSCO Corporation
 - c. O-Z Gedney Co.
 - d. Thomas & Betts, Electrical
 2. Description: Bronze connectors, suitable for grounding and bonding applications, in configurations required for particular installation.
- D. Exothermic Connections:
 1. Manufacturers:
 - a. Copperweld, Inc.
 - b. ILSCO Corporation

- c. O-Z Gedney Co.
 - d. Thomas & Betts, Electrical
2. Product Description: Exothermic materials, accessories, and tools for preparing and making permanent field connections between grounding system components.

1.3. EXECUTION

- A. Examination:
- 1. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.
 - 2. Verify final backfill and compaction has been completed before driving rod electrodes.
- B. Preparation: Remove paint, rust, mill oils, surface contaminants at connection points.
- C. Existing Work:
- 1. Modify existing grounding system to maintain continuity to accommodate renovations.
 - 2. Extend existing grounding system using materials and methods compatible with existing electrical installations, or as specified.
- D. Installation:
- 1. Install in accordance with IEEE 142
 - 2. Install rod electrodes at indicated
 - 3. Install grounding and bonding conductors concealed from view.
 - 4. Install grounding well pipe with cover at. Install well pipe top flush with finished grade.
 - 5. Install 4 AWG bare copper wire in foundation footing.
 - 6. Bond together metal siding not attached to grounded structure; bond to ground.
 - 7. Bond together reinforcing steel and metal accessories in structures.
 - 8. Bond together each metallic raceway, pipe, duct and other metal object entering. Install AWG bare copper bonding conductor.
 - 9. Install isolated grounding conductor for circuits supplying in accordance with IEEE 1100.
 - 10. Equipment Grounding Conductor: Install separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.
 - 11. 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.
 - 12. 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.
 - 13. 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.
 - 14. 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.

15. Grounding electrical system using continuous metal raceway system enclosing circuit conductors in accordance with NEC.
16. Permanently attach equipment and grounding conductors prior to energizing equipment.

E. Field Quality Control:

1. Inspect and test in accordance with NETA ATS, except Section 4.
2. Grounding and Bonding: Perform inspections and tests listed in NETA ATS, Section 7.13.
3. Perform ground resistance testing in accordance with IEEE 142.
4. Perform leakage current tests in accordance with NFPA 99.
5. Perform continuity testing in accordance with IEEE 142.
6. When improper grounding is found on receptacles, check receptacles in entire project and correct. Perform retest.

END 26 05 26.

DIVISION 26 – ELECTRICAL
SECTION 26 05 33: RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

1.1 GENERAL

- A. Summary: Section includes conduit and tubing, surface raceways, wireways, outlet boxes, pull and junction boxes, and handholes.
- B. References:
1. American National Standards Institute:
 - a. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
 - b. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.
 - c. ANSI C80.5 - Aluminum Rigid Conduit - (ARC).
 2. National Electrical Manufacturers Association:
 - a. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
 - b. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
 - c. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
 - d. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.
 - e. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
 - f. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
 - g. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.
- C. System Description:
1. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.
 2. Underground More than 5 feet outside Foundation Wall: Provide rigid steel conduit or non-metallic conduit. Provide cast metal boxes or nonmetallic handhole.
 3. Underground Within 5 feet from Foundation Wall: Provide rigid steel conduit, or nonmetallic conduit. Provide cast metal or nonmetallic boxes.
 4. In or Under Slab on Grade: Provide rigid steel conduit, thickwall nonmetallic conduit. Provide cast or nonmetallic metal boxes.
 5. Outdoor Locations, Above Grade: Provide, intermediate metal conduit. Provide cast metal or nonmetallic outlet, pull, and junction boxes.
 6. In Slab Above Grade: Provide, intermediate metal conduit, or electrical metallic tubing. Provide cast boxes.
 7. Wet and Damp Locations: Provide rigid steel conduit, or thickwall nonmetallic conduit. Provide cast metal or nonmetallic outlet, junction, and pull boxes. Provide flush mounting outlet box in finished areas.
 8. Concealed Dry Locations: Provide electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.
 9. Exposed Dry Locations: Provide, electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

- D. Design Requirements:
 - 1. Minimum Raceway Size: 1/2 inch unless otherwise specified.

- E. Submittals:
 - 1. Section 01 33 00 - Submittal Procedures: Submittal procedures.
 - 2. Product Data: Submit for the following:
 - a. Flexible metal conduit.
 - b. Liquidtight flexible metal conduit.
 - c. Nonmetallic conduit.
 - d. Flexible nonmetallic conduit.
 - e. Nonmetallic tubing.
 - f. Raceway fittings.
 - g. Conduit bodies.
 - h. Surface raceway.
 - i. Wireway
 - j. Pull and junction boxes.
 - k. Handholes

 - 3. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

- F. Closeout Submittals:
 - 1. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
 - 2. Project Record Documents:
 - a. Record actual routing of conduits larger than 2 inch.
 - b. Record actual locations and mounting heights of outlet, pull, and junction boxes.

- G. Delivery, Storage, and Handling:
 - 1. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
 - 2. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
 - 3. Protect PVC conduit from sunlight.

- H. Coordination:
 - 1. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
 - 2. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.

1.2. PRODUCTS

- A. Metal Conduit:
 - 1. Manufacturers:
 - a. Carlon Electrical Products
 - b. Hubbell Wiring Devices
 - c. Thomas & Betts Corp.
 - d. Walker Systems Inc.
 - e. The Wiremold Co.

2. Rigid Steel Conduit: ANSI C80.1,
 3. Rigid Aluminum Conduit: ANSI C80.5.
 4. Intermediate Metal Conduit (IMC): Rigid steel.
 5. Fittings and Conduit Bodies: NEMA FB 1; material to match conduit.
- B. Flexible Metal Conduit
1. Manufacturers:
 - a. Carlon Electrical Products
 - b. Hubbell Wiring Devices
 - c. Thomas & Betts Corp.
 - d. Walker Systems Inc.
 - e. The Wiremold Co.
 - f. Substitutions
 2. Product Description: Interlocked steel construction.
 3. Fittings: NEMA FB 1.
- C. Liquidtight Flexible Metal Conduit:
1. Manufacturers:
 - a. Carlon Electrical Products
 - b. Hubbell Wiring Devices
 - c. Thomas & Betts Corp.
 - d. Walker Systems Inc.
 - e. The Wiremold Co. Product Description: Interlocked steel construction with PVC jacket.
 2. Fittings: NEMA FB 1.
- D. Electrical Metallic Tubing (EMT):
1. Manufacturers:
 - a. Carlon Electrical Products
 - b. Hubbell Wiring Devices
 - c. Thomas & Betts Corp.
 - d. Walker Systems Inc.
 - e. The Wiremold Co.
 2. Product Description: ANSI C80.3; galvanized tubing.
 3. Fittings and Conduit Bodies: NEMA FB 1; steel or malleable iron, compression type.
- E. Nonmetallic Conduit:
1. Manufacturers:
 - a. Carlon Electrical Products
 - b. Hubbell Wiring Devices
 - c. Thomas & Betts Corp.
 - d. Walker Systems Inc.
 - e. The Wiremold Co.
 2. Product Description: NEMA TC 2; Schedule 40 PVC.
 3. Fittings and Conduit Bodies: NEMA TC 3.
- F. Surface Metal Raceway:
1. Manufacturers:

- a. Carlon Electrical Products
 - b. Hubbell Wiring Devices
 - c. Thomas & Betts Corp.
 - d. Walker Systems Inc.
 - e. The Wiremold Co.
2. Product Description: Sheet metal channel with fitted cover, suitable for use as surface metal raceway.
 3. Finish: Gray enamel.
 4. Fittings, Boxes, and Extension Rings: Furnish manufacturer's standard accessories; match finish on raceway.
- G. Surface Nonmetal Raceway:
1. Manufacturers:
 - a. Carlon Electrical Products
 - b. Hubbell Wiring Devices
 - c. Thomas & Betts Corp.
 - d. Walker Systems Inc.
 - e. The Wiremold Co. M
 2. Product Description: Plastic channel with fitted cover, suitable for use as surface raceway.
 3. Finish: Gray.
 4. Fittings, Boxes, and Extension Rings: Furnish manufacturer's standard accessories, finish to match raceway.
- H. Wireway:
1. Manufacturers:
 - a. Carlon Electrical Products
 - b. Hubbell Wiring Devices
 - c. Thomas & Betts Corp.
 - d. Walker Systems Inc.
 - e. The Wiremold Co.
 2. Product Description: General purpose type wireway.
 3. Knockouts: Manufacturer's standard.
 4. Size: 6 x 6 inch 8 x 8 inch; length as indicated on Drawings.
 5. Cover: Screw cover
 6. Connector: Slip-in.
 7. Fittings: Lay-in type with removable top, bottom, and side; captive screws.
 8. Finish: Rust inhibiting primer coating with gray enamel finish.
- I. Outlet Boxes:
1. Manufacturers:
 - a. Carlon Electrical Products
 - b. Hubbell Wiring Devices
 - c. Thomas & Betts Corp.
 - d. Walker Systems Inc.
 - e. The Wiremold Co.
 2. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
 - a. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2 inch male fixture studs where required.

- b. Concrete Ceiling Boxes: Concrete type.
- 3. Nonmetallic Outlet Boxes: NEMA OS 2.
- 4. Cast Boxes: NEMA FB 1, Type FD. Furnish gasketed cover by box manufacturer.
- 5. Wall Plates for Unfinished Areas: Furnish gasketed cover.

- J. Pull and Junction Boxes:
 - 1. Manufacturers:
 - a. Carlon Electrical Products
 - b. Hubbell Wiring Devices
 - c. Thomas & Betts Corp.
 - d. Walker Systems Inc.
 - e. The Wiremold Co. Model

 - 2. Locate outlet boxes to allow luminaires positioned as indicated on Drawings.
 - 3. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

- K. Adjusting:
 - 1. Section 01 70 00 - Execution and Closeout Requirements: Testing, adjusting, and balancing.
 - 2. Adjust flush-mounting outlets to make front flush with finished wall material.
 - 3. Install knockout closures in unused openings in boxes.

- L. Cleaning:
 - 1. Section 01 70 00 - Execution and Closeout Requirements: Final cleaning.
 - 2. Clean interior of boxes to remove dust, debris, and other material.
 - 3. Clean exposed surfaces and restore finish.

END 26 05 33.

**DIVISION 26 – ELECTRICAL
SECTION 26 09 23: LIGHTING CONTROL DEVICES**

1.1 GENERAL

- A. Related Documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Summary: Section includes photoelectric sensors, and occupancy sensors.
- C. Submittals:
 - 1. Product Data: Include dimensions and data on features, components, and ratings for lighting control devices.
 - 2. Maintenance Data: For lighting control devices to include in maintenance manuals specified in Division 1.
- D. Quality Assurance:
 - 1. Source Limitations: Obtain lighting control devices from a single source with total responsibility for compatibility of lighting control system components specified in this Section.
 - 2. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, for their indicated use and installation conditions by a testing agency acceptable to authorities having jurisdiction.
 - 3. Comply with 47 CFR 15, Subparts A and B, for Class A digital devices.
 - 4. Comply with NFPA 70.
- E. Coordination: Coordinate features of devices specified in this Section with systems and components specified in other Sections to form an integrated system of compatible components. Match components and interconnections for optimum performance of specified functions.

1.2. PRODUCTS

- A. Manufacturers:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Photoelectric Sensors:
 - 1) Allen-Bradley/Rockwell Automation
 - 2) Area Lighting Research, Inc.
 - 3) Fisher Pierce
 - 4) Grasslin Controls, Corp.
 - 5) Intermatic, Inc.
 - 6) Paragon Electric Co., Inc.
 - 7) Rhodes: M H Rhodes, Inc.
 - 8) SSAC, Inc.
 - 9) Tork, Inc.
 - b. Occupancy Sensors:
 - 1) Arrow Hart Wiring Devices
 - 2) BRK Electronics

- 3) Bryant Electric
- 4) Honeywell, Inc.; Home and Building Controls
- 5) Hubbell Lighting, Inc.
- 6) Lightolier
- 7) Lithonia Control Systems
- 8) MyTech Corporation
- 9) Novitas, Inc.
- 10) RAB Electric Manufacturing Co., Inc.
- 11) SenTec, Inc.
- 12) Sterner Lighting Systems, Inc.
- 13) Tork, Inc.
- 14) Touchplate
- 15) Unenco Electronics (A Hubbell Co.)
- 16) Watt Stopper, Inc. (The)

B. General Lighting Control Device Requirements:

1. Line-Voltage Surge Protection: Include in all 120- and 277-V solid-state equipment. Comply with UL 1449 and with ANSI C62.41 for Category A locations.

C. Photoelectric Sensors:

1. Description: Solid state, complying with UL 773A.
2. Light-Level Monitoring Range: 0 to 3500 fc (0 to 37 673 lx).
3. Indoor Ceiling- or Wall-Mounting Units: Semiflush, calibrated to detect adequacy of daylighting in perimeter locations, and arranged to turn artificial illumination on and off to suit varying intensities of available daylighting.
4. Outdoor Sealed Units: Weathertight housing, resistant to high temperatures and equipped with sun-glare shield and ice preventer.

D. Occupancy Sensors:

1. Ceiling-Mounting Units: Unit receives 24-V dc power from a remote source and, on sensing occupancy, closes contacts that provide signal input to a remote microprocessor-based lighting control system.
2. Switch-Box-Mounting Units: Unit receives power directly from switch leg of the 120- or 277-V ac circuit it controls and operates integral power switching contacts rated 800 W at 120-V ac, and 1000 W at 277-V ac, minimum.
3. Operation: Refer to lighting control scope of work on drawings.
4. Dual-Technology Type: Uses a combination of passive-infrared and ultrasonic detection methods to distinguish between occupied and unoccupied conditions for area covered. Particular technology or combination of technologies that controls each function (on or off) is selectable in the field by operating controls on unit.

1.3. EXECUTION

A. Installation:

1. Install equipment level and plumb and according to manufacturer's written instructions.
2. Mount lighting control devices according to manufacturer's written instructions and requirements in Division 26 Section "Common Work Results for Electrical."
3. Mounting heights indicated are to bottom of unit for suspended devices and to center of unit for wall-mounting devices.

- B. Control Wiring Installation:
1. Install wiring between sensing and control devices according to manufacturer's written instructions and as specified in Division 26 Section "Conductors and Cables" for low-voltage connections and Division 26 Section "Voice and Data Systems" for digital circuits.
 2. Wiring Method: Install all wiring in raceway as specified in Division 26 Section "Raceways and Boxes."
 3. Wiring Method: Install all wiring in raceway as specified in Division 26 Section "Raceways and Boxes," unless run in accessible ceiling space and gypsum board partitions.
 4. Bundle, train, and support wiring in enclosures.
 5. Ground equipment.
 6. Connections: Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.
- C. Identification:
1. Identify components and power and control wiring according to Division 26 Section "Common Work Results for Electrical."
 2. Identify components and power and control wiring according to Division 26 Section "Electrical Identification."
- D. Field Quality Control:
1. Schedule visual and mechanical inspections and electrical tests with at least seven days' advance notice.
 2. Inspect control components for defects and physical damage, testing laboratory labeling, and nameplate compliance with the Contract Documents.
 3. Check tightness of electrical connections with torque wrench calibrated within previous six months. Use manufacturer's recommended torque values.
 4. Verify settings of photoelectric devices with photometer calibrated within previous six months.
 5. Electrical Tests: Use particular caution when testing devices containing solid-state components. Perform the following according to manufacturer's written instructions:
 - a. Continuity tests of circuits.
 - b. Operational Tests: Set and operate devices to demonstrate their functions and capabilities in a methodical sequence that cues and reproduces actual operating functions.
 - 1) Include testing of devices under conditions that simulate actual operational conditions. Record control settings, operations, cues, and functional observations.
 6. Correct deficiencies, make necessary adjustments, and retest. Verify that specified requirements are met.
 7. Test Labeling: After satisfactory completion of tests and inspections, apply a label to tested components indicating test results, date, and responsible agency and representative.
 8. Reports: Written reports of tests and observations. Record defective materials and workmanship and unsatisfactory test results. Record repairs and adjustments.
- E. Cleaning: Clean equipment and devices internally and externally using methods and materials recommended by manufacturers, and repair damaged finishes.

- F. Demonstration: Train Owner's maintenance personnel as specified below:
1. Train Owner's maintenance personnel on troubleshooting, servicing, adjusting, and preventive maintenance. Provide a minimum of three hours' training.
 2. Training Aid: Use the approved final version of maintenance manuals as a training aid.
 3. Schedule training with Owner, through Architect, with at least seven days' advance notice.

END 26 09 23.

**DIVISION 26 – ELECTRICAL
SECTION 26 14 10: WIRING DEVICES**

1.1 GENERAL

- A. Work Includes:
 - 1. Base Bid:
 - a. Electrical Contractor:
 - 1) Receptacles, connectors, switches, and finish plates.
- B. Related Documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- C. Definitions:
 - 1. GFCI: Ground-fault circuit interrupter.
 - 2. TVSS: Transient voltage surge suppressor.
- D. Submittals:
 - 1. See Section 01 33 00 – Shop Drawings, Product Data and Samples, for submittal procedures.
 - 2. Product Data: For each product specified.
 - 3. Shop Drawings: Legends for receptacles and switch plates.
 - 4. Samples: For devices and device plates for color selection and evaluation of technical features.
 - 5. Maintenance Data: For materials and products to include in maintenance manuals specified in Section 01 73 00.
- E. Quality Assurance:
 - 1. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
 - 2. Comply with NEMA WD 1.
 - 3. Comply with NFPA 70.
- F. Coordination:
 - 1. Receptacles for Owner-Furnished Equipment: Match plug configurations.
 - a. Cord and Plug Sets: Match equipment requirements.

1.2. PRODUCTS

- A. Manufacturers:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Wiring Devices:
 - 1) Bryant Electric, Inc.
 - 2) Eagle Electric Manufacturing Co., Inc.
 - 3) GE Company; GE Wiring Devices
 - 4) Hubbell, Inc.; Wiring Devices Div.
 - 5) Killark Electric Manufacturing Co.
 - 6) Pass & Seymour/Legrand; Wiring Devices Div.

- b. Wiring Devices for Hazardous (Classified) Locations:
 - 1) Crouse-Hinds Electrical Co.; Distribution Equipment Div.
 - 2) Killark Electric Manufacturing Co.
 - 3) Pyle-National, Inc.; an Amphenol Co.
 - 4) Appleton Electric
 - c. Multi-outlet Assemblies:
 - 1) Airey-Thompson Co.
 - 2) Wiremold
- B. Receptacles:
 - 1. Straight-Blade and Locking Receptacles: Specification grade.
 - 2. GFCI Receptacles: Feed-through type, with integral NEMA WD 6, Configuration 5-20R duplex receptacle arranged to protect connected downstream receptacles on same circuit. Design units for installation in a 2-3/4-inch- (70-mm-) deep outlet box without an adapter.
 - 3. Isolated-Ground Receptacles: Equipment grounding contacts connected only to the green grounding screw terminal of the device with inherent electrical isolation from mounting strap.
 - a. Devices: Listed and labeled as isolated-ground receptacles.
 - b. Isolation Method: Integral to receptacle construction and not dependent on removable parts.
 - 4. TVSS Receptacles: Duplex type, NEMA WD 6, Configuration 5-20R, with integral TVSS in line to ground, line to neutral, and neutral to ground.
 - a. TVSS Components: Multiple metal-oxide varistors; rated a nominal clamp level of 500 transient-suppression voltage and minimum single transient pulse energy dissipation of 140 J line to neutral, and 70 J line to ground and neutral to ground.
 - b. Active TVSS Indication: Light visible in face of device to indicate device as "active" or "no longer active."
 - c. Identification: Distinctive marking on face of device denotes TVSS-type unit.
 - 5. Industrial Heavy-Duty Receptacle: Comply with IEC 309-1.
 - 6. Hazardous (Classified) Location Receptacles: Comply with NEMA FB 11.
- C. Cord and Plug Sets:
 - 1. Description: Match voltage and current ratings and number of conductors to requirements of equipment being connected.
 - a. Cord: Rubber-insulated, stranded-copper conductors, with type SOW-A jacket. Green-insulated grounding conductor, and equipment-rating ampacity plus a minimum of 30 percent.
 - b. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.
- D. Switches:
 - 1. Snap Switches: Specification grade, quiet type.
 - 2. Combination Switch and Receptacle: Both devices in a single gang unit with plaster ears and removable tab connector that permit separate or common feed connection.
 - a. Switch: 20 A, 120/277-V ac.
 - b. Receptacle: NEMA WD 6, Configuration 5-20R.

3. Dimmer Switches: Modular, full-wave, solid-state units with integral, quiet on/off switches and audible and electromagnetic noise filters.
 - a. Control: Continuously adjustable slide, toggle, or rotary knob. Single-pole or three-way switch to suit connections.
 - b. Incandescent Lamp Dimmers: Modular, 120 V, 60 Hz with continuously adjustable rotary knob, toggle, or slide; single pole with soft tap or other quiet switch; electromagnetic filter to eliminate noise, RF, and TV interference; and 5-inch (130-mm) wire connecting leads.
 - c. Fluorescent Lamp Dimmers: Modular; compatible with dimmer ballasts; trim potentiometer to adjust low-end dimming; dimmer-ballast combination capable of consistent dimming to a maximum of 1 percent of full brightness.

- E. Wall Plates: Single and combination types match corresponding wiring devices.
 1. Plate-Securing Screws: Metal with head color to match plate finish.
 2. Material for Finished Spaces: Heavy plastic, specification grade, ivory finish.
 3. Material for Unfinished Spaces: Galvanized steel.

- F. Floor Service Fittings:
 1. Type: Modular, flush-type, dual-service units suitable for wiring method used.
 2. Type: Modular, above-floor, dual-service units suitable for wiring method used.
 3. Compartmentation: Barrier separates power and signal compartments.
 4. Housing Material: Die-cast aluminum, satin finished.
 5. Power Receptacle: NEMA WD 6, Configuration 5-20R, gray finish, unless otherwise indicated.
 6. Signal Outlet: Blank cover with bushed cable opening, unless otherwise indicated.

- G. Multioutlet Assemblies:
 1. Components of Assemblies: Products from a single manufacturer designed for use as a complete, matching assembly of raceways and receptacles.
 2. Raceway Material: Metal, with manufacturer's standard finish.
 3. Wire: as indicated by drawings. Refer to drawings for additional specification

- H. Telephone/Power Service Poles:
 1. Poles: Nominal 2.5-inch- (65-mm-) square cross section with height adequate to extend from floor to at least 6 inches (150 mm) above ceiling, and separate channels for power and signal wiring.
 2. Mounting: Ceiling trim flange with concealed bracing arranged for positive connection to ceiling supports, and pole foot with carpet pad attachment.
 3. Finishes: One of manufacturers standard finish and trim combinations, including painted and satin anodized-aluminum finishes and wood-grain-type trim.
 4. Wiring: as indicated by drawings.

1.3. EXECUTION

- A. Installation:
 1. Install devices and assemblies plumb and secure.
 2. Install wall plates when painting is complete.
 3. Install wall dimmers to achieve indicated rating after derating for ganging as instructed by manufacturer.
 4. Do not share neutral conductor on load side of dimmers.

5. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical, and grounding terminal of receptacles on top. Group adjacent switches under single, multi-gang wall plates.
 6. Protect devices and assemblies during painting.
 7. Adjust locations at which floor service outlets are installed to suit arrangement of partitions and furnishings.
- B. Identification:
1. Comply with Section 26 05 00 - "Common Work Results for Electrical."
 - a. Switches: Where three or more switches are ganged, and elsewhere as indicated, identify each switch with approved legend engraved on wall plate.
 - b. Receptacles: Identify panelboard and circuit number from which served. Use machine-printed, pressure-sensitive, abrasion-resistant label tape on face of plate and durable wire markers or tags within outlet boxes.
- C. Connections:
1. Connect wiring device grounding terminal to outlet box with bonding jumper.
 2. Isolated-Ground Receptacles: Connect to isolated-ground conductor routed to designated isolated equipment ground terminal of electrical system.
 3. Tighten electrical connectors and terminals according to manufacturers published torque-tightening values. If manufacturers torque values are not indicated, use those specified in UL 486A and UL 486B.
- D. Field Quality Control:
1. Test wiring devices for proper polarity and ground continuity. Operate each device at least six times.
 2. Check TVSS receptacle indicating lights for normal indication.
 3. Test GFCI operation with both local and remote fault simulations according to manufacturer's written instructions.
 4. Replace damaged or defective components.
- E. Cleaning: Internally clean devices, device outlet boxes, and enclosures. Replace stained or improperly painted wall plates or devices.

END 26 14 10.

DIVISION 26 – ELECTRICAL
SECTION 26 28 19: ENCLOSED SWITCHES

1.1 GENERAL

A. Summary:

1. Section includes fusible and non-fusible switches.

B. References:

1. National Electrical Manufacturers Association:
 - a. NEMA FU 1 - Low Voltage Cartridge Fuses.
 - b. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
2. International Electrical Testing Association:
 - a. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

C. Submittals:

1. Section 01 33 00 - Submittal Procedures: Submittal procedures.
2. Product Data: Submit switch ratings and enclosure dimensions.

D. Closeout Submittals:

1. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
2. Project Record Documents: Record actual locations of enclosed switches and ratings of installed fuses.

E. Qualifications:

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

1.2 PRODUCTS

A. Fusible Switch Assemblies:

1. Manufacturers:
 - a. GE Electrical Model
 - b. Hubbell Inc. Model
 - c. Westinghouse Electric Corp.
 - d. Square D
2. Product Description: NEMA KS 1, Type GD, enclosed load interrupter knife switch. Handle lockable in OFF position.
3. Fuse clips: Designed to accommodate NEMA FU 1, Class R fuses.
4. Enclosure: NEMA KS 1, to meet conditions. Fabricate enclosure from steel finished with manufacturer's standard gray enamel.
 - a. Interior Dry Locations: Type 1.
 - b. Exterior Locations: Type 3R.

- c. Industrial Locations: Type.
 - d. Locations: Type.
 - 5. Service Entrance: Switches identified for use as service equipment are to be labeled for this application. Furnish solid neutral assembly and equipment ground bar.
 - 6. Furnish switches with entirely copper current carrying parts.
- B. Non-Fusible Switch Assemblies:
- 1. Manufacturers:
 - a. GE Electrical
 - b. Hubbell Inc.
 - c. Westinghouse Electric Corp.
 - d. Square D
 - 2. Product Description: NEMA KS 1, Type GD enclosed load interrupter knife switch. Handle lockable in OFF position.
 - 3. Enclosure: NEMA KS 1, to meet conditions. Fabricate enclosure from steel finished with manufacturer's standard gray enamel.
 - a. Interior Dry Locations: Type 1.
 - b. Exterior Locations: Type 3R.
 - c. Industrial Locations: Type.
 - d. Locations: Type.
 - 4. Service Entrance: Switches identified for use as service equipment are to be labeled for this application. Furnish solid neutral assembly and equipment ground bar.
 - 5. Furnish switches with entirely copper current carrying parts.
- C. Switch Ratings:
- 1. Switch Rating: Horsepower rated for AC or DC as indicated on Drawings.
 - 2. Short Circuit Current Rating: UL listed for 10,000 rms symmetrical amperes when used with or protected by Class H or K fuses (30-600 ampere).

1.3 EXECUTION

- A. Existing Work:
 - 1. Disconnect and remove abandoned enclosed switches.
 - 2. Maintain access to existing enclosed switches and other installations remaining active and requiring access. Modify installation or provide access panel.
 - 3. Clean and repair existing enclosed switches to remain or to be reinstalled.
- B. Installation:
 - 1. Install enclosed switches plumb. Provide supports in accordance with Section 26 05 00.
 - 2. Height: 5 feet to operating handle.
 - 3. Install fuses for fusible disconnect switches.
 - 4. Install engraved plastic nameplates in accordance with Section 26 05 00.

5. Apply adhesive tag on inside door of each fused switch indicating NEMA fuse class and size installed.
- C. Field Quality Control:
1. Section: Field inspecting, testing, adjusting, and balancing.
 2. Inspect and test in accordance with NETA ATS, except Section 4.
 3. Perform inspections and tests listed in NETA ATS, Section 7.5.

END 26 28 19.

**DIVISION 26 – ELECTRICAL
SECTION 26 51 00: INTERIOR LIGHTING**

1.1 GENERAL

- A. Work Includes:
 - 1. Base Bid: Electrical contractor.
 - 2. Provide and install all interior lighting fixtures, lighting fixtures mounted on exterior building surfaces, lamps, ballasts, emergency lighting units, and accessories.

- B. Related Documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

- C. Submittals:
 - 1. See Section 01 33 00 – Shop Drawings, Product Data and Samples, for submittal procedures.
 - 2. Product Data: For each type of lighting fixture indicated, arranged in order of fixture designation. Include data on features, accessories, and the following:
 - a. Dimensions of fixtures.
 - b. Certified results of independent laboratory tests for fixtures and lamps for electrical ratings and photometric data.
 - c. Certified results of laboratory tests for fixtures and lamps for photometric performance.
 - d. Emergency lighting unit battery and charger.
 - e. Fluorescent and high-intensity-discharge ballasts.
 - f. Air and Thermal Performance Data: For air-handling fixtures. Furnish data required in "Submittals" Article in Section 23 33 00 - "Diffusers, Registers, and Grilles."
 - g. Sound Performance Data: For air-handling fixtures. Indicate sound power level and sound transmission class in test reports certified according to ADC.
 - h. Types of lamps.
 - 3. Shop Drawings: Show details of nonstandard or custom fixtures. Indicate dimensions, weights, method of field assembly, components, features, and accessories.
 - a. Wiring Diagrams: Detail wiring for fixtures and differentiate between manufacturer-installed and field-installed wiring.

- D. Quality Assurance:
 - 1. Fixtures, Emergency Lighting Units, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
 - 2. Comply with NFPA 70.
 - 3. FM Compliance: Fixtures for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM.
 - 4. NFPA 101 Compliance: Comply with visibility and luminance requirements for exit signs.

- E. Coordination:

1. Fixtures, Mounting Hardware, and Trim: Coordinate layout and installation of lighting fixtures with ceiling system and other construction.
- F. Warranty:
1. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
 2. Special Warranty for Batteries: Written warranty, executed by manufacturer agreeing to replace rechargeable batteries that fail in materials or workmanship within specified warranty period.
 - a. Special Warranty Period for Batteries: Manufacturer's standard, but not less than 10 years from date of Substantial Completion. Full warranty shall apply for first year, and prorated warranty for last nine years.
 3. Special Warranties for Fluorescent Ballasts: Written warranty, executed by manufacturer agreeing to replace fluorescent ballasts that fail in materials or workmanship within specified warranty period.
 - a. Special Warranty Period for Electronic Ballasts: Five years from date of Substantial Completion.
 - b. Special Warranty Period for Electromagnetic Ballasts: Manufacturers' standard warranty, but not less than two years from date substantial completion.

1.2. PRODUCTS

- A. Manufacturers:
1. Products: Subject to compliance with requirements, provide one of the products indicated for each designation in the Interior Lighting Fixture Schedule at the end of Part 3.
- B. Fixtures and Fixture Components, General:
1. Metal Parts: Free from burrs, sharp corners, and edges.
 2. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.
 3. Doors, Frames, and Other Internal Access: Smooth operating, free from light leakage under operating conditions, and arranged to permit relamping without use of tools. Arrange doors, frames, lenses, diffusers, and other pieces to prevent accidental falling during relamping and when secured in operating position.
 4. Reflecting Surfaces: Minimum reflectance as follows, unless otherwise indicated:
 - a. White Surfaces: 85 percent.
 - b. Specular Surfaces: 83 percent.
 - c. Diffusing Specular Surfaces: 75 percent.
 - d. Laminated Silver Metallized Film: 90 percent.
 5. Lenses, Diffusers, Covers, and Globes: 100 percent virgin acrylic plastic or annealed crystal glass, unless otherwise indicated.
 - a. Plastic: High resistance to yellowing and other changes due to aging, exposure to heat, and ultraviolet radiation.
 - b. Lens Thickness: 0.125 inch (3mm) minimum, unless greater thickness is indicated.

