PUBLIC ANNOUNCEMENT AND GENERAL INFORMATION

WILLIAMSON COUNTY PURCHASING DEPARTMENT

SOLICITATION

Break Room Remodel for Williamson County Justice Center

BIDS MUST BE RECEIVED ON OR BEFORE:
Mar 1, 2016 3:00:00 PM CST
BIDS WILL BE PUBLICLY OPENED:
Mar 1, 2016 3:00:00 PM CST

Notice is hereby given that sealed Bids for the above-mentioned goods and/or services will be accepted by the Williamson County Purchasing Department. Williamson County uses BidSync to distribute and receive bids. Specifications for this IFB may be obtained by registering at www.bidsync.com.

Williamson County prefers and requests electronic submittal of this bid.

All electronic bids must be submitted via: www.bidsync.com

All interested Bidders are invited to submit a Bid in accordance with the Instructions and General Requirements, Bid Format, Bid Specifications, and Definitions, Terms and Conditions stated in this IFB.

Bidders are strongly encouraged to carefully read this entire IFB.

Electronic bids are requested, however paper bids will currently still be received, until further notice and may be mailed or delivered to the address listed below.

Please note that a complete package must be submitted choosing one of the above two methods. Split packages submitted will be considered "unresponsive" and will not be accepted or evaluated.

- ✓ If mailed or delivered in person, Bids and Bid addenda are to be delivered in sealed envelope on or before the submittal deadline, as noted in the 'Public Announcement and General Information' listed above for this IFB, to:

Williamson County Purchasing Department
Attn: **IFB NAME AND NUMBER**
901 South Austin Avenue
Georgetown, Texas 78626

- ✓ Bidders should list the Bid Number, Bid Name, Name and Address of Bidder, and the Date of the Bid opening on the outside of the box or envelope and note "Sealed Bid Enclosed."
- ✓ Bidder should submit one (1) original; **AND** one (1) CD **OR** (1) USB copy of the Bid.
- ✓ **Williamson County will not accept any Bids received after the submittal deadline, and shall return such Bids unopened to the Bidder.**
- ✓ Williamson County will not accept any responsibility for Bids being delivered by third party carriers.
- ✓ Facsimile transmittals will NOT be accepted.

✓ Bids will be publicly opened and read aloud in the Williamson Purchasing Department at the time and date indicated above.

✓ All submitted questions with their answers will be posted and updated on www.bidsync.com.

✓ It is the Bidder's responsibility to review all documents in BidSync including any addenda that may have been added after the document packet was originally released and posted.

✓ Any addenda and/or other information relevant to the IFB will be posted on www.bidsync.com.

✓ The Williamson County Purchasing Department takes no responsibility to ensure any interested Respondent has obtained any outstanding addenda or additional information.

✓ Williamson County will NOT be responsible for unmarked or improperly marked envelopes.

Bid 1601-048
Break Room Remodel for Williamson County Justice Center

Bid Number	**1601-048**
Bid Title	**Break Room Remodel for Williamson County Justice Center**
Expected Expenditure	**$95,000.00** (This price is expected - not guaranteed)
Bid Start Date	**In Held**
Bid End Date	**Mar 1, 2016 3:00:00 PM CST**
Question & Answer End Date	**Feb 26, 2016 5:00:00 PM CST**
Bid Contact	**Connie Singleton** **512-943-1553** **csingleton@wilco.org**
Contract Duration	**120 days**
Contract Renewal	**Not Applicable**
Prices Good for	**90 days**
Pre-Bid Conference	**Feb 17, 2016 10:30:00 AM CST** **Attendance is optional** **Location: Williamson County Justice Center** **405 Martin Luther King Dr.** **Georgetown, TX 78626** **Go to main entrance - through Security, meeting will begin from the lobby.**

Bid Comments

Break Room Remodel for Williamson County Justice Center
Williamson County is seeking qualified companies to furnish all labor, materials to add 3 break room areas to the ends of existing hallways at the Williamson County Justice Center. Provide all services required to complete remodeling project per. the plans and specifications.
BID CHECK LIST

If entering an electronic bid in BIDSYNC (PREFERRED), the following documents MUST be completed and attached to FIRST LINE ITEM.

Pricing/Bid Form - enter total on first line item and attach the completed Bid Form.

IFB (Bid) Affidavit – fillable form – complete and accept
Conflict of Interest Form – fillable form – complete and accept
References - fillable form – complete and accept
Bid Bond – see details below

If delivering a paper bid instead of electronic; the above listed documents must be completed and delivered in a sealed envelope, addressed to:
Williamson County Purchasing
Attn: Break Room Remodel Wilco Justice Center #1601-048
901 South Austin Ave
Georgetown, TX 78626.

BIDS THAT ARE SUBMITTED PARTIALLY ELECTRONIC VIA BIDSYNC and PARTIALLY PAPER WILL BE DISQUALIFIED .

BID BOND REQUIRED
Bidders are not required to use Surety 2000 for your Bid Bond supplier, however; when bidding electronically in Bidsync and you choose to use Surety 2000, you may import your bid bond directly from the Surety 2000 web site.
To use a different bond provider you MUST:

Scan the completed bond
Download the completed bond to the line item of this bid with your other required documents.
On all bids requiring a bid bond – you MUST supply the bond according to the instructions below or your bid will be disqualified.
All Bids shall be accompanied by either:
A bid bond not less than five percent (5%) of the total maximum bid price, from a surety company authorized to do business in the state of Texas.
OR
A certified cashier's check: payable without recourse to Williamson County and drawn upon a National or State bank in an amount not less than five percent (5%) of the total maximum bid price;
For unit price contracts, the total maximum bid price shall be estimated and calculated by multiplying the estimated quantities to the unit bid price.
Bid bonds other than Surety 2000 must be attached to the line item of the electronic bid OR submitted in the same sealed envelope with a paper Bid. Bids requiring a bid bond and submitted without a cashier's check or a bid bond will not be considered.

TIME OF PERFORMANCE

This project is to be substantially completed in Ninety (90) calendar days and finally completed in One Hundred and Twenty (120) calendar days after the Notice to Proceed.

LIQUIDATED DAMAGES for failure to substantially complete the work within the allotted time will be applied. Liquidated damages for this project are $300 per calendar day .
PERFORMANCE AND PAYMENT BONDS
To the extent this IFB is for the procurement of a public work contract, the following shall apply:

Chapter 262.032 of the Texas Local Government Code governs the requirements for performance bonds for government entities making public work contracts. A performance bond is required if the contract is in excess of $100,000 and is to be made for the full amount of the contract.

Chapter 2253.021 of the Texas Government Code governs the requirements for payment bonds for government entities making public work contracts. A payment bond is required if the contract is in excess of $25,000 and is to be made for the full amount of the contract.

The bonds are to be executed and delivered to the County prior to issuing Notice to Proceed . The bonds must be executed by a corporate surety or sureties in accordance with the Texas Insurance Code. For unit price contracts, the total contract price shall be estimated and calculated by multiplying the estimated quantities to the Bidder's unit bid price.

If the public works contract is less than $50,000, the performance bond will not be required as long as the contract provides that payment is not due until the work is completed and accepted by the County.

CONTRACT ADMINISTRATION

Gary Wilson, (or successor), Director of Facilities, Williamson County 3101 S.E. Inner Loop Rd, Georgetown, Texas shall serve as Williamson County's Contract Administrator with designated responsibility to ensure compliance with the requirements of the Contract and any ensuing Agreement, such as but not limited to, acceptance, inspection and delivery. The Contract Administrator will serve as liaison between the Williamson County Commissioners Court and the Successful Bidder.

The Successful Bidder agrees to maintain insurance in accordance with this IFB.
Successful Bidder will be required to submit Certificates of Insurance prior to being awarded the Contract. A copy of the issued policy should be submitted to the Purchasing Department within 60 days of the contract award date.

All certificates of insurance coverage as specified below must be provided to Williamson County at the following address:

Williamson County
901 South Austin Avenue
Georgetown, Texas 78626

Failure to comply with these Insurance Requirements may result in the termination of the Contract and any

ensuing Agreement between the Successful Bidder and County.

By signing its Bid, the Successful Bidder agrees to maintain at all times during any term of the Contract and any ensuing Agreement, at Successful Bidder's cost, insurance in accordance with this provision.

The following coverage limits shall be required at a minimum:

Worker's Compensation	**Statutory – Texas Law**
Employer's Liability:	
Bodily Injury by Accident	**$500,000 Ea. Accident**
Bodily Injury by Disease	**$500,000 Ea. Employee**
Bodily Injury by Disease	**$500,000 Policy Limit**

Comprehensive general liability including completed operations and contractual liability insurance for bodily injury, death, or property damages in the following amounts:

COVERAGE	PER PERSON	PER OCCURRENCE
Comprehensive General Liability	$1,000,000	$1,000,000

Aggregate policy limits: $1,000,000

Comprehensive automobile and auto liability insurance (covering owned, hired, leased and non-owned vehicles):

COVERAGE	PER PERSON	PER OCCURRENCE
Bodily injury (including death)	$1,000,000	$1,000,000
Property damage	$1,000,000	$1,000,000
Aggregate policy limits:	No aggregate limit	

E. Umbrella Coverage: $1,000,000

Item Response Form

Item **1601-048--01-01 - BASE BID TOTAL**

Quantity **1 each**

Unit Price

Delivery Location **Williamson County, Texas**

Building Maintenance
3101 SE Inner Loop Rd
Georgetown TX 78626
Qty 1

Description
Enter Total for Base bid here.

Item **1601-048--01-02 - TOTAL ALTERNATE #1**

Quantity **1 each**

Unit Price

Delivery Location **Williamson County, Texas**

Building Maintenance
3101 SE Inner Loop Rd
Georgetown TX 78626
Qty 1

Description

Enter Total for Alternate #1(Add break room labeled as L1-A at the first floor hallway)

Item	**1601-048--01-03 - TOTAL ALTERNATE #2**
Quantity	**1 each**
Unit Price	
Delivery Location	**Williamson County, Texas** Building Maintenance 3101 SE Inner Loop Rd Georgetown TX 78626 **Qty** 1

Description

Enter Total for Alternate **#2** (Add Break room labeled as area L2-A at the Second Floor Hallway)

TENANT IMPROVEMENT FOR:

WILCO JUSTICE CENTER BREAK ROOMS

405 MARTIN LUTHER KING DR., GEORGETOWN, TEXAS 78626

PROJECT TEAM

ARCHITECT

MODE DESIGN COMPANY
109 S. HARRIS STREET, SUITE 200
ROUND ROCK, TX 78664
512|713-1150
RYAN@MODEDC.US

MEP ENGINEER

STAR OF TEXAS ENGINEERING
2851 JOE DIMAGGIO BLVD., SUITE 9
ROUND ROCK, TX 78665
512|739-8844
DWILLIAMS@STAROFTEXASENGINEERING.COM

CODE ANALYSIS:

CURRENT CODES:
2012 INTERNATIONAL BUILDING, FIRE, PLUMBING, FUEL GAS, MECHANICAL, EXISTING BUILDING AND PROPERTY MAINTENANCE CODES
2000 IECC
2014 NATIONAL ELECTRICAL CODE

SECTION 302:
OCCUPANCY CLASSIFICATION ACCESSORY TO A-2 COURTROOM OCCUPANCY

TABLE 1004.1.2:
OCCUPANT LOAD

1A
260 SF / 15 NET = 18 OCCUPANTS

2A
361 SF / 15 NET = 24 OCCUPANTS

2B
365 SF / 15 NET = 24 OCCUPANTS

SECTION 1014.3:
COMMON PATH OF EGRESS TRAVEL = 75 FEET

SECTION 1015.1:
NUMBER OF EXITS REQUIRED = 1 EXIT

TABLE 1016.2:
EXIT ACCESS TRAVEL DISTANCE = 200 FEET

SHEET INDEX

MODE design company
109 S | harris street | round rock
suite 200 | texas 78664
ryan@modedc.us | www.modedc.us
+1 512 733 1150

REGISTERED ARCHITECT
RYAN HANSANUWAT
22732
STATE OF TEXAS

12/21/2015

TENANT IMPROVEMENT FOR:
WILCO JUSTICE CENTER BREAK ROOMS
405 MARTIN LUTHER KING DR., GEORGETOWN, TEXAS 78626

PROJECT PHASE
CONSTRUCTION DOCUMENTS
REVISIONS

PROJECT NUMBER
15116-00
DATE ISSUED
12/21/2015
SHEET TITLE

COVER SHEET

SHEET NUMBER

A-0.0

GENERAL

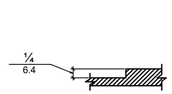


Figure 303.2 Vertical Change in Level

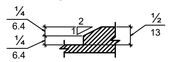


Figure 303.3 Beveled Change in Level

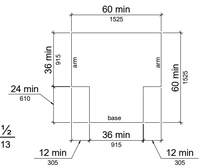


Figure 304.3.2 T-Shaped Turning Space

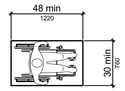


Figure 305.3 Clear Floor or Ground Space

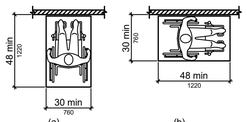


Figure 305.5 Position of Clear Floor or Ground Space

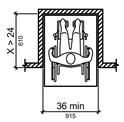


Figure 305.7.1 Maneuvering Clearance in an Alcove, Forward Approach

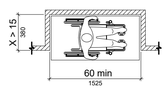


Figure 305.7.2 Maneuvering Clearance in an Alcove, Parallel Approach

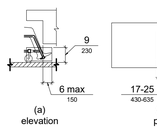


Figure 306.2 Toe Clearance

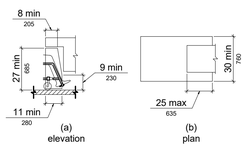


Figure 306.3 Knee Clearance

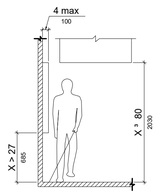


Figure 307.2 Limits of Protruding Objects

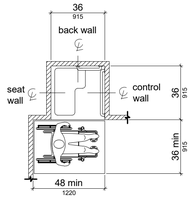


Figure 308.2.2 Obstructed High Forward Reach

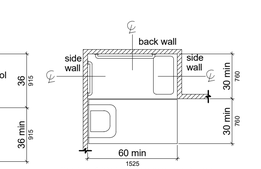


Figure 308.3.1 Unobstructed Side Reach

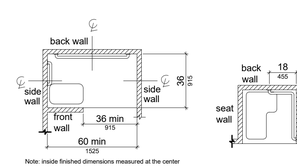


Figure 308.3.2 Obstructed High Side Reach

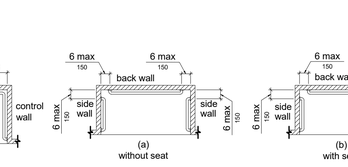


Figure 404.2.3 Clear Width of Doorways

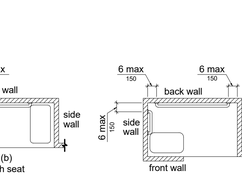
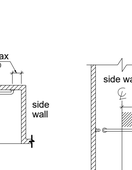
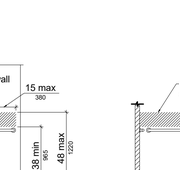


Figure 404.2.4.3 Maneuvering Clearances at Recessed Doors and Gates





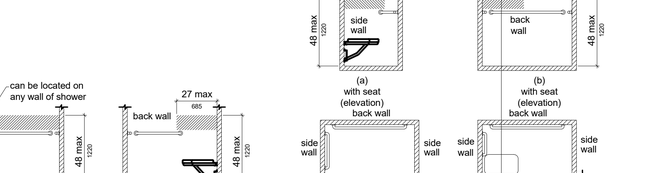


Figure 404.2.6 Doors in Series and Gates in Series

RAMPS AND STAIRS

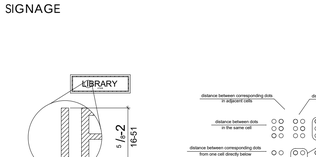


Figure 405.7 Ramp Landings

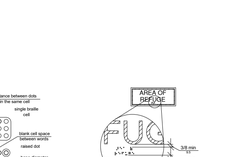


Figure 405.9.1 Extended Floor or Ground Surface Edge Protection

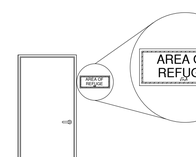


Figure 405.9.2 Curb or Barrier Edge Protection

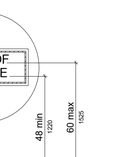


Figure 504.5 Stair Nosings

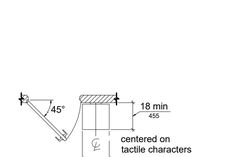


Figure 505.4 Handrail Height

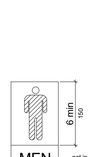


Figure 505.5 Handrail Clearance

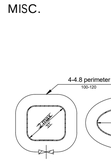


Figure 505.6 Horizontal Projections Below Gripping Surface

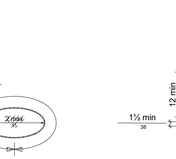


Figure 505.7.2 Handrail Non-Circular Cross Section

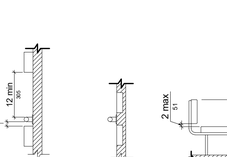


Figure 505.10.1 Top and Bottom Handrail Extension at Ramps

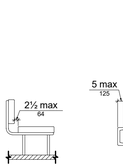


Figure 505.10.2 Top Handrail Extension at Stairs

Note: X = tread depth
Figure 505.10.3 Bottom Handrail Extension at Stairs

TOILET AND BATHING ROOMS

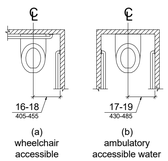


Figure 604.2 Water Closet Location

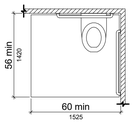


Figure 604.3.1 Size of Clearance at Water Closets

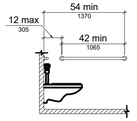


Figure 604.5.1 Side Wall Grab Bar at Water Closets

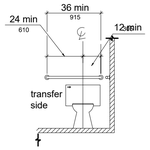


Figure 604.5.2 Rear Wall Grab Bar at Water Closets

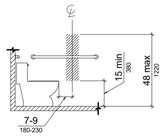
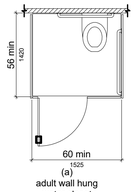


Figure 604.7 Dispenser Outlet Location



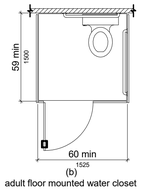


Figure 604.8.1.1 Size of Wheelchair Accessible Toilet Compartment

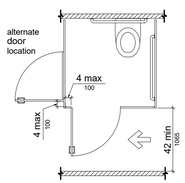


Figure 604.8.1.2 Wheelchair Accessible Toilet Compartment Doors

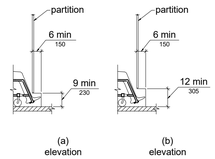


Figure 604.8.1.4 Wheelchair Accessible Toilet Compartment Toe Clearance

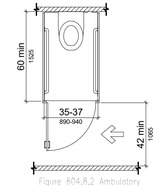


Figure 604.8.2 Ambulatory Accessible Toilet Compartment

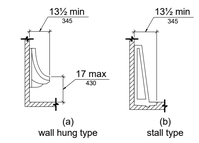


Figure 605.2 Height and Depth of Urinals

Note: inside finished dimensions measured at the center points of opposing sides
Figure 608.2.1 Transfer Type Shower Compartment Size and Clearance

Note: inside finished dimensions measured at the center points of opposing sides
Figure 608.2.2 Standard Roll-In Type Shower Compartment Size and Clearance

Note: inside finished dimensions measured at the center points of opposing sides
Figure 608.2.3 Alternate Roll-In Type Shower Compartment Size and Clearance

Figure 608.3.1 Grab Bars for Transfer Type Showers

Figure 608.3.2 Grab Bars for Standard Roll-In Type Showers

Figure 608.3.3 Grab Bars for Alternate Roll-In Type Showers

Figure 608.5.1 Transfer Type Shower Compartment Control Location

Figure 608.5.2 Standard Roll-In Type Shower Compartment Control Location

Figure 608.5.3 Alternate Roll-In Type Shower Compartment Control Location

SIGNAGE

Figure 703.2.5 Height of Raised Characters

Figure 703.3.1 Braille Measurement

Figure 703.3.2 Position of Braille

Figure 703.4.1 Height of Tactile Characters Above Finish Floor or Ground

Figure 703.4.2 Location of Tactile Signs at Doors

MISC.

Figure 703.6.1 Pictogram Field

Figure 609.2.2 Grab Bar Non-Circular Cross Section

Figure 609.3 Spacing of Grab Bars

Figure 903.4 Bench Back Support

Figure 602.5 Drinking Fountain Spout Location

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ACCESSIBILITY DIAGRAMS

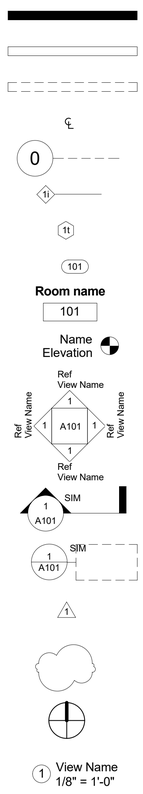
SHEET NUMBER

A-0.1

GENERAL NOTES

1. CONTRACTOR TO VISIT SITE AND VERIFY CONDITIONS PRIOR TO STARTING WORK.
2. CONTRACTOR TO FURNISH ALL PERMITS AND OBTAIN ALL APPROVALS REQUIRED BY GOVERNING AGENCIES.
3. ALL WORK TO COMPLY WITH APPLICABLE RULES OF THE AUTHORITY HAVING LAWFUL JURISDICTION.
4. ALL EQUIPMENT, FIXTURES, AND MATERIALS ARE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
5. TRADES ARE TO VERIFY CONDITION OF WORK BY OTHERS AS ACCEPTABLE FOR THEIR INSTALLATION PRIOR TO STARTING WORK. STARTING OF WORK INDICATES ACCEPTANCE.
6. NOTIFY THE ARCHITECT OF ANY DISCREPANCIES IN THE DRAWINGS.
7. CONTRACTOR TO PROTECT AREAS AND SURFACES ADJACENT TO CONSTRUCTION AREA FROM DAMAGE AND DEBRIS.
8. GENERAL CONTRACTOR IS RESPONSIBLE FOR MAINTAINING A CLEAN AND SAFE JOB SITE THROUGHOUT THE CONSTRUCTION PERIOD.
9. GENERAL CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION OF WORK OF ALL SUB-CONTRACTORS PRIOR TO INSTALLATION OF CONSTRUCTION.
10. PREPARE ALL SURFACES FOR INSTALLATION OF NEW FINISHES AND MATERIALS AS INDICATED ON PLANS.
11. AT THE COMPLETION OF CONSTRUCTION, GENERAL CONTRACTOR WILL THOROUGHLY CLEAN THE ENTIRE BUILDING, INCLUDING, BUT NOT LIMITED TO, ALL PARTITIONS, FLOORS, GLASS SURFACES, RETURN AND SUPPLY GRILLES, LIGHT FIXTURE LENSES AND PLASTIC LAMINATE MILLWORK.
12. PRIOR TO PURCHASE, CONTRACTOR SHALL SUBMIT FOR APPROVAL SAMPLES, MANUFACTURER'S CATALOG DATA, AND/OR SHOP DRAWINGS OF PRODUCTS AND MATERIALS OTHER THAN THOSE SPECIFIED.
13. ALL DOORS ARE LOCATED 6" OFF ADJACENT PARTITION, UNLESS NOTED OTHERWISE.
14. ALL DIMENSIONS ARE TO FINISH FACE OF PARTITION, UNLESS NOTED OTHERWISE.
15. INSTALL LIGHT SWITCHES 48" ABOVE FINISH FLOOR AND A MAXIMUM OF 6" FROM THE LATCH JAMB OR A MAXIMUM OF 6" BEYOND THE LATCH STILE OF THE DOOR IN ITS OPEN POSITION AGAINST THE DOOR STOP.
16. GENERAL CONTRACTOR TO USE MULTI-GANG BOXES IN ALL POSSIBLE LOCATIONS.
17. ALL INTERIOR DOOR OPENINGS ARE TO BE FRAMED WITH DOUBLE STUDS AT THE JAMB, UNLESS NOTED OTHERWISE.

FLOOR PLAN LEGEND



NEW WALL
EXISTING WALL TO REMAIN
ITEMS TO BE DEMOLISHED
CENTERLINE
COLUMN GRID
PARTITION TYPE
WINDOW TYPE
DOOR NUMBER
ROOM NAME AND NUMBER
ELEVATION DATUM POINT
ELEVATION VIEW
SECTION/DETAIL
ENLARGED PLAN
REVISION KEY
REVISION CLOUD
NORTH ARROW
VIEW TITLE

ARCHITECTURE ABBREVIATIONS

A/C	AIR CONDITIONING
ACC	ACCESS
ACP	ACOUSTICAL CEILING PANEL
ADDL	ADDITIONAL
ADDM	ADDENDUM
ADH	ADHESIVE
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AGG	AGGRETATE
ALT	ALTERNATE
ALUM	ALUMINUM
APPROX	APPROXIMATELY
ARCH	ARCHITECT/ARCHITECTURAL
ASPH	ASPHALT
AUTO	AUTOMATIC
AV	AUDIO VISUAL
BD	BOARD
BL	BUILDING LINE
BLDG	BUILDING
BLVD	BOULEVARD
BM	BEAM
B.M.	BENCH MARK
BRK	BRICK
BRZ	BRONZE
BSMT	BASEMENT
BTU	BRITISH THERMAL UNIT
BVL	BEVEL/BEVELED
CAB	CABINET
CB	CATCH BASIN
C/C	CENTER TO CENTER
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
CI	CAST IRON
CG	CORNER GUARD
CLG	CEILING
CLK	CAULK/CAULKING
CLO	CLOSET
CLR	CLEAR/CLEARANCE
CMU	CONCRETE MASONRY UNIT
CND	CONDUIT
COL	COLUMN
COMP	COMPOSITION/COMPOSITE
CONC	CONCRETE
CONF	CONFERENCE
CONN	CONNECTION
CONST	CONSTRUCTION
CSMT	CASEMENT
DEPT	DEPARTMENT
DH	DOUBLE HUNG
DIA	DIAMETER
DIM	DIMENSION
DN	DOWN
DS	DOWNSPOUT
DW	DISHWASHER
DWG	DRAWING
E	EAST
EA	EACH
EB	EXPANSION BOLT
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRIC/ELECTRICAL
ELEV	ELEVATION/ELEVATOR
EMER	EMERGENCY
ENC	ENCLOSURE
ENT	ENTRANCE
EQ	EQUAL
EQPT	EQUIPMENT
ESTM	ESTIMATE
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EXC	EXCAVATE
EXF	EXHAUST FAN
EXH	EXHAUST
EXT	EXTERIOR
FA	FIRE ALARM
FBD	FIBER BOARD
FBO	FURNISHED BY OWNER
FBRK	FIRE BRICK
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FF	FINISH FLOOR
FFE	FINISHED FLOOR ELEVATION
FFL	FINISHED FLOOR LINE
FIN	FINISHED
FIXT	FIXTURE
FLOUR	FLOURESCENT
FLR	FLOOR
FNDN	FOUNDATION
FOC	FACE OF CONCRETE
FOF	FACE OF FINISH
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FP	FIREPROOF
FPL	FIREPLACE
FRC	FIRE RESISTANT COATING
FRT	FIRE RETARDANT
FT	FOOT/FEET
FTG	FOOTING
FURR	FURRED/FURRING
FURN	FURNISHED
GA	GUAGE
GALV	GALVANIZED
GB	GRAB BAR
GC	GENERAL CONTRACTOR
GD	GRADE
GEN	GENERAL
GL	GLASS/GLAZING
GLB	GLASS BLOCK
GTR	GUTTER
GVL	GRAVEL
GYP	GYPSUM
GYP BD	GYPSUM BOARD
HB	HOSE BIB
HC	HOLLOW CORE
HDP	HANDICAP
HDR	HEADER
HDWD	HARDWOOD
HDWR	HARDWARE
HM	HOLLOW METAL
HORZ	HORIZONTAL
HT	HEIGHT
HTG	HEATING
HVAC	HEATING VENTILATION AIR CONDITIONING
HW	HOT WATER
IBC	INTERNATIONAL BUILDING CODE
IN	INCH
INCL	INCLUDED
INSUL	INSULATION
INT	INTERIOR
JAN	JANITOR
JBOX	JUNCTION BOX
JCT	JUNCTION
JST	JOIST
JT	JOINT
KIT	KITCHEN
KPL	KICKPLATE
KO	KNOCK OUT
LAB	LABORATORY
LAM	LAMINATE
LAV	LAVATORY
LH	LEFT HAND
LL	LIVE LOAD
LT	LIGHT
LWT	LIGHTWEIGHT
MAS	MASONRY
MATL	MATERIAL
MAX	MAXIMUM
MB	MACHINE BOLT
MECH	MECHANICAL
MEMB	MEMBRANE
MEZZ	MEZZANINE
MFR	MANUFACTURER
MH	MAN HOLE
MICRO	MICROWAVE
MIN	MINIMUM
MIR	MIRROR
MISC	MISCELLANEOUS
MLD	MOULDING
MLWK	MILLWORK
MO	MASONRY OPENING
MOD	MODULAR
MTD	MOUNTED
MTL	METAL
MULT	MULTIPLE
N	NORTH
NAT	NATURAL
NIC	NOT IN CONTRACT
NOM	NOMINAL
NTS	NOT TO SCALE
OBS	OBSCURE
OC	ON CENTER
OCEW	ON CENTER EACH WAY
OD	OUTSIDE DIAMETER
OH	OVERHEAD
OP	OPAQUE
OPNG	OPENING
OPP	OPPOSITE
OPP HD	OPPOSITE HAND
ORIG	ORIGINAL
OWJ	OPEN WEB JOIST
OZ	OUNCE
PAR	PARALLEL
PART	PARTITION
PART BD	PARTICLE BOARD
PC	PRECAST
PCF	POUNDS PER CUBIC FOOT
PED	PEDESTAL
PERIM	PERIMETER
PERM	PERMANENT
PERP	PERPENDICULAR
PFL	POUNDS PER LINEAL FOOT
PKG	PARKING
PL	PLATE
PL	PROPERTY LINE
PLAS	PLASTER
PLAM	PLASTIC LAMINATE
PLMB	PLUMBING
PLYWD	PLYWOOD
PNL	PANEL
PREFAB	PREFABRICATED
PREFIN	PREFINISHED
PRF	PREFORMED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PAINT
PVC	POLYVINYL CHLORIDE
R	RADIUS
RA	RETURN AIR
RD	ROOF DRAIN
RE BAR	REINFORCING BARS
RECP	RECEPTACLE
REF	REFERENCE
REFR	REFRIGERATOR
REG	REGISTER
REINF	REINFORCED
REQ'D	REQUIRED
RET	RETURN
RH	RIGHT HAND
RM	ROOM
RO	ROUGH OPENING
ROW	RIGHT OF WAY
RT	RUBBER TILE
S	SOUTH
SBC	STANDARD BUILDING CODE
SC	SOLID CORE
SCHED	SCHEDULE
SCN	SCREEN
SEAL	SEALANT
SHTH	SHEATHING
SHT	SHEET
SH	SHINGLE HUNG
SIM	SIMILAR
SLV	SLEEVE
SPEC	SPECIFICATIONS
SQ	SQUARE
SQ FT	SQUARE FEET
SST	STAINLESS STEEL
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRUCT	STRUCTURAL
SUSP	SUSPENDED
SYM	SYMMETRICAL
SYN	SYNTHETIC
SYS	SYSTEM
TAN	TANGENT
TAS	TEXAS ACCESSIBILITY STANDARDS
TECH	TECHNICAL
TELE	TELEPHONE
T&G	TONGUE AND GROOVE
THK	THICK
THRES	THRESHOLD
TLT	TOILET
TOB	TOP OF BLOCK
TOC	TOP OF CURB
TOM	TOP OF MASONRY
TOP	TOP OF PARAPET
TOPL	TOP OF PLATE
TOS	TOP OF STEEL
TOSL	TOP OF SLAB
TOW	TOP OF WALL
TRANS	TRANSFORMER
TS	TUBE STEEL
TV	TELEVISION
TYP	TYPICAL
UBC	UNIFORM BUILDING CODE
UNFIN	UNFINISHED
UNO	UNLESS NOTED OTHERWISE
UR	URINAL
VB	VAPOR BARRIER
VAR	VARIES
VERT	VERTICAL
VENT	VENTILATION
VOL	VOLUME
WTW	WALL TO WALL
WC	WATER CLOSET
WH	WATER HEATER
WP	WATER PROOFING
W	WEST
W/	WITH
W/O	WITHOUT
WD	WOOD
WDW	WINDOW
WT	WEIGHT
WI	WROUGHT IRON
YD	YARD

INTERIOR FINISHES ABBREVIATIONS

ACP	ACOUSTICAL CEILING PANEL
CONC	CONCRETE
CPT	CARPET/CARPET TILE
CT	CERAMIC TILE
F	FURNITURE
FAB	FABRIC (FURNITURE)
FWC	FABRIC WALLCOVERING
GL	GLASS/GLAZING
GLB	GLASS BLOCK
MTL	METAL
PL	PLASTIC LAMINATE
PT	PAINT
QT	QUARRY TILE
RAF	RAISED FLOORING
RB	RESILIENT BASE
RES	RESINOUS FLOORING
RF	RESILIENT FLOORING
SP	SPECIALTY PRODUCTS
SS	SOLID SURFACE
ST	STONE/STONE FLOORING
STC	STAINED CONCRETE
TZ	TERRAZZO
VCT	VINYL COMPOSITION TILE
VT	VINYL TILE
VWC	VINYL WALL COVERING
WD	WOOD VENEER/WOOD BASE/ WOOD TRIM
WDFL	WOOD FLOORING
WT	WINDOW TREATMENT

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12/21/2015

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ABBREVIATIONS AND NOTES

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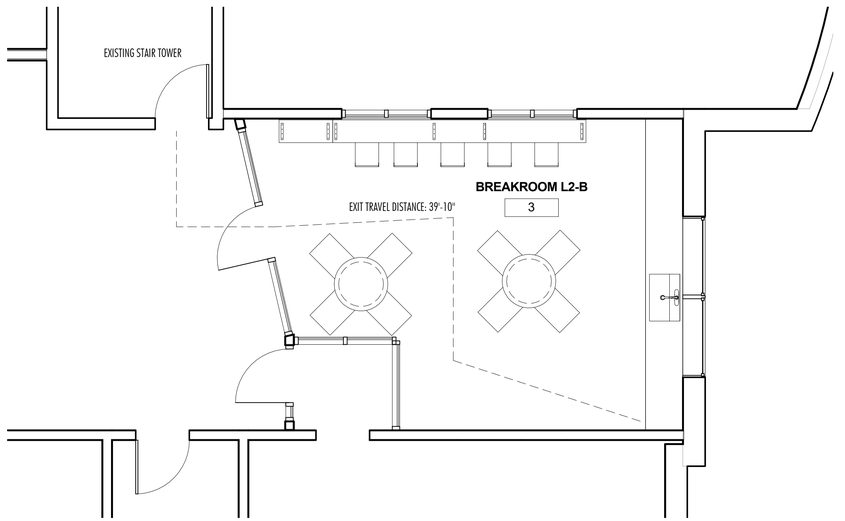
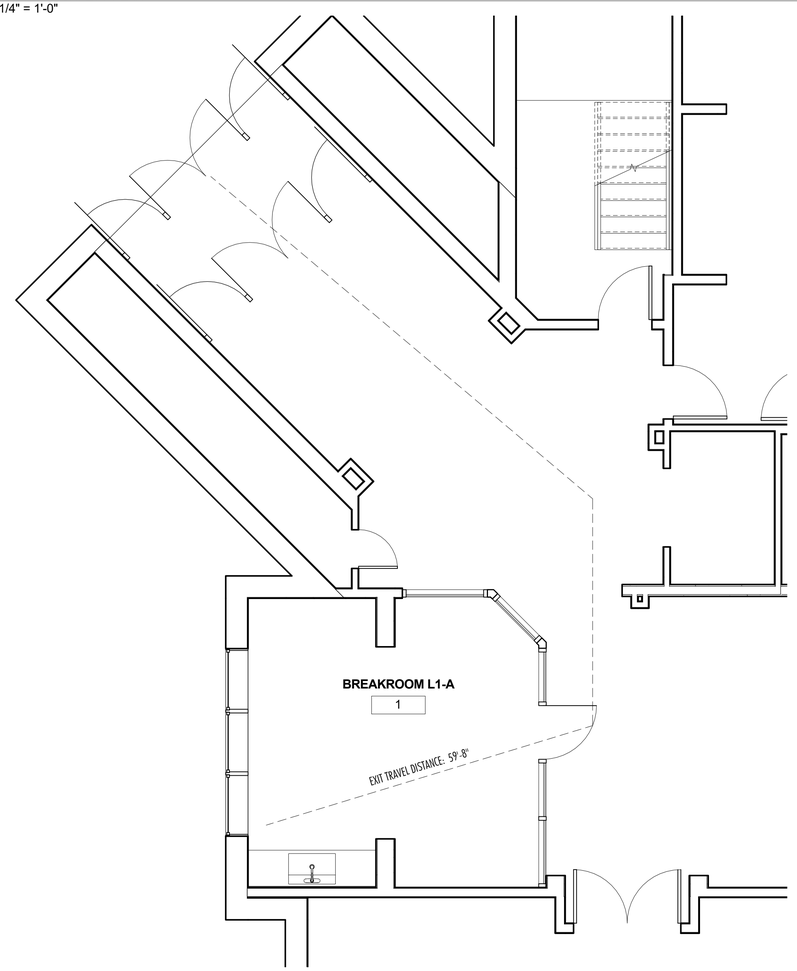
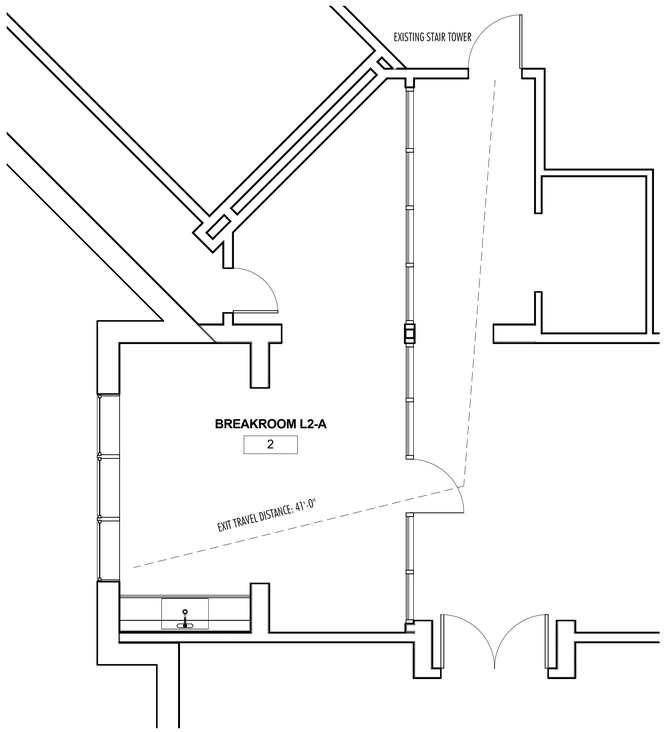


3 L2-B - LIFE SAFETY PLAN
1/4" = 1'-0"



1 L1-A - LIFE SAFETY PLAN
1/4" = 1'-0"



2 L2-A - LIFE SAFETY PLAN
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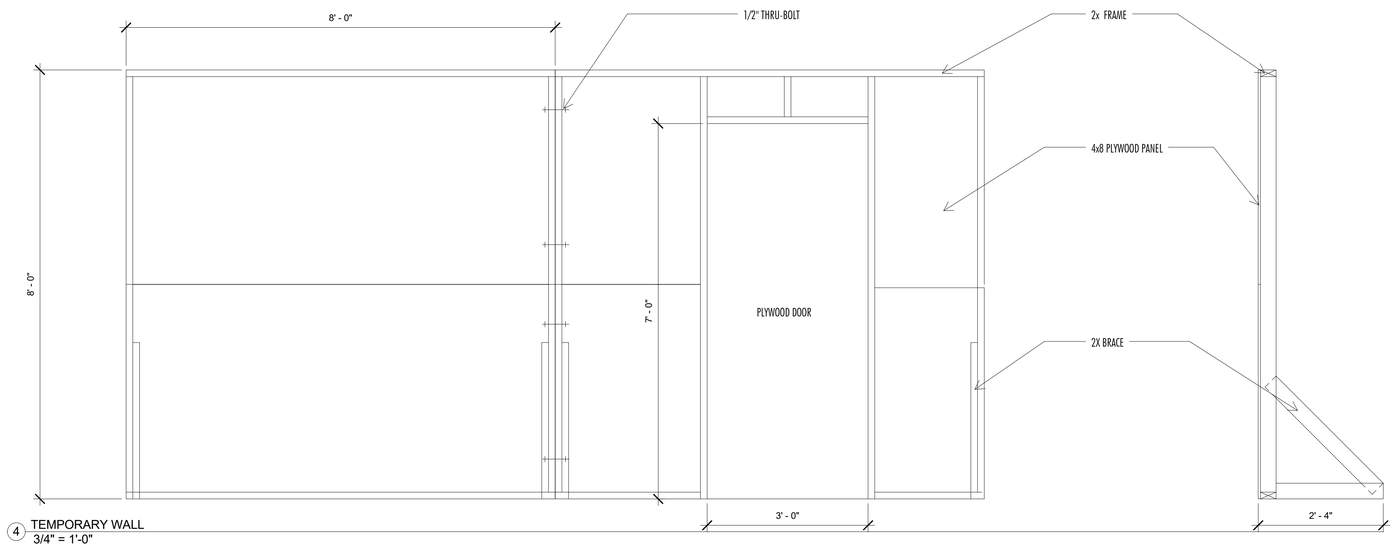
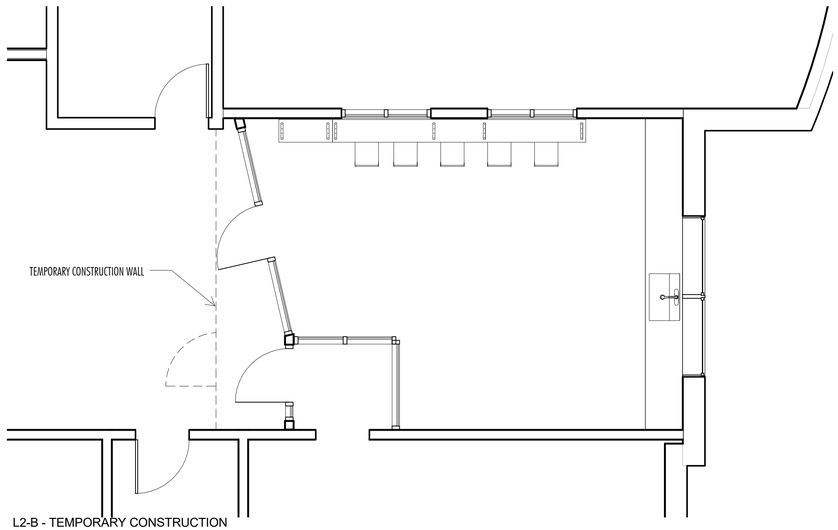
LIFE SAFETY PLAN

SHEET NUMBER

A-0.3



4 TEMPORARY WALL
3/4" = 1'-0"



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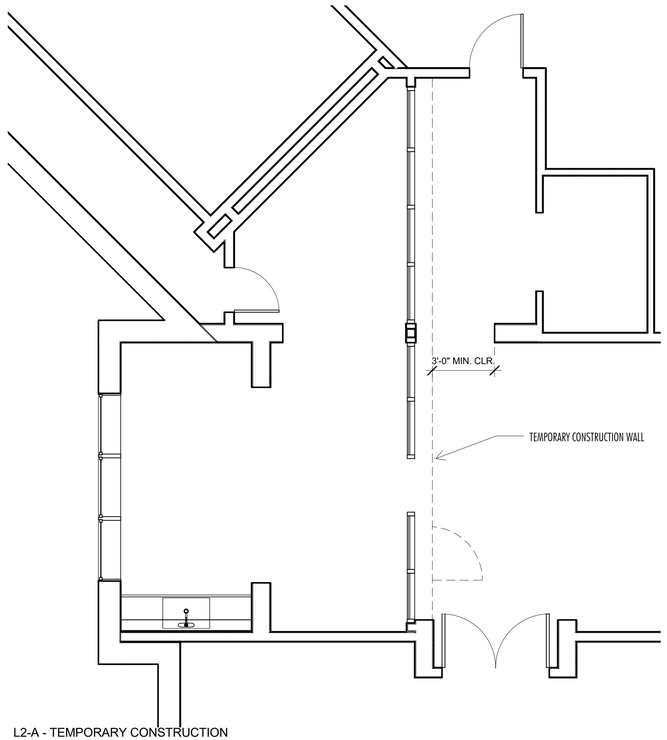
3 1/4" = 1'-0"



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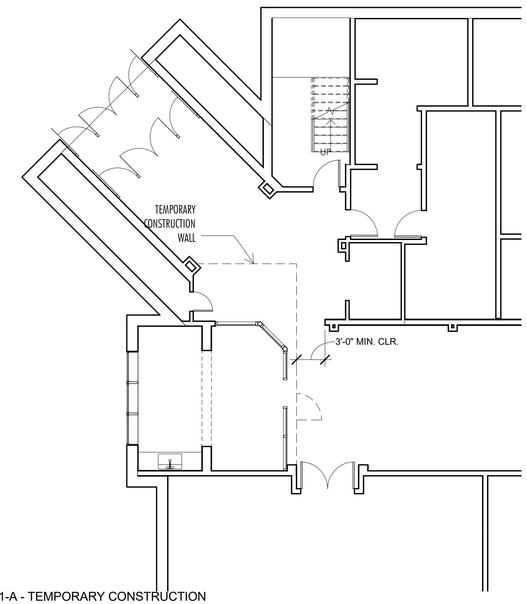
2 1/4" = 1'-0"



L1-A - TEMPORARY CONSTRUCTION PLAN
1 1/8" = 1'-0"

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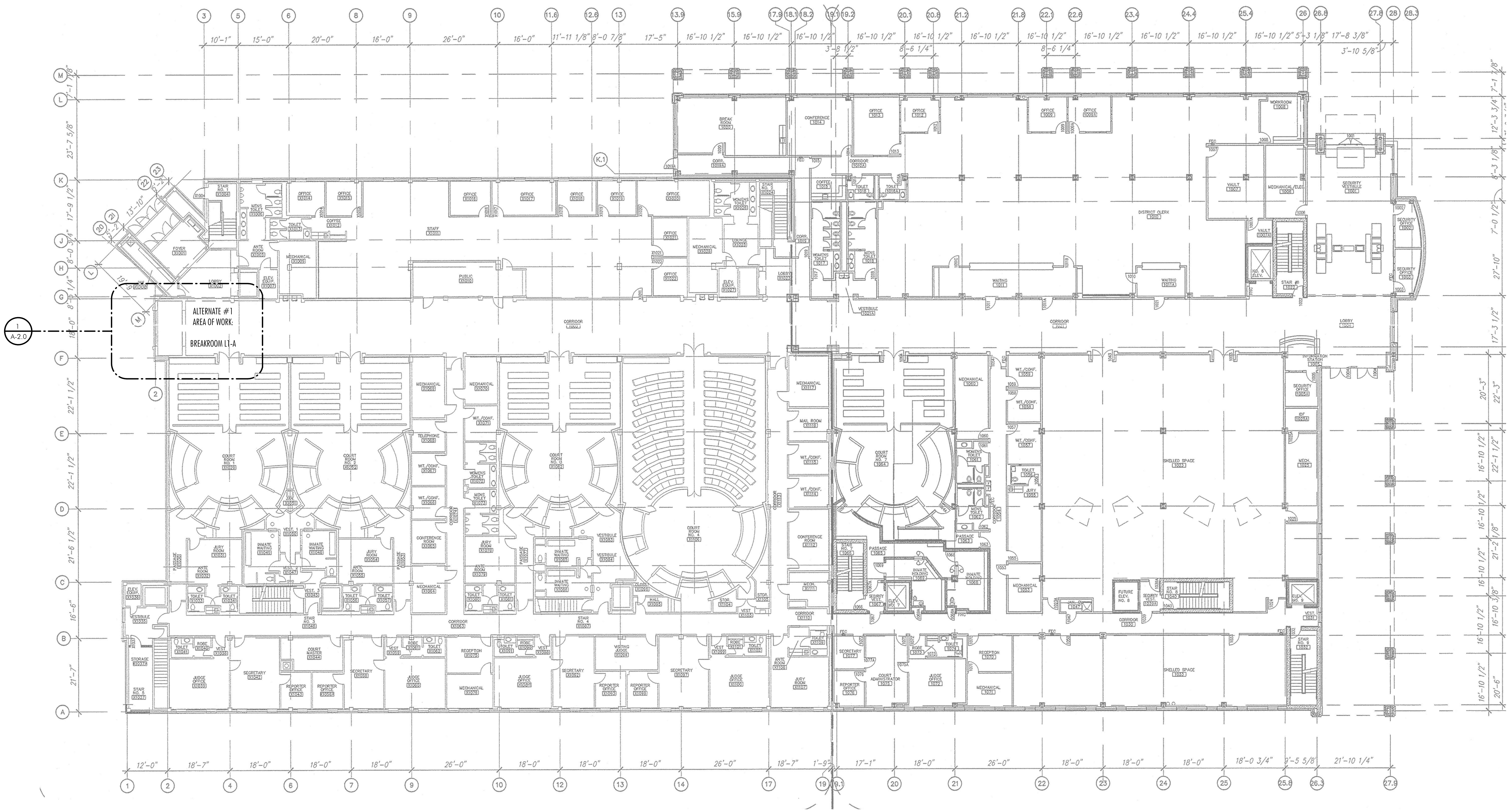

1 01-EXISTING FLOOR PLAN
1/16" = 1'-0"

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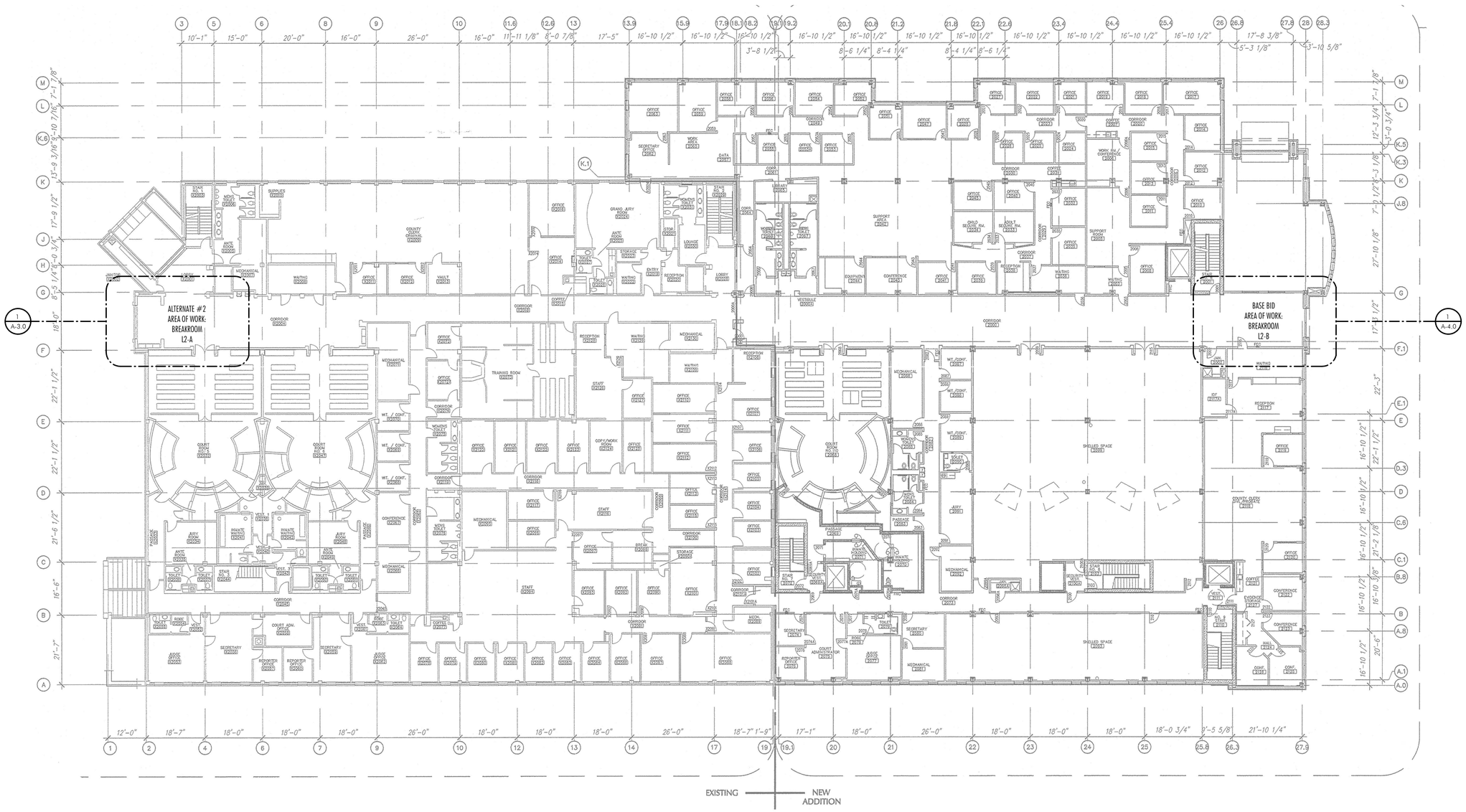
SHEET TITLE
FIRST FLOOR PLAN

SHEET NUMBER
A-1.1



1 02-EXISTING FLOOR PLAN
1/16" = 1'-0"

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SHEET TITLE

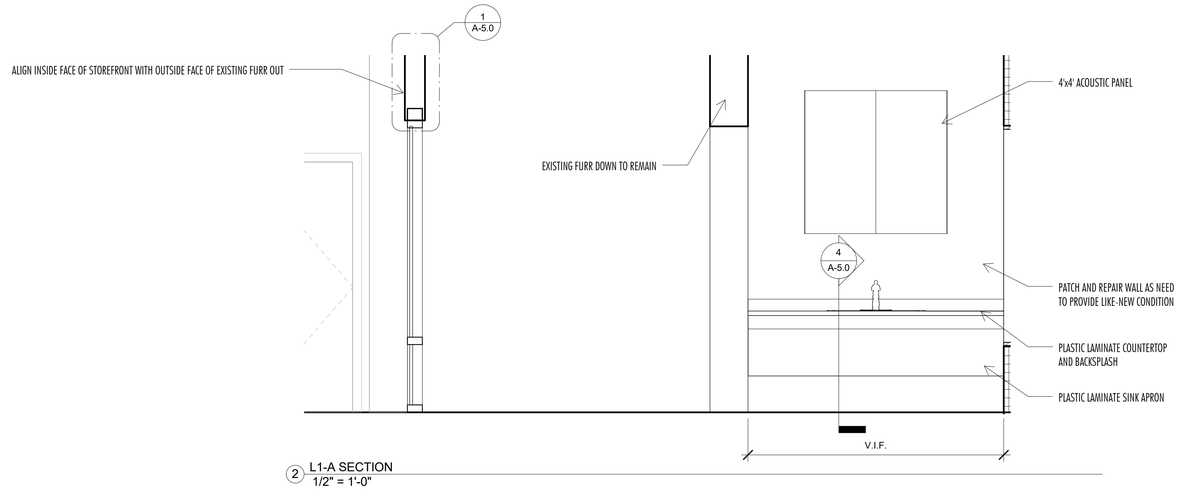
SECOND FLOOR PLAN

SHEET NUMBER

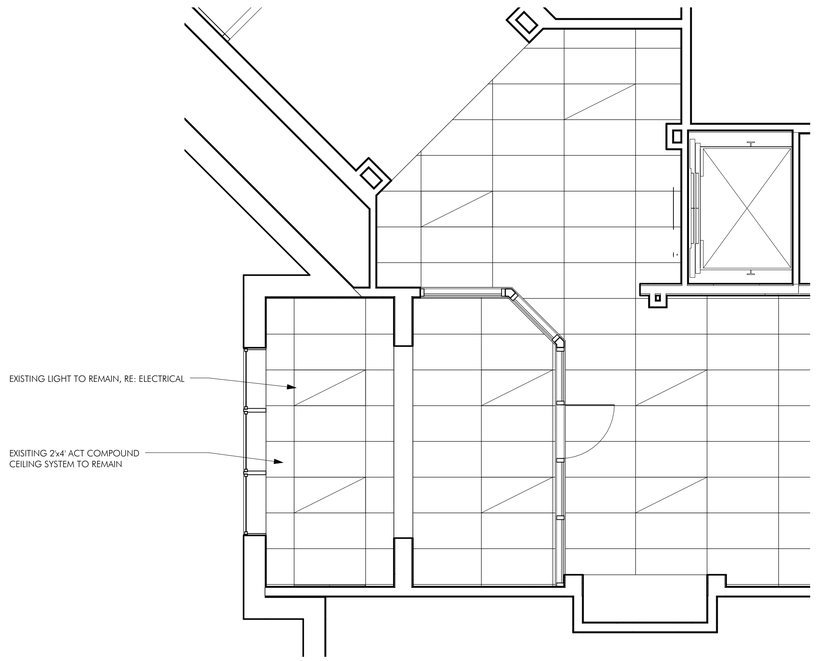
A-1.2

NOTES:

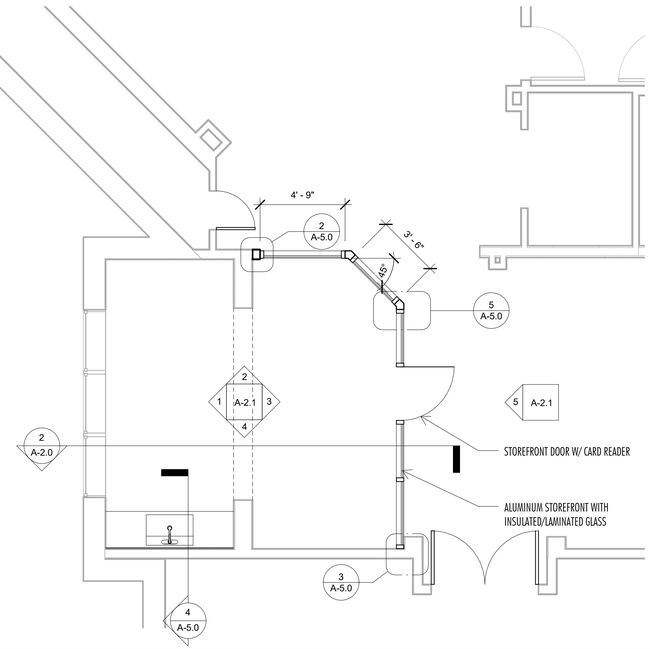
1. PLASTIC LAMINATE TO BE STANSARD LEVEL. CORDINATE FINAL COLOR SELECTION W/ OWNER



2 L1-A SECTION
1/2" = 1'-0"



5 L1-A - ENLARGED RCP
1/4" = 1'-0"



1 L1-A - ENLARGED PLAN
1/4" = 1'-0"

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REGISTERED ARCHITECT
RYAN HANSANDWAT
22737
STATE OF TEXAS

12/21/2015

TENANT IMPROVEMENT FOR:

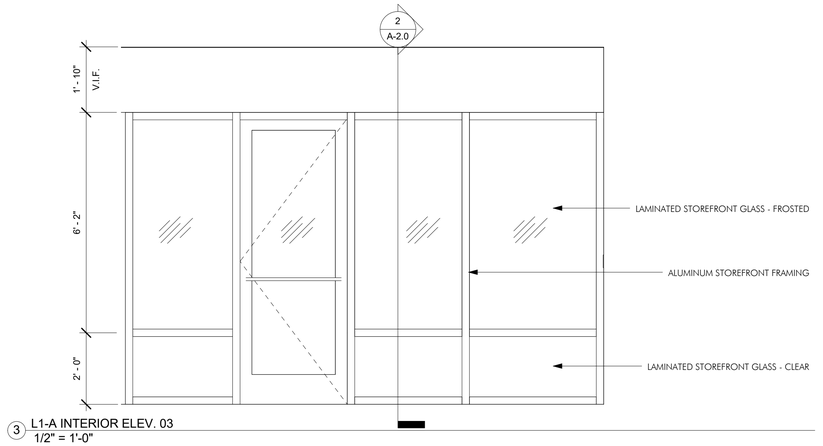
WILCO JUSTICE CENTER BREAK ROOMS
405 MARTIN LUTHER KING DR., GEORGETOWN, TEXAS 78626

PROJECT PHASE
CONSTRUCTION DOCUMENTS
REVISIONS

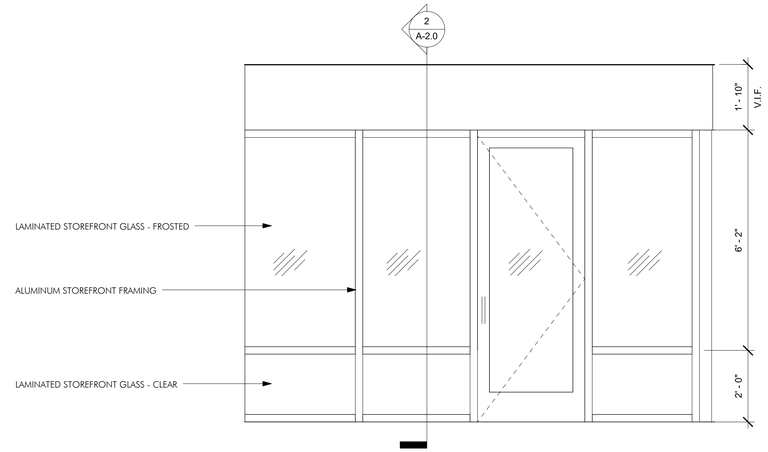
PROJECT NUMBER
15116-00
DATE ISSUED
12/21/2015
SHEET TITLE

L1-A ENLARGED PLANS/INTERIOR ELEV. & DETAILS- ALT. #1

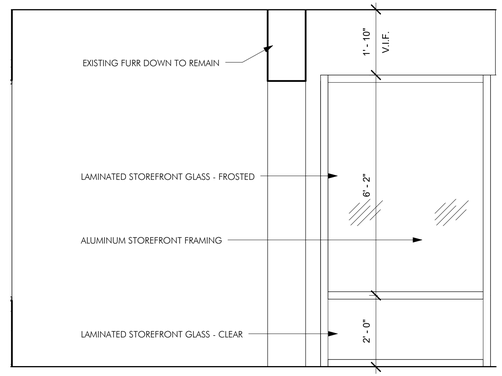
A-2.0



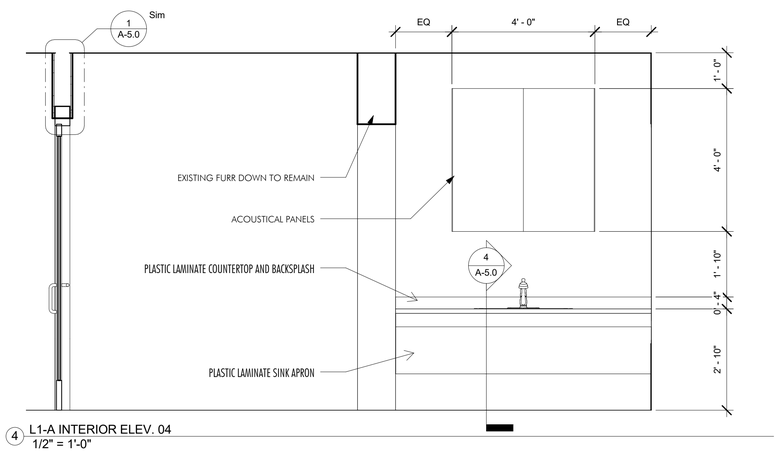
3 L1-A INTERIOR ELEV. 03
1/2" = 1'-0"



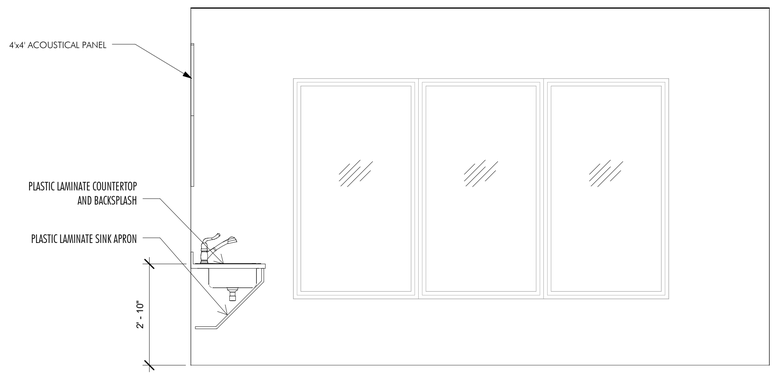
5 L1-A INTERIOR ELEV. 05
1/2" = 1'-0"



2 L1-A INTERIOR ELEV. 02
1/2" = 1'-0"



4 L1-A INTERIOR ELEV. 04
1/2" = 1'-0"



1 L1-A INTERIOR ELEV. 01
1/2" = 1'-0"

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PROJECT NUMBER
15116-00
DATE ISSUED
12/21/2015
SHEET TITLE

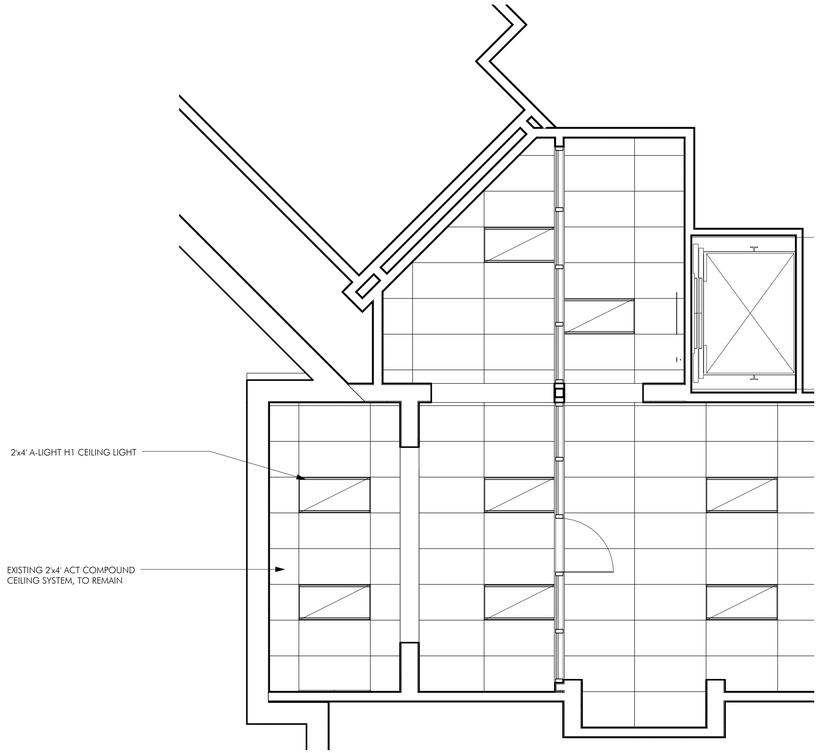
L-1A INTERIOR ELEVATIONS- ALT. #1

SHEET NUMBER

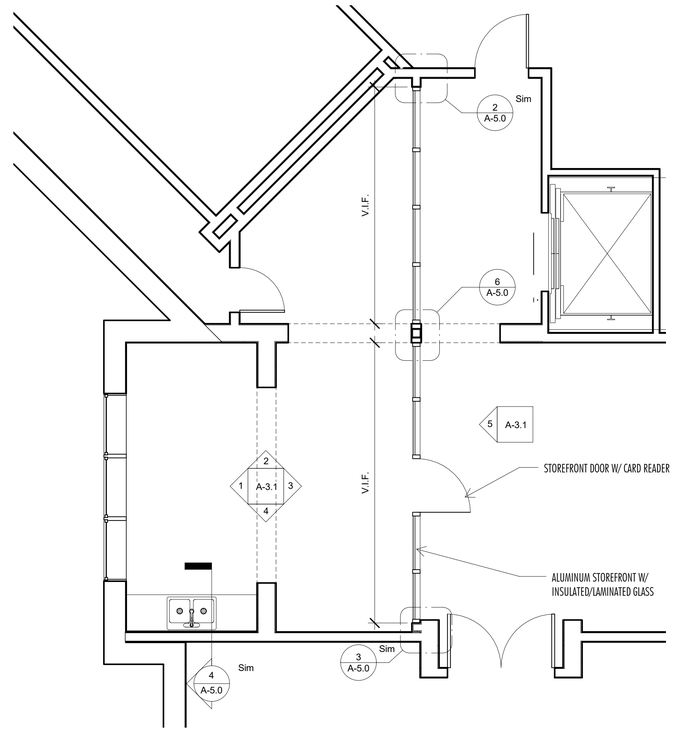
A-2.1

NOTES:

1. PLASTIC LAMINATE TO BE STANSARD LEVEL. CORDINATE FINAL COLOR SELECTION W/ OWNER



2 L2-A - ENLARGED RCP
1/4" = 1'-0"



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1/4" = 1'-0"

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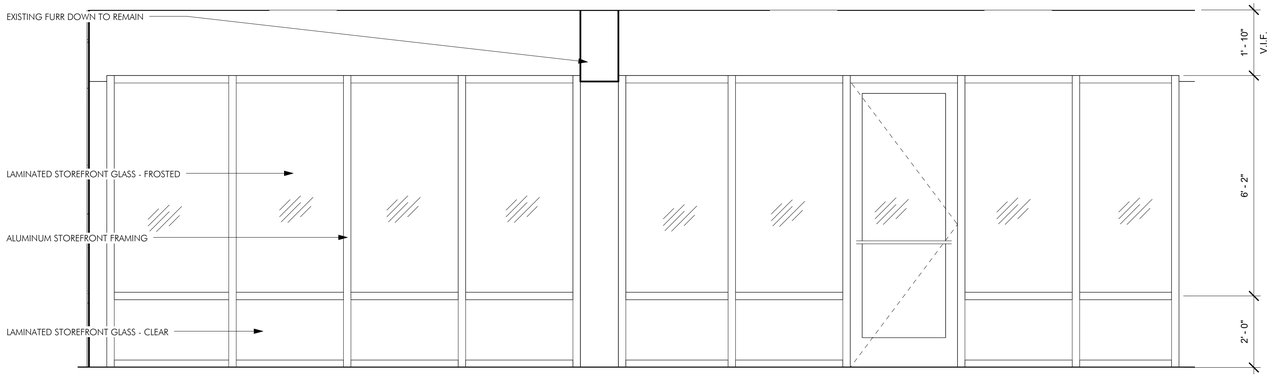
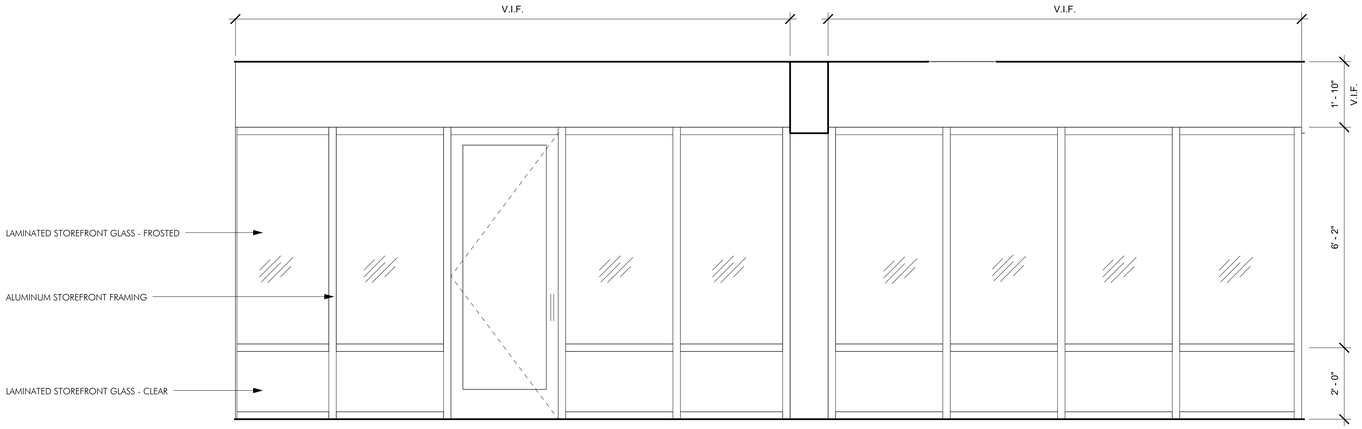
L2-A ENLARGED PLANS/INTERIOR ELEV. & DETAILS- ALT. #2

A-3.0



3 L2-A INTERIOR ELEV. 03
1/2" = 1'-0"



5 L2-A INTERIOR ELEV. 05
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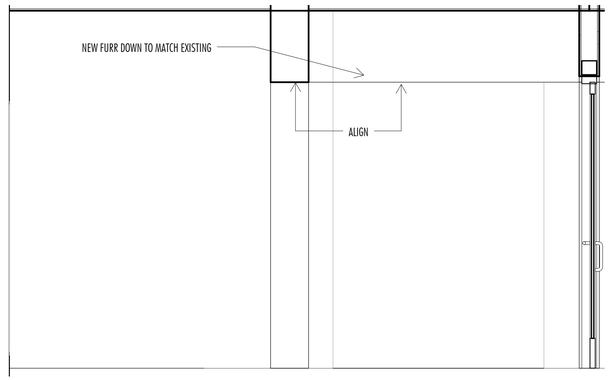
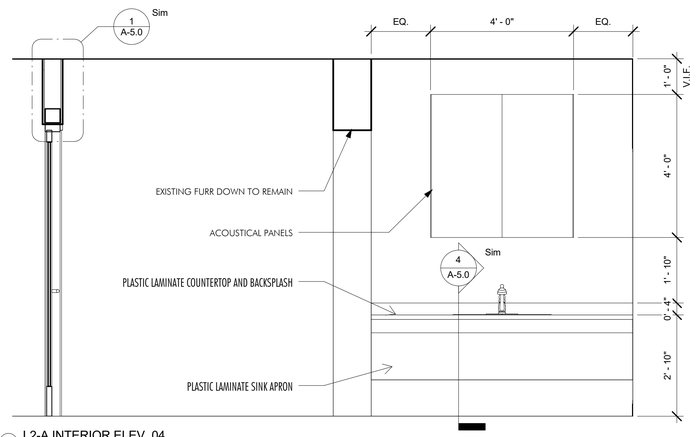
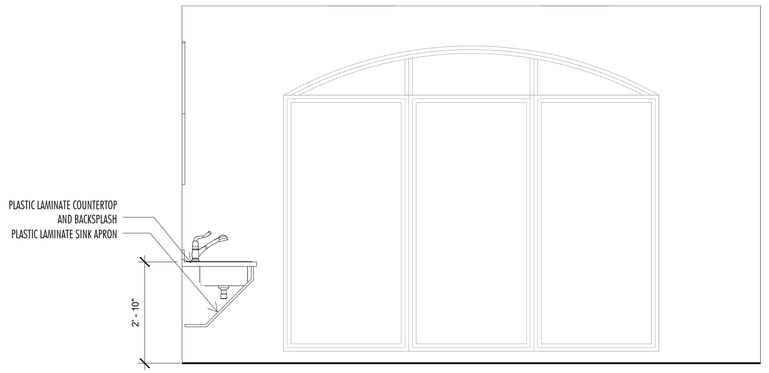


2 L2-A INTERIOR ELEV. 02
1/2" = 1'-0"



4 L2-A INTERIOR ELEV. 04
1/2" = 1'-0"



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1/2" = 1'-0"

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12/21/2015

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PROJECT NUMBER
15116-00
DATE ISSUED
12/21/2015
SHEET TITLE

L2-A INTERIOR ELEVATIONS- ALT. #2

SHEET NUMBER

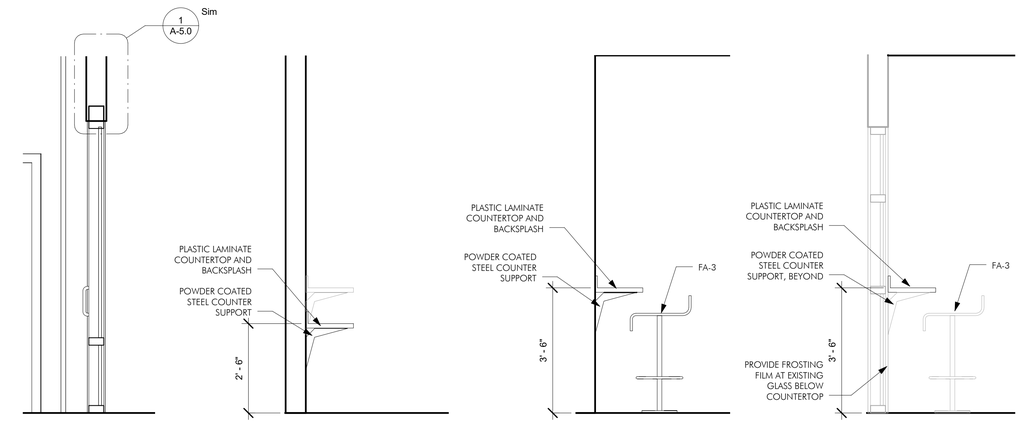
A-3.1

NOTES:

1. PLASTIC LAMINATE TO BE STANSARD LEVEL. CORDINATE FINAL COLOR SELECTION W/ OWNER

FIXED FURNITURE LEGEND:

FA-1: FIXED 36" TABLE. BASIS OF DESIGN: DUMOR, INC 482-36
FA-2: FIXED CHAIR. BASIS OF DESIGN: DUMOR, INC 481-20NA
FA-3: FIXED STOOL. BASIS OF DESIGN: FAIRWEATHER SF, COASTAL COLLECTION - CITY SERIES, MODEL CS-PS PUB STOOL

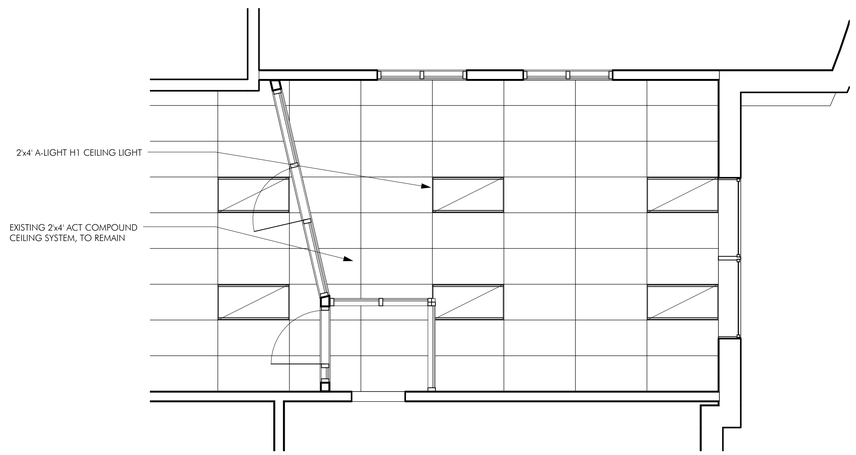


7 L-2B SECTION 5
1/2" = 1'-0"

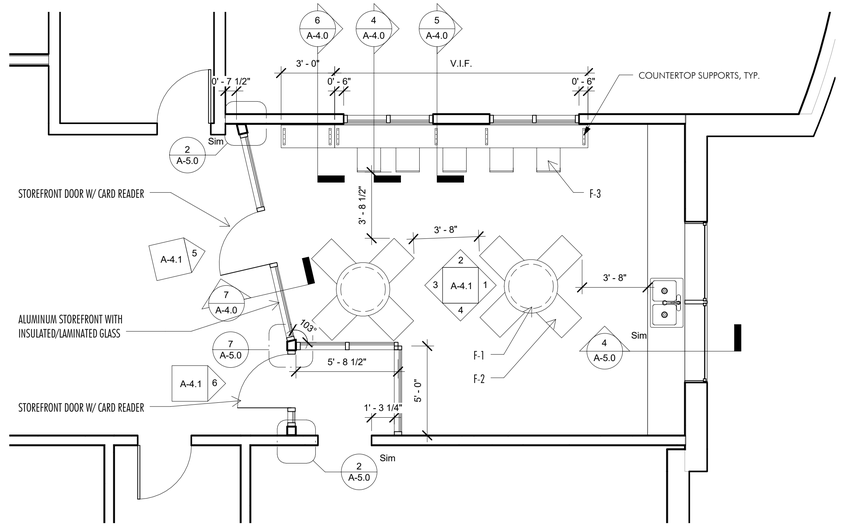
6 L-2B SECTION 4
1/2" = 1'-0"

