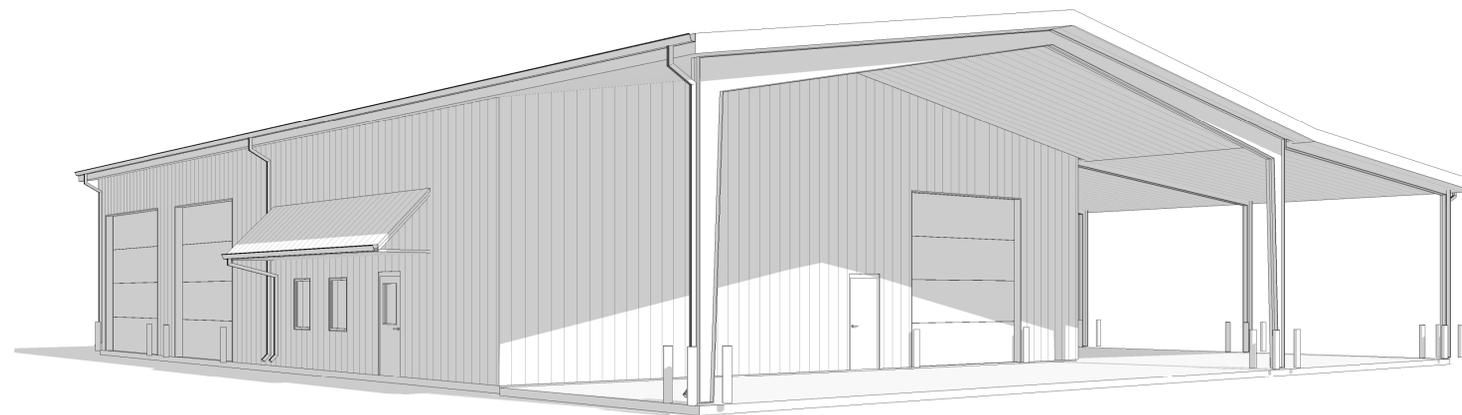


CONTRACT DOCUMENTS  
FOR THE

# HILL COUNTY MAINTENANCE BARN

901 FM 308  
PENELOPE, TEXAS



VICINITY MAP



**OWNER**

HILL COUNTY  
CONTACT: JUDGE JUSTIN LEWIS  
PO BOX 457  
HILLSBORO, TX 76645

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MRB GROUP  
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**ARCHITECT**

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BELTON, TX 76513  
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CSTEWART@CENTEXENG.COM

**DRAWING INDEX**

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T1	NOTES, SYMBOLS, & ABBREVIATIONS
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A1.01	FIRST FLOOR PLAN
A1.02	RCP PLAN / PARTITION TYPES
A2.01	ROOF PLAN
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**MRB** | *group*

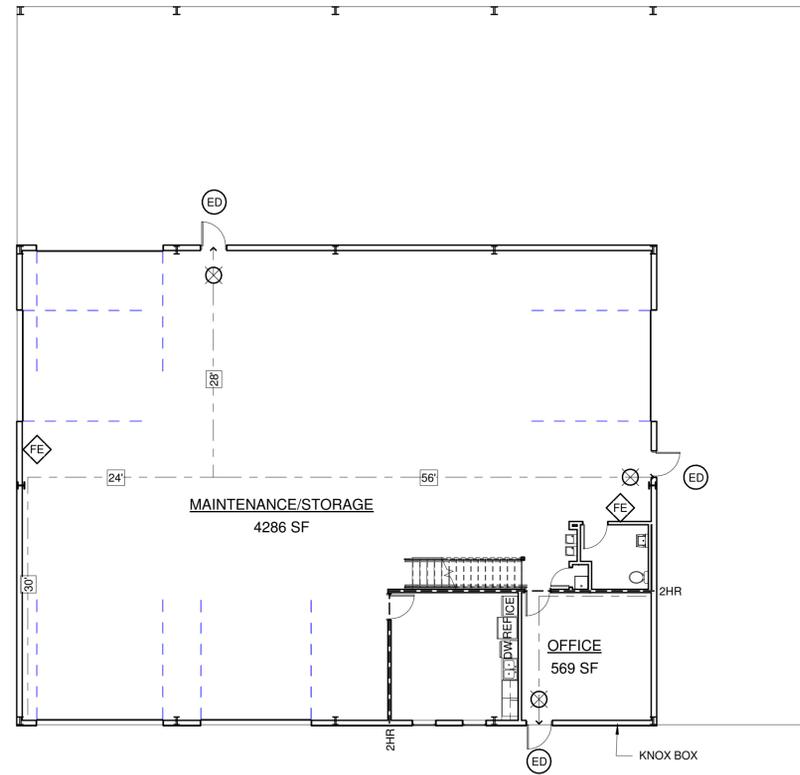
Engineering, Architecture, Surveying, D.P.C.

The Culver Road Armory, 145 Culver Road, Suite 160, Rochester, New York 14620  
Phone: 585-381-9250  
5250 South 31st Street, Temple, Texas 76502  
Phone: 254-771-2054  
[www.mrbgroup.com](http://www.mrbgroup.com)

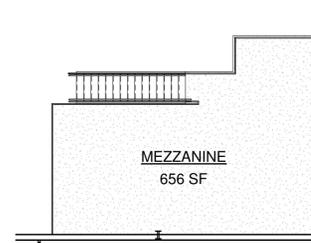
**PROJECT# 0843.20002**  
**JUNE 2020**



## LIFE SAFETY PLAN



④ FLOOR PLAN  
3/32" = 1'-0"



① MEZZANINE  
3/32" = 1'-0"

## 2018 INTERNATIONAL BUILDING CODE LIFE SAFETY SUMMARY

ITEM:	PROVIDED:	ALLOWABLE/ REQUIRED:	NOTES:
OCCUPANCY	B-BUSINESS / S-2 STORAGE		
TOTAL BLDG AREA (SF)	4,855		PER 2018 IBC SECTION 202 BUILDING AREA INCLUDES "AREAS OF THE BUILDING NOT PROVIDED WITHIN THE SURROUNDING WALLS...IF SUCH AREAS ARE INCLUDED WITHIN THE HORIZONTAL PROJECTION OF THE ROOF OR FLOOR ABOVE". EXCLUDES MEZZANINE PER 505.2
CONSTRUCTION TYPE:	IIA		PER 2015 IBC TABLE 601: NON COMBUSTIBLE/UPROTECTED
MAINTENANCE AREA (OCCUPANTS/FLOOR AREA)	4,286 / 9	UNLIMITED / 1/500	PER TABLE 506.2 PER 2018 IBC 1004.1.2
BUSINESS (OCCUPANTS/FLOOR AREA)	569 / 6	UNLIMITED / 1/100	
TOTAL OCCUPANTS	14		B+S1 COMBINED
EXITS (MAIN LEVEL)	2		PER 1006.3.1 THE MINIMUM NUMBER OF EXITS PER STORY FOR OCCUPANT LOADS UP TO 500 IS 2 EXITS.
TRAVEL DISTANCE (MAIN LEVEL)	110' MAX.	200'	PER 1017.2
EGRESS WIDTH FOR EGRESS COMPONENTS OTHER THAN STAIRWAYS (INCHES)	44"	5.60	PER 1005.3.2: THE CAPACITY, IN INCHES, OF MEANS OF EGRESS COMPONENTS OTHER THAN STAIRWAYS SHALL BE CALCULATED BY MULTIPLYING THE OCCUPANT LOAD SERVED BY SUCH COMPONENT BY A FACTOR OF (0.2) INCHES PER OCCUPANT.
COMMON PATH OF TRAVEL	54' MAX.	75'	PER TABLE 1006.2.1
DEAD END CORRIDORS	NA	20'	PER 1020.4: WHERE MORE THAN ONE EXIT OR EXIT ACCESS DOORWAY IS REQUIRED, THE EXIT ACCESS SHALL BE ARRANGED SUCH THAT THERE ARE NO DEAD END CORRIDORS MORE THAN 20 FEET IN LENGTH.
WATER CLOSETS	1	1	PER 2902.1
LAVATORIES	1	1	PER 2902.1
DRINKING FOUNTAINS	2 (H/LO)	1	PER 2902.1
AUTOMATIC SPRINKLER SYSTEM	NO	NO	PER 903.2.9 - NUMBER 4: S1 FIRE AREAS THAT STORE COMMERCIAL TRUCKS OR BUSES AND EXCEED 5,000 SF REQUIRE AN AUTOMATIC SPRINKLER SYSTEM
FIRE BARRIERS: REQUIRED SEPARATION BETWEEN ADJACENT OCCUPANCIES	YES - 2 HOUR	YES - 2 HOUR	PER TABLE 508.4: A 1 HOUR SEPARATION IS REQUIRED BETWEEN A & B OCCUPANCIES PROVIDED AN AUTOMATIC SPRINKLER SYSTEM IS INSTALLED. THIS INCREASES TO A 2 HOUR SEPARATION WITHOUT A SPRINKLER SYSTEM

No.	Revisions and Descriptions	By	Date

Project: **HILL COUNTY MAINTENANCE BARN**  
**901 FM 308**  
**PENELOPE, TEXAS 76676**

Drawing Title: **LIFE SAFETY PLAN**

Drawn By: **CNC**  
 Checked By: **TR**  
 Scale: **3/32" = 1'-0"**  
 Date: **06/15/2020**

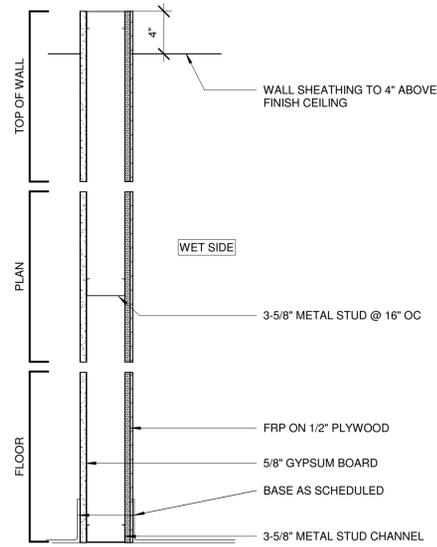


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 5250 South 31st Street, Temple, Texas 76788 Phone: 254-771-2054  
 Corporate Office: The Collier Road, Suite 100, Rochester, New York 14620  
 TRITE Firm Number: F-11015  
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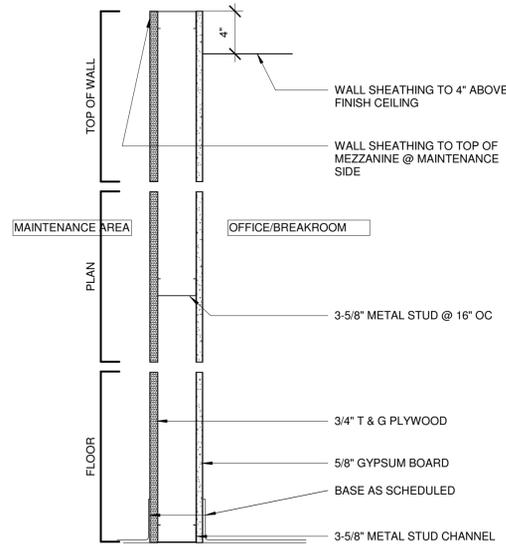
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 of **0843.20002**

Project No. **0843.20002**

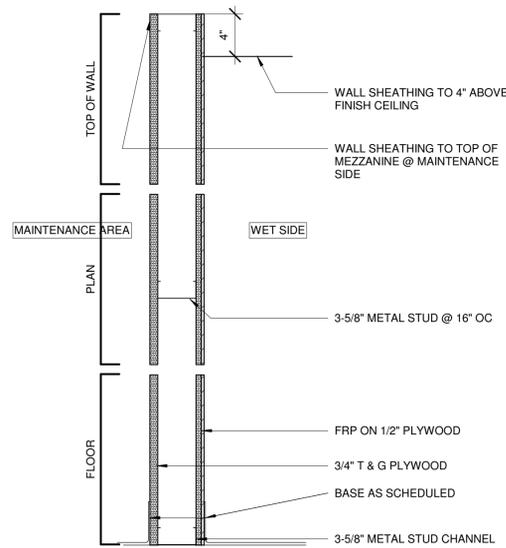




4 WALL TYPE 2  
1 1/2" = 1'-0"



3 WALL TYPE 1  
1 1/2" = 1'-0"

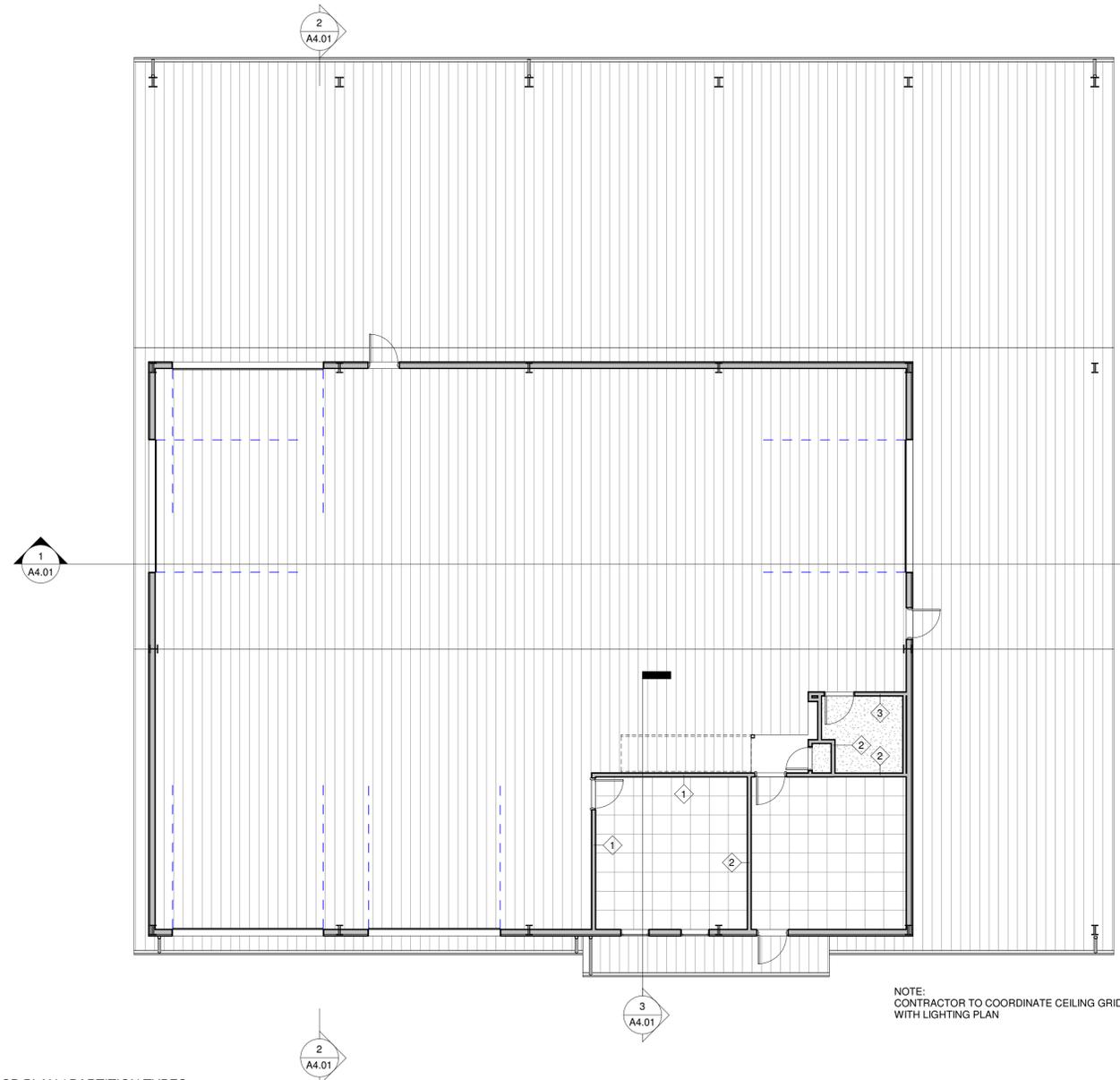


5 WALL TYPE 3  
1 1/2" = 1'-0"

- 2' x 2' ACOUSTIC CEILING TILE
- GYP. BD.
- EXPOSED STRUCTURE

Wall Schedule		
Type Mark	Width	Type Comments
1	5"	STANDARD WALL - 5/8" GYPSUM BOARD (1) SIDE AND 3/4" T & G PLYWD (1) SIDE OF 3 5/8" METAL STUDS @ 16" OC
2	4 7/8"	WET WALL - 5/8" GYPSUM BOARD (1) SIDE AND FRP ON 1/2" PLYWD ON (1) WET SIDE OF 3 5/8" METAL STUDS @ 16" OC
3	5"	STANDARD WALL - FRP ON 1/2" PLYWD (1) WET SIDE AND 3/4" T & G PLYWD (1) SIDE OF 3 5/8" METAL STUDS @ 16" OC

2 RCP LEGEND  
1/8" = 1'-0"



NOTE:  
CONTRACTOR TO COORDINATE CEILING GRID  
WITH LIGHTING PLAN

1 RCP PLAN / PARTITION TYPES  
1/8" = 1'-0"

No.	Revisions and Descriptions	By	Date

Project: **HILL COUNTY MAINTENANCE BARN**  
**901 FM 308**  
**PENELOPE, TEXAS 76676**  
 Drawing Title: **RCP PLAN / PARTITION TYPES**

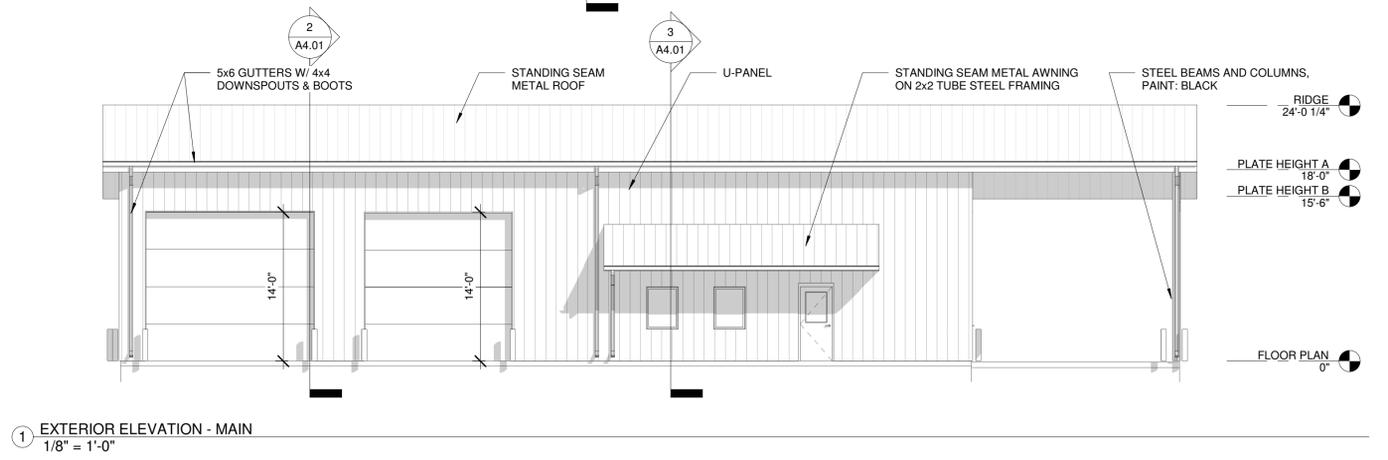
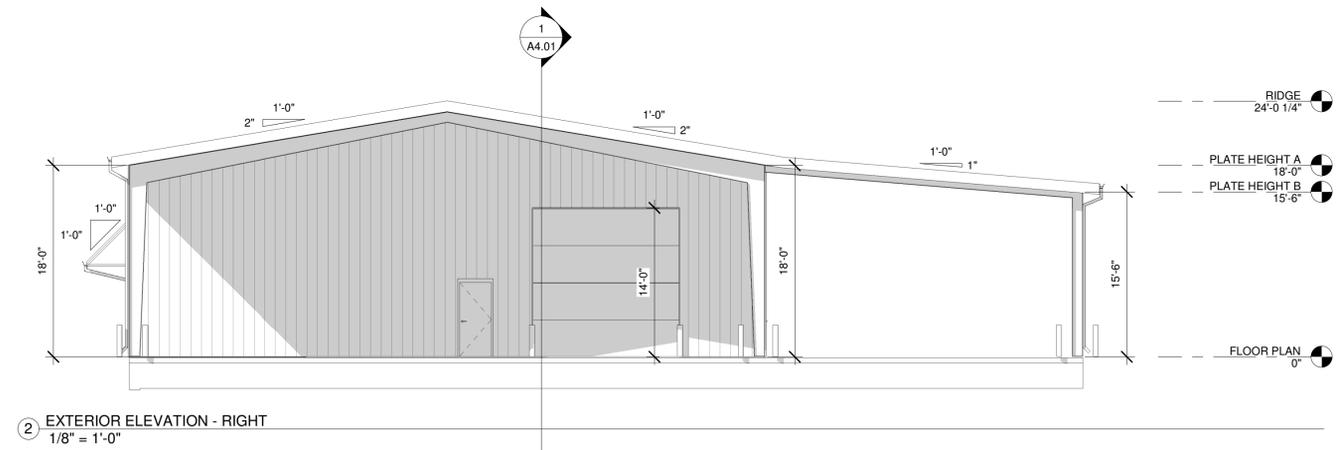
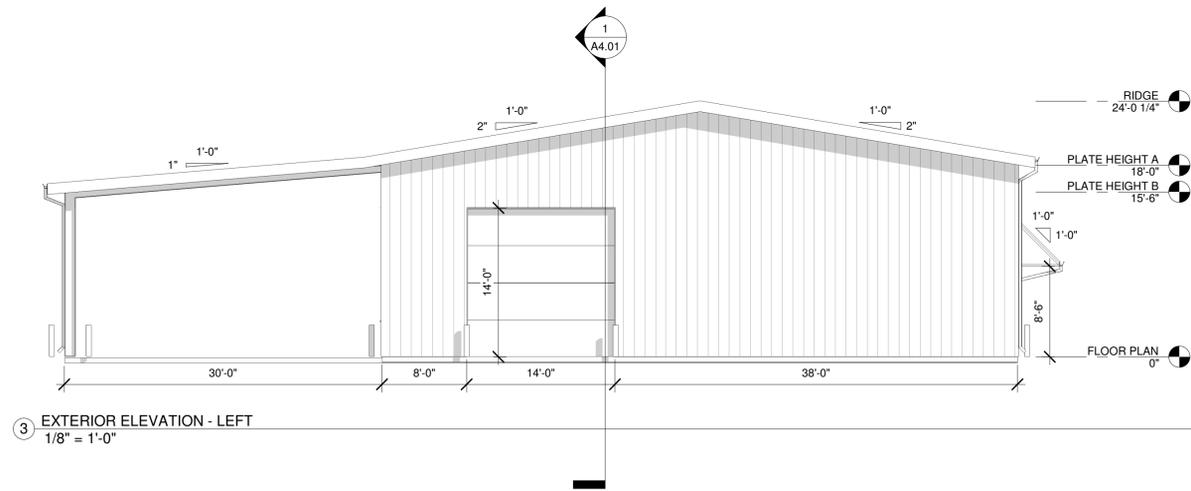
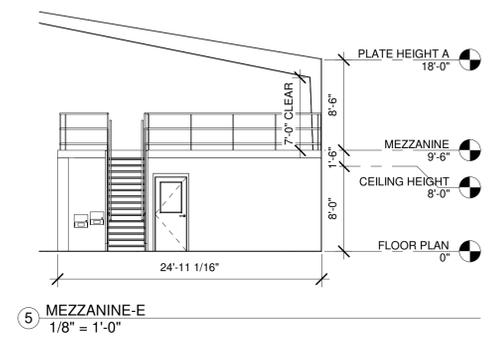
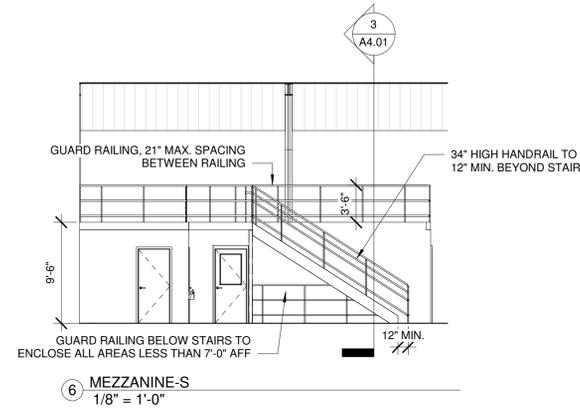
Drawn By: **CNC**  
 Checked By: **TR**  
 Scale: **As indicated**  
 Date: **06/16/2020**