- C. Fluorescent Lamp Ballasts:
1. General Requirements: All ballasts shall comply with State of Illinois standards including the following:
 - a. Designed for type and quantity of lamps indicated at full light output.
 - b. Minimum power factor of 0.99
 - c. Total Harmonic Distortion Rating: Less than 10 percent.
 - d. Less than 6 percent third harmonic distortion.
 - e. Five year manufacturers warranty.
 - f. Compliance with applicable ANSI specifications.
 - g. Polychlorinated biphenyls (PCB) are not allowed.
 - h. Sound Rating: A
 2. Additional requirements: Electronic Ballasts for Linear Lamps: Unless otherwise indicated, features include the following, besides those in "General Requirements" Paragraph above:
 - a. Certified Ballast Manufacturer Certification: Indicated by label.
 - b. Encapsulation: Without voids in potting compound.
 - c. Parallel Lamp Circuits: Multiple lamp ballasts connected to maintain full light output on surviving lamps if one or more lamps fail.
 3. Additional requirements: Ballasts for Compact Lamps in Recessed Fixtures: Unless otherwise indicated, additional features include the following:
 - a. Type: Electronic or electromagnetic, fully encapsulated in potting compound.
 - b. Operating Frequency: 20 kHz or higher.
 - c. Flicker: Less than 5 percent.
 - d. Lamp Current Crest Factor: Less than 1.7.
 - e. Transient Protection: Comply with IEEE C62.41 for Category A1 locations.
 4. Additional requirements: Ballasts for Compact Lamps in Nonrecessed Fixtures: Unless otherwise indicated, additional features include the following:
 - a. Power Factor: 90 percent, minimum.
 - b. Ballast Coil Temperature: 65 deg C, maximum.
 - c. Transient Protection: Comply with IEEE C62.41 for Category A1 locations.
- D. Fluorescent Dimming Ballasts and Controls:
1. Manufacturers:
 - a. Cooper Industries
 - b. Lutron Corp.
 - c. Advance Corp.
 - d. Hubbell Inc.
 - e. Pass & Seymour
 - f. Lithonia Corp.
 2. Product Description: Electrical assembly of control unit and ballast to furnish smooth dimming of fluorescent lamps.
 3. Control Unit: Linear slide type, rated 600 watts at 120 volts.
 4. Ballast: Selected by dimming system manufacturer as suitable for operation with control unit and suitable for lamp type and quantity specified for luminaire.
- E. Exit Signs:
1. General Requirements: Comply with UL 924 and the following:

- a. Sign Colors and Lettering Size: Comply with authorities having jurisdiction.
 2. Internally Lighted Signs: As follows:
 - a. Lamps for AC Operation: LED
 3. Self-Powered Exit Signs (Battery Type): Integral automatic charger in a self-contained power pack.
 - a. Battery: Sealed, maintenance-free, nickel-cadmium type with special warranty.
 - b. Charger: Fully automatic, solid-state type with sealed transfer relay.
 - c. Operation: Relay automatically energizes lamp from unit when circuit voltage drops to 80 percent of nominal or below. When normal voltage is restored, relay disconnects lamps, and battery is automatically recharged and floated on charger.
- F. Emergency Lighting Units:
1. General Requirements: Self-contained units. Comply with UL 924. Units include the following features:
 - a. Battery: Sealed, maintenance-free, lead-acid type with minimum 10-year nominal life and special warranty.
 - b. Charger: Fully automatic, solid-state type with sealed transfer relay.
 - c. Operation: Relay automatically turns lamp on when supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps, and battery is automatically recharged and floated on charger.
 - d. Wire Guard: Where indicated, heavy-chrome-plated wire guard arranged to protect lamp heads or fixtures.
 - e. Integral Time-Delay Relay: Arranged to hold unit on for fixed interval after restoring power after an outage. Provides adequate time delay to permit high-intensity-discharge lamps to restrike and develop adequate output.
- G. Lamps:
1. Fluorescent Color Temperature and Minimum Color-Rendering Index: 3000 K and 85 CRI, unless otherwise indicated.
 2. Noncompact Fluorescent Lamp Life: Rated average is 20,000 hours at 3 hours per start when used on rapid-start circuits.
- H. Fixture Support Components:
1. Comply with Section 260500 - "Basic Electrical Materials and Methods," for channel- and angle-iron supports and nonmetallic channel and angle supports.
 2. Single-Stem Hangers: 1/2-inch (12-mm) steel tubing with swivel ball fitting and ceiling canopy. Finish same as fixture.
 3. Twin-Stem Hangers: Two, 1/2-inch (12mm) steel tubes with single canopy arranged to mount a single fixture. Finish same as fixture.
 4. Rod Hangers: 3/16-inch (5-mm) minimum diameter, cadmium-plated, threaded steel rod.
 5. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.
 6. Aircraft Cable Support: Use cable, anchorages, and intermediate supports recommended by fixture manufacturer.

- I. Finishes:
 - 1. Fixtures: Manufacturer's standard, unless otherwise indicated.
 - a. Paint Finish: Applied over corrosion-resistant treatment or primer, free of defects.
 - b. Metallic Finish: Corrosion resistant.

1.3. EXECUTION

- A. Installation:
 - 1. Fixtures: Set level, plumb, and square with ceiling and walls, and secure according to manufacturer's written instructions and approved submittal materials. Install lamps in each fixture.
 - 2. Support for Fixtures in or on Grid-Type Suspended Ceilings: Use grid for support.
 - a. Install a minimum of four ceiling support system rods or wires for each fixture. Locate not more than 6 inches (150 mm) from fixture corners.
 - b. Support Clips: Fasten to fixtures and to ceiling grid members at or near each fixture corner.
 - c. Fixtures of Sizes Less Than Ceiling Grid: Arrange as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch (20-mm) metal channels spanning and secured to ceiling tees.
 - 3. Suspended Fixture Support: As follows:
 - a. Pendants and Rods: Where longer than 48 inches (1200), brace to limit swinging.
 - b. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.
 - c. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.
 - d. Continuous Rows: Suspend from cable installed according to fixture manufacturer's written instructions and details on Drawings.
 - 4. Air-Handling Fixtures: Install with dampers closed.
- B. Connections:
 - 1. Ground Equipment: Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- C. Field Quality Control:
 - 1. Inspect each installed fixture for damage. Replace damaged fixtures and components.
 - 2. Advance Notice: Give dates and times for field tests.
 - 3. Provide instruments to make and record test results.
 - 4. Tests: As follows:
 - a. Verify normal operation of each fixture after installation.
 - b. Emergency Lighting: Interrupt electrical supply to demonstrate proper operation.
 - c. Verify normal transfer to battery source and retransfer to normal.
 - d. Report results in writing.

5. Malfunctioning Fixtures and Components: Replace or repair, then retest. Repeat procedure until units operate properly.
 6. Corrosive Fixtures: Replace during warranty period.
- D. Cleaning and Adjusting:
1. Clean fixtures internally and externally after installation. Use methods and materials recommended by manufacturer.
 2. Adjust aimable fixtures to provide required light intensities.
- E. Interior Lighting Fixture Schedule: See contract drawings.

END 26 51 00.

DIVISION 27 – COMMUNICATIONS
SECTION 27 13 43: COMMUNICATIONS SERVICES CABLING

PART 1 GENERAL

A. SUMMARY

1. Section includes and backboards, termination devices, outlets, and premises wiring.

B. REFERENCES

A. International Electrical Testing Association:

1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

B. National Fire Protection Association:

1. NFPA 262 - Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.

C. Telecommunications Industry Association/Electronic Industries Alliance:

1. TIA/EIA 568 - Commercial Building Telecommunications Cabling Standard.
2. TIA/EIA 569 - Commercial Building Standard for Telecommunications Pathways and Spaces.

D. Underwriters Laboratories, Inc.:

1. UL 2043 - Fire Test for Heat and Visible Smoke Release for Discrete Products and their Accessories Installed in Air-Handling Spaces.

C. SYSTEM DESCRIPTION

A. Telecommunications Utility Company: existing.

B. Horizontal Pathway: Conform to TIA/EIA 569, using raceway, backboards as indicated on Drawings.

C. Entrance Wiring: Existing.

D. Backbone Wiring: existing.

E. Horizontal Wiring: Complete from telecommunications closet to each outlet using unshielded horizontal cables.

D. SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit catalog data for each termination device, cable, and outlet device.

- C. Test Reports: Indicate procedures and results for specified field testing and inspection.
- E. CLOSEOUT SUBMITTALS
 - A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
 - B. Project Record Documents: Record actual locations and sizes of pathways and outlets.
- F. 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. Provide combustible electrical equipment exposed within plenums with peak rate of heat release not greater than 100 kW, peak optical density not greater than 0.5, and average optical density not greater than 0.15 when tested in accordance with UL 2043.
 - C. Perform Work in accordance with
 - D. Maintain one copy of each document on site.
- G. QUALIFICATIONS
 - A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.
 - B. Installer: Company specializing in installing products specified in this section with minimum three years experience.
 - C. Testing Agency: Company specializing in testing products specified in this section with minimum three years experience.

PART 2 PRODUCTS

- A. PATCH PANEL
 - A. Product Description: TIA/EIA 568, wall-mounted or rack-mounted assembly of terminals and accessory patch cords, with adequate capacity for active and spare circuits.
- B. TELEPHONE OUTLET JACKS
 - A. Product Description: Conform to TIA/EIA 568 requirements for cable connectors for specific cable types.

C. UNSHIELDED HORIZONTAL CABLE

- A. Product Description: TIA/EIA 568, Cat5e, 100-ohm, unshielded twisted pair plenum rated noncombustible cable with 4 pairs, 22 AWG copper conductor.

PART 3 EXECUTION

A. EXISTING WORK

- A. Remove exposed abandoned telecommunications cables and pathways, including abandoned cables and pathways above accessible ceiling finishes. Cut flush with walls and floors, and patch surfaces.
- B. Disconnect and remove abandoned telecommunications equipment.
- C. Maintain access to existing telecommunications equipment, cabling, and terminations and other installations remaining active and requiring access. Modify installation or provide access panel.
- D. Extend existing telecommunications installations using materials and methods compatible with existing installations, or as specified.
- E. Clean and repair existing telecommunications equipment remaining or is to be reinstalled.

B. INSTALLATION

- A. Install pathways in accordance with TIA/EIA 569.
- B. Install wire and cable in accordance with TIA/EIA 568.
- C. Finish paint termination backboards with durable enamel in accordance with Section prior to installation of telephone equipment.
- D. Install termination backboards plumb, and attach securely to building wall at each corner.
- E. Install engraved plastic nameplates in accordance with Section. Mark backboards and cabinets with legend "TELEPHONE."

C. FIELD QUALITY CONTROL

- A. Section: Field inspecting, testing, adjusting, and balancing.
- B. Inspect and test optical fiber cables in accordance with NETA ATS, except Section 4. Perform inspections and tests listed in NETA ATS, Section 7.25.
- C. Inspect and test copper cables and terminations in accordance with TIA/EIA 568.

END OF SECTION

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY
SECTION 28 31 00: FIRE DETECTION AND ALARM

1.1 GENERAL

- A. Summary: 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. References:
 - 1. National Fire Protection Association:
 - a. NFPA 72 - National Fire Alarm Code.
 - b. NFPA 262 - Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.
- C. System Description:
 - 1. Fire Alarm System: NFPA 72, automatic local fire alarm system
 - 2. Alarm Sequence of Operation: Actuation of initiating device causes the following system operations:
 - a. Local fire alarm signaling devices sound and display with signal.
 - b. Zone-coded signal transmits to central station.
 - c. Location of alarm zone indicates on fire alarm control panel.
 - d. Signal transmits to building smoke removal system.
 - e. Signal transmits to building elevator control panel, initiating return to main floor or alternate floor and lockout for fire service.
 - f. Signal transmits to building mechanical controls, shutting down fans and operating dampers.
 - g. Signal transmits to release door hold-open devices.
 - h. Signal releases magnetic door hold opens.
 - i. Signal releases electric door locks.
 - 3. Drill Sequence of Operation: Manual drill function causes alarm mode sequence of operation.
 - 4. Trouble Sequence of Operation: System or circuit trouble causes the following system operations:
 - a. Visual and audible trouble alarm indicates at fire alarm control panel.
 - b. Visual and audible trouble alarm indicates at remote annunciator panel.
 - c. Trouble signal transmits to central station.
 - 5. Zoning:
- D. Submittals:
 - 1. Section 01 33 00 - Submittal Procedures: Submittal procedures.
 - 2. Shop Drawings: Indicate system wiring diagram showing each device and wiring connection; indicate annunciator layout, and.
 - 3. Product Data: Submit catalog data showing electrical characteristics and connection requirements.
 - 4. Test Reports: Indicate procedures and results for specified field testing and inspection.
 - 5. Manufacturer's Field Reports: Indicate activities on site, adverse findings, and recommendations.
- E. Closeout Submittals:

1. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
 2. Project Record Documents: Record actual locations of fire alarm equipment.
 3. Operation and Maintenance Data: Submit manufacturer's standard operating and maintenance instructions.
- F. Quality Assurance:
1. 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.
 2. Perform Work in accordance with
 3. Maintain one copy of each document on site.
- G. Qualifications:
1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.
 2. Installer: Certified fire alarm installer with service facilities within miles of Project.
- H. Maintenance Service:
1. Section 01 70 00 - Execution and Closeout Requirements: Maintenance service.
 2. Furnish service and maintenance of fire alarm equipment for one year from Date of Substantial Completion.
- I. Maintenance Materials:
1. Section 01 70 00 - Execution and Closeout Requirements: Spare parts and maintenance products.
 2. Furnish six keys of each type.
- J. Extra Materials: Refer to drawings

1.2 PRODUCTS

- A. Control Panel:
1. Manufacturers:
 - a. Cerberus Pyrotronics.
 - b. Edwards Systems Technology; Unit of General Signal.
 - c. Faraday, Inc.
 - d. Federal Signal Corp.; Commercial Products Group.
 - e. Fire Control Instruments, Inc.
 - f. Fire Lite Alarms, Inc.
 - g. Gamewell Co. (The).
 - h. Grinnell Fire Protection Systems.
 - i. Harrington Signal, Inc; Fire Alarm.
 - j. Honeywell, Inc.
 - k. Notifier; Div. of Pittway Corp.
 - l. Silent Knight.
 - m. Simplex
 2. Product Description: UL/FM listed Modular fire alarm control panel with flush wall-mounted enclosure.
 3. Power supply: Adequate to serve control panel modules, remote detectors, smoke dampers, 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 10 minutes.

4. System Supervision: Component or power supply failure places system in trouble mode.
 5. 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.
 6. 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.
 7. Auxiliary Relays: Sufficient SPDT auxiliary relay contacts to provide accessory functions specified.
- B. Manual Fire Alarm Stations:
1. Product Description: Manual single-action station with break-glass rod.
 2. Mounting: Surface.
 3. Type: Coded.
 4. Backbox: Manufacturer's standard.
- C. Spot Heat Detector:
1. Product Description: Fixed temperature, spot heat detector.
- D. Ceiling Smoke Detector:
1. Product Description: NFPA 72, ionization type or photoelectric type ceiling smoke detector with the following features:
 - a. Adjustable sensitivity.
 - b. Plug-in base.
 - c. Auxiliary relay contact.
 - d. Integral thermal element rated 135 degrees F.
 - e. Visual indication of detector actuation.
 2. Mounting: 4 inch outlet box.
 3. Furnish two-wire detector with common power supply and signal circuits.
- E. Duct-Mounted Smoke Detector:
1. Product Description: NFPA 72, ionization type with the following features:
 - a. Auxiliary SPDT relay contact.
 - b. Key-operated normal-reset-test switch.
 - c. Duct sampling tubes extending width of duct.
 - d. Visual indication of detector actuation.
 - e. Duct-mounted housing.
 2. Furnish two-wire detector with common power supply and signal circuits.
- F. Alarm Bells:
1. Product Description: NFPA 72, vibrating, electric bell with the following features:
 - a. Operating mechanism behind dome.
 - b. Integral strobe lamp and flasher with red lettered "FIRE" on white lens.
 - c. Size: 8 inch.
 - d. Sound Rating: 81 dB at 10 feet.
- G. Alarm Horn:
1. Product Description: NFPA 72, surface type fire alarm horn with the following features:
 - a. Sound Rating: 87 dB at 10 feet.
 - b. Integral strobe lamp and flasher with red lettered "FIRE" on white lens.

2. 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.
3. Fire alarm circuit conductors have insulation color or code as follows:
 - a. Power Branch Circuit Conductors: Black, red, white.
 - b. Initiating Device Circuit: Black, red.
 - c. Detector Power Supply: Violet, brown.
 - d. Signal Device Circuit: Blue (positive), white (negative).
 - e. Door Release: Gray, gray.

1.3 EXECUTION

- A. Examination:
 1. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
 2. Verify products and systems receiving devices are ready for installation.
- B. Existing Work:
 1. Remove exposed abandoned fire alarm wiring. Cut cable flush with walls and floors, and patch surfaces.
 2. Disconnect and remove abandoned fire alarm equipment.
 3. Maintain access to existing fire alarm equipment and other installations remaining active and requiring access. Modify installation or provide access panel.
 4. Extend existing fire alarm installations using materials and methods as specified.
 5. Clean and repair existing fire alarm equipment to remain or to be reinstalled.
- C. Installation:
 1. Install manual station with operating handle 4 feet 6 inches feet above floor.
 2. Install audible and visual signal devices 7 feet 6 inches feet above floor.
 3. panel. box with last device or separate box adjacent to last device in circuit.
 4. Mount outlet box for electric door holder to withstand 80 pounds pulling force.
 5. Connect conduit and wire to door release devices, sprinkler flow switches, sprinkler valve tamper switches, fire suppression system control panels, duct smoke detectors.
 6. Automatic Detector Installation: Conform to NFPA 72.
 7. Install engraved plastic nameplates in accordance with Section 28 05 00.
 8. Ground and bond fire alarm equipment and circuits in accordance with Section 26 05 26.
- D. Field Quality Control:
 1. Section: Field inspecting, testing, adjusting, and balancing.
 2. Test in accordance with NFPA 72 and local fire department requirements.
- E. Manufacturer's Field Services:
 1. Section 01 40 00 - Quality Requirements: Manufacturer's field services.
 2. Include services of technician to supervise installation, adjustments, final connections, and system testing.
- F. Demonstration and Training: Furnish 4 hours of instruction each for two persons, to be conducted at project site with manufacturer's representative.

END 28 31 00.

The following sections were prepared by the Engineer:

ROOT ENGINEERING SERVICES

45 FM 3356
Van Alstyne, Texas 75495

DIVISION 21 – FIRE SUPPRESSION

211100 Fire Suppression Sprinklers

DIVISION 22 – PLUMBING

None

DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING

230500 Common Work Results for HVAC
230593 Testing, Adjusting and Balancing for HVAC
230700 HVAC Insulation
230800 Commissioning of HVAC
233300 Air Duct Accessories
238900 Metal Ducts
239300 Diffusers, Registers, and Grilles

DIVISION 26 – ELECTRICAL

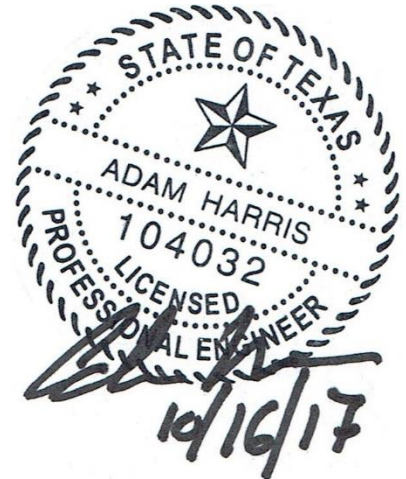
260500 Common Work Results for Electrical
260519 Low-Voltage Electrical Power Conductors and Cables
260526 Grounding and Bonding for Electrical Systems
260533 Raceway and Boxes for Electrical Systems
260923 Lighting Control Devices
261410 Wiring Devices
262819 Enclosed Switches
265100 Interior Lighting

DIVISION 27 – COMMUNICATIONS

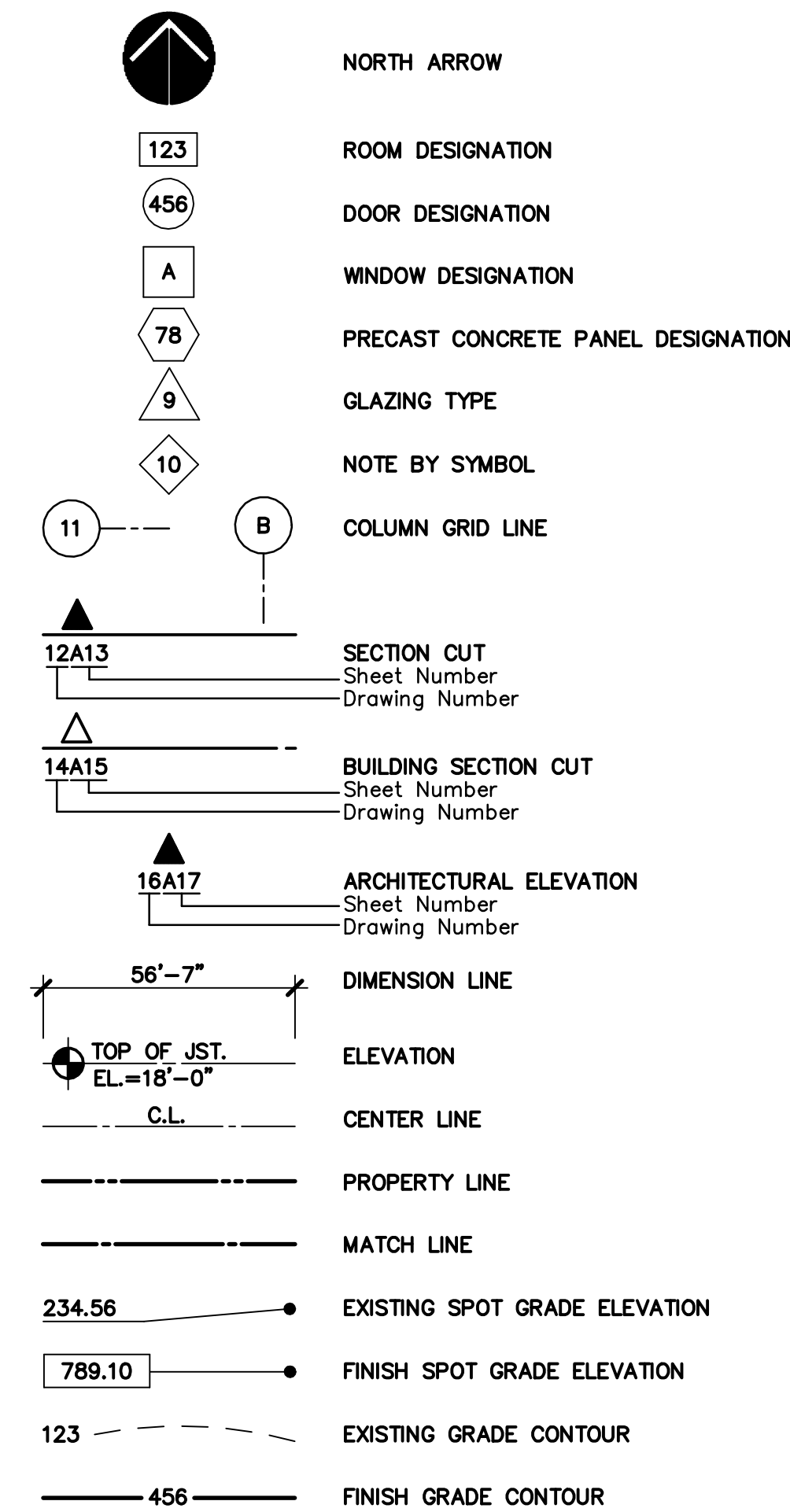
271343 Communications Services Cabling

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

283100 Fire Detection and Alarm



GRAPHIC CONVENTIONS



NOTE: ALL SYMBOLS INDICATED ABOVE MAY NOT APPEAR IN THIS PROJECT.



PROJECT DATA

OWNER: COLLIN COUNTY
4600 COMMUNITY AVENUE
MCKINNEY, TEXAS 75071
972-547-5370

DEVELOPMENT LOCATION: COLLIN COUNTY SHERIFF'S OFFICE
4300 COMMUNITY AVENUE
MCKINNEY, TEXAS 75071

CODE AUTHORITY: 2012 INTERNATIONAL BUILDING CODE
2011 NATIONAL ELECTRIC CODE
2015 INTERNATIONAL ENERGY CONSERVATION CODE

OCCUPANCY: B-BUSINESS & S2 STORAGE

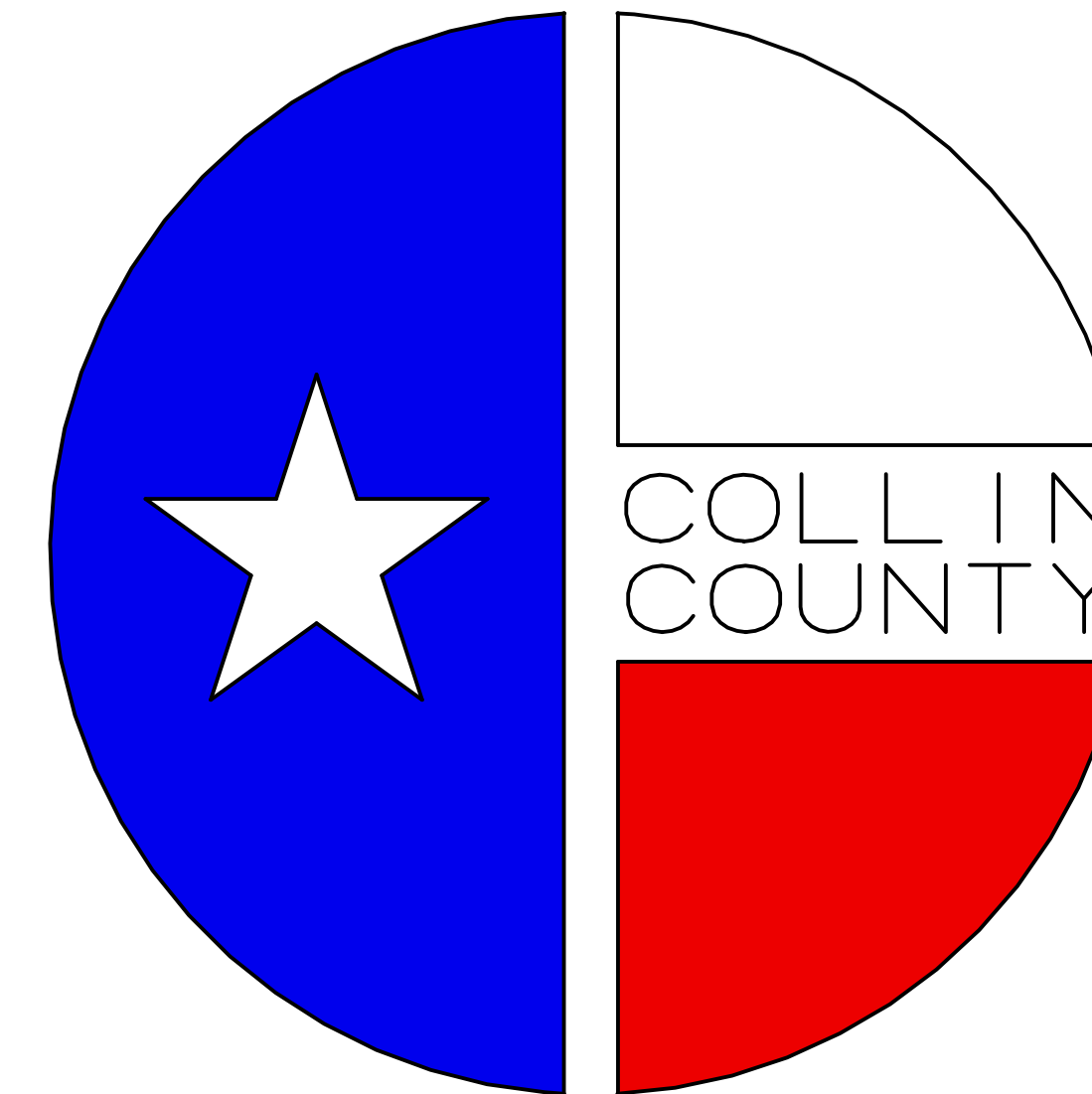
CONSTRUCTION TYPE: TYPE II-B

ALLOWABLE HEIGHT: 3 STORY
ACTUAL HEIGHT: 2 STORY

FIRE PROTECTION: AUTOMATIC SPRINKLER SYSTEM

ABBREVIATIONS

AFF	ABOVE FINISH FLOOR	KD	KILN DRIED
AGG	AGGREGATE	KW	KILOWATT
A/C	AIR CONDITIONING	KD	KNOCKED DOWN
ALUM	ALUMINUM	LAV	LAVATORY
AMP	AMPERE	LH	LEFT HAND
ANGL or L	ANGLE	LHR	LEFT HAND REVERSE
APPROX	APPROXIMATE	LVL	LEVEL
ASPH	ASPHALT	LW	LIGHT WEIGHT
AVE	AVENUE	LF	LINEAR FEET
AVG	AVERAGE	LL	LIVE LOAD
BM	BEAM	LBR	LUMBER
BM	BENCH MARK	MFR	MANUFACTURER
BLK	BLOCK	MK	MARK
BLKG	BLOCKING	MAX	MAXIMUM
BD	BOARD	MED	MEDIUM
BRK	BRICK	MTL	METAL
BTU	BRITISH THERMAL UNIT	MTR	METER
CAB	CABINET	MIN	MINIMUM
CPT	CARPET	MIN or '	MINUTE
CLG	CEILING	NOM	NOMINAL
CEM	CEMENT	N	NORTH
CEM PLAS	CEMENT PLASTER	NO or #	NUMBER
CTR	CENTER	OCT	OCTAGONAL
CL or C	CENTER LINE	OFFC	OFFICE
CER	CERAMIC	OC	ON CENTER
CT	CERAMIC TILE	OPNG	OPENING
CHAN	CHANNEL	OZ	OUNCE
CKT	CIRCUIT	OD	OUTSIDE DIAMETER
CKT BKR	CIRCUIT BREAKER	OA	OVERALL
CO	CLEAN OUT	PG	PAGE
CW	COLD WATER	PR	PAIR
COL	COLUMN	PKG	PARKING
CONC	CONCRETE	P	PENNY (NAIL SIZE)
CONC BLK	CONCRETE BLOCK	d	PERCENT
CONN	CONNECTION	%	PERCENT
CONTR	CONTRACTOR	PLAS	PLASTER
CONTR	CONTRACTOR	PLAS LAM	PLASTIC LAMINATE
CF	CUBIC FEET/FOOT	PL GL	PLATE GLASS
CFM	CUBIC FEET PER MINUTE	PLMB	PLUMBING
CI	CUBIC INCH	PLYWD	PLYWOOD
CY	CUBIC YARD	PT	POINT
CYL	CYLINDER	LB or #	POUND
DL	DEAD LOAD	PL or L	PROPERTY LINE
DEG or °	DEGREE	PC	PULL CHAIN
DTL	DETAIL	PB	PUSH BUTTON
DIAM or Ø	DIAMETER	QTY	QUANTITY
DIM	DIMENSION	QT	QUART
DC	DIRECT CURRENT	R	RADIUS
DISC	DISCONNECT	REFL	REFLECTED
DWL	DOWEL	RET	RETURN
DN	DOWN	RH	RIGHT HAND
DS	DOWNSPOUT	RHR	RIGHT HAND REVERSE
DWG	DRAWING	R	RISER
E	EAST	RFG	ROOFING
ELEC	ELECTRIC or ELECTRICAL	RD	ROUGH OPENING
ENC	ELECTRIC WATER COOLER	RND or Ø	ROUND
ELEV	ELEVATION	SS	SANITARY SEWER
ENCL	ENCLOSURE	SEC or "	SECOND
ENGR	ENGINEER	SECT	SECTION
EQUIP	EQUIPMENT	SEL	SELECT
EST	ESTIMATE	SEW	SEWER
EXT	EXTERIOR	SHTG	SHEATHING
FAB	FABRICATE	SHT	SHEET
FT or '	FEET or FOOT	SDG	SIDING
FFM	FEET PER MINUTE	S or SK	SINK
FPS	FEET PER SECOND	S	SOUTH
FIN	FINISH	SYP	SOUTHERN YELLOW PINE
FIN FLR	FINISH FLOOR	SPCS	SPACES
FH	FIRE HYDRANT	SPKR	SPEAKER
FIXT	FIXTURE	SQ	SQUARE
FLR	FLOOR	SS	SQUARE FEET/FOOT
FD	FLOOR DRAIN	SS	STAINLESS STEEL
FTG	FOOTING	ST	STREET
GAL	GALLON	STD	STANDARD
GPH	GALLONS PER HOUR	STA	STATION
GPM	GALLONS PER MINUTE	STL	STEEL
GPS	GALLONS PER SECOND	SUSP	SUSPENDED
GALV	GALVANIZED	SW	SWITCH
GAGE	GAGE	TEL	TELEPHONE
GL	GLASS	TEMP	TEMPERATURE
GOVT	GOVERNMENT	TER	TERRAZZO
GR	GRADE	THK	THICK
GRND	GROUND	T&G	TONGUE & GROOVE
GYP	GYPSONUM	TYP	TYPICAL
GWB	GYPSONUM WALL BOARD	UL	UNDERWRITER'S LABORATORY
HC	HANDICAP	UR	URINAL
HDW	HARDWARE	VCT	VINYL COMPOSITION TILE
HD	HEAD	VWC	VINYL WALL COVERING
HTR	HEATER	V	VOLT
HT	HEIGHT	VOL	VOLUME
HORIZ	HORIZONTAL	WTR	WATER
HP	HORSE POWER	WC	WATER CLOSET
HB	HOSE BIBB	WH	WATER HEATER
HW	HOT WATER	WP	WATERPROOF
IN or "	INCH	W	WATT
INC	INCORPORATED	WHR	WATT HOUR
INFO	INFORMATION	WF	WEATHERPROOF
ID	INSIDE DIAMETER	WT	WEIGHT
INSUL	INSULATION	W	WEST
INT	INTERIOR	WP	WESTERN PINE
INV	INVERT	W/	WITH
JT	JOINT	W/O	WITHOUT
J-BOX	JUNCTION BOX	WD	WOOD
		WI	WROUGHT IRON
		YD	YARD
		YP	YELLOW PINE



