COLLIN COUNTY, TEXAS

ADDENDUM No. One (1) IFB NO. 11267-09

INVITATION FOR BIDS

FOR

Construction, Building: Juvenile Justice Alternative Education Building and Juvenile Probation

DATE: August 19, 2009

NOTICE TO ALL PROSPECTIVE BIDDERS:

YOU ARE HEREBY DIRECTED TO MAKE CHANGES TO THE INVITATION FOR PROPOSALS IN ACCORDANCE WITH THE ATTACHED INFORMATION.

DELETE:	001119 Advertisement for Request for Competitive Sealed Proposals
REPLACE WITH:	001119 Advertisement for Request for Competitive Sealed Proposals-REVISED (Attached) **Modifies bid opening date to September 3, 2009**
DELETE:	002116 Instructions to Offerors
REPLACE WITH:	002116 Instruction to Offerors-Revised (Attached) **Modifies 1.55 to include Builders' Risk (Item I)** **1.56: Project Schedule** **2.2 A: Project Staffing** **2.2 D: Resumes of Subs** **2.2 E: Resumes of Superintendents/Project Managers of Subs**
ADD:	Pre-Proposal attendee list (attached).

PLEASE NOTE ALL OTHER TERMS, CONDITIONS, SPECIFICATIONS DRAWINGS, ETC. REMAIN UNCHANGED. REFER TO VAI ARCHITECTS ADDENDUM NO. 1 WRITE UP FOR ADDITIONAL ADDENDUM ITEMS.

SINCERELY,
FRANKLIN YBARBO
PURCHASING AGENT

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ADDENDUM 1

Collin County Juvenile Justice
Alternative Education Program
4690 Community Ave.
McKinney, TX 75071

VAI Project No. 08005.000

August 19, 2009

ADDENDUM NO. 1
Addendum to Drawings and Specifications dated 07.15.09

NOTICE TO BIDDERS:

The following becomes part of the original Plans and Specifications, just as if printed and bound therein, and takes precedence over any items that may conflict. The bidder shall acknowledge receipt of this Addendum on his bid form, incorporating its provisions in his bid.

PROJECT MANUAL REVISIONS:

The following revisions to the specifications are considered part of the Contract Documents:

ITEM NO. 1

Specification Section 00 4213 – Proposal Form:
ADD: Alternate No. 3 Add "Shell Building" and associated site improvements at Classroom Pod "A"
Alternate No. 4 Add "Interior Finish-out" at Classroom Pod "A"

ITEM NO. 2

Specification Section 00 6113.13 – Performance Bond:
ADD: Section in its entirety.

ITEM NO. 3

Specification Section 01 2300 – Alternates:
ADD: Alternate No. 3 and No. 4

ITEM NO. 4

Specification Section 01 0510 – Exterior Design Selections:
ADD: Masonry textures to brick types and change size for BK4.

ITEM NO. 5

Specification Section 05 12 00–1.3–K-1:
REVISE: Requirement for certification by AISC Quality Control Program was eliminated.

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ADDENDUM 1

ITEM NO. 6

Specification Section 05 31 13-2.1-A-2:
ADD: composite 3" deep 20 gauge type 3 ES Floor-Dek by Metal Dek Group of CSi to list of approved materials.

ITEM NO. 7

Specification Section 05 31 23-2.1-A:
ADD: Type B-Dek roof deck by Metal Dek Group of CSi to list of approved materials.

ITEM NO. 8

Specification Section 08 3313 – Overhead Coiling Counter Doors
DELETE: References to fire rated door requirements.

ITEM NO. 9

Specification Section 08 4400 – Glazed Aluminum Wall Systems:
REVISE: Paragraph 2.2, A., 1, to read as follows:

Aluminum Storefront System: Kawneer ~~2250 IG~~ Trifab VG 451 Center Glazed.

ITEM NO. 10

Specification Section 10 1000 – Visual Display Surfaces:
REVISE: Add Porcelain Enamel Marker Board Material Paragraph; revise Tackboard Material Paragraph; add additional accessories.

ITEM NO. 11

Specification Section 230900 – Instrumentation and Control for HVAC:
ADD: Section in its entirety.

ITEM NO. 12

Specification Section 238219 – Fan Coil Units:
ADD: 2.2G 5. The entire cabinet shall have double wall construction.

ITEM NO. 13

Specification Section 260513 MediumVoltage Cables:
CHANGE: 2.2A to MV105

ITEM NO. 14

Specification Section 262413 – Switchboards:
ADD: B. Siemens
C. Cutler Hammer

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ADDENDUM 1

ITEM NO. 15

Specification Section 262416 Panelboards:
ADD: 2.2A
1. Siemens
2. Cutler Hammer

ITEM NO. 16

Specification Section 263213 – Standby Power Systems 125 KW Generator:
DELETE: APC and +ATS Set from title
ADD: 1D Kohler and Detroit Diesel are approved bidders.
CHANGE: 2.A.1 from 3 to 4 wire.
DELETE: 2.3G 1 and 3 APC
DELETE: 2.3H.5
CHANGE: 2.3.H.C from 24 to 8 hours
CHANGE: 4.A from 10 days to 30 days.

ITEM NO. 17

Specification Section 263600 Transfer Switches:
ADD: Section in its entirety.

ITEM NO. 18

Specification Section 283111 – Fire Alarm and Life Safety System:
CHANGE: 1.1.1 Multiplex EST QS4 to Edwards EST 3 System
CHANGE: 1.1.2 GE Security to Edwards

ITEM NO. 19

Specification Section 231123 – Facility Natural Gas Piping:
DELETE: Section in its entirety.

ITEM NO. 20

Specification Section 323224 – Stone Strong Precast Modular Block Retaining Wall System:
ADD: Section in its entirety.

ITEM NO. 21

Specification Section 329300 - Landscaping 2.1-F-5
REVISE: Canopy trees shall be a minimum of three inches in caliper as measured 24 inches above the ground.

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ADDENDUM 1

DRAWING REVISIONS:

The following revisions to the drawings are considered part of the Contract Documents:

ARCHITECTURAL:

ITEM NO. 1

Drawing A2.02:
CHANGE: Classroom Pod "A" shell building will be bid as Alternate No. 3 similar to Pod "D" Alternate No.1. The interior finish-out will be Alternate No. 4. An exterior wall from Grids 2 to 4 will part of base bid similar to what is being done for Alternate No. 1 refer to 10/A6.02 for wall condition to close off Corridor A103 from the exterior and 04/A5.02 for similar elevation. Provide MEP as per Alternate No.1 for Alternate No. 3 refer to Sheets 01/M2.05, 01/P2.05, 01/E3.05.

CHANGE: Tackboards – Add (1) 4'x4' Tackboard in each of the following rooms. Mount top at 7'-0" AFF. Final location in rooms to be determined:
A107 Classroom, A108 Classroom, A109 Classroom, A110 Classroom, A115 Classroom, A116 Classroom, A117 Classroom, A118 Classroom, A121 Computer/Media Center, A122 Computer/Media Center
B103 Classroom, B104 Classroom, B105 Classroom, B106 Classroom, B111 Classroom, B112 Classroom, B113 Classroom, B114 Classroom, B117 Computer/Media Center, B118 Computer/Media Center
B124 Classroom, B125 Classroom, B126 Classroom, B127 Classroom, B132 Classroom, B133 Classroom, B134 Classroom, B135 Classroom, B138 Computer/Media Center, B139 Computer/Media Center

ITEM NO. 2

Drawing A2.04:
CHANGE: Indicated location of basketball goal in Multi-Purpose C186.

ITEM NO. 3

Drawing A2.05 – 01 & 02:
CHANGE: Added "SIM" to wall section callouts 06, 07 & 08/A6.02

ITEM NO. 4

Drawing A4.01 – 01
CHANGE: Added locations of roof splash blocks and ground splash block.

ITEM NO. 5

Drawing A4.02 – 01
CHANGE: Added locations of roof splash blocks and ground splash block.

ITEM NO. 6

Drawing A5.01 – 01, 03, 06, & 07
CHANGE: Tagged locations of metal gutters and downspouts on elevations.

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ADDENDUM 1

ITEM NO. 7

Drawing A5.03 – 01, 02 & 03:
CHANGE: Added note "NO BASEMENT AT ALTERNATE" to elevations.

Revised Exterior Finish Legend brick size for BK4 to 4"x4"x12".

ITEM NO. 8

Drawing A6.02 – 06, 07 & 08:
CHANGE: Added note "NO BASEMENT AT SIM" to wall sections 06, 07 & 08

ITEM NO. 9

Drawing A8.01 – Door Schedule
CHANGE: Added additional information for base bid doors M101A, M101B, M102, A103, A103A, A104B, B100B, C100A, C124B, C125, C126, C127A, C127B, C158, C167, C171, C180B, C186A.

Added additional information for Alternate doors M103, B121B

ITEM NO. 10

Drawing A9.01:
CHANGE: Room Finish Schedule – Provide SC01 (Sealed Concrete) in lieu of STC01 (Stained Concrete) floor finish in all rooms where STC01 is designated. Stained Concrete is not used on this project. Refer to Section 09 6150 Concrete Floor Sealer for specification requirements.

CHANGE: Room Finish Schedule – Revise Floor Finish at C124 Lounge and C174 Break to VCT01 only in lieu of VCT01/CPT01.

CHANGE: Room Finish Schedule – Add M101 Mechanical. Floor finish to be SC01 Sealed Concrete. No base required. Wall finish – exposed concrete block; no paint required. Ceiling finish – exposed structure; no paint required.

CHANGE: Room Finish Schedule – Revise the following:
A114 Electrical – Revise base to RB01. Revise wall finish to IPT01. Delete SGWB01 ceiling. Add Note 14 - "Exposed structure painted IPTXX".
B110 Electrical – Revise base to RB01. Revise wall finish to IPT01. Delete SGWB01 ceiling. Add Note 14 - "Exposed structure painted IPTXX".
B131 Electrical – Add Note 14 - "Exposed structure painted IPTXX".
C119 Restroom Vestibule – Revise floor finish to CT03. Revise base finish to CMB03.
C127 Vestibule – Revise floor finish to CT01.
C168 Corridor – Revise floor finish to CT01. Revise base finish to CMB01.
C178 Restroom Vestibule - Revise floor finish to CT03. Revise base finish to CMB03.
C180 Kitchen – Revise floor finish to QT01 (Quarry tile per Section 01 0520 Interior Design Selections). Provide 6" Quarry tile base to match.
C184 Restroom – Revise floor finish to CT03. Revise base finish to CMB03. Revise wall finish to CT05 on all walls.

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ADDENDUM 1

ITEM NO. 11

Drawing A9.02:
CHANGE: Interior Elevation 03 and 04 – Revise to include clarification of the extent of RLS01 (Resilient Linoleum Sheet) wainscot. Note RLS01 wainscot will be provided on all wall surfaces in Corridors serving Classroom Pods.

CHANGE: Interior Elevation 05/A9.02 – Ceramic tile CT05 will be provided on the wall surfaces adjacent to the EWC's. Delete ceramic tile on ceiling furr-down directly above EWC's.

Provide ceramic tile CT05 in a similar application adjacent to the EWC's in Corridor B101 and Corridor B122.

Add ceramic tile CT05 full height on the fixture wall only adjacent to the EWC's in Corridor C101 and RR Vestibule C178.

ITEM NO. 12

Drawing A9.03:
CHANGE: Interior Elevation 01 – Revise Atlas Brick to BK4.

Drawing A9.03:
CHANGE: Interior Elevation 04 – Revise brick band to stop at exterior glazed wall.

ITEM NO. 13

Drawing A9.04:
CHANGE: Interior Elevation C180 Kitchen – Refer to detail 10/A9.04 included with this Addendum for stainless steel counter.

MECHANICAL:

ITEM NO. 1

Drawing MEP1.03:
CHANGE: Show gas service and edit various notes.

ITEM NO. 2

Drawing M3.01:
CHANGE: Modify notes as indicated.

ELECTRICAL:

ITEM NO. 1

Drawing E3.02:
ADD: Note to confirm desired location of special ed. data and receptacle location.

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ADDENDUM 1

ITEM NO. 2

Drawing E3.04:
ADD: Note confirming the requirement Forest System 3 fire alarm.

ITEM NO. 3

Drawing E5.02:
CHANGE: Show pole lighting detail as “not used: refer to structural.”

ITEM NO. 4

Drawing E6.01:
ADD: Notes indicating the required AIC Rating for the electrical panels.

LANDSCAPE IRRIGATION:

ITEM NO. 1

Drawing IR 1.00 and IR 1.00A
CHANGE: Revisions in irrigation head placement surrounding parking lots.

CIVIL:

ITEM NO. 1

Drawing C2.1, C7.1
CHANGE: Revised Stone Strong Retaining Wall note (Reference attached drawing – C2.1, C7.1)

ITEM NO. 2

Drawing C3.1, C8.1
CHANGE: Revised grading in bar ditch, revised grading at storm drainage discharge location at the base of the retaining wall (Reference attached drawing – C3.1, C8.1)

ITEM NO. 3

Drawing C3.4
CHANGE: Revised the size of storm drainage line “ST-1”, revised storm drainage calls on storm drainage line “ST-1” to identify all laterals, revised the alignment of storm drainage line “ST-3”, added additional TXDOT Type “R” grouted rock rip rap at the edge of the concrete apron in the City’s right-of-way, revised City pavement section for replacement pavement over storm drainage line “ST-2”, revised note for pavement replacement over storm drainage line “ST-2” to include directions for contractor to maintain one lane of traffic operations at all times, clarified the thickness of the concrete apron around the headwall for storm drainage line “ST-2”. (Reference attached drawing – C3.4)

ITEM NO. 4

Drawing C3.5
CHANGE: Revised the sixe of Line “ST-1”, Revised the outfall profile for Line “ST-2”, Revised the elevations of Line “ST-3”, identified the thickness of the concrete apron at entry headwall of Line “ST-2”, included note about erosion control blankets on sections A-A, B-B, and C-C (Reference attached drawing – C3.5)

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ITEM NO. 5

Drawing C3.7
CHANGE: Revised details to match plan sheets (Reference attached drawing – C3.7)

ITEM NO. 6

Drawing C4.3
CHANGE: Included note instructing contractor to install internal drop connection for the sanitary sewer line if the existing manhole is found to be 6' in diameter (Reference attached drawing – C4.3)

ITEM NO. 7

Drawing C6.1
CHANGE: Revised typical ditch section note (Reference attached drawing – C6.1)

ITEM NO. 8

Drawing C6.2
CHANGE: Revised typical ditch section note (Reference attached drawing – C6.2)

ITEM NO. 9

Drawing C6.1
CHANGE: Revised typical ditch section note (Reference attached drawing – C6.1)

END OF ADDENDUM NO. 1

COLLIN COUNTY JUVENILE JUSTICE

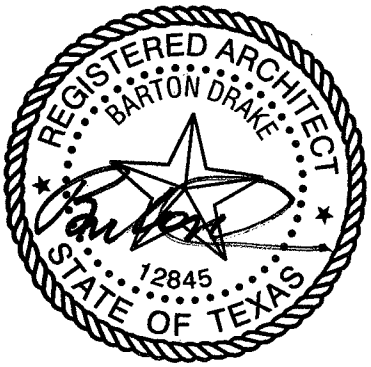
McKinney, Texas

PROJECT MANUAL

Addendum 1

ALTERNATIVE EDUCATION PROGRAM

vai
architects
16000 North Dallas Parkway, Suite 200
Dallas, Texas 75248



HKS
ARCHITECTURE ENGINEERING INTERIORS
1919 McKinney Avenue
Dallas, Texas 75201

Project No. 11824.000

August 19, 2009

COLLIN COUNTY JUVENILE JUSTICE
ALTERNATIVE EDUCATION PROGRAM
McKINNEY, TEXAS

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SECOND COLUMN: SHADED INDICATES SECTION IS INCLUDED IN CURRENT PRINTING

THIRD COLUMN: REVISION NUMBER ("O" INDICATES ORIGINAL, REVISIONS ARE NUMBERED CONSECUTIVELY)

FOURTH COLUMN: SPECIFICATION SECTION NUMBER

FIFTH COLUMN: SPECIFICATION SECTION TITLE

NOTE FOR REVISED SPECIFICATION SECTIONS

1. DELETED INFORMATION IS INDICATED BY A STRIKETHROUGH (IE, ~~THIS IS DELETED~~).
2. NEW INFORMATION IS INDICATED BY A DOUBLE UNDERLINE (IE, THIS IS ADDED).
3. ALL REVISED INFORMATION IS FURTHER IDENTIFIED BY A HEAVY VERTICAL LINE TO THE RIGHT OF ALL REVISIONS IN EACH INDIVIDUAL SPECIFICATION SECTION (REFER TO HEAVY BOLD LINE TO THE RIGHT FOR AN EXAMPLE).

Issue and Revision History

110408	☐		Design Development Progress Set
022709	☐		50% Construction Documents
040609	☐		100% Construction Documents
071509	☐		Bid Documents
081909	☒		Addendum 1

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

DIVISION 01 - GENERAL REQUIREMENTS

DIVISION 02 - EXISTING CONDITIONS

DIVISION 03 - CONCRETE

DIVISION 04 - MASONRY

DIVISION 05 - METALS

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

DIVISION 08 - OPENINGS

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DIVISION 32 - EXTERIOR IMPROVEMENTS

DIVISION 33 - UTILITIES

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SECTION 00 1119 - ADVERTISEMENT FOR REQUEST FOR COMPETITIVE SEALED PROPOSALS-REVISED

BY ORDER OF the Collin County Commissioners Court, Collin County, Texas, proposals will be received electronically through the BidSync web site located at www.bidsync.com. Offerors are encouraged to submit proposals electronically by utilizing the BidSync System. However, you may submit a sealed hard copy paper proposal to the Office of the Collin County Purchasing Agent. All proposals, both electronic or hard copy paper form must be submitted as stated below:

SUBMIT HARD COPY PAPER PROPOSALS 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, September 3, 2009

MARK ENVELOPE:

CSP No. **11267-09**
Project: **CONSTRUCTION, BUILDING: JUVENILE JUSTICE ALTERNATIVE EDUCATION PROGRAM (JJAEP) AND JUVENILE PROBATION**

ALL PROPOSALS 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 the construction of a new Alternative Education Program Building; Project Location: Community Avenue (adjacent to Collin County Juvenile Detention), McKinney, TX 75071. Payment for the contract work shall be made pursuant to the terms of the Contract Documents.

Collin County uses BidSync 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 proposal. Hard copy paper proposal 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 proposals must be received at the designated location by the deadline shown. Proposals 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 proposal forms provided in this Competive Sealed

Proposal must be completed prior to submission. Failure to complete the forms shall render your proposal null and void. We would appreciate you indicating on your "NO BID" response any requirements of this proposal request which may have influenced your decision to "NO BID".

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

A MANDATORY PRE-PROPOSAL CONFERENCE will be held by Collin County in the Commissioners' Courtroom located at the Collin County Administration Building, 4th Floor, 2300 Bloomdale Rd., McKinney, TX 75071 on Tuesday, August 11, 2009, at 9:00 a.m. in order for Offerors to ask questions regarding the proposed work. All Offerors desiring to bid the work should have a representative at the pre-proposal conference; Offerors that do no attend the pre-proposal conference shall not be considered in the evaluation for award of a contract per Texas Local Government Code 262.0256. Attendance shall be mandatory at the pre-proposal conference.

No oral, telegraphic, telephonic or facsimile proposalswill be considered. IFB's, RFP's, CSP's, RFQ's and RFI's may be submitted in electronic format via BidSync at www.bidsync.com.

BID SECURITY: All Offerors 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, Suite 3160, McKinney, TX 75071 and shall be delivered in an envelope, marked plainly on the outside with the CSP 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: mdobecka@collincountytx.gov

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 PROPOSAL DOCUMENTS: Drawings, specifications, instructions to Offerors, and bidding and contract documents may be examined without charge at the following locations:

VAI Architects, Inc.
16000 North Dallas Pkwy
Suite 200

FW Dodge McGraw Hill
9155 Sterling Dr.
Suite 160

Dallas, TX 75248
Phone: (972) 934-8888
Fax: (972) 458-2323

Irving, Texas 75063
Phone: (972) 819-1310
Fax: (775) 429-0593

iSqFt
14109 Inwood Rd.
Dallas, Texas 75244
Phone: (888) 601-5761
Fax: (866) 570-8187

North Texas Construction Report
2828 Trinity Mills Pkwy., Suite 330
Carrollton, Texas 75006
Phone: (972) 820-9020
Fax: (972) 820-8910

OFFERORS MAY SECURE copies of the Proposal Documents from Southwestern Blueprint Company, 4827 Keller Springs Rd., Addison, TX 75001, 972-250-1414, www.swbp.com

1. Complete sets of Drawings and Specifications may be purchased upon nonrefundable payment of $309.50 per set; payable to: Southwestern Blueprint Company.

2. Partial sets of Drawings and Specifications will not be available.

END OF SECTION

SECTION 00 2116 - INSTRUCTIONS TO OFFERORS-REVISED

PART 1 - GENERAL REQUIREMENTS

1.1 GENERAL INFORMATION

A. Collin County ("Owner") is soliciting Competitive Sealed Proposals ("Proposals") for selection of a General Contractor firm for “Name of Project” ("Project"), by order of Commissioners’ Court of Collin County per Vernon’s Texas Codes Annotated Local Government Code, Chapter 271, and Section 271.116 and in accordance with the terms, conditions, and requirements set forth in this Request for Competitive Sealed Proposals ("CSP").

B. This CSP provides the information necessary to prepare and submit Competitive Sealed Proposals for consideration and ranking by the Owner.

C. The award of the contract shall be made to the responsible offeror whose proposal is determined to be the “best value” for the County resulting from negotiation, taking into consideration the relative importance of price and other factors set forth in the Request For Competitive Sealed Proposals in accordance with Vernon’s Texas Code Annotated, Local Government.

EVALUATION CRITERIA	ASSIGNED POINTS
1. OFFEROR’S ABILITY TO PROVIDE CONSTRUCTION SERVICES	15
2.QUALIFICATIONS OF CONSTRUCTION TEAM	10
3.OFFEROR’S PAST PERFORMANCE ON COLLIN COUNTY (IF APPLICABLE) AND REPRESENTATIVE PROJECTS	10
4. OFFEROR’S PROJECT PLANNING AND SCHEDULING FOR THIS PROJECT	10
5. OFFEROR’S QUALITY CONTROL PROGRAM FOR THIS PROJECT	5
6. OFFEROR’S PROJECT SAFETY PROGRAM FOR THIS PROJECT	5
7. OFFEROR’S WARRANTY AND SERVICE SUPPORT PROGRAM FOR THIS PROJECT	5
8. OFFEROR’S PRICING AND DELIVERY PROPOSAL	40

D. Owner may select the Proposal that offers the "best value" for the County based on the published selection criteria and on its ranking evaluation. . The Owner may request one or more offerors to attend an interview with the Owner to confirm their Proposal and answer additional questions. The Owner will then rank offerors in order to identify a "best value". The Owner may first attempt to negotiate a contract with the selected offeror. The Owner may discuss with the

selected offeror options for a scope or time modification and any price change associated with the modification. If the Owner is unable to reach a contract with the selected offeror, the Owner may formally end negotiations with that offeror and proceed to the next "best value" offeror in the order of the selection ranking until a contract is reached or all proposals are rejected.

1.2 RELATED DOCUMENTS

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

1.3 DEFINITIONS

A. All definitions set forth in the General Conditions of the Contract for Construction or in other Contract Documents are applicable to these Proposal Documents.

B. Proposal Documents include the Advertisement for Competitive Sealed Proposal, Instructions to Offerors, the proposal form, other sample Proposal and contract forms, and the proposed Contract Documents including any Addenda issued prior to receipt of proposals.

C. Addenda are written or graphic instruments issued prior to the opening of the Proposal Documents, which modify or interpret the Proposal 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. “Barton Drake” will be hereafter referred to in the Project Manual as “Architect” and all correspondence shall be addressed to:

VAI Architects, Inc.
16000 North Dallas Parkway
Suite 200
Dallas, TX 75248

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 Proposal 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 Proposal Documents.

H. The Base Proposal is the sum stated in the Proposal for which the Offeror offers to perform the Work described in the Proposal Documents as the base, to which work may be added or from which work may be deleted for sums stated in Alternate proposals.

I. An Alternate Proposal (or Alternate) is an amount stated in the Proposal to be added to or deducted from the amount of the Base Proposal in the corresponding change in the Work, as described in the Proposal Documents or in the proposed Contract Documents.

J. A Unit Price is an amount stated in the Proposal as a price per unit of measurement for materials or service as described in the Proposal Documents or in the proposed Contract Documents.

K. An Offeror/Proposer is a person or entity who submits a Proposal.

L. A Sub-Bidder is a person or entity who submits a bid to an Offeror/Proposer for materials or labor for a portion of the work.

M. A Contractor is a person or entity who is determined to be the best evaluated Offeror/Proposer to whom Owner (on the basis of Owner's evaluation as hereinafter provided) makes an award.

N. The Proposal 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

1.4 EXAMINATION OF DOCUMENTS AND SITE

A. Each Offeror/Proposer, by making his/her Proposal, represents that he/she has read and understands the Proposal Documents.

B. Each Offeror/Proposer, by making his/her Proposal, 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 proposal 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 proposal.

D. Before submitting a proposal each Offeror/Proposer will, at Offeror's/Proposer'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 Offeror deems necessary to determine its proposal for performing and furnishing the work in accordance with the time, price and other terms and conditions of the Contract Documents. Offeror/Proposer 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 proposal.

E. On request in advance, Owner will provide each Offeror/Proposer access to the site to conduct explorations and tests as each Offeror/Proposer deems necessary for submission of a proposal. Offeror 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 Offeror by making his/her proposal represents that his/her proposal is based upon the materials, systems, and equipment required by the Proposal Documents without exception.

1.5 PROPOSAL DOCUMENTS

A. Complete sets of Proposal Documents shall be used in preparing proposals; neither County, nor Architect assumes any responsibility for errors or misinterpretations resulting from use of incomplete sets of Proposal Documents.

B. County or the Architect, in making copies of the Proposal Documents available on the above terms, do so only for the purpose of obtaining Proposals on the Work and do not confer a license or grant for any other use.

1.6 PROPOSAL PROCEDURES

A. All proposals shall be prepared on the forms provided by the Architect and submitted in accordance with the Instruction to Offerors. The Architect or owner will furnish Offerors with proposal forms which will provide for the following proposal items. Offerors shall provide all requested information. Prices proposed shall *only* be considered if they are provided in the appropriate space(s) on the Collin County proposal form(s). For consideration, any additions or deductions to the proposal prices offered must be shown under the exceptions section of the 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 Offeror/proposer generated documents appearing elsewhere on the proposal 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 proposal item as detailed and described in these specifications.
2. Acknowledgment of Addenda.
3. Number of consecutive calendar days to complete project.
4. Additional price if a performance bond is required.
5. Alternate proposals.
6. Unit prices.

B. A proposal (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 proposals indicated in the Advertisement or Competitive Sealed Proposal, or prior to any extension thereof issued to the Offerors. Proposals 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 Offerors, no Offeror shall modify, withdraw or cancel his/her proposal or any part thereof for ninety (90) consecutive calendar days after the time designated for the receipt of proposals in the Advertisement or Competitive Sealed Proposal.

D. Proposals shall not contain any recapitulation of the Work to be done.

E. The Offeror shall make no additional stipulations on the Proposal Form or limit or qualify his/her proposal in any other manner. Proposals 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.

1.7 DISCREPANCIES AND AMBIGUITIES

Any interpretations, corrections and/or changes to a Competitive Sealed Proposal 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 BidSync.

A. It shall be the sole responsibility of the Offeror to verify issuance/non-issuance of addenda and to check all avenues of document availability (i.e. BidSync at www.bidsync.com; telephoning Purchasing Department directly, etc.) prior to opening/receipt date and time to insure Offeror's receipt of any addenda issued. Offeror shall acknowledge receipt of all addenda.

1.8 SUBSTITUTIONS

A. Each Offeror represents that his/her proposal is based upon the materials and equipment described in the Proposal 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 proposals.

C. If the Architect and Owner approve a proposed substitution, such approval will be set forth in an Addendum.

1.9 QUALIFICATIONS OF OFFERORS

A. Offerors may be disqualified and their proposals not considered for any of the following specific reasons:

1. Reason for believing collusion exists among Offerors.
2. The Offeror being interested in any litigation against Owner.
3. The Offeror 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.

B. Minimum Standards For Responsible Prospective Offerors: A prospective Offeror 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 Offeror's ability to meet these minimum standards listed above.

C. In determining to whom to award the contract, the Owner may consider;

1. The offeror that offers the best value for the governmental entity based on the published selection criteria and on its ranking evaluation.

2. Any other relevant factors specifically listed in the Instruction to Offerors.

1.10 PREPARATION OF PROPOSAL

A. Offeror shall submit his/her proposal on the forms furnished by the Architect. All blank spaces in forms shall be correctly filled in and the Offeror 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 proposal is submitted by an individual, his/her name must be signed by him/her or his/her duly authorized agency. If the proposal is submitted by a firm, association or partnership, the name and address of each member must be given, and the proposal must be signed by an official or duly authorized agent. Powers of attorney authorizing agents or others to sign proposals must be properly certified and must be in writing and submitted with the proposal.

B. Offeror 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 Offerors during the Proposal process is subject to release under the Act.

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

1.11 BID SECURITY

A. Each proposal must be accompanied by Bid Security (in accordance with instructions set forth in section 001119-Advertisement for Competitive Sealed Proposal) made payable to Owner in an amount of five percent (5%) of the Offeror's maximum proposal price and in the form of a Cashier's Check or a Bid Bond, duly executed by Offeror 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 Offeror 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 Offeror 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 Offeror will be forfeited. The Bid Security of the other Offerors 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 proposal opening, whereupon, the Bid Security furnished by such Offerors will be returned. Bid Security with proposals which are not competitive will be returned within seven (7) consecutive calendar days after the contract award.

C. Should the Offeror 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 proposal 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 Offeror 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 Offerors until either:

1. The Contract has been executed and the bonds have been furnished, or
2. The specified time has elapsed so that proposals may be withdrawn, or
3. All proposals have been rejected.

1.12 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 shall post with Owner, not later than ten (10) consecutive calendar days of Collin County Commissioners' Court award of Contract, a Maintenance Bond in the amount of 10 percent (10%) 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.

D. The Contractor must demonstrate to Owner that it can secure the required performance, payment and maintenance 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 Offeror 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.

E.. The Contractor must file with the performance, payment, and maintenance 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.

F. 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.

1.13 FILING PROPOSAL

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 Competitive Sealed Proposal (CSP) 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 BidSync at www.bidsync.com.

C. All Bids, submittals or proposals submitted electronically via BidSync at www.bidsync.com shall remain locked until official date and time of opening as stated in the Special Terms and Conditions of the CSP.

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 proposals as stated in the Advertisement for Competitive Sealed Proposal or CSP. Each hard copy paper bid shall be in a sealed envelope plainly marked with the word "Proposal or CSP", and the name and proposal number of the project as designated in the Advertisement for Competitive Sealed Proposal or CSP.

1.14 MODIFICATION AND WITHDRAWAL OF PROPOSAL

A. No bid, proposal, or submittal may be withdrawn or modified after the proposal opening.

1.15 IRREGULAR PROPOSAL

A. It is understood that Collin County, Texas reserves the right to accept or reject any and/or all Proposals, proposals, or submittals for any or all products and/or services covered in an Competitive Sealed Proposal (CSP) 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.

1.16 REJECTION OF PROPOSAL

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

1.17 METHOD OF AWARD

A. In evaluating proposals, Owner will consider whether or not the proposals comply with the prescribed requirements, base prices, any alternates, unit pricing, completion time, Offeror's

qualifications, Offeror's proposed subcontractors, suppliers, etc., and other data as may be requested in the Proposal Documents. Evaluation of the proposals shall be based on the selection criteria outlined in proposal documents.

B. By submitting its' proposal in response to this CSP, Offeror accepts the evaluation process and acknowledges and accepts that determination of the "best value" offer will require subjective judgments by the Owner. Owner reserves the right to consider any proposal "non-responsive" if the Base Proposal Cost is determined to be unreasonable or irresponsible in relation to other submitted proposals and/or Owner's estimate of the construction cost.

C. Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any proposal and to establish the responsibility, qualifications and financial ability of Offeror, proposed subcontractors, suppliers and other persons and organizations to perform and furnish the Work in accordance with the Proposal Documents to Owner's satisfaction within the prescribed time.

D. If the contract is to be awarded, the work will be awarded as a Lump-Sum contract to the Offeror offering the "Best Value" to the Owner. If no alternates are selected by Owner, the Owner may award the contract to a responsible Offeror who submits the best evaluated proposal.

E. Evaluation of Alternates - Any and/or all or none of the alternates may be considered in evaluation. Owner may award Contract on base proposal plus any and/or all or none of the alternates.

F. Owner anticipates award within ninety (90) consecutive calendar days after proposal opening.

G. The proposal, 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.

H. 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.

1.18 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.

1.19 FAILURE TO EXECUTE CONTRACT

A. The failure of the Offeror 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 Proposal, and Owner may annul the award, at the Owner's sole discretion.

1.20 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.

1.21 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.

1.22 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.

B. 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.

C. 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.

1.23 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.

1.24 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. .

1.25 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, and Chapter 171.

1.26 ETHICS

A. The Offeror/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.

1.27 PROPOSAL COMPLIANCE

A. Proposal 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.

1.28 DRUG FREE

A. All Offerors 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 proposal 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 proposal 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:

SUBSTANCE	MAXIMUM LEVEL
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) Metaboline	100 NG/ML
Methadone, Urinary	300 NG/ML
Methaquaone, Urine	300 NG/ML
Propoxyphene	300 NG/ML

1.29 INDEMNIFICATION

A. To the fullest extent permitted by law, Contractor shall defend, indemnify and save harmless Collin County and all its past, present and future officers, agents and employees and all entities, their officers, agents and employees who are participating in this contract from all suits, claims, actions, damages (including personal injury and or property damages), or demands of any character, name and description, (including attorneys' fees, expenses and other defense costs of any nature) brought for or on account of any injuries or damages received or sustained by any person, persons, or property on account of Contractor's breach of the contract arising from an award, and/or any negligent act, error, omission or fault of the Contractor, or of any agent, employee, subcontractor or supplier of Contractor in the execution of, or performance under, any contract which may result from an award. Contractor shall pay in full any judgment with costs, including attorneys' fees and expenses which are rendered against Collin County and/or participating entities arising out of such breach, act, error, omission and/or fault.

1.30 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

proposal. The calendar day count shall commence ten (10) consecutive calendar days after the date of the Notice to Proceed.

1.31 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 general conditions, delay, and impact or acceleration damages against the Owner.

1.32 LIQUIDATED DAMAGES FOR FAILURE TO COMPLETE ON TIME

A. 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:

The sum of Twelve Hundred Dollars ($1200.00, not to exceed) -per calendar day.

B. 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.

1.33 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.

1.34 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.

1.35 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.

1.36 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.

1.37 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.

1.38 PROVISION CONCERNING ESCALATOR CLAUSES

A. Proposal(s) containing any condition which provides for changes in the stated proposal 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 Offeror without being considered.

1.39 ESTIMATES OF QUANTITIES

A. 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.

1.40 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.

1.41 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 Engineer 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 engineers 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 proposal 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, and 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.

1.42 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.

1.43 PERMITS

A. Owner shall be responsible for initial building permit and applicable impact fees. Contractor shall be responsible for obtaining and payment of, all other necessary permits.

1.44 MATERIALS TESTING

A. Owner will be responsible for all materials testing.

1.45 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.

	Rates	Fringes
IRONWORKER (Structural).....	$ 20.10	4.60

* SUTX1989-002 11/01/1989

	Rates	Fringes
Acoustical Installer.....	$ 12.27	
CARPENTER (Excluding Acoustical Installers & Drywall Hangers).....	$ 12.36	1.38
DRYWALL HANGER.....	$ 12.17	
ELECTRICIAN.....	$ 13.10	1.97
Laborer, Unskilled (Excluding Landscape Laborers).....	$ 7.04	.86
Painters:		
Brush & Spray.....	$ 10.15	
Painters doing drywall finishing only.....	$ 10.08	
PAPERHANGER.....	$ 12.50	2.20
Plumbers and Pipefitters (Including HVAC Work).....	$ 12.47	1.87
Power Equipment Operator		
Cranes.....	$ 15.00	2.85
ROOFER, Including Built Up, Composition and Single Ply.....	$ 10.17	1.10

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Sheet metal worker (Including
HVAC Duct Work).................$ 10.94            1.45

SPRINKLER FITTER................$ 12.00            2.30

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

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

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)).
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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.