5 L-2B SECTION 3
1/2" = 1'-0"

4 L2-B SECTION 2
1/2" = 1'-0"



2 L2-B - ENLARGED RCP
1/4" = 1'-0"



1 L2-B - ENLARGED PLAN
1/4" = 1'-0"

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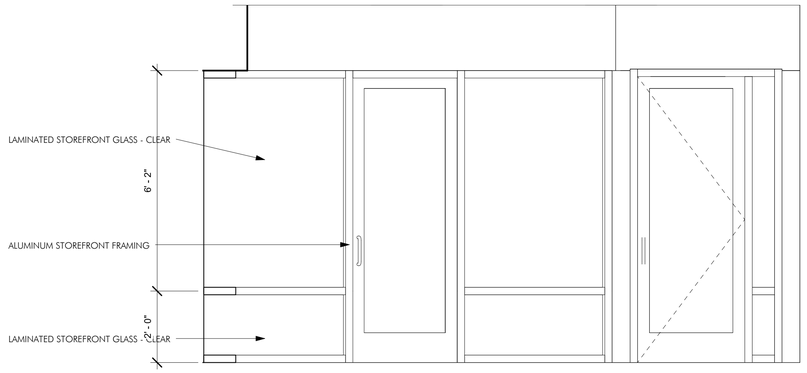
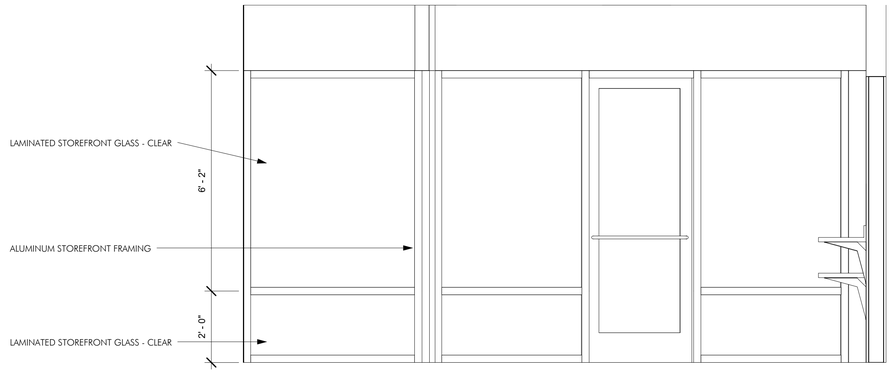
L2-B ENLARGED PLANS/INTERIOR ELEV. & DETAILS- BASE BID

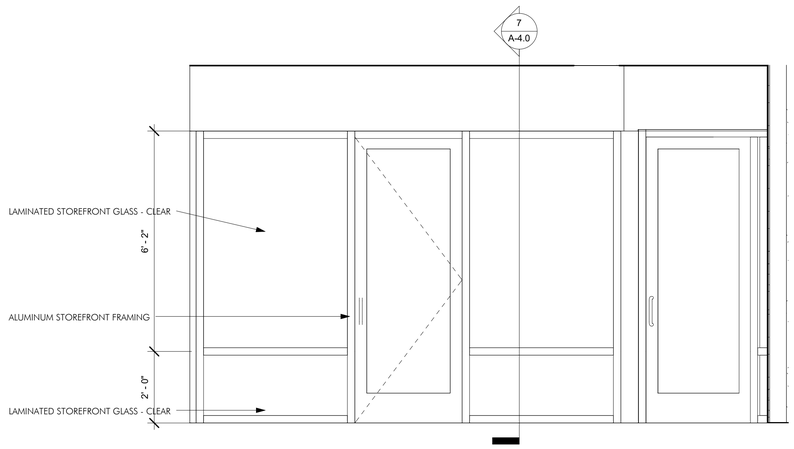
A-4.0



6 L2-B INTERIOR ELEV. 06
1/2" = 1'-0"

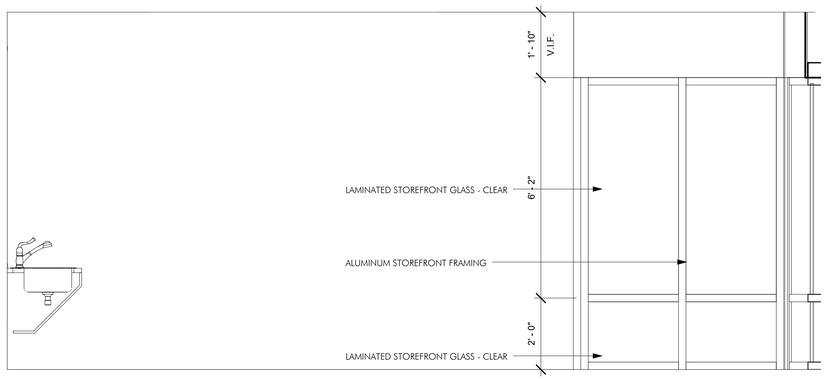


3 L2-B INTERIOR ELEV. 03
1/2" = 1'-0"

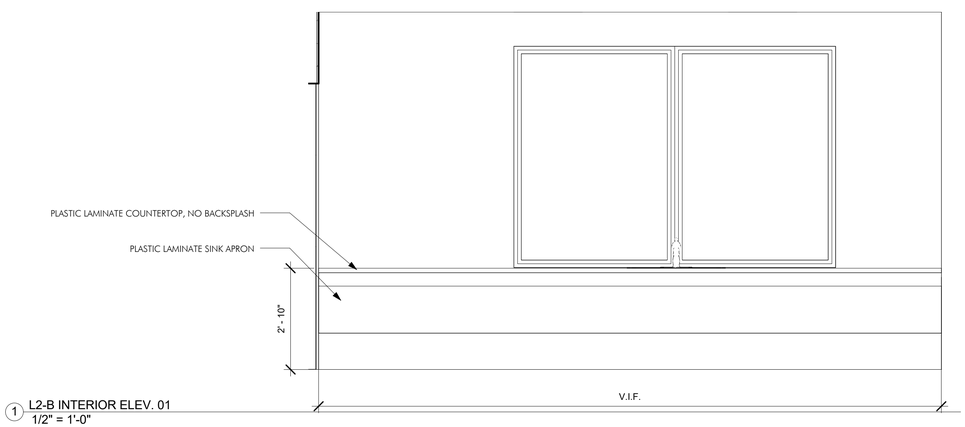


5 L2-B INTERIOR ELEV. 05
1/2" = 1'-0"

2 L2-B INTERIOR ELEV. 02
1/2" = 1'-0"



4 L2-B INTERIOR ELEV. 04
1/2" = 1'-0"



1 L2-B INTERIOR ELEV. 01
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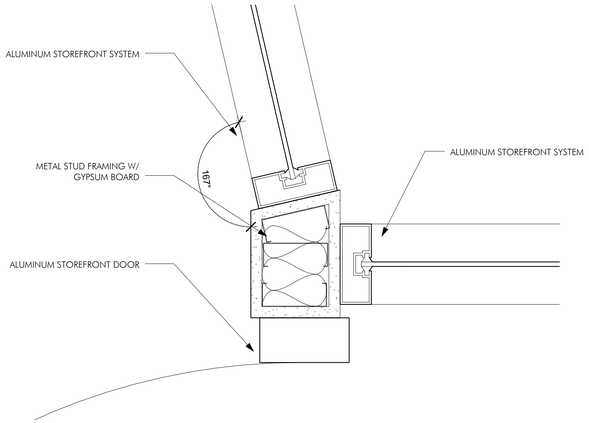
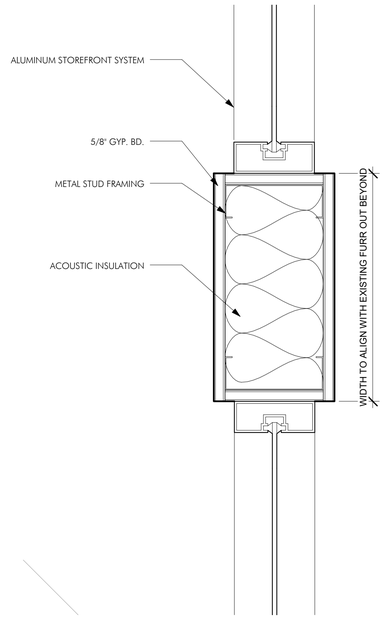
L2-B INTERIOR ELEVATIONS- BASE BID

SHEET NUMBER

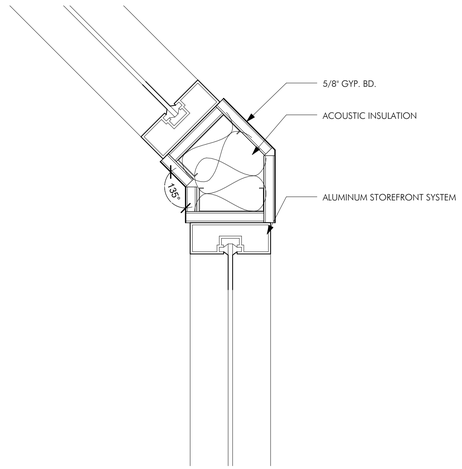
A-4.1



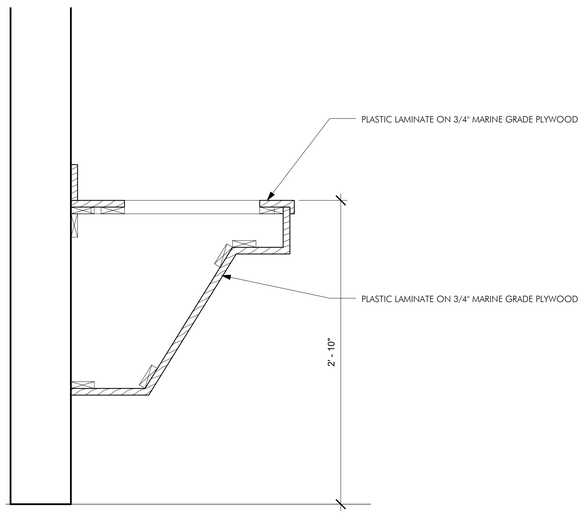
7 STOREFRONT JAMB DETAIL 5
3" = 1'-0"



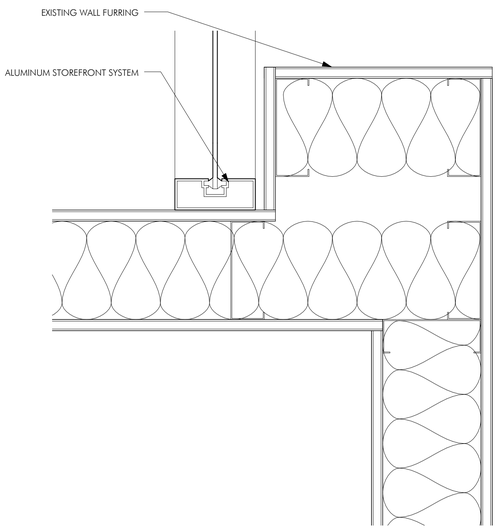
6 STOREFRONT JAMB DETAIL 4
3" = 1'-0"



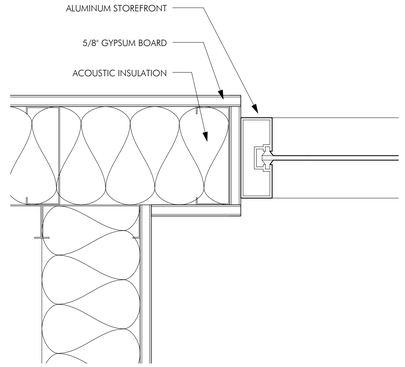
5 STOREFRONT JAMB DETAIL 3
3" = 1'-0"



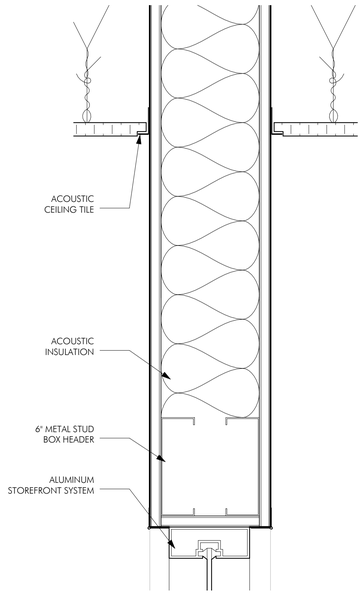
4 TYPICAL MILLWORK SECTION
1 1/2" = 1'-0"



3 STOREFRONT JAMB DETAIL 2
3" = 1'-0"



2 STOREFRONT JAMB DETAIL 1
3" = 1'-0"



1 STOREFRONT HEAD DETAIL
3" = 1'-0"

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PROJECT PHASE
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SHEET TITLE

TYPICAL DETAILS

SHEET NUMBER

A-5.0

MECHANICAL LEGEND

(NOTE: ALL SYMBOLS SHOWN ARE NOT NECESSARILY USED ON DRAWINGS)

SYMBOL LEGEND

TWO–LINE	ONE–LINE	DUCTWORK
		DUCTWORK SIZE, 1st NO. VISIBLE DIMENSION
		DUCTWORK TURNING
		BRANCH DUCT TAKEOFF
		DUCT TEE
		TRANSITION
		FLEXIBLE DUCT
		FLEXIBLE CONNECTION
		VOLUME DAMPER
		FIRE DAMPER OR SMOKE DAMPER
		SUPPLY DUCT, OUTSIDE AIR DUCT SECTION RECTANGULAR, FLAT, OVAL, ROUND
		RETURN/EXHAUST/OUTSIDE AIR DUCT SECTION
		SIDEWALL GRILLE OR REGISTER (SUPPLY)
		SIDEWALL GRILLE OR REGISTER (RETURN OR EXHAUST)
		CEILING GRILLE OR REGISTER (SUPPLY)
		CEILING GRILLE OR REGISTER (EXHAUST & RETURN)
(D)	(D)	SMOKE DETECTOR (DIVISION 26)
(T)	(T)	THERMOSTAT
R		CHANGE IN ELEVATION (R), (F)

	VALVES
	TWO–WAY CONTROL VALVE
	THREE–WAY CONTROL VALVE
	UNION
	BUTTERFLY VALVE
C	TEMPERATURE/ PRESSURE RELIEF VALVE
	GLOBE VALVE
	GATE VALVE
	STRAINER W/ BLOWDOWN GATE VALVE

	BALL VALVE
	CIRCUIT SETTER, BALANCING VALVE
	PLUG VALVE
	VALVE IN VERTICAL
	FIRE CONTROL
FS	FIRE SPRINKLER LINE
F	FIRE SUPPLY MAIN
FDC	FIRE DEPARTMENT CONNECTION LINE
	FLANGE CONNECTION
	DROP AT 45° ANGLE
	ELBOW TURNING DOWN
	ELBOW TURNING UP
	CAPPED PIPE
	FLEXIBLE CONNECTION
	CONCENTRIC PIPE REDUCER/INCREASER
	ECCENTRIC PIPE REDUCER/INCREASER
SLOPE	DIRECTION OF SLOPE (DOWN WARD)

GENERAL NOTES

1. THESE GENERAL NOTES APPLY TO ALL SHEETS
2. IN ANY CASE WHERE A PIPE OR DUCT SHOWN ON A PLAN SHEET DIFFERS FROM THAT SHOWN IN A SCHEMATIC OR DETAIL, USE THE LARGER OF THE TWO SIZES SHOWN.
3. PIPING SHOWN ON EACH PLAN IS RUN ABOVE THE CEILING ON THE FLOOR WHERE IT IS SHOWN UNLESS OTHERWISE NOTED.
4. MOUNT THERMOSTATS 48 INCHES ABOVE FINISHED FLOOR AND CENTERED ABOVE THE LIGHT SWITCHES WHERE BOTH OCCUR IN THE SAME LOCATION, UNLESS OTHERWISE NOTED.
5. ALL DUCT DIMENSIONS SHOWN ARE CLEAR AIRSTREAM DIMENSIONS.
6. DO NOT RUN AIR HANDLERS OR EXHAUST FANS UNTIL ALL INTERIOR CLEANING AND PAINTING IS COMPLETE. THE CLEANING OF FOULED COILS OR FAN ASSEMBLIES DUE TO PAINT OR CONSTRUCTION DEBRIS WILL BE THE RESPONSIBILITY OF THE HVAC CONTRACTOR.
7. ALL REFRIGERANT CIRCUIT SERVICE PORTS LOCATED ON THE EXTERIOR OF THE BUILDING SHALL BE PROVIDED WITH LOCKING ACCESS PORT CAPS.
8. NORMAL DESIGN CONDITIONS:

	OUTSIDE	INSIDE
SUMMER:	98 °F db, 78 °F wb	75 °F db, 50% RH
WINTER:	20 °F db	72 °F db

ABBREVIATIONS

B. VA.	BALL VALVE
BAL. VA.	CKT. SETTER BALANCING VALVE
D	CONDENSATE DRAIN LINE
EOD	EMERGENCY OVERFLOW DRAIN
EXT FCO	EXTERIOR FLOOR CLEANOUT
FS	FIRE SPRINKLER
F	FIRE LINE (BUILDING MAIN)
FD (OR) SD	FIRE / SMOKE DAMPER
GT. V	GATE VALVE
GL. V	GLOBE VALVE
MVD	MOTORIZED VOLUME DAMPER
OA, RA, EXH	O.A.,R.A. EXH. AIR DUCT
RED.	REDUCER
TI	TEMP. INDICATOR (THERMOMETER)
T.&P.	TEMP. & PRESS. RELIEF VALVE
VD	VOLUME DAMPER

DIFFUSER & GRILLE SCHEDULE

MARK	CFM RANGE	SUPPLY	RETURN	EXHAUST	TYPE	DIFFUSER CONNECTION SIZE	PATTERN	REMARKS
A	0–150	●		●	LOUVER FACE CLG. DIFFUSER	6"ø	4–WAY	PRICE ASCD, 24/24 FACE
B	151–300	●		●		8"ø		
C	301–450	●		●		10"ø		
D	451–650	●		●		12"ø		
E	651–850	●		●		14"ø		
F	0–1000		●		ALUMINUM EGG CRATE	22" X 22"	–	PRICE 80, 24/24 FACE
EX	–				–	–	–	EXISTING DIFFUSER/GRILLE TO REMAIN OR BE RELOCATED.

SINGLE DUCT SUPPLY VAV BOX SCHEDULE

MARK	DESIGN AIR FLOW (CFM) MAX/MIN	VAV BOX STATIC PRESS. DIFF. (IN. H_2O)	INLET SIZE (IN. DIA.)	HEATING CFM	CAPACITY AT HEATING CFM BTUH	WATER GPM	E.A.T./ L.A.T./ °F	MIN. ROWS	REMARKS
VAV–2–11	520/180	0.5"	8	180	6800	0.5	55/90	2	TITUS DESV W/ HOT WATER COIL – MUST MATCH EXISTING BUILDING BOXES

* INLET DUCT SHALL BE SAME SIZE AS BOX INLET UNLESS OTHERWISE INDICATED ON PLANS.
** PROVIDE 24 VOLT CONTROL TRANSFORMER, DDC ZONE SENSOR, DISCONNECT SWITCH, HANGER BRACKETS, LOW LEAKAGE GASKETED ACCESS DOOR, 1" LINER.
*** DDC CONTROLS SHALL BE PROVIDED AND INSTALLED THAT MATCH THE EXISTING BUILDING CONTROL SYSTEM.
**** GPM IS BASED ON 160 °F EWT PER EXISTING BUILDING DRAWINGS.
***** ELECTRICAL CONTRACTOR SHALL PROVIDE 120/1/60 POWER TO EACH BOX FOR CONTROLS.

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STATE OF TEXAS
T. DREW WILLIAMS
113389
REGISTERED PROFESSIONAL ENGINEER
12/8/15 #F-15783

WILCO JUSTICE CENTER EXPANSION BREAK ROOMS

405 MARTIN LUTHER KING DR., GEORGETOWN, TEXAS 78626

PROJECT PHASE
PERMIT
REVISIONS

PROJECT NUMBER

DATE ISSUED
12/08/15

SHEET TITLE
Mechanical Schedules

SHEET NUMBER
M1-0

STAR OF TEXAS ENGINEERING, PLLC
2851 Joe DiMaggio Blvd.. STE. 9, Round Rock, TX 78665
512-917-0925
dmcdonald@staroftexasengineering.com
TBPE F-15783

GENERAL NOTES (APPLIES TO ALL VIEWS):

1. ALL MECHANICAL WORK SHOWN IN HALF-TONE IS EXISTING TO REMAIN.

2. ALL MECHANICAL EQUIPMENT SHOWN IN BOLD LINE TYPE IS NEW TO BE INSTALLED.

3. DASHED LINE TYPE IS TO BE REMOVED.

4. CONNECT TO EXISTING SYMBOL.

5. WHERE THERE ARE SHEET ROCK OR INACCESSIBLE CEILINGS CONCEALING VOLUME DAMPERS, PROVIDE AND INSTALL YOUNG'S REGULATORS. COORDINATE EXACT LOCATION OF CONTROLLER / "BUTTON" WITH ARCHITECT.

6. INSTALL DUCT AND PIPE PENETRATIONS PER STRUCTURAL AND ARCHITECTURAL REQUIREMENTS.

7. ALL DUCT DIMENSIONS SHOWN ARE CLEAR AIRSTREAM SHEETMETAL DIMENSIONS.

8. ALL RETURN AIR GRILLES SHALL BE TYPE "F" UNLESS OTHERWISE NOTED.

9. BALANCE NEW AND EXISTING DIFFUSERS TO THE THOSE SCHEDULED ON THE PLANS. PROVIDE MANUAL BALANCING DAMPERS IN EXISTING DUCT TAPS IF NONE ARE PROVIDED CURRENTLY.

10. NOT ALL DUCT OFFSETS ARE SHOWN. PROVIDE AND INSTALL ALL ADDITIONAL OFFSETS AS REQUIRED FOR A COMPLETE, WORKING AND MAINTAINABLE SYSTEM.

11. CFM'S SHOWN ASSUMES BLINDS AND/OR SHADING BEING ADDED TO THE EXISTING WINDOWS.

PLAN NOTES (APPLIES TO ALL VIEWS):

1. RELOCATE EXISTING THERMOSTAT TO NEW LOCATION. PROVIDE ALL NEW WIRING AS REQUIRED.

2. NEW LOCATION OF EXISTING THERMOSTAT.

3. REMOVE EXISTING DIFFUSER, DUCTWORK AND DAMPER AND INSTALL NEW AS SHOWN. CAP/SEAL MAIN DUCT AIR TIGHT. TYPICAL.

4. RELOCATE EXISTING FVAV UNIT OFF NEW WALL AS REQUIRED FOR MAINTENANCE ACCESS. COORDINATE FINAL LOCATION IN THE FIELD. PROVIDE NEW DUCTWORK, PIPING, WIRING, ETC. AS REQUIRED.

5. CONTRACTOR SHALL RE-SHEAVE EXISTING UNIT (AHU-2-C1) AS REQUIRED TO PROVIDE THE ADDITIONAL 50 CFM BEING ADDED TO THE SYSTEM.

6. CONTRACTOR SHALL RE-SHEAVE EXISTING UNIT (AHU-19-C2) AS REQUIRED TO PROVIDE THE ADDITIONAL 225 CFM BEING ADDED TO THE SYSTEM.

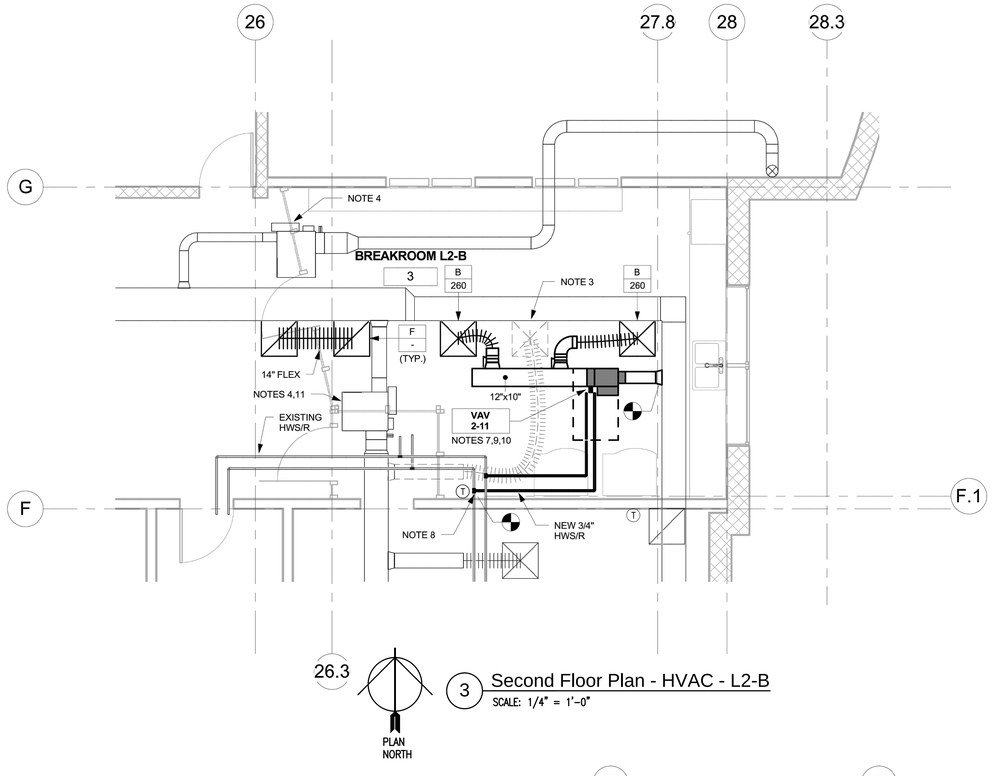
7. CONTRACTOR SHALL RE-SHEAVE EXISTING UNIT (AHU-A-1 IN ATTIC) AS REQUIRED TO PROVIDE THE ADDITIONAL 180 CFM BEING ADDED TO THE SYSTEM.

8. HOT TAP EXISTING 3/4" HWS/R LINES WITH NEW 3/4" HWS/R LINES. CONTRACTOR SHALL VERIFY EXACT SUPPLY/RETURN CONFIGURATIONS BEFORE INSTALLATION.

9. INSTALL VAV UNIT PER MANUFACTURER'S RECOMMENDATIONS AND MAINTAIN ALL RECOMMENDED CLEARANCE.

10. PROVIDE 2-WAY HEATING WATER CONTROL VALVING ASSEMBLY. SEE DETAIL.

11. CONTRACTOR SHALL REBALANCE EXISTING FVAV UNIT AS REQUIRED FOR THE REMOVAL OF 340 CFM FROM THE SYSTEM.

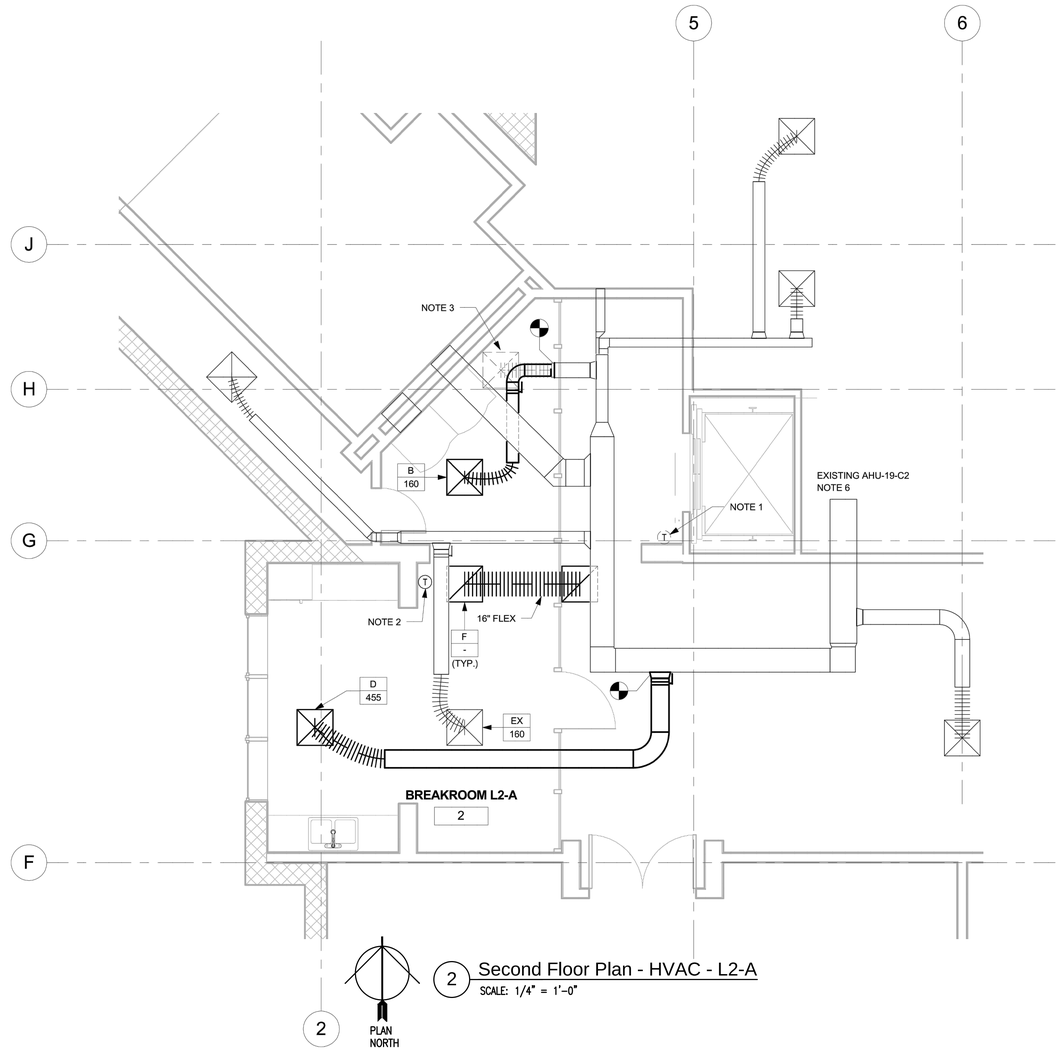


26.3

PLAN NORTH

3 Second Floor Plan - HVAC - L2-B

SCALE: 1/4" = 1'-0"

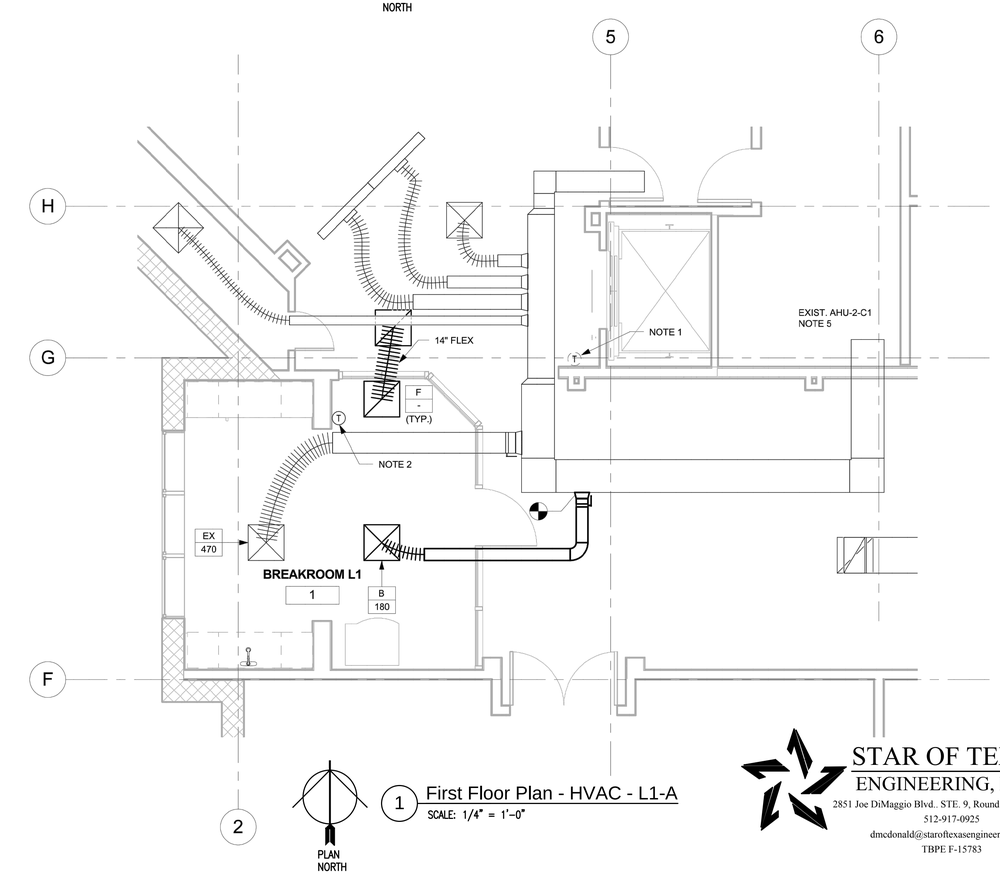


2

PLAN NORTH

2 Second Floor Plan - HVAC - L2-A

SCALE: 1/4" = 1'-0"



2

PLAN NORTH

1 First Floor Plan - HVAC - L1-A

SCALE: 1/4" = 1'-0"

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WILCO JUSTICE CENTER EXPANSION BREAK ROOMS

405 MARTIN LUTHER KING DR., GEORGETOWN, TEXAS 78626

PROJECT PHASE

PERMIT

REVISIONS

PROJECT NUMBER

DATE ISSUED
12/08/15

SHEET TITLE

Floor Plans - HVAC

SHEET NUMBER

M2-1

Williamson County, Texas

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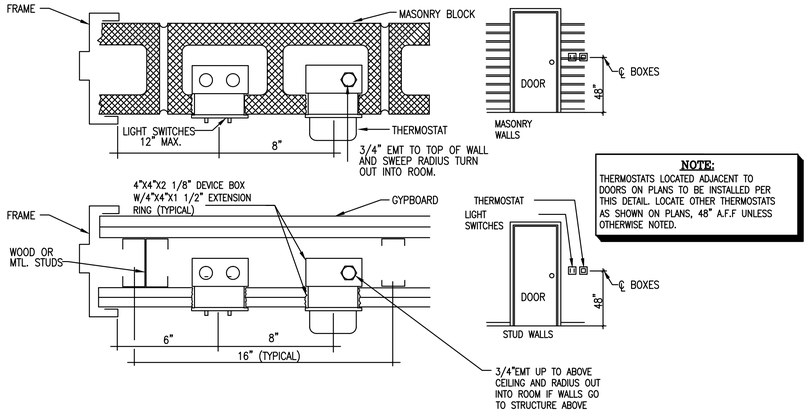
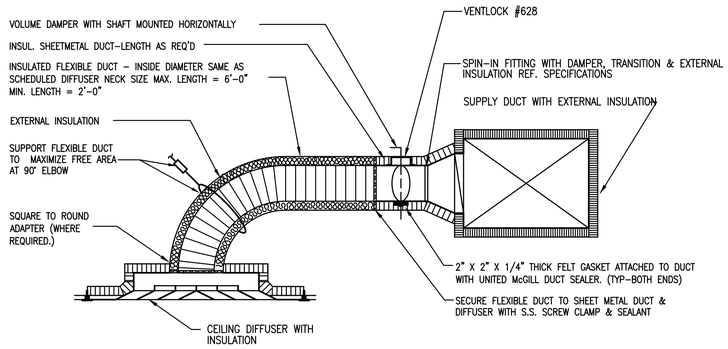


NOTE:
THERMOSTATS LOCATED ADJACENT TO DOORS ON PLANS TO BE INSTALLED PER THIS DETAIL. LOCATE OTHER THERMOSTATS AS SHOWN ON PLANS, 48" A.F.F UNLESS OTHERWISE NOTED.

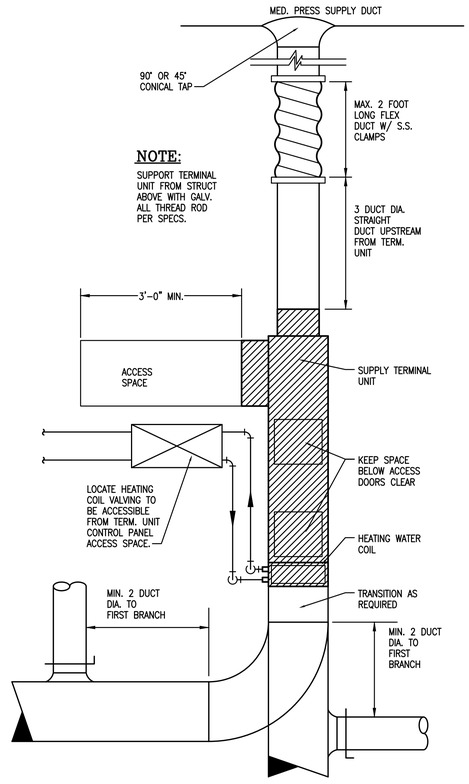
1 ROOM THERMOSTAT/ LIGHT SWITCH DETAIL

SCALE: NOT TO SCALE



2 DIFFUSER CONNECTION DETAIL

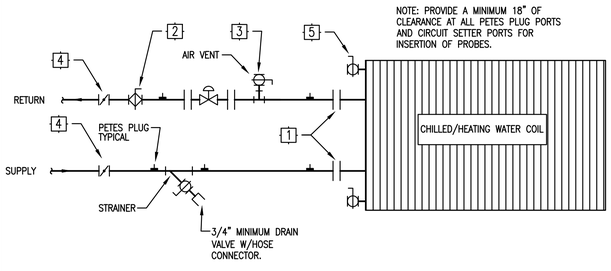
SCALE: NOT TO SCALE



NOTE:
SUPPORT TERMINAL UNIT FROM STRUCT ABOVE WITH GALV. ALL THREAD ROD PER SPECS.

3 TERMINAL UNIT INSTALLATION DETAIL

SCALE: NOT TO SCALE



1. PROVIDE UNIONS FOR 3/4" TO 1 1/2" AND FLANGES FOR 2" AND UP (TYPICAL).
2. PROVIDE BALANCING VALVES AS REQUIRED BY PIPE SIZE & SPECIFICATIONS. BALANCE FLOW THROUGH COIL WITH CONTROL VALVE IN FULL OPEN POSITION.
3. AIR VENT CAN BE DELETED IF COILS ARE EQUIPPED WITH DRAINS AND VENTS AS DESCRIBED IN KEYNOTE 5.
4. PROVIDE BALL VALVES UNDER 2 1/2" AND BUTTERFLY VALVES WITH GEAR OPERATORS 3" AND ABOVE. (TYPICAL)
5. IF COILS ARE EQUIPPED WITH VENTS AND DRAINS, EXTEND OUTSIDE OF CASING AND PROVIDE WITH 1/2" BALLS VALVES. (TYPICAL)

4 WATER COIL CONNECTION W/ 2–WAY CONTROL VALVE

SCALE: NOT TO SCALE

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12/8/15

WILCO JUSTICE CENTER EXPANSION BREAK ROOMS

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PROJECT PHASE
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REVISIONS

PROJECT NUMBER

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12/08/15

SHEET TITLE
Mechanical Details

SHEET NUMBER
M3-1

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MECHANICAL GENERAL PROVISIONS

IT IS THE INTENT OF THE CONTRACT DOCUMENTS TO PROVIDE AN INSTALLATION COMPLETE IN EVERY RESPECT. IN THE EVENT THAT ADDITIONAL DETAILS OF SPECIAL CONSTRUCTION MAY BE REQUIRED FOR WORK INDICATED OR SPECIFIED IN THIS SECTION OR WORK SPECIFIED IN OTHER SECTIONS, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE SAME AS WELL AS TO PROVIDE MATERIAL AND EQUIPMENT USUALLY FURNISHED WITH SUCH SYSTEMS OR REQUIRED TO COMPLETE THE INSTALLATION, WHETHER MENTIONED OR NOT.

CODE REQUIREMENTS AND PERMITS
PERFORM WORK IN ACCORDANCE WITH APPLICABLE STATUTES, ORDINANCES, CODES, AND REGULATIONS OF GOVERNMENTAL AUTHORITIES HAVING JURISDICTION. OBTAIN AND PAY FOR ALL PERMITS AND INSPECTIONS.

AIR FILTERS
IMMEDIATELY PRIOR TO FINAL ACCEPTANCE OF PROJECT, REPLACE DISPOSABLE TYPE AIR FILTERS. IF AIR HANDLING UNITS ARE OPERATING DURING CONSTRUCTION, INSTALL HIGH EFFICIENCY FILTERS IN UNITS AND REPLACE AT END OF CONSTRUCTION.

GUARANTEE
GUARANTEE WORK FOR 1 YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THE PROJECT AND DURING THAT PERIOD MAKE GOOD ANY FAULTS OR IMPERFECTIONS THAT MAY ARISE DUE TO DEFECTS OR OMISSIONS IN MATERIALS OR WORKMANSHIP.

SUBMITTAL DATA
ENGINEER'S APPROVAL OF SUBMITTED MATERIAL CONSTITUTES AN ACKNOWLEDGMENT ONLY AND IN NO WAY RELIEVES THE CONTRACTOR OF FULL RESPONSIBILITY FOR PROVIDING ALL SYSTEMS COMPLETE IN ACCORDANCE WITH THE INTENT OF THE DRAWINGS AND SPECIFICATIONS. CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING DIMENSIONS AT JOB SITE, FOR INFORMATION WHICH PERTAINS TO FABRICATION PROCESSES OR CONSTRUCTION TECHNIQUES AND FOR COORDINATION OF WORK WITH ALL OTHER TRADES. ANY MATERIALS OR EQUIPMENT PROVIDED BY THIS CONTRACTOR WITHOUT APPROVED SHOP DRAWINGS CONSTITUTES THE CONTRACTOR'S AGREEMENT TO COMPLY WITH THE ENGINEER'S INTENT WHETHER SPECIFIED, SHOWN OR IMPLIED.

CONTROLS
PROVIDE AND INSTALL A 7 DAY/24 HOUR PROGRAMMABLE THERMOSTAT

FIRESTOPPING
ALL PIPING, TUBING, DUCTWORK, CONDUIT, ETC. PASSING THROUGH FIRE RATED FLOORS AND/OR WALLS SHALL HAVE THE VOID AREA BETWEEN THE MATERIAL PASSING THROUGH FLOOR AND/OR WALL SEALED WITH AN APPROVED FIRE-STOP MATERIAL TO MAINTAIN THE FIRE RATING OF THE FLOOR AND/OR WALL. DEPENDING ON THE PARTICULAR INSTALLATION, THE CONTRACTOR SHALL USE FS900 SERIES FIRE STOP CAULK OR FS500/600 SERIES FIRE-STOP COMPONENTS AS MANUFACTURED BY INTERNATIONAL PROTECTIVE COATINGS OR APPROVED EQUIVALENT.
ALL FIRE STOP SYSTEMS SHALL BE INSTALLED AS REQUIRED BY THE MANUFACTURER AND U.L. REQUIREMENTS FOR EACH APPLICATION.

EXISTING FACILITIES
THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOSS OR DAMAGE TO THE EXISTING FACILITIES AS USED BY HIS WORKMEN, AND SHALL BE RESPONSIBLE FOR REPAIRING OR REPLACING SUCH LOSS OR DAMAGE. THE CONTRACTOR SHALL SEND PROPER NOTICES AND RECEIVE WRITTEN PERMISSION FROM THE OWNER TO ENTER EXISTING AREAS. BEFORE BEGINNING WORK IN EXISTING AREAS, MAKE THE NECESSARY ARRANGEMENTS AND PERFORM OTHER SERVICES REQUIRED FOR THE CARE, PROTECTION, AND IN SERVICE MAINTENANCE OF ALL ELECTRICAL, COMMUNICATION, PLUMBING, HEATING, AIR CONDITIONING, AND VENTILATING SERVICES FOR EXISTING FACILITIES. THE CONTRACTOR SHALL ERECT TEMPORARY BARRICADES WITH NECESSARY SAFETY DEVICES, AS REQUIRED TO PROTECT PERSONNEL FROM INJURY, REMOVING ALL SUCH TEMPORARY PROTECTION UPON COMPLETION OF THE WORK.
THE CONTRACTOR SHALL PROVIDE TEMPORARY OR NEW SERVICES TO ALL EXISTING FACILITIES AS REQUIRED TO MAINTAIN THEIR PROPER OPERATION WHEN NORMAL SERVICES ARE DISRUPTED AS A RESULT OF THE WORK BEING ACCOMPLISHED UNDER THIS PROJECT.
WHERE EXISTING CONSTRUCTION IS REMOVED TO PROVIDE WORKING AND EXTENSION ACCESS TO EXISTING UTILITIES, THE CONTRACTOR SHALL REMOVE DOORS, PIPING, CONDUIT, OUTLET BOXES, WIRING, LIGHT FIXTURES, AIR CONDITIONING DUCTWORK, AND EQUIPMENT, ETC., TO PROVIDE THIS ACCESS AND SHALL REINSTALL SAME UPON COMPLETION OF WORK IN THE AREAS AFFECTED. WHERE PARTITIONS, WALLS, FLOORS, OR CEILINGS OF EXISTING CONSTRUCTION ARE INDICATED TO BE REMOVED AND EQUIPMENT LOCATED IN THESE AREAS IS REQUIRED TO REMAIN IN OPERATION, THE CONTRACTOR SHALL REMOVE AND REINSTALL ALL EQUIPMENT REQUIRED FOR THE OPERATION OF THE REMAINING ELECTRICAL SYSTEMS. THIS IS TO INCLUDE BUT IS NOT LIMITED TO ELECTRICAL SWITCHES, RELAYS, FIXTURES, CONDUIT, ETC.

OUTAGES
OUTAGES OF SERVICES AS REQUIRED BY THE PROJECT WILL BE PERMITTED BUT ONLY AT TIME APPROVED BY THE OWNER. THE CONTRACTOR SHALL NOTIFY THE OWNER IN WRITING TWO WEEKS IN ADVANCE OF THE REQUESTED OUTAGE IN ORDER TO SCHEDULE REQUIRED OUTAGES. NO OUTAGES SHALL BE TAKEN UNLESS WRITTEN APPROVAL HAS FIRST BEEN RECEIVED FROM THE OWNER. THE TIME ALLOWED FOR OUTAGES WILL NOT BE DURING NORMAL WORKING HOURS UNLESS OTHERWISE APPROVED BY THE OWNER. ALL COSTS OF OUTAGES, INCLUDING OVERTIME CHARGES, SHALL BE INCLUDED IN THE CONTRACT AMOUNT.

ACCESS DOORS
SCOPE
THIS SECTION PROVIDES FOR FURNISHING AND INSTALLING ACCESS DOORS IN ALL WALL OR CEILING LOCATIONS AS REQUIRED OR SHOWN FOR ACCESS TO VALVES, CONTROLS, WATER HAMMER ARRESTORS, TRAP PRIMERS, AND OTHER EQUIPMENT REQUIRING MAINTENANCE, ADJUSTMENT OR OPERATION. PROVIDE ACCESS DOORS TO PROVIDE ACCESS TO ALL MECHANICAL ITEMS REQUIRING SERVICE OR MAINTENANCE, WHETHER SHOWN ON DRAWINGS OR NOT.

LOW TEMPERATURE PIPING INSULATION

SCOPE
THIS SECTION PROVIDES FOR INSTALLING AND FURNISHING LOW TEMPERATURE PIPING INSULATION AS NOTED BELOW.

CONDENSATE DRAINS LINES
1/2" – ARMAFLEX AP

REFRIGERANT SUCTION LINE
1 – ARMAFLEX AP

CHILLED WATER PIPING, 6" AND SMALLER
1-1/2" – KOOLPHEN-K

FLANGE, VALVE AND FITTING INSULATION

A. PROVIDE MOLDED OR MITERED COVERS FOR FLANGES, VALVES AND FITTINGS.

INSULATION SHIELD

A. FIELD FABRICATED. USE SECTIONS OF HIGH DENSITY FIBERGLASS OR FOAMGLASS INSULATION THAT WILL SUPPORT THE BEARING AREA AT HANGERS AND SUPPORTS. FURTHER SUPPORT INSULATION AT HANGERS AND SUPPORTS WITH A SHIELD OF GALVANIZED METAL EXTENDING NOT LESS THAN 4 INCHES ON EITHER SIDE OF THE SUPPORT BEARING AREA, COVERING AT LEAST HALF OF THE PIPE CIRCUMFERENCE, AND CONFORMING TO THE SCHEDULE BELOW. ADHERE METAL SHIELD TO INSULATION SO THAT METAL WILL NOT SLIDE WITH RESPECT TO INSULATION.

PIPE DIAMETER	INSULATED SECTION LENGTH IN INCHES	MINIMUM U.S. STANDARD GAGE OF METAL SHIELD
3" AND SMALLER	12	18
4" TO 6"	12	16
8" TO 18"	18	14

SEALANT, ADHESIVE AND FINISH

A. SEALANT. BENJAMIN FOSTER 30-45 TO BE USED AT VALVE COVERS.

B. ADHESIVE. FURNISH BENJAMIN FOSTER 85-20 TO SEAL LONGITUDINAL LAPS OF THE VAPOR BARRIER JACKET AND TO ADHERE BUTT JOINT COVERS. SELF-SEALING LAPS AND BUTT STRIPS ARE NOT ALLOWED.

C. FINISH. USE BENJAMIN FOSTER 30-65, 30-80 OR 30-90 WITH GLASS FABRIC REINFORCEMENT.

D. FINISH ARMAFLEX AP INSULATION WITH MINIMUM 2-COATS OF ARMSTRONG FINISH PER MANUFACTURER'S RECOMMENDATIONS FOR OUTDOOR INSULATION ONLY. DO NOT USE ARMSTRONG FINISH FOR INDOOR APPLICATIONS. ARMAFLEX AP INSULATION SHALL BE APPLIED WITH A LOW-VOC ADHESIVE, ARMAFLEX 520 BLV.

EXECUTION

PIPE

A. APPLY INSULATION TO CLEAN, DRY PIPES. BUTT INSULATION JOINTS FIRMLY TOGETHER. SEAL LONGITUDINAL LAPS AND BUTT STRIPS WITH SEALANT.

EXTERNAL DUCT INSULATION
WORK INCLUDED
THIS SECTION PROVIDES FOR THE FURNISHING AND INSTALLATION OF EXTERNAL INSULATION ON LOW-VELOCITY SUPPLY AIR DUCTS.
EXTERNAL INSULATION OF CONCEALED AND EXPOSED DUCTS IS INCLUDED IN THIS SECTION. INTERNAL ACOUSTIC DUCT LININGS ARE SPECIFIED UNDER DUCTWORK AND NOT INCLUDED IN THIS SECTION.

RELATED WORK
DIVISION 15 – MECHANICAL. INSULATION – GENERAL.

PRODUCTS
INSULATION
DUCT, ROUND, FLAT OVAL, OR RECTANGULAR. PROVIDE FLEXIBLE GLASS FIBER INSULATION WITH FACTORY-APPLIED, REINFORCED FOIL-KRAFT FACING. A MINIMUM THERMAL RESISTANCE OF 6.0 (SQ.FT. X DEGREES F X HRS. PER BTU) AT 75ØF IS REQUIRED, AFTER INSTALLATION (NOT IN BAG). PROVIDE MINIMUM 1-POUND DENSITY INSULATION, WHICH COMPLIES WITH SPECIFICATION H-B-100B.

COATING AND ADHESIVE
COATING. PROVIDE BENJAMIN FOSTER 30-35 VAPOR BARRIER COATING.
ADHESIVE. PROVIDE BENJAMIN FOSTER 85-20 VAPOR BARRIER ADHESIVE.

EXECUTION
DUCT, ROUND, OR RECTANGULAR
INSULATION SHALL BE WRAPPED TIGHTLY ON THE DUCTWORK WITH ALL CIRCUMFERENTIAL JOINTS BUTTED AND LONGITUDINAL JOINTS OVERLAPPED A MINIMUM OF 2 INCHES. IN ADDITION, SECURE INSULATION TO THE BOTTOM OF RECTANGULAR DUCTWORK OVER 24 INCHES WIDE BY THE USE OF MECHANICAL FASTENERS AT NO MORE THAN 18 INCHES ON CENTER.

INSTALLATION OF GREASE DUCT AND 1- AND 2-HOUR AIR DUCT WRAP

A. INSTALLATION TO BE PER UL LISTING AND MANUFACTURER'S RECOMMENDATIONS. WHEN DUCT WIDTH OR HEIGHT IS 18" OR WIDER, USE PINS AND CLIPS ON BOTTOM OF DUCT EVENLY SPACED 8-TO-12" APART FROM EACH OTHER ON ALL VERTICAL DUCT SECTIONS, SIDES AND BOTTOMS. AT OVERLAPS, INSTALL PINS AND CLIPS PER MANUFACTURER. ACCESS DOORS TO BE INSTALLED WITH TWO METAL ACCESS DOOR PLATES, THREADED STUDS WELDED AROUND PERIMETER AND SEALED CLK FIRESTOP SEALANT, THREE LAYERS OF PYROSCAT FP DUCT WRAP AND 2-MIL ALUMINUM FOIL TAPE, ALL PER MANUFACTURER'S RECOMMENDATIONS. FLOOR AND WALL PENETRATIONS TO BE PER MANUFACTURER'S RECOMMENDATIONS. REPAIR DAMAGED DUCT WRAP, ROD PENETRATIONS, ETC., PER MANUFACTURER'S RECOMMENDATIONS.

PIPING FOR EQUIPMENT DRAINS

SCOPE
THIS SECTION PROVIDES FOR FURNISHING AND INSTALLING PIPING AND PIPING APPURTENANCES TO DRAIN AIR HANDLERS AND OTHER EQUIPMENT REQUIRING DRAINS.

PIPE AND FITTINGS
PROVIDE SEAMLESS, HARD-DRAWN, TYPE L, COPPER WATER TUBE CONFORMING TO ASTM B 88, AND WROUGHT COPPER FITTINGS.

REFRIGERANT PIPING AND APPURTENANCES

GENERAL

WORK INCLUDED

A. THIS SECTION SPECIFIES THE FURNISHING AND INSTALLATION OF COPPER TUBING, VALVES, STRAINERS AND SIGHT GLASS FOR REFRIGERANT PIPING.

RELATED WORK

A. DIVISION 15 – MECHANICAL.

(1) PIPE AND PIPE FITTINGS.
(2) VALVES, STRAINERS, AND VENTS.
(3) LOW TEMPERATURE PIPING INSULATION.

PRODUCTS

PIPE AND FITTINGS

A. FURNISH REFRIGERANT PIPING OF TYPE L-ACR, HARD-DRAWN COPPER TUBING WITH SWEAT-TYPE, WROUGHT COPPER FITTINGS. CAST FITTINGS ARE NOT PERMITTED.

SERVICE VALVES

A. PROVIDE ANGLE OR GLOBE SERVICE VALVES, WITH SWEAT CONNECTIONS. USE PACKED-TYPE VALVES WITH GASKETED SEAL CAP AND BACK SEAT FEATURE. VALVES MUST BE WRENCH OPERATED. FURNISH VALVES ESPECIALLY DESIGNED FOR REFRIGERANT SERVICE, IN CONFORMANCE WITH THE ARI CODE.
B. PLACE SERVICE VALVES AT THE INLET AND OUTLET OF EACH COMPRESSOR, ON BOTH SIDES OF EACH STRAINER AND SOLENOID VALVE, AND AS OTHERWISE SHOWN AND SPECIFIED.

SIGHT GLASSES

A. PROVIDE SUITABLE DOUBLE-WINDOW SIGHT GLASS IN THE LIQUID LINE LEAVING THE CONDENSER.

SOLENOID VALVES

A. FURNISH PILOT-OPERATED, FLOATING PISTON SOLENOID VALVES SUITABLE FOR OPERATION WITH REFRIGERANT.
B. USE VALVES WITH A BRONZE BODY AND SWEAT-TYPE CONNECTIONS.
C. PROVIDE STAINLESS STEEL STEM AND PLUNGER ASSEMBLY, AND A STAINLESS STEEL PISTON.
D. FURNISH SOLENOID COILS WHICH ARE SEALED AND MOISTURE PROOF.
E. USE ELECTRICAL CHARACTERISTICS OF 115-VOLT, 60 HERTZ.

EXECUTION

PRESSURE TEST

AFTER ALL REFRIGERANT EQUIPMENT AND PIPING ARE INSTALLED, CHARGE THE SYSTEM WITH THE PROPER REFRIGERANT AND DRY NITROGEN TO 300 PSIG.

A. TEST ALL JOINTS WITH A HALIDE TORCH OR AN ELECTRONIC LEAK DETECTOR.
B. REPAIR ALL LEAKS AND RETEST EACH SYSTEM UNTIL PROVED ABSOLUTELY TIGHT.

EVACUATION AND DRYING

AFTER REFRIGERANT SYSTEM HAS BEEN PRESSURE TESTED, CONNECT A SUITABLE VACUUM PUMP, AND EVACUATE PIPING SYSTEM, INCLUDING ALL LINES AND EQUIPMENT. VERIFY ALL EQUIPMENT, GAUGES, HOSES, HOSE GASKETS, ETC., ARE AIR TIGHT AND LEAK FREE. USING A CALIBRATED MICRON GAUGE (BACHARACH, J.B., RONAIRE) TRIPLE EVACUATE REFRIGERANT SYSTEM AS FOLLOWS:

A. EVACUATE REFRIGERANT TO 1500 MICRONS, BREAK VACUUM USING DRY NITROGEN. DO NOT ALLOW ANY AIR TO ENTER SYSTEM.
B. EVACUATE REFRIGERANT SYSTEM FOR THE 2ND TIME TO 1500 MICRONS. BREAK VACUUM USING DRY NITROGEN. DO NOT ALLOW ANY AIR TO ENTER SYSTEM.
C. EVACUATE REFRIGERANT SYSTEM FOR THE 3RD TIME TO 500 MICRONS. MAINTAIN VACUUM FOR A MINIMUM OF FOUR HOURS AT 500 MICRONS.
D. DOCUMENT ALL STAGES OF EVACUATION AND SUBMIT A BRIEF WRITTEN REPORT TO THE ENGINEER.
E. CHARGE REFRIGERANT SYSTEM WITH THE PROPER REFRIGERANT. DO NOT ALLOW ANY AIR OR NITROGEN TO ENTER THE SYSTEM.

DUCTWORK (SHEETMETAL)

DUCT WORK TO BE FABRICATED AND INSTALLED PER LATEST EDITION OF SMACNA. GUARANTEE ALL DUCTWORK FOR ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE. THE GUARANTEE WILL COVER WORKMANSHIP. NOISE, CHATTER, WHISTLING, OR VIBRATION. DUCTWORK MUST BE FREE FROM PULSATION UNDER ALL CONDITIONS OF OPERATION.

CONTRACTOR COORDINATION
ERECT ALL DUCTS IN THE GENERAL LOCATIONS SHOWN, BUT CONFORM TO ALL STRUCTURAL AND FINISH CONDITIONS OF THE BUILDING. BEFORE FABRICATING ANY DUCTWORK, CHECK THE PHYSICAL CONDITIONS AT THE JOB SITE AND MAKE ALL NECESSARY CHANGES IN CROSS SECTIONS, OFFSETS, AND SIMILAR ITEMS, WHETHER THEY ARE SPECIFICALLY INDICATED OR NOT.

STANDARD AND CODES
EXCEPT AS OTHERWISE INDICATED, SHEET METAL DUCTWORK MATERIAL AND INSTALLATION SHALL COMPLY WITH THE FIFTH EDITION OF SMACNA LOW PRESSURE DUCT CONSTRUCTION STANDARDS.

SEALING OF SEAMS AND JOINTS (NOT FOR EXPOSED DUCTWORK)
THE ENTIRE DUCT SYSTEM SHALL BE SEALED. THE SEAMS AND JOINTS SHALL BE SEALED BY USE OF HARDCAST DT TAPE WITH FTA-20 (INDOOR) ADHESIVE. DUCT SHALL BE THOROUGHLY CLEANED PRIOR TO APPLICATION.

INSTALLATION
CONSTRUCTION STANDARDS. USE CONSTRUCTION METHODS WHICH FOLLOW THE REQUIREMENTS OUTLINED IN PARAGRAPH 1.5, AS WELL AS SMACNA BALANCING AND ADJUSTING PUBLICATIONS, UNLESS OTHERWISE INDICATED IN THESE SPECIFICATIONS OR ACCOMPANYING DRAWINGS.

REINFORCEMENT.
REINFORCE DUCTS HAVING ONE SIDE EQUAL TO 25 INCHES OR MORE IN ACCORDANCE WITH RECOMMENDED CONSTRUCTION PRACTICE OF SMACNA. CROSS BREAKING OR BEADING. CROSS BREAK OR BEAD SHEET METAL FOR RIGIDITY, EXCEPT DUCTS WHICH ARE 12 INCHES OR LESS IN THE LONGEST DIMENSION.
WALL PENETRATIONS. WHERE DUCTS PASS THROUGH WALLS IN EXPOSED AREAS, INSTALL SUITABLE ESCUTCHEONS MADE OF SHEET METAL ANGLES AS CLOSERS. AT ALL LOCATIONS WHERE DUCTWORK PASSES THROUGH FLOORS, PROVIDE WATERTIGHT SLEEVES PROJECTING 3 INCHES ABOVE FINISHED FLOOR AND FLUSH WITH BOTTOM OF FLOOR SLAB. FABRICATE SLEEVES OF 1/8-INCH THICK STEEL, GALVANIZED AFTER FABRICATION. ANCHOR INTO ADJACENT FLOOR SLAB AS REQUIRED. SLEEVES ARE REQUIRED INSIDE AS WELL AS OUTSIDE CHASES.
SUPPORT DUCTS WHERE PASSING THROUGH FLOORS WITH STEEL STRUCTURAL ANGLES OF ADEQUATE BEARING SURFACE, GALVANIZED AFTER FABRICATION AND RESTING ON TOP OF THE SLEEVE.
ELBOWS.

RECTANGULAR.
WHERE SQUARE ELBOWS ARE SHOWN, OR ARE REQUIRED FOR GOOD AIR FLOW, PROVIDE AND INSTALL BARBER-COLMAN OR EQUAL DOUBLE-WALL AIR FOIL TURNING VANES. USE RADIUS ELBOWS WITH A CENTER LINE RADIUS OF NOT LESS THAN 1-1/2 TIMES THE DUCT WIDTH. RADIUS ELBOWS MAY BE PROVIDED IN LIEU OF VANED ELBOWS WHERE SPACE AND AIR FLOW REQUIREMENTS PERMIT.
ROUND DUCT. PROVIDE ELBOWS WITH A CENTERLINE RADIUS OF 1-1/2 TIMES THE DUCT DIAMETER OR DUCT WIDTH. FOR ROUND DUCTS, FURNISH SMOOTH ELBOWS OR 5-PIECE, 90º ELBOWS AND 3-PIECE, 45º ELBOWS.
LOW PRESSURE INSULATED FLEXIBLE DUCT. DO NOT EXCEED 6 FEET IN LENGTH WITH ANY FLEXIBLE DUCT. SUPPORT DUCT INDEPENDENTLY OF LIGHTS, CEILING AND PIPING.

FLEXIBLE CONNECTIONS
WHERE DUCTS CONNECT TO FANS , MAKE FLEXIBLE AIRTIGHT CONNECTIONS USING "VENTGLAS" FABRIC. THE FABRIC MUST BE FIRE-RESISTANT, WATERPROOF AND MILDEW RESISTANT WITH A WEIGHT OF APPROXIMATELY 30 OUNCES PER SQUARE YARD. PROVIDE A MINIMUM OF 1/2-INCH SLACK IN THE CONNECTIONS, AND A MINIMUM OF 2-1/2-INCHES DISTANCE BETWEEN THE EDGES OF THE DUCTS. ALSO PROVIDE A MINIMUM OF 1-INCH SLACK FOR EACH INCH OF STATIC PRESSURE ON THE FAN SYSTEM. SECURELY FASTEN FABRIC TO APPARATUS AND TO ADJACENT DUCTWORK BY MEANS OF GALVANIZED FLATS OR DRAW BANDS.
ACCESS DOORS
INSTALL DUCTWORK ACCESS DOORS IN STRUCTURAL ANGLE FRAMES AND PROVIDE WITH SASH LOCKS AND HINGES ARRANGED FOR CONVENIENT ACCESS.
CONSTRUCT DOORS WHICH OCCUR IN INSULATED DUCTS WITH AN INSULATION FILLER.

DUCTWORK FOR REMOVAL OF GREASE-LADEN VAPORS
A. DUCTWORK REMOVING GREASE-LADEN VAPORS SUCH AS THOSE FROM COOKING EQUIPMENT SHOULD BE:

1. LISTED GREASE DUCTS ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION, OR 16-GAGE BLACK STEEL, WITH LIQUID-TIGHT CONTINUOUS EXTERNAL WELD ON ALL SEAMS AND JOINTS, COMPLYING WITH NFPA 96 AND UMC.

DUCT LEAKAGE
ALLOWABLE LEAKAGE. MAXIMUM ALLOWABLE LEAKAGE IS 5% OF TOTAL FLOW.

AIR BALANCE

SCOPE
CONTRACTOR SHALL PROVIDE AN AIR BALANCE OF ALL DUCTED SYSTEMS. ADJUST SHEAVES, BELTS, DRIVES, DAMPERS, ETC., TO OBTAIN AIR QUANTITIES SHOWN. VERIFY PROPER OPERATION OF ALL SYSTEMS. VERIFY ALL VOLUME DAMPERS ARE INSTALLED. PERFORM TAB OPERATIONS AS REQUIRED BY THE NEBB TEST AND BALANCE PROCEDURES MANUAL AND RECORD TESTS RESULTS FOR THE OWNER'S REVIEW.

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12/3/15 TBPE #F-15783

WILCO JUSTICE CENTER EXPANSION BREAK ROOMS

405 MARTIN LUTHER KING DR., GEORGETOWN, TEXAS 78626

PROJECT PHASE
PERMIT
REVISIONS

PROJECT NUMBER

DATE ISSUED
12/08/15

SHEET TITLE
Mechanical Specifications

SHEET NUMBER
M4-1

Williamson County, Texas

ELECTRICAL SYMBOLS

POWER

- SIMPLEX RECEPTACLE-18" AFF
- CEILING MOUNTED SIMPLEX RECEPTACLE. SEE SPECIFICATIONS AND/OR DRAWING GENERAL OR KEYED NOTES FOR ADDITIONAL INFORMATION.
- FLOOR MOUNTED SIMPLEX RECEPTACLE. SEE SPECIFICATIONS AND/OR DRAWING GENERAL OR KEYED NOTES FOR ADDITIONAL INFORMATION.
- SIMPLEX RECEPTACLE ON EMERGENCY POWER - 18" AFF
- DUPLEX RECEPTACLE-18" AFF
- DUPLEX RECEPTACLE ON EMERGENCY POWER - 18" AFF
- GF DUPLEX RECEPTACLE WITH ROUND FAULT CIRCUIT INTERRUPTER - 18" AFF
- WP DUPLEX RECEPTACLE WITH WEATHERPROOF WHILE IN USE COVER - 18" AFF
- TV DUPLEX RECEPTACLE FOR TELEVISION - 78" AFF
- # DUPLEX RECEPTACLE W/NUMERAL INDICATING CIRCUIT NUMBER
- TR TAMPER RESISTANT DUPLEX RECEPTACLE - 18" AFF
- DUPLEX RECEPTACLE; MOUNT BOTTOM OF DEVICE 4" ABOVE COUNTER OR DESKTOP OR SEE ARCH. ELEVATION IF PROVIDED
- QUADRAPLEX RECEPTACLE-18" AFF
- CEILING MOUNTED QUADRAPLEX RECEPTACLE
- CEILING MOUNTED DUPLEX RECEPTACLE. SEE SPECIFICATIONS AND/OR DRAWING GENERAL OR KEYED NOTES FOR ADDITIONAL INFORMATION.
- CEILING MOUNTED DUPLEX RECEPTACLE ON EMERGENCY POWER. SEE SPECIFICATIONS AND/OR DRAWING GENERAL OR KEYED NOTES FOR ADDITIONAL INFORMATION.
- FLOOR MOUNTED DUPLEX RECEPTACLE. SEE SPECIFICATIONS AND/OR DRAWING GENERAL OR KEYED NOTES FOR ADDITIONAL INFORMATION.
- FLOOR MOUNTED DUPLEX RECEPTACLE ON EMERGENCY POWER. SEE SPECIFICATIONS AND/OR DRAWING GENERAL OR KEYED NOTES FOR ADDITIONAL INFORMATION.
- FLOOR MOUNTED QUADRAPLEX RECEPTACLE. SEE SPECIFICATIONS AND/OR DRAWING GENERAL OR KEYED NOTES FOR ADDITIONAL INFORMATION
- SPECIALTY OUTLET, SEE SPECIFICATIONS AND/OR DRAWING GENERAL OR KEYED NOTES FOR ADDITIONAL INFORMATION.
- POWER POLE, SEE SPECIFICATIONS AND/OR DRAWING GENERAL NOTES OR KEYED NOTES FOR ADDITIONAL INFORMATION.
- DISCONNECT SWITCH, 3-POLE UNLESS NOTED OTHERWISE
- COMBINATION CONTACTOR STARTER AND DISCONNECT. 3-POLE FUSIBLE SWITCH TYPE WITH MINIMUM NEMA '1' UNLESS NOTED OTHERWISE
- M THREE-PHASE MANUAL MOTOR STARTER AND DISCONNECT PLUS ENCLOSURE
- $_{M}$ SINGLE-PHASE MANUAL MOTOR STARTER AND DISCONNECT PLUS ENCLOSURE
- ELECTRICAL CONNECTION
- ELECTRICAL SOLENOID OR COIL CONNECTION
- MOTOR - BY DIV. 23. XX REPRESENTS HORSEPOWER VALUE
- JUNCTION BOX
- MULTIOUTLET ASSEMBLY
- ELECTRICAL PANELBOARD
- ELECTRICAL ENCLOSURE
- PUSH PLATE (AUTO DOOR)
- B BUSWAY (IN PLAN)
- GROUNDING BUS BAR OR MODULE
- 5/8" X 10' COPPER CLAD STEEL GROUND ROD
- VFD ## VARIABLE FREQUENCY CONTROLLER, SEE SCHEDULE
- ATTACHED DEVICE IS WALL MOUNTED
- ENCLOSED DEVICE IS FLOOR MOUNTED
- E EMERGENCY POWER OFF SWITCH WITH SHUNT TRIP TO POWER PANEL
- P WALL MOUNTED J-BOX FOR FURNITURE SYSTEM POWER/CIRCUIT WHIP CONNECTION. SEE SPECIFICATIONS AND/OR DRAWING GENERAL NOTES OR KEYED NOTES FOR ADDITIONAL INFORMATION.
- P FIRE RATED POKE-THRU FOR FURNITURE SYSTEM POWER CONNECTION. SEE DRAWING FOR BASIS OF DESIGN MODEL NUMBER.
- F CAST-IN-PLACE OR RAISED ACCESS FLOOR BOX. SEE DRAWING FOR BASIS OF DESIGN MODEL NUMBER.

CIRCUITING

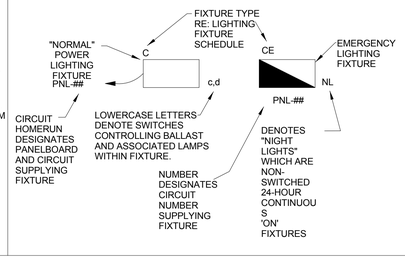
- LA-# CIRCUIT HOMERUN TO SOURCE OF SUPPLY: "LA' INDICATES SOURCE OF SUPPLY (SWBD, PANEL, ETC.) '#' SIGN INDICATES RECOMMENDED CIRCUIT IN SOURCE OF SUPPLY TO UTILIZE. UNLESS NOTED OTHERWISE IN THE DOCUMENTS, THIS SYMBOL SHALL REPRESENT A CIRCUIT CONTAINING INDIVIDUAL PHASE, NEUTRAL, AND EQUIPMENT GROUNDING CONDUCTORS, ALL WITH INSULATION RATINGS PER THE SPECIFICATIONS. THE MINIMUM WIRE SIZE SHALL BE #12 AWG COPPER.
- SWITCH LEG
- NEUTRAL
- HOT
- GROUND
- CIRCUIT OR LINE CONTINUATION OR BREAK
- TRAVELER WIRE

LIGHTING

- 2'x4' FLUORESCENT LIGHTING FIXTURE ON NORMAL POWER
- 2'x2' FLUORESCENT LIGHTING FIXTURE ON NORMAL POWER
- 1'x4' FLUORESCENT LIGHTING FIXTURE ON NORMAL POWER
- HATCHING INDICATES LIGHTING FIXTURE WITH EMERGENCY POWER PROVISION
- WALL MOUNTED EMERGENCY LIGHTING UNIT
- WALL MOUNTED LIGHT FIXTURES
- WALL MOUNTED LIGHT FIXTURE
- WALL MOUNTED LIGHT FIXTURES
- POLE MOUNTED LIGHT FIXTURES
- DUAL POLE MOUNTED LIGHT FIXTURES
- CEILING MOUNTED DOWNLIGHTS
- UNDERCABINET LIGHT OR COVE/STRIP LIGHT
- TRACK LIGHTING
- SPORTS LIGHTING POLE AND LUMINAIRE
- EXIT SIGN. FIELD REMOVABLE DIRECTIONAL ARROWS (CHEVRON TYPE) AS SHOWN ON DRAWINGS. SHADING INDICATES FACE OF SIGN.
- REMOTE-MOUNTED EMERGENCY LIGHTING FIXTURE HEAD(S)
- SPECIAL WORDING ILLUMINATED SIGN
- $_{S}X$ SINGLE POLE SWITCH - 48" AFF. 'X' INDICATES SWITCH DESIGNATION. SEE LIGHT FIXTURE FOR SWITCH DESIGNATION.
- $_{S}3X$ 3-WAY SWITCH - 48" AFF
- $_{S}4X$ 4-WAY SWITCH - 48" AFF
- $_{S}DX$ DIMMER SWITCH - 48" AFF
- $_{S}PX$ SINGLE POLE SWITCH WITH PILOT LIGHT - 48" AFF
- $_{S}KX$ KEY OPERATED SWITCH - 48" AFF
- $_{S}TX$ SPRING WOUND TIMER OPERATED SWITCH - 48" AFF
- $_{S}LX$ LOW VOLTAGE SWITCH - 48" AFF
- $_{S}OS$ SINGLE RELAY, LINE VOLTAGE WALLBOX TYPE OCCUPANCY SENSOR, WATT-STOPPER 'DW-103' OR APPROVED EQUAL - MOUNT AT +48" AFF U.N.O.
- $_{S}OS2$ DUAL-RELAY, LINE VOLTAGE WALLBOX TYPE OCCUPANCY SENSOR, WATT-STOPPER 'DW-203' OR APPROVED EQUAL - MOUNT AT +48" AFF U.N.O.
- OS OCCUPANCY SENSOR - CEILING MOUNTED. SEE SPECIFICATIONS AND/OR GENERAL OR KEYED NOTES FOR ADDITIONAL INFORMATION.
- OS OCCUPANCY SENSOR - WALL MOUNTED. SEE SPECIFICATIONS AND/OR DRAWING GENERAL OR KEYED NOTES FOR ADDITIONAL INFORMATION.
- R MOTION DETECTOR RELAY. SEE SPECIFICATIONS AND/OR DRAWING GENERAL OR KEYED NOTES FOR MORE INFORMATION.
- PE PHOTO-ELECTRIC CELL/SWITCH. ORIENT TO FACE NORTHERN SKY U.N.O. SEE SPECIFICATIONS AND/OR DRAWING GENERAL OR KEYED NOTES FOR ADDITIONAL INFORMATION.
- LOW VOLTAGE LIGHTING CONTROL MOMENTARY OVERRIDE SWITCH. SEE SPECIFICATIONS AND/OR DRAWING GENERAL OR KEYED NOTED FOR ADDITIONAL INFORMATION.
- R OCCUPANCY SENSOR RELAY PACK. SEE SPECIFICATIONS AND/OR GENERAL OR KEYED NOTES FOR ADDITIONAL INFORMATION.
- CEILING FANS

NOTES

1. GENERAL NOTE
2. (1) KEYED NOTE
3. (1) REVISION TRIANGLE



COMMUNICATIONS

- TELEPHONE OUTLET - 18" AFF
- W WALL MOUNTED TELEPHONE OUTLET - 48" AFF
- DATA OUTLET - 18" AFF
- TELEPHONE/DATA OUTLET 18" AFF UNO - SEE DETAILS
- TV TELEVISION OUTLET - 78" AFF
- TELEPHONE OUTLET MOUNTED ABOVE COUNTER TOP
- IC INTERCOM OUTLET
- CEILING MOUNTED DATA OUTLET
- IC CEILING MOUNTED INTERCOM OUTLET
- CEILING MOUNTED PHONE OUTLET
- TV CEILING MOUNTED TELEVISION OUTLET
- FLOOR MOUNTED DATA/VOICE OUTLET
- C CLOCK OUTLET. SEE SPECIFICATIONS AND/OR DRAWING GENERAL OR KEYED NOTES FOR ADDITIONAL INFORMATION.
- S CEILING MOUNTED PAGING SPEAKER
- S_{V} SPEAKER VOLUME CONTROL
- LOW VOLTAGE, MOMENTARY PUSH BUTTON, SEE SPECIFICATIONS AND/OR DRAWING FOR ADDITIONAL INFORMATION.
- TELEPHONE TERMINAL BOARD
- D WALL MOUNTED J-BOX FOR FURNITURE SYSTEM DATA/TELEPHONE CABLING CONNECTION. SEE SPECIFICATIONS AND/OR DRAWING GENERAL OR KEYED NOTES FOR ADDITIONAL INFORMATION. FIRE RATED POKE-THRU FOR FURNITURE SYSTEM DATA/TELEPHONE CONNECTION. SEE DRAWING FOR BASIS OF DESIGN MODEL NUMBER.
- D

ONE-LINE

- POINT OF CONNECTION
- CIRCUIT BREAKER
- CONTACT
- CAPACITOR
- SWITCH
- INSTRUMENT TRANSFORMER
- POWER TRANSFORMER
- GROUND
- TRANSFER SWITCH
- EM ELECTRONIC MULTIFUNCTION METER
- FUSE
- DRAWOUT CIRCUIT BREAKER
- STAB-ON BREAKER
- OVERLOAD RELAY
- MOTOR CONTROL CENTER COMBINATION STARTER
- THREE-PHASE MOTOR STARTER ONLY
- THREE PHASE COMBINATION MOTOR STARTER AND DISCONNECT
- M THREE PHASE MANUAL MOTOR STARTER AND DISCONNECT
- THREE PHASE DISCONNECT SWITCH
- $_{M}$ SINGLE PHASE MOTOR STARTER AND DISCONNECT.
- VFD ## VARIABLE FREQUENCY CONTROLLER, BY DIV. 23
- CNTR EQUIPMENT CONTROLLER SUPPLIED BY EQUIPMENT VENDOR
- # MOTOR, # REPRESENTS HORSEPOWER VALUE. BY DIV. 23
- ST SHUNT TRIP
- K KIRK KEY INTERLOCK
- SPD SURGE PROTECTION DEVICE
- PFCC POWER FACTOR CORRECTION CAPACITOR
- GF GROUND FAULT CIRCUIT INTERRUPTER.
- A30 FEEDER SIZE, SEE FEEDER SCHEDULE UNLESS NOTED ON DRAWINGS.
- M CURRENT TRANSFORMER AND METER

ABBREVIATIONS

ABBREV.	DESCRIPTION
A	AMMETER, AMPERE
AB	ABSOLUTE
AC	ALTERNATING CURRENT
ACB	AIR CIRCUIT BREAKER
AF	AMPERE FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMP INTERRUPTING CAPACITY
AL	ALUMINUM
ANN	ANNUNCIATOR
ARF	ABOVE RAISED FLOOR
AS	AMMETER SWITCH
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
ATX	AUTO TRANSFORMER
B	BELL
BC	BARE COPPER
BKR	BREAKER
BLDG	BUILDING
BOC	BOTTOM OF CONDUIT
BOD	BOTTOM OF DUCT
BOT	BOTTOM OF TRAY
BRN	BUS REFERENCE NUMBER
C	CONDUIT, COIL
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
CO	CONDUIT ONLY
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CRE	CORROSION RESISTANT
CRS	COATED RIGID STEEL CONDUIT
CRWP	CLEANROOM WALL PANEL
CT	CURRENT TRANSFORMER
CU	COPPER
D	DUCT
DB	DUCT BANK
DIA	DIAMETER
DC	DIRECT CURRENT
DIV	DIVISION
△	DELTA CONNECTED
E	EMPTY, EMERGENCY
(E)	EXISTING
EG	ENGINE GENERATOR
EM	EMERGENCY
EPO	EMERGENCY POWER OFF
EMO	EMERGENCY MANUAL OFF
EMT	ELECTRICAL METALLIC TUBING
ENT	ELECTRICAL NON-METALLIC TUBING
EOL	END-OF-LINE DEVICE
EOS	ELECTROSTATIC OVERSTRESS
ERT	EMERGENCY RESPONSE TEAM
EWC	ELECTRIC WATER COOLER
F	FLUSH
(F)	FUTURE
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FBO	FURNISHED BY OWNER
FC	FIELD-COORDINATE
FDR	FEEDER
FLR	FLOOR
FMC	FLEXIBLE METALLIC CONDUIT
FNC	FLEXIBLE NONMETALLIC CONDUIT
FOL	FAST SPEED OL RELAY
FU	FUSE
FV	FIELD-VERIFY
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
FVRI	FIELD-VERIFY PRIOR TO ROUGH-IN
G	GROUND
GEC	GROUNDING ELECTRODE CONDUCTOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFR	GROUND FAULT RELAY
GRD	GROUND
GSM	GAS SAFETY MONITOR
H	HORN
HG	HOSPITAL GRADE
HH	HANDHOLE
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
HT	HEIGHT
ICCB	INSULATED CASE CIRCUIT BREAKER
IER	INTEGRATED EQUIPMENT RATING
IG	ISOLATED GROUND
IMC	INTERMEDIATE METALLIC CONDUIT
I/O	INPUT/OUTPUT
IPS	UNINTERRUPTIBLE POWER SUPPLY
I.T.	INFORMATION TECHNOLOGY
J	JUNCTION BOX
K	KEY INTERLOCK
KA	KILOAMPERE
KVA	KILOVOLT-AMPERE
KVAR	KILOVOLT-AMPERE REACTIVE
KW	KILOWATT
KWH	KILOWATT HOUR
KX	KNOX BOX
L	LONG
LAN	LOCAL AREA NETWORK
LC	LIGHTING CONTACTOR
LFMC	LIQUIDTIGHT FMC
LFNC	LIQUIDTIGHT FNC
LFS	LIGHTING FIXTURE SCHEDULE
LSI	LONG TIME, SHORT TIME, INSTANTANEOUS TRIP
LSIG	LSI PLUS GROUND FAULT TRIP
LTG	LIGHTING

ABBREV.	DESCRIPTION
M	MAGNETIC, COIL OR CONTACT
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCCB	MOLDED CASE CIRCUIT BREAKER
MCP	MOTOR CIRCUIT PROTECTOR
MFR	MANUFACTURER
MH	MANHOLE
MLO	MAIN LUGS ONLY
MT,MTD	MOUNT, MOUNTED
MTG	MOUNTING
(N)	NEW
N	NEUTRAL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NF	NON-FUSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NP	NAMEPLATE
NTS	NOT TO SCALE
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED, OWNER INSTALLED
OHE	OVERHEAD ELECTRIC
OL	OVERLOAD RELAY
OO	ON-OFF
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
PA	PUBLIC ADDRESS
PB	PUSHBUTTON
PC	PHOTOCELL
PIV	POST INDICATOR VALVE
PL	PILOT LIGHT
PNL	PANEL
PVC	POLYVINYL CHLORIDE
∅	PHASE
QTY	QUANTITY
(R)	RELOCATED
R	RATE OF RISE
RCPT	RECEPTACLE
RM	ROOM
RNC	RIGID NON-METALLIC CONDUIT
RQD	REQUIRED
RSC	RIGID STEEL CONDUIT
RVNR	REDUCED VOLTAGE NON-REVERSING
RVR	REDUCED VOLTAGE REVERSING
S	SPEAKER
SBJ	SYSTEM BONDING JUMPER
SCADA	SUPERVISORY CONTROL & DATA ACQUISITION
SCP	SECURITY CONTROL PANEL
SFEP	SMOKE/FUME EXHAUST PANEL
SOL	SLOW SPEED OL RELAY
SPD	SURGE PROTECTION DEVICE
SQ	SQUARE
SS	STAINLESS STEEL
STP	SHIELDED TWISTED PAIR
SUR	SURFACE
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMMETRICAL
2S1W	TWO SPEED, ONE WINDING
2S2W	TWO SPEED, TWO WINDING
T	THERMOSTAT
TB	TERMINAL BLOCK
TBD	TO BE DETERMINED
TDR	TIME DELAY RELAY
TJB	TERMINAL JUNCTION BOX
TS	TAMPER SWITCH
TWL	TWISTLOCK
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
TYP	TYPICAL
U/E	UNDERGROUND ELECTRIC
U/G	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SUPPLY
UTP	UNSHIELDED TWISTED PAIR
V	VOLTMETER, VOLT
VA	VOLT-AMPERE
VAR	VOLT-AMPERE REACTIVE
VFC	VARIABLE FREQUENCY CONTROLLER
VP	VAPORPROOF
VS	VALVE SUPERVISORY SWITCH, VOLTMETER SWITCH
VT	VOLTAGE TRANSFORMER
W	WATT, WIRE, WIDE
WCR	WITHSTAND/CLOSING RATING
WHD	WATTHOUR DEMAND METER
WP	WEATHER PROTECTED
X	EXPLOSION CLASS & GROUP AS NOTED
(X)	EXISTING TO BE RELOCATED
XFMR	TRANSFORMER
Y	WYE CONNECTED
Y-△	WYE-DELTA REDUCED VOLTAGE STARTER
Z	IMPEDANCE

SHEET INDEX

LINE TYPES

DEMOLITION WORK

- EXISTING TO REMAIN
- EXISTING TO BE REMOVED

NOTE: DEMOLITION WORK IS SPECIFIED ONLY ON DEMOLITION SHEETS UNLESS EXPLICITY NOTED OTHERWISE.