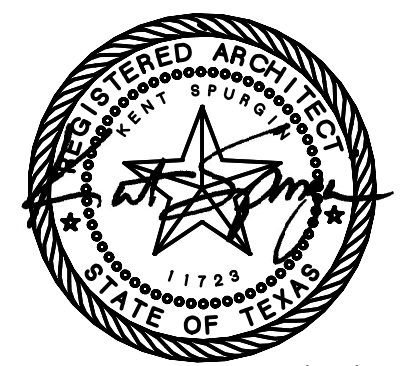
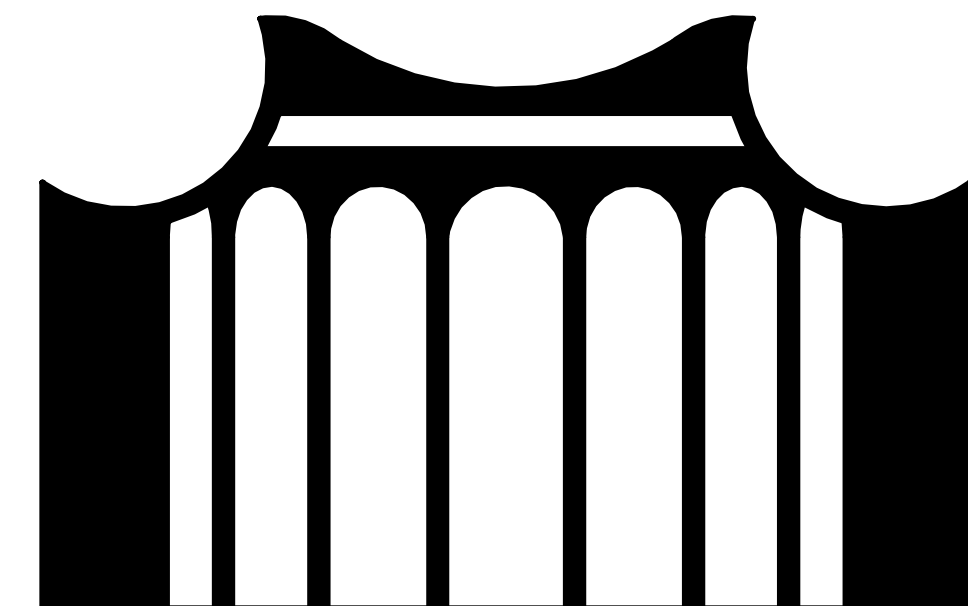
MODIFICATIONS TO

SHERIFF'S OFFICE LOBBY

COLLIN COUNTY SHERIFF'S OFFICE
4300 COMMUNITY AVENUE
MCKINNEY, TEXAS 75071

CONSTRUCTION DOCUMENTS

SPURGIN & ASSOCIATES ARCHITECTS



SPURGIN & ASSOCIATES ARCHITECTS
MCKINNEY, TEXAS 75070

ROOT ENGINEERING SERVICES
HOWE, TEXAS 75459

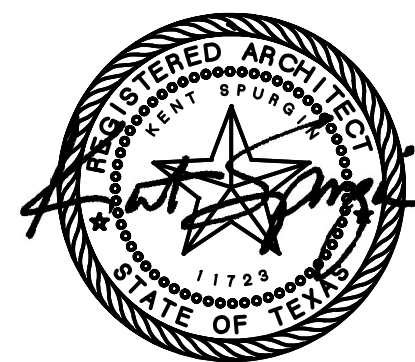
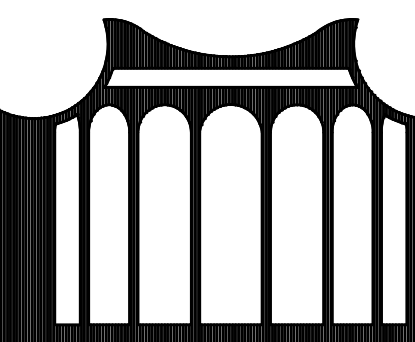
COMMISSIONERS COURT

KEITH SELF COUNTY JUDGE
SUSAN FLETCHER COMMISSIONER-PRECINCT 1
CHERYL WILLIAMS COMMISSIONER-PRECINCT 2
CHRIS HILL COMMISSIONER-PRECINCT 3
DUNCAN WEBB COMMISSIONER-PRECINCT 4

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- A5 DIMENSION CONTROL PLAN, DR/MDW SCHEDULES
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- DE2 ELECTRICAL POWER DEMO PLAN
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- LV2 LOW VOLTAGE NOTES & SCHEDULES
- P1 PLUMBING PLAN
- FP1 FIRE PROTECTION PLAN

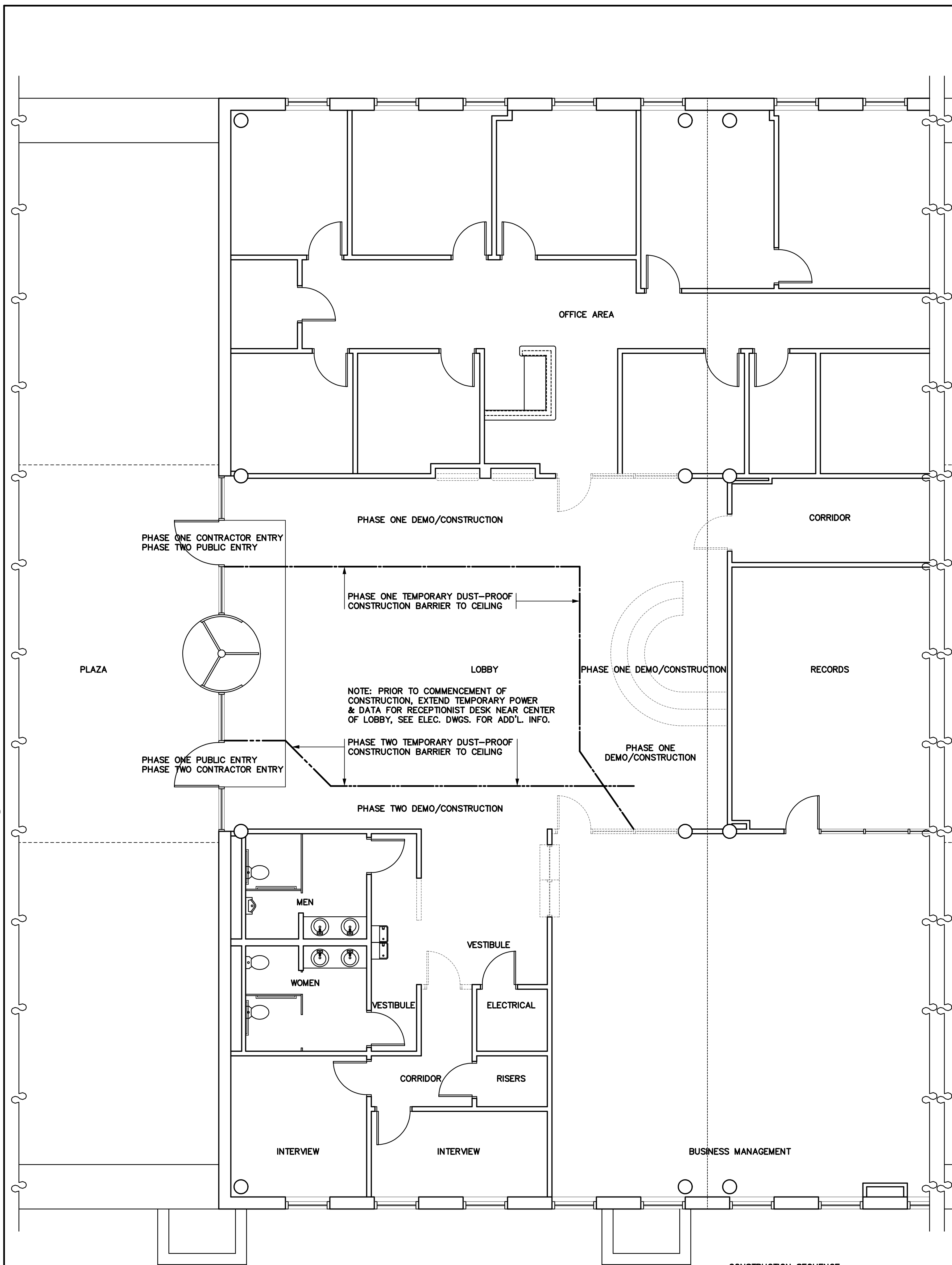
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ISSUE DATE: NOV 2017
SET NUMBER: _____



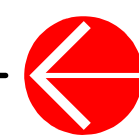
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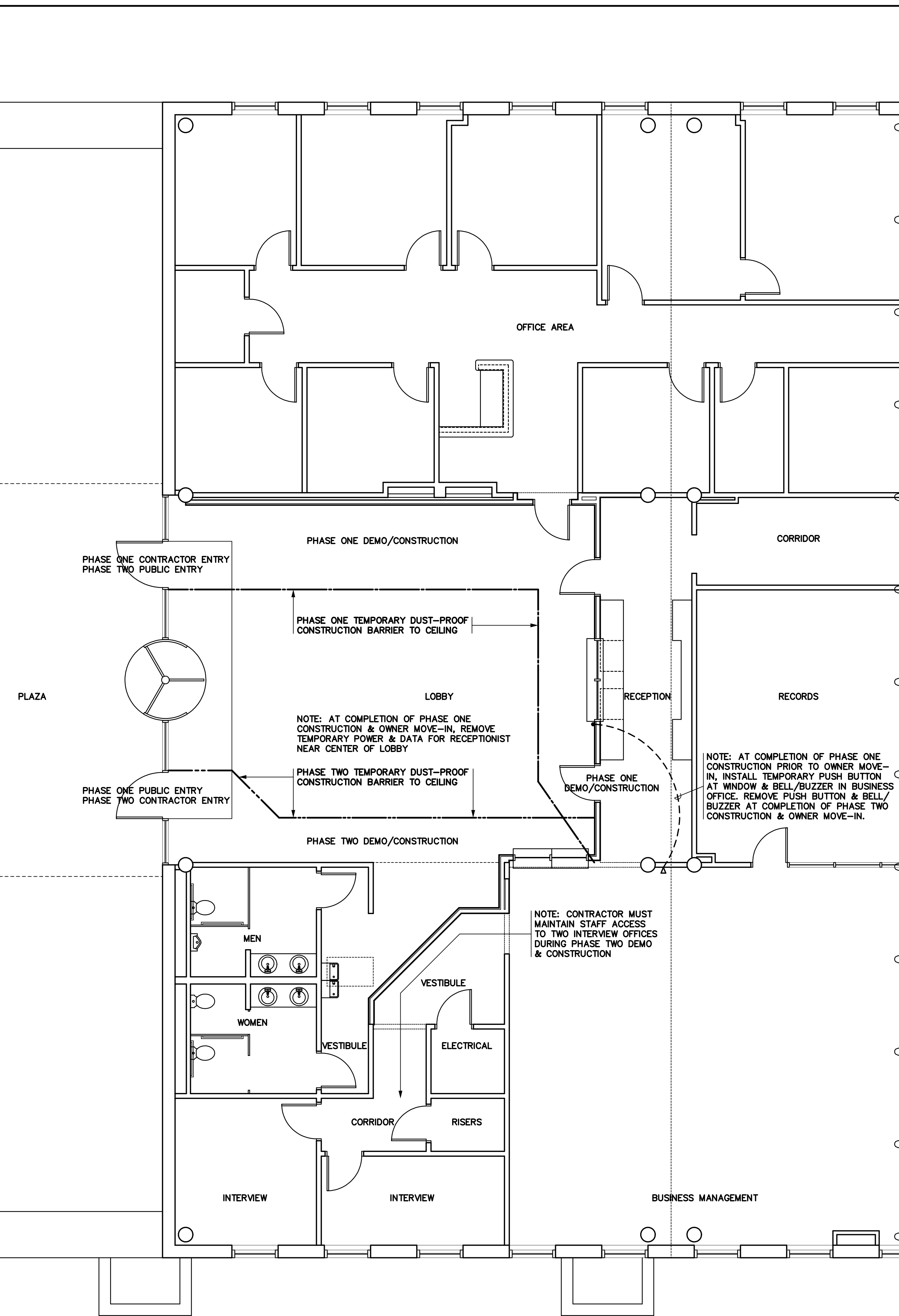
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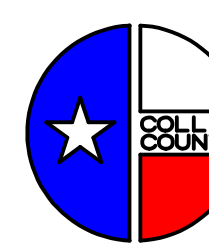
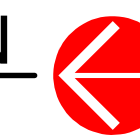
1 PHASING PLAN-DEMO
3/16" = 1'-0"



- CONSTRUCTION SEQUENCE:
1. ERECT TEMPORARY PHASE ONE DUST-PROOF CONSTRUCTION BARRIER.
 2. COMPLETE PHASE ONE DEMO & NEW CONSTRUCTION IN ITS ENTIRETY.
 3. OWNER SHALL OCCUPY PHASE ONE CONSTRUCTION AREA.
 4. REMOVE PHASE ONE TEMPORARY DUST-PROOF CONSTRUCTION BARRIER.
 5. ERECT PHASE TWO TEMPORARY DUST-PROOF CONSTRUCTION BARRIER.
 6. COMPLETE PHASE TWO DEMO (WITH PARTICULAR QUICK ATTENTION TO CREATING PATHWAY TO TWO INTERVIEW OFFICES).
 7. COMPLETE PHASE TWO CONSTRUCTION IN ITS ENTIRETY.



2 PHASING PLAN-CONSTRUCTION
3/16" = 1'-0"



MODIFICATIONS TO

SHERIFF'S OFFICE LOBBY

COLLIN COUNTY
SHERIFF'S OFFICE
4300 COMMUNITY AVE.
MCKINNEY, TEXAS 75071

SHEET TITLE

PHASING PLANS

PROJECT NUMBER

1628

ISSUE DATE

NOVEMBER 2017

REVISION DATE

SHEET NUMBER

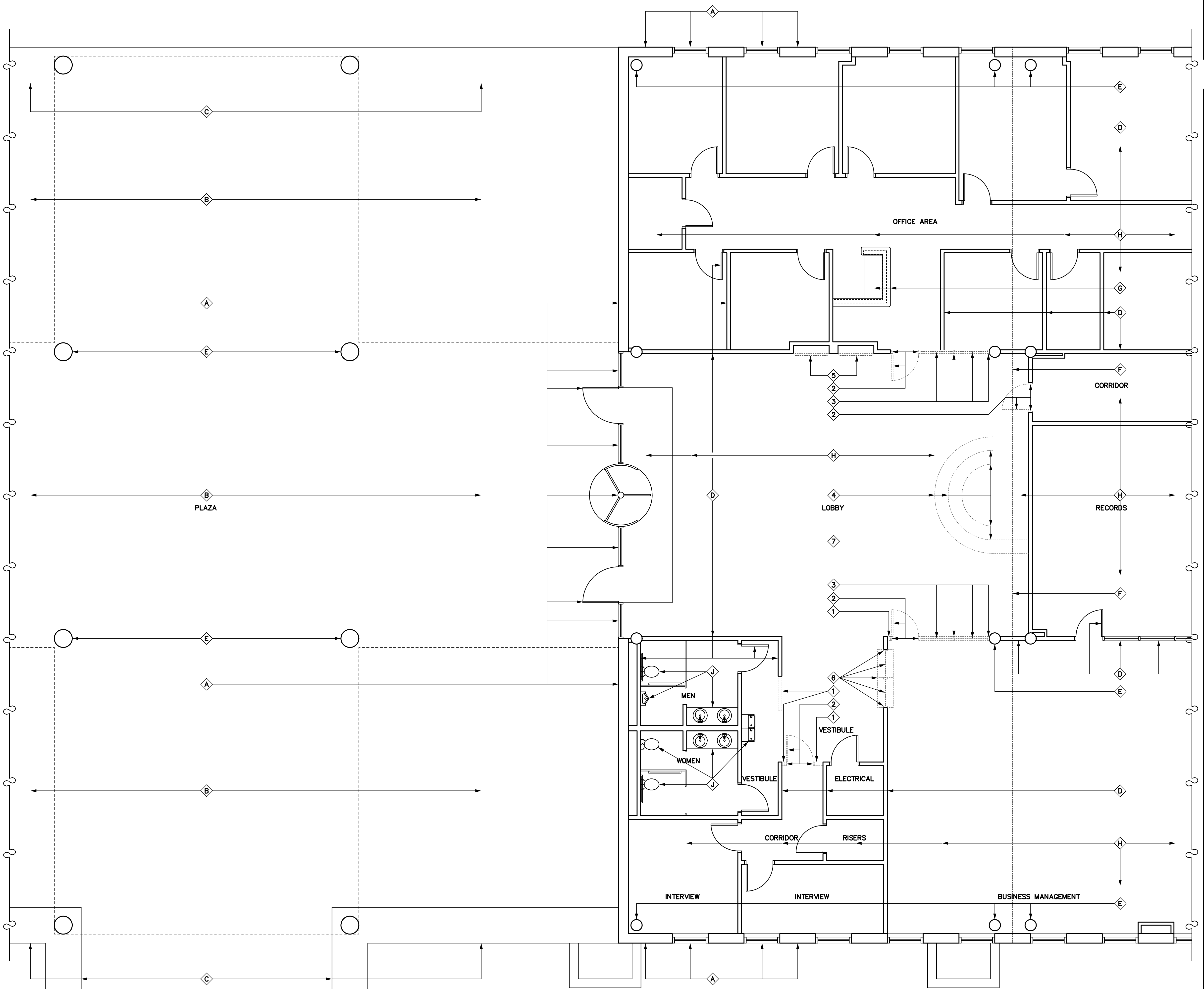
A0

NOTES BY SYMBOL

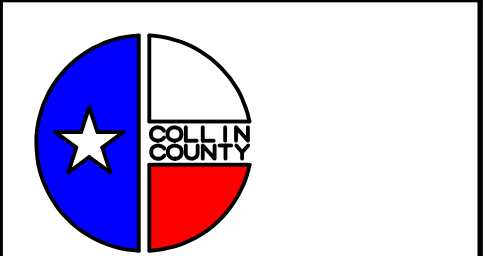
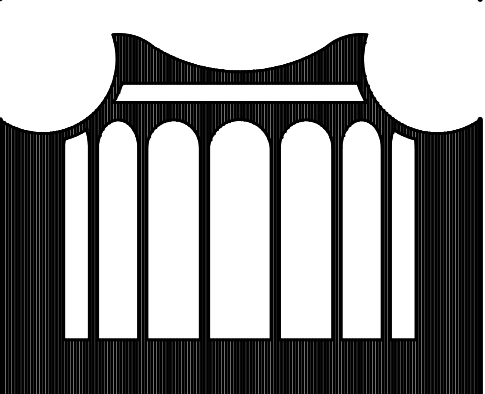
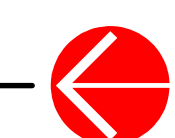
- ① REMOVE EXISTING GWB & METAL STUD PARTITION, TYPICAL FOR DASHED LINES.
- ② REMOVE EXISTING DOOR & FRAME.
- ③ REMOVE EXISTING WINDOW GLASS & FRAME.
- ④ REMOVE EXISTING MILLWORK.
- ⑤ REMOVE EXISTING BUILT-IN 3'H X 4'W DISPLAY CASE & RETURN TO OWNER.
- ⑥ REMOVE EXISTING SERVICE WINDOW GLASS & WOOD COUNTER.
- ⑦ PROVIDE FULL HEIGHT DUST STOP PRIOR TO COMMENCEMENT OF DEMO WORK UNTIL COMPLETION OF PROJECT - EXISTING BUSINESS AREAS WILL REMAIN IN OPERATION DURING COURSE OF THE WORK & MUST REMAIN DUST-FREE.

GENERAL NOTES

- Ⓐ EXISTING EXTERIOR WALLS, DOORS & WINDOWS TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓑ EXISTING C.I.P. CONCRETE ENTRANCE PAVING TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓒ EXISTING BRICK WALL W/ CAST STONE CAP TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓓ EXISTING INTERIOR PARTITIONS, DOORS & WINDOWS TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓔ EXISTING C.I.P. CONCRETE COLUMN TO REMAIN, TYPICAL.
- Ⓕ EXISTING BUILDING EXPANSION JOINT & JOINT COVERS TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓖ EXISTING MILLWORK TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓗ EXISTING FLOORING & BASE TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓙ EXISTING PLUMBING FIXTURES TO REMAIN UNLESS NOTED, TYPICAL.

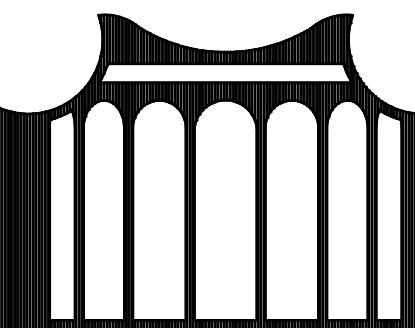


1 DEMOLITION FLOOR PLAN
3/16" = 1'-0"



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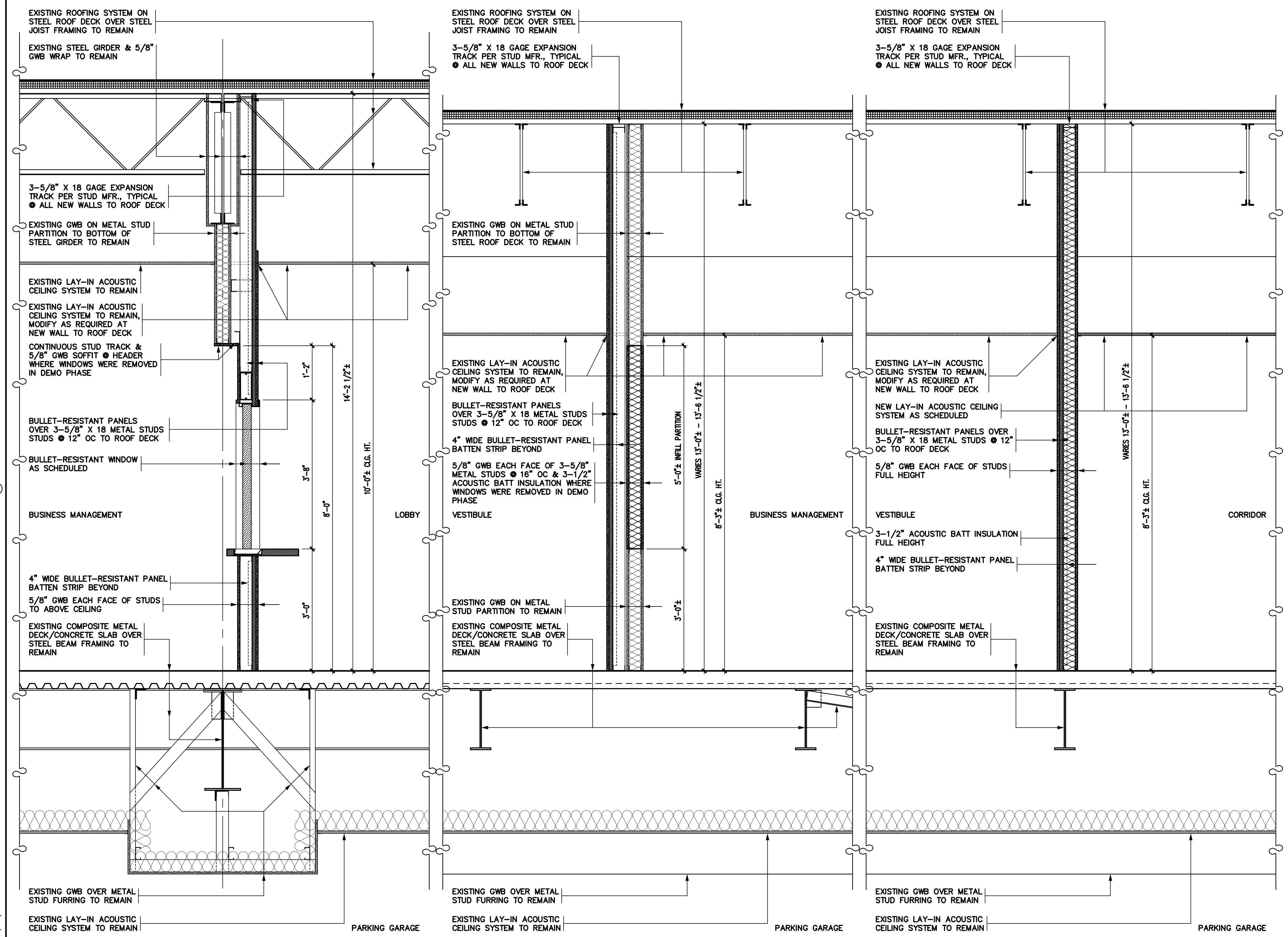
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11/15/17

NOTE: DEDUCT ALTERNATE BID ONE: ABOVE CEILING, BETWEEN TERMINATION OF GWB & ROOF DECK, PROVIDE/INSTALL LEVEL 3 BULLET-RESISTANT PANELS IN LIEU OF LEVEL 7 BULLET-RESISTANT PANELS AS DETAILED ALL LOCATIONS.

NOTE: EXISTING SPRAY-ON FIREPROOFING ON ALL STEEL ROOF & FLOOR FRAMING MEMBERS NOT SHOWN FOR CLARITY. TOUCH-UP/REPLACE/REPAIR SPRAY-ON FIREPROOFING DAMAGED BY THE WORK OF THIS PROJECT.