1.46 Collin County Purchasing Department shall serve as Contract Administrator or shall supervise agents designated by Collin County.

1.47 All warranties shall be stated as required in the Uniform Commercial Code.

1.48 The Contractor and Collin County agree that both parties have all rights, duties, and remedies available as stated in the Uniform Commercial Code.

1.49 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.

1.50 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.

1.51 CRIMINAL HISTORY BACKGROUND CHECK

A. 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.

1.52 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.

1.53 CERTIFICATION OF ELIGIBILITY

A. 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 Offeror/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 proposal submission and time of award, the Offeror/Quoter/Offeror will notify the Collin County Purchasing Agent. Failure to do so may result in terminating this contract for default.

1.54 NOTICE TO CONTRACTORS (IF APPLICABLE)

A. 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.

1.55 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 coverage's 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 coverage's at not less than the specified amounts:

B. Workers Compensation insurance required by Texas Law at statutory limits, including employer's liability coverage at minimum limits. 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 $1,000,000
Personal and Advertising Injury $ 1,000,000
Each Occurrence $ 1,000,000

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.

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 $600,000 per occurrence; or separate limits of $500,000 for bodily injury (per person),

$500,000 for bodily injury (per accident) and $100,000 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 coverage's 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 B+ 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.

I. Vendor shall procure and maintain for the duration of the completed project: Builders' Risk Insurance (BRI) - Completed Value Form, insurance carried must equal the completed value of the structure. BRI shall be on an "all risk" or equivalent policy form. The cost of such insurance shall be included in the Vendor's bid. Vendor shall name Collin County as additional insured.

1.56 PROJECT PLANNING SCHEDULE: The following anticipated dates are for planning purposes only (if there is a conflict between the dates below and the Proposal Form, the duration shown on the Proposal Form shall govern). The contractual dates required by the Owner of the "best value" offeror will be identified in the executed agreement.

- Owner conducts Pre-Bid Meeting — August 11, 2009
- Deadline to submit Request for Substitutions by 4:00 PM — August 14, 2009
- Addenda posted to the Bid Sync COB — August 19, 2009~~As Needed~~
- Owner receives Request For Competitive Sealed Proposals — September 3~~August 20~~, 2009
- Owner determines Contractor offering "Best Value" — October 12~~September 28~~, 2009
- Selected Contractor delivers executed Agreement to Owner — October 26~~12~~, 2009
- Owner issues Notice to Proceed with Construction — October 30~~14~~, 2009
- Contractor achieves Substantial Completion — To be determined
- Contractor achieves Final Completion — To be determined

PART 2 - REQUIREMENTS FOR COMPETITIVE SEALED PROPOSALS

Offerors shall carefully read the information contained in the following criteria and submit a complete statement of Proposal to all questions in Part 2 formatted as directed in Part 3. Incomplete Proposals will be considered non-responsive and subject to rejection. Failure to properly investigate existing conditions shall not be considered a reason for additional costs for work on this project.

2.1 CRITERIA ONE: OFFEROR'S ABILITY TO PROVIDE CONSTRUCTION SERVICES (POINTS VALUE 15)

A. Provide a statement of interest for the Project including a narrative describing the offeror's unique qualifications as they pertain to this particular Project.

B. Provide a statement on the availability and commitment of the offeror, its Principal~~@~~) and assigned professionals to undertake the Project.

2.2 CRITERIA TWO: QUALIFICATIONS OF CONSTRUCTION TEAM (POINTS VALUE 10)

A. Provide resumes of the Offeror's~~Offeror's~~ team that will be directly involved in the Project, including their experience with similar projects, the number of years with the firm, and their city(s) of residence. At a **MINIMUM**, Collin County requests the following team members to be officed on-site during the project; One (1) Project Manager, Two (2) Project Engineers (One (1) to stay until submittals are completed), One (1) Superintendent and One (1) Receptionist/Secretary. All remaining team members may be at the offeror's discretion and should be identified accordingly, to include the same information described above~~Include as applicable; Project Managers, Superintendents, Assistant Project Managers and Superintendents, Expeditors, Project Scheduler, Quality Control Inspectors, Safety Coordinator/Assistant, Carpenter Foreman, and Labor Foreman~~.

B. For the each team member identified above, provide his/her current status, and when each team member will be available to provide Construction Services for this Project.

C. Describe, in graphic and written form, the proposed Project assignments, lines of authority, and communication for each team member to be directly involved in the Project. Indicate the estimated percent of time these team members will be involved in the Construction Services. Indicate the estimated percent of time these team members will be officed on-site during the project.

D. Identify the mechanical, electrical, and plumbing sub contractors included as part of this proposal, including their experience with similar projects, the number of years with the firm, and their city(s) of residence. In the event this information is not known at the deadline for proposal submittal, proposers will have until 2 p.m. the following business day to provide the requested information. Email submission to Contract Administrator is acceptable. Failure to provide requested information could result in rejection of proposal.

E. Provide resumes of the Project Manager and Superintendent that will be directly involved in the Project for the mechanical, electrical, and plumbing subcontractor, including their experience with similar projects, the number of years with the firm, and their city(s) of residence. In the event this information is not known at the deadline for proposal submittal, proposers will have until 2 p.m. the following business day to provide the requested information. Email submission to Contract Administrator is acceptable. Failure to provide requested information could result in rejection of proposal.

2.3 CRITERIA THREE: OFFEROR'S PAST PERFORMANCE ON COLLIN COUNTY (IF APPLICABLE) AND REPRESENTATIVE PROJECTS (POINTS VALUE 10)

A. Identify and describe the Construction Team's past experience for providing Construction Services that are most similar to this project within the last five (5) years. List the projects in order of priority, with the most similar project listed first. Provide the following information for each project listed:

1. Project name, location, contract delivery method, and description Color images (photographic or machine reproductions)
2. Final construction cost
3. Final project size in gross square feet
4. Type of construction (new, renovation, or expansion)
5. Actual Notice To Proceed, Substantial Completion, and Final Payment dates for Construction Services
6. Name of Project Manager (individual responsible to the Owner for the overall success of the project)
7. Name of Project Superintendent (individual responsible for coordinating the day to day work)
8. Names of Mechanical, Plumbing and Electrical Subcontractors

References (for each project listed above, identify the following):

1. The Owner's representative who served as the day-to-day liaison during construction, including telephone number

2. Architect/Engineer’s name and representative who served as the day-to-day liaison during construction, including telephone number
3. Length of business relationship with the Owner

References shall be considered relevant based on specific project participation and experience with the offeror. The Owner may contact references during any part of this process. The Owner reserves the right to contact any other references at any time during the CSP process.

B. Section 005213 is a draft copy of the Competitive Sealed Proposal Agreement for Owner. Identify any terms of the Agreement you will request to be changed prior to signing the Owner's Competitive Sealed Proposal Agreement.

2.4 CRITERIA FOUR: OFFEROR'S PROJECT PLANNING AND SCHEDULING FOR THIS PROJECT (POINTS VALUE 10)

A. Provide a Critical Path Management (CPM) Milestone schedule for this Project as described in Owner Specification Section 00100 using the Project Planning Schedule and identify specific critical process, phases, milestones, approvals, and procurements anticipated. Clearly identify the **10%** Total Project Float required during the Construction

B. Describe what you perceive are the critical Construction issues for this project.

C. Describe your approach to assuring timely completion of this project, including methods for schedule recovery, if necessary. From any three (3) of the projects listed in response to Section 2.3 of this CSP, provide examples of how these techniques were used, including specific scheduling challenges/requirements and actual solutions.

D. Project will physically connect to (or occur within) an existing building that will remain occupied during construction. Describe the anticipated steps necessary to maintain operation of the occupied building during construction.

2.5 CRITERIA FIVE: OFFEROR'S QUALITY CONTROL PROGRAM FOR THIS PROJECT (POINTS VALUE 5)

A. Describe your quality control program. Explain the methods used to ensure quality control during the Construction phase of a project. Provide specific examples of how these techniques or procedures were used from any of three (3) projects listed in response to Section 2.3 of this CSP.

B. Describe how your quality control team will measure the quality of construction and Commissioning performed by trade Subcontractors as required by Owner and how will you address non-conforming work.

C. Describe how you have maintained security during the construction of an occupied Facility listed in 2.3 of this CSP.

D. Describe your past experience dealing with congested site conditions for any project listed in Section 2.3 of this CSP.

E. Provide examples of records, reports, monitoring systems, and information management systems you will use on this Project.

F. Describe your approach to coordinating inspections and approvals with the County Fire Marshall regarding approval of life safety systems.

2.6 CRITERIA SIX: OFFEROR'S PROJECT SAFETY PROGRAM FOR THIS PROJECT (POINTS VALUE 5)

A. Describe your job site safety program for this Project and specific safety policies in which employees must be in compliance.

1. Identify any deaths that have occurred on a project site controlled by your firm, or any subcontractor(s) (at any contractual level), that had a death on your project site? If so, describe how you have revised your program.

2. Identify the proposed safety management team members for Construction services. Identify their intended percent of monthly involvement and duration for this Project. Include all details necessary to demonstrate the credentials required by Project Safety specification.

B. Describe the methodology, including any technology or other assets that the firm intends to use for prevention and/or control of incidents and insurance claims on this Project.

C. Identify (in separate figures) the percentage of the Construction Cost that is to be included in the Project General Conditions for each of the following pieces of the Project Safety Program:

1. On-site safety education & training,
2. Personal protective equipment, signage, and hardware,
3. First aid and emergency response equipment,
4. Safety incentives and recognition,
5. Contingency for post incident drug testing and incident management costs
6. Miscellaneous other safety-related expenses (NOTE: DO NOT LIST items that will appear elsewhere in the Project's General Conditions; office equipment, salaries, etc.)

D. Briefly describe the firm's approach for anticipating, recognizing and controlling safety risks and note the safety resources that the firm provides for each project's Safety program.

E. Describe the level of importance for Enforcement and Support of Project Safety that

the firm includes in performance evaluations for Superintendents and Project Managers.

F. Describe the Safety and Insurance/Claims History information and weighting that the firm includes in the submission and award process for "best value Subcontracts.

G. For all projects that the firm has managed (or co-managed) in the past five (5) years, list and describe all events or incidents that have reached any of the following levels of severity:

1. Any occupational illness or injury that resulted in death or total and permanent disability
2. Any occupational illnesses or injuries that resulted in hospital admittances
3. Explosion, fire or water damage that claimed 5% of the project's construction value
4. Failure, collapse, or overturning of a scaffold, excavation, crane or motorized mobile equipment when workers were present at the project

2.7 CRITERIA SEVEN: OFFEROR'S WARRANTY AND SERVICE SUPPORT PROGRAM FOR THIS PROJECT (POINTS VALUE 5)

A. Describe your warranty service support philosophy and warranty service implementation plan for this Project.

B. Describe how you will measure the quality of service provided to the Owner for this Project.

C. Provide reference letters from three (3) Owners (other than Collin County), identified in Sections 2.3 that describe your response to, and performance on, warranty services AFTER substantial completion.

2.8 CRITERIA EIGHT: OFFEROR'S PRICING AND DELIVERY PROPOSAL (POINTS VALUE 40)

A. Complete the "Offeror's Pricing and Delivery Proposal" included with the Proposal Documents.

PART 3 - FORMAT OF PROPOSALS

3.1 GENERAL INSTRUCTIONS

A. Proposals shall be prepared SIMPLY AND ECONOMICALLY, providing a straightforward, CONCISE description of the offeror's ability to meet the requirements of this CSP. Emphasis shall be on the QUALITY, completeness, clarity of content, responsiveness to the requirements, and an understanding of Owner’s needs. Each bound copy must be in the following order.

.

1. Cover
2. Cover Letter
3. Table of Contents
4. Criteria One: Offeror's Ability to Provide Construction Services
5. Criteria Two: Offeror’s Qualifications of Construction Team
7. Criteria Three: Offeror’s Past Performance on Collin County (if applicable) and Representative projects.
8. Criteria Four: Offeror’s Project Planning and Scheduling
9. Criteria Five: Offeror’s Quality Control Program
10. Criteria Six: Offeror’s Project Safety Program
11. Criteria Seven: Offeror's Warranty and Service Support Program
12. Criteria Eight: Offeror’s Pricing (see bid form)

B. Proposals shall be a MAXIMUM OF FIFTY (50) PRINTED PAGES. The cover, table of contents, divider sheets, Pricing, and Delivery Proposal, and Execution of Offer do not count as printed pages.

C. Offerors shall carefully read the information contained in this CSP and submit a complete response to all requirements and questions as directed. Incomplete Proposals will be considered non-responsive and subject to rejection.

D. Proposals and any other information included in response to this CSP shall become the property of the Owner.

E. Proposals that are qualified with conditional clauses, alterations, items not called for in the CSP documents, or irregularities of any kind are subject to rejection by the Owner, at its option.

F. The Owner makes no representations of any kind that an award will be made as a result of this CSP. The Owner reserves the right to accept or reject any or all Proposals, waive any formalities or minor technical inconsistencies, or delete any Itern/requirements from this CSP when deemed to be in Owner's best interest.

G. Proposals shall consist of answers to questions identified in Part 2 of the CSP. Separate each section of the Qualifications by use of a divider sheet with an integral tab for ready reference. Identify the tabs in accordance with the parts under Part 2, which is to be consistent with the Table of Contents. TAB IDENTIFICATION BY NUMBERS ONLY IS NOT ACCEPTABLE.

F. Failure to comply with all requirements contained in this Request for Proposals may result in the rejection of the Proposals.

G. 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 Competitive Sealed Proposal (CSP) 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.

H, No oral, telegraphic or telephonic submittals will be accepted. Bids, proposals, or submittals may be submitted in electronic format via Bid Sync at www.bidsync.com.

I. All Bids, submittals or proposals submitted electronically via Bid Sync at www.bidsync.com shall remain locked until official date and time of opening as stated in the Special Terms and Conditions of the CSP.

K. 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.

L. No bid, proposal, or submittal will be considered unless it is filed with the Owner Purchasing Department within the time limit for receiving proposals as stated in the Advertisement for Competitive Sealed Proposal or CSP. Each hard copy paper bid shall be in a sealed envelope plainly marked with the word "Proposal or CSP", and the name and proposal number of the project as designated in the Advertisement for Competitive Sealed Proposal or CSP.

3.2 PAGE SIZE, BINDING, DIVIDERS AND TABS:

A. Proposals shall be printed on letter-size (8-1/2" x 11") paper and assembled with spiral-type bindings or staples. DO NOT USE METAL-RING HARD COVER BINDERS.

B. Additional attachments shall NOT be included with the Proposals. Only the responses provided by the Offeror to the questions identified in Part 2 of this CSP will be used by the Owner for evaluation.

C. Separate and identify each criteria response to Part 2 of this CSP by use of a divider sheet with an integral tab for ready reference.

3.3 TABLE OF CONTENTS:

A. Submittals shall include a "Table of Contents" and give page numbers for each part the Qualifications.

3.4 PAGINATION:

A. Number all pages of the submittal sequentially using Arabic numerals (1, 2, 3, etc.).

SECTION 00 4213 - PROPOSAL FORM

Proposal of _____ Date _____
(Name of Firm)

PROPOSAL NO.: **11267-09**

TO: **COLLIN COUNTY, TEXAS (Owner)**

FOR: **CONSTRUCTION, BUILDING: JUVENILE JUSTICE ALTERNATIVE EDUCATION PROGRAM (JJAEP) AND JUVENILE PROBATION**

The undersigned, as Offeror, declares that the only person or parties interested in this Proposal are those principals named herein, that his/her Proposal is made without collusion with any other person, firm or corporation, that he/she has carefully examined the Contract Documents including the Form of Contract, Invitation to Offerors, Instruction to Offerors, 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.

It is understood that the following quantities of work to be done at unit prices are approximate only and are intended principally to serve as a guide in evaluating Proposals.

It is agreed that the quantities of work to be done at unit prices and materials to be furnished may be increased or diminished as may be considered necessary in the opinion of Collin County to complete the work fully as planned and contemplated, and that all quantities of work, whether increased or decreased, are to be performed at the unit prices set forth below except as provided for in the Contract Document.

It is understood and agreed that the Bid Security accompanying this Proposal will be returned to the offeror, unless in case of the acceptance of the Proposal the Offeror shall fail to execute a contract and file a Performance Bond, a Payment Bond, a Maintenance Bond and a Certificate of Insurance within ten (10) consecutive calendar days after its acceptance, in which case the Bid Security shall become the property of the Owner and shall be considered as payment for damages caused by delay and other inconveniences suffered by the Owner because of such failure of the Offeror.

It is understood and agreed that all work under this Contract will be completed within_____ consecutive calendar days. Completion date will be established in the Notice to Proceed.

The undersigned proposes and agrees to perform all work of whatever nature required, in strict accordance with the drawings and specifications for the following sum of prices, to-wit:

Labor and Material Breakdown:

A: Total Material Cost Incorporated in Project $_____

B: Total Labor Cost Incorporated in Project $_____

C. Proposal Grand Total $_____

Item A & B Must Add Up to C. the Proposal Grand Total.

Proposal Grand Total (written in words) _____

_____

_____

_____

Payment for Additional Items, Unit Prices:

Piers-Unit price per linear foot for piers (add and/or deduct)

18" Round $_____
24" Round $_____
36" Round $_____
42" Round $_____

Pier Casing-Unit price per linear foot for casing (add and/or deduct)

18" Round $_____
24" Round $_____
36" Round $_____
42" Round $_____

Fire Alarm Devices -Unit price each (add and/or deduct)

Fire alarm smoke detectors $_____
Fire alarm audio / visual devices $_____
Fire alarm visual only devices $_____
Fire alarm pull stations $_____

Electrical Devices -Unit price each (add and/or deduct)

Duplex receptacles $_____
Quad receptacles $_____
Exit lights $_____
Telephone / data devices $_____

Alternate No. 1, Add "Shell Building" and associated site improvements at Classroom Pod "D".

$_____

Alternate No. 2, Add "Interior Finish-out" at Classroom Pod "D". $_____

Alternate No. 3, Add "Shell Building" and associated site improvements at Classroom Pod "A".

$_____

Alternate No. 4, Add "Interior Finish-out" at Classroom Pod "A". $_____

Collin County would like to offer the option for successful offeror to accept credit card payments for services rendered. Collin County currently uses MasterCard as its credit card provider.

Would your company be willing to accept monthly credit card payments? Yes No

If applicable, does your company offer any additional discounts for timely payment with or without credit card payment? Yes No

If yes, please explain_____

Receipt is hereby acknowledged of the following Addenda to the Contract Documents.

Addendum No. 1 dated _____ Received _____
Addendum No. 2 dated _____ Received _____
Addendum No. 3 dated _____ Received _____
Addendum No. 4 dated _____ Received _____

The undersigned Offeror 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 Proposal, 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 proposed within _____consecutive calendar days subject to such extensions of time allowed by Specifications.

The undersigned Offeror agrees that this Proposal shall be good and may not be withdrawn for a period of ninety (90) consecutive calendar days after closing time for receiving Proposals.

The undersigned Offeror agrees that if he/she is notified of the acceptance of this proposal within ninety (90) consecutive calendar days of the time set for opening of Proposals, he/she will execute a contract for the Work for the stated prices, and will execute and deliver to Owner within ten (10) consecutive calendar days after signing of contract, a Performance Bond and a Payment Bond for the total amount of the Contract, a Maintenance Bond for 10% of the total amount of the contract, and a Certificate of Insurance, as stipulated in the Specifications.

The undersigned Offeror further agrees that the enclosed Bid Security in the amount of five percent (5%) of the Greatest Amount of Proposal is the agreed amount of liquidated damages which Collin County, Texas will suffer by the failure of the undersigned Offeror to execute the Contract and to furnish the Performance and Payment Bonds and by reason of such failure on the part of the undersigned Offeror, the Bid Security will immediately be forfeited to Collin County, Texas.

The undersigned Offeror also understands that the Commissioners' Court of Collin County, Texas reserves the right to reject any and/or all Proposals covered in this Proposal request and to waive informalities or defects in Proposals or to accept such Proposals as it shall deem to be in the best interest of Owner.

It is understood that the work proposed to be done will be accepted when fully completed in accordance with the Contract Documents.

Accompanying this Proposal, is a certified check, cashier's check or Bid Bond in the amount of five percent (5%) of the total amount proposed. Also accompanying this Proposal, all the information required in Section 00 2116 – Instructions to Offerors.

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

Respectfully submitted,

Contractor: _____

By: _____

Title: _____

Address: _____

_____

Seal and Authorization
(If a Corporation)

Phone: _____

Fax: _____

E-mail
Address: _____

END OF SECTION

00 6113.13 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 _____ , 200____ , 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 _____ _____.

NOW, THEREFORE, THE 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 _____ 200_____ .

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.

Revised 11/2008

SECTION 01 0510

EXTERIOR DESIGN SELECTIONS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes a schedule summary of Design Selections for exterior materials and finishes technically specified in various technical Sections of this Project Manual.

B. Refer to Division 1 Section "Interior Design Selections" for interior materials and finishes.

1.2 PROCEDURES

A. References in this Section to specific manufacturer, model name and model number, are to establish preferred design selection standard only. Other "Acceptable Manufacturers" listed in the technical section, if qualified, are allowed to submit in accordance with Division 1 Section "Product Requirements".

B. Each material selection is referenced by Section name and number to where it is specified.

1.3 GENERAL SELECTIONS

A. Following materials may be included in a number of technical specification sections and are scheduled together to avoid duplication.

Architectural Metal Finishes

AMF01: Metal Panels
Type: Fluoropolymer coating
Coating Color: Zinc Gray

AMF02: Aluminum storefront and entrances
Type: Anodized
Anodized Color: Clear

AMF03: Wall Louvers
Type: Anodized
Anodized Color: Dark Bronze

1.4 SELECTIONS BY SECTION

04 2100 - Brick Masonry

BK1 Brick type 1

Manufacturer: Interstate
Style name: N/A
Color/Texture Selection: Platinum Matte
Size: 4" deep x 4" wide x 8" long
Mortar Color: TBD

BK2 Brick type 2

Manufacturer: Sioux City Brick
Style name: N/A
Color/Texture Selection: Mountain Shadow Velour
Size: 4" x 4"x 8"

BK3 Brick type 3 (Soldier Course)

Manufacturer: Sioux City Brick
Style name: N/A
Color/Texture Selection: Mountain Shadow Velour
Size: 4" x 4" x 8"

BK4 Brick type 4 (Running Bond Course)

Manufacturer: Sioux City Brick
Style name: N/A
Color/Texture Selection: Mountain Shadow Velour
Size: 4" x 4"x ~~16"~~ 12”

BK5 Brick type 5

Manufacturer: Interstate Atlas Brick
Style name: N/A
Color/Texture Selection: Ironstone Matte
Size: 6"x 4"x 16"

07 4213 - Formed Metal Wall Panels

Finish Color: AMF01. See Architectural Metal Finishes above.

07 5552 - Modified Bituminous Membrane Roofing

Granule Color: White

07 7100 - Manufactured Roof Specialties

Finish Color: AMF01. See Architectural Metal Finishes above.

07 9200 - Joint Sealants

Urethane Construction Sealant:
Color Selection: As selected from Manufacturer's Standard Colors

Silicone Construction Sealant:
Color Selection: As selected from Manufacturer's Standard Colors

08 4123 - Aluminum Entrance Doors

Finish Color: AMF02. See Architectural Metal Finishes above.
Hardware Finish: US 32D Satin Stainless Steel.

08 4400 - Glazed Aluminum Wall Systems

Finish Color: AMF02. See Architectural Metal Finishes above.

08 7100 - Door Hardware

Refer to Section 08 7100.

08 8000 - Glazing

Glass Schedule:

Glass Type "A": Insulating Vision Glass
Outboard Lite:
Thickness:¼-inch
Description: High-performance low-e
Mfr. and Model: PPG Solarban 80 (2) Clear
AirSpace: 1/2"
Inboard Lilte:
Thickness:¼-inch
Description: Clear
U-Value of Unit:
Winter Night-time: 0.29
Summer Day-time: 0.27

08 9100 - Wall Louvers

Finish Color: AMF03. See Architectural Metal Finishes above.

09 9100 - Painting

Exterior Paint Colors:

XPT01: Hollow metal doors/frames
Manufacturer:
Number:
Sheen:
Texture:
Color:
Type:

XPT02: TBD
Manufacturer:
Number:
Sheen:
Texture:
Color:
Type:

XPT03: TBD
Manufacturer:
Number:
Sheen:
Texture:
Color:
Type:

XPT04: TBD
Manufacturer:
Number:
Sheen:
Texture:
Color:
Type:

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

COLLIN COUNTY JUVENILE JUSTICE
ALTERNATIVE EDUCATION PROGRAM
McKINNEY, TEXAS

SECTION 01 2300

ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

A. Alternate: An amount proposed by bidders for certain work that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

E. Acceptance of Alternates will be exercised at option of Owner in any order or combination.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

ALTERNATE NO. 1:

Add "Shell Building" and associated site improvements at Classroom Pod "D".

ALTERNATE NO. 2:

Add "Interior Finish-out" at Classroom Pod "D".

ALTERNATE NO. 3:

Add "Shell Building" and associated site improvements at Classroom Pod "A".

ALTERNATE NO. 4:

Add "Interior Finish-out" at Classroom Pod "A".

END OF SECTION

COLLIN COUNTY JUVENILE JUSTICE
ALTERNATIVE EDUCATION PROGRAM
McKINNEY, TEXAS

SECTION 05 12 00

STRUCTURAL STEEL

PART 1 - GENERAL

1.1 REFERENCED DOCUMENTS

A. The drawings and General Provisions of the Contract, including the General and Supplementary Conditions and Conditions and Division Specification Sections, apply to work specified in this Section.

1.2 DESCRIPTION OF WORK

A. Work Included: Furnish all labor, materials, services, equipment and appliances required in conjunction with or properly incidental to furnishing, fabrication, delivery, and erection of structural steel complete, including, but not limited to, the following:
   1. Structural steel columns, girders, beams, angles, rigid frames, trusses, shelf angles, angle frames for opening in floors and roofs, galvanized cooling tower grillage, steel supports for elevator machines, steel hoist beams for elevator equipment, steel supports for elevator guide rails, steel plates, miscellaneous deck support angles, shop welded shear studs, connections and component parts.
   2. Qualification of welders.
   3. Shop prime coat of paint and field touch-up painting.
   4. Grouting of base plates.
   5. Temporary construction bracing.
   6. Fabrication/erection inspection and testing.

B. Extent of structural steel work is shown on Drawings including schedules, notes and details to show sizes and locations of members, typical connections and types of steel required.

C. Include all supplementary parts and members necessary to complete structural work, regardless of whether all such parts are definitely shown or specified and furnish all such bolts, gussets, plates, etc., as may be required for proper assembly of all items. Include miscellaneous deck support angles as required for proper support of metal floor deck around columns, gussets, openings, and obstructions.

D. Connection Design:
   1. All typical beam to column and beam to beam connections are detailed and shown on the Construction Documents. The Contractor is to comply with these details.
   2. Where indicated, truss, bracing connections and special or non-typical structural steel beam connections shall be designed by the fabricator, in accordance with criteria on Drawings. Fabricator-designed connections shall be submitted together with complete calculations for review for acceptability by the Architect.

E. Substitutions:
   1. Proposed substitutions of sections or modification of details, and reasons therefore, shall be submitted with shop drawings for review. Submitted substitutions must be clearly identified and noted as such. Approved substitutions, modifications, and necessary changes in related portions of work shall be coordinated by fabricator and shall be accomplished at no additional cost to Owner.

   2. Substitutions to the beam to column and beam to beam connections shown on the drawings

will be reviewed for acceptability if submitted with calculations prepared by a licensed professional engineer.

F. Responsibility for Errors: Fabricator shall be responsible for all errors of detailing, fabrications, and for correct fitting of structural steel members.

G. Templates: Shall be furnished by fabricator with instructions for setting of anchor bolts and bearing plates.

H. Related Work Specified in Other Sections:
1. Quality Requirements: Section 01 40 00.
2. Miscellaneous metal fabrications: 05 50 00.
3. Metal stairs: 05 51 00.
4. Finished painting: Division 9.
5. Grouting of base plates: Section 03 30 00.

1.3 QUALITY CONTROL

A. Latest adopted edition of all standards referenced in this Section shall apply, unless noted otherwise. In case of conflict between Contract Documents and a referenced standard, Contract Documents shall govern. In case of conflict between Contract Documents and Building Code, more stringent shall govern.

B. Contractor shall furnish fabrication/erection inspection and testing of all welds in accordance with AWS D.1.1, Chapter 6. Submit records of inspections and tests to Owner's testing laboratory for their review.

C. Fabricator shall have developed a detailed fabrication procedural manual reflecting key quality control procedures used in fabrication process and shall provide a copy of the manual for examination by Owner's testing laboratory.

D. Fabricator shall employ a competent technician, engineer or independent testing laboratory to inspect fabrication work to ensure compliance with Contract Documents and shall identify such inspector to Owner's testing laboratory. Inspector shall examine in the shop all welding, bolting, shear studs, painting, galvanizing, and straightness and alignment of fabricated members.

E. Quality Requirements: Refer to Section 01 40 00.

F. All materials, fabrication procedures, and field erection are subject to verification inspection and testing by Owner's testing laboratory, in both shop and field. Such inspections and tests will not relieve Contractor of his responsibility for providing materials and fabrication procedures in compliance with specified requirements. Owner reserves the right to use ultrasonic or radiographic inspection to verify adequacy of all welds. Testing procedures and acceptance criteria shall be as specified in AWS D1.1. Promptly remove and replace materials or fabricated components which do not comply.

G. Qualifications for Welding Work: Contractor shall be responsible for qualifying welding operators in accordance with AWS "Standard Qualification Procedure." Provide certification, to Owner's testing laboratory, that welders to be employed in work have satisfactorily passed AWS qualification tests within previous months. If recertification of welders is required, retesting will be Contractor's responsibility.

H. Qualifications of Welding Procedures: Contractor shall provide testing laboratory with welding procedures which are to be used in executing this work. Welding procedures shall be qualified prior to use in accordance with AWS D1.1, Part B.

I. Qualifications of Welding Procedures: Contractor shall provide testing laboratory with welding procedures which are to be used in executing this work. Welding procedures shall be qualified prior to use in accordance with AWS D1.1, Part B.

J. Comply with Provisions of the Following Codes, Specifications and Standards, in Addition to Building Code:
1. AISC, "Code of Standard Practice for Steel Buildings and Bridges."
2. AISC, " Specification for Structural Steel Buildings, including "Commentary" and Supplements thereto, as issued.
3. AISC, " Specifications for Structural Joints using ASTM A 325 or A 490 Bolts," Approved by the Research Council on Structural Connections of the Engineering Foundation.
4. AISC, " Specification for Architecturally Exposed Structural Steel."
5. AWS D1.1, " Structural Welding Code."
6. ASTM A6, " Specifications for General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling, and Bars for Structural Use."
7. Industrial Fasteners Institute, " Handbook on Bolt, Nut, and Rivet Standards."
8. Steel structure painting council:
   a. Painting manual, Vol. 1, Good Painting Practice.
   b. Painting manual, Vol. 2, Systems Specifications.

K. Qualifications:
1. ~~1.~~ Structural steel fabricator shall have not less than 10 years experience in fabrication of structural steel for buildings ~~and shall be currently certified, under the AISC Quality Certification Program.~~
2. Structural steel erector shall have not less than 5 years experience in erection of structural steel.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's specifications and installation instructions, including laboratory test reports and other data, to show compliance with Specifications for the following products.
1. Structural steel primer paint.
2. Shrinkage-resistant grout.

B. Mill Certificates: Submit for Architect's record certificates of mill analysis showing compliance with Specifications for the following products:
1. Structural steel (each type).
2. High-strength bolts (each type), including nuts and washers.
3. Shear studs.

C. Shop Drawings:
1. All typical beam to column and beam to beam connections are detailed and shown on the Contract Documents. The Contractor is to comply with these connection details. If the Contractor would like to substitute a connection, it shall be submitted in accordance with the specified procedure for substitutions, with calculations prepared by a licensed professional engineer.
2. Submit shop drawings of all structural steel, including complete details and schedules for fabrication and shop assembly of members, erection plans and details, procedures, and diagrams showing sequence of erection. Include details of cuts, connections, camber, holes, and other pertinent data. Indicate welds by standard AWS symbols and show size, length, and type of each weld.
3. Submit design calculations for the non-typical beam, truss and bracing connections that are designed by the fabrication. Calculations shall bear seal of a Licensed Professional Engineer, licensed in the State of Texas. Calculations shall show applied loads and Reference applicable piece mark from the shop drawings as well as location or mark from

structural drawings.

4. Structural steel members for which shop drawings have not been reviewed shall not be fabricated. Architect's review shall cover general locations, spacings, and details of design. Omission from shop drawings of any materials required by Contract Documents shall not relieve Contractor of responsibility of furnishing and installing such materials, even though such shop drawings may have been reviewed and returned.
5. Submit setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed by other trades.

D. Certification: Submit evidence of current AISC plant certification (see "Qualifications").

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time to not delay that work.

B. Store materials to permit easy access for inspection and identification. Keep steel members off ground using pallets, platforms or other supports. Protected steel members and packaged materials from corrosion and deterioration.

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

D. Support cambered members during shipment and handling in a manner which will not result in loss of camber.

1.6 JOB CONDITIONS

A. Coordinate erection of structural steel with work of other trades.

B. Do not install columns which have embeds or anchor bolts in concrete until concrete members have attained their 28 day compressive strengths.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Metal Surfaces, General: For fabrication of work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names, and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating and application of surface finishes.

B. Steel:
1. Wide flange (W) shapes, tees, splice plates and stiffener plates: ASTM A 992 (50 ksi yield).
2. Other rolled shapes, plates, and bars: ASTM A 36 (36 ksi yield).
3. Cold formed steel tubing (HHS): ASTM A 500, Grade B, (46,000 psi yield for rectangular shapes, 42,000 psi for round shapes).
4. Steel pipe: ASTM A 53, Type E or S, Grade B.
5. All structural shapes within groups 4 and 5 of A.I.S.C. grouping for tensile property classification shall be supplied using killed steel.
6. For plates exceeding 2" thickness used in built-up members, which are spliced or connected by full penetration welds, provide material with Charpy V-Notch, testing in accordance with ASTM A 6, Supplementary Requirement S5. Impact test shall be conducted by producer in accordance with ASTM A 673, Frequency P and shall meet a minimum average value of 20

foot-pounds absorbed energy at 70° F.

C. Bolts and Washers:
1. Anchor bolts: Anchor bolts (or anchor rods) for anchoring to concrete shall conform to ASTM F1554, Grade 105, and to requirements for regular hexagon bolts and nuts of ANSI Standards B 18.2.1 and B18.2.2. Washers for anchor bolts shall be oversize.
2. All bolts for connections shall be high strength bolts conforming to ASTM A 325. Dimensions of bolt heads and nuts shall conform to requirements for heavy hexagon nuts of ANSI Standards B18.2.1 and B18.2.2. Nuts shall be ASTM A 563 materials.
3. Washers: Flat and smooth circular hardened washers conforming to requirements of ASTM F 436. Beveled washers for "S" shapes and channels shall be square or rectangular, taper in thickness, and smooth. Washers for use with high-strength bolts shall be hardened.
4. Direct tension indicator washers for high-strength bolts in friction connections shall conform to ASTM F 959, Type A 325.
5. Tension control (twist off) bolts may, at Contractor's option, be used in lieu of conventional high-strength bolts. Tension control bolts shall conform to ASTM F 1852 with A 325 marking.
6. Drilled expansion anchor bolts shall be one of the following (no substitutions):
Wej-it Bolt, Wej-it Corporation, Tulsa, OK
Kwik Bolt, Hilti Fastening Systems, Tulsa, OK.
Trubolt, Ramset Fastening Systems, Paris, KY.
Wedge-All, Simpson Anchors, McKinney, TX

D. Welding electrodes shall conform to requirements of Specifications of American Welding Society. Use E70 electrodes. For high-strength, low-alloy steel, provide electrodes, welding rods, and filler metals equal in strength and compatible in appearance with parent metal jointed.