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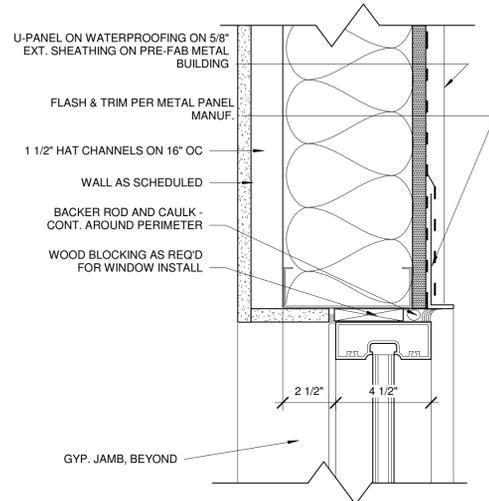
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 of   
 Project No. **0843.20002**



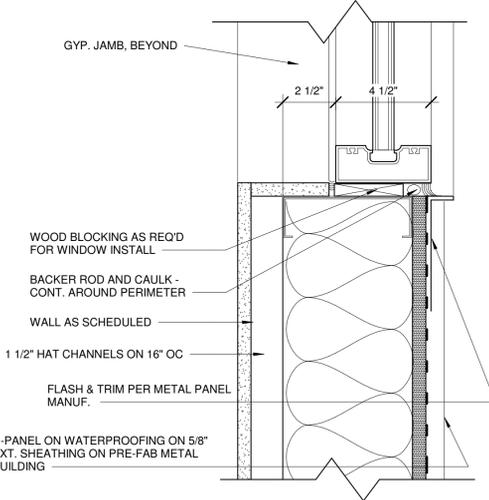


Project: <b>HILL COUNTY MAINTENANCE BARN</b> 901 FM 308 PENELOPE, TEXAS 76676		Drawing Title: <b>BUILDING ELEVATIONS</b>	By Date
Drawn By: CMC	Checked By: TR		
Scale: 1/8" = 1'-0"		Date: 06/16/2020	
		<b>MRB group</b> Engineering, Architecture & Surveying 5250 South 31st Street, Temple, Texas 76762 Phone: 254-771-2054 Corporate Office: The Collier Road, Jimmy's, 45 Collier Road, Suite 100, Rochester, New York 14620 TBPTE Firm Number: F-110615 www.mrbgroup.com	
		Sheet No. <b>A3.01</b>	Project No. <b>0843.20002</b>

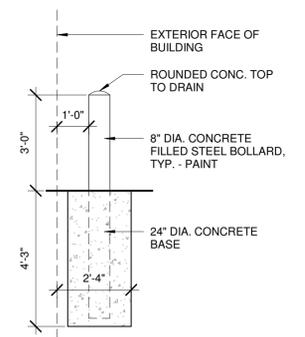




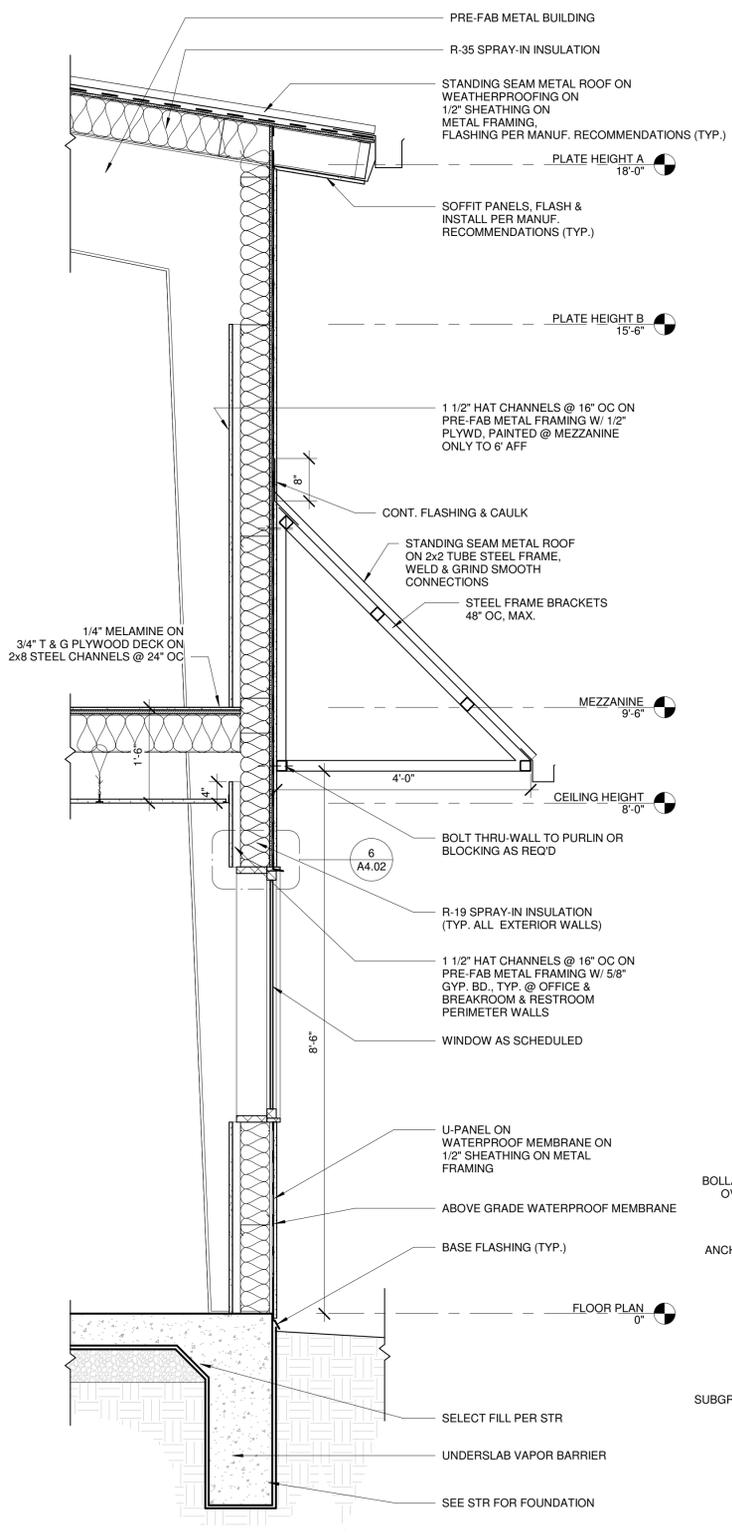
6 HEADER/JAMB @ METAL PANEL  
3" = 1'-0"



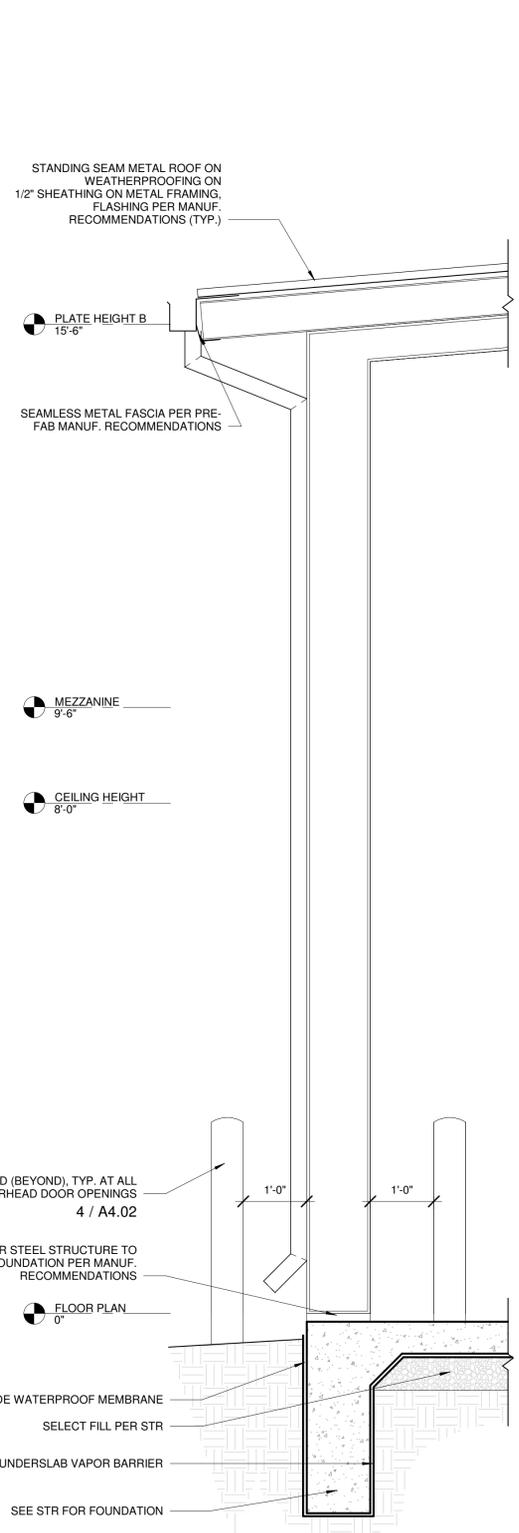
5 SILL @ METAL PANEL  
3" = 1'-0"



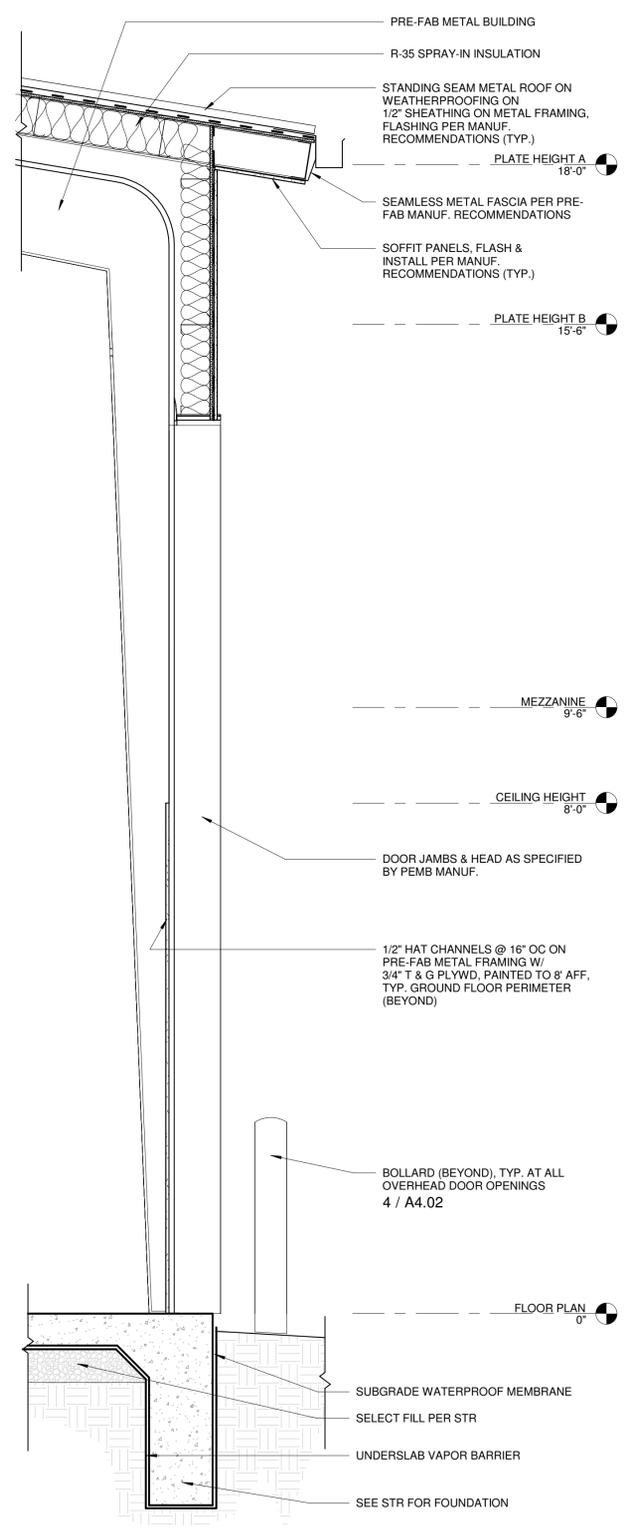
4 BOLLARD, TYP.  
3/8" = 1'-0"



3 BUILDING SECTION @ MEZZANINE - Callout 1  
3/4" = 1'-0"



2 BUILDING SECTION (TRANSVERSE) - Callout 2  
3/4" = 1'-0"



1 BUILDING SECTION (TRANSVERSE) - Callout 1  
3/4" = 1'-0"

No.	Revisions and Descriptions	By	Date

Project: **HILL COUNTY MAINTENANCE BARN**  
**901 FM 308**  
**PENELOPE, TEXAS 76676**  
 Drawing Title: **WALL SECTIONS**

Drawn By: CMC  
 Checked By: TR  
 Scale: As indicated  
 Date: 06/16/2020



**MRB group**  
 Engineering, Architecture & Surveying  
 5250 South 31st Street, Temple, Texas 76702 Phone: 254-771-2054  
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Sheet No. **A4.02**  
 of \_\_\_\_\_  
 Project No. **0843.20002**

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## HARDWARE SCHEDULE

HW 1	EXTERIOR/UNCONDITIONED SINGLE EGRESS:		
1-1/2 PR HINGES	1279 - 4-1/2 x 4-1/2	HA	
1 PULL	1191G-3	TR	
1 PANIC	33A-L-06	VD	
1 CYLINDER	C953 - ICC/7	FA	
1 CLOSER	P1461 - TB	LCN	
1 BRACKET	1460-18PA	LCN	
1 STOP	1214ES - 2-1/4"	TR	
1 THRESHOLD	425	NGP	
1 SWEEP	102V	NGP	
1 SEAL		BY DOOR SUPPLIER	
HW 2	OFFICE SET:		
1-1/2 PR HINGES	1279 - 4-1/2 x 4-1/2	HA	
1 ENTRY LOCK	B501 DAN	FA	
1 CLOSER	C953 - ICC/7	FA	
1 STOP	1211 \ 1270	TR	
1 THRESHOLD	425	NGP	
1 SWEEP	102V	NGP	
1 SEAL		BY DOOR SUPPLIER	
3 SILENCER	GJ64	GJ	
HW 3	UNI-SEX PRIVACY:		
1-1/2 PR HINGES	1279 - 4-1/2 x 4-1/2	HA	
1 PRIVACY LOCK	B301 DAN	FA	
1 CLOSER	C953 - ICC/7	FA	
1 STOP	1211 \ 1270	TR	
1 THRESHOLD	425	NGP	
1 SWEEP	102V	NGP	
1 SEAL		BY DOOR SUPPLIER	
3 SILENCER	GJ64	GJ	
DOUBLE COAT HOOK	734S-S	ASJ	
HW 4	STORAGE:		
1-1/2 PR HINGES	1279 - 4-1/2 x 4-1/2	HA	
1 ENTRY LOCK	B501 DAN	FA	
1 STOP	1211 \ 1270	TR	
1 THRESHOLD	425	NGP	
1 SWEEP	102V	NGP	
1 SEAL		BY DOOR SUPPLIER	
3 SILENCER	GJ64	GJ	

**MANUFACTURERS LISTING:**

SEL	SELECT HINGE
HA	HAGER HINGE
VD	VON DUPRIN
FA	FALCON LOCK
A/R	ADAMS-RITE
DO	DORMA
LCN	LCN
NGP	NATIONAL GUARD PRODUCTS
TR	TRIMCO MFG
GJ	GLYNN-JOHNSON

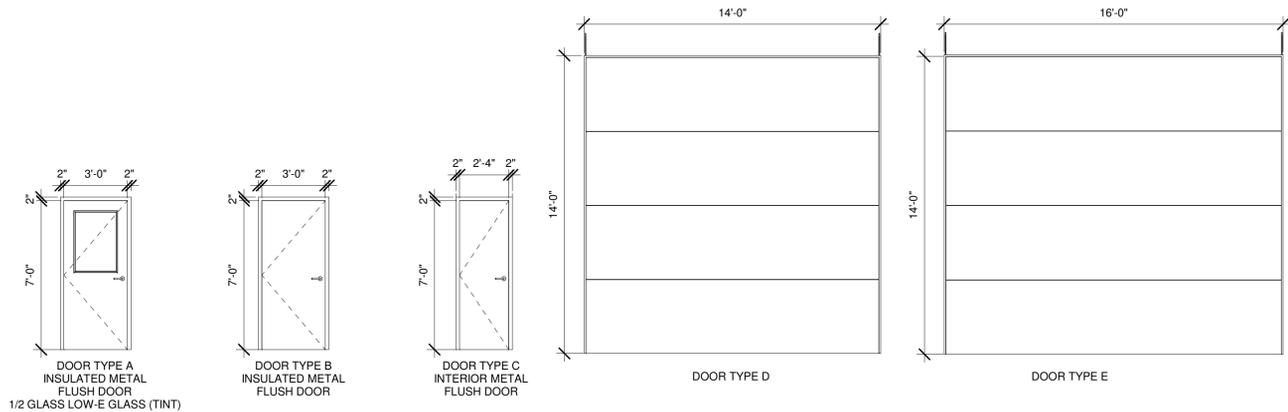
**HARDWARE NOTES:**

- ALL HARDWARE FINISHES TO BE 626/US26D.
- FINAL HARDWARE SCHEDULE TO BE REVIEWED AND APPROVED BY OWNER AND OWNER'S SECURITY VENDOR PRIOR TO ORDERING DEVICES.
- ALL LOCKSETS SUPPLIED FOR INTERIOR AND EXTERIOR DOORS SHALL BE KEYED TO MASTER KEY.