NEW WORK

- EXISTING TO REMAIN
- NEW WORK
- NEW WORK, OBSCURED VIEW

GENERAL NOTES:

1) SOME SYMBOLS MAY NOT BE USED FOR THIS PROJECT.
2) SEE SPECIFICATIONS AND/OR DRAWINGS FOR ADDITIONAL INFORMATION REGARDING THE DEVICES ILLUSTRATED ON THIS SHEET.

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PROJECT PHASE
PERMIT
REVISIONS

PROJECT NUMBER

DATE ISSUED
12/08/15
SHEET TITLE
ELECTRICAL SYMBOLS, ABBREV. & SHEET INDEX

E0.0

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GENERAL NOTES - POWER PLANS

(THESE APPLY TO ALL SHEETS CONTAINING POWER PLANS/INFORMATION)

1. REFER TO SHEET E0.0 FOR ELECTRICAL SYMBOLS AND ABBREVIATIONS.
2. THE DRAWINGS ARE DIAGRAMMATIC ONLY. CONTRACTOR SHALL COORDINATE LIGHT FIXTURES, DEVICES, AND EQUIPMENT LOCATIONS WITH BUILDING ELEMENTS, THE COMPLETE SET OF CONTRACT DOCUMENTS, AND THE WORK OF OTHER TRADES PRIOR TO ROUGH-IN AND/OR INSTALLATION. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT FIXTURE PLACEMENT AND HEIGHT.
3. ADDITIONAL WORK WILL BE REQUIRED TO PROVIDE NECESSARY INFRASTRUCTURE FOR OTHER BUILDING SYSTEMS NOT SHOWN ON THESE PLANS. REFER TO ALL DRAWINGS AND SPECIFICATIONS INCLUDED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-COORDINATING ALL CIRCUIT REQUIREMENTS AND SHALL PROVIDE ALL INFRASTRUCTURE REQUIRED (CIRCUIT BREAKERS, SWITCHES, FUSES, TERMINATIONS, CONDUIT SYSTEM, BACKBOX(ES), ETC.) FOR A COMPLETE AND OPERABLE SYSTEM. CONNECT ADDITIONAL CIRCUITS NOT SHOWN ON THIS PLAN TO THE NEAREST SUITABLE PANELBOARD WITH SUFFICIENT AMPACITY. DENOTE ADDITIONAL CIRCUITS ON AS-BUILT FLOOR PLANS AND PANEL SCHEDULES.
4. THE COMMUNICATIONS (DATA & TELEPHONE) AND SECURITY SYSTEMS ARE TO BE SPECIFIED BY THE OWNER. THE CONTRACTOR FIELD-COORDINATE THE EXACT REQUIREMENTS WITH THE OWNER AND/OR OWNER'S REPRESENTATIVE AND SHALL FURNISH AND INSTALL ALL INFRASTRUCTURE REQUIRED FOR A COMPLETE AND OPERABLE SYSTEM. RE: GENERAL NOTE #3 ABOVE.
5. "PROVIDE" SHALL BE UNDERSTOOD TO MEAN "FURNISH AND INSTALL".
6. THE MINIMUM ALLOWABLE CONDUCTOR SIZE SHALL BE #12 AWG.
7. THE MINIMUM ALLOWABLE CONDUIT SIZE SHALL BE 3/4". THE CONTRACTOR SHALL ADHERE TO FILL RATES REQUIRED BY NEC.
8. ALL WIRING DEVICES (RECEPTACLES AND SWITCHES) SHALL BE RATED 20 AMPERE, MINIMUM.
9. SHOULD ANY 120VAC, 20-AMPERE POWER DEVICE BE SPECIFIED WITHOUT CIRCUIT INFORMATION, PROVIDE (2)-#12, #12G. (OR LARGER IF REQ'D DUE TO CIRCUIT LENGTH; RE: SPECS AND BRANCH-CIRCUIT VOLTAGE DROP TABLE) IN 3/4" C. FROM THE DEVICE TO THE NEAREST AVAILABLE CIRCUIT WITH SUFFICIENT CAPACITY. IF NO CIRCUIT WITH SUFFICIENT CAPACITY EXISTS, PROVIDE A NEW CIRCUIT FROM THE APPROPRIATE PANELBOARD SERVING THAT AREA. IF NECESSARY, PROVIDE A NEW 20-AMPERE CIRCUIT BREAKER AND ALL CONDUIT, CONDUCTORS, BOXES, TERMINATIONS, LABELING, ETC. AS NECESSARY. MINIMUM CONDUCTOR SIZE SHALL BE #12 AWG OR AS REQUIRED DUE TO CIRCUIT LENGTH. RE: SPECIFICATIONS FOR MORE INFORMATION.
10. UNLESS NOTED OTHERWISE, ALL 20-AMPERE POWER RECEPTACLES LOCATED IN AREAS CONSIDERED 'WET' LOCATIONS SHALL BE WEATHER-RESISTANT GFCI-TYPE RECEPTACLES. THE ENGINEER AND AHJ SHALL HAVE FINAL DECISION ON DETERMINATION OF 'WET' LOCATION. PROVIDE A WEATHERPROOF WHILE-IN-USE COVER PLATE.
11. ALL POWER RECEPTACLES PROTECTED BY ONE (1) OR MORE GROUND-FAULT CIRCUIT INTERRUPTER (GFCI) DEVICES SHALL BE IDENTIFIED WITH THE MANUFACTURER'S LABELS.
12. REFER TO ELECTRICAL SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
13. NON-METALLIC CABLE IS NOT ALLOWED.
14. NOTE: CIRCUITS SHALL NOT BE SHARED BETWEEN OUTLETS, DEVICES, ETC. ON DIFFERENT BUILDING LEVELS OR FLOORS, OR BETWEEN DIFFERENT TENANTS, UNLESS NOTED OTHERWISE IN THE CONSTRUCTION DOCUMENTS.
15. ADHERE TO WORKING CLEARANCES REQUIRED BY THE NEC AND THE AHJ.
16. UPON COMPLETION OF THIS PROJECT, THE CONTRACTOR SHALL PROVIDE CONSISTENT, COMPLETE, AND ACCURATELY LABELED PANELBOARD SCHEDULES. EVERY CIRCUIT SHALL BE LEGIBLY IDENTIFIED AS TO ITS CLEAR, EVIDENT, AND SPECIFIC PURPOSE OR USE. THE IDENTIFICATION SHALL INCLUDE SUFFICIENT DETAIL TO ALLOW EACH CIRCUIT TO BE DISTINGUISHED FROM ALL OTHERS. UPDATE AND PROVIDE AS-BUILT DOCUMENTS ACCORDINGLY.
17. THE ELECTRICAL SYSTEM SHALL BE PROVIDED IN STRICT ACCORDANCE WITH THE 2014 NATIONAL ELECTRICAL CODE, THE 2000 INTERNATIONAL ENERGY CONSERVATION CODE, AND ANY AND ALL APPLICABLE CITY OF GEORGETOWN DESIGN STANDARDS. NOTHING SPECIFIED IN THESE DOCUMENTS SHALL BE MISCONSTRUED AS RELIEVING THE CONTRACTOR FROM STRICT COMPLIANCE WITH THESE DOCUMENTS. IN THE EVENT OF A CONFLICT BETWEEN THE CONSTRUCTION DOCUMENTS AND THE DOCUMENTS LISTED ABOVE, PROVIDE THE MOST STRINGENT INSTALLATION/EQUIPMENT/DEVICES, ETC. THAT WILL SATISFY THE REQUIREMENTS CONTAINED IN ALL DOCUMENTS.
18. ALL NEW JUNCTION BOX COVERS SHALL BE CLEARLY LABELED AND IDENTIFIED WITH THE BRANCH-CIRCUIT(S) CONTAINED WITHIN, INCLUDING THE SOURCE PANEL OR BOARD I.D. LABEL. EX: "A-1,3,5" ON FACE OF JUNCTION BOX COVER.
19. PROVIDE COLOR CODING OF CONDUCTORS PER THE LOCAL ORDINANCE AND AS REQUIRED BY THE AHJ. COLOR CODING SHALL BE CONSISTENT THROUGHOUT THE ENTIRE PROJECT. THE CONTRACTOR SHALL OBTAIN COLOR CODING INFORMATION PRIOR TO CONDUCTOR INSTALLATION.
20. USE OF MC CABLE SHALL BE LIMITED TO FINAL CONNECTION TO LIGHTING FIXTURES (WHIPS) AND IN-WALL USE. ALL CIRCUIT HOMERUNS SHALL BE INSTALLED IN EMT OR RIGID GALVANIZED STEEL - NON-METALLIC AND/OR MC CABLE IS NOT ALLOWED FOR CIRCUIT HOMERUNS. REFER TO ELECTRICAL SPECIFICATIONS FOR MORE INFORMATION.
21. AN INSULATED EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED WITHIN ALL RACEWAYS. THE RACEWAY SHALL NOT BE USED FOR THE PURPOSE OF EQUIPMENT GROUNDING CONDUCTOR.

GENERAL NOTES - LIGHTING PLANS

(THESE APPLY TO ALL SHEETS CONTAINING LIGHTING PLANS/INFORMATION)

1. REFER TO SHEET E0.0 FOR ELECTRICAL SYMBOLS AND ABBREVIATIONS.
2. THE DRAWINGS ARE DIAGRAMMATIC ONLY. CONTRACTOR SHALL COORDINATE LIGHT FIXTURES, DEVICES, AND EQUIPMENT LOCATIONS WITH BUILDING ELEMENTS, THE COMPLETE SET OF CONTRACT DOCUMENTS, AND THE WORK OF OTHER TRADES PRIOR TO ROUGH-IN AND/OR INSTALLATION. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT FIXTURE PLACEMENT AND HEIGHT. FIELD-COORDINATE THE EXACT LOCATIONS PRIOR TO ROUGH-IN
3. "PROVIDE" SHALL BE UNDERSTOOD TO MEAN "FURNISH AND INSTALL".
4. ALL WIRING DEVICES (RECEPTACLES AND TOGGLE SWITCHES) SHALL BE RATED 20 AMPERE, MINIMUM.
5. ALL LIGHTING CIRCUITS SHALL BE A MINIMUM (2)-#10, #10G. IN 3/4" C. OR LARGER IF SO REQUIRED DUE TO CIRCUIT DISTANCE. REFER TO SPECIFICATIONS AND BRANCH-CIRCUIT VOLTAGE DROP TABLE FOR ADDITIONAL INFORMATION.
6. SWITCHES THAT DO NOT HAVE A SWITCHING LETTER DESIGNATION SHALL CONTROL ALL LIGHTS LOCATED WITHIN THE ROOM WHERE THE SWITCH IS LOCATED.
7. COORDINATE ALL NON-EMERGENCY 24 HOUR LIGHTS WITH OWNER AND ARCHITECT. A (24) HOUR NON-SWITCHED LIGHT SHALL BE LOCATED OVER SECURITY KEYPAD(S) UNLESS OTHERWISE DIRECTED BY OWNER.
8. CIRCUITRY ASSOCIATED WITH THE SCOPE OF WORK SHALL BE ACCURATELY IDENTIFIED AT THE RESPECTIVE ABOVE CEILING JUNCTION BOXES. THE ASSOCIATED PANEL, CIRCUITS, AND VOLTAGE SHALL BE IDENTIFIED ON ALL JUNCTION BOX COVERS.
9. CONTRACTOR SHALL PROVIDE ACCURATE TYPE-WRITTEN PANEL SCHEDULES INDICATING THE LOCATION OF LIGHT FIXTURES AND DEVICES BY BOTH ROOM NUMBERS AND AREA DESCRIPTION.
10. CONTRACTOR IS TO INCORPORATE IN THE BID THE HIGHEST FIXTURE LAYOUT PRICE IF ANY DISCREPANCIES BETWEEN THIS SHEET AND ARCHITECTURAL REFLECTED CEILING PLAN LIGHTING LAYOUT IS FOUND.
11. EXIT SIGNS SHALL BE NON-SWITCHED. TYPICAL ALL EXIT SIGNS.
12. THE CONTRACTOR SHALL VERIFY AND PROVIDE THE REQUIRED BALLAST, DRIVER, AND/OR POWER SUPPLY QUANTITY FOR EACH FIXTURE TYPE, OR GROUP OF FIXTURES, PRIOR TO BID.
13. REFER TO ELECTRICAL SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
14. NOTE: CIRCUITS SHALL NOT BE SHARED BETWEEN OUTLETS, DEVICES, ETC. ON DIFFERENT FLOORS, UNLESS NOTED OTHERWISE IN THE CONSTRUCTION DOCUMENTS.
15. WHERE A REMOTE BALLAST AND/OR BATTERY PACK IS SPECIFIED OR REQUIRED, THE CONTRACTOR SHALL PROVIDE BALLAST AND/OR BATTERY PACK IN AN ACCESSIBLE LOCATION WITHIN THE SELECTED EQUIPMENT MANUFACTURER'S RATINGS AND DISTANCE LIMITATIONS. FIELD-COORDINATE THE EXACT INSTALLATION LOCATION AND PROVIDE SMALL LABEL AT FIXTURE AND AT BALLAST AND BATTERY PACK INDICATING FIXTURE AND BALLAST/BATTERY PACK ARE ASSOCIATED WITH ONE ANOTHER. PROVIDE REMOTE-MOUNTED TEST SWITCH IF NECESSARY IN A LOCATION EASILY ACCESSIBLE BY THE OWNER'S MAINTENANCE STAFF (NOT MOUNTED ABOVE OR WITHIN A CEILING). PROVIDE ALL REQUIRED INFRASTRUCTURE NECESSARY FOR THE REMOTE MOUNTING OF THE BALLAST AND/ BATTERY PACK PLUS TEST SWITCH, INCLUDING, BUT NOT LIMITED TO: JUNCTION BOXES, BACK BOXES; RACEWAY, TERMINATIONS, DEVICES, INTERCONNECTING WIRING, LABELING, COVER PLATES, CONDUCTORS, ETC.
16. THE CONTRACTOR SHALL PROVIDE IN THEIR BID AN ALLOWANCE FOR FURNISHING AND INSTALLING FOUR (4) EXIT SIGNS (MATCH EXISTING BUILDING STANDARDS), INCLUDING CIRCUITING TO THE APPROPRIATE CIRCUIT. THE EXACT LOCATION SHALL BE AS DETERMINED BY THE AHJ.

GENERAL NOTES - DEMOLITION PLANS

(THESE APPLY TO ALL SHEETS CONTAINING DEMOLITION PLANS/INFORMATION)

1. CONTRACTOR SHALL VISIT THE SITE PRIOR TO BID AND START OF CONSTRUCTION TO DETERMINE EXISTING CONDITION OF ELECTRICAL SYSTEMS AND DEVICES. CONTRACTOR WILL BE RESPONSIBLE FOR REVIEWING ANY DOCUMENTS WHICH REFLECT EXISTING CONDITIONS.
2. CONTRACTOR SHALL PROVIDE THE OWNER A WRITTEN LIST OF ANY UNCOVERED OR SURVEYED CONSTRUCTION AND/OR CODE DEFICIENCIES NOT INDICATED ON THE DOCUMENTS. CONTRACTOR SHALL OBTAIN WRITTEN DIRECTION FROM OWNER ON HOW ADDRESS DEFICIENCIES PRIOR TO STARTING ANY WORK.
3. CONTRACTOR SHALL VERIFY AND/OR DETERMINE EXISTING CIRCUITING ARRANGEMENTS FOR EQUIPMENT TO BE REMOVED BEFORE DE-ENERGIZING ANY CIRCUITS. CONTRACTOR SHALL CIRCUIT TRACE TO DETERMINE PANEL AND CIRCUIT CONNECTIONS FOR ALL EXISTING EQUIPMENT TO BE REMOVED IN PREPARATION FOR RENOVATING THE DEVICES.
4. CONTRACTOR SHALL PLAN ANY NECESSARY POWER OUTAGES, SHALL PREPARE A WRITTEN PROCEDURE TO BE FOLLOWED DURING THE OUTAGE TO COMPLETE THE PLANNED WORK, SHALL PROVIDE DETAILS TO THE OWNER OF WHERE POWER DISRUPTION WILL OCCUR, AND SHALL COORDINATE WITH THE OWNER TO DETERMINE WHEN THE POWER DISRUPTION IS ACCEPTABLE.
5. CONTRACTOR SHALL PROVIDE TEMPORARY WIRING AND CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. CONTRACTOR SHALL REMOVE, RELOCATE, AND EXTEND EXISTING INSTALLATIONS TO ACCOMMODATE NEW CONSTRUCTION. IF WORK MUST BE PERFORMED ON ENERGIZED EQUIPMENT OR CIRCUITS, CONTRACTOR SHALL USE PERSONNEL QUALIFIED FOR SUCH OPERATIONS.
6. CONTRACTOR SHALL REMOVE EXPOSED ABANDONED CONDUIT, INCLUDING ABANDONED CONDUIT ABOVE ACCESSIBLE CEILING FINISHES. CONTRACTOR SHALL CUT CONDUIT FLUSH WITH WALLS AND FLOORS, AND PATCH SURFACES.
7. CONTRACTOR WILL BE RESPONSIBLE FOR CONFIRMING ALL WIRING REMAINING IN RENOVATED AREAS IS ACTIVE UPON COMPLETION OF RENOVATION AND ANY EXISTING WIRING WHICH IS INACTIVE OR ABANDONED SHALL BE REMOVED.
8. UPON COMPLETION OF RENOVATION, CONTRACTOR SHALL PROVIDE CONTINUITY OF ANY CIRCUITS TO EXISTING OUTLETS OR EQUIPMENT TO REMAIN THAT MAY BE INTERRUPTED DUE TO THE DEMOLITION OF WALLS OR THE REMOVAL OF EXISTING DEVICES. CONTRACTOR SHALL CIRCUIT TRACE ALL EXISTING EQUIPMENT TO REMAIN TO CONFIRM PANEL AND CIRCUIT NUMBER OUTLET IS CONNECTED, AND PROVIDE 'AS-BUILT' DRAWINGS INDICATING FINAL CIRCUITING. NEW PANEL DIRECTORIES ON PANELBOARDS SHALL BE CORRECTED TO REFLECT CIRCUITING CHANGES DUE TO DEMOLITION.
9. EXISTING EQUIPMENT REMOVED FROM THE BUILDING SHALL BECOME THE PROPERTY OF THE OWNER IF HE ELECTS TO RETAIN THEM. ALL MATERIALS AND EQUIPMENT BEING REMOVED BY THE CONTRACTOR AND NOT REUSED IN THE PROJECT WHICH THE OWNER ELECTS NOT TO RETAIN BECOMES THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE PREMISES.
10. CONTRACTOR SHALL MAINTAIN ACCESS TO EXISTING ELECTRICAL EQUIPMENT OR DEVICES WHICH REMAIN ACTIVE. CONTRACTOR SHALL EXTEND EXISTING INSTALLATIONS USING MATERIALS AND METHODS AS SPECIFIED.
11. CONTRACTOR SHALL CLEAN AND REPAIR EXISTING MATERIALS AND EQUIPMENT WHICH REMAIN OR ARE TO BE REUSED. CONTRACTOR SHALL RESTORE ANY DAMAGED MATERIAL, EQUIPMENT, AND/OR FINISHES TO REMAIN TO ORIGINAL CONDITION UPON COMPLETION OF RENOVATION. CONTRACTOR SHALL EMPLOY CRAFTS THAT ORIGINALLY PERFORMED THE WORK.
12. THE CONTRACTOR SHALL NOTE ANY EXISTING FIRE RATING/PREVENTION METHODS EMPLOYED - FIRE CAULK, LIGHTING FIXTURE "FIRE BOXES", ETC. THE CONTRACTOR SHALL MAINTAIN AND/OR RESTORE THE ORIGINAL FIRE RATING (USING SAME METHOD AS ORIGINALLY PROVIDED) AT EACH LOCATION AFFECTED BY THE WORK PERFORMED IN THIS RENOVATION. FINAL INSTALLATION APPROVAL SHALL BE BY THE AHJ AND OWNER.
13. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER OF ANY DISCOVERED FACILITY DEFICIENCIES THAT COULD POTENTIALLY CAUSE A LIFE SAFETY HAZARD TO BUILDING OCCUPANTS. FOR EXAMPLE, LIGHTING FIXTURES NOT PROPERLY SUPPORTED, BROKEN CEILING GRIDS OR TILES, DAMAGED LIGHTING FIXTURES, EXPOSED CONDUCTORS, ETC. THE CONTRACTOR SHALL NOTIFY THE OWNER AND WAIT FOR NOTICE OF HOW TO PROCEED PRIOR TO RENOVATING THE AFFECTED AREA.
14. BEGINNING OF DEMOLITION INDICATES THAT CONTRACTOR ACCEPTS EXISTING CONDITIONS.

Voltage	Phase	#12 Max. Distance	#10 Max. Distance	#8 Max. Distance
120	1	66	102	163
208	1	115	177	283
208	3	132	205	326
240	1	132	205	326
240	3	153	236	377
277	1	153	236	376
480	1	265	409	652
480	3	306	472	753

Notes:
1) All single-phase distances are 'one way' distances.
2) All distances assume copper conductor material.
3) All distances assume a 20 ampere overcurrent protective device.

1 BRANCH CIRCUIT VOLTAGE DROP TABLE
NOT TO SCALE

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12/08/2015 DIV. 26 ONLY

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REVISIONS

PROJECT NUMBER

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SECTION 26 05 00 ELECTRICAL GENERAL PROVISIONS

1. GENERAL

1.1 SCOPE:

A. THE WORK COVERED BY DIVISION 26 INCLUDES THE FURNISHING OF ALL MATERIALS, LABOR, TRANSPORTATION, TOOLS, PERMITS, FEES, UTILITIES, AND INCIDENTALS NECESSARY AND THE COMPLETE INSTALLATION OF ALL ELECTRICAL WORK REQUIRED IN THE CONTRACT DOCUMENTS AND SPECIFIED HEREIN. THE INTENT OF THE CONTRACT DOCUMENTS IS TO PROVIDE AN INSTALLATION COMPLETE IN EVERY RESPECT. IN THE EVENT THAT ADDITIONAL DETAILS OR SPECIAL CONSTRUCTION MAY BE REQUIRED FOR THE WORK INDICATED OR SPECIFIED IN DIVISION 26 OR WORK SPECIFIED IN OTHER DIVISIONS OF THE SPECIFICATIONS, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ALL MATERIAL AND LABOR WHICH IS USUALLY FURNISHED WITH SUCH SYSTEMS IN ORDER TO MAKE THE INSTALLATION COMPLETE AND OPERATIONAL. INCLUDE ALL COST ASSOCIATED WITH THE REQUIRED TESTING AS SPECIFIED IN SPECIFICATION SECTION 26 60 05 ELECTRICAL TESTING - 600V AND BELOW.

B. THE CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION AND PROPER RELATION OF HIS WORK TO THE BUILDING STRUCTURE AND TO THE WORK OF OTHER TRADES. THE CONTRACTOR SHALL ADVISE THE ARCHITECT/ENGINEER OF ANY DISCREPANCY PRIOR TO BIDDING.

1.2 DEFINITIONS:

A. WHERE USED IN THE DRAWINGS AND/OR SPECIFICATIONS, 'PROVIDE' SHALL BE UNDERSTOOD TO MEAN 'FURNISH AND INSTALL.'

B. 'CONSTRUCTION DOCUMENTS' SHALL BE UNDERSTOOD TO MEAN THE COMPLETE SET OF CONSTRUCTION DRAWINGS AND SPECIFICATIONS, INCLUDING, BUT NOT LIMITED TO, ALL ARCHITECTURAL, MECHANICAL, PLUMBING, AND OTHER CONSULTANT DRAWINGS AND SPECIFICATIONS.

C. WHERE USED IN THE DRAWINGS AND/OR SPECIFICATIONS, 'OWNER' OR 'OWNER' SHALL BE UNDERSTOOD TO MEAN THE FACILITY OWNER AND/OR TENANT.

D. WHERE USED IN THE DRAWINGS AND/OR SPECIFICATIONS, 'CONTRACTOR' OR 'CONTRACTOR' SHALL BE UNDERSTOOD TO MEAN THE GENERAL CONTRACTOR AND THEIR SUB-CONTRACTORS.

1.3 CODES AND STANDARDS:

A. ALL WORK SHALL COMPLY WITH THE LATEST ADOPTED EDITION OF THE APPLICABLE RULES AND REGULATIONS OF THE NATIONAL ELECTRICAL CODE (NEC), THE NATIONAL ELECTRICAL SAFETY CODE (NESC), AMERICANS WITH DISABILITIES ACT (ADA), THE TERMS AND CONDITIONS OF SERVICE OF THE ELECTRICAL UTILITY, AS WELL AS ANY OTHER AUTHORITIES THAT MAY HAVE LAWFUL JURISDICTION PERTAINING TO THE WORK SPECIFIED. NONE OF THE TERMS OR PROVISIONS OF THIS SPECIFICATION SHALL BE CONSTRUED AS WAIVING ANY OF THE RULES, REGULATIONS, OR REQUIREMENTS OF THESE CODES OR AUTHORITIES.

B. THE CONTRACTOR SHALL THOROUGHLY STUDY AND RESOLVE ANY CODE VIOLATION DISCOVERED IN THE CONTRACT DOCUMENTS WITH THE ARCHITECT/ENGINEER PRIOR TO AWARD OF THE CONTRACT. SHOULD THE CONTRACTOR BE AWARDED THE CONTRACT AND A CODE VIOLATION IS DISCOVERED AT A LATER DATE, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A DESCRIPTION OF THE ISSUE WITH A PROPOSED RESOLUTION THAT WILL BRING THE INSTALLATION INTO FULL CODE COMPLIANCE. THE PROPOSED RESOLUTION SHALL NOT CREATE ANY ADDITIONAL PROJECT COST OR DELAY. FOR RENOVATIONS TO EXISTING ELECTRICAL SYSTEMS, THE CONTRACTOR SHALL, UPON DISCOVERY OF AN EXISTING INSTALLATION THAT VIOLATES CURRENT CODES AND THAT IS WITHIN THE SCOPE OF WORK OF THE PROJECT, SUBMIT TO THE GENERAL CONTRACTOR AND ENGINEER A DESCRIPTION OF THE ISSUE WITH A PROPOSED RESOLUTION THAT WILL BRING THE INSTALLATION INTO FULL CODE COMPLIANCE.

C. THE CODES SHALL GOVERN IN CASE OF DIRECT CONFLICT BETWEEN THE CODES AND THE DRAWINGS OR SPECIFICATIONS. IN ANY INSTANCE WHERE THE DRAWINGS OR SPECIFICATIONS CALL FOR MATERIALS OF A BETTER QUALITY OR LARGER SIZE THAN REQUIRED BY THE CODES, THOSE PROVISIONS OF THE DRAWINGS OR SPECIFICATIONS SHALL TAKE PRECEDENCE.

1.4 RELATED DOCUMENTS:

A. THE DRAWINGS AND SPECIFICATIONS, THE GENERAL CONDITIONS, SUPPLEMENTARY GENERAL CONDITIONS AND OTHER REQUIREMENTS OF DIVISION 01, APPLY TO THE WORK SPECIFIED IN DIVISION 26, AND SHALL BE COMPLIED WITH IN EVERY RESPECT. THE CONTRACTOR SHALL EXAMINE ALL OF THE DOCUMENTS WHICH MAKE UP THE CONTRACT DOCUMENTS, AND SHALL COORDINATE THEM WITH THE WORK ON THE ELECTRICAL PLANS AND IN DIVISION 26 OF THESE SPECIFICATIONS.

1.5 DRAWINGS AND SPECIFICATIONS:

A. THE SPECIFICATIONS ARE ACCOMPANIED BY DRAWINGS FOR THE PROJECT AND DETAILS OF THE INSTALLATIONS INDICATING THE LOCATIONS OF EQUIPMENT, OUTLETS, LIGHT FIXTURES, SWITCHES, CONTROLS, RECEPTACLES, ETC. THE DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY TO EACH OTHER, AND WHAT IS REQUIRED BY ONE SHALL BE AS BINDING AS IF REQUIRED BY BOTH. ITEMS SPECIFICALLY MENTIONED IN THE SPECIFICATIONS BUT NOT SHOWN ON THE DRAWINGS AND/OR ITEMS SHOWN ON THE DRAWINGS BUT NOT SPECIFICALLY MENTIONED IN THE SPECIFICATIONS SHALL BE INSTALLED BY THE CONTRACTOR UNDER THE APPROPRIATE SECTION OF WORK AS IF THEY WERE BOTH SPECIFIED AND SHOWN. SHOULD THE DRAWINGS OR SPECIFICATIONS CONFLICT, THE CONTRACTOR SHALL INSTALL/COMPLY WITH THE LARGER OR MORE STRINGENT REQUIREMENT.

B. THE INTERRELATION OF THE SPECIFICATIONS, DRAWINGS, AND SCHEDULES IS AS FOLLOWS: THE SPECIFICATIONS DETERMINE THE NATURE, INSTALLATION PROCEDURES, AND QUALITY OF THE MATERIALS, THE DRAWINGS SHOW IN SCHEMATIC FORM, WITH THE USE OF SYMBOLS AND NOTES, THE QUANTITY, GENERAL LOCATION, SIZES, AND INTERCONNECTIONS OF THE VARIOUS DEVICES REQUIRED TO ACCOMPLISH THE ELECTRICAL SYSTEM FOR THIS PROJECT, AND THE SCHEDULES GIVE THE PERFORMANCE CHARACTERISTICS. SHOULD THE DRAWINGS DISAGREE IN THEMSELVES, OR WITH THE SPECIFICATIONS, THE BETTER QUALITY OR GREATER QUANTITY OF WORK OR MATERIALS SHALL BE ESTIMATED UPON, AND UNLESS OTHERWISE DIRECTED BY THE ARCHITECT/ENGINEER IN WRITING, SHALL BE PERFORMED OR FURNISHED. IN CASE THE SPECIFICATIONS SHOULD NOT FULLY AGREE WITH THE SCHEDULES, THE LATTER SHALL GOVERN. FIGURES INDICATED ON DRAWINGS GOVERN SCALE MEASUREMENTS AND LARGE SCALE DETAILS GOVERN SMALL SCALE DRAWINGS.

C. CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING THE ACTUAL DIMENSIONS, EQUIPMENT CONNECTION REQUIREMENTS, PROPER ROUTING AND COORDINATE WITH OTHER DIVISIONS OF WORK SO THAT THE ELECTRICAL SYSTEM IS AN INTEGRAL PART OF THE PROJECT. EXISTING CONDITIONS, ARCHITECTURAL AND MECHANICAL DRAWINGS SHALL BE USED TO DETERMINE EXACT LOCATIONS OF FIXTURES, DEVICES AND EQUIPMENT.

D. IF ANY DEPARTURES FROM THE CONTRACT DOCUMENTS ARE DEEMED NECESSARY BY THE CONTRACTOR, DETAILS OF SUCH DEPARTURES AND THE REASONS THEREFORE SHALL BE SUBMITTED IN WRITING TO THE ARCHITECT/ENGINEER FOR REVIEW. NO DEPARTURES FROM THE CONTRACT DOCUMENTS SHALL BE MADE WITHOUT PRIOR WRITTEN APPROVAL OF THE ARCHITECT/ENGINEER.

1.6 ELECTRICAL UTILITIES:

A. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VISIT THE SITE AND CONFIRM WITH EACH INDIVIDUAL UTILITY THE EXACT REQUIREMENTS FOR ALL ELECTRICAL UTILITIES. THE BID SUBMITTED BY THE CONTRACTOR SHALL INCLUDE COSTS FOR ALL SUCH COORDINATION WORK AS WELL AS ANY AND ALL ELECTRICAL COMPANY CHARGES AND/OR FEES. SHOULD ADDITIONAL ITEMS BE REQUIRED, INCLUDING, BUT NOT LIMITED TO SECONDARY ENCLOSURES, TRANSOCKETS, P.T./C.T. ENCLOSURES, ETC. THE CONTRACTOR SHALL PROVIDE THE REQUIRED ITEMS AT NO ADDITIONAL COST.

1.7 TEMPORARY SERVICES:

A. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO FURNISH AND INSTALL A COMPLETE SYSTEM FOR TEMPORARY CONSTRUCTION POWER AND LIGHTING. TEMPORARY SERVICES SHALL BE INSTALLED IN ACCORDANCE WITH REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC), THE NATIONAL ELECTRICAL SAFETY CODE (NESC), AND THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA). THE CONTRACTOR SHALL PAY FOR THE COST OF THE TEMPORARY CONSTRUCTION POWER AND LIGHTING SYSTEMS.

B. REMOVE ALL TEMPORARY SERVICES UPON COMPLETION OF THE WORK.

1.8 BUILDING CONSTRUCTION:

A. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW THE DRAWINGS AND SPECIFICATIONS SO AS TO THOROUGHLY FAMILIARIZE HIMSELF WITH THE TYPE AND QUALITY OF CONSTRUCTION TO BE PROVIDED ON THIS PROJECT.

B. THE CONTRACTOR SHALL CAREFULLY INVESTIGATE STRUCTURAL AND FINISH CONDITIONS AND SHALL COORDINATE WITH ALL OTHER TRADES IN ORDER TO AVOID INTERFERENCE BETWEEN THE VARIOUS PHASES OF WORK.

C. THE APPROXIMATE LOCATIONS OF ELECTRICAL ITEMS ARE INDICATED ON THE ELECTRICAL DRAWINGS. THESE DRAWINGS ARE DIAGRAMMATIC AND ARE NOT INTENDED TO GIVE COMPLETE AND EXACT DETAILS IN REGARD TO LOCATION OF OUTLETS, APPARATUS, ETC. EXACT LOCATIONS ARE TO BE DETERMINED BY ACTUAL MEASUREMENTS AT THE JOB SITE AND WILL IN ALL CASES BE SUBJECT TO THE APPROVAL OF THE ARCHITECT/OWNER/ENGINEER. THE ARCHITECT/OWNER/ENGINEER RESERVES THE RIGHT TO MAKE ANY REASONABLE CHANGES IN THE LOCATION INDICATED WITHOUT ADDITIONAL COST.

1.9 CONTRACTOR QUALIFICATIONS:

A. AN ACCEPTABLE CONTRACTOR FOR THE WORK UNDER THIS DIVISION SHALL BE A SPECIALIST IN THIS FIELD AND HAVE THE PERSONAL EXPERIENCE, TRAINING, SKILL AND THE ORGANIZATION TO PROVIDE A PRACTICAL WORKING SYSTEM. IF REQUIRED, HE SHALL BE ABLE TO FURNISH ACCEPTABLE EVIDENCE OF HAVING CONTRACTED FOR AND INSTALLED NOT LESS THAN THREE SYSTEMS OF COMPARABLE SIZE AND TYPE TO THIS ONE, THAT HAVE SERVED THEIR OWNERS SATISFACTORILY FOR NOT LESS THAN THREE YEARS.

B. THE FOREMAN OR SUPERINTENDENT FOR THIS WORK SHALL HAVE HAD EXPERIENCE IN INSTALLING NOT LESS THAN THREE SUCH SYSTEMS. ADEQUATE AND COMPETENT SUPERVISION SHALL BE PROVIDED TO ENSURE FIRST CLASS WORKMANSHIP AND INSTALLATION.

C. WORK SHALL BE EXECUTED AND ALL MATERIALS INSTALLED TO PRESENT A NEAT APPEARANCE WHEN COMPLETED IN ACCORDANCE WITH THE BEST PRACTICE OF THE TRADES IN A THOROUGH, SUBSTANTIAL, WORKMANLIKE MANNER BY COMPETENT WORKMEN.

D. THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION TECHNIQUES REQUIRED FOR ALL SYSTEMS SPECIFIED AND SHOWN ON THE DRAWINGS.

E. THE CONTRACTOR IS RESPONSIBLE FOR THE SAFETY OF ALL WORKMEN AND VISITORS ON THE JOBSITE AT ALL TIMES. THE CONTRACTOR IS TO BE HELD RESPONSIBLE FOR THE FULL DIRECTION AND SUPERVISION OF ALL WORK BEING PERFORMED BY HIS EMPLOYEES, AGENTS OR CONTRACTORS. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE AREA AT ALL TIMES PRIOR TO ACCEPTANCE, PARTICULARLY IN THE PREVENTION OF DAMAGE TO THE ELECTRICAL DISTRIBUTION SYSTEM BY THE ACTIVITIES OF OTHER TRADES AND UTILITIES.

1.10 OBSERVATION OF THE WORK:

A. ARCHITECT/ENGINEER'S AND/OR OWNER'S AUTHORIZED REPRESENTATIVE SHALL HAVE THE RIGHT TO OBSERVE THE WORK AT ANY TIME. THE CONTRACTOR SHALL HAVE A REPRESENTATIVE PRESENT WHEN HIS WORK IS BEING OBSERVED, AND HE SHALL GIVE ASSISTANCE, AS MAY BE REQUIRED, TO THE ARCHITECT/ENGINEER'S REPRESENTATIVE. RECOMMENDATIONS MADE BY OBSERVER SHALL BE PROMPTLY CARRIED OUT, AND ALL UNSATISFACTORY MATERIAL AND/OR WORKMANSHIP SHALL BE REPLACED TO THE SATISFACTION OF THE ARCHITECT/ENGINEER.

1.11 SUBMITTALS:

A. COMPLY WITH THE REQUIREMENTS OF DIVISION 01.

B. CONTRACTOR IS RESPONSIBLE FOR CONFORMING AND CORRELATING EQUIPMENT DIMENSIONS AT JOB SITE; FOR INFORMATION WHICH PERTAINS TO FABRICATION PROCESSES OR CONSTRUCTION TECHNIQUES; AND FOR COORDINATION OF WORK OF ALL TRADES. REVIEW OF SUBMITTALS SHALL NOT RELIEVE THE CONTRACTOR ANY SUBCONTRACTOR, AND/OR MATERIAL SUPPLIER OF RESPONSIBILITY FOR DEVIATION FROM REQUIREMENTS OF CONTRACT DOCUMENTS, NOR FOR ERRORS OR OMISSIONS IN SUBMITTALS.

C. SUBMITTAL OF SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES WILL BE ACCEPTED ONLY WHEN THEY ARE SUBMITTED BY THE CONTRACTOR. EACH SUBMITTAL SHALL INDICATE BY SIGNED STAMP THAT THE SUBMITTALS HAVE BEEN CHECKED AND THAT THEY ARE IN ACCORDANCE WITH CONTRACT DOCUMENTS AND THAT DIMENSIONS AND RELATIONSHIP WITH WORK OF OTHER TRADES HAVE BEEN CHECKED. SUBMITTALS THAT HAVE NOT BEEN CHECKED AND SIGNED BY THE CONTRACTOR WILL BE RETURNED FOR CHECKING BEFORE BEING REVIEWED.

D. ARCHITECT/ENGINEER'S REVIEW OF SUBMITTALS IS ONLY FOR GENERAL CONFORMANCE WITH DESIGN CONCEPT OF PROJECT AND GENERAL COMPLIANCE WITH THE CONTRACT DOCUMENTS. ARCHITECT'S/ENGINEER'S REVIEW CONSTITUTES AN ACKNOWLEDGMENT ONLY AND IN NO WAY RELIEVES THE CONTRACTOR OF FULL RESPONSIBILITY FOR PROVIDING ALL MATERIALS AND SYSTEMS IN ACCORDANCE WITH THE INTENT OF THE CONTRACT DOCUMENTS. ANY MATERIAL PROVIDED BY THE CONTRACTOR WITHOUT SUBMITTALS REVIEWED BY THE ENGINEER IS AT THE CONTRACTOR'S RISK AND CONSTITUTES THE CONTRACTOR'S AGREEMENT TO COMPLY WITH THE ENGINEER'S INTENT WHETHER SPECIFIED, SHOWN, OR IMPLIED.

E. ORGANIZE DATA IN A HARDBACK, 3-RING BINDER (1/2" MINIMUM) WITH THE PROJECT TITLE SHOWN ON THE SPINE AND FRONT COVER AND SECTIONS INDEXED BY SPECIFICATION NUMBER. SHOW ANY REVISIONS TO EQUIPMENT LAYOUTS REQUIRED BY USE OF SELECTED EQUIPMENT. TYPE OF SUBMITTAL DATA IS LISTED IN THE INDIVIDUAL SECTIONS OF THIS DIVISION.

F. SUBMITTALS PROVIDED FOR LIGHTING FIXTURES, SAFETY SWITCHES/DISCONNECTS, MOTOR STARTERS, SWITCHBOARDS, PANELBOARDS, AND TRANSFORMERS SHALL EXPLICITLY INDICATE, BY USE OF UNIQUE IDENTIFIER, EQUIPMENT FOR WHICH DEVICE IS PROPOSED TO BE UTILIZED WITH OR ON. EXAMPLES OF ACCEPTABLE IDENTIFIERS INCLUDE, BUT ARE NOT LIMITED TO, EQUIPMENT CONNECTION SCHEDULE I.D. TAGS/MARKS, LIGHTING FIXTURE SCHEDULE FIXTURE TYPES, SWITCHBOARD/ PANELBOARD I.D. TAGS, ETC. SUBMITTALS PROVIDED WITHOUT THESE IDENTIFYING MARKS CLEARLY DENOTED ON EQUIPMENT CUTSHEETS AND BILL OF MATERIAL SHALL CONSTITUTE ACCEPTABLE GROUNDS FOR SUBMITTAL REJECTION WITHOUT REVIEW. THE CONTRACTOR SHALL REFER TO EACH INDIVIDUAL SPECIFICATION SECTION FOR ADDITIONAL SUBMITTAL REQUIREMENTS.

1.12 SUBSTITUTIONS AND PRODUCT OPTIONS:

A. SUBMIT TO ARCHITECT/ENGINEER A COMPLETE LIST OF MAJOR PRODUCTS PROPOSED TO BE USED, WITH THE NAME OF THE MANUFACTURER AND THE INSTALLING SUBCONTRACTOR.

B. CONTRACTOR'S OPTIONS:

1) FOR PRODUCTS SPECIFIED ONLY BY REFERENCE STANDARD, SELECT ANY PRODUCT MEETING THAT STANDARD.

2) FOR PRODUCTS SPECIFIED BY NAMING ONE OR MORE PRODUCTS OR MANUFACTURERS, SELECT ANY ONE OF THE PRODUCTS OR MANUFACTURERS NAMED, OR AN EQUIVALENT PRODUCT OR MANUFACTURER, WHICH COMPLIES WITH THE SPECIFICATIONS. CONTRACTOR MUST SUBMIT A REQUEST FOR SUBSTITUTION FOR ANY PRODUCT OR MANUFACTURER NOT SPECIFICALLY NAMED; SEE BELOW FOR FURTHER INSTRUCTION.

C. "BASIS OF DESIGN" MANUFACTURERS' NAMES AND CATALOG NUMBERS SPECIFIED UNDER SECTIONS OF DIVISION 26 ARE USED TO ESTABLISH STANDARDS OF DESIGN, PERFORMANCE, QUALITY AND SERVICEABILITY AND NOT TO LIMIT COMPETITION. EQUIPMENT OF EQUIVALENT DESIGN TO THAT SPECIFIED FOR LISTED AND APPROVED MANUFACTURERS WILL BE ACCEPTABLE UPON APPROVAL BY THE ARCHITECT/ENGINEER. THE ARCHITECT/ENGINEER WILL CONSIDER WRITTEN REQUESTS FOR SUBSTITUTION OF SPECIFIED PRODUCTS, IF RECEIVED FOURTEEN DAYS PRIOR TO BID DATE. AFTER BID DATE, REQUEST FOR SUBSTITUTION WILL BE CONSIDERED ONLY IN CASES OF PRODUCT UNAVAILABILITY OR OTHER CONDITIONS BEYOND CONTROL OF THE CONTRACTOR. IT IS THE CONTRACTOR'S RESPONSIBILITY TO:

1) INVESTIGATE THE PROPOSED SUBSTITUTE PRODUCT TO DETERMINE THAT IT HAS ALL THE SAME ACCESSORIES AND IS EQUIVALENT OR SUPERIOR IN ALL RESPECTS TO THAT SPECIFIED.

2) PROVIDE THE SAME GUARANTEE FOR THE SUBSTITUTION THAT HE WOULD FOR THAT SPECIFIED.

3) COORDINATE THE INSTALLATION OF THE EQUIPMENT WHICH HE PROPOSES TO SUBSTITUTE WITH ALL TRADES AND INCLUDES THE COSTS FOR ANY CHANGES REQUIRED FOR THE WORK TO BE COMPLETE IN ALL RESPECTS. THE CONTRACTOR WILL PREPARE SHOP DRAWINGS WHERE REQUIRED BY THE ARCHITECT/ENGINEER OR WHERE DIMENSIONS VARY.

4) PROVIDE ITEMIZED COST BREAKDOWN INCLUDING MATERIAL AND LABOR FOR THE PROPOSED PRODUCT SUBSTITUTIONS.

5) SUBMIT COMPLETE DESIGN AND PERFORMANCE DATA.

NOTE: SUBSTITUTION REQUESTS ARE NOT ALLOWED FOR SELECT ITEMS. REFER TO EACH INDIVIDUAL SPECIFICATION SECTION FOR MORE INFORMATION.

1.13 PROJECT RECORD DOCUMENTS:

A. THROUGHOUT PROGRESS OF THE WORK OF THIS CONTRACT, MAINTAIN AN ACCURATE RECORD OF ALL CHANGES IN THE CONTRACT DOCUMENTS. UPON COMPLETION OF THE WORK OF THIS CONTRACT, TRANSFER THE RECORDED CHANGES TO A SET OF REPRODUCIBLE RECORD DOCUMENTS. DELEGATE THE RESPONSIBILITY FOR MAINTENANCE OF RECORD DOCUMENTS TO ONE PERSON ON THE CONTRACTOR'S STAFF. THOROUGHLY COORDINATE ALL CHANGES WITHIN THE RECORD DOCUMENTS, MAKING ADEQUATE AND PROPER ENTRIES ON EACH PAGE OF SPECIFICATIONS AND EACH SHEET OF DRAWINGS AND OTHER DOCUMENTS WHERE SUCH ENTRY IS REQUIRED TO PROPERLY SHOW THE CHANGE. MARK THE DRAWINGS WITH A COLORED PENCIL. RECORD INSTALLED FEEDER CONDUITS, DIMENSIONING THE EXACT LOCATION AND ELEVATION OF THE CONDUIT. ACCURACY OF RECORDS SHALL BE SUCH THAT FUTURE SEARCH FOR ITEMS SHOWN IN THE CONTRACT DOCUMENTS MAY REASONABLY RELY ON INFORMATION OBTAINED FROM THE APPROVED RECORD DOCUMENTS. MAKE ALL ENTRIES WITHIN 24 HOURS AFTER RECEIPT OF INFORMATION.

B. THE ARCHITECT/ENGINEER WILL VISIT THE SITE PERIODICALLY AND MAY REQUEST TO SEE THE "AS-BUILT" DOCUMENTATION. IF THE CONTRACTOR DOES NOT KEEP AN ACCURATE SET OF AS-BUILT DRAWINGS, THE PAY REQUEST MAY BE ALTERED OR DELAYED AT THE REQUEST OF THE ARCHITECT/ENGINEER.

C. RECORD DOCUMENTS SHALL CONSIST OF THE FOLLOWING:

1) PROMPTLY FOLLOWING AWARD OF CONTRACT, SECURE FROM THE ARCHITECT/ENGINEER, ONE COMPLETE SET OF ALL DOCUMENTS COMPRISING THE CONTRACT.

2) AT A TIME NEAR THE COMPLETION OF THE WORK, SECURE A REVIEW BY THE ARCHITECT/ENGINEER OF ALL RECORDED "AS-BUILT" DATA TO DATE. MAKE ALL REQUIRED REVISIONS NOTED BY THE ARCHITECT/ENGINEER.

3) CAREFULLY TRANSFER ALL CHANGE DATA SHOWN ON THE JOB SET OF RECORD DRAWINGS TO THE SET TO BE SUBMITTED, COORDINATING THE CHANGES AS REQUIRED, AND CLEARLY INDICATING AT EACH AFFECTED DETAIL AND OTHER DRAWING THE FULL DESCRIPTION OF ALL CHANGES MADE DURING CONSTRUCTION AND THE ACTUAL LOCATION OF ITEMS. CALL ATTENTION TO EACH ENTRY BY DRAWING A "CLOUD" AROUND THE AREA OR AREAS AFFECTED. MAKE ALL CHANGE ENTRIES NEATLY, CONSISTENTLY, AND IN INK OR CRISP BLACK PLASTIC LEAD PENCIL.

4) SUBMIT THE COMPLETED TOTAL SET OF RECORD DOCUMENTS TO THE ARCHITECT/ENGINEER AS DESCRIBED ABOVE. PARTICIPATE IN REVIEW MEETING OR MEETINGS AS REQUIRED BY THE ARCHITECT/ENGINEER, MAKE ALL REQUIRED CHANGES IN THE RECORD DOCUMENTS, AND PROMPTLY DELIVER THE FINAL RECORD DOCUMENTS TO THE ARCHITECT/ENGINEER. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL CERTIFY THE "RECORD DRAWINGS" FOR CORRECTNESS BY SIGNING THE FOLLOWING CERTIFICATION, WHICH SHALL BE LOCATED ON, OR ADJACENT TO, THE TITLE BLOCK OF EACH INDIVIDUAL DRAWING:

CERTIFIED CORRECT (3/8" HIGH LETTERS)

(NAME OF THE CONTRACTOR)

BY

DATE

(NAME OF THE SUB-CONTRACTOR)

BY

DATE

D. DELIVER RECORD DRAWINGS TO THE ARCHITECT/ENGINEER IN THE NUMBER AND MANNER SPECIFIED IN DIVISION 01 - GENERAL REQUIREMENTS.

1.14 OPERATION AND MAINTENANCE DATA ("O&M" MANUALS):

A. PREPARE AND SUBMIT SETS OF PRODUCT DATA, SHOP DRAWINGS, WIRING DIAGRAMS, INSTRUCTIONS AND PARTS LISTS FOR OPERATING AND MAINTAINING EQUIPMENT AND SYSTEMS INSTALLED. INCLUDE IN THE INSTRUCTIONS A DESCRIPTION OF NORMAL ADJUSTMENTS AND A LIST OF ITEMS TO BE LUBRICATED. PROVIDE ANY SPECIAL SERVICING TOOLS AS REQUIRED FOR THIS EQUIPMENT. DELIVER MANUALS AND TOOLS TO THE ARCHITECT/ENGINEER AS A CONDITION OF FINAL ACCEPTANCE. REFER TO DIVISION 01 FOR OTHER REQUIREMENTS. THE MANUAL SHALL INCLUDE:

1) MANUFACTURER'S INSTALLATION INSTRUCTION BROCHURES.

2) MANUFACTURER'S LOCAL REPRESENTATIVE AND/OR DISTRIBUTOR'S NAME AND ADDRESS.

3) MANUFACTURER'S OPERATING AND MAINTENANCE BROCHURES.

4) MANUFACTURER'S INTERNAL WIRING DIAGRAM.

5) CONTRACTOR'S INSTALLATION WIRING DIAGRAM.

6) CONTROL SYSTEM INSTALLATION DRAWINGS.

7) REPLACEMENT PART NUMBER LISTINGS AND/OR DESCRIPTIONS.

8) FRAMED OPERATING INSTRUCTIONS WHEN REQUIRED.

9) MANUFACTURER'S WARRANTIES AND GUARANTEES.

B. THE MANUAL SHALL INCLUDE ALL OF THE ABOVE LISTED DATA BOUND INTO A PERMANENT HARD-BACK, THREE RING BINDER(S) IDENTIFIED ON THE COVER AS "OPERATING AND MAINTENANCE MANUAL" WITH ADDITIONAL COVER DISPLAY OF THE NAMES AND LOCATION OF BUILDING, THE OWNER, THE ARCHITECT, THE ENGINEER, THE GENERAL CONTRACTOR, AND THE CONTRACTORS INSTALLING EQUIPMENT REPRESENTED IN THE BROCHURE.

C. CONTENTS OF THE MANUAL SHALL BE GROUPED IN SECTIONS ACCORDING TO THE VARIOUS SECTIONS OF DIVISION 26, AND SHALL BE LISTED IN A TABLE OF CONTENTS. SECTIONS SHALL BE ORGANIZED AS FOLLOWS:

1) EACH "TAB" IN THE BROCHURE SHALL IDENTIFY THE GROUPING OF ALL LITERATURE REQUIRED FOR A SINGLE CLASS OF EQUIPMENT; I.E., "TRANSFORMERS", "LIGHTING FIXTURES", "GEAR", ETC., FOR ALL TYPES OF EQUIPMENT ON THE JOB.

2) CONTENTS UNDER EACH "TAB" SHALL REFER TO A SINGLE CLASS OF EQUIPMENT, AND SHALL BE ARRANGED IN THE FOLLOWING SEQUENCE: FIRST, THE MANUFACTURER'S INSTALLATION BROCHURE; SECOND, THE MANUFACTURER'S OPERATING AND MAINTENANCE BROCHURE; THIRD, THE MANUFACTURER'S INSTALLATION WIRING DIAGRAM; FOURTH, THE CONTRACTOR'S FIELD WIRING DIAGRAM, IF DIFFERENT; AND FIFTH, THE MANUFACTURER'S BROCHURE LISTING REPLACEMENT PART NUMBERS AND DESCRIPTION.

3) PROVIDE FINAL TAB "WARRANTIES AND GUARANTEES" BEHIND WHICH ALL SUCH ITEMS WILL BE LOCATED.

D. UPON COMPLETION OF THE WORK AND AT A TIME DESIGNATED BY THE ARCHITECT/ENGINEER, INSTRUCT THE OWNER'S OPERATING PERSONNEL IN OPERATION AND MAINTENANCE OF ELECTRICAL EQUIPMENT AND SYSTEMS. BEFORE PROCEEDING WITH INSTRUCTION, PREPARE A TYPED OUTLINE IN TRIPLICATE LISTING THE SUBJECTS THAT WILL BE COVERED. SUBMIT THE OUTLINE FOR REVIEW BY THE ARCHITECT/ENGINEER. AT THE CONCLUSION OF THE INSTRUCTION, OBTAIN THE SIGNATURES OF THE PEOPLE INSTRUCTED ON EACH COPY OF THE OUTLINE TO SIGNIFY THAT THEY HAVE A PROPER UNDERSTANDING OF THE OPERATION AND MAINTENANCE OF THE SYSTEM. SUBMIT THE SIGNED OUTLINES TO THE ARCHITECT/ENGINEER AS A CONDITION OF FINAL ACCEPTANCE. PROVIDE A MINIMUM OF 8 HOURS OF GENERAL INSTRUCTION IN ADDITION TO ANY TIME SPECIFIED IN OTHER SECTIONS OF DIVISION 26.

E. DELIVER OPERATIONS AND MAINTENANCE DATA TO THE ARCHITECT/ENGINEER IN THE NUMBER AND MANNER SPECIFIED IN DIVISION 01 - GENERAL REQUIREMENTS.

1.15 PERMITS:

A. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS REQUIRED BY THE "AUTHORITY HAVING JURISDICTION" AS PERTAINS TO DIVISION 26 WORK.

2. PRODUCTS

2.1 CONSTRUCTION MATERIALS:

A. ALL MATERIALS SHALL BE NEW AND SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE AND/OR THE STANDARDS ORGANIZATIONS REGULATING THOSE PRODUCTS AND SHALL BE LISTED OR LABELED BY UNDERWRITERS LABORATORIES. THE LISTING OR LABELING BY UNDERWRITERS LABORATORIES WILL BE ACCEPTED AS EVIDENCE THAT THE MATERIALS OR EQUIPMENT CONFORM TO THE APPLICABLE STANDARDS OF THAT AGENCY. IN LIEU OF A UL LISTING, THE CONTRACTOR MAY SUBMIT A STATEMENT FROM A NATIONALLY RECOGNIZED, INDEPENDENT TESTING AGENCY ACCEPTABLE TO THE LOCAL AUTHORITY AND OWNER'S INSURANCE COMPANY, INDICATING THAT THE ITEMS HAVE BEEN TESTED IN ACCORDANCE WITH REQUIRED PROCEDURES, AND THAT THE MATERIALS AND EQUIPMENT COMPLY WITH ALL CONTRACT REQUIREMENTS.

2.2 STANDARD PRODUCTS:

A. ALL MATERIALS AND EQUIPMENT SHALL BE STANDARD CATALOG PRODUCTS OF DOMESTIC MANUFACTURERS REGULARLY ENGAGED IN THE MANUFACTURE OF PRODUCTS CONFORMING TO THESE SPECIFICATIONS. MATERIALS AND EQUIPMENT SHALL HAVE BEEN IN SATISFACTORY USE AT LEAST TWO YEARS PRIOR TO BID OPENING. WHERE CUSTOM OR SPECIAL ITEMS ARE REQUIRED, THESE SHALL BE FULLY DESCRIBED BY DRAWINGS AND/OR MATERIAL LIST WHICH DETAIL THE ITEM PROPOSED FOR USE ON THIS PROJECT.

2.3 MANUFACTURERS INSTRUCTIONS:

A. THE CONTRACTOR IS FULLY RESPONSIBLE FOR FURNISHING THE PROPER ELECTRICAL EQUIPMENT AND/OR MATERIAL AND FOR SEEING THAT IT IS INSTALLED AS INTENDED BY THE MANUFACTURER'S WRITTEN INSTRUCTIONS. IF NEEDED FOR PROPER INSTALLATION, OPERATION, OR START UP, THE CONTRACTOR SHALL REQUEST ADVICE AND ASSISTANCE FROM A REPRESENTATIVE OF THE SPECIFIC MANUFACTURER. THE MANUFACTURERS' PUBLISHED INSTRUCTIONS SHALL BE FOLLOWED FOR PREPARING, ASSEMBLING, INSTALLING, ERECTING, AND CLEANING ALL MATERIALS AND EQUIPMENT. THE CONTRACTOR SHALL PROMPTLY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY CONFLICT BETWEEN THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND THE MANUFACTURER'S DIRECTIONS AND SHALL OBTAIN THE ARCHITECT/ENGINEER'S INSTRUCTIONS BEFORE PROCEEDING WITH THE WORK. SHOULD THE CONTRACTOR PERFORM ANY WORK THAT DOES NOT COMPLY WITH THE MANUFACTURER'S DIRECTIONS OR INSTRUCTIONS FROM THE ARCHITECT/ENGINEER, HE SHALL BEAR ALL COSTS ARISING IN CONNECTION WITH CORRECTING THE DEFICIENCIES.

2.4 RUST PREVENTION:

A. ALL METALLIC MATERIALS SHALL BE PROTECTED AGAINST CORROSION. EXPOSED METALLIC PARTS OF OUTDOOR APPARATUS SHALL BE GIVEN A RUST INHIBITING TREATMENT AND STANDARD FINISH BY THE MANUFACTURER. ALL PARTS SUCH AS BOXES, BODIES, FITTINGS, GUARDS, AND MISCELLANEOUS PARTS SHALL BE PROTECTED BY GALVANIZING, EXCEPT WHERE OTHER EQUIVALENT PROTECTIVE TREATMENT IS SPECIFICALLY APPROVED IN WRITING.

2.5 DELIVERY AND STORAGE:

A. THE CONTRACTOR SHALL NOT DELIVER ANY EQUIPMENT TO THE JOB SITE UNTIL THE EQUIPMENT IS READY TO BE INSTALLED OR UNTIL THERE IS SUITABLE SPACE PROVIDED TO PROPERLY PROTECT EQUIPMENT FROM WEATHER, HUMIDITY, DUST, AND PHYSICAL DAMAGE.

B. ALL EQUIPMENT SHALL BE PROTECTED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND THE REQUIREMENTS OF NFPA 70B, ANNEX J, TITLED "EQUIPMENT STORAGE AND MAINTENANCE DURING CONSTRUCTION."

C. ALL EQUIPMENT INJURED OR DAMAGED IN TRANSIT FROM FACTORY, DURING DELIVERY TO PREMISES, WHILE IN STORAGE ON PREMISES, WHILE BEING ERECTED AND INSTALLED, AND WHILE BEING TESTED, UNTIL TIME OF FINAL ACCEPTANCE, SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER.

2.6 CAPACITIES AND SPACE LIMITATIONS:

A. CAPACITIES SHALL BE NOT LESS THAN THOSE INDICATED BUT SHALL BE SUCH THAT NO COMPONENT OR SYSTEM BECOMES INOPERATIVE OR IS DAMAGED BECAUSE OF START-UP OR OTHER OVERLOAD CONDITIONS. WHERE APPROVED EQUIPMENT REQUIRES ELECTRICAL POWER OTHER THAN THAT INDICATED IN THE CONTRACT DOCUMENTS FOR THE SPECIFIED EQUIPMENT, THE CONTRACTOR IS RESPONSIBLE FOR ADJUSTING PROTECTIVE DEVICES, STARTER SIZES, CONDUCTORS, CONDUITS, ETC., TO ACCOMMODATE THE APPROVED DEVICE'S ELECTRICAL REQUIREMENTS.

B. THE CONTRACTOR IS RESPONSIBLE TO VERIFY THAT THE EQUIPMENT HE PROPOSES TO PROVIDE WILL PHYSICALLY FIT WITHIN THE SPACE INDICATED ON THE CONTRACT DOCUMENTS AND THAT THE REQUIRED CODE CLEARANCES AND MAINTENANCE ACCESS ARE MAINTAINED. ANY SPACE CONFLICTS SHALL BE NOTED IN THE SUBMITTALS. PROVIDE SCALE DRAWINGS TO THE ARCHITECT/ENGINEER INDICATING PROPOSED SOLUTIONS TO ANY SPACE CONFLICT FOR THE ARCHITECT/ENGINEER'S REVIEW AND APPROVAL.

2.7 NAMEPLATES:

A. EACH PIECE OF EQUIPMENT SHALL HAVE A NAMEPLATE FROM THE MANUFACTURER WITH THE FOLLOWING INFORMATION: NAME, ADDRESS, CATALOG NUMBER, VOLTAGE, PHASE, FULL LOAD AMPERES OR HORSEPOWER, AND/OR OTHER PERTINENT INFORMATION ON A PLATE SECURELY ATTACHED TO THE EQUIPMENT. ALL DATA ON NAMEPLATES SHALL BE LEGIBLE AT THE TIME OF FINAL OBSERVATION. REFER TO SPECIFICATION SECTION 26 05 53, ELECTRICAL IDENTIFICATION.

B. ALL ELECTRICAL DISTRIBUTION EQUIPMENT INSTALLED INDOORS WITHIN NEMA '1' ENCLOSURES SHALL HAVE MECHANICALLY FASTENED (TWO SCREW HOLE), ENGRAVED PHENOLIC PANEL LABELS AND TYPED DIRECTORIES OF THE LOADS SERVED. FIELD-CONFIRM SPECIFIED NAMEPLATE DOES NOT VOID ANY INDIVIDUAL MANUFACTURER WARRANTY.

3. EXECUTION

3.1 PROTECTION OF EQUIPMENT:

A. DURING CONSTRUCTION, PROTECT ALL ITEMS FROM INSULATION MOISTURE ABSORPTION AND METALLIC COMPONENT CORROSION BY APPROPRIATE USE OF STRIP HEATERS, LAMPS OR OTHER SUITABLE MEANS. APPLY PROTECTION IMMEDIATELY UPON RECEIVING THE PRODUCTS AND MAINTAIN CONTINUOUSLY.

B. KEEP PRODUCTS CLEAN BY ELEVATING ABOVE GROUND OR FLOOR AND BY USING SUITABLE COVERINGS.

C. TAKE SUCH PRECAUTIONS AS ARE NECESSARY TO PROTECT APPARATUS AND MATERIALS FROM DAMAGE. FAILURE TO PROTECT MATERIALS IS SUFFICIENT CAUSE FOR REJECTION OF THE APPARATUS OR MATERIAL IN QUESTION.

D. PROTECT FACTORY FINISH FROM DAMAGE DURING CONSTRUCTION OPERATIONS AND UNTIL ACCEPTANCE OF THE PROJECT. RESTORE ANY FINISHES THAT BECOME MARRED OR DAMAGED TO THE SATISFACTION OF THE OWNER AND ARCHITECT/ENGINEER.

3.2 INSTALLATION:

A. COOPERATION WITH TRADES OF ADJACENT, RELATED OR AFFECTED MATERIALS OR OPERATIONS, AND OF TRADES PERFORMING CONTINUATIONS OF THIS WORK UNDER SUBSEQUENT CONTRACTS, IS CONSIDERED A PART OF THIS WORK. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH OTHER TRADES IN ORDER TO EFFECT TIMELY AND ACCURATE PLACING OF WORK AND TO BRING TOGETHER, IN PROPER AND CORRECT SEQUENCE, THE WORK OF SUCH TRADES. FOR RENOVATION WORK OR WHERE NEW ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN EXISTING ROOMS OR SPACES, THE CONTRACTOR SHALL CAREFULLY AND COMPLETELY INVESTIGATE THE EXISTING CONDITIONS, PRIOR TO THE ROUGH-IN OR INSTALLATION OF ANY NEW OR PROPOSED EQUIPMENT. EXISTING ITEMS, INCLUDING, BUT NOT LIMITED TO: JUNCTION OR PULL BOXES, CONDUITS, TRANSFORMERS, DISCONNECTS, STARTERS, ETC. MAY POSE CONFLICTS WITH THE NEW EQUIPMENT OR PROPOSED LAYOUT AND SHALL BE REQUIRED TO BE RELOCATED TO ACCOMMODATE NEW WORK. THE CONTRACTOR SHALL NOTIFY THE ENGINEER THAT FURTHER COORDINATION IS NECESSARY AND SHALL FURNISH TO THE ENGINEER A HAND SKETCH AND DESCRIPTION OF HOW BEST TO ACCOMMODATE THE NEW WORK GIVEN THE EXISTING CONDITIONS. ADHERE TO THE WORKING CLEARANCES REQUIRED BY THE NEC. THE ENGINEER RETAINS THE RIGHT TO MODIFY THE CONTRACTOR'S PROPOSED LAYOUT. THE CONTRACTOR SHALL INSTALL THE EQUIPMENT AS SPECIFIED IN THE ENGINEER'S REVISED LAYOUT AT NO ADDITIONAL COST TO THE PROJECT.

B. INSTALL MINIMUM 3-1/2-INCH THICK CONCRETE HOUSEKEEPING PADS FOR INDOOR FLOOR-MOUNTED EQUIPMENT, EXCEPT WHERE DIRECT FLOOR MOUNTING IS REQUIRED. POUR PADS ON ROUGHENED FLOOR SLABS, SIZED SO THAT OUTER EDGES EXTEND A MINIMUM OF 3-INCHES BEYOND EQUIPMENT. TROWEL PADS SMOOTH AND CHAMFER EDGES TO A 1-INCH BEVEL. SECURE EQUIPMENT TO PADS AS RECOMMENDED BY THE MANUFACTURER. CONTRACTOR SHALL OBTAIN THE SERVICES OF A STRUCTURAL ENGINEER, LICENSED TO PRACTICE IN TEXAS, TO DETAIL SLAB REBAR OR REINFORCEMENT REQUIREMENTS.

C. ALL EQUIPMENT SHALL BE INSTALLED LEVEL AND PLUMB. SHEET METAL ENCLOSURES SHALL BE SEPARATED FROM WALLS A MINIMUM 1/2-INCH BY INSTALLING CORROSION-RESISTANT SPACERS OR METAL FRAMING. PROVIDE CORROSION-RESISTANT BOLTS, NUTS AND WASHERS TO ANCHOR EQUIPMENT.

D. PERMANENTLY SEAL OUTDOOR EQUIPMENT AT THE BASE USING CONCRETE GROUT. SEAL OR SCREEN OPENINGS INTO EQUIPMENT TO PREVENT ENTRANCE OF ANIMALS, BIRDS AND INSECTS. USE GALVANIZED STEEL OR COPPER MESH WITH OPENINGS NOT LARGER THAN 1/16-INCH FOR SCREENED OPENINGS. SEAL SMALL CRACKS AND OPENINGS FROM THE INSIDE WITH A SILICONE SEALING COMPOUND.

E. CONCEAL ELECTRICAL WORK IN WALLS, FLOORS, CHASES, UNDER FLOORS, UNDERGROUND AND ABOVE CEILINGS EXCEPT:

1) WHERE SHOWN OR SPECIFIED TO BE EXPOSED. EXPOSED IS UNDERSTOOD TO MEAN OPEN TO VIEW.

2) WHERE EXPOSURE IS NECESSARY TO THE PROPER FUNCTION.

3) WHERE SIZE OF MATERIALS AND EQUIPMENT PRECLUDE CONCEALMENT.

4) WHERE EXPOSURE IS UNAVOIDABLE, SUCH AS IN EXPOSED CEILING ENVIRONMENTS.

F. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH NECA 1. ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN SUCH A MANNER AS TO ALLOW REMOVAL FOR SERVICE WITHOUT DISASSEMBLY OF OTHER EQUIPMENT. MANUFACTURER'S REQUIRED ACCESS SHALL BE PROVIDED IN ADDITION TO ANY CODE REQUIRED CLEARANCES.

G. INSTALL ALL ELECTRICAL EQUIPMENT SO THAT CLEARANCES ARE ADHERED TO AS REQUIRED BY THE LATEST ADOPTED VERSION OF THE NATIONAL ELECTRICAL CODE AND MANUFACTURER'S RECOMMENDATIONS.

H. ELECTRICAL EQUIPMENT TO BE FURNISHED AND INSTALLED WITHIN AREAS DESIGNATED AS "HAZARDOUS" AND/OR "CLASSIFIED" BY THE NFPA, OWNER, AHJ, OR ENGINEER SHALL BE LISTED AND SUITABLE FOR USE IN THE ENVIRONMENT IN WHICH IT IS TO BE INSTALLED.

I. ALL EQUIPMENT SHALL BE LISTED FOR THE ENVIRONMENT IN WHICH IT IS TO BE INSTALLED, WHETHER SPECIFIED AS SUCH ON THE DRAWINGS OR NOT. ELECTRICAL EQUIPMENT INSTALLED EXTERIOR TO THE BUILDING OR IN WET LOCATIONS SHALL BE WEATHERPROOF NEMA '3R' ENCLOSURES AT A MINIMUM, OR AS REQUIRED BY THE ENVIRONMENT. TYPICALLY, INDOOR EQUIPMENT MAY BE PROVIDED WITH NEMA '1' ENCLOSURES, BUT SHOULD THE ENVIRONMENT REQUIRE A DIFFERENT ENCLOSURE, THE CONTRACTOR SHALL FURNISH AND INSTALL THE ENCLOSURE WHICH IS REQUIRED BY THE INSTALLATION ENVIRONMENT AT NO ADDITIONAL COST.

J. THE ELECTRICAL SYSTEM, FROM THE SERVICE ENTRANCE TO THE FINAL UTILIZATION OUTLET, SHALL BE ARRANGED AS REQUIRED BY THE AHJ, IN STRICT COMPLIANCE WITH THE NEC AND ALL LOCAL AMENDMENTS TO THE NEC AND ALL LOCAL ORDINANCES. SHOULD THE AHJ REQUIRE AN ARRANGEMENT IN CONFLICT WITH THAT WHICH IS SPECIFIED ON THE DRAWINGS, THE CONTRACTOR SHALL INFORM THE ENGINEER OF SUCH CONFLICT AND PROVIDE A RECOMMENDED SOLUTION THAT WILL BRING THE SYSTEM INTO FULL COMPLIANCE WITH THE REQUIREMENTS OF THE AHJ. THE PROPOSED SOLUTION SHALL NOT CREATE ADDITIONAL COST OR DELAY THE PROJECT.

3.3 HOISTING, SCAFFOLDING, AND TRANSPORTATION:

A. THE CONTRACTOR SHALL PROVIDE HIS OWN HOISTING, SCAFFOLDING AND LADDERS AS REQUIRED TO SET HIS MATERIALS AND EQUIPMENT IN PLACE.

B. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRANSPORTATION TO FACILITATE THE DELIVERY OF ALL MATERIALS, EQUIPMENT, TOOLS, AND LABOR TO THE JOB.

3.4 CLEANING:

A. THE CONTRACTOR SHALL, AT ALL TIMES, KEEP THE PREMISES FREE FROM ACCUMULATIONS OF WASTE MATERIAL OR RUBBISH CAUSED BY HIM, HIS EMPLOYEES, OR HIS WORK. DEBRIS SHALL BE REMOVED, NOT ONLY FROM THE BUILDING, BUT ALSO FROM THE SITE AND FROM ANY PUBLIC AREA ADJACENT TO THE SITE.

B. AT COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL REMOVE ALL OF HIS TOOLS, SCAFFOLDING, AND SURPLUS MATERIALS.

3.5 CONDUIT SLEEVES AND PENETRATION SEALS:

A. WHERE CONDUITS PASS THROUGH WALLS OR FLOORS NOT ON FILL, GALVANIZED SHEET METAL SLEEVES SHALL BE USED. IN WALLS, THEY SHALL BE FLUSH WITH EACH FINISHED SURFACE. IN FLOOR SLABS, SLEEVES SHALL EXTEND 1-1/2" ABOVE FLOOR SLAB AND BE CEMENTED IN A WATER TIGHT MANNER. SIZE OF SLEEVES SHALL BE AT LEAST 1/2" GREATER THAN OUTSIDE DIAMETER OF THE CONDUIT.

B. FOR CONDUITS PASSING THROUGH OUTSIDE WALLS INTO INTERIOR SPACES, FURNISH AND INSTALL GALVANIZED STEEL SLEEVES HAVING AN INSIDE DIAMETER AT LEAST 2" GREATER THAN THE OUTSIDE DIAMETER OF CONTAINED CONDUIT. AFTER CONDUITS ARE INSTALLED, THE ANNULAR SPACE BETWEEN THE CONDUIT AND SLEEVE SHALL BE EFFECTIVELY SEALED WITH AN APPROVED MASTIC SEALER AS DIRECTED BY THE ARCHITECT/OWNER.

C. SLEEVES AND FLASHINGS COMPATIBLE WITH THE ROOFING INSTALLATION SHALL BE PROVIDED FOR ROOF PENETRATIONS OR ANCHORAGE OF SUPPORTS. ALL ROOF PENETRATIONS AND ANCHORAGE DETAILS SHALL BE REVIEWED AND APPROVED BY THE OWNER, ROOFING CONSULTANT AND/OR ARCHITECT.

3.6 FIREPROOFING:

A. ALL RACEWAYS, CABLES, ETC. PASSING THROUGH FIRE RATED PARTITIONS (INCLUDING, BUT NOT LIMITED TO: WALLS, CEILINGS, FLOORS, ETC.) SHALL HAVE THE VOID AREA BETWEEN THE MATERIAL PASSING THROUGH PARTITION SEALED WITH AN APPROVED FIRE-STOP MATERIAL TO MAINTAIN THE FIRE RATING OF THE PARTITION.

3.7 COORDINATION:

A. ADDITIONAL WORK:

1) THE CONTRACTOR SHALL BE ADVISED THAT ADDITIONAL WORK WILL BE REQUIRED OF THE CONTRACTOR BY OTHER PROJECT CONSULTANTS AND TRADES. THIS INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING CONSULTANTS AND CONTRACTORS:

a. ARCHITECT (FOR BOTH ARCHITECTURALLY SPECIFIED EQUIPMENT AND OWNER FURNISHED EQUIPMENT).

b. TECHNOLOGY (VOICE/DATA/ETC.).

c. FIRE ALARM.

d. AUDIO/VISUAL.

e. SECURITY (INTRUSION AND DETECTION AND CAMERAS).

f. PUBLIC ADDRESS.

g. MECHANICAL AND PLUMBING ENGINEER(S).

h. ACOUSTICS.

i. CONTROLS.

j. DOOR HARDWARE CONTRACTOR.

k. OTHERS AS INCLUDED IN THE CONSTRUCTION DOCUMENTS

2) PRIOR TO BID, THE CONTRACTOR SHALL OBTAIN A COMPLETE SET OF PROJECT DOCUMENTS, INCLUDING ANY AND ALL ADDENDA, AND CAREFULLY REVIEW AND COORDINATE THE REQUIREMENTS AND PROVISIONS SPECIFIED BY EACH INDIVIDUAL TRADE. WHERE ITEMS REQUIRING ELECTRICAL CONNECTIONS ARE EXPLICITLY OR IMPLICITLY SPECIFIED BY OTHER CONSULTANTS AND NOT EXPLICITLY SHOWN OR NOTED ON THE ELECTRICAL DOCUMENTS, THE CONTRACTOR SHALL PROVIDE THE NECESSARY CIRCUIT(S) FROM THE NEAREST PANELBOARD OF THE CORRECT VOLTAGE AND PHASE WITH SUFFICIENT SPARE CAPACITY. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY ITEMS REQUIRED BY ALL OTHER CONSULTANTS AND TRADES TO FORM COMPLETE AND OPERABLE SYSTEMS. THIS INCLUDES, BUT IS NOT LIMITED TO ALL: JUNCTION BOXES, RACEWAY SYSTEMS, FACE PLATES, IDENTIFYING TAGS AND LABELS, CONDUCTORS, TERMINATIONS, CIRCUIT BREAKERS, TRANSFORMERS, DISCONNECTS, FUSES, ENCLOSURES, ETC.