E. Primer Paint:
1. Standard shop coat of red oxide primer, meeting requirements of "SSPC-Paint 13" or Federal Specification "TT-P-636," applied to a dry film thickness of 2.0 mils, or
2. Tnemec 10-99G (Green) Primer or Carboline "Rustamore 29" (Gray) Primer, applied to a dry film thickness of not less than 2.5 mils.
3. Epoxy primer for exterior exposed steel and steel over crawlspace – Tnemec "Series 66-121 Hi-Build Epoxoline" primer Carboline "Carboline 858" applied to a dry film thickness of 3 to 5 mils.
4. For architecturally exposed steel - primer as specified in Division 9 or, if not specified, as recommended by manufacturer of finish coat specified in Division 9.

F. Non-shrink Grout: Premixed, non-shrinking, non-metallic grout. Compressive strength in 28 days shall be 5000 psi minimum, but in no case less than specified strength of base concrete. Grout shall conform to ASTM C 1107, Grade B when tested at fluid consistency.

G. Zinc-coating: For galvanized steel shall conform to ASTM A 123, threaded products shall conform to ASTM A 153, Class C and sheet steel shall conform to ASTM A 591.

H. Use "ZRC" cold galvanizing compound, as manufactured by ZRC Chemical Products, Quincy, Mass.

J. Slide Bearings: If required, shall be reinforced teflon, factory prebonded to steel plates with initial static coefficient of friction not exceeding 0.06 at interface, over a working stress range of 500 to 2000 psi. Bearing shall be one of the following:
1. " Fluorogold" slide bearings, by Fluorocarbon Co., Pine Brook, N.J.
2. " Con-Slide" slide bearings, by Con-Serv, Inc., East Hampton, N.J.

2.2 FABRICATION

A. Shop Fabrication and Assembly:
   1. Fabricate and assemble structural assemblies in the shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings.
   2. Provide camber in members where indicated. Specified camber applies at jobsite, just prior to erection, lying down flat so that member weight has no effect. Contractor shall take necessary precautions to prevent or compensate for camber loss during shipment. Measured camber in members up to 50'-0" long shall be within a tolerance of -0" to +1/2" from amount specified. For members greater than 50'-0" long, both positive and negative tolerance may increase 1/8" for every 10'-0" of length in excess of 50'-0". Members with a field measured camber outside of specified tolerance shall be returned to shop.
   3. If heat is used to camber steel beams, it shall be carefully controlled and applied in a manner which will not alter the material properties of the member, and only in the presence of the testing laboratory. Follow AISC recommendations for heat cambering.
   4. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.
   5. Where finishing is required, complete assembly, including welding of units, before start finishing operations. Provide finish surfaces of members exposed in final structure free marking, burrs, and other defects.
   6. Splicing of structural steel members is prohibited without prior approval of Architect. Any member having a splice not shown and detailed on approved shop drawings shall be rejected.
   7. Members in compression joints which depend on contact bearing shall have bearing surfaces milled to a common plane. Members to be milled shall be completely assembled before milling.
   8. Plates shall be free of gross internal discontinuities such as ruptures and delaminations. Plates shall comply with ASTM A 578, Level 1.
   9. Mill tolerances: Comply with ASTM A 6.
   10. Fabrication tolerances: Comply with AISC Code of Standard Practice.

B. Connections:
   1. Weld or bolt shop connections, as indicated on Drawings.
   2. Bolt field connections, except where welded connections or other connections are indicated. Provide specified threaded fasteners for all principal bolted connections. Holes for bolted connections shall be drilled or punched at right angles to member. Slope of surfaces under bolt head and nut shall not exceed 1:20. Provide beveled washers where slopes exceed 1:20. Bolt holes shall have a diameter not greater than 1/16" larger than nominal bolt diameter. Do not flame cut holes or enlarge by burning. Provide washers over all slotted holes in an outer ply.
   3. High-strength bolted construction: Install in accordance with AISC, “Specifications for Structural Joints using ASTM A 325 or A 490 Bolts,” (RCRBSJ).
   4. Welded construction: Comply with AWS Structural Welding Code for procedures, appearance and quality of welds and methods used in correcting welding work. Assemble and weld built-up sections by methods which produce true alignment of axes without warp. Welds not specified shall be continuous fillet welds designed to develop full strength of member. No combination of bolts and welds shall be used for stress transmission at the same face of any connections.
   5. Heavy shapes (ASTM A6, groups 4 and 5, and built-up sections containing plates thicker than 2"): Comply with all special requirements for welding heavy shapes continued in the AISC Specification and in AWS Structural Welding Code.
   6. Clean completed welds prior to inspection. Slag shall be removed from completed welds, and adjacent base metal shall be cleaned by brushing or other suitable means. Tightly adherent splatter remaining after cleaning is acceptable unless its removal is required for the purpose of nondestructive testing.
   7. For high-strength, low-alloy steels follow welding procedures recommended by steel producer

for exposed and concealed connections.

8. Base plates: Hole sizes for anchor bolts may be oversized to facilitate erection as follows:
   Bolts 3/4" to 7/8" diameter - 5/16" oversize
   Bolts 1" to 2" diameter - 1/2" oversize

   Use oversize or plate washers under nut at all oversized holes in base plates. Washers must be large enough to cover entire hole. Washer thickness shall be at least 1/8 of bolt diameter.

C. Steel Wall Framing: Select members which are true and straight for fabrication. Straighten as required to provide uniform, square, and true members in completed wall framing.

D. Holes for Other Work: Provide holes required for securing other work to structural steel framing and for passage of other work through steel framing members, as shown on final shop drawings. Provide threaded nuts welded to framing and other specialty items as indicated to receive other work. Cut, drill or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

E. Zinc-coating: Following Steel Shall be Galvanized:
   1. Cooling tower grillage and supports, including fasteners.
   2. Cooling tower screen support members and braces.
   3. Masonry shelf angles.
   4. Exposed railing.

F. Architecturally Exposed Structural Steel: Shall be straight and true. Select or straighten members to meet permissible variations of ASTM A6, subject to tolerances of AISC Code of Standard Practice, Section 10. Exposed surfaces shall be smooth, free of embedded scale, trademarks, roll imperfection marks and other irregularities. Fill any depressions with weld metal of the same composition as the parent metal. Grind welds and raised marks smooth and flush with adjacent surfaces.

2.3 SHOP PAINTING

A. General: Shop paint structural steel, except members or portions of members to receive a galvanized coating, moment connections, or members to be embedded in concrete or mortar. Paint embedded steel which is partially exposed on exposed portions and initial 2" of embedded areas only.
   1. Do not paint surfaces which are to be welded or are part of a moment connection.
   2. Do not paint surfaces which are scheduled to receive sprayed-on fireproofing.
   3. Do not paint surfaces of exposed high-strength, low-alloy steel members (weathering steel).
   4. Do not paint top surface of beams which support composite metal floor deck.
   5. Apply 2 coats of paint to surfaces which are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

B. Surface Preparation: After inspection and before shipping, clean steel to be painted. Remove loose rust, mill scale, spatter, and slag or flux deposits. Clean in accordance with Steel Structure Painting Council (SSPC) as follows:
   1. SP-2, “Hand Tool Cleaning or SP-3, “Power Tool Cleaning” for members in enclosed conditioned space
   2. SP-6, “Commercial Blast Cleaning” for members exposed to weather, architecturally exposed structural steel (AESS), member in non-conditioned spaces, members in crawlspaces.
   3. SP-10, “Near-White Blast Cleaning” for high-strength, low-alloy steel surfaces to avoid uneven oxidation.

C. Painting: Immediately after surface preparation apply structural steel primer paint in accordance with manufacturer’s instructions, at a rate to provide a uniform dry film thickness as specified. Use

painting methods which results in full coverage of joints, corners, edges and exposed surfaces.

PART 3 - EXECUTION

3.1 INSPECTION

A. Erector must examine areas and conditions under which structural steel work is to be installed, and notify Contractor of conditions detrimental to proper and timely completion work.

3.2 SURVEY

A. Employ a registered professional engineer or public surveyor, experienced in survey work, to establish permanent bench marks as shown and as necessary for accurate erection of structural steel. Check elevations of concrete and masonry bearing surfaces and locations of anchor bolts and similar devices before erection work proceeds, report discrepancies to Architect. Do not proceed with erection until corrections have been made, or until compensating adjustments to structural steel work have been agreed upon with Architect.

3.3 ERECTION

A. General: Comply with AISC Specifications and Code of Standard Practice, and as herein specified.

B. Temporary Shoring and Bracing:
1. Provide adequate shoring and bracing to safely withstand all loads to which structure may be subjected during construction process including wind loads, dead loads, construction material, and equipment loads. Such bracing shall remain in place as long as required for safety.
2. As erection progresses, make a sufficient number of permanent welded or bolted connections to withstand erection stresses and maintain stability.
3. Design of temporary shoring and bracing shall be responsibility of Contractor.

C. Temporary Planking; Provide planking and working platforms, as necessary, to effectively complete work.

D. Anchor Bolts: Furnish anchor bolts and other connectors required for securing structural steel to foundations and other in-place work. Furnish templates and other devices as necessary for presetting bolts and other anchors in accurate locations. Refer to Division 3 of these Specifications for anchor bolt installation requirements in concrete, and Division 4 for masonry installation.

E. Setting Bases and Bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of base and bearing plates.
1. Set loose and attached base plates and bearing plates, for structural members, on wedges or other adjusting devices.
2. Tighten anchor bolts after supported members are positioned and plumbed. Do not remove wedges or shims but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.

F. Slide Bearing Plates: Shall be permanently affixed to member and support, respectively, by welding or bolting as indicated. Member faces shall be aligned and leveled so as to maintain full and level contact between surfaces before completing installation. Use tapered shims where required for leveling.

G. Field Assembly:
1. Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming a part of a complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
2. Level and plumb individual members of structure within tolerances defined by AISC Code for Standard Practice, unless closer tolerances are required for proper fitting of adjoining or enclosing materials, in which case the most stringent shall apply.
3. Set horizontal members with their natural camber (or specified camber) up.
4. Exposed-to-view faces of members designated as architecturally exposed structural steel shall be plumbed, leveled and aligned to a tolerance not to exceed 2 the amount permitted for structural steel, unless adjoining materials dictate a tighter tolerance.
5. Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be when completed and in service.
6. Splice members only where indicated and accepted on final shop drawing.
7. Where parts cannot be assembled or fitted properly, as a result of errors in fabrication or of deformation due to handling or transportation, such condition shall be immediately reported to Architect, along with proposed method of correction. Straightening of bends or warps shall be done by approved methods. Bent or damaged heat-treated parts will be rejected.
8. Fastening of splices in compression members shall be done after abutting surfaces have been brought completely into contact.

H. Erection Bolts: On exposed welded construction, remove erection bolts, fill holes with plug welds and grind smooth at exposed surfaces. On non-exposed welded construction, erection bolts shall be tightened securely and left in place, or if removed, holes shall be filled with plug welds.

I. Bolted Connections:
1. High-strength bolts shall be installed in conformance with “Specifications for Structural Joints using ASTM A 325 or A 490 Bolts.”
2. A 307 bolts and high-strength (A 325 and A 490) bolts noted to be “snug-tight” shall be tightened using a few impacts of an impact wrench or the full effort of a man using an ordinary spud wrench, bringing plies into snug contact.
3. High-strength bolts which are not specifically designated to be “snug-tight” shall be tightened to provide at least the minimum tension shown in Table 4 of “Specification for Structural Joints using ASTM A 325 and A 490 Bolts.” Tightening shall be done by turn- of-the-nut method, with direct tension indicators, or by properly calibrated wrenches.
4. Bolted parts shall fit solidly together when assembled. All joint surfaces shall be free of burrs, dirt and other foreign material that would prevent solid seating of parts.
5. Bolts tightened by calibrated wrench or torque control shall have a hardened washer under the element (nut or bolt head) turned in tightening.
6. Hardened washers shall be placed over slotted holes in an outer ply. Hardened beveled washers shall be used where outer face of bolted parts has a slope greater than 1:20 with respect to bolt axis.

J. Field Welding: Comply with ASI Structural Welding Code and AISC Specification for Structural Steel Buildings. Pay particular attention to surface preparation, preheating, sequence, and continuity of welds. Where heavy shapes are to be welded, comply with all special requirements of AISC Specification and AWS Structural Welding Code.

K. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.

L. Do not enlarge unfair holes in members by burning or by use of drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts.

M. Gas Cutting: Do not use gas cutting torches in field for correcting fabrication errors in structural framing. Cutting will be permitted only on secondary members which are not under stress, as acceptable to Architect. Finish gas-cut sections equal to a sheared appearance when permitted.

N. Touch-up Painting; Immediately after erection, touch-up areas of hot-dip galvanized members where galvanizing has been abraded during shipping and erection and where it has been removed or damaged due to welding. Apply specified cold galvanizing compound in accordance with manufacturer's instructions, to a minimum dry film thickness of 20 mils.

3.4 CLEANUP

A. Clean up all debris caused by work of this Section, keeping the area clean and neat at all times.

END OF SECTION

COLLIN COUNTY JUVENILE JUSTICE
ALTERNATIVE EDUCATION PROGRAM
McKINNEY, TEXAS

SECTION 05 31 13

STEEL FLOOR DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, Bidding Requirements, Contract Forms, Conditions of the Contract and Division 1 - General Requirements apply to the work of this section

1.2 WORK INCLUDED

A. Metal floor decking

1.3 RELATED WORK

A. Structural Steel - Section 05 12 00

B. Steel Joist Framing – Section 05 21 00

C. Steel Roof Decking – Section 05 31 23

1.4 QUALITY ASSURANCE

A. Welder Qualifications: Welders and welding procedures shall comply with the requirements of ANSI/AWS D1.1 Structural Welding Code.

B. Label construction: Floor deck units shall be listed by Underwriters Laboratories as "Steel Floor and Form Unit", and shall bear the UL Classification Marking.

1.5 REFERENCES

A. American National Standards Institute (ANSI)/American Welding Society (AWS):

B. Underwriters Laboratories, Inc. (UL):
1. Building Materials List January 1983

1.6 SUBMITTALS

A. Shop Drawings: Submit in accordance with Section 013300. Indicated type of deck, gage of metal, finish, and shape and size of special pieces and accessories.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Floor decking: Provide one of the following decks:
1. Composite, 3" deep, 20 gauge, type 3VLI; Vulcraft, a division of Nucor Corp
2. Composite, 3” deep, 20 gauge type 3 ES Floor-Dek; Metal Dek Group, a unit of CSi.

C. Finish:
1. Floor decking units shall have a light commercial class zinc coating.

PART 3 - EXECUTION

3.1 ERECTION

A. Placement: Place steel deck units on the supporting steel framework and adjust to final position before fastening permanently. Bring each unit to proper bearing on the supports. Place units in straight alignment and with a minimum of clearance between ends of abutting units. Deck units shall be continuous over at least three spans.

B. Fastening:
1. Weld units to steel framework at ends and at intermediate supports with 5/8" diameter fusion welds. Space welds as called for in general notes section of structural drawings. Use 2" welding washers for deck gages lighter than 22.
2. Fasten side joints of roof decking together by button punching, spaced not over 36" on center.
3. Deck fastening system shall meet or exceed the required diaphragm resistance noted on the drawings.

C. Openings: As the steel deck units are erected, cut and form the holes and openings which are located and dimensioned on the drawings. Holes required for the work of other trades will be cut by the trades requiring them. Provide deck reinforcing for openings as recommended by the manufacturer.

D. Where interior partitions are indicated to extend to the underside of metal floor deck, provide manufacturer's standard rubber closure installed to fill all voids between top of partitions and underside of metal deck.

E. Furnish sump pans for roof drains, per manufacturer's standards.

F. Heavily damaged roof deck coating shall be wire brushed, cleaned and recoated with the same enamel paint as factory applied.

END OF SECTION

COLLIN COUNTY JUVENILE JUSTICE
ALTERNATIVE EDUCATION PROGRAM
McKINNEY, TEXAS

SECTION 05 31 23

STEEL ROOF DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, Bidding Requirements, Contract Forms, Conditions of the Contract and Division 1 - General Requirements apply to the work of this section

1.2 WORK INCLUDED

A. Metal floor and Roof decking

1.3 RELATED WORK

A. Structural Steel - Section 05 12 00

B. Steel Joist Framing – Section 05 21 00

C. Steel Floor Decking – Section 05 31 13

1.4 QUALITY ASSURANCE

A. Welder Qualifications: Welders and welding procedures shall comply with the requirements of ANSI/AWS D1.1 Structural Welding Code.

B. Label construction: Floor deck units shall be listed by Underwriters Laboratories as "Steel Floor and Form Unit", and shall bear the UL Classification Marking.

1.5 REFERENCES

A. American National Standards Institute (ANSI)/American Welding Society (AWS):

B. Underwriters Laboratories, Inc. (UL):
1. Building Materials List January 1983

1.6 SUBMITTALS

A. Shop Drawings: Submit in accordance with Section 013300. Indicated type of deck, gage of metal, finish, and shape and size of special pieces and accessories.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Roof Decking: Provide 1-1/2" deep wide rib deck units with ribs spaced 6" o.c. Deck plate shall have a flat surface, ribbed top flange is not acceptable. Product/Manufacturer, one of the following: Type 1.5 B Roof Deck by Vulcraft, a Div. of Nucor Corp. or Type B Roof Deck, by Wheeling Corrugating Co., B-Dek by Metal Dek Group of CSi, or approved equal. Deck gage shall be as called for in the drawings.

B. Finish:
   1. Roof decking units shall have a light commercial class zinc coating.

PART 3 - EXECUTION

3.1 ERECTION

A. Placement: Place steel deck units on the supporting steel framework and adjust to final position before fastening permanently. Bring each unit to proper bearing on the supports. Place units in straight alignment and with a minimum of clearance between ends of abutting units. Deck units shall be continuous over at least three spans.

B. Fastening:
   1. Weld units to steel framework at ends and at intermediate supports with 5/8" diameter fusion welds. Space welds as called for in general notes section of structural drawings. Use 2" welding washers for deck gages lighter than 22.
   2. Fasten side joints of roof decking together with No.12 self-tapping Tek screws, spaced as required to provide the minimum diaphragm strength shown on the structural drawings, but not over 18" on center.
   3. Deck fastening system shall meet or exceed the required diaphragm resistance noted on the drawings.

C. Openings: As the steel deck units are erected, cut and form the holes and openings which are located and dimensioned on the drawings. Holes required for the work of other trades will be cut by the trades requiring them. Provide deck reinforcing for openings as recommended by the manufacturer.

D. Where interior partitions are indicated to extend to the underside of metal floor deck, provide manufacturer's standard rubber closure installed to fill all voids between top of partitions and underside of metal deck.

E. Furnish sump pans for roof drains, per manufacturer's standards.

F. Heavily damaged roof deck coating shall be wire brushed, cleaned and recoated with the same enamel paint as factory applied.

END OF SECTION

COLLIN COUNTY JUVENILE JUSTICE
ALTERNATIVE EDUCATION PROGRAM
McKINNEY, TEXAS

SECTION 08 3313

OVERHEAD COILING COUNTER DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes overhead coiling counter doors including supplementary items necessary to complete the Work required for their installation.

B. Provide complete operating shutter assemblies including curtains, guides, counterbalance mechanism, hardware, operators, and installation accessories.

C. Electrical service and connections for powered operators and accessories are specified in Division 26.

1.2 PERFORMANCE REQUIREMENTS

A. Operation-Cycle Requirements: Design overhead coiling counter shutter components and operator to operate for not less than 20,000 cycles.

1.3 SUBMITTALS

A. Product Data: For each type and size of overhead coiling counter shutter and accessory. Include details of construction relative to materials, dimensions of individual components, profiles, and finishes. Provide roughing-in diagrams, operating instructions, and maintenance information. Include the following:

1. Setting drawings, templates, and installation instructions for built-in or embedded anchor devices.
2. Summary of forces and loads on walls and jambs.
3. Motors: Show nameplate data and ratings; characteristics; mounting arrangements; size and location of winding termination lugs, conduit entry, and grounding lug; and coatings.
4. Fire-Rated Shutters: Information describing fire-release system, including testing and resetting instructions.

B. Shop Drawings: For special components and installations not dimensioned or detailed in manufacturer's data sheets.

C. Wiring Diagrams: Detail wiring for power, signal, and control systems. Differentiate between manufacturer-installed and field-installed wiring and between components provided by shutter manufacturer and those provided by others.

D. Samples for Verification: Of each type of exposed finish required, prepared on Samples of size indicated below and of same thickness and material indicated for Work. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.

E. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.

F. Oversize Construction Certification: For shutter assemblies required to be fire-rated and exceeding limitations of labeled assemblies, submit certification of a testing agency acceptable to authorities having jurisdiction that each shutter and frame assembly has been constructed to comply with design, materials, and construction equivalent to requirements for labeled construction.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who is an authorized representative of the overhead coiling shutter manufacturer for both installation and maintenance of units required for this Project.

B. Source Limitations: Obtain overhead coiling shutters through one source from a single manufacturer. Obtain accessories from the overhead coiling shutter manufacturer.

~~C. Fire-Rated Shutter Assemblies: Provide assemblies complying with NFPA 80 that are identical to shutter and frame assemblies tested for fire-test-response characteristics per UL 10b, and that are labeled and listed for fire ratings indicated by UL, FM, ITS/Warnock Hersey, or another testing and inspecting agency acceptable to authorities having jurisdiction.~~

~~D. Oversize Fire-Rated Shutter Assemblies: For units exceeding sizes of tested assemblies, provide certification by a testing agency acceptable to authorities having jurisdiction that shutters comply with all standard construction requirements of tested and labeled fire-rated shutter assemblies, except for size.~~

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Following Manufacturers listed are “acceptable” only if manufacturer can evidence product compliance with requirements of Contract Documents.

The Cookson Company.
Cornell Iron Works Inc.
Mahon Door Corp.
McKeon Rolling Steel Door Company, Inc.
Overhead Door Corporation.
Pacific Rolling Door Co.
Raynor Garage Shutters.
Southwestern Steel Rolling Door Co.
Wayne-Dalton Corp.
Windsor Door; A United Dominion Company.

B. For manufacturers not listed, submit as substitution according to the Conditions of the Contract and Division 1 Specifications Sections.

2.2 SHUTTER CURTAIN MATERIALS

A. Curtain: Manufacturers standard flat-profile interlocking slats, designed to withstand required wind loading, in a continuous length for width of opening without splices. Provide slats of material thickness recommended by shutter manufacturer for performance, size, and type of shutter indicated, and as follows:

1. Stainless-Steel Curtain Slats: ASTM A 240 or ASTM A 666. Type 300 series.

B. Endlocks: Manufacturer's standard locks on not less than alternate curtain slats for curtain alignment and resistance against lateral movement.

C. Bottom Bar: Manufacturer's standard continuous or tubular shape, either stainless steel or aluminum extrusions to suit type of curtain slats.

1. Provide motor-operated Shutters with combination bottom astragal and sensor edge.

D. Curtain Jamb Guides: Fabricate curtain jamb guides of angles, or channels and angles of material and finish to match curtain slats, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Provide continuous integral wear strips to prevent metal-to-metal contact and minimize noise of travel and removable stops on guides to prevent overtravel of curtain.

2.3 ACCESSORIES

A. Hood: Form to entirely enclose coiled curtain and operating mechanism at opening head and act as weatherseal. Contour to suit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Provide closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting projecting beyond wall face. Provide intermediate support brackets as required to prevent sag.

1. Stainless Steel Shutters: Fabricate hoods of stainless-steel sheet, Type 300 series, complying with ASTM A 240 or ASTM A 666, and not less than 0.025-inch thick.
2. Include automatic drop baffle to guard against passage of smoke or flame.
3. Shape: Square.

B. Integral Frame, Hood, and Fascia: Provide welded assemblies of the following sheet metal:

1. Fabricate of not less than 0.064-inch- thick, hot-dip galvanized steel sheet with G90 zinc coating, complying with ASTM A 653.
2. Fabricate of not less than 0.0625-inch- thick, stainless-steel sheet, Type 300 series, complying with ASTM A 240 or ASTM A 666.

C. Integral Sills: Fabricate sills as integral part of frame assembly of same sheet metal, but not less than 0.078 inch thick.

D. Smoke Seals: Provide UL-listed and -tested smoke-seal perimeter gaskets.

E. Fabricate locking device assembly with lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bar to engage through slots in tracks, operable from inside only.

1. Lock cylinder is specified in Division 8 Section, “Door Hardware”.

~~F. Provide automatic-closing device inoperative during normal counter shutter operations, with governor unit complying with requirements of NFPA 80, with easily tested and reset release mechanism, and designed to be activated by the following:~~

~~1. Building fire alarm and detection system and shutter-holder-release devices.~~
~~2. Provide time delay release device similar to Overhead Door Corp. "Fire Sentinel Model FS-C" for easy test and reset operation.~~

2.4 COUNTERBALANCING MECHANISM

A. General: Counterbalance shutters by means of adjustable-tension steel helical torsion spring, mounted around a steel shaft and contained in a spring barrel connected to curtain with required barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.

B. Counterbalance Barrel: Fabricate spring barrel of hot-formed, structural-quality, welded or seamless carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than 0.03 in./ft. of span under full load.

C. Provide spring balance of one or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Provide cast-steel barrel plugs to secure ends of springs to barrel and shaft.

D. Fabricate torsion rod for counterbalance shaft of cold-rolled steel, sized to hold fixed spring ends and carry torsional load.

E. Brackets: Provide mounting brackets of manufacturer's standard design, either cast-iron or cold-rolled steel plate with bell-mouth guide groove for curtain.

2.5 FINISHES, GENERAL

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.6 STAINLESS-STEEL FINISHES

A. Remove or blend tool and die marks and stretch lines into finish.

B. Grind and polish surfaces to produce uniform, directional textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.

C. Bright, Directional Polish: No. 4 finish.

D. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

2.7 ELECTRIC SHUTTER OPERATORS

A. General: Provide electric shutter operator assembly of size and capacity recommended and provided by shutter manufacturer for shutter and operational life specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, remote-control stations, control devices, integral gearing for locking shutter, and accessories required for proper operation. Comply with NFPA 70.

B. Disconnect Device: Provide hand-operated disconnect or mechanism for automatically engaging sprocket-chain operator and releasing brake for emergency manual operation while disconnecting motor, without affecting timing of limit switch. Mount disconnect and operator so they are accessible from floor level.

1. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.
2. Provide safety interlock switch to disengage power supply when shutter is locked.

C. Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency auxiliary operator.

D. Provide control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V, ac or dc.

E. Door-Operator Type: Provide wall-, hood-, or bracket-mounted, jackshaft, gear-head hoist-type shutter operator unit consisting of electric motor, enclosed worm-gear running-in-oil primary drive, chain and sprocket secondary drive, and auxiliary chain-hoist and floor level disconnect.

F. Electric Motors: Provide high-starting torque, reversible, continuous-duty, Class A insulated, electric motors, complying with NEMA MG 1, with overload protection, sized to start, accelerate, and operate shutter in either direction, from any position, at not less than 2/3 fps or more than 1 fps, without exceeding nameplate ratings or considering service factor.

1. Type: Polyphase, medium-induction type.
2. Service Factor: According to NEMA MG 1, unless otherwise indicated.
3. Coordinate wiring requirements and electric characteristics of motors with building electrical system.
4. Provide open dripproof-type motor, and controller with NEMA ICS 6, Type 1 enclosure.

G. Remote-Control Station: Provide momentary-contact, 3-button control station with push-button controls labeled "Open," "Close," and "Stop." Locate on interior side adjacent to shutter.

1. Provide interior units, full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.

H. Obstruction Detection Device: Provide each motorized shutter with indicated external automatic safety sensor able to protect full width of shutter opening. Activation of sensor immediately stops and reverses downward shutter travel.

1. Sensor Edge: Provide each motorized shutter with an automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor immediately stops and reverses downward travel. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.

a. Provide electrically actuated automatic bottom bar.
b. Provide self-monitoring, 4-wire configured device.

I. Limit Switches: Provide adjustable switches, interlocked with motor controls and set to automatically stop shutter at fully opened and fully closed positions.

J. Provide electric operators with ADA-compliant audible alarm and visual indicator lights.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrate surfaces to receive overhead coiling counter doors and associated work and conditions under which work will be installed. Do not proceed until unsatisfactory conditions have been corrected in a manner acceptable to the Installer. Starting of work within a particular area will be construed as installers acceptance of surface conditions.

3.2 INSTALLATION

A. General: Install shutter and operating equipment complete with necessary hardware, jamb and head mold strips, anchors, inserts, hangers, and equipment supports according to Shop Drawings, manufacturer's written instructions, and as specified.

~~1. Install fire-rated shutters to comply with NFPA 80.~~

B. Lubricate bearings and sliding parts; adjust shutters to operate easily, free from warp, twist, or distortion and fitting weathertight for entire perimeter.

3.3 DEMONSTRATION

A. Startup Services: Engage a factory-authorized service representative to perform startup services and to train Owner's maintenance personnel as specified below:

1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

~~a. Test shutter closing when activated by detector or alarm connected fire-release system. Reset closing mechanism after successful test.~~

2. Train Owner's maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing, preventive maintenance, and procedures for testing and resetting release devices.
3. Review data in the maintenance manuals. Refer to Division 1 Section "Operation and Maintenance Data."

END OF SECTION

COLLIN COUNTY JUVENILE JUSTICE
ALTERNATIVE EDUCATION PROGRAM
McKINNEY, TEXAS

SECTION 08 4400

GLAZED ALUMINUM WALL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Work required for this section includes glazed aluminum wall systems and supplementary items necessary to complete their installation.

B. Aluminum entrances are included in other Division 8 Sections.

1.2 SYSTEM DESCRIPTION

A. This is a performance specification and glazed aluminum wall system manufacturer shall be responsible for complete design and engineering required to meet specified performance requirements within physical and aesthetic requirements established.

B. Contents documents establish aesthetic criteria and performance requirements for the wall system. Requirements specified or indicated by details are intended to establish basic dimensions of module and sight lines and profiles of members. Include modifications or additions required to meet specified requirements and maintain the visual design concept.

C. Contract Documents do not necessarily indicate or describe total work required for completion of Work. Furnish and install all items required for complete installation.

D. Dimension and profile adjustments may be made in proposed design in interest of fabrication or erection methods or techniques, weatherability factor, or ability of design to satisfy aesthetic and performance requirements, provided that design intent and intent of Contract Documents are maintained.

1.3 PERFORMANCE REQUIREMENTS

A. General: Provide manufacturer's glazed aluminum wall system, adapted to application indicated, that complies with performance requirements specified as demonstrated by testing the manufacturers corresponding systems according to test methods indicated.

1. It is the intent to allow manufacturer to provide a standard system and components to the extent that such system complies with the aesthetic design and performance criteria.

B. Air and Water Infiltration: Design and install the glazed aluminum wall system for permanent resistance to air and water leakage through the system in accordance with the following:

1. Air Infiltration: Air leakage through wall system shall not exceed 0.06 cfm per sq. ft. of fixed wall area when tested in accordance with ASTM E 283 at a minimum static air pressure differential of 6.24 lbf per sq. ft.

2. Water Penetration:

    a. Static Air Pressure: There shall be no evidence of uncontrolled water leakage through the wall system, as defined in AAMA 501, when tested in accordance with ASTM E 331 at a minimum differential pressure of 20 percent of inward design wind load but not less than 12.0 lbf per sq. ft.

C. Structural Performance: Design, engineer, fabricate, and install glazed aluminum wall system, including anchorages, to withstand the effects of a wind load acting inward and outward, normal to the plane of the wall, when tested in accordance with ASTM E 330, with no material and deflection failures or permanent deformation of structural members exceeding 0.2 percent of the span.

1. Meet wind load requirements of applicable Local Building Codes and Design Wind Pressures Schedule on drawings.
2. Structural test pressure shall be equal to 150 percent of the positive and negative design wind pressures.
3. Design wall system to accommodate movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
4. Deflections: Wall system shall be capable of withstanding building movements including wind loading and of performing within the following limitations:

    a. Deflection of framing members perpendicular to the plane of the wall shall not exceed 1/175 of its clear span or 3/4 inch, whichever is less.
    b. Deflection of members parallel to the plane of the wall, when carrying its full dead load, shall not exceed an amount that will reduce glass bite by less than 75 percent of the design dimension and shall not reduce edge clearance between itself and the panel, glass, or other fixed member to less than 1/8 inch.
    c. Deflection of framing members in a direction normal to wall plane is limited to 1/360 of clear span, 3/4 inches maximum, where gypsum board surfaces are subject to bending.
    d. Deflection of framing members overhanging an anchor point is limited to 2 times the length of the cantilevered member, divided by 175.
    e. The center deflection of the window stool trim, when subjected to a 250 pound vertical concentrated load, shall not exceed 1/8".
    f. Design wall system to accommodate 3/8" differential vertical live load movement of the floors.

D. Seismic Loads: Provide glazed aluminum wall system, including anchorage, capable of withstanding the effects of earthquake motions calculated according to requirements of authorities having jurisdiction.

E. Thermal Movements: Provide glazed aluminum wall system, including anchorages, capable of withstanding thermal movements resulting from an ambient temperature differential of 120 deg F, and a metal surface temperature range of 180 deg F within the wall framing without causing buckling, damaging stresses on glazing, failure of joint sealants, damaging loads on fasteners, noise or vibration, and other detrimental effects.

F. Condensation Requirements: Provide glazed aluminum wall system with thermal-break construction that has been tested in accordance with AAMA 1503.1 and certified by the manufacturer to provide a condensation resistance factor (CRF) of not less than 55.

G. Comply with requirements of 2006 International Energy Conservation Code, Climate Zone 3.

H. Infiltrated and Condensation Water Management: Design system to incorporate provisions for guttering and weeping infiltrated and condensate water out of system to the exterior. Coordinate with other adjacent exterior wall components.

I. Dimensional Tolerances: Provide glazed aluminum wall system, including anchorage, that accommodates dimensional tolerances of building frame and other adjacent construction.

1.4 SUBMITTALS

A. Product data: Include manufacturer's specifications for materials, finishes, construction details, installation instructions, and recommendations for maintenance.

B. Shop Drawings: Prepared by manufacturer, not fabricator. Show adaptation of manufacturer's standard glazed aluminum wall system to the project; include typical unit elevations at 1/2-inch scale and details at full scale. Show dimensions, profiles of members, anchorage system, interface with building construction, and glazing.

1. Include setting drawings, templates, and directions for the installation of anchor bolts and other anchorages installed as a unit of work under other sections.
2. Indicate where and how the system deviates from Contract Documents.
3. Shop drawings shall contain seal of a professional engineer currently registered in licensing jurisdiction of the project and a written statement that the wall system conforms to project requirements, applicable codes, and specified conditions.
4. Provide for information only, material properties and other information needed for structural analysis including computations, prepared, signed, or, and sealed by a professional engineer licensed to practice in the jurisdiction where the project is located.
5. Submittal shall contain statement explaining how proposed system design will accommodate infiltrated and condensate water.

C. Samples: Provide pairs of samples of each aluminum finish type and color on 12-inch-long sections of extrusions or formed shapes and on 6-inch-squares of aluminum sheet or plate. Include 2 or more units in each sample set showing the extreme limits of variations expected in color and texture of finish.

D. Sample Mock-Up: Provide 24 inch by 24 inch sample mock up of typical horizontal and vertical mullion intersection with glazing condition. Include sample mock-up of any unusual condition.

E. Test Reports: Provide test reports from a qualified independent testing agency evidencing compliance of the manufacturer's glazed aluminum wall system with performance requirements indicated based on comprehensive testing of manufacturers current system.

F. Manufacturer's Project Acceptance Document: Submit certification that manufacturer and installer will warrant glazed aluminum wall system for the specific site, design, details and application indicated for this Project.

1. Submit sample copy of Manufacturer's Extended Warranty.

G. Manufacturer’s Field Reports: Submit detailed report of visits made by representatives of the manufacturer to the Project as specified in “Field Quality Control” Article.

H. Design Engineer Design Certification: Submit certification stating that the design of all components, including connection to the supporting structure, is in compliance with all provisions of the Contract Documents and the local building code.

I. Design Engineer Inspection Certification: Submit as specified in the “Field Quality Control” Article.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer to perform glazed aluminum wall work who has a minimum of 5 years specialized experience in installing glazed aluminum wall systems similar to that required for this Project and who is acceptable to manufacturer of wall system.

1. Installer Certification: Submit written certification from manufacturer of glazed aluminum wall system certifying that Installer is approved by manufacturer to install specified system.
2. Installer's Field Supervision: Require Installer to maintain a full-time supervisor/foreman who is on job site during times that glazed aluminum wall system work is in progress and who is experienced in installing systems similar to type and scope required for this Project.