Door Schedule									
Mark	Type	Description	Finish	Type Mark	Frame Material	Hardware	Fire Rating	Comments	
101A	36" x 84" HM	HM		B	HM	1			
101B	168" x 168"			D	HM			PER DOOR MANUF.	
101C	36" x 84" HM	HM		B	HM	1			
101D	192" x 168"			E	HM			PER DOOR MANUF.	
101E	168" x 168"			D	HM			PER DOOR MANUF.	
101F	192" x 168"			E	HM			PER DOOR MANUF.	
101G	168" x 168"			D	HM			PER DOOR MANUF.	
102A	36" x 84" HM	HM		A	HM	1			
102B	36" x 84"	HM		A	HM	2			
103	36" x 84"	HM		A	HM	2			
104	36" x 84"	HM		B	HM	3			
105	28" x 84"	HM		C	HM	4			

## DOOR & FRAME SPECIFICATIONS

- ALL HOLLOW METAL DOORS TO BE INSULATED.
- ALL DOORS TO BE: INTERIOR - 20 GA. / EXTERIOR - 18 GA.
- FRAMES TO BE: INTERIOR - 18 GA. / EXTERIOR - 16 GA.



DOOR TYPES  
1/4" = 1'-0"

## WINDOW SPECIFICATIONS

FRAME: TUBELITE 14000 SERIES FLUSH GLAZE OR EQUAL, CLEAR ANODIZED  
GLAZING: SOLARBAN 60 ON SOLAR GRAY 6MM / AIR 1/2" / CLEAR 6MM (U-VALUE .29) OR EQUAL

Window Schedule				
Type Mark	Type	Count	Head Height	Comments
A	36" x 48"	2	7'-0"	

No.	Revisions and Descriptions	By	Date

Project Title: **HILL COUNTY MAINTENANCE BARN**  
**901 FM 308**  
**PENELOPE, TEXAS 76676**  
 Drawing Title: **DOOR & WINDOW TYPES AND SCHEDULES**

Drawn By: CJC  
 Checked By: TR  
 Scale: As indicated  
 Date: 06/16/2020



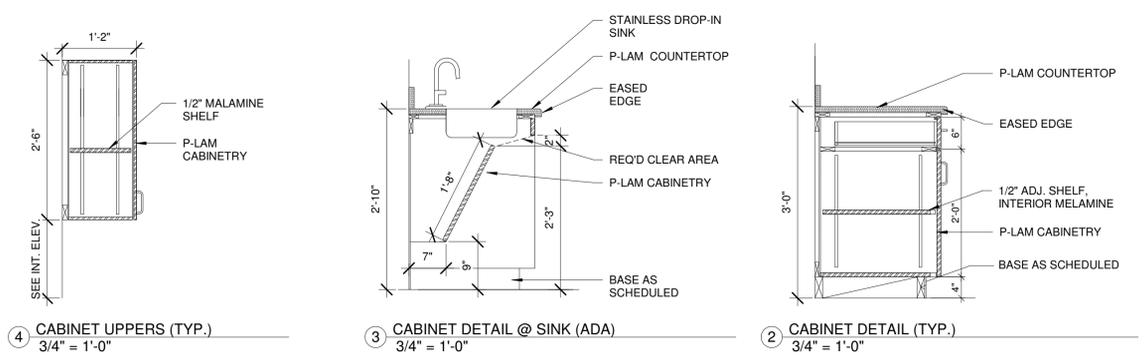
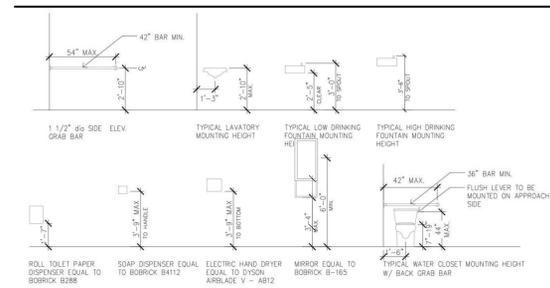
**MRB group**  
 Engineering, Architecture & Surveying  
 5250 South 31st Street, Temple, Texas 76768 Phone: 254-771-2054  
 Corporate Office: The Collier Road, Suite 160, Rochester, New York 14620  
 TYPE Firm Number: F-10053  
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Sheet No. **A6.01**  
 Project No. **0843.20002**

## ACCESSORIES LEGEND

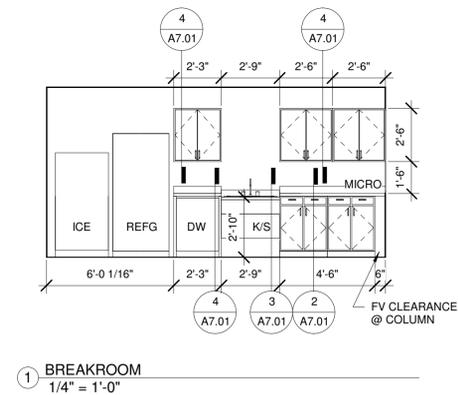
A1	PAPER TOWEL DISPENSER SURFACE/ROLL	INSTALL AT EACH RESTROOM LAVATORY AS SHOWN ON PLANS 1. MODEL NUMBER: BOBRICK B-2860
A2	TOILET TISSUE DISPENSER	EACH TOILET ROOM 1. MODEL NUMBER: BOBRICK B-2890
A6	SINK	PORCELAIN WALL-MOUNT RE: MEP
A7	SOAP DISPENSER	INSTALLED ADJACENT EACH SINK 1. MODEL NUMBER: BOBRICK B-2111
A8	MIRROR	INSTALLED OVER EACH WALL MOUNTED LAVATORY 1. DESCRIPTION: 24" WIDE X 36" HIGH. GALVANIZED, WELDED MITRED CORNERS. STEEL BACK WITH SLOTS FOR MOUNTING SCREWS AND INTEGRAL SCREW-HEAD LOCK. BACK PROTECTED BY SHOCK-ABSORBING WATER-RESISTANT PADDING 2. INSTALL MIRROR AT 3'-4" AFF TO REFLECTIVE SURFACE
A9	36" x 42" GRAB BAR	INSTALLED IN EACH ACCESSIBLE TOILET AS SHOWN ON PLANS 1. MODEL NUMBER: BOBRICK B-6806 2. DESCRIPTION: 1-1/2" OUTSIDE DIA. X PLAN LENGTH, HORIZONTAL, 1-1/2" WALL CLEARANCE. TYPE 304 MINIMUM 18 GA. STAINLESS STEEL. CONCEALED SCREW ATTACHED MOUNTING AND ANCHORAGE. NO.4 SATIN FINISH. MINIMUM 900 POUND SUPPORTING CAPACITY
A10	DOUBLE ROBE HOOK	EACH RESTROOM 1. MODEL NUMBER BOBRICK B-672

## TYPICAL MOUNTING HEIGHTS



## CABINETY SPECIFICATIONS

- CABINETY HARDWARE - 4" WIRE PULLS, TYP.



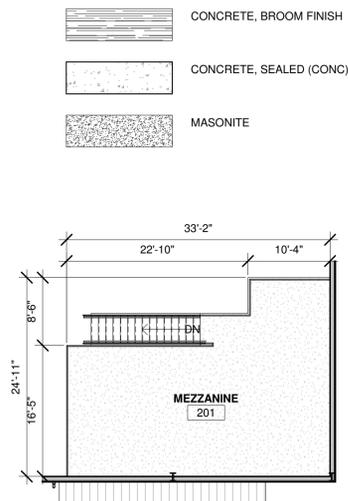
Project Title: <b>HILL COUNTY MAINTENANCE BARN 901 FM 308 PENELOPE, TEXAS 76676</b>		Drawing Title: <b>INTERIOR ELEVATIONS &amp; DETAILS</b>	
Drawn By: CNC	Checked By: TR	Scale: As indicated	Date: 06/16/2020
		No.:	By:
		Revisions and Descriptions	
		Engineering, Architecture & Surveying 5250 South 31st Street, Temple, Texas 76702 Phone: 254-771-2054 Corporate Office: The Collier Road, Suite 100, Rockster, New York 14620 TYPED FROM NUMBER: F-10015 www.mrbgroup.com	
Sheet No. <b>A7.01</b>		Project No. <b>0843.20002</b>	

Finish Material Legend					
CODE	MATERIAL	MANUF.	SIZE	STYLE/COLOR	COMMENTS
CONC-1	SEALED CONCRETE	-	-	-	PER MANUF. RECOMMENDATIONS
B-1	RUBBER BASE	ROPPE	4"	TBD	PER MANUF. RECOMMENDATIONS
PT-1	PAINT	SHERWIN-WILLIAMS	-	A100 SATIN LATEX 7038 TONY TAUPE	INTERIOR WALL PAINT
PT-2	PAINT	SHERWIN-WILLIAMS	-	A100	INTERIOR DOOR TRIM PAINT
PT-3	PAINT	SHERWIN-WILLIAMS	-	TBD	EXTERIOR STUCCO PAINT
PT-4	PAINT	SHERWIN-WILLIAMS	-	TBD	EXTERIOR TRIM PAINT
FRP-1	RESILIENT WALL PANELS	-	-	TBD	INSTALL OVER 1/2" PLYWOOD PER MANUF. RECOMMENDATIONS
PLAM-1	PLATIC LAMINATE	WILSONART	-	TBD	CABINETSRY (TYP.)
PLAM-1	PLASTIC LAMINATE	WILSONART	-	TBD	COUNTERTOPS (TYP.)

ALL MATERIALS TO BE OR EQUAL TO MANUFACTURER LISTED

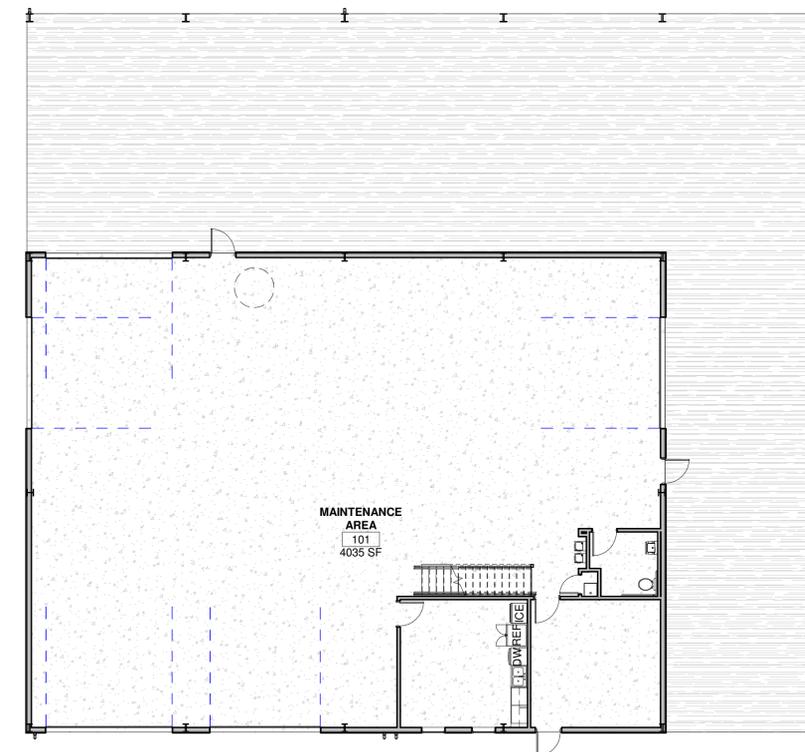
### FINISH SPECIFICATIONS

WALLS	ALL PAINTS TO BE SHERWIN WILLIAMS UNLESS OTHERWISE NOTED OR APPROVED EQUIVALENT  ALL INTERIOR GYP. BD. WALLS TO BE 5/8" TYPE 'X' GYPSUM BOARD, TEXTURED WITH A MEDIUM LEVEL ORANGE PEEL AND PAINTED WITH ONE COAT ULTRA SPEC 500 WALL PRIMER 534 (1.1 MILS) AND TWO COATS INTERIOR PAINT SATIN A100 (1.6 MILS)  WET WALLS TO BE RFP LAMINATED TO 1/2" PLY
CEILING	ACT - 2X2 ACOUSTIC TILE, ARMSTRONG OPTIMA LAY-IN TEGULAR (AT OFFICE AND BREAKROOM ONLY) - INSTALL PER MANUF. RECOMMENDATIONS  GYP. BD. - INTERIOR CEILING (AT RESTROOM ONLY) TO BE 5/8" TYPE 'X' GYPSUM BOARD, TEXTURED WITH A MEDIUM LEVEL ORANGE PEEL AND PAINTED WITH ONE COAT PREP RITE 200 LATEX WALL PRIMER B28W200 (1.1 MILS) AND TWO COATS REGAL INTERIOR PAINT PEARL 310 (1.6 MILS)
FLOORS	PROVIDE TRANSITIONS @ ALL CHANGES IN MATERIALS UNLESS OTHERWISE NOTED.  CONCRETE FLOORS INSIDE BUILDING TO BE CLEANED AND SEALED  MEZZANINE FLOORING TO BE 1/4" MELAMINE ON 3/4" T & G PLYWOOD
TRIM	HOLLOW METAL FRAMES TO BE PAINTED WITH SATIN WATER BASE ACRYLIC LATEX EQUIVALENT TO ONE COAT OF DTM ACRYLIC PRIMER/FINISH (2.5 MILS) AND TWO FINISH COATS DTM ACRYLIC 5-6 (3.0 MILS EA.).  BASE TO BE 4" RUBBER COVE BASE, INSTALLED PER MANUF. RECOMMENDATIONS, ROPPE OR EQUAL (AT OFFICE, BREAKROOM, & RESTROOM AREAS)
DOORS	ALL DOORS TO BE HOLLOW METAL, PAINTED
MILLWORK	P-LAM BASE CABINET AND DOORS WITH PVC EDGE BANDING AND MELAMIN INTERIORS, TYP.  ALL COUNTERTOPS TO BE P-LAM
SIGNAGE	ALL SIGNAGE TO BE ADA COMPLIANT. STANDARD SIGNAGE @ EACH RESTROOM
EXTERIOR	ANY EXPOSED STEEL OR CONDUIT ON BUILDING TO BE PAINTED.  PREFINISHED ITEMS TO BE PROTECTED AND CLEANED OF ANY PAINT OVERSPRAY



4 FLOOR PATTERN PLAN - MEZZANINE  
3/32" = 1'-0"

Room Finish Schedule									
No.	Room Name	Area	Base	Floor	Wall	Ceiling	Clg Ht	Millwork	Comments
101	MAINTENANCE AREA	4035 SF	B-1	CONC.	PT-1	-	8'-0"		1/2" PLYWD, PAINTED TO 8' @ PERIMETER WALLS
102	OFFICE	262 SF	B-1	CONC.	PT-1	ACT-1	8'-0"		
103	BREAKROOM	256 SF	B-1	CONC.	PT-1/FRP-1	ACT-1	8'-0"	PLAM-1	SEE INT. ELEVATIONS
104	UNI-SEX	64 SF	B-1	CONC.	PT-1	GB/PT-1	8'-0"		
105	JANI	6 SF	B-1	CONC.	PT-1	GB/PT-1	8'-0"		
201	MEZZANINE	4663 SF	B-1	MELA	PT-1	-	8'-0"		1/2" PLYWD TO 6' @ PERIMETER WALLS

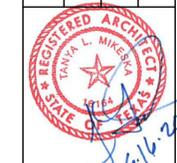


1 FLOOR PATTERN PLAN  
3/32" = 1'-0"

No.	Revisions and Descriptions	By	Date

Project: **HILL COUNTY MAINTENANCE BARN**  
**901 FM 308**  
**PENELOPE, TEXAS 76676**  
 Drawing Title: **FINISH PLAN & SCHEDULE**

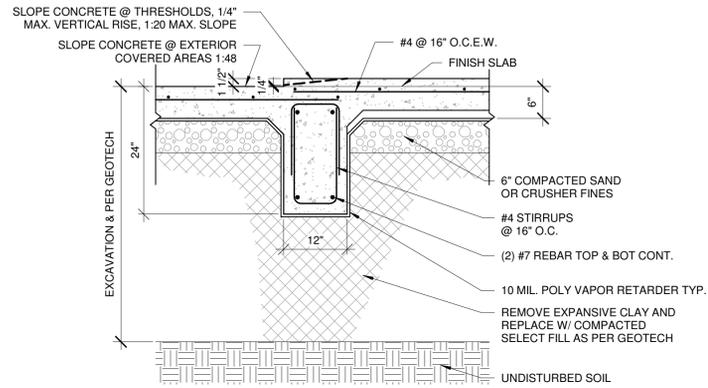
Drawn By: CMC  
 Checked By: TR  
 Scale: As indicated  
 Date: 06/16/2020



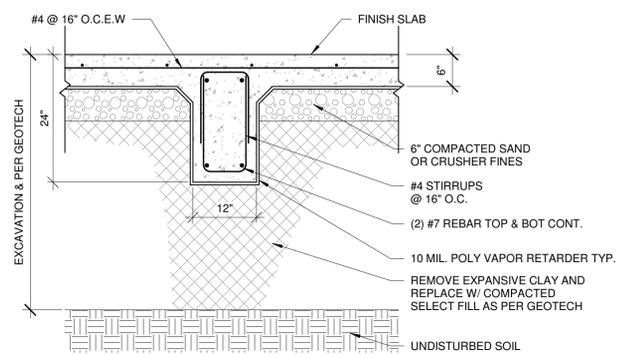
**MRB group**  
 Engineering, Architecture & Surveying  
 5250 South 31st Street, Temple, Texas 76702 Phone: 254-771-2054  
 Corporate Office: The Collier Road, Jimmy's, 45 Collier Road, Suite 100, Rochester, New York 14620  
 TRIPLE FIRM NUMBER: F-10063  
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 of  
 Project No. **0843.20002**

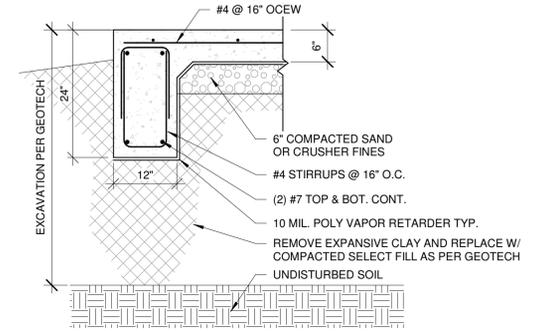




④ TYP. PERIMETER GRADE BEAM @ COVERED AREA  
3/4" = 1'-0"

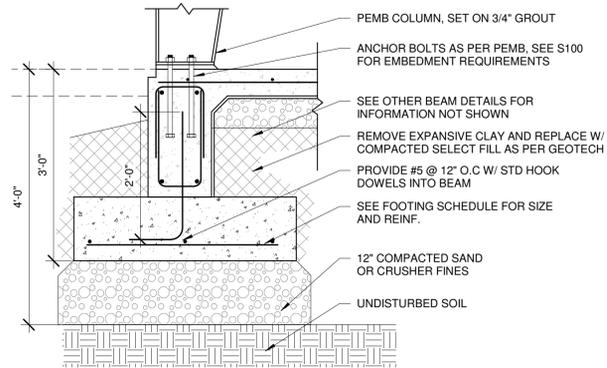


③ TYP. INTERIOR GRADE BEAM DETAIL  
3/4" = 1'-0"



② TYP. PERIMETER GRADE BEAM DETAIL  
3/4" = 1'-0"

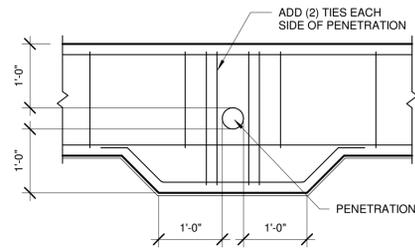
NOTES:  
1. 18" OF UPPER FILL OUTSIDE BUILDING PERIMETER SHALL CONSIST OF CLAY TO PREVENT MOISTURE FROM ENTERING THE SELECT FILL PAD.