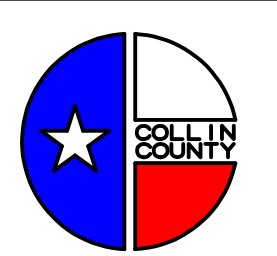
1 WALL SECTION
3/4" = 1'-0"

2 WALL SECTION
3/4" = 1'-0"

3 WALL SECTION
3/4" = 1'-0"

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MODIFICATIONS TO

SHERIFF'S OFFICE LOBBY

COLLIN COUNTY
SHERIFF'S OFFICE
4300 COMMUNITY AVE.
MCKINNEY, TEXAS 75071

SHEET TITLE

WALL SECTIONS

PROJECT NUMBER

1628

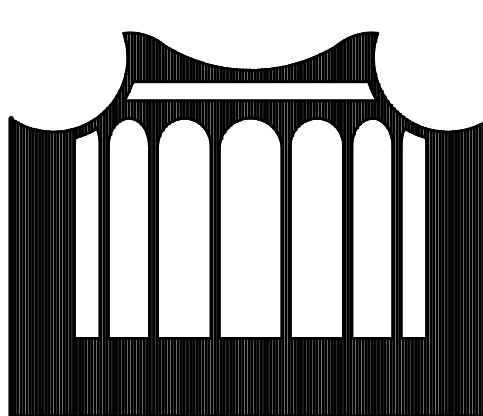
ISSUE DATE

NOVEMBER 2017

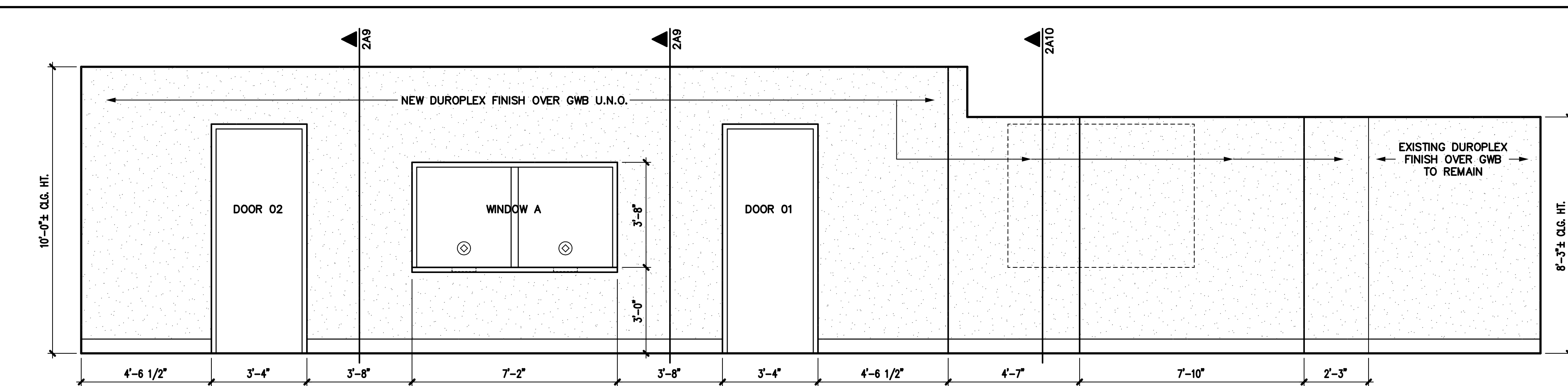
REVISION DATE

SHEET NUMBER

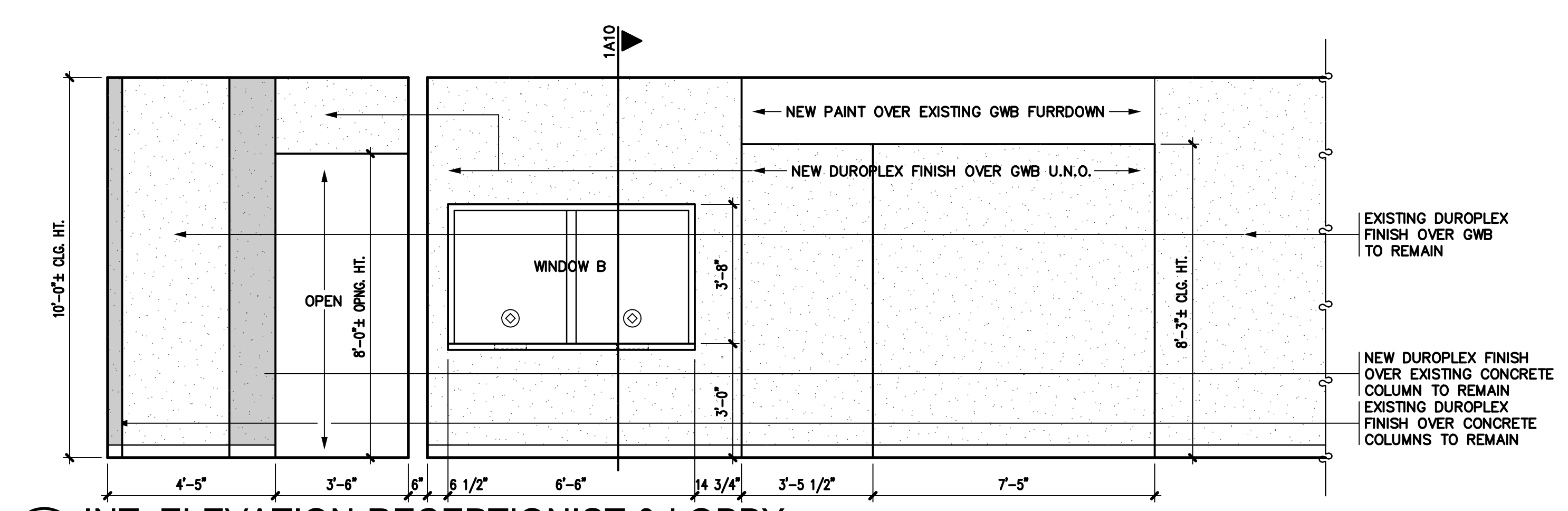
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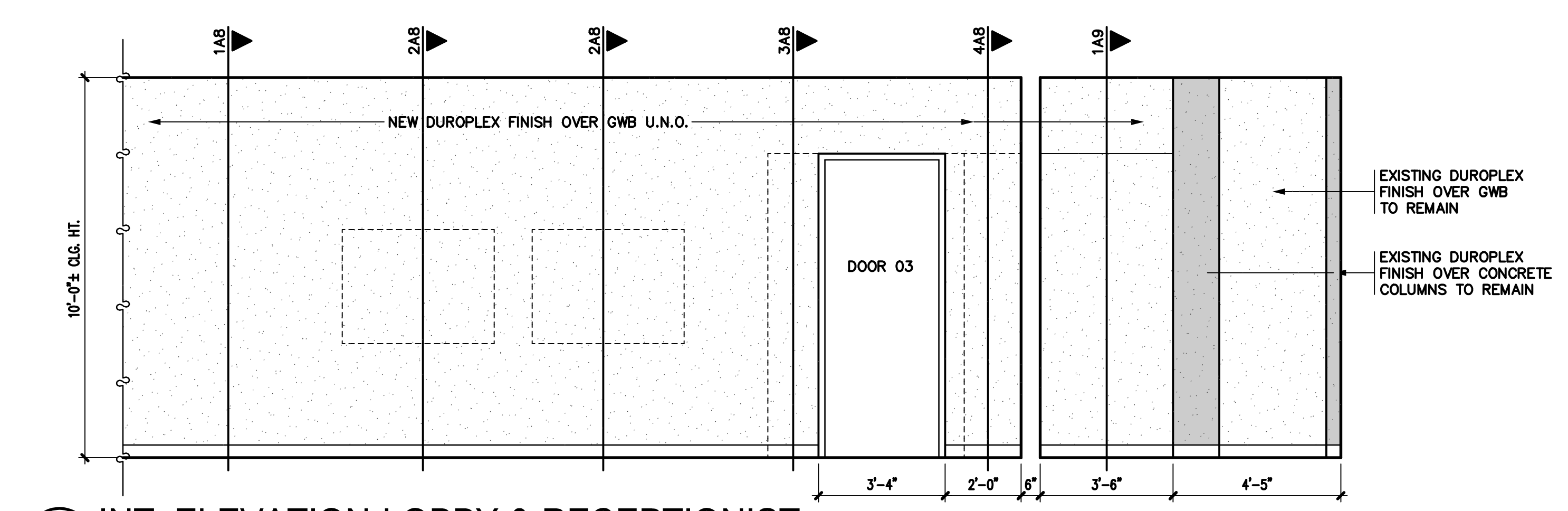
11/15/17



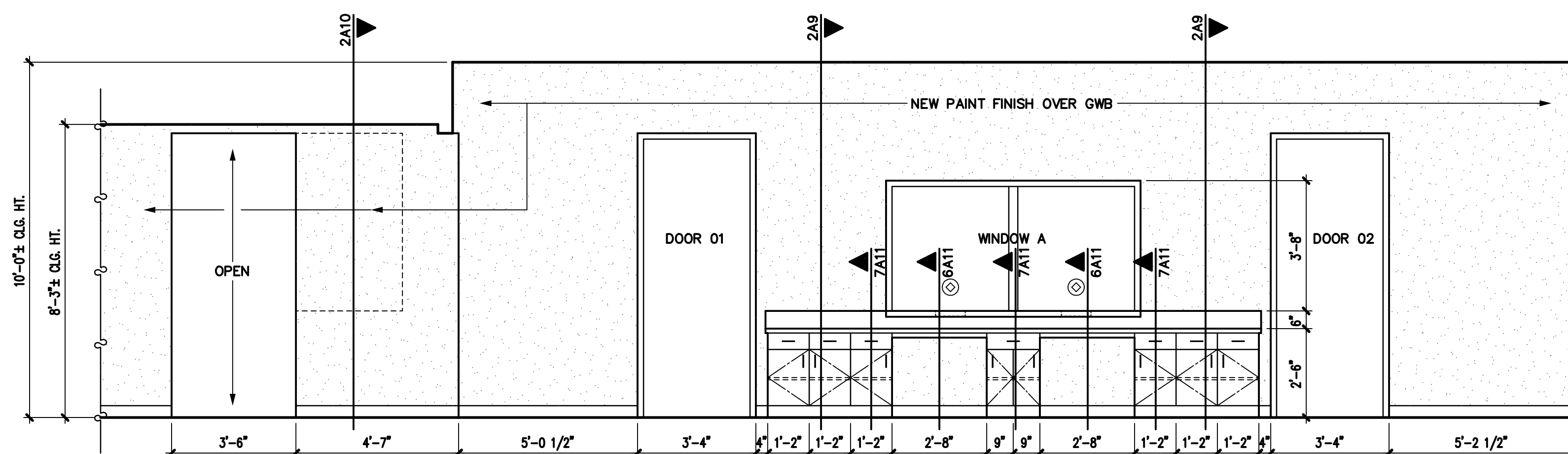
1 INT. ELEVATION-LOBBY & VESTIBULE
3/8" = 1'-0" (LOOKING SOUTH)



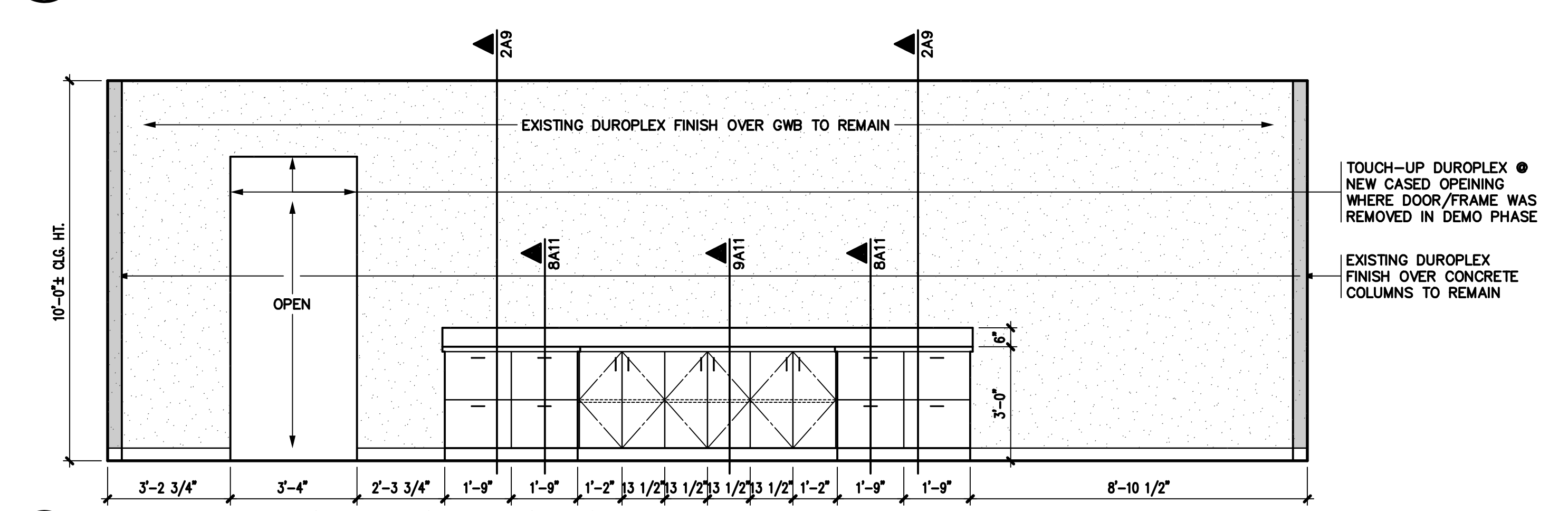
2 INT. ELEVATION-RECEPTIONIST & LOBBY
3/8" = 1'-0" (LOOKING WEST)



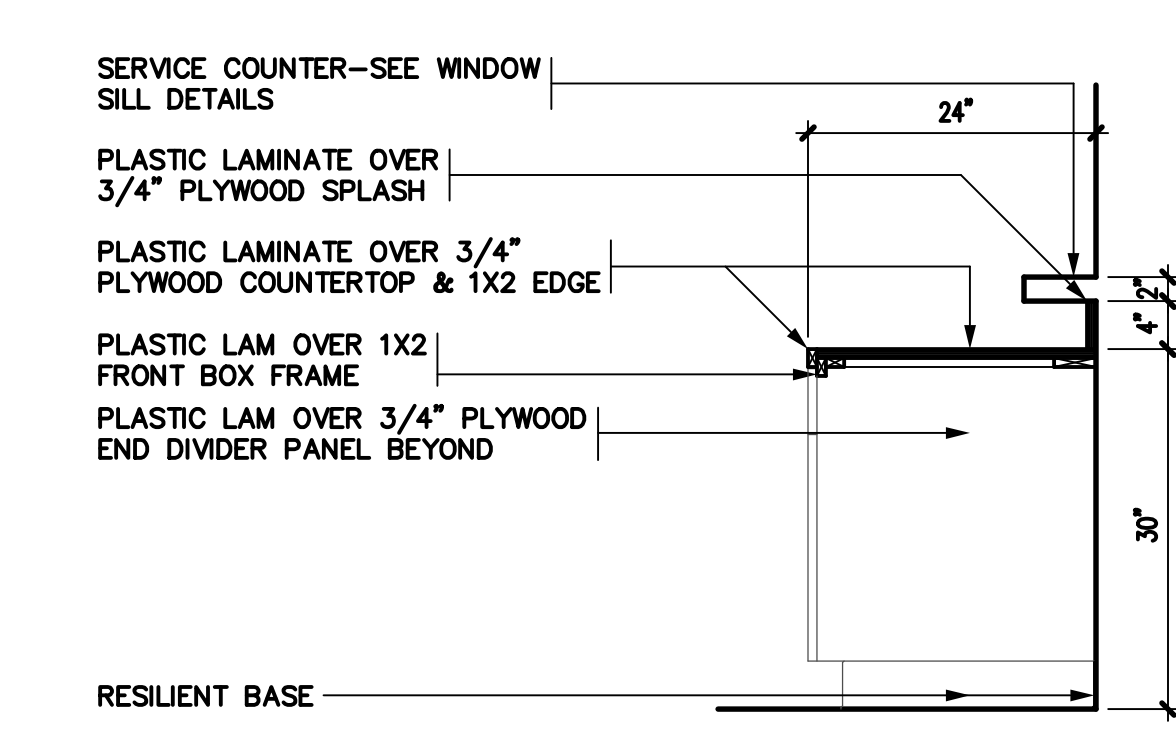
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3/8" = 1'-0" (LOOKING EAST)



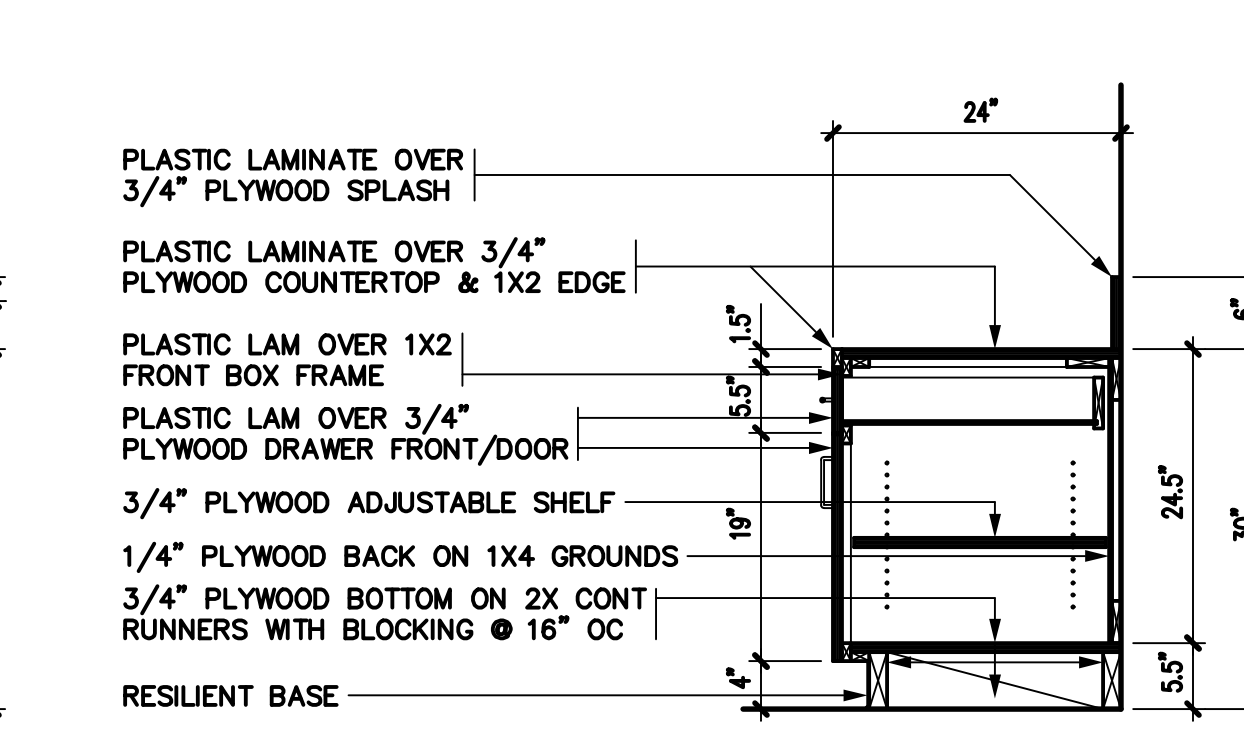
4 INT. ELEVATION-BUS. MGMT. & RECEPTIONIST
3/8" = 1'-0" (LOOKING NORTH)



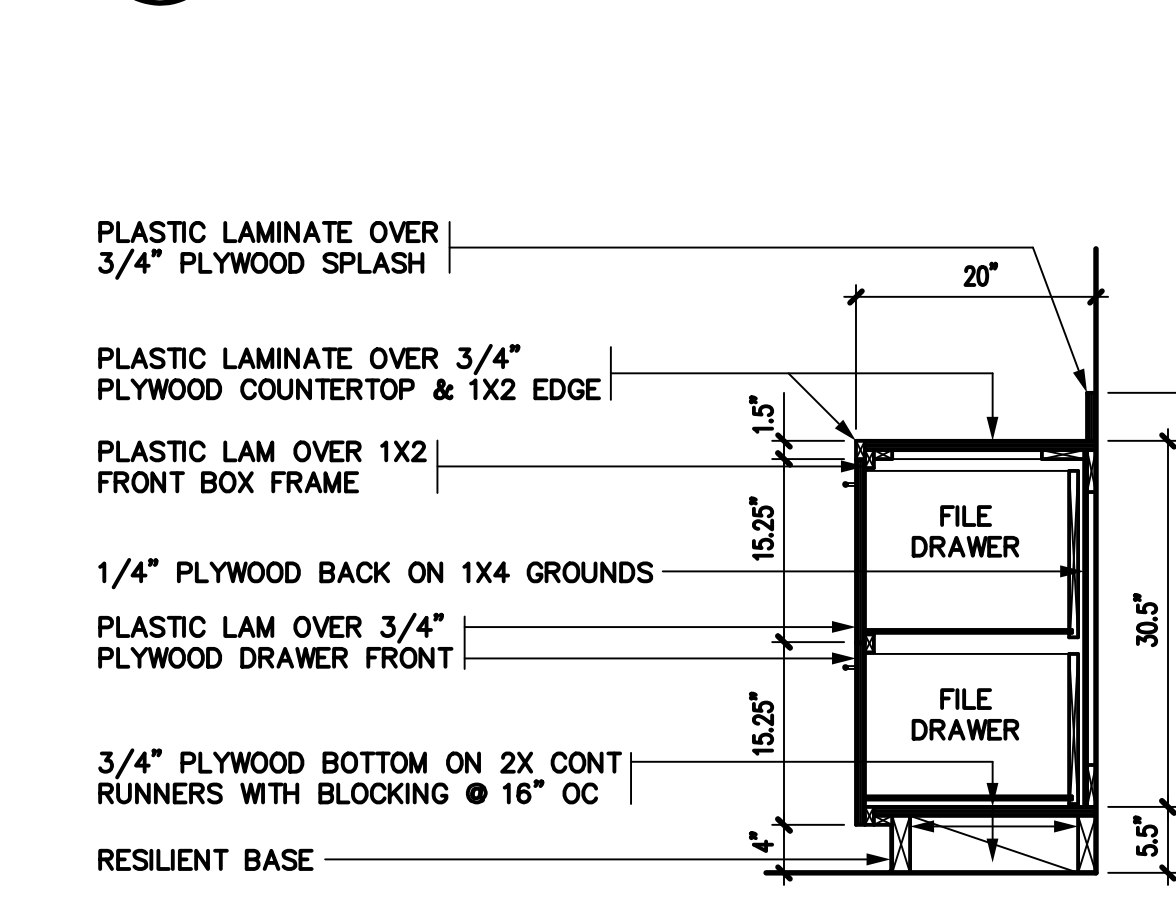
5 INT. ELEVATION-RECEPTIONIST
3/8" = 1'-0" (LOOKING SOUTH)



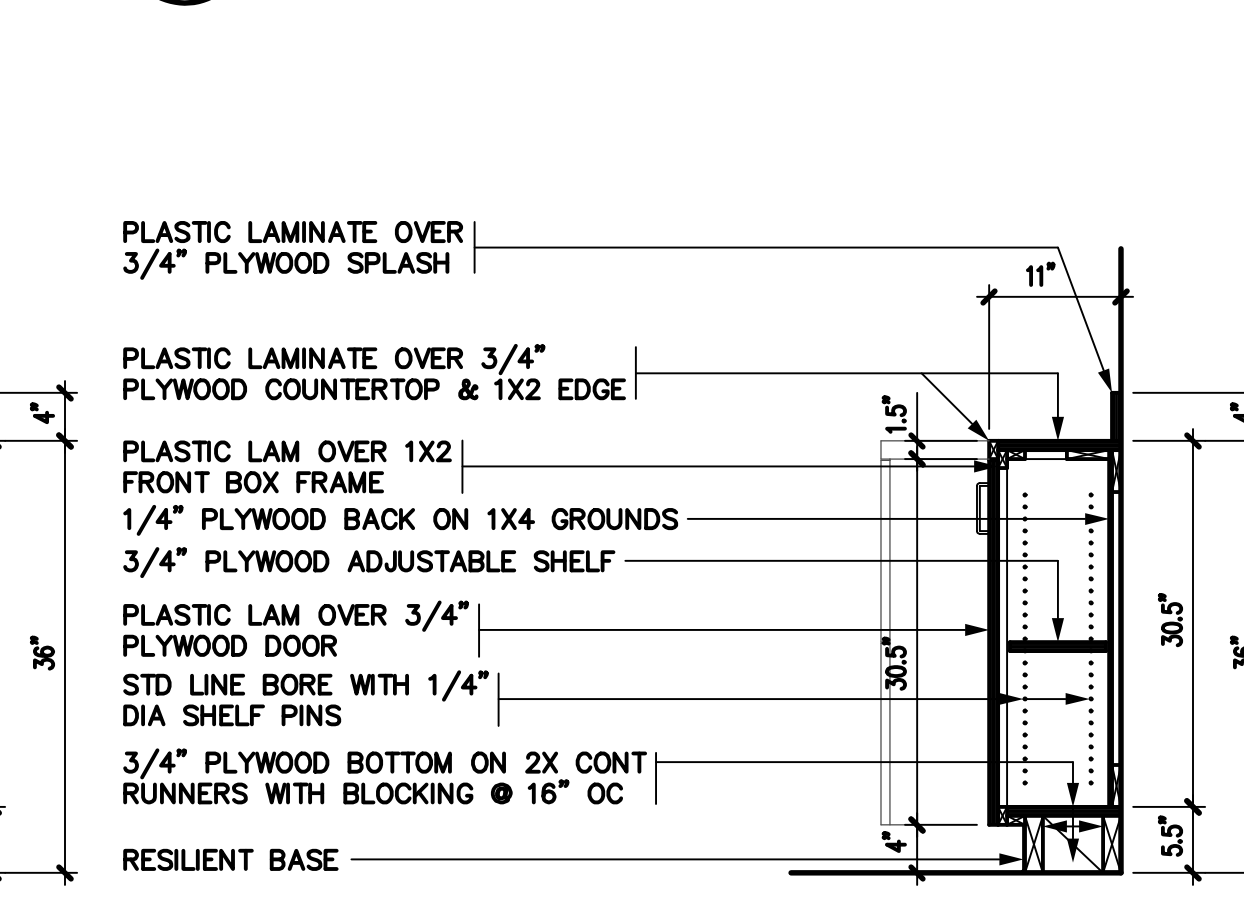
6 MILLWORK SECTION
3/4" = 1'-0"



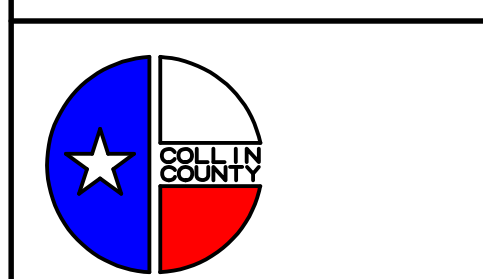
7 MILLWORK SECTION
3/4" = 1'-0"



8 MILLWORK SECTION
3/4" = 1'-0"



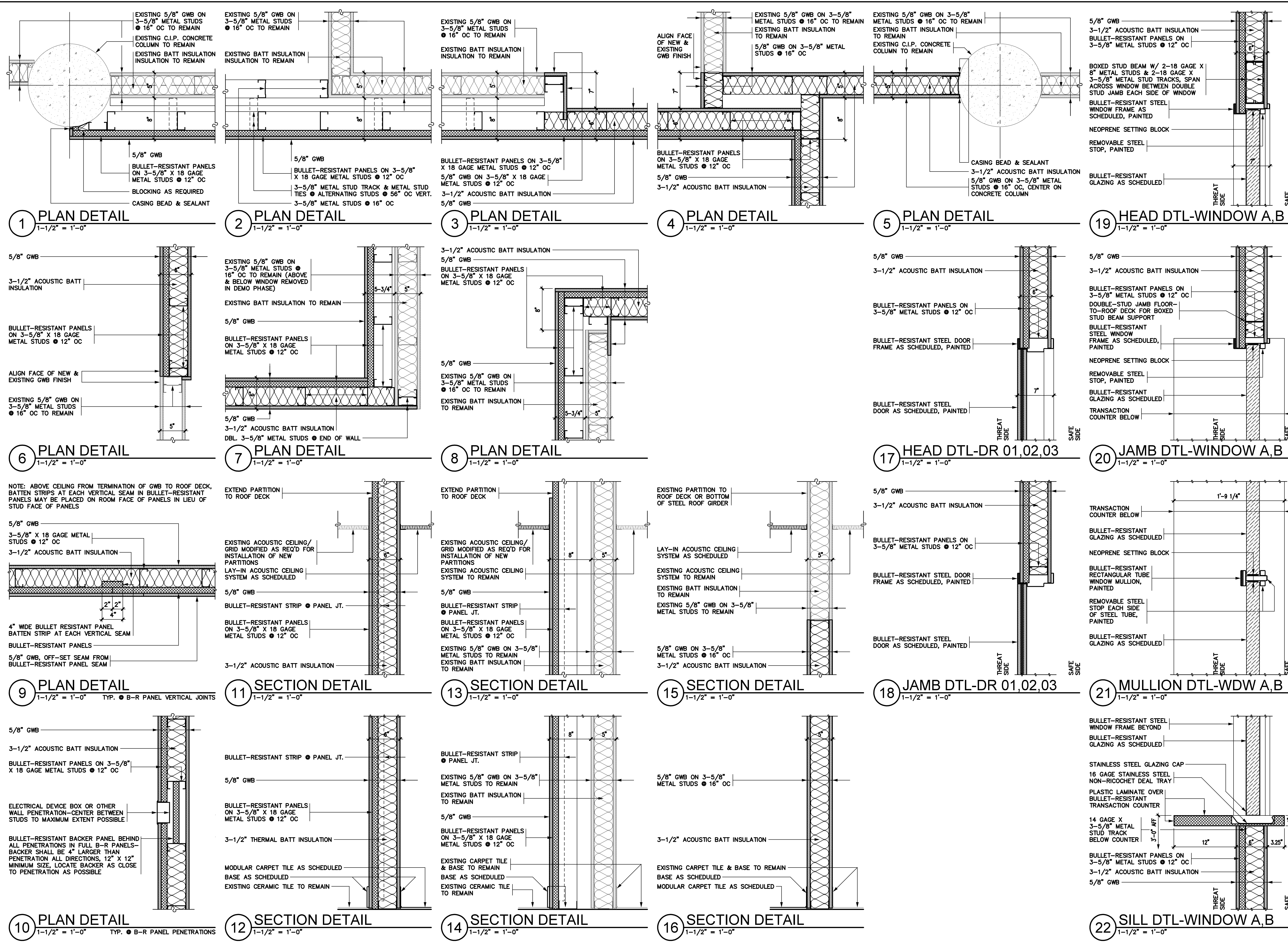
9 MILLWORK SECTION
3/4" = 1'-0"



MODIFICATIONS TO
SHERIFF'S OFFICE LOBBY
COLLIN COUNTY SHERIFF'S OFFICE
4300 COMMUNITY AVE.
MCKINNEY, TEXAS 75071

SHEET TITLE
INTERIOR ELEVATIONS & MILLWORK SECTIONS
PROJECT NUMBER
1628
ISSUE DATE
NOVEMBER 2017
REVISION DATE
SHEET NUMBER

A11



SPURGIN & ASSOCIATES ARCHITECTS

REGISTERED ARCHITECT
STATE OF TEXAS

11/15/17

MODIFICATIONS TO
SHERIFF'S OFFICE LOBBY
COLLIN COUNTY SHERIFF'S OFFICE
4300 COMMUNITY AVE.
MCKINNEY, TEXAS 75071

SHEET TITLE
PLAN, SECTION, DOOR & WINDOW DETAILS

PROJECT NUMBER
1628

ISSUE DATE
NOVEMBER 2017

REVISION DATE

SHEET NUMBER
A12

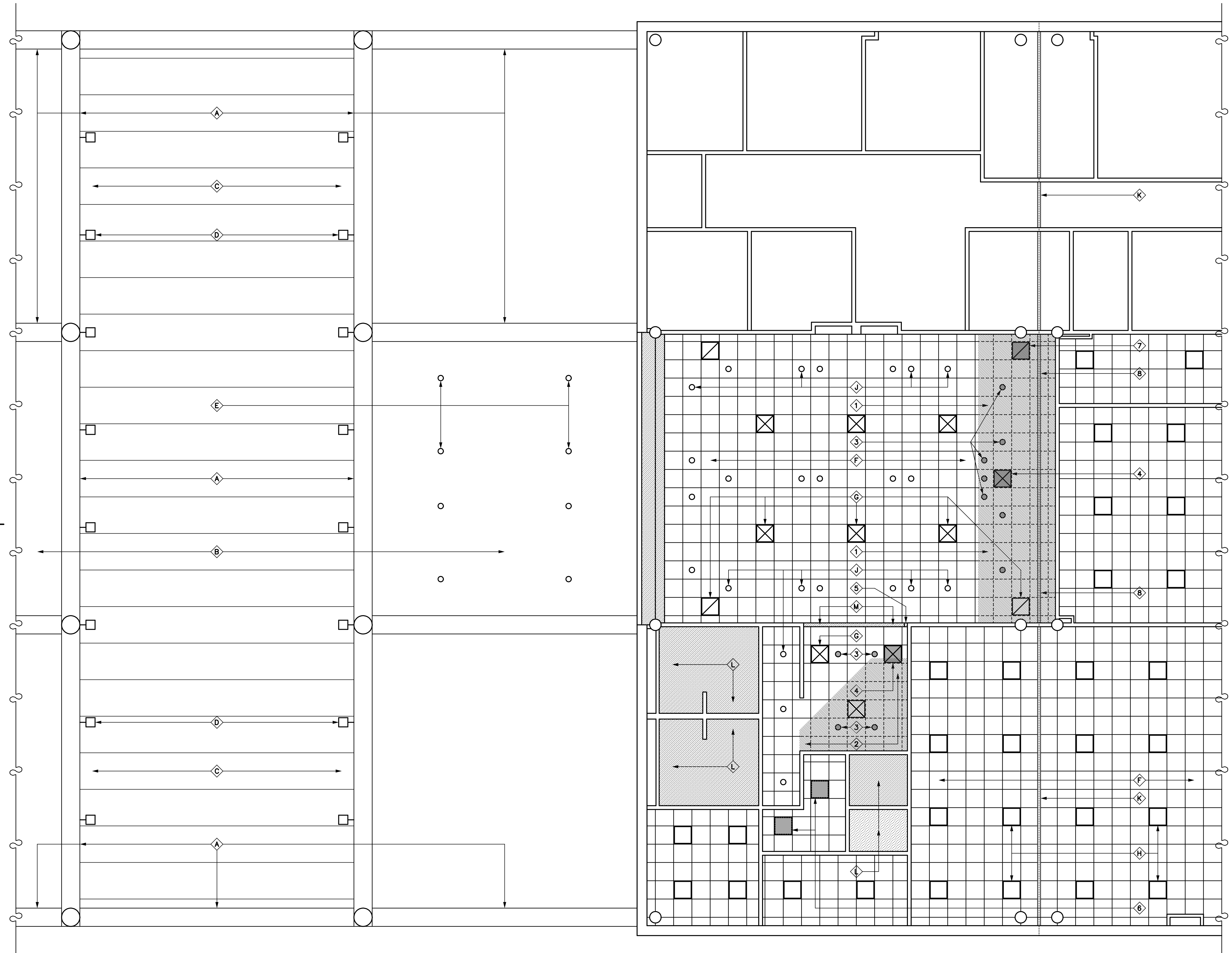
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NOTES BY SYMBOL

- ① REMOVE EXISTING LAY-IN ACOUSTICAL CEILING SYSTEM IN ITS ENTIRETY AT NEW PARTITION & NEW RECEPTIONIST AREA, TYPICAL FOR HATCHED AREA. RETURN LAY-IN ACOUSTIC PANELS TO OWNER FOR MAINTENANCE STOCK. SAVE EXISTING CEILING EXPANSION JOINT COVER TO BE RE-INSTALLED.
- ② REMOVE EXISTING LAY-IN ACOUSTICAL CEILING SYSTEM IN ITS ENTIRETY AT NEW PARTITION & NEW CORRIDOR AREA, TYPICAL FOR HATCHED AREA. RETURN LAY-IN ACOUSTIC PANELS TO OWNER FOR MAINTENANCE STOCK.
- ③ REMOVE EXISTING RECESSED COMPACT FLUORESCENT LIGHT FIXTURE & SAVE TO BE RELOCATED, TYPICAL FOR 11 DASHED/SHADED FIXTURES.
- ④ REMOVE EXISTING SUPPLY AIR DIFFUSER (X) & SAVE TO BE RELOCATED, TYPICAL FOR DASHED/SHADED DIFFUSERS.
- ⑤ REMOVE/MODIFY END OF GWB FURRDOWN AS REQUIRED BY NEW PARTITION TO ROOF DECK.
- ⑥ REMOVE EXISTING 2' X 2' LAY-IN FLUORESCENT LIGHT FIXTURE & RETURN TO OWNER, TYPICAL FOR 2 DASHED/SHADED FIXTURES.
- ⑦ REMOVE EXISTING RETURN AIR GRILLE (J) & SAVE TO BE RELOCATED, TYPICAL FOR DASHED/SHADED DIFFUSERS.
- ⑧ REMOVE EXISTING CEILING EXPANSION JOINT COVER & SAVE TO BE RE-INSTALLED WITH NEW LAY-IN ACOUSTIC CEILING SYSTEM.