B. Design Engineer Qualifications: Professional engineer legally authorized to practice in the jurisdiction where the Project is located and experienced in providing engineering services of the kind indicated that have resulted in the installation of glazed aluminum wall systems similar to this Project in material, design, and extent, and, that has a record of successful in-service performance.

C. Preconstruction Testing Service: The Owner will engage a qualified independent testing laboratory to perform the preconstruction testing indicated.

1. Refer to Division 1 Section “Testing Mock-up For Building Enclosure System”.

D. Single-Source Responsibility: Provide glazed aluminum wall system for the project from one source from a single manufacturer.

E. Field-Constructed Mock-Up: Prior to installing aluminum wall system, construct a full-size sample mock-up, including mullions, panels, vision glass, and other elements of the system, to verify selections made under sample submittals and to represent completed system for aesthetic effects and qualities of materials and installation. Build the mock-up to comply with following requirements, using materials indicated for the final installation.

1. Construct the mock-up on site in the location and sizes indicated or, if not indicated, as directed by the Architect.
2. Demonstrate the proposed range of aesthetic effects and workmanship.
3. Obtain the Architect's acceptance of the mock-up before starting final erection of the glazed aluminum wall system.
4. Maintain the mock-up in undisturbed condition during construction as a standard for judging completed wall installation.
5. When directed, demolish and remove mock-up from the site unless accepted by the Architect, to be incorporated into the Work.

F. Product Options: The drawings indicate size, profiles, and dimensional requirements of the glazed aluminum wall system and are based on the specific type and model indicated. Glazed aluminum wall systems by other manufacturers having equal performance characteristics may be considered provided deviations in dimensions and profiles are minor and do not change the intended aesthetic effects or intended performance requirements as judged by the Architect.

G. Preinstallation Conference: Before beginning wall installation, conduct a preinstallation conference at the Project site with the wall system manufacturer, installer, and other interested parties to review procedures, schedules, and coordination of the wall installation with other elements of the Work.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings.

1. Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabrication without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Following manufacturers listed are "acceptable" only if manufacturer can evidence product compliance with requirements of Contract Documents.

Kawneer Company, Inc.
United States Aluminum Corp.
Vistawall Architectural Products.
YKK AP America Inc.

B. For manufacturers not listed, submit as substitution according to the Conditions of the Contract and Division 1 Specification Sections.

2.2 PRODUCT STANDARD

A. The design for glazed aluminum wall system is based on the following manufacturer's system. Subject to compliance with requirements, provide named product or a comparable product by one of the acceptable manufacturers.

1. Aluminum Storefront System: Kawneer ~~2250 IG~~ Trifab VG 451 Center Glazed.

2.3 MATERIALS

A. Aluminum: Provide alloy, temper, and thickness recommended by the manufacturer for the type of use and finish indicated and with not less than the strength and durability properties required to fulfill performance requirements.

1. Extruded Bars, Tubes and Shapes: Comply with requirements of ASTM B 221.
2. Plate and Sheet: Comply with requirements of ASTM B 209.

B. Glass: Provide glass of types and thicknesses indicated. Fabricate glass to sizes required for openings indicated with edge clearances and tolerances complying with manufacturer's recommendations. Refer to Division 8 Section "Glazing" for requirements.

C. Glazing Gaskets: Manufacturer's standard sealed-corner pressure- glazing or wedge-lock dry glazing system. Refer to Division 8 Section "Glazing" for requirements.

D. Concealed Metal Joint Sealant: Curtain wall type, nondrying, nonskinning, AAMA 809.2.

E. Exposed Sealants and joint fillers, for joints at the interface of wall construction and other work, shall comply with requirements specified in Division 7 Section "Joint Sealers".

F. Steel Reinforcement: With manufacturer's standard corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.

1. Structural Shapes, Plates, and Bars: ASTM A 36.
2. Cold-Rolled Sheet and Strip: ASTM A 611.
3. Hot-Rolled Sheet and Strip: ASTM A 570.

G. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

H. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

1. Where fasteners are subject to loosening or turn out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
2. Reinforce members as required to receive fastener threads.
3. Use exposed fasteners with countersunk Phillips screw heads.
4. Finish exposed portions to match framing system.
5. At movement joints, use slip-joint linings, spacers, and sleeves of material and type recommended by manufacturer.

I. Anchors: Three-way adjustable anchors that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.

1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123 or ASTM A 153 requirements.

J. Concealed Flashing: Dead-soft, 0.018-inch- thick stainless steel, ASTM A 240 of type recommended by manufacturer.

K. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil thickness per coat.

2.4 FABRICATION

A. General: Fabricate glazed aluminum wall system at the manufacturer's shop to the fullest extent possible and before applying finishes. Provide concealed fasteners. Make provisions to drain to exterior face of wall, water entering at joints and condensation occurring within wall construction including secondary water. Provide horizontal members with continuous gutters to drain moisture to exterior through protected weep holes.

1. Match exposed work to produce continuity of line. Fit joints accurately and secure rigidly.
2. Seal joints and connections in exterior metal watertight with metal joint sealant.
3. Provide properly designed watertight expansion joints as required.
4. Design and anchor wall system so that it will not be distorted nor the fastenings seriously stressed from the expansion and contraction of the metal. Provide slotted holes for erection adjustment.
5. Welding shall conform to the requirements of the Standard Code for Arc and Gas Welding of the American Welding Society.
6. Welds shall be of adequate strength and durability, with jointing tight, flush, smooth and clean.
7. Weld behind finished surfaces so as to cause no distortion and/or discoloration on the finished side.
8. Remove weld splatter and welding oxides on finished surfaces.
9. Provide minimum clearances and depth of glazing packets as recommended by glass manufacturer for thickness and type of glass indicated.

2.5 FINISHES

A. General: Comply with the NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Finish designations prefixed by "AA" conform to the system established by the Aluminum Association for designating aluminum finishes.

D. Clear Anodized Finish: AA-M12C22A41 (Mechanical Finish: as fabricated, nonspecular; Chemical Finish: etched, medium matte; Anodic Coating: Class I Architectural, clear film thicker than 0.7 mil) complying with AAMA 611, Class 1.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates surfaces to receive glazed aluminum wall system and associated work and conditions under which work will be installed. Do not proceed with installation until unsatisfactory conditions have been corrected in a manner acceptable to Installer. Starting work within a particular area will be construed as applicator's acceptance of surface conditions.

3.2 PREPARATION

A. Furnish inserts for setting in concrete forming, and similar work required to support glazed aluminum wall system.

B. Field measure and verify governing dimensions, including floor elevations, floor-to-floor heights, minimum clearance between wall system and structural frames and other permissible dimensional tolerances in building frame.

C. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

3.3 INSTALLATION

A. Comply with manufacturer's instructions for installing fabricated wall components, with particular care and attention to preservation of applied finishes. Discard or remove and replace damaged members.

B. Fit joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints. Seal joints watertight, unless otherwise indicated. Provide means to drain water to the exterior to produce a permanently weatherproof system.

C. Install components to drain water passing joints, condensation occurring in glazing channels, condensation occurring within framing members, and moisture migrating within the system to the exterior.

D. Do not cut, trim, weld or braze component parts during erection, in any manner which would damage finish, decrease strength or result in visual imperfection or failure in performance of construction.

E. Secure to structure with non-staining and non-corrosive shims, anchors, fasteners, spacers and fillers.

F. Maintain minimum clearance of one inch between inside face of wall system and outside face of building structure. Allow 3/8 inch minimum for sealant between wall system and adjacent construction.

G. Anchor components securely in place. Shim and allow for movement resulting from changes in thermal conditions. Provide separators and isolators to prevent corrosion, electrolytic deterioration, and impede movement of moving joints.

H. Glazing: Install glass and glazing material in accordance with manufacturers, recommendations and as specified. Comply with requirements specified in Division 8 Section "Glazing".

I. Sealants and joint fillers: Seal perimeter of glazed aluminum wall system. Comply with requirements specified in Division 7 Section "Joint Sealants".

J. Erection Tolerances: Install components plumb, level, accurately aligned, and located in reference to column lines and floor levels. Adjust work to conform to the tolerances indicated below. Tolerances indicated below are maximum and are not cumulative.

1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
3. Alignment:

    a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
    b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
    c. Where surfaces are separated by reveal or protruding element of 1 inch wide or greater, limit offset from true alignment to 1/4 inch.

4. Location: Limit variation from plane or location shown to 1/8 inch in 12 feet or 1/2 inch in any total length.

3.4 FIELD QUALITY CONTROL TESTS

A. Test installed glazed aluminum wall system in accordance with AAMA 501.2. "Specifications for Field Check of Metal Curtainwalls for Water Leakage."

1. After lower two typical floors of the wall system is completed, perform test at location designated by the Architect. Perform additional test on top two typical floors.
2. Satisfactory results of the check do not relieve the Contractor from conforming to requirements of the approved shop drawings and job specifications.
3. Remedial measures found necessary and effective in eliminating leakage in the area checked shall be used in fabricating and installing the remainder of the wall on the building.

B. Design Engineer Inspection: Design engineer, responsible for the structural aspects of the system shall inspect the completed installation for compliance with the design and direct installer to correct any portion that is not in compliance. Upon resolution of all installation deficiencies, design engineer shall certify that installation is in compliance with the design.

C. Manufacturer’s Field Service: Manufacturer's representative shall periodically inspect material and installation to insure installation is proceeding in accordance with manufacturer’s recommendations and warranty requirements. Representative shall submit a written report of each visit indicating observations, findings and conclusions of inspection.

END OF SECTION

COLLIN COUNTY JUVENILE JUSTICE
ALTERNATIVE EDUCATION PROGRAM
McKINNEY, TEXAS

SECTION 10 1000

VISUAL DISPLAY SURFACES

PART 1 - GENERAL

1.1 SUMMARY

A. Work for this section includes visual display surfaces and supplementary items necessary to complete their installation.

1.2 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data: For each type of visual display board indicated.

C. Shop Drawings: For each type of visual display board required.

1. Include dimensioned elevations. Show location of joints between individual panels where unit dimensions exceed maximum panel length.
2. Include sections of typical trim members.
3. Show anchors, grounds, reinforcement, accessories, layout, and installation details.

D. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors and textures available.

E. Samples for Verification: Of specified products, showing color and texture or finish selected. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected. Prepare Samples from the same material to be used for the Work.
1. Aluminum Trim and Accessories: Samples of each finish type and color, on 6-inch- (150-mm-) long sections of extrusions and not less than 4-inch (100-mm) squares of sheet or plate. Include Sample sets showing the full range of color variations expected.
2. Tackboards: Sample panel not less than 8-1/2 by 11 inches (215 by 280mm) for each type, color and texture required.

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain visual display surfaces through one source from a single manufacturer.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Following manufacturers listed are "acceptable" only if manufacturer can evidence product compliance with requirements of Contract Documents.

Best-Rite Chalkboard Co.
Carolina Chalkboard Co.
Claridge Products and Equipment, Inc.
Ghent Manufacturing Inc.
Greensteel, Inc.
Lemco, Inc.
Marsh Chalkboard Co.
Nelson Adams

B. For manufacturers not listed, submit as substitution according to the Conditions of the Contract and Division 1 Specification Sections.

2.2 MATERIALS

A. Porcelain Enamel Panels: Balanced, high-pressure-laminated, porcelain enamel panels of 3-ply construction consisting of face sheet, core material, and backing.

1. Face Sheet: 0.024-inch (0.61-mm) enameling grade steel especially processed for temperatures used in coating porcelain on steel. Coat exposed face and edges with a 3-coat process consisting of primer, ground coat, and color cover coat. Coat concealed face with a 2-coat process consisting of primer and ground coat. Fuse cover and ground coats to steel at manufacturer's standard firing temperatures, but not less than 1200 deg F (649 deg C).
   a. Markerboard Cover Coat: Provide manufacturer's standard, light-colored, special writing surface with gloss finish intended for use with erasable dry markers.

2. Core: 3/8-inch- (9.5-mm-) thick, particleboard core material complying with requirements of ANSI A208.1, Grade 1-M-1.
3. Backing Sheet: 0.015-inch- (0.38-mm-) thick, aluminum-sheet backing.
4. Laminating Adhesive: Manufacturer's standard, moisture-resistant, thermoplastic-type adhesive.

B. Plastic-Impregnated Cork Tackboards: Seamless sheet, 1/4-inch- (6.4-mm-) thick, ground natural cork compressed with a resinous binder with washable vinyl finish and integral color throughout, factory laminated to ~~burlap~~ 1/4 inch particleboard backing. Provide color and texture as scheduled or as selected from manufacturer's standards.

2.3 ACCESSORIES

A. Metal Trim and Accessories: Fabricate frames and trim of not less than 0.062-inch- (1.57-mm-) thick, extruded-aluminum alloy, size and shape as indicated, to suit type of installation. Provide straight, single-length units. Keep joints to a minimum. Miter corners to a neat, hairline closure.

1. Where size of visual display surfaces or other conditions require support in addition to normal trim, provide structural supports or modify trim as selected by Architect from manufacturer's standard structural support accessories to suit conditions indicated.
2. Factory-Applied Trim: Manufacturer's standard narrow trim with no visible screws or exposed joints.

B. Markertray: Manufacturer's standard, continuous.

1. Solid Type: Extruded aluminum with ribbed section and smoothly curved exposed ends.

C. Map Rail: Provide the following accessories:

1. Display Rail: Continuous and integral with map rail; fabricated from cork approximately 1 to 2 in (25 to 50 mm) wide.
2. End Stops: Located at each end of map rail.
3. Map Hooks and Clips: Two map hooks with flexible metal clips for every 48 inches (1219 mm) of map rail or fraction thereof.

2.4 FABRICATION

A. Porcelain Enamel Boards: Laminate facing sheet and backing sheet to core material under pressure with manufacturer's recommended flexible, waterproof adhesive.

B. Assembly: Provide factory-assembled units, unless field-assembled units are required.

1. Make joints only where total length exceeds maximum manufactured length. Fabricate with minimum number of joints, balanced around center of board, as acceptable to Architect.
2. Provide manufacturer's standard vertical joint system between abutting sections of chalkboards.

2.5 FINISHES

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.

B. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.

C. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 607.1.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine wall surfaces, with Installer present, for compliance with requirements and other conditions affecting installation of visual display surfaces.

1. Surfaces to receive visual display surfaces shall be free of dirt, scaling paint, and projections or depressions that would affect installation.
2. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Deliver factory-built visual display surfaces completely assembled in one piece without joints, where possible. If dimensions exceed panel size, provide 2 or more pieces of equal length as acceptable to Architect. When overall dimensions require delivery in separate units, prefit components at the factory, disassemble for delivery, and make final joints at the site. Use splines at joints to maintain

B. Install units in locations and at mounting heights indicated and according to manufacturer's written instructions. Keep perimeter lines straight, plumb, and level. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.

3.3 ADJUSTING AND CLEANING

A. Verify that accessories required for each unit have been properly installed.

B. Clean units according to manufacturer's written instructions.

END OF SECTION

COLLIN COUNTY JUVENILE JUSTICE
ALTERNATIVE EDUCATION PROGRAM
McKINNEY, TEXAS

SECTION 230900

INSTRUMENTATION AND CONTROL FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes control equipment for HVAC systems and components, including control components for terminal heating and cooling units not supplied with factory-wired controls.

B. Related Sections include the following:

1. Division 23 Section "Meters and Gages for HVAC Piping" for measuring equipment that relates to this Section.
2. Division 23 Section "Sequence of Operations for HVAC Controls" for requirements that relate to this Section.

1.3 DEFINITIONS

A. DDC: Direct digital control.

B. I/O: Input/output.

C. LonWorks: A control network technology platform for designing and implementing interoperable control devices and networks.

D. MS/TP: Master slave/token passing.

E. PC: Personal computer.

F. PID: Proportional plus integral plus derivative.

G. RTD: Resistance temperature detector.

1.4 SYSTEM PERFORMANCE

A. Comply with the following performance requirements:

1. Graphic Display: Display graphic with minimum 20 dynamic points with current data within 10 seconds.
2. Graphic Refresh: Update graphic with minimum 20 dynamic points with current data within 8 seconds.
3. Object Command: Reaction time of less than two seconds between operator command of a binary object and device reaction.
4. Object Scan: Transmit change of state and change of analog values to control units or workstation within six seconds.
5. Alarm Response Time: Annunciate alarm at workstation within 45 seconds. Multiple workstations must receive alarms within five seconds of each other.
6. Program Execution Frequency: Run capability of applications as often as five seconds, but selected consistent with mechanical process under control.
7. Performance: Programmable controllers shall execute DDC PID control loops, and scan and update process values and outputs at least once per second.
8. Reporting Accuracy and Stability of Control: Report values and maintain measured variables within tolerances as follows:

    a. Water Temperature: Plus or minus 1 deg F.
    b. Water Flow: Plus or minus 5 percent of full scale.
    c. Water Pressure: Plus or minus 2 percent of full scale.
    d. Space Temperature: Plus or minus 1 deg F .
    e. Ducted Air Temperature: Plus or minus 1 deg F .
    f. Outside Air Temperature: Plus or minus 1 deg F .
    g. Dew Point Temperature: Plus or minus 2 deg F .
    h. Temperature Differential: Plus or minus 0.25 deg F .
    i. Relative Humidity: Plus or minus 2 percent.
    j. Airflow (Pressurized Spaces): Plus or minus 3 percent of full scale.
    k. Airflow (Measuring Stations): Plus or minus 5 percent of full scale.
    l. Airflow (Terminal): Plus or minus 5 percent of full scale.
    m. Air Pressure (Space): Plus or minus 0.01-inch wg .
    n. Air Pressure (Ducts): Plus or minus 0.1-inch wg .
    o. Electrical: Plus or minus 5 percent of reading.

1.5 SEQUENCE OF OPERATION

A. See specification 230993 for Sequence of Operation.

1.6 SUBMITTALS

A. Product Data: Include manufacturer's technical literature for each control device. Indicate dimensions, capacities, performance characteristics, electrical characteristics, finishes for materials, and installation and startup instructions for each type of product indicated.

1. DDC System Hardware: Bill of materials of equipment indicating quantity, manufacturer, and model number. Include technical data for operator workstation equipment, interface equipment, control units, transducers/transmitters, sensors, actuators, valves, relays/switches, control panels, and operator interface equipment.
2. Control System Software: Include technical data for operating system software, operator interface, color graphics, and other third-party applications.
3. Controlled Systems: Instrumentation list with element name, type of device, manufacturer, model number, and product data. Include written description of sequence of operation including schematic diagram.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

1. Bill of materials of equipment indicating quantity, manufacturer, and model number.
2. Schematic flow diagrams showing fans, pumps, coils, dampers, valves, and control devices.
3. Wiring Diagrams: Power, signal, and control wiring.
4. Details of control panel faces, including controls, instruments, and labeling.
5. Written description of sequence of operation.
6. Schedule of dampers including size, leakage, and flow characteristics.
7. Schedule of valves including flow characteristics.
8. DDC System Hardware:

    a. Wiring diagrams for control units with termination numbers.
    b. Schematic diagrams and floor plans for field sensors and control hardware.
    c. Schematic diagrams for control, communication, and power wiring, showing trunk data conductors and wiring between operator workstation and control unit locations.

9. Control System Software: List of color graphics indicating monitored systems, data (connected and calculated) point addresses, output schedule, and operator notations.
10. Controlled Systems:

    a. Schematic diagrams of each controlled system with control points labeled and control elements graphically shown, with wiring.
    b. Scaled drawings showing mounting, routing, and wiring of elements including bases and special construction.
    c. Written description of sequence of operation including schematic diagram.
    d. Points list.

C. Data Communications Protocol Certificates: Certify that each proposed DDC system component complies with LonWorks.

D. Samples for Initial Selection: For each color required, of each type of thermostat cover with factory-applied color finishes.

E. Samples for Verification: For each color required, of each type of thermostat cover.

F. Software and Firmware Operational Documentation: Include the following:

1. Software operating and upgrade manuals.
2. Program Software Backup: On a magnetic media or compact disc, complete with data files.
3. Device address list.
4. Printout of software application and graphic screens.
5. Software license required by and installed for DDC workstations and control systems.

G. Software Upgrade Kit: For Owner to use in modifying software to suit future systems revisions or monitoring and control revisions.

H. Qualification Data: For Installer.

I. Field quality-control test reports.

J. Operation and Maintenance Data: For HVAC instrumentation and control system to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:

1. Maintenance instructions and lists of spare parts for each type of control device and compressed-air station.
2. Interconnection wiring diagrams with identified and numbered system components and devices.
3. Keyboard illustrations and step-by-step procedures indexed for each operator function.
4. Inspection period, cleaning methods, cleaning materials recommended, and calibration tolerances.
5. Calibration records and list of set points.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Automatic control system manufacturer's authorized representative who is trained and approved for installation of system components required for this Project.

B. 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.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Factory-Mounted Components: Where control devices specified in this Section are indicated to be factory mounted on equipment, arrange for shipping of control devices to equipment manufacturer.

B. System Software: Update to latest version of software at Project completion.

1.9 COORDINATION

A. Coordinate location of thermostats, humidistats, and other exposed control sensors with plans and room details before installation.

B. Coordinate supply of conditioned electrical branch circuits for control units and operator workstation.

C. Coordinate equipment with Division 26 Section "Electrical Power Monitoring and Control" to achieve compatibility of communication interfaces.

D. Coordinate equipment with Division 26 Section "Panelboards" to achieve compatibility with starter coils and annunciation devices.

E. Coordinate equipment with Division 26 Section "Motor-Control Centers" to achieve compatibility with motor starters and annunciation devices.

1.10 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Replacement Materials: One replacement diaphragm or relay mechanism for each unique valve motor, controller, thermostat, and positioning relay.
2. Maintenance Materials: One thermostat adjusting key(s).

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 CONTROL SYSTEM

A. Manufacturers:

1. Alerton Inc.
2. Automated Logic Corporation.
3. Honeywell International Inc.; Home & Building Control.
4. TAC Americas, INC.

B. Control system shall consist of sensors, indicators, actuators, final control elements, interface equipment, other apparatus, accessories, and software connected to distributed controllers operating in multiuser, multitasking environment on token-passing network and programmed to control mechanical systems. An operator workstation permits interface with the network via dynamic color graphics with each mechanical system, building floor plan, and control device depicted by point-and-click graphics.

C. INTEGRATION OF NEW DDC COMPONENTS INTSTALLED UNDER THIS CONTRACT INTO OWNER'S EXISTING ENERGY MANAGEMENT SYSTEM SHALL BE ACCOMPLISHED BY ROCKWALL CONTROLS, INC. NO EXCEPTIONS! CONTACT JOHN WHITE AT 972-771-3514.

2.3 DDC EQUIPMENT

A. Operator Workstation: One PC-based microcomputer with minimum configuration as follows:

1. Motherboard: With 8 integrated USB 2.0 ports, integrated Intel Pro 10/100 (Ethernet), integrated audio, bios, and hardware monitoring.
2. Processor: Intel Pentium 4.
3. Random-Access Memory: 512 MB.
4. Graphics: Video adapter, minimum 1280 x 1024 pixels, 64-MB video memory, with TV out.
5. Monitor: 19 inches , LCD color.

6. Keyboard: QWERTY, 105 keys in ergonomic shape.
7. Floppy-Disk Drive: 1.44 MB.
8. Hard-Disk Drive: 160 GB.
9. CD-ROM Read/Write Drive: 48x24x48.
10. Mouse: Three button, optical.
11. Uninterruptible Power Supply:
12. Operating System: Microsoft Windows XP Professional with high-speed Internet access.

    a. LonWorks Compliance: Control units shall use LonTalk protocol and communicate using EIA/CEA 709.1 datalink/physical layer protocol.

13. Printer: Black-and-white, laser-jet type as follows:

    a. Print Head: 1200 x 1200 dpi resolution.
    b. Paper Handling: Minimum of 250 sheet trays.
    c. Print Speed: Minimum of 120 characters per second.

14. Application Software:

    a. I/O capability from operator station.
    b. System security for each operator via software password and access levels.
    c. Automatic system diagnostics; monitor system and report failures.
    d. Database creation and support.
    e. Automatic and manual database save and restore.
    f. Dynamic color graphic displays with up to 10 screen displays at once.
    g. Custom graphics generation and graphics library of HVAC equipment and symbols.
    h. Alarm processing, messages, and reactions.
    i. Trend logs retrievable in spreadsheets and database programs.
    j. Alarm and event processing.
    k. Object and property status and control.
    l. Automatic restart of field equipment on restoration of power.
    m. Data collection, reports, and logs. Include standard reports for the following:

        1) Current values of all objects.
        2) Current alarm summary.
        3) Disabled objects.
        4) Alarm lockout objects.
        5) Logs.

    n. Custom report development.
    o. Utility and weather reports.
    p. Workstation application editors for controllers and schedules.
    q. Maintenance management.

15. Custom Application Software:

    a. English language oriented.
    b. Full-screen character editor/programming environment.
    c. Allow development of independently executing program modules with debugging/simulation capability.
    d. Support conditional statements.
    e. Support floating-point arithmetic with mathematic functions.
    f. Contains predefined time variables.

B. Diagnostic Terminal Unit: Portable notebook-style, PC-based microcomputer terminal capable of accessing system data by connecting to system network with minimum configuration as follows:

1. System: With one integrated USB 2.0 port, integrated Intel Pro 10/100 (Ethernet), integrated audio, bios, and hardware monitoring.
2. Processor: Intel Pentium 4
3. Random-Access Memory: 160 MB.
4. Graphics: Video adapter, minimum 800 x 600 pixels, 64-MB video memory.
5. Monitor: 17 inches , LCD color.
6. Keyboard: QWERTY 105 keys in ergonomic shape.
7. Floppy-Disk Drive: 1.44 MB.
8. Hard-Disk Drive: 160 MB.
9. CD-ROM Read/Write Drive: 48x24x48.
10. Pointing Device: Touch pad or other internal device.

C. Control Units: Modular, comprising processor board with programmable, nonvolatile, random-access memory; local operator access and display panel; integral interface equipment; and backup power source.

1. Units monitor or control each I/O point; process information; execute commands from other control units, devices, and operator stations; and download from or upload to operator workstation or diagnostic terminal unit.
2. Stand-alone mode control functions operate regardless of network status. Functions include the following:

    a. Global communications.
    b. Discrete/digital, analog, and pulse I/O.
    c. Monitoring, controlling, or addressing data points.
    d. Software applications, scheduling, and alarm processing.
    e. Testing and developing control algorithms without disrupting field hardware and controlled environment.

3. Standard Application Programs:

    a. Electric Control Programs: Demand limiting, duty cycling, automatic time scheduling, start/stop time optimization, night setback/setup, on-off control with differential sequencing, staggered start, antishort cycling, PID control, DDC with fine tuning, and trend logging.
    b. HVAC Control Programs: Optimal run time, supply-air reset, and enthalpy switchover.
    c. Programming Application Features: Include trend point; alarm processing and messaging; weekly, monthly, and annual scheduling; energy calculations; run-time totalization; and security access.
    d. Remote communications.
    e. Maintenance management.
    f. Units of Measure: Inch-pound and SI (metric).

4. Local operator interface provides for download from or upload to operator workstation or diagnostic terminal unit.
5. LonWorks Compliance: Control units shall use LonTalk protocol and communicate using EIA/CEA 709.1 datalink/physical layer protocol.

D. Local Control Units: Modular, comprising processor board with electronically programmable, nonvolatile, read-only memory; and backup power source.

1. Units monitor or control each I/O point, process information, and download from or upload to operator workstation or diagnostic terminal unit.
2. Stand-alone mode control functions operate regardless of network status. Functions include the following:

    a. Global communications.
    b. Discrete/digital, analog, and pulse I/O.
    c. Monitoring, controlling, or addressing data points.

3. Local operator interface provides for download from or upload to operator workstation or diagnostic terminal unit.
4. LonWorks Compliance: Control units shall use LonTalk protocol and communicate using EIA/CEA 709.1 datalink/physical layer protocol.

E. I/O Interface: Hardwired inputs and outputs may tie into system through controllers. Protect points so that shorting will cause no damage to controllers.

1. Binary Inputs: Allow monitoring of on-off signals without external power.
2. Pulse Accumulation Inputs: Accept up to 10 pulses per second.
3. Analog Inputs: Allow monitoring of low-voltage (0- to 10-V dc), current (4 to 20 mA), or resistance signals.
4. Binary Outputs: Provide on-off or pulsed low-voltage signal, selectable for normally open or normally closed operation.
5. Analog Outputs: Provide modulating signal, either low voltage (0- to 10-V dc) or current (4 to 20 mA).
6. Tri-State Outputs: Provide two coordinated binary outputs for control of three-point, floating-type electronic actuators.
7. Universal I/Os: Provide software selectable binary or analog outputs.

F. Power Supplies: Transformers with Class 2 current-limiting type or overcurrent protection; limit connected loads to 80 percent of rated capacity. DC power supply shall match output current and voltage requirements and be full-wave rectifier type with the following:

1. Output ripple of 5.0 mV maximum peak to peak.
2. Combined 1 percent line and load regulation with 100-mic.sec. response time for 50 percent load changes.
3. Built-in overvoltage and overcurrent protection and be able to withstand 150 percent overload for at least 3 seconds without failure.

G. Power Line Filtering: Internal or external transient voltage and surge suppression for workstations or controllers with the following:

1. Minimum dielectric strength of 1000 V.
2. Maximum response time of 10 nanoseconds.
3. Minimum transverse-mode noise attenuation of 65 dB.
4. Minimum common-mode noise attenuation of 150 dB at 40 to 100 Hz.

2.4 UNITARY CONTROLLERS

A. Unitized, capable of stand-alone operation with sufficient memory to support its operating system, database, and programming requirements, and with sufficient I/O capacity for the application.

1. Configuration: Local keypad and display; diagnostic LEDs for power, communication, and processor; wiring termination to terminal strip or card connected with ribbon cable; memory with bios; and 72-hour battery backup.
2. Operating System: Manage I/O communication to allow distributed controllers to share real and virtual object information and allow central monitoring and alarms. Perform automatic system diagnostics; monitor system and report failures.
3. LonWorks Compliance: Communicate using EIA/CEA 709.1 datalink/physical layer protocol using LonTalk protocol.
4. Enclosure: Dustproof rated for operation at 32 to 120 deg F .
5. Enclosure: Waterproof rated for operation at 40 to 150 deg F .

2.5 ANALOG CONTROLLERS

A. Step Controllers: 6- or 10-stage type, with heavy-duty switching rated to handle loads and operated by electric motor.

B. Electric, Outdoor-Reset Controllers: Remote-bulb or bimetal rod-and-tube type, proportioning action with adjustable throttling range, adjustable set point, scale range minus 10 to plus 120 deg F , and single- or double-pole contacts.

C. Electronic Controllers: Wheatstone-bridge-amplifier type, in steel enclosure with provision for remote-resistance readjustment. Identify adjustments on controllers, including proportional band and authority.

1. Single controllers can be integral with control motor if provided with accessible control readjustment potentiometer.

D. Fan-Speed Controllers: Solid-state model providing field-adjustable proportional control of motor speed from maximum to minimum of 55 percent and on-off action below minimum fan speed. Controller shall briefly apply full voltage, when motor is started, to rapidly bring motor up to minimum speed. Equip with filtered circuit to eliminate radio interference.

2.6 TIME CLOCKS

A. Manufacturers:

1. ATC-Diversified Electronics.
2. Grasslin Controls Corporation.
3. Paragon Electric Co., Inc.
4. Precision Multiple Controls, Inc.
5. SSAC Inc.; ABB USA.
6. TCS/Basys Controls.
7. Theben AG - Lumilite Control Technology, Inc.
8. Time Mark Corporation.

B. Seven-day, programming-switch timer with synchronous-timing motor and seven-day dial; continuously charged, nickel-cadmium-battery-driven, eight-hour, power-failure carryover; multiple-switch trippers; minimum of two and maximum of eight signals per day with two normally open and two normally closed output contacts.

C. Solid-state, programmable time control with 8 separate programs each with up to 100 on-off operations; 1-second resolution; lithium battery backup; keyboard interface and manual

override; individual on-off-auto switches for each program; 365-day calendar with 20 programmable holidays; choice of fail-safe operation for each program; system fault alarm; and communications package allowing networking of time controls and programming from PC.

2.7 ELECTRONIC SENSORS

A. Description: Vibration and corrosion resistant; for wall, immersion, or duct mounting as required.

B. Thermistor Temperature Sensors and Transmitters:

1. Manufacturers:

   a. BEC Controls Corporation.
   b. Ebtron, Inc.
   c. Heat-Timer Corporation.
   d. I.T.M. Instruments Inc.
   e. MAMAC Systems, Inc.
   f. RDF Corporation.

2. Accuracy: Plus or minus 0.5 deg F at calibration point.
3. Wire: Twisted, shielded-pair cable.
4. Insertion Elements in Ducts: Single point, 8 inches; use where not affected by temperature stratification or where ducts are smaller than 9 sq. ft.
5. Averaging Elements in Ducts: 72 inches; use where prone to temperature stratification or where ducts are larger than 10 sq. ft. .
6. Insertion Elements for Liquids: TP 304 stainless-steel socket with minimum insertion length of 2-1/2 inches .
7. Room Sensor Cover Construction: Manufacturer's standard locking covers.

   a. Set-Point Adjustment: Exposed.
   b. Set-Point Indication: Concealed.
   c. Thermometer: Exposed.
   d. Orientation: Vertical.

8. Outside-Air Sensors: Watertight inlet fitting, shielded from direct sunlight.
9. Room Security Sensors: Stainless-steel cover plate with insulated back and security screws.

C. Humidity Sensors: Bulk polymer sensor element.

1. Manufacturers:

   a. BEC Controls Corporation.
   b. General Eastern Instruments.
   c. MAMAC Systems, Inc.
   d. ROTRONIC Instrument Corp.
   e. TCS/Basys Controls.
   f. Vaisala.

2. Accuracy: 2 percent full range with linear output.
3. Room Sensor Range: 20 to 80 percent relative humidity.
4. Room Sensor Cover Construction: Manufacturer's standard locking covers.

5. Duct Sensor: 20 to 80 percent relative humidity range with element guard and mounting plate.
6. Outside-Air Sensor: 20 to 80 percent relative humidity range with mounting enclosure, suitable for operation at outdoor temperatures of 32 to 120 deg F.
7. Duct and Sensors: With element guard and mounting plate, range of 0 to 100 percent relative humidity.

D. Pressure Transmitters/Transducers:

1. Manufacturers:

   a. BEC Controls Corporation.
   b. General Eastern Instruments.
   c. MAMAC Systems, Inc.
   d. ROTRONIC Instrument Corp.
   e. TCS/Basys Controls.
   f. Vaisala.

2. Static-Pressure Transmitter: Nondirectional sensor with suitable range for expected input, and temperature compensated.

   a. Accuracy: 2 percent of full scale with repeatability of 0.5 percent.
   b. Output: 4 to 20 mA.
   c. Building Static-Pressure Range: 0- to 0.25-inch wg.
   d. Duct Static-Pressure Range: 0- to 5-inch wg .

3. Water Pressure Transducers: Stainless-steel diaphragm construction, suitable for service; minimum 150-psig operating pressure; linear output 4 to 20 mA.
4. Water Differential-Pressure Transducers: Stainless-steel diaphragm construction, suitable for service; minimum 150-psig operating pressure and tested to 300-psig linear output 4 to 20 mA.
5. Differential-Pressure Switch (Air or Water): Snap acting, with pilot-duty rating and with suitable scale range and differential.
6. Pressure Transmitters: Direct acting for gas, liquid, or steam service; range suitable for system; linear output 4 to 20 mA.

2.8 STATUS SENSORS

A. Status Inputs for Electric Motors: Comply with ISA 50.00.01, current-sensing fixed- or split-core transformers with self-powered transmitter, adjustable and suitable for 175 percent of rated motor current.

B. Voltage Transmitter (100- to 600-V ac): Comply with ISA 50.00.01, single-loop, self-powered transmitter, adjustable, with suitable range and 1 percent full-scale accuracy.

C. Power Monitor: 3-phase type with disconnect/shorting switch assembly, listed voltage and current transformers, with pulse kilowatt hour output and 4- to 20-mA kW output, with maximum 2 percent error at 1.0 power factor and 2.5 percent error at 0.5 power factor.

D. Current Switches: Self-powered, solid-state with adjustable trip current, selected to match current and system output requirements.

E. Electronic Valve/Damper Position Indicator: Visual scale indicating percent of travel and 2- to 10-V dc, feedback signal.