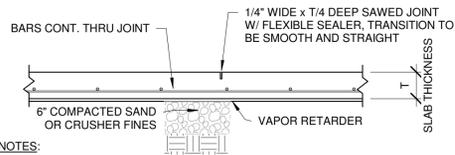
- NOTES:
- CENTER FOOTING BELOW COLUMN
  - B/O FOOTING TO BE MINIMUM 3'-0" BELOW TOP OF FINISHED SLAB

FOOTING SCHEDULE		
MARK	SIZE (LxWxH)	REINFORCING
F1	5'-0" x 5'-0" x 12"	(5) #5 BOT EA. WAY

⑤ TYP. FOOTING BELOW COLUMN  
3/4" = 1'-0"

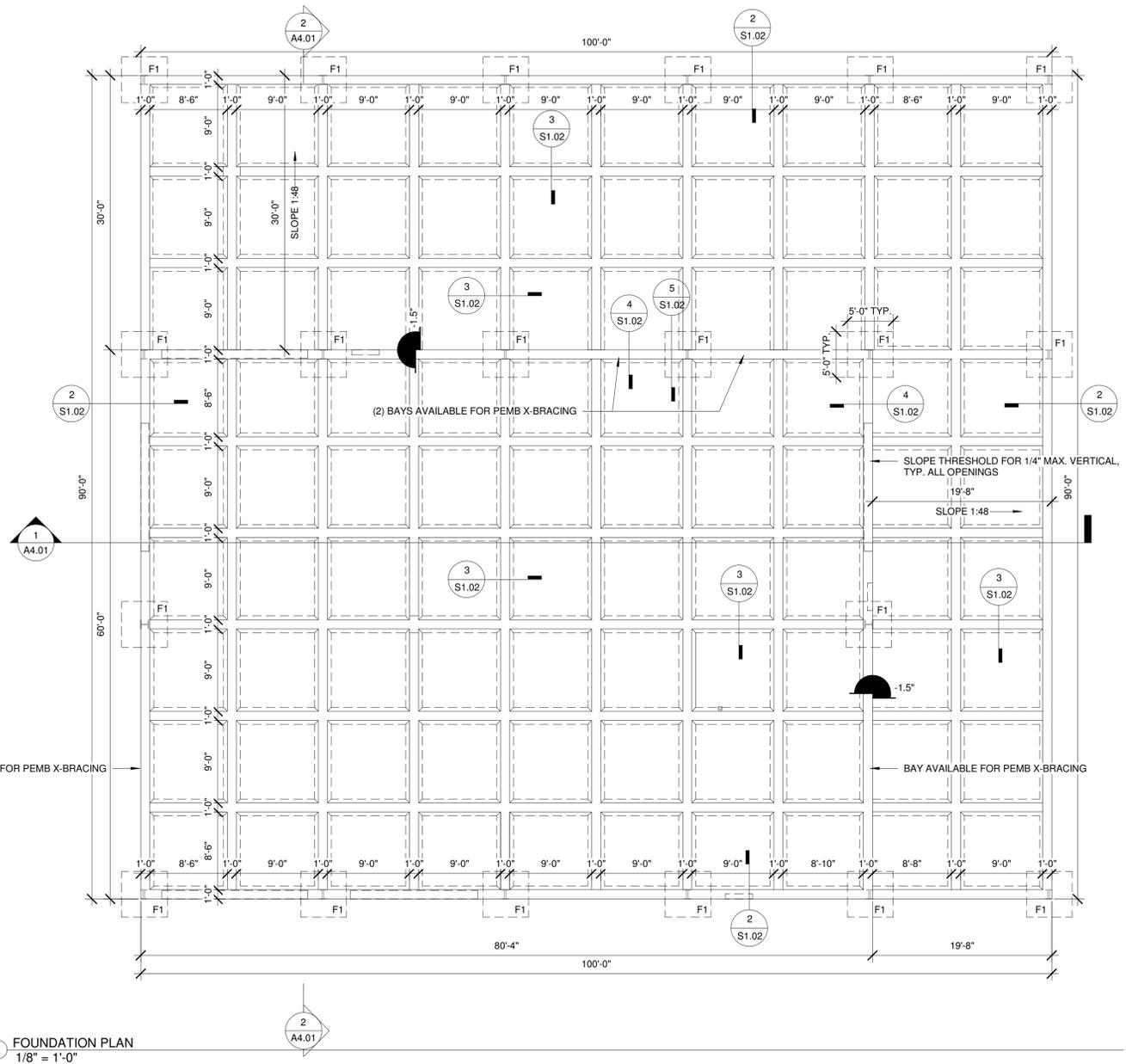


⑦ GRADE BEAM PENETRATION  
3/4" = 1'-0"



- NOTES:
- POUR BREAKS TO BE LOCATED AT MIDDLE OF SPANS
  - CONTRACTOR TO SUBMIT POUR BREAK LOCATIONS PRIOR TO CONSTRUCTION
  - CONTROL JOINTS @ 20' MAX. BETWEEN COLUMN BAYS, TYP.
  - SAW CUTTING SHALL BE PERFORMED WITHIN 6-12 HOURS AFTER FINISHING OR AS SOON AS THE CONCRETE WILL NOT RAVEL
  - SAWCUT JOINTS ARE PERMITTED USING A "SOFF-CUT" MACHINE OR EQUAL IMMEDIATELY AFTER FINISHING SLAB

⑧ SLAB ON GRADE CONTROL JOINT  
3/4" = 1'-0"



① FOUNDATION PLAN  
1/8" = 1'-0"

Project: **HILL COUNTY MAINTENANCE BARN**  
901 FM 308  
PENELOPE, TEXAS 76676

Drawn By: CMC  
Checked By: TR  
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Date: 06/16/2020

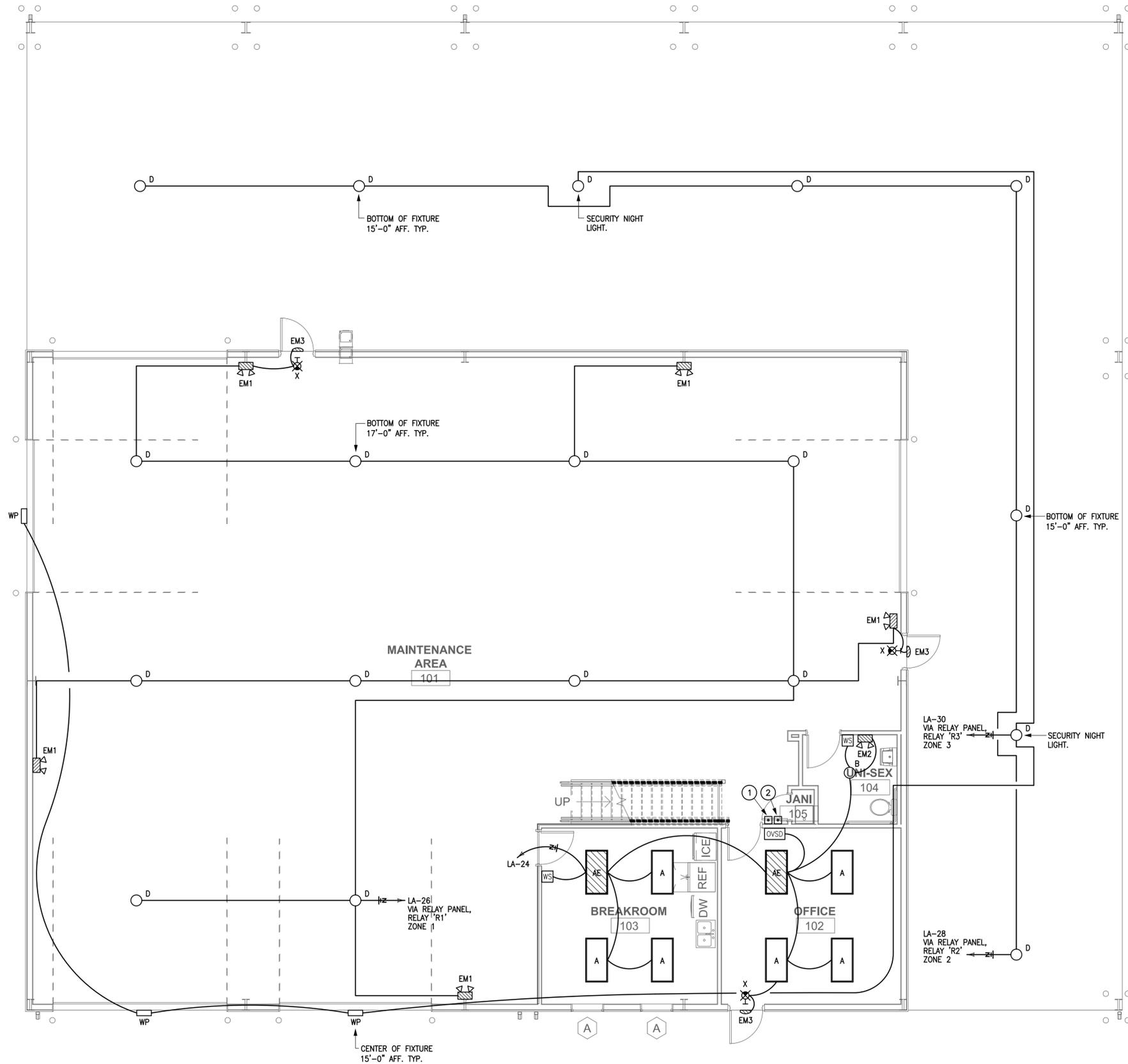
REGISTERED ARCHITECT  
TANYA L. MIKES  
STATE OF TEXAS

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Sheet No. **S1.02**  
Project No. **0843.20002**

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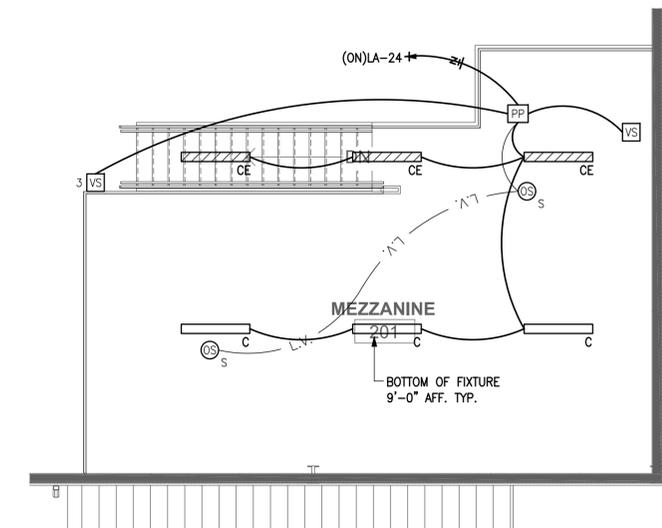
**1 ELECTRICAL LIGHTING PLAN - 1ST FLOOR**  
SCALE: 3/16" = 1'-0"

**ELECTRICAL GENERAL NOTES:**

1. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION AND MOUNTING HEIGHTS OF ALL LIGHTING FIXTURES.
2. EACH CONDUIT SHALL BE LIMITED TO (3) CIRCUITS MAXIMUM.
3. ALL LIGHTING BRANCH CIRCUIT CONDUITS SHALL CONTAIN A GROUND WIRE. USING THE CONDUIT SYSTEM AS THE ONLY GROUND PATH IS NOT ACCEPTABLE.
4. ELECTRICIAN OF RECORD, & BONDED PER DIVISION 0-"CONTRACT" SPECIFICATIONS, AND BE FAMILIAR & EXPERIENCED WITH SUCH WORK INDICATED HEREIN, & QUALIFIED BY MOST RECENT OSHA CERTIFICATION TO WORK ON ENERGIZED EQUIPMENT. REFER TO & COMPLY WITH OSHA 29CFR.1910 & 1926 ELECTRICAL SAFETY PORTIONS. CONSTRUCTION METHOD AND MEANS AND THEIR REQUIREMENTS. CONTRACTOR SHALL PROVIDE WORK WITHIN STANDARD OF CARE FOR PROFESSION.
5. REFER TO LIGHT FIXTURE SCHEDULE.
6. MOUNT ALL LIGHT SWITCHES AT +48" A.F.F. UNLESS OTHERWISE NOTED.
7. EMERGENCY LIGHTING UNITS & OR EXIT SIGNS SHALL BE CONNECTED TO UNSWITCHED LEG OF CIRCUIT INDICATED.
8. ALL ELECTRICAL WORK INCLUDED IN THIS PROJECT SHALL MEET THE REQUIREMENTS OF THE CURRENT NATIONAL ELECTRICAL CODE (N.E.C.).
9. ELECTRICAL CONTRACTOR SHALL FIRESTOP HIS OWN PENETRATIONS THROUGH RATED WALLS.

**ELECTRICAL KEYED NOTES:**

- ① 1 BUTTON ON/OFF LOW VOLTAGE SWITCH FOR OVERRIDE OF LIGHTING CIRCUIT ZONE 1.
- ② 1 BUTTON ON/OFF LOW VOLTAGE SWITCH FOR OVERRIDE OF LIGHTING CIRCUIT ZONE 2.

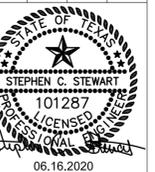


**2 ELECTRICAL LIGHTING PLAN - MEZZANINE**  
SCALE: 3/16" = 1'-0"

No.	Revisions and Descriptions	By	Date

Project Title: **HILL COUNTY MAINTENANCE BARN**  
**901 FM 308**  
**PENELOPE, TEXAS 76676**  
**100% REVIEW SET**  
 Drawing Title: **ELECTRICAL LIGHTING PLAN**

Drawn By: MP  
 Checked By: CS  
 Scale: SEE PLANS  
 Date: 06/16/2020

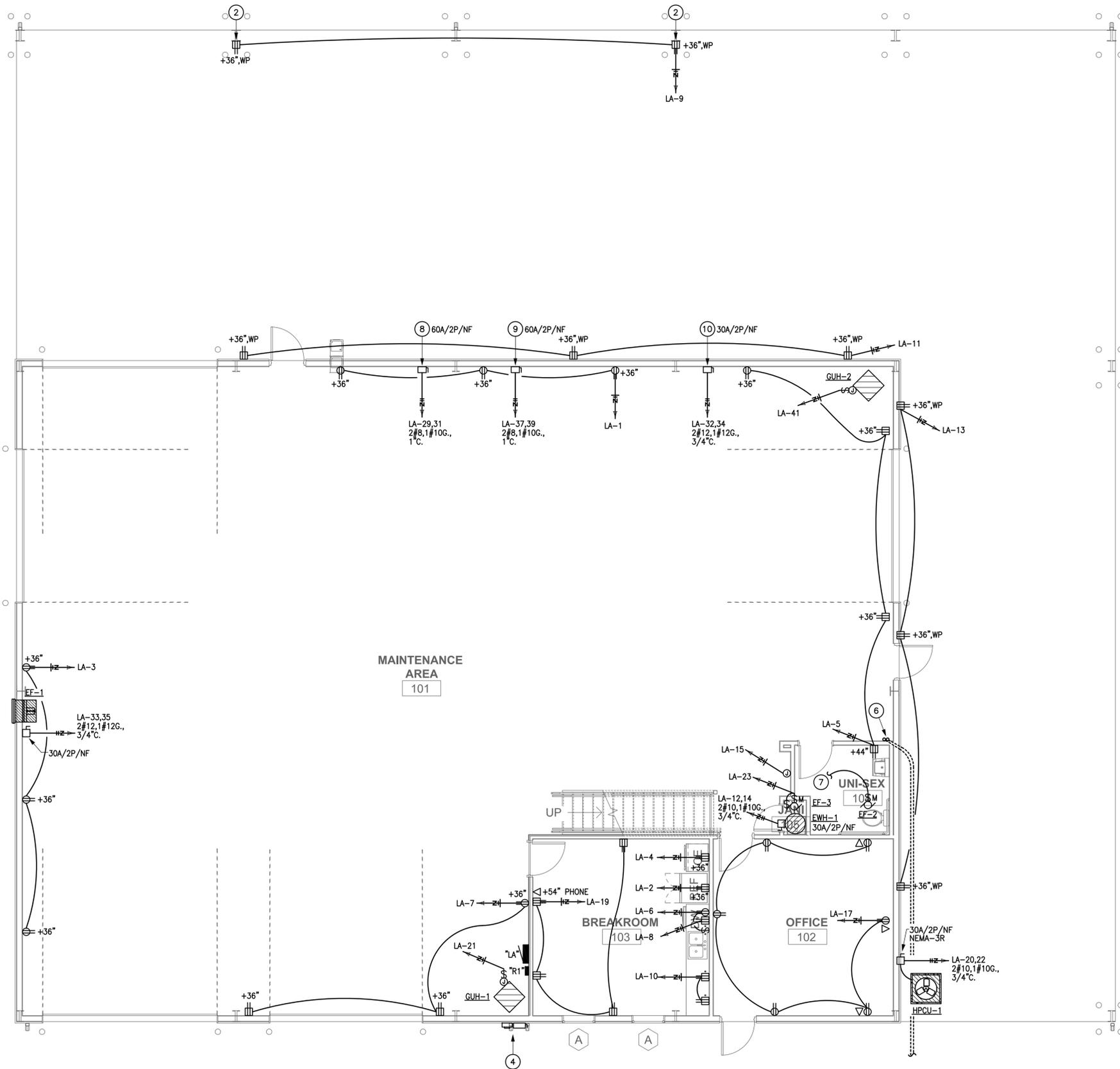


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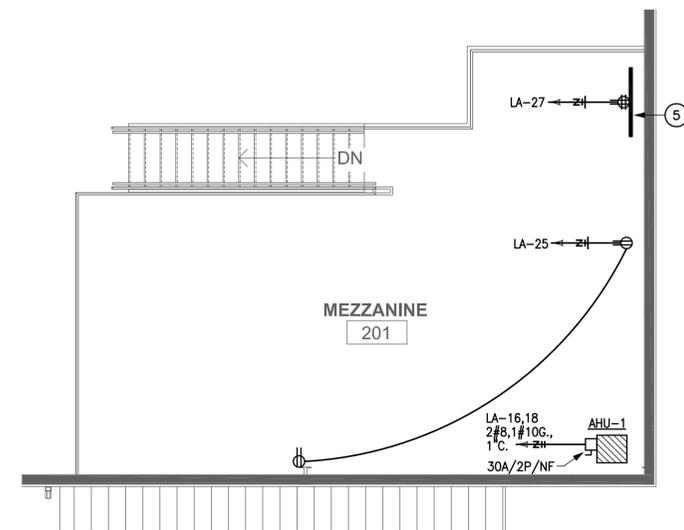
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 5250 South 31st Street, Temple, Texas 76705 Phone: 254-771-2054  
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 Phone: 585-581-9250  
 TBPE Firm Number: F-11615  
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Sheet No. **E101**  
 of \_\_\_\_\_  
 Project No. **0843.20002**

CEN-TEX ENGINEERING  
 Texas Reg. F-11794  
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 Temple, Texas 76501



**1 ELECTRICAL POWER PLAN - 1ST FLOOR**  
SCALE: 3/16" = 1'-0"



**2 ELECTRICAL POWER PLAN - MEZZANINE**  
SCALE: 3/16" = 1'-0"

**ELECTRICAL GENERAL NOTES:**

- REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION AND MOUNTING HEIGHTS OF ALL ELECTRICAL OUTLETS.
- REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION AND MOUNTING HEIGHTS OF ALL LIGHTING FIXTURES.
- NO MORE THAN THREE SINGLE PHASE CIRCUITS AND NO MORE THAN SIX CURRENT CARRYING CONDUCTORS SHALL BE INSTALLED IN A SINGLE RACEWAY. WHEN FOUR, FIVE, OR SIX CURRENT CARRYING CONDUCTORS ARE INSTALLED IN A SINGLE RACEWAY, THEIR CURRENT CARRYING CAPACITIES SHALL BE DERATED AS REQUIRED BY THE NEC FOR NON-DIVERSIFIED LOADS. THE INSTALLED WIRE SIZE SHALL HAVE A NOMINAL AMPACITY RATING OF 125% OF THAT REQUIRED OR SPECIFIED WHEN FOUR OR MORE CURRENT CARRYING CONDUCTORS ARE INSTALLED IN A SINGLE RACEWAY. NEUTRAL CONDUCTORS SHALL BE CONSIDERED A CURRENT CARRYING CONDUCTOR IN ALL NON-LINEAR LOADED CIRCUITS AS REQUIRED BY THE NEC.
- EXTEND 1" C. WITH PULL-WIRE FROM TELE./DATA OUTLET BOX TO ABOVE CEILING.
- VERIFY MOUNTING HEIGHTS OF RECEPTACLES WITH CASEWORK ELEVATIONS PRIOR TO ROUGH-IN. REFER TO ARCHITECTURAL DRAWINGS FOR ROOM ELEVATIONS FOR LOCATION AND COORDINATION OF ELECTRICAL OUTLETS. AT KNEESPACE LOCATIONS, LOCATE ELECTRICAL OUTLETS WITHIN KNEESPACE, UNLESS NOTED OTHERWISE. AT COUNTERS WITH OUT KNEESPACE, LOCATE OUTLETS HORIZONTALLY 6" ABOVE BACK SPLASH, UNLESS NOTED OTHERWISE.
- ALL RECEPTACLE, AND EQUIPMENT BRANCH CIRCUIT CONDUITS SHALL CONTAIN A GROUND WIRE. USING THE CONDUIT SYSTEM AS THE ONLY GROUND PATH IS NOT ACCEPTABLE.
- ELECTRICIAN OF RECORD, & BONDED PER DIVISION 0-"CONTRACT" SPECIFICATIONS, AND BE FAMILIAR & EXPERIENCED WITH SUCH WORK INDICATED HEREIN, & QUALIFIED BY MOST RECENT OSHA CERTIFICATION TO WORK ON ENERGIZED EQUIPMENT. REFER TO & COMPLY WITH OSHA 29CFR.1910 & 1926 ELECTRICAL SAFETY PORTIONS. CONSTRUCTION METHOD AND MEANS AND THEIR REQUIREMENTS. CONTRACTOR SHALL PROVIDE WORK WITHIN STANDARD OF CARE FOR PROFESSION.
- MOUNT ALL RECEPTACLES AT +18" A.F.F. UNLESS OTHERWISE NOTED.
- ALL ELECTRICAL WORK INCLUDED IN THIS PROJECT SHALL MEET THE REQUIREMENTS OF THE LATEST NATIONAL ELECTRICAL CODE (N.E.C.).