GENERAL NOTES

- Ⓐ EXISTING EXPOSED CONCRETE ROOF BEAM TO REMAIN, TYPICAL.
- Ⓑ EXISTING EXPOSED CONCRETE ROOF SLAB TO REMAIN, TYPICAL.
- Ⓒ EXISTING BARREL-VAULTED METAL PANEL CEILING TO REMAIN, TYPICAL.
- Ⓓ EXISTING WALL MOUNTED FLOOD LIGHTING FIXTURES TO REMAIN, TYPICAL.
- Ⓔ EXISTING CEILING MOUNTED DOWN-LIGHTING FIXTURES TO REMAIN, TYPICAL.
- Ⓕ EXISTING LAY-IN ACOUSTICAL CEILING SYSTEM TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓖ EXISTING LAY-IN SUPPLY AIR DIFFUSERS (X) & RETURN AIR GRILLES (J) TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓗ EXISTING LAY-IN FLUORESCENT LIGHT FIXTURES TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓙ EXISTING RECESSED COMPACT FLUORESCENT LIGHT FIXTURES TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓚ EXISTING CEILING EXPANSION JOINT COVER TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓛ EXISTING GWB CEILING TO REMAIN, TYPICAL.
- Ⓜ EXISTING GWB FURR-DOWN TO REMAIN UNLESS NOTED, TYPICAL.



SPURGIN & ASSOCIATES ARCHITECTS

11/15/17

MODIFICATIONS TO
SHERIFF'S OFFICE LOBBY
COLLIN COUNTY SHERIFF'S OFFICE
4300 COMMUNITY AVE.
MCKINNEY, TEXAS 75071

SHEET TITLE
DEMO REFLECTED CEILING PLAN

PROJECT NUMBER
1628
ISSUE DATE
NOVEMBER 2017
REVISION DATE

SHEET NUMBER
A2

1 DEMOLITION CEILING PLAN
3/16" = 1'-0"

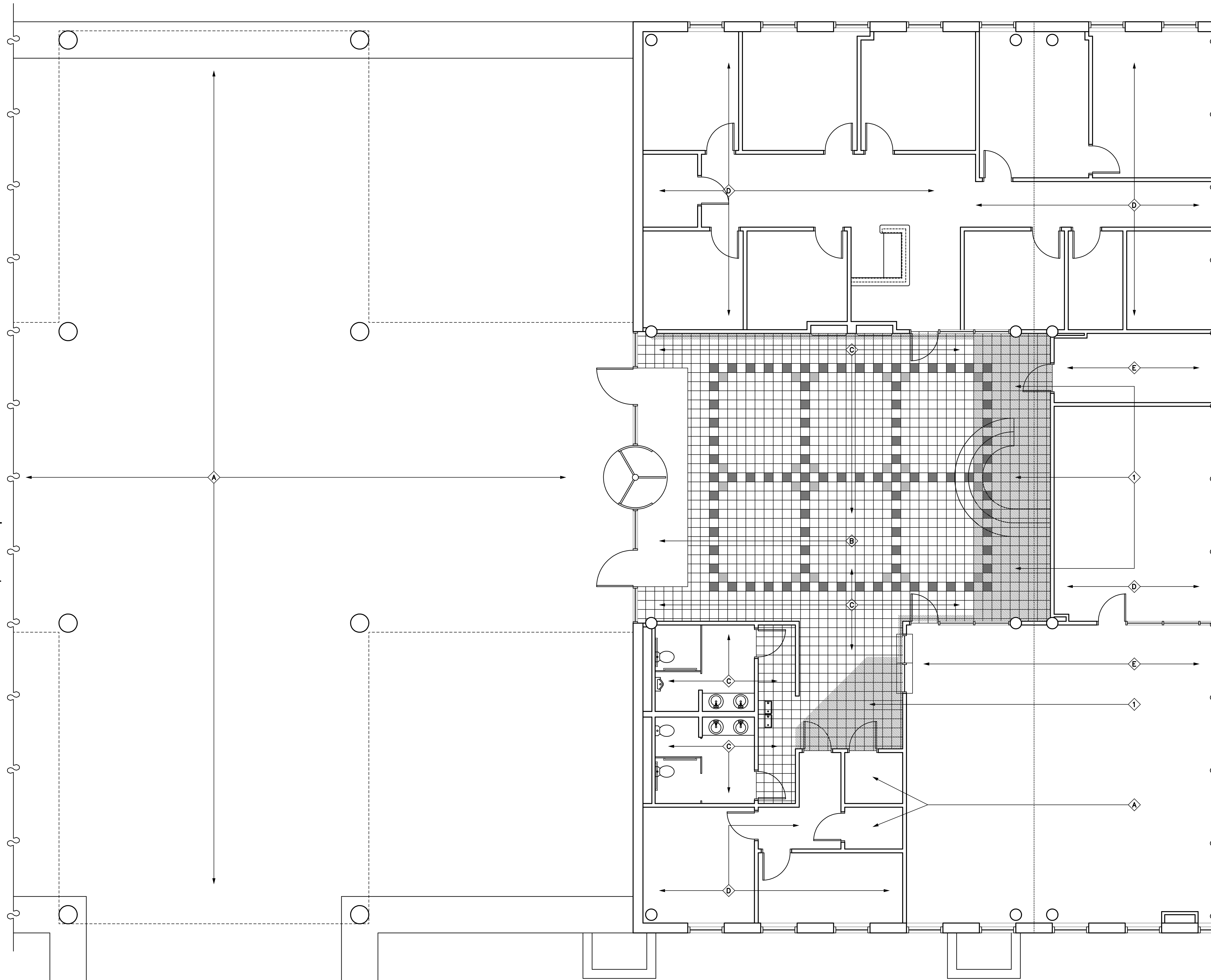
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NOTES BY SYMBOL

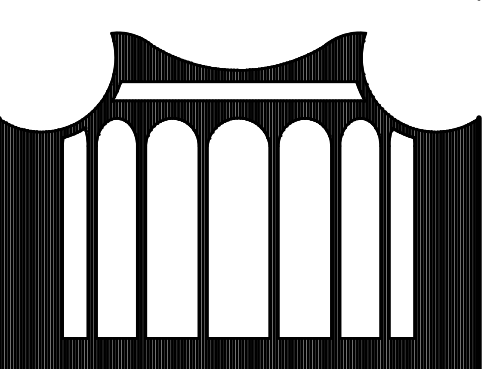
◇ REMOVE EXISTING PORCELAIN CERAMIC TILE FLOORING & BASE IN AREAS TO RECEIVE NEW PARTITIONS & MODULAR CARPET TILE FLOORING. TYPICAL FOR HATCHED AREA. TAKE ALL PRECAUTIONS NECESSARY IN REMOVING CERAMIC TILE SCHEDULED SO AS TO PREVENT DAMAGE TO EXISTING CERAMIC TILE TO REMAIN. SAVE CERAMIC TILE TO BE REMOVED FOR RE-INSTALLATION NEAR RESTROOMS TO MAXIMUM EXTENT PRACTICAL.

GENERAL NOTES

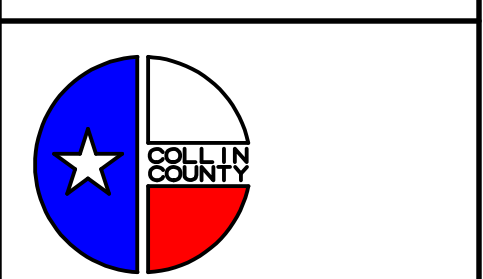
- Ⓐ EXISTING EXPOSED CONCRETE TO REMAIN; NO WORK REQUIRED THIS AREA.
- Ⓑ EXISTING RECESSED WALK-OFF MAT TO REMAIN.
- Ⓒ EXISTING PORCELAIN CERAMIC TILE TO REMAIN UNLESS NOTED.
- Ⓓ EXISTING MODULAR CARPET TILE TO REMAIN; NO WORK REQUIRED THIS AREA.
- Ⓔ EXISTING MODULAR CARPET TILE TO REMAIN UNLESS NOTED.



1 DEMOLITION FLOORING PLAN
3/16" = 1'-0"



11/15/17



MODIFICATIONS TO
SHERIFF'S OFFICE LOBBY
COLLIN COUNTY
SHERIFF'S OFFICE
4300 COMMUNITY AVE.
MCKINNEY, TEXAS 75071

SHEET TITLE
DEMO FLOORING PLAN

PROJECT NUMBER
1628
ISSUE DATE
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SHEET NUMBER
A3

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NOTES BY SYMBOL

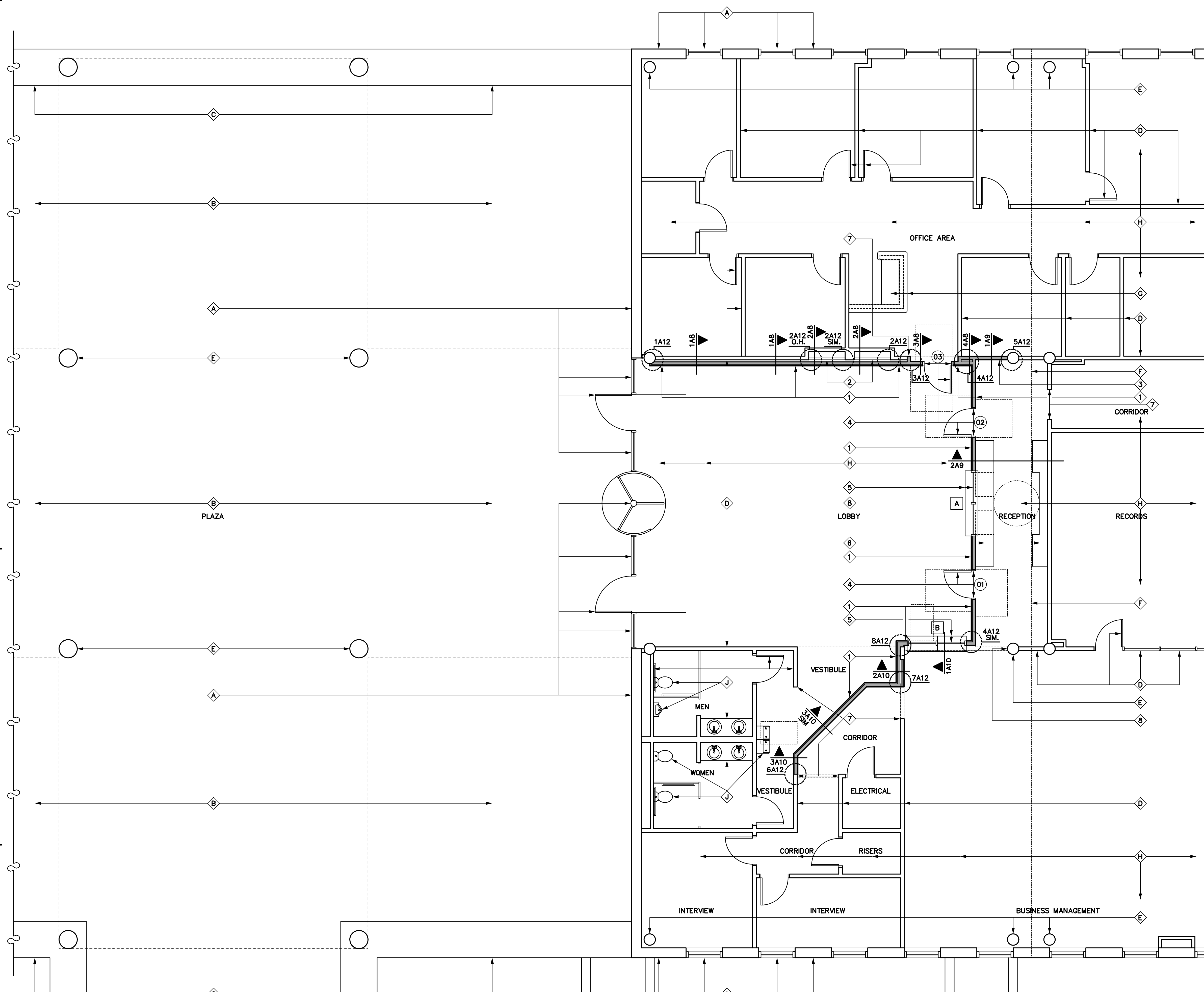
- ① NEW BULLET-RESISTANT PARTITION: 3-5/8" X 18 GAGE METAL STUDS @ 12" OC WITH 5/8" GWB OVER LEVEL 7 BULLET-RESISTANT PANELS ON PUBLIC SIDE, 5/8" GWB ON PRIVATE SIDE WHERE EXPOSED, WITH 3-1/2" ACOUSTIC BATT INSULATION WHERE SHOWN; EXTEND TO ROOF DECK. SEE WALL SECTIONS FOR ADDITIONAL INFORMATION. FINISH GWB WITH NEW PAINT FINISH ON PRIVATE OFFICE/RECEPTION SIDE & NEW DUROPLEX COATING ON LOBBY/WEST VESTIBULE SIDE.
- ② NEW 3-5/8" X 20 GAGE METAL STUD INFILL @ 16" OC IN WALL OPENINGS WHERE 3' X 4' DISPLAY CASES WERE REMOVED IN DEMO PHASE. SEE WALL SECTIONS FOR ADDITIONAL INFORMATION.
- ③ NEW PARTITION: 3-5/8" X 20 GAGE METAL STUDS @ 16" OC WITH 5/8" GWB ON BOTH SIDES & 3-1/2" ACOUSTIC BATT INSULATION. SEE WALL SECTIONS FOR ADDITIONAL INFORMATION. FINISH GWB WITH NEW PAINT FINISH ON PRIVATE OFFICE SIDE & NEW DUROPLEX COATING ON RECEPTION SIDE.
- ④ NEW BULLET-RESISTANT STEEL DOOR & FRAME.
- ⑤ NEW BULLET-RESISTANT GLASS & STEEL FRAME TRANSACTION WINDOW.
- ⑥ NEW MILLWORK; SEE INTERIOR ELEVATIONS & MILLWORK SECTIONS.
- ⑦ NEW 5/8" GWB PATCH/REPAIR WHERE DOOR FRAME OR PARTITION WAS REMOVED/MODIFIED DURING DEMO PHASE. FINISH GWB WITH NEW DUROPLEX COATING TO MATCH EXISTING ADJACENT WALLS.
- ⑧ RELOCATE 3 EXISTING CARD READERS @ 3 EXISTING DOORS REMOVED IN DEMO PHASE & REINSTALL @ NEW DOORS 01, 02 & 03.

GENERAL NOTES

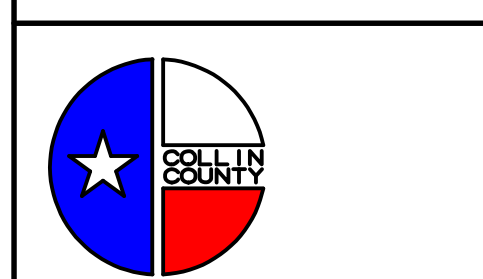
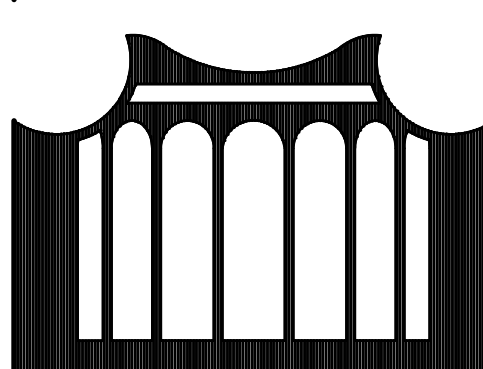
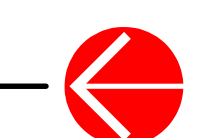
- Ⓐ EXISTING EXTERIOR WALLS, DOORS & WINDOWS TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓑ EXISTING C.I.P. CONCRETE ENTRANCE PAVING TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓒ EXISTING BRICK WALL W/ CAST STONE CAP TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓓ EXISTING INTERIOR PARTITIONS, DOORS & WINDOWS TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓔ EXISTING C.I.P. CONCRETE COLUMN TO REMAIN, TYPICAL.
- Ⓕ EXISTING BUILDING EXPANSION JOINT & JOINT COVERS TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓖ EXISTING MILLWORK TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓗ EXISTING FLOORING & BASE TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓙ EXISTING PLUMBING FIXTURES TO REMAIN UNLESS NOTED, TYPICAL.

ROOM FINISH NOTES

1. SEE SHEET A6 FOR INFORMATION REGARDING NEW & MODIFIED CEILING FINISHES.
2. SEE SHEET A7 FOR INFORMATION REGARDING NEW & MODIFIED FLOORING FINISHES.
3. INSTALL NEW CERAMIC TILE BASE TO MATCH EXISTING (APPROXIMATELY 4"H X 8"L) IN LOBBY & VESTIBULE.
4. INSTALL NEW 4" CARPET BASE TO MATCH MODULAR CARPET TILE IN RECEPTION & CORRIDOR (NORTH OF BUSINESS MANAGEMENT), WEST WALLS OF OFFICE AREA (EAST OF LOBBY & RECEPTION) & NORTH & EAST WALLS OF BUSINESS MANAGEMENT.
5. ON ALL NEW GWB IN LOBBY & VESTIBULE, APPLY DUROPLEX COATING TO MATCH EXISTING WALLS TO REMAIN.
6. ON ALL NEW GWB ON EAST & WEST WALLS IN RECEPTION, APPLY DUROPLEX COATING TO MATCH EXISTING WALLS TO REMAIN.
7. ON ALL NEW GWB ON NORTH WALL OF RECEPTION, WEST FURDOWN IN LOBBY ABOVE VESTIBULE, WEST WALLS IN OFFICE AREA (EAST OF LOBBY & RECEPTION), CORRIDOR (NORTH OF BUSINESS MANAGEMENT) & NORTH & EAST WALLS OF BUSINESS MANAGEMENT, APPLY PAINT FINISH TO MATCH EXISTING WALLS TO REMAIN.



1 NEW FLOOR PLAN
3/16" = 1'-0"



MODIFICATIONS TO
SHERIFF'S OFFICE LOBBY

COLLIN COUNTY
SHERIFF'S OFFICE
4300 COMMUNITY AVE.
MCKINNEY, TEXAS 75017

SHEET TITLE
NEW FLOOR PLAN & ROOM FINISH NOTES

PROJECT NUMBER
1628

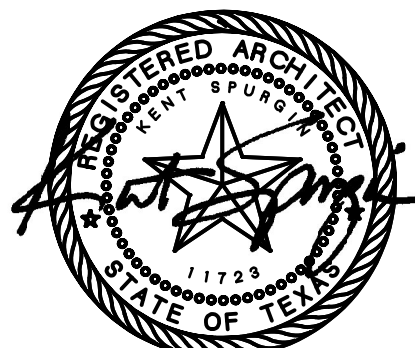
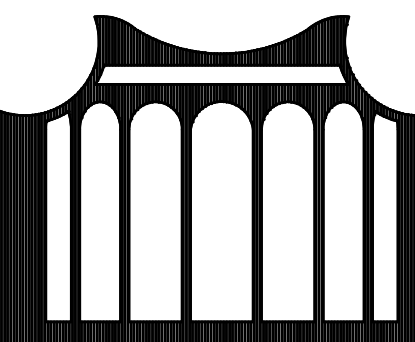
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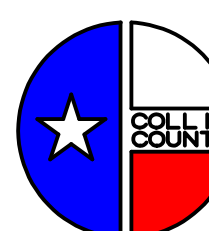
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MODIFICATIONS TO

**SHERIFF'S
OFFICE
LOBBY**

COLLIN COUNTY
SHERIFF'S OFFICE
4300 COMMUNITY AVE.
MCKINNEY, TEXAS 75071

SHEET TITLE

**DIMENSION CONTROL
PLAN, DOOR SCHED.
& WINDOW SCHED.**

PROJECT NUMBER

1628

ISSUE DATE

NOVEMBER 2017

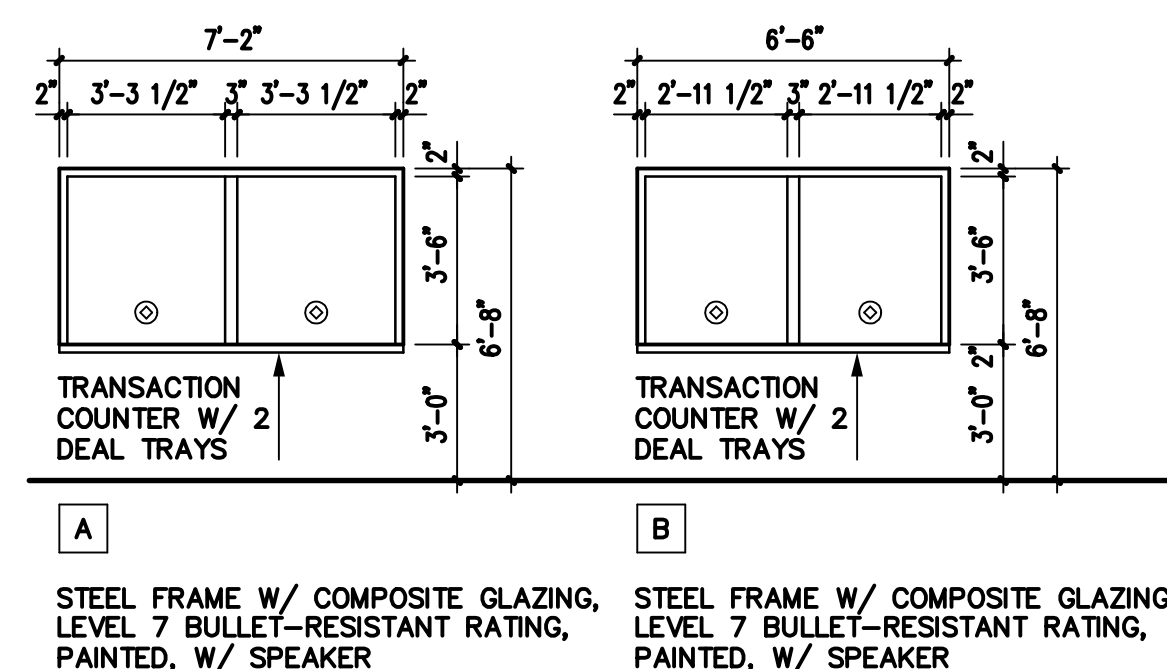
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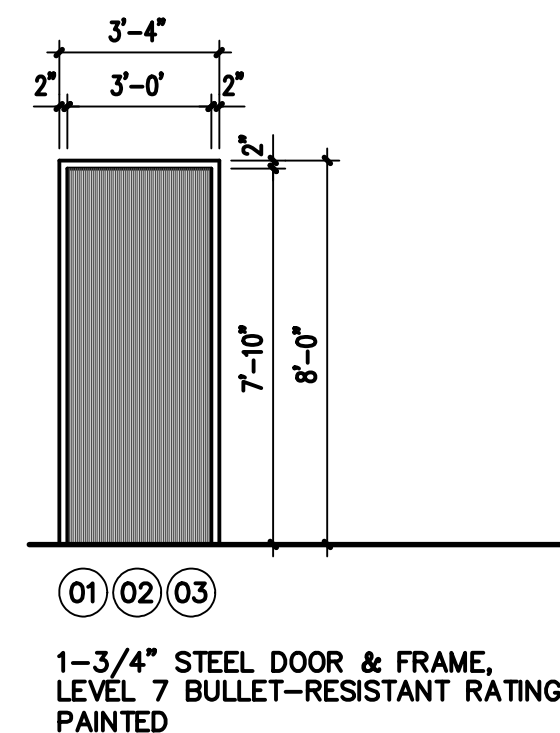
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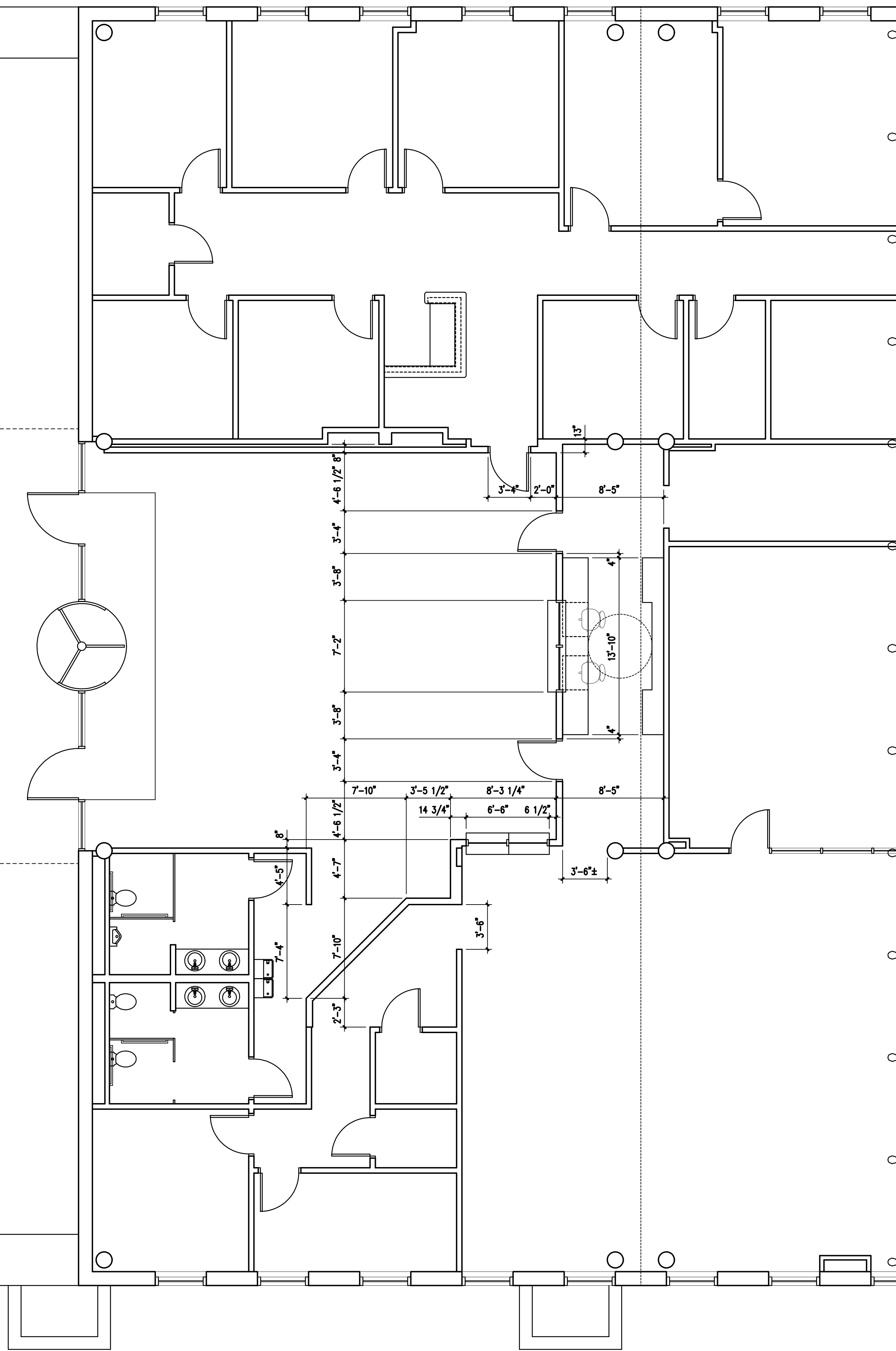
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3 WINDOW SCHEDULE
1/4" = 1'-0"

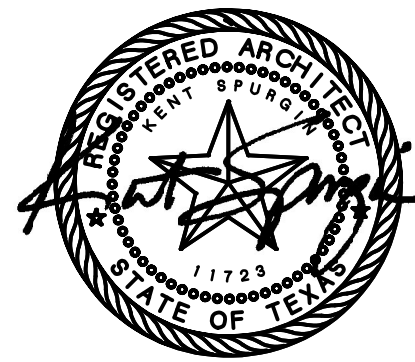
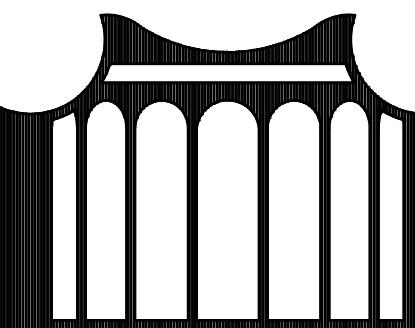


2 DOOR SCHEDULE
1/4" = 1'-0"

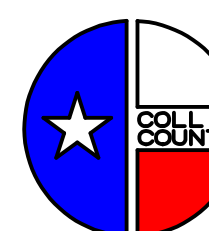


1 DIMENSION CONTROL PLAN
3/16" = 1'-0"





11/15/17



MODIFICATIONS TO

**SHERIFF'S
OFFICE
LOBBY**

COLLIN COUNTY
SHERIFF'S OFFICE
4300 COMMUNITY AVE.
MCKINNEY, TEXAS 75071

SHEET TITLE

NEW CEILING PLAN

PROJECT NUMBER

1628

ISSUE DATE

NOVEMBER 2017

REVISION DATE

SHEET NUMBER

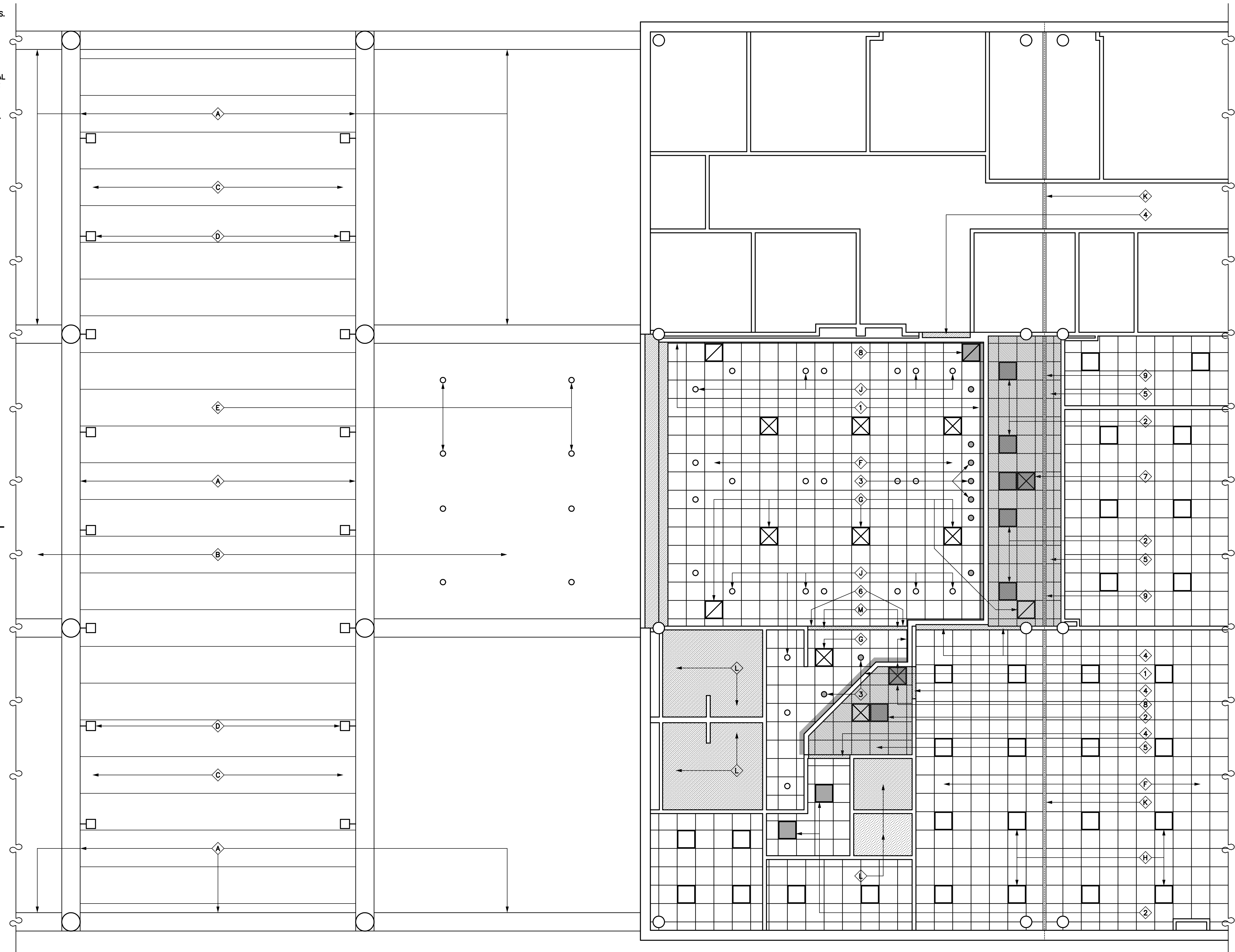
A6

NOTES BY SYMBOL

- ① MODIFY/PATCH EXISTING LAY-IN ACOUSTICAL CEILING SYSTEM GRID & LAY-IN ACOUSTICAL PANELS AS REQUIRED ADJACENT TO NEW PARTITION, TYPICAL FOR SHADED AREA.
- ② NEW LAY-IN FLUORESCENT LIGHT FIXTURE, TYPICAL FOR 8 SHADED FIXTURES.
- ③ RELOCATED EXISTING RECESSED COMPACT FLUORESCENT LIGHT FIXTURE, TYPICAL FOR 9 SHADED FIXTURES.
- ④ NEW 5/8" GWB CASED OPENING HEADER 8'-0" AFF (APPROX. 3" BELOW LAY-IN ACOUSTICAL CEILING).
- ⑤ NEW LAY-IN ACOUSTICAL CEILING SYSTEM AS SCHEDULED/SPECIFIED, TYPICAL FOR HATCHED AREA. RE-INSTALL EXISTING CEILING EXPANSION JOINT COVER IN NEW CEILING.
- ⑥ REPAIR/TOUCH-UP GWB FURRDOWN AT NEW PARTITION TO ROOF DECK & PAINT 24" HIGH VERTICAL & 5" WIDE HORIZONTAL SURFACES OF FURRDOWN.
- ⑦ RELOCATED EXISTING SUPPLY AIR DIFFUSER (X), TYPICAL FOR SHADED UNIT.
- ⑧ RELOCATED EXISTING RETURN AIR GRILLE (/), TYPICAL FOR SHADED UNIT.
- ⑨ EXISTING CEILING EXPANSION JOINT COVER REMOVED IN DEMO PHASE & RE-INSTALLED WITH NEW LAY-IN ACOUSTIC CEILING SYSTEM.