F. Water-Flow Switches: Bellows-actuated mercury or snap-acting type with pilot-duty rating, stainless-steel or bronze paddle, with appropriate range and differential adjustment, in NEMA 250, Type 1 enclosure.

1. Manufacturers:

a. BEC Controls Corporation.
b. I.T.M. Instruments Inc.

2.9 FLOW MEASURING STATIONS

A. Duct Airflow Station: Combination of air straightener and multiport, self-averaging pitot tube station.

1. Manufacturers:

a. Air Monitor Corporation.
b. Wetmaster Co., Ltd.

2. Casing: Galvanized-steel frame.
3. Flow Straightener: Aluminum honeycomb, 3/4-inch parallel cell, 3 inches deep.
4. Sensing Manifold: Copper manifold with bullet-nosed static pressure sensors positioned on equal area basis.

2.10 THERMOSTATS

A. Manufacturers:

1. Erie Controls.
2. Danfoss Inc.; Air-Conditioning and Refrigeration Div.
3. Heat-Timer Corporation.
4. Sauter Controls Corporation.
5. tekmar Control Systems, Inc.
6. Theben AG - Lumilite Control Technology, Inc.

B. Combination Thermostat and Fan Switches: Line-voltage thermostat with push-button or lever-operated fan switch.
1. Mount on single electric switch box.

C. Electric, solid-state, microcomputer-based room thermostat with remote sensor.

1. Automatic switching from heating to cooling.
2. Preferential rate control to minimize overshoot and deviation from set point.
3. Set up for four separate temperatures per day.
4. Instant override of set point for continuous or timed period from 1 hour to 31 days.
5. Short-cycle protection.
6. Programming based on every day of week.
7. Selection features include degree F or degree C display, 12- or 24-hour clock, keyboard disable, remote sensor, and fan on-auto.

8. Battery replacement without program loss.
9. Thermostat display features include the following:

    a. Time of day.
    b. Actual room temperature.
    c. Programmed temperature.
    d. Programmed time.
    e. Duration of timed override.
    f. Day of week.
    g. System mode indications include "heating," "off," "fan auto," and "fan on."

D. Low-Voltage, On-Off Thermostats: NEMA DC 3, 24-V, bimetal-operated, mercury-switch type, with adjustable or fixed anticipation heater, concealed set-point adjustment, 55 to 85 deg F) set-point range, and 2 deg F maximum differential.

E. Remote-Bulb Thermostats: On-off or modulating type, liquid filled to compensate for changes in ambient temperature; with copper capillary and bulb, unless otherwise indicated.

1. Bulbs in water lines with separate wells of same material as bulb.
2. Bulbs in air ducts with flanges and shields.
3. Averaging Elements: Copper tubing with either single- or multiple-unit elements, extended to cover full width of duct or unit; adequately supported.
4. Scale settings and differential settings are clearly visible and adjustable from front of instrument.
5. On-Off Thermostat: With precision snap switches and with electrical ratings required by application.
6. Modulating Thermostats: Construct so complete potentiometer coil and wiper assembly is removable for inspection or replacement without disturbing calibration of instrument.

F. Fire-Protection Thermostats: Listed and labeled by an NRTL acceptable to authorities having jurisdiction; with fixed or adjustable settings to operate at not less than 75 deg F (24 deg C) above normal maximum operating temperature, and the following:

1. Reset: Manual.
2. Reset: Automatic, with control circuit arranged to require manual reset at central control panel; with pilot light and reset switch on panel labeled to indicate operation.

G. Immersion Thermostat: Remote-bulb or bimetal rod-and-tube type, proportioning action with adjustable throttling range and adjustable set point.

H. Airstream Thermostats: Two-pipe, fully proportional, single-temperature type; with adjustable set point in middle of range, adjustable throttling range, plug-in test fitting or permanent pressure gage, remote bulb, bimetal rod and tube, or averaging element.

I. Electric, Low-Limit Duct Thermostat: Snap-acting, single-pole, single-throw, manual-reset switch that trips if temperature sensed across any 12 inches of bulb length is equal to or below set point.

1. Bulb Length: Minimum 20 feet .
2. Quantity: One thermostat for every 20 sq. ft. of coil surface.

J. Electric, High-Limit Duct Thermostat: Snap-acting, single-pole, single-throw, manual- reset switch that trips if temperature sensed across any 12 inches of bulb length is equal to or above set point.

1. Bulb Length: Minimum 20 feet
2. Quantity: One thermostat for every 20 sq. ft. of coil surface.

2.11 ACTUATORS

A. Electronic Actuators: Direct-coupled type designed for minimum 60,000 full-stroke cycles at rated torque.

1. Manufacturers:

   a. Belimo Aircontrols (USA), Inc.

2. Valves: Size for torque required for valve close off at maximum pump differential pressure.
3. Dampers: Size for running torque calculated as follows:

   a. Parallel-Blade Damper with Edge Seals: 7 inch-lb/sq. ft. of damper.
   b. Opposed-Blade Damper with Edge Seals: 5 inch-lb/sq. ft. of damper.
   c. Parallel-Blade Damper without Edge Seals: 4 inch-lb/sq. ft of damper.
   d. Opposed-Blade Damper without Edge Seals: 3 inch-lb/sq. ft. of damper.
   e. Dampers with 2- to 3-Inch wg of Pressure Drop or Face Velocities of 1000 to 2500 fpm : Increase running torque by 1.5.
   f. Dampers with 3- to 4-Inch wg of Pressure Drop or Face Velocities of 2500 to 3000 fpm: Increase running torque by 2.0.

4. Coupling: V-bolt and V-shaped, toothed cradle.
5. Overload Protection: Electronic overload or digital rotation-sensing circuitry.
6. Fail-Safe Operation: Mechanical, spring-return mechanism. Provide external, manual gear release on nonspring-return actuators. Actuators on outside air dampers shall be spring-return to normally closed position.
7. Power Requirements (Two-Position Spring Return): 24-V ac.
8. Power Requirements (Modulating): Maximum 10 VA at 24-V ac or 8 W at 24-V dc.
9. Proportional Signal: 2- to 10-V dc or 4 to 20 mA, and 2- to 10-V dc position feedback signal.
10. Temperature Rating: 40 to 104 deg F
11. Temperature Rating (Smoke Dampers): Minus 22 to plus 250 deg F
12. Run Time: 12 seconds open, 5 seconds closed.

2.12 CONTROL VALVES

A. Manufacturers:

1. Danfoss Inc.; Air Conditioning & Refrigeration Div.
2. Erie Controls.
3. Hayward Industrial Products, Inc.
4. Magnatrol Valve Corporation.
5. Neles-Jamesbury.
6. Parker Hannifin Corporation; Skinner Valve Division.
7. Pneuline Controls.
8. Sauter Controls Corporation.

B. Control Valves: Factory fabricated, of type, body material, and pressure class based on maximum pressure and temperature rating of piping system, unless otherwise indicated.

C. Hydronic system globe valves shall have the following characteristics:

1. NPS 2 and Smaller: Class 125 bronze body, bronze trim, rising stem, renewable composition disc, and screwed ends with backseating capacity repackable under pressure.
2. NPS 2-1/2 and Larger: Class 125 iron body, bronze trim, rising stem, plug-type disc, flanged ends, and renewable seat and disc.
3. Internal Construction: Replaceable plugs and stainless-steel or brass seats.

    a. Single-Seated Valves: Cage trim provides seating and guiding surfaces for plug on top and bottom.
    b. Double-Seated Valves: Balanced plug; cage trim provides seating and guiding surfaces for plugs on top and bottom.

4. Sizing: 5-psig maximum pressure drop at design flow rate or the following:

    a. Two Position: Line size.
    b. Two-Way Modulating: Either the value specified above or twice the load pressure drop, whichever is more.
    c. Three-Way Modulating: Twice the load pressure drop, but not more than value specified above.

5. Flow Characteristics: Two-way valves shall have equal percentage characteristics; three-way valves shall have linear characteristics.
6. Close-Off (Differential) Pressure Rating: Combination of actuator and trim shall provide minimum close-off pressure rating of 150 percent of total system (pump) head for two-way valves and 100 percent of pressure differential across valve or 100 percent of total system (pump) head.

D. Butterfly Valves: 150-psig maximum pressure differential, ASTM A 126 cast-iron or ASTM A 536 ductile-iron body and bonnet, extended neck, stainless-steel stem, field-replaceable EPDM or Buna N sleeve and stem seals.

1. Body Style: Lug.
2. Disc Type: Aluminum bronze.
3. Sizing: 1-psig maximum pressure drop at design flow rate.

E. Terminal Unit Control Valves: Bronze body, bronze trim, two or three ports as indicated, replaceable plugs and seats, and union and threaded ends.

1. Rating: Class 125 for service at 125 psig and 250 deg F operating conditions.
2. Sizing: 3-psig maximum pressure drop at design flow rate, to close against pump shutoff head.
3. Flow Characteristics: Two-way valves shall have equal percentage characteristics; three-way valves shall have linear characteristics.

2.13 DAMPERS

A. Manufacturers:

1. Air Balance Inc.
2. Don Park Inc.; Autodamp Div.
3. TAMCO (T. A. Morrison & Co. Inc.).
4. United Enertech Corp.
5. Vent Products Company, Inc.

B. Dampers: AMCA-rated, opposed-blade design; 0.108-inch- minimum thick, galvanized-steel or 0.125-inch- minimum thick, extruded-aluminum frames with holes for duct mounting; damper blades shall not be less than 0.064-inch- thick galvanized steel with maximum blade width of 8 inches and length of 48 inches .

1. Secure blades to 1/2-inch- diameter, zinc-plated axles using zinc-plated hardware, with nylon blade bearings, blade-linkage hardware of zinc-plated steel and brass, ends sealed against spring-stainless-steel blade bearings, and thrust bearings at each end of every blade.
2. Operating Temperature Range: From minus 40 to plus 200 deg F.
3. Edge Seals, Standard Pressure Applications: Closed-cell neoprene.
4. Edge Seals, Low-Leakage Applications: Use inflatable blade edging or replaceable rubber blade seals and spring-loaded stainless-steel side seals, rated for leakage at less than 10 cfm per sq. ft. of damper area, at differential pressure of 4-inch wg when damper is held by torque of 50 in. x lbf ; when tested according to AMCA 500D.

2.14 CONTROL CABLE

A. Electronic and fiber-optic cables for control wiring are specified in Division 27 Section "Communications Horizontal Cabling."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that power supply is available to control units and operator workstation.

B. Verify that piping and duct-, pipe-, and equipment-mounted devices are installed before proceeding with installation.

3.2 INSTALLATION

A. Install software in control units and operator workstation(s). Implement all features of programs to specified requirements and as appropriate to sequence of operation.

B. Connect and configure equipment and software to achieve sequence of operation specified.

C. Verify location of thermostats, humidistats, and other exposed control sensors with Drawings and room details before installation. Install devices 48 inches above the floor.

1. Install averaging elements in ducts and plenums in crossing or zigzag pattern.

D. Install guards on thermostats in the following locations:

1. Entrances.
2. Public areas.
3. Where indicated.

E. Install automatic dampers according to Division 23 Section "Air Duct Accessories."

F. Install damper motors on outside of duct in warm areas, not in locations exposed to outdoor temperatures.

G. Install labels and nameplates to identify control components according to Division 23 Section "Identification for HVAC Piping and Equipment."

H. Install hydronic instrument wells, valves, and other accessories according to Division 23 Section "Hydronic Piping."

I. Install duct volume-control dampers according to Division 23 Sections specifying air ducts.

J. Install electronic and fiber-optic cables according to Division 27 Section "Communications Horizontal Cabling."

3.3 ELECTRICAL WIRING AND CONNECTION INSTALLATION

A. Install raceways, boxes, and cabinets according to Division 26 Section "Raceway and Boxes for Electrical Systems."

B. Install building wire and cable according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

C. Install signal and communication cable according to Division 27 Section "Communications Horizontal Cabling."

1. Conceal cable, except in mechanical rooms and areas where other conduit and piping are exposed.
2. Install exposed cable in raceway.
3. Bundle and harness multiconductor instrument cable in place of single cables where several cables follow a common path.
4. Fasten flexible conductors, bridging cabinets and doors, along hinge side; protect against abrasion. Tie and support conductors.
5. Number-code or color-code conductors for future identification and service of control system, except local individual room control cables.
6. Install wire and cable with sufficient slack and flexible connections to allow for vibration of piping and equipment.

D. Connect manual-reset limit controls independent of manual-control switch positions. Automatic duct heater resets may be connected in interlock circuit of power controllers.

E. Connect hand-off-auto selector switches to override automatic interlock controls when switch is in hand position.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.

B. Perform the following field tests and inspections and prepare test reports:

1. Operational Test: After electrical circuitry has been energized, start units to confirm proper unit operation. Remove and replace malfunctioning units and retest.
2. Test and adjust controls and safeties.
3. Test calibration of electronic controllers by disconnecting input sensors and stimulating operation with compatible signal generator.
4. Test each point through its full operating range to verify that safety and operating control set points are as required.
5. Test each control loop to verify stable mode of operation and compliance with sequence of operation. Adjust PID actions.
6. Test each system for compliance with sequence of operation.
7. Test software and hardware interlocks.

C. DDC Verification:

1. Verify that instruments are installed before calibration, testing, and loop or leak checks.
2. Check instruments for proper location and accessibility.
3. Check instrument installation for direction of flow, elevation, orientation, insertion depth, and other applicable considerations.
4. Check flow instruments. Inspect tag number and line and bore size, and verify that inlet side is identified and that meters are installed correctly.
5. Check pressure instruments, piping slope, installation of valve manifold, and self-contained pressure regulators.
6. Check temperature instruments and material and length of sensing elements.
7. Check control valves. Verify that they are in correct direction.
8. Check air-operated dampers. Verify that pressure gages are provided and that proper blade alignment, either parallel or opposed, has been provided.
9. Check DDC system as follows:

    a. Verify that DDC controller power supply is from emergency power supply, if applicable.
    b. Verify that wires at control panels are tagged with their service designation and approved tagging system.
    c. Verify that spare I/O capacity has been provided.
    d. Verify that DDC controllers are protected from power supply surges.

D. Replace damaged or malfunctioning controls and equipment and repeat testing procedures.

3.5 ADJUSTING

A. Calibrating and Adjusting:

1. Calibrate instruments.
2. Make three-point calibration test for both linearity and accuracy for each analog instrument.

3. Calibrate equipment and procedures using manufacturer's written recommendations and instruction manuals. Use test equipment with accuracy at least double that of instrument being calibrated.
4. Control System Inputs and Outputs:

    a. Check analog inputs at 0, 50, and 100 percent of span.
    b. Check analog outputs using milliampere meter at 0, 50, and 100 percent output.
    c. Check digital inputs using jumper wire.
    d. Check digital outputs using ohmmeter to test for contact making or breaking.
    e. Check resistance temperature inputs at 0, 50, and 100 percent of span using a precision-resistant source.

5. Flow:

    a. Set differential pressure flow transmitters for 0 and 100 percent values with 3-point calibration accomplished at 50, 90, and 100 percent of span.
    b. Manually operate flow switches to verify that they make or break contact.

6. Pressure:

    a. Calibrate pressure transmitters at 0, 50, and 100 percent of span.
    b. Calibrate pressure switches to make or break contacts, with adjustable differential set at minimum.

7. Temperature:

    a. Calibrate resistance temperature transmitters at 0, 50, and 100 percent of span using a precision-resistance source.
    b. Calibrate temperature switches to make or break contacts.

8. Stroke and adjust control valves and dampers without positioners, following the manufacturer's recommended procedure, so that valve or damper is 100 percent open and closed.
9. Stroke and adjust control valves and dampers with positioners, following manufacturer's recommended procedure, so that valve and damper is 0, 50, and 100 percent closed.
10. Provide diagnostic and test instruments for calibration and adjustment of system.
11. Provide written description of procedures and equipment for calibrating each type of instrument. Submit procedures review and approval before initiating startup procedures.

B. Adjust initial temperature and humidity set points.

C. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to three visits to Project during other than normal occupancy hours for this purpose.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain HVAC instrumentation and controls. Refer to Division 01 Section "Demonstration and Training."

END OF SECTION

COLLIN COUNTY JUVENILE JUSTICE
ALTERNATIVE EDUCATION PROGRAM
McKINNEY, TEXAS

SECTION 238219

FAN COIL UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes fan-coil units and accessories.

1.3 DEFINITIONS

A. BAS: Building automation system.

1.4 SUBMITTALS

A. Product Data: Include rated capacities, operating characteristics, furnished specialties, and accessories.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

1. Wiring Diagrams: Power, signal, and control wiring.

C. Coordination Drawings: Floor plans, reflected ceiling plans, and other details, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

1. Ceiling suspension components.
2. Structural members to which fan-coil units will be attached.
3. Method of attaching hangers to building structure.
4. Size and location of initial access modules for acoustical tile.
5. Items penetrating finished ceiling, including the following:

a. Lighting fixtures.
b. Air outlets and inlets.
c. Speakers.

d. Sprinklers.
e. Access panels.

6. Perimeter moldings for exposed or partially exposed cabinets.

D. Samples for Initial Selection: For units with factory-applied color finishes.

E. Field quality-control test reports.

F. Operation and Maintenance Data: For fan-coil units to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:

1. Maintenance schedules and repair part lists for motors, coils, integral controls, and filters.

G. Warranty: Special warranty specified in this Section.

1.5 QUALITY ASSURANCE

A. 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.

B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2004, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."

C. ASHRAE/IESNA 90.1-2004 Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2004, Section 6 - "Heating, Ventilating, and Air-Conditioning."

1.6 COORDINATION

A. Coordinate layout and installation of fan-coil units and suspension system components with other construction that penetrates or is supported by ceilings, including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.

B. Coordinate size and location of wall sleeves for outdoor-air intake.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of condensing units that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

1.8 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Fan-Coil-Unit Filters: Furnish (1) spare filters for each filter installed.
2. Fan Belts: Furnish (1) spare fan belts for each unit installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

2.2 DUCTED FAN-COIL UNITS

A. Basis-of-Design Product: a comparable product by one of the following:

B. Manufacturers:

1. A-E Air.
2. Carrier Corporation
3. Environmental Technologies, Inc.
4. McQuay International.
5. Rosemex.
6. Trane.

C. Description: Factory-packaged and -tested units rated according to ARI 440, ASHRAE 33, and UL 1995.

D. Coil Section Insulation: 1-inch (25-mm) thick foil-faced glass fiber complying with ASTM C 1071 and attached with adhesive complying with ASTM C 916.

1. Fire-Hazard Classification: Insulation and adhesive shall have a combined maximum flame-spread index of 25 and smoke-developed index of 50 when tested according to ASTM E 84.
2. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.

E. Drain Pans: Stainless steel. Fabricate pans and drain connections to comply with ASHRAE 62.1-2004.

F. Chassis: Galvanized steel where exposed to moisture, with baked-enamel finish and removable access panels.

G. Cabinets: Steel with baked-enamel finish in manufacturer's standard paint color.

1. Supply-Air Plenum: Sheet metal plenum finished and insulated to match the chassis..
2. Return-Air Plenum: Sheet metal plenum finished to match the chassis.
3. Mixing Plenum: Sheet metal plenum finished and insulated to match the chassis with outdoor- and return-air, formed-steel dampers.
4. Dampers: Galvanized steel with extruded-vinyl blade seals, flexible-metal jamb seals, and interlocking linkage.
5. The entire cabinet shall have double wall construction.

H. Filters: Minimum arrestance according to ASHRAE 52.1, and a minimum efficiency reporting value (MERV) according to ASHRAE 52.2.

1. Washable Foam: 70 percent arrestance and 3 MERV.
2. Glass Fiber Treated with Adhesive: 80 percent arrestance and 5 MERV.
3. Pleated Cotton-Polyester Media: 90 percent arrestance and 7 MERV.

I. Hydronic Coils: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch (2.5 mm), rated for a minimum working pressure of 200 psig (1378 kPa) and a maximum entering-water temperature of 220 deg F (104 deg C). Include manual air vent and drain.

J. Belt-Driven Fans: Double width, forward curved, centrifugal; with permanently lubricated, single-speed motor installed on an adjustable fan base resiliently mounted in the cabinet. Aluminum or painted-steel wheels, and painted-steel or galvanized-steel fan scrolls.

1. Motors: Comply with requirements in Division 23 Section "Common Motor Requirements for HVAC Equipment."

K. Factory, Hydronic Piping Package: ASTM B 88, Type L copper tube with wrought-copper fittings and brazed joints. Label piping to indicate service, inlet, and outlet.

1. Two-way, modulating control valve for chilled-water coil.
2. Two-way, modulating control valve for heating coil.
3. Two-way, modulating control valve for reheat coil.

4. Two-Piece Ball Valves: Bronze body with full-port, chrome-plated bronze ball; PTFE or TFE seats; and 600-psig (4140-kPa) minimum CWP rating and blowout-proof stem.
5. Calibrated-Orifice Balancing Valves: Bronze body, ball type; 125-psig (860-kPa) working pressure, 250 deg F (121 deg C) maximum operating temperature; with calibrated orifice or venturi, connections for portable differential pressure meter with integral seals, threaded ends, and equipped with a memory stop to retain set position.
6. Automatic Flow-Control Valve: Brass or ferrous-metal body; 300-psig (2070-kPa) working pressure at 250 deg F (121 deg C); with removable, corrosion-resistant, tamperproof, self-cleaning piston spring; factory set to maintain constant indicated flow with plus or minus 10 percent over differential pressure range of 2 to 80 psig (13.8 to 552 kPa).
7. Y-Pattern Hydronic Strainers: Cast-iron body (ASTM A 126, Class B); 125-psig (860-kPa) working pressure, with threaded connections, bolted cover, perforated stainless-steel basket, and bottom drain connection. Include minimum NPS 1/2 (DN 15) hose-end, full-port, ball-type blowdown valve in drain connection.
8. Wrought-Copper Unions: ASME B16.22.

L. Remote condensing units are specified in Division 23 Section "Packaged Compressor and Condenser Units."

M. Remote Condensing Units: Factory assembled and tested, consisting of compressors, condenser coils, fans, motors, refrigerant receiver, and operating controls. Construct, test, and rate condensing units according to ARI 210/240 and ASHRAE 15.

N. BAS Interface Requirements:

1. Interface relay for scheduled operation.
2. Interface relay to provide indication of fault at the central workstation.

3. Provide BACnet interface for central BAS workstation for the following functions:

   a. Adjust set points.
   b. Fan-coil-unit start, stop, and operating status.
   c. Data inquiry including outdoor-air damper position, supply- and room-air temperature.
   d. Occupied and unoccupied schedules.

O. Electrical Connection: Factory wire motors and controls for a single electrical connection.

P. Capacities and Characteristics: As scheduled on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive fan-coil units for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine roughing-in for piping and electrical connections to verify actual locations before fan-coil-unit installation.

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

3.2 INSTALLATION

A. Install fan-coil units level and plumb.

B. Install fan-coil units to comply with NFPA 90A.

C. Suspend fan-coil units from structure with elastomeric hangers. Vibration isolators are specified in Division 23 Section "Vibration and Seismic Controls for HVAC Piping and Equipment."

D. Verify locations of thermostats, humidistats, and other exposed control sensors with Drawings and room details before installation. Install devices 48 inches above finished floor.

E. Install new filters in each fan-coil unit within two weeks after Substantial Completion.

3.3 CONNECTIONS

A. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of piping, fittings, and specialties. Specific connection requirements are as follows:

1. Install piping adjacent to machine to allow service and maintenance.
2. Connect piping to fan-coil-unit factory hydronic piping package. Install piping package if shipped loose.
3. Connect condensate drain to indirect waste.

a. Install condensate trap of adequate depth to seal against the pressure of fan. Install cleanouts in piping at changes of direction.

B. Connect supply and return ducts to fan-coil units with flexible duct connectors specified in Division 23 Section "Air Duct Accessories." Comply with safety requirements in UL 1995 for duct connections.

C. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

D. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.

B. Perform the following field tests and inspections and prepare test reports:

1. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
2. Operate electric heating elements through each stage to verify proper operation and electrical connections.
3. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

C. Remove and replace malfunctioning units and retest as specified above.

3.5 ADJUSTING

A. Adjust initial temperature and humidity set points.

B. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other than normal occupancy hours for this purpose.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fan-coil units. Refer to Division 01 Section "Demonstration and Training."

END OF SECTION

COLLIN COUNTY JUVENILE JUSTICE
ALTERNATIVE EDUCATION PROGRAM
McKINNEY, TEXAS

SECTION 260513

MEDIUM-VOLTAGE CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes cables and related splices, terminations, and accessories for medium-voltage electrical distribution systems.

1.3 DEFINITIONS

A. NETA ATS: Acceptance Testing Specification.

1.4 SUBMITTALS

A. Product Data: For each type of cable indicated. Include splices and terminations for cables and cable accessories.

1.5 QUALITY ASSURANCE

A. Installer: Engage a cable splicer, trained and certified by splice material manufacturer, to install, splice, and terminate medium-voltage cable.

B. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.

C. Source Limitations: Obtain cables and accessories through one source from a single manufacturer.

D. 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.

E. Comply with IEEE C2 and NFPA 70.

1.6 PROJECT CONDITIONS

A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify VAI and Owner no fewer than 10 working days in advance of proposed interruption of electric service.
2. Do not proceed with interruption of electric service without Owner's written permission.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. 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. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cables:

a. American Insulated Wire Corp.; a Leviton Company.
b. General Cable Technologies Corporation.
c. Kerite Co. (The); Hubbell Incorporated.
d. Okonite Company (The).
e. Pirelli Cables & Systems NA.
f. Rome Cable Corporation.
g. Southwire Company.

2. Cable Splicing and Terminating Products and Accessories:

a. Engineered Products Company.
b. G&W Electric Company.
c. MPHusky.
d. Raychem Corp.; Telephone Energy and Industrial Division; Tyco International Ltd.
e. RTE Components; Cooper Power Systems, Inc.
f. Scott Fetzer Co. (The); Adalet.
g. Thomas & Betts Corporation.

h. Thomas & Betts Corporation/Elastimold.
i. 3M; Electrical Products Division.

2.2 CABLES

A. Cable Type: MV~~90~~ 105.

B. Comply with UL 1072, AEIC CS 8, ICEA S-93-639, and ICEA S-97-682 , ICEA S-94-649.

C. Primary feeder Conductor: Shall be aluminum.

D. Conductor Stranding: [Compact round, concentric lay, Class B)] [Concentric lay, Class B].

E. Strand Filling: Conductor interstices are filled with impermeable compound.

F. Conductor Insulation: Crosslinked polyethylene.

G. Conductor Insulation: Ethylene-propylene rubber.

1. Voltage Rating: 25 kV.
2. Insulation Thickness: 133 percent insulation level.

H. Cable Armor: Interlocked aluminum, Interlocked galvanized steel, Corrugated aluminum tube applied over cable.

I. Cable Jacket: Sunlight-resistant PVC, Chlorosulfonated polyethylene, CPE.

2.3 SOLID TERMINATIONS

A. Shielded-Cable Terminations: Comply with the following classes of IEEE 48. Insulation class is equivalent to that of cable. Include shield ground strap for shielded cable terminations.

1. Class 1 Terminations: Modular type, furnished as a kit, with stress-relief tube; multiple, molded-silicone rubber, insulator modules; shield ground strap; and compression-type connector.
2. Class 1 Terminations: Heat-shrink type with heat-shrink inner stress control and outer nontracking tubes; multiple, molded, nontracking skirt modules; and compression-type connector.
3. Class 1 Terminations: Modular type, furnished as a kit, with stress-relief shield terminator; multiple-wet-process, porcelain, insulator modules; shield ground strap; and compression-type connector.
4. Class 1 Terminations, Indoors: Kit with stress-relief tube, nontracking insulator tube, shield ground strap, compression-type connector, and end seal.
5. Class 2 Terminations, Indoors: Kit with stress-relief tube, nontracking insulator tube, shield ground strap, and compression-type connector. Include silicone-rubber tape, cold-shrink-rubber sleeve, or heat-shrink plastic-sleeve moisture seal for end of insulation whether or not supplied with kits.
6. Class 3 Terminations: Kit with stress cone and compression-type connector.

B. Nonshielded-Cable Terminations: Kit with compression-type connector. Include silicone-rubber tape, cold-shrink-rubber sleeve, or heat-shrink plastic-sleeve moisture seal for end of insulation whether or not supplied with kits.

2.4 SEPARABLE INSULATED CONNECTORS

A. Description: Modular system, complying with IEEE 386, with disconnecting, single-pole, cable terminators and with matching, stationary, plug-in, dead-front terminals designed for cable voltage and for sealing against moisture.

B. Terminations at Distribution Points: Modular type, consisting of terminators installed on cables and modular, dead-front, terminal junctions for interconnecting cables.

C. Load-Break Cable Terminators: Elbow-type units with 200-A load make/break and continuous-current rating; coordinated with insulation diameter, conductor size, and material of cable being terminated. Include test point on terminator body that is capacitance coupled.

D. Dead-Break Cable Terminators: Elbow-type unit with 600-A continuous-current rating; designed for de-energized disconnecting and connecting; coordinated with insulation diameter, conductor size, and material of cable being terminated. Include test point on terminator body that is capacitance coupled.

E. Dead-Front Terminal Junctions: Modular bracket-mounted groups of dead-front stationary terminals that mate and match with above cable terminators. Two-, three-, or four-terminal units as indicated, with fully rated, insulated, watertight conductor connection between terminals and complete with grounding lug, manufacturer's standard accessory stands, stainless-steel mounting brackets, and attaching hardware.

1. Protective Cap: Insulating, electrostatic-shielding, water-sealing cap with drain wire.
2. Portable Feed-Through Accessory: Two-terminal, dead-front junction arranged for removable mounting on accessory stand of stationary terminal junction.
3. Grounding Kit: Jumpered elbows, portable feed-through accessory units, protective caps, test rods suitable for concurrently grounding three phases of feeders, and carrying case.
4. Standoff Insulator: Portable, single dead-front terminal for removable mounting on accessory stand of stationary terminal junction. Insulators suitable for fully insulated isolation of energized cable-elbow terminator.

F. Test-Point Fault Indicators: Applicable current-trip ratings and arranged for installation in test points of load-break separable connectors, and complete with self-resetting indicators capable of being installed with shotgun hot stick and tested with test tool.

G. Tool Set: Shotgun hot stick with energized terminal indicator, fault-indicator test tool, and carrying case.

2.5 ARC-PROOFING MATERIALS

A. Tape for First Course on Metal Objects: 10-mil- (250-micrometer-) thick, corrosion-protective, moisture-resistant, PVC pipe-wrapping tape.

B. Arc-Proofing Tape: Fireproof tape, flexible, conformable, intumescent to 0.3 inch (8 mm) thick, compatible with cable jacket.

C. Glass-Cloth Tape: Pressure-sensitive adhesive type, 1/2 inch (13 mm) wide.

2.6 FAULT INDICATORS

A. Indicators: Automatically reset fault indicator with inrush restraint feature, arranged to clamp to cable sheath and provide a display after a fault has occurred in cable. Instrument shall not be affected by heat, moisture, and corrosive conditions and shall be recommended by manufacturer for installation conditions.

B. Resetting Tool: Designed for use with fault indicators, with moisture-resistant storage and carrying case.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install cables according to IEEE 576.

B. Pull Conductors: Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

1. Where necessary, use manufacturer-approved pulling compound or lubricant that will not deteriorate conductor or insulation.
2. Use pulling means, including fish tape, cable, rope, and basket-weave cable grips that will not damage cables and raceways. Do not use rope hitches for pulling attachment to cable.

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

D. Support cables according to Division 26 Section "Common Work Results for Electrical."

E. Install direct-buried cables on leveled and tamped bed of 3-inch- (75-mm-) thick, clean sand. Separate cables crossing other cables or piping by a minimum of 4 inches (100 mm) of tamped earth. Install permanent markers at ends of cable runs, changes in direction, and buried splices.

F. Install "buried-cable" warning tape 12 inches (305 mm) above cables.

G. In manholes, handholes, pull boxes, junction boxes, and cable vaults, train cables around walls by the longest route from entry to exit and support cables at intervals adequate to prevent sag.

H. Install terminations at ends of conductors and seal multiconductor cable ends with standard kits.

I. Install separable insulated-connector components as follows:

1. Protective Cap: At each terminal junction, with one on each terminal to which no feeder is indicated to be connected.
2. Portable Feed-Through Accessory: Three.
3. Standoff Insulator: Three.

J. Arc Proofing: Unless otherwise indicated, arc proof medium-voltage cable at locations not protected by conduit, cable tray, direct burial, or termination materials. In addition to arc-proofing tape manufacturer's written instructions, apply arc proofing as follows:

1. Clean cable sheath.
2. Wrap metallic cable components with 10-mil (250-micrometer) pipe-wrapping tape.
3. Smooth surface contours with electrical insulation putty.
4. Apply arc-proofing tape in one half-lapped layer with coated side toward cable.
5. Band arc-proofing tape with 1-inch- (25-mm-) wide bands of half-lapped, adhesive, glass-cloth tape 2 inches (50 mm) o.c.

K. Seal around cables passing through fire-rated elements according to Division 07 Section "Penetration Firestopping."

L. Install fault indicators on each phase where indicated.

M. Ground shields of shielded cable at terminations, splices, and separable insulated connectors. Ground metal bodies of terminators, splices, cable and separable insulated-connector fittings, and hardware.

3.2 FIELD QUALITY CONTROL

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

B. Testing: Engage a qualified testing and inspecting agency to perform the following field tests and inspections and prepare test reports:

C. Perform the following field tests and inspections and prepare test reports:

1. Perform each visual and mechanical inspection and electrical test stated in NETA ATS. Certify compliance with test parameters.
2. After installing medium-voltage cables and before electrical circuitry has been energized, test for compliance with requirements.

D. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION

COLLIN COUNTY JUVENILE JUSTICE
ALTERNATIVE EDUCATION PROGRAM
McKINNEY, TEXAS

SECTION 262413

SWITCHBOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Main Switchboard - Furnish and install the Service Entrance switchboards as herein specified and shown on the associated electrical drawings.

1.02

Not used.

1.03 REFERENCES

The switchboards and overcurrent protection devices referenced herein are designed and manufactured according to the following appropriate specifications.

A. ANSI/NFPA 70 - National Electrical Code (NEC).
B. ANSI/IEEE C12.1 - Code for Electricity Metering.
C. ANSI C39.1 - Electrical Analog Indicating Instruments.
D. ANSI C57.13 - Instrument Transformers.
E. NEMA AB 1 - Molded Case Circuit Breakers and Molded Case Switches.
F. NEMA KS 1 - Enclosed Switches.
G. NEMA PB 2 - Deadfront Distribution Switchboards, File E8681
H. NEMA PB 2.1 - Proper Handling, Installation, Operation and Maintenance of Deadfront Switchboards Rated 600 Volts or Less.
I. NEMA PB 2.2 - Application Guide for Ground Fault Protective Devices for Equipment.
J. UL 50 - Cabinets and Boxes.
K. UL 98 - Enclosed and Dead Front Switches.
L. UL 489 - Molded Case Circuit Breakers.
M. UL 891 - Dead-Front Switchboards.
N. UL 943 - Ground Fault Circuit Interrupters.
O. UL 1053 - Ground-Fault Sensing and Relaying Equipment.
P. UL 977 - Fused Power Circuit Devices.

1.04 SUBMITTALS

A. Shop Drawings shall indicate front and side enclosure elevations with overall dimensions shown, conduit entrance locations and requirements, nameplate legends, one-line diagrams, equipment schedule, and switchboard instrument details.

1.05 QUALIFICATIONS

A. To be considered for approval, a manufacturer shall have specialized in the manufacturing and assembly of switchboards for at least thirty (30) years.

B. Furnish products listed by Underwriters Laboratories Incorporated and in accordance with standards listed in Article 1.03 - References.

C. The manufacturing facility shall be registered by Underwriters Laboratories Inc. to the International Organization for Standardization ISO 9002 Series Standards for quality.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products in conformance with manufacturer's recommended practices as outlined in applicable Installation and Maintenance Manuals.

B. Each switchboard section shall be delivered in individual shipping splits for ease of handling. They shall be individually wrapped for protection and mounted on shipping skids.

C. Inspect and report concealed damage to carrier within their required time period.

D. Store in a clean, dry space. Maintain factory protection and/or provide an additional heavy canvas or heavy plastic cover to protect structure from dirt, water, construction debris, and traffic. Where applicable, provide adequate heating within enclosures to prevent condensation.