3.8 ELECTRICAL CONNECTIONS TO MOTORS AND EQUIPMENT:

A. CONTRACTOR SHALL COORDINATE WITH ALL OTHER DIVISIONS OF THESE SPECIFICATIONS AS REQUIRED TO VERIFY ALL ELECTRICAL REQUIREMENTS OF THOSE DIVISIONS. THIS IS TO INCLUDE BUT NOT BE LIMITED TO VERIFICATION OF POWER, VOLTAGE, PHASE AND OTHER CHARACTERISTICS AS BEING COMPATIBLE WITH THAT CALLED FOR ON THE ELECTRICAL DRAWINGS AND DIVISION 26 SPECIFICATIONS, AS WELL AS THAT CALLED FOR IN OTHER DIVISIONS OF THE SPECIFICATIONS REQUIRING ELECTRICAL CONNECTIONS. SHOULD ADDITIONAL EQUIPMENT, DEVICES, OR FIXTURES BE REQUIRED, INCLUDING, BUT NOT LIMITED TO, BUCK/BOOST TRANSFORMERS, CIRCUIT BREAKERS, FUSES, DISCONNECTING MEANS, RECEPTACLES, SWITCHES, CORD CAPS, SERVICE CORDS, CONDUCTORS, CONDUIT, BOXES, TERMINATIONS, IDENTIFYING TAGS/LABELS, ENCLOSURES, ETC., THE CONTRACTOR SHALL PROVIDE THESE TO CREATE A COMPLETE AND OPERATIONAL SYSTEM. THIS SHALL BE DONE PRIOR TO PLACING ORDERS FOR EQUIPMENT OR MATERIAL, AND PRIOR TO ANY ROUGH-IN, ETC. CHANGES OF THIS NATURE SHALL NOT CREATE ANY COST TO THE PROJECT.

B. MOTORS ARE SPECIFIED IN OTHER DIVISIONS OF THE SPECIFICATIONS. ELECTRICAL WORK INCLUDES THE ELECTRICAL CONNECTION OF ALL MOTORS, EXCEPT THOSE WHICH ARE WIRED AS A PART OF EQUIPMENT. CONNECTION OF MOTORS SPECIFIED IN OTHER DIVISIONS OF THE SPECIFICATIONS, BUT NOT REFLECTED ON ELECTRICAL DRAWINGS SHALL BE INCLUDED IN DIVISION 26 SCOPE OF WORK. WHERE CONNECTIONS ARE NOT SHOWN ON ELECTRICAL DRAWINGS, INCLUDE IN BID THE NECESSARY CIRCUIT(S) FROM THE NEAREST PANELBOARD OF THE CORRECT VOLTAGE AND PHASE WITH SUFFICIENT SPARE CAPACITY. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY ITEMS REQUIRED BY ALL OTHER CONSULTANTS AND TRADES TO FORM COMPLETE AND OPERABLE SYSTEMS. THIS INCLUDES, BUT IS NOT LIMITED TO ALL: JUNCTION BOXES, RACEWAY SYSTEMS, FACE PLATES, IDENTIFYING TAGS AND LABELS, CONDUCTORS, TERMINATIONS, CIRCUIT BREAKERS, TRANSFORMERS, DISCONNECTS, FUSES, ENCLOSURES, ETC.

C. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING, INSTALLING, AND LOCATING A DISCONNECT SWITCH FOR EACH PIECE OF EQUIPMENT OR MOTOR PROVIDED ON THE PROJECT UNLESS THE DEVICE IS INTEGRAL TO THE MOTOR/EQUIPMENT OR PROVIDED BY THE VENDOR SUPPLYING THE MOTOR/EQUIPMENT. IF NECESSARY, THE CONTRACTOR SHALL FURNISH AND INSTALL A MAGNETIC MOTOR STARTER WITH OVERLOAD. STARTERS AND OVERLOADS SHALL BE SIZED FOR THE MOTOR HORSEPOWER OR AS RECOMMENDED BY THE MANUFACTURER FOR THE PIECE OF EQUIPMENT TO BE PROVIDED. MOTORS OR EQUIPMENT LOCATED INTERIOR TO THE BUILDING SHALL BE PROVIDED WITH A COMBINATION STARTER/DISCONNECT SWITCH LOCATED WITHIN SIGHT AND NO MORE THAN 15' FROM MOTOR/EQUIPMENT. EXTERIOR MOUNTED MOTORS OR EQUIPMENT SHALL BE PROVIDED WITH A SEPARATE MAGNETIC MOTOR STARTER LOCATED INSIDE OF THE BUILDING IN A CONDITIONED AND ACCESSIBLE LOCATION ACCEPTABLE TO THE ENGINEER AND OWNER, PLUS A SEPARATE ENCLOSED DISCONNECT SWITCH MOUNTED ADJACENT TO THE EXTERIOR MOTOR OR EQUIPMENT. DISCONNECT SHALL NOT BE MOUNTED OR SCREWED INTO THE UNIT HOUSING BUT MOUNTED ON A GALVANIZED STEEL CHANNEL SUPPORT ASSEMBLY SECURELY ATTACHED TO THE ADJACENT WALL OR SLAB. MOTOR OVERLOADS MAY BE REMOVED FROM THE MAGNETIC MOTOR STARTERS IF PROVIDED INTEGRAL TO THE LOCAL DISCONNECT SUPPLIED BY THE VENDOR OR ANOTHER DIVISION. SEE DIVISION 23 DOCUMENTS FOR ADDITIONAL INFORMATION. CONTRACTOR SHALL PROVIDE ALL REQUIRED CODE CLEARANCES AND COORDINATE WITH DIVISION 23 CONTRACTOR FOR DEVICE LOCATION RECOMMENDATIONS.

D. CONTRACTOR SHALL PROVIDE AND INSTALL A FUSED DISCONNECT AT EACH OF THE FOLLOWING LOCATIONS:

1) EACH PIECE OF DIVISION 23'S EQUIPMENT WHERE THE MANUFACTURER OR NAMEPLATE EXPLICITLY REQUIRES FUSE PROTECTION ONLY.

2) ON THE PRIMARY SIDE OF EACH DRY TYPE TRANSFORMER WHERE THE FEEDER BREAKER IS NOT LOCATED WITHIN SIGHT OR PROVIDED WITH PERMANENT PROVISIONS TO LOCK IT IN THE "OFF" POSITION. THE DISCONNECT AND FUSES SHALL BE SIZED AS REQUIRED BY THE NEC AND BE SEPARATELY SUPPORTED FROM STRUCTURE AND MOUNTED ADJACENT TO THE TRANSFORMER.

3) ON THE SECONDARY SIDE OF EACH DRY TYPE TRANSFORMER WHERE THE LOW VOLTAGE PANEL MAIN BREAKER IS OUT OF SIGHT OR HAS MORE THAN 25' OF SECONDARY CONDUCTOR LENGTH. DISCONNECT SHALL BE MOUNTED ADJACENT TO THE TRANSFORMER. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING THE DISCONNECT AND MAINTAINING ALL CLEARANCES REQUIRED BY CODE.

3.9 CUTTING AND PATCHING:

A. WHEN IT BECOMES NECESSARY TO CUT THROUGH ANY WALL, FLOOR, OR CEILING TO INSTALL ANY WORK UNDER THE CONTRACT, OR TO REPAIR ANY DEFECTS THAT MAY APPEAR UP TO THE EXPIRATION OF THE GUARANTEE PERIOD, SUCH CUTTING SHALL BE DONE BY THE CONTRACTOR. THE CONTRACTOR WILL NOT BE PERMITTED TO CUT OR MODIFY ANY STRUCTURAL MEMBERS.

B. PATCHING OF ALL OPENINGS CUT BY THE CONTRACTOR, OR REPAIRING OF ANY DAMAGE TO THE WORK OF OTHER TRADES CAUSED BY CUTTING OR BY THE FAILURE OF ANY PART OF THE WORK INSTALLED UNDER THIS CONTRACT, SHALL BE PERFORMED BY THE APPROPRIATE TRADE AND SHALL BE PAID FOR BY THE CONTRACTOR. RESTORE THE SURFACE TO MATCH THE ADJACENT SURFACES TO THE SATISFACTION OF THE OWNER, ARCHITECT AND ENGINEER. OBTAIN APPROVAL OF RESTORATION PRIOR TO SUBMITTING SUBSTANTIAL COMPLETION PAY APPLICATION. FAILURE TO DO SO MAY RESULT IN THE CONTRACTING OF A THIRD PARTY TO PERFORM THE WORK. THIS CONTRACTOR WILL BE HELD RESPONSIBLE FOR COMPLETE PAYMENT OF THIRD PARTY CONTRACTOR.

C. ANY OPENINGS CUT THROUGH EXTERIOR WALLS OR ROOFS SHALL BE PROVIDED WITH SUITABLE COVERS WHILE THEY ARE LEFT OPEN TO PROTECT THE PROPERTY OR MATERIALS INVOLVED. ANY OPENINGS CUT THROUGH WALLS BELOW GRADE SHALL BE PROPERLY PROTECTED TO PREVENT ENTRANCE OF WATER OR OTHER DAMAGING ELEMENTS. ALL OPENINGS SHALL BE WATERPROOFED UPON COMPLETION OF THE WORK AS SPECIFIED BY THE ARCHITECT. ANY OPENINGS THROUGH FIRE RATED WALLS OR FLOORS SHALL BE SEALED TO MAINTAIN THE MINIMUM FIRE RATING OF WALL OR FLOOR PENETRATED.

3.10 VIBRATION ISOLATION:

A. THE CONTRACTOR SHALL FURNISH AND INSTALL VIBRATION ISOLATION MEANS FOR ALL EQUIPMENT AND MATERIALS FURNISHED UNDER THE CONTRACT TO PREVENT THE TRANSMISSION OF PERCEPTIBLE VIBRATION AND STRUCTURE BORNE OR AIR BORNE NOISE TO OCCUPIED AREAS. ITEMS REQUIRING VIBRATION ISOLATION SHALL INCLUDE:

1) ALL TRANSFORMERS SHALL BE MOUNTED ON ONE INCH (1") THICK CORK RIB PADS AND/OR RUBBER OR STEEL SPRING ISOLATOR UNITS PROPERLY SIZED, SPACED, AND LOADED, WHICH IN TURN SHALL REST ON A 3 1/2" MINIMUM CONCRETE BASE.

2) WHERE TRANSFORMERS ARE TO BE SUSPENDED FROM THE STRUCTURE ABOVE, EACH HANGER SHALL BE EQUIPPED WITH DOUBLE-DEFLECTING STEEL SPRING AND RUBBER IN-SHEAR ANTI-VIBRATION HANGERS. THE RUBBER IN SHEAR MOUNTING FOR EACH HANGER SHALL PROVIDE A STATIC DEFLECTION AT LEAST EQUIVALENT TO THE STATIC DEFLECTION FOR A 1/4" RUBBER PAD. ANTI-VIBRATION MOUNTINGS SHALL BE EQUIPPED WITH ADEQUATE LEVELING MECHANISMS WHICH DO NOT INTERFERE WITH PROPER HANGER OPERATION.

3) RACEWAY SYSTEMS SHALL BE ISOLATED FROM ALL DRY TYPE TRANSFORMERS AND ROTATING OR RECIPROCATING MACHINERY. INSTALL 12" OF FLEXIBLE METAL CONDUIT PER 1" OF CONDUIT DIAMETER. THE MINIMUM LENGTH OF FLEXIBLE CONDUIT USED FOR ISOLATION SHALL BE 12" AND THE MAXIMUM LENGTH SHALL NOT EXCEED 36".

3.11 CONDITIONS OF EQUIPMENT AT FINAL ACCEPTANCE:

A. AT TIME OF ACCEPTANCE, THE CONTRACTOR SHALL HAVE INSPECTED ALL INSTALLED SYSTEMS TO ASSURE THE FOLLOWING HAVE BEEN COMPLETED:

1) FIXTURES ARE OPERATING; LAMPS, LENSES AND REFLECTORS ARE FREE OF DUST, DEBRIS, AND FINGERPRINTS.

2) PANELBOARDS HAVE ALL CONDUCTORS NEATLY FORMED, LACED AND MADE UP TIGHT. ENCLOSURES SHALL BE VACUUM CLEANED, SURFACES CLEAN OF STRAY PAINT, DUST, GREASE AND FINGERPRINTS. ALL CIRCUIT DIRECTORIES TO BE TYPEWRITTEN, COMPLETED, AND IN PLACE.

3) WALL PLATES AND EXPOSED SWITCH AND RECEPTACLE PARTS TO BE CLEAN, FREE OF PAINT, PLASTER, ETC.

4) DISCONNECT SWITCHES SHALL BE VACUUM CLEANED, SURFACES CLEAN OF STRAY PAINT, DUST, GREASE AND FINGERPRINTS.

5) TRANSFORMERS SHALL BE CLEANED INTERNALLY AND EXTERNALLY AND HAVE ALL SURFACES RESTORED TO INITIAL SURFACE CONDITIONS.

6) TOUCH-UP ALL SCRATCHED SURFACES USING PAINT MATCHING THE EXISTING EQUIPMENT PAINT. WHERE PAINT CANNOT BE MATCHED THE ENTIRE SURFACE SHALL BE REPAINTED IN A COLOR AND MANNER APPROVED BY THE ARCHITECT/ENGINEER.

7) ALL ELECTRICAL EQUIPMENT SHALL BE IDENTIFIED AS SPECIFIED UNDER THESE SPECIFICATIONS.

8) ALL REQUIREMENTS SPECIFIED IN SPECIFICATION SECTION 26 60 05, ELECTRICAL TESTING 600 VOLT AND BELOW, HAVE BEEN PERFORMED, VERIFIED, DOCUMENTED, AND REVIEWED BY THE ARCHITECT/ENGINEER.

3.12 WARRANTIES:

A. COMPLY WITH THE REQUIREMENTS OF DIVISION 01.

3.13 GUARANTEE:

A. THE CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND WORKMANSHIP FOR A PERIOD OF TWELVE (12) MONTHS AFTER THE FINAL ACCEPTANCE OF WORK.

END OF SECTION 26 05 00

SECTION 26 05 01 ELECTRICAL SELECTIVE DEMOLITION

1. GENERAL

1.1 RELATED DOCUMENTS:

A. DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS, DIVISION 01 AND DIVISION 26. SPECIFICATION SECTIONS APPLY TO THE WORK OF THIS SECTION.

1.2 DESCRIPTION OF WORK:

A. REFER TO THE COMPLETE SET OF CONTRACT DOCUMENTS FOR THE EXTENT OF SELECTIVE DEMOLITION.

1.3 TYPES OF SELECTIVE DEMOLITION WORK:

A. DEMOLITION REQUIRES THE SELECTIVE REMOVAL AND SUBSEQUENT OFF SITE DISPOSAL IN A LEGAL MANNER OF THE FOLLOWING ITEMS BUT NOT LIMITED TO:

1) ITEMS REQUIRED TO BE REMOVED TO ACCOMMODATE THE INSTALLATION OF NEW EQUIPMENT, INCLUDING REMOVAL, RELOCATION, AND RE-INSTALLATION.

B. RELATED WORK SPECIFIED ELSEWHERE:

1) REMODELING CONSTRUCTION WORK AND PATCHING IS INCLUDED WITHIN THE RESPECTIVE SECTIONS OF SPECIFICATIONS, INCLUDING THE REMOVAL OF MATERIALS FOR RE-USE AND INCORPORATED INTO REMODELING OR NEW CONSTRUCTION.

2) RELOCATION OF PIPES, CONDUITS, DUCTS, AND OTHER MECHANICAL OR ELECTRICAL WORK ARE SPECIFIED BY RESPECTIVE TRADES.

3) SHOULD ANY ASBESTOS CONTAINING MATERIAL BE ENCOUNTERED, CONTRACTOR SHALL STOP WORK IMMEDIATELY AND CONTACT OWNER AND OWNER'S REPRESENTATIVE BEFORE PROCEEDING WITH WORK. THE COST OF ASBESTOS ABATEMENT AND REMOVAL IS NOT INCLUDED AS PART OF THIS CONTRACT. THE OWNER WILL PROVIDE SEPARATE CONTRACTORS FOR THIS WORK SHOULD IT BE REQUIRED. HOWEVER, SHOULD THE CONTRACTOR FAIL TO COMPLY WITH ABOVE STATED REQUIREMENTS, HE/SHE WILL BE CHARGED THE COSTS INCURRED TO THE OWNER FOR THE ASBESTOS CLEANUP PROCESS DUE TO THE CONTRACTOR'S ACTIONS IN DISTURBING ASBESTOS CONTAINING MATERIALS. CONTACT THE OWNER REGARDING ANY ASBESTOS INFORMATION REQUIRED FOR THIS PROJECT.

1.4 SUBMITTALS:

A. SCHEDULE - SUBMIT SCHEDULE INDICATING PROPOSED METHODS AND SEQUENCE OF OPERATIONS FOR SELECTIVE DEMOLITION WORK TO THE OWNER'S REPRESENTATIVE FOR REVIEW PRIOR TO COMMENCEMENT OF WORK. INCLUDE COORDINATION FOR SHUT-OFF, CAPPING, CONTINUATION OF SERVICES, NOISE PROTECTION, AND DUST CONTROL DETAILS AS REQUIRED.

B. PROVIDE DETAILED SEQUENCE OF DEMOLITION AND REMOVAL WORK TO ENSURE UNINTERRUPTED PROGRESS OF OWNER'S ONSITE OPERATIONS.

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PROJECT PHASE
PERMIT
REVISIONS

PROJECT NUMBER

DATE ISSUED
12/08/15

SHEET TITLE
ELECTRICAL SPECIFICATIONS

SHEET NUMBER
E0.2

1.5 JOB CONDITIONS:

A. OWNER AND OTHER BUILDING TENANTS MAY BE CONTINUOUSLY OCCUPYING AREAS OF THE BUILDING. CONDUCT SELECTIVE DEMOLITION WORK IN A MANNER THAT WILL MINIMIZE NEED FOR DISRUPTION OF OWNER'S AND OTHER TENANT'S NORMAL OPERATIONS. PROVIDE MINIMUM 72 HOUR ADVANCE NOTICE TO OWNER OF DEMOLITION ACTIVITIES WHICH WILL IMPACT OWNER'S AND/OR OTHER TENANT'S OPERATIONS.

B. CONDITION OF STRUCTURES - OWNER AND ENGINEER ASSUME NO RESPONSIBILITY FOR ACTUAL CONDITIONS OF ITEMS OR STRUCTURES TO BE DEMOLISHED.

C. PARTIAL DEMOLITION AND REMOVAL - ITEMS INDICATED TO BE REMOVED BUT OF SALVABLE VALUE TO CONTRACTOR MAY BE REMOVED FROM STRUCTURE AS WORK PROGRESSES. TRANSPORT SALVAGE ITEMS FROM SITE AS THEY ARE REMOVED.

D. STORAGE AND SALE OF REMOVED ITEMS ONSITE WILL NOT BE PERMITTED.

E. PROVIDE TEMPORARY BARRICADES AND OTHER FORMS OF PROTECTION AS REQUIRED TO PROTECT OWNER'S PERSONNEL AND GENERAL PUBLIC FROM INJURY DUE TO SELECTIVE DEMOLITION.

F. PROVIDE PROTECTIVE MEASURES AS REQUIRED TO PROVIDE FREE AND SAFE PASSAGE OF OWNER'S PERSONNEL AND GENERAL PUBLIC TO AND FROM OCCUPIED AREAS.

G. ERECT TEMPORARY COVERED PASSAGEWAYS AS REQUIRED BY AUTHORITIES HAVING JURISDICTION.

H. PROVIDE INTERIOR AND EXTERIOR SHORING, BRACING, AND SUPPORT TO PREVENT MOVEMENT, SETTLEMENT, AND COLLAPSE OF STRUCTURE/ELEMENT TO BE DEMOLISHED AND WORK TO REMAIN AFTER DEMOLITION.

I. PROTECT FROM DAMAGE ANY FINISH WORK THAT IS TO REMAIN IN PLACE AND BECOMES EXPOSED DURING THE DEMOLITION PROCESS.

J. PROTECT FLOORS WITH SUITABLE COVERING WHEN NECESSARY.

K. PROTECT ALL EQUIPMENT, FURNISHINGS AND OWNER'S PROPERTY.

L. CONSTRUCT TEMPORARY INSULATED SOLID DUSTPROOF PARTITIONS WHERE REQUIRED TO SEPARATE AREAS WHERE NOISY OR EXTENSIVE DIRT OR DUST OPERATIONS ARE PERFORMED. EQUIP WITH DUSTPROOF DOORS AND SECURITY LOCKS IF NEEDED.

M. PROVIDE TEMPORARY WEATHER PROTECTION TO INSURE THAT NO WATER LEAKAGE OR DAMAGE OCCURS TO STRUCTURE OR INTERIOR AREAS OF EXISTING BUILDINGS.

N. REMOVE PROTECTIONS AT THE COMPLETION OF THE WORK.

O. PROMPTLY REPAIR DAMAGE CAUSED TO ADJACENT FACILITIES BY DEMOLITION WORK AT NO COST TO THE OWNER.

P. TRAFFIC - CONDUCT SELECTIVE DEMOLITION OPERATIONS AND DEBRIS REMOVAL IN A MANNER TO ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, WALKWAYS, AND OTHER ADJACENT FACILITIES.

Q. EXPLOSIVES/FIRES - USE OF EXPLOSIVES OR FIRES WILL NOT BE PERMITTED.

R. UTILITY SERVICES - MAINTAIN EXISTING UTILITIES AND KEEP ALL IN SERVICE AND OPERATIONAL. PROTECT AGAINST DAMAGE DURING DEMOLITION OPERATIONS.

S. DO NOT INTERRUPT EXISTING UTILITIES SERVING OCCUPIED OR USED FACILITIES, EXCEPT WHEN AUTHORIZED IN WRITING BY THOSE HAVING JURISDICTION. PROVIDE TEMPORARY SERVICES DURING INTERRUPTIONS TO EXISTING UTILITIES, AS REQUIRED BY AND ACCEPTABLE TO OWNER AND UTILITY SUPPLIERS.

T. PROVIDE TEMPORARY WIRING AND CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. REMOVE, RELOCATE, AND EXTEND EXISTING INSTALLATIONS TO ACCOMMODATE NEW CONSTRUCTION. IF WORK MUST BE PERFORMED ON ENERGIZED EQUIPMENT OR CIRCUITS, USE PERSONNEL QUALIFIED FOR SUCH OPERATIONS.

U. ENVIRONMENTAL CONTROL/PROTECTION- COMPLY WITH GOVERNING REGULATIONS.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION

3.1 EXAMINATION AND PREPARATION:

A. VISIT THE SITE PRIOR TO BID AND START OF CONSTRUCTION TO DETERMINE EXISTING CONDITION OF ELECTRICAL SYSTEMS AND DEVICES. CONTRACTOR WILL BE RESPONSIBLE FOR REVIEWING ANY DOCUMENTS WHICH REFLECT EXISTING CONDITIONS.

B. PROVIDE THE OWNER A WRITTEN LIST OF ANY UNCOVERED OR SURVEYED CONSTRUCTION AND/OR CODE DEFICIENCIES NOT INDICATED ON THE DOCUMENTS. OBTAIN WRITTEN DIRECTION FROM OWNER ON HOW ADDRESS DEFICIENCIES PRIOR TO STARTING ANY WORK.

C. VERIFY AND/OR DETERMINE EXISTING CIRCUITING ARRANGEMENTS FOR EQUIPMENT TO BE REMOVED BEFORE DE-ENERGIZING ANY CIRCUITS. EXISTING CIRCUIT FOR EQUIPMENT TO BE REMOVED OR REPLACED SHALL BE CIRCUIT TRACED TO DETERMINE PANEL CONNECTIONS. VERIFY THAT ABANDONED WIRING AND EQUIPMENT SERVE ONLY ABANDONED FACILITIES AND AREAS.

D. THE CONTRACTOR SHALL NOTE ANY EXISTING FIRE RATING/PREVENTION METHODS EMPLOYED AT EACH FACILITY - FIRE CAULK, LIGHTING FIXTURE "FIRE BOXES", ETC. MAINTAIN AND/OR RESTORE THE ORIGINAL FIRE RATING (USING SAME METHOD AS ORIGINALLY PROVIDED) AT EACH LOCATION AFFECTED BY THE WORK PERFORMED IN THIS RENOVATION. FINAL INSTALLATION APPROVAL SHALL BE BY THE AHJ AND OWNER.

E. PLAN ANY NECESSARY POWER OUTAGES. PREPARE A WRITTEN PROCEDURE TO BE FOLLOWED DURING THE OUTAGE TO COMPLETE THE PLANNED WORK. PROVIDE DETAILS TO THE OWNER OF WHERE POWER DISRUPTION WILL OCCUR, AND COORDINATE WITH THE OWNER TO DETERMINE WHEN THE POWER DISRUPTION IS ACCEPTABLE.

F. IMMEDIATELY NOTIFY THE OWNER OF ANY DISCOVERED FACILITY DEFICIENCIES THAT COULD POTENTIALLY CAUSE A LIFE SAFETY HAZARD TO BUILDING OCCUPANTS. FOR EXAMPLE, LIGHTING FIXTURES NOT PROPERLY SUPPORTED, BROKEN CEILING GRIDS OR TILES, DAMAGED LIGHTING FIXTURES, EXPOSED CONDUCTORS, ETC. AFTER NOTIFYING THE OWNER, WAIT FOR A NOTICE OF HOW TO PROCEED PRIOR TO WORKING IN THE AFFECTED AREA.

G. MAINTAIN ACCESS TO EXISTING ELECTRICAL EQUIPMENT OR DEVICES WHICH REMAIN ACTIVE.

H. MAINTAIN ELECTRICAL SERVICE, FIRE ALARM SYSTEM, TELEPHONE SYSTEM, AND OTHER SYSTEMS DEEMED CRITICAL TO BE OPERATIONAL BY OWNER OR ENGINEER IN SERVICE UNTIL NEW SYSTEM IS READY TO OPERATE. MINIMIZE THE DURATION TIME OF OUTAGE BY ONLY DISABLING THE SYSTEMS WHEN PERFORMING THE SWITCHOVER AND CONNECTIONS TO THE NEW SYSTEM.

I. BEGINNING OF DEMOLITION INDICATES THAT CONTRACTOR ACCEPTS EXISTING CONDITIONS.

3.2 DEMOLITION:

A. PERFORM SELECTIVE DEMOLITION WORK IN A SYSTEMATIC MANNER. USE METHODS AS REQUIRED TO COMPLETE WORK INDICATED ON DRAWINGS IN ACCORDANCE WITH DEMOLITION SCHEDULE AND GOVERNING REGULATIONS.

B. DEMOLISH CONCRETE AND MASONRY IN SMALL SECTIONS. CUT CONCRETE AND MASONRY AT JUNCTURES WITH CONSTRUCTION TO REMAIN USING POWER DRIVEN MASONRY SAW OR HAND TOOLS; DO NOT USE POWER DRIVEN IMPACT TOOLS.

C. PROMPTLY REMOVE DEBRIS TO AVOID IMPOSING EXCESSIVE LOADS ON SUPPORTING WALLS, FLOORS OR FRAMING.

D. PROVIDE SERVICES FOR EFFECTIVE AIR AND WATER POLLUTION CONTROL AS REQUIRED BY LOCAL, STATE, AND FEDERAL AUTHORITIES HAVING JURISDICTION.

E. SUBMIT A DETAILED WRITTEN REPORT TO THE OWNER IF ANY UNANTICIPATED PROBLEMS ARE FOUND WHICH CONFLICT WITH THE INTENDED FUNCTION OF THE DESIGN. AFTER NOTIFYING THE OWNER, WAIT FOR A NOTICE OF HOW TO PROCEED PRIOR TO WORKING IN THE AFFECTED AREA. RESCHEDULE THE SELECTIVE DEMOLITION AGENDA AS NECESSARY TO PROCEED WITH WORK AND OVERALL PROGRESS WITHOUT DELAY.

F. PROVIDE NEW PANEL DIRECTORIES REFLECTING DEMOLITION CIRCUIT CHANGES ON PANELBOARDS AFFECTED BY THE SCOPE OF WORK.

3.3 DISPOSAL OF DEMOLITION MATERIALS:

A. IF HAZARDOUS MATERIALS ARE ENCOUNTERED DURING DEMOLITION OPERATIONS, COMPLY WITH APPLICABLE REGULATIONS, LAWS AND ORDINANCES CONCERNING REMOVAL HANDLING AND PROTECTION AGAINST EXPOSURE OR ENVIRONMENTAL POLLUTION. IF ASBESTOS IS ENCOUNTERED, DO NOT DISTURB IT, CONTACT OWNER IMMEDIATELY.

B. REFRIGERANTS SHALL NOT BE RELEASED INTO THE ENVIRONMENT. REFRIGERANTS SHALL BE CAPTURED, STORED, TRANSPORTED, AND HANDLED IN A LEGAL MANNER. DOCUMENTATION INDICATING LEGAL REFRIGERANT DISPOSAL SHALL BE PRESENTED TO OWNER.

C. REMOVE EXPOSED ABANDONED CONDUIT, INCLUDING ABANDONED CONDUIT ABOVE ACCESSIBLE CEILING FINISHES. CONTRACTOR SHALL CUT CONDUIT FLUSH WITH WALLS AND FLOORS, AND PATCH SURFACES. REMOVE DEBRIS, RUBBISH, AND OTHER MATERIALS RESULTING FROM DEMOLITION OPERATIONS FROM BUILDING SITE.

D. ALL MATERIALS AND EQUIPMENT BEING REMOVED BY THE CONTRACTOR AND DEEMED UNWANTED BY THE OWNER BECOMES PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE PREMISES AND DISPOSED OF BY RECYCLING OR OTHER ENVIRONMENTALLY SAFE MANNER.

3.4 CLEAN-UP AND REPAIR:

A. UPON COMPLETION OF DEMOLITION WORK, REMOVE TOOLS, EQUIPMENT AND DEMOLISHED MATERIALS FROM SITE. REMOVE PROTECTIONS AND SWEEP CLEAN ALL INTERIOR AREAS.

B. CLEAN AND REPAIR EXISTING MATERIALS AND EQUIPMENT WHICH REMAIN OR ARE TO BE REUSED. RESTORE ANY DAMAGED MATERIAL, EQUIPMENT, AND/OR FINISHES TO REMAIN TO ORIGINAL CONDITION UPON COMPLETION OF RENOVATION. CONTRACTOR SHALL EMPLOY CRAFTS THAT ORIGINALLY PERFORMED THE WORK. CLEAN EXPOSED SURFACES AND CHECK TIGHTNESS OF ELECTRICAL CONNECTIONS.

END OF SECTION 26 05 01

<u>SECTION 26 05 19 600 VOLT INSULATED CONDUCTORS</u>

1. GENERAL

1.1 SCOPE:

A. THIS SECTION SPECIFIES THE FURNISHING AND INSTALLATION OF 600 VOLT INSULATED CONDUCTORS.

1.2 REFERENCE STANDARDS:

A. ICEA S-95-658 (NEMA WC 70) - NON-SHIELDED POWER CABLE RATED 2000 V OR LESS.

B. UL 83 - THERMOPLASTIC-INSULATED WIRES AND CABLES.

C. UL 486A - WIRE CONNECTORS AND SOLDERING LUGS FOR USE WITH COPPER CONDUCTORS.

D. NECA 1 - 2000 - STANDARD PRACTICES FOR GOOD WORKMANSHIP IN ELECTRICAL CONTRACTING (ANSI)

1.3 APPLICABLE PROVISIONS:

A. REFER TO SECTION 26 05 00, ELECTRICAL GENERAL PROVISIONS.

B. REFER TO SECTION 26 60 05, ELECTRICAL TESTING.

1.4 SUBMITTALS:

A. NONE REQUIRED.

1.5 DELIVERY, HANDLING AND STORAGE:

A. DELIVER CONDUCTORS PROPERLY PACKAGED IN FACTORY-FABRICATED CONTAINERS, OR WOUND ON NEMA-STANDARD TYPE WIRE AND CABLE REELS.

B. HANDLE CONDUCTORS CAREFULLY TO AVOID ABRADING, PUNCTURING AND TEARING WIRE AND CABLE INSULATION AND SHEATHING. ENSURE THAT DIELECTRIC RESISTANCE INTEGRITY OF CONDUCTORS IS MAINTAINED PRIOR TO AND UPON COMPLETED INSTALLATION.

C. STORE CONDUCTORS IN A CLEAN DRY SPACE IN ORIGINAL CONTAINERS. PROTECT PRODUCTS FROM WEATHER, DAMAGING FUMES, CONSTRUCTION DEBRIS AND TRAFFIC.

2. PRODUCTS

2.1 600-VOLT INSULATED CONDUCTORS:

A. CONDUCTORS SHALL BE SOFT-DRAWN ANNEALED COPPER WITH CONDUCTIVITY OF NOT LESS THAN 98% AT 20 DEGREES C (68 DEGREES F).

B. UNLESS INDICATED OTHERWISE ON THE DRAWINGS, THE FOLLOWING MINIMUM WIRE AND CONDUIT SIZE SHALL BE PROVIDED FOR THE INDICATED BREAKERS FOR CONDUCTOR LENGTHS (PHASE AND NEUTRAL FOR SINGLE-POLE ('1P') CIRCUIT BREAKERS, PHASE PLUS PHASE FOR DOUBLE- OR TRIPLE-POLE ('2P' OR '3P', RESPECTIVELY) CIRCUIT BREAKERS) OF 100' OR LESS.

1) 1P - 20, SEE THIS SPECIFICATION SECTION, 2.1.F, THREE CONDUCTOR, 3/4" C.

2) 2P - 20, SEE THIS SPECIFICATION SECTION, 2.1.F, FOUR CONDUCTOR, 3/4" C.

3) 3P - 20, SEE THIS SPECIFICATION SECTION, 2.1.F, FIVE CONDUCTOR, 3/4" C.

4) 1P - 30, 2#10 & #10G., 3/4" C.

5) 2P - 30, 3#10 & #10G., 3/4"C.

6) 3P - 30, 3#10, #10N., #10G., 3/4" C.

7) 1P - 40, 2#8 & #10G., 3/4"C.

8) 2P - 40, 3#8 & #10G., 3/4"C.

9) 3P - 40, 3#8, #8N., #10G., 1" C.

C. FEEDERS: COPPER , OR WHERE ALLOWED BY THE AHJ AND SPECIFIED ON THE DRAWINGS, COMPACT STRANDED ALUMINUM. SOLID FOR NO. 10 AWG AND SMALLER; STRANDED FOR NO. 8 AWG AND LARGER.

D. BRANCH CIRCUITS: COPPER ONLY - ALUMINUM IS NOT ALLOWED. SOLID FOR NO. 10 AWG AND SMALLER; STRANDED FOR NO. 8 AWG AND LARGER.

E. THE CONTRACTOR SHALL INCREASE THE CONDUCTOR SIZE AS NECESSARY, DEPENDENT ON TOTAL CIRCUIT LENGTH, TO ACCOMMODATE FOR VOLTAGE DROP. REFER TO THE VOLTAGE DROP TABLE ON THE DRAWINGS FOR MINIMUM REQUIRED CONDUCTOR SIZES.

F. 120 VOLT, 208 VOLT (1-PHASE), AND 277 VOLT 20 AMP BRANCH CIRCUITS SHALL BE A MINIMUM #12 AWG CONDUCTOR. TYPICALLY (2)-#12 & #12 G. IN 3/4" C. SHALL COMPRISE A SINGLE CIRCUIT UNLESS INDICATED OTHERWISE ON THE DRAWINGS.

G. FURNISH FACTORY-COLORED INSULATION FOR CONDUCTORS OR WITH A FIELD APPLIED TAPE.

H. CONDUCTORS SHALL BE PERMANENTLY MARKED TO INDICATE VOLTAGE, INSULATION TYPE AND TEMPERATURE RATING AND SIZE IN ACCORDANCE WITH NEC ARTICLE 310.11. ENSURE THESE MARKINGS ARE VISIBLE AT ALL TERMINATIONS AND ACCESSIBLE LOCATIONS ALONG THE CONDUCTOR'S LENGTH.

2.2 CONDUCTOR REQUIREMENTS:

A. FEEDERS AND BRANCH-CIRCUITS: TYPE THWN-2, SINGLE CONDUCTORS IN RACEWAY.

B. FEEDERS OR BRANCH CIRCUITS IN WET LOCATIONS OR CONCEALED IN CONCRETE, BELOW SLABS-ON-GRADE, CRAWL SPACES AND UNDERGROUND: TYPE THWN-2 OR XHHW-2, SINGLE CONDUCTORS IN RACEWAY.

C. NEUTRAL CONDUCTOR(S) SHALL MATCH THE AMPACITY, PHYSICAL SIZE, MATERIAL, QUANTITY (IF PARALLELED INSTALLATION), AND INSULATION TYPE OF THE LARGEST UNGROUNDED PHASE CONDUCTOR, WHETHER SPECIFIED AS SUCH ON THE DRAWING OR NOT.

D. ALUMINUM CONDUCTORS, WHERE ALLOWED BY THE AHJ AND THE OWNER, SHALL BE AA-8000 SERIES ONLY. SHOULD ALUMINUM CONDUCTORS BE SELECTED FOR USE, THE CONTRACTOR SHALL MAKE ALL OTHER INFRASTRUCTURE MODIFICATIONS NECESSARY TO ACCOMMODATE THE CONDUCTOR MATERIAL AT NO ADDITIONAL COST, INCLUDING, BUT NOT LIMITED TO: LARGER CONDUIT SIZE, TERMINAL LUG TYPE, SIZE, AND QUANTITY, OXIDE INHIBITING COMPOUND, ETC.

E. CORD DROPS AND PORTABLE APPLIANCE CONNECTIONS: TYPE SO OR SJO HARD SERVICE CORD (TYPE AS REQUIRED BY VOLTAGE LEVEL AVAILABLE) WITH STAINLESS-STEEL, WIRE-MESH, STRAIN RELIEF DEVICE AT TERMINATIONS TO SUIT APPLICATION.

F. CLASS 1 CONTROL CIRCUITS: TYPE THWN-2, IN RACEWAY.

G. CLASS 2 CONTROL CIRCUITS: TYPE THWN-2, IN RACEWAY, POWER-LIMITED CABLE, CONCEALED IN BUILDING FINISHES OR POWER-LIMITED TRAY CABLE, IN CABLE TRAY.

3. EXECUTION

3.1 INSTALLATION:

A. MECHANICALLY PROTECT ALL CONDUCTORS BY INSTALLING IN RACEWAY. INSTALL WIRE AND CABLE SECURELY, IN A NEAT AND WORKMANLIKE MANNER, AS SPECIFIED IN NECA 1. COMPLETELY AND THOROUGHLY SWAB RACEWAY BEFORE INSTALLING WIRE.

B. ROUTE WIRE AND CABLE AS REQUIRED BY PROJECT CONDITIONS. WIRE AND CABLE ROUTING INDICATED IS DIAGRAMMATIC, CONTRACTOR TO DETERMINED EXACT FEEDER OR BRANCH CIRCUIT ROUTING IN FIELD. CONTRACTOR TO BE RESPONSIBLE FOR DETERMINING EXACT ROUTING AND LENGTHS REQUIRED.

C. USE WIRING METHODS INDICATED. NOT MORE THAN THREE ALTERNATE PHASE CONDUCTORS MAY SHARE A COMMON NEUTRAL. PROVIDE DEDICATED CIRCUITS AND NEUTRALS (ONE PHASE PER NEUTRAL) FOR BRANCH CIRCUITS AS FOLLOWS: 1) CONNECTED TO A "K" RATED TRANSFORMER, 2) CONNECTED TO A GROUND FAULT (GFCI) OR ARC FAULT (AFCI) CIRCUIT BREAKER OR, 3) OTHER SINGLE PHASE CIRCUIT WHERE CONNECTING MULTIPLE PHASES TO A COMMON NEUTRAL WILL ADVERSELY EFFECT THE OPERATION OF THE SUPPLIED LOAD. ONLY CIRCUITS CONNECTED TO SINGLE PHASE GENERAL PURPOSE RECEPTACLE OR LIGHTING BRANCH CIRCUITS RATED A MAXIMUM 20 AMPS MAY BE COMBINED. CONTRACTOR SHALL CONFIRM WITH THE BUILDING OWNER THAT CONNECTING MULTIPLE PHASES TO A COMMON NEUTRAL IS ACCEPTABLE, AUTHORIZATION SHALL BE PROVIDED IN WRITING. AT NO TIME SHALL TWO CONDUCTORS/CIRCUITS OF THE SAME PHASE SHARE A COMMON NEUTRAL. THE CIRCUIT BREAKER SERVING ANY MULTIWIRE BRANCH-CIRCUIT MUST BE MULTIPLE POLE TYPE WITH A COMMON INTERNAL TRIP, TO SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CIRCUIT CONDUCTORS OF THE MULTIWIRE BRANCH-CIRCUIT.

D. PULL ALL CONDUCTORS INTO RACEWAY AT SAME TIME.

E. CLEAN CONDUCTOR SURFACES BEFORE INSTALLING LUGS AND CONNECTORS.

F. MAKE SPLICES, TAPS, AND TERMINATIONS TO CARRY FULL AMPACITY OF CONDUCTORS WITH NO PERCEPTIBLE TEMPERATURE RISE.

G. ALL BUILDING FEEDERS SHALL BE CONTINUOUS FROM SWITCHBOARD TO PANEL, PANEL TO PANEL AS WELL AS BRANCH CIRCUITS FROM PANEL TO OUTLET, UTILIZATION DEVICE OR EQUIPMENT FOR CONDUCTOR LENGTHS 250' OR LESS. FEEDER AND BRANCH CIRCUIT CONDUCTOR SPLICES WILL NOT BE ALLOWED FOR ONE WAY LENGTHS LESS THAN 250'.

H. CONCEAL CABLES IN FINISHED WALLS, CEILINGS, AND FLOORS, UNLESS OTHERWISE INDICATED.

I. USE MANUFACTURER-APPROVED PULLING COMPOUND OR LUBRICANT WHERE NECESSARY; COMPOUND USED MUST NOT DETERIORATE CONDUCTOR OR INSULATION. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM PULLING TENSIONS AND SIDEWALL PRESSURE VALUES.

J. USE PULLING MEANS, INCLUDING FISH TAPE, CABLE, ROPE, AND BASKET-WEAVE WIRE/CABLE GRIPS THAT WILL NOT DAMAGE CABLES OR RACEWAY.

K. NEATLY AND SECURELY BUNDLE ALL CONDUCTORS IN ENCLOSURES USING NYLON STRAPS WITH A LOCKING HUB OR HEAD ON ONE END AND A TAPER ON THE OTHER.

L. AT LEAST 6 INCHES (MEASURED FROM THE FINISHED SURFACE) OF EACH CONDUCTOR SHALL EXTEND OUTSIDE A BOX'S OPENING.

M. MULTI-POLE BREAKERS WITH COMMON HANDLE OPERATION AND COMMON INTERNAL TRIP SHALL BE PROVIDED WHERE PHASES ARE COMBINED SHARING A COMMON NEUTRAL.

N. INSTALL NO MORE THAN THREE PHASE CONDUCTORS OF DIFFERENT PHASES, A NEUTRAL OR NEUTRALS, AND A GROUNDING CONDUCTOR IN A SINGLE RACEWAY UNLESS SPECIFICALLY NOTED ON THE DRAWINGS. WHERE CIRCUITS ARE COMBINED INTO A COMMON RACEWAY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE AMPACITY ADJUSTMENT OF THE INDIVIDUAL CONDUCTOR AMPACITIES PER NEC REQUIREMENTS.

O. USE EQUIPMENT HOMERUN CIRCUIT NUMBERS AS INDICATED FOR PANELBOARD CONNECTIONS. COMPLY WITH AMPACITY ADJUSTMENT FACTORS AS REQUIRED BY THE NEC ARTICLE 310.15.

P. GENERAL USE CIRCUIT NUMBERS MAY BE CHANGED. UPDATE CIRCUIT DIRECTORY.

Q. FOR MULTI-SECTION PANELBOARDS, WHETHER SHOWN ON THE DRAWINGS OR NOT, THE CONTRACTOR SHALL PROVIDE INTERCONNECTING CONDUCTORS FROM THE FEED-THROUGH LUGS OR FEEDER BREAKER IN EACH SECTION OF THE PANELBOARD OR DISTRIBUTION BOARD TO THE INCOMING LUGS OF THE SECOND SECTION, AND FROM THE FEED-THROUGH LUGS OR FEEDER BREAKER SECOND SECTION TO THE INCOMING LUGS OF THE THIRD SECTION, ETC. THE MINIMUM SIZE OF THE INTERCONNECTING CONDUCTORS SHALL EITHER MATCH OR EXCEED THE PHYSICAL SIZE OR AMPACITY OF THE FIRST SECTION'S INCOMING CONDUCTOR SIZE OR SHALL MEET OR EXCEED THE PANELBOARD OR DISTRIBUTION BOARD'S AMPERE RATING. FOR DOWNSTREAM SECTIONS OF A PANELBOARD THAT ARE SUPPLIED BY A FEEDER BREAKER, THE INCOMING CONDUCTOR SIZE SHALL BE SIZED PER THE AMPERE RATING OF THE OVERCURRENT PROTECTIVE DEVICE SUPPLYING THE FEEDER, UNLESS NOTED OTHERWISE ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.

R. PROVIDE TWELVE-INCHES OF SLACK CORD, NEATLY COILED AND BUNDLED, FOR EACH CORD DROP AND PORTABLE APPLIANCE CONNECTION AS SPECIFIED IN THIS SECTION.

S. WHETHER SPECIFIED AS SUCH ON THE DOCUMENTS OR NOT, CONDUCTORS INSTALLED IN PARALLEL SHALL CONSIST OF THE SAME CONDUCTOR MATERIAL, BE OF THE SAME LENGTH, BE THE SAME PHYSICAL SIZE (IN CIRCULAR MIL AREA), HAVE THE SAME INSULATION TYPE AND RATING, BE TERMINATED IN THE SAME MANNER, AND BE A MINIMUM OF 1/0 AWG. THIS REQUIREMENT APPLIES TO THE PARALLELED CONDUCTORS IN EACH PHASE, NEUTRAL, EQUIPMENT GROUNDING CONDUCTOR, AND EQUIPMENT BONDING JUMPER. REFER TO ELECTRICAL SPECIFICATION SECTION 26 05 43 RACEWAYS FOR ADDITIONAL REQUIREMENTS.

3.2 SPLICES AND TERMINATIONS:

A. DESCRIPTION: FACTORY-FABRICATED CONNECTORS AND SPLICES OF SIZE, AMPACITY RATING, MATERIAL, TYPE, AND CLASS FOR APPLICATION AND SERVICE INDICATED.

B. ALL WIRE SPLICES #6 AND LARGER SHALL HAVE UL LISTED FOR SUBMERSIBLE APPLICATION TYPE WATER PROOF INSULATING HEAT SHRINK TYPE COVERINGS, UL LISTED FOR 600 VOLT APPLICATIONS SIMILAR OR APPROVED EQUAL TO 3M ITCSN HEAVY WALL SHRINK TUBING. COVERING SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

C. TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES. IF MANUFACTURER'S TORQUE VALUES ARE NOT INDICATED, USE THOSE SPECIFIED IN UL 486A AND UL 486B.

D. MAKE SPLICES AND TAPS FOR CONDUCTORS #6 AND LARGER WITH PERMANENT, STRAIGHT OR 'T' BARREL COMPRESSION TYPE CONNECTORS. COMPRESSIONS SHALL BE MADE WITH COMPRESSION TOOL INTENDED FOR APPLICATION WITH PROPER DIES SIZED FOR CONNECTOR AND WIRE. CONNECTOR MATERIAL SHALL MATCH CONDUCTOR.

E. FOR MULTI-TERMINAL (POLARIS) TYPE CONNECTORS, CONTRACTOR SHALL DISTRIBUTE SOURCE AND LOAD CONDUCTORS IN ACCORDANCE WITH UL 486A AND UL 486B AND MANUFACTURER'S RECOMMENDATIONS.

F. ALL ALUMINUM TERMINATIONS SHALL HAVE AN U.L. LISTED OXIDE-INHIBITING COMPOUND IMMEDIATELY APPLIED TO THE ALUMINUM CONDUCTOR PRIOR TO APPLICATION OF COMPRESSION LUG BARREL. WIRE BRUSH THE EXPOSED CONDUCTOR PRIOR TO APPLICATION OF COMPOUND.

G. UTILIZE MECHANICAL COMPRESSION TYPE CONNECTORS WITH ALL ALUMINUM TERMINATIONS AND SPLICES. CONNECTORS SHALL BE DUAL RATED (AL7CU OR AL9CU), U.L. LISTED FOR USE WITH ALUMINUM AND COPPER CONDUCTORS, AND SIZED TO ACCEPT THE SPECIFIED CONDUCTORS. CRIMP THE CONNECTION PER THE MANUFACTURER'S RECOMMENDATION AND WIPE OFF ANY EXCESS JOINT COMPOUND. TORQUE TERMINATIONS PER SPECIFICATIONS.

3.3 IDENTIFICATION:

A. REFER TO SECTION 26 05 53 FOR THE REQUIREMENTS FOR THE IDENTIFICATION OF 600 VOLT INSULATED CONDUCTORS.

3.4 TESTING:

A. REFER TO SECTION 26 60 05 FOR THE REQUIREMENTS OF TESTING.

END OF SECTION 26 05 19

<u>SECTION 26 05 20 ELECTRICAL BOXES</u>

1. GENERAL

1.1 SCOPE:

A. THIS SECTION SPECIFIES THE FURNISHING AND INSTALLATION OF ALL OUTLET BOXES, FLOOR BOXES, JUNCTION BOXES, AND PULL BOXES.

1.2 REFERENCE STANDARDS:

A. NEMA OS 1 - SHEET-STEEL OUTLET BOXES, DEVICE BOXES, COVERS AND BOX SUPPORTS.

B. UL 50 - ENCLOSURES FOR ELECTRICAL EQUIPMENT.

C. UL 514A - METALLIC OUTLET BOXES.

D. UL 514C - NONMETALLIC OUTLET BOXES, FLUSH-DEVICE BOXES, AND COVERS.

E. NECA 1-2000 - STANDARD PRACTICES FOR GOOD WORKMANSHIP IN ELECTRICAL CONTRACTING (ANSI)

1.3 APPLICABLE PROVISIONS:

A. REFER TO SECTION 26 05 00, ELECTRICAL GENERAL PROVISIONS.

1.4 SUBMITTALS:

A. NONE REQUIRED.

1.5 DELIVERY, HANDLING AND STORAGE:

A. DELIVER BOXES AND FITTINGS IN SUITABLE CONTAINERS.

B. HANDLING SHALL BE DONE TO ENSURE THAT BOXES AND FITTINGS ARE NOT DAMAGED IN ANY WAY OR CAUSE DAMAGE TO FINISHES.

C. STORE BOXES AND FITTINGS IN SUITABLE AREAS TO PREVENT CORROSION.

2. PRODUCTS

2.1 OUTLET BOXES:

A. FOR EXPOSED DEVICE BOXES, FURNISH FS OR FD CAST BOXES FOR RIGID METAL CONDUIT SYSTEMS AND GALVANIZED STEEL BOXES FOR EMT CONDUIT SYSTEMS.

B. FOR LIGHTING FIXTURES, FURNISH 4" SQUARE WITH RAISED TILE COVERS GALVANIZED STEEL BOXES, MINIMUM 1-1/2 INCH DEEP BY 4 INCH WITH ACCESSORIES TO PROPERLY SUPPORT FIXTURES.

C. FOR MASONRY BOXES, FURNISH RECTANGULAR GALVANIZED STEEL BOXES, MINIMUM 3-1/2-INCH DEEP BY 3-3/4 INCH HIGH.

D. GALVANIZED BOXES WITH LARGER THAN 3/4" RACEWAY SHALL BE 4 - 11/16" SQUARE AND 2 - 1/8" DEEP MINIMUM.

E. ALL METALLIC BOXES ARE TO HAVE AN INTERNAL MEANS OF GROUNDING.

F. WITHIN FRAMED, DRYWALL, PLASTERED OR TILE COVERED WALLS, WITH 3/4" MAX. RACEWAY, FURNISH GALVANIZED STEEL 4" SQUARE, MINIMUM 1-1/2" DEEP BOXES WITH RAISED TILE COVER AND A FAR-SIDE SUPPORT.

G. WITHIN MASONRY WALLS, WITH 3/4" MAX. RACEWAY, FURNISH GALVANIZED STEEL BOXES, MINIMUM 2-1/2" DEEP.

2.2 JUNCTION AND PULL BOXES:

A. FURNISH GALVANIZED CODE-GAGE SHEET STEEL JUNCTION AND PULL BOXES WHERE SHOWN ON THE DRAWINGS OR WHERE INSTALLATION CONDITIONS WARRANT THEIR USE. BOXES SHALL BE FURNISHED WITH HINGED COVERS. SIZE COVER SO THAT IT CAN EASILY BE HANDLED BY ONE PERSON. ALL HARDWARE AND FASTENERS SHALL BE GALVANIZED.

B. FURNISH NEMA 1 BOXES IN INTERIOR DRY LOCATIONS.

C. FURNISH NEMA 3R BOXES IN ALL EXTERIOR LOCATIONS AND INTERIOR LOCATIONS SUBJECT TO MOISTURE.

D. FURNISH NEMA 4 CAST IRON BOXES WITH EXTERNAL FLUSH FLANGED COVER WHEN CAST IN CONCRETE.

E. FURNISH, MINIMUM 4" SQUARE, 1-1/2" DEEP, GALVANIZED STEEL JUNCTION AND PULLBOXES WHERE INSTALLATION CONDITIONS WARRANTS THEIR USE.

2.3 FLUSH FLOOR BOXES:

A. FURNISH RECTANGULAR, CAST IRON, CONCRETE TIGHT, CORROSION RESISTANT, FULLY ADJUSTABLE, MINIMUM OF TWENTY-FOUR CUBIC INCHES PER GANG, COMPARTMENTAL TYPE FOR COMBINATION RECEPTACLE AND COMMUNICATIONS TYPE, COMPLETE WITH DUPLEX RECEPTACLE AND PROVISIONS FOR COMMUNICATION JACKS INSERTS WHERE INDICATED AND HINGED FLOORING INSERT BRUSHED ALUMINUM COVER PLATE UNLESS OTHERWISE NOTED ON THE DRAWINGS. COVER PLATE FLANGES SHALL BE COMPATIBLE WITH THE FINISHED FLOOR.

B. FLOOR BOX COVERS SHALL COMPLY WITH THE SCRUB WATER EXCLUSION TEST REQUIREMENTS OF UL FOR TILE, TERRAZZO, WOOD AND CARPETED FLOORS.

3. EXECUTION

3.1 COORDINATION:

A. IN ORDER THAT ALL OUTLETS MAY COME IN PROPER RELATION TO EQUIPMENT, PANELING, DECORATED AREAS, ETC., THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE DETAILS OF THESE SPACES AND SHALL CAREFULLY LAY OUT ALL OUTLETS SO THAT THE EQUIPMENT OR PIPING OF OTHER TRADES PASSING UNDER, OVER, ACROSS OR IN CLOSE PROXIMITY TO SAME, WILL NOT CAUSE THE DEVICE OR FIXTURES AT OR IN THESE OUTLETS TO BE INACCESSIBLE FOR USE OR MAINTENANCE. THE CONTRACTOR MUST CONSULT WITH THE OTHER CONTRACTORS ON THE PROJECT AND PROCURE ALL DETAILS OF THE VARIOUS LOCATIONS SO AS TO MAKE THE OUTLET BOXES COME IN PROPER RELATION TO THE WORK OF ALL OTHER TRADES. THE ARCHITECT/ENGINEER RESERVES THE RIGHT TO REQUIRE THE CONTRACTOR RELOCATE, AT NO COST, ANY OUTLET A REASONABLE DISTANCE FROM ITS ORIGINAL LOCATION SHOWN ON THE PLANS.

B. SHOULD OUTLETS OR RECEPTACLES BE SHOWN ON THE ENGINEERING PLANS AT THE SAME LOCATION WHERE THE ARCHITECT SPECIFIES, OR THERE IS TO BE PERMANENTLY INSTALLED EQUIPMENT AND/OR FURNITURE, ENCLOSED CABINETS, STORAGE RACKS, AND/OR OTHER ITEMS CREATING A CONFLICT, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT PRIOR TO ANY INSTALLATION AND RELOCATE THE OUTLETS OR RECEPTACLES AS DIRECTED AT NO ADDITIONAL COST.

3.2 OUTLET BOXES:

A. UNLESS OTHERWISE INDICATED, INSTALL ALL OUTLET BOXES FLUSH WITH THE FINISHED WALL OR CEILING LINE. INSTALL GALVANIZED STEEL EXTENSION RINGS WHERE REQUIRED TO EXTEND THE BOX FORWARD IN CONFORMANCE TO NEC REQUIREMENTS. ATTACH RING WITH AT LEAST TWO MACHINE SCREWS. SECURELY FASTEN OUTLET BOXES TO FRAMING. PROVIDE ADDITIONAL CROSS BRACING, BRIDGING, AND/OR STRAPS FOR BOXES INSTALLED IN STUD TYPE FRAMING SYSTEMS.

B. BOXES FOR SUSPENDED LIGHTING FIXTURES SHALL NOT BE ATTACHED TO OR SUPPORTED FROM SUSPENDED CEILINGS, UNLESS SPECIFICALLY APPROVED BY CEILING INSTALLER/MANUFACTURER. DO NOT SUPPORT BOXES FROM CEILING SUSPENSION GRID.

C. DO NOT CONNECT OUTLET BOXES BACK TO BACK UNLESS SPECIFIC APPROVAL IS OBTAINED FROM THE ARCHITECT/ENGINEER. WHERE SUCH A CONNECTION IS NECESSARY TO COMPLETE A PARTICULAR INSTALLATION, FILL THE VOIDS BETWEEN THE BOXES WITH SOUND INSULATING MATERIAL.

D. INSTALL ONLY THE CONDUIT OPENINGS NECESSARY TO ACCOMMODATE THE CONDUITS AT THE INDIVIDUAL LOCATION. INSTALL KNOCKOUT CLOSURES TO CAP ALL UNUSED OPENINGS.

E. INSTALL WEATHERPROOF OUTLETS AND OUTLET BOXES IN AREAS SUBJECT TO MOISTURE WITH GASKETS BETWEEN THE BOX AND THE COVER PLATE.

F. ALL BOXES SHALL BE INSTALLED WITH COVER PLATES.

G. MOUNTING HEIGHT OF A WALL-MOUNTED OUTLET BOX MEANS THE HEIGHT FROM FINISHED FLOOR TO HORIZONTAL CENTER LINE OF THE COVER PLATE. WHERE OUTLETS ARE INDICATED ADJACENT TO EACH OTHER, MOUNT THESE OUTLETS IN A SYMMETRICAL PATTERN WITH ALL TOPS AT THE SAME ELEVATION. WHERE OUTLETS ARE INDICATED ADJACENT, BUT WITH DIFFERENT MOUNTING HEIGHTS, LINE UP OUTLETS TO FORM A SYMMETRICAL VERTICAL PATTERN ON THE WALL.

H. BOXES TO WHICH LIGHT FIXTURES OR PENDANTS ARE MOUNTED SHALL NOT CONTAIN ANY CONDUCTORS FOREIGN TO THE OPERATION OF SUCH LIGHT OR PENDANT APPLICATION. REMOVAL OF LIGHTS, PENDANTS AND CORD DROPS TO ACCESS OTHER BRANCH CIRCUITS IS NOT ACCEPTABLE.

I. RACEWAYS ARE NOT ALLOWED TO TERMINATE TO EXTENSION RINGS.

3.3 JUNCTION AND PULL BOXES:

A. INSTALL BOXES AS REQUIRED TO FACILITATE CONDUCTOR INSTALLATION IN RACEWAY SYSTEMS. JUNCTION AND PULL BOXES SHALL BE SIZED TO ACCOMMODATE CONDUCTOR SYSTEM SPLICES AND ASSOCIATED INSULATION. GENERALLY INSTALL BOXES IN CONDUIT RUNS OF MORE THAN 100 FEET OR AS REQUIRED IN SECTION 26 05 43. LOCATE BOXES STRATEGICALLY AND MAKE THEM OF SUCH SHAPE TO PERMIT EASY PULLING OF CONDUCTORS.

B. INSTALL BOXES SO THAT COVERS ARE READILY ACCESSIBLE AND EASILY REMOVABLE AFTER COMPLETION OF THE INSTALLATION. INCLUDE SUITABLE ACCESS DOORS FOR BOXES ABOVE INACCESSIBLE CEILINGS. SELECT A PRACTICAL SIZE FOR EACH BOX AND COVER. ALL BOXES SHALL HAVE COVERS.

3.4 IDENTIFICATION:

A. REFER TO SECTION 26 05 53 FOR THE REQUIREMENTS FOR THE IDENTIFICATION OF ELECTRICAL BOXES.

3.5 FLOOR BOXES:

A. VERIFY LOCATIONS OF ALL FLOOR BOXES WITH THE ARCHITECT/ENGINEER BEFORE INSTALLATION. COMPLETELY ENVELOPE FLOOR BOXES IN CONCRETE EXCEPT AT THE TOP. INCREASE SLAB THICKNESS AT BOXES IF REQUIRED FOR BOTTOM COVERING. ADJUST COVERS FLUSH WITH FINISHED FLOOR.

END OF SECTION 26 05 20

<u>SECTION 26 05 26 GROUNDING AND BONDING</u>

1. GENERAL

1.1 SCOPE:

A. THIS SECTION SPECIFIES THE FURNISHING AND INSTALLATION OF GROUNDING AND BONDING EQUIPMENT FOR ELECTRICAL SYSTEMS.

B. SECTION INCLUDES:

1) GROUNDING AND BONDING COMPONENTS.

1.2 REFERENCE STANDARDS:

A. IEEE STD 81 - IEEE GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM.

B. IEEE STD 142 - IEEE RECOMMENDED PRACTICE FOR GROUNDING OF INDUSTRIAL AND COMMERCIAL POWER SYSTEMS.

C. UL 83 - THERMOPLASTIC-INSULATED WIRES AND CABLES.

D. UL 467 - GROUNDING AND BONDING EQUIPMENT.

E. UL 486A - WIRE CONNECTORS AND SOLDERING LUGS FOR USE WITH COPPER CONDUCTORS.

F. NECA 331 - STANDARD FOR BUILDING AND SERVICE ENTRANCE GROUNDING AND BONDING.

G. IEEE C2 - UNDERGROUND COMPONENT GROUNDING.

1.3 APPLICABLE PROVISIONS:

A. REFER TO SECTION 26 05 00, ELECTRICAL GENERAL PROVISIONS.

1.4 SUBMITTALS:

A. NONE REQUIRED.

1.5 DELIVERY, HANDLING AND STORAGE:

A. DELIVER GROUNDING AND BONDING MATERIALS AND ACCESSORIES IN SUITABLE CONTAINERS.

B. HANDLING SHALL BE DONE TO ENSURE THAT GROUNDING AND BONDING MATERIALS AND ACCESSORIES ARE NOT DAMAGED IN ANY WAY OR CAUSE DAMAGE TO FINISHES.

C. STORE GROUNDING AND BONDING MATERIALS AND ACCESSORIES IN SUITABLE AREAS TO PREVENT CORROSION.

2. PRODUCTS

2.1 CONNECTIONS:

A. LISTED AND LABELED BY A NATIONALLY RECOGNIZED TESTING LABORATORY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION FOR APPLICATIONS IN WHICH USED, AND FOR SPECIFIC TYPES, SIZES AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS CONNECTED.

B. FOR ABOVE GRADE CONNECTIONS FURNISH BONDS AND CLAMPS OF A NON-FERROUS MATERIAL WHICH WILL NOT CAUSE ELECTROLYTIC ACTION BETWEEN THE CONDUCTOR AND THE CONNECTOR.

2.2 BUSHINGS:

A. FURNISH THREADED MALLEABLE IRON OR STEEL INSULATED BUSHINGS WITH EXTERNAL LUG FOR GROUNDING CONDUCTOR WHERE METALLIC CONDUIT CONTAINING GROUND CONDUCTORS IS USED OR PLASTIC BUSHINGS FOR PVC CONDUIT.

2.3 CONDUCTORS:

A. FURNISH BARE COPPER CONDUCTORS FOR BONDING JUMPERS. FURNISH 600-VOLT INSULATED CONDUCTORS HAVING A GREEN-COLORED INSULATION FOR GROUNDING ELECTRODE AND EQUIPMENT GROUNDING CONDUCTORS. USE SOLID CONDUCTORS FOR #10 AWG WIRE; STRANDED FOR #8 AWG AND LARGER.

3. EXECUTION

3.1 INSTALLATION:

A. ALL METALLIC CONDUITS SHALL BE ELECTRICALLY CONTINUOUS.

B. INSTALL BONDING JUMPERS IN RACEWAY SYSTEM AROUND EXPANSION JOINTS.

C. INSTALL GROUNDING CONDUCTORS IN THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE TO MINIMIZE TRANSIENT VOLTAGE RISES.

D. APPLY CORROSION-RESISTANT FINISH TO FIELD-CONNECTIONS, BURIED METALLIC GROUNDING AND BONDING PRODUCTS, AND PLACES WHERE FACTORY APPLIED PROTECTIVE COATINGS HAVE BEEN DESTROYED.

E. INSTALL CLAMP-ON CONNECTORS ON CLEAN METAL CONTACT SURFACES TO ENSURE ELECTRICAL CONDUCTIVITY AND CIRCUIT INTEGRITY.

F. TIGHTEN GROUNDING AND BONDING CONNECTORS AND TERMINALS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES FOR CONNECTORS AND BOLTS. WHERE MANUFACTURER'S TORQUE REQUIREMENTS ARE NOT INDICATED, TIGHTEN CONNECTIONS TO COMPLY WITH TORQUE TIGHTENING VALUES SPECIFIED IN UL 486A TO ASSURE PERMANENT AND EFFECTIVE GROUNDING.

G. PROTECT ALL EXPOSED, GROUNDING ELECTRODE CONDUCTORS WITH SCHEDULE 40 PVC NONMETALLIC CONDUIT. GROUNDING ELECTRODE CONDUCTORS SHALL NOT BE PROTECTED WITH METALLIC MATERIALS.

3.2 SYSTEM GROUND:

A. WHERE A SYSTEM NEUTRAL IS USED, GROUND THE SYSTEM NEUTRAL CONDUCTOR AS REQUIRED BY NEC ARTICLE 250. GROUND THE SYSTEM NEUTRAL ONLY AT THE POINT OF SERVICE AND ISOLATE IT FROM GROUND AT ALL OTHER POINTS IN THE SYSTEM.

B. GROUND NEUTRALS OF SEPARATELY DERIVED SYSTEMS SUCH AS TRANSFORMERS, ETC., IN ACCORDANCE WITH NEC ARTICLE 250.30 AND AS SHOWN ON THE DRAWINGS.

C. SIZE THE SYSTEM GROUNDING CONDUCTORS TO COMPLY WITH NEC TABLE 250.66, UNLESS INDICATED OR SHOWN LARGER.

3.3 SYSTEM BONDING:

A. SEPARATELY DERIVED SYSTEMS.

1) INSTALL A BONDING JUMPER BETWEEN THE MAIN SERVICE SYSTEM GROUND BUS AND EACH SEPARATELY DERIVED ELECTRICAL SYSTEM'S (TRANSFORMER) GROUNDED (XO-NEUTRAL) BUS.

3.4 ADDITIONAL BONDING:

A. INSTALL 3/0 AWG BONDING JUMPERS AROUND ALL STRUCTURAL METAL EXPANSION JOINTS.

B. BOND THE GROUNDED (XO-NEUTRAL) CONDUCTOR OF EACH SEPARATELY DERIVED SYSTEM TO THE NEAREST AVAILABLE POINT OF THE GROUNDING ELECTRODE SYSTEM.

C. INSTALL BONDING JUMPERS AROUND RACEWAY EXPANSION JOINTS.

D. INSTALL BONDING JUMPERS AROUND INSULATED WATER PIPE JOINTS.

3.5 EQUIPMENT GROUND:

A. RACEWAYS SHALL NOT BE USED AS THE SOLE EQUIPMENT GROUND. EACH FEEDER AND BRANCH CIRCUIT SHALL BE PROVIDED WITH A GREEN INSULATED COPPER GROUNDING CONDUCTOR. FOR EXISTING INSTALLATIONS, PROVIDE NEW CONDUIT IF REQUIRED DUE TO INSTALLATION OF NEW EQUIPMENT GROUNDING CONDUCTOR. ADHERE TO CONDUIT FILL RATES SPECIFIED BY THE NATIONAL ELECTRICAL CODE.

B. BOND THE EQUIPMENT GROUNDING CONDUCTORS TO ALL BOXES AND ENCLOSURES.

C. EACH RECEPTACLE SHALL BE BONDED TO ITS RESPECTIVE DEVICE BOX. THE CONNECTION SHALL BE MADE BY MEANS OF A BONDING JUMPER BETWEEN THE DEVICE AND THE BOX. WHERE THE RECEPTACLE MOUNTING YOKE IS DESIGNED AND LISTED FOR THE PURPOSE OF GROUNDING; THE BONDING JUMPER MAY BE OMITTED. THIS DOES NOT SUBSTITUTE FOR THE NEED OF GROUNDING THE OUTLET BOX.

END OF SECTION 26 05 26

<u>SECTION 26 05 29 ELECTRICAL HANGERS AND SUPPORTS</u>

1. GENERAL

1.1 SCOPE:

A. THIS SECTION SPECIFIES THE FURNISHING AND INSTALLATION OF METAL FRAMING, INCLUDING CHANNELS, HANGERS, BRACKETS, FITTINGS, CLAMPS, HARDWARE, ANCHOR BOLTS, RODS, AND ELECTRICAL ACCESSORIES FOR INSTALLING ELECTRICAL EQUIPMENT AND MATERIALS.

1.2 REFERENCE STANDARDS:

A. AISI SG02-1- NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS.

B. ASTM A36 - STANDARD SPECIFICATION FOR CARBON STRUCTURAL STEEL.

C. ASTM A123 - STANDARD SPECIFICATION FOR ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS.

D. ASTM A153 - STANDARD SPECIFICATION FOR ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE.

E. ASTM A575 - STANDARD SPECIFICATION FOR STEEL BARS, CARBON, MERCHANT QUALITY, M-GRADES.

F. ASTM A576 - STANDARD SPECIFICATION FOR STEEL BARS, CARBON, HOT-WROUGHT, SPECIAL QUALITY.

G. ASTM A635 - STANDARD SPECIFICATION FOR STEEL, SHEET AND STRIP, HEAVY-THICKNESS COILS, CARBON, COMMERCIAL STEEL, DRAWING STEEL, STRUCTURAL, HIGH-STRENGTH LOW-ALLOY, AND HIGH-STRENGTH LOW-ALLOY WITH IMPROVED FORMABILITY, HOT ROLLED, GENERAL REQUIREMENTS FOR.

H. ASTM A653 - STANDARD SPECIFICATION FOR STEEL SHEET, ZINC-COATED (GALVANIZED) OR ZINC-IRON ALLOY-COATED (GALVANNEALED) BY THE HOT-DIP PROCESS.

I. ASTM A659 - STANDARD SPECIFICATION FOR COMMERCIAL STEEL (CS), SHEET AND STRIP, CARBON (0.16 MAXIMUM TO 0.25 MAXIMUM PERCENT), HOT- ROLLED.

J. ASTM A1011 - STANDARD SPECIFICATION FOR STEEL, SHEET AND STRIP, HOT-ROLLED, CARBON, STRUCTURAL, HIGH-STRENGTH LOW-ALLOY, AND HIGH-STRENGTH LOW-ALLOY WITH IMPROVED FORMABILITY.

K. ASTM 1018 - STANDARD SPECIFICATION FOR STEEL, SHEET AND STRIP, HEAVY-THICKNESS COILS, HOT-ROLLED, CARBON, COMMERCIAL, DRAWING, STRUCTURAL, HIGH-STRENGTH LOW-ALLOY, AND HIGH-STRENGTH LOW-ALLOY WITH IMPROVED FORMABILITY.

L. ASTM B633 - STANDARD SPECIFICATION FOR ELECTRODEPOSITED COATINGS OF ZINC ON IRON AND STEEL.

M. ASTM B695 - STANDARD SPECIFICATION FOR COATING OF ZINC MECHANICALLY DEPOSITED ON IRON AND STEEL.

N. ASTM F1136 - STANDARD SPECIFICATION FOR CHROMIUM/ZINC CORROSION PROTECTIVE COATINGS FOR FASTENERS.

O. MFMA-3 - METAL FRAMING STANDARDS PUBLICATION.

P. MFMA-102 - GUIDELINES FOR THE USE OF METAL FRAMING.

Q. NECA 1 - 2000 - STANDARD PRACTICES FOR GOOD WORKMANSHIP IN ELECTRICAL CONTRACTING (ANSI)

1.3 APPLICABLE PROVISIONS:

A. REFER TO SECTION 26 05 00, ELECTRICAL GENERAL PROVISIONS.

1.4 SUBMITTALS:

A. NONE REQUIRED.

1.5 DELIVERY, HANDLING AND STORAGE:

A. DELIVER METAL FRAMING, FITTINGS AND ACCESSORIES IN SUITABLE CONTAINERS.

B. HANDLING SHALL BE DONE TO ENSURE THAT METAL FRAMING, FITTINGS AND ACCESSORIES ARE NOT DAMAGED IN ANY WAY OR CAUSE DAMAGE TO FINISHES.

C. STORE METAL FRAMING, FITTINGS AND ACCESSORIES IN SUITABLE AREAS TO PREVENT CORROSION.

2. PRODUCTS

2.1 MATERIALS:

A. FURNISH CHANNELS, FITTINGS, CLAMPS, ELECTRICAL ACCESSORIES AND BRACKETS FABRICATED FROM SHEET STEEL OR FROM MALLEABLE CAST IRON. FURNISH THREADED FASTENERS FABRICATED FROM CARBON STEEL.

2.2 COATINGS:

A. HOT-DIP GALVANIZE ALL STEEL COMPONENTS WHERE DIRECTLY EXPOSED TO WEATHER OR IN CRAWL SPACES.

B. ELECTRO-GALVANIZE ALL STEEL COMPONENTS.

2.3 SIZES:

A. FURNISH CHANNELS FABRICATED FROM NOT LESS THAN 12-GAGE SHEET STEEL, 1-5/8 INCHES WIDE AND NOT LESS THAN 1-1/2 INCHES DEEP FOR HANGERS SUPPORTING RACEWAYS. FURNISH CHANNELS FABRICATED FROM NOT LESS THAN 12-GAGE SHEET STEEL, 1-5/8 INCHES WIDE AND NOT LESS THAN 1-1/2 INCHES DEEP FOR ANCHORING VERTICAL RACEWAYS TO WALLS OR WHEN USED TO PROVIDE SPACE BETWEEN RACEWAYS OR BETWEEN RACEWAYS AND WALLS OR FLOORS.

3. EXECUTION

3.1 INSTALLATION:

A. INSTALL METAL FRAMING TO SUPPORT WALL MOUNTED OR FLOOR SUPPORTED EQUIPMENT AND WALL OR CEILING MOUNTED RACEWAYS. WHERE INSTALLED HORIZONTALLY, METAL FRAMING SHALL BE ANCHORED TO A MINIMUM OF TWO WALL STUDS OR TWO DIFFERENT MASONRY UNITS USING METALLIC ANCHORS. WHERE INSTALLED VERTICALLY, METAL FRAMING SHALL BE ANCHORED TO A WALL STUD OR TWO DIFFERENT MASONRY UNITS USING A MINIMUM OF TWO METALLIC ANCHORS. WHERE INSTALLED ON CAST-IN-PLACE CONCRETE TEES OR THE WEB OF PAN JOISTS, DO NOT INSTALL ANCHORS IN THE LOWER 6-INCHES OF THE TEE OR WEB.

B. ALL HANGERS, BRACKETS, CLAMPS, ETC., SHALL BE OF STANDARD WEIGHT STEEL. PERFORATED STRAP HANGERS SHALL NOT BE USED IN ANY WORK. WHEN TWO (2) OR MORE CONDUITS ARE RUN PARALLEL, THEY MAY BE SUPPORTED ON TRAPEZE HANGERS, EQUAL TO THE MODERN CO. OTHER HANGERS SHALL BE CONSTRUCTED WITH RODS AND HANGER ADJUSTERS OF ADEQUATE SIZE TO CARRY THE LOADS IMPOSED.

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SHEET NUMBER
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C. UNLESS OTHERWISE SHOWN ON THE DRAWINGS, ALL HORIZONTAL RUNS OF CONDUIT AND PIPING SHALL BE SUSPENDED FROM THE FLOOR OR ROOF CONSTRUCTION, AS THE CASE MAY BE, BY MEANS OF APPROVED HANGERS PLACED NOT FARTHER APART THAN TEN (10) FEET ON CENTERS. VERTICAL RISERS SHALL BE SUPPORTED BY APPROVED RISER CLAMPS OR SUPPORTS INSTALLED AT THE RESPECTIVE FLOOR LINES.

D. SUPPORTS AND HANGERS SHALL BE INSTALLED TO PERMIT FREE EXPANSION AND CONTRACTION IN THE RACEWAY SYSTEMS. WHERE NECESSARY TO CONTROL EXPANSION AND CONTRACTION, THE RACEWAYS SHALL BE GUIDED AND FIRMLY ANCHORED. ANCHORS SHALL BE APPROVED BY THE ENGINEER AND SHALL BE DESIGNED FOR EQUAL EFFECTIVENESS FOR BOTH LONGITUDINAL AND TRANSVERSE THRUST. NO CONDUIT SHALL BE SELF-SUPPORTING, NOR SHALL IT BE SUPPORTED FROM EQUIPMENT CONNECTIONS. TRANSMISSION OF VIBRATIONS, NOISE, ETC., SHALL BE CONSIDERED AND ANY SPECIAL SUSPENSION WITH VIBRATION DAMPERS TO MINIMIZE TRANSMISSION SHALL BE USED WHERE NECESSARY.

E. WHERE DUCTS INTERFERE WITH THE PROPER LOCATION OF HANGERS, FURNISH AND INSTALL TRAPEZE HANGERS. TRAPEZE HANGERS MAY BE USED TO SUPPORT GROUPS OF CONDUIT RUN IN PARALLEL.

F. INSTALL METAL FRAMING TO SUPPORT WALL MOUNTED EQUIPMENT AND WALL OR CEILING MOUNTED RACEWAYS.

G. INSTALL EXPANSION BOLTS TO ATTACH FRAMING TO CONCRETE. SPACE BOLTS A MAXIMUM OF 24 INCHES ON CENTER, WITH NOT LESS THAN TWO BOLTS PER PIECE OF FRAMING.

H. FOR RACEWAY INSTALLED ALONG THE ROOFTOP, PROVIDE COOPER B-LINE "DB" SERIES SUPPORTS, INSTALLED IN INTERVALS AS REQUIRED BY THE NEC, AHJ, AND MANUFACTURER. THE BOTTOM OF THE CONDUIT SHALL BE A MINIMUM OF +12" ABOVE THE SURFACE OF THE ROOFTOP. THE EXACT SUPPORT SHALL BE AS NECESSARY TO SUPPORT THE WEIGHT OF THE PROPOSED INSTALLATION PLUS CONSIDERATION OF FUTURE REQUIREMENTS.

3.2 ANCHOR BOLTS:

a. INSTALL 1/2-INCH DIAMETER BY 3 INCH LONG EXPANSION BOLTS TO ATTACH FRAMING TO CONCRETE. SPACE BOLTS A MAXIMUM OF 24 INCHES ON CENTER, WITH NOT LESS THAN TWO BOLTS PER PIECE OF FRAMING.

3.3 TOUCH-UP:

A. TOUCH UP ALL SCRATCHES OR CUTS ON STEEL COMPONENTS WITH AN APPROVED ZINC CHROMATE OR A 90 PERCENT ZINC PAINT.

END OF SECTION 26 05 29

SECTION 26 05 43 RACEWAYS

1. GENERAL

1.1 SCOPE:

A. THIS SECTION SPECIFIES THE FURNISHING AND INSTALLATION OF RACEWAY SYSTEMS.

1.2 REFERENCE STANDARDS:

A. ANSI C80.1 - RIGID STEEL CONDUIT - ZINC-COATED.

B. ANSI C80.3 - ELECTRICAL METALLIC TUBING - ZINC-COATED.

C. NEMA FB 2.10 - SELECTION AND INSTALLATION GUIDELINES FOR FITTINGS FOR USE WITH NON-FLEXIBLE ELECTRICAL METAL CONDUIT OR TUBING (RIGID METAL CONDUIT, INTERMEDIATE METAL CONDUIT AND ELECTRICAL METALLIC TUBING).

D. NEMA FB 2.20 - SELECTION AND INSTALLATION GUIDELINES FOR FITTINGS FOR USE WITH FLEXIBLE ELECTRICAL CONDUIT AND CABLE.

E. NEMA TC 2 - ELECTRICAL POLYVINYL CHLORIDE (PVC) CONDUIT.

F. NEMA TC 3 - POLYVINYL CHLORIDE (PVC) FITTINGS FOR USE WITH RIGID PVC CONDUIT AND TUBING.

G. UL 1 - FLEXIBLE METAL CONDUIT.

H. UL 5 - SURFACE METAL RACEWAYS AND FITTINGS.

I. UL 5A - NONMETALLIC SURFACE RACEWAYS AND FITTINGS.

J. UL 6 - ELECTRICAL RIGID METAL CONDUIT - STEEL.

K. UL 360 - LIQUID-TIGHT FLEXIBLE STEEL CONDUIT.

L. UL 467 - GROUNDING AND BONDING EQUIPMENT.

M. UL 651 - SCHEDULE 40 AND 80 RIGID PVC CONDUIT.

N. UL 797 - ELECTRICAL METALLIC TUBING - STEEL.

O. UL 870 - WIREWAYS, AUXILIARY GUTTERS AND ASSOCIATED FITTINGS.

P. NECA 1-2000 - STANDARD PRACTICES FOR GOOD WORKMANSHIP IN ELECTRICAL CONTRACTING (ANSI).

Q. NECA 101-2001 - STANDARD FOR INSTALLING STEEL CONDUITS (RIGID, IMC, EMT).

R. NECA 111-2003 - STANDARD FOR INSTALLING NONMETALLIC RACEWAYS (RNC, ENT, LFNC) (ANSI)

1.3 APPLICABLE PROVISIONS:

A. REFER TO SECTION 26 05 00, ELECTRICAL GENERAL PROVISIONS.

1.4 SUBMITTALS:

A. NONE REQUIRED.

1.5 DELIVERY, HANDLING AND STORAGE:

A. DELIVER RACEWAYS AND FITTINGS IN SUITABLE CONTAINERS.

B. HANDLING SHALL BE DONE TO ENSURE THAT RACEWAYS AND FITTINGS ARE NOT DAMAGED IN ANY WAY OR CAUSE DAMAGE TO FINISHES.

C. STORE RACEWAYS AND FITTINGS IN SUITABLE AREAS TO PREVENT CORROSION.

2. PRODUCTS

2.1 CONDUIT AND FITTINGS:

A. RIGID METAL CONDUIT.

1) HOT-DIP GALVANIZED RIGID STEEL CONDUIT, GALVANIZED AFTER FABRICATION. ALL THREADS SHALL BE GALVANIZED AFTER CUTTING. A UNIFORM ZINC COATING SHALL BE APPLIED TO THE INNER AND OUTER WALLS.