GENERAL NOTES

- Ⓐ EXISTING EXPOSED CONCRETE ROOF BEAM TO REMAIN, TYPICAL.
- Ⓑ EXISTING EXPOSED CONCRETE ROOF SLAB TO REMAIN, TYPICAL.
- Ⓒ EXISTING BARREL-VAULTED METAL PANEL CEILING TO REMAIN, TYPICAL.
- Ⓓ EXISTING WALL MOUNTED FLOOD LIGHTING FIXTURES TO REMAIN, TYPICAL.
- Ⓔ EXISTING CEILING MOUNTED DOWN-LIGHTING FIXTURES TO REMAIN, TYPICAL.
- Ⓕ EXISTING LAY-IN ACOUSTICAL CEILING SYSTEM TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓖ EXISTING LAY-IN SUPPLY AIR DIFFUSERS (X) & RETURN AIR GRILLES (/) TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓗ EXISTING LAY-IN FLUORESCENT LIGHT FIXTURES TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓙ EXISTING RECESSED COMPACT FLUORESCENT LIGHT FIXTURES TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓚ EXISTING CEILING EXPANSION JOINT COVER TO REMAIN UNLESS NOTED, TYPICAL.
- Ⓛ EXISTING GWB CEILING TO REMAIN, TYPICAL.
- Ⓜ EXISTING GWB FURR-DOWN TO REMAIN UNLESS NOTED, TYPICAL.



1 NEW CEILING PLAN
3/16" = 1'-0"



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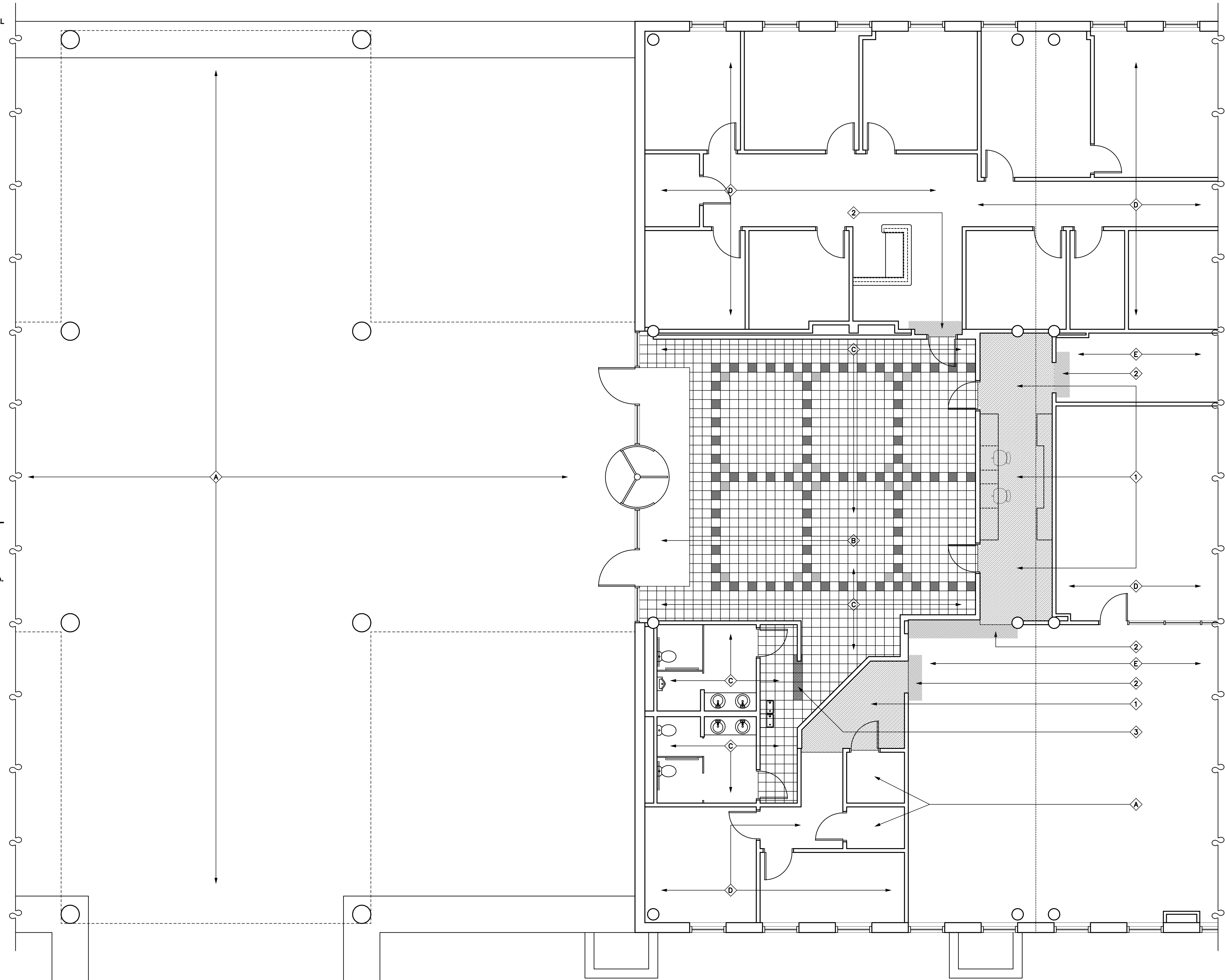
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NOTES BY SYMBOL

- ① NEW MODULAR CARPET TILE TO MATCH EXISTING MODULAR CARPET TILE TO REMAIN & NEW 4" MATCHING CARPET BASE; MATCH EXISTING LAYOUT TO MAXIMUM EXTENT PRACTICAL, TYPICAL FOR DOT-HATCHED AREA.
- ② REPLACE EXISTING MODULAR CARPET TILE CUT PIECES IN DOORWAYS AS REQUIRED FOR CONTINUITY WITH NEW MODULAR CARPET TILE AREAS, TYPICAL FOR CROSS-HATCHED AREAS.
- ③ INSTALL NEW CERAMIC TILE TO MATCH EXISTING TO REMAIN (OR USE EXISTING CERAMIC TILE REMOVED DURING DEMO PHASE) WHERE WALL WAS REMOVED IN DEMO PHASE, TYPICAL FOR HATCHED AREA.

GENERAL NOTES

- Ⓐ EXISTING EXPOSED CONCRETE TO REMAIN; NO WORK REQUIRED THIS AREA.
- Ⓑ EXISTING RECESSED WALK-OFF MAT TO REMAIN.
- Ⓒ EXISTING PORCELAIN CERAMIC TILE TO REMAIN UNLESS NOTED.
- Ⓓ EXISTING MODULAR CARPET TILE TO REMAIN; NO WORK REQUIRED THIS AREA.
- Ⓔ EXISTING MODULAR CARPET TILE TO REMAIN UNLESS NOTED.



① NEW FLOORING PLAN
3/16" = 1'-0"

SPURGIN & ASSOCIATES ARCHITECTS

11/15/17

MODIFICATIONS TO
SHERIFF'S OFFICE LOBBY
COLLIN COUNTY
SHERIFF'S OFFICE
4300 COMMUNITY AVE.
MCKINNEY, TEXAS 75071

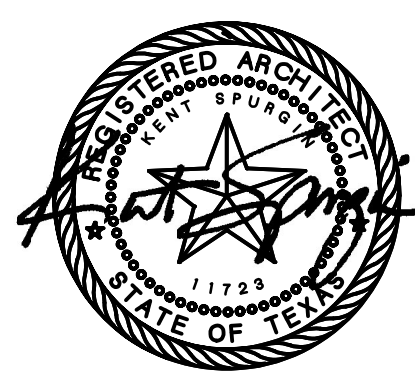
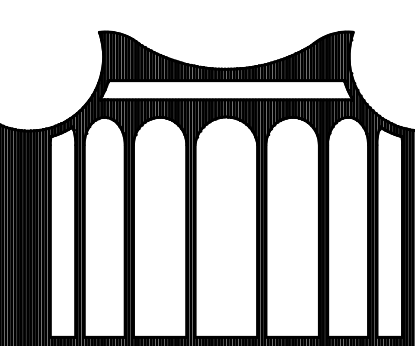
SHEET TITLE
NEW FLOORING PLAN

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1628
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SHEET NUMBER
A7

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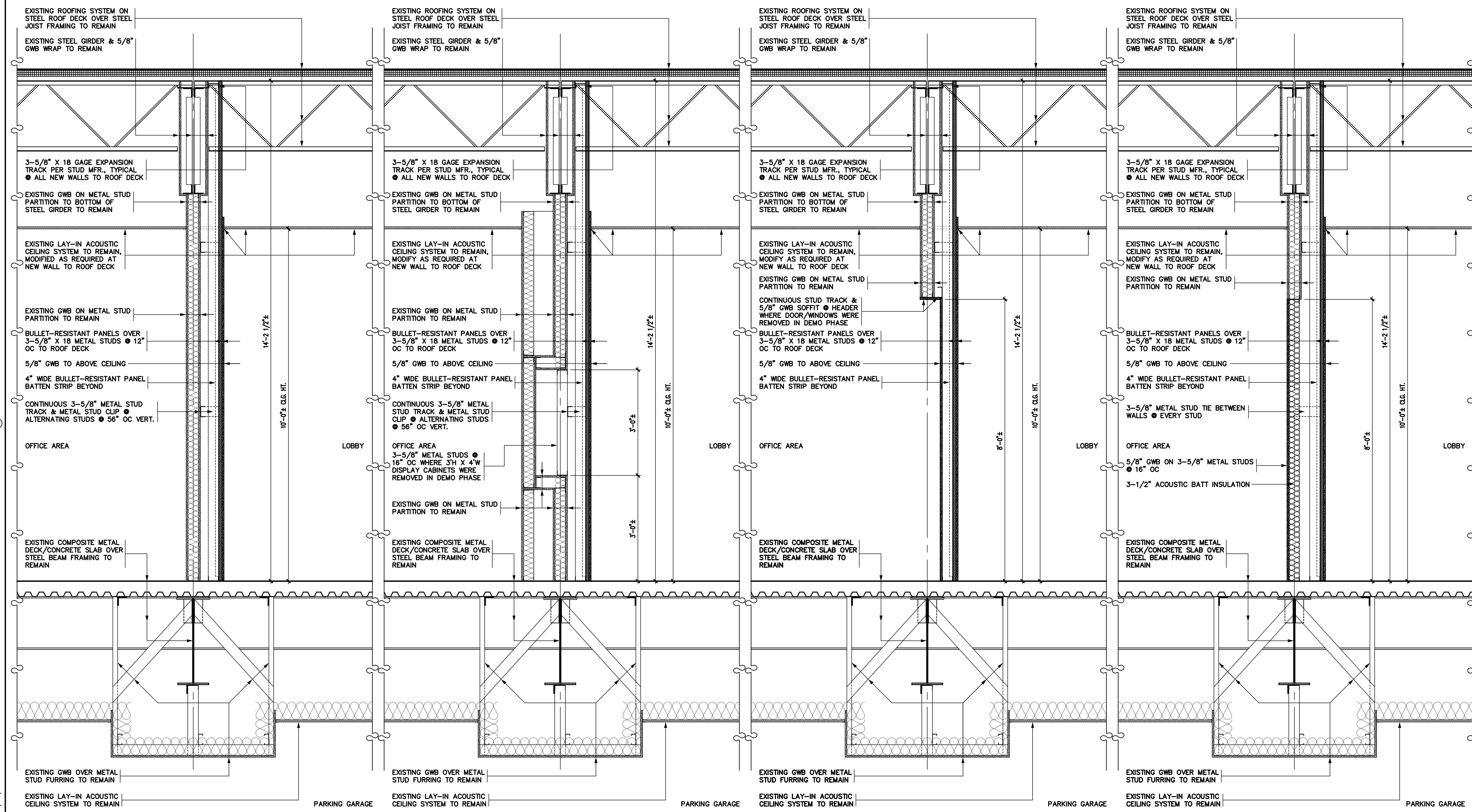
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11/15/17

NOTE: DEDUCT ALTERNATE BID ONE: ABOVE CEILING, BETWEEN TERMINATION OF GWB & ROOF DECK, PROVIDE/INSTALL LEVEL 3 BULLET-RESISTANT PANELS IN LIEU OF LEVEL 7 BULLET-RESISTANT PANELS AS DETAILED ALL LOCATIONS.

NOTE: EXISTING SPRAY-ON FIREPROOFING ON ALL STEEL ROOF & FLOOR FRAMING MEMBERS NOT SHOWN FOR CLARITY. TOUCH-UP/REPLACE/REPAIR SPRAY-ON FIREPROOFING DAMAGED BY THE WORK OF THIS PROJECT.



1 WALL SECTION
3/4" = 1'-0"

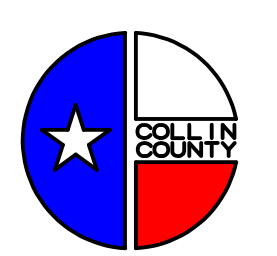
2 WALL SECTION
3/4" = 1'-0"

3 WALL SECTION
3/4" = 1'-0"

4 WALL SECTION
3/4" = 1'-0"

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MODIFICATIONS TO

SHERIFF'S OFFICE LOBBY

COLLIN COUNTY
SHERIFF'S OFFICE
4300 COMMUNITY AVE.
MCKINNEY, TEXAS 75071

SHEET TITLE

WALL SECTIONS

PROJECT NUMBER

1628

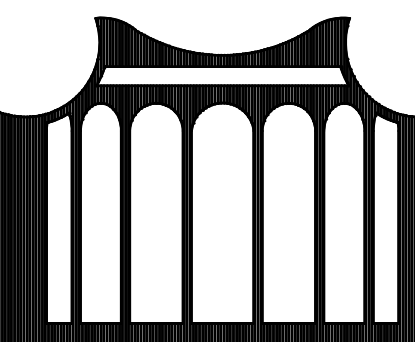
ISSUE DATE

NOVEMBER 2017

REVISION DATE

SHEET NUMBER

A8



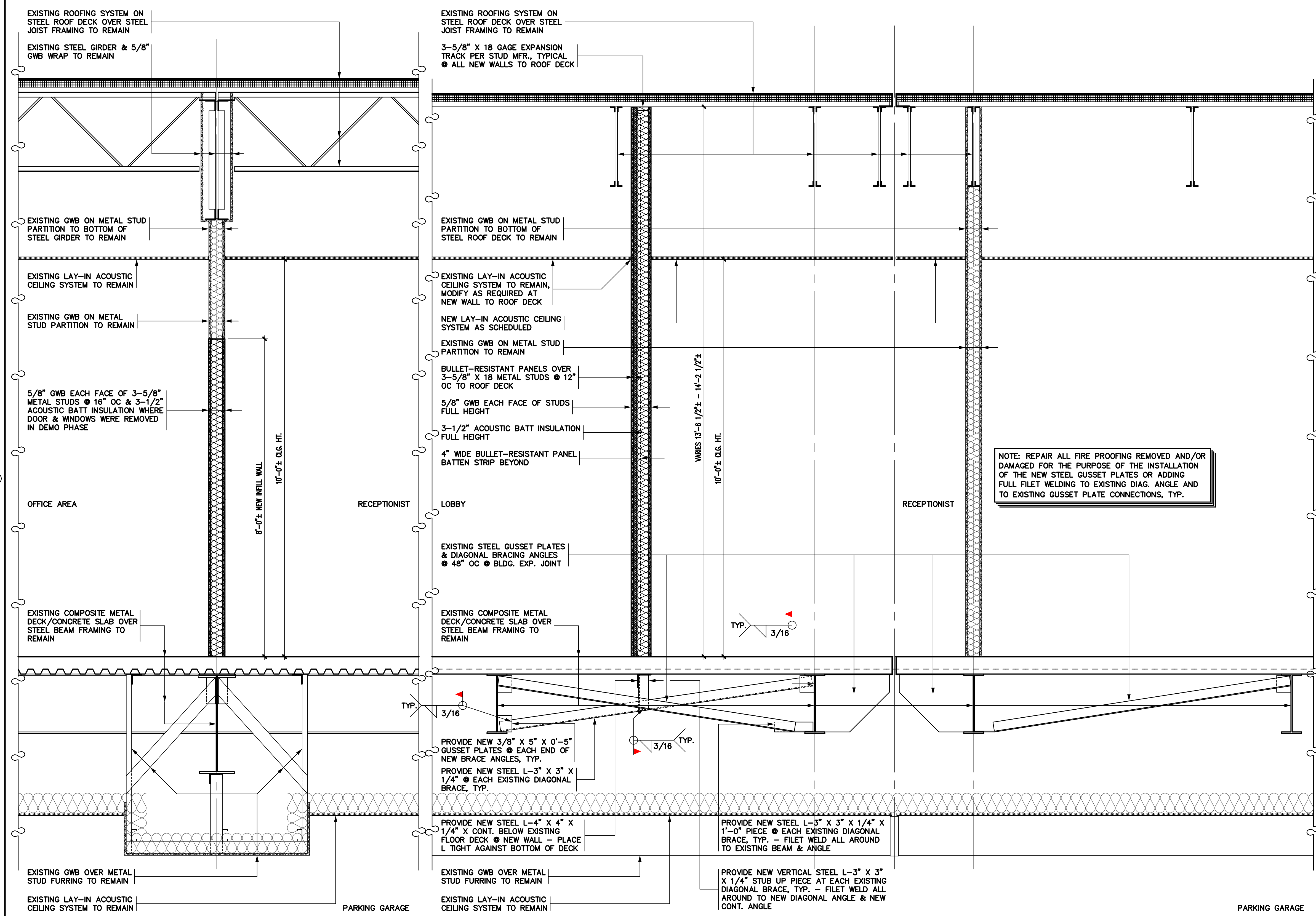
11/15/17

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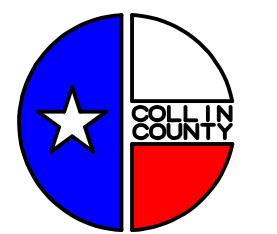
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1 WALL SECTION
3/4" = 1'-0"

2 WALL SECTION
3/4" = 1'-0"

NOTE: REPAIR ALL FIRE PROOFING REMOVED AND/OR DAMAGED FOR THE PURPOSE OF THE INSTALLATION OF THE NEW STEEL GUSSET PLATES OR ADDING FULL FILE WELDING TO EXISTING DIAG. ANGLE AND TO EXISTING GUSSET PLATE CONNECTIONS, TYP.



MODIFICATIONS TO

SHERIFF'S OFFICE LOBBY

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4300 COMMUNITY AVE.
MCKINNEY, TEXAS 75071

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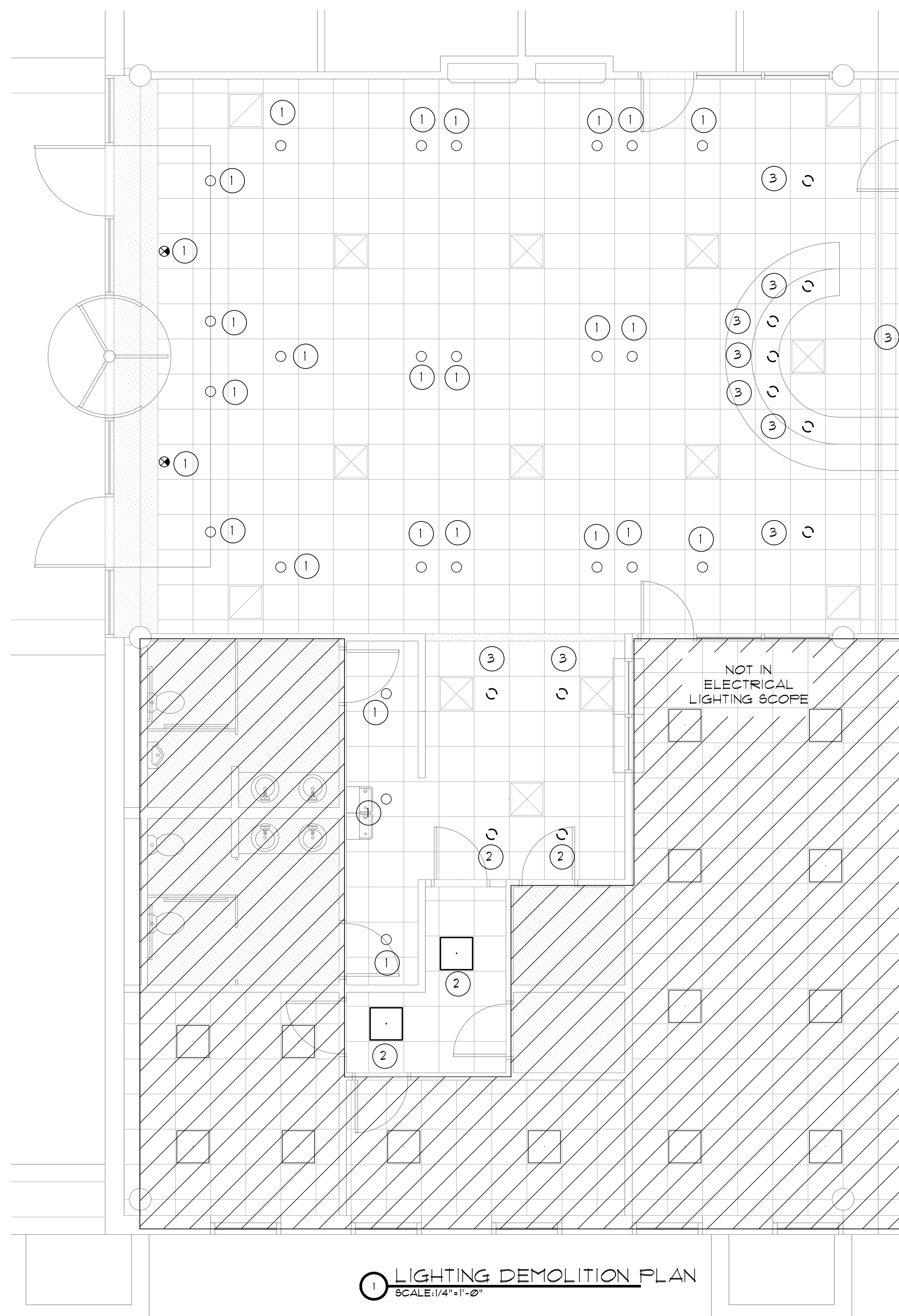
WALL SECTIONS

PROJECT NUMBER
1628
ISSUE DATE
NOVEMBER 2017
REVISION DATE

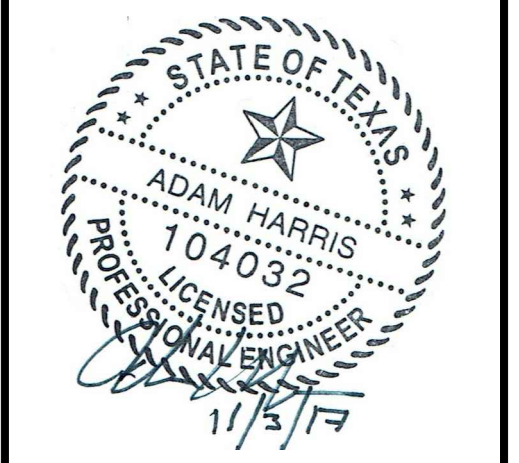
SHEET NUMBER
A9

DEMOLITION NOTES

- 1 EXISTING TO REMAIN ELECTRICAL / DATA / FIRE ALARM / FIRE PROTECTION DEVICE. REWORK WITH NEW WALL / CEILING / FLOOR AS NEEDED.
- 2 EC TO DEMOLISH EXISTING ELECTRICAL / LIGHT / POWER / DATA / FIRE ALARM / FIRE PROTECTION DEVICE(S), REUSE CIRCUIT(S) FOR NEW POWER / DATA DEVICES SHOWN ON NEW PLAN
- 3 EC TO RELOCATE EXISTING ELECTRICAL / LIGHT / POWER / DATA / FIRE ALARM / FIRE PROTECTION DEVICE(S) TO LOCATION SHOWN ON NEW PLAN



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PROJECT
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Rev. No.	Description	Date
...	FOR REVIEW	9/22/2017
...	FOR REVIEW	10/05/2017
...	FOR PERMIT	11/15/2017

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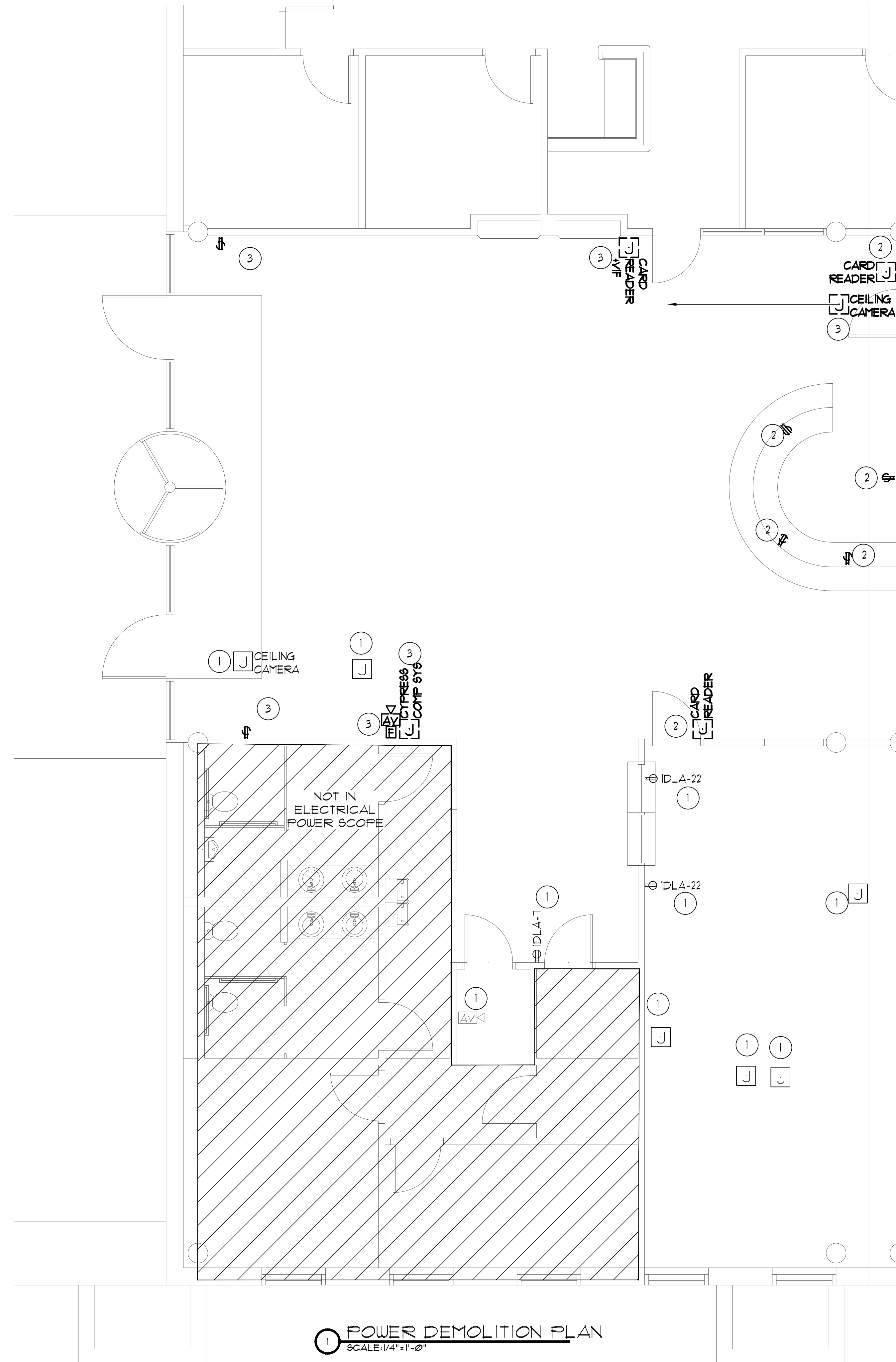
Drawing Title
ELECTRICAL LIGHTING DEMOLITION PLANS