**ELECTRICAL KEYED NOTES:**

- MOUNT J-BOX WITHIN THE CONFINEMENTS OF DRINKING FOUNTAIN CABINET. PROVIDE G.F.C.I. BREAKER. COORDINATE EXACT REQUIREMENTS WITH DRINKING FOUNTAIN MANUFACTURER'S RECOMMENDATIONS.
- WEATHERPROOF WHILE IN USE TYPE RECEPTACLES.
- EXHAUST FAN TO BE INTERLOCKED WITH LIGHTS IN THIS ROOM.
- APPROXIMATE LOCATION OF NEW ELECTRICAL SERVICE EQUIPMENT. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY SITE CONDITIONS AND CERTIFY A CODE COMPLIANT SYSTEM. REFER TO SHEET E301 FOR ONE-LINE DIAGRAM.
- 36" WIDE" X 48" TALL X 3/4" THICK PLYWOOD TELEPHONE TERMINAL BOARD.
- (2) 3" CONDUIT FOR TELEPHONE/COMMUNICATIONS. RISE UP TO MEZZANINE LEVEL AT TELEPHONE BOARD. COORDINATE EXACT SITE ROUTING WITH LOCAL TELEPHONE COMPANY.
- EXHAUST FAN SHALL TIE IN WITH LIGHTING CIRCUIT WITHIN THIS ROOM.
- VERIFY LOCATION AND EXACT ELECTRICAL REQUIREMENTS OF AIR COMPRESSOR WITH OWNER PRIOR TO CONSTRUCTION.
- VERIFY LOCATION AND EXACT ELECTRICAL REQUIREMENTS OF WELDER WITH OWNER PRIOR TO CONSTRUCTION.
- VERIFY LOCATION AND EXACT ELECTRICAL REQUIREMENTS OF PRESSURE WASHER WITH OWNER PRIOR TO CONSTRUCTION.

Project Title: **HILL COUNTY MAINTENANCE BARN**  
901 FM 308  
PENELOPE, TEXAS 76676  
100% REVIEW SET  
**ELECTRICAL POWER PLAN**

Drawn By: MP  
Checked By: CS  
Scale: SEE PLANS  
Date: 06/16/2020



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Corporate Office: The Calver Road, Suite 100, Rochester, New York 14620  
Phone: 585-581-0250  
TBE Firm Number: F-10615  
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**NOTE TO CONTRACTOR FOR COORDINATION WITH LOCAL ELECTRIC UTILITY COMPANY DESIGN STANDARDS:**

- ALTHOUGH THE ENGINEER HAS MADE EVERY EFFORT TO VERIFY & COORDINATE THE PROJECT SITE UTILITIES, THE SITE UTILITY SERVICE LOCATIONS ARE NOT NECESSARILY FINAL AND ARE SUBJECT TO REVISIONS PER REVIEW BY THE RESPECTIVE UTILITY COMPANIES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN APPROVALS FROM, AND COORDINATE WITH THE LOCAL UTILITY COMPANY TERMS & CONDITIONS PACKAGE, TO PROVIDE UTILITY SERVICE TO THE PROJECT. CONTRACTOR SHALL BASE HIS BID ON CONFORMANCE TO ALL UTILITY REQUIREMENTS AND SPECIFICATIONS DRAWINGS & NOTES.
- CONTRACTOR SHALL CONTACT LOCAL ELECTRIC UTILITY COMPANY IMMEDIATELY UPON AWARD OF CONTRACT. CONTRACTOR SHALL COORDINATE ALL UTILITIES AND THEIR REQUIREMENTS, ROUTING, METERING, AND DISCONNECTING MEANS PRIOR TO INSTALLATION OF ANY CONDUITS OR PIPING AS ESTABLISHED ELECTRICAL SERVICE DESIGN STANDARDS MAY HAVE CHANGED DURING THE DESIGN PHASE OF THIS PROJECT TO WHEN THE ACTUAL CONSTRUCTION PHASE STARTS.

### ELECTRICAL LOAD ANALYSIS

LOAD DESCRIPTION 120/240V., 1Ø - 3W	LOAD KVA	LOAD (FULL LOAD AMPS)		
		AØ	BØ	NEUT
LIGHTING CONNECTED LOAD = 2.7 KVA AT 1.25% = 0.4	3.3	13.7	13.7	33.7
RECEPTACLES - FIRST 10 KW OF 5.94 KVA AT 100% = N/A	5.94	24.7	24.7	24.7
REMAINDER KVA AT 50% (N.E.C. 220-13) = N/A	-	-	-	-
HVAC: AIR HANDLING UNITS AT 100% =	7.4	30.8	30.8	-
AIR COOLED CONDENSING UNITS AT 100% =	4.1	17.0	17.0	-
EXHAUST FANS AT 100% =	0.9	3.7	3.7	3.7
GAS FIRED UNIT HEATERS AT 100% =	3.7	15.4	15.4	15.4
PLUMBING EQUIPMENT AT 100% =	4.5	18.7	18.7	-
SHOP EQUIPMENT: AIR COMPRESSOR AT 100% =	2.1	8.7	8.7	-
WELDER AT 100% =	4.5	18.7	18.7	-
PRESSURE WASHER AT 100% =	1.8	7.5	7.5	-
MISCELLANEOUS AT 100% =	5.1	21.2	21.2	21.2
TOTAL ESTIMATED CONNECTED LOAD =	39.64	180.1	180.1	98.7
SERVICE PROVIDED =	0.9	200.0	200.0	200.0
ELECTRICAL SERVICE SIZE = 200 AMPS AT 240V., 1Ø, - 3W				

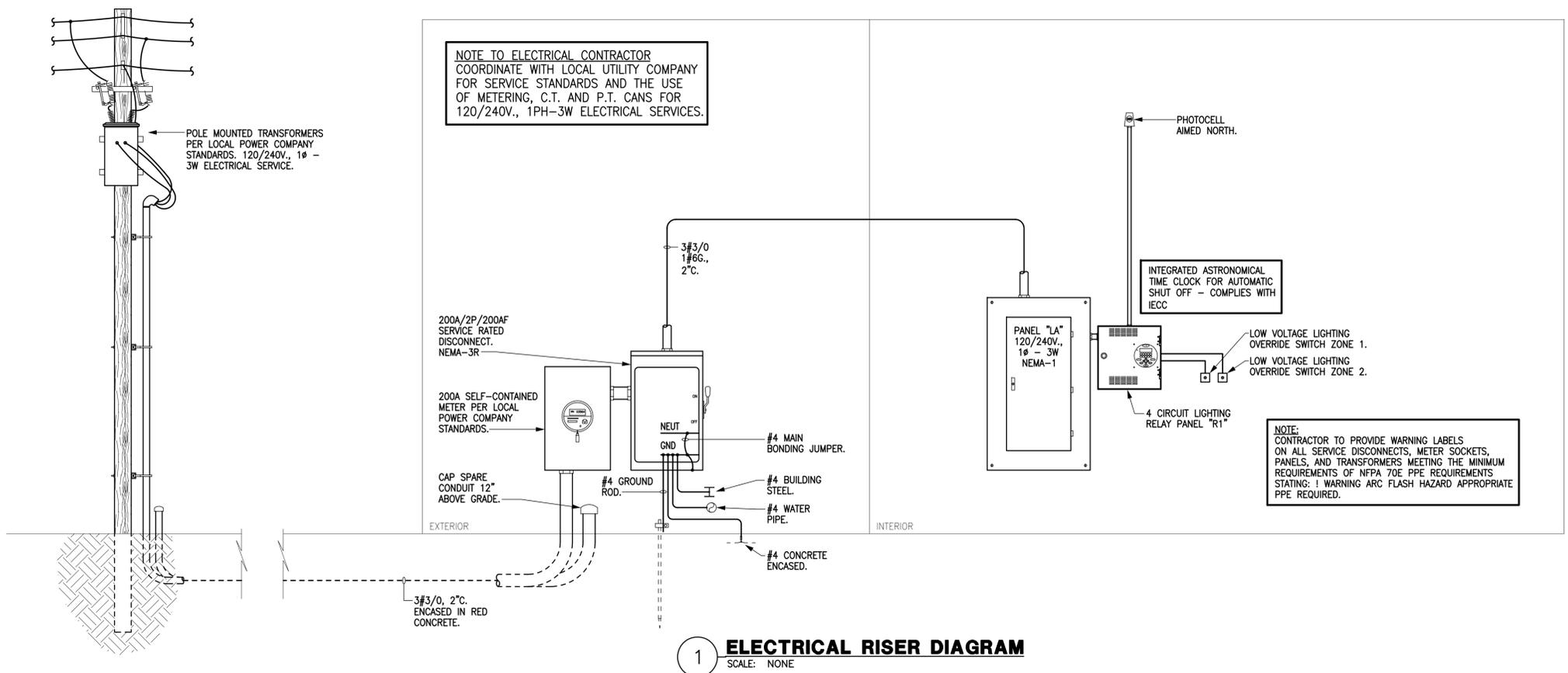
### PANEL 'LA'

LOCATION: TENANT SUITE

LOAD	WIRE SIZE	LTG	KVA	RCP	MISC	BKR	C <sub>K</sub>	PHASES			C <sub>K</sub>	BKR	MISC	KVA	RCP	LTG	WIRE SIZE	LOAD
								A	B	C								
RECEPTACLES	#12	0.54	20/1	1						2	20/1	0.8				#12	REFRIGERATOR	
RECEPTACLES	#12	0.54	20/1	3						4	20/1	0.8				#12	ICE MACHINE	
RECEPTACLES	#12	0.72	20/1	5						6	20/1	0.4				#12	DISH WASHER	
RECEPTACLES	#12	0.54	20/1	7						8	20/1	1.4				#12	REC'S ABV CTR BRK ROOM	
RECEPTACLES	#12	0.36	20/1	9						10	20/1	1.4				#12	REC'S ABV CTR BRK ROOM	
RECEPTACLES	#12	0.54	20/1	11						12	30/2	4.5				#10	WATER HEATER	
RECEPTACLES	#12	0.54	20/1	13						14	-	-				-	-	
EDF	#12	-	0.5	20/1	15					16	35/2	7.4				#8	AHU-1	
RECEPTACLES	#12	1.08	20/1	17						18	-	-				-	-	
RECEPTACLES	#12	0.72	20/1	19						20	30/2	4.1				#10	HPCU-1	
GAS UNIT HTR CTLS	#12	-	1.6	20/1	21					22	-	-				-	-	
EX. FAN	#12	0.1	20/1	23						24	20/1	-				0.7	#12	LIGHTING
RECEPTACLES	#12	0.36	20/1	25						26	20/1	-				1.0	#12	LIGHTING INTERIOR ZONE 1
TELE TERM BOARD	#12	-	0.2	20/1	27					28	20/1	-				1.0	#12	LIGHTING EXTERIOR ZONE 2
AIR COMPRESSOR	#8	-	2.1	40/2	29					30	20/1	-				0.2	#12	LIGHTING EXTERIOR ZONE 3
--	-	-	-	-	31					32	20/2	1.8				#12	PRESSURE WASHER	
EF-1	#12	-	0.8	20/2	33					34	-	-				-	-	
--	-	-	-	-	35					36	20/1	-				-	-	
WELDER	#8	-	4.5	50/2	37					38	20/1	-				-	-	
--	-	-	-	-	39					40	20/1	-				-	-	
GAS UNIT HTR CTLS	#12	-	1.6	20/1	41					42	20/1	-				-	-	
SUBTOTAL													22.6	-	2.7			

CONN. LTG. 2.7 x 1.25 = 3.3 KVA    CONN. HVAC. 11.6 x 1.0 = 11.6 KVA    CONN. MISC./EQUIP. 22.5 x 1.0 = 22.5 KVA  
 XFMR LOAD - x 1.0 = - KVA    CONN. RECEPT. 5.94 x NEC = 5.94 KVA    TOTAL LOAD = 43.34 KVA    180.5 AMPS

- NOTES:
- PROVIDE AND INSTALL "HACR" RATED BREAKER.
  - ROUTE THROUGH RELAY PANEL, VIA RELAY 'R1'. CIRCUIT ON/OFF INTERNAL TIMECLOCK.
  - ROUTE THROUGH RELAY PANEL, VIA RELAY 'R2'. CIRCUIT ON PHOTOCELL AND OFF INTERNAL TIMECLOCK.
  - ROUTE THROUGH RELAY PANEL, VIA RELAY 'R3'. CIRCUIT ON PHOTOCELL AND OFF.



**1 ELECTRICAL RISER DIAGRAM**  
 SCALE: NONE

Project Title: **HILL COUNTY MAINTENANCE BARN**  
 901 FM 308  
 PENELOPE, TEXAS 76676  
 100% REVIEW SET

Project No. \_\_\_\_\_  
 Date \_\_\_\_\_

Drawn By: MP  
 Checked By: CS  
 Scale: SEE PLANS  
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Professional Engineer Seal: **STEPHEN C. STEWART**, License No. 101287, State of Texas, Mechanical Engineering.

Sheet No. **E301**  
 of \_\_\_\_\_  
 Project No. **0843.20002**

CEN-TEX ENGINEERING  
 Texas Reg. F-11794  
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 Temple, Texas 76701

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SYMBOL LEGEND	
SYMBOL	DESCRIPTION (DISREGARD ITEMS NOT SHOWN ON PLANS)
<b>LIGHTING (LETTER DENOTES TYPE - SEE LIGHT FIXTURE SCHEDULE)</b>	
	LED FIXTURE
	LED FIXTURE ON EMERGENCY CIRCUIT
	DOWNLIGHT FIXTURE
	LIGHT FIXTURE - WALL MOUNTED
	DOWNLIGHT FIXTURE ON EMERGENCY CIRCUIT
	LIGHT FIXTURE - WALL MOUNTED ON EMERGENCY CIRCUIT
	EXIT LIGHT-CEILING MTD WITH DIRECTIONAL ARROWS AS REQUIRED
	EXIT LIGHT-WALL MTD WITH DIRECTIONAL ARROWS AS REQUIRED
	EMERGENCY LIGHTING UNIT EQUIPMENT
<b>SWITCHES</b>	
	DUAL-LEVEL SWITCH, INBOARD/OUTBOARD.
	SINGLE POLE SWITCH
	2-POLE SWITCH
	3-WAY SWITCH
	KEYED SWITCH
	WALL DIMMER SWITCH, SIZE AND TYPE AS REQUIRED
	SWITCH WITH PILOT LIGHT
	MOMENTARY CONTACT SWITCH
	TIME SWITCH
<b>RECEPTACLES AND OUTLETS</b>	
	SIMPLEX RECEPTACLE
	DUPLEX RECEPTACLE
	125/250 VOLT, 1 PHASE, 3-WIRE, 20 AMPS UNLESS NOTED OTHERWISE
	DOUBLE DUPLEX IN 2-GANG BOX WITH SINGLE COVER PLATE
	DOUBLE DUPLEX ISOLATED GROUND IN 2-GANG BOX WITH SINGLE COVER PLATE
	ISOLATED GROUND DUPLEX RECEPTACLE
	ISOLATED GROUND SIMPLEX RECEPTACLE
	250 VOLT, 1 PHASE, SPECIAL PURPOSE OUTLET, 20 AMPS UNLESS NOTED OTHERWISE
	JUNCTION BOX
	FLUSH FLOOR DUPLEX RECEPTACLE OUTLET
	DUPLEX GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE
	DOUBLE DUPLEX GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE IN 2-GANG BOX WITH SINGLE COVER PLATE
	FLUSH FLOOR JUNCTION BOX
	TELEVISION OUTLET SINGLE GANG OUTLET BOX W/EMPTY 3/4" C. TO ACCESSIBLE AREA ABOVE CEILING
	TWO CHANNEL POWER/DATA, NON-METALLIC SURFACE RACEWAY, LENGTH AS REQUIRED
<b>COMMUNICATION AND FIRE ALARM EQUIPMENT</b>	
	SINGLE GANG OUTLET BOX W/EMPTY 3/4" C. TO ACCESSIBLE AREA ABOVE CEILING
	TRANSFORMER FOR DOOR BELL/BUZZER
	CHIME/BUZZER
	FIRE ALARM REMOTE ANNUNCIATOR (RECESSED MOUNTED)
<b>MOTOR CONTROLLERS AND EQUIPMENT</b>	
	MOTOR, MAKE FINAL MOTOR CONNECTION
	3-PHASE MOTOR, MAKE FINAL MOTOR CONNECTION
	DISCONNECT SWITCH AS REQUIRED
	COMBINATION MOTOR STARTER/DISCONNECT SWITCH AS REQUIRED
	MOTOR STARTER
	MOTOR CONTROLLER PUSH BUTTON CONTROL, P=PILOT LIGHT
	MANUAL MOTOR SWITCH AS REQUIRED
	PREWIRED DEVICE, MAKE ELECTRICAL FINAL CONNECTIONS
	VARIABLE FREQUENCY DRIVE MOTOR CONTROLLER FURNISHED BY DIVISION 15 AND INSTALLED BY DIVISION 16
<b>ELECTRICAL EQUIPMENT</b>	
	277/480 VOLT DISTRIBUTION OR PANELBOARD
	120/208 VOLT PANELBOARD
	TELEPHONE CABINET
	PLYWOOD TELEPHONE BACKBOARD
	DRY TYPE TRANSFORMER
<b>CIRCUITING</b>	
	CONDUIT
	CONDUIT BELOW FLOOR, SLAB, OR GRADE
	3/4" C. UNLESS OTHERWISE NOTED; LONG HATCH, NEUTRAL; SHORT HATCH, PHASE; "Z" HATCH, INSULATED GROUND. NO HATCHES INDICATES 2 CONDUCTORS. ARROW INDICATES HOMERUN.
	PARTIAL ELECTRICAL HOME RUN
<b>SUBSCRIPTS AND ABBREVIATIONS</b>	
WP	INDICATES WEATHERPROOF
WG	INDICATES WIREGUARD
NL	LIGHT FIXTURE ON NIGHT LIGHT CIRCUIT
.	NEXT TO ANY SYMBOL INDICATES FINAL ROUGH-IN FIELD COORDINATION BY CONTRACTOR WITH ARCHITECTURAL MILLWORK DRAWINGS AND OTHER TRADES

- GENERAL NOTES:**
- ALL EXTERIOR BUILDING ELECTRICAL EQUIPMENT TO BE WEATHERPROOF NEMA-3R MINIMUM.
  - DISREGARD ANY SYMBOLS THAT ARE NOT USED ON PLANS.

LIGHTING CONTROLS LEGEND	
SYMBOL	DESCRIPTION
	WALL MOUNTED OCCUPANCY/VACANCY SENSOR WITH PASSIVE INFRARED/MICROPHONICS DUAL TECHNOLOGY DETECTION, AUTO "OFF" AND MANUAL "ON". MOUNT TO CENTER OF BOX AT +48" A.F.F.
	WALL MOUNTED OCCUPANCY/VACANCY SENSOR WITH PASSIVE INFRARED/MICROPHONICS DUAL TECHNOLOGY DETECTION, AUTO "OFF", MANUAL "ON" AND DIMMING. MOUNT TO CENTER OF BOX AT +48" A.F.F.
	WALL MOUNTED OCCUPANCY SENSOR WITH PASSIVE INFRARED/MICROPHONICS DUAL TECHNOLOGY DETECTION AND AUTO "ON/OFF". MOUNT TO CENTER OF BOX AT +48" A.F.F.
	WALL MOUNTED VACANCY SWITCH WALL POD WITH MANUAL "ON". MOUNT TO CENTER OF BOX AT +48" A.F.F.
	WALL MOUNTED VACANCY 3-WAY SWITCH WALL POD WITH MANUAL "ON". MOUNT TO CENTER OF BOX AT +48" A.F.F.
	WALL MOUNTED VACANCY 2-BUTTON SWITCH WALL POD WITH MANUAL "ON" AND LOWER/RAISE DIMMING. MOUNT TO CENTER OF BOX AT +48" A.F.F.
	CEILING MOUNTED OCCUPANCY SENSOR WITH 360° PASSIVE INFRARED/MICROPHONICS DUAL TECHNOLOGY DETECTION. STANDARD RANGE.
	CEILING MOUNTED OCCUPANCY SENSOR WITH 360° PASSIVE INFRARED/MICROPHONICS DUAL TECHNOLOGY DETECTION. EXTENDED RANGE.
	ADJUSTABLE WALL MOUNTED OCCUPANCY SENSOR WITH WIDE PASSIVE INFRARED/MICROPHONICS DUAL TECHNOLOGY DETECTION. EXTENDED RANGE.
	CEILING MOUNTED PHOTOCELL DAYLIGHT SENSOR FOR DIMMING/DAYLIGHT HARVESTING. SENSORSWITCH
	POWER PACK RELAY MODULE.
	CLASS 2 LOW VOLTAGE WIRING.

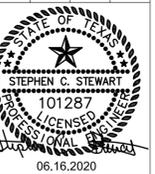
- NOTE:**
- DISREGARD ANY SYMBOLS THAT ARE NOT USED ON PLANS.