2) FITTINGS SHALL BE THREADED STEEL HOT-DIP GALVANIZED WITH STEEL LOCKNUT PLUS NYLON OR THERMOPLASTIC BUSHING WHERE CONDUIT ENTERS A BOX OR PANEL.

B. RIGID NONMETALLIC CONDUIT.

1) PVC: SCHEDULES 40 OR 80 RATED FOR USE WITH 90º C. CONDUCTORS, UL LABELED AND LISTED 651 (CONDUITS), 514B (FITTINGS) AND COMPLYING WITH NEMA SPECIFICATION TC-2 (CONDUIT), TC-3 (FITTINGS).

2) PVC COMPOUND SHALL BE MADE WITH INERT MODIFIERS TO IMPROVE WEATHER ABILITY AND HEAT DISTORTION. INSTALLED CONDUIT AND FITTINGS SHALL BE HOMOGENEOUS PLASTIC FREE FROM VISIBLE CRACKS HOLES OR FOREIGN INCLUSIONS, SMOOTH AND FREE OF BLISTERS, NICKS OR OTHER IMPERFECTIONS EITHER INTERIOR OR EXTERIOR TO THE CONDUIT. CONDUIT FITTINGS AND CEMENT SHALL BE FROM THE SAME MANUFACTURER TO INSURE SYSTEM INTEGRITY. UL STAMP SHALL BE VISIBLE ON CONDUIT SECTIONS.

C. INTERMEDIATE METAL CONDUIT (IMC).

1) CONDUIT SHALL BE SIMILAR TO RIGID STEEL CONDUIT EXCEPT THINNER WALL.

2) FITTINGS SHALL BE THREADED STEEL HOT-DIP GALVANIZED WITH STEEL LOCKNUT PLUS NYLON OR THERMOPLASTIC BUSHING WHERE CONDUIT ENTERS A BOX OR PANEL.

D. ELECTRICAL METALLIC TUBING (EMT).

1) EMT SHALL BE MADE OF HOT-DIP GALVANIZED STEEL.

2) FITTINGS SHALL BE STEEL, ELECTRO ZINC PLATED. PROVIDE STEEL THREADED LOCKNUT WHERE CONNECTION ENTERS A BOX OR PANEL WITH NYLON OR THERMOPLASTIC INSULATOR. CONNECTORS SHALL BE STEEL SET SCREW OR COMPRESSION TYPE WHEN USED INTERIOR TO A CONDITIONED BUILDING. COMBINATION UL LISTED RAIN/CONCRETE TIGHT COMPRESSION CONNECTORS SHALL BE USED WHERE EXPOSED, ENCASED IN CONCRETE OR PLACED IN NON-CONDITIONED INTERIOR SPACES.

E. FLEXIBLE METAL CONDUIT (FMC).

1) SPIRALLY WOUND CONTINUOUSLY INTERLOCKED ZINC COATED STRIP STEEL.

2) FITTINGS SHALL BE LISTED FOR FMC USAGE. FITTINGS SHALL BE STEEL, ELECTRO ZINC PLATED WITH SCREWED WEDGE TO HOLD CABLE IN PLACE. SEE T & B SERIES #3100 FOR BASIS OF DESIGN. PROVIDE THERMOPLASTIC OR NYLON INSULATED BUSHING WHERE CABLE ENTERS A BOX OR PANEL.

F. LIQUID-TIGHT FLEXIBLE METAL CONDUIT (LFMC).

1) SPIRALLY WOUND CONTINUOUSLY INTERLOCKED ZINC COATED STRIP STEEL WITH A UV STABILIZED POLYVINYL CHLORIDE (PVC) OUTER JACKET BONDED TO THE CONDUIT. LFTMC SHALL BE UL LISTED WITH GROUND CONDUCTOR.

2) FITTINGS SHALL BE COMPRESSION WATER TIGHT TYPE, GALVANIZED ZINC PLATED STEEL INCLUDING BODY, GLAND AND LOCKNUT. SEALING GASKET SHALL BE PROVIDED. PROVIDE NYLON OR THERMOPLASTIC INSULATED BUSHING WHERE CONDUIT ENTERS A BOX OR PANEL.

G. METAL CLAD CABLE (MC).

1) GALVANIZED INTERLOCKING STEEL ARMOR.

2) 600 VOLT, TYPE THWN-2, INTEGRALLY COLORED INSULATION.

3) CABLE ASSEMBLY:

a. ALL INSULATED CIRCUIT CONDUCTORS AND ANY INSULATED GROUNDING CONDUCTORS SHALL BE CABLED TOGETHER AND CONTAINED UNDER AN OVERALL NONMETALLIC TAPE COVERING.

b. SIZE #12 AWG OR #10 AWG, COPPER CONDUCTORS.

4) FITTINGS SHALL BE LISTED FOR MC USAGE. FITTINGS SHALL BE STEEL, ELECTRO ZINC PLATED WITH SCREWED WEDGE TO HOLD CABLE IN PLACE. SEE T & B SERIES #3100 FOR BASIS OF DESIGN FOR TYPICAL MC CABLE. PROVIDE THERMOPLASTIC OR NYLON INSULATED BUSHING WERE CABLE ENTERS A BOX OR PANEL.

H. PVC COATED RIGID METAL CONDUIT.

1) CONDUIT SHALL BE RIGID STEEL CONDUIT WITH EXTERNAL PVC COATING, 0.040-INCH MINIMUM, AND COMPLY WITH REQUIREMENTS LISTED IN NEMA RN 1.

2) FITTINGS SHALL BE THREADED STEEL FITTINGS WITH EXTERNAL PVC COATING TO MATCH CONDUIT AND COMPLY WITH REQUIREMENTS LISTED IN NEMA FB 1.

I. METAL WIRE-WAYS.

1) FURNISH WITH WIRE RETAINERS ON NOT LESS THAN 12 INCH CENTERS. ALL SCREWS INSTALLED TOWARDS INSIDE SHALL BE PROTECTED TO PREVENT POSSIBLE WIRE INSULATION DAMAGE.

2) THE FINISH SHALL BE THE MANUFACTURERS' STANDARD COLOR AND SHALL CONSIST OF NOT LESS THAN TWO COATS OF ENAMEL OVER A RUST-INHIBITING PRIME COAT.

2.2 ACCEPTABLE MANUFACTURERS:

A. PROVIDE PRODUCTS FROM ONE OF THE FOLLOWING, OR EQUIVALENT:

1) SOUTHWIRE COMPANY (MC CABLE)
2) ALLIED CONDUIT
3) WHEATLAND

3. EXECUTION

3.1 CONDUIT AND FITTINGS:

A. TYPES ACCORDING TO USE.

1) USE GALVANIZED RIGID METAL CONDUIT (RMC) WHERE EXPOSED TO RAIN, CONDENSATION, MOISTURE, AND/OR CORROSIVE ENVIRONMENTS/ATMOSPHERES. USE RMC WHEN THE CONDUIT MAY BE SUBJECT TO SEVERE PHYSICAL DAMAGE. MINIMUM SIZE OF RMC FOR ANY LOCATION IS 3/4". SEAL CONDUIT ENDS AT EACH BUILDING ENTRY.

2) USE ELECTRICAL METALLIC TUBING (EMT) IN DRY INTERIOR WALLS OR CEILING SPACES, WHERE EXPOSED IN OPEN INTERIOR AREAS, OR 36-INCHES ABOVE THE FINISHED FLOOR IN MECHANICAL OR ELECTRICAL ROOMS. CONDUIT WHICH ENTERS OR LEAVES THE TOP OF PANELBOARDS OR ENCLOSURES MAY BE EMT, PROVIDED THE TOP OF THE PANELBOARD OR ENCLOSURE IS A MINIMUM OF 60 INCHES ABOVE THE FINISHED FLOOR. ADDITIONALLY, USE ELECTRICAL METALLIC TUBING INSIDE WHEN EXPOSED AND MORE THAN ONE FOOT ABOVE A FINISHED FLOOR. ELECTRICAL METALLIC TUBING SHALL NOT BE INSTALLED IN CONCRETE, IN CONTACT WITH EARTH, OR WHERE SUBJECT TO SEVERE PHYSICAL DAMAGE. DO NOT USE IN THE MORTAR-FILLED CELLS OF CONCRETE MASONRY UNITS. GALVANIZED ELECTRICAL METALLIC TUBING MAY BE USED IN CRAWL SPACES WITH THE FIRST LEVEL ELEVATED, WITHIN EMPTY CELLS OF CONCRETE MASONRY UNITS, AND WITHIN EQUIPMENT YARDS WHEN ABOVE 10-FEET TO THE FINISHED FLOOR OR GRADE. GALVANIZED COMPRESSION FITTINGS ARE REQUIRED IN ANY EXTERIOR ENVIRONMENT.

3) RIGID NONMETALLIC CONDUIT SHALL NOT BE INSTALLED WITHIN THE BUILDING ENVELOPE EXCEPT WHERE EXPLICITLY ALLOWED BY THESE SPECIFICATIONS OR THE AHJ. WHEN GROUNDING ELECTRODE OR BONDING CONDUCTOR(S) ARE INSTALLED EXPOSED BELOW TEN FEET ABOVE THE FINISHED FLOOR, USE RIGID NON-METALLIC CONDUIT TO GUARD FROM PHYSICAL DAMAGE. PROVIDE SCHEDULE 40 OR 80 PVC AS REQUIRED BY THE CONSTRUCTION DOCUMENTS.

4) FLEXIBLE METAL CONDUIT (FMC) MAY BE USED IN DRY, INTERIOR LOCATIONS WITH A MINIMUM LENGTH OF TWO FEET AND A MAXIMUM LENGTH OF SIX FEET AS THE FINAL CONNECTION TO TRANSFORMERS, MOTORS AND VIBRATING EQUIPMENT. ALSO, USE FMC TO CONNECT TO CEILING MOUNTED OUTLET BOXES OR RECESSED LIGHT FIXTURES. FMC MAY NOT BE USED FOR CIRCUIT HOMERUNS.

5) METAL CLAD CABLE (MC) USE SHALL BE APPROVED BY THE LOCAL AUTHORITY HAVING JURISDICTION PRIOR TO ANY INSTALLATION AND, IF ALLOWED, SHALL BE INSTALLED AS PER THEIR SPECIFIC REQUIREMENTS IN ADDITION TO NEC REQUIREMENTS. METAL-CLAD CABLE MAY BE USED IN LIEU OF FLEXIBLE METAL CONDUIT AS LONG AS IT'S USED IN CONCEALED AND DRY LOCATIONS. METAL CLAD CABLE SHALL BE USED FOR SINGLE POLE, THREE WIRE (PHASE, NEUTRAL AND GROUND) BRANCH CIRCUITS ONLY SUPPLIED FROM MAXIMUM 20 AMP BREAKERS. METAL CLAD CABLE SHALL BE ROUTED PARALLEL OR PERPENDICULAR TO BUILDING WALLS. ALL CABLE SHALL BE SUPPORTED AS PER NEC REQUIREMENTS. METAL CLAD CABLE MAY NOT BE USED FOR CIRCUIT HOMERUNS.

TYPE MC CABLE CONNECTORS SHALL COMPLY WITH UL 514B STANDARD FOR CONDUIT, TUBING, AND CABLE FITTINGS, SPECIFICALLY SECTION 7.12.3(B). TYPE MC CABLE SHOULD NOT BE USED IN WET LOCATIONS, DIRECT BURIAL, WITHIN CONDUIT, OR WHERE SUBJECT TO PHYSICAL DAMAGE.

6) LIQUID-TIGHT FLEXIBLE METAL CONDUIT (LFMC) MAY BE USED IN EXTERIOR LOCATIONS AND DAMP OR WET INTERIOR LOCATIONS AS THE FINAL CONNECTION TO ALL LIQUID PUMP MOTORS AND ASSOCIATED CONTROL CONNECTIONS, AND THE FINAL CONNECTION TO TRANSFORMERS, MOTORS AND VIBRATING EQUIPMENT. IN ALL LOCATIONS, ADHERE TO A MINIMUM LENGTH OF 2 FEET AND A MAXIMUM LENGTH OF SIX FEET. LIQUID-TIGHT FLEXIBLE METAL CONDUIT MAY NOT BE USED FOR CIRCUIT HOMERUNS.

B. TRANSITIONS.

1) CONTINUE THE HEAVIER, MORE PROTECTIVE TYPE CONDUIT APPLICATION NOT LESS THAN 4 INCHES INTO THE AREA WHERE LIGHTER, LESS PROTECTIVE TYPE CONDUIT IS PERMITTED.

C. INSTALL SLEEVES IN THE FORMS OF WALLS FOR THE INSTALLATION OF RACEWAYS. SET SLEEVES IN PLACE A SUFFICIENT TIME AHEAD SO AS NOT TO DELAY THE WORK. SEAL ALL OPENINGS AND VOIDS AROUND SLEEVES THROUGH FLOORS AND WALLS.

D. INSTALLATION REQUIREMENTS.

1) COMPLY WITH NECA 1 OR NECA 101 FOR INSTALLATION REQUIREMENTS.

2) INSTALL ALL RACEWAY SYSTEMS IN COMPLIANCE WITH THEIR RESPECTIVE ARTICLE IN THE NEC.

3) INSTALL RACEWAY SYSTEMS TO COMPLY WITH DRAWINGS AND SPECIFICATION REQUIREMENTS, COMPLETE WITH ALL JUNCTION AND PULL BOXES AS NECESSARY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND SIZE ALL J-BOXES, PULL BOXES OR GUTTERS AS REQUIRED BY CODE OR AS NECESSARY FOR EASE OF INSTALLATION.

4) INSTALL RACEWAYS PERPENDICULAR AND PARALLEL TO THE BUILDING LINES IN A NEAT AND ORDERLY MANNER.

5) INSTALL RACEWAYS CONCEALED IN ALL FINISHED AREAS UNLESS OTHERWISE SPECIFICALLY INDICATED ON THE DRAWINGS. WHEN EXPOSED THE EXACT ROUTING SHALL BE CONFIRMED IN THE FIELD WITH THE ARCHITECT/ENGINEER PRIOR TO ROUGH-IN.

6) METALLIC RACEWAYS SHALL BE CONTINUOUS BETWEEN ENCLOSURES AND BOXES. THE RACEWAY SHALL BE SECURED TO ENCLOSURES AND BOXES SO THAT THE RACEWAY SYSTEM IS ELECTRICALLY CONTINUOUS THROUGHOUT.

7) NO WIRING SYSTEMS OF ANY TYPE SHALL BE INSTALLED IN DUCTS USED TO TRANSPORT DUST, LOOSE STOCK, OR FLAMMABLE VAPORS.

8) NO WIRING SYSTEM OF ANY TYPE SHALL BE INSTALLED IN ANY SHAFT CONTAINING DUCTS USED FOR VAPOR REMOVAL OR FOR VENTILATION OF COMMERCIAL-TYPE COOKING EQUIPMENT.

9) KEEP RACEWAYS AT LEAST 12 INCHES AWAY FROM PARALLEL RUNS OF FLUES AND WATER PIPES. INSTALL HORIZONTAL RACEWAY RUNS ABOVE WATER PIPING.

10) ARRANGE STUB-UPS SO CURVED PORTIONS OF BENDS ARE NOT VISIBLE ABOVE THE FINISHED SLAB.

11) INSTALL NO MORE THAN THE EQUIVALENT OF THREE 90-DEGREE BENDS IN ANY CONDUIT RUN. SHOULD MORE THAN THREE 90-DEGREE BENDS BE REQUIRED, THE CONTRACTOR SHALL FURNISH AND INSTALL A PULL BOX, SIZED AS REQUIRED BY THE NEC AND AHJ, IN LINE WITH THE CONDUIT, AFTER THE THIRD BEND BUT PRIOR TO A FOURTH. BOXES SHALL BE INDEPENDENTLY SUPPORTED FROM STRUCTURE, WHERE APPLICABLE. INSTALL BOX(ES) IN THIS MANNER AFTER THE EQUIVALENT OF THREE 90-DEGREE BENDS IN ANY CONDUIT RUN.

12) THREADED CONDUIT JOINTS, EXPOSED TO WET, DAMP, CORROSIVE, OR OUTDOOR CONDITIONS: APPLY LISTED EPOXY PAINT COMPOUND TO THREADS OF RACEWAY AND FITTINGS BEFORE MAKING UP JOINTS. FOLLOW COMPOUND MANUFACTURER'S WRITTEN INSTRUCTIONS.

13) SHOULD MC CABLE BE USED, THE OUTER JACKET SHALL ONLY BE CUT WITH AN APPROVED ROTARY-TYPE CUTTING TOOL THAT IS CALIBRATED TO THE MANUFACTURE'S SPECIFICATIONS. AN ANTI-SHORT SHALL BE USED WITH MC CABLE CONNECTORS OR BE MANUFACTURED WITH ANTI-SHORT AS AN INTEGRAL PART OF THE CONNECTOR. THE END OF MC CABLE, WHERE IT TERMINATES IN APPROVED CONNECTORS, SHALL NOT BE TAPED OR PAINTED.

14) WHETHER SPECIFIED ON THE DOCUMENTS OR NOT, PARALLELED RACEWAYS INSTALLED FOR PARALLELED CONDUCTOR INSTALLATIONS SHALL BE ALL OF THE SAME TYPE, SIZE, AND MATERIAL. EACH RACEWAY SHALL CONTAIN THE SAME QUANTITY OF CONDUCTORS.

E. INSTALLATION METHODS.

1) ALL CIRCUIT HOMERUNS SHALL BE CONTAINED IN EMT OR RMC, DEPENDING ON THE INSTALLATION LOCATION. FLEXIBLE CONDUITS AND/OR NON-METALLIC CONDUITS SHALL NOT BE UTILIZED FOR CIRCUIT HOMERUNS.

2) RACEWAY SYSTEMS SHALL BE COMPLETE BEFORE INSTALLING CONDUCTORS.

3) RACEWAYS SHALL HAVE OPENINGS TEMPORARILY PLUGGED TO EXCLUDE FOREIGN OBJECTS. THE INTERIOR OF ALL RACEWAYS SHALL BE CLEANED BEFORE INSTALLING CONDUCTORS.

4) JOINTS SHALL BE CUT SQUARE AND BE REAMED SMOOTH. FIELD THREADED RACEWAYS SHALL BE COATED WITH AN APPROVED ZINC CHROMATE OR WITH A 90 PERCENT ZINC PAINT.

5) BENDS SHALL BE MADE WITH STANDARD ELLS OR CONDUIT FIELD BENT TO RADII IN ACCORDANCE WITH THE NEC. CONDUIT BODIES WITH A MAXIMUM SIZE OF 1-INCH MAY BE USED IN LIEU OF CONDUIT ELLS WHERE EASE OF INSTALLATION AND APPEARANCE WARRANTS THEIR USE. FIELD BENDS SHALL BE MADE USING EQUIPMENT DESIGNED FOR THE PARTICULAR RACEWAY MATERIAL AND SIZE. BENDS SHALL BE FREE FROM DENTS OR FLATTENING.

6) SECURELY FASTEN AND SUPPORT RACEWAY TO STRUCTURE OR METAL FRAMING USING MALLEABLE IRON PIPE STRAPS OR OTHER APPROVED MEANS. BRANCH CIRCUIT RACEWAYS 1 INCH AND SMALLER MAY BE ATTACHED TO WALL STUDS. WIRES OF ANY TYPE FOR SECURING RACEWAYS ARE NOT ACCEPTABLE. RACEWAYS SHALL NOT BE SUPPORTED FROM SUSPENDED CEILING SUSPENSION SYSTEM.

7) INSTALL A NO. 30 NYLON PULLING LINE IN ALL EMPTY RACEWAYS. IDENTIFY BOTH ENDS OF THE LINE BY MEANS OF LABELS OR TAGS READING "PULLING LINE."

8) INSTALL EXPANSION-DEFLECTION FITTINGS WHERE RACEWAYS CROSS STRUCTURAL EXPANSION JOINTS OR WHERE REQUIRED TO COMPENSATE FOR THERMAL EXPANSION AND CONTRACTION. INSTALL BONDING JUMPERS ACROSS FITTINGS IN METAL RACEWAY SYSTEMS.

9) TERMINATE CONCEALED RACEWAYS FOR FUTURE USE WITH A COUPLING SET FLUSH WITH THE STRUCTURAL SURFACE. INSTALL AN APPROVED PLUG FLUSH WITH THE SURFACE.

10) ALL OPENINGS AROUND ELECTRICAL PENETRATIONS AT FIRE RATED WALLS, OR SOUND-RESISTANT-RATED PARTITIONS, FLOORS OR CEILINGS SHALL BE SEALED TO MAINTAIN THE RATING OF THE PENETRATION.

11) INSTALL RACEWAY SEALING FITTINGS AT SUITABLE, APPROVED, AND ACCESSIBLE LOCATIONS AND FILL THEM WITH LISTED SEALING COMPOUND. FOR CONCEALED RACEWAYS, INSTALL EACH FITTING IN A FLUSH STEEL BOX WITH A BLANK COVER PLATE.

TYPICAL AREAS INCLUDE, BUT ARE NOT LIMITED TO:

a. WHERE CONDUITS PASS FROM WARM TO COLD LOCATIONS, SUCH AS BOUNDARIES OF REFRIGERATED SPACES.

b. WITHIN HAZARDOUS LOCATIONS.

c. WHERE OTHERWISE REQUIRED BY NFPA 70.

12) CEILING SYSTEM WIRES OR LAY-IN TYPE CEILING GRID COMPONENTS SHALL NOT BE USED AS A MEANS OF SUPPORT.

13) INDEPENDENT SUPPORT WIRES AND ASSOCIATED FITTINGS WHICH ARE INSTALLED IN ADDITION TO THE CEILING SYSTEM SUPPORT WIRES SHALL BE PERMITTED.

14) INDEPENDENT WIRES WITHIN THE CAVITY OF A FIRE-RATED FLOOR-CEILING OR ROOF-CEILING ASSEMBLY SHALL BE DISTINGUISHABLE BY COLOR.

15) INDEPENDENT SUPPORT WIRES THAT PROVIDE SUPPORT FOR DEVICE BOXES SHALL BE SECURED AT BOTH ENDS.

16) MINIMIZE ROOF PENETRATIONS BY ROUTING CONDUIT THROUGH THE EQUIPMENT ROOF OPENING. IF ROOF PENETRATION IS NECESSARY, COORDINATE WITH THE ARCHITECTURAL SPECIFICATIONS AND PENETRATE AS DIRECTLY BELOW THE EQUIPMENT DISCONNECT OR WIRING CONNECTION POINT AS POSSIBLE. DO NOT USE FLEXIBLE CONDUIT IN A PITCH PAN.

17) RECESSED BOXES IN MASONRY WALLS: SAW-CUT OPENING FOR BOX IN CENTER OF CELL OF MASONRY BLOCK, AND INSTALL BOX FLUSH WITH SURFACE OF WALL.

18) ALL FITTINGS TERMINATING IN PANELS OR JUNCTION BOXES SHALL BE PROVIDED WITH PLASTIC INSERTS OR INSULATED BUSHINGS OR THROATS TO REDUCE STRIPPING OFF OF INSULATION WHEN PULLED. INSERTS AND THROATS SHALL NOT IMPEDE ELECTRICAL BONDING AND GROUNDING BETWEEN RACEWAYS OR BETWEEN RACEWAY AND PANEL OR JUNCTION BOX. ALL METAL RACEWAYS INCLUDING JUNCTION/PULL BOXES, PANELS OR OTHER UTILIZATION EQUIPMENT SHALL BE ELECTRICALLY CONTINUOUS AND GROUNDED.

19) FOR EACH ELECTRICAL WIREWAY SYSTEM INDICATED OR PROVIDED, PROVIDE A COMPLETE ASSEMBLY OF CONDUIT, TUBING OR DUCT WITH FITTINGS INCLUDING, BUT NOT NECESSARILY LIMITED TO, CONNECTORS, NIPPLES, COUPLINGS, LOCKNUTS, BUSHINGS, EXPANSION FITTINGS, OTHER COMPONENTS AND ACCESSORIES AS NEEDED TO FORM A COMPLETE SYSTEM OF THE TYPE INDICATED.

20) PROVIDE EXPANSION FITTINGS FOR ALL CONDUIT SYSTEMS AS RECOMMENDED BY THE MANUFACTURER BUT NO GREATER THAN 100' OR LONGER BETWEEN FITTINGS.

END OF SECTION 26 05 43

SECTION 26 05 53 ELECTRICAL IDENTIFICATION

1. GENERAL

1.1 SCOPE:

A. THIS SECTION SPECIFIES THE FURNISHING AND INSTALLATION OF PRODUCTS FOR THE IDENTIFICATION OF ELECTRICAL MATERIALS AND EQUIPMENT.

1.2 REFERENCE STANDARDS:

A. NFPA 70 - NATIONAL ELECTRICAL CODE.

B. OSHA - OCCUPATIONAL SAFETY AND HEALTH ACT.

1.3 APPLICABLE PROVISIONS:

A. REFER TO SECTION 26 05 00, ELECTRICAL GENERAL PROVISIONS.

1.4 SUBMITTALS:

A. REFER TO ELECTRICAL SPECIFICATION SECTION 26 27 26 WIRING DEVICES.

B. PROVIDE SAMPLE OF IDENTIFICATION NAMEPLATE TO BE USED ON ELECTRICAL DISTRIBUTION EQUIPMENT.

1.5 DELIVERY, HANDLING AND STORAGE:

A. DELIVER ELECTRICAL IDENTIFICATION MATERIALS AND ACCESSORIES IN SUITABLE CONTAINERS.

B. HANDLING SHALL BE DONE TO ENSURE THAT ELECTRICAL IDENTIFICATION MATERIALS AND ACCESSORIES ARE NOT DAMAGED IN ANY WAY OR CAUSE DAMAGE TO FINISHES.

C. STORE ELECTRICAL IDENTIFICATION MATERIALS IN SUITABLE AREAS TO PREVENT CORROSION.

2. PRODUCTS

2.1 COLORED TAPE:

A. FURNISH SCOTCH NO. 35 OR APPROVED EQUIVALENT 7-MIL THICK BY 3/4" WIDE VINYL ADHESIVE TAPE FOR COLOR CODING.

2.2 EQUIPMENT IDENTIFICATION NAMEPLATES:

A. FURNISH PERMANENTLY ENGRAVED, TWO SCREW HOLE BLACK-WHITE-BLACK PHENOLIC NAMEPLATES FOR IDENTIFICATION OF ALL NEW ELECTRICAL DISTRIBUTION EQUIPMENT INSTALLED WITHIN NEMA '1' INTERIOR ENCLOSURES -PANELBOARDS, TRANSFORMERS, DISCONNECT SWITCHES, ETC. EDGES OF NAMEPLATES SHALL BE CHAMFERED. FURNISH PERMANENTLY INSTALLED ADHESIVE NAMEPLATES FOR IDENTIFICATION OF ELECTRICAL DISTRIBUTION EQUIPMENT INSTALLED WITHIN ENCLOSURES OTHER THAN NEMA '1' OR WHERE INSTALLED IN EXTERIOR OR HAZARDOUS ENVIRONMENTS. THE NAMEPLATES SHALL BE SUITABLE FOR THE ENVIRONMENT IN WHICH THEY ARE INSTALLED.

3. EXECUTION

3.1 INSTALLATION:

A. INSTALL IDENTIFICATION PRODUCTS AS REQUIRED BY THE NEC AND OSHA AND ELSEWHERE WHERE REQUIRED BY THIS SECTION.

B. INSTALL IDENTIFICATION PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.

C. WHERE IDENTIFICATION IS TO BE APPLIED TO SURFACES THAT REQUIRE A FIELD FINISH, INSTALL IDENTIFICATION AFTER COMPLETION OF THE FINISH WORK.

3.2 OUTLET, JUNCTION AND PULL BOXES:

A. LABEL OUTLET BOX COVERS USING A BLACK PERMANENT MARKING PEN WITH THE IDENTITY OF THE CIRCUITS CONTAINED WITHIN THE BOX.

3.3 INSULATED CONDUCTORS:

A. COLOR CODE ALL 600 VOLT INSULATED CONDUCTORS BY INSTALLING CONDUCTORS WITH FACTORY COLORED INSULATION FOR CONDUCTORS 10 AWG AND SMALLER.

B. INSTALL COLORED TAPE ON ALL 600 VOLT CONDUCTORS #8 AWG AND LARGER. APPLY TAPE IN HALF-LAPPED TURNS FOR A DISTANCE OF 6 INCHES FROM TERMINAL POINTS AND IN BOXES WHERE SPLICES OR TAPS ARE MADE. APPLY THE LAST TWO LAPS OF TAPE WITH NO TENSION TO PREVENT POSSIBLE UNWINDING. DO NOT COVER FACTORY APPLIED CABLE IDENTIFICATION MARKINGS WITH TAPING; TAPE LOCATIONS MAY BE ADJUSTED SLIGHTLY TO PREVENT THE COVERING OF FACTORY MARKINGS.

C. COLOR CODE CONDUCTORS IN ACCORDANCE WITH THE EXISTING BUILDING STANDARD OR AS REQUIRED BY LOCAL CODES, IF DIFFERENT FROM THE COLOR SCHEME INDICATED ON THE DETAIL ON THE DRAWINGS. INSTALL A PERMANENTLY ADHERED LABEL IN THE INTERIOR OF EACH PANELBOARD WITH THE COLOR CODING USED ON THE PROJECT.

3.4 ADDITIONAL ELECTRICAL IDENTIFICATION:

A. PREPARE A NEATLY TYPED PANELBOARD CIRCUIT DIRECTORY. IDENTIFY ALL CIRCUITS BY THE EQUIPMENT SERVED AND BY THE ROOM NUMBER AS PER NEC REQUIREMENTS; NOTE THAT THE ROOM NUMBERS / SIGNAGE ACTUALLY INSTALLED MAY BE DIFFERENT FROM THOSE SHOWN ON DRAWINGS. INDICATE SPARES AND SPACES WITH LIGHT, ERASABLE PENCIL MARKING.

B.FOR EACH DRY TYPE TRANSFORMER WHERE THE FEEDER BREAKER IS TO BE USED AS THE PRIMARY SIDE DISCONNECTING MEANS AND IS LOCATED OUT OF SIGHT FROM THE TRANSFORMER, THE CONTRACTOR SHALL FIELD-LABEL THE TRANSFORMER WITH AN ADHESIVE LABEL WHICH STATES THE ACTUAL PHYSICAL LOCATION OF THE PANEL (ROOM NAME AND NUMBER) AND THE SERVING PANEL AND CIRCUIT NUMBER. EXAMPLE: "TRANSFORMER PRIMARY SERVED BY PANELBOARD 'HA' LOCATED IN ROOM #21".

3.5 EMERGENCY LIGHTING:

A. LABEL EMERGENCY AND EXIT LIGHTING POWER PACKS, USING BLACK MARKING PEN, WITH THE IDENTITY OF THE UN-SWITCHED CIRCUIT.

END OF SECTION 26 05 53

SECTION 26 22 00 DRY-TYPE TRANSFORMERS - 600 VOLT AND BELOW

1. GENERAL

1.1 SCOPE:

A. THIS SECTION SPECIFIES THE FURNISHING AND INSTALLATION OF DRY-TYPE TRANSFORMERS WITH 600-VOLT AND BELOW PRIMARY AND RATED 500 KVA AND SMALLER.

1.2 REFERENCE STANDARDS:

A. IEEE C57.12.01 - IEEE STANDARD GENERAL REQUIREMENTS FOR DRY-TYPE DISTRIBUTION AND POWER TRANSFORMERS INCLUDING THOSE WITH SOLID CAST AND/OR RESIN-ENCAPSULATED WINDINGS.

B. IEEE C57.12.91 - IEEE STANDARD TEST CODE FOR DRY-TYPE DISTRIBUTION AND POWER TRANSFORMERS.

C. IEEE C57.96 - IEEE GUIDE FOR LOADING DRY TYPE DISTRIBUTION AND POWER TRANSFORMERS.

D. IEEE C57.110 - IEEE RECOMMENDED PRACTICE FOR ESTABLISHING TRANSFORMER CAPABILITY WHEN SUPPLYING NONSINUSOIDAL LOAD CURRENTS.

E. NECA 409-2002 - RECOMMENDED PRACTICE FOR INSTALLING AND MAINTAINING DRY-TYPE TRANSFORMERS (ANSI).

F. NEMA ST 20 - DRY TYPE TRANSFORMERS FOR GENERAL APPLICATIONS.

G. UL 1561 - DRY-TYPE GENERAL PURPOSE AND POWER TRANSFORMERS.

I. NEMA TP1 - GUIDE FOR DETERMINING ENERGY EFFICIENCY FOR DISTRIBUTION TRANSFORMERS.

H. IEEE STD 519 - IEEE RECOMMENDED PRACTICES AND REQUIREMENTS FOR HARMONIC CONTROL IN ELECTRICAL POWER SYSTEMS.

1.3 APPLICABLE PROVISIONS:

A. REFER TO SECTION 26 05 00, ELECTRICAL GENERAL PROVISIONS.

1.4 SUBMITTALS:

A. SUBMIT MANUFACTURER'S TECHNICAL DATA FOR ALL DRY-TYPE TRANSFORMERS. INCLUDE DATA SUBSTANTIATING THAT MATERIALS COMPLY WITH THE REQUIREMENTS OF THIS SECTION. DATA SHALL INCLUDE, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING:

B. RATED KVA, NUMBER OF PHASES AND FREQUENCY.

C. IMPEDANCE.

D. PRIMARY VOLTAGE AND CONNECTION DIAGRAM.

E. SECONDARY VOLTAGE AND CONNECTION DIAGRAM.

F. NUMBER AND PERCENT TAPS.

G. SOUND LEVEL DATA.

H. OUTLINE DIMENSIONS.

I. TOTAL WEIGHT OF UNIT.

1.5 DELIVERY, HANDLING AND STORAGE:

A. DELIVER TRANSFORMERS IN SUITABLE CONTAINERS.

B. HANDLING SHALL BE DONE TO ENSURE THAT TRANSFORMERS ARE NOT DAMAGED IN ANY WAY OR CAUSE DAMAGE TO FINISHES.

C. STORE TRANSFORMERS IN SUITABLE AREAS TO PREVENT CORROSION.

1.6 OPERATING AND MAINTENANCE DATA:

A. SUBMIT MANUFACTURER'S STANDARD OPERATING AND MAINTENANCE DATA/MANUALS.

2. PRODUCTS

2.1 RATINGS:

A. REQUIRED KVA, VOLTAGES, PHASES, AND WINDING CONFIGURATIONS ARE INDICATED ON THE DRAWINGS. TRANSFORMERS MUST BE RATED FOR 60 HERTZ OPERATION, SELF-COOLED NEMA CLASS AA.

2.2 CORES:

A. CONSTRUCT CORES OF HIGH GRADE, NON-AGING SILICON STEEL WITH HIGH MAGNETIC PERMEABILITY, AND LOW HYSTERESIS AND EDDY CURRENT LOSSES. MAGNETIC FLUX DENSITIES SHALL BE KEPT WELL BELOW THE SATURATION POINT. THERE SHALL BE NO METAL-TO-METAL CONTACT BETWEEN THE CORE AND COIL AND THE ENCLOSURE.

2.3 COILS:

A. USE COPPER WIRE (BAR STOCK) OR ALUMINUM FOR COIL WINDINGS. TRANSFORMER COILS SHALL BE OF CONTINUOUS WOUND CONSTRUCTION AND SHALL BE IMPREGNATED WITH NONHYGROSCOPIC, THERMOSETTING VARNISH.

B. FURNISH TRANSFORMERS WITH FULL LOAD RATED TAPS IN THE PRIMARY WINDING, SIX 2-1/2 PERCENT TAPS, FOUR BELOW AND TWO ABOVE RATED VOLTAGE.

2.4 INSULATION SYSTEM:

A. FURNISH AN INSULATION SYSTEM WHICH IS THE MANUFACTURER'S STANDARD FOR A MAXIMUM 150 DEGREES C RISE OVER A 40 DEGREES C AMBIENT AT FULL LOAD FOR ALL TRANSFORMERS RATED 15 KVA AND LARGER.

2.5 SOUND REQUIREMENTS:

A. AVERAGE SOUND LEVELS MUST NOT EXCEED THE VALUES AS MEASURED IN ACCORDANCE WITH NEMA STANDARD ST 20.

2.6 CONSTRUCTION:

A. UNLESS OTHERWISE SPECIFIED OR INDICATED, FURNISH TRANSFORMERS IN DRIP-PROOF METAL ENCLOSURES DESIGNED TO PROVIDE AIR COOLING AND TO PREVENT ACCIDENTAL CONTACT WITH LIVE CONDUCTORS. THE MAXIMUM TEMPERATURE ON TOP OF THE ENCLOSURE SHALL NOT EXCEED 50 DEGREE C RISE ABOVE A 40 DEGREE C AMBIENT FOR 150 DEGREE C RISE TRANSFORMERS.

B. LOCATE THE WIRING COMPARTMENT BELOW THE CORE AND COIL. HAVE THE COMPARTMENT COOLED BY AIR CIRCULATION OR INSULATED FROM THE CORE AND COIL WITH A SUITABLE THERMAL BARRIER.

C. FURNISH NEOPRENE RUBBER PADS TO ISOLATE CORE AND COIL ASSEMBLY FROM TRANSFORMER ENCLOSURE.

D. GROUND THE CORE OF THE TRANSFORMER TO THE ENCLOSURE WITH A FLEXIBLE GROUNDING CONDUCTOR SIZED ACCORDING TO NEC REQUIREMENTS. TRANSFORMER CORE SHALL BE VISIBLY GROUNDED TO THE TRANSFORMER ENCLOSURE.

E. INSIDE AND OUTSIDE SURFACES SHALL BE PROPERLY CLEANED, PRIMED, AND A FINISH COAT OF GRAY PAINT APPLIED.

2.7 ACCEPTABLE MANUFACTURERS:

A. BASIS OF DESIGN MANUFACTURER SHALL BE SQUARE D. SHOULD CONTRACTOR SELECT OTHER THAN BASIS OF DESIGN IT WILL BE THEIR RESPONSIBILITY TO COORDINATE ALL PHYSICAL SIZE, PERFORMANCE OR OTHER OPERATIONAL REQUIREMENTS AND PROVIDE ALL OPTIONS AND ACCESSORIES AS SPECIFIED HEREIN. OTHER ACCEPTABLE MANUFACTURERS INCLUDE:

1) EATON ELECTRICAL/CUTLER-HAMMER: WWW.EATONELECTRICAL.COM.

2) GE INDUSTRIAL: WWW.GEINDUSTRIAL.COM.

3) SQUARE 'D' / SCHNEIDER ELECTRIC: WWW.SQUARED.COM.

4) SUBSTITUTIONS: NOT PERMITTED.

THE LISTING OF SPECIFIC MANUFACTURERS ABOVE DOES NOT IMPLY ACCEPTANCE OF THEIR PRODUCTS THAT DO NOT MEET THE SPECIFIED RATINGS, FEATURES AND FUNCTIONS. MANUFACTURERS LISTED ABOVE ARE NOT RELIEVED FROM MEETING OR EXCEEDING ALL REQUIREMENTS LISTED IN THE CONSTRUCTION DOCUMENTS IN THEIR ENTIRETY.

3. EXECUTION

3.1 TAP SETTING:

A. SELECT THE APPROPRIATE TAP SETTING ON TRANSFORMER SO THAT THE NO-LOAD SECONDARY VOLTAGE IS WITHIN +/- 1/2 OF A TAP SPAN OF THE NAMEPLATE RATING. RECORD THE TRANSFORMER SERIAL NUMBER, KVA RATING, SELECTED TAP SETTING AND SECONDARY VOLTAGE READINGS. SUBMIT THREE COPIES OF THE RECORD TO THE ARCHITECT/ENGINEER.

3.2 INSTALLATION:

A. ALL TRANSFORMERS SHALL BE INSTALLED AND CONNECTED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS. WHERE TRANSFORMERS ARE SPECIFIED TO BE WALL- OR CEILING-MOUNTED, THE CONTRACTOR SHALL COORDINATE ALL TRANSFORMER SUPPORT SIZING REQUIREMENTS WITH THE PROJECT STRUCTURAL ENGINEER. ANY REQUIRED INCREASE IN THE TRANSFORMER SUPPORT DEEMED NECESSARY BY THE PROJECT STRUCTURAL ENGINEER SHALL BE PROVIDED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

B. UNLESS NOTED OTHERWISE ON THE DRAWINGS, PROVIDE FLOOR MOUNTING FOR TRANSFORMERS PER THE FOLLOWING:

1) CONSTRUCT CONCRETE PAD FOR FLOOR MOUNTED TRANSFORMERS IN ACCORDANCE WITH SECTION 26 05 00 - ELECTRICAL GENERAL PROVISIONS. MAINTAIN A MINIMUM OF 6 INCHES FREE AIR SPACE BETWEEN ENCLOSURE AND WALLS.

2) INSTALL TRANSFORMERS ON 1" THICK HIGH RESILIENCY PADS TO ISOLATE TRANSFORMER FROM FLOOR USING KORFUND "ELASTORIB" OR EQUIVALENT.

C. WHERE TRANSFORMER IS SPECIFIED TO BE WALL-MOUNTED:

1) SECURELY ANCHOR WALL MOUNTING BRACKETS TO WALL TO PROVIDE ADEQUATE SUPPORT.

2) ANCHOR TRANSFORMER SECURELY TO WALL BRACKETS USING MINIMUM 1/2" DIAMETER BOLTS, OR AS SPECIFIED BY THE PROJECT STRUCTURAL ENGINEER.

D. WHERE TRANSFORMER IS SPECIFIED TO BE CEILING-MOUNTED:

1) SUSPEND TRANSFORMERS FROM STRUCTURE BY MEANS OF TRAPEZE HANGERS CONSTRUCTED OF GALVANIZED ALL-THREAD RODS AND METAL FRAMING CHANNELS. MAKE DOUBLE-NUT CONNECTIONS BETWEEN RODS AND CHANNELS. LOCATE TO PROVIDE ADEQUATE VENTILATION AND ACCESSIBILITY.

2) INSTALL TRANSFORMER ON 1" THICK HIGH RESILIENCY PADS TO ISOLATE TRANSFORMER FROM TRAPEZE HANGER USING KORFUND "ELASTORIB" OR EQUIVALENT.

3) THE MAXIMUM SIZE TRANSFORMER THAT MAY BE INSTALLED SUSPENDED AND CONCEALED ABOVE A SUSPENDED CEILING IS 50 KVA. THE MAXIMUM SIZE TRANSFORMER THAT MAY BE INSTALLED SUSPENDED IN AN EXPOSED CEILING LOCATION SHALL BE 225 KVA. THE CONTRACTOR SHALL PROVIDE A LABEL ON THE FRONT OF THE EQUIPMENT OR FIRST PANELBOARD DOWNSTREAM OF THE TRANSFORMER THAT CLEARLY STATES THE EQUIPMENT/PANELBOARD IS SERVED BY A SUSPENDED TRANSFORMER AND THE TRANSFORMER'S PHYSICAL LOCATION, INCLUDING FINAL ROOM NUMBER. PROVIDE ADDITIONAL SMOKE DETECTORS IF REQUIRED BY THESE SPECIFICATIONS, BY THE PROJECT THIRD-PARTY REVIEWER, OR BY THE LOCAL AHJ.

E. CONDUIT CONNECTIONS:

1) ATTACH INCOMING AND OUTGOING CONDUITS TO THE TRANSFORMER ENCLOSURE WITH 24-INCH LONG FLEXIBLE METAL CONDUIT. INSTALL A BONDING JUMPER, SIZED PER NEC TABLE 250.122, ON OUTSIDE OF FLEXIBLE CONDUIT.

F. CABLE CONNECTIONS:

1) MAKE TRANSFORMER CABLE CONNECTIONS WITH COMPRESSION-TYPE LUGS SUITABLE FOR TERMINATION OF 75 DEGREE C RATED CONDUCTORS. POSITION LUGS SO THAT FIELD CONNECTIONS AND WIRING WILL NOT BE EXPOSED TO TEMPERATURE ABOVE 75 DEGREES C.

3.3 GROUNDING:

A. INSTALL TRANSFORMER GROUNDING IN ACCORDANCE WITH NEC ARTICLE 250.

3.4 IDENTIFICATION:

A. REFER TO SECTION 26 05 53 FOR THE REQUIREMENTS FOR THE IDENTIFICATION OF TRANSFORMERS.

3.5 TESTING:

A. REFER TO SECTION 26 60 05 FOR TESTING REQUIREMENTS ASSOCIATED WITH EQUIPMENT INSTALLED UNDER THIS SECTION.

END OF SECTION 26 22 00

SECTION 26 24 16 PANELBOARDS

1. GENERAL

1.1 SCOPE:

A. THIS SECTION SPECIFIES THE FURNISHING AND INSTALLATION OF DISTRIBUTION AND BRANCH CIRCUIT PANELBOARDS.

B. THIS SECTION SPECIFIES THE FURNISHING AND INSTALLATION OF MOLDED CASE, THERMAL-MAGNETIC AND ELECTRONIC, SOLID-STATE TRIP CIRCUIT BREAKERS

1.2 REFERENCE STANDARDS:

A. NEMA AB 1 - MOLDED-CASE CIRCUIT BREAKERS, MOLDED CASE SWITCHES AND CIRCUIT-BREAKER ENCLOSURES.

B. NEMA AB 3 - MOLDED CASE CIRCUIT BREAKERS AND THEIR APPLICATION.

C. NEMA PB 1 - PANELBOARDS.

D. NEMA PB 1.1 - GENERAL INSTRUCTIONS FOR PROPER INSTALLATION, OPERATION, AND MAINTENANCE OF PANELBOARDS RATED 600 VOLTS OR LESS.

E. NECA 407-2002 - RECOMMENDED PRACTICE FOR INSTALLING AND MAINTAINING PANELBOARDS (ANSI).

F. UL 50 - ENCLOSURES FOR ELECTRICAL EQUIPMENT.

G. UL 67 - PANELBOARDS.

H. UL 489 - MOLDED-CASE CIRCUIT BREAKERS, MOLDED-CASE SWITCHES AND CIRCUIT-BREAKER ENCLOSURES.

1.3 APPLICABLE PROVISIONS:

A. REFER TO SECTION 26 05 00, ELECTRICAL GENERAL PROVISIONS.

1.4 SUBMITTALS:

A. SUBMIT MANUFACTURER'S TECHNICAL PRODUCT DATA ON CIRCUIT BREAKERS AND ACCESSORIES.

B. SUBMIT SHOP DRAWINGS FOR EACH PANELBOARD WHICH INCLUDE OUTLINE AND SUPPORT POINTS, DIMENSIONS, VOLTAGE, MAIN BUS AMPACITY, SHORT CIRCUIT AMPERE INTERRUPTING RATING, CIRCUIT BREAKER ARRANGEMENT, SIZES AND NUMBER OF POLES. SHOP DRAWING SHALL LIST ALL CIRCUIT BREAKERS TO BE INSTALLED IN PANELBOARD.

C. CIRCUIT BREAKER ARRANGEMENT MUST BE IDENTICAL TO THE SCHEDULES OR ONE LINE DIAGRAM UNLESS THERE IS A TECHNICAL REASON FOR DEVIATION. ALL REASONS FOR DEVIATION MUST BE STATED ON THE SUBMITTALS.

1.5 DELIVERY, HANDLING AND STORAGE:

A. DELIVER PANELBOARDS IN SUITABLE CONTAINERS.

B. HANDLING SHALL BE DONE TO ENSURE THAT PANELBOARDS ARE NOT DAMAGED IN ANY WAY OR CAUSE DAMAGE TO FINISHES.

C. STORE PANELBOARDS IN SUITABLE AREAS TO PREVENT CORROSION.

1.6 OPERATION AND MAINTENANCE DATA:

A. SUBMIT MANUFACTURER'S STANDARD OPERATION AND MAINTENANCE DATA/MANUALS.

2. PRODUCTS

2.1 GENERAL:

A. MATERIAL: FABRICATE ALL BUSES OF 98 PERCENT IACS CONDUCTIVITY COPPER. SIZE BUS TO LIMIT TEMPERATURE RISE WITHIN THE PANELBOARD TO 65° BASED ON 40° AMBIENT.

B. FURNISH FULL SIZE COPPER NEUTRAL BUS IN ALL PANELS OR AS REQUIRED BY THE PANEL SCHEDULE AND/OR ONE LINE DIAGRAM.

C. FURNISH ALL PANELBOARDS WITH A SEPARATE COPPER EQUIPMENT GROUND BUS.

D. FURNISH ALL SPACES SPECIFIED ON THE SCHEDULES COMPLETE WITH ALL BREAKER MOUNTING HARDWARE AND ACCESSORIES REQUIRED TO ACCOMMODATE THE INSTALLATION OF A BREAKER WITH FRAME SIZE SPECIFIED. THESE ARE IDENTIFIED AS EITHER "BUSSED SPACES" OR "PREPARED SPACES" ON THE DRAWINGS.

E. FURNISH NAMEPLATE AND A METALLIC CIRCUIT DIRECTORY FRAME AND CARD WITH A CLEAR PLASTIC COVERING ON THE INSIDE OF THE DOOR FOR ALL PANELBOARDS.

F. HINGE ALL DOORS WHICH PROVIDE ACCESS TO PROTECTIVE DEVICE LOAD TERMINALS.

G. ENCLOSURES SHALL BE A MINIMUM 20" WIDE MADE FROM GALVANIZED STEEL WITH WELDED INTERIOR MOUNTING STUDS.

H. FURNISH AND INSTALL LUGS OF SUFFICIENT SIZE, VOLTAGE AND AMPERE RATING, AND TERMINATION STYLE FOR ALL PANELBOARDS AND DISTRIBUTION BOARDS. THE LUGS SHALL BE RATED FOR THE CONDUCTOR MATERIAL AND SIZED AS REQUIRED TO ACCOMMODATE THE CONDUCTOR SIZES AND QUANTITY OF TERMINATIONS AS SHOWN ON THE DRAWING(S) AND THE WRITTEN SPECIFICATIONS.

I. WHERE THE INCOMING OR FEED-THROUGH LUGS OR CONDUCTORS TO A PANELBOARD OR DISTRIBUTION BOARD NECESSITATE AN INCREASE IN ENCLOSURE SIZE TO COMPLY WITH THESE SPECIFICATIONS AND/OR NEC REQUIREMENTS (EX: COMPRESSION TERMINALS, OR WIRE BENDING SPACE), THE CONTRACTOR SHALL COORDINATE WITH THE SELECTED EQUIPMENT MANUFACTURER PRIOR TO BID TO ENSURE THE EQUIPMENT WILL COMPLY WITH THE SPECIFICATIONS AND DRAWINGS. REFER TO REQUIREMENTS IN SPECIFICATION SECTION 26 05 19 600 VOLT INSULATED CONDUCTORS.

2.2 SHORT CIRCUIT RATINGS:

A. EACH PANELBOARD SHALL HAVE A SHORT CIRCUIT CURRENT RATING EQUAL TO OR GREATER THAN THE RATING SHOWN ON THE PANELBOARD SCHEDULE OR ON THE ONE-LINE DIAGRAM. THE SHORT CIRCUIT RATING SHALL BE BASED SOLELY ON THE RATINGS OF THE BRANCH BREAKERS IN THE PANEL. SERIES RATING OF STANDARD AIC BRANCH BREAKERS WITH HIGH AIC INTEGRAL OR REMOTE MAIN/FEEDER BREAKERS IS NOT ACCEPTABLE.

B. BUS BARS SHALL BE BRACED FOR THE AVAILABLE SHORT-CIRCUIT CURRENT AS SHOWN ON THE DRAWINGS, BUT NOT BE LESS THAN 10,000 A SYMMETRICAL FOR 120/208 V AND 120/240 V DISTRIBUTION EQUIPMENT (PANELBOARDS), AND 14,000 A SYMMETRICAL FOR 277/480 V DISTRIBUTION EQUIPMENT (PANELBOARDS). PANELBOARDS SHALL BE MARKED WITH THEIR MAXIMUM SHORT CIRCUIT CURRENT RATING AT THE SUPPLY VOLTAGE. SHOULD THE ONE-LINE AND/OR PANELBOARD SCHEDULES REQUIRE HIGHER RATINGS, THE CONTRACTOR SHALL PROVIDE EQUIPMENT RATED AS REQUIRED.

C. IN TWO-SECTION PANELBOARDS, THE MAIN BUS IN EACH SECTION SHALL BE FULL SIZE. WHETHER SPECIFIED ON THE DRAWINGS OR NOT, THE FIRST SECTION SHALL BE FURNISHED WITH SUBFEED LUGS ON THE LINE SIDE OF MAIN LUGS ONLY, OR THROUGH-FEED LUGS FOR MAIN BREAKER TYPE PANELBOARDS, AND HAVE FIELD-INSTALLED CABLE CONNECTIONS TO THE SECOND SECTION AS SHOWN ON THE DRAWINGS. PANELBOARD SECTIONS WITH TAPPED BUS OR CROSSOVER BUS ARE NOT ACCEPTABLE.

D. SERIES-RATED PANELBOARDS ARE NOT PERMITTED.

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PROJECT PHASE
PERMIT
REVISIONS

PROJECT NUMBER

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SHEET TITLE
ELECTRICAL SPECIFICATIONS

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E0.4

E. SHOULD THE ACTUAL INSTALLATION REQUIRE HIGHER RATINGS FOR ANY REASON, INCLUDING BUT NOT LIMITED TO: FIELD MODIFICATIONS SUCH AS CHANGING OF THE SPECIFIED CONDUCTOR MATERIAL, SIZE, LENGTH, OR TYPE, CHANGE TO THE SPECIFIED RACEWAY TYPE, THE RELOCATION OF THE UTILITY TRANSFORMER OR SEPARATELY DERIVED SYSTEM FROM THE LOCATION SHOWN ON THE CONTRACT DOCUMENTS, THE INTRODUCTION OF A LARGE MOTOR NEAR THE PANELBOARD OR SOURCE OF SUPPLY, ETC., THE CONTRACTOR SHALL PROVIDE EQUIPMENT RATED AS REQUIRED AT NO ADDITIONAL COST. THE CONTRACTOR SHALL ENGAGE THE SELECTED ELECTRICAL EQUIPMENT MANUFACTURER TO PROVIDE A COMPLETE REVISED ELECTRICAL SYSTEM STUDY TO ESTABLISH THE REQUIRED AMPERE INTERRUPTING CAPACITY RATINGS. THE CONTRACTOR SHALL BEAR ALL RESPONSIBILITY FOR COMPENSATING THE SELECTED MANUFACTURER FOR THESE ADDITIONAL SERVICES.

2.3 BRANCH CIRCUIT PANELBOARDS:

A. PANELBOARD BUS STRUCTURE AND MAIN LUGS OR MAIN CIRCUIT BREAKER SHALL HAVE CURRENT RATINGS AS SHOWN ON THE PANELBOARD SCHEDULE. SUCH RATINGS SHALL BE ESTABLISHED BY HEAT RISE TESTS, CONDUCTED IN ACCORDANCE WITH UL STANDARD 67. BUS BAR CONNECTIONS TO THE BRANCH CIRCUIT BREAKERS SHALL BE THE "DISTRIBUTED PHASE" OR PHASE SEQUENCE TYPE. ALL CURRENT CARRYING PARTS OF THE BUS STRUCTURE SHALL BE PLATED.

B. THE PANELBOARD BUS ASSEMBLY SHALL BE ENCLOSED IN A 20" WIDE STEEL CABINET. THE RIGIDITY AND GAUGE OF STEEL SHALL BE AS SPECIFIED IN UL STANDARD 50 FOR CABINETS. THE SIZE OF WIRING GUTTERS SHALL BE IN ACCORDANCE WITH UL STANDARD 67. THE BOX SHALL BE FABRICATED FROM GALVANIZED STEEL. EACH FRONT SHALL INCLUDE A HINGED DOOR AND HAVE A FLUSH, CYLINDER TUMBLER-TYPE LOCK WITH CATCH AND DOOR PULL. FRONT IS NOT REMOVABLE WITH DOOR CLOSED. ALL PANELBOARDS AND DISTRIBUTION BOARDS SHALL BE KEYED ALIKE. PROVIDE 2 KEYS PER LOCK. FRONTS SHALL HAVE ADJUSTABLE INDICATING TRIM CLAMPS WHICH SHALL BE COMPLETELY CONCEALED WHEN THE DOORS ARE CLOSED. DOORS SHALL BE MOUNTED WITH COMPLETELY CONCEALED STEEL HINGES. FRONTS SHALL BE OF THE CONCEALED HINGED TYPE. DOOR-IN-DOOR TRIM SHALL BE PROVIDED. BOTH HINGED TRIM AND TRIM DOOR SHALL UTILIZE THREE POINT LATCHING. NO TOOLS SHALL BE REQUIRED TO INSTALL OR REMOVE TRIM. TRIM SHALL BE EQUIPPED WITH A DOOR-ACTUATED TRIM LOCKING TAB. EQUIP LOCKING TAB WITH PROVISION FOR A SCREW SUCH THAT REMOVAL OF TRIM REQUIRES A TOOL, AT THE OWNER'S OPTION. INSTALLATION SHALL BE TAMPER RESISTANT WITH NO EXPOSED HARDWARE ON THE PANELBOARD TRIM.

2.4 OVERCURRENT PROTECTIVE DEVICES:

A. FURNISH THERMAL MAGNETIC OR ELECTRONIC TRIP, SOLID-STATE CIRCUIT BREAKERS FOR BRANCH CIRCUIT PANELBOARDS FOR THE SPECIFIED SERVICE WITH THE NUMBER OF POLES AND AMPERE RATINGS INDICATED.

B. FURNISH BREAKERS WHICH ARE QUICK-MAKE AND QUICK-BREAK ON BOTH MANUAL AND AUTOMATIC OPERATION. USE A TRIP-FREE BREAKER WHICH IS TRIP INDICATING. INCORPORATE INVERSE TIME CHARACTERISTIC BY BI-METALLIC OVERLOAD ELEMENTS AND AN INSTANTANEOUS CHARACTERISTIC BY MAGNETIC TRIP.

C. MULTI-POLE BREAKERS, USE THE COMMON-TRIP TYPE SO THAT AN OVERLOAD OR FAULT ON ONE POLE WILL TRIP ALL POLES SIMULTANEOUSLY. HANDLE TIES ARE NOT ACCEPTABLE.

D. CONNECT BREAKERS TO THE BRANCH CIRCUIT PANELBOARD MAIN BUS BY MEANS OF A SOLIDLY BOLTED CONNECTION. USE BREAKERS WHICH ARE INTERCHANGEABLE, CAPABLE OF BEING OPERATED IN ANY POSITION WITHIN THE PANEL. INDEPENDENTLY MOUNT BREAKERS SO THAT A SINGLE UNIT CAN BE REMOVED FROM THE FRONT OF THE PANEL WITHOUT DISTURBING OR REMOVING MAIN BUS, OTHER UNITS OR OTHER CIRCUIT BREAKER CONNECTIONS.

E. CIRCUIT BREAKERS SHALL BE EQUIPPED WITH FACTORY INSTALLED MECHANICAL LUGS.

F. CIRCUIT BREAKERS SHALL HAVE A PERMANENT TRIP UNIT CONTAINING INDIVIDUAL THERMAL AND MAGNETIC TRIP ELEMENTS IN EACH POLE.

G. THERMAL TRIP ELEMENTS SHALL BE FACTORY PRESET AND SEALED. CIRCUIT BREAKERS INSTALLED IN INTERIOR ENVIRONMENTS SHALL BE TRUE RMS SENSING AND THERMALLY RESPONSIVE TO PROTECT CIRCUIT CONDUCTOR(S) IN 40° C AMBIENT TEMPERATURE.

H. MOLDED-CASE CIRCUIT BREAKERS SHALL BE AS FOLLOWS:

1) UL 489 LISTED, WITH INTERRUPTING CAPACITY TO MEET AVAILABLE FAULT CURRENTS.
2) PROVIDE AS SHOWN BELOW UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
a. UP TO AND INCLUDING 150 AMPERE FRAME SIZES SHALL BE NON-ADJUSTABLE, FIXED INVERSE TIME-CURRENT ELEMENT FOR LOW-LEVEL OVERLOADS, AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS.
b. OVER 150 AMPERE FRAME SIZES SHALL BE EQUIPPED WITH DIGITAL SOLID-STATE RMS SENSING TRIP UNITS AND ADJUSTABLE INSTANTANEOUS TRIPS.
3) INTEGRALLY FUSED CIRCUIT BREAKERS: THERMAL-MAGNETIC TRIP ELEMENT WITH INTEGRAL LIMITER-STYLE FUSE LISTED FOR USE WITH CIRCUIT BREAKER AND TRIP ACTIVATION ON FUSE OPENING OR ON OPENING OF FUSE COMPARTMENT DOOR AS SHOWN ON THE DRAWINGS.
4) GFCI CIRCUIT BREAKERS: SINGLE- AND TWO-POLE CONFIGURATIONS WITH 5-MA TRIP SENSITIVITY.
5) GFEP CIRCUIT BREAKERS: SINGLE- AND TWO-POLE CONFIGURATIONS WITH 30-MA TRIP SENSITIVITY.

I. MOLDED-CASE CIRCUIT-BREAKER FEATURES AND ACCESSORIES:
1) STANDARD FRAME SIZES, TRIP RATINGS, AND NUMBER OF POLES.
2) LUGS: MECHANICAL STYLE SUITABLE FOR NUMBER, SIZE, TRIP RATINGS, AND CONDUCTOR MATERIAL.
3) APPLICATION LISTING: TYPE SWD OR HID FOR SWITCHING FLUORESCENT OR HIGH-INTENSITY DISCHARGE LIGHTING LOADS; TYPE HACR FOR HEATING, AIR-CONDITIONING, AND REFRIGERATING EQUIPMENT.
4) GROUND-FAULT PROTECTION (WHEN SHOWN ON THE DRAWINGS OR REQUIRED BY CODE): INTEGRALLY MOUNTED RELAY AND TRIP UNIT WITH ADJUSTABLE PICKUP AND TIME-DELAY SETTINGS, PUSH-TO-TEST FEATURE, AND GROUND-FAULT INDICATOR.
5) SHUNT TRIP (WHEN SHOWN ON THE DRAWINGS OR REQUIRED BY CODE): 120-V TRIP COIL ENERGIZED FROM SEPARATE CIRCUIT, SET TO TRIP AT 75 PERCENT OF RATED VOLTAGE.
6) UNDERVOLTAGE TRIP (WHEN SHOWN ON THE DRAWINGS OR REQUIRED BY CODE): SET TO OPERATE AT 35 TO 75 PERCENT OF RATED VOLTAGE WITH FIELD-ADJUSTABLE 0.1- TO 0.6-SECOND TIME DELAY.
7) PAD LOCK 'OFF' CAPABILITY (WHEN SHOWN ON THE DRAWINGS OR WHEN THE CIRCUIT BREAKER SERVES A PIECE OF EQUIPMENT WITHOUT A LOCAL DISCONNECTING MEANS-ONLY WHERE ALLOWED BY THE NEC AND AHJ): BREAKER ENCLOSURE SHALL BE PROVIDED WITH ABILITY TO LOCK CIRCUIT BREAKER IN THE OFF POSITION.

J. WHERE INDICATED, PROVIDE GROUND FAULT (GFCB) OR SHUNT TRIP BREAKERS. COORDINATE EXACT CIRCUIT BREAKER TYPE REQUIRED WITH EQUIPMENT PROVIDED BY ALL OTHER TRADES PRIOR TO ORDERING CIRCUIT BREAKERS.

K. WHEN REQUIRED, CIRCUIT BREAKERS SHALL BE LISTED AS HACR TYPE. COORDINATE EXACT CIRCUIT BREAKER TYPE REQUIRED WITH EQUIPMENT PROVIDED BY ALL OTHER TRADES PRIOR TO ORDERING CIRCUIT BREAKERS.

L. WHEN REQUIRED, CIRCUIT BREAKERS SHALL BE LISTED AS SWITCH DUTY TYPE.

2.5 FINISH:

A. SURFACES OF THE TRIP ASSEMBLY SHALL BE PROPERLY CLEANED, PRIMED, AND A FINISH COAT OF GRAY PAINT APPLIED.

B. NEMA 3R ENCLOSURES SHALL BE PROPERLY CLEANED, PRIMED, AND A FINISH COAT OF GRAY PAINT APPLIED.

C. SUPPLY ONE QUART OF FINISH PAINT FOR EACH PROJECT. TOUCH-UP AFTER INSTALLATION.

2.6 ACCEPTABLE MANUFACTURERS:

A. BASIS OF DESIGN MANUFACTURER SHALL BE SQUARE D. SHOULD CONTRACTOR SELECT OTHER THAN BASIS OF DESIGN IT WILL BE THEIR RESPONSIBILITY TO COORDINATE ALL PHYSICAL SIZE, PERFORMANCE OR OTHER OPERATIONAL REQUIREMENTS AND PROVIDE ALL OPTIONS AND ACCESSORIES AS SPECIFIED HEREIN. OTHER ACCEPTABLE MANUFACTURERS INCLUDE:
1) EATON ELECTRICAL/CUTLER-HAMMER: WWW.EATONELECTRICAL.COM.
2) GE INDUSTRIAL: WWW.GEINDUSTRIAL.COM.
3) SQUARE 'D' / SCHNEIDER ELECTRIC: WWW.SQUARED.COM.
4) SUBSTITUTIONS: NOT PERMITTED.

B. THE LISTING OF SPECIFIC MANUFACTURERS ABOVE DOES NOT IMPLY ACCEPTANCE OF THEIR PRODUCTS THAT DO NOT MEET THE SPECIFIED RATINGS, FEATURES AND FUNCTIONS. MANUFACTURERS LISTED ABOVE ARE NOT RELIEVED FROM MEETING OR EXCEEDING ALL REQUIREMENTS LISTED IN THE CONSTRUCTION DOCUMENTS IN THEIR ENTIRETY.

1. EXECUTION

3.1 INSTALLATION:

A. AT THE COMPLETION OF THE ELECTRICAL SYSTEM, THE CONTRACTOR SHALL CHECK EACH PHASE OF ALL PANELBOARDS UNDER FULL LOAD CONDITIONS AND ARRANGE SO THAT ALL PHASES SHALL CARRY APPROXIMATELY THE SAME LOAD. REFER TO SECTION 26 60 05, ELECTRICAL TESTING - 600 VOLT AND BELOW, FOR TEST REQUIREMENTS.

B. CHECK BOLTED AND CIRCUIT BREAKER CONNECTIONS USING A TORQUE WRENCH.

C. THE FACES OF ALL CIRCUIT BREAKERS SHALL BE FLUSH WITH EACH OTHER.

D. AFFIX PERMANENT AND INDIVIDUAL CIRCUIT NUMBERS TO EACH CIRCUIT BREAKER IN A UNIFORM POSITION.

E. WHERE A BREAKER SERVES THE PRIMARY SIDE OF A TRANSFORMER MOUNTED OUT OF SIGHT FROM THE BREAKER, PROVIDE PERMANENT PAD LOCKING PROVISIONS AT THE BREAKER SUCH THAT IT MAY BE LOCKED IN THE 'OFF' POSITION.

3.2 MOUNTING HEIGHT:

A. INSTALL THE PANELBOARDS TO COMPLY WITH THE APPLICABLE PROVISIONS OF NEMA STANDARD PB1.1 AND SUCH THAT THE CENTER OF THE SWITCH OR CIRCUIT BREAKER IN THE HIGHEST POSITION WILL NOT BE MORE THAN 6-1/2 FEET ABOVE THE FLOOR OR WORKING PLATFORM.

3.3 PANELBOARD DIRECTORY:

A. PREPARE A NEATLY TYPED CIRCUIT DIRECTORY AND INSTALL IN A METALLIC HOLDER BEHIND A CLEAR HEAT-RESISTANT PLASTIC PROTECTOR ON THE INSIDE OF THE DOOR OF EACH PANELBOARD. IDENTIFY CIRCUITS BY EQUIPMENT SERVED AND BY ROOM NUMBERS SELECTED BY THE OWNER; NAMES AND NUMBERS MAY BE DIFFERENT FROM THOSE SHOWN ON DRAWINGS. INDICATE SPARES AND SPACES WITH LIGHT, ERASABLE PENCIL MARKING.

3.4 IDENTIFICATION:

A. REFER TO SECTION 26 05 53, ELECTRICAL IDENTIFICATION, FOR THE REQUIREMENTS FOR THE IDENTIFICATION OF PANELBOARDS.

END OF SECTION 26 24 16

SECTION 26 27 26 WIRING DEVICES

1. GENERAL

1.1 SCOPE:

A. THIS SECTION SPECIFIES THE FURNISHING AND INSTALLATION OF WIRING DEVICES AND DEVICE COVER PLATES.

1.2 REFERENCE STANDARDS:

A. ADA - AMERICANS WITH DISABILITIES ACT (PUBLIC LAW 101-336).

B. IEEE C62.41.1 - IEEE GUIDE ON THE SURGE ENVIRONMENT IN LOW-VOLTAGE (1000V AND LESS) AC POWER CIRCUITS.

C. IEEE C62.41.2 - IEEE RECOMMENDED PRACTICE ON CHARACTERIZATION OF SURGES IN LOW-VOLTAGE (1000V AND LESS) AC POWER CIRCUITS.

D. NEMA WD 6 - WIRING DEVICES - DIMENSIONAL REQUIREMENTS.

E. NEMA WD 7 - OCCUPANCY MOTION SENSORS.

F. UL 20 - GENERAL-USE SNAP SWITCHES.

G. UL 498 - ATTACHMENT PLUGS AND RECEPTACLES.

H. UL 943 - GROUND-FAULT CIRCUIT-INTERRUPTERS.

I. UL 1699 - ARC-FAULT CIRCUIT INTERRUPTERS.

J. UL 1449 - TRANSIENT VOLTAGE SURGE SUPPRESSORS.

K. UL 1472 - SOLID-STATE DIMMING CONTROLS.

L. NECA 1-2000 - STANDARD PRACTICES FOR GOOD WORKMANSHIP IN ELECTRICAL CONTRACTING (ANSI)

1.3 APPLICABLE PROVISIONS:

A. REFER TO SECTION 26 05 00, ELECTRICAL GENERAL PROVISIONS.

B. REFER TO SECTION 26 60 05, ELECTRICAL TESTING.

1.4 SUBMITTALS:

A. SUBMIT MANUFACTURER'S TECHNICAL PRODUCT DATA ON EACH TYPE OF PRODUCT. INCLUDE DATA SUBSTANTIATING THAT MATERIALS COMPLY WITH THE REQUIREMENTS OF THIS SECTION.

B. SHOP DRAWINGS: LIST OF LEGENDS AND DESCRIPTION OF MATERIALS AND PROCESS USED FOR PREMARKING WALL PLATES.

1.5 DELIVERY, HANDLING AND STORAGE:

A. DELIVER WIRING DEVICES AND DEVICE PLATES IN SUITABLE CONTAINERS.

B. HANDLING SHALL BE DONE TO ENSURE THAT WIRING DEVICES AND DEVICE PLATES ARE NOT DAMAGED IN ANY WAY OR CAUSE DAMAGE TO FINISHES.

C. STORE WIRING DEVICES AND DEVICE PLATES IN SUITABLE AREAS TO PREVENT CORROSION.

1.6 DEFINITIONS:

A. EMI: ELECTROMAGNETIC INTERFERENCE.

B. GFCI: GROUND-FAULT CIRCUIT INTERRUPTER

C. PIGTAIL: SHORT LEAD USED TO CONNECT A DEVICE TO A BRANCH-CIRCUIT CONDUCTOR.

D. RFI: RADIO-FREQUENCY INTERFERENCE.

E. SPD: SURGE PROTECTIVE DEVICES.

F. UTP: UNSHIELDED TWISTED PAIR.

2. PRODUCTS

2.1 MANUFACTURERS

A. MANUFACTURERS' NAMES: SHORTENED VERSIONS (SHOWN IN PARENTHESES) OF THE FOLLOWING MANUFACTURERS' NAMES ARE USED IN OTHER PART 2 ARTICLES:
1. COOPER WIRING DEVICES; DIVISION OF COOPER INDUSTRIES, INC. (COOPER).
2. HUBBELL INCORPORATED; WIRING DEVICE-KELLEMS (HUBBELL).
3. LEVITON MFG. COMPANY INC. (LEVITON).
4. PASS & SEYMOUR/LEGRAND (PASS & SEYMOUR).

B. SOURCE LIMITATIONS: OBTAIN EACH TYPE OF WIRING DEVICE AND ASSOCIATED WALL PLATE FROM SINGLE SOURCE FROM SINGLE MANUFACTURER.

2.2 GENERAL WIRING-DEVICE REQUIREMENTS

A. WIRING DEVICES, COMPONENTS, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.

B. COMPLY WITH NFPA 70 AND ALL APPLICABLE REQUIREMENTS OF THE AHJ.

C. DEVICES THAT ARE MANUFACTURED FOR USE WITH MODULAR PLUG-IN CONNECTORS ARE NOT ACCEPTABLE.

2.3 STRAIGHT-BLADE RECEPTACLES

A. CONVENIENCE RECEPTACLES, COMMERCIAL GRADE, 125 V, 20 A: COMPLY WITH NEMA WD 1, NEMA WD 6 CONFIGURATION 5-20R, UL 498, AND FS WC-596.
1. BASIS-OF-DESIGN PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE COOPER; 5361 (SINGLE), 5362 (DUPLEX) OR COMPARABLE PRODUCT BY ONE OF THE FOLLOWING:
a. HUBBELL: HBL5361 (SINGLE), 5362 (DUPLEX).
b. LEVITON; 5361 (SINGLE), 5362-S (DUPLEX).
c. PASS & SEYMOUR; 5361 (SINGLE), 5362 (DUPLEX).
2. DESCRIPTION: STEEL PLATED MOUNTING STRAP WITH RIVETED BRASS GROUND CONTACTS. MINIMUM OF TRIPLE-WIPE CONTACTS ON BOTH LINE AND NEUTRAL.

B. TAMPER-RESISTANT CONVENIENCE RECEPTACLES, 125 V, 20 A: COMPLY WITH NEMA WD 1, NEMA WD 6 CONFIGURATION 5-20R, UL 498 SUPPLEMENT SD, AND FS W-C-596.
1. BASIS-OF-DESIGN PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE COOPER; TRBR20 OR COMPARABLE PRODUCT BY ONE OF THE FOLLOWING:
a. HUBBELL; BR20TR.
b. LEVITON; TBR20.
c. PASS & SEYMOUR; TR63.

C. TAMPER-RESISTANT AND WEATHER-RESISTANT CONVENIENCE RECEPTACLES, 125 V, 20 A; COMPLY WITH NEMA WD 1, NEMA WD 6 CONFIGURATION 5-20R, AND UL 498 SUPPLEMENT SD AND FS WC-596.
1. BASIS-OF-DESIGN PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE COOPER; TWRBR20 OR COMPARABLE PRODUCT BY ONE OF THE FOLLOWING:
a. HUBBELL; BR20_WRTR.
b. LEVITON; TWR20.
c. PASS & SEYMOUR: NO EQUAL

2.4 GFCI RECEPTACLES

A. GENERAL DESCRIPTION:
1. STRAIGHT BLADE, NON-FEED-THROUGH TYPE.
2. COMPLY WITH NEMA WD 1, NEMA WD 6, CONFIGURATION 5-20R, UL 498, UL 943 CLASS A, AND FS WC-596.
3. GFCI POWER RECEPTACLE SHALL AUTOMATICALLY MONITOR THE GROUND-FAULT FUNCTIONALITY AND PROVIDE A VISUAL AND/OR AUDIBLE INDICATION THAT IT CAN NO LONGER PROVIDE PROTECTION. EACH GFCI POWER RECEPTACLE SHALL INCLUDE INDICATOR LIGHT THAT SHOWS WHEN THE GFCI HAS MALFUNCTIONED AND NO LONGER PROVIDES PROPER GFCI PROTECTION. WHEN MALFUNCTION OCCURS THE INDICATOR LIGHT SHALL REMAIN ON AND NOT TURN OFF.
4. THE GFCI MUST INCLUDE THE FUNCTIONALITY SUCH THAT IF THE LINE CONDUCTOR IS INCORRECTLY WIRED TO THE LOAD TERMINAL, POWER TO THE RECEPTACLE WILL BE DENIED.

B. DUPLEX GFCI CONVENIENCE RECEPTACLES, 125 V, 20 A:
1. BASIS-OF-DESIGN PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE COOPER; VGF20 OR COMPARABLE PRODUCT BY ONE OF THE FOLLOWING:
a. HUBBELL; GFRST20.
b. PASS & SEYMOUR; 2095.
c. LEVITON; 7899.

C. TAMPER-RESISTANT GFCI CONVENIENCE RECEPTACLES, 125 V, 20 A:
1. PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE THE FOLLOWING:
2. BASIS-OF-DESIGN PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE HUBBELL GFTRST20 OR COMPARABLE PRODUCT BY COOPER WIRING DEVICES, LEVITON, OR PASS & SEYMOUR.

D. WEATHER- AND TAMPER-RESISTANT GFCI CONVENIENCE RECEPTACLES, 125 V, 20 A:
1. PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE THE FOLLOWING:
2. BASIS-OF-DESIGN PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE HUBBELL GFTWRST20 OR COMPARABLE PRODUCT BY COOPER WIRING DEVICES, LEVITON, OR PASS & SEYMOUR.

2.5 TWIST-LOCKING RECEPTACLES

A. SINGLE CONVENIENCE RECEPTACLES, 125 V, 20 A: COMPLY WITH NEMA WD 1, NEMA WD 6 CONFIGURATION L5-20R, AND UL 498.
1. BASIS-OF-DESIGN PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE COOPER; CWL520R OR COMPARABLE PRODUCT BY ONE OF THE FOLLOWING:
a. HUBBELL; HBL2310.
b. LEVITON; 2310.
c. PASS & SEYMOUR; L520-R.

2.6 PENDANT CORD-CONNECTOR DEVICES

A. DESCRIPTION:
1. MATCHING, LOCKING-TYPE PLUG AND RECEPTACLE BODY CONNECTOR.
2. NEMA WD 6 CONFIGURATIONS L5-20P AND L5-20R, HEAVY-DUTY GRADE, AND FS W-C-596.
3. BODY: NYLON, WITH SCREW-OPEN, CABLE-GRIPPING JAWS AND PROVISION FOR ATTACHING EXTERNAL CABLE GRIP.
4. EXTERNAL CABLE GRIP: WOVEN WIRE-MESH TYPE MADE OF HIGH-STRENGTH, GALVANIZED-STEEL WIRE STRAND, MATCHED TO CABLE DIAMETER, AND WITH ATTACHMENT PROVISION DESIGNED FOR CORRESPONDING CONNECTOR.

2.7 CORD AND PLUG SETS

A. DESCRIPTION:
1. MATCH VOLTAGE AND CURRENT RATINGS AND NUMBER OF CONDUCTORS TO REQUIREMENTS OF EQUIPMENT BEING CONNECTED.
2. CORD: RUBBER-INSULATED, STRANDED-COPPER CONDUCTORS, WITH TYPE SOW-A JACKET; WITH GREEN-INSULATED GROUNDING CONDUCTOR AND AMPACITY OF AT LEAST 130 PERCENT OF THE EQUIPMENT RATING.
3. PLUG: NYLON BODY AND INTEGRAL CABLE-CLAMPING JAWS. MATCH CORD AND RECEPTACLE TYPE FOR CONNECTION.

2.8 TOGGLE SWITCHES

A. COMPLY WITH NEMA WD 1, UL 20, AND FS WS-896.

B. SWITCHES, 120/277 V, 20 A:
1. BASIS-OF-DESIGN PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE COOPER; AH1221 (SINGLE POLE), AH1222 (TWO POLE), AH1223 (THREE WAY), AH1224 (FOUR-WAY), OR COMPARABLE PRODUCT BY ONE OF THE FOLLOWING:
a. HUBBELL; HBL1221 (SINGLE POLE), HBL1222 (TWO POLE), HBL1223 (THREE WAY), HBL1224 (FOUR WAY).
b. LEVITON; 1221-2 (SINGLE POLE), 1222-2 (TWO POLE), 1223-2 (THREE WAY), 1224-2 (FOUR WAY).
c. PASS & SEYMOUR; PS20ACI (SINGLE POLE), PS20AC2 (TWO POLE), PS20AC3 (THREE WAY), PS20AC4 (FOUR WAY).