Drawing No.
DE1

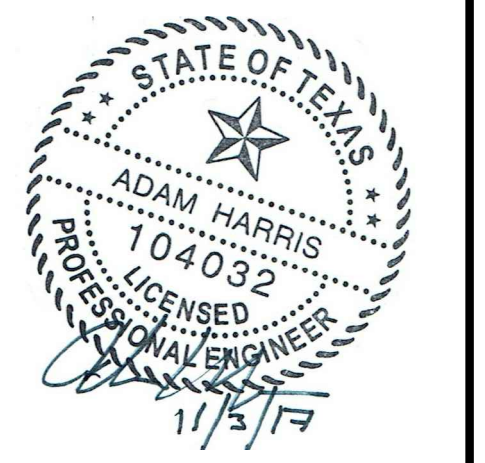
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Dwg By	XX
Check By	XX
Consult Job No.	XXXXX

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 Drawing Title

ELECTRICAL POWER
 DEMOLITION PLANS

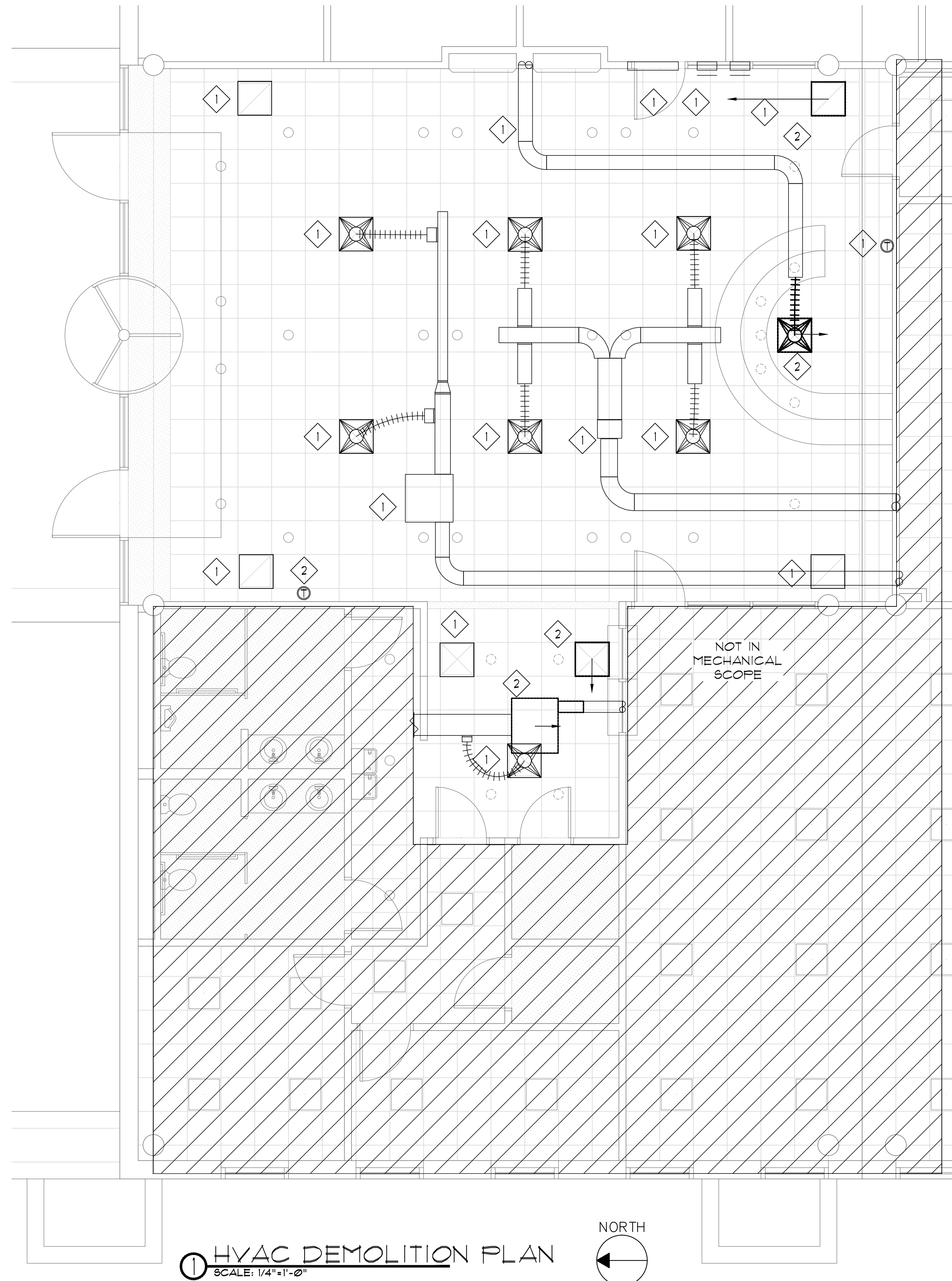
Drawing No. **DE2**

Scale	
Dwg By	XX
Check By	XX
Comp. No.	XXXXX

DRAWING LEGEND	
DETAIL	DESCRIPTION
	SUPPLY DIFFUSER WITH RIGID ROUND ELBOW CONNECTION AND INSULATED FLEXIBLE DUCT RUNOUT
	RETURN GRILLE WITH RIGID ROUND ELBOW CONNECTION AND INSULATED FLEXIBLE DUCT RUNOUT
	FAN (EXHAUST, TRANSFER, ETC.) REFER TO SCHEDULE
	THERMOSTAT (FOR FURNACE, RTU, ETC.)
	SPACE TEMPERATURE SENSOR (DUCT MOUNTED UNLESS NOTED OTHERWISE)
	SMOKE DUCT DETECTOR
	HUMIDITY SENSOR (DUCT MOUNTED UNLESS SHOWN / NOTED OTHERWISE)
	CO2 SENSOR (DUCT MOUNTED UNLESS SHOWN / NOTED OTHERWISE)
	MOTORIZED DAMPER
	RECTANGULAR OR ROUND SUPPLY OR RETURN DUCT (AS NOTED)
	ROUND INSULATED FLEXIBLE DUCT
	LOCKING MANUAL BALANCE DAMPER
	RECTANGULAR TAKE-OFF FROM RECTANGULAR DUCT WITH LOCKING VOLUME DAMPER
	ROUND TAKE-OFF FROM RECTANGULAR DUCT WITH LOCKING VOLUME DAMPER
	TURNING VANES (DOUBLE WALLED)
	DIFFUSER DESIGNATION S: SUPPLY AIR R: RETURN AIR E: EXHAUST AIR O: OUTSIDE AIR

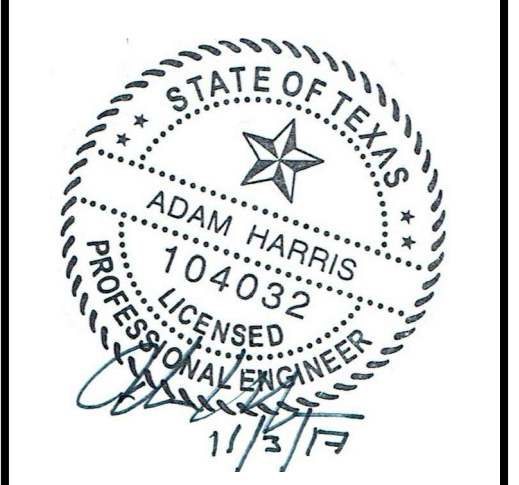
DEMOLITION NOTES

- 1 EXISTING TO REMAIN MECHANICAL DEVICE(S). MC TO REWORK WITH NEW WALL / CEILING / FLOOR AS NEEDED.
- 2 MC TO RELOCATE EXISTING MECHANICAL DEVICE TO LOCATION SHOWN IN NEW PLANS.
- 3 MC TO DEMOLISH EXISTING DUCTWORK / DIFFUSER / GRILLE DEVICE AS SHOWN. MC TO DEMOLISH TO NEAREST ACTIVE BRANCH AND CAP / CONNECT TO NEW AS SHOWN ON NEW PLANS.



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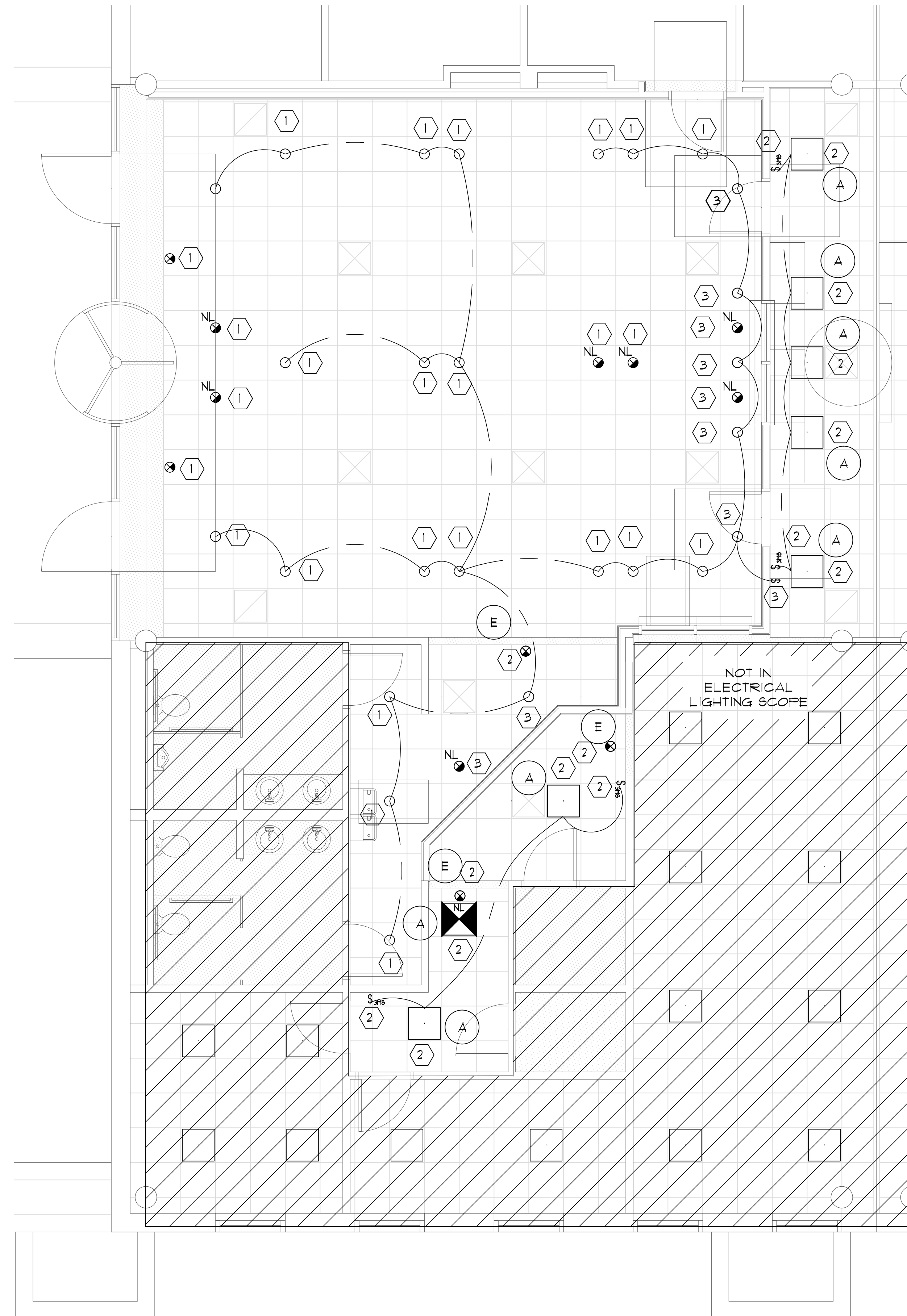
Drawing Title	
MECHANICAL DEMOLITION PLANS	
Drawing No. DM1	
Scale	
Dwg. By: XX	Check By: XX

NEW ELECTRICAL NOTES

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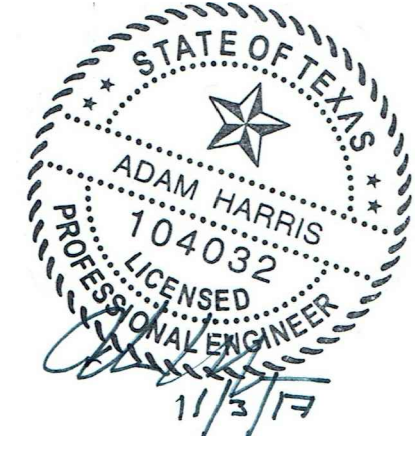
LIGHT CONTROL SCHEDULE		
ITEM	DESCRIPTION	REFERENCE MODEL
396	3-WAY SINGLE RELAY, PASSIVE DUAL TECH SENSING WALL SWITCH. MANUAL ON SWITCHING. LOW VOLTAGE. ORDER WITH 1 POWER PACK PER STRING OF LIGHTS.	SENSORSWITCH W&D FDT LV WITH PF20

LIGHTING SCHEDULE						
Tag	Mount	Voltage	Lamps	Description	Make	Model
A	Lay-In	120 or 277	LED (39W)	2x2' volumetric recessed LED troffer. Fixture to have 4000 nominal lumens, curved linear prism diffuser / lens, eldoLED that dims to 1% (0-10V dimming), 82 CRI 3500K color temperature, no nLight controls, no built-in occupancy control	Lithonia	2BLT2 - 40L ADP - EZ1 LP835 - -
AE	Lay-In	120 or 277	LED (39W)	2x2' volumetric recessed LED troffer. Fixture to have 4000 nominal lumens, curved linear prism diffuser / lens, eldoLED that dims to 1% (0-10V dimming), 82 CRI 3500K color temperature, no nLight controls, no built-in occupancy control, with 1400 lumen emergency battery pack	Lithonia	2BLT2 - 40L ADP - EZ1 LP835 - - EL14L
ETR				Existing light fixture		
E	Multi	120 or 277	LED	Exit sign with universal mounting, white housing, red color letters, NICAD battery with self diagnostics	EELP	XE 2 R W EM SD



1 LIGHTING PLAN
SCALE: 1/4" = 1'-0"

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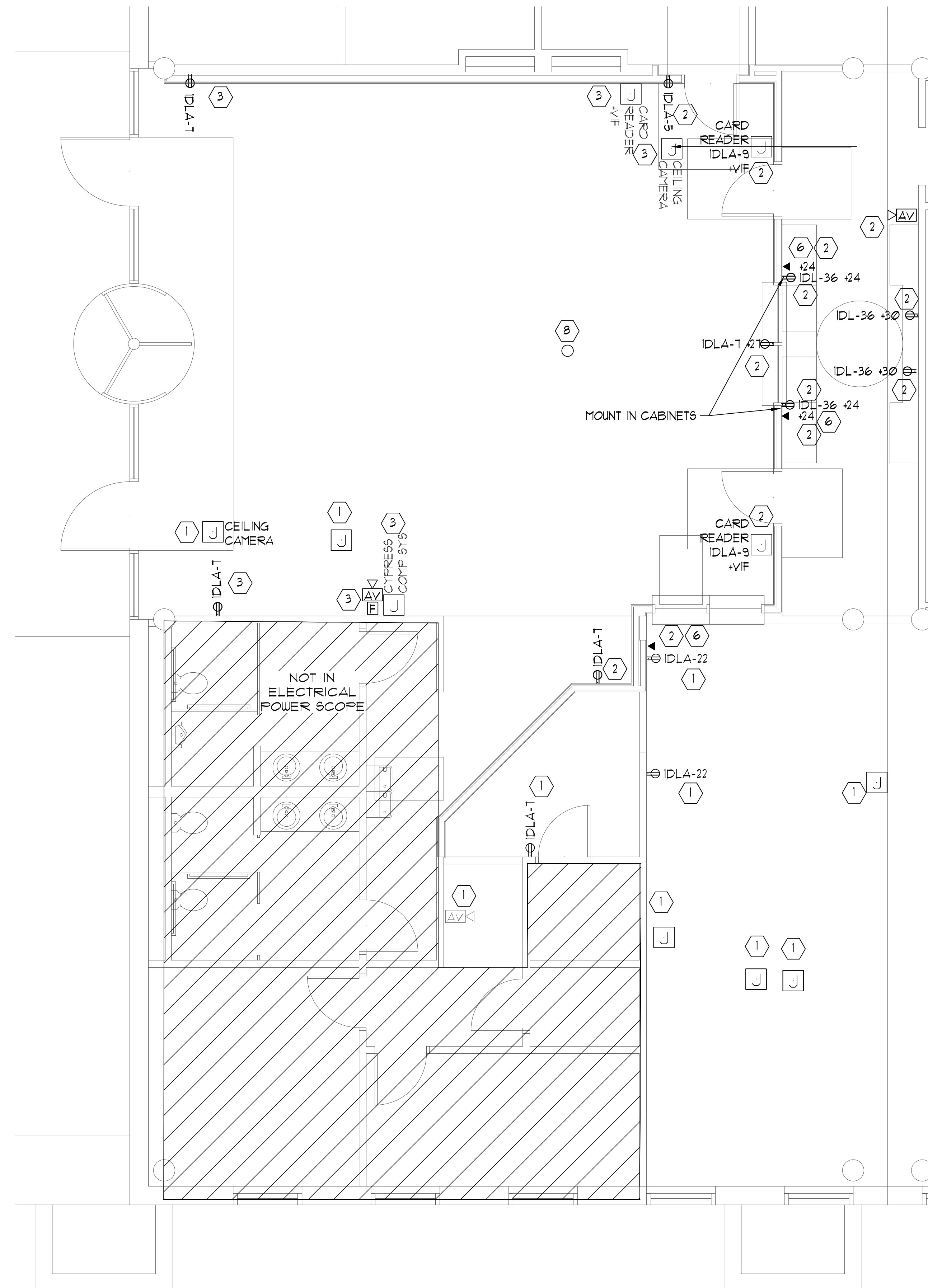
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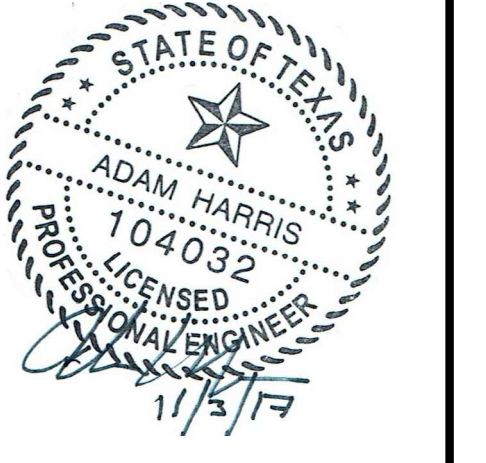
Drawing Title	
ELECTRICAL LIGHTING PLANS	
Drawing No.	
E1	
Scale	
Dwg By: XX	Check By: XX
Consult Job No.	XXXXX

NEW ELECTRICAL NOTES

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1 POWER PLAN
SCALE: 1/4"=1'-0"



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Drawing Title
ELECTRICAL POWER PLANS

Drawing No.
E2

Scale	
Dwg By	XX
Check By	XX
Comp. No.	XXXX

FIRE PROTECTION SCOPE OF WORK-EXISTING

THE FIRE PROTECTION SYSTEM WORK SHALL BE DESIGN BUILD. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY LABOR, MATERIALS, DESIGN, CALCULATIONS AND COORDINATE WITH ALL LOCAL AUTHORITIES HAVING JURISDICTION TO PRODUCE A COMPLETE AND USABLE SYSTEM WHICH COMPLIES WITH ALL APPLICABLE CODES, LAWS AND REGULATIONS INCLUDING NFPA13 AND THE LOCAL BUILDING CODE. COORDINATE ALL INSTALLATIONS WITH THE GC AND OTHER TRADES TO AVOID CONFLICTS. THE FF SUBCONTRACTOR SHALL BE OBLIGATED TO RELOCATE/REDESIGN ANY PIPE WHICH COME INTO CONFLICT WITH OTHER TRADES AT NO ADDITIONAL COST TO THE OWNER, UNDER ALL CIRCUMSTANCES.

SYSTEM TYPE: WET PIPE WATER SPRINKLER, NFPA 13.

WATER SERVICE/RISER: EXISTING TO REMAIN

DESIGN: THE DESIGN BUILD CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE SURVEY OF EXISTING, FLOW TEST, DESIGN, CALCULATIONS, DETAILING, SUBMITTAL, APPROVAL, COORDINATION, LABOR MATERIAL, TESTING AND FINAL PRODUCT. IF REQUIRED, THE CONTRACTOR SHALL INCLUDE ANY REQUIRED FLOW TEST. IF NECESSARY, REPLACEMENT OR AUGMENTATION OF THE RPZ BACK FLOW PREVENTER SHALL BE INCLUDED (DOUBLE DETECTOR CHECK WILL NOT BE ACCEPTABLE). THE EXISTING BACK FLOW PREVENTER MAY BE RETAINED ONLY IF CALCULATIONS DOCUMENT AND CONFIRM CAPACITY IS ADEQUATE. CONTRACTOR SHALL RELOCATE HEADS IN THE EXISTING SUITE AS NEEDED FOR DESIGN/COVERAGE.

MATERIALS: PIPE SHALL BE BLACK STEEL, 2" AND SMALLER SHALL BE SCH40 WITH THREADED FITTINGS, 2-1/2" AND LARGER MAY BE SCH10 WITH MECHANICAL COUPLINGS OR BUTT WELD FITTINGS.

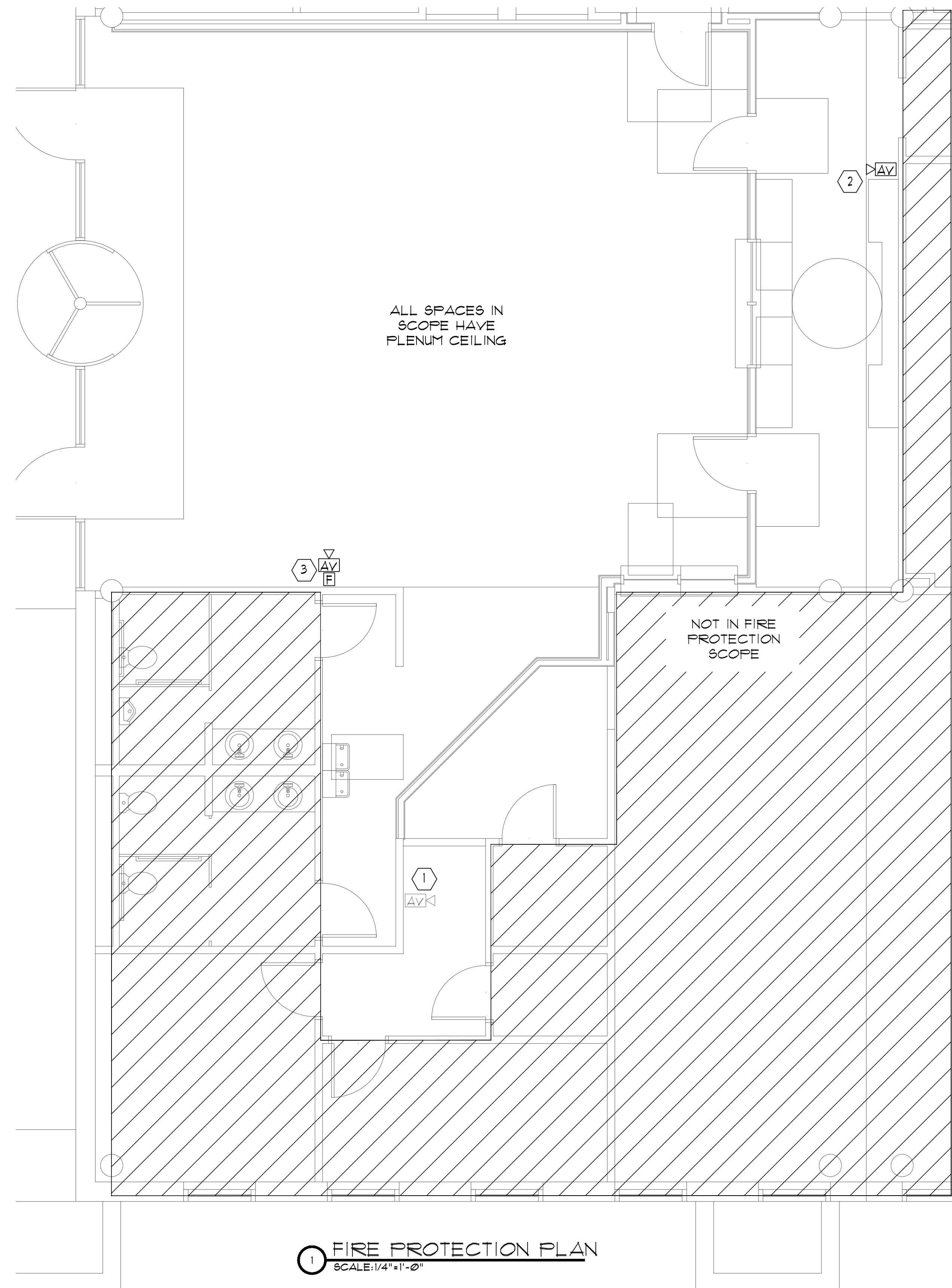
HEADS: SHALL BE EXPOSED TYPE. HEADS SHALL MATCH EXISTING AND BE CENTERED IN TILE.

NEW ELECTRICAL NOTES

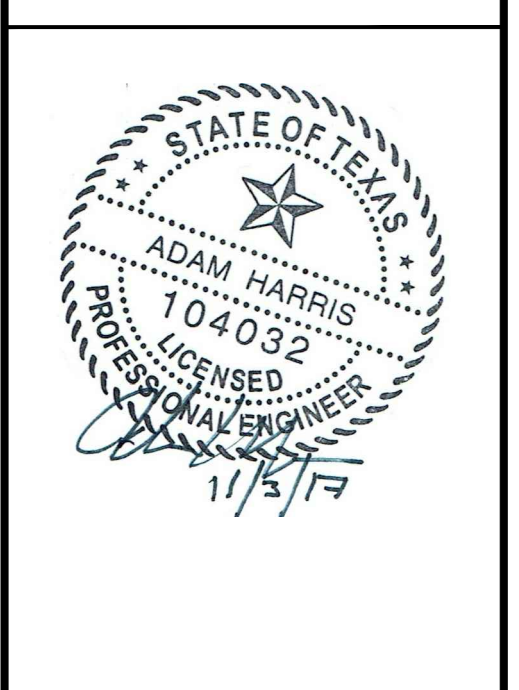
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FIRE ALARM REQUIREMENTS-EXISTING

EC SHALL CONNECT ALL NEW FIRE ALARM DEVICES TO EXISTING FACP. EC SHALL DESIGN, DETAIL, AND FURNISH A COMPLETE AND USABLE FIRE ALARM SYSTEM THAT COMPLIES WITH ALL LOCAL AND NATIONAL CODES. NEW REMOTE DEVICES SHALL INCLUDE HORN STROBE UNITS, FULL STATIONS, ZONE IDENTIFICATION DEVICES, AND SMOKE DETECTORS. ALL NEW DEVICES SHALL BE ADDRESSABLE AND FULLY COMPATIBLE WITH EXISTING SYSTEM. FA CONTRACTOR SHALL ALLOW FOR UP TO 5 ADDITIONAL REMOTE DEVICES FROM THAT SHOWN OR DESCRIBED BY THESE DOCUMENTS. IF ADDITIONAL DEVICES ARE REQUIRED BY AUTHORITY HAVING JURISDICTION THE FIVE AFOREMENTIONED SHALL BE INSTALLED AT NO ADDITIONAL CHARGE. WIRING SHALL BE PLENUM CABLE TYPE IF REQUIRED, WITH EMT CONDUIT IN CONCEALED LOCATIONS SUCH AS WALL CAVITIES, OR ANY SURFACE MOUNTED (EXPOSED) DEVICES BELOW 10' AFF. EC SHALL PREPARE AND SEE TO APPROVAL ALL SUBMISSIONS BY AUTHORITY HAVING JURISDICTION. THIS INCLUDES BUT IS NOT LIMITED TO SHOP DRAWINGS, BATTERY CALCULATIONS, CUT SHEETS, ETC. RECONNECT SUPERVISORY SERVICE AS REQUIRED BY AUTHORITY HAVING JURISDICTION. (FEES TO BE SUBMITTED AND PAID BY OWNER)



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 Drawing Title
FIRE PROTECTION PLANS
 Drawing No.
FP1
 Scale
 Dwg By: XX Check By: XX
 Consult Job No. XXXXX

NEW ELECTRICAL NOTES

- 1 EXISTING TO REMAIN ELECTRICAL / DATA / FIRE ALARM / FIRE PROTECTION DEVICE UNLESS NOTED OTHERWISE. REWORK WITH NEW WALL / CEILING / FLOOR AS NEEDED. RECIRCUIT AS SHOWN IF INDICATED.
- 2 EC TO FURNISH AND INSTALL NEW ELECTRICAL / LIGHT / POWER / DATA / FIRE ALARM / FIRE PROTECTION DEVICE(S) AS SHOWN. EC TO REUSE EXISTING LOCAL CIRCUIT(S) IF NO CIRCUIT INDICATED. EC TO VERIFY NEW LOADS DO NOT OVERLOAD CIRCUIT.
- 3 EC TO RELOCATE EXISTING ELECTRICAL / LIGHT / POWER / DATA / FIRE ALARM / FIRE PROTECTION DEVICE(S) TO LOCATION SHOWN.
- 4 EC TO FURNISH AND INSTALL NEW OCCUPANCY CONTROLLED RECEPTACLE TO BE CONTROLLED BY 2ND POWER PACK OF OCCUPANCY SENSOR. REFER TO LIGHTING PLANS. RECEPTACLE TO BE LEVITON 5362-81W (2 EACH FOR QUAD RECEPTACLE). OCCUPANCY CONTROLLED HALF OF RECEPTACLE TO BE CONTROLLED BY 2ND LIGHTING POWER PACK. CONSTANT POWER TO GO TO REMAINING HALF OF RECEPTACLE. EC TO BREAK TANG BETWEEN RECEPTACLE HALVES.
- 5 GENERAL NOTE TYPICAL OF PROJECT: "DAISY CHAINING" OF GFI RECEPTACLES IS PROHIBITED. EACH RECEPTACLE TO BE GFI. TYPICAL OF GFI RECEPTACLES.
- 6 GENERAL NOTE TYPICAL OF PROJECT: DATA CONDUIT TO BE INDIVIDUAL 3/4" (MINIMUM) CONDUIT FROM DATA JACK TO ABOVE CEILING. COMBINING OF CONDUITS IS PROHIBITED UNLESS NOTED OTHERWISE. INCLUDE ONLY ONE DATA JACK / TERMINATION UNLESS NOTED OTHERWISE. TYPICAL OF DATA OUTLETS.
- 7 EC TO FURNISH AND INSTALL NEW GFI RECEPTACLES TO REPLACE EXISTING NON-GFI RECEPTACLES.
- 8 EC TO INCLUDE TEMPORARY POWER POLE AND DATA POLE TO RECEPTIONIST TEMPORARY LOCATION DURING PHASE 1 CONSTRUCTION. VERIFY EXACT LOCATION IN FIELD. REMOVE POWER AT COMPLETION OF PHASE 1 CONSTRUCTION. DATA TO BE LEFT COILED ABOVE CEILING FOR FUTURE USE.