LIGHTING FIXTURE SCHEDULE							
TYPE	MANUFACTURER	CATALOG NUMBER	MOUNTING	LAMPS	VOLTS	DESCRIPTION	LOCATION
				TYPE			
A	VERSALED LIGHTING	#VLP6-B-24-50L-QT-40K	RECESSED	50 WATT L.E.D. 5410 LUMENS, 4000°K	120/277	2'X4' LED FLAT PANEL.	INTERIOR.
AE	VERSALED LIGHTING	#VLP6-B-24-50L-QT-40K-EBLED14W	RECESSED	50 WATT L.E.D. 5410 LUMENS, 4000°K	120/277	SAME AS TYPE "A" EXCEPT WITH AN EMERGENCY BACK-UP BATTERY.	INTERIOR.
B	VERSALED LIGHTING	#RCAN6-NC-PL-120V-40K	RECESSED	9.5 WATT L.E.D. 850 LUMENS, 4000°K	120	6" RECESSED DOWNLIGHT.	INTERIOR.
C	VERSALED LIGHTING	#VLVT1-B-35L-QT-40K	SURFACE, CHAIN	35 WATT L.E.D. 4550 LUMENS, 4000°K	120/277	4' VAPOR TIGHT.	INTERIOR.
CE	VERSALED LIGHTING	#VLVT1-B-35L-QT-40K-EBCP-LED-11W	SURFACE, CHAIN	35 WATT L.E.D. 4550 LUMENS, 4000°K	120/277	SAME AS TYPE "C" EXCEPT WITH AN EMERGENCY BACK-UP BATTERY.	INTERIOR.
D	VERSALED LIGHTING	#VLHLED33-102L-QT-40K	PENDANT	102 WATT L.E.D. 14497 LUMENS, 4000°K	120/277	ROUND LED HIGHBAY SUITABLE FOR WET LOCATIONS.	INTERIOR/ EXTERIOR.
EM1	EELP	#EM20-E-HO-SD	SURFACE	INCLUDED	120/277	HIGH OUTPUT LED EMERGENCY LIGHTING UNIT.	INTERIOR.
EM2	EELP	#EM1-LED-SD	SURFACE	INCLUDED	120/277	LED EMERGENCY LIGHTING UNIT.	INTERIOR.
EM3	EELP	#DEM-LED-BR-ACEM-CW	SURFACE	INCLUDED	120/277	EXTERIOR EGRESS EMERGENCY LIGHTING UNIT.	EXTERIOR.
WP	VERSALED LIGHTING	#VLP59-B-78L-QT-40K	SURFACE	78 WATT L.E.D. 8789 LUMENS, 4000°K	120/277	EXTERIOR WALL-PACK.	EXTERIOR.
X	EELP	#XE-S-2-R-W-EM	UNIVERSAL	LED (INCLUDED)	120/277	LED EDGETIT EXIT SIGN WITH BACK-UP BATTERY.	INTERIOR.

- NOTE:**
- ALL LIGHT FIXTURES TO BE PROVIDED AS SPECIFIED. NO SUBSTITUTIONS WITHOUT FULL PHOTOMETRIC STUDY WILL BE CONSIDERED.
  - ALL COLORS SPECIFIED FOR FIXTURES SHALL BE COORDINATED WITH OWNER/ARCHITECT PRIOR TO PURCHASING.
  - COORDINATE AND CONFIRM ALL MOUNTING HEIGHTS WITH THE OWNER/ARCHITECT PRIOR TO CONSTRUCTION.
  - CONTACT ANDY MACEK AT ERT LIGHTING FOR LIGHT FIXTURE SELECTION ASSISTANCE. (ANDY@ERTLIGHTING.COM) 903-456-0381

Project Title: **HILL COUNTY MAINTENANCE BARN**  
**901 FM 308**  
**PENELOPE, TEXAS 76676**  
**100% REVIEW SET**

Drawn By: **MP**  
Checked By: **CS**  
Scale: **SEE PLANS**  
Date: **06/16/2020**



06.16.2020

**MRB group**  
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Sheet No. **E501**  
of \_\_\_\_\_  
Project No. **0843.20002**

PART 1 - GENERAL

1.01 SCOPE OF WORK: FURNISH AND INSTALL ALL MATERIALS AND EQUIPMENT AND PROVIDE ALL LABOR, TOOLS, TRANSPORTATION, SUPERINTENDENCE AND SERVICES REQUIRED AND NECESSARY TO COMPLETE THE WORK SHOWN ON THE DRAWINGS AND/OR SPECIFIED HEREIN.

ALSO INCLUDED WILL BE ALL OTHER WORK AND MISCELLANEOUS ITEMS, NOT SPECIFICALLY MENTIONED, BUT REASONABLY INFERRED FOR A COMPLETE INSTALLATION INCLUDING ALL ACCESSORIES AND APPURTENANCES REQUIRED FOR TESTING THE SYSTEM. IT IS THE INTENT OF THE DRAWINGS AND SPECIFICATIONS THAT ALL SYSTEMS BE COMPLETE AND READY FOR OPERATION.

1.02 REGULATORY REQUIREMENTS: ALL WORK AND MATERIALS SHALL COMPLY WITH THE LATEST RULES, CODES AND REGULATIONS, INCLUDING, BUT NOT LIMITED TO THE FOLLOWING:

- A. 2015 INTERNATIONAL BUILDING CODE
B. 2015 INTERNATIONAL FIRE CODE
C. 2015 INTERNATIONAL PLUMBING CODE
D. 2015 INTERNATIONAL FUEL GAS CODE
E. 2015 INTERNATIONAL MECHANICAL CODE
F. 2015 INTERNATIONAL ENERGY CONSERVATION CODE/ASHRAE 90.1-2013 ENERGY CODE COMPLIANCE
G. 2017 NATIONAL ELECTRIC CODE
H. LOCAL CODE ORDINANCES AND AMENDMENTS
I. NATIONAL ELECTRICAL MANUFACTURER ASSOCIATION (NEMA)
J. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
K. NATIONAL ELECTRICAL SAFETY CODE (NEISC)
L. INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE)
M. UNDERWRITERS' LABORATORIES (UL)
N. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
O. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
P. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)
Q. AMERICANS WITH DISABILITIES ACT (ADA)
R. APPLICABLE UTILITY COMPANIES

1.03 LICENSE, FEES AND PERMITS: ELECTRICAL CONTRACTOR SHALL PAY FOR ALL LICENSES, PERMITS AND INSPECTION FEES REQUIRED BY THE AUTHORITY HAVING JURISDICTION AND SHALL ARRANGE FOR ALL REQUIRED INSPECTIONS.

1.04 SAFETY AND INDEMNITY: THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

NO ACT, SERVICE, DRAWING REVIEW OR CONSTRUCTION REVIEW BY THE OWNER, THE ENGINEERS OR THEIR CONSULTANTS, IS INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES, IN, ON, OR NEAR THE CONSTRUCTION SITE.

1.05 DRAWINGS AND SPECIFICATIONS: ALL DRAWINGS AND SPECIFICATIONS SHALL BE CONSIDERED AS A WHOLE AND WORK OF THIS DIVISION SHOWN ANYWHERE THEREIN SHALL BE FURNISHED UNDER THIS DIVISION.

DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF EQUIPMENT AND WIRING. MOST DIRECT ROUTING OF CONDUITS AND WIRING IS NOT ASSURED. EXACT REQUIREMENTS SHALL BE GOVERNED BY CONDITIONS OF THE JOB. CONSULT ALL OTHER DRAWINGS IN PREPARATION OF THE BID. EXTRA LENGTHS OF WIRING OR ADDITION OF PULL OR JUNCTION BOXES, ETC. NECESSITATED BY SUCH CONDITIONS SHALL BE INCLUDED.

1.06 CONDITIONS AT SITE: THE ELECTRICAL CONTRACTOR SHALL HAVE EXAMINED THE SITE AND FAMILIARIZED THEMSELVES WITH ALL DISCREMINABLE EXISTING CONDITIONS. NO EXTRA PAYMENT WILL BE ALLOWED FOR WORK REQUIRED BECAUSE OF THESE CONDITIONS, WHETHER SPECIFICALLY MENTIONED OR NOT.

1.07 WORKMANSHIP AND CONTRACTOR'S QUALIFICATIONS: ONLY QUALITY WORKMANSHIP WILL BE ACCEPTED. HAPHAZARD OR POOR INSTALLATION WILL BE CAUSE FOR REJECTION OF WORK. THE CONTRACTOR SHALL BE LICENSED IN THE STATE IN WHICH THE JOB IS LOCATED.

1.08 SHOP DRAWINGS AND MATERIALS LIST: SUBMIT TO OWNER IN A SINGLE PACKAGE SIX (6) COPIES OF COMPLETE SHOP DRAWINGS AND MATERIALS LIST, AS NOTED BELOW, FOR REVIEW WITHIN FIFTEEN (15) DAYS AFTER AWARD OF CONTRACT. SUBMITTALS REQUIRED AS FOLLOWS:

- A. WIRING DEVICES: SWITCHES, RECEPTACLES, DEVICE PLATES.
B. ENCLOSURES FOR UTILITY COMPANY METERING.
C. MAIN FUSED DISCONNECT SWITCH OR ENCLOSED CIRCUIT BREAKER.
D. DISTRIBUTION PANELBOARDS, PANELBOARDS.
E. DISCONNECT SWITCHES.
F. LIGHTING FIXTURES, LAMPS AND LIGHTING CONTROL EQUIPMENT.

1.09 SUBSTITUTIONS: ONE OR MORE MAKES OF MATERIALS OR METHODS MAY HAVE BEEN SPECIFIED TO ESTABLISH THE STANDARD OF QUALITY, WORKMANSHIP, FINISH AND DESIGN REQUIRED, BUT OTHER MATERIALS OR METHODS EQUAL IN QUALITY, WORKMANSHIP, FINISH, DESIGN, AND GUARANTEED PERFORMANCE WILL BE ACCEPTED. HOWEVER, ALL CHANGES AND SUBSTITUTIONS SHALL BE REQUIRED IN LETTER FORM AND SHALL BE ACCOMPANIED WITH A STATEMENT OF THE AMOUNT OF MONEY TO BE RETURNED TO THE CONTRACTOR IF THE SUBSTITUTION IS PERMITTED.

NO WORK INVOLVING MATERIALS SUBMITTED FOR SUBSTITUTION SHALL PROCEED UNTIL WRITTEN ACCEPTANCE IS RECEIVED FROM THE OWNER. THE OWNER IS THE SOLE JUDGE OF ACCEPTABILITY OF PREFERRED SUBSTITUTIONS. IF A SUBSTITUTION ITEM IS PERMITTED, AND ANY RE-DESIGN EFFORT IS THEREBY NECESSITATED, THE REQUIRED RE-DESIGN SHALL BE AT THE CONTRACTOR'S EXPENSE.

1.10 COORDINATION: COORDINATE WORK WITH OTHER TRADES TO AVOID CONFLICT AND TO PROVIDE CORRECT ROUGH-IN AND CONNECTION FOR EQUIPMENT FURNISHED UNDER OTHER TRADES THAT REQUIRE ELECTRICAL CONNECTIONS. INFORM CONTRACTORS OF OTHER TRADES OF THE REQUIRED ACCESS TO AND LEANBACKS OF ELECTRICAL EQUIPMENT TO MAINTAIN SERVICE ABILITY AND CODE COMPLIANCE.

VERIFY EQUIPMENT DIMENSIONS AND REQUIREMENTS WITH PROVISIONS SPECIFIED UNDER THIS SECTION. CHECK ACTUAL JOB CONDITIONS BEFORE FABRICATING WORK. REPORT NECESSARY CHANGES IN TIME TO PREVENT NEEDLESS WORK, CHANGES OR ADDITIONS, SUBJECT TO ADDITIONAL COMPENSATION, WHICH ARE MADE WITHOUT WRITTEN AUTHORIZATION AND IN AGREED PRICE, SHALL BE AT THE CONTRACTOR'S RISK AND EXPENSE.

1.11 ROUTINGS: ALL CONDUIT ROUTINGS, INCLUDING MC CABLE, SHALL BE PARALLEL AND PERPENDICULAR TO THE BUILDING STRUCTURE AND LINES. CONDUITS SHALL BE CONCEALED WHERE POSSIBLE UNLESS NOTED OTHERWISE. AESTHETIC APPEARANCE IS VERY IMPORTANT FOR THE WORK OF THIS PROJECT - THE CONTRACTOR WILL BE REQUIRED TO REMOVE AND REPLACE WORK THAT IS NOT NEAT AND ACCURATE. UNDERGROUND ROUTINGS, IF ANY, BETWEEN BUILDINGS MAY TAKE MOST DIRECT ROUTE.

1.12 CUTTING AND PATCHING: ALL CUTTING AND PATCHING REQUIRED FOR WORK OF THIS DIVISION IS INCLUDED HEREIN. COORDINATION WITH GENERAL CONTRACTOR AND OTHER TRADES IS IMPERATIVE. CONTRACTOR SHALL BEAR THE RESPONSIBILITY FOR AND THE ADDED EXPENSE OF ADJUSTING FOR IMPROPER HOLES, SUPPORTS, ETC.

1.13 ACCEPTANCE DEMONSTRATION: UPON COMPLETION OF THE WORK, AT A TIME TO BE DESIGNATED BY THE OWNER, THE CONTRACTOR SHALL DEMONSTRATE FOR THE OWNER THE OPERATION OF THE ELECTRICAL INSTALLATION, INCLUDING ANY AND ALL SPECIAL ITEMS INSTALLED BY HIM/HER OR INSTALLED UNDER THEIR SUPERVISION. PROPERLY SET AUTOMATIC TIME SWITCHES TO PERFORM SWITCHING OPERATIONS IN ACCORDANCE WITH SCHEDULES PROVIDED BY THE OWNER'S REPRESENTATIVE AND DEMONSTRATE (USING THE MANUFACTURER'S OPERATING INSTRUCTIONS) HOW TO OVERRIDE AND/OR TEST TIME SWITCHES' PROGRAMMING.

1.14 RECORD DRAWINGS, EQUIPMENT DATA: MAINTAIN ONE SET OF CLEAN WORKING DRAWINGS AT THE JOB SITE AND ENTER DAILY SUCH "AS-BUILTS" INFORMATION AS FEEDER AND SERVICE ROUTES, PULL BOX LOCATIONS AND CHANGES IN LAYOUT OR ARRANGEMENT WHICH OCCUR DURING CONSTRUCTION. DELIVER COMPLETED DRAWINGS TO THE OWNER.

DELIVER TO THE OWNER'S REPRESENTATIVE THREE COPIES OF DATA SHEETS OR OTHER CURRENT MANUFACTURERS' PUBLICATIONS FOR EACH ITEM OF ELECTRICAL EQUIPMENT FURNISHED FOR THE PROJECT INCLUDING AT LEAST THESE DATA:

- A. TECHNICAL DESCRIPTION AND REPLACEABLE PARTS LIST.
B. PHYSICAL DESCRIPTION AND INSTALLATION INSTRUCTIONS.
C. USER'S MANUAL AND OPERATING INSTRUCTIONS.
D. MANUFACTURER'S WARRANTY.

1.15 CLEAN-UP: RID THE PREMISES OF SCRAP MATERIALS, TRASH AND DEBRIS BOTH DURING CONSTRUCTION AND AT COMPLETION OF THE PROJECT. LEAVE THE BUILDING AND SURROUNDING AREA IN A CLEAN AND ORDERLY CONDITION.

1.16 TEMPORARY SERVICES: PROVIDE ADEQUATE AND SAFE TEMPORARY ELECTRICAL POWER AND LIGHTING THROUGHOUT THE CONSTRUCTION AND FINISHING OF THE PREMISES FOR WIREMANSHIP OCCUPANCY IN ADDITION TO SPECIAL OR UNUSUAL REQUIREMENTS, PROVIDE AT LEAST THESE ITEMS:

- A. SIX 20-AMP CIRCUITS FOR CONSTRUCTION POWER TOOLS. PROVIDE GFI TEMPORARY CIRCUITS WITH COVERPLATES TO MEET OSHA REQUIREMENTS.
B. EIGHT OR MORE LIGHT STRINGS SUSPENDED APPROXIMATELY ONE FOOT BELOW THE HEIGHT OF FINISH CEILING WITH LAMPS SPACED NOT MORE THAN TWELVE FEET ON CENTERS. STRINGS SHALL BE RUN THE LENGTH OF THE BUILDING FOOTPRINT WITH ONE STRING WITHIN EIGHT FEET OF EACH WALL AND ONE (OR MORE) INTERMEDIATE STRING(S) ARRANGED TO LIMIT THE SPACING BETWEEN ROWS TO SIXTEEN FEET OR LESS.
C. FLOOD LIGHTING AND TASK LIGHTING FOR PAINTING AND OTHER FINISH WORK. WHEN PERMANENT ELECTRICAL SERVICE IS OPERABLE, DISCONNECT AND REMOVE FROM THE PREMISES THE MATERIALS AND EQUIPMENT USED FOR TEMPORARY POWER AND LIGHTING, AND RESTORE MODIFICATIONS AND REPAIR DAMAGE CAUSED BY THE INSTALLATION, USE OR REMOVAL OF TEMPORARY SERVICE PROVISIONS.

1.17 WARRANTY: THE CONTRACTOR SHALL UNCONDITIONALLY WARRANT ALL WORK TO BE FREE OF DEFECTS IN MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE AND WILL REPAIR OR REPLACE ANY DEFECTIVE WORK PROMPTLY AND WITHOUT CHARGE AND RESTORE ANY OTHER EXISTING WORK DAMAGED IN THE COURSE OF REPAIRING DEFECTIVE MATERIALS AND WORKMANSHIP.

PART 2 - PRODUCTS

2.01 MATERIAL APPROVAL: ALL MATERIALS MUST BE NEW AND BEAR UNDERWRITER'S LABORATORIES LABEL. MATERIALS THAT ARE NOT COVERED BY UL TESTING STANDARDS SHALL BE TESTED AND APPROVED BY AN INDEPENDENT TESTING LABORATORY OR A GOVERNMENTAL AGENCY.

MATERIAL NOT IN ACCORDANCE WITH THESE SPECIFICATIONS MAY BE REJECTED EITHER BEFORE OR AFTER INSTALLATION.

2.02 CONDUITS AND OTHER RACEWAYS:

- A. RIGID STEEL: HOT-DIPPED GALVANIZED.
B. INTERMEDIATE METAL CONDUIT (IMC): HOT-DIPPED GALVANIZED.
C. ELECTRICAL METALLIC TUBING (EMT): ELECTRO-GALVANIZED.
D. WIREWAY: CODE GAUGE STEEL, WITH KNOCKOUTS AND HINGED COVER, CORROSION RESISTANT, GRAY BAKED ENAMEL FINISH.
E. PROVIDE FITTINGS AND ACCESSORIES APPROVED FOR THE PURPOSE EQUAL IN ALL RESPECTS TO THE CONDUIT OR RACEWAY. EMT CONNECTORS AND COUPLINGS SHALL BE STEEL SETSCREW TYPE INDOORS AND STEEL COMPRESSION TYPE IN WET LOCATIONS AND OUTDOORS.

2.03 WIRES AND CABLES:

- A. FOR POWER AND LIGHTING SYSTEM 600V OR LESS:
1. CONDUCTOR: MINIMUM SIZE #12 AWG.
a. #12 AND #10 AWG SOLID COPPER.
b. #8 AWG AND LARGER SHALL BE STRANDED COPPER.
2. INSULATION TYPE:
a. #12 TO #1 AWG: THIN FOR WET OR UNDERGROUND AND THIN FOR DRY LOCATIONS.
b. #1/0 THROUGH #4/0 AWG: XHHW (55 MILS).
c. #250 KCMIL AND LARGER: XHHW (65 MILS).
d. GROUNDING WIRE: TW.
B. FOR SIGNAL AND COMMUNICATIONS CIRCUIT:
1. CONDUCTORS FOR GENERAL USE SHALL BE STRANDED COPPER CONDUCTOR, #16 AWG MINIMUM, WITH THIN INSULATION FOR UNDERGROUND OR WET LOCATIONS AND THIN INSULATION FOR DRY LOCATIONS.
2. SPECIAL CABLES SHALL BE AS SPECIFIED ON DRAWINGS.

C. ACCEPTABLE PRODUCTS: GENERAL ELECTRIC, ANACONDA, OKONITE, PARANITE OR TRIANGLE PRODUCTS CONFORMING OR EXCEEDING APPLICABLE IJCA STANDARDS.

2.04 OUTLET BOXES, JUNCTION AND PULL BOXES:

- A. OUTLET BOXES: 4" SQUARE X 1-1/2" DEEP (OR LARGER) GALVANIZED SHEET STEEL, KO-TYPE WITH PLASTER RING AND COVER FOR GENERAL INTERIOR USE AND CAST METAL TYPE FS OR FD WITH MATCHING SCREW COVERS FOR EXTERIOR AND EXPOSED INTERIOR LOCATIONS (GASKETED IN DAMP OR WET LOCATIONS).
B. JUNCTION BOXES SHALL BE SAME AS OUTLET BOXES UP TO 42 CU. IN. AND CODE-GAUGE STEEL IN LARGER SIZES WITH SURFACE OR FLUSH-TYPE SCREW-MOUNTED TRIM COVERS, BOTH BOXES AND COVERS INHIBITOR-PRIMED AND PAINTED INSIDE OUT.
C. PULL BOXES SHALL BE SAME AS JUNCTION BOXES UNLESS INDICATED OTHERWISE ON THE DRAWINGS, WITH COVERS.
D. TELEPHONE OUTLET BOXES SHALL BE THE TYPE AND SIZE REQUIRED BY THE SERVING TELEPHONE COMPANY BUT NOT SMALLER THAN 4-11/16" SQUARE X 2-1/8" DEEP WITH SINGLE-GANG RING AND SIERRA #5-754N SPLIT PLATE BUSHING.
E. ALL BOXES AND ASSOCIATED COMPONENTS SHALL BE STEEL CITY 663 SERIES, WITH #60-3B COVERPLATE.
F. MULTISERVICE FLOOR BOXES SHALL BE RECTANGULAR, CAST IRON, FULLY ADJUSTABLE WITH NUMBER OF GANGS, DATA OUTLETS, AND 5-20R DUPLEX RECEPTACLES AS SHOWN ON PLANS AND SHALL CONTAIN SEPARATE COMPARTMENTS FOR POWER AND VOICE/DATA CABLING. FLOOR BOX SYSTEMS SHALL BE EQUAL TO LEGRAND OMBXBOX 80CSX-1 AND SHALL INCLUDE FLANGES AND COVERPLATES TO MATCH FLOOR BOX GANG CONFIGURATION. COORDINATE WITH ARCHITECT FOR FLOOR TYPE AND COLOR OF FLANGES AND COVERPLATES.