C. ILLUMINATED SWITCHES, 20 A:
1. BASIS-OF-DESIGN PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE SINGLE-POLE OR THREE-WAY AS REQUIRED, COOPER; AH1221PL (120 V AND 277 V) OR AH1223PL, OR COMPARABLE PRODUCT BY ONE OF THE FOLLOWING:
a. HUBBELL; HBL1221PL OR HBL1223PL (120 V AND 277 V).
b. LEVITON; 1221-PL OR 7P OR 1223-PL OR 7P.
c. PASS & SEYMOUR; PS20AC1-PL OR PS20AC3-XPL.
2. DESCRIPTION: UNLESS NOTED OTHERWISE ON THE DRAWINGS OR WITHIN THE SPECIFICATIONS, SWITCHES SHALL BE SINGLE POLE, WITH NEON-LIGHTED HANDLE, ILLUMINATED WHEN SWITCH IS "ON."

D. PILOT-LIGHT SWITCHES, 20 A:
1. BASIS-OF-DESIGN PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE SINGLE-POLE OR THREE-WAY AS REQUIRED, COOPER; AH1991ILC (120 V AND 277 V) OR COOPER AH1993ILC, OR COMPARABLE PRODUCT BY ONE OF THE FOLLOWING:
a. HUBBELL; HBL1221ILC OR HBL1223ILC (120 V AND 277 V).
b. LEVITON; 1221-LH OR 7L OR 1223-LH OR 7L.
c. PASS & SEYMOUR; PS20AC1-XSL OR PS20AC3-XSL (277 V).
2. DESCRIPTION: UNLESS NOTED OTHERWISE ON THE DRAWINGS OR WITHIN THE SPECIFICATIONS, SWITCHES SHALL BE SINGLE POLE, WITH NEON-LIGHTED HANDLE, ILLUMINATED WHEN SWITCH IS "OFF."

2.9 WALL-BOX SENSORS

A. BASIS-OF-DESIGN PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE WATT STOPPER 'DW-103' (SINGLE-CIRCUIT) OR WATT STOPPER 'DW-203' (DUAL CIRCUIT) OR COMPARABLE PRODUCT BY ONE OF THE FOLLOWING:
1. WATT STOPPER.
2. LEVITON.
3. SENSOR SWITCH.

B. DESCRIPTION:
1. OCCUPANCY/VACANCY SENSOR: DUAL-TECHNOLOGY SENSOR SHALL BE SUITABLE FOR THE CONTROL OF INCANDESCENT/HALOGEN, CFL, LED, MLV, ELV (120V 15A, 1800W), FLUORESCENT (120V, 800W AND 277V, 1200W). SENSORS SHALL ALSO HAVE A MINIMUM 1/6 HP RATING AND SHALL CARRY THE APPLICABLE UNDERWRITERS' LABORATORIES MARKING - UL244A.
2. VACANCY SENSORS MUST BE CALIFORNIA TITLE 24 COMPLIANT - MANUAL ON/AUTO-OFF OPERATION (SELECTABLE SWITCH IN SINGLE SENSOR IS ACCEPTABLE FOR VACANCY OR OCCUPANCY).
3. SELECTABLE TIME DELAY OF 5 SECONDS (TEST), 5 MINUTES, 15 MINUTES, AND 30 MINUTES FOR LIGHTS TO REMAIN ON AFTER ROOM IS VACATED.
4. FOR MULTI-RELAY OCCUPANCY SENSORS (DUAL CIRCUIT), EACH RELAY SHALL BE INDIVIDUALLY CONTROLLABLE VIA INTEGRAL DIP SWITCHES.
5. SENSORS SHALL HAVE A MINIMUM COVERAGE OF 180 DEGREES AND 1000 SQ. FT.
6. TAMPER-RESISTANT REINFORCED FRESNEL LENS.

2.10 CEILING-MOUNTED AND WALL-MOUNTED OCCUPANCY MOTION SENSORS:

A. BASIS OF DESIGN PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE THE FOLLOWING PRODUCTS BY ACUITY BRANDS:
a. CEILING-MOUNTED, 180-DEGREE, 500 SF
b. CEILING-MOUNTED, 360-DEGREE, 2000 SF
c. OR EQUIVALENT SENSOR BY COOPER, HUBBELL, OR PASS & SEYMOUR.

B. CEILING- AND WALL-MOUNTED OCCUPANCY SENSORS: DRAWINGS INDICATE DEVICE LOCATIONS FOR GENERAL INTENT ONLY. COORDINATE WITH SELECTED MANUFACTURER PRIOR TO BID TO PROVIDE LAYOUT OF DEVICES SHOWING OPTIMUM COVERAGE AND WIRING DIAGRAMS TO ACHIEVE SWITCHING SCHEMES SHOWN ON DRAWINGS. COORDINATE DEVICE LOCATIONS WITH ALL PLANS AFFECTING DEVICES' PERFORMANCE. NOTE THAT WALL-BOX TYPE OCCUPANCY SENSORS ARE EXCLUDED FROM THIS REQUIREMENT.

C. FURNISH CEILING-MOUNTED, DUAL (PASSIVE INFRARED AND ULTRASOUND) TECHNOLOGY OCCUPANCY MOTION SENSORS WITH AN ADJUSTABLE DELAYED-OFF TIME SETTING, 180- OR 360-DEGREE COVERAGE, AS SCHEDULED ON DRAWINGS AND NOTED IN THESE SPECIFICATIONS. MOUNT RELAY POWER PACK ONE FOOT ABOVE CEILING AT ASSOCIATED LIGHT SWITCH LOCATIONS.

D. FURNISH WALL-MOUNTED, DUAL (PASSIVE INFRARED AND ULTRASONIC) TECHNOLOGY OCCUPANCY MOTION SENSORS WITH AN ADJUSTABLE DELAYED-OFF TIME SETTING, 180-DEGREE COVERAGE, AS SCHEDULED ON THE DRAWINGS AND NOTED IN THESE SPECIFICATIONS. MOUNT RELAY POWER PACK ONE FOOT ABOVE CEILING AT ASSOCIATED LIGHT SWITCH LOCATIONS.

E. FURNISH LINE VOLTAGE WALL-BOX TYPE, PASSIVE INFRARED TECHNOLOGY OCCUPANCY MOTION SENSORS WITH AN ADJUSTABLE DELAYED-OFF TIME SETTING, AS SCHEDULED ON DRAWINGS.

F. FURNISH POWER PACKS AS NEEDED FOR SWITCHING SCHEMES SHOWN ON DRAWINGS.

G. FURNISH HARD-CEILING RACEWAY ADAPTER KITS WHERE REQUIRED BY REFLECTED CEILING PLAN.

H. ALL SENSORS SHALL BE SUITABLE AND U.L. LISTED FOR THE ENVIRONMENT IN WHICH THEY ARE TO BE INSTALLED.

2.11 WALL PLATES

A. SINGLE AND COMBINATION TYPES SHALL MATCH CORRESPONDING WIRING DEVICES.
1. PLATE-SECURING SCREWS: METAL WITH HEAD COLOR TO MATCH PLATE FINISH.
2. MATERIAL FOR FINISHED SPACES: STEEL WITH WHITE BAKED ENAMEL, SUITABLE FOR FIELD PAINTING.
3. MATERIAL FOR UNFINISHED SPACES: GALVANIZED STEEL.
4. MATERIAL FOR DAMP LOCATIONS: CAST ALUMINUM WITH SPRING-LOADED LIFT COVER, AND LISTED AND LABELED FOR USE IN WET AND DAMP LOCATIONS.

B. WET-LOCATION, WEATHERPROOF COVER PLATES: NEMA 250, COMPLYING WITH TYPE 3R, WEATHER-RESISTANT, DIE-CAST ALUMINUM WITH LOCKABLE COVER.

1. UN-ATTENDED USE:
a. COOPER WIUMH-1
b. HUBBELL WP26MH
c. PASS & SEYMOUR WIUC10-CAGH

2.12 FLOOR SERVICE FITTINGS

A. TYPE: MODULAR, FLUSH-TYPE, DUAL-SERVICE UNITS SUITABLE FOR WIRING METHOD USED.

B. COMPARTMENTS: BARRIER SEPARATES POWER FROM VOICE AND DATA COMMUNICATION CABLING.

C. SERVICE PLATE: ROUND, DIE-CAST ALUMINUM WITH SATIN FINISH.

D. POWER RECEPTACLE: NEMA WD 6 CONFIGURATION 5-20R, GRAY FINISH, UNLESS OTHERWISE INDICATED.

E. VOICE AND DATA COMMUNICATION OUTLET: BLANK COVER WITH BUSHED CABLE OPENING.

2.12 POKE-THROUGH ASSEMBLIES

A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:

B. BASIS-OF-DESIGN PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE [PRODUCT INDICATED ON DRAWINGS] <INSERT MANUFACTURER'S NAME; PRODUCT NAME OR DESIGNATION> OR COMPARABLE PRODUCT BY ONE OF THE FOLLOWING:
1. HUBBELL INCORPORATED; WIRING DEVICE-KELLEMS.
2. PASS & SEYMOUR/LEGRAND.
3. SQUARE D/SCHNEIDER ELECTRIC.
4. THOMAS & BETTS CORPORATION.
5. WIREMOLD/LEGRAND.

C. DESCRIPTION:
1. FACTORY-FABRICATED AND -WIRED ASSEMBLY OF BELOW-FLOOR JUNCTION BOX WITH MULTICHANNELED, THROUGH-FLOOR RACEWAY/FIRESTOP UNIT AND DETACHABLE MATCHING FLOOR SERVICE-OUTLET ASSEMBLY.
2. COMPLY WITH UL 514 SCRUB WATER EXCLUSION REQUIREMENTS.
3. SERVICE-OUTLET ASSEMBLY: FLUSH TYPE WITH TWO SIMPLEX RECEPTACLES AND SPACE FOR TWO RJ-45 JACKS COMPLYING WITH REQUIREMENTS IN SECTION 271500 "COMMUNICATIONS HORIZONTAL CABLING."
4. SIZE: SELECTED TO FIT NOMINAL 3-INCH CORED HOLES IN FLOOR AND MATCHED TO FLOOR THICKNESS.
5. FIRE RATING: UNIT IS LISTED AND LABELED FOR FIRE RATING OF FLOOR-CEILING ASSEMBLY.
6. CLOSURE PLUG: ARRANGED TO CLOSE UNUSED 3-INCH CORED OPENINGS AND RE-ESTABLISH FIRE RATING OF FLOOR.
7. WIRING RACEWAYS AND COMPARTMENTS: FOR A MINIMUM OF FOUR NO. 10 AWG CONDUCTORS, PLUS COMMUNICATIONS CABLING AS SPECIFIED BY THE OWNER.

2.13 FINISHES

A. DEVICE AND WALL PLATE COLOR:
1. WIRING DEVICES CONNECTED TO NORMAL POWER SYSTEM: AS SELECTED BY ARCHITECT UNLESS OTHERWISE INDICATED OR REQUIRED BY NFPA 70 OR DEVICE LISTING.
2. BLANK STAINLESS STEEL PLATES SHALL BE INSTALLED AT ALL UNUSED OR UNCOVERED OUTLET BOXES.

B. FOR COVERS, MATCH DEVICE COLOR UNLESS DIRECTED OTHERWISE BY THE OWNER, ARCHITECT, AHJ, OR THE CONTRACT DOCUMENTS.

3. EXECUTION

3.1 GENERAL:

A. WHERE ITEMS OF EQUIPMENT ARE INSTALLED UNDER OTHER SECTIONS OF THIS SPECIFICATION OR BY THE OWNER, FURNISH AND INSTALL A COMPATIBLE RECEPTACLE FOR THE CAP OR PLUG AND CORD OF THE EQUIPMENT.

B. MULTIPLE GANG SINGLE JUNCTION BOXES WITH MULTIPLE GANG SINGLE COVER PLATES SHALL BE USED FOR ALL MULTIPLE ADJACENT DEVICE LOCATIONS.

C. WHERE COVER PLATES DO NOT COMPLETELY CONCEAL THE ROUGH OPENINGS FOR THE DEVICES, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PAINT, PATCH, ETC., AROUND THE OPENING TO THE SATISFACTION OF THE ARCHITECT/ENGINEER.

D. TIGHTEN SCREWS, CONNECTORS AND TERMINALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

E. INSTALL WIRING DEVICES ONLY IN ELECTRICAL BOXES WHICH ARE CLEAN AND FREE OF EXCESS BUILDING MATERIALS, DIRT, AND DEBRIS.

F. INSTALL COVER PLATES, AFTER PAINTING WORK IS COMPLETED, TIGHT TO SURFACES OVER WHICH THEY ARE INSTALLED.

G. WHERE MORE THAN ONE DEVICE OCCURS IN AN OUTLET BOX, RESULTING IN A 300 VOLT OR HIGHER POTENTIAL BETWEEN THEM, INSTALL A BARRIER BETWEEN THE DEVICES.

H. COORDINATE THE EXACT ROUGH-IN LOCATION OF DEVICES INSTALLED IN, ON OR ABOVE MILLWORK AND/OR CASEWORK WITH THE MILLWORK AND/OR CASEWORK DRAWINGS.

I. ATTACH, WITH AN APPROVED GROUNDING SCREW, ALL EQUIPMENT GROUNDING CONDUCTORS WHICH ENTER A METALLIC BOX TO THE BOX AND FROM THE BOX TO THE DEVICE(S). DO NOT RELY ON ANY SELF-GROUNDING FEATURE.

J. IF A MULTIWIRE BRANCH CIRCUIT (SHARED NEUTRAL CIRCUIT) SERVING A RECEPTACLE EXIST WITHIN THE RECEPTACLE'S BOX, THE CONTINUITY OF THE GROUNDED CONDUCTOR SHALL NOT DEPEND ON THE RECEPTACLE (PIG-TAILS ARE REQUIRED).

K. AT LEAST 6 INCHES (MEASURED FROM THE FINISHED SURFACE) OF EACH CONDUCTOR SHALL EXTEND OUTSIDE A BOX'S OPENING.

L. DEVICES SHALL BE INSTALLED SO THAT THE MOUNTING YOKE OR STRAP IS HELD RIGIDLY AT THE SURFACE OF THE WALL, BOX, OR RAISED BOX COVER.

M. DO NOT REMOVE SURFACE PROTECTION, SUCH AS PLASTIC FILM AND SMUDGE COVERS, UNTIL THE LAST POSSIBLE MOMENT.

N. WHEN THERE IS A CHOICE, USE SIDE WIRING WITH BINDING-HEAD SCREW TERMINALS. WRAP SOLID CONDUCTOR TIGHTLY CLOCKWISE, TWO-THIRDS TO THREE-FOURTHS OF THE WAY AROUND TERMINAL SCREW.

O. WHEN MOUNTING INTO METAL BOXES, REMOVE THE FIBER OR PLASTIC WASHERS USED TO HOLD DEVICE-MOUNTING SCREWS IN YOKES, ALLOWING METAL-TO-METAL CONTACT.

3.2 WALL SWITCHES:

A. INSTALL WALL SWITCHES VERTICALLY IN A SUITABLE STEEL OUTLET BOX CENTERED AT A HEIGHT OF 46-INCHES FROM FINISHED FLOOR ON THE STRIKE SIDE OF THE DOOR AS FINALLY HUNG, OR AS SHOWN ON THE DRAWINGS.

B. INSTALL WALL SWITCHES IN A UNIFORM POSITION SO THE SAME DIRECTION OF OPERATION WILL OPEN AND CLOSE THE CIRCUITS THROUGHOUT THE JOB, GENERALLY UP FOR THE ON POSITION.

3.3 OCCUPANCY SENSORS:

A. INSTALL CEILING-MOUNTED SENSORS AT LOCATIONS INDICATED BY MANUFACTURER'S LAYOUT. CONNECT TO ACCOMMODATE SWITCHING SCHEME SHOWN ON DRAWINGS.

B. INSTALL WALL-BOX TYPE SENSORS VERTICALLY IN A SUITABLE STEEL OUTLET BOX CENTERED AT A HEIGHT OF 46-INCHES FROM FINISHED FLOOR ON THE STRIKE SIDE OF THE DOOR AS FINALLY HUNG AND TO ACCOMPLISH OPTIMUM COVERAGE OF SPACE. INSTALL SINGLE- OR DUAL-RELAY SWITCH AS INDICATED ON THE DRAWINGS OR AS REQUIRED TO ACCOMMODATE SWITCHING SCHEME SHOWN ON THE DRAWINGS.

C. INSTALL WALL-MOUNTED SENSORS AT LOCATIONS INDICATED BY MANUFACTURER'S LAYOUT. GENERALLY PROVIDE WALL-MOUNTED SENSORS IN LOCATIONS WITH EXPOSED CEILINGS OR WHERE CEILING OR SUSPENDED-MOUNTING WOULD BE IMPRACTICAL OR WOULD NOT PROVIDE REQUIRED COVERAGE AREA.

D. ALL OCCUPANCY SENSORS ARE TO BE POSITIONED AND AIMED SUCH THAT THE SENSOR ONLY RESPONDS TO MOTION IN THE ROOM OR AREA CONTAINING THE SENSOR. FOR ROOMS AND AREAS CONTAINING MULTIPLE SENSORS AND SWITCHLEGS WHERE CONTROL RESOLUTION IS CRITICAL, THE SENSORS ARE LABELED ON THE DRAWINGS WITH WHICH LIGHTING FIXTURE(S) AND SWITCHLEG THEY ARE TO BE ASSOCIATED WITH AND SPECIFICALLY CONTROL. THE SELECTED MANUFACTURER AND CONTRACTOR SHALL POSITION AND AIM SENSORS SUCH THAT THEY ONLY CONTROL AND RESPOND TO MOTION WITHIN THE AREAS THAT THE LIGHTING FIXTURES DESIGNATED TO BE CONTROLLED BY THE SENSORS ARE LOCATED.

E. OCCUPANCY SENSORS AND ASSOCIATED RELAY/POWER PACKS SHALL BE PROVIDED POWER FROM THE SAME BRANCH-CIRCUIT AS THEY CONTROL.

F. ALL OCCUPANCY SENSORS SHALL HAVE NORMALLY CLOSED CONTACTS AND ALLOW CURRENT TO POWER THE LIGHTING FIXTURES IN THE EVENT OF A SENSOR FAILURE.

G. ALL OCCUPANCY SENSORS FUNCTIONALITY SHALL BE SET TO MANUAL 'ON', AUTOMATIC 'OFF'. THE MAXIMUM TIME DELAY TO OFF SHALL BE SET TO A MAXIMUM OF THIRTY (30) MINUTES. IF AUTOMATIC 'ON' IS DESIRED BY THE OWNER, REQUIRED BY THE AHJ OR CODE, OR SPECIFIED ON THE DRAWINGS, THE CONTRACTOR SHALL PROVIDE A DUAL-CIRCUIT RELAY TYPE OCCUPANCY SENSOR AND CONNECT THE FIXTURES SUCH THAT NO MORE THAN FIFTY PERCENT (50%) OF THE LIGHTING FIXTURES IN THE SPACE ARE POWERED 'ON' UPON ACTIVATION/DETECTION OF MOTION. FULL AUTOMATIC 'ON' IS ACCEPTABLE IN PUBLIC CORRIDORS, STAIRWAYS, RESTROOMS, PRIMARY BUILDING ENTRANCE AREAS, AND LOBBIES, AND ELSEWHERE AS ALLOWED BY THE AHJ.

I. WHETHER SPECIFIED IN THE DRAWINGS OR NOT, AN OCCUPANCY SENSOR SHALL BE PROVIDED IN THE FOLLOWING LOCATIONS:

a. CONFERENCE ROOMS
b. MEETING ROOMS
c. EMPLOYEE/STAFF ONLY BREAK AND LUNCH ROOMS
d. PRIVATE OFFICES
e. RESTROOMS
f. STORAGE ROOMS
g. JANITORIAL CLOSETS / ROOMS
h. ANY SPACE LESS THAN THREE-HUNDRED (300) SQUARE-FEET THAT IS ENCLOSED BY FLOOR TO CEILING HEIGHT PARTITIONS.

3.4 RECEPTACLES:

A. INSTALL INTERIOR RECEPTACLES VERTICALLY IN A SUITABLE STEEL OUTLET BOX CENTERED AT A HEIGHT OF 18-INCHES FROM THE FLOOR OR AS SHOWN ON THE DRAWINGS. INSTALL EXTERIOR RECEPTACLES HORIZONTALLY IN A SUITABLE STEEL OUTLET BOX CENTERED AT A HEIGHT OF 18-INCHES FROM THE FLOOR OR AS SHOWN ON THE DRAWINGS. RECEPTACLES SHALL BE INSTALLED WITH THE GROUND PRONG ON TOP OR TO THE LEFT ON HORIZONTALLY MOUNTED DEVICES. THE ARCHITECT/ENGINEER RESERVES THE RIGHT TO MAKE ANY REASONABLE CHANGES IN RECEPTACLE LOCATIONS WITHOUT CHANGE IN THE CONTRACT SUM.

B. AT A MINIMUM, WHETHER SHOWN ON THE DRAWINGS OR NOT, A GFCI TYPE DUPLEX RECEPTACLE(S) SHALL BE FURNISHED AND INSTALLED AS REQUIRED BY THE NEC INCLUDING BUT NOT LIMITED TO THE LOCATIONS LISTED BELOW. CONNECT TO THE CIRCUIT AS SPECIFIED ON THE DRAWINGS, OR IF NO CIRCUIT IS IDENTIFIED, TO THE NEAREST AVAILABLE CIRCUIT OF THE APPROPRIATE VOLTAGE AND WITH SUFFICIENT CAPACITY. IF NO CIRCUIT EXISTS, FURNISH AND INSTALL A POWER CIRCUIT FROM THE NEAREST APPROPRIATE PANELBOARD WITH SUFFICIENT CAPACITY. PROVIDE A NEW CIRCUIT BREAKER IF NECESSARY; MATCH THE PANELBOARD MANUFACTURER, BREAKER TYPE, STYLE, AND AIC RATING. A WEATHERPROOF ENCLOSURE SHALL BE PROVIDED FOR ALL OUT DOOR OUTLETS OR OUTLETS SUBJECT TO DIRECT OR INDIRECT WATER SPLASH, SPRAY OR CONDENSATION.

1) WITHIN SIX-FEET (6') OF ANY SOURCE OF WATER.

2) ANY RECEPTACLES SHOWN ON THE DRAWINGS LOCATED WITHIN A SPACE CONSIDERED A WET LOCATION WHERE THE OUTLET IS SUBJECT TO WATER CONDENSATION, SPLASHING OR SPRAY SHALL BE GFCI TYPE.

C. INSTALL NON-FEED-THROUGH-TYPE GFCI RECEPTACLES WHERE PROTECTION OF DOWNSTREAM RECEPTACLES IS NOT REQUIRED.

3.5 DEVICE COVER PLATES:

A. INSTALL A DEVICE COVER PLATE FOR EACH DEVICE OR GROUPING OF DEVICES.

B. ENGRAVE THE DEVICE PLATES OF WALL SWITCHES CONTROLLING EQUIPMENT WHICH IS NOT IN SIGHT OF THE SWITCH, WITH THE DESIGNATION OF THE EQUIPMENT BEING CONTROLLED BY THE SWITCH. LETTERING SHALL BE 1/8 INCH HIGH AND OF A CONTRASTING COLOR.

END OF SECTION 26 27 26

SECTION 26 28 13 FUSES - 600 VOLT AND BELOW

1. GENERAL

1.1 SCOPE:

A. THIS SECTION SPECIFIES THE FURNISHING AND INSTALLATION OF FUSES RATED 600 VOLTS AND BELOW, 6000 AMPERES AND BELOW.

1.2 REFERENCE STANDARDS:

A. NEMA FU 1 - LOW VOLTAGE CARTRIDGE FUSES.

B. UL 248-1 - LOW-VOLTAGE FUSES - PART 1: GENERAL REQUIREMENTS.

C. UL 248-4 - LOW-VOLTAGE FUSES - PART 4: CLASS CC FUSES.

D. UL 248-9 - LOW-VOLTAGE FUSES - PART 9: CLASS K FUSES.

E. UL 248-10 - LOW-VOLTAGE FUSES - PART 10: CLASS L FUSES.

F. UL 248-12 - LOW-VOLTAGE FUSES - PART 12: CLASS R FUSES.

1.3 APPLICABLE PROVISIONS:

A. REFER TO SECTION 26 05 00, ELECTRICAL GENERAL PROVISIONS.

1.4 SUBMITTALS:

A. SUBMIT MANUFACTURER'S TECHNICAL PRODUCT DATA ON FUSES. INCLUDE DATA SUBSTANTIATING THAT MATERIALS COMPLY WITH THE REQUIREMENTS OF THIS SECTION.

1.5 DELIVERY, HANDLING AND STORAGE:

A. DELIVER FUSES IN SUITABLE CONTAINERS.

B. HANDLING SHALL BE DONE TO ENSURE THAT FUSES ARE NOT DAMAGED IN ANY WAY.

C. STORE FUSES IN SUITABLE AREAS TO PREVENT DAMAGE.

1.6 OPERATING AND MAINTENANCE DATA:

A. SUBMIT MANUFACTURER'S STANDARD OPERATING AND MAINTENANCE DATA/MANUALS.

2. PRODUCTS

2.1 VOLTAGE:

A. FURNISH FUSES WITH VOLTAGE RATINGS SUITABLE FOR THE NOMINAL VOLTAGE OF THE SYSTEM IN WHICH THEY ARE TO BE APPLIED.

2.2 TYPES:

A. FURNISH UL CLASS RK-5 FOR 600 AMPERE AND SMALLER OR UL CLASS L FOR 601-6000 AMPERES. ALL FUSES SHALL BE TIME DELAY, CURRENT LIMITING FUSES HAVING A MINIMUM 200,000 RMS SYMMETRICAL AMPERE INTERRUPTING RATING. FURNISH AND INSTALL FUSES ON ALL CIRCUITS SUPPLYING MOTORS, WHERE REQUIRED BY THE SELECTED EQUIPMENT MANUFACTURER(S), AND WHERE OTHERWISE INDICATED OR REQUIRED BY CODE. SHOULD A MANUFACTURER OR THE AHJ REQUIRE FUSE PROTECTION FOR A CIRCUIT THAT IS NOT SPECIFIED AS SUCH ON THE DRAWINGS, THE CONTRACTOR SHALL PROVIDE THE FUSE PROTECTION REQUIRED, INCLUDING FUSIBLE DISCONNECTING OR DISTRIBUTION EQUIPMENT, AT NO ADDITIONAL COST.

B. FURNISH UL CLASS CC TIME DELAY, CURRENT LIMITING FUSES HAVING 200,000 RMS SYMMETRICAL AMPERE INTERRUPTING RATING. USE ON ALL CONTROL POWER TRANSFORMERS.

2.3 MANUFACTURER:

A. ALL LOW VOLTAGE FUSES MUST BE THE PRODUCT OF A SINGLE MANUFACTURER.

2.4 ACCEPTABLE MANUFACTURERS:

A. COOPER BUSSMAN, LITTLEFUSE, OR MERSEN.

3. EXECUTION

3.1 INSTALLATION:

A. FOLLOW THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

B. CHECK FASTENERS ON FUSE CLIPS FOR TIGHTNESS WHEN INSTALLING FUSES.

C. INSTALL FUSES SO LABEL IS IN AN UPRIGHT, READABLE POSITION. FUSES WITHOUT LABELS ARE NOT ACCEPTABLE.

D. FUSE SIZES AS RECOMMENDED BY EQUIPMENT MANUFACTURERS SHALL TAKE PRECEDENCE OVER SIZES SHOWN ON THE DRAWINGS. SAFETY SWITCHES AND MOTOR STARTERS SHALL BE PROVIDED TO MEET FUSE REQUIREMENTS AS SPECIFIED BY THE SELECTED EQUIPMENT MANUFACTURERS. FIELD-COORDINATE WITH ALL OTHER TRADES PRIOR TO BID AND ORDERING ANY EQUIPMENT.

END OF SECTION 26 28 13

SECTION 26 28 16 ENCLOSED SWITCHES AND CIRCUIT BREAKERS

1.0 GENERAL

1.1 RELATED DOCUMENTS:

A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND OTHER DIVISION 01 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.

1.2 SUMMARY:

A. THIS SECTION INCLUDES THE FOLLOWING INDIVIDUALLY MOUNTED, ENCLOSED SWITCHES AND CIRCUIT BREAKERS:
1) FUSIBLE SWITCHES.
2) NONFUSIBLE SWITCHES.
3) MOLDED-CASE CIRCUIT BREAKERS.
4) MOLDED-CASE SWITCHES.
5) ENCLOSURES.

1.3 DEFINITIONS:
A. GD: GENERAL DUTY.
B. GFCI: GROUND-FAULT CIRCUIT INTERRUPTER.
C. HD: HEAVY DUTY.
D. RMS: ROOT MEAN SQUARE.
E. SPDT: SINGLE POLE, DOUBLE THROW.

1.4 SUBMITTALS:

A. PRODUCT DATA: FOR EACH TYPE OF ENCLOSED SWITCH, CIRCUIT BREAKER, ACCESSORY, AND COMPONENT INDICATED. INCLUDE DIMENSIONED ELEVATIONS, SECTIONS, WEIGHTS, AND MANUFACTURERS' TECHNICAL DATA ON FEATURES, PERFORMANCE, ELECTRICAL CHARACTERISTICS, RATINGS, AND FINISHES.
1) ENCLOSURE TYPES AND DETAILS FOR TYPES OTHER THAN NEMA 250, TYPE 1.
2) CURRENT AND VOLTAGE RATINGS.
3) SHORT-CIRCUIT CURRENT RATING.
4) UL LISTING FOR INSTALLED DEVICES.
5) FEATURES, CHARACTERISTICS, RATINGS, AND FACTORY SETTINGS OF INDIVIDUAL OVER-CURRENT PROTECTIVE DEVICES AND AUXILIARY COMPONENTS.

B. SHOP DRAWINGS: DIAGRAM POWER, SIGNAL, AND CONTROL WIRING.

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. COMPLY WITH NFPA 70.

C. PRODUCT SELECTION FOR RESTRICTED SPACE: CONTRACTOR SHALL PROVIDE SHOP DRAWINGS INDICATING DIMENSIONS FOR ENCLOSED SWITCHES AND CIRCUIT BREAKERS, INCLUDING CLEARANCES BETWEEN ENCLOSURES, AND ADJACENT SURFACES AND OTHER ITEMS. COMPLY WITH ALLOWED SPACE.

1.6 ENVIRONMENTAL LIMITATIONS: RATE EQUIPMENT FOR CONTINUOUS OPERATION FOR THE AMBIENT TEMPERATURE AND ALTITUDE IN WHICH THEY ARE TO BE INSTALLED.

1.7 COORDINATION:

A. COORDINATE LAYOUT AND INSTALLATION OF SWITCHES, CIRCUIT BREAKERS, AND COMPONENTS WITH OTHER CONSTRUCTION, INCLUDING CONDUIT, PIPING, EQUIPMENT, AND ADJACENT SURFACES. MAINTAIN REQUIRED WORKSPACE CLEARANCES AND REQUIRED CLEARANCES FOR EQUIPMENT ACCESS DOORS AND PANELS.

B. SIZE. THE PHYSICAL SIZE AND CONFIGURATION OF THE ENCLOSED SWITCH AND/OR CIRCUIT BREAKER MAY BE VARIED TO SUIT THE MANUFACTURER'S STANDARD DESIGN, PROVIDED THE INTENDED FUNCTIONS ARE ACCOMPLISHED AND THE PROPOSED EQUIPMENT WILL PHYSICALLY FIT WITHIN THE SPACE ALLOTTED IN THE FLOOR PLANS. ANY CHANGE IN SIZE OR CONFIGURATION MUST BE NOTED ON THE SUBMITTAL.

2.0 PRODUCTS:

2.1 FUSIBLE AND NONFUSIBLE SWITCHES:

A. ALL SAFETY SWITCHES SHALL BE HEAVY-DUTY TYPE WITH AN AMPERE AND HORSEPOWER RATING MEETING OR EXCEEDING THE REQUIREMENTS OF THE ACTUAL MOTORS FURNISHED AND COMPLYING WITH THE MINIMUM RATING REQUIREMENTS OF THE NEC. THE SAFETY SWITCH HORSEPOWER RATING SHALL MEET OR EXCEED THE HORSEPOWER RATING THAT CORRESPONDS TO THE SUM OF ALL LOCKED-ROTOR CURRENTS (THAT MAY BE STARTED SIMULTANEOUSLY) ON EACH MOTOR CIRCUIT. SWITCHES SHALL BE RATED 600VAC FOR USE ON THE 480-VOLT SYSTEM AND 240VAC FOR USE ON THE 208-VOLT SYSTEM.

B. FUSIBLE SWITCH, 800A AND SMALLER: NEMA KS 1, TYPE HD, WITH CLIPS OR BOLT PADS TO ACCOMMODATE SPECIFIED FUSES, LOCKABLE HANDLE WITH CAPABILITY TO ACCEPT TWO PADLOCKS, AND INTERLOCKED WITH COVER IN CLOSED POSITION.

C. NONFUSIBLE SWITCH, 800A AND SMALLER: NEMA KS 1, TYPE HD, LOCKABLE HANDLE WITH CAPABILITY TO ACCEPT TWO PADLOCKS, AND INTERLOCKED WITH COVER IN CLOSED POSITION.

D. ACCESSORIES:
1) EQUIPMENT GROUND KIT: INTERNALLY MOUNTED AND LABELED FOR COPPER AND ALUMINUM GROUND CONDUCTORS.
2) NEUTRAL KIT: INTERNALLY MOUNTED; INSULATED, CAPABLE OF BEING GROUNDED, AND BONDED; AND LABELED FOR COPPER AND ALUMINUM NEUTRAL CONDUCTORS.
3) AUXILIARY CONTACT KIT: AUXILIARY SET OF CONTACTS ARRANGED TO OPEN BEFORE SWITCH BLADES OPEN.

2.2 MOLDED-CASE CIRCUIT BREAKERS AND SWITCHES:
A. MOLDED-CASE CIRCUIT BREAKERS SHALL BE AS FOLLOWS:

1) UL 489 LISTED, WITH INTERRUPTING CAPACITY TO MEET AVAILABLE FAULT CURRENTS.

2) PROVIDE AS SHOWN BELOW UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
a. UP TO AND INCLUDING 150 AMPERE FRAME SIZES SHALL BE NON-ADJUSTABLE, FIXED INVERSE TIME-CURRENT ELEMENT FOR LOW-LEVEL OVERLOADS, AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS.
b. OVER 150 AMPERE FRAME SIZES SHALL BE EQUIPPED WITH DIGITAL SOLID-STATE RMS SENSING TRIP UNITS AND ADJUSTABLE INSTANTANEOUS TRIPS.

3) INTEGRALLY FUSED CIRCUIT BREAKERS: THERMAL-MAGNETIC TRIP ELEMENT WITH INTEGRAL LIMITER-STYLE FUSE LISTED FOR USE WITH CIRCUIT BREAKER AND TRIP ACTIVATION ON FUSE OPENING OR ON OPENING OF FUSE COMPARTMENT DOOR AS SHOWN ON THE DRAWINGS.

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REVISIONS

PROJECT NUMBER

DATE ISSUED
12/08/15

SHEET TITLE
ELECTRICAL SPECIFICATIONS

SHEET NUMBER
E0.5

4) GFCI CIRCUIT BREAKERS: SINGLE- AND TWO-POLE CONFIGURATIONS WITH 5-MA TRIP SENSITIVITY.
5) GFEP CIRCUIT BREAKER: SINGLE- AND TWO-POLE CONFIGURATIONS WITH 30-MA TRIP SENSITIVITY.

B. MOLDED-CASE CIRCUIT-BREAKER FEATURES AND ACCESSORIES:
1) STANDARD FRAME SIZES, TRIP RATINGS, AND NUMBER OF POLES.
2) LUGS: MECHANICAL STYLE SUITABLE FOR NUMBER, SIZE, TRIP RATINGS, AND CONDUCTOR MATERIAL.
3) APPLICATION LISTING: TYPE SWD FOR SWITCHING FLUORESCENT LIGHTING LOADS; TYPE HACR FOR HEATING, AIR-CONDITIONING, AND REFRIGERATING EQUIPMENT.
4) GROUND-FAULT PROTECTION (WHEN SHOWN ON THE DRAWINGS OR REQUIRED BY THE AHJ, NEC OR OTHER GOVERNING CODE): INTEGRALLY MOUNTED RELAY AND TRIP UNIT WITH ADJUSTABLE PICKUP AND TIME-DELAY SETTINGS, PUSH-TO-TEST FEATURE, AND GROUND-FAULT INDICATOR.
5) SHUNT TRIP (WHEN SHOWN ON THE DRAWINGS OR REQUIRED BY THE AHJ, NEC, OR OTHER GOVERNING CODE): 120-V TRIP COIL ENERGIZED FROM SEPARATE CIRCUIT, SET TO TRIP AT 75 PERCENT OF RATED VOLTAGE.
6) UNDERVOLTAGE TRIP (WHEN SHOWN ON THE DRAWINGS): SET TO OPERATE AT 35 TO 75 PERCENT OF RATED VOLTAGE WITH FIELD-ADJUSTABLE 0.1- TO 0.6-SECOND TIME DELAY.
7) PAD LOCK 'OFF' CAPABILITY (WHEN SHOWN ON THE DRAWINGS OR REQUIRED BY THE AHJ, NEC OR OTHER GOVERNING CODE): BREAKER ENCLOSURE SHALL BE PROVIDED WITH ABILITY TO LOCK CIRCUIT BREAKER IN THE OFF POSITION.

C. MOLDED-CASE SWITCHES: MOLDED-CASE CIRCUIT BREAKER WITH FIXED, HIGH-SET INSTANTANEOUS TRIP ONLY, AND SHORT-CIRCUIT WITHSTAND RATING EQUAL TO EQUIVALENT BREAKER FRAME SIZE INTERRUPTING RATING.

2.3 ENCLOSURES:

A. NEMA AB 1 AND NEMA KS 1 TO MEET ENVIRONMENTAL CONDITIONS OF INSTALLED LOCATION.
1) OUTDOOR LOCATIONS: NEMA 250, TYPE 3R.
2) OTHER WET OR DAMP INDOOR LOCATIONS: NEMA 250, TYPE 4.
3) HAZARDOUS AREAS INDICATED ON DRAWINGS: NEMA 250, TYPE 7C.

2.3 ACCEPTABLE MANUFACTURERS:

A. BASIS OF DESIGN MANUFACTURER SHALL BE SQUARE D. SHOULD CONTRACTOR SELECT OTHER THAN BASIS OF DESIGN IT WILL BE THEIR RESPONSIBILITY TO COORDINATE ALL PHYSICAL SIZE, PERFORMANCE OR OTHER OPERATIONAL REQUIREMENTS AND PROVIDE ALL OPTIONS AND ACCESSORIES AS SPECIFIED HEREIN. OTHER ACCEPTABLE MANUFACTURERS INCLUDE:
1) EATON ELECTRICAL/CUTLER-HAMMER: WWW.EATONELECTRICAL.COM.
2) GE INDUSTRIAL: WWW.GEINDUSTRIAL.COM.
3) SQUARE 'D' / SCHNEIDER ELECTRIC: WWW.SQUARED.COM.
4) SUBSTITUTIONS: NOT PERMITTED.

B. THE LISTING OF SPECIFIC MANUFACTURERS ABOVE DOES NOT IMPLY ACCEPTANCE OF THEIR PRODUCTS THAT DO NOT MEET THE SPECIFIED RATINGS, FEATURES AND FUNCTIONS. MANUFACTURERS LISTED ABOVE ARE NOT RELIEVED FROM MEETING OR EXCEEDING ALL REQUIREMENTS LISTED IN THE CONSTRUCTION DOCUMENTS IN THEIR ENTIRETY.

3.0 EXECUTION

3.1 EXAMINATION:

A. EXAMINE ELEMENTS AND SURFACES TO RECEIVE ENCLOSED SWITCHES AND CIRCUIT BREAKERS FOR COMPLIANCE WITH INSTALLATION TOLERANCES AND OTHER CONDITIONS AFFECTING PERFORMANCE.

B. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

3.2 INSTALLATION:

A. COMPLY WITH APPLICABLE PORTIONS OF NECA 1, NEMA PB 1.1, AND NEMA PB 2.1 FOR INSTALLATION OF ENCLOSED SWITCHES AND CIRCUIT BREAKERS.

B. MOUNT INDIVIDUAL WALL-MOUNTING SWITCHES AND CIRCUIT BREAKERS WITH TOPS AT UNIFORM HEIGHT, UNLESS OTHERWISE INDICATED. REFER TO SPECIFICATION SECTION 26 05 53, ELECTRICAL IDENTIFICATION, FOR ADDITIONAL INFORMATION. ANCHOR FLOOR-MOUNTING SWITCHES TO CONCRETE BASE.

C. TEMPORARY LIFTING PROVISIONS: REMOVE TEMPORARY LIFTING EYES, CHANNELS, AND BRACKETS AND TEMPORARY BLOCKING OF MOVING PARTS FROM ENCLOSURES AND COMPONENTS.

D. INSTALL THE FUSES AS SPECIFIED IN THE CONTRACT DOCUMENTS, AS REQUIRED BY THE SELECTED EQUIPMENT MANUFACTURER(S), OR AS REQUIRED BY THE AHJ. REFER TO SPECIFICATION SECTION 26 28 13, FUSES 600 VOLT AND BELOW. PARALLELING OF FUSES PER PHASE IS NOT ACCEPTABLE.

E. SHOULD A MANUFACTURER OR THE AHJ REQUIRE FUSE PROTECTION FOR A CIRCUIT THAT IS NOT SPECIFIED AS SUCH ON THE DRAWINGS, THE CONTRACTOR SHALL PROVIDE THE FUSE PROTECTION REQUIRED, INCLUDING FUSIBLE DISCONNECTING OR DISTRIBUTION EQUIPMENT, AT NO ADDITIONAL COST.

3.3 FIELD QUALITY CONTROL:

A. INSPECT, TEST AND ADJUST FIELD-ASSEMBLED COMPONENTS AND EQUIPMENT INSTALLATION, INCLUDING CONNECTIONS. REPORT RESULTS IN WRITING.

B. PROVIDE ACCEPTANCE TESTING AS FOLLOWS:
1) INSPECT MECHANICAL AND ELECTRICAL CONNECTIONS.
2) VERIFY SWITCH TYPE AND LABELING VERIFICATION.
3) VERIFY RATING OF INSTALLED FUSES.
4) INSPECT PROPER INSTALLATION OF TYPE, SIZE, QUANTITY, AND ARRANGEMENT OF MOUNTING OR ANCHORAGE DEVICES COMPLYING WITH MANUFACTURER'S CERTIFICATION.
5) CORRECT MALFUNCTIONING UNITS ON-SITE, WHERE POSSIBLE, AND RETEST TO DEMONSTRATE COMPLIANCE; OTHERWISE, REPLACE WITH NEW UNITS AND RETEST.
6) INFRARED SCANNING:
a. INITIAL INFRARED SCANNING: AFTER SUBSTANTIAL COMPLETION, BUT NOT MORE THAN 60 DAYS AFTER FINAL ACCEPTANCE, PERFORM AN INFRARED SCAN OF EACH ENCLOSED SWITCH AND CIRCUIT BREAKER. OPEN OR REMOVE DOORS OR PANELS SO CONNECTIONS ARE ACCESSIBLE TO PORTABLE SCANNER.
b. FOLLOW-UP INFRARED SCANNING: PERFORM AN ADDITIONAL FOLLOW-UP INFRARED SCAN OF EACH UNIT 11 MONTHS AFTER DATE OF SUBSTANTIAL COMPLETION.
c. INSTRUMENTS, EQUIPMENT AND REPORTS:
7) USE AN INFRARED SCANNING DEVICE DESIGNED TO MEASURE TEMPERATURE OR TO DETECT SIGNIFICANT DEVIATIONS FROM NORMAL VALUES. PROVIDE CALIBRATION RECORD FOR DEVICE.

8) PREPARE A CERTIFIED REPORT THAT IDENTIFIES ENCLOSED SWITCHES AND CIRCUIT BREAKERS INCLUDED AND DESCRIBES SCANNING RESULTS. INCLUDE NOTATION OF DEFICIENCIES DETECTED, REMEDIAL ACTION TAKEN AND OBSERVATIONS AFTER REMEDIAL ACTION.

3.5 IDENTIFICATION:
A. IDENTIFY FIELD-INSTALLED CONDUCTORS, INTERCONNECTING WIRING, AND COMPONENTS; PROVIDE WARNING SIGNS AS SPECIFIED IN DIVISION 26, SECTION 26 05 53, ELECTRICAL IDENTIFICATION.

B. ENCLOSURE NAMEPLATES: LABEL EACH ENCLOSURE WITH ENGRAVED METAL OR LAMINATED-PLASTIC NAMEPLATE AS SPECIFIED IN DIVISION 26, SECTION 26 05 53, ELECTRICAL IDENTIFICATION.

3.6 CLEANING:

A. ON COMPLETION OF INSTALLATION, VACUUM DIRT AND DEBRIS FROM INTERIORS; DO NOT USE COMPRESSED AIR TO ASSIST IN CLEANING.

B. INSPECT EXPOSED SURFACES AND REPAIR DAMAGED FINISHES.

END OF SECTION 26 28 16

SECTION 26 51 13 LIGHTING FIXTURES AND LAMPS

1. GENERAL

1.1 SCOPE:

A. THIS SECTION SPECIFIES THE FURNISHING AND INSTALLATION OF LIGHTING FIXTURES COMPLETE WITH LAMPS, DRIVERS, BALLASTS AND OTHER ACCESSORIES.

1.2 REFERENCE STANDARDS:

A. ANSI C78 SERIES - LAMPS.

B. ANSI C82 SERIES - BALLASTS.

C. IEEE C62.41.1 - IEEE GUIDE ON THE SURGE ENVIRONMENT IN LOW-VOLTAGE (1000V AND LESS) AC POWER CIRCUITS.

D. IEEE C62.41.2 - IEEE RECOMMENDED PRACTICE ON CHARACTERIZATION OF SURGES IN LOW-VOLTAGE (1000V AND LESS) AC POWER CIRCUITS.

E. NECA/IESNA 500-1998 - RECOMMENDED PRACTICE FOR INSTALLING INDOOR COMMERCIAL LIGHTING SYSTEMS (ANSI).

F. NECA/IESNA 501-2000 - RECOMMENDED PRACTICE FOR INSTALLING EXTERIOR LIGHTING SYSTEMS (ANSI).

G. NECA/IESNA 502-1999 - RECOMMEND PRACTICE FOR INSTALLING INDUSTRIAL LIGHTING SYSTEMS (ANSI).

H. UL 924 - EMERGENCY LIGHTING AND POWER EQUIPMENT.

I. UL 935 - FLUORESCENT LAMP BALLASTS.

J. UL 1029 - HIGH-INTENSITY-DISCHARGE LAMP BALLASTS.

K. UL 1574 - TRACK LIGHTING SYSTEMS.

L. UL 1598 - LUMINAIRES.

1.3 APPLICABLE PROVISIONS:

A. REFER TO SECTION 26 05 00, ELECTRICAL GENERAL PROVISIONS.

1.4 SUBMITTALS:

A. SUBMIT MANUFACTURER'S TECHNICAL PRODUCT DATA FOR ALL LIGHT FIXTURES, LAMPS, DRIVERS, BALLASTS AND ACCESSORIES. INCLUDE PUBLISHED PHOTOMETRIC DATA, COEFFICIENTS OF UTILIZATION AND CANDLEPOWER DISTRIBUTION CURVES FOR LIGHT FIXTURES.

1.5 DELIVERY, HANDLING AND STORAGE:

A. DELIVER ALL LIGHTING FIXTURES IN FACTORY-FABRICATED CONTAINERS OR WRAPPINGS, WHICH PROPERLY PROTECT FIXTURES FROM DAMAGE.

B. HANDLE ALL LIGHTING FIXTURES CAREFULLY TO PREVENT DAMAGE, BREAKING, AND SCARRING OF FINISHES. DO NOT INSTALL DAMAGED UNITS OR COMPONENTS.

C. STORE ALL LIGHTING FIXTURES IN ORIGINAL PACKAGING. STORE LAID FLAT AND BLOCKED OFF GROUND INSIDE A WELL-VENTILATED AREA PROTECTED FROM WEATHER, MOISTURE, SOILING, EXTREME TEMPERATURES AND HUMIDITY.

1.6 DISCONNECTING MEANS:

A. IN FLUORESCENT LUMINARIES THAT USE DOUBLE-ENDED LAMPS AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE, PROVIDE AN INTERNAL DISCONNECTING MEANS TO DISCONNECT SIMULTANEOUSLY THE SOURCE OF SUPPLY ALL CONDUCTORS OF THE BALLAST, INCLUDING THE GROUNDED CONDUCTOR. THE LINE SIDE TERMINALS OF THE DISCONNECTING MEANS SHALL BE GUARDED. THE DISCONNECTING MEANS SHALL BE LOCATED SO AS TO BE ACCESSIBLE TO QUALIFIED PERSONS BEFORE SERVICING OR MAINTAINING THE BALLAST.

1.7 OPERATION AND MAINTENANCE DATA:

A. SUBMIT MANUFACTURER'S STANDARD OPERATION AND MAINTENANCE DATA/MANUALS IN ACCORDANCE WITH SECTION 26 05 00. PROVIDE LAMP ORDERING INFORMATION FOR EACH TYPE OF LAMP AND THE LOCAL LAMP DISTRIBUTOR'S ADDRESS AND PHONE NUMBER.

1.8 COORDINATION:

A. THE VARIOUS CEILING TYPES ARE INDICATED ON THE ARCHITECTURAL PLANS AND IN THE ROOM FINISH SCHEDULES. ALL LIGHTING FIXTURES SHALL BE COORDINATED WITH THE ARCHITECTURAL REQUIREMENTS PRIOR TO BID AND AGAIN PRIOR TO RELEASING THE LIGHTING FIXTURE PACKAGE TO INSURE THAT THE PROPER TRIM KIT, AND/OR MOUNTING ACCESSORY IS PROVIDED WITH EACH FIXTURE FOR THE INTENDED APPLICATION. ALL TRIM KITS AND ACCESSORIES SHALL BE PROVIDED BY CONTRACTOR WHETHER OR NOT THEY ARE SPECIFICALLY INDICATED BY THE MANUFACTURER'S CATALOG NUMBERS ON THE LIGHTING FIXTURE SCHEDULE. ADDITIONAL TIME OR MONEY WILL NOT BE ALLOWED FOR COORDINATION OF LIGHTING FIXTURE(S), TRIM KIT(S) REQUIRED, AND CEILING TYPES.

1.9 FIRE RATED FIXTURES OR BOXES:

A. THE CONTRACTOR SHALL PROVIDE ALL MEANS NECESSARY OF MAINTAINING THE FIRE RATING OF THE CEILING ASSEMBLIES INTO WHICH THE LIGHTING FIXTURES ARE INSTALLED. WHETHER SPECIFIED ON THE DRAWINGS OR NOT, THE CONTRACTOR MAY PROVIDE FIRE-RATED LIGHTING FIXTURES EQUIVALENT OR GREATER TO THE FIRE RATING, OR IC-RATED LIGHTING FIXTURE PLUS 'FIRE BOXES' EQUIVALENT OR GREATER TO THE FIRE RATING. FIRE BOXES SHALL BE BY TENMAT, INC. OR EQUIVALENT AND SHALL BE LISTED FOR THE SPECIFIC PURPOSE.

2. PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

A. NEW LIGHTING FIXTURES ARE SCHEDULED ON THE DRAWINGS.

B. LAMPS, FLUORESCENT: GENERAL ELECTRIC ECOLUX, OSRAM/SYLVANIA ECOLOGIC, PHILIPS ALTO.

C. LAMPS, INCANDESCENT, HALOGEN, AND HID: GENERAL ELECTRIC, OSRAM/SYLVANIA, PHILIPS, VENTURE.

D. ELECTRONIC BALLASTS FOR FLUORESCENT FIXTURES: ADVANCE, OSRAM/SYLVANIA, GENERAL ELECTRIC.

2.2 LIGHTING FIXTURES:

A. LIGHT FIXTURES ARE SPECIFIED BY TYPE AND MANUFACTURER IN THE LIGHT FIXTURE SCHEDULE ON THE DRAWINGS. ALL LIGHT FIXTURES SHALL BE INSTALLED COMPLETE WITH LAMPS, BALLASTS AND ACCESSORIES.

2.3 LAMPS:

A. ALL LAMPS SHALL COMPLY WITH PUBLIC LAW 102-486, THE NATIONAL ENERGY POLICY ACT OF 1992.

B. INCANDESCENT LAMPS SHALL BE RATED 130 VOLT AND HAVE THE WATTAGE AND LAMP SHAPE AS SPECIFIED IN THE LIGHT FIXTURE SCHEDULE.

C. LINEAR FLUORESCENT LAMPS SHALL HAVE THE WATTAGE AS INDICATED IN THE LIGHT FIXTURE SCHEDULE, SHALL HAVE A COLOR RENDERING INDEX (CRI) OF 82 OR GREATER, AND UNLESS NOTED OTHERWISE IN THE DRAWINGS, A MAXIMUM CORRELATED COLOR TEMPERATURE (CCT) OF 3500 DEGREES KELVIN. LAMPS SHALL PASS THE ENVIRONMENTAL PROTECTION AGENCY'S (EPA) TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP). FORTY-EIGHT INCH LONG LAMPS SHALL HAVE AN AVERAGE RATED LIFE OF 24,000 HOURS BASED ON 12 HOURS PER START USING AN INSTANT START BALLAST. LAMPS SHALL HAVE A TWO YEAR WARRANTY FROM DATE OF INSTALLATION AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP; WARRANTY SHALL INCLUDE REPLACEMENT OF DEFECTIVE LAMPS. LAMPS SHALL ALSO HAVE A BRASS BASE.

D. COMPACT FLUORESCENT (TWIN TUBE, DOUBLE TWIN TUBE AND TRIPLE TWIN TUBE) LAMPS SHALL HAVE THE WATTAGE AS INDICATED IN THE LIGHT FIXTURE SCHEDULE, SHALL HAVE A COLOR RENDERING INDEX (CRI) OF 82 OR GREATER, AND UNLESS NOTED OTHERWISE IN THE DRAWINGS, A MAXIMUM CORRELATED COLOR TEMPERATURE (CCT) OF 3500 DEGREES KELVIN. LAMPS SHALL HAVE AN AVERAGE RATED LIFE OF 10,000 HOURS. LAMPS SHALL HAVE A TWO YEAR WARRANTY FROM DATE OF INSTALLATION AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP; WARRANTY SHALL INCLUDE REPLACEMENT OF DEFECTIVE LAMPS.

2.4 BALLASTS:

A. ALL FLUORESCENT BALLASTS MUST CONFORM TO THE FOLLOWING:

1) WHERE REQUIRED BY PUBLIC LAW 100-357, COMPLY WITH THE ENERGY POLICY AND CONSERVATION ACT OF 1987 AND THE NATIONAL APPLIANCE ENERGY CONSERVATION AMENDMENTS OF 1988.

1) OPERATE FROM A MINIMUM INPUT VOLTAGE RANGE OF 120 TO 277 VOLTS AND 60 HERTZ.

2) HAVE A POWER FACTOR EQUAL TO OR GREATER THAN 0.98.

3) BE THERMALLY PROTECTED CLASS P.

4) HAVE A CLASS "A" SOUND RATING.

5) CONTAIN NO PCBS.

6) HAVE INTEGRAL CIRCUITRY FOR END OF LAMP LIFE PROTECTION ON LAMPS 5/8" DIAMETER AND SMALLER.

B. WHERE SPECIFIED, FURNISH ELECTRONIC INSTANT-START PARALLEL-CONNECTED BALLASTS FOR LINEAR FLUORESCENT LIGHT FIXTURES WHICH MEET THE FOLLOWING STANDARDS:

1) OPERATE LAMPS AT A FREQUENCY OF 20KHZ OR GREATER WITHOUT VISIBLE LAMP FLICKER.

1) HAVE INPUT CURRENT TOTAL HARMONIC DISTORTION (THD) NOT EXCEEDING 10%.

2) HAVE LAMP CURRENT CREST FACTOR NOT EXCEEDING 1.7.

3) CAPABLE OF WITHSTANDING LINE TRANSIENTS AS RECOMMENDED BY IEEE C62.41.

4) COMPLY WITH THE REQUIREMENTS OF THE FEDERAL COMMUNICATION COMMISSION RULES AND REGULATIONS, PART 18 NON-CONSUMER EQUIPMENT FOR EMI/RFI.

5) COMPLY WITH ANSI C82.11 - HIGH FREQUENCY FLUORESCENT LAMP BALLASTS.

6) SHALL HAVE A FIVE YEAR WARRANTY FROM DATE OF INSTALLATION AGAINST DEFECTS IN MATERIAL AND WORKMANSHIP.

7) ALLOW REMAINING LAMP(S) TO MAINTAIN FULL LIGHT OUTPUT IF ONE OR MORE LAMPS FAIL.

8) ANTI-STRIATION CONTROL.

9) UL TYPE CC RATING - ANTI ARCING CONTROL.

10) DESIGNED FOR PARALLEL OPERATION.

C. WHERE SPECIFIED, FURNISH ELECTRONIC PROGRAM-START PARALLEL-CONNECTED BALLASTS FOR LINEAR FLUORESCENT LIGHT FIXTURES SIMILAR TO GENERAL ELECTRIC LFL ULTRASTART ELECTRONIC PROGRAM/RAPID START BALLAST, OR APPROVED EQUIVALENT WHICH MEET THE FOLLOWING STANDARDS:

1) OPERATE LAMPS AT A FREQUENCY OF 20KHZ OR GREATER WITHOUT VISIBLE LAMP FLICKER.

2) HAVE INPUT CURRENT TOTAL HARMONIC DISTORTION (THD) NOT EXCEEDING 10%.

3) HAVE LAMP CREST FACTOR NOT EXCEEDING 1.7.

4) CAPABLE OF WITHSTANDING LINE TRANSIENTS AS RECOMMENDED BY ANSI - C62.41.

5) FCC COMMISSION RULES AND REGULATIONS, PART 18 NON-CONSUMER EQUIPMENT.

6) SHALL HAVE A FIVE YEAR WARRANTY FROM DATE OF INSTALLATION AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP.

7) ANTI-STRIATION CONTROL.

8) ROHS COMPLIANT, NEMA PREMIUM.

D. FURNISH ELECTRONIC PROGRAMMED RAPID START BALLASTS FOR COMPACT FLUORESCENT LIGHTING FIXTURES WHICH MEET THE FOLLOWING STANDARDS:

1) OPERATE LAMPS AT A FREQUENCY OF 50 KHZ OR GREATER WITHOUT VISIBLE LAMP FLICKER.

1) HAVE INPUT CURRENT TOTAL HARMONIC DISTORTION (THD) NOT EXCEEDING 10%.

2) HAVE LAMP CURRENT CREST FACTOR NOT EXCEEDING 1.7.

3) CAPABLE OF WITHSTANDING LINE TRANSIENTS AS RECOMMENDED BY IEEE C62.41.

4) COMPLY WITH THE REQUIREMENTS OF THE FEDERAL COMMUNICATION COMMISSION RULES AND REGULATIONS, PART 18 NON-CONSUMER EQUIPMENT FOR EMI/RFI.

5) COMPLY WITH ANSI C82.11 - HIGH FREQUENCY FLUORESCENT LAMP BALLASTS.

6) SHALL HAVE A FIVE YEAR WARRANTY FROM DATE OF INSTALLATION AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP; WARRANTY SHALL INCLUDE REPLACEMENT OF DEFECTIVE BALLASTS.

E. FURNISH NEMA 1 OR NEMA 3R ENCLOSURES WHERE BALLASTS ARE TO BE REMOTELY MOUNTED FROM THE FIXTURE.

F. BALLAST WHICH ARE LOCATED OUTDOORS AND IN UNHEATED INDOOR AREAS SHALL BE RATED FOR RELIABLE STARTING TO 0 DEGREE FAHRENHEIT OR AS RECOMMENDED BY THE BALLAST MANUFACTURER FOR THE SPECIFIC APPLICATION.

2.5 EMERGENCY BATTERY SYSTEM:

A. WHERE INDICATED ON THE DRAWINGS, FURNISH FIXTURES WITH A FACTORY INSTALLED EMERGENCY BATTERY SYSTEM CONSISTING OF A SEALED RECHARGEABLE MAINTENANCE-FREE NICKEL CADMIUM BATTERY, BATTERY CHARGER, SOLID STATE INVERTER, TEST SWITCH, AND "READY" LIGHT, ALL INSTALLED WITHIN THE FIXTURE. SYSTEM SHALL BE SUITABLE FOR USE IN BOTH NORMAL AND EMERGENCY OPERATIONAL MODES. SYSTEM SHALL ONE LAMP IN EACH FIXTURE AT NOT LESS THAN 33% LIGHT OUTPUT INITIALLY TO NOT LESS THAN 25% LIGHT OUTPUT AFTER 90 MINUTES OF OPERATION. UNLESS NOTED OTHERWISE ON THE DRAWINGS, FURNISH BODINE B50U OR APPROVED EQUIVALENT FOR T8 LAMPS OR BODINE B84C OR APPROVED EQUIVALENT FOR COMPACT FLUORESCENT LAMPS.

B. TEST SWITCH AND PILOT LIGHT MOUNTED ON THE BALLAST CHANNEL COVER FOR LINEAR FLUORESCENT FIXTURES MOUNTED AT +9'-0" ABOVE THE FINISHED FLOOR OR LOWER.

C. TEST SWITCH AND PILOT LIGHT MOUNTED IN SIDE OF FIXTURE REFLECTOR FOR RECESSED OPEN DOWNLIGHTS.

D. TEST SWITCH AND PILOT LIGHT MOUNTED REMOTELY FOR ALL OTHER FIXTURES. PROVIDE WALL-MOUNTED REMOTE TEST SWITCHES AND ASSOCIATED PILOT LIGHT IN A SECURE LOCATION WITHIN SIGHT OF THE FIXTURE TO BE TESTED AND WITHIN THE FIXTURE AND BATTERY PACK MANUFACTURER'S ALLOWABLE REMOTE MOUNTING DISTANCE. FIELD-COORDINATE THE EXACT LOCATION WITH THE ARCHITECT PRIOR TO ROUGH-IN.

E. LABEL EMERGENCY LIGHTING POWER PACKS, USING A BLACK MARKING PEN, WITH THE IDENTITY OF THE UN-SWITCHED CIRCUIT.

2.6 LENS:

A. LENSES FOR FLUORESCENT FIXTURES SHALL BE ACRYLIC PATTERN 12 WITH NOMINAL THICKNESS OF 0.125 INCHES UNLESS OTHERWISE INDICATED IN THE LIGHTING FIXTURE SCHEDULE.

B. FURNISH ONE LENS RETAINING HOLD-DOWN CLIP ON ALL SIDES OF FLUORESCENT LIGHT FIXTURES WITH LENGTH EXCEEDING TWO FEET.

2.7 LINEAR FLUORESCENT LAMP HOLDERS:

A. LINEAR FLUORESCENT LAMP HOLDERS SHALL BE TURN TYPE, MEDIUM BASE, BI-PIN, 660 WATT, 600 VOLT.

2.8 EMERGENCY EXIT LIGHTS:

A. EXIT LIGHTS MUST CONFORM TO THE FOLLOWING:

1) FURNISH A SYSTEM CONSISTING OF A SEALED RECHARGEABLE MAINTENANCE-FREE NICKEL CADMIUM BATTERY, BATTERY CHARGER, SOLID STATE INVERTER, TEST SWITCH, AND PILOT LIGHT.

2) MEET OR EXCEED THE CURRENT NFPA REQUIREMENTS.

3) LIGHT EMITTING DIODE (LED) TYPE.

4) DIE-CAST ALUMINUM OR THERMOPLASTIC; MATCH EXISTING BUILDING STANDARD.

5) CONCEALED AND REMOVABLE DIRECTIONAL CHEVRON KNOCK-OUTS.

6) STENCIL FACE.

7) LETTER COLOR TO MATCH BUILDING OR OWNER STANDARD, OR AS REQUIRED BY THE AHJ.

B. LABEL POWER PACKS, USING A BLACK MARKING PEN, WITH THE IDENTITY OF THE UN-SWITCHED CIRCUIT.

3. EXECUTION

3.1 INSTALLATION:

A. INSTALL LIGHTING FIXTURES AT LOCATIONS AND HEIGHTS AS INDICATED, IN ACCORDANCE WITH FIXTURE MANUFACTURER'S WRITTEN INSTRUCTIONS AND APPLICABLE REQUIREMENTS OF NEC. FIELD-VERIFY THE MOUNTING HEIGHT OF ALL SUSPENDED LIGHTING FIXTURES WITH THE ARCHITECT AND OWNER PRIOR TO ORDERING FIXTURES AND AGAIN PRIOR TO INSTALLATION

B. INSTALL FIXTURES AND/OR FIXTURE OUTLET BOXES WITH HANGERS TO PROPERLY SUPPORT FIXTURE WEIGHT.

C. INSTALL HANGERS AND SUPPORT MEMBERS FOR FIXTURES AS REQUIRED FOR PROPER INSTALLATION. INSTALL APPURTENANCES WHICH INCLUDE STUD SUPPORTS, STEMS, MOUNTING BRACKETS, FRAMES AND PLASTER RINGS.

D. SUPPORT FIXTURES FROM THE BUILDING STRUCTURE OR FROM FURRING CHANNELS. FURRING CHANNELS MUST BE A MINIMUM SIZE OF 3/4 INCHES. LAY-IN (RECESSED) LIGHTING FIXTURES SHALL BE SUPPORTED FROM BUILDING STRUCTURE BY MINIMUM 12 GAUGE GALVANIZED CARBON STEEL SOFT TEMPER HANGER WIRES. INSTALL TWO HANGERS AT DIAGONALLY OPPOSITE CORNERS OF EACH LAY-IN LIGHT FIXTURE 2'X4' OR SMALLER AND ONE HANGER AT EACH CORNER OF EACH LAY-IN LIGHT FIXTURE LARGER THAN 2'X4'. SUPPORTING OF LIGHT FIXTURES FROM CEILING SYSTEM IS NOT ACCEPTABLE.

E. INSTALL SUPPORT MEMBERS FOR EXIT FIXTURES AS REQUIRED TO PROVIDE RIGID INSTALLATION.

F. EACH RECESSED LIGHTING FIXTURE SHALL BE SEPARATELY CONNECTED TO AN ABOVE CEILING JUNCTION BOX (I.E. DAISY CHAINING FROM FIXTURE TO FIXTURE WITH FLEXIBLE CONDUIT IS NOT ALLOWED). IN A “MASTER-SLAVE” FIXTURE ARRANGEMENT, “SLAVE” FIXTURES ARE TO BE CONNECTED TO THEIR RESPECTIVE “MASTER” FIXTURE WITH A FACTORY FURNISHED CONNECTOR. FLEXIBLE METAL CONDUIT FROM JUNCTION BOX TO LIGHTING FIXTURE SHALL NOT TOUCH THE CEILING AS FINALLY INSTALLED.

G. INSTALL FLUSH MOUNTED FIXTURES PROPERLY TO ELIMINATE LIGHT LEAKAGE BETWEEN FIXTURE FRAME AND FINISHED SURFACE.

H. TIGHTEN CONNECTORS AND TERMINALS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES FOR EQUIPMENT CONNECTORS. WHERE MANUFACTURER'S TORQUE REQUIREMENTS ARE NOT INDICATED, TIGHTEN CONNECTORS AND TERMINALS TO COMPLY WITH TIGHTENING TORQUES SPECIFIED IN UL STANDARD 486A.

I. BOXES TO WHICH LIGHT FIXTURES OR PENDANTS ARE MOUNTED SHALL NOT CONTAIN ANY CONDUCTORS FOREIGN TO THE OPERATION OF SUCH LIGHT OR PENDANT APPLICATION. REMOVAL OF LIGHTS, PENDANTS AND CORD DROPS TO ACCESS OTHER BRANCH CIRCUITS IS NOT ACCEPTABLE.

J. LOCATE MECHANICAL, ELECTRICAL EQUIPMENT, ETC. ROOM LIGHT FIXTURES TO PROVIDE THE BEST COVERAGE AND CLEAR ALL OBSTRUCTIONS SUCH AS DUCTS, PIPING, BRACING AND SUPPORTS.

K. LIGHTING FIXTURES AND POWER RECEPTACLES SHALL NOT BE CONNECTED TO A COMMON CIRCUIT UNLESS SHOWN AND NOTED SPECIFICALLY ON THE DRAWINGS.

3.2 GROUNDING:

A. INSTALL EQUIPMENT GROUNDING CONNECTIONS FOR ALL LIGHTING FIXTURES.

3.3 ADJUSTING AND CLEANING:

A. PRIOR TO FINAL OBSERVATION, ADJUST ALL DIRECTIONAL LIGHT FIXTURES AS DIRECTED BY THE ARCHITECT/ENGINEER.

B. ORIENT ALL EMERGENCY LIGHTING UNITS TO ILLUMINATE THE PATH OF EGRESS.

C. CLEAN ALL LIGHT FIXTURE HOUSINGS, REFLECTORS, LENSES AND DIFFUSERS AT COMPLETION OF PROJECT.

3.4 DEMONSTRATION:

A. DEMONSTRATE THAT ALL LIGHT FIXTURES ARE COMPLETE AND OPERATIONAL.

B. DEMONSTRATE THE OPERATION OF ALL LIGHTING CONTROLS, INCLUDING THE SETTING AND ADJUSTMENT OF TIME CLOCKS AND OTHER AUTOMATIC CONTROLS.

END OF SECTION 26 51 13

SECTION 26 60 05 ELECTRICAL TESTING - 600 VOLT AND BELOW

1. GENERAL

1.1 THE BIDDING AND CONTRACT REQUIREMENTS, DIVISION 01 AND GENERAL REQUIREMENTS OF THIS APPLY TO ALL WORK REQUIRED FOR THIS SECTION.

A. SCOPE:

1) ALL BUILDING ELECTRICAL SYSTEMS AND EQUIPMENT SHALL BE TESTED AND ADJUSTED FOR PROPER OPERATION. ALL FAULTY EQUIPMENT AND MATERIAL SHALL BE REPAIRED OR REPLACED. SPECIFIC TESTS REQUIRING SUBMITTAL OF TEST RESULTS ARE OUTLINED HEREIN BELOW.

2) ALL INSTRUMENTS, MATERIALS, PERSONNEL, AND DOCUMENTATION OF TEST RESULTS SHALL BE INCLUDED IN THE WORK OF THIS DIVISION.

2. QUALITY ASSURANCE

2.1 TESTING AGENCY QUALIFICATIONS:

A. AS SPECIFIED IN EACH SECTION CONTAINING ELECTRICAL TESTING REQUIREMENTS AND IN SUBPARAGRAPH AND ASSOCIATED SUBPARAGRAPH BELOW. AN UNBIASED, INDEPENDENT TESTING AGENCY, SELECTED BY THE GENERAL CONTRACTOR, SHALL ENTER INTO A CONTRACTUAL AGREEMENT WITH THE GENERAL CONTRACTOR TO PROVIDE TESTING AS OUTLINED BELOW, OR PRIOR TO THE PROJECT'S SUBSTANTIAL COMPLETION DATE IF NO TIMELINE IS EXPLICITLY STATED.

1) INDEPENDENT TESTING AGENCIES: INDEPENDENT OF MANUFACTURERS, SUPPLIERS, AND INSTALLERS OF COMPONENTS TO BE TESTED OR INSPECTED. THE TESTING AGENCY SHALL BE REGULARLY ENGAGED IN THE TESTING OF ELECTRICAL EQUIPMENT, DEVICES, INSTALLATIONS, AND SYSTEMS. THE PRIME ELECTRICAL CONTRACTOR DOES NOT MEET THIS REQUIREMENT NOR DO CONTRACTORS SUB-CONTRACTED TO THE PRIME ELECTRICAL CONTRACTOR. THE TESTING FIRM SHALL PROVIDE TESTING IN ACCORDANCE WITH NETA ATS PUBLISHED SPECIFICATIONS.
a. TESTING AGENCY'S FIELD SUPERVISOR FOR POWER COMPONENT TESTING: 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 DIVISION 26 POWER COMPONENT SECTIONS.

B. TEST EQUIPMENT SUITABILITY: COMPLY WITH NETA ATS, SECTION 5.2.

C. TEST EQUIPMENT CALIBRATION: COMPLY WITH NETA ATS, SECTION 5.3.

3. EXECUTION

3.1 600 VOLT BUILDING WIRE AND CABLE TESTS:

A. PRIOR TO ENERGIZATION OF THE NEW AND/OR “MODIFIED” FEEDERS AND BRANCH CIRCUITS, CHECK ALL WIRE AND CABLE FOR CONTINUITY OF CIRCUITRY AND FOR SHORT CIRCUITS. A “MODIFIED” CONDUCTOR, AS USED IN THE CONTEXT OF THIS SPECIFICATION SECTION, SHALL BE DEFINED AS ONE IN WHICH ELECTRICAL LOAD HAS BEEN ADDED OR REMOVED AS A RESULT OF THIS RENOVATION. CORRECT ALL MALFUNCTIONS WHEN DETECTED.

B. EACH NEW AND/OR MODIFIED FEEDER CONDUCTOR SHALL HAVE ITS INSULATION RESISTANCE TESTED AFTER ITS INSTALLATION IS COMPLETED, PRIOR TO CONNECTION AT ITS SOURCE AND POINT OF TERMINATION.

C. TESTS SHALL BE MADE USING A BIDDLE MEGGER OR EQUIVALENT AT A VOLTAGE OF NOT LESS THAN 1000 OR 500 VDC, FOR THE 480VAC AND 208VAC SYSTEMS, RESPECTIVELY, OR OTHER VOLTAGE AS RECOMMENDED BY THE SELECTED CONDUCTOR MANUFACTURER AND AFTER ONE MINUTE OF OPERATION AT SLIP SPEED. RESISTANCE SHALL BE MEASURED FROM CONDUCTOR TO CONDUCTOR, AND CONDUCTOR TO GROUND.

D. CONDUCTORS, WHICH DO NOT MEET OR EXCEED THE FOLLOWING INSULATION RESISTANCE VALUES SHALL BE REMOVED, REPLACED, AND RETESTED.

WIRE SIZE (AWG)	INSULATION RESISTANCE (OHMS)
NO. 6 THROUGH NO. 2	100K
NO. 1 THROUGH NO. 4/0	50K
LARGER THAN NO. 4/0	25K

E. SUBMIT FOUR (4) COPIES OF CERTIFIED TEST RESULTS FOR OWNER'S RECORD KEEPING. RESULTS SHALL INDICATE WEATHER CONDITIONS FOR TESTS, FEEDER TESTED, CONDUCTOR SIZE AND TYPE AND RESISTANCE MEASUREMENTS.

F. WHERE REUSED EXISTING FEEDERS FAIL TO MEET THE ABOVE INSULATION REQUIREMENTS, NOTIFY THE ARCHITECT/ENGINEER IN WRITING FOR DIRECTION PRIOR TO PLACING THE EXISTING FEEDERS BACK IN SERVICE.

3.2 THERMOGRAPHIC TESTING:

A. CONDUCT A THERMOGRAPHIC TEST OF ALL TERMINALS IN THE MODIFIED DISTRIBUTION PANELS, LIGHTING AND POWER PANELBOARDS, AND ALL OTHER ELECTRICAL POWER DISTRIBUTION APPARATUS AS WELL AS EACH NEW AND/OR MODIFIED WIRE SPLICE IN JUNCTION BOXES OR OTHER ENCLOSURES FOR WIRE #3 AND LARGER USING AN INFRARED TEMPERATURE-SCANNING DEVICE. THE TEST SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY. CONNECTIONS INDICATING HIGHER TEMPERATURE LEVELS THAN ARE ACCEPTABLE SHALL BE TIGHTENED OR CORRECTED AS REQUIRED TO ELIMINATE THE ABNORMAL CONDITION.

B. CONDUCT AND DOCUMENT THE TEST BETWEEN FOUR AND SIX MONTHS OF BENEFICIAL OCCUPANCY OF THE PROJECT AND COMPLETE ALL CORRECTIONS OF ABNORMAL CONDITIONS PRIOR TO COMPLETION OF THE FIRST YEAR OF THE WARRANTY PERIOD.

C. SUBMIT FOUR (4) COPIES OF CERTIFIED TEST RESULTS FOR OWNER'S RECORD KEEPING. RESULTS SHALL SHOW EQUIPMENT TESTED, TEMPERATURE DETECTED AND APPLICABLE, CORRECTIVE ACTIONS AND RETEST RESULTS.

3.3 WIRING DEVICES:

A. TEST ALL RECEPTACLES FOR POWER POLARITY AND GROUND TO ASSURE THAT ALL RECEPTACLES ARE OPERATING PROPERLY, CORRECTLY WIRED AND SUITABLY GROUNDED. PERFORM AN OPERATION TEST OF ALL GROUND FAULT CIRCUIT-INTERRUPTER RECEPTACLES.

3.4 DRY-TYPE TRANSFORMER - LOAD, VOLTAGE AND TAP SETTING:

A. MEASURE AND RECORD LOAD CURRENT AND VOLTAGE ON EACH DRY-TYPE TRANSFORMER, WHILE LOADED, TO VERIFY PROPER TAP SETTING. INCLUDE TAP SELECTION WITH SUBMITTAL DATA.

B. SUBMIT FOUR (4) COPIES OF CERTIFIED TEST RESULTS FOR [APPROVAL] [OWNER'S RECORD KEEPING]. TEST RESULTS SHALL SHOW TRANSFORMER TESTED, LOAD CURRENT (SECONDARY), INPUT AND OUTPUT VOLTAGE AND TAP SETTING.

3.5 EMERGENCY LIGHTING SYSTEM TESTS:

A. UPON COMPLETION OF INSTALLATION OF THE EMERGENCY LIGHTING SYSTEM AND AFTER THE BUILDING NORMAL POWER SOURCE HAS BEEN ENERGIZED, TEST THE EMERGENCY LIGHTING SYSTEM TO DEMONSTRATE CAPABILITY AND COMPLIANCE WITH SPECIFIED REQUIREMENTS. FIRST, MIMIC A COMPLETE LOSS OF BUILDING POWER BY DE-ENERGIZING THE MAIN BREAKER OR DISCONNECT. SECOND, RE-ENERGIZE THE MAIN DISCONNECT AND DE-ENERGIZE INDIVIDUAL BRANCH-CIRCUITS SERVING LIGHTING FIXTURES IN EACH AREA. CORRECT ANY CIRCUITING OR CONNECTION ERRORS.

3.6 BALANCING OF ELECTRICAL CIRCUITS:

A. THE NEW AND/OR MODIFIED FEEDER AND BRANCH CIRCUITS SYSTEM FOR POWER AND LIGHTING SHALL BE CONNECTED TO PANELBOARD BUSES IN SUCH A MANNER THAT LOADS CONNECTED THERETO WILL BE BALANCED ON ALL PHASES AS CLOSELY AS PRACTICABLE.

B. SHOULD THERE BE ANY UNFAVORABLE CONDITION OF UNBALANCE ON ANY PART OF THE ELECTRICAL SYSTEM, THE CONTRACTOR SHALL MAKE SUCH CHANGES THAT MAY BE NECESSARY TO REMEDY THE UNBALANCED CONDITION.

C. THE CONTRACTOR SHALL PROVIDE TO THE ARCHITECT/ENGINEER A COMPLETE LIST OF ALL PANELS STATING THE MEASURED LOADS ON EACH PHASE PRIOR TO COMPLETION OF THE PROJECT.

3.7 DEMONSTRATION TESTS:

A. DEMONSTRATE THE ESSENTIAL FEATURES OF THE FOLLOWING SYSTEMS:
1) POWER DISTRIBUTION EQUIPMENT:
a. PANELBOARDS.
2) LIGHTING FIXTURES AND EQUIPMENT:
a. LIGHT FIXTURE SWITCHING.
b. INDOOR LIGHTING FIXTURES.
c. LIGHT FIXTURES, WITH EMERGENCY BATTERY PACK.
D.LIGHTING CONTROL(S).

3.8 MEASUREMENTS:

A. SYSTEM VOLTAGES SHALL BE MEASURED AND RECORDED UNDER MAXIMUM LOAD CONDITIONS AVAILABLE DURING CONSTRUCTION. INCOMING SERVICE VOLTAGE, AS WELL AS TRANSFORMER SECONDARY VOLTAGES SHALL BE CHECKED AND ADJUSTED TO BE EQUAL TO THE VOLTAGE RATING, OR NOT EXCEEDING 2-1/2% ABOVE THE VOLTAGE RATING. LINE-TO-LINE VOLTAGES SHOULD BE ADJUSTED BETWEEN 200 AND 208 VOLTS. A RECORD OF EACH FINAL TEST ALONG WITH TIME OF DAY, DATE, AND CONDITIONS OF LOADING SHOULD BE RECORDED FOR EACH TEST LOCATION.

B. TEST FOR LOAD DIVISION BETWEEN ALL CONDUCTORS IN PARALLEL FEEDERS. DIVISION OF CURRENTS SHALL NOT EXCEED 10% OF FEEDER CURRENT. RECORD OF TEST FOR EACH PARALLEL FEEDER SHALL BE MADE. RECORDS SHALL BE COMPLETE WITH AMPERAGE, VOLTAGE, AND FEEDER IDENTIFICATION. WHERE CORRECTIVE MEASURES ARE TAKEN, BEFORE AND AFTER TEST CONDITIONS SHALL BE PROVIDED. ALL TESTS SHALL BE SIGNED BY THE TESTER AND THE WITNESS OF THE TEST.