E. Handle in accordance with NEMA PB 2.1 and manufacturer's written instructions. Lift only by lifting means provided for this express purpose. Handle carefully to avoid damage to switchboard internal components, enclosure, and finish.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Conform to NEMA PB 2 service conditions during and after installation of switchboards.

1.08 MAINTENANCE MATERIALS

A. Provide one (1) set of installation and maintenance instructions with each switchboard. Instructions are to be easily identified and affixed within the incoming or main section of the line-up.

B. [Provide one (1) copy of complete Operations and Maintenance Manual on CD ROM.]

1.09 WARRANTY

A. Manufacturer shall warrant equipment to be free from defects in materials and workmanship for eighteen (18) months from date of shipment.

PART 2 PRODUCTS

2.01 APPROVED MANUFACTURERS

A. Square D Company, type QED-2.

B. Siemens

C. Cutler Hammer

2.02 SWITCHBOARD - GENERAL

A. Short Circuit Current Rating: Switchboards shall be rated with a minimum short circuit current rating as indicated on the drawings.

B. Future Provisions: All unused spaces provided, unless otherwise specified, shall be fully equipped for future devices, including all appropriate connectors and mounting hardware.

C. Enclosure: Type 1 - General Purpose.

1. Sections shall be completely front and rear aligned. Staggered arrangements shall not be acceptable.

2. Switchboard height shall be 91.5“ including 1.5” floor sills and excluding lifting members and pull boxes.
3. The switchboards shall be of deadfront construction.
4. The switchboard frame shall be of formed steel rigidly bolted together to support all cover plates, bussing and component devices during shipment and installation.
5. Steel base channels shall be bolted to the frame to rigidly support the entire shipping section for moving on rollers and floor mounting.
6. Each switchboard section shall have an open bottom and an individually removable top plate for installation and termination of conduit.
7. The switchboard enclosure shall be painted on all exterior surfaces. The paint finish shall be ANSI #49 medium-light grey, applied by the electro-deposition process over an iron phosphate pre-treatment.
8. All front covers shall be screw removable with a single tool and all doors shall be hinged with removable hinge pins.
9. Top and bottom conduit areas shall be clearly indicated on shop drawings.

D. Nameplates: Provide 1” H X 3” W engraved laminated (Gravoply) nameplates for each device. Furnish black letters on a white background for all voltages.

E. Bus Composition: Shall be [plated copper] [plated aluminum]. Plating shall be applied continuously to all bus work. The switchboard bussing shall be of sufficient cross-sectional area to meet UL Standard 891 temperature rise requirements. The phase and neutral through-bus shall have an ampacity as shown in the plans and shall be sized to carry 100% of that ampacity . The neutral shall be of equivalent ampacity as the phase bus bar. Tapered bus shall not be acceptable. Full provisions for the addition of future sections shall be provided. Bussing shall include all necessary hardware to accommodate splicing for future additions.

F. Bus Connections: Shall be bolted with Grade 5 bolts and conical spring washers.

G. Ground Bus: Sized per NFPA70 and UL 891 Tables 25.1 and 25.2 and shall extend the entire length of the switchboard. Provisions for the addition of future sections shall be provided.

H. Accessibility: Accessible from the front.

2.02 SWITCHBOARD - MAIN CIRCUIT BREAKER DEVICES

A. Circuit breakers above 250 amperes.
1. Electronic trip, standard function 80% rated, molded case circuit breaker.
a. Group mounted through 1200 amperes. Individually fixed mounted above 1200 amperes.
1) Circuit breakers shall have power terminals to accommodate either cable or bolted bus connections.
2) Provide the following time/current curve shaping adjustments to maximize system selective coordination. Each adjustment shall have discrete settings and each function is independent from all other adjustments.

LSI(G):

Adjustable Long Time Ampere Rating and Delay

Adjustable Short Time Pickup and Delay with I^2t “IN” ramp.

Adjustable Instantaneous Pickup

Adjustable Ground Fault Pickup and Delay (Where required by NEC)

High Level Override

Trip indicator for indication of Overload, Short Circuit, and Ground Fault trip.

3) Terminations

(a) All lugs shall be UL Listed to accept solid and/or stranded [copper and aluminum conductors] [copper conductors only]. Lugs shall be suitable for 75° C rated wire, or 90° C rated wire sized according to the 75° C temperature rating tables in the NEC.

(b) All circuit breakers shall be UL Listed to accept field installable/removable mechanical type lugs.

(c) All circuit breakers shall be suitable for bus connection.

B. Circuit Breakers 250 amperes and below.

1. Thermal magnetic molded case circuit breakers

a. Group mounted.

1) Circuit protective devices shall be molded case circuit breakers. Circuit breakers shall be standard, high, or extra high interrupting capacity, or true current limiting as indicated on the drawings.

2) Branch circuit breakers shall be group mounted plug-on with mechanical restraint on a common pan or rail assembly.

3) The interior shall have three flat bus bars aligned vertically with glass reinforced polyester insulators laminated between phases. The molded polyester insulators shall support and provide phase isolation to the entire length of bus

4) Circuit breakers equipped with line terminal jaws shall not require additional external mounting hardware. Circuit breakers shall be held in mounted position by a self-contained bracket secured to the mounting pan by fasteners. Circuit breakers of different frame size shall be capable of being mounted across from each other.

2.03 MIMIC BUS

A. Show the entire single line switchboard bus work, as depicted on the factory record drawing, on an engraved laminated plastic (Gravoply) nameplate. The nameplate shall be at least 12” x 12”, .0625” thick, and located at eye level on the front cover of the switchboard incoming service section.

2.04 INSTRUMENTATION

A. Provide a PowerLogic CM-3350 Circuit Monitor where indicated on the drawings. No substitutions allowed.

B. Electronic circuit monitors shall provide true rms metered values. Information provided by each circuit monitor shall include frequency, temperature, current, demand current, voltage, real power, reactive power, apparent power, demand power, predicted demand power, power factor, accumulated energy, accumulated reactive energy, total harmonic distortion (THD) of each current and voltage, and K-factor of each current.

C. The current and voltage signals shall be digitally sampled at a rate high enough to provide true rms accuracy to the 255^{th} harmonic, based on fundamental of 60 Hz.

D. All setup parameters required by the Circuit Monitors shall be stored in nonvolatile memory and retained in the event of a control power interruption.

E. The Circuit Monitors shall accept metering inputs of up to 600Vac direct connection or from industry standard instrument transformers, 120 VAC secondary VTs and 5 A secondary CTs. Connection to 480Y/277 VAC circuits shall be possible without use of VTs.

F. The Circuit Monitor shall be accurate to 0.04% of reading plus/minus 0.025% of full scale for voltage and current metering and 0.08% of reading plus 0.025% for power.

G. The Circuit Monitor's energy readings shall meet the revenue accuracy requirements of ANSI C12.20 0.2 class metering. No annual re-calibration by users shall be required to maintain published accuracy.

H. Ride through capability shall be available for backup control power for up to 2 seconds.

I. The Circuit Monitor display shall provide local access to the following metered quantities as well as the minimum and maximum value of each instantaneous quantity since last reset of min/max:

1. Current, per phase rms, 3-phase average and neutral (if applicable)
2. Voltage, phase-to-phase, phase-to-neutral, and 3-phase average (phase-to-phase and phase-to-neutral)
3. Real power, per phase and 3-phase total
4. Reactive power, per phase and 3-phase total
5. Apparent power, per phase and 3-phase total
6. Power factor, 3-phase total and per phase
7. Frequency
8. Demand current, per phase and three phase average
9. Demand real power, three phase total
10. Demand apparent power, three phase total
11. Accumulated Energy, (MWh and MVARh)
12. THD, current and voltage, per phase
13. K-factor, current, per phase

J. Circuit Monitor shall be provided with a vacuum fluorescent display which shall be automatically activated by a proximity sensor as the operator approaches.

K. The Circuit Monitor shall communicate via RS-232, RS-485, and Ethernet simultaneously.

L. The Circuit Monitor shall provide Modbus communications using Modbus TCP via an Ethernet network at 10/100Mbaud using UTP or Fiber connections. Ethernet connection shall provide data access to the customer's existing Honeywell energy management system.

M. The Circuit Monitor display shall provide a RS-232 communications port on board the metering module as well as an IR RS-232 communications port located on the display. The operator shall be able to connect a small Personal Computer (PC) to either the module port or the display port without use of tools or splices.

N. It shall be possible to field upgrade the firmware in the Circuit Monitor to enhance functionality. These firmware upgrades shall be done through either the display port or communication connection. No Circuit Monitor disassembly or changing of integrated circuit chips shall be required. It shall not be necessary to de-energize the circuit or the equipment to upgrade the firmware.

O. Default demand calculation method shall be a 15 minute continuous sliding block.

P. All Circuit Monitors shall include current and voltage waveform capture capability. Waveform capture shall be user selectable for 12, 24, 36, 48, or 60 cycles of data, or can be user specified up to 30 seconds.

Q. Waveform capture manually triggered from the Power Monitoring and Control System software shall be captured at 128 samples/cycle for one cycle providing harmonic content up to the 63rd harmonic current and voltage. Each voltage and current of all the phases shall be sampled concurrently so that proper phase relationships are maintained, so that

harmonic flow analysis can be performed, and so that the effect of a disturbance can be observed on all phase voltages and currents.

R. Harmonic analysis performed on the captured waveforms shall resolve harmonics through the 63rd using Power Monitoring and Control Software.

S. Time synchronization to 1 millisecond between monitors shall be accomplished via GPS synchronization.

T. The Circuit Monitor shall have a minimum of 8MB of on board memory to log harmonic magnitudes and angles.

PART 3 EXECUTION

3.01 INSPECTION

A. Examine area to receive switchboard to provide adequate clearance for switchboard installation.

B. Check that concrete pads are level and free of irregularities.

C. Start work only after unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Install switchboard in accordance with manufacturer's written guidelines, the NEC, and local codes.

3.03 FIELD QUALITY CONTROL

A. Inspect completed installation for physical damage, proper alignment, anchorage, and grounding.

B. Measure, using a Megger, the insulation resistance of each bus section phase-to-phase and phase-to-ground for one minute each, at minimum test voltage of 1000 VDC; minimum acceptable value for insulation resistance is 1 megohms. NOTE: Refer to manufacturer's literature for specific testing procedures.

C. Check tightness of accessible bolted bus joints using calibrated torque wrench per manufacturer's recommended torque values.

D. Physically test key interlock systems to check for proper functionality.

E. Test ground fault systems by operating push-to-test button.

3.04 ADJUSTING

A. Adjust all operating mechanisms for free mechanical movement per manufacturers specifications.

B. Tighten bolted bus connections in accordance with manufacturer's instructions.

C. Adjust circuit breaker trip and time delay settings to values [indicated.] [as instructed by the Architect/Engineer.]

3.05 CLEANING

A. Touch up scratched or marred surfaces to match original finish.

END OF SECTION

COLLIN COUNTY JUVENILE JUSTICE
ALTERNATIVE EDUCATION PROGRAM
McKINNEY, TEXAS

SECTION 262416

PANELBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Distribution panelboards.
2. Lighting and appliance branch-circuit panelboards.

1.3 DEFINITIONS

A. SVR: Suppressed voltage rating.

B. TVSS: Transient voltage surge suppressor.

1.4 SUBMITTALS

A. Product Data: For each type of panelboard, switching and overcurrent protective device, transient voltage suppression device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each panelboard and related equipment.

1. Include dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings.
2. Detail enclosure types and details for types other than NEMA 250, Type 1.
3. Detail bus configuration, current, and voltage ratings.
4. Short-circuit current rating of panelboards and overcurrent protective devices.
5. Include evidence of NRTL listing for series rating of installed devices.
6. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
7. Include wiring diagrams for power, signal, and control wiring.

8. Include time-current coordination curves for each type and rating of overcurrent protective device included in panelboards. Submit on translucent log-log graft paper; include selectable ranges for each type of overcurrent protective device.

C. Qualification Data: For qualified testing agency.

D. Field Quality-Control Reports:

1. Test procedures used.
2. Test results that comply with requirements.
3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

E. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:

1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
2. Time-current curves, including selectable ranges for each type of overcurrent protective device that allows adjustments.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with NEMA PB 1.

D. Comply with NFPA 70.

E. Be all cer: C.I.E.D.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Remove loose packing and flammable materials from inside panelboards; install temporary electric heating (250 W per panelboard) to prevent condensation.

B. Handle and prepare panelboards for installation according to NEMA PB 1.

1.7 PROJECT CONDITIONS

A. Environmental Limitations:

1. Do not deliver or install panelboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above panelboards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:

a. Ambient Temperature: Not exceeding 23 deg F (minus 5 deg C) to plus 104 deg F (plus 40 deg C).
b. Altitude: Not exceeding 6600 feet (2000 m).

B. Service Conditions: NEMA PB 1, usual service conditions, as follows:

1. Ambient temperatures within limits specified.
2. Altitude not exceeding 6600 feet (2000 m).

C. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Architect, Construction Manager, Owner no fewer than ten days in advance of proposed interruption of electric service.
2. Do not proceed with interruption of electric service without Owner's written permission.
3. Comply with NFPA 70E.

1.8 COORDINATION

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace transient voltage suppression devices that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

1.10 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Keys: Two spares for each type of panelboard cabinet lock.
2. Circuit Breakers Including GFCI and Ground Fault Equipment Protection (GFEP) Types: Two spares for each panelboard.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PANELBOARDS

A. Enclosures: Flush- and surface-mounted cabinets.

1. Rated for environmental conditions at installed location.

a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
b. Outdoor Locations: NEMA 250, Type 3R.
c. [Kitchen] [Wash-Down] Areas: NEMA 250, Type 4X.
d. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
e. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 5.

2. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
3. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.
4. Skirt for Surface-Mounted Panelboards: Same gage and finish as panelboard front with flanges for attachment to panelboard, wall, and ceiling or floor.
5. Gutter Extension and Barrier: Same gage and finish as panelboard enclosure; integral with enclosure body. Arrange to isolate individual panel sections.
6. Finishes:

a. Panels and Trim: galvanized steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
b. Back Boxes: Same finish as panels and trim.

7. Directory Card: Inside panelboard door, mounted in transparent card holder.

B. Incoming Mains Location Top or bottom.

C. Phase, Neutral, and Ground Buses:

1. Material: Tin-plated aluminum.
2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.
3. Isolated Ground Bus: Adequate for branch-circuit isolated ground conductors; insulated from box.

4. Extra-Capacity Neutral Bus: Neutral bus rated 200 percent of phase bus and UL listed as suitable for nonlinear loads.
5. Split Bus: Vertical buses divided into individual vertical sections.

D. Conductor Connectors: Suitable for use with conductor material and sizes.

1. Material: Tin-plated aluminum].
2. Main and Neutral Lugs: Mechanical type.
3. Ground Lugs and Bus-Configured Terminators: Mechanical type.
4. Feed-Through Lugs: Mechanical type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
5. Subfeed (Double) Lugs: Mechanical type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.
6. Gutter-Tap Lugs: Mechanical type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.
7. Extra-Capacity Neutral Lugs: Rated 200 percent of phase lugs mounted on extra-capacity neutral bus.

E. Service Equipment Label: NRTL labeled for use as service equipment for panelboards or load centers with one or more main service disconnecting and overcurrent protective devices.

F. Future Devices: Mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.

G. Panelboard Short-Circuit Current Rating: Rated for series-connected system with integral or remote upstream overcurrent protective devices and labeled by an NRTL. Include size and type of allowable upstream and branch devices, listed and labeled for series-connected short-circuit rating by an NRTL.

2.2 DISTRIBUTION PANELBOARDS

A. Basis-of-Design Product: Subject to compliance with requirements, provide or comparable product by one of the following:

1. Square D; a brand of Schneider Electric.
2. Siemens
3. Cutler Hammer

B. Panelboards: NEMA PB 1, power and feeder distribution type.

C. Doors: Secured with vault-type latch with tumbler lock; keyed alike.

1. For doors more than 36 inches (914 mm) high, provide two latches, keyed alike.

D. Mains: [Circuit breaker] [Fused switch] [Lugs only].

E. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers; plug-in circuit breakers where individual positive-locking device requires mechanical release for removal.

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Basis-of-Design Product: Subject to compliance with requirements, provide or comparable product by one of the following:

1. Square D; a brand of Schneider Electric.

B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.

C. Mains: [Circuit breaker or lugs only, as specified on plans.

D. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

E. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

2.4 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

A. Basis-of-Design Product: Subject to compliance with requirements, provide comparable product by one of the following:
1. Square D; a brand of Schneider Electric.

B. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
3. Molded-Case Circuit-Breaker (MCCB) Features and Accessories:

a. Standard frame sizes, trip ratings, and number of poles.
b. Lugs Mechanical style, suitable for number, size, trip ratings, and conductor materials.
c. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge (HID) lighting circuits.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Receive, inspect, handle, and store panelboards according to NEMA PB 1.1.

B. Examine panelboards before installation. Reject panelboards that are damaged or rusted or have been subjected to water saturation.

C. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.

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

3.2 INSTALLATION

A. Install panelboards and accessories according to NEMA PB 1.1.

B. Equipment Mounting: Install panelboards on concrete bases, 4-inch (100-mm) nominal thickness. Comply with requirements for concrete base specified in Division 03.

1. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around full perimeter of base.
2. For panelboards, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
3. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
4. Install anchor bolts to elevations required for proper attachment to panelboards.
5. Attach panelboard to the vertical finished or structural surface behind the panelboard.

C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from panelboards.

D. Comply with mounting and anchoring requirements specified in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."

E. Mount top of trim 90 inches (2286 mm) above finished floor unless otherwise indicated.

F. Mount panelboard cabinet plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.

G. Install overcurrent protective devices and controllers not already factory installed.

1. Set field-adjustable, circuit-breaker trip ranges.

H. Install filler plates in unused spaces.

I. Stub four 1-inch (27-GRC) empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future.

J. Arrange conductors in gutters into groups and bundle and wrap with wire ties[after completing load balancing].

K. Comply with NECA 1.

3.3 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with Division 26 Section "Identification for Electrical Systems."

B. Create a directory to indicate installed circuit loads after balancing panelboard loads; incorporate Owner's final room designations. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.

C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

D. Device Nameplates: Label each branch circuit device in distribution panelboards with a nameplate complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL

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

B. Perform tests and inspections.

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

C. Acceptance Testing Preparation:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

D. Tests and Inspections:

1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
3. Perform the following infrared scan tests and inspections and prepare reports:

a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each panelboard. Remove front panels so joints and connections are accessible to portable scanner.
b. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each panelboard 11 months after date of Substantial Completion.
c. Instruments and Equipment:

1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

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

F. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 ADJUSTING

A. Adjust moving parts and operable component to function smoothly, and lubricate as recommended by manufacturer.

B. Set field-adjustable circuit-breaker trip ranges per manufacturer's recommendation.

C. Load Balancing: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes.

1. Measure as directed during period of normal system loading.
2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility and at time directed. Avoid disrupting critical 24-hour services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.
3. After circuit changes, recheck loads during normal load period. Record all load readings before and after changes and submit test records.
4. Tolerance: Difference exceeding 20 percent between phase loads, within a panelboard, is not acceptable. Rebalance and recheck as necessary to meet this minimum requirement.

3.6 PROTECTION

A. Temporary Heating: Apply temporary heat to maintain temperature according to manufacturer's written instructions.

END OF SECTION

COLLIN COUNTY JUVENILE JUSTICE
ALTERNATIVE EDUCATION PROGRAM
McKINNEY, TEXAS

SECTION 263213

~~APC~~ STANDBY POWER SYSTEMS

125KW GENERATOR ~~+ ATS SET~~

PART 1 GENERAL

Scope

A. Provide complete factory assembled generator set equipment with digital (microprocessor based) electronic generator set controls, digital governor, and digital voltage regulator.

B. Provide factory test, startup by a supplier authorized by the equipment manufacturer(s), and on-site testing of the system.

C. The generator set manufacturer shall warrant all equipment provided under this section so that there is one source for warranty and product service. Technicians specifically trained and certified by the manufacturer to support the product and employed by the generator set supplier shall service the generator sets.

Codes and Standards

A. The generator set installation and on-site testing shall conform to the requirements of the following codes and standards, as applicable. The generator set shall include necessary features to meet the requirements of these standards.

1. CSA 282, 1989 Emergency Electrical Power Supply for Buildings
2. IEEE446 – Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
3. NFPA37 –
4. NFPA70 – National Electrical Code. Equipment shall be suitable for use in systems in compliance to Article 700, 701, and 702. Note: APC equipment recommended for use in systems in compliance with Article 702 only.
5. NFPA99 – Essential Electrical Systems for Health Care Facilities. Note: APC equipment not recommended for use in NFPA 99 systems.
6. NFPA110 – Emergency and Standby Power Systems. The generator set shall meet all requirements for Level 1 systems. Level 1 prototype tests required by this standard shall have been performed on a complete and functional unit, component level type tests will not substitute for this requirement. Note: APC equipment not recommended for use in NFPA 110 required systems.

B. The generator set and supplied accessories shall meet the requirements of the following standards:

1. NEMA MG1-1998 part 32. Alternator shall comply with the requirements of this standard.
2. UL142 – Sub-base Tanks
3. UL1236 – Battery Chargers
4. UL2200. The generator set shall be listed to UL2200.

C. The control system for the generator set shall comply with the following requirements.
1. CSA C22.2, No. 14 – M91 Industrial Control Equipment.
2. EN50082-2, Electromagnetic Compatibility – Generic Immunity Requirements, Part 2: Industrial.
3. EN55011, Limits and Methods of Measurement of Radio Interference Characteristics of Industrial, Scientific and Medical Equipment.
4. FCC Part 15, Subpart B.
5. IEC8528 part 4. Control Systems for Generator Sets
6. IEC Std 801.2, 801.3, and 801.5 for susceptibility, conducted, and radiated electromagnetic emissions.
7. UL508. The entire control system of the generator set shall be UL508 listed and labeled.
8. UL1236 –Battery Chargers.

D. The generator set manufacturer shall be certified to ISO 9001 International Quality Standard and shall have third party certification verifying quality assurance in design/development, production, installation, and service, in accordance with ISO 9001.

Acceptable Manufacturers

Only approved bidders shall supply equipment provided under this contract. Equipment specifications for this project are based on generator sets manufactured by Cummins Power Generation with microprocessor-based controls. Equipment by other suppliers that meets the requirement of this specification are acceptable, if approved not less than 2 weeks before scheduled bid date. Proposals must include a line by line compliance statement based on this specification. Kohler and Detroit Diesel are approved bidders.

PART 2. PRODUCTS

Generator set

A. Ratings
1. The generator set shall operate at 1800 rpm and at a voltage of: 480Volts AC, Three phase, ~~3~~ 4-wire, 60 hertz.
2. The generator set shall be rated at 125kW, 156kVA at 0.8 PF, standby rating, based on site conditions of: ambient temperatures up to 95 degrees F.

B. Performance

1. Voltage regulation shall be plus or minus 0.5 percent for any constant load between no load and rated load. Random voltage variation with any steady load from no load to full load shall not exceed plus or minus 0.5 percent.
2. Frequency regulation shall be isochronous from steady state no load to steady state rated load. Random frequency variation with any steady load from no load to full load shall not exceed plus or minus 0.5%.
3. The diesel engine-generator set shall accept a single step load of 100% nameplate kW and power factor, less applicable derating factors, with the engine-generator set at operating temperature.
4. The generator set shall be capable of recovering to a minimum of 90% of rated no load voltage following the application of the specified kVA load at near zero power factor applied to the generator set. Maximum voltage dip on application of this load, considering both alternator performance and engine speed changes shall not exceed 25%.
5. The alternator shall produce a clean AC voltage waveform, with not more than 5% total harmonic distortion at full linear load, when measured from line to neutral, and with not more than 3% in any single harmonic, and no 3rd order harmonics or their multiples. Telephone influence factor shall be less than 40.
6. The generator set shall be certified by the engine manufacturer to be suitable for use at the installed location and rating, and shall meet all applicable exhaust emission requirements at the time of commissioning.

C. Construction

1. The engine-generator set shall be mounted on a heavy-duty steel base to maintain alignment between components. The base shall incorporate a battery tray with hold-down clamps within the rails.
2. All switches, lamps, and meters in the control system shall be oil-tight and dust-tight. All active control components shall be installed within a UL/NEMA 3R enclosure. There shall be no exposed points in the control (with the door open) that operate in excess of 50 volts.

D. Connections

1. The generator set load connections shall be composed of silver or tin plated copper bus bars, drilled to accept mechanical or compression terminations of the number and type as shown on the drawings. Sufficient lug space shall be provided for use with cables of the number and size as shown on the drawings.
2. Power connections to auxiliary devices shall be made at the devices, with required protection located at a wall-mounted common distribution panel.
3. Generator set control interfaces to other system components shall be made on a permanently labeled terminal block assembly. Labels describing connection point functions shall be provided.

Engine and Engine Equipment

The engine shall be diesel, 4 cycle, radiator and fan cooled. The horsepower rating of the engine at its minimum tolerance level shall be sufficient to drive the alternator and all connected accessories. Two cycle engines are not acceptable. Engine accessories and features shall include:

A. An electronic governor system shall provide automatic isochronous frequency regulation. The governing system dynamic capabilities shall be controlled as a function of engine coolant temperature to provide fast, stable operation at varying engine operating temperature conditions. The control system shall actively control the fuel rate and excitation as appropriate to the state of the generator set. Fuel rate shall be regulated as a function of starting, accelerating to start disconnect speed, accelerating to rated speed. The governing system shall include a programmable warm up at idle and cooldown at idle function. While operating in idle state, the control system shall disable the alternator excitation system.

B. Skid-mounted radiator and cooling system rated for full load operation in 122 degrees F (50 degrees C) ambient as measured at the alternator air inlet. Radiator fan shall be suitable for use in a system with 0.5 in H_2O restriction. Radiator shall be sized based on a core temperature that is 20F higher than the rated operation temperature, or prototype tested to verify cooling performance of the engine/radiator/fan operation in a controlled environment. Radiator shall be provided with a duct adapter flange. The equipment manufacturer shall fill the cooling system with a 50/50-ethylene glycol/water mixture prior to shipping. Rotating parts shall be guarded against accidental contact.

C. Electric starter(s) capable of three complete cranking cycles without overheating.

D. Positive displacement, mechanical, full pressure, lubrication oil pump.

E. Full flow lubrication oil filters with replaceable spin-on canister elements and dipstick oil level indicator.

F. An engine driven, mechanical, positive displacement fuel pump. Fuel filter with replaceable spin-on canister element. Fuel cooler, suitable for operation of the generator set at full rated load in the ambient temperature specified shall be provided if required for operation due to the design of the engine and the installation.

G. Replaceable dry element air cleaner with restriction indicator.

H. Flexible supply and return fuel lines.

I. Engine mounted battery charging alternator, 40-ampere minimum and solid-state voltage regulator.

J. Coolant heater

   1. Engine mounted, thermostatically controlled, coolant heater(s) for each engine. Heater voltage shall be as shown on the project drawings. The coolant heater shall be UL499 listed and labeled.

2. The coolant heater shall be installed on the engine with silicone hose connections. Steel tubing shall be used for connections into the engine coolant system wherever the length of pipe run exceeds 12 inches. The coolant heater installation shall be specifically designed to provide proper venting of the system. The coolant heaters shall provisions to isolate the heater for replacement of the heater element without draining the coolant from the generator set. The quick disconnect/automatic sealing couplers shall allow the heater element to be replaced without draining the engine cooling system or significant coolant loss.
3. The coolant heater shall be provided with a DC thermostat, installed at the engine thermostat housing. An AC power connection box shall be provided for a single AC power connection to the coolant heater system.
4. The coolant heater(s) shall be sized as recommended by the engine manufacturer to warm the engine to a minimum of 104F (40C) in a 40F (4C) ambient, in compliance with NFPA110 requirements, or the temperature required for starting and load pickup requirements of this specification

K. Provide vibration isolators, spring/pad type, quantity as recommended by the generator set manufacturer. Isolators shall include seismic restraints if required by site location.

L. Starting and Control Batteries shall be calcium/lead antimony type, 24 volt DC, sized as recommended by the engine manufacturer, complete with battery cables and connectors. The batteries shall be capable of a minimum of three complete 15-second cranking cycles at 40F ambient temperature when fully charged.

M. Provide exhaust silencer(s) for each engine of size and type as recommended by the generator set manufacturer and approved by the engine manufacturer. The mufflers shall be critical grade. Exhaust system shall be installed according to the engine manufacturer's recommendations and applicable codes and standards.

N. A UL listed/CSA certified 10 amp voltage regulated battery charger shall be provided for each engine-generator set. The charger shall be located in the generator enclosure. Input AC voltage and DC output voltage shall be as required. Chargers shall be equipped with float, taper and equalize charge settings. Monitors shall provide visual output for:

Loss of AC power - red light

Low battery voltage - red light

High battery voltage - red light

Power ON - green light

Charger to be monitored by Engine controls and cause alarm condition at ATS when used in conjunction with APC ATS.

O. Provide a dual wall sub-base fuel storage tank with 8 hours of capacity. The tank shall be constructed of corrosion resistant steel and shall be UL listed. The equipment, as installed, shall meet all local and regional requirements for above ground tanks.

2.03 AC Generator

A. The AC generator shall be; synchronous, four pole, 2/3 pitch, revolving field, drip-proof construction, single prelubricated sealed bearing, air cooled by a direct drive centrifugal blower fan, and directly connected to the engine with flexible drive disc. All insulation system components shall meet NEMA MG1 temperature limits for Class H insulation system and shall be UL1446 listed. Actual temperature rise measured by resistance method at full load shall not exceed 125 degrees Centigrade.

B. The generator shall be capable of delivering rated output (kVA) at rated frequency and power factor, at any voltage not more than 5 percent above or below rated voltage.

C. A permanent magnet generator (PMG) shall be included to provide a reliable source of excitation power for optimum motor starting and short circuit performance. The PMG and controls shall be capable of sustaining and regulating current supplied to a single phase or three phase fault at approximately 300% of rated current for not more than 10 seconds.

D. The subtransient reactance of the alternator shall not exceed 15 percent, based on the standby rating of the generator set.

Generator set Control.

The generator set shall be provided with a microprocessor-based control system that is designed to provide automatic starting, monitoring, and control functions for the generator set. The control system shall also be designed to allow local monitoring and control of the generator set, and remote monitoring and control as described in this specification.

The control shall be mounted on the generator set. The control shall be vibration isolated and prototype tested to verify the durability of all components in the system under the vibration conditions encountered.

The generator set mounted control shall include the following features and functions:

A. Control Switches

1. Mode Select Switch. The mode select switch shall initiate the following control modes. When in the RUN or MANUAL position the generator set shall start, and accelerate to rated speed and voltage as directed by the operator. A separate push-button to initiate starting is acceptable. In the OFF position the generator set shall immediately stop, bypassing all time delays. In the AUTO position the generator set shall be ready to accept a signal from a remote device to start and accelerate to rated speed and voltage.

2. EMERGENCY STOP switch. Switch shall be Red "mushroom-head" push-button. Depressing the emergency stop switch shall cause the generator set to immediately shut down, and be locked out from automatic restarting.

3. RESET switch. The RESET switch shall be used to clear a fault and allow restarting the generator set after it has shut down for any fault condition.

4. PANEL LAMP switch. Depressing the panel lamp switch shall cause the entire panel to be lighted with DC control power. The panel lamps shall automatically be switched off 10 minutes after the switch is depressed, or after the switch is depressed a second time.

B. Generator Set AC Output Metering. The generator set shall be provided with a metering set including the following features and functions:

1. Digital metering set, 1% accuracy, to indicate generator RMS voltage and current, frequency, output current, output KW, KW-hours, and power factor. Generator output voltage shall be available in line-to-line and line-to-neutral voltages, and shall display all three-phase voltages (line to neutral or line to line) simultaneously.

2. Digital voltmeter, ammeter, frequency meter, power factor meter, and kilowatt (KW) meter. Voltmeter and ammeter shall display all three phases. Meter scales shall be color coded in the following fashion: green shall indicate normal operating condition, amber shall indicate operation in ranges that indicate potential failure, and red shall indicate failure impending. Metering accuracy shall be within 1% at rated output

3. The control system shall monitor the total load on the generator set, and maintain data logs of total operating hours at specific load levels ranging from 0 to 110% of rated load, in 10% increments. The control shall display hours of operation at less than 30% load and total hours of operation at more than 90% of rated load.

4. The control system shall log total number of operating hours, total kWH, and total control on hours, as well as total values since reset.

C. Generator Set Alarm and Status Display.

1. The generator set control shall include LED alarm and status indication lamps. The lamps shall be high-intensity LED type. The lamp condition shall be clearly apparent under bright room lighting conditions. Functions indicated by the lamps shall include:

- The control shall include green lamps to indicate that the generator set is running at rated frequency and voltage, and that a remote start signal has been received at the generator set. The running signal shall be based on actual sensed voltage and frequency on the output terminals of the generator set.
- The control shall include a flashing red lamp to indicate that the control is not in automatic state, and red common shutdown lamp.
- The control shall include an amber common warning indication lamp.
- The generator set control shall indicate the existence of the warning and shutdown conditions on the control panel. All conditions indicated below for warning shall be field-configurable for shutdown. Conditions required to be annunciated shall include:

low oil pressure (warning)
low oil pressure (shutdown)
oil pressure sender failure (warning)
low coolant temperature (warning)
high coolant temperature (warning)
high coolant temperature (shutdown)
high oil temperature (warning)
engine temperature sender failure (warning)
low coolant level (warning)
fail to crank (shutdown)
fail to start/overcrank (shutdown)

overspeed (shutdown)
low DC voltage (warning)
high DC voltage (warning)
weak battery (warning)
high AC voltage (shutdown)
low AC voltage (shutdown)
under frequency (shutdown)
over current (warning)
over current (shutdown)
short circuit (shutdown)
ground fault (warning) (optional--when required by code or specified)
over load (warning)
emergency stop (shutdown)

D. Engine Status Monitoring.

1. The following information shall be available from a digital status panel on the generator set control:

   engine oil pressure (psi or kPA)
   engine coolant temperature (degrees F or C)
   engine oil temperature (degrees F or C)
   engine speed (rpm)
   number of hours of operation (hours)
   number of start attempts
   battery voltage (DC volts)

2. The control system shall also incorporate a data logging and display provision to allow logging of the last 10 warning or shutdown indications on the generator set, as well as total time of operation at various loads, as a percent of the standby rating of the generator set.

E. Engine Control Functions.

1. The control system provided shall include a cycle cranking system, which allows for user selected crank time, rest time, and # of cycles. Initial settings shall be for 3 cranking periods of 15 seconds each, with 15-second rest period between cranking periods.
2. The control system shall include an idle mode control, which allows the engine to run in idle mode in the RUN position only. In this mode, the alternator excitation system shall be disabled.
3. The control system shall include an engine governor control, which functions to provide steady state frequency regulation as noted elsewhere in this specification. The governor control shall include adjustments for gain, damping, and a ramping function to control engine speed and limit exhaust smoke while the unit is starting.
4. The control system shall include time delay start (adjustable 0-300 seconds) and time delay stop (adjustable 0-600 seconds) functions.

5. The control system shall include sender failure monitoring logic for speed sensing, oil pressure, and engine temperature which is capable of discriminating between failed sender or wiring components, and an actual failure conditions.