LOW VOLTAGE SCOPE OF WORK

REFER TO SHEET LV2.

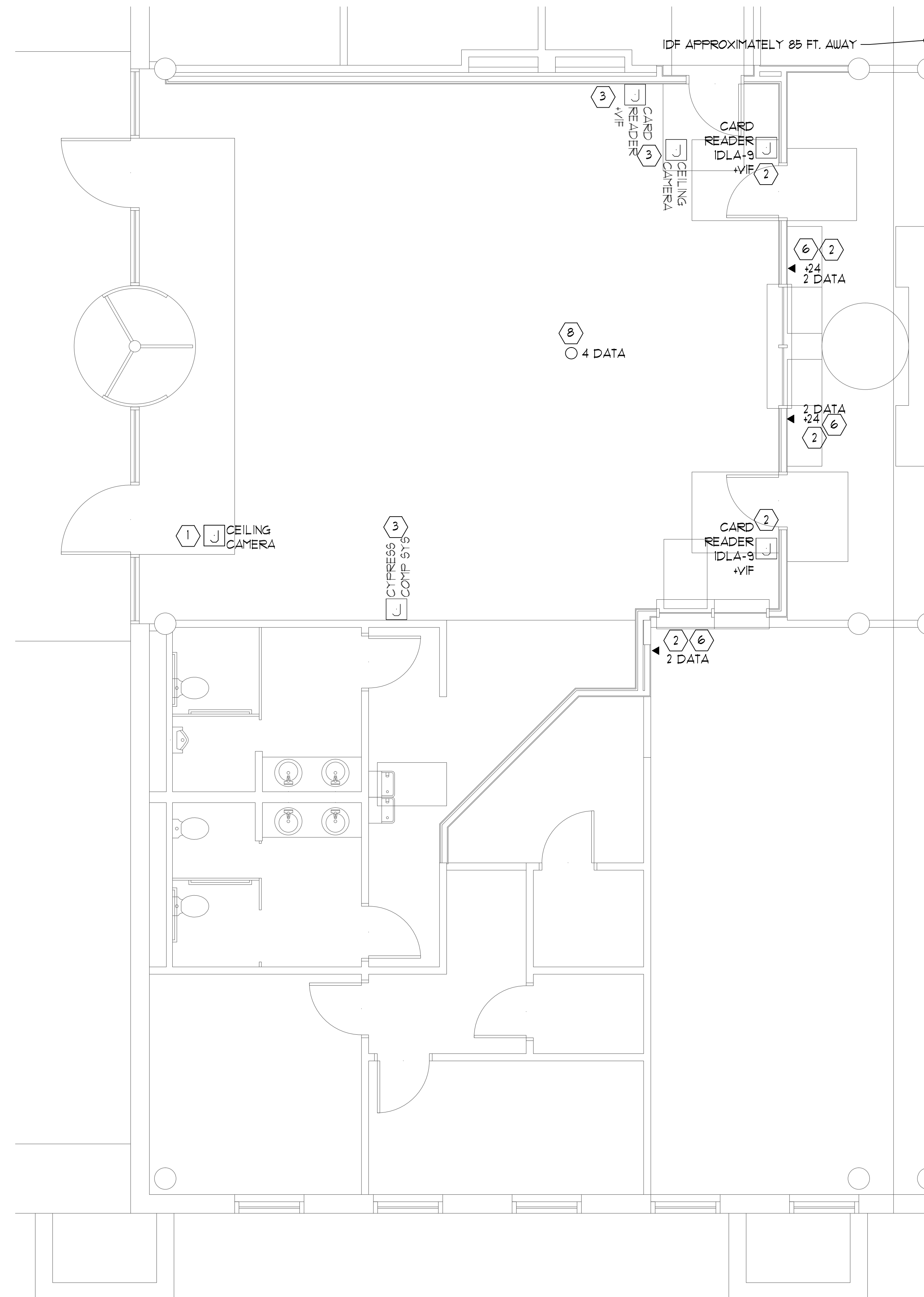
ALL WORK TO BE DONE WITH PANDUIT JACKS, CABLE, ETC. AS REQUIRED PER PANDUIT CERTIFICATION. PROJECT TO BE PANDUIT CERTIFIED.

LOW VOLTAGE FOR MOTOROLA OR COG NOT COVERED IN MEP SCOPE OF WORK

COLOR STANDARDS:

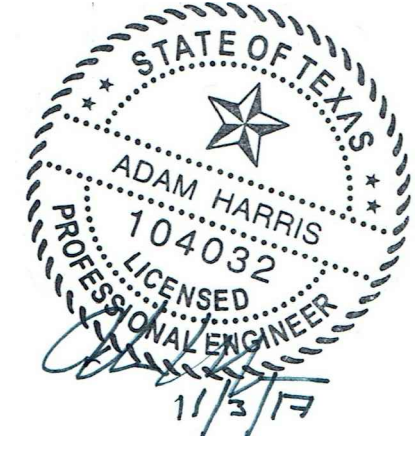
- RED: 911
- BLUE: COUNTY DATA LINES
- YELLOW: COUNTY WIRELESS ACCESS POINTS
- PURPLE: COUNTY ANALOG PHONE LINES
- GREEN: COUNTY AUDIO / VISUAL CONNECTIONS
- GREY: MOTOROLA
- RADIO CONNECTIONS TO BE DETERMINED

ALL TOMBSTONE COLORS TO MATCH CABLE COLOR



1 LOW VOLTAGE PLAN
SCALE: 1/4" = 1'-0"

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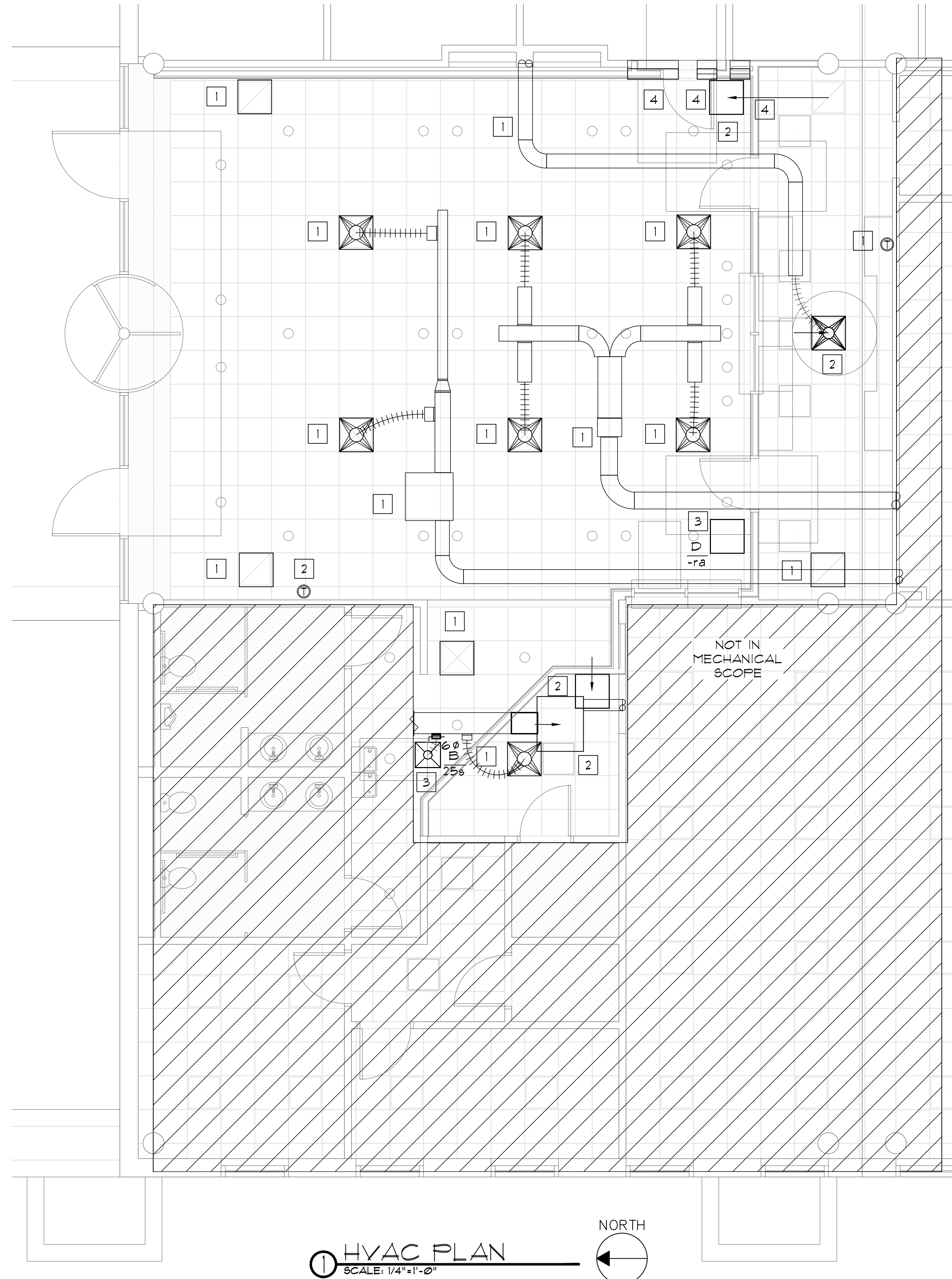
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Drawing Title			
LOW VOLTAGE PLANS			
Drawing No.			
LV1			
Scale			
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		Consult. Job No.	XXXXX

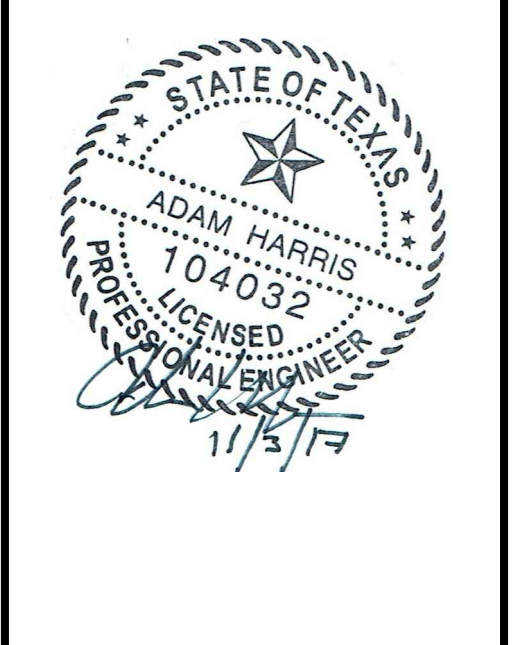
DRAWING LEGEND	
DETAIL	DESCRIPTION
	SUPPLY DIFFUSER WITH RIGID ROUND ELBOW CONNECTION AND INSULATED FLEXIBLE DUCT RUNOUT
	RETURN GRILLE WITH RIGID ROUND ELBOW CONNECTION AND INSULATED FLEXIBLE DUCT RUNOUT
	FAN (EXHAUST, TRANSFER, ETC.) REFER TO SCHEDULE
	THERMOSTAT (FOR FURNACE, RTU ETC.)
	SPACE TEMPERATURE SENSOR (DUCT MOUNTED UNLESS NOTED OTHERWISE)
	SMOKE DUCT DETECTOR
	HUMIDITY SENSOR (DUCT MOUNTED UNLESS SHOWN / NOTED OTHERWISE)
	CO2 SENSOR (DUCT MOUNTED UNLESS SHOWN / NOTED OTHERWISE)
	MOTORIZED DAMPER
	RECTANGULAR OR ROUND SUPPLY OR RETURN DUCT (AS NOTED)
	ROUND INSULATED FLEXIBLE DUCT
	LOCKING MANUAL BALANCE DAMPER
	RECTANGULAR TAKE-OFF FROM RECTANGULAR DUCT WITH LOCKING VOLUME DAMPER
	ROUND TAKE-OFF FROM RECTANGULAR DUCT WITH LOCKING VOLUME DAMPER
	TURNING VANES (DOUBLE WALLED)
	DIFFUSER DESIGNATION S: SUPPLY AIR R: RETURN AIR E: EXHAUST AIR O: OUTSIDE AIR

NEW MECHANICAL NOTES

- 1 EXISTING TO REMAIN MECHANICAL DEVICE(S). MC TO REWORK WITH NEW WALL / CEILING / FLOOR AS NEEDED.
- 2 MC TO RELOCATE EXISTING MECHANICAL DEVICE TO LOCATION SHOWN IN NEW PLANS. CONNECT WITH NEW DUCTWORK, FLEX, AND TRANSITIONS AS NEEDED. DUCTWORK / FLEX FREE AREA SIZE INDICATED ON PLANS. FLEX NOT TO EXCEED 6'. MC TO FURNISH AND INSTALL PREMIUM LOCKING QUADRANT DAMPER PER SUPPLY / EXHAUST DIFFUSER / GRILLE.
- 3 NEW MECHANICAL DEVICE. MC TO FURNISH AND INSTALL NEW DUCTWORK, FLEX, AND TRANSITIONS AS NEEDED. DUCTWORK / FLEX FREE AREA SIZE INDICATED ON PLANS. FLEX NOT TO EXCEED 6'. MC TO FURNISH AND INSTALL PREMIUM LOCKING QUADRANT DAMPER PER SUPPLY / EXHAUST DIFFUSER / GRILLE UNLESS DAMPER INCLUDED IN DIFFUSER / GRILLE. MC TO FURNISH AND INSTALL LAY-IN OR DRYWALL CEILING ADAPTER AS NEEDED.
- 4 MC TO MATCH OPENING SAME SIZE AS EXISTING IN NEW WALL TO DECK. VERIFY QUANTITY / LOCATION. MC TO FURNISH AND INSTALL NEW SHEET METAL SLEEVE.



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MECHANICAL PLANS	
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GENERAL MECHANICAL NOTES

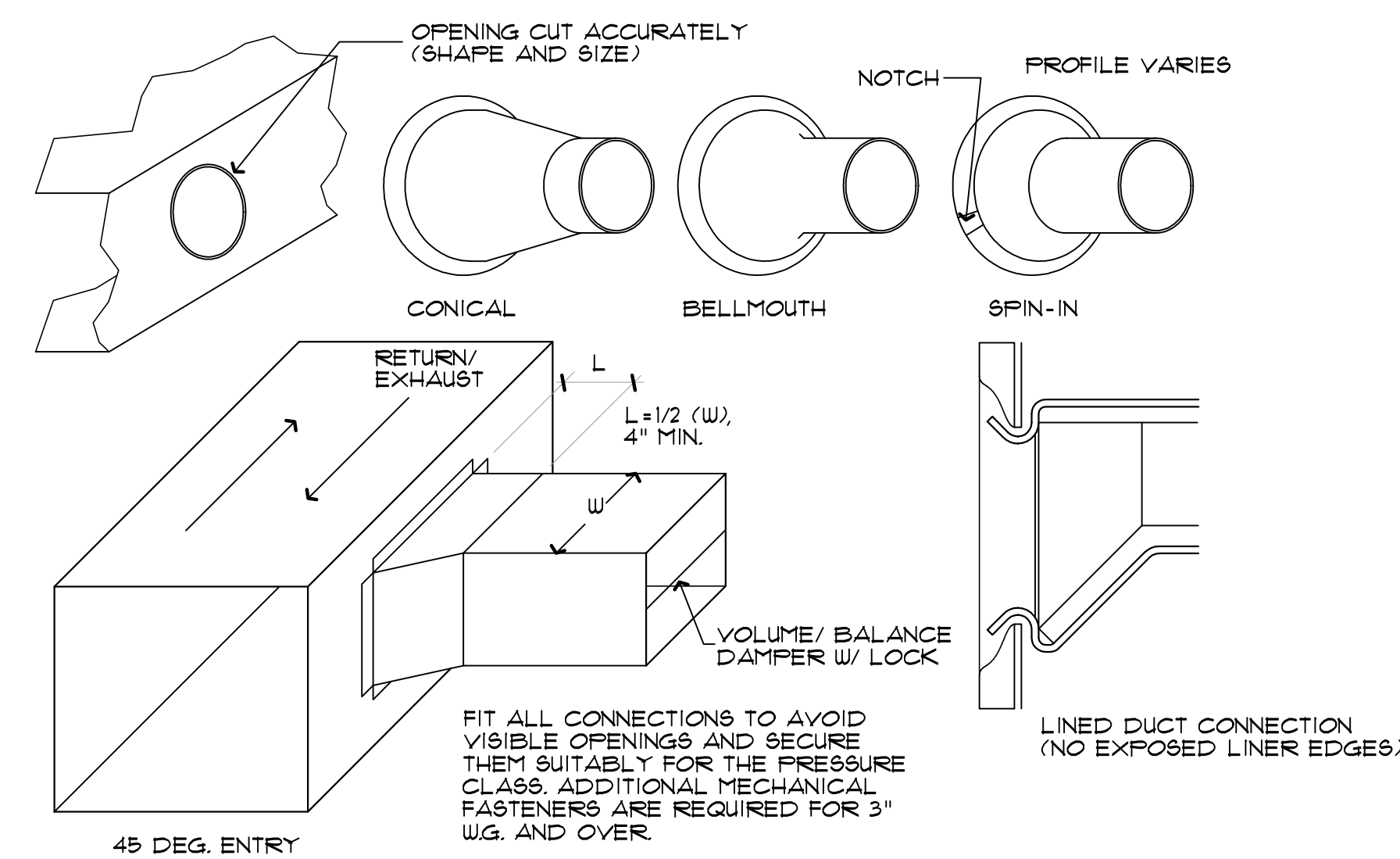
- 1 THE MECHANICAL SUBCONTRACTOR SHALL PROVIDE A COMPLETE AND USABLE SYSTEM WITHIN THE INTENT AND SPIRIT OF THAT INDICATED BY THIS DRAWING. WORK OR MATERIALS NOT SHOWN BY THIS DRAWING, BUT NECESSARY TO COMPLETE THE SYSTEM SHALL BE INCLUDED AT NO ADDITIONAL COST. THE MECHANICAL SUBCONTRACTOR SHALL FURNISH AND INSTALL ALL HVAC SYSTEM REQUIREMENTS INCLUDING GRILLES, DIFFUSERS, DUCTWORK, CONTROLS, CONTROL WIRING, DUCTWORK, EQUIPMENT, HVAC PIPING, CUTTING AND PATCHING, ETC.
- 2 THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS, MAKE ADJUSTMENTS TO AVOID CONFLICT. NOTIFY THE ENGINEER IN WRITING OF SIGNIFICANT CONSTRUCTABILITY ISSUES.
- 3 PROVIDE VOLUME DAMPERS WHERE INDICATED.
- 4 ALL RECTANGULAR AND ROUND DUCTWORK SHALL BE GALVANIZED SHEET METAL, FABRICATED AND SUPPORTED TO SMACNA STANDARDS. ALL SUPPLY DUCT SHALL HAVE 2" ISF BLANKET INSUL W/ VAPOR BARRIER (R-8). EXPOSED DUCTWORK THAT IS ROUND TO BE SPIRAL AND TO HAVE 1" LINER, INSIDE DIAMETER AS SHOWN. FURNISH AND INSTALL NEOPRENE FLEX CONNECTION BETWEEN DUCTWORK AND RTUS/AHUS.
- 5 FLEXIBLE DUCT SHALL BE FLEXMASTER TYPE V OR EQUAL FIBERGLASS INSULATED TYPE. FLEX DUCT SHALL NOT EXCEED 6' IN LENGTH. RIGID ROUND DUCT WITH EXTERIOR INSULATION. USE RIGID ROUND DUCT WITH EXTERIOR INSULATION ABOVE WHERE SHOWN ON THE PLAN. USE RIGID ELBOW FITTINGS WHENEVER POSSIBLE TO AVOID UNNECESSARY CHANGE OF DIRECTION WITH FLEXDUCT.
- 6 SEAL ALL DUCTWORK SEAMS WITH FIBERGLASS TAPE IMBEDDED IN ARABOL SEALER OR ALUMINUM TAPE. DUCT TAPE IS NOT ACCEPTABLE. VAPOR SEAL ALL EXTERIOR INSULATION WITH ALUMINUM TAPE. DUCT TAPE IS NOT ACCEPTABLE.
- 7 CONTRACTOR SHALL ADJUST CURB PLACEMENT AND TRANSITION DUCTWORK AS REQUIRED TO CLEAR STRUCTURAL AND OTHER OBSTACLES. THE CONFIGURATION OF THE STRUCTURE AND OTHER OBSTACLES IN THE EXISTING BUILDING IS NOT KNOWN IN DETAIL. THE CONTRACTOR WILL INVESTIGATE, VERIFY THE DESIGN SHOWN, AND ADJUST AS REQUIRED.
- 8 ALL WORK SHALL COMPLY WITH APPLICABLE CODES, REGULATIONS, LAWS AND THE DETERMINATIONS OF THE LOCAL BUILDING OFFICIAL AT NO EXTRA COST. THE CONTRACTOR SHALL INFORM THE ENGINEER IN WRITING OF ANY CONFLICT BETWEEN THE PLANS AND APPLICABLE CODES.
- 9 ALL MATERIALS WILL BE NEW AND IN NEW CONDITION. SCRATCH AND DENTED, SECONDHAND, SURPLUS, ETC ARE NOT ACCEPTABLE.
- 10 ELECTRICAL CONNECTIONS 120V OR HIGHER SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL SUBCONTRACTOR. MECHANICAL SHALL COORDINATE THIS WORK. MECHANICAL SHALL FURNISH DUCT SMOKE DETECTORS AS REQUIRED TO ELECTRICAL FOR FIRE ALARM INSTALLATION.
- 11 THE MECH SUBCONTRACTOR SHALL START UP EACH UNIT, TEST FOR HEAT AND COOL OPERATION, INSURE ALL DUCTWORK IS FREE OF RATTLES, LEAKS, WHISTLES, ETC. AN INDEPENDENT CONTRACTOR SHALL BALANCE THE SYSTEM AS INDICATED BY DRAWINGS, RTU SCHEDULE, AND VENTILATION SCHEDULES. SUBMIT FOUR COPIES OF A CERTIFIED TEST AND BALANCE REPORT TO THE ARCHITECT FOR APPROVAL. UPON APPROVAL CONTRACTOR SHALL FILE REPORT WITH LOCAL AUTHORITY.
- 12 WHEN SYSTEMS ARE COMPLETE AND OPERATIONAL, A "PUNCH LIST" INSPECTION SHALL BE REQUESTED BY THE CONTRACTOR. SUCH AN INSPECTION SHALL NOT BE CONDUCTED ON INCOMPLETE OR NON-OPERATIONAL SYSTEMS.
- 13 ALL DUCTWORK (SUPPLY AND RETURN) IN UNCONDITIONED SPACES SHALL BE INSULATED WITH A MINIMUM VALUE OF R-5 INSULATION. ALL DUCTS OUTSIDE OF THE BUILDING ENVELOPE SHALL BE INSULATED WITH R-8 MINIMUM.
- 14 DUCTS SHALL BE SUPPORTED WITH APPROVED HANGERS AT INTERVALS NOT EXCEEDING 10 FEET OR BY OTHER APPROVED DUCT SUPPORT SYSTEMS DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE. FLEXIBLE AND OTHER FACTORY MADE DUCTS SHALL BE SUPPORTED IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS.
- 15 SMOKE DETECTORS SHALL BE INSTALLED IN RETURN AIR SYSTEMS WITH A DESIGN CAPACITY GREATER THAN 2000 CFM IN THE RETURN AIR DUCT OR FLENUM UPSTREAM OF ANY FILTERS, EXHAUST AIR CONNECTIONS, OUTDOOR AIR CONNECTIONS, OR DECONTAMINATION EQUIPMENT AND APPLIANCES.
- 16 UPON SELECTION OF MECHANICAL APPLIANCES SUBMIT MANUFACTURING INSTALLATION INSTRUCTION TO BUILDING DEPARTMENT, INCLUDE ANY LISTING FOR OUTDOOR INSTALLATION, IF APPLICABLE.
- 17 EQUIPMENT SHALL BE INSTALLED AS REQUIRED BY THE TERMS OF THEIR APPROVAL, IN ACCORDANCE WITH THE CONDITIONS OF THE LISTING, THE MANUFACTURERS INSTALLATION INSTRUCTIONS AND APPLICABLE CODES. MANUFACTURERS INSTALLATION INSTRUCTIONS SHALL BE AVAILABLE ON THE JOB SITE FOR INSPECTION.
- 18 ALL COVERING, LININGS, ADHESIVES, WHEN USED SHALL HAVE A FLAME SPREAD RATING NOT MORE THAN 25 AND SMOKE DEVELOPED RATING NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM-E84.

AIR DEVICE SCHEDULE

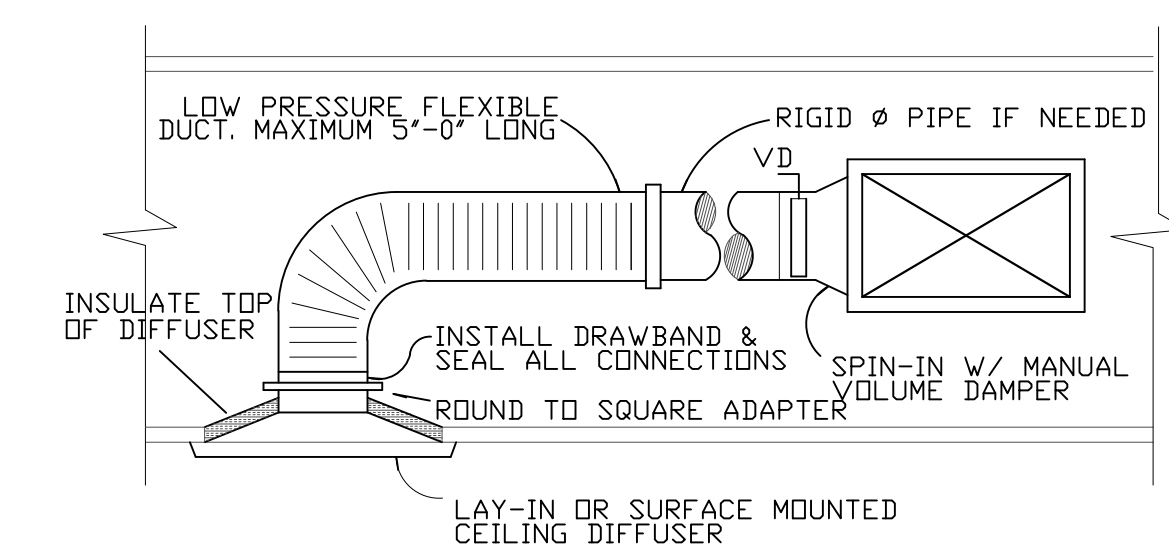
MARK	TYPE	NECK SIZE	FACE SIZE	THROW PATTERN	MOUNTING	TITUS OR AS INDICATED
A	DIRECTIONAL CEILING DIFFUSER	6"φ	24"x24"	4-WAY	LAY-IN	TMS 6 24x24 326
B	DIRECTIONAL CEILING DIFFUSER	6"φ	12"x12"	4-WAY	LAY-IN	TMS 6 12x12 326
C	CUBE CORE CEILING RETURN	22"x10"	24"x12"	-	LAY-IN	50F
D	CUBE CORE CEILING RETURN	22"x22"	24"x24"	-	LAY-IN	50F
E	DIRECTIONAL CEILING DIFFUSER	8"φ	24"x24"	4-WAY	LAY-IN	TMS 8 24x24 326

NOTES:

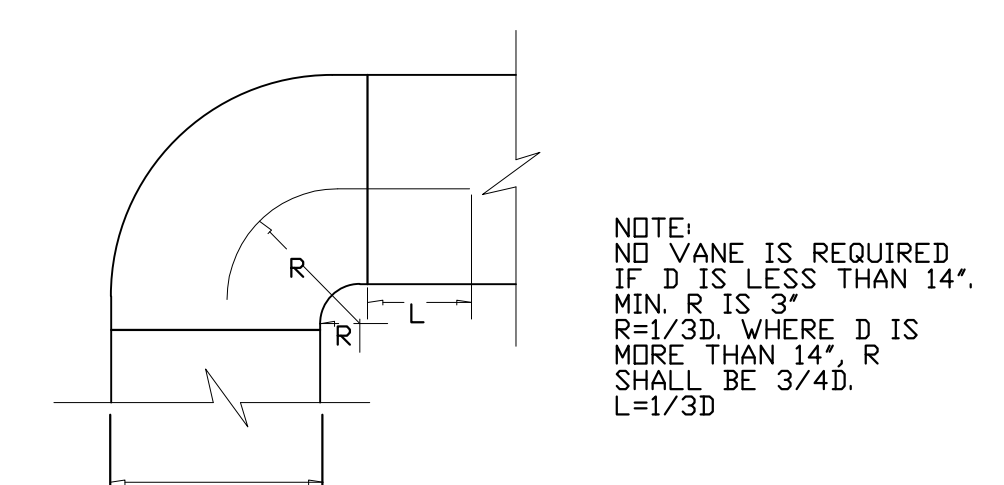
1. MECHANICAL CONTRACTOR TO PROVIDE SQUARE TO ROUND TRANSITIONS AS REQUIRED. PROVIDE LAY-IN FRAME WHERE REQUIRED.
2. ALL DEVICES SHALL BE METAL-AIRE, TITUS, T & B, OR APPROVED EQUAL (UNLESS NOTED OTHERWISE) COMPLETE WITH V.D.
3. ALL FRAMING REQUIRED FOR DIFFUSER INSTALLATION SHALL BE BY THE GENERAL CONTRACTOR
4. SEE MECHANICAL PLAN FOR DIFFUSER LOCATIONS



2 DUCT INSTALLATION DETAIL
SCALE:1/8\"/>



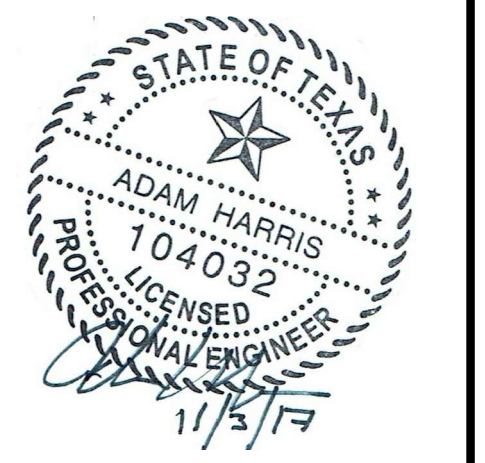
1 DIFFUSER INSTALLATION DETAIL
SCALE:1/8\"/>



3 RADIUS ELBOW DETAIL
SCALE:1/8\"/>

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MECHANICAL SCHEDULES
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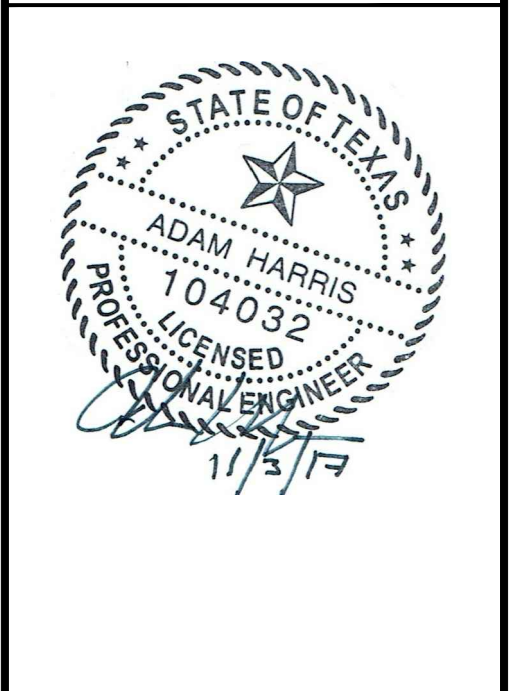
Drawing No. **M2**

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Consult Job No.	xxxxx



1 PLUMBING PLAN
SCALE: 1/4"=1'-0"

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