END OF SECTION 26 60 05

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PROJECT PHASE
PERMIT
REVISIONS

PROJECT NUMBER

DATE ISSUED
12/08/15

SHEET TITLE
ELECTRICAL SPECIFICATIONS

SHEET NUMBER
E0.6

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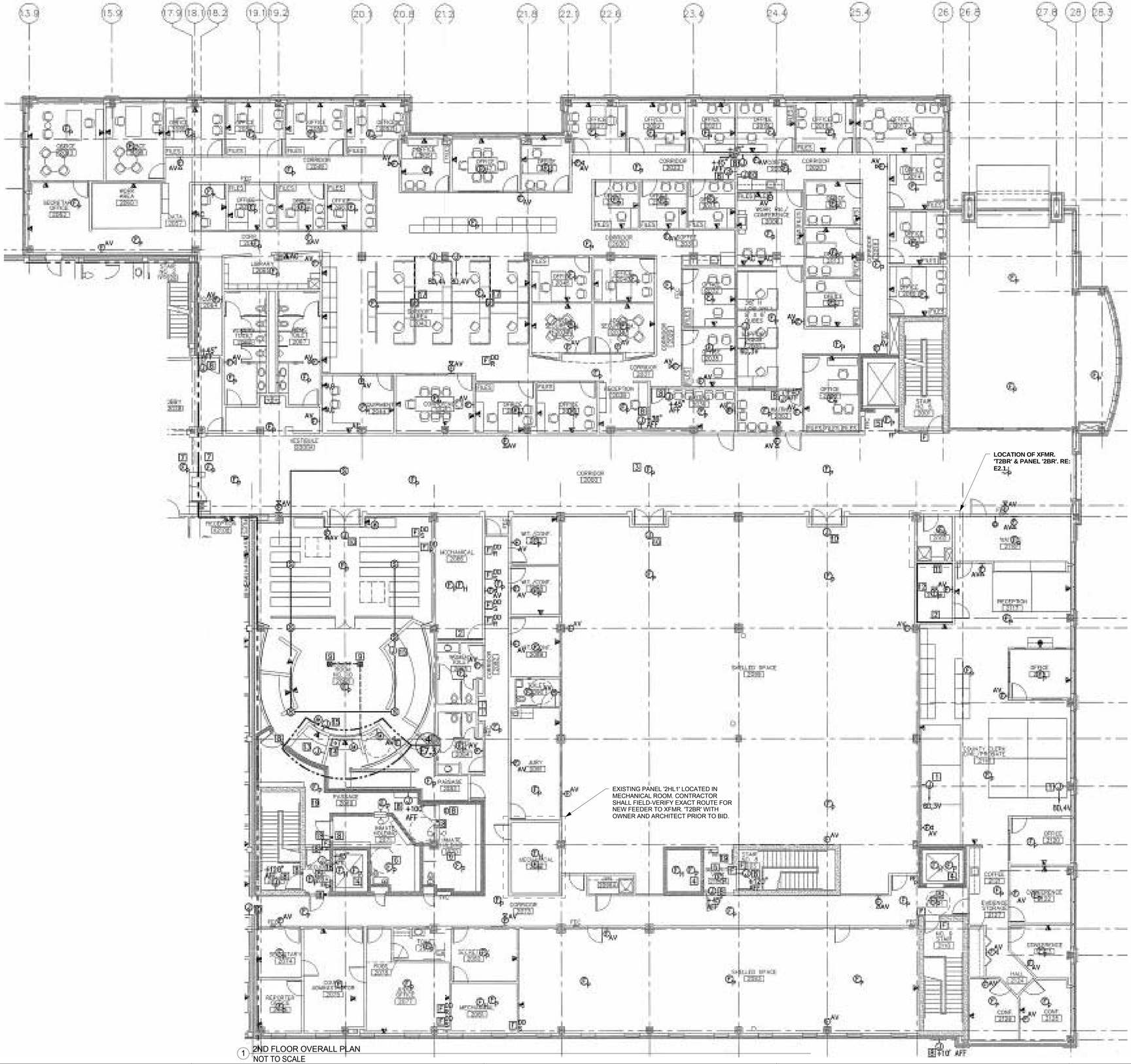

1 2ND FLOOR OVERALL PLAN
NOT TO SCALE

NOTE: THIS PLAN IS INCLUDED FOR INFORMATIONAL PURPOSES ONLY TO SHOW LOCATION OF EXISTING PANEL IN RELATION NEW XFMR 'T2BR' & PANEL '2BR'.

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SHEET TITLE

2ND FLOOR OVERALL PLAN

SHEET NUMBER

E2.0

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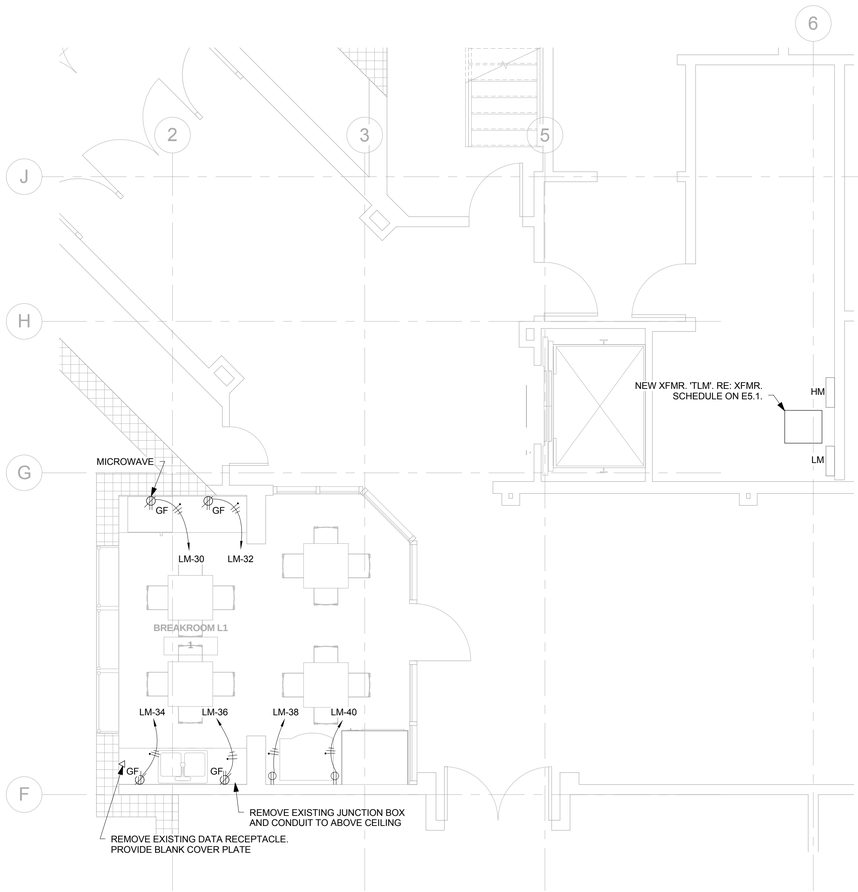
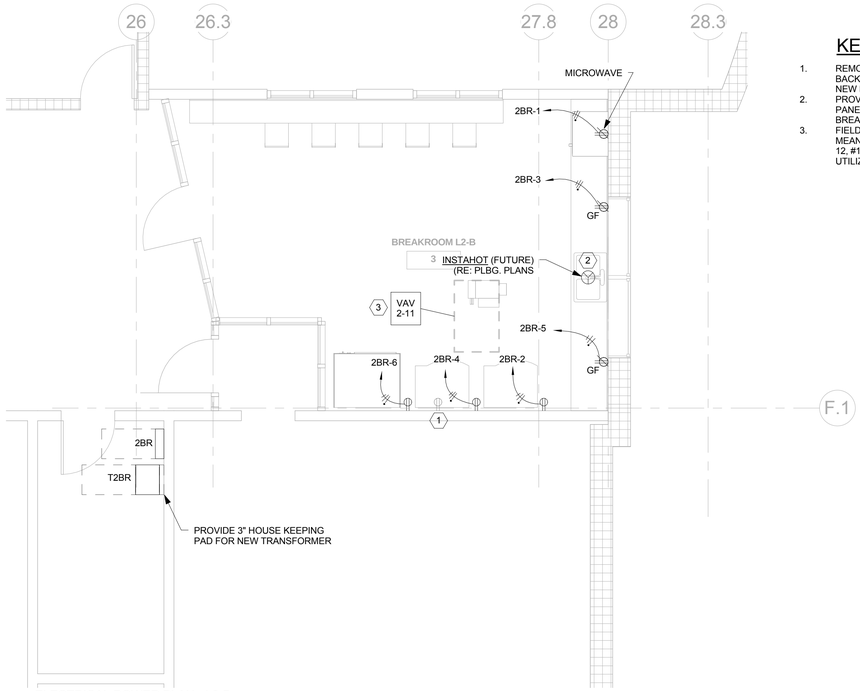
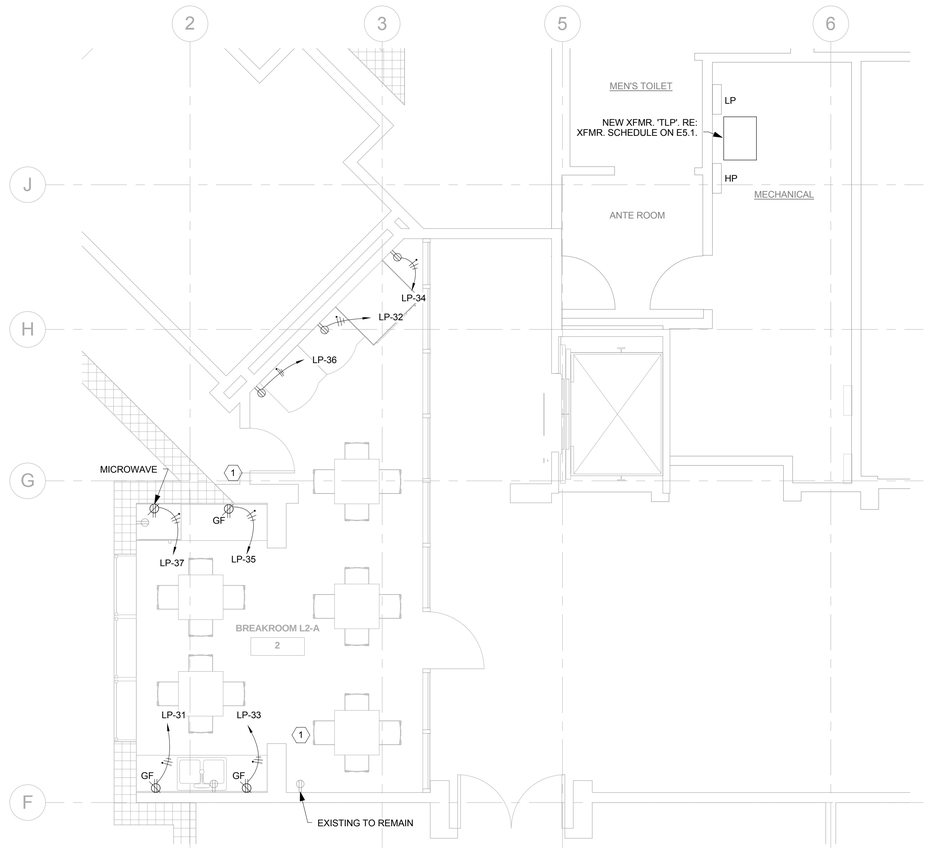


1 ELECTRICAL POWER PLAN - L1-A
1/4" = 1'-0"

NOTE: POWER RECEPTACLES INSTALLED FOR VENDING MACHINES MUST BE ACCESSIBLE. IF NOT ACCESSIBLE, PROVIDE A GFCI RESET AND TEST SWITCH REMOTE FROM THE RECEPTACLE IN AN ACCESSIBLE LOCATION. FIELD-COORDINATE THE EXACT LOCATION W/ OWNER & ARCHITECT PRIOR TO ROUGH-IN. TYP.



3 ELECTRICAL POWER PLAN - L2-B
1/4" = 1'-0"



2 ELECTRICAL POWER PLAN - L2-A
1/4" = 1'-0"

KEYED NOTES: (INDICATED BY " (#) ")

1. REMOVE EXISTING POWER RECEPTACLE. REMOVE SUPPLY CIRCUIT BACK TO NEAREST UPSTREAM JUNCTION BOX TO REMAIN. PROVIDE NEW BLANK COVER PLATE OVER BACKBOX.
2. PROVIDE 3/4"C. W/ PULLSTRING FROM BELOW SINK BACK TO PANELBOARD '2BR'. LABEL CONDUIT AT EACH END, 'SPARE TO BREAKROOM SINK' AND 'SPARE TO PANEL '2BR".
3. FIELD-VERIFY EXACT TERMINATION POINT. LOCAL DISCONNECTING MEANS IS PROVIDED BY VAV MFR. CONNECT TO PANEL 2BR WITH (2)-# 12, #12 G., IN 3/4"C. RE: PANELBOARD SCHEDULE FOR CIRCUIT TO UTILIZE.

REMOVE ALL ABANDONED SURFACE MOUNTED RACEWAY AND BOXES.

FIELD-VERIFY THE EXACT LOCATION OF ALL POWER RECEPTACLES W/ OWNER AND ARCH. TYP.

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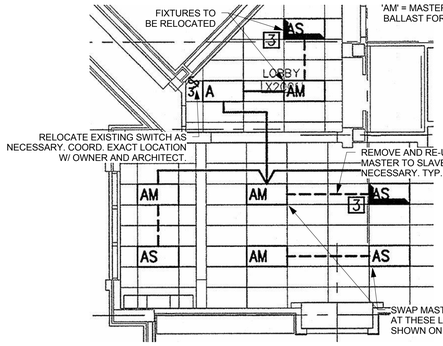
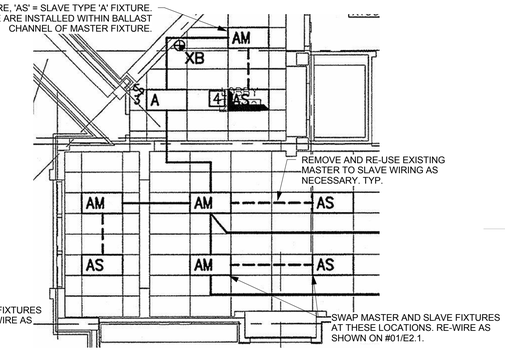
ELECTRICAL POWER PLAN

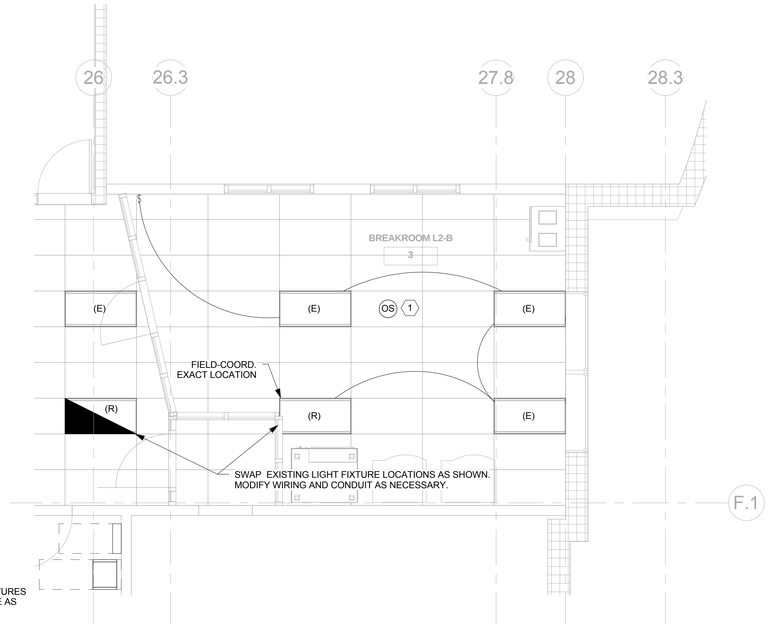
SHEET NUMBER
E2.1



5 EXISTING LIGHTING PLAN - L2-A
NOT TO SCALE



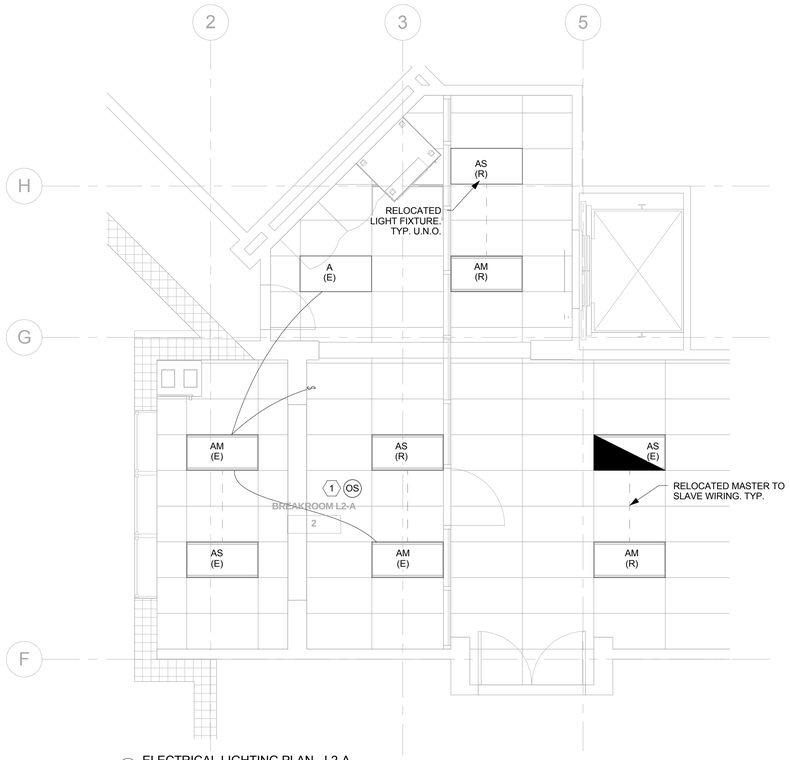
4 EXISTING LIGHTING PLAN - L1-A
NOT TO SCALE



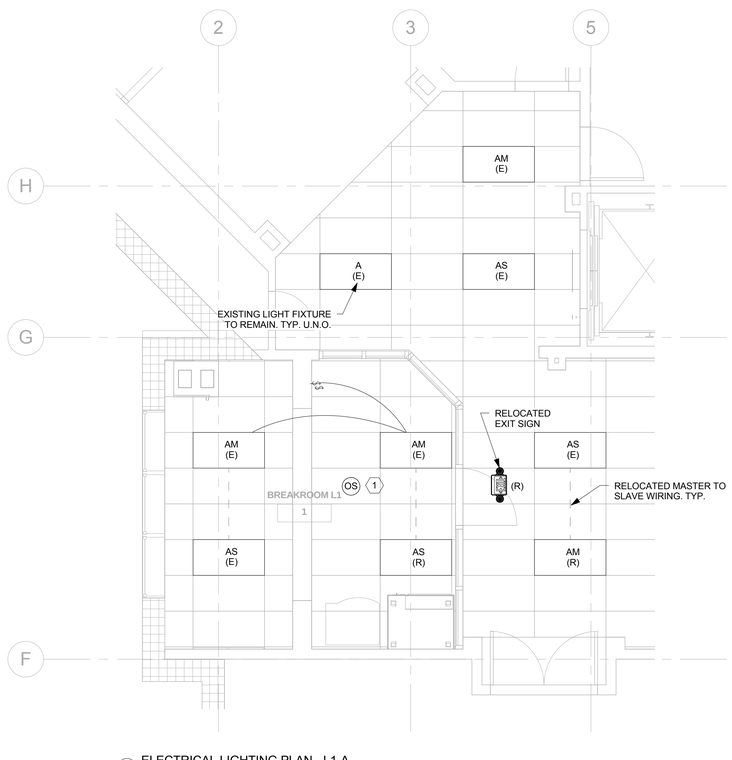
3 ELECTRICAL LIGHTING PLAN - L2-B
1/4" = 1'-0"

KEYED NOTES: (INDICATED BY " (#) ")

1. REFER TO DETAIL #02/E4.1. SET MAXIMUM TIME DELAY TO 'OFF' AT 30 MINUTES. TYPICAL.



2 ELECTRICAL LIGHTING PLAN - L2-A
1/4" = 1'-0"



1 ELECTRICAL LIGHTING PLAN - L1-A
1/4" = 1'-0"

MODIFY EXISTING LIGHTING CIRCUIT(S) AND CONDUITS AS NECESSARY TO ACCOMPLISH MASTER/SLAVE AND SWITCHING SCHEMES AS SHOWN.

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ELECTRICAL LIGHTING PLAN

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E2.2

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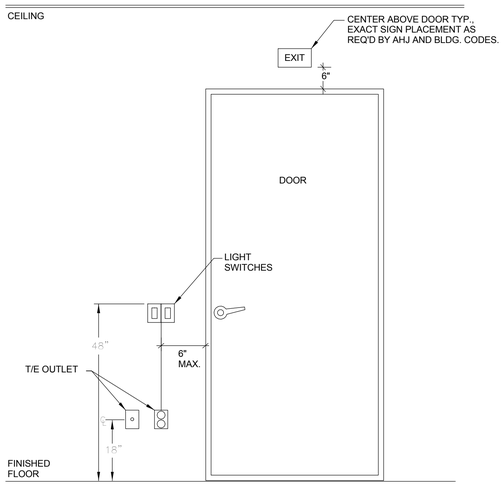
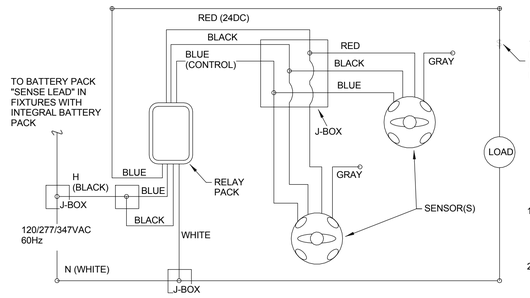


GENERAL NOTE:

1. COORDINATE FINAL LOCATION OF ALL DEVICES WITH THE ARCHITECT AND THE ENGINEER PRIOR TO INSTALLATION. WHERE DEVICES ARE SHOWN IN APPROXIMATELY THE SAME LOCATION ON THE DRAWINGS, IT SHALL BE ALIGNED AS INDICATED. IF THERE IS NOT SUFFICIENT WALL SPACE TO ALIGN THE TEMPERATURE SENSOR HORIZONTALLY WITH THE LIGHT SWITCHES, THEY SHALL BE VERTICALLY ALIGNED ABOVE THE SWITCHES, OR AT AN ALTERNATE LOCATION APPROVED BY THE ARCHITECT AND ENGINEER. TEMPERATURE SENSOR SHALL NOT BE INSTALLED DIRECTLY ABOVE DIMMER SWITCHES.

1 DEVICE COORDINATION DETAIL
NOT TO SCALE

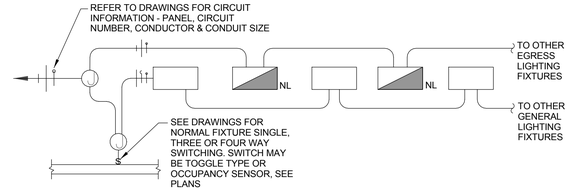


GENERAL NOTES:

1) WHEN USING THE PHOTOCELL FUNCTION, CONNECT THE GRAY WIRE OF THE SENSOR TO THE BLUE WIRE OF THE POWER PACK. DO NOT USE THE BLUE WIRE OF SENSOR

2) ENSURE TO CAP ANY WIRE THAT IS NOT BEING USED

2 TYPICAL CEILING MOUNTED OCCUPANCY SENSOR WITH RELAY PACK-WIRING DIAGRAM
NOT TO SCALE

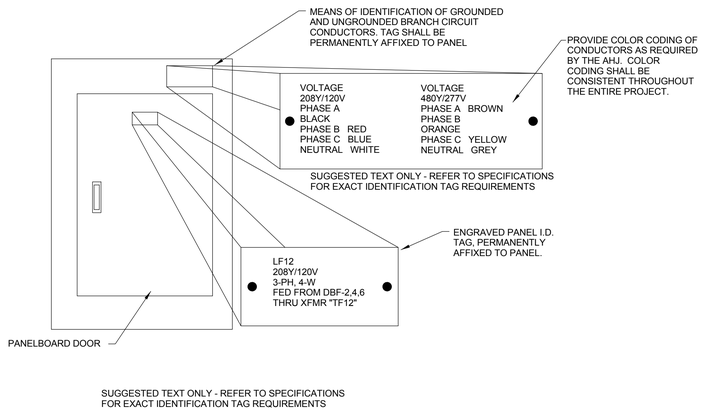


GENERAL NOTES:

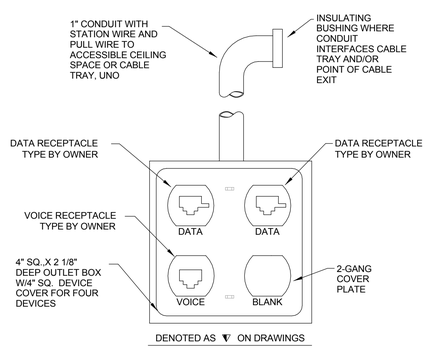
1. CONNECTIONS ARE SHOWN SCHEMATICALLY. DAISY-CHAINING OF FIXTURES IS NOT ALLOWED.

2. REFER TO LIGHTING FIXTURE SCHEDULE FOR FIXTURE TYPES, TYPICAL.

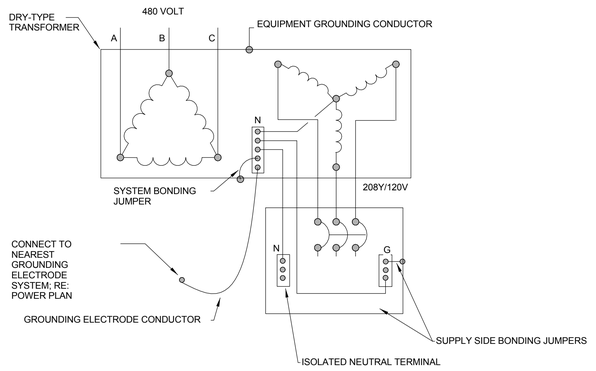
3 TYP. WIRING FOR EGRESS LIGHTING WITH INTEGRAL BATTERY PACK LIGHT FIXTURES
NOT TO SCALE



4 PANELBOARD IDENTIFICATION TAG EXAMPLE
NOT TO SCALE



5 TYPICAL VOICE/DATA COMBINATION DEVICE
NOT TO SCALE



6 TYPICAL 480: 208Y/120V TRANSFORMER GROUNDING DETAIL
NOT TO SCALE

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PROJECT PHASE
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PROJECT NUMBER

DATE ISSUED
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SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E4.1

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TRANSFORMER SCHEDULE

MARK	XFMR RATING (KVA)	FED BY	PRIMARY VOLTAGE	PRIMARY BREAKER	PRIMARY FEEDER SETS	PHASE	# _ Φ	# _ G.	_ ° C.	FEEDS	SECONDARY VOLTAGE	SECONDARY CIRCUIT.	GROUNDING ELECTRODE	REMARKS/NOTES
T2BR	30	2HL1	480	45	1	3	6	10	1	2BR	208	Refer to Panel Board Schedule	#8	SEE NOTES
TLM (NEW)	75	HM	480	125	1	3	1	6	1.5	LM	208	Refer to Panel Board Schedule	#2	SEE NOTES
TLP (NEW)	75	HP	480	125	1	3	1	6	1.5	LP	208	Refer to Panel Board Schedule	#2	SEE NOTES

XFMR SCHEDULE NOTES:

1. ALL NEW TRANSFORMERS SHALL MEET OR EXCEED 2016 ENERGY EFFICIENCY REQUIREMENTS. PROVIDE GENERAL ELECTRIC TRANSFORMERS AS A BASIS OF DESIGN.
2. REFER TO DETAIL #06/E4.1.

EXISTING PANELBOARD 2HL1

PROJECT : WILCO B.R. — MAIN CKT BRKR RATING : — ENCLOSURE : EXISTING
PROJECT # : 201531 — MAIN LUGS ONLY RATING : 225 — MOUNTING : SURFACE
LOCATION : RE: PLANS — BUS RATING : 225 — CB TYPE : MATCH EXISTING MFR., TYPE, STYLE, AIC RATING FOR NEW BRKRS
VOLTAGE : 480/277V, 3PH, 4W — 100% NEUTRAL BUS (COPPER)
INTERRUPTING CAPACITY : EXISTING — COPPER EQUIPMENT GROUND BUS

		SETS	Φ_QTY	# _ Φ	# _ N.	# _EGC.	_ ° C.							
FEEDER SIZE:	EXISTING	TO	REMAIN				EACH IN		NOTE: COPPER CONDUCTORS					

CKT	AMPS	POLE	LOAD DESCRIPTION	LOAD	TYPE	PH	TYPE	LOAD	LOAD DESCRIPTION	AMPS	POLE	CKT
1	20	1	RM 2052-53; 2062-63 LIGHTING			A			AHU-2-1	20	1	2
3	20	1	RM 2042-44; RM 2061; RM 2064-67 LTG			B			AHU-2-2	20	1	4
5	20	1	RM 2034-35; 2037-39; 2060-61 LTG			C			AHU-2-3	20	1	6
7	20	1	RM 2030-40; 2045 LTG			A			AHU-2-4	20	1	8
9	20	1	RM 2003; 2005-8;2010-15; 2024-28 LTG			B			AHU-2-5	20	1	10
11	20	1	ROOF 2002;2004 LTG			C			AHU-2-6	20	1	12
13	20	1	COURT RM 101 LTG			A			AHU-2-7	20	1	14
15	20	1	RM 2069-72; 2082-92; RM 2096-98 LTG			B			FVAV-2-1 THRU FVAV-2-3	15	1	16
17	20	1	COURT RM 411 LTG			C			FVAV-2-4 THRU FVAV-2-5	15	1	18
19	20	1	RM 2073; 2104-23; 2127-34 LIGHTING			A			FVAV-2-6 THRU FVAV-2-8	15	1	20
21	20	1	COURT RM 412 LTG			B			RM 2000 LIGHTING	20	1	22
23	20	1	RM 2093; 2116-28 LTG			C			RM X2016, X2004, X2028, X2001	20	1	24
25	20	1	RM 2014-81; 2093-95; 2104-6A LIGHTING			A			DPD	60	3	26
27	20	1	EMERGENCY LIGHTING			B			-	-	-	28
29	20	1	EF-1			C			-	-	-	30
31	20	1	SPARE			A			SPARE	20	1	32
33	20	1	AHU-A-2			B			SPARE	20	1	34
35	20	1	AHU-A-4			C			SPARE	20	1	36
37	20	1	RM 2074-77;80-83; 89 LIGHTING			A		6,600	NEW PANEL '2BR' THRU XFMR "T2BR"	45	3	38
39	20	1	SPARE			B		6,600	(SEE NOTE #2 THIS SCHEDULE)	"	"	40
41	20	1	SPARE			C		3,840	"	"	"	42

	PANEL	SUB	FEED	CONN.	DEMAND LOAD	
	VA	FEED	THRU	LOAD	VOLT-AMP	AMPS
PHASE A	23,545	6,600	0	30,145	30,145	109
PHASE B	23,545	6,600	0	30,145	30,145	109
PHASE C	23,545	3,840	0	27,385	27,385	99
TOTAL	70,635	17,040	0	87,675	87,675	106

NOTES : (THESE NOTES APPLY TO THIS PANELBOARD ONLY, UNLESS NOTED OTHERWISE)
1) NEW AND RELOCATED LOADS AND DEVICES ARE SHOWN IN BOLD TEXT. EXISTING LOADS AND DEVICES ARE SHOWN IN GREY ITALICS.
2) REMOVE EXISTING SPARE 20A/3P CIRCUIT BREAKERS AT THIS LOCATION, RETURN TO OWNER.

EXISTING PANELBOARD LM

PROJECT : WILCO B.R. — MAIN CKT BRKR RATING : 225 — ENCLOSURE : EXISTING
PROJECT # : 201531 — MAIN LUGS ONLY RATING : — MOUNTING : SURFACE
LOCATION : RE: PLANS — BUS RATING : 225 — CB TYPE : MATCH EXISTING MFR., TYPE, STYLE, AIC RATING FOR NEW BRKRS
VOLTAGE : 208/120V, 3PH, 4W — 100% NEUTRAL BUS (COPPER)
INTERRUPTING CAPACITY : EXISTING — COPPER EQUIPMENT GROUND BUS

		SETS	Φ_QTY	# _ Φ	# _ N.	# _EGC.	_ ° C.							
FEEDER SIZE:	B225	1	3	4/0		4/0	4	2 1/2	NOTE: COPPER CONDUCTORS					

CKT	AMPS	POLE	LOAD DESCRIPTION	LOAD	TYPE	PH	TYPE	LOAD	LOAD DESCRIPTION	AMPS	POLE	CKT
1	20	1	EXISTING			A			EXISTING	20	1	2
3	20	1	EXISTING			B			EXISTING	20	1	4
5	20	1	EXISTING			C			EXISTING	20	1	6
7	20	1	EXISTING			A			EXISTING	20	1	8
9	20	1	EXISTING			B			EXISTING	20	1	10
11	20	1	EXISTING			C			EXISTING	20	1	12
13	20	1	EXISTING			A			EXISTING	20	1	14
15	20	1	EXISTING			B			EXISTING	20	1	16
17	20	1	EXISTING			C			EXISTING	20	1	18
19	20	1	EXISTING			A			EXISTING	20	1	20
21	20	1	EXISTING			B			EXISTING	20	1	22
23	20	1	EXISTING			C			EXISTING	20	1	24
25	20	1	EXISTING			A			EXISTING	20	1	26
27	20	1	EXISTING			B			EXISTING	20	1	28
29	20	1	EXISTING			C	2	1,800	REC - MICROWAVE	20	1	30
31	20	1	EXISTING			A	2	1,800	REC - COUNTERTOP BREAKRM L1	20	1	32
33	20	1	EXISTING			B	2	1,800	REC - COUNTERTOP BREAKRM L1	20	1	34
35	20	1	EXISTING			C	2	1,800	REC - COUNTERTOP BREAKRM L1	20	1	36
37			BUSSED SPACE			A	2	1,800	REC - VENDING BREAKRM L1	20	1	38
39			BUSSED SPACE			B	2	1,800	REC - VENDING BREAKRM L1	20	1	40
41			BUSSED SPACE			C			BUSSED SPACE			42

	PANEL	SUB	FEED	CONN.	DEMAND LOAD	
	VA	FEED	THRU	LOAD	VOLT-AMP	AMPS
PHASE A	18,600	0	0	18,600	18,600	155
PHASE B	18,600	0	0	18,600	18,600	155
PHASE C	18,600	0	0	18,600	18,600	155
TOTAL	55,800	0	0	55,800	55,800	155

NOTES : (THESE NOTES APPLY TO THIS PANELBOARD ONLY, UNLESS NOTED OTHERWISE)
1) NEW AND RELOCATED LOADS AND DEVICES ARE SHOWN IN BOLD TEXT. EXISTING LOADS AND DEVICES ARE SHOWN IN GREY ITALICS.
2) REMOVE EXISTING 150AMP / 3 POLE MAIN BREAKER. FURNISH AND INSTALL A NEW 225A/3P MAIN BREAKER.

NEW PANELBOARD 2BR

PROJECT : WILCO B.R. — MAIN CKT BRKR RATING : 100 — ENCLOSURE : NEMA 1
PROJECT # : 201531 — MAIN LUGS ONLY RATING : — MOUNTING : SURFACE
LOCATION : RE: PLANS — BUS RATING : 100 — CB TYPE : BOLT-ON
VOLTAGE : 208/120V, 3PH, 4W — 100% NEUTRAL BUS (COPPER)
INTERRUPTING CAPACITY : 10,000A RMS SYM. MIN. (FULLY-RATED) — COPPER EQUIPMENT GROUND BUS

		SETS	Φ_QTY	# _ Φ	# _ N.	# _EGC.	_ ° C.							
FEEDER SIZE:	B100	1	3	3	3	8	1 1/4	NOTE: COPPER CONDUCTORS						

CKT	AMPS	POLE	LOAD DESCRIPTION	LOAD	TYPE	PH	TYPE	LOAD	LOAD DESCRIPTION	AMPS	POLE	CKT
1	20	1	REC - MICROWAVE	1,800	2	A	2	1,800	REC - VENDING BRK RM L2-B	20	1	2
3	20	1	REC - COUNTERTOP BRK RM L2-B	1,800	2	B	2	1,800	REC - VENDING BRK RM L2-B	20	1	4
5	20	1	REC - COUNTERTOP BRK RM L2-B	1,800	2	C	2	1,800	REC - VENDING BRK RM L2-B	20	1	6
7	30	2	INSTAHOT WATER HEATER (FUTURE)	3,000	2	A			SPARE	20	1	8
9	"	"	BREAKROOM L2-B	3,000	2	B			SPARE	20	1	10
11	20	1	VAV-2-11	240	2	C			SPARE	20	1	12
13	20	1	SPARE			A			SPARE	20	1	14
15	20	1	SPARE			B			SPARE	20	1	16
17	20	1	SPARE			C			SPARE	20	1	18
19			BUSSED SPACE			A			BUSSED SPACE			20
21			BUSSED SPACE			B			BUSSED SPACE			22
23			BUSSED SPACE			C			BUSSED SPACE			24
25			BUSSED SPACE			A			BUSSED SPACE			26
27			BUSSED SPACE			B			BUSSED SPACE			28
29			BUSSED SPACE			C			BUSSED SPACE			30
31			BUSSED SPACE			A			BUSSED SPACE			32
33			BUSSED SPACE			B			BUSSED SPACE			34
35			BUSSED SPACE			C			BUSSED SPACE			36
37			BUSSED SPACE			A			BUSSED SPACE			38
39			BUSSED SPACE			B			BUSSED SPACE			40
41			BUSSED SPACE			C			BUSSED SPACE			42

	PANEL	SUB	FEED	CONN.	DEMAND LOAD	
	VA	FEED	THRU	LOAD	VOLT-AMP	AMPS
PHASE A	6,600	0	0	6,600	6,600	55
PHASE B	6,600	0	0	6,600	6,600	55
PHASE C	3,840	0	0	3,840	3,840	32
TOTAL	17,040	0	0	17,040	17,040	47

NOTES : (THESE NOTES APPLY TO THIS PANELBOARD ONLY, UNLESS NOTED OTHERWISE)
1) PROVIDE DOOR-IN-DOOR CONSTRUCTION.
2) PROVIDE METALLIC DIRECTORY HOLDER WITH CLEAR PLASTIC COVER.
3) PROVIDE UL 1449 3RD EDITION SURGE PROTECTIVE DEVICE. BASIS OF DESIGN SHALL BE EATON 'SPD-100-208Y-3-A' OR APPROVED EQUAL.

EXISTING PANELBOARD HP

PROJECT : WILCO B.R. — MAIN CKT BRKR RATING : — ENCLOSURE : EXISTING
PROJECT # : 201531 — MAIN LUGS ONLY RATING : 225 — MOUNTING : SURFACE
LOCATION : RE: PLANS — BUS RATING : 225 — CB TYPE : MATCH EXISTING MFR., TYPE, STYLE, AIC RATING FOR NEW BRKRS
VOLTAGE : 480/277V, 3PH, 4W — 100% NEUTRAL BUS (COPPER)
INTERRUPTING CAPACITY : EXISTING — COPPER EQUIPMENT GROUND BUS

		SETS	Φ_QTY	# _ Φ	# _ N.	# _EGC.	_ ° C.							
FEEDER SIZE:	EXISTING	TO	REMAIN				EACH IN		NOTE: COPPER CONDUCTORS					

CKT	AMPS	POLE	LOAD DESCRIPTION	LOAD	TYPE	PH	TYPE	LOAD	LOAD DESCRIPTION	AMPS	POLE	CKT
1	"	"	EXISTING AHU-2-C1	720	6	A	1	4,432	EXISTING LIGHTING	20	1	2
3	"	"	"	720	6	B	1	4,432	EXISTING LIGHTING	20	1	4
5	"	"	"	720	6	C	1	4,432	EXISTING LIGHTING	20	1	6
7	15	3	EXISTING AHU-1B-C2	720	6	A	1	4,432	EXISTING LIGHTING	20	1	8
9	"	"	"	720	6	B	1	4,432	EXISTING LIGHTING	20	1	10
11	"	"	"	720	6	C	1	4,432	EXISTING LIGHTING	20	1	12
13	15	3	EXISTING AHU-1A-C2	528	6	A			EXISTING SPARE (FIELD-VERIFY)	20	1	14
15	"	"	"	528	6	B			EXISTING SPARE (FIELD-VERIFY)	20	1	16
17					6	C			EXISTING SPARE (FIELD-VERIFY)	20	1	18
19	125	3	PANELBOARD 'LP' THRU NEW XFMR 'TP'	20,400		A			BUSSED SPACE			20
21	"	"	(REMOVE EXISTING 90A/3P)	18,600		B			BUSSED SPACE			22
23	"	"	"	18,600		C			BUSSED SPACE			24
25			BUSSED SPACE			A			BUSSED SPACE			26
27			BUSSED SPACE			B			BUSSED SPACE			28
29			BUSSED SPACE			C			BUSSED SPACE			30
31			BUSSED SPACE			A			BUSSED SPACE			32
33			BUSSED SPACE			B			BUSSED SPACE			34
35			BUSSED SPACE			C			BUSSED SPACE			36
37			BUSSED SPACE			A			BUSSED SPACE			38
39			BUSSED SPACE			B			BUSSED SPACE			40
41			BUSSED SPACE			C			BUSSED SPACE			42

	PANEL	SUB	FEED	CONN.	DEMAND LOAD	
	VA	FEED	THRU	LOAD	VOLT-AMP	AMPS
PHASE A	10,471	20,400	0	30,871	33,176	120
PHASE B	10,471	18,600	0	29,071	31,242	113
PHASE C	10,471	18,600	0	29,071	31,242	113
TOTAL	31,412	57,600	0	89,012	95,660	115

NOTES : (THESE NOTES APPLY TO THIS PANELBOARD ONLY, UNLESS NOTED OTHERWISE)
1) NEW AND RELOCATED LOADS AND DEVICES ARE SHOWN IN BOLD TEXT. EXISTING LOADS AND DEVICES ARE SHOWN IN GREY ITALICS.

ELECTRICAL LOAD SUMMARY NORTH UTILITY SERVICE AND MAIN SWITCHBOARD

EXISTING PEAK DEMAND LOAD PER GEORGETOWN UTILITIES=	550.59	KVA
MULTIPLIED BY 1.25 PER NEC	688.24	KVA
PROPOSED ADDITIONAL LOAD	17.04	KVA
OVERALL LOAD AT 480VAC 3-PHASE	848.71	AMPS
EXISTING SWITCHBOARD IS RATED 2,000 AMPERES AT 480VAC 3-PHASE, 4-WIRE		

EXISTING PANELBOARD HM

PROJECT : WILCO B.R. — MAIN CKT BRKR RATING : — ENCLOSURE : EXISTING
PROJECT # : 201531 — MAIN LUGS ONLY RATING : 225 — MOUNTING : SURFACE
LOCATION : RE: PLANS — BUS RATING : 225 — CB TYPE : MATCH EXISTING MFR., TYPE, STYLE, AIC RATING FOR NEW BRKRS
VOLTAGE : 480/277V, 3PH, 4W — 100% NEUTRAL BUS (COPPER)
INTERRUPTING CAPACITY : EXISTING — COPPER EQUIPMENT GROUND BUS

		SETS	Φ_QTY	# _ Φ	# _ N.	# _EGC.	_ ° C.							
FEEDER SIZE:	EXISTING	TO	REMAIN				EACH IN		NOTE: COPPER CONDUCTORS					

CKT	AMPS	POLE	LOAD DESCRIPTION	LOAD	TYPE	PH	TYPE	LOAD	LOAD DESCRIPTION	AMPS	POLE	CKT
1	15	3	EXISTING AHU-3-C1	720	6	A	1	4,432	EXISTING LIGHTING	20	1	2
3	"	"	"	720	6	B	1	4,432	EXISTING LIGHTING	20	1	4
5	"	"	"	720	6	C	1	4,432	EXISTING LIGHTING	20	1	6
7	15	3	EXISTING AHU-3-C1	720	6	A	1	4,432	EXISTING LIGHTING	20	1	8
9	"	"	"	720	6	B	1	4,432	EXISTING LIGHTING	20	1	10
11	"	"	"	720	6	C			BUSSED SPACE			12
13	15	3	EXISTING AHU-4-C1	528	6	A		18,600	PANELBOARD 'LM' THRU NEW XFMR 'TM'	125	3	14
15	"	"	"	528	6	B		18,600	(REMOVE EXISTING 60A/3P)	"	"	16
17	"	"	"	528	6	C		18,600	"	"	"	18
19	15	3	EXISTING AHU-4-C1	528	6	A	6	2,500	EXISTING EDH-3-C	20	3	20
21	"	"	"	528	6	B	6	2,500	"	"	"	22
23	"	"	"	528	6	C	6	2,500	"	"	"	24
25	15	3	EXISTING AHU-5-C1	720	6	A			BUSSED SPACE			26
27	"	"	"	720	6	B			BUSSED SPACE			28
29				720	6	C			BUSSED SPACE			30

	PANEL	SUB	FEED	CONN.	DEMAND LOAD	
	VA	FEED	THRU	LOAD	VOLT-AMP	AMPS
PHASE A	14,577	18,600	0	33,177	35,110	127
PHASE B	14,577	18,600	0	33,177	35,110	127
PHASE C	10,145	18,600	0	28,745	30,420	110
TOTAL	39,300	55,800	0	95,100	100,640	121

NOTES : (THESE NOTES APPLY TO THIS PANELBOARD ONLY, UNLESS NOTED OTHERWISE)
1) NEW AND RELOCATED LOADS AND DEVICES ARE SHOWN IN BOLD TEXT. EXISTING LOADS AND DEVICES ARE SHOWN IN GREY ITALICS.

EXISTING PANELBOARD LP

PROJECT : WILCO B.R. — MAIN CKT BRKR RATING : 225 — ENCLOSURE : EXISTING
PROJECT # : 201531 — MAIN LUGS ONLY RATING : — MOUNTING : SURFACE
LOCATION : RE: PLANS — BUS RATING : 225 — CB TYPE : MATCH EXISTING MFR., TYPE, STYLE, AIC RATING FOR NEW BRKRS
VOLTAGE : 208/120V, 3PH, 4W — 100% NEUTRAL BUS (COPPER)
INTERRUPTING CAPACITY : EXISTING — COPPER EQUIPMENT GROUND BUS

		SETS	Φ_QTY	# _ Φ	# _ N.	# _EGC.	_ ° C.							
FEEDER SIZE:	B225	1	3	40		40	4	2 1/2	NOTE: COPPER CONDUCTORS					

CKT	AMPS	POLE	LOAD DESCRIPTION	LOAD	TYPE	PH	TYPE	LOAD	LOAD DESCRIPTION	AMPS	POLE	CKT
1	20	1	EXISTING			A			EXISTING	20	1	2
3	20	1	EXISTING			B			EXISTING	20	1	4
5	20	1	EXISTING			C			EXISTING	20	1	6
7	20	1	EXISTING			A			EXISTING	20	1	8
9	20	1	EXISTING			B			EXISTING	20	1	10
11	20	1	EXISTING			C			EXISTING	20	1	12
13	20	1	EXISTING			A			EXISTING	20	1	14
15	20	1	EXISTING			B			EXISTING	20	1	16
17	20	1	EXISTING			C			EXISTING	20	1	18
19	20	1	EXISTING			A			EXISTING	20	1	20
21	20	1	EXISTING			B			EXISTING	20	1	22
23	20	1	EXISTING			C			EXISTING	20	1	24
25	20	1	EXISTING			A			EXISTING	20	1	26
27	20	1	EXISTING			B			EXISTING	20	1	28
29	20	1	EXISTING			C			EXISTING	20	1	30
31	20	1	REC - VENDING BRK RM L2-A	1,800	2	A	2	1,800	REC - COUNTERTOP BRK RM L2-A	20	1	32
33	20	1	REC - VENDING BRK RM L2-A	1,800	2	B	2	1,800	REC - COUNTERTOP BRK RM L2-A	20	1	34
35	20	1	REC - VENDING BRK RM L2-A	1,800	2	C	2	1,800	REC - COUNTERTOP BRK RM L2-A	20	1	36
37	20	1	REC - MICROWAVE	1,800	2	A			BUSSED SPACE			38
39			BUSSED SPACE			B			BUSSED SPACE			40
41			BUSSED SPACE			C			BUSSED SPACE			42

	PANEL	SUB	FEED	CONN.	DEMAND LOAD	
	VA	FEED	THRU	LOAD	VOLT-AMP	AMPS
PHASE A	20,400	0	0	20,400	20,400	170
PHASE B	18,600	0	0	18,600	18,600	155
PHASE C	18,600	0	0	18,600	18,600	155
TOTAL	57,600	0	0	57,600	57,600	160

NOTES : (THESE NOTES APPLY TO THIS PANELBOARD ONLY, UNLESS NOTED OTHERWISE)
1) NEW AND RELOCATED LOADS AND DEVICES ARE SHOWN IN BOLD TEXT. EXISTING LOADS AND DEVICES ARE SHOWN IN GREY ITALICS.
2) REMOVE EXISTING 150AMP / 3 POLE MAIN BREAKER. FURNISH AND INSTALL A NEW 225A/3P MAIN BREAKER.

ELECTRICAL LOAD SUMMARY SOUTH UTILITY SERVICE AND MAIN SWITCHBOARD

EXISTING PEAK DEMAND LOAD PER GEORGETOWN UTILITIES=	417.18	KVA
MULTIPLIED BY 1.25 PER NEC	521.47	KVA
PROPOSED ADDITIONAL LOAD	196.30	KVA
OVERALL LOAD AT 480VAC 3-PHASE	863.74	AMPS
EXISTING SWITCHBOARD IS RATED 2,000 AMPERES AT 480VAC 3-PHASE, 4-WIRE		

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ISSUED FOR PERMIT ONLY
12/08/2015 DIV. 26 ONLY

WILCO JUSTICE CENTER

EXPANSION BREAK ROOMS
405 MARTIN LUTHER KING DR., GEORGETOWN, TEXAS 78626

PROJECT PHASE
PERMIT
REVISIONS

PROJECT NUMBER

DATE ISSUED
12/08/15
SHEET TITLE

ELECTRICAL
ONE-LINE DIAGRAM
& SCHEDULES

E5.1

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PLUMBING LEGEND

(NOTE: ALL SYMBOLS SHOWN ARE NOT NECESSARILY USED ON DRAWINGS)

SYMBOL LEGEND

VALVES

- UNION
- BUTTERFLY VALVE
- TEMPERATURE/ PRESSURE RELIEF VALVE
- GLOBE VALVE
- CHECK VALVE
- GATE VALVE
- GATE VALVE WITH C.I. VALVE BOX
- PRESSURE REDUCING VALVE
- STRAINER W/ BLOWDOWN GATE VALVE
- THERMOWELL W/ THERMOMETER (TI)
- PRESSURE GAUGE W/ GAUGE COCK (PI)
- BALL VALVE
- CIRCUIT SETTER, BALANCING VALVE (B&G CB-SERIES)
- PLUG VALVE
- NEEDLE VALVE
- VALVE IN VERTICAL
- DIRT LEG (6" LONG)

PIPING

- DOMESTIC COLD WATER (DOMESTIC/POTABLE)
- DOMESTIC HOT WATER SUPPLY (120°F)
- DOMESTIC HOT WATER RETURN (120°F)
- SANITARY SEWER
- CD — HVAC CONDENSATE DRAIN (UNDERGROUND)
- CD — HVAC CONDENSATE DRAIN (ABOVE GROUND)
- SANITARY VENT
- SD — STORM DRAIN
- EOD — EMERGENCY OVERFLOW DRAIN
- DIRECTION OF FLOW
- G — NATURAL GAS
- HPG — HIGH PRESSURE GAS
- WATER HAMMER ARRESTOR (PLAN)
- WATER HAMMER ARRESTOR (ISOMETRIC)
- FCO — FLOOR CLEANOUT
- WCO — WALL CLEANOUT
- P-TRAP
- ELBOW TURNING DOWN
- ELBOW TURNING UP
- CAPPED PIPE
- FLEXIBLE CONNECTION
- CONCENTRIC PIPE REDUCER/INCREASER
- ECCENTRIC PIPE REDUCER/INCREASER
- PIPE SLEEVE
- SLOPE — DIRECTION OF SLOPE (DNWARD)
- FLOOR DRAIN
- VENT THRU ROOF (RISER)
- VENT THRU ROOF (PLAN)
- P / 1 — SANITARY WASTE OR VENT STACK WASTE OR VENT NO.
- DS / 1 — STORM DRAIN DOWNSPOUT STORM DRAIN DOWNSPOUT NO.

ABBREVIATIONS

B. VA.	BALL VALVE
BAL. VA.	CKT. SETTER BALANCING VALVE
CO	CLEANOUT
CW	DOM. COLD WTR. (POTABLE)
D	CONDENSATE DRAIN LINE
EOD	EMERGENCY OVERFLOW DRAIN
EXT FCO	EXTERIOR FLOOR CLEANOUT
FCO	FLOOR CLEANOUT
FD (OR) SD	FIRE / SMOKE DAMPER
GT. V	GATE VALVE
GL. V	GLOBE VALVE
G	NATURAL GAS
HPG	HIGH PRESSURE NATURAL GAS
HW	DOMESTIC HOT WATER 140°F
NPW	NON-POTABLE WATER (COLD)
PW	DOMESTIC COLD WATER
PI	PRESSURE INDICATOR (GAUGE)
RED.	REDUCER
SAN	SOIL & WASTE (ABOVE GRADE)
SD	STORM DRAIN
TI	TEMP. INDICATOR (THERMOMETER)
T.&P.	TEMP. & PRESS. RELIEF VALVE
VD	VOLUME DAMPER
VTR	VENT THRU ROOF
V	SANITARY VENT
WHA	WATER HAMMER ARRESTOR
WCO	WALL CLEANOUT

PLUMBING FIXTURE SCHEDULE

MARK	FIXTURE	TRIM & ACCESSORIES	SUPPORT	REMARKS
SK-2	SINK, SINGLE COMPARTMENT, ADA ELKAY "COURMET LUSTERTONE" NO. LRAD3319	FAUCET: MOEN COMMERCIAL NO. 8225 OFFSET STRAINER:MCGUIRE NO. 1151AWC STOPS: CHICAGO FAUCET NO. 1006 TRAP: McGUIRE NO. 8912-C-F STOP & TRAP COVERS: PLUMBEREX 'HANDY SHIELD'	ROUGH-IN BRACKET - SIOUX CHIEF "PIPE TITAN" NO. 572-2X SERIES	ADA COMPLIANT, 2.2 GPM AERATOR
FCO	FLOOR CLEANOUT J.R. SMITH NO. 4053-F-C-U-NB (OR WATTS APPROVED EQUAL)	HEAVY DUTY TOP, TAPER THREAD BRONZE PLUG, NICKLE BRONZE TOP	SET IN CONCRETE FLOOR	TOP FLUSH WITH FINISHED FLOOR
WCO	WALL CLEANOUT J.R. SMITH NO. 4532-U-Y (OR WATTS APPROVED EQUAL)	NO-HUB CONNECTIONS, TAPER THREAD BRONZE PLUG, STAINLESS STEEL ACCESS COVER VANDAL PROOF SCREW	SET IN WALL	COVER FLUSH WITH FINISHED WALL
WHA	WATER HAMMER ARRESTORS J.R. SMITH NO. 5000-SERIES	STAINLESS STEEL BELOWS TYPE	IN LINE	
TRAP PRIMER	PRECISION PLUMBING PRODUCTS 'PRIME RITE'		IN LINE IN WALL	EQUIPMENT WITH ACCESS DOOR (FIRE RATED WHERE NECESSARY)
WATER SUPPLY BALL VALVES (ABV. GRD.)	APOLLO 70-100	600 PSI, TEFLON SEAT, CAST BRASS, BLOMENT PROOF STEM, FULL PORT, CHROME BALL, THREADED END	IN LINE	

PLUMBING FIXTURE CONNECTION SCHEDULE

MARK	FIXTURE	COLD WATER	HOT WATER	WASTE (SANITARY)	VENT (SANITARY)
SK-1	SINK, DOUBLE COMPARTMENT, STAINLESS STEEL, ADA	1/2"	1/2"	2" W/ 2"WCO	2"

PIPING SCHEDULE

SYMBOL	SERVICE	PIPE MATERIAL	TYPE JOINT	FITTINGS	TEST
———	SANITARY WASTE	STANDARD WEIGHT DWV CAST IRON	NEOPRENE GASKET	STANDARD WEIGHT DWV CAST IRON	10 ft. FOR 6 HOURS
– – – –	SANITARY VENT	DWV CAST IRON	S.S. NO-HUB	DWV CAST IRON	10 ft. FOR 6 HOURS
——— D ———	DOMESTIC WATER & EQUIPMENT DRAIN (SIZES 2-1/2 INCHES IN DIAMETER AND SMALLER)	TYPE 'L' HARD DRAWN COPPER (TYPE 'K' FOR UNDERGROUND)	SWEAT WITH LEAD FREE SOLDER, SILVER SOLDER FOR UNDERGROUND	WROUGHT COPPER (CONTINUOUS NO JOINTS UNDER-FLOOR SLAB)	150 ft. FOR 24 HOURS

FIRE SPRINKLER NOTES

1. THE BUILDING PRESENTLY HAS A COMPLETE AUTOMATIC FIRE SPRINKLER AND STANDPIPE FIRE PROTECTION SYSTEM. CONTRACTOR SHALL MODIFY THE EXISTING WET PIPE FIRE SPRINKLER SYSTEM TO ACCOMMODATE THE RENOVATED AREA SHOWN ON THE PLANS. CONTRATOR SHALL VISIT THE SITE AND FIELD VERIFY EXISTING CONDITIONS PRIOR TO BID. CONTRACTOR SHALL VERIFY PIPE SIZES, AVAILABLE PRESSURE, AVAILABLE FLOW RATES AND THE LOCATION OF ALL EXISTING SYSTEM COMPONENTS. DRAWINGS INDICATE CERTAIN INFORMATION PERTAINING TO EXISTING PIPING WHICH HAS BEEN TAKEN FROM AVAILABLE DRAWINGS, SUCH INFORMATION IS NOT GUARANTEED AS TO ACCURACY OF LOCATION OR COMPLETE INFORMATION.
2. THE PURPOSE OF THE NEW WORK IS TO PROVIDE A COMPLETE, WORKING AND APPROVED AUTOMATIC FIRE SPRINKLER SYSTEM FOR THE AREAS/COMPARTMENTS RELATED TO THE RENOVATION AREA AS REQUIRED TO MEET THE REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION LEAVING IN PLACE AND IN SERVICE ALL EXISTING PIPING SERVING ALL OTHER AREAS OF THE BUILDING. CONTRACTOR SHALL PERFORM WHATEVER WORK IS NECESSARY TO SATISFY THE PURPOSE OF THE NEW WORK AND LEAVE EXISTING SERVICES AND STRUCTURES IN A SATISFACTORY AND SERVICEABLE CONDITION.
3. CONTRACTOR SHALL INCLUDE IN HIS BID THE COST FOR REHABILITATING THE EXISTING FIRE SPRINKLER SYSTEM TO ENSURE THE NEW AND EXISTING SYSTEM MEET THE MINIMUM ACCEPTABLE STANDARDS OF THE CITY OF GEORGETOWN NFPA, THE STATE BOARD OF INSURANCE AND THE STANDARDS LISTED IN SPECIFICATION 15501. CONTRACTOR SHALL CORRECT ALL EXISTING DEFICIENCIES.
4. IT IS A REQUIREMENT OF THIS CONTRACT TO VISIT THE SITE PRIOR TO BID TO DETERMINE THE CONDITION OF THE EXISTING SYSTEM AND THE EXTENT OF WORK REQUIRED. FIELD VERIFY ALL EXISTING PIPE RUNS, SIZES, CONNECTIONS, SUPPORTS, RISERS, SPRINKLER HEAD LOCATIONS, AVAILABLE PRESSURE, AVAILABLE FLOW RATES AND THE LOCATION OF ALL EXISTING SPRINKLER SYSTEM COMPONENTS. WHILE VISITING THE SITE, CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE CONTRACT DOCUMENTS AND EXISTING CONDITIONS. CONTRACTOR SHALL BE FULLY KNOWLEDGEABLE OF THE EXISTING CONDITIONS AND THE PLANS OF THE NEW WORK, INCLUDING THE HVAC, ARCHITECTURAL AND ELECTRICAL PLANS TO DETERMINE THE EXTENT OF WORK REQUIRED.
5. PROVIDE A COMPLETE SERVICE AND PERFORMANCE TEST ON THE EXISTING FIRE SPRINKLER SYSTEM TO DETERMINE CONDITION AND ACCEPTABILITY OF THE EXISTING FIRE SPRINKLER SYSTEM COMPONENTS.
6. ALL IMPAIRMENTS TO THE EXISTING SYSTEM AFFECTING OTHER AREAS OF THE BUILDING SHALL BE COORDINATED WITH THE OWNER AND SHALL BE PERFORMED AT TIMES AGREEABLE TO THE OWNER. CONTRACTOR SHALL ENSURE DURATION OF IMPAIRMENTS ARE KEPT TO AN ABSOLUTE MINIMUM.
7. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE AVAILABLE FLOW AND PRESSURE CHARACTERISTICS BEFORE BEGINNING THE DESIGN OF THE FIRE PROTECTION SYSTEM. PERFORM A HYDRAULIC TEST ON THE EXISTING FIRE MAIN USING EXISTING FIRE HYDRANTS TO DETERMINE THE AVAILABLE FLOW AND PRESSURE. TEST SHALL BE TAKEN AT HYDRANTS LOCATED AT AREAS CAPABLE OF PROVIDING TRUE AND REPRESENTATIVE FLOW AND PRESSURE CHARACTERISTICS OF THE EXISTING FIRE MAINS. TEST SHALL BE PERFORMED AND DOCUMENTED PER NFPA PAMPHLETS AND WITH FULL AUTHORIZATION FROM THE BUILDING OWNER AND THE CITY OF TEMPLE. THIS CONTRACTOR SHALL SCHEDULE THE FLOW TEST WITH THE CITY OF GEORGETOWN AND PROVIDE A MINIMUM 72-HOUR NOTICE TO THE OWNERS REPRESENTATIVE, THE ARCHITECT/ ENGINEER AND THE BUILDING INSURANCE UNDERWRITER REPRESENTATIVE. THE CONTRACTORS LICENSED PROFESSIONAL ENGINEER SHALL BE PRESENT TO WITNESS THE HYDRAULIC TEST.
8. SYSTEM DESIGN. THE SPRINKLER SYSTEM CONTRACTOR IS REQUIRED TO DEVELOP, SUBMIT AND INSTALL A COMPLETE AND APPROVED FIRE PROTECTION SYSTEM DESIGN. DESIGN THE SYSTEM IN ACCORDANCE WITH STATUTES, ORDINANCES, CODES AND REGULATIONS OF NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), UNDERWRITERS LABORATORIES (U.L.), TEXAS STATE DEPARTMENT OF INSURANCE, OSHA, UNIFORM BUILDING CODE, CITY OF TEMPLE FIRE DEPARTMENT, THE BUILDING INSURANCE UNDERWRITER, AND ANY STATE, LOCAL OR OTHER GOVERNMENTAL AUTHORITIES HAVING JURISDICTION.
9. PREPARE COMPLETE AND DETAILED SHOP DRAWINGS AND HYDRAULIC CALCULATIONS FOR THE ENTIRE FIRE PROTECTION SYSTEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETE DESIGN OF THE FIRE PROTECTION SYSTEM. ALL PRESSURE LOSSES THRU THE DISTRIBUTION SYSTEM AND FLUCTUATIONS IN SUPPLY SYSTEM PRESSURES SHALL BE ADEQUATELY ACCOUNTED FOR. INCLUDE AN ADEQUATE SAFETY FACTOR IN ALL HYDRAULIC CALCULATION. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE OR OTHERWISE CORRECT ANY PORTION OF THE EXISTING FIRE SPRINKLER SYSTEM THAT DOES NOT MEET AVAILABLE PRESSURES AND FLOW RATES. FUTURE CHANGES IN WATER SUPPLIES SHALL BE CONSIDERED.
10. IN ADDITION TO THE DETAILED SHOP DRAWINGS AND HYDRAULIC CALCULATIONS, OBTAIN AND PAY FOR THE SERVICES OF A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF TEXAS AND EXPERIENCED IN HYDRAULIC CALCULATIONS AND FIRE PROTECTION SYSTEM INSTALLATION TO REVIEW, CALCULATIONS AND INSTALLATION. SUBMIT A SIGNED LETTER FROM THE LICENSED PROFESSIONAL ENGINEER STATING THE SYSTEM PLANS HAVE BEEN REVIEWED, COMPLY WITH THE REQUIREMENTS OF NFPA 13 AND THE INSTALLED SYSTEM HAS BEEN INSTALLED IN ACCORDANCE WITH THE APPROVED PLANS AND CALCULATIONS. COPIES OF THIS LETTER SHALL BE SUBMITTED TO THE TEXAS DEPARTMENT OF INSURANCE, THE OWNERS REPRESENTATIVE AND THE ARCHITECT/ENGINEER. THE PROFESSIONAL SHALL NOT BE AN EMPLOYEE OF THE CONTRACTOR.
11. SUBMIT THE RESULTS OF THE HYDRAULIC TEST, THE PROFESSIONAL ENGINEER'S CERTIFICATION OF THE DRAWINGS AND HYDRAULIC CALCULATIONS, THE DETAILED SHOP DRAWINGS AND THE HYDRAULIC CALCULATIONS TO THE BUILDING INSURANCE UNDERWRITER, THE CITY OF GEORGETOWN FIRE MARSHALL'S OFFICE, AND ANY OTHER STATE OR LOCAL GOVERNING BODY HAVING JURISDICTION FOR APPROVAL. CONTRACTOR SHALL COMMENCE DESIGN WORK ON SUBMITTAL DRAWINGS IMMEDIATELY AFTER AWARD OF CONTRACT AND SHALL SUBMIT APPROVED DRAWINGS TO THE ARCHITECT IN A REASONABLE AMOUNT OF TIME (FOR ENGINEER'S ACKNOWLEDGMENT) PRIOR TO INSTALLATION OF ANY PORTION OF THE FIRE SYSTEMS.
12. APPROVED DATA SHALL BEAR SEAL OF THE CITY OF GEORGETOWN FIRE DEPARTMENT, AND THE PROFESSIONAL ENGINEER AS WELL AS THE BUILDING INSURANCE UNDERWRITER. SUBMIT APPROVED DRAWINGS ONLY. DO NOT SUBMIT DRAWINGS WITHOUT APPROVAL SEAL AND SIGNATURE. DRAWINGS SHALL INCLUDE ALL REQUIRED INFORMATION REQUIRED BY NFPA PAMPHLETS FOR WORKING PLANS, INCLUDING ALL DETAILS, PLANS, CALCULATIONS, ETC. ALL FIRE SPRINKLER DRAWINGS SHALL INCLUDE ALL INFORMATION REQUIRED BY NFPA.

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WILCO JUSTICE CENTER EXPANSION BREAK ROOMS

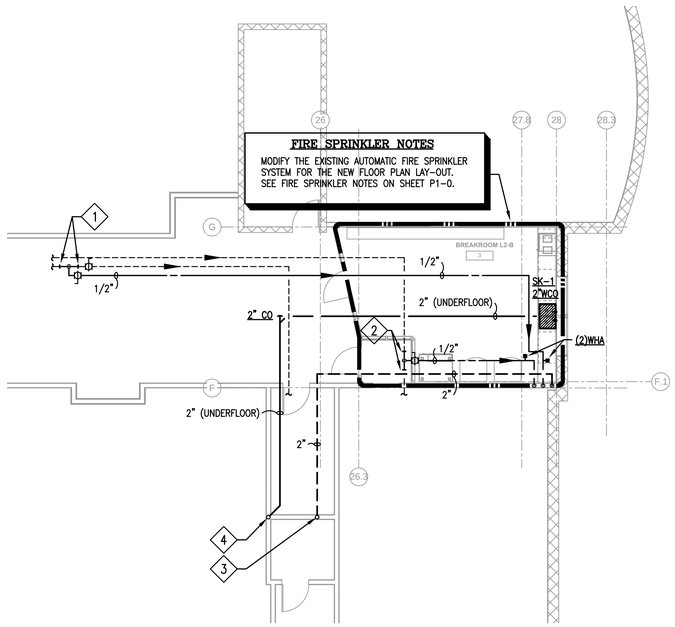
405 MARTIN LUTHER KING DR., GEORGETOWN, TEXAS 78626

PROJECT PHASE
PERMIT
REVISIONS

PROJECT NUMBER

DATE ISSUED
12/08/15
SHEET TITLE
Symbols/Legend & Abbr. - Plbg

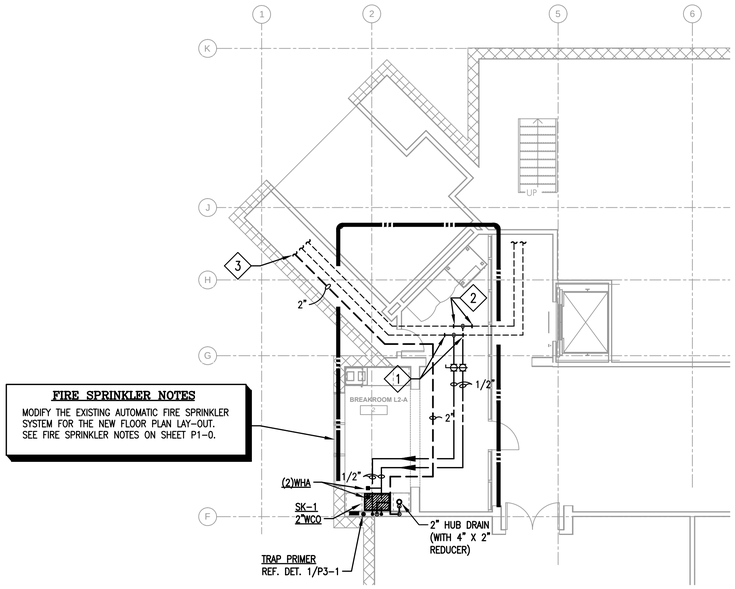
SHEET NUMBER
P1-0



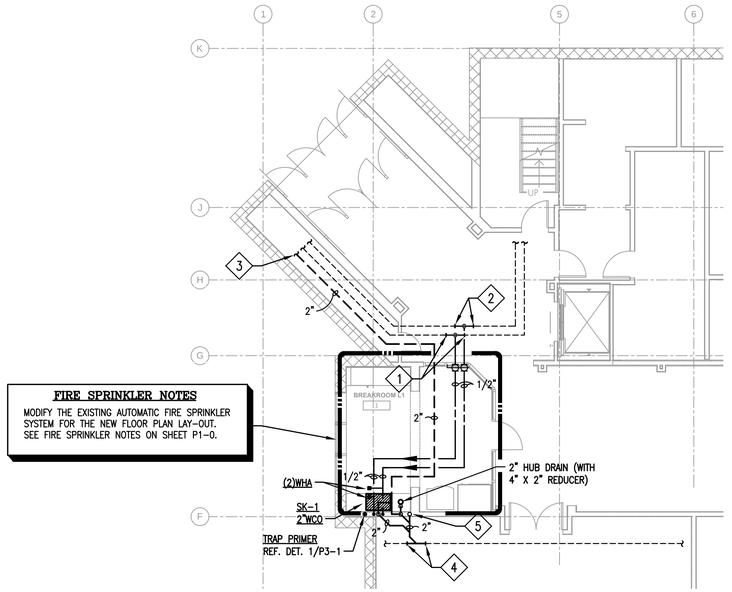
3 Level 2 Break Room (L2-B) - Floor Plan - Plumbing
SCALE: 1/8" = 1'-0"

GENERAL NOTES

1. VISIT THE SITE AND FIELD VERIFY EXISTING CONDITIONS PRIOR TO BID. VERIFY PIPE SIZES AND LOCATIONS OF ALL EXISTING PLUMBING CONNECTIONS. INCLUDING THE FLOW LINE ELEVATION OF EXISTING WASTE PIPING. SUBMIT ELEVATION FINDINGS TO ARCHITECT PRIOR TO START OF CONSTRUCTION. DRAWINGS INDICATE CERTAIN INFORMATION PERTAINING TO EXISTING ABOVE FLOOR AND UNDERFLOOR PLUMBING PIPING WHICH HAS BEEN TAKEN FROM AVAILABLE DRAWINGS. SUCH INFORMATION IS NOT GUARANTEED AS TO ACCURACY OF LOCATION OR COMPLETE INFORMATION. THE PURPOSE OF THE NEW WORK IS TO PERFORM THE CHANGES SHOWN AND TO LEAVE IN PLACE AND IN SERVICE EXISTING PIPING SERVING EXISTING EQUIPMENT SHOWN TO BE LEFT IN PLACE AND IN SERVICE PERFORM WHATEVER WORK IS NECESSARY TO SATISFY THE PURPOSE OF THE NEW WORK AND LEAVE EXISTING SERVICES AND STRUCTURES IN SATISFACTORY AND SERVICEABLE CONDITION.
2. REMOVE AND REPLACE EXISTING CONSTRUCTION AS REQUIRED TO ACCOMMODATE NEW WORK. REPLACE ALL REMOVED CONSTRUCTION TO MATCH EXISTING. MAINTAIN STRUCTURAL AND AESTHETIC INTEGRITY OF EXISTING.
3. CORE DRILL THROUGH EXISTING CONSTRUCTION AS REQUIRED TO ACCOMMODATE NEW WORK. FIELD VERIFY EXACT LOCATION OF CORE DRILLING. DO NOT DRILL THROUGH ANY STRUCTURAL MEMBER, MAINTAIN STRUCTURAL INTEGRITY OF BUILDING.
4. PERFORM WORK IN ACCORDANCE WITH APPLICABLE STATUES, ORDINANCES, CODES, AND REGULATIONS OF GOVERNMENTAL AUTHORITIES HAVING JURISDICTION. OBTAIN AND PAY FOR ALL PERMITS AND INSPECTIONS.
5. ROUTE ALL PIPING CONCEALED, HIDDEN FROM VIEW AND AS HIGH AS POSSIBLE ABOVE CEILING LEVELS.
6. PIPE PENETRATIONS THROUGH NEW AND EXISTING FIRE RATED CONSTRUCTION SHALL BE FIRE STOPPED USING 3M, HILTI, RECTORSEAL OR DOW CORNING U.L. PENETRATIONS. APPLY/INSTALL U.L. ASSEMBLIES IN STRICT CONFORMANCE TO THE MANUFACTURER'S RECOMMENDATIONS. FIRE RATING OF PIPE PENETRATION SHALL MEET OR EXCEED THE RATING OF THE PENETRATED ITEM. SUBMIT EVIDENCE/CERTIFICATION OF CONFORMANCE.
7. SUPPORT INSULATION AT HANGERS AND SUPPORTS WITH A SHIELD OF GALVANIZED METAL EXTENDING NOT LESS THAN 4-INCHS ON EITHER SIDE OF THE SUPPORT BEARING AREA COVERING AT LEASE HALF OF THE PIPE CIRCUMFERENCE.
8. INSULATE ALL WATER SUPPLY (HOT AND COLD) PIPING WITH 1-INCH THICK FIBERGLASS PIPE INSULATION. FIBERGLASS PIPE INSULATION SHALL HAVE AN ALL SERVICE JACKET (ASJ) WITH SELF-SEALING LAPS (OWENS CORNING SSL-11 OR EQUAL). ALL PIPING INSULATION USED ON THE PROJECT SHALL HAVE A FLAME SPREAD RATING NOT EXCEEDING 25 AN A SMOKE DEVELOPED RATING NOT EXCEEDING 50 AS DETERMINED BY TEST PROCEDURES ASTM E 84 NFPA 225 AND U.L. 723. THESE RATINGS MUST BE AS TESTED ON THE COMPOSITE OF INSULATION JACKET OR FACING AND ADHESIVE. COMPONENTS SUCH AS ADHESIVES MASTIC AND CEMENTS SHALL MEET THE SAME INDIVIDUAL RATINGS AS THE MINIMUM REQUIREMENTS.
9. SUPPORT INSULATION AT HANGERS AND SUPPORTS WITH A SHIELD OF GALVANIZED METAL EXTENDING NOT LESS THAN 4-INCHS ON EITHER SIDE OF THE SUPPORT BEARING AREA COVERING AT LEASE HALF OF THE PIPE CIRCUMFERENCE.



2 Level 2 Break Room (L2-A) - Floor Plan - Plumbing
SCALE: 1/8" = 1'-0"



1 Level 1 Break Room (L1-A) - Floor Plan - Plumbing
SCALE: 1/8" = 1'-0"

NOTE:

1. ROUTE ALL PIPING AS HIGH ABOVE CEILING.
2. SEE PLUMBING RISER DIAGRAMS AND PLUMBING DETAILS FOR ADDITIONAL VALVES, WHA, & SIZES NOT SHOWN HERE.
3. ALL WATER HAMMER ARRESTORS (WHA) SHALL BE 3/4" TYPE "A" LOCATED ABOVE CEILING. UNLESS NOTED OTHERWISE.

KEYED NOTES

1. CONNECT NEW 1/2" CW LINE TO EXISTING. (FIELD VERIFY EXACT SIZE AND LOCATION.)
2. CONNECT NEW 1/2" HW LINE TO EXISTING. (FIELD VERIFY EXACT SIZE AND LOCATION.)
3. CONNECT NEW 2" SANITARY VENT TO EXISTING. (FIELD VERIFY EXACT SIZE AND LOCATION.)
4. CONNECT NEW 2" SANITARY WASTE LINE TO EXISTING. (FIELD VERIFY EXACT SIZE AND LOCATION.)
5. 2" SANITARY WASTE LINE DOWN FROM ABOVE.

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WILCO JUSTICE CENTER EXPANSION BREAK ROOMS

405 MARTIN LUTHER KING DR., GEORGETOWN, TEXAS 78626

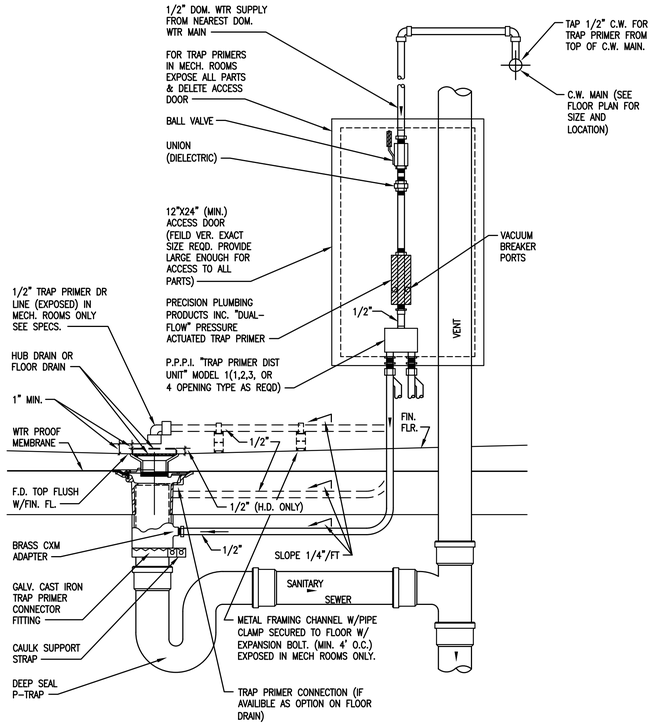
PROJECT PHASE
PERMIT
REVISIONS

PROJECT NUMBER

DATE ISSUED
12/08/15

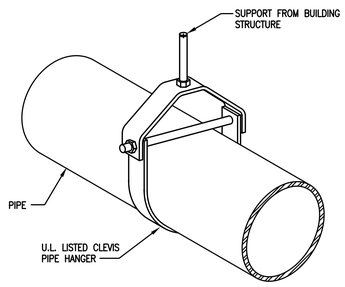
SHEET TITLE
Floor Plans - Plumbing

SHEET NUMBER
P2-1



1 TYPICAL TRAP PRIMER DETAIL

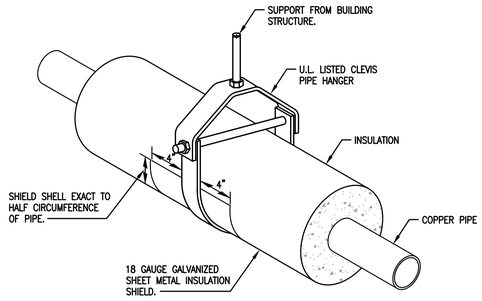
SCALE: NOT TO SCALE



SANITARY WASTE & VENT PIPING

2 TYPICAL PIPE SUPPORT DETAIL

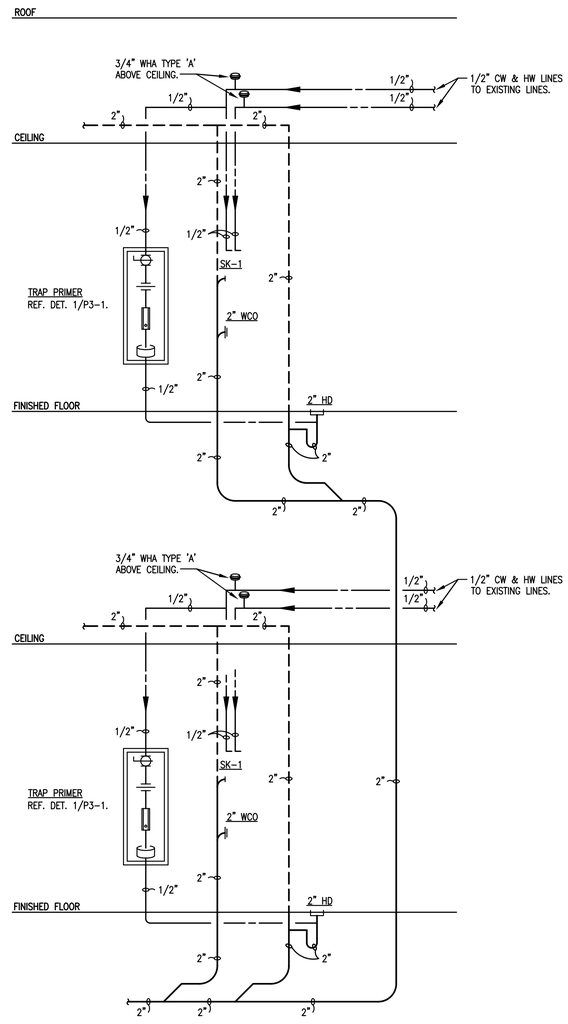
SCALE: NOT TO SCALE



DOMESTIC WATER PIPING

3 TYPICAL PIPE SUPPORT DETAIL

SCALE: NOT TO SCALE



BREAK ROOM L1, & BREAK ROOM L2-A

4 PLUMBING RISER DIAGRAM

SCALE: NOT TO SCALE

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SHEET TITLE
Plumbing Details

SHEET NUMBER
P3-1

1.0 BID FORMAT AND SUBMISSION

1.1 Organization of Bid Contents for Submittal

Each Bid should be organized and items submitted in the order described in of this IFB.