F. Alternator Control Functions:

1. The generator set shall include a full wave rectified automatic digital voltage regulation system that is matched and prototype tested by the engine manufacturer with the governing system provided. It shall be immune from misoperation due to load-induced voltage waveform distortion and provide a pulse width modulated output to the alternator exciter. The voltage regulation system shall be equipped with three-phase line to neutral RMS sensing and shall control buildup of AC generator voltage to provide a linear rise and limit overshoot. The system shall include a torque-matching characteristic, which shall reduce output voltage in proportion to frequency below an adjustable frequency threshold. Torque matching characteristic shall be adjustable for roll-off frequency and rate, and be capable of being curve-matched to the engine torque curve with adjustments in the field. The voltage regulator shall include adjustments for gain, damping, and frequency roll-off. Adjustments shall be broad range, and made via digital raise-lower switches, with an alphanumeric LED readout to indicate setting level. Rotary potentiometers for system adjustments are not acceptable.
2. Controls shall be provided to monitor the output current of the generator set and initiate an alarm (over current warning) when load current exceeds 110% of the rated current of the generator set on any phase for more than 60 seconds. The controls shall shut down and lock out the generator set when output current level approaches the thermal damage point of the alternator (over current shutdown). The protective functions provided shall be in compliance to the requirements of NFPA70 article 445.
3. Controls shall be provided to individually monitor all three phases of the output current for short circuit conditions. The control/protection system shall monitor the current level and voltage. The controls shall shut down and lock out the generator set when output current level approaches the thermal damage point of the alternator (short circuit shutdown). The protective functions provided shall be in compliance to the requirements of NFPA70 article 445.
4. Controls shall be provided to monitor the KW load on the generator set, and initiate an alarm condition (over load) when total load on the generator set exceeds the generator set rating for in excess of 5 seconds. Controls shall include a load shed control, to operate a set of dry contacts (for use in shedding customer load devices) when the generator set is overloaded.
5. An AC over/under voltage monitoring system that responds only to true RMS voltage conditions shall be provided. The system shall initiate shutdown of the generator set when alternator output voltage exceeds 110% of the operator-set voltage level for more than 10 seconds, or with no intentional delay when voltage exceeds 130%. Under voltage shutdown shall occur when the output voltage of the alternator is less than 85% for more than 10 seconds.
6. When required by National Electrical Code or indicated on project drawings, the control System shall include a ground fault monitoring relay. The relay shall be adjustable from 3.8-1200 amps, and include adjustable time delay of 0-10.0 seconds. The relay shall be for indication only, and not trip or shut down the generator set.

Note bonding and grounding requirements for the generator set, and provide relay that will function correctly in system as installed.

7. The generator set control shall include a 120VAC-control heater

G. Other Control Function

1. The generator set shall be provided with a network communication module to allow ~~APC~~ communication with the generator set control by remote devices. The control shall communicate all engine and alternator data, and allow starting and stopping of the generator set via the network in both test and emergency modes.
2. A battery monitoring system shall be provided which initiates alarms when the DC control and starting voltage is less than 25VDC or more than 32 VDC. During engine cranking (starter engaged), the low voltage limit shall be disabled, and DC voltage shall be monitored as load is applied to the battery, to detect impending battery failure or deteriorated battery condition
3. The following information shall communicated to the ATS when used with an ~~APC~~ ATS.

Generator Status Event
Low Fuel Level Alarm
Low Fuel Level Alarm Cleared Cleared
Low Runtime Alarm
Low Runtime Alarm Cleared
Very Low Fuel Level Alarm
Very Low Fuel Level Alarm Cleared Cleared
Very Low Runtime Alarm
Very Low Runtime Alarm Cleared
Service Interval Exceeded Alarm
Service Interval Exceeded Alarm Cleared
Service Record Reset
Low Coolant Level
Low Coolant Level Cleared
Very Low Coolant Level
Very Low Coolant Level Cleared
High Coolant Temp
High Coolant Temp Cleared
Very High Coolant Temp
Very High Coolant Temp Cleared
Low Coolant Temp
Low Coolant Temp Cleared
Low Oil Level
Low Oil Level Cleared
Low Bat V During Crank
Low Bat V During Crank Cleared
Very Low Bat V During Crank
Very Low Bat V During Crank Cleared

Local EStop
Local EStop Cleared
Remote EStop
Remote EStop Cleared
High Battery Voltage
High Battery Voltage Cleared
Low Battery Voltage
Low Battery Voltage Cleared
Control Switch not in Auto
Control Switch not in Auto Cleared
Low Oil Pressure
Low Oil Pressure Cleared
Very Low Oil Pressure
Very Low Oil Pressure Cleared
Overload
Overload Cleared
Low AC Voltage
Low AC Voltage Cleared
Ready for Load
Ready for Load Cleared
Common Fault
Common Fault Cleared
High AC Voltage
High AC Voltage Cleared
Overspeed
Overspeed Cleared
Engine Cold, May not Start
Engine Cold, May not Start Cleared
Output Breaker Off
Output Breaker Off Cleared
Gen Shutdown, Will not Start
Gen Shutdown, Will not Start Cleared
Gen Battery Charger Voltage Low
Gen Battery Charger Voltage Low Cleared
Generator Fuel Level
Generator Runtime with and without Generator Running
Genset Hardware data
Software Version level
Fault History
Event Log
Generator Output Breaker Position Status
Engine Starting Battery Voltage
Engine Starting Battery Weak Warning
Engine Oil Lube Pressure

STA 3971
081909

Engine Lube Oil Level
Engine Coolant Temp
Engine Coolant Level
Engine Operating Hours
Number of Starts
Engine RPM
Output Power- kW and PF
Generator Total kWh
Generator Total kWh
%governing and % Voltage Regulation
Overspeed
Overcrank

H. Control Interfaces for Remote Monitoring:

1. A fused 10 amp switched 12VDC power supply circuit shall be provided for customer use. DC power shall be available from this circuit at all times from the engine starting/control batteries.

2. The control shall be provided with a direct serial communication link for the APC communication network interface as described elsewhere in this specification and shown on the drawings.

Other equipment to be provided with the generator set

A. The generator set shall be provided with a mounted main line circuit breaker, sized to carry the rated output current of the generator set. The circuit breaker shall incorporate an electronic trip unit that operates to protect the alternator under all overcurrent conditions, or a thermal-magnetic trip with other overcurrent protection devices that positively protect the alternator under overcurrent conditions. The supplier shall submit time overcurrent characteristic curves and thermal damage curve for the alternator, demonstrating the effectiveness of the protection provided.

B. Outdoor Weather-Protective Enclosure

1. The generator set shall be provided with an outdoor enclosure, with the entire package listed under UL2200. The package shall comply with the requirements of the National Electrical Code for all wiring materials and component spacing. The total assembly of generator set, enclosure, and sub-base fuel tank (when used) shall be designed to be lifted into place using spreader bars. Housing shall provide ample airflow for generator set operation at rated load in an ambient temperature of 100F. The housing shall have hinged access doors as required to maintain easy access for all operating and service functions. All doors shall be lockable, and include retainers to hold the door open during service. Enclosure roof shall be cambered to prevent rainwater accumulation. Openings shall be screened to limit access of rodents into the enclosure. All electrical power and control interconnections shall be made within the perimeter of the enclosure.

2. All sheet metal shall be primed for corrosion protection and finish painted with the manufacturers standard color using a two step electrocoating paint process, or equal meeting the performance requirements specified below. All surfaces of all metal parts shall be primed and painted. The painting process shall result in a coating that meets the following requirements:

   Primer thickness, 0.5-2.0 mils. Top coat thickness, 0.8-1.2 mils.

   Gloss, per ASTM D523-89, 80% plus or minus 5%. Gloss retention after one year shall exceed 50%.

   Crosshatch adhesion, per ASTM D3359-93, 4B-5B.

   Impact resistance, per ASTM D2794-93, 120-160 inch-pounds.

   Salt Spray, per ASTM B117-90, 1000+ hours.

   Humidity, per ASTM D2247-92, 1000+ hours.

   Water Soak, per ASTM D2247-92, 1000+ hours.

3. Painting of hoses, clamps, wiring harnesses, and other non-metallic service parts shall not be acceptable. Fasteners used shall be corrosion resistant, and designed to minimize marring of the painted surface when removed for normal installation or service work.

4. Enclosure shall be constructed of minimum 12 gauge steel for framework and 14 gauge steel for panels. All hardware and hinges shall be stainless steel.

~~5. A factory-mounted exhaust silencer shall be installed inside the enclosure. The exhaust shall exit the enclosure through a rain collar and terminate with a rain cap. Exhaust connections to the generator set shall be through seamless flexible connections.~~

6. The enclosure shall include the following maintenance provisions:

   - Flexible coolant and lubricating oil drain lines, that extend to the exterior of the enclosure, with internal drain valves

7. External radiator fill provision.

8. The generator set shall be provided with a sound-attenuated housing which allows the generator set to operate at full rated load in an ambient temperature of up to 100F. The enclosure shall reduce the sound level of the generator set while operating at full rated load to a maximum of 72 dBA at any location 7 meters from the generator set in a free field environment.

9. The enclosure shall be insulated with non-hydroscopic materials.

C. Provide a sub-base fuel tank for the generator set, sized to allow for full load operation of the generator set for ~~24~~ 8 hours. The sub-base fuel tank shall be UL142 listed and labeled. Installation shall be in compliance to NFPA37. The fuel tank shall be a double-walled, steel construction and include the following features:

   1. Emergency tank and basin vents.

   2. Mechanical level gauge.

3. Fuel supply and return lines, connected to generator set with flexible fuel lines as recommended by the engine manufacturer and in compliance to UL2200 and NFPA 37 requirements.
4. Leak detection provisions, wired to the generator set control for local and remote alarm indication.
5. Continuous float level gauge. Wire gauge to generator control to be remote indication of fuel level and runtime.
6. Basin drain.
7. Integral lifting provisions
8. Overfill Catch basin with drain.

PART 3 OPERATION

Sequence of Operation

A. Generator set shall start on receipt of a start signal from remote equipment. The start signal shall be via hardwired connection to the generator set control and a redundant signal over the required network connection.

B. The generator set shall complete a time delay start period as programmed into the control.

C. The generator set control shall initiate the starting sequence for the generator set. The starting sequence shall include the following functions:

D. The control system shall verify that the engine is rotating when the starter is signaled to operate. If the engine does not rotate after two attempts, the control system shall shut down and lock out the generator set, and indicate “fail to crank” shutdown.

E. The engine shall fire and accelerate as quickly as practical to start disconnect speed. If the engine does not start, it shall complete a cycle cranking process as described elsewhere in this specification. If the engine has not started by the completion of the cycle cranking sequence, it shall be shut down and locked out, and the control system shall indicate “fail to start”.

F. The engine shall accelerate to rated speed and the alternator to rated voltage. Excitation shall be disabled until the engine has exceeded programmed idle speed, and regulated to prevent over voltage conditions and oscillation as the engine accelerates and the alternator builds to rated voltage.

G. On reaching rated speed and voltage, the generator set shall operate as dictated by the control system in isochronous state.

H. When all start signals have been removed from the generator set, it shall complete a time delay stop sequence. The duration of the time delay stop period shall be adjustable by the operator.

I. On completion of the time delay stop period, the generator set control shall switch off the excitation system and shall shut down.

J. Any start signal received after the time stop sequence has begun shall immediately terminate the stopping sequence and return the generator set to isochronous operation.

PART 4 OTHER REQUIREMENTS

Submittals

A. Within ~~10~~ 30 days after award of contract, provide six sets of the following information for review:
   - Manufacturer's product literature and performance data, sufficient to verify compliance to specification requirements.
   - A paragraph by paragraph specification compliance statement, describing the differences between the specified and the proposed equipment.
   - Manufacturer's certification of prototype testing.
   - Manufacturer's published warranty documents.
   - Shop drawings showing plan and elevation views with certified overall dimensions, as well as wiring interconnection details.
   - Interconnection wiring diagrams showing all external connections required; with field wiring terminals marked in a consistent point-to-point manner.
   - Manufacturer's installation instructions.

Factory Testing

A. The generator set manufacturer shall perform a complete operational test on the generator set prior to shipping from the factory. A certified test report shall be provided. Equipment supplied shall be fully tested at the factory for function and performance.
B. Factory testing may be witnessed by the owner and consulting engineer. Costs for travel expenses will be the responsibility of the owner and consulting engineer. Supplier is responsible to provide two weeks notice for testing.
C. Generator set factory tests on the equipment shall be performed at rated load and rated power factor. Generator sets that have not been factory tested at rated power factor will not be acceptable. Tests shall include: run at full load, maximum power, voltage regulation, transient and steady-state governing, single step load pickup, and function of safety shutdowns.

Installation

A. Equipment shall be installed by the contractor in accordance with final submittals and contract documents. Installation shall comply with applicable state and local codes as required by the authority having jurisdiction. Install equipment in accordance with manufacturer's instructions and instructions included in the listing or labeling of UL listed products.
B. Installation of equipment shall include furnishing and installing all interconnecting wiring between all major equipment provided for the on-site power system. The contractor shall also perform interconnecting wiring between equipment sections (when required), under the supervision of the equipment supplier.
C. Equipment shall be installed on concrete housekeeping pads. Equipment shall be permanently fastened to the pad in accordance with manufacturer's instructions and seismic requirements of the site.
D. Equipment shall be initially started and operated by representatives of the manufacturer.
E. All equipment shall be physically inspected for damage. Scratches and other installation damage shall be repaired prior to final system testing. Equipment shall

be thoroughly cleaned to remove all dirt and construction debris prior to initial operation and final testing of the system.

On-Site Acceptance Test:

A. The complete installation shall be tested for compliance with the specification following completion of all site work. Testing shall be conducted by representatives of the manufacturer, with required fuel supplied by Contractor. The Engineer shall be notified in advance and shall have the option to witness the tests.
B. Installation acceptance tests to be conducted on-site shall include a "cold start" test, a two hour full load test, and a one step rated load pickup test in accordance with NFPA 110. Provide a resistive load bank and make temporary connections for full load test, if necessary.
C. Perform a power failure test on the entire installed system. This test shall be conducted by opening the power supply from the utility service, and observing proper operation of the system for at least 2 hours. Coordinate timing and obtain approval for start of test with site personnel.

Training

A. The equipment supplier shall provide training for the facility operating personnel covering operation and maintenance of the equipment provided. The training program shall be not less than 4 hours in duration and the class size shall be limited to 5 persons. Training date shall be coordinated with the facility owner.

Service and support

A. The manufacturer of the generator set shall maintain service parts inventory at a central location which is accessible to the service location 24 hours per day, 365 days per year.
B. The generator set shall be serviced by a local service organization that is trained and factory certified in generator set service. The supplier shall maintain an inventory of critical replacement parts at the local service organization, and in service vehicles. The service organization shall be on call 24 hours per day, 365 days per year.
C. The manufacturer shall maintain model and serial number records of each generator set provided for at least 20 years.

Warranty

A. The generator set and associated equipment shall be warranted for a period of not less than 2 years from the date of commissioning against defects in materials and workmanship. If assembly services are included in the original purchase and are also performed by Supplier authorized service personnel, Supplier offers an additional year of parts warranty and the first year of on site coverage at no additional charge.

END OF SECTION

COLLIN COUNTY JUVENILLE JUSTICE
ALTERNATIVE EDUCATION PROGRAM
McKINNEY, TEXAS

SECTION 263600

TRANSFER SWITCHES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes transfer switches rated 600 V and less, including the following:

1. Automatic transfer switches.
2. Bypass/isolation switches.
3. Remote annunciation and control systems.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, weights, operating characteristics, furnished specialties, and accessories.

B. Shop Drawings: Dimensioned plans, elevations, sections, and details showing minimum clearances, conductor entry provisions, gutter space, installed features and devices, and material lists for each switch specified.

1. Single-Line Diagram: Show connections between transfer switch, bypass/isolation switch, power sources, and load; and show interlocking provisions for each combined transfer switch and bypass/isolation switch.

C. Field quality-control test reports.

D. Operation and Maintenance Data: For each type of product to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:

1. Features and operating sequences, both automatic and manual.
2. List of all factory settings of relays; provide relay-setting and calibration instructions, including software, where applicable.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Maintain a service center capable of providing training, parts, and emergency maintenance repairs within a response period of less than eight hours from time of notification.

B. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.

C. Source Limitations: Obtain automatic transfer switches, bypass/isolation and remote annunciator and control panels through one source from a single manufacturer.

D. 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.

E. Comply with NEMA ICS 1.

F. Comply with NFPA 70.

G. Comply with NFPA 99.

H. Comply with NFPA 110.

I. Comply with UL 1008 unless requirements of these Specifications are stricter.

1.5 PROJECT CONDITIONS

A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service:

1. Notify Architect and Owner no fewer than 10 days in advance of proposed interruption of electrical service.
2. Do not proceed with interruption of electrical service without Architect's and Owner's written permission.

1.6 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. 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. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Contactor Transfer Switches:

a. AC Data Systems, Inc.
b. Caterpillar; Engine Div.
c. Emerson; ASCO Power Technologies, LP.
d. Kohler Power Systems; Generator Division.
e. Onan/Cummins Power Generation; Industrial Business Group.
f. Russelectric, Inc.
g. Spectrum Detroit Diesel.
h. Square D.

2.2 GENERAL TRANSFER-SWITCH PRODUCT REQUIREMENTS

A. Indicated Current Ratings: Apply as defined in UL 1008 for continuous loading and total system transfer, including tungsten filament lamp loads not exceeding 30 percent of switch ampere rating, unless otherwise indicated.

B. Tested Fault-Current Closing and Withstand Ratings: Adequate for duty imposed by protective devices at installation locations in Project under the fault conditions indicated, based on testing according to UL 1008.

1. Where transfer switch includes internal fault-current protection, rating of switch and trip unit combination shall exceed indicated fault-current value at installation location.

C. Solid-State Controls: Repetitive accuracy of all settings shall be plus or minus 2 percent or better over an operating temperature range of minus 20 to plus 70 deg C.

D. Resistance to Damage by Voltage Transients: Components shall meet or exceed voltage-surge withstand capability requirements when tested according to IEEE C62.41. Components shall meet or exceed voltage-impulse withstand test of NEMA ICS 1.

E. Electrical Operation: Accomplish by a nonfused, momentarily energized solenoid or electric-motor-operated mechanism, mechanically and electrically interlocked in both directions.

F. Switch Characteristics: Designed for continuous-duty repetitive transfer of full-rated current between active power sources.

1. Limitation: Switches using molded-case switches or circuit breakers or insulated-case circuit-breaker components are not acceptable.
2. Switch Action: Double throw; mechanically held in both directions.

3. Contacts: Silver composition or silver alloy for load-current switching. Conventional automatic transfer-switch units, rated 225 A and higher, shall have separate arcing contacts.

G. Neutral Switching. Where four-pole switches are indicated, provide neutral pole switched simultaneously with phase poles.

H. Neutral Terminal: Solid and fully rated, unless otherwise indicated.

I. Oversize Neutral: Ampacity and switch rating of neutral path through units indicated for oversize neutral shall be double the nominal rating of circuit in which switch is installed.

J. Heater: Equip switches exposed to outdoor temperatures and humidity, and other units indicated, with an internal heater. Provide thermostat within enclosure to control heater.

K. Battery Charger: For generator starting batteries.

1. Float type rated 10 A.
2. Ammeter to display charging current.
3. Fused ac inputs and dc outputs.

L. Annunciation, Control, and Programming Interface Components: Devices at transfer switches for communicating with remote programming devices, annunciators, or annunciator and control panels shall have communication capability matched with remote device.

M. Factory Wiring: Train and bundle factory wiring and label, consistent with Shop Drawings, either by color-code or by numbered or lettered wire and cable tape markers at terminations. Color-coding and wire and cable tape markers are specified in Division 26 Section "Identification for Electrical Systems."

1. Designated Terminals: Pressure type, suitable for types and sizes of field wiring indicated.
2. Power-Terminal Arrangement and Field-Wiring Space: Suitable for top, side, or bottom entrance of feeder conductors as indicated.
3. Control Wiring: Equipped with lugs suitable for connection to terminal strips.

N. Enclosures: General-purpose NEMA 250, Type 1, complying with NEMA ICS 6 and UL 508, unless otherwise indicated.

2.3 AUTOMATIC TRANSFER SWITCHES

A. Comply with Level 1 equipment according to NFPA 110.

B. Switching Arrangement: Double-throw type, incapable of pauses or intermediate position stops during normal functioning, unless otherwise indicated.

C. Manual Switch Operation: Under load, with door closed and with either or both sources energized. Transfer time is same as for electrical operation. Control circuit automatically disconnects from electrical operator during manual operation.

D. Manual Switch Operation: Unloaded. Control circuit automatically disconnects from electrical operator during manual operation.

E. Signal-Before-Transfer Contacts: A set of normally open/normally closed dry contacts operates in advance of retransfer to normal source. Interval is adjustable from 1 to 30 seconds.

F. Digital Communication Interface: Matched to capability of remote annunciator or annunciator and control panel.

G. Automatic Open-Transition Transfer Switches:

H. Motor Disconnect and Timing Relay: Controls designate starters so they disconnect motors before transfer and reconnect them selectively at an adjustable time interval after transfer. Control connection to motor starters is through wiring external to automatic transfer switch. Time delay for reconnecting individual motor loads is adjustable between 1 and 60 seconds, and settings are as indicated. Relay contacts handling motor-control circuit inrush and seal currents are rated for actual currents to be encountered.

I. Programmed Neutral Switch Position: Switch operator has a programmed neutral position arranged to provide a midpoint between the two working switch positions, with an intentional, time-controlled pause at midpoint during transfer. Pause is adjustable from 0.5 to 30 seconds minimum and factory set for 0.5 second, unless otherwise indicated. Time delay occurs for both transfer directions. Pause is disabled unless both sources are live.

J. Automatic Transfer-Switch Features:

1. Undervoltage Sensing for Each Phase of Normal Source: Sense low phase-to-ground voltage on each phase. Pickup voltage shall be adjustable from 85 to 100 percent of nominal, and dropout voltage is adjustable from 75 to 98 percent of pickup value. Factory set for pickup at 90 percent and dropout at 85 percent.
2. Adjustable Time Delay: For override of normal-source voltage sensing to delay transfer and engine start signals. Adjustable from zero to six seconds, and factory set for one second.
3. Voltage/Frequency Lockout Relay: Prevent premature transfer to generator. Pickup voltage shall be adjustable from 85 to 100 percent of nominal. Factory set for pickup at 90 percent. Pickup frequency shall be adjustable from 90 to 100 percent of nominal. Factory set for pickup at 95 percent.
4. Time Delay for Retransfer to Normal Source: Adjustable from 0 to 30 minutes, and factory set for 10 minutes to automatically defeat delay on loss of voltage or sustained undervoltage of emergency source, provided normal supply has been restored.
5. Test Switch: Simulate normal-source failure.
6. Switch-Position Pilot Lights: Indicate source to which load is connected.
7. Source-Available Indicating Lights: Supervise sources via transfer-switch normal- and emergency-source sensing circuits.

    a. Normal Power Supervision: Green light with nameplate engraved "Normal Source Available."
    b. Emergency Power Supervision: Red light with nameplate engraved "Emergency Source Available."

8. Unassigned Auxiliary Contacts: Two normally open, single-pole, double-throw contacts for each switch position, rated 10 A at 240-V ac.

9. Transfer Override Switch: Overrides automatic retransfer control so automatic transfer switch will remain connected to emergency power source regardless of condition of normal source. Pilot light indicates override status.
10. Engine Starting Contacts: One isolated and normally closed, and one isolated and normally open; rated 10 A at 32-V dc minimum.
11. Engine Shutdown Contacts: Instantaneous; shall initiate shutdown sequence at remote engine-generator controls after retransfer of load to normal source.
12. Engine Shutdown Contacts: Time delay adjustable from zero to five minutes, and factory set for five minutes. Contacts shall initiate shutdown at remote engine-generator controls after retransfer of load to normal source.
13. Engine-Generator Exerciser: Solid-state, programmable-time switch starts engine generator and transfers load to it from normal source for a preset time, then retransfers and shuts down engine after a preset cool-down period. Initiates exercise cycle at preset intervals adjustable from 7 to 30 days. Running periods are adjustable from 10 to 30 minutes. Factory settings are for 7-day exercise cycle, 20-minute running period, and 5-minute cool-down period. Exerciser features include the following:

    a. Exerciser Transfer Selector Switch: Permits selection of exercise with and without load transfer.
    b. Push-button programming control with digital display of settings.
    c. Integral battery operation of time switch when normal control power is not available.

2.4 BYPASS/ISOLATION SWITCHES

A. Comply with requirements for Level 1 equipment according to NFPA 110.

B. Description: Manual type, arranged to select and connect either source of power directly to load, isolating transfer switch from load and from both power sources. Include the following features for each combined automatic transfer switch and bypass/isolation switch:

1. Means to lock bypass/isolation switch in the position that isolates transfer switch with an arrangement that permits complete electrical testing of transfer switch while isolated. While isolated, interlocks prevent transfer-switch operation, except for testing or maintenance.
2. Drawout Arrangement for Transfer Switch: Provide physical separation from live parts and accessibility for testing and maintenance operations.
3. Bypass/Isolation Switch Current, Voltage, Closing, and Short-Circuit Withstand Ratings: Equal to or greater than those of associated automatic transfer switch, and with same phase arrangement and number of poles.
4. Contact temperatures of bypass/isolation switches shall not exceed those of automatic transfer-switch contacts when they are carrying rated load.
5. Operability: Constructed so load bypass and transfer-switch isolation can be performed by 1 person in no more than 2 operations in 15 seconds or less.
6. Legend: Manufacturer's standard legend for control labels and instruction signs shall describe operating instructions.
7. Maintainability: Fabricate to allow convenient removal of major components from front without removing other parts or main power conductors.

C. Interconnection of Bypass/Isolation Switches with Automatic Transfer Switches: Factory-installed copper bus bars; plated at connection points and braced for the indicated available short-circuit current.

2.5 REMOTE ANNUNCIATOR AND CONTROL SYSTEM

A. Functional Description: Include the following functions for indicated transfer switches:

1. Indication of sources available, as defined by actual pickup and dropout settings of transfer-switch controls.
2. Indication of switch position.
3. Indication of switch in test mode.
4. Indication of failure of digital communication link.
5. Key-switch or user-code access to control functions of panel.
6. Control of switch-test initiation.
7. Control of switch operation in either direction.
8. Control of time-delay bypass for transfer to normal source.

B. Malfunction of annunciator, annunciation and control panel, or communication link shall not affect functions of automatic transfer switch. In the event of failure of communication link, automatic transfer switch automatically reverts to stand-alone, self-contained operation. Automatic transfer-switch sensing, controlling, or operating function shall not depend on remote panel for proper operation.

C. Remote Annunciation and Control Panel: Solid-state components. Include the following features:

1. Controls and indicating lights grouped together for each transfer switch.
2. Label each indicating light control group. Indicate transfer switch it controls, location of switch, and load it serves.
3. Digital Communication Capability: Matched to that of transfer switches supervised.
4. Mounting: Flush, modular, steel cabinet, unless otherwise indicated.

2.6 SOURCE QUALITY CONTROL

A. Factory test and inspect components, assembled switches, and associated equipment. Ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for compliance with specified requirements. Perform dielectric strength test complying with NEMA ICS 1.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Design each fastener and support to carry load indicated by seismic requirements and according to seismic-restraint details. See Division 26 Section "Vibration and Seismic Controls for Electrical Systems."

B. Floor-Mounting Switch: Anchor to floor by bolting.

1. Concrete Bases: 4 inches (100 mm) high, reinforced, with chamfered edges. Extend base no more than 4 inches (100 mm) in all directions beyond the maximum dimensions of switch, unless otherwise indicated or unless required for seismic support. Construct

concrete bases according to Division 26 Section "Hangers and Supports for Electrical Systems."

C. Annunciator and Control Panel Mounting: Flush in wall, unless otherwise indicated.

D. Identify components according to Division 26 Section "Identification for Electrical Systems."

E. Set field-adjustable intervals and delays, relays, and engine exerciser clock.

3.2 CONNECTIONS

A. Wiring to Remote Components: Match type and number of cables and conductors to control and communication requirements of transfer switches as recommended by manufacturer. Increase raceway sizes at no additional cost to Owner if necessary to accommodate required wiring.

B. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

C. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.3 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified independent testing and inspecting agency to perform tests and inspections and prepare test reports.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections. Report results in writing.

C. Perform tests and inspections and prepare test reports.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installation, including connections, and to assist in testing.
2. After installing equipment and after electrical circuitry has been energized, test for compliance with requirements.
3. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
4. Measure insulation resistance phase-to-phase and phase-to-ground with insulation-resistance tester. Include external annunciation and control circuits. Use test voltages and procedure recommended by manufacturer. Comply with manufacturer's specified minimum resistance.

    a. Check for electrical continuity of circuits and for short circuits.
    b. Inspect for physical damage, proper installation and connection, and integrity of barriers, covers, and safety features.
    c. Verify that manual transfer warnings are properly placed.
    d. Perform manual transfer operation.

5. After energizing circuits, demonstrate interlocking sequence and operational function for each switch at least three times.

    a. Simulate power failures of normal source to automatic transfer switches and of emergency source with normal source available.
    b. Simulate loss of phase-to-ground voltage for each phase of normal source.
    c. Verify time-delay settings.
    d. Verify pickup and dropout voltages by data readout or inspection of control settings.
    e. Test bypass/isolation unit functional modes and related automatic transfer-switch operations.
    f. Perform contact-resistance test across main contacts and correct values exceeding 500 microhms and values for 1 pole deviating by more than 50 percent from other poles.
    g. Verify proper sequence and correct timing of automatic engine starting, transfer time delay, retransfer time delay on restoration of normal power, and engine cool-down and shutdown.

6. Ground-Fault Tests: Coordinate with testing of ground-fault protective devices for power delivery from both sources.

    a. Verify grounding connections and locations and ratings of sensors.

D. Testing Agency's Tests and Inspections:

1. After installing equipment and after electrical circuitry has been energized, test for compliance with requirements.
2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
3. Measure insulation resistance phase-to-phase and phase-to-ground with insulation-resistance tester. Include external annunciation and control circuits. Use test voltages and procedure recommended by manufacturer. Comply with manufacturer's specified minimum resistance.

    a. Check for electrical continuity of circuits and for short circuits.
    b. Inspect for physical damage, proper installation and connection, and integrity of barriers, covers, and safety features.
    c. Verify that manual transfer warnings are properly placed.
    d. Perform manual transfer operation.

4. After energizing circuits, demonstrate interlocking sequence and operational function for each switch at least three times.

    a. Simulate power failures of normal source to automatic transfer switches and of emergency source with normal source available.
    b. Simulate loss of phase-to-ground voltage for each phase of normal source.
    c. Verify time-delay settings.
    d. Verify pickup and dropout voltages by data readout or inspection of control settings.
    e. Test bypass/isolation unit functional modes and related automatic transfer-switch operations.

f. Perform contact-resistance test across main contacts and correct values exceeding 500 microhms and values for 1 pole deviating by more than 50 percent from other poles.
g. Verify proper sequence and correct timing of automatic engine starting, transfer time delay, retransfer time delay on restoration of normal power, and engine cool-down and shutdown.

5. Ground-Fault Tests: Coordinate with testing of ground-fault protective devices for power delivery from both sources.

a. Verify grounding connections and locations and ratings of sensors.

E. Coordinate tests with tests of generator and run them concurrently.

F. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation and contact resistances and time delays. Attach a label or tag to each tested component indicating satisfactory completion of tests.

G. Remove and replace malfunctioning units and retest as specified above.

H. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each switch. Remove all access panels so joints and connections are accessible to portable scanner.

1. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switch 11 months after date of Substantial Completion.
2. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
3. Record of Infrared Scanning: Prepare a certified report that identifies switches checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain transfer switches and related equipment as specified below. Refer to Division 01 Section "Demonstration and Training."

B. Coordinate this training with that for generator equipment.

END OF SECTION

COLLIN COUNTY JUVENILE JUSTICE
ALTERNATIVE EDUCATION PROGRAM
McKINNEY, TEXAS

SECTION 32 3224

STONE STRONG PRECAST MODULAR BLOCK RETAINING WALL SYSTEM

PART 1- GENERAL

1.01 Description

A. Work includes furnishing and installing precast modular blocks (PMB) to the lines and grades shown on the plans and as specified herein. Also included is furnishing and installing appurtenant materials required for construction of the complete system.

B. The contractor is solely responsible for safety. The Engineer and Owner shall not be responsible for means or methods of construction or for safety of workers or the public.

1.02 References

A. ASTM - American Society for Testing and Materials (AASHTO - American Association of State and Highway Transportation Officials)

B. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens (AASHTO T22)

C. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregate (AASHTO T27)

D. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (AASHTO T89 & T90)

E. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (AASHTO T99)

F. ASTM D4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles

G. ASTM D4595 - Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method

H. ASTM D5262 - Standard Test Method for Evaluating the Unconfined Creep Behavior of Geosynthetics

I. ASTM D6638 - Standard Test Method for Determining Connection Strength Between Geosynthetic Reinforcement and Segmental Concrete Units (Modular Concrete Blocks)

J. ASTM D6916 - Standard Test Method for Determining the Shear Strength Between Segmental Concrete Units

K. ASTM C33 - Standard Specification for Concrete Aggregates (AASHTO M43)

1.03 Submittals

A. Submit for review 2 sets of shop drawings for the retaining wall system prepared by a Professional Engineer registered in the state of Texas. The shop drawings shall indicate the layout, height, and construction details of the retaining wall system. Design shall conform to relevant requirements and design methodologies of AASHTO Standard Specifications for Highway Bridges, except that minimum safety factors shall be 1.5 for sliding and overturning and 2.0 for bearing. Upon request, design calculations shall also be submitted.

B. Submit grain size test results for aggregates to be used for the wall base, and for unit fill.

C. Submit test results on borrow soil to be used for backfill including Proctor and grain size or Atterberg limits results.

1.05 Delivery, Storage, and Handling

A. Contractor shall check the materials upon delivery to assure that proper materials have been received.

B. Contractor shall protect the materials from damage. Damaged material shall not be incorporated into the wall or the reinforced soil embankments.

C. Contractor shall prevent excessive mud, concrete, adhesives and other substances that may adhere from coming in contact with the materials.

D. Exposed faces of precast modular block units shall be reasonably free of chips, cracks, or stains when viewed from a distance of 10 feet.

PART 2: MATERIALS

2.01 Wall Units

A. Precast modular blocks shall be Stone Strong units manufactured under license from Stone Strong LLC.

B. Dimension tolerances for precast modular blocks shall be +/- 1/8 inch for horizontal and vertical dimensions of the face and +½ to -¼ inch for the face to tail width.

C. Concrete for precast modular blocks shall have a minimum 28-day compressive strength of 4,000 psi. Entrained air content shall be between 5 and 7%.

D. Reinforcing steel (if used) shall be Grade 60. Minimum clear cover to reinforcement shall be 1½ inches.

E. The face pattern shall be selected from the manufacturer's standard molds. The color of the units shall be natural gray.

2.02 Geogrid

A. If geogrid reinforcement shall be Synteen SF55 and SF110, and shall be as detailed in the shop drawings. Substitution of a different type of geogrid shall not be allowed.

2.03 Backfill

A. Select granular backfill within the geogrid reinforced zone shall be TxDOT Type D granular material.

B. All other backfill behind and in front of the wall shall consist of suitable on-site soil or imported borrow and shall be approved by the Geotechnical Engineer. Fat clay soils, cobbles, and large rock should generally be avoided unless approved by the Geotechnical Engineer based on local practices. Frozen soils, excessively wet or dry soils, debris, and deleterious materials should not be used.

PART 3: EXECUTION

3.01 Excavation

A. Excavate as required for installation of the retaining wall system. Excavate to the base level for a sufficient distance behind the face to permit installation of the base.

B. Slope or shore excavation as necessary for safety and for conformance with applicable OSHA requirements.

3.02 Wall Base

A. Foundation soils shall be excavated to the dimensions shown on the plans. Foundation soil shall be observed by the Geotechnical Engineer to confirm that the bearing soils are similar to the design conditions or assumptions.

B. Construct the wall base to the lines and grades shown on the plans. Place and consolidate concrete, strike, and finish plane and level. Overexcavated areas shall be filled with additional concrete or granular base material. Compact granular base material to provide a hard and level surface to support the wall units. Base material shall be compacted to a minimum of 95 percent of the maximum dry density (ASTM D698, Standard Proctor). Final base elevation shall be within 0.1 feet of plan elevation.

C. Prepare and smooth the granular material to ensure complete contact of the first course with the base. The base may be dressed with fine aggregate to aid leveling.

3.03 Unit Installation

A. Place the first course of units directly on the wall base. Check units for level and alignment. Units shall be within 1/8 inch of level from end to end and from front to back. Adjacent units should be in contact. If possible, begin placing units at the lowest section of the wall.

B. Fill all voids between and within the blocks with granular unit fill. Additional unit fill is not required behind the units, but may be placed for the convenience of the contractor.

C. Place backfill behind the units in maximum loose lifts of 8 inches and compact. Compact all backfill to a minimum of 95 percent of the maximum dry density (ASTM D698, Standard Proctor). For cohesive soils, the moisture content at the time of compaction should be adjusted to within -2 and +3 percent of optimum. Place backfill in successive lifts until level with the top of the facing unit.

D. Remove all excess aggregate and other materials from the top of the units before laying up the next course.

E. For geogrid reinforced walls, place the correct geogrid at the locations and elevations shown on the plans or the shop drawings. Geogrid reinforcement shall be placed horizontally on compacted backfill. The length of the geogrid is measured from the front face of the wall. Extend the grid onto the front face flange of the facing unit. Orient the geogrid with the strong axis (machine direction) placed perpendicular to the wall face. Geogrid shall not be spliced by any means in the roll direction.