2.05 WIRING DEVICES AND PLATES SHALL BE HUBBELL, ARROW HART, LEVITON, GE OR P&S WITH HUBBELL NUMBERS USED TO SPECIFY TYPE USED.

A. STANDARD DESIGN:

- 1. SWITCH AND RECEPTACLE DEVICES SHALL BE AS SPECIFIED BY ARCHITECT.
2. WALL PLATES SHALL BE AS SPECIFIED BY ARCHITECT.
3. ISOLATED GROUND RECEPTACLES SHALL BE ORANGE WITH INDICATOR TRIANGLE AS REQUIRED PER NEC, MANUFACTURED BY LEVITON #5362-IGW OR APPROVED EQUAL.
4. SWITCHES SHALL BE 20 AMP, 120/277 VOLT A.C. RATED: SINGLE POLE SWITCHES SHALL BE #1221, 3-WAY SWITCHES SHALL BE #1223, AND 4-WAY SWITCHES SHALL BE #1224 (HUBBELL NUMBERS).
5. RECEPTACLES SHALL BE GROUNDING TYPE #5362 (HUBBELL NUMBER).
6. PROVIDE DIMMERS WITH LINEAR SLIDE AND ON/OFF SWITCH, SIZED FOR 150 PERCENT OF THE LOAD, UNLESS LARGER SIZE IS INDICATED. PROVIDE INCANDESCENT, FLUORESCENT, LED, OR LOW VOLTAGE TYPE DIMMER TO MATCH THE LOAD APPLICATION SHOWN ON THE DRAWINGS. PROVIDE SINGLE-POLE OR THREE-WAY DIMMERS AS INDICATED ON PLANS. PROVIDE GANG DIMMERS AS REQUIRED IN ACCORDANCE WITH MANUFACTURER'S DIRECTIONS. PROVIDE DIMMERS WITH COVERPLATE AS SPECIFIED BY ARCHITECT.
7. WALL-SWITCH OCCUPANCY/VACANCY SENSORS SHALL BE DUAL-RELAY, MULTI-TECHNOLOGY WALL-SWITCH TYPE 120/277V, ADJUSTABLE TIME DELAY UP TO 30 MINUTES, 180-DEGREE FIELD OF VIEW, EQUAL TO LEVITON OSSM1-MD.
8. CEILING MOUNT OCCUPANCY SENSORS SHALL BE MULTI-TECHNOLOGY, 360 DEGREE, SELF-ADJUSTING, ADJUSTABLE TIME DELAY UP TO 30 MINUTES, COMMERCIAL GRADE, EQUAL TO LEVITON OSC05-MOW.

2.06 CONDUIT HANGERS:

FOR INDIVIDUAL CONDUIT RUNS NOT DIRECTLY FASTENED TO THE STRUCTURE, USE ROD HANGERS MANUFACTURED BY CADDY, UNISTRUT, OR POWERSTRUT. FOR MULTIPLE CONDUIT RUNS, USE UNISTRUT OR POWERSTRUT TRAPEZOID TYPE CONDUIT SUPPORT DESIGNED FOR MAXIMUM DEFLECTION NOT GREATER THAN 1/8".

2.07 WIRE CONNECTORS:

FOR WIRE SIZES #8 AWG AND SMALLER: INSULATED PRESSURE TYPE (WITH LIVE SPRING) RATED 105 DEGREES C., 600V, FOR BUILDING WIRING AND 1000V IN SIGNS OR FIXTURES; SCOTCHLOK OR IDEAL FOR WIRE SIZE #6 AWG AND LARGER; T & B OR EQUIVALENT COMPRESSION TYPE WITH 3M #33+ OR PLYMOUTH "SLPKNOT GRAY" TAPE INSULATION.

2.08 PANELBOARDS:

- A. CONSTRUCTION: CABINETS SHALL BE OF CODE GAUGE, GALVANIZED STEEL, SURFACE FLUSH MOUNTED AS INDICATED. DOORS SHALL BE OF GOLD-ROLLED STEEL WITH CONCEALED HINGES AND FLUSH CATCH AND LOCK. ALL PANELS SHALL BE KEYPED ALIKE. PANELS LOCATED ADJACENT TO EACH OTHER SHALL HAVE IDENTICALLY SIZED ENCLOSURE AND TRIMS. MINIMUM PANEL WIDTH SHALL BE 20". FINISH EXPOSED PART WITH ONE COAT OF PRIMER AND ONE COAT OF LIGHT GRAY ENAMEL SUITABLE FOR OVERPAINTING IN FIELD IF DESIRED.
B. BUS BARS: PROVIDE GROUND BLOCK WITH FULL COMPLEMENT OF TERMINALS IN ADDITION TO INSULATED NEUTRAL BUS. FUTURE BREAKER SPACES SHALL HAVE COMPLETE PROVISION INCLUDING BUSES AND CONNECTING HARDWARE.
C. MANUFACTURERS: PANELBOARDS SHALL BE GENERAL ELECTRIC, SQUARE D, EATON, OR SIEMENS-ITE.
D. CIRCUIT BREAKERS: SHALL BE QUICK-MAKE, QUICK-BREAK, MOLDED CASE TYPE:
1. 120/208 VOLT PANELS: SHALL BE BOLT-ON TYPE WITH MINIMUM SYMMETRICAL INTERRUPTING CAPACITY AS SHOWN ON THE PLANS. NO SERIES RATING ALLOWED.
2. 277/480 VOLT PANELS: SHALL BE BOLT-ON TYPE, WITH MINIMUM SYMMETRICAL INTERRUPTING CAPACITY AS SHOWN ON THE PLANS. NO SERIES RATING ALLOWED.
3. PROVIDE MULTI-POLE UNITS WITH COMMON TRIP ELEMENT.
4. CIRCUIT BREAKERS USED FOR CONTROL OF LIGHTING (PANELBOARD SWITCHING) SHALL BE UNDERWRITERS' LABORATORIES LISTED AND MARKED "SWO" TO INDICATE THEIR STABILITY.
E. IDENTIFICATION: PROVIDE SCREWED-ON (NO ADHESIVES) BAKELITE OR PHOTO-ETCHED METALLIC NAMEPLATE IDENTIFICATION ON OUTSIDE OF EACH PANEL, SHOWING PANEL DESIGNATION, VOLTAGE, AND PHASE IN MINIMUM 1/4" HIGH LETTERS. EACH PANEL SHALL CONTAIN A METAL-FRAMED CIRCUIT DIRECTORY INSIDE COVER, WITH PLASTIC PROTECTOR.

F. COMPLETE SHOP DRAWINGS ARE REQUIRED. SEE ARTICLE 1.08.

2.10 INDIVIDUALLY MOUNTED MOTOR CONTROLLERS:

- A. FOR POLYPHASE MOTORS: COMBINATION MOTOR CIRCUIT PROTECTOR AND MAGNETIC STARTER, WITH 3-LEG OVERLOAD PROTECTION. PROVIDE TWO INTERLOCK CONTACTS OF THE INTERCHANGABLE OPEN-CLOSE TYPE. PROVIDE HAND-OFF-AUTOMATIC SELECTOR SWITCH, MOTOR RUNNING PILOT LIGHT AND RESET BUTTON IN COVER. CIRCUITS 300V AND OVER SHALL BE PROVIDED WITH INDIVIDUAL 120V CONTROL TRANSFORMERS. PROVIDE REDUCED VOLTAGE STARTERS FOR LARGE MOTORS (7.5 HP AND GREATER) OR AS REQUIRED BY UTILITY CO.
B. STARTERS FOR FRACTIONAL HORSEPOWER 120V MOTORS SHALL BE MANUAL TYPE UNLESS SHOWN OTHERWISE, EQUIPPED WITH BUILT-IN OVERLOAD PROTECTION.
C. ACCEPTABLE MANUFACTURERS: GENERAL ELECTRIC, EATON, SIEMENS, SQUARE D, AND ALLEN BRADLEY.
D. TELEPHONE OUTLET BOXES SHALL BE THE TYPE AND SIZE REQUIRED BY THE SERVING TELEPHONE COMPANY BUT NOT SMALLER THAN 4-11/16" SQUARE X 2-1/8" DEEP WITH SINGLE-GANG RING AND SIERRA #5-754N SPLIT PLATE BUSHING.
E. ALL BOXES AND ASSOCIATED COMPONENTS SHALL BE STEEL CITY 663 SERIES, WITH #60-3B COVERPLATE.
F. MULTISERVICE FLOOR BOXES SHALL BE RECTANGULAR, CAST IRON, FULLY ADJUSTABLE WITH NUMBER OF GANGS, DATA OUTLETS, AND 5-20R DUPLEX RECEPTACLES AS SHOWN ON PLANS AND SHALL CONTAIN SEPARATE COMPARTMENTS FOR POWER AND VOICE/DATA CABLING. FLOOR BOX SYSTEMS SHALL BE EQUAL TO LEGRAND OMBXBOX 80CSX-1 AND SHALL INCLUDE FLANGES AND COVERPLATES TO MATCH FLOOR BOX GANG CONFIGURATION. COORDINATE WITH ARCHITECT FOR FLOOR TYPE AND COLOR OF FLANGES AND COVERPLATES.
G. ACCEPTABLE MANUFACTURERS: GENERAL ELECTRIC, EATON, SIEMENS, SQUARE D, AND ALLEN BRADLEY.
H. MISCELLANEOUS MATERIALS:
A. SAFETY SWITCHES: HEAVY DUTY TYPE, 600V, HORSEPOWER RATED FOR MOTORS, FUSED OR NON-FUSED AS REQUIRED. MOUNT IN ENCLOSURE WITH NEMA RATING AS REQUIRED FOR THE SPECIFIC APPLICATION. GENERAL ELECTRIC, SQUARE D, EATON OR SIEMENS-ITS.
B. TIME CLOCK: TORK #DGLC, OR ACCEPTED SUBSTITUTE.
C. PHOTOCELLS: TORK EPC1, OR ACCEPTED SUBSTITUTE.
D. CONTACTORS/RELAYS: AS MANUFACTURED BY ASCO, OR ACCEPTED SUBSTITUTE, MECHANICALLY HELD WITH RELAYS AS REQUIRED TO OPERATE ON TWO WIRE CONTROL CIRCUITS.

2.12 LIGHTING:

- A. LIGHTING TO BE PROVIDED BY THE ELECTRICAL CONTRACTOR AS INDICATED ON THE DRAWINGS. SUBCONTRACTORS TO INSTALL ALL FIXTURES COMPLETE, INCLUDING LAMPS AND BALLASTS, READY FOR SERVICE.
B. SUPPORTS: PROPER SUPPORTS AND MOUNTING ACCESSORIES, SUCH AS HANGERS, STEMS, YOKES, PLASTER FRAMES, ETC. SHALL BE PROVIDED AS REQUIRED BY THE TYPE OF CEILING INSTALLED. FIXTURES SHALL HANG FLAMB REGARDLESS OF CEILING SLOPE.
C. FIXTURE DESIGNATION: FIXTURE TYPES ARE DESIGNATED ON DRAWINGS. FOR EXACT FIXTURE COUNT AND LOCATION, REFER TO REFLECTED CEILING PLAN.
D. BALLASTRY: ADVANCE, GE, OR APPROVED HIGH FREQUENCY ELECTRONIC, FULL LIGHT OUTPUT, ENERGY SAVING, CLASS "P", HIGH POWER FACTOR, 10% THD, ETL CERTIFIED, SOUND RATING "A" OR AS INDICATED ON DRAWINGS.
E. BATTERY PACKS:
1. WHERE FIXTURES ARE SHOWN IN THE CONTRACT DOCUMENTS TO HAVE BATTERY BACK UP, PROVIDE BATTERY PACK INVERTER WITH ENDO-OF-LIFE SHUTDOWN AS FOLLOWS: TO PROVIDE A MINIMUM 1500 LUMENS.
2. PENETRATING FIRE RATED FLOOR OR WALL: INSTALL CONDUIT IN CONDUIT SLEEVE OR FRAMED OPENING. SEAL PENETRATION WITH FIRE RETARDANT SEALANT.
3. PENETRATING ROOF OR EXTERIOR WALL: AVOID PENETRATING ROOF OR EXTERIOR WALL WHERE POSSIBLE. WHERE PENETRATIONS ARE NECESSARY, BUILDING WEATHERPROOF INTEGRITY MUST BE PRESERVED. CONDUITS PENETRATING THROUGH ROOF SHALL HAVE ROOF FLASHING WITH CAULK TYPE COUNTERFLASHING SLEEVE.
4. PENETRATING SOUND INSULATED OR AIR PLENUM WALL: INSTALL CONDUIT IN CONDUIT SLEEVE AND SEAL PENETRATION AS DETAILED ON THE DRAWINGS.
5. PENETRATING NON-FIRE RATED DRY WALL: CONDUIT SLEEVES ARE NOT REQUIRED. PENETRATIONS MUST BE SEALED WITH PLASTER PRIOR TO PAINTING. PENETRATIONS MADE AFTER WALL FINISH IS APPLIED MUST BE AS SMALL AS POSSIBLE AND PROVIDED WITH ESCUTCHEONS, ONE ON EACH SIDE OF WALL.
6. AVOID CUTTING AND BORING HOLES THROUGH STRUCTURE OR STRUCTURAL MEMBERS WHEREVER POSSIBLE. OBTAIN PRIOR APPROVAL OF OWNER AND CONFORM TO ALL STRUCTURAL REQUIREMENTS WHEN CUTTING OR BORING THE STRUCTURE IS NECESSARY AND PERMITTED.
7. FURNISH AND INSTALL ALL NECESSARY HARDWARE, HANGERS, BLOCKING, BRACKETS, BRACING, RUNNERS, ETC. REQUIRED FOR EQUIPMENT SPECIFIED UNDER THIS SECTION.
8. PROVIDE NECESSARY BACKING REQUIRED TO INSURE RIGID MOUNTING OF OUTLET BOXES.

PART 3 - EXECUTION

3.01 GENERAL:

- A. ELECTRIC SYSTEM LAYOUTS INDICATED ON THE DRAWINGS ARE GENERALLY DIAGRAMMATIC AND SHALL BE FOLLOWED AS CLOSELY AS ACTUAL CONSTRUCTION AND WORK OF OTHER TRADES WILL PERMIT. GOVERN EXACT ROUTING OF CABLE AND WIRING AND THE LOCATIONS OF OUTLETS BY THE STRUCTURE AND EQUIPMENT SERVED. TAKE ALL DIMENSIONS FROM ARCHITECTURAL DRAWINGS.
B. CONSULT ALL OTHER DRAWINGS, VERIFY SCALES AND REPORT ANY DIMENSIONAL DISCREPANCIES OR OTHER CONFLICTS WITH THE ARCHITECT BEFORE SUBMITTING BID.
C. ALL HOME RUNS TO PANELBOARDS ARE INDICATED AS STARTING FROM THE OUTLET NEAREST THE PANEL AND CONTINUING IN THE GENERAL DIRECTION OF THAT PANEL. CONTINUE SUCH CIRCUITS TO THE PANEL AS THOUGH THE ROUTES WERE COMPLETELY INDICATED. TERMINATE HOMERUNS OF SIGNAL, ALARM, AND COMMUNICATION SYSTEMS IN A SIMILAR MANNER.
D. AVOID CUTTING AND BORING HOLES THROUGH STRUCTURE OR STRUCTURAL MEMBERS WHEREVER POSSIBLE. OBTAIN PRIOR APPROVAL OF OWNER AND CONFORM TO ALL STRUCTURAL REQUIREMENTS WHEN CUTTING OR BORING THE STRUCTURE IS NECESSARY AND PERMITTED.
E. FURNISH AND INSTALL ALL NECESSARY HARDWARE, HANGERS, BLOCKING, BRACKETS, BRACING, RUNNERS, ETC. REQUIRED FOR EQUIPMENT SPECIFIED UNDER THIS SECTION.
F. PROVIDE NECESSARY BACKING REQUIRED TO INSURE RIGID MOUNTING OF OUTLET BOXES.

3.02 WIRING METHODS:

- A. NO "ROMEX" OR ARMORED CABLE WIRING IS PERMITTED - ALL ELECTRICAL WIRING MUST BE IN CONDUIT.
B. CONDUIT SHALL BE RIGID STEEL, IMC, EMT, METAL CLAD (MC) CABLE, OR SCHEDULE 40 PVC AS FOLLOWS:
1. ABOVE GROUND: USE RIGID STEEL, IMC, MC, OR EMT. MC CABLE SHALL BE INSTALLED ONLY WHERE PERMITTED BY CODE AND THE AUTHORITY HAVING JURISDICTION.
a. WET LOCATIONS: RIGID STEEL OR IMC ONLY.
b. LOCATIONS SUBJECT TO MECHANICAL DEFORMATION: RIGID STEEL OR IMC ONLY.
c. HAZARDOUS LOCATIONS: THREADED RIGID STEEL OR THREADED STEEL IMC ONLY.
d. DRY INTERIOR LOCATIONS FOR BRANCH CIRCUIT WIRING AND NOT SUBJECT TO MECHANICAL DEFORMATION: EMT, IMC, MC, OR RIGID STEEL CONDUIT.
e. DRY INTERIOR LOCATIONS FOR OTHER THAN BRANCH CIRCUIT WIRING AND NOT SUBJECT TO MECHANICAL DEFORMATION: EMT, IMC, OR RIGID STEEL CONDUIT.
2. UNDERGROUND: USE RIGID STEEL OR SCHEDULE 40 PVC WITH RIGID STEEL ELLS AND RIGID STEEL CONDUIT/FITTINGS WHEN EMERGING FROM GRADE, UNLESS NOTED OTHERWISE.
C. USE FLEXIBLE CONDUITS IN THE FOLLOWING APPLICATIONS (MAX 6-FT):
1. RECESSED LIGHTING FIXTURES.
2. MOTOR CONNECTIONS.
3. TRANSFORMER CONNECTIONS.
4. AT BUILDING JOINTS.

5. AT WET LOCATIONS, FLEXIBLE CONDUIT SHALL BE LIQUIDTIGHT TYPE.

- D. LIGHT FIXTURES INSTALLED IN GYP BOARD CEILINGS MAY BE WIRED FROM FIXTURE TO FIXTURE USING MC CABLE UNLESS PROHIBITED BY THE AHJ. VERIFY THAT LIGHT FIXTURES ARE PROVIDED WITH JUNCTION BOXES APPROVED FOR THIS PURPOSE. MC TYPE CABLE TO MEET ANSI/NFPA 70 REQUIREMENTS. CABLE ARMOR TO BE INTERLOCKED STEEL METAL TAPE MC TYPE CABLE MANUFACTURED BY APC CABLE SYSTEMS, PIRELLI CABLE CORPORATION AND SOUTHWIRE COMPANY ARE APPROVED. MC CABLE SHALL NOT BE USED TO WIRE LIGHT FIXTURES INSTALLED IN EXPOSED CEILINGS FROM FIXTURE TO FIXTURE (6-FT LIGHT FIXTURE WHIPS ARE PERMITTED).
E. ALL WIRING SHALL BE IN CONDUIT.
F. ALL CONDUIT AND MC CABLE SHALL BE SUPPORTED AS REQUIRED BY THE NEC.