1.2 Conflict of Interest

No public official shall have interest in a contract, in accordance with Vernon's Texas Codes Annotated, Local Government Code Title 5, Subtitle C, Chapter 171, as amended.

As of January 1, 2006, Bidders are responsible for complying with Local Government Code Title 5, Subtitle C, Chapter 176. Additional information may be obtained from the Williamson County website at the following link:

http://www.wilco.org/CountyDepartments/Purchasing/ConflictofInterestDisclosure/tabid/689/language/en-US/Default.aspx

Each Bidder must disclose any existing or potential conflict of interest relative to the performance of the requirements of this IFB. **Examples of potential conflicts may include an existing business or personal relationship between the Bidder, its principal, or any affiliate or subcontractor, with Williamson County or any other entity or person involved in any way in the project that is the subject of this IFB.** Similarly, any personal or business relationship between the Bidder, the principals, or any affiliate or subcontractor, with any employee or official of Williamson County or its suppliers must be disclosed. Any such relationship that might be perceived or represented as a conflict must be disclosed. Failure to disclose any such relationship or reveal personal relationships with Williamson County employees or officials may be cause for termination. Williamson County will decide if an actual or perceived conflict should result in Bid disqualification.

By submitting a Bid in response to this IFB, all Bidders affirm that they have not given, nor intend to give, at any time hereafter any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor, or service to a Williamson County public servant or any employee, official or representative of same, in connection with this procurement.

Each Bidder must provide a Conflict of Interest Statement in accordance with this IFB.

1.3 Certificate of Interested Parties

As of January 1, 2016, Bidders are responsible for complying with the Texas Government Code Section 2252.908. The law states that Williamson County may not enter into certain contracts with a Bidder unless the Bidder submits a disclosure of interested parties to Williamson County at the time the Bidder submits the signed contract to Williamson County. The law applies only to a contract of Williamson County that either (1) requires an action or vote by the Commissioners Court before the contract may be signed or (2) has a value of at least $1 million. The disclosure requirement applies to a contract entered into on or after January 1, 2016.

By January 1, 2016, the Texas Ethics Commission will make available on its website a new filing application that must be used to file Form 1295. A Bidder must use the application to enter the required information on Form 1295 and print a copy of the form and a separate certification of filing that will contain a unique certification number. An authorized agent of the Bidder must sign the printed copy of the form and have the form notarized. The completed Form 1295 and certification of filing must be filed with Williamson County.

Williamson County must notify the commission, using the commission's filing application, of the receipt of the filed Form 1295 and certification of filing not later than the 30th day after the date the contract binds all parties to the contract. The commission will post the completed Form 1295 to its website within seven business days after receiving notice from Williamson County.

Information regarding how to use the filing application will be available on the Texas Ethics Commission website by January 1, 2016.

1.4 Ethics

The Bidder shall not accept or offer gifts or anything of value nor enter into any business arrangement with any employee, official or agent of Williamson County.

1.5 Bid Submittal Deadline

The Bid is due no later than the submittal date and time set forth in the 'Public Announcement and General Information' listed above for this IFB. Contents of each Bid shall be submitted in accordance with this IFB.

1.6 Delivery of Bids

Williamson County uses BidSync to distribute and receive bids and proposals Bids can be submitted electronically through BidSync or by hard copy. Refer to www.bidsync.com for further information.

If mailed or delivered in person, Bids and Bid addenda are to be delivered in sealed envelope on or before the submittal deadline, as noted in the 'Public Announcement and General Information' listed above for this IFB, to:

Williamson County Purchasing Department
Attn: **BID NAME AND NUMBER**
901 South Austin Avenue Georgetown, Texas 78626

Williamson County will not accept any Bids received after the submittal deadline, and shall return such Bids unopened to the Bidder. Williamson County will not accept any responsibility for Bids being delivered by third party carriers. Bidder should submit one (1) original, and one (1) copy of their Bid on CD (or other portable storage device). Bids will be opened publicly and read aloud. In the case of an RFP (Request for Proposal) submissions may be recognized in a manner to avoid public disclosure of contents; however, names of Bidders will then be read aloud.

Bidders should list the Bid Number, Bid Name, Name and Address of Bidder, and the Date of the Bid opening on the outside of the box or envelope and note "Sealed Bid Enclosed."

2.1 INSTRUCTIONS AND GENERAL REQUIREMENTS RELATED TO THIS BID

Read this document carefully. Follow all instructions and requirements. You are responsible for fulfilling all requirements and specifications. Be sure you have a clear understanding of this IFB.
General requirements apply to all advertised IFBs; however, these may be superseded, in whole or in part, by the Bid Specifications, Addenda issued as a part of this IFB and Modifications issued as a part of this IFB. Be sure your Bid package is complete.

2.2 Ambiguity, Conflict, or other Errors in the IFB

If Bidder discovers any ambiguity, conflict, discrepancy, omission or other error in this IFB, Bidder shall immediately notify Williamson County Purchasing Department of such error in writing and request modification or clarification of the document. Modifications will be made by issuing Addenda. If the Bidder fails to notify Williamson County prior to the date and time fixed for submission of Bids of an error or ambiguity in the IFB known to Bidder, or an error or ambiguity that reasonably should have been known to Bidder, then Bidder shall be deemed to have waived the error or ambiguity or its later resolution.
Williamson County may also modify the IFB, no later than 48 hours prior to the date and time fixed for submission of Bids, by issuance of an Addendum. All addenda will be numbered consecutively, beginning with 1.

2.3 Notification of Most Current Address

Bidders in receipt of this IFB shall notify the Williamson County Purchasing Department of any address changes, contact person changes, and/or telephone number changes no later than 48 hours prior to the date and time fixed for submission of Bids.

2.4 Bid Preparation Cost

Cost of developing Bids is entirely the responsibility of Bidders and shall not be charged to Williamson County.

2.5 Signature of Bidder

If the Bidder is a Corporation or Limited Liability Company, the legal name of the Corporation or Limited Liability Company shall be provided together with the signature of the officer or officers authorized to sign on behalf of such entity.
If the Bidder is a General Partnership, the true name of the firm shall be provided with the signature of each partner authorized to sign.
If the Bidder is a Limited Partnership, the name of the Limited Partner's General Partner shall be provided with the signature of the officer authorized to sign on behalf of the General Partner.
If the Bidder is a Sole Proprietor(s) (individual), each Sole Proprietor(s) shall sign.

If signature is by an agent, other than the Sole Proprietor(s) or an officer of a Corporation, Limited Liability Company, General Partner or a member of a General Partnership, a power of attorney or equivalent document must be submitted to the Williamson County Purchasing Department.

2.6 Assumed Business Name

If the Bidder operates business under an Assumed Business Name, the Bidder must have on file with the Williamson County Clerk a current Assumed Name Certificate and provide a file marked copy of same.

2.7 Bid Obligation

The contents of the IFB, Bid, and any clarification thereof submitted by the Successful Bidder shall become part of the contractual obligation and incorporated by reference into the Contract and any ensuing Agreement.

2.8 Compliance with IFB Specifications

It is intended that this IFB describe the requirements and the Bid format in sufficient detail to secure comparable Bids. Failure to comply with all provisions of the IFB may, at the sole discretion of Williamson County, result in disqualification.

2.9 Withdrawal of Bid

The Bidder may withdraw its Bid by submitting a written request over the signature of an authorized individual, as described herein above, to the Williamson County Purchasing Department any time prior to the submission deadline. The Bidder may thereafter submit a new Bid prior to the deadline. Modification of the Bid in any manner will not be considered if submitted after the deadline. Withdrawal of a Bid after the deadline will be subject to written approval of the Williamson County Purchasing Agent.

2.10 Evaluation/Award

Williamson County reserves the right to use all pertinent information (also learned from sources other than disclosed in the BID process) that might affect Williamson County's judgment as to the appropriateness of an award to the lowest and best evaluated Bid. This information may be appended to the Bid evaluation process results. Information on a Bidder from reliable sources, and not within the Bidder's Bid, may also be noted and made part of the evaluation file. Williamson County shall have sole discretion for determining the reliability of the source.
To ensure the proper and fair evaluation of a solicitation, Williamson County prohibits unsolicited communication initiated by the Bidder to the County Official or Employee evaluating or considering the Bids prior to the time an award has been made. Unsolicited communication may be ground for disqualifying the offending Bidder from consideration or award of the solicitation then in evaluation, or any future solicitation.

Communication between Bidder and the County will be initiated by the appropriate County Official or Employee in order to obtain information or clarification needed to develop a proper and accurate evaluation of the solicitation.

To award the lowest responsible bidder in accordance with Texas Government Code and Local Government Code, the County may consider, to the extent allowed by law, the following:

- Price
- Bidder's experience and reputation
- Quality of the Bidder's goods and/or services
- Bidder's safety record
- Bidder's proposed personnel
- Bidder's financial capabilities
- Any other relevant factors specifically listed in the IFB

Consideration of Location of Principal Office

Pursuant to Texas Local Government Code Section 271.905, in purchasing under this title any real property or personal property that is not affixed to real property, if Williamson County receives one or more Bids from a Bidder whose principal place of business is in Williamson County and whose Bid is within three percent (3%) of the lowest bid price received by Williamson County from a Bidder who is not a resident of Williamson County, Williamson County may enter into a contract with:
the lowest Bidder; or the Bidder whose principal place of business is in Williamson County if the Williamson County Commissioners Court determines, in writing, that the local Bidder offers Williamson County the best combination of contract price and additional economic development opportunities for Williamson County created by the contract award, including the employment of residents of Williamson County and increased tax revenues to Williamson County.

This consideration does not prohibit Williamson County from rejecting all Bids. It is understood that the Commissioners Court of Williamson County, Texas, reserves the right to accept or reject any and/or all Bids for any or all goods and/or services covered in this IFB, and to waive informalities or defects in the Bid or to accept such Bid it shall deem to be in the best interest of Williamson County.

Awards should be made approximately sixty (60) business days after the Bid opening date Results may be obtained by viewing the Williamson County vendor portal at the following link:

http://www.wilco.org/CountyDepartments/Purchasing/SearchforaPastBid/tabid/5213/language/en-US/Default.aspx

2.11 Responsibility

It is expected that a prospective Bidder will be able to affirmatively demonstrate Bidder's responsibility. A prospective Bidder should be able to meet the following requirements:

a) have adequate financial resources, or the ability to obtain such resources as required;
b) be able to comply with the required or proposed delivery schedule;
c) have a satisfactory record of performance that can be determined thru references provided
d) have a satisfactory record of performance with Williamson County; and e) be otherwise qualified and eligible to receive an award.

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

2.12 Firm Pricing

For unit price items, all of the items listed are to be on a "per unit" basis, stating a firm price per unit or unit quantity of each item. Bidder must submit a firm price that must be good from the date of Bid opening for the fixed period of time set out in this IFB. Unless the IFB expressly states otherwise, this period shall be until the end of the Initial Contract Period. Bids which do not state a fixed price, or which are subject to change without notice, will not be considered. The Court may award a contract for the period implied or expressly stated in the lowest and best Bid.

2.13 Purchase Orders

If required by the Williamson County Purchasing Department, a purchase order(s) may be generated to the Successful Bidder for goods and/or services. If a purchase order is issued, the purchase order number must appear on all itemized invoices and/or requests for payment.

2.14 Silence of Specifications

The apparent silence of these specifications 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 practices are to prevail. All interpretations of these specifications shall be made on the basis of this statement.

2.15 References

Williamson County may require Bidder to supply a list of at least three (3) references where like services and/or goods have been supplied by their firm within the past five (5) years. References should be provided in accordance with this IFB.

3.1 DEFINITIONS, TERMS AND CONDITIONS

3.2 Definitions

a) "Addenda" – Means any written or graphic instruments issued by Williamson County prior to the consideration of Bids which modify or interpret the Bid Documents by additions, deletions, clarifications, or corrections.
b) "Agreement" – The Successful Bidder may be required by Williamson County to sign an additional Agreement containing terms necessary to ensure compliance with the IFB and Bidder's Bid. Such ensuing Agreement(s) shall contain the Bid Specifications, Terms and Conditions that are derived from the IFB.
c) "Contract" – This IFB and the Bid of the Successful Bidder shall become a contract between the Successful Bidder and
d) Williamson County once the Successful Bidder's Bid is properly accepted by the Williamson County Commissioners Court.
e) "Bid Documents" – The Legal Notice, IFB including attachments, and any Addenda issued by Williamson County prior to the consideration of any Bids.
f) "Bid" – The completed and signed bid form referred to as the Price Sheet and ALL required forms and documentation listed in the bid package which have been submitted in accordance with the terms and conditions described in the IFB package. A Bid submitted in accordance with this IFB is irrevocable during the specified period for evaluation and acceptance of Bids unless a waiver is obtained from the Williamson County Purchasing Agent.
g) "Bidder" – A person or entity who submits a Bid in response to this IFB.
h) "IFB" – Refers to this document, together with the attachments thereto and any future addenda issued by Williamson County.
i) "Successful Bidder"– The liable Bidder to whom Williamson County intends to award the Contract.

3.2.1 Venue and Governing Law

Bidder hereby agrees and acknowledges that venue and jurisdiction of any suit, right, or cause of action arising out of or in connection with this IFB, the Contract and any ensuing Agreement shall lie exclusively in either Williamson County, Texas or in the Austin Division of the Western Federal District of Texas, and the parties hereto expressly consent and submit to such jurisdiction. Furthermore, except to the extent that this IFB, the Contract and any ensuing Agreement is governed by the laws of the United States, this IFB, the Contract and any ensuing Agreement shall be governed by and construed in accordance with the laws of the State of Texas, excluding, however, its choice of law rules.

3.2.2 Incorporation by Reference and Precedence

The Contract shall be derived from (1) the IFB and its Schedules; and (2) the Bidder's Bid. In the event of a dispute under the Contract, applicable documents will be referred to for the purpose of clarification or for additional detail in the following order of precedence: (1) the IFB and its Schedules; and (2) the Bidder's Bid.

In the event Williamson County requires that an ensuing Agreement be executed following award and a dispute arises between the terms and conditions of the ensuing Agreement, (2) the IFB, and its Schedules; and (3) the Bidder's Bid, applicable documents will be referred to for the purpose of clarification or for additional detail in the following order of precedence: (1) terms and conditions of the ensuing Agreement, (2) the IFB; and (3) the Bidder's Bid.

3.2.3 Ownership of Bid

Each Bid shall become the property of Williamson County upon submittal and will not be returned to Bidders unless received after the submittal deadline.

3.2.4 Disqualification of Bidder

Upon signing and submittal of the Bid, a Bidder offering to sell supplies, materials, services, or equipment to Williamson County certifies that the Bidder has not violated the antitrust laws of this state codified in Section 15.01, et seq, Business & Commerce Code, or the Federal Antitrust Laws, and has not communicated directly or indirectly the offer made to any competitor or any other person engaged in such line of business. Any or all Bids may be rejected if Williamson County believes that collusion exists among the Bidders.

3.2.5 Funding

Williamson County intends to budget and make sufficient funds available and authorize funds for expenditure to finance the costs of the Contract. Bidders understand and agree that the County's payment of amounts under the Contract shall be contingent on Williamson County receiving appropriations or other expenditure authority sufficient to allow the County, in the exercise of reasonable administrative discretion, to make payments under this Contract.

3.2.6 Assignment, Successors and Assigns

The Successful Bidder may not assign, sell, or otherwise transfer the Contract or any other rights or interests obtained under the Contract without written permission of the Williamson County Commissioners Court. The Contract and any ensuing Agreement shall be binding upon and inure to the benefit of the contracting parties hereto and their respective successors and permitted assigns.

3.2.7 Implied Requirements

Products or services not specifically described or required in the IFB, but are necessary to provide the functional capabilities described by the Bidder, shall be implied and deemed to be included in the Bid.

3.2.8 Termination

a) **Termination for Cause:** Williamson County reserves the right to terminate the Contract and/or any ensuing Agreement for default if the Successful Bidder breaches any of the IFB Specifications, Terms and Conditions, including warranties of Bidder, if any, or if the Successful Bidder becomes insolvent or commits acts of bankruptcy. Such right of termination is in addition to and not in lieu of any other remedies Williamson County may have at law or in equity or as may otherwise be provided hereunder. Default may be construed as, but not limited to, failure to deliver the proper goods and/or services within the proper amount of time, and/or to properly perform any and all other requirements to Williamson County's satisfaction, and/or to meet all other obligations and requirements.

b) **Termination for Convenience:** Williamson County may terminate the Contract and/or any ensuing Agreement for convenience and without cause or further liability, upon no less than thirty (30) calendar day's written notice to Successful Bidder. Williamson County reserves the right to extend this period if it is in the best interest of the County. In the event Williamson County exercises its right to terminate without cause, it is understood and agreed that only the amounts due to the Successful Bidder for goods, commodities and/or services provided and expenses incurred to and including the date of termination, will be due and payable. No penalty will be assessed for Williamson County's termination for convenience.

3.2.9 Non-Performance

It is the objective of Williamson County to obtain complete and satisfactory performance of the requirements set forth herein. In addition to any other remedies available at law, in equity or that may be set out herein, failure to perform may result in a deduction of payment equal to the amount of the goods and/or services that were not provided and/or performed to Williamson County's satisfaction. In the event of such non-performance, Williamson County shall have the right, but shall not be obligated, to complete the services itself or by others and/or purchase the goods from other sources. If Williamson County elects to acquire the goods or perform the services itself or by others, pursuant to the foregoing, the Successful Bidder shall reimburse Williamson County, within ten (10) calendar days of demand, for all costs incurred by Williamson County (including, without limitation, applicable, general, and administrative expenses, and field overhead, and the cost of necessary equipment, materials, and field labor) in correcting the nonperformance which the Successful Bidder fails to meet pursuant to the requirements set out herein. In the event the Successful Bidder refuses to reimburse Williamson County as set out in this provision, Williamson County shall have the right to deduct such reimbursement amounts from any amounts that may be then owing or that may become owing in the future to the Successful Bidder.

3.2.10 Proprietary Information and Texas Public Information Act

All material submitted to Williamson County shall become public property and subject to the Texas Public Information Act upon receipt. If a Bidder does not desire proprietary information in the Bid to be disclosed, each page must be clearly identified and marked proprietary at time of submittal or, more preferably, all proprietary information may be placed in a folder or appendix and be clearly identified and marked as being proprietary. Williamson County will, to the extent allowed by law, endeavor to protect from public disclosure the information that has been identified and marked as proprietary. The final decision as to what information must be disclosed, however, lies with the Texas Attorney General. Failure to clearly identify and mark information as being proprietary as set forth under this provision will result in all unmarked information being deemed non-proprietary and available to the public. For all information that has not been clearly identified and marked as proprietary by the Bidder, Williamson County may choose to place such information on the County's website and/or a similar public database without obtaining any type of prior consent from the Bidder.

To the extent, if any, that any provision in this IFB or in the Bidder's Bid is in conflict with Tex. Gov't Code 552.001 et seq., as amended (the "Public Information Act"), the same shall be of no force or effect. Furthermore, it is expressly understood and agreed that Williamson County, its officers and employees may request advice, decisions and opinions of the Attorney General of the State of Texas in regard to the application of the Public Information Act to any items or data furnished to Williamson County as to whether or not the same are available to the public. It is further understood that Williamson County's officers and employees shall have the right to rely on the advice, decisions and opinions of the Attorney General, and that Williamson County, its officers and employees shall have no liability or obligation to any party hereto for the disclosure to the public, or to any person or persons, of any items or data furnished to Williamson County by a party hereto, in reliance of any advice, decision or opinion of the
Attorney General of the State of Texas.

3.2.11 Right to Audit

Successful Bidder agrees that Williamson County or its duly authorized representatives shall, until the expiration of three (3) years after termination or expiration of the services to be performed, have access to and the right to examine and photocopy any and all books, documents, papers and records of Successful Bidder, which are directly pertinent to the services to be performed or goods to be delivered for the purposes of making audits, examinations, excerpts and transcriptions. Successful Bidder agrees that Williamson County shall have access during normal working hours to all necessary facilities and shall be provided adequate and appropriate work space in order to conduct audits in compliance with the provisions of this section. Williamson County shall give Successful Bidder reasonable advance notice of intended audits.

3.2.12 Testing and Inspections

Williamson County reserves the right to inspect and test equipment, supplies, materials and goods for quality and compliance with this IFB, and ability to meet the needs of the user. Demonstration units must be available for review. Should the goods or services fail to meet requirements and/or be unavailable for evaluation, Williamson County can deem the Bidder to be in breach and terminate the Contract and/or any ensuing Agreement(s).

3.2.13 Bid Preparation Cost

Cost of developing Bids is the sole responsibility of Bidders and shall not be charged to Williamson County. There is no expressed or implied obligation for Williamson County to reimburse Bidders for any expense incurred in preparing a Bid in response to this IFB and Williamson County will not reimburse Bidders for such expenses.

3.2.14 INDEMNIFICATION

SUCCESSFUL BIDDER SHALL INDEMNIFY, DEFEND AND SAVE HARMLESS WILLIAMSON COUNTY, ITS OFFICIALS, EMPLOYEES, AGENTS AND AGENTS' EMPLOYEES FROM AND AGAINST ALL CLAIMS, LIABILITY, AND EXPENSES, INCLUDING REASONABLE ATTORNEYS' FEES, ARISING FROM ACTIVITIES OF BIDDER, ITS AGENTS, SERVANTS OR EMPLOYEES, PERFORMED HEREUNDER THAT RESULT FROM THE NEGLIGENT ACT, ERROR, OR OMISSION OF BIDDER OR ANY OF BIDDER'S AGENTS, SERVANTS OR EMPLOYEES, AS WELL AS ALL CLAIMS OF LOSS OR DAMAGE TO THE BIDDER'S AND WILLIAMSON COUNTY'S PROPERTY, EQUIPMENT, AND/OR SUPPLIES.

FURTHERMORE, WILLIAMSON COUNTY, ITS OFFICIALS, EMPLOYEES, AGENTS AND AGENTS' EMPLOYEES SHALL NOT BE LIABLE FOR DAMAGES TO THE SUCCESSFUL BIDDER ARISING FROM ANY ACT OF ANY THIRD PARTY, INCLUDING, BUT NOT BEING LIMITED TO THEFT. SUCCESSFUL BIDDER FURTHER AGREES TO INDEMNIFY, DEFEND AND SAVE HARMLESS WILLIAMSON COUNTY FROM, ITS OFFICIALS, EMPLOYEES, AGENTS AND AGENTS' EMPLOYEES AGAINST ALL CLAIMS OF WHATEVER NATURE ARISING FROM ANY ACCIDENT, INJURY, OR DAMAGE WHATSOEVER CAUSED TO ANY PERSON OR TO THE PROPERTY OF ANY PERSON OCCURRING IN RELATION TO SUCCESSFUL BIDDER'S PERFORMANCE OF ANY SERVICES REQUESTED HEREUNDER DURING THE TERM OF THE CONTRACT AND/OR ANY ENSUING AGREEMENT(S).

SUCCESSFUL BIDDER SHALL TIMELY REPORT ALL CLAIMS, DEMANDS, SUITS, ACTIONS, PROCEEDINGS, LIENS OR JUDGMENTS TO WILLIAMSON COUNTY AND SHALL, UPON THE RECEIPT OF ANY CLAIM, DEMAND, SUIT, ACTION, PROCEEDING, LIEN OR JUDGMENT, NOT LATER THAN THE FIFTEENTH (15TH) DAY OF EACH MONTH; PROVIDE WILLIAMSON COUNTY WITH A WRITTEN REPORT ON EACH SUCH MATTER, SETTING FORTH THE STATUS OF EACH MATTER, THE SCHEDULE OR PLANNED PROCEEDINGS WITH RESPECT TO EACH MATTER AND THE COOPERATION OR ASSISTANCE, IF ANY, OF WILLIAMSON COUNTY REQUIRED BY SUCCESSFUL BIDDER IN THE DEFENSE OF EACH MATTER. SUCCESSFUL BIDDER'S DUTY TO DEFEND, INDEMNIFY AND HOLD WILLIAMSON COUNTY HARMLESS SHALL BE ABSOLUTE. IT SHALL NOT ABATE OR END BY REASON OF THE EXPIRATION OR TERMINATION OF THE CONTRACT AND/OR ANY ENSUING AGREEMENT(S) UNLESS OTHERWISE AGREED BY WILLIAMSON COUNTY IN WRITING. THE PROVISIONS OF THIS SECTION SHALL SURVIVE THE TERMINATION OF THE CONTRACT AND SHALL REMAIN IN FULL FORCE AND EFFECT WITH RESPECT TO ALL SUCH MATTERS NO MATTER WHEN THEY ARISE.

IN THE EVENT OF ANY DISPUTE BETWEEN THE PARTIES AS TO WHETHER A CLAIM, DEMAND, SUIT, ACTION, PROCEEDING, LIEN OR JUDGMENT APPEARS TO HAVE BEEN CAUSED BY OR APPEARS TO HAVE ARISEN OUT OF OR IN CONNECTION WITH ACTS OR OMISSIONS OF WILLIAMSON COUNTY, BIDDER SHALL NEVER-THE- LESS FULLY DEFEND SUCH CLAIM, DEMAND, SUIT, ACTION, PROCEEDING, LIEN OR JUDGMENT UNTIL AND UNLESS THERE IS A DETERMINATION BY A COURT OF COMPETENT JURISDICTION THAT THE ACTS AND OMISSIONS OF BIDDER ARE NOT AT ISSUE IN THE MATTER.

SUCCESSFUL BIDDER'S INDEMNIFICATION SHALL COVER, AND SUCCESSFUL BIDDER AGREES TO INDEMNIFY WILLIAMSON COUNTY, IN THE EVENT WILLIAMSON COUNTY IS FOUND TO HAVE BEEN NEGLIGENT FOR HAVING

SELECTED SUCCESSFUL BIDDER TO PER THE WORK DESCRIBED IN THIS REQUEST. THE PROVISION BY SUCCESSFUL BIDDER OF INSURANCE SHALL NOT LIMIT THE LIABILITY OF SUCCESSFUL BIDDER UNDER THE CONTRACT AND/OR ANY ENSUING AGREEMENT.

3.2.15 Waiver of Subrogation

Successful Bidder and Successful Bidder's insurance carrier waive any and all rights whatsoever with regard to subrogation against Williamson County as an indirect party to any suit arising out of personal or property damages resulting from the Bidder's performance under this Contract and any ensuing Agreement.

3.2.16 Relationship of the Parties

The Successful Bidder shall be an independent contractor and shall assume all of the rights, obligations, liabilities, applicable to it as such independent contractor hereunder and any provisions herein which may appear to give Williamson County the right to direct the Successful Bidder as to details of doing work herein covered or to exercise a measure of control over the work shall be deemed to mean that the Successful Bidder shall follow the desires of Williamson County in the results of the work only. Williamson County shall not retain or have the right to control the Successful Bidder's means, methods or details pertaining to the Successful Bidder's performance of the work. Williamson County and the Successful Bidder hereby agree and declare that the Successful Bidder is an independent contractor and as such meets the qualifications of an "Independent Contractor" under Texas Workers Compensation Act, Texas Labor Code, Section 406.141, that the Successful Bidder is not an employee of Williamson County, and that the Successful Bidder and its employees, agents and sub- contractors shall not be entitled to workers compensation coverage or any other type of insurance coverage held by Williamson County.

3.2.17 Sole Provider

The Successful Bidder agrees and acknowledges that it shall not be considered a sole provider of the goods and/or services described herein and that Williamson County may contract with other providers of such goods and/or services if Williamson County deems, at its sole discretion, that multiple providers of the same goods and/or services will serve the best interest of Williamson County.

3.2.18 Force Majeure

If the party obligated to perform is prevented from performance by an act of war, order of legal authority, act of God, or other unavoidable cause not attributable to the fault or negligence of said party, the other party shall grant such party relief from the performance. The burden of proof for the need of such relief shall rest upon the party obligated to perform. To obtain release based on force majeure, the party obligated to perform shall file a written request with the other party.

3.2.19 Severability

If any provision of this IFB, the Contract or any ensuing Agreement shall be held invalid or unenforceable by any court of competent jurisdiction, such holding shall not invalidate or render unenforceable any other provision thereof, but rather the entire IFB, Contract or any ensuing Agreement will be construed as if not containing the particular invalid or unenforceable provision or provisions, and the rights and obligation of the parties shall be construed and enforced in accordance therewith. The parties acknowledge that if any provision of this IFB, the Contract or any ensuing Agreement is determined to be invalid or unenforceable, it is the desire and intention of each that such provision be reformed and construed in such a manner that it will, to the maximum extent practicable, give effect to the intent of this IFB, the Contract or any ensuing Agreement and be deemed to be validated and enforceable.

3.2.20 Equal Opportunity

Neither party shall discriminate against any employee or applicant for employment because of race, color, sex, religion or national origin.

3.2.21 Notice

Any notice to be given shall be in writing and may be affected by personal delivery, or by registered or certified mail, return receipt requested, addressed to the proper party, at the following address:

Williamson County Purchasing Department Purchasing Agent 901 South Austin Avenue Georgetown, Texas 78626

Bidder: Address set out in IFB referred to as the Bid Affidavit.

Notices given in accordance with this provision shall be effective upon (i) receipt by the party to which notice is given, or (ii) on the third

3.2.22 Sales and Use Tax Exemption

Williamson County is a body corporate and politic under the laws of the State of Texas and claims exemption from sales and use taxes under Texas Tax Code Ann. § 151.309, as amended, and the services and/or goods subject hereof are being secured for use by Williamson County.

3.2.23 Compliance with Laws

Williamson County and Successful Bidder shall comply with all federal, state, and local laws, statutes, ordinances, rules and regulations, and the orders and decrees of any courts or administrative bodies or tribunals in any matter affecting the performance of the Contract and any ensuing Agreement, including, without limitation, Workers' Compensation laws, salary and wage statutes and regulations, licensing laws and regulations. When required, the Successful Bidder shall furnish Williamson County with certification of compliance with said laws, statues, ordinances, rules, regulations, orders, and decrees above specified.

3.2.24 Incorporation of Schedules, Exhibits, Appendices & Attachments

All of the Schedules, Exhibits, Appendices and Attachments referred to herein are incorporated by reference as if set forth verbatim herein. All of the Schedules, Exhibits, Appendices and Attachments referred to herein are incorporated by reference as if set forth verbatim herein. Any conflicting terms in the contract documents will be resolved at the sole discretion of the Williamson County Commissioners Court.

3.2.25 No Waiver of Immunities

Nothing herein shall be deemed to waive, modify or amend any legal defense available at law or in equity to Williamson County, its past or present officers, employees, or agents, nor to create any legal rights or claim on behalf of any third party. Williamson County does not waive, modify, or alter to any extent whatsoever the availability of the defense of governmental immunity under the laws of the State of Texas and of the United States.

3.2.26 No Waiver

The failure or delay of any party to enforce at any time or any period of time any of the provisions of this IFB, the Contract or any ensuing Agreement shall not constitute a present or future waiver of such provisions nor the right of either party to enforce each and every provision. Furthermore, no term or provision hereof shall be deemed waived and no breach excused unless such waiver or consent shall be in writing and signed by the party claimed to have waived or consented. Any consent by any party to, or waiver of, a breach by the other, whether expressed or implied, shall not constitute a consent to, waiver of or excuse for any other, different or subsequent breach.

3.2.27 Current Revenues

The obligations of the parties under the Contract and any ensuing Agreement do not constitute a general obligation or indebtedness of Williamson County for which Williamson County is obligated to levy, pledge, or collect any of taxation. It is understood and agreed that Williamson County shall have the right to terminate the Contract and any ensuing Agreement at the end of any Williamson County fiscal year if the governing body of Williamson County does not appropriate sufficient funds as determined by Williamson County's budget for the fiscal year in question. Williamson County may effect such termination by giving written notice of termination to the Successful Bidder at the end of its then-current fiscal year.

3.2.28 FOB – Destination

To the extent applicable to this IFB, all of the items listed are to be Free On Board to final destination (FOB Destination) with all transportation charges if applicable to be included in the Bid, unless otherwise specified in the Invitation for Bids. The title and risk of loss of the goods shall not pass to Williamson County until receipt and acceptance takes place at the FOB Destination point.

3.2.29 Binding Effect

This Contract and any ensuing Agreement shall be binding upon and inure to the benefit of the parties and their respective permitted assigns and successors.

3.2.30 Assignment

The Successful Bidder's interest and duties hereunder may not be assigned or delegated to a third party without the express written consent of Williamson County.

3.2.31 Safety

Successful Bidder is responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with any services to be provided hereunder. The safety program shall comply with all applicable requirements of the current federal Occupational Safety and Health Act and all other applicable federal, state and local laws and regulations.

3.2.32 General Obligations and Reliance

Successful Bidder shall perform all services and/or provide all goods, as well as those reasonably inferable and necessary for completion and provision of services and/or goods required hereunder. The Successful Bidder shall keep Williamson County informed of the progress and quality of the services. Successful Bidder agrees and acknowledges that Williamson County is relying on Successful Bidder's represented expertise and ability to provide the goods and/or services described herein. Successful Bidder agrees to use its best efforts, skill, judgment, and abilities to perform its obligations in accordance with the highest standards used in the profession and to further the interests of Williamson County in accordance with Williamson County's requirements and procedures. Successful Bidder's duties as set forth herein shall at no time be in any way diminished by reason of any approval by the Williamson County nor shall the Successful Bidder be released from any liability by reason of such approval by Williamson County, it being understood that Williamson County at all times is ultimately relying upon the Successful Bidder's skill and knowledge in performing the services and providing any goods required hereunder.

3.2.33 Estimated Quantities

To the extent applicable to this IFB, the estimated quantity of each item listed in this IFB is only an estimate -- the actual quantity to be purchased may be more or less. Williamson County is not obligated to purchase any minimum amount, and Williamson County may purchase any reasonable amount greater than the estimate for the same unit price. Any limit on quantities available must be stated expressly in the Bid.

3.2.34 Contractual Development

The contents of the IFB and the selected Bid will become an integral part of the Contract, but may be modified, at Williamson County's sole discretion, by provisions of an ensuing Agreement. Therefore, the Bidder must agree to inclusion in an ensuing Agreement of the Bid Specifications, Terms and Conditions of this IFB. If an ensuing Agreement is required under this IFB, information relative to the Agreement will be located in the Special Provisions Section of this IFB.

3.2.35 Survivability

All applicable agreements that were entered into between Successful Bidder and Williamson County under the terms and conditions of the Contract and/or any ensuing Agreement shall survive the expiration or termination thereof for ninety (90) days unless a new contract has been awarded.

3.2.36 Air Quality

In determining the overall best Bid, Williamson County may, to the extent applicable, exercise the following option granted to local governments under the Texas Local Government Code.

Option – TLGC § 271.907. This option allows Williamson County to evaluate Bids and give preference to goods and/or services of a Bidder that demonstrates that the Bidder meets or exceeds any and all state or federal environmental standards, including voluntary standards, relating to air quality. If the Bid being submitted will have an effect on air quality for Williamson County (as it relates to any state, federal, or voluntary air quality standard), then the Bidder is encouraged to provide information in narrative indicating the anticipated air quality impact. Bidders are expected to meet all mandated state and federal air quality standards.

3.2.37 Entire Agreement

The Contract and any ensuing Agreement shall supersede all prior Agreements, written or oral between the Successful Bidder and Williamson County and shall constitute the entire Agreement and understanding between the parties with respect to the services and/or

goods to be provided. Each of the provisions herein shall be binding upon the parties and may not be waived, modified amended or altered except by writing signed by the Successful Bidder and Williamson County.

3.2.38 Payment

Williamson County's payment for goods and services shall be governed by Chapter 2251 of the Texas Government Code. An invoice shall be deemed overdue the 31st day after the later of (1) the date Williamson County receives the goods under the Contract; (2) the date the performance of the service under the Contract is completed; or (3) the date the Williamson County Auditor receives an invoice for the goods or services. Interest charges for any overdue payments shall be paid by Williamson County in accordance with Texas Government Code Section 2251.025. More specifically, the rate of interest that shall accrue on a late payment is the rate in effect on September 1 of Williamson County's fiscal year in which the payment becomes due. The said rate in effect on September 1 shall be equal to the sum of one percent (1%); and (2) the prime rate published in the Wall Street Journal on the first day of July of the preceding fiscal year that does not fall on a Saturday or Sunday.

In the event that an error appears in an invoice submitted by Successful Bidder, Williamson County shall notify Successful Bidder of the error not later than the twenty first (21st) day after the date Williamson County receives the invoice. If the error is resolved in favor of Successful Bidder, Successful Bidder shall be entitled to receive interest on the unpaid balance of the invoice submitted by Successful Bidder beginning on the date that the payment for the invoice became overdue. If the error is resolved in favor of Williamson County, Successful Bidder shall submit a corrected invoice that must be paid in accordance within the time set forth above. The unpaid balance accrues interest as provided by Chapter 2251 of the Texas Government Code if the corrected invoice is not paid by the appropriate date.
As a minimum, invoices shall include:

a) Name, address, and telephone number of Successful Bidder and similar information in the event the payment is to be made to a different address
b) Williamson County contract, Purchase Order, and/or delivery order number
c) Identification of items or service as outlined in the Contract
d) Quantity or quantities, applicable unit prices, total prices, and total amount
e) Any additional payment information which may be called for by the Contract

Payment inquiries should be directed to the Williamson County Auditor's Office, Accounts Payable Department: accountspayable@wilco.org , 512-943-1500.

3.2.39 Contractual Formation and Ensuing Agreement

The IFB and the Bidder's Bid, when properly accepted by the Williamson County Commissioners Court, shall constitute a contract equally binding between the Successful Bidder and Williamson County.
If an ensuing Agreement is required by this IFB, that information will be provided in Special Provisions section of this IFB. The Successful Bidder shall be required to execute the Agreement at the Williamson County Purchasing Department approximately ten (10) calendar days after the Successful Bidder is notified of award. The ensuing Agreement shall be in the same form as the Agreement which is attached to the end of this IFB. The only anticipated changes in the ensuing Agreement will be to include additional exhibits, to fill in blanks to identify the Successful Bidder, and terms relating to the compensation, or to revise the Agreement to accommodate corrections, changes in the scope of services, or changes pursuant to Addenda issued. **Bidders should raise any questions regarding the terms of the Agreement in the of written questions or submittals as described in the Public Announcement and General Information portion of this IFB.** Because the signed ensuing Agreement will be substantively and substantially derived from the attached Agreement, each Bidder is urged to seek independent legal counsel as to any questions about the terms, conditions or provisions contained in the Agreement ***before*** submitting a Bid. Again, the attached Agreement contains important legal provisions and is considered part and parcel of this IFB. Failure or refusal to sign aforesaid Agreement shall be grounds for Williamson County to revoke any award which has been issued, forfeit Bid security, if applicable, and select another Bidder.

3.2.40 Cooperative Purchasing Program

During the term of the Contract resulting from this IFB, Williamson County would like to afford the same prices, terms and conditions to other political subdivisions or public entities. Another entity's participation in the Contract resulting from this Invitation to Bid is subject to a properly authorized Purchasing Cooperative Inter-local Agreement with Williamson County. Any liability created by Purchase Orders issued against the Contract shall be the sole responsibility of the governmental agency placing the order.

3.2.41 Insurance Requirements

To the extent applicable Insurance information will appear in the Special Provisions section of this IFB.

3.2.42 Bidders Bond, Warranty Bond, Performance and Payment Bonds

To the extent applicable Bond information will appear in the Special Provisions section of this IFB.

3.2.43 Legal Liability Information

The Successful Bidder shall disclose all legal liability information by listing any pending litigation or anticipated litigation that your firm is involved in, including but not limited to, potential or actual legal matters with private parties and any local, State, Federal or international governmental entities. Williamson County reserves the right to consider legal liability information in the recommendation of any proposed contract to the Williamson County Commissioners Court.

3.2.44 Inclement Weather

In case of inclement weather or any other unforeseen event causing the County to close for business on the date of a bid/proposal submission deadline, the bid closing will automatically be postponed until the next business day the County is open. If inclement weather conditions or any other unforeseen event causes delays in carrier service operations, the County may issue an addendum to all known vendors interested in the project to extend the deadline. It will be the responsibility of the vendor to notify the County of their interest in the project if these conditions are impacting their ability to turn in a submission within the stated deadline. The County reserves the right to make the final judgment call to extend any deadline.

CONFLICT OF INTEREST QUESTIONNAIRE

For vendor or other person doing business with local governmental entity **Form CIQ**

This questionnaire is being filed in accordance with chapter 176 of the Local Government Code by a person doing business with the governmental entity.

By law this questionnaire must be filed with the records administrator of the local government not later than the 7th business day after the date the person becomes aware of facts that require the statement to be filed. See Section 176.006, Local Government Code.

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

OFFICE USE ONLY

Date Received

1 **Name of person doing business with local governmental entity.**

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.**

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than September 1 of the year for which an activity described in Section 176.006(a), Local Government Code, is pending and not later than the 7th business day after the date the originally filed questionnaire becomes incomplete or inaccurate.)

3 **Describe each affiliation or business relationship with an employee or contractor of the local governmental entity who makes recommendations to a local government officer of the local governmental entity with respect to expenditure of money.**

4 **Describe each affiliation or business relationship with a person who is a local government officer and who appoints or employs a local government officer of the local governmental entity that is the subject of this questionnaire.**

CONFLICT OF INTEREST QUESTIONNAIRE
For vendor or other person doing business with local governmental entity

Form CIQ
Page 2

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Name of local government officer with whom filer has affiliation or business relationship.
(Complete this section only if the answer to A, B, or C is YES.)

This section, item 5 including subparts A, B, C & D, must be completed for each officer with whom the filer has affiliation or other relationship. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income from the filer of the questionnaire?

☐ Yes ☐ No

B. Is the filer of the questionnaire receiving or likely to receive taxable income from or at the direction of the local government officer named in this section AND the taxable income is not from the local governmental entity?

☐ Yes ☐ No

C. Is the filer of this questionnaire affiliated with a corporation or other business entity that the local government officer serves as an officer or director, or holds an ownership of 10 percent or more?

☐ Yes ☐ No

D. Describe each affiliation or business relationship.

6. Describe any other affiliation or business relationship that might cause conflict of interest:

7

Signature of person doing business with the governmental entity

Date

Signature not required if completing in BIDSYNC electronically.

Bidder References

List the last (3) companies or governmental agencies, where the same or similar goods and/or services as contained in this IFB package, were recently provided by Bidder.

Reference 1

Client Name: Location:

Contact Name: Title:

Phone: E-mail

Contract Date To: Contract Date From: Contract Value: $

Scope of Work:

Reference 2

Client Name: Location:

Contact Name: Title:

Phone: E-mail

Contract Date To: Contract Date From: Contract Value: $

Scope of Work:

Reference 3

Client Name:

Location:

Contact Name:

Title:

Phone:

E-mail

Contract Date To:

Contract Date From:

Contract Value: $

Scope of Work:

Agreement for Construction Services
(Break Room Remodel for Williamson County Justice Center)

This Agreement ("Agreement") between Williamson County, Texas, a political subdivision of the State of Texas ("Owner") and _____ ("Contractor") is entered into in accordance with the following terms and conditions:

ARTICLE 1 SCOPE OF WORK: The Owner desires to retain Contractor to provide the construction services described herein. The Contractor shall have the overall responsibility for and shall provide complete construction services and furnish all materials, equipment, tools and labor as necessary or reasonably inferable to complete the following described construction services, or any phase of such services, in accordance with the Owner's requirements and the terms of this Agreement (hereinafter collectively referred to as the "Work"):

As described in the Invitation for Bid #1601-048, including the specifications set forth in the attached Exhibit "A", which is incorporated herein as if copied in full.

ARTICLE 2 CONTRACT PRICE: Owner agrees to pay to the Contractor, for the satisfactory performance of the Work, the sum of _____ ($_____) in accordance with the terms and conditions of this Agreement.

ARTICLE 3 PLANS AND SPECIFICATIONS: The Work shall be performed pursuant to and in accordance with the following described plans and specifications, as well as any revisions made thereto:

As described in the Invitation for Bid #1601-048, including any exhibits, which is incorporated herein as if copied in full.

_____

_____

Additional Work: Should Owner choose to add additional work, such additional work shall be described in a separate written amendment to this Agreement wherein the additional work shall be described and the parties shall set forth the amount of compensation to be paid by Owner for the additional work. Contractor shall not begin any additional work and Owner shall not be obligated to pay for any additional work unless a written amendment to this Agreement has been signed by both parties.

ARTICLE 4 SUBSTANTIAL AND FINAL COMPLETION:

4.1 Commencement of Work. Contractor shall commence the Work upon instruction to do so from the Owner and Construction shall be deemed to have commenced on the date of such instruction.

4.2 Substantial Completion. "Substantial Completion" means the stage in the progress of the Work when the Work, or designated portions thereof, may still require minor modifications or adjustments but,

in the Owner's opinion, the Work has progressed to the point such that all parts of the Work under consideration are fully operational and usable for intended purposes, as evidenced by a Certificate of Substantial Completion approved by the Owner. If a Certificate of Occupancy is required by public authorities having jurisdiction over the Work, said certificate shall be issued before the Work or any portion thereof is considered substantially complete. When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall notify Owner's Designated Representative (sometimes referred to as the "ODR") and request a determination as to whether the Work or designated portion thereof is substantially complete. If the ODR does not consider the Work substantially complete, the ODR will notify the Contractor giving reasons therefore. Failure on the Owner's part to list a reason does not alter the responsibility of the Contractor to complete all Work in accordance with the terms of this Agreement. After satisfactorily completing items identified by Owner's Designated Representative, the Contractor shall then submit another request for the ODR to determine Substantial Completion. If The ODR considers the Work substantially complete, The ODR will prepare and deliver a certificate of Substantial Completion which shall establish the date of Substantial Completion, shall include a punch list of items to be completed or corrected before final completion and final payment, shall establish the time within which the Contractor shall finish the punch list, and shall establish responsibilities of the Owner and the Contractor for security, maintenance, heat, utilities, damage to the Work, warranty and insurance. Failure to include an item on the punch list does not alter the responsibility of the Contractor to complete all Work in accordance with the terms and conditions of this Agreement. The certificate of Substantial Completion shall be signed by the Owner and the Contractor to evidence acceptance of the responsibilities assigned to them in such certificate.

Substantial Completion (as defined in this agreement) for all stages of the Work shall be achieved on or before the following Substantial Completion date:

DATE FOR SUBSTANTIAL COMPLETION: Ninety (90) calendar days after the date of County's Notice to Proceed.

4.3 Final Completion. The Work shall be fully and finally completed within One Hundred Twenty (120) calendar days the date of County's Notice to Proceed; provided, however, Owner may extend said time period in the event bad weather affects the progress of the Work. Owner shall, at its sole discretion, determine when the Work has been fully and finally completed to its satisfaction.

4.4 Liquidated Damages. For each consecutive calendar day after the date of Substantial Completion that the Work is not Substantially Complete, the Owner may deduct the amount of Three Hundred Dollars per day ($300.00/day) from any money due or that becomes due the Contractor, not as a penalty but as liquidated damages representing the parties' estimate at the time of contract execution of the damages that the Owner will sustain for late completion. The parties stipulate and agree that calculating Owner's actual damages for late completion of the Work would be impractical, unduly burdensome, and cause unnecessary delay and that the amount of daily liquidated damages set forth is reasonable.

ARTICLE 5 PAYMENT:

On or before the first Wednesday of each month, the Contractor shall submit to the ODR a statement showing the total value of the work performed up to and including the last day of the preceding month. The statement shall also include the value of all sound materials delivered on the Work site and to be included in the Work and all partially completed Work, whether bid as a lump sum or a unit item, which in the opinion of the ODR is acceptable. The ODR shall examine and approve or modify and approve such statement. The Owner shall then pay the Contractor on or before the 25th day of the following month the total amount of the approved statement less all previous payments and all further sums that may by retained by the Owner under the terms of this Agreement or under the law.

At any time following the completion of all Work, including all punch list items, cleanup, and the delivery of record documents, the Contractor shall submit a certified application for final payment, including all sums held as retainage if any, to the ODR for its review and approval. Contractor shall submit, prior to or with the application for final payment, final copies of all close out documents, including maintenance and operating instructions, guarantees and warranties, certificates, and all other items required by this Agreement. Contractor shall also submit consent of surety to final payment, an affidavit that all payrolls, bills for materials and equipment, subcontracted work and other indebtedness connected with the Work, except as specifically noted, have been paid or will be paid or otherwise satisfied within the period of time required by Chapter 2251, Texas Government Code. Contractor shall furnish documentation establishing payment or satisfaction of all such obligations, such as receipts, releases and waivers of claims arising out of the Agreement. Owner is entitled to rely upon this affidavit and the Contractor may not submit a claim on behalf of a subcontractor or vendor if that claim has not been noted as an exception in the affidavit.

Owner may deduct from the final payment all sums due from Contractor for any reason, Liquidated Damages and all other deductions authorized by this Agreement. If the certificate of final completion notes any Work remaining incomplete or defects not remedied, the Owner may deduct the reasonable cost of remedying such deficiencies from the final payment. If such deductions are made, Owner shall identify each deduction made and the reason for each deduction, and furnish Contractor with an explanation of the deduction and the amount deducted on or by the 21st day after Owner's receipt of an approved or deemed approved application for final payment.

Final Payment shall become due and payable by Owner, subject to all allowable offsets and deductions, on the 31st day next following Owner’s approval of the application for payment. If Contractor disputes any amount deducted by the Owner, Contractor shall give notice of the dispute on or before the 30th day next following receipt of final payment; failure to do so will bar any subsequent claim for payment of amounts deducted.

Final payment shall constitute a waiver of all claims by the Contractor except those specifically identified in writing and submitted to the ODR prior to the application for final payment. Provided, however, that the Work shall not be deemed fully performed by the Contractor and closed until the expiration of all warranty periods.

ARTICLE 6 CONTRACTOR'S GENERAL RESPONSIBILITIES AND COVENANTS:

6.1 Contractor shall perform all services specifically allocated to it hereunder, as well as those services reasonably inferable and necessary for completion of the Work. The Contractor shall keep the Owner informed of the progress and quality of the Work. Contractor agrees and acknowledges that Owner is entering into this Agreement in reliance on Contractor's represented expertise and ability to provide the Work described in this Agreement. Contractor agrees to use its best efforts, skill, judgment, and abilities to perform its obligations in accordance with the highest standards used in the profession and to further the interests of Owner in accordance with Owner's requirements and procedures. Contractor's duties as set forth herein shall at no time be in any way diminished by reason of any approval by the Owner nor shall the Contractor be released from any liability by reason of such approval by the Owner, it being understood that the Owner at all times is ultimately relying upon the Contractor's skill and knowledge in performing the services required hereunder.

6.2 Contractor is responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. The safety program shall comply with all applicable requirements of the current federal Occupational Safety and Health Act and all other applicable federal, state and local laws and regulations.

6.3 Contractor shall be an independent contractor under this Agreement and shall assume all of the rights, obligations, liabilities, applicable to it as such independent contractor hereunder and any provisions in this agreement which may appear to give Owner the right to direct Contractor as to details of doing the Work herein covered or to exercise a measure of control over the Work shall be deemed to mean that Contractor shall follow the desires of Owner in the results of the Work only. Owner shall not retain or have the right to control the Contractor's means, methods or details pertaining to the Contractor's performance of the Work described herein, nor shall Owner have the power to direct the order in which Contractor's Work is performed under this agreement. Owner and Contractor hereby agree and declare that Contractor is an Independent Contractor and as such meets the qualifications of an Independent Contractor under Texas Worker's Compensation Act, Texas Labor Code, Section 406.141, that the Contractor is not an employee of Owner for purposes of this Agreement, and that the Contractor and its employees, agents and sub-subcontractors shall not be entitled to worker's compensation coverage or any other type of insurance coverage held by Owner.

6.4 As part of Contractor obligation to coordinate the Work, Contract shall:

a. cooperate with the ODR and endeavor to further the interests of the Owner and the Work;
b. provide an on-site, full-time superintendent for the duration of the Work;
c. visit the Work site and inspect the existing facilities, systems and conditions to insure an accurate understanding of the existing conditions as required;
d. at Owner's request, attend public meetings and hearings concerning the development of the Work;
e. review all drawings, specifications, and other plans as they are developed by the Owner and/or its architect and advise Owner of any error, inconsistency or omission discovered in the drawings, specifications, and other plans;
f. review the drawings, specifications, and other plans for compliance with all applicable laws and code requirements;
g. advise Owner of any tests that should be performed;
h. organize and maintain a competent, full-time staff at the Work site with clearly defined lines of authority and communication as necessary to coordinate construction activities, monitor and direct progress of the Work;
i. attend Owner's regularly scheduled Work progress meetings and fully advise the ODR of the Work status including schedule, costs, quality and changes;

j. assist Owner in obtaining building permits and obtain special permits for permanent improvements as required by law; and
k. shall coordinate, monitor and inspect the Work of subcontractors to ensure conformance with the drawings, specifications, other plans and with the terms of this Agreement.

6.5 Contractor shall identify every subcontractor it intends to use for the Work to the Owner in writing at least ten (10) days before entering into any subcontract. Contractor shall not use any subcontractor to which Owner has a reasonable objection. If Owner does not object to a particular subcontractor with said ten (10) days, such subcontract may be considered acceptable to Owner. Following Owner's acceptance of a subcontractor, that subcontractor shall not be changed without Owner's written consent, which shall not be unreasonably withheld.

6.6 Contractor's designated representative, which is set forth below Contractor's signature herein below, shall be responsible for the day-to-day management of the Work on behalf of Contractor. The designated representative shall be the Owner's primary contact during the Work and shall be available as required for the benefit of the Work and the Owner. The contractor's designated representative shall be authorized to act on behalf of and bind the Contractor in all matters related to the Work including, but not limited to, execution of Change Orders.

6.7 NO ALTERATIONS OR CHANGES SHALL BE MADE, HOWEVER, EXCEPT UPON THE WRITTEN ORDER OF THE OWNER, OR THE ODR.

6.8 Contractor shall promptly correct any defective Work at Contractor's sole expense, unless the Owner specifically agrees, in writing, to accept the Work.

6.9 Contractor shall maintain and deliver the close out documents that describe changes or deviations from the original drawings, specifications and plans that occurred during construction and that reflect the actual "As Built" conditions of the completed Work.

COMMISSIONING AND WARRANTY RESPONSIBILITIES

6.10 Contractor shall provide commissioning, starting and check-out services for the systems installed as a part of the Work prior to completion and acceptance. Operation manuals and instructions will be provided to the Owner, the systems will be demonstrated and training provided to Williamson County's operators upon completion and prior to acceptance.

6.11 Contractor hereby warrants that the materials and equipment provided for the Work will be of good quality and new unless otherwise required or permitted by the Owner; that the construction will be free from faults and defects; and that the construction will conform with the requirements of the plans, specifications, drawings and the terms of this Agreement.

ARTICLE 7 OWNER'S RESPONSIBILITIES

7.1 The Owner shall:

a. provide the general schedule for the Work provided Owner is of the opinion such schedule is necessary. The general schedule will set forth the Owner's plan for milestone dates and completion of the Work;
b. identify a person as its ODR who is authorized to act in the Owner's behalf with respect to the Work. The ODR shall examine the documents submitted by the Contractor and shall render decisions on behalf of the Owner to the extent allowed by Texas law;
c. at Owner's cost, will secure the services of surveyors, soils engineers, existing facility surveys, testing and balancing, environmental surveys or other special consultants to develop such additional information as may be necessary for the design or construction of the Work;
d. furnish required information and services and shall render approvals and decisions as expeditiously as is consistent with reasonable skill and care and the orderly progress of the Contractor's services and of the Work;
e. shall have the right to reject any defective Work. Should Contractor refuse or neglect to correct any such Work within a reasonable time after notice, Owner may have the Work corrected and recover all expenses incurred from Contractor on demand; and
f. Owner shall furnish to the Contractor a sufficient number of plans, drawings and specifications sets.

ARTICLE 8 INSURANCE AND INDEMNITY

8.1 Insurance. The Contractor shall carry insurance in the types and amounts indicated below for the duration of the Agreement, which shall include items owned by Owner in the care, custody and control of Contractor prior to and during construction. Contractor must also complete and file the declaration pages from the insurance policies with Owner whenever a previously identified policy period expires during the term of the Agreement, as proof of continuing coverage. Contractor shall update all expired policies prior to submission of any payment requests hereunder. Failure to update policies shall be reason for payment to be withheld until evidence for renewal is provided to the Owner.

8.1.1 The Contractor shall provide and maintain, until the Work covered in this Agreement is completed and accepted by the Owner, the minimum insurance coverage in the minimum amounts as described below. Coverage shall be written on an occurrence basis by companies authorized and admitted to do business in the State of Texas and rated A- or better by A.M. Best Company or otherwise acceptable to Owner.

Type of Coverage	Limits of Liability
a. Worker's Compensation	Statutory
b. Employer's Liability	
Bodily Injury by Accident	$500,000 Ea. Accident
Bodily Injury by Disease	$500,000 Ea. Employee
Bodily Injury by Disease	$500,000 Policy Limit

c. Comprehensive general liability including completed operations and contractual liability insurance for bodily injury, death, or property damages in the following amounts:

COVERAGE	PER PERSON	PER OCCURRENCE

Comprehensive General Liability (*including premises, completed operations and contractual*)	$1,000,000	$1,000,000
Aggregate policy limits:	$1,000,000	

d. Comprehensive automobile and auto liability insurance (covering owned, hired, leased and non-owned vehicles):

COVERAGE	PER PERSON	PER OCCURRENCE
Bodily injury (including death)	$1,000,000	$1,000,000
Property damage	$1,000,000	$1,000,000
Aggregate policy limits	No aggregate limit	

e. Umbrella coverage in the amount of not less than $1,000,000.

8.1.2 The above insurance requirements are not intended to be compounded with the Contractor's standing insurance policies. If the Contractor already has in force insurance policies which provide the required coverage, there is no need to purchase duplicate coverage for this Work.

8.1.3 Policies must include the following clauses, as applicable.

a. "This insurance shall not be canceled, limited in scope or coverage, or non-renewed until after thirty (30) days prior written notice, or ten (10) days for non-payment of premium, has been given to Williamson County."
b. "It is agreed that the Contractor's insurance shall be deemed primary with respect to any insurance or self insurance carried by Williamson County for liability arising out of operations under the Agreement with Williamson County."
c. "Williamson County, it officials, directors, employees, representatives, and volunteers are added as additional insured as respects operations and activities of, or on behalf of the named insured performed under Agreement with the Owner." This is not applicable to the workers' compensation policy.
d. "The workers' compensation and employers' liability policy will provide a waiver of subrogation in favor of Williamson County."

8.1.4 Workers' Compensation Insurance Coverage:

In the event that Contractor employs any individual to perform any portion of the Work, Contractor shall comply with Texas Labor Code, §406.096, which requires workers' compensation insurance coverage for all employees providing services on a building or construction project for a governmental entity.

a. Definitions:
(1) Certificate of Coverage ("certificate") - A copy of a certificate of insurance, a certificate of authority to self-insure issued by the Texas Workers' Compensation

Commission, or a coverage agreement (TWCC-81, TWCC-82, TWCC-83, or TWCC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees providing services on a project, for the Duration of the Work.

(2) Duration of the Work - includes the time from the beginning of the Work until the Work has been completed and accepted by the Owner.

(3) Coverage – Workers' compensation insurance meeting the statutory requirements of the Texas Labor Code, §401.011(44).

(4) Persons providing services relating to the Work ("subcontractor") - includes all persons or entities performing all or part of the services the Contractor has undertaken to perform the Work, regardless of whether that person contracted directly with the Contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services in relation to the Work. "Services" include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other service related to a project. "Services" does not include activities unrelated to the Work, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

b. The Contractor shall provide Coverage, based on proper reporting of classification codes and payroll amounts and filing of any Coverage agreements, which meets the statutory requirements of Texas labor Code, §401.011(44) for all employees of the Contractor providing services in relation to the Work, for the Duration of the Work.

c. The Contractor must provide a Certificate of Coverage to the Owner prior to or contemporaneously with the execution of this Agreement.

d. If the Coverage period shown on the Contractor's current Certificate of Coverage ends during the Duration of the Work, the Contractor must, prior to the end of the Coverage period, file a new Certificate of Coverage with the Owner showing that Coverage has been extended.

e. The Contractor shall obtain from each person providing services in relation to the Work, and provide to the Owner:

(1) a Certificate of Coverage, prior to that person beginning any of the Work, so the Owner will have on file Certificates of Coverage showing Coverage for all persons providing services in relation to the Work; and

(2) no later than seven days after receipt by the Contractor, a new Certificate of Coverage showing extension of Coverage, if the Coverage period shown on the current Certificate of Coverage ends during the Duration of the Work.

f. The Contractor shall retain all required Certificates of Coverage for the Duration of the Work and for one year thereafter.

g. The Contractor shall notify the Owner in writing by certified mail or personal delivery, within 10 days after the Contractor knew or should have known, of any change that materially affects the provision of Coverage of any person providing services in relation to the Work.

h. The Contractor shall post on the Work site a notice, in the text, form and manner prescribed by the Texas Workers' Compensation Commission, informing all persons providing services in relation to the Work that they are required to be covered, and stating how a person may verify Coverage and report lack of Coverage.

i. By signing this Agreement or providing or causing to be provided a Certificate of Coverage, the Contractor is representing to the Owner that all employees of the Contractor who will provide services in relation to the Work and all persons providing services in relation to the Work will be covered by workers' compensation coverage for the Duration of the Work, 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.

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

8.1.5 The furnishing of the above listed insurance coverage must be tendered prior to execution of the Agreement, and in no event later than ten (10) calendar days from Notice of Award. Failure to provide the insurance in a timely fashion may result in loss of Contractor's bid bond.

8.1.6 The Contractor shall not cause or allow any of its required insurance to be canceled, nor permit any insurance to lapse during the term of the Agreement or as required in the Agreement. If the Contractor fails to obtain, maintain or renew any insurance required by this Agreement, the Owner may, among other remedies available hereunder or at law, obtain insurance coverage directly and recover the cost of that insurance from the Contractor or declare this Agreement void if the Contractor does not remedy the breach within ten (10) days after receipt of notice of breach from the Owner.

8.1.7 The Owner reserves the right to review the insurance requirements set forth in this Article during the effective period of the Agreement and to make reasonable adjustments to the insurance coverage and their limits when deemed necessary and prudent by the Owner based upon changes in statutory law, court decisions, or the claims history of the industry as well as the Contractor.

8.1.8 The Owner shall be entitled, upon request, and without expense, to receive complete copies of the policies with all endorsements and may make any reasonable requests for deletion, or revision or modification of particular policy terms, conditions, limitations, or exclusions, except where policy provisions are established by law or regulation binding upon the Parties or the underwriter of any of such polices. Damages caused by the Contractor and not covered by insurance shall be paid by the Contractor.

8.1.9 Contractor shall be responsible for payment of premiums for all of the insurance coverages required under this Agreement. Contractor further agrees that for each claim, suit or action made against insurance provided hereunder, with respect to all matters for which the Contractor is responsible hereunder, Contractor shall be solely responsible for all deductibles and self-insured retentions. **Any deductibles or self-insured retentions over $50,000 in the Contractor's insurance must be declared and approved in writing by Owner in advance.**

8.1.10 The Contractor shall contractually require each person or entity with whom it contracts to provide services in relation to the Work, to comply with each and every insurance requirement that Contractor must comply with hereunder. More specifically, each person or entity with whom Contractor contracts to provide services on the in relation to the Work must comply with each insurance requirement under this Article 8 just as if such person or entity was the Contractor. Thus, every reference to Contractor under each insurance requirement of this Article 8 shall mean and include each person or entity with whom Contractor contracts to provide services in relation to the Work. If any such person or entity with whom Contractor contracts to provide services in relation to the Work fails to obtain, maintain or renew any insurance required by this Agreement, the Owner may, among other remedies available

hereunder or at law, obtain insurance coverage directly and recover the cost of that insurance from the Contractor or declare this Agreement void if the Contractor does not remedy the breach within ten (10) days after receipt of notice of breach from the Owner.

8.2 INDEMNITY.

8.2.1 INDEMNIFICATION - EMPLOYEE PERSONAL INJURY CLAIMS. TO THE FULLEST EXTENT PERMITTED BY LAW, THE CONTRACTOR SHALL INDEMNIFY, DEFEND (WITH COUNSEL OF OWNER'S CHOOSING), AND HOLD HARMLESS OWNER, AND OWNER'S EMPLOYEES, AGENTS, REPRESENTATIVES, PARTNERS, OFFICERS, AND DIRECTORS (COLLECTIVELY, THE "INDEMNITEES") AND SHALL ASSUME ENTIRE RESPONSIBILITY AND LIABILITY (OTHER THAN AS A RESULT OF INDEMNITEES' GROSS NEGLIGENCE) FOR ANY CLAIM OR ACTION BASED ON OR ARISING OUT OF THE PERSONAL INJURY, OR DEATH, OF ANY EMPLOYEE OF THE CONTRACTOR, OR OF ANY SUBCONTRACTOR, OR OF ANY OTHER ENTITY FOR WHOSE ACTS THEY MAY BE LIABLE, WHICH OCCURRED OR WAS ALLEGED TO HAVE OCCURRED ON THE WORK SITE OR IN CONNECTION WITH THE PERFORMANCE OF THE WORK. CONTRACTOR HEREBY INDEMNIFIES THE INDEMNITEES EVEN TO THE EXTENT THAT SUCH PERSONAL INJURY WAS CAUSED OR ALLEGED TO HAVE BEEN CAUSED BY THE SOLE, COMPARATIVE OR CONCURRENT NEGLIGENCE OF THE STRICT LIABILITY OF ANY INDEMNIFIED PARTY. THIS INDEMNIFICATION SHALL NOT BE LIMITED TO DAMAGES, COMPENSATION, OR BENEFITS PAYABLE UNDER INSURANCE POLICIES, WORKERS COMPENSATION ACTS, DISABILITY BENEFITS ACTS, OR OTHER EMPLOYEES BENEFIT ACTS.

8.2.2 INDEMNIFICATION - OTHER THAN EMPLOYEE PERSONAL INJURY CLAIMS. TO THE FULLEST EXTENT PERMITTED BY LAW, CONTRACTOR SHALL INDEMNIFY, DEFEND (WITH COUNSEL OF OWNER'S CHOOSING), AND HOLD HARMLESS OWNER, AND OWNER'S EMPLOYEES, AGENTS, REPRESENTATIVES, PARTNERS, OFFICERS, AND DIRECTORS (COLLECTIVELY, THE "INDEMNITEES") FROM AND AGAINST CLAIMS, DAMAGES, LOSSES AND EXPENSES, INCLUDING BUT NOT LIMITED TO ATTORNEYS' FEES, ARISING OUT OF OR ALLEGED TO BE RESULTING FROM THE PERFORMANCE OF THIS AGREEMENT OR THE WORK DESCRIBED HEREIN, TO THE EXTENT CAUSED BY THE NEGLIGENCE, ACTS, ERRORS, OR OMISSIONS OF CONTRACTOR OR ITS SUBCONTRACTORS, ANYONE EMPLOYED BY THEM OR ANYONE FOR WHOSE ACTS THEY MAY BE LIABLE, REGARDLESS OF WHETHER OR NOT SUCH CLAIM, DAMAGE, LOSS OR EXPENSE IS CAUSED IN WHOLE OR IN PART BY A PARTY INDEMNIFIED HEREUNDER.

8.3 Except for the obligation of Owner to pay Contractor the Contract Price pursuant to the terms of this Agreement, and to perform certain other obligations pursuant to the terms and conditions explicitly set forth herein, Owner shall have no liability to Contractor or to anyone claiming through or under Contractor by reason of the execution or performance of this Agreement. Notwithstanding any obligation or liability of Owner to Contractor, no present or future partner or affiliate of Owner or any agent, officer, director, or employee of Owner, Williamson County, or of the various departments comprising Williamson County, or anyone claiming under Owner has or shall have any personal liability to Contractor or to anyone claming through or under Contractor by reason of the execution or performance of this Agreement.

ARTICLE 9 BONDS

9.1 Payment Bond. Upon execution of this Agreement, Contractor shall provide a Payment Bond in the amount of 100% of the Contract Price, as security for the true and faithful payment in full of all subcontractors and persons performing labor, services, materials, machinery, and fixtures in connection with the Work. The surety for a Payment Bond shall meet the requirements of Texas law.

ARTICLE 10 TERMINATION

10.1 Termination for Cause. If either party commits an Event of Breach (a breach of any of the covenants, terms and/or conditions of this Agreement), the non-breaching party shall deliver written notice of such Event of Breach to the breaching party. Such notice must specify the nature of the Event of Breach and inform the breaching party that unless the Event of Breach is cured within three (3) business days of receipt of the notice, additional steps may be taken to terminate this Agreement. If the breaching party begins a good faith attempt to cure the Event of Breach within three (3) business days, then and in that instance, the three (3) business day period may be extended by the non-breaching party, so long as the breaching party continues to prosecute a cure diligently to completion and continues to make a good faith attempt to cure the Event of Breach. If, in the opinion of the non-breaching party, the breaching party does not cure the breach within three (3) business days or otherwise fails to make any diligent attempt to correct the Event of Breach, the breaching party shall be deemed to be in breach and the non-breaching party may, in addition to seeking the remedies available hereunder and under the law, terminate this Agreement.

10.2 Termination for Convenience. The Owner may terminate this Agreement for convenience and without cause or further liability upon thirty (30) days written notice to Contractor. In the event of such termination, it is understood and agreed that only the amounts due to Contractor for goods, commodities and/or services provided and expenses incurred to and including the date of termination, will be due and payable. No penalty will be assessed for Owner's termination of this Agreement for convenience.

ARTICLE 11 MISCELLANEOUS PROVISIONS

11.1 Interest and Late Payments. Except as otherwise specifically set forth herein, Owner's payment for goods and services shall be governed by Chapter 2251 of the Texas Government Code. Interest charges for any overdue payments shall be paid by Owner in accordance with Texas Government Code Section 2251.025. More specifically, the rate of interest that shall accrue on a late payment is the rate in effect on September 1 of Owner's fiscal year in which the payment becomes due. The said rate in effect on September 1 shall be equal to the sum of one percent (1%); and (2) the prime rate published in the Wall Street Journal on the first day of July of the preceding fiscal year that does not fall on a Saturday or Sunday.

In the event that an error appears in an invoice/application for payment submitted by Contractor, Owner shall notify Contractor of the error not later than the twenty first (21st) day after the date Owner receives the invoice/application for payment. If the error is resolved in favor of Contractor, Contractor shall be entitled to receive interest on the unpaid balance of the invoice/application for payment submitted by Contractor beginning on the date that the payment for the invoice/application for payment became overdue. If the error is resolved in favor of the Owner, Contractor shall submit a corrected invoice/application for payment that must be paid in accordance within the time set forth above. The unpaid balance accrues interest as provided by Chapter 2251 of the Texas Government Code if the corrected invoice/application for payment is not paid by the appropriate date.

11.2 Assignment; Successors and Assigns. This Agreement is a personal service contract for the services of Contractor, and Contractor's interest in this Agreement, duties hereunder and/or fees due hereunder may not be assigned or delegated to a third party. This Agreement shall be binding upon and inure to the benefit of parties hereto and their respective successors and assigns.

11.3 Captions. The captions of paragraphs in this Agreement are for convenience only and shall not be considered or referred to in resolving questions of interpretation or construction.

11.4 Governing Law and Venue. This Agreement and all of the rights and obligations of the parties and all of the terms and conditions shall be construed, interpreted and applied in accordance with and governed by and enforced under the laws of the State of Texas without reference to its conflicts of law provisions. Williamson County where the Work site is located shall be the sole place of venue for any legal action arising from or related to this Agreement or the project in which the Owner is a party.

11.5 Waivers. No delay or omission by either party in exercising any right or power arising from non-compliance or failure of performance by the other party with any of the provisions of this Agreement shall impair or constitute a waiver of any such right or power. A waiver by either party of any covenant or condition of this Agreement shall not be construed as a waiver of any subsequent breach of that or of any other covenant or condition of the Agreement.

11.6 Interpretation. In the event of any dispute over the meaning or application of any provision of the Contract Documents, the Contract Documents shall be interpreted fairly and reasonably, and neither more strongly for or against any party, regardless of the actual drafter of the Contract Documents.

11.7 Binding Effect. This Agreement shall be binding upon and inure to the benefit of the parties and their respective permitted assigns and successors.

11.8 Appointment. Owner hereby expressly reserves the right from time to time to designate by notice to Contractor a representative(s) to act partially or wholly for Owner in connection with the performance of Owner's obligations. Contractor shall act only upon instructions from the designated representative(s) unless otherwise specifically notified to the contrary.

11.9 Audits. Contractor agrees that Owner or its duly authorized representatives shall, until the expiration of three (3) years after final payment under this Agreement, have access to and the right to examine and photocopy any and all books, documents, papers and records of Contractor which are directly pertinent to the services to be performed under this Agreement for the purposes of making audits, examinations, excerpts, and transcriptions. Contractor agrees that Owner shall have access during normal working hours to all necessary Contractor facilities and shall be provided adequate and appropriate work space in order to conduct audits in compliance with the provisions of this section. Owner shall give Contractor reasonable advance notice of intended audits.

11.10 Severability. Should any term or provision of this Agreement be held invalid or unenforceable in any respect, the remaining terms and provisions shall not be affected and this Agreement shall be construed as if the invalid or unenforceable term or provision had never been included.

11.11 No Waiver of Immunities. Nothing in this Agreement shall be deemed to waive, modify or amend any legal defense available at law or in equity to Owner, its past or present officers, employees, or agents, nor to create any legal rights or claim on behalf of any third party. Owner does not waive, modify, or alter to any extent whatsoever the availability of the defense of governmental immunity under the laws of the State of Texas and of the United States.

11.12 Current Revenues. Under Texas law, a contract with a governmental entity that contains a claim against future revenues is void; therefore, each party paying for the performance of governmental functions or services must make those payments from current revenues available to the paying party.

11.13 Compliance with Laws. Contractor shall comply with all federal, state, and local laws, statutes, ordinances, rules and regulations, and the orders and decrees of any courts or administrative bodies or tribunals in any matter affecting the performance of this Agreement, including, without limitation, Worker's Compensation laws, minimum and maximum salary and wage statutes and regulations, licensing laws and regulations. When required, Contractor shall furnish the County with certification of compliance with said laws, statutes, ordinances, rules, regulations, orders, and decrees above specified.

11.14 Sales and Use Tax Exemption. Owner is a body corporate and politic under the laws of the State of Texas and claims exemption from sales and use taxes under Texas Tax Code Ann. § 151.309, as amended.

11.15 Texas Public Information Act. To the extent, if any, that any provision in this Agreement is in conflict with Tex. Gov't Code 552.001 *et seq.*, as amended (the "Public Information Act"), the same shall be of no force or effect. Furthermore, it is expressly understood and agreed that Owner, its officers and employees may request advice, decisions and opinions of the Attorney General of the State of Texas in regard to the application of the Public Information Act to any information or data furnished to Owner whether or not the same are available to the public. It is further understood that Owner, its officers and employees shall have the right to rely on the advice, decisions and opinions of the Attorney General, and that Owner, its officers and employees shall have no liability or obligation to Contractor for the disclosure to the public, or to any person or persons, of any software or a part thereof, or other items or data furnished to Owner by Contractor in reliance of any advice, decision or opinion of the Attorney General of the State of Texas.

11.16 Force Majeure. If the party obligated to perform is prevented from performance by an act of war, order of legal authority, act of God, or other unavoidable cause not attributable to the fault or negligence of said party, the other party shall grant such party relief from the performance of this Agreement. The burden of proof for the need of such relief shall rest upon the party obligated to perform. To obtain release based on force majeure, the party obligated to perform shall file a written request with the other party.

11.17 Equal Opportunity in Employment. The parties to this Agreement agree that during the performance of the services under this Agreement they will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The parties to this Agreement will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; termination; rates of pay or other forms of compensation, and selection for training, including apprenticeship.

11.18 Reports of Accidents. Within 24 hours after Contractor becomes aware of the occurrence of any accident or other event which results in, or might result in, injury to the person or property of any third person (other than an employee of the Contractor), whether or not it results from or involves any action or failure to act by the Contractor or any employee or agent of the Contractor and which arises in any manner from the performance of this Agreement, the Contractor shall send a written report of such accident or other event to the County, setting forth a full and concise statement of the facts pertaining thereto. The Contractor shall also immediately send the County a copy of any summons, subpoena,

notice, or other documents served upon the Contractor, its agents, employees, or representatives, or received by it or them, in connection with any matter before any court arising in any manner from the Contractor's performance of work under this Agreement.

11.19 Relationship of the Parties. Each party to this Agreement, in the performance of this Agreement, shall act in an individual capacity and not as agents, employees, partners, joint ventures or associates of one another. The employees or agents of one party shall not be deemed or construed to be the employees or agents of the other party for any purposes whatsoever.

11.20 Appropriation of Funds by Owner. Owner believes it has sufficient funds currently available and authorized for expenditure to finance the costs of this Agreement. Contractor understands and agrees that the Owner's payment of amounts under this Agreement is contingent on the Owner receiving appropriations or other expenditure authority sufficient to allow the Owner, in the exercise of reasonable administrative discretion, to continue to make payments under this Agreement.

11.21 Execution in Counterparts. This Agreement may be executed in counterparts, each of which, when executed and delivered, shall be deemed to be an original and all of which together shall constitute one and the same document.

11.22 Entire Agreement. This Agreement, which expressly includes Invitation for Bid #1601-048, Standard Terms & Conditions, and Contractor's Bid as if copied here in full, represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either oral or written. This Agreement may be amended only by written instrument signed by each party to this Agreement. NO OFFICIAL, EMPLOYEE, AGENT, OR REPRESENTATIVE OF THE OWNER HAS ANY AUTHORITY, EITHER EXPRESS OR IMPLIED, TO AMEND THIS AGREEMENT, EXCEPT PURSUANT TO SUCH EXPRESS AUTHORITY AS MAY BE GRANTED BY THE WILLIAMSON COUNTY COMMISSIONERS COURT.

BY SIGNING BELOW, the Parties have executed and bound themselves to this Agreement to be effective as of the date of the last party's execution hereof (Effective Date).

OWNER:	**CONTRACTOR:**
WILLIAMSON COUNTY, TEXAS, a political subdivision of the state of Texas	_____
By: _____	By: _____
Printed Name: _____	Printed Name: _____
Title: _____	Title: _____
Date: _____	Date: _____

Party Representatives

Owner's Designated Representative ("ODR"):	Contractor's Designated Representative:

_____
_____
_____
_____

Phone _____
Fax _____

_____
_____
_____
_____

Phone _____
Fax _____

BID AFFIDAVIT

This form must be completed, signed, notarized and returned with Bid package

The undersigned certifies that the IFB and the Bidder's Bid have been carefully reviewed and are submitted as correct and final. Bidder further certifies and agrees to furnish any and/or all goods and/or services upon which prices are extended at the price Bid, and upon the conditions contained in the IFB.

STATE OF _____ COUNTY OF _____

BEFORE ME, the undersigned authority, a Notary Public in and for the State of _____, on this

day personally appeared _____ (*Name of Signer*), who after being by me duly sworn, did depose and say:

"I, _____ (*Name of Signer*) am a duly authorized officer of/agent for

_____ (*Name of Respondent*) and have been duly authorized

to execute the foregoing on behalf of the said _____

(Name of Respondent).

I hereby certify that the foregoing Bid has not been prepared in collusion with any other Bidder or other person or persons engaged in the same line of business prior to the official opening of this Bid. Further, I certify that the Bidder is not now, nor has been for the past six (6) months, directly or indirectly concerned in any pool or agreement or combination, to control the price of services/commodities Bid on, or to influence any person or persons to submit a Bid or not to submit a Bid thereon."

Name and Address of Respondent:

_____

Fax: _____ Telephone #: _____

By: _____ Printed Name: _____

Title:

_____

SUBSCRIBED AND SWORN to before me by the above-named _____

_____ on this the _____ day of _____, 20_____

_____

Notary Public in and for

The State of _____

Question and Answers for Bid #1601-048 - Break Room Remodel for Williamson County Justice Center

Overall Bid Questions
There are no questions associated with this bid.