F. Geogrids shall be placed side by side to provide complete coverage along the wall face. No overlap is required between adjacent grids on straight sections of the wall. On convex curves, place a minimum of 3 inches of backfill material between overlapping geogrid layers.

G. Place the next course of precast modular block units in running bond with the previous course. Place the web recess over the alignment hoop protruding from the unit below,

and pull the unit forward to contact the hoop. Batter should be within ¼ inch tolerance (4 inches from 24 SF unit below, 2 inches from 6 SF unit below).

H. For geogrid reinforced walls, pull geogrids taught and stake the loose end before placing the next course of backfill. Backfill shall be placed, spread, and compacted in such a manner that minimizes the development of wrinkles in the geogrid and/or movement of the geogrid. Do not operate equipment directly on the geogrid. A minimum backfill depth of 6 inches should be placed before operating equipment over the grids.

I. Continue placing successive courses to the elevations shown on the plans. Construct wall in level stages, placing the units at each course for the entire length of the wall, if possible. Unit fill and backfill should be placed to the level of the top of the facing unit before placing the next course.

J. Provide temporary swales to divert runoff away from wall excavation and away from face.

K. Final grade above and below the retaining wall shall provide for positive drainage and prevent ponding. Protect completed wall from other construction. Do not operate large equipment or store materials above the wall that exceed the design surcharge loads.

L. Where tail extensions are indicated on the plans, concrete shall be placed in the center void between the blocks extending to the minimum width behind the blocks indicated on the drawings. Tail extensions may formed or may be poured directly against a cut embankment. Tail extensions should be poured in lifts not to exceed 4½ feet until the previous lift has fully set. The tail extension should be allowed to reach 2,000 psi compressive strength before backfill is placed above the top of the extension.

PART 4: CONSTRUCTION QUALITY CONTROL AND ASSURANCE

4.01 Construction Quality Control

A. The contractor is responsible to ensure that all installation and materials meet the quality specified in the construction drawings.

B. The contractor shall verify that installation is in accordance with the specifications and construction drawings.

4.02 Quality Assurance

A. The owner is responsible to engage testing and inspection services to provide independent quality construction assurance.

B. Compaction testing shall be done a minimum of every 1 foot of vertical fill and every 100 lineal feet along the wall.

C. Testing shall be done at a variety of locations to cover the entire backfill zone.

D. The independent inspection professional should perform sufficient testing and observation to verify that wall installation substantially conforms to the design drawings and specifications.

END OF SECTION

COLLIN COUNTY JUVENILE JUSTICE
ALTERNATIVE EDUCATION PROGRAM
McKINNEY, TEXAS

SECTION 329300

LANDSCAPING

PART 1 GENERAL

1.1 DESCRIPTION

A. This section specifies providing complete landscaping as shown.

1.2 SCOPE

A. Work Included:

1. Providing complete landscaping as shown.
2. Eradication of weeds.
3. Excavation of plant pits.
4. Provide plant materials and related items.
5. Finished grading of planted areas.
6. Providing topsoil and compost.
7. Providing mulch.
8. Providing steel edging.
9. Providing filter fabric.
10. Providing decorative gravel and boulders. – NOT USED
11. Providing flagstone
12. Provide tree staking and guying.
13. Warranty and replacements.

1.3 REFERENCES

A. Applicable Standards: Apply standards for plant materials as described in the following:

1. “Grades and Standards”, latest edition, Texas Association of Nurserymen Specifications, Austin, Texas 78704.
2. “American Standard for Nursery Stock”, Edition approved May 12, 2004 by American Nursery and Landscape Association (ANSI Z60.1-2004) - plant materials.
3. “Standardized Plant Names”, 1942 Edition, American Joint Committee on Horticultural Nomenclature.
4. Hortus III – 1976 Edition, Bailey Horatorium, Cornell University – plant nomenclature.

B. The following Codes, Regulations, Reference Standards, and Specifications apply to work included in this Section and Section 02930.

1. Codes and regulations of the jurisdictional authorities.
2. "REFERENCE CODES AND STANDARDS": Section 01090.

a. AASHTO: M288.
b. ASTM: A6, C33.

C. Observation at growing site does not preclude right of rejection at the Worksite. Plants damaged in transit or at the Worksite shall be rejected.

D. Personnel: Perform work only with qualified personnel familiar with required landscaping.

1.4 DEFINITIONS

A. Weeds: Any plant not specified on the drawings or accepted as a substitute.

1.5 QUALITY ASSURANCE

A. Source quality control: Furnish certificates of inspection of landscape materials, to accompany shipments, as required by governmental authorities or as requested for inspection by Owner. Comply with applicable federal, state, county and local regulations governing landscape materials.

B. Qualifications:

1. Manufacturer: Company specializing in manufacturing Products specified with minimum 5 years documented experience.
2. Installer: Company specializing in performing the Work of this Section with minimum 5 years documented experience installing projects of similar size and scope, especially seeding buffalograss. The Landscape Contractor shall furnish a list of references or previous work experience as requested by the Owner. The Landscape Contractor shall employ only skilled personnel and provide adequate supervision.

1.6 SUBMITTALS

Submit the following for approval in accordance with City Standard Specifications – Submittals, and with the additional requirements as specified for each:

A. SAMPLES: Provide representative quantities (1 gallon plastic bag or container each) of the following:
1. Compost
2. Coarsely shredded cedar mulch
3. All decorative gravels (crushed or decomposed granite, aggregates, river rock or other) identified on the drawing and decomposed granite.- NOT USED
4. Tree Staking Materials: Provide written confirmation staking method shown on drawings.
5. Herbicide: Manufacturer’s literature.
6. Steel edging: Manufacturer’s literature.
7. Filter fabric: Manufacturer’s literature.
8. Anti-dessicant: Manufacturer’s literature.

Samples shall be approved by Owner’s Representative prior to installation. Attach product name, address of manufacturer and/or supplier and appropriate literature to each sample.

Literature or Product Data shall consist of manufacturer's current specifications, with catalog cuts, data sheets and installation instructions. Samples shall be submitted no less than 60 days prior to installation.

B. PHOTOS - Plant Material Samples: Submit documentation within sixty (60) days after award of Contract that all plant materials have been located and are ready to be secured. Arrange specific review procedure of plant materials at time of submission. Submittals and review shall be organized as follows:

1. Preliminary Review: Submit representative photographs for review of all plant materials in the required sizes and in available quantity at least ninety (90) working days prior to shipment to the site.

    a. Submittal shall include two (2) items per plant: 1) a minimum of one color 35mm photograph mounted on white bond paper or one color digital image on white bond paper and 2) one color photocopy of the mounted sheet. Include one (1) set for each plant type and size required for the project. The 8 1/2" x 11" sheet is to include the name and address of the supplier, size of the plant in the picture and Botanical and English name of the plant.
    b. Tree photographs shall include a person or device to determine scale, and shall include two photographs of each tree type or group. The two photographs shall be taken at approximately 90 degrees from each other.
    c. Provide any additional tree groups and specimen photographs as required to illustrate the quality and/or quantity of material.
    d. Poor quality photographs, photographs that are not in color, not mounted and labeled, or photographs which do not adequately represent the plant material will be rejected.
2. Photograph Acceptance and Nursery Review: Acceptance of material through photographs does not preclude rejection of unsatisfactory material upon delivery. The Owner's Representative reserves the right to refuse review from photographs or at the grower if, in his judgment suitable material or sufficient quantities are not available. Contractor shall insure a sufficient quantity of plants will be available whenever trips are arranged to a nursery for the purposes of tagging material for the project.
3. Unavailable Material: If proof is submitted that any plant specified is not obtainable, a proposal will be considered for use of the nearest equivalent size or variety with corresponding adjustment of Contract price. Substantiate such proof in writing no later than fifteen (15) days after award of contract.

C. Special Warranty: Submit written special warranty registered with manufacturer as specified in this Section.

1.7 PROJECT CONDITIONS OR SITE CONDITIONS

A. Verify and examine site conditions with the Owner's Representative. Proceed when official notice is given to the Contractor that the Work site is ready. Proceed with and complete the landscape work as rapidly as portions of the site become available.

B. Planting Restrictions: Perform actual planting only when weather and soil conditions are suitable in accordance with locally accepted practice. Do not install plant life when ambient temperatures may drop below 35 degrees F or above 100 degrees F. Commence landscaping

work when the Site is free of rocks and debris. All planting areas to be left approximately 5" (0.4 foot) below finished grade by others for landscape contractor to add soil amendments. All lawn areas to be left approximately 1-1/2 inches (0.1 foot) below finished grade by others for landscape contractor to add soil mix.

C. Protection:

1. Do not move equipment over existing or newly placed paving without approval of Owner's Representative.
2. Provide board-roading to protect paving.
3. Protect paving, structures and any other site improvement from damage, with protection boards, ramps, and protective sheeting.

D. Utilities:

1. Determine locations of underground utilities and perform work in a manner which is intended to avoid possible damage. Hand excavate, where required, to minimize possibility of damage to underground utilities.
2. Refer to Landscape Drainage System Section for tree subdrainage at base of root ball for tie in to existing extension from storm drain pipe.
3. Coordinate work with Owner's Representative to prevent damage to underground sprinkler system.

1.8 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver packaged materials in sealed containers showing weight, analysis and name of manufacturer, supplier or grower. Protect materials from deterioration during delivery and while stored at the site.

B. Storage: Store products with protection from weather or other conditions which would damage or impair the effectiveness of the product. Protect metal containers from sun during summer months with temperatures above 80 degrees F.

C. Handling: Do not lift or handle container plants by tops, stems or trunks at any time. Do not bind or handle plants with wire or rope at any time.

D. Plant Materials:

1. Deliver trees, shrubs and other containerized plants after preparations for planting have been completed and plant immediately.
2. Preparation:
   a. Balled and Burlapped (B&B) Plants: Dig and prepare shipment in a manner intended to protect roots and branches from damage and protect the shape, and future development. Trees shall have been root pruned within the past three (3) years, have no girdling roots, have no "J" shaped roots, and the trunk flare shall be visible.
   b. Do not deliver plants until site conditions are ready for planting. If planting is delayed, heel-in bare rooted or freshly dug plants in a bed containing adequate peat moss to keep roots moist. Separate bundles and trim roots, if long or

damaged, using sharp pruning shears. Place plants in flats, pots, or other containers in a sheltered spot protected from sun, wind and mechanical damage and keep roots moist. Storage is at Contractor's own risk.

3. Plants should bear label from the grower certifying genus and species. Labels should be securely attached and waterproof bearing legible designation of botanical and common name. Plants not labeled may be rejected.

E. Damage: Protect plant material in transit and at the site. Material not properly protected and which is damaged will be rejected.

1.9 SEQUENCING

A. Coordinate rough and landscape grading, soil preparation, irrigation, and other related units of Work specified in other Sections to ensure that plant material can be supported and installed as indicated.

1.10 SCHEDULING

A. Submit a proposed work schedule to the Owner's Representative for approval at least sixty (60) days prior to start of work under this Section. After approval, no modification shall be made to this schedule without written authorization by the Owner.

B. In general, the work shall proceed as rapidly as the site becomes available, consistent with normal seasonal limitations for planting work.

1.11 WARRANTY

A. General: Warranties specified in this Section shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

B. In accordance with the General Provisions, warranty for trees shall be valid for three (3) years after final acceptance. Replace dead trees or trees not in vigorous, thriving condition as soon as weather permits. Replace trees, which have partially died thereby damaging shape, size, or symmetry. The opinion of the Owner's representative as to what constitutes a dead plant shall be final.

C. Replace plants and trees with same kind and size as originally planted at no cost to the Owner. Provide one year warranty on replacement plants. Protect irrigation system, other piping conduit, or other work during replacement. Repair any damage immediately.

D. Warranty excludes replacement of plants after final acceptance because of injury by storm, drought, drowning, hail, freeze, insects, or diseases.

E. Plants will be guaranteed to be true to species, variety or cultivar as specified.

F. Warranty: Warrant that all trees and shrubs planted under this Contract will be healthy and in flourishing condition of active growth three (3) years from date of Conditional Acceptance.

G. Replacements: As soon as weather conditions permit, replace, without cost to Owner all dead plants and all plants not in a vigorous, thriving condition, as determined by Owner's Representative during and at the end of Warranty Period.

1.12 REPLACEMENTS

A. General:

1. Plant materials exhibiting conditions which are determined as being unacceptable due to workmanship by the Contractor shall be repaired and/or replaced at no additional cost to the Owner.
2. Closely match replacements to adjacent specimens of the same species. Apply all requirements of this Specification to all replacements.

B. Replacement Quantities: Contractor shall be held responsible for a maximum of two (2) replacements for each failed tree and same area of sedum planting after final acceptance during the Warranty Period.

1.13 PLANT CARE UNTIL FINAL ACCEPTANCE

A. Water: When irrigation system is not operational, provide necessary hoses and other watering equipment required to complete landscaping.

B. Maintain plantings and trees by watering, cultivating, weeding, raking, fertilizing, controlling diseases and pests, cleaning, and replacing plants as necessary to keep landscape in a vigorous, healthy condition as needed until final acceptance. Maintenance includes but is not limited to the following:

1. Watering Trees: Tree balls to be kept moistened to the depth of the tree ball.
2. Weeding: Remove weeds and foreign grass over plant and gravel areas at least once a week. Herbicides may be used only when approved by Owner's Representative.
3. Cultivating: Cultivate bed areas to a depth of approximately three inches once a month. Care should be taken not to damage plant roots.
4. Application of pesticides, herbicides and insecticides shall be in accordance with manufacturer's instructions per Owner and Owner's Representative approval. Remedy damage from use of pesticides.
5. Trimming and pruning includes only removal of dead or broken branches, and treatment of pruned areas and other wounds. Do not shear any plants.
6. Disease control.
7. Maintaining guys and stakes.

C. Coordinate watering schedules during installation and until final acceptance. Provide deep root watering to keep root balls moist on newly installed trees at a minimum of once every two weeks during summer months or as weather conditions indicate.

D. Maintenance Instructions: Submit 2 copies of typewritten instructions recommending procedures to be established by the Owner for the maintenance of landscape work for one full year. Submit one set of instructions to Owner's Representative for approval. Submit two copies of revised instructions prior to expiration of Contractor's maintenance period(s) required under the contract.

PART 2 - PRODUCTS

2.1 PLANTS

A. General: Provide healthy, field-grown ball and burlapped plants or nursery-grown container plants, well-formed No. 1 grade from a recognized, local nursery, and of the species and variety shown on the drawings, complying with the requirements of ANSI Z60.1-2004. Listed tree heights are from tops of root balls to nominal tops of plants. Provide only healthy, vigorous stock, grown under climatic conditions similar to conditions in the locality of the project and free of disease, insects, eggs, larvae, and defects such as knots, sun-scald, injuries, abrasions, or disfigurement.

B. Vigor: Trees shall be sound, healthy and vigorous, well branched and densely foliated when in leaf. They shall be free of disease, insect pests, eggs, or larvae. They shall have healthy, well-developed root systems. Trees shall be free from physical damage or adverse conditions which would prevent thriving growth.

C. Container Stock: Verify that all container stock has been grown in the containers in which delivered for at least six (6) months, but not over two (2) years. Samples must prove to be free of kinked, circling or girdling roots and with no evidence of a pot-bound condition. Do not install container trees that have cracked or broken balls of earth when taken from container. Field grown trees recently transplanted into containers will not be accepted. Container grown material shall have been stepped up in container size relative to the caliper of the plant material so the rootball diameter relative to the plant's trunk caliper is per horticultural standards.

D. Balled and burlapped trees, when accepted, shall have a root ball size of ten (10x) times the caliper.

E. Nursery grown B&B material shall be pruned and thinned at the place of growth immediately prior to digging as required for packaging and safe moving. Method of pruning shall be as approved in the field by the Owner's Representative. Do not remove self-locking tags during this pruning prior to delivery to site. Trees shall have been root pruned within the past three (3) years, have no girdling roots, have no "J" shaped roots, and the trunk flare shall be visible.

F. Shade Trees: No. 1 grade nursery stock healthy, vigorous, full-branched, well-shaped, trunk diameter, and height requirements as specified:

1. Ensure balls are firm, neat, slightly tapered, and well burlapped. Reject trees with loose or broken balls at time of planting.
2. Trees will be individually approved or rejected by the Owner's Representative on site.

3. Root balls: Minimum 10 inches in diameter for each 1 inch caliper, measured 6 inches above root ball.
4. Trees: Free of physical damage such as scrapes, bark abrasions, or split branches. Contractor shall prune trees as directed by the Owner's representative, at no additional fee.
5. Provide trees with full rounded crowns, meeting height and spread standards after pruning. Caliper inches are to be measured at 24" from ground. No flat sided trees or trees with open areas on any side will be acceptable. Trees shall be consistently superior in form and branching, and typical of the growth habit of their species unless otherwise specified.

G. Trees shall conform to the sizes and quality notes in the plant list and/or as indicated, with the exception of that larger trees than those specified may be used if approved by the Owner's Representative. Use of larger treess shall not increase the contract price. Specified sizes shall be after pruning, and plants shall be measured with their branches in normal position.

H. Tree Caliper Measurement: for a single stem tree, the diameter (caliper) of the trunk shall be measured twelve (12") inches above the top of the root ball for a tree having a diameter up to and including eight (8") inches, and measured at four and one-half feet above the top of the root ball for a tree having a diameter of more that eight (8") inches. For multi-stem trees, the diameter of the trunk measured at the narrowest point below branching when branching occurs higher that twelve (12") inches above the top of the root ball. When branching occurs at or lower than twelve (12") inches above the top of the root ball, caliper means the diameter of the largest stem plus the average diameter of the remaining stems, measured at four and one-half feet above the top of the root ball.

I. Plants shall have normal, well-developed branches and vigorous, fibrous root systems, conforming to the specifications of the last edition of American Standard for Nursery Stock, Edition approved May 12, 2004 by American Nursery and Landscape Association (ANSI Z60.1-2004).

J. Shrubs: Nursery grown, healthy, vigorous, of normal habit of growth for species, free from disease, insect eggs, and larvae. Specified sizes are before pruning and measured with branches in normal position. Plants to be well rooted and established in the container.

K. Pruning: Do not prune plants before delivery. For pruning after installation, see Section 02980 – Landscape Maintenance – One (1) Year.

2.2 COMPOST

A. Compost produced by aerobic (biological) decomposition of organic matter and meets the requirements set forth by the United States Department of Agriculture and the United States Composting Council (USCC), "Test Methods for the Examination of Composting and Compost" (TMECC), shown in Table 1. Compost feedstock may include, but is not limited to, leaves and yard trimmings, biosolids, food scraps, food-processing residuals, manure or other agricultural residuals, forest residues, bark, and paper. Ensure compost and wood chips do not contain any visible refuse, other physical contaminants, or any substance considered to be harmful to plant growth. Do not use materials that have been treated with chemical preservatives as a compost

feedstock or as wood chips. Do not use mixed municipal solid waste compost. Provide compost meeting all applicable United States Code of Federal Regulations (CFR), Title 40, Part 503 standards for Class A biosolids and Texas Commission on Environmental Quality (TCEQ) health and safety regulations as defined in the Texas Administrative Code (TAC), Chapter 332, including the time and temperature standards in Subchapter B, Part 23. Meet the requirements of the USCC Seal of Testing Assurance (STA) program.

Acceptable compost is as supplied by O.R.R. (Organic Residual Reclamation, LLC.), (254) 485-1337, attention: Jim Tate, cell (214) 228-7392 or approved equal.

Table 1
Physical Requirements for Compost

Particle Size: 95% passing 16 mm in accordance with TMECC 02.02-B, "Sample Sieving for Aggregate Size Classification"
Heavy Metals: Pass in accordance with TMECC 04.06, "Heavy Metals and Hazardous Elements" 04.06-As, Arsenic 04.06-Hg, Mercury 04.06-Cr, Chromium 04.06-Mo, Molybdenum 04.06-Cd, Cadmium 04.06-Ni, Nickel 04.06-Cu, Copper 04.06-Se, Selenium 04.06-Pb, Lead 04.06-Zn, Zinc
Soluble Salts: below 5 mmhos/cm in accordance with TMECC 04.08-A.
pH: 6.5 – 8.5 in accordance with TMECC 04.11-A, "Electrometric pH Determinations for Compost" "1:5 Slurry pH"
Maturity: germination and vigor greater than 80% in accordance with TMECC 05.05-A, "Germination and Vigor"
Organic Matter Content: 25-65% (dry mass) in accordance with TMECC 05.07-A, "Loss-On-Ignition Organic Matter Method"
Stability: less than 4 in accordance with TMECC 05.08-F, "Biological Available Carbon"
Fecal Coliform: Pass (< 1000 per gram dry wt) in accordance with TMECC 07.01-B, "Fecal Coliforms"

AgIndex: above 8 to insure salts present are nutrient salts and not more sodium and/or chloride salts

2.2 TOPSOIL

A. Sandy Loam:

1. Friable, fertile, dark, loamy soil, free of clay lumps, subsoil, stones, and other extraneous material and free of weeds and foreign grasses. Loam containing Dallisgrass, Johnsongrass or Nutgrass will be rejected.
2. Physical properties as follows:

a. Clay: between 7-27 percent.

b. Silt: between 15-35 percent.
c. Sand: less than 52 percent.
d. Organic matter: between 4-12 percent of total dry weight.

2.3 WEED CONTROL

A. If weeds exist within proposed landscape areas at the beginning of work, spray with a nonselective systemic contact herbicide, as recommended and applied by an approved licensed applicator. If weeds are not present, apply a non-selective pre-emergent herbicide to bed areas.
B. Clear and remove these existing weeds upon herbicide's completed action by grubbing off all plant parts at lease ½" below the surface of the soil.

2.3 MISCELLANEOUS MATERIALS

A. Wrapping Material: Do not use!

B. Tree Paint: Do not use!

C. Mulch: Coarsely shredded cedar mulch that has been decomposing or composting for a minimum of 60 days and graded to eliminate large branch materials from passing the screen.

D. Guying Materials for Shade Trees in planter pits:

1. Guying Cable: 1 x 19 Aircord size as specified.
3. Turnbuckles: Galvanized or dip-painted and weldless.
4. Cable Clamps: Galvanized or copper, size as required.
5. Guying Frame: 2 x 4 untreated timber square frame painted flat black.

E. Staking Materials for Shade Trees at lawn:

1. Frame: 2" x 2" x 4' cross members - untreated lumber.
2. Hardware: 2 ½" drywall screw - unfinished.
3. Stakes: 2" x 2" x 4' with taper to penetrate into existing soil - untreated lumber.
4. Stakes if tree is 3" caliper and larger: 2" x 2" x 8' with taper to pentrate into existing soil, untreated lumber, extend diagonal stakes above grade to act as tree stakes above grade.
5. Tree Straps for trees 3" caliper and larger: non-girdling, flexible straps to allow tree sway, attach to 2 diagonal extended stakes.

F. Steel Edging: 4 inches by 3/16 inch, green (heavy gauge) by approved manufacturer.

2.4 FLAGSTONE.

A. Provide "Millsaps" thick flagstone where shown on plans and per details. Supplied by Custom Stone Supply, Dallas, or approved equal.

1. Provide irregular random stone at minimum size indicated on the drawing.

2. Use sand or decomposed granite as base material

2.5 FILTER FABRIC (SOIL SEPARATOR FABRIC)

A. In accordance with ASTM D5261 and ASTMD 5199.

B. In accordance with the following additional requirements:

1. Non-woven pervious filter fabric weighing approximately 7.2 ounces per square yard; free of defects.
2. Fabric: Long chain synthetic polymer composed of at least 85 percent by weight of propylene, ethylene, ester, amide or vinyl-chloride, and with stabilizers or inhibitors to make fabric resistant to deterioration due to ultra violet and heat exposure.
3. Fabric formed or treated so that filaments retain their positions relative to each other.
4. Edges selvaged.
5. Physical strength:
   a. Tensile strength: 205-pound minimum in each direction, ASTM D4632.
   b. Elongation at failure: 50 percent, ASTM D4632.
   c. Puncture strength: 130-pound minimum, ASTM D4833.
6. Percent of open area: Not less than five percent nor more than six percent.
7. Apparent opening size (A.O.S.): 70 - 100 US Standard Sieve, ASTM D4751.
8. Securing Pins: As recommended by manufacturer of filter fabric.
9. Filter Fabric to be Mirafi® 180N as manufactured by Ten Cate Nicolon, available: Lone Star Products, Inc., Grand Prairie, Texas, (469) 523-0444 or approved equal.

2.6 WATER

A. Clean, fresh and potable, furnished and paid for by Contractor.

B. Provie transport as required.

2.7 INSECTICIDE

Provide product information as needed to treat insect damage or infestation.

2.8 ANTI-DESICCANT

A. Anti-desiccants for retarding excessive loss of plant moisture and inhibiting wilt shall be sprayable, water insoluble vinyl-vinyledine complex which will produce a moisture retarding barrier not removable by rain.

B. Wilt-pruf Formula NCF as manufactured by Nursery Specialty Products, Greenwich, Connecticut, or approved equal.

2.9 MACHINERY AND EQUIPMENT

A. Machinery requirements listed under this Section are NOT intended to be restrictive of specific manufacturers or models, unless so stated. Specific mention of the manufacturers is intended as a guide to illustrate the final product of the maintenance operations desired. All equipment used shall be and maintained in top working condition at all times.

B. Pruning and grinding tools shall be maintained in safe, working condition, cutting edges shall be sharp at all times.

C. Insecticide spreaders shall be of the hand-held or cyclone type. The Contractor shall be responsible for any grade, plant material (trees, perennials, etc.), or hardscape amenity (fence, pavement,retaining wall, etc.) damage caused by the spreader and the application process. Spreaders shall be in a safe working condition at all times.

D. Insecticide and fungicide sprayers shall be of the hand-held, backpack, or vehicle-mounted type. The Contractor shall be responsible for any grade, plant material (trees, shrubs, perennials, etc.), or hardscape amenity (fence, pavement,retaining wall, etc.) damage caused by the sprayer and the application process. Sprayers shall be in a safe working condition at all times.

PART 3 - EXECUTION

3.1 SITE PREPARATION

Examine subgrade and verify conditions under which work is to be performed. Do not proceed with work until all grading and related work is completed in a satisfactory manner so that the landscape installation can proceed. Review tree pits and receive approval from Owner's Representative prior to starting work.

3.2 BED PREPARATION

A. Totally eradicate all weeds from bed prior to soil amendments and planting. Apply herbicide one week prior to bed preparation to treat weeds.

B. Remove existing soil as needed to allow for soil amendments to meet finished grade. Apply 2 inches of topsoil (sandy loam) and 3 inches of compost to bed and till thoroughly into soil for a depth of eight to ten inches.

3.3 SHRUB PLANTING

A. Stake bed locations for approval from Owner's Representative. The Owner's Representative reserves right to interchange or shift locations of plants prior to planting.

B. Plant in pits two (2) times greater in diameter than root balls or container diameter. Remove all burlap, ropes, wires and strings from the rootball.

C. Score the root ball vertically at four (4) equal points around the edge prior to planting.

D. Plant shrub such that top of the root ball at the flare of the shrub is one (1) inch above finished grade.

E. Backfill to depths of root balls with planting media consisting of 5 parts topsoil and 2 parts compost. Carefully settle by watering to prevent air pockets. All backfilling in 9 inch layers and watered in thoroughly.

F. Carefully prune plants to remove dead or broken branches and hand-rake bed areas to smooth even surfaces.

G. Rock or aggregate subbase materials will be encountered on this site:

1. Contractor shall perform a twenty-four (24) hour percolation test for the planting pit(s) prior to planting.
2. If planting pit does not drain within twenty-four (24) hours the Contractor shall notify the Owner's Representative.

3.4 TREE PLANTING

A. Shade Trees at Tree Planter Pits:

1. Stake locations at center of each tree pit planter for approval.
2. Excavate Structural Soil to depth as needed to provide for tree guying system as per Drawings.
3. Excavate Structural Soil for tree root pit to depth required to maintain flare of tree trunk at 2" below finished elevation of adjacent paving.
4. Plant directly into excavated pit. Remove all burlap, ropes, wires and strings from the rootball.
5. Backfill and compact Structural Soil media in 6" lifts around root balls to four and one half (4 ½") inches from adjacent pavement elevation.

B. Shade Trees at Open Space and Planter Beds:

1. Stake locations for approval.
2. Percolation test: After approval of tree locations, excavate pit and perform percolation test. The pit should be the same depth as the height of the root ball or slightly less so that the root ball sits no more than one inch above surrounding grade. The pit should be dug so that the pits are 12 inches or more greater in diameter than root balls for trees in planter beds or two times the diameter of the root ball for trees in lawn areas. Fill excavated pits with water and wait until next day. If the water level has not dropped at least six inches within 12 to 24 hours, then install tree drainage system as approved by the Owner's Representative. If the water level drops more than six inches, a tree drainage system may not be required. A Owner's Representative must be present to monitor and record the results of the percolation test. Receive approval from Owner's Representative for extent and layout of proposed tree drainage system. The tree drainage system will be considered a change order to the bid.
3. Install tree drainage system where shown at trees in shrub planter location and as approved if needed in lawn areas.

4. Till soil to 10 inch depth within 10' radius of tree.
5. Plant in pits two (2) times greater in diameter than root balls or container diameter. Remove all burlap, ropes, wires and strings from the rootball.
6. Remove soil and trim any girdling roots at the base of the tree trunk to expose the tree's natural root flare prior to installation in the tree pit.
7. Score the root ball vertically at four (4) equal points around the edge prior to planting.
8. Plant tree such that top of the root ball at the trunk flare of the tree is one (1) inch above finished grade. Refer to planting details for cross-section of tree planters.
9. Backfill to depths of root balls with planting media consisting of 5 parts native stockpiled/imported topsoil and 2 parts compost. Carefully settle by watering to prevent air pockets. All backfilling in 9 inch layers and watered in thoroughly.

3.5 TREE GUYING

Provide deadmen with guys attached at time of tree pit excavation. Guy all trees as detailed immediately following planting operation. Take precautions during guying operation to prevent damage or injury to branches and roots.

3.6 TREE STAKING

Stake all trees as detailed immediately following planting operation. Take precautions during staking operation to prevent damage or injury to roots. Orient all stakes within each cluster or row of trees in the same direction.

3.7 TREE SAUCERS

Form a watering saucer around each new tree per construction drawings. Contractor is responsible for deep watering trees a minimum of once per week until final acceptance and as needed to promote growth.

3.8 TREE WRAPPING

Do not wrap trees.

3.9 TOP DRESSING

After planting has been completed and approved, top dress tree planter with 2 inch depth of compost directly over top of root ball tapering to 1 inch depth at flare of tree trunk. Finish dressing tree planter with 2 inch depth of coarsely shredded cedar mulch tapering to 1 inch above compost at flare of tree trunk. Delay this operation until near final acceptance. Top dressing must achieve specifed depth to attain final acceptance.

3.10 PRUNING OF NEW TREES

Prune trees to preserve natural character of plant. Remove sucker growth, broken or badly bruised branches, and crossed branches. Thin native trees heavier than nursery grown plants.

When directed by the Owner's Representative, remove approximately one-third of wood by thinning. Do not cut back terminal branches

3.11 FLAGSTONE

A. Verify use and layout of flagstone with Landscape Architect prior to installation. Provide mock-up for Owner's review and approval.

B. Apply herbicide to area to eliminate weeds and scarify soil to remove all weeds.

C. Provide excavation as detailed in the drawings to achieve decomposed granite sub-base so that flagstone is flush to adjacent paving.

D. Provide stone at sizes and maximum joint spacing as indicated on the drawing.

3.12 BOULDERS – NOT USED.

Verify location and placement including orientation of each boulder with the Landscape Architect in the field. Excavate to submerge boulder from two to six inches. Clean boulders as needed without removing moss or lichen. Replace boulders damaged by construction prior to final acceptance.

3.13 EXISTING AND NEW TREES

A. Trees shall be continuously and routinely inspected for distress caused by construction activities. Notify Owner's representative at first sign of distress.

B. Any Fire Ant mounds around or on top of a new or protected tree root zone shall be treated immediately and the mound removed physically. Do not allow the mound to build on the tree trunk as this will cover the tree root flare and possibly cause injury or death. Insure that any chemical application to the Fire Ant mound is safe for application atop tree root zones.

C. Trees: Pruning will be carried out by experienced pruning personnel.

1. Receive approval in the field for extent of pruning from Owner's Representative.
2. Sterilize pruning tools with alcohol or hydrogen peroxide between individual plants, especially in the genus Quercus. Paint all wounds on plants of the genus Quercus with wound paint as soon as possible. Paint deliberate wounds (pruning) within I hour. Paint accidental wounds (storm or equipment damage or vandalism) as soon as they are observed.
3. Raise limbs to an acceptable height as approved by the Owner's Representative. Raise limbs to seven foot height for trees within 10 feet of sidewalk.
4. No weed-eaters or edgers are to be used within 15" of any tree. Should the need for trimming be necessary within 15" of any tree, it shall be done so by hand trimming only.
5. Remove dead wood, broken branches, mistletoe and suckers from trees as needed. Thin prune by removing no more than 20 percent of growth. Sterilize pruning tools with alcohol or hydrogen peroxide between individual plants to keep down spread of disease. Paint all wounds of plants of the genus Quercus with orange shellac as soon as possible. Paint

deliberate wounds within one hour and accidental wounds due to storms, etc. as soon as possible.

3.14 WATERING

Deep root water all existing trees to remain within the construction limits of the project once every two weeks during the summer and once a month during the winter, during the duration of the project and until final acceptance. This should be adjusted to the amount of rain. However, unless it has rained at least 1/2" since the last watering, continue to deep root water. Complete deep root watering by filling each tree saucer three times and letting it percolate dry.

3.15 WEED REMOVAL

A. Contractor shall obtain prior approval from the Owner's Representative before applying the herbicides.

B. The Contractor shall be held solely responsible for plant loss due to the application of herbicides. Any loss of plant material shall be replaced at Contractor's sole expense and all plant replacements shall be of the same species and size of the existing plant materials.

C. Regard all herbicides as hazardous to health and dangerous to the environment; chemicals should be handled with extreme caution and only by experienced personnel. Read and follow all label directions and apply in manner to comply with local, state and federal guidelines. Limit public access to any area recently treated with herbicides.

3.16 CLEAN-UP

Keep premises neat and orderly including organization of storage areas. Remove trash and debris from excavated planting areas, gravel beds, flagstone and paved areas, and turf areas. Remove debris and work items from Work site daily as work progresses. Keep paved areas clean by sweeping or hosing.

3.17 FINAL ACCEPTANCE

A. Due to seasonal requirements, final acceptance of this section may not coincide with that of the remaining contract work.

B. Request inspection for final acceptance at least 10 calendar days before the end of the maintenance period.

C. Final acceptance shall be considered the time at which planting and related work, as well as, clean-up are 100% completed.

END OF SECTION

MANDATORY PRE-PROPOSAL SIGN-IN SHEET

Project:	IFB 11267-09, Construction, Building: Juvenile Justice Alternative Education Program (JJAEP) and Juvenile Probation	**Meeting Date:**	August 11, 2009
Facilitator:	Matt Dobecka, CPPB Collin County Purchasing	**Place/Room:**	Administration Building/Commissioners' Court Room

Name	Company	Phone	Fax	E-Mail
NEAL VOGEL	CONSTRUCTORS	214-525-5116		NEAL.VOGEL@CONSTRUCTORS-COM
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COURTNEY R. NICHTER	CF JORDAN	(214)349-7900		cnichter@cfjordan.com

MANDATORY PRE-PROPOSAL SIGN-IN SHEET

Project:	IFB 11267-09, Construction, Building: Juvenile Justice Alternative Education Program (JJAEP) and Juvenile Probation	**Meeting Date:**	August 11, 2009
Facilitator:	Matt Dobecka, CPPB Collin County Purchasing	**Place/Room:**	Administration Building/Commissioners' Court Room

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Juan Galvan	Galvan Floors	817 920 0931 817 825 3819	817 920 1758	monica@Galvanfloor.com or minmi
Randy Smith	RTS Enterprises	903-892-9276	903-813-1209	randy@rtsenterprises.net
CRAIG LARSON	MITCHELL ENTERPRISES	903.893-6593	903 868-0679	craigl@mitchellgc.com
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Name	Company	Phone	Fax	E-Mail
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Name	Company	Phone	Fax	E-Mail
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