3.03 INSTALLATION OF CONDUITS:

- A. GENERAL:
1. RUN ALL CONDUIT CONCEALED, IF POSSIBLE, UNLESS NOTED OTHERWISE ON THE PLANS.
2. RUN ALL CONDUIT PARALLEL TO OR AT RIGHT ANGLES TO CENTER LINES OF COLUMNS AND BEAMS.
3. CONDUITS ABOVE CEILINGS SHALL NOT OBSTRUCT REMOVAL OF CEILING TILES, LIGHTING FIXTURES, AIR DIFFUSERS, ETC.
4. CONDUITS SHALL NOT CROSS ANY DUCT SHAFT OR AREA DESIGNATED AS FUTURE DUCT SHAFT HORIZONTAL. CONDUIT RISERS, WHEN ALLOWED IN DUCT SHAFT, MUST BE COORDINATED WITH MECHANICAL WORK TO AVOID ANY CONFLICT.
5. INSTALL NO MORE THAN THE EQUIVALENT OF THREE 90-DEGREE BENDS IN ANY CONDUIT RUN EXCEPT FOR COMMUNICATIONS CONDUITS, FOR WHICH ONLY TWO BENDS ARE ALLOWED. PROVIDE J-BOXES AS NEEDED WHERE MORE BENDS ARE NEEDED.
B. CONDUIT SUPPORTS:
1. SUPPORT CONDUITS WITH UNDERWRITER'S LABORATORIES LISTED STEEL CONDUIT SUPPORTS AT INTERVALS REQUIRED BY THE NATIONAL ELECTRIC CODE. WIRES OR SHEET METAL STRIPS ARE NOT ACCEPTABLE FOR CONDUIT SUPPORT. USE CONDUIT HANGERS FOR ALL CONDUITS NOT DIRECTLY FASTENED TO STRUCTURE AND FOR ALL MULTIPLE CONDUIT RUNS. DO NOT ATTACH ANY CONDUIT TO MECHANICAL DUCTS OR PIPES.
2. AVOID ATTACHING CONDUIT TO AIR MOVING SYSTEM. WHEN IT IS NECESSARY TO SUPPORT CONDUIT FROM AIR MOVING SYSTEM, PROVIDE A LENGTH OF FLEXIBLE CONDUIT BETWEEN PORTION ATTACHED TO AIR MOVING SYSTEM AND PORTION ATTACHED TO THE BUILDING TO MINIMIZE TRANSMISSION OF VIBRATION TO THE BUILDING STRUCTURE.
3. AN NFPA 251 TESTED AND APPROVED CEILING SYSTEM CAN BE USED TO SUPPORT BRANCH CIRCUIT CABLING WHERE APPROVED BY THE AHJ.
C. CONDUIT PENETRATION:
1. PENETRATING FIRE RATED FLOOR OR WALL: INSTALL CONDUIT IN CONDUIT SLEEVE OR FRAMED OPENING. SEAL PENETRATION WITH FIRE RETARDANT SEALANT.
2. PENETRATING ROOF OR EXTERIOR WALL: AVOID PENETRATING ROOF OR EXTERIOR WALL WHERE POSSIBLE. WHERE PENETRATIONS ARE NECESSARY, BUILDING WEATHERPROOF INTEGRITY MUST BE PRESERVED. CONDUITS PENETRATING THROUGH ROOF SHALL HAVE ROOF FLASHING WITH CAULK TYPE COUNTERFLASHING SLEEVE.
3. PENETRATING SOUND INSULATED OR AIR PLENUM WALL: INSTALL CONDUIT IN CONDUIT SLEEVE AND SEAL PENETRATION AS DETAILED ON THE DRAWINGS.
4. PENETRATING NON-FIRE RATED DRY WALL: CONDUIT SLEEVES ARE NOT REQUIRED. PENETRATIONS MUST BE SEALED WITH PLASTER PRIOR TO PAINTING. PENETRATIONS MADE AFTER WALL FINISH IS APPLIED MUST BE AS SMALL AS POSSIBLE AND PROVIDED WITH ESCUTCHEONS, ONE ON EACH SIDE OF WALL.
5. PENETRATING SOUND INSULATED: CUT HOLE AS SMALL AS POSSIBLE TO PERMIT CONDUIT PENETRATION. PROVIDE ESCUTCHEON FOR EACH CONDUIT BELOW CEILING.

3.04 CONNECTIONS TO EQUIPMENT:

- A. GENERAL:
1. FURNISH AND INSTALL REQUIRED POWER SUPPLY CONDUIT AND WIRING TO ALL EQUIPMENT. SEE BELOW FOR OTHER WIRING REQUIRED.
2. FURNISH AND INSTALL A DISCONNECT SWITCH IMMEDIATELY AHEAD OF AND ADJACENT TO EACH MAGNETIC MOTOR STARTER OR APPLIANCE UNLESS THE MOTOR APPLIANCE IS LOCATED ADJACENT AND WITHIN SIGHT OF THE SERVING PANELBOARD, CIRCUIT BREAKER OR SWITCH. VERIFY ALL EQUIPMENT NAMEPLATE CURRENT RATINGS PRIOR TO INSTALLATION.
3. INSTALL ALL ROUGH-IN WORK FOR EQUIPMENT FROM APPROVED SHOP DRAWINGS TO SUIT THE SPECIFIC REQUIREMENTS OF THE EQUIPMENT.
4. FURNISH AND INSTALL MANUAL THERMAL PROTECTION FOR ALL MOTORS NOT INTEGRALLY EQUIPPED WITH THERMAL PROTECTION.
5. FURNISH 120 VOLT POWER TO EACH CONTROL PANEL AND TIME SWITCH REQUIRING A SOURCE OF POWER TO OPERATE.

3.05 INSTALLATION OF CONDUCTORS:

- A. PULL NO WIRE INTO ANY PORTION OF THE CONDUIT SYSTEM UNTIL ALL CONSTRUCTION WORK WHICH MIGHT DAMAGE THE WIRE HAS BEEN COMPLETED.
B. INSTALL ALL WIRE CONTINUOUS FROM OUTLET TO OUTLET OR TERMINAL TO TERMINAL. SPICES IN CABLES WHEN REQUIRED SHALL BE MADE IN HAND HOLES, PULL BOXES OR JUNCTION BOXES. MAKE BRANCH CIRCUIT SPLICES IN OUTLET BOXES WITH 8" OF CORRECTLY COLOR-CODED TAILS LEFT IN THE BOX.
C. SPICES IN WIRES AND CABLES SHALL BE MADE UTILIZING MATERIALS AND METHODS DESCRIBED HEREIN BEFORE.
D. MAKE ALL GROUND, NEUTRAL AND LINE CONNECTIONS TO RECEPTACLE AND WIRING DEVICE TERMINALS AS RECOMMENDED BY MANUFACTURER.
E. PROVIDE BRADY WIRE MARKERS WHERE NUMBER OF CONDUCTORS IN A BOX EXCEEDS FOUR.

7. MEGGER AND RECORD INSULATING RESISTANCE OF ALL 600 VOLT INSULATED CONDUCTORS SIZE #4/0 AND LARGER USING 500 VOLT MEGGER FOR ONE MINUTE. MAKE TESTS WITH CIRCUITS ISOLATED FROM SOURCE AND LOAD. VERIFY THAT RESULTS ARE WITHIN THE MANUFACTURER'S RESISTANCE SPECIFICATIONS. SUBMIT ALL RESULTS TO ENGINEER.

3.06 WIRE COLOR CODE: COLOR CODING SHALL BE CONTINUOUS FOR WIRE #12 THROUGH #10 AWG. PHASE CONDUCTORS #8 AND LARGER AND CONDUCTORS OF ANY SIZE IN CABLE ASSEMBLIES MAY HAVE COLORED PHASING TAP AT TERMINATIONS. COLOR CODE WIRES AS FOLLOWS:

Table with 5 columns: VOLTAGE, PHASE A, PHASE B, PHASE C, NEUTRAL GND. Values: 120/208V GREEN, RED, BLACK, BLUE, WHITE; 277/480V BROWN, YELLOW, PURPLE, GRAY, GREEN.

3.07 IDENTIFICATION:

- A. PROVIDE NAMEPLATES FOR SWITCHGEARS, PANELBOARDS, AND ALL SIMILAR DEVICES. NAMEPLATES SHALL BE SCREWED (NO ADHESIVES) ENGRAVED BAKELITE OR PHOTO-ETCHED METALLIC NAMEPLATE IDENTIFICATION SHOWING PANEL DESIGNATION, VOLTAGE AND PHASE IN MINIMUM 1/4" HIGH LETTERS.
B. EACH PANELBOARD SHALL CONTAIN A METAL-FRAMED CIRCUIT DIRECTORY INSIDE COVER, WITH PLASTIC PROTECTOR.
C. PANELBOARD SCHEDULE: AFTER COMPLETION OF WORK, PROVIDE TYPEWRITTEN UPDATED PANELBOARD SCHEDULES FOR ALL PANELBOARDS. INCLUDE ROOM/EQUIPMENT DESIGNATIONS TO IDENTIFY ROOM/EQUIPMENT SERVED BY CIRCUIT.
D. ELECTRICAL SERVICE AND SEPARATELY DERIVED ALTERNATING CURRENT SYSTEMS SHALL BE GROUNDED IN ACCORDANCE WITH NEC ARTICLE 250-3 TO 250-28, INCLUSIVE.
E. GROUNDING CONDUCTORS SHALL BE IDENTIFIED WITH GREEN INSULATION. WHERE GREEN INSULATION IS NOT AVAILABLE ON LARGER SIZES, BLACK INSULATION SHALL BE USED AND SUITABLY IDENTIFIED WITH GREEN TAPE AT EACH JUNCTION BOX OR DEVICE ENCLOSURE.

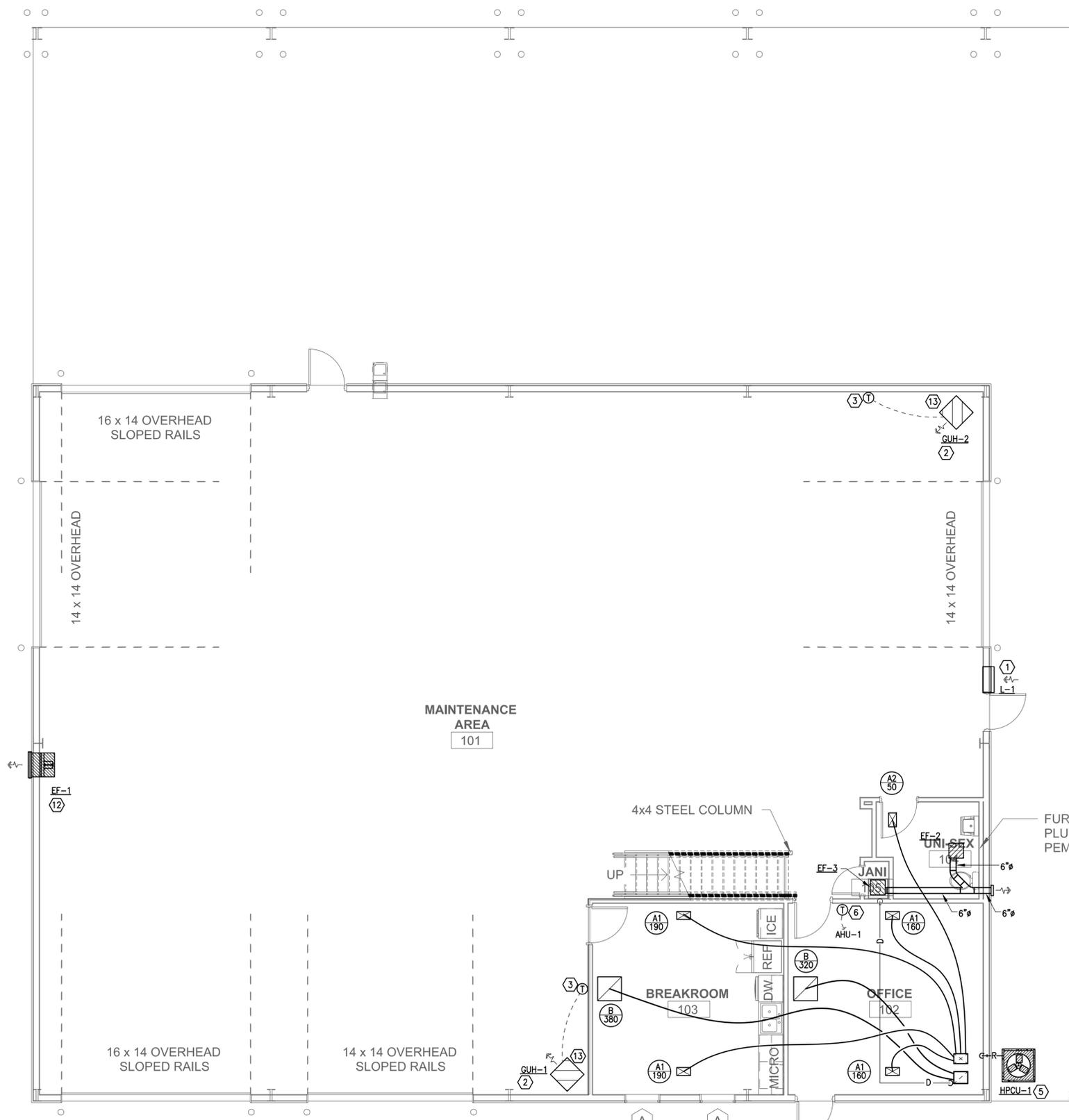
FIRE ALARM SYSTEM SPECIFICATIONS:

- 1. WHERE REQUIRED BY CODE, FIRE ALARM SYSTEM SHALL BE FURNISHED, INSTALLED AND WIRED BY THE FIRE ALARM CONTRACTOR. SHOP DRAWINGS SHALL BE PREPARED AND SUBMITTED BY A NICET LEVEL III MINIMUM CERTIFIED FIRE ALARM TECHNICIAN, TRAINED AND CERTIFIED BY MANUFACTURER IN FIRE ALARM SYSTEM DESIGN. FIRE ALARM CONTRACTOR SHALL PROVIDE A COMPLETE SYSTEM EQUAL TO NOTIFIER SYSTEM 500 OR EQUAL OF PYROTRONICS, EDWARDS SYSTEMS TECHNOLOGIES OR SIMPLEX. CONTROL PANEL TO BE MICROPROCESSOR BASED SYSTEM CONTAINING FIRE ALARM ZONES IN CITY NEEDED FOR COMPLETE SYSTEM, INITIATING ALARM POWER MODULES FOR HORNS & STROBES, CONTROL RELAY MODULE FOR CONTROL OF H.V.A.C. EQUIPMENT, AND ALL OTHER MISCELLANEOUS ITEMS FOR A COMPLETE AND OPERATING FIRE ALARM SYSTEM. CONTROL PANEL TO BE PROGRAMMED SO THAT IF ANY ONE ZONE IS IN ALARM, ALL H.V.A.C. UNITS ARE TO BE SHUT DOWN AND SMOKE PURGE SEQUENCE SHALL BE ACTIVATED.
ZONE #1 = MANUAL PULL STATIONS
ZONE #2 = DUCT DETECTORS FOR H.V.A.C. UNITS
2. THE FOLLOWING PERIPHERAL DEVICES TO BE INSTALLED AS A PART OF THE FIRE ALARM SYSTEM (WHERE REQUIRED):
2.1. MANUAL PULL STATION, NON-CODED, DUAL-ACTION, UNIT, +3"-10" A.F.F. #NBG-10.
2.2. AREA SMOKE DETECTORS, PHOTO-ELECTRIC TYPE #2451-8402B.
2.3. DUCT MOUNTED SMOKE DETECTORS, PHOTO-ELECTRIC TYPE #2451-DH40ACDC WITH REQUIRED SAMPLING TUBES (PROVIDED BY MECHANICAL CONTRACTOR, CONNECTED BY ELECTRICAL CONTRACTOR). COORDINATE WITH MECHANICAL CONTRACTOR FOR LOCATIONS.
2.4. HORN/STROBE UNIT, MINIMUM 75cd, 80° TO BOTTOM OF UNIT, OR SOME OTHER CONSISTENT HEIGHT AT LEAST 6 INCHES BELOW THE CEILING, #SS2475ADA.
2.5. STROBE ONLY UNIT, MINIMUM 75cd, 80° TO BOTTOM OF UNIT, OR SOME OTHER CONSISTENT HEIGHT AT LEAST 6 INCHES BELOW THE CEILING, #SI1-24-VR.
2.6. EXTERIOR BELL, 6" GONG WITH WEATHERPROOF BACKBOX, +10"-0" ABOVE FINISHED GRADE, #KMS-62A.
2.7. ANNUNCIATOR PANEL, COMPATIBLE WITH AND WITH SAME MANUFACTURER AS THAT OF THE FIRE ALARM CONTROL PANEL. INSTALL WITH TOP OF PANEL NOT MORE THAN 72 INCHES A.F.F.
2.8. MAGNETIC DOOR HOLD-OPENS DESIGNED TO CLOSE AUTOMATICALLY UPON ACTIVATION OF THE FIRE ALARM SYSTEM.
3. CONTRACTOR TO PROVIDE 1/2" EMT CONDUIT FROM FIRE ALARM CONTROL CABINET TO OWNER'S TELEPHONE TERMINAL BOARD. OWNER TO PROVIDE WIRING AND CONNECTION TO LOCAL ENERGY MUNICIPAL BOX OUTPUT. ALL FIRE ALARM CONDUCTORS TO BE AS RECOMMENDED BY MANUFACTURER AND MUST BE INSTALLED IN CONDUIT.
4. ALL FIRE ALARM MATERIALS AND INSTALLATION TO BE IN CONFORMANCE WITH N.F.P.A. 72 AND A.D.A. (AMERICANS WITH DISABILITIES ACT). IN AREAS AND CORRIDORS WHERE TWO OR MORE VISUAL STROBE UNITS ARE INSTALLED, PROVIDE SYNCHRONIZED STROBE UNITS SO AS TO PROVIDE A FLASH RATE MINIMUM OF 1 Hz AND A MAXIMUM OF 3 Hz.
5. ADDRESSABLE NOTIFICATION APPLIANCES ARE ACCEPTABLE.
6. ALL PERIPHERAL DEVICE ADDS SHALL BE PRICED TO THE OWNER MATCHING CURRENT GSA PRICING.
7. ELECTRICAL AND FIRE ALARM CONTRACTOR SHALL PROVIDE SUBMITTAL DOCUMENTS FOR EQUIPMENT AND DEVICES BEING INSTALLED FOR APPROVAL BY THE ENGINEER OR ARCHITECT.
8. ELECTRICAL AND FIRE ALARM CONTRACTOR TO COORDINATE WIRING AND CONNECTION OF ALL ELEVATOR EQUIPMENT IN ACCORDANCE WITH NFPA 72 AND ELEVATOR MANUFACTURER'S INSTRUCTIONS.

Project Title: HILL COUNTY MAINTENANCE BARN
901 FM 308
PENELOPE, TEXAS 76676
100% REVIEW SET
ELECTRICAL SPECIFICATIONS

Professional Engineer Seal for Stephen C. Stewart, License No. 101287, State of Texas. Includes name, title, and date 06/16/2020.

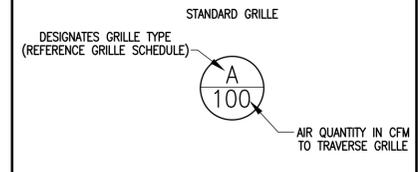
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1 MECHANICAL LAYOUT - 1ST FLOOR

2 MECHANICAL LAYOUT - MEZZANINE

**GRILLE SIZING SCHEDULE**



**SUPPLY DIFFUSER NECK SIZING SCHEDULE**

SIZE	AIRFLOW (CFM)
4"	0 - 50
6"	50 - 100
8"	100 - 210
10"	210 - 380
12"	380 - 500
14"	500 - 700
16"	700 - 800

**RETURN FLEX DUCT SIZING SCHEDULE**

SIZE	AIRFLOW (CFM)
4"	0 - 50
6"	50 - 100
8"	100 - 200
10"	200 - 300
12"	300 - 400
14"	400 - 500
16"	600 - 700

**CONDENSATE DRAIN SIZING SCHEDULE**

PIPE DIA.	EQUIPMENT CAPACITY
3/4"	UP TO 5 TONS
1"	OVER 5 TONS TO 25 TONS
1-1/4"	OVER 25 TONS TO 60 TONS
1-1/2"	OVER 60 TONS TO 100 TONS
2"	OVER 100 TONS TO 200 TONS

**MECHANICAL CONTRACTOR NOTES**

CONTRACTOR TO BE AWARE OF OBSTRUCTIONS AND BE PREPARED TO OFFSET DUCT AND PIPING BOTH VERTICALLY AND HORIZONTALLY TO ROUTE MECHANICAL SYSTEM. CONTRACTOR SHALL MAINTAIN FREE AREA OF DUCTWORK. CONTRACTOR SHALL SUBMIT RFI'S FOR ALL CHANGES PRIOR TO INSTALLATION. CONTRACTOR SHALL REFER TO DETAILS FOR DETAILED INSTALLATION INSTRUCTION.

**MECHANICAL GENERAL NOTES:**

- CODES, RULES AND REGULATIONS - DESIGN OF SYSTEM
  - ALL WORK AND MATERIALS SHALL BE IN FULL ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS, ORDINANCES AND CODES.
  - WHEN THE DRAWINGS CALL FOR MATERIALS OR CONSTRUCTION OF A BETTER QUALITY OR LARGER SIZES THAN REQUIRED BY THE ABOVE MENTIONED CODES AND RULES, WORK SHALL BE AS SPECIFIED OR SHOWN RATHER THAN AS REQUIRED BY CODE. ALL ITEMS OR FEATURES OF THE MECHANICAL SYSTEMS REQUIRED BY CODE SHALL BE INCLUDED, EVEN THOUGH NOT SPECIFIED HEREIN.
  - INSTALLATION OF THE SYSTEMS SHALL BE IN ACCORDANCE WITH THE ABOVE MENTIONED CODES AND REGULATIONS AND ALSO SHALL CONFORM TO GOOD, ACCEPTED MECHANICAL PRACTICES.
- PROVIDE AND INSTALL VOLUME DAMPERS IN ALL BRANCH DUCTS.
- FLEXIBLE CONNECTIONS AT SUPPLY AND RETURN AIR OPENINGS OF ALL AIR CONDITIONING UNITS.
- FLEXIBLE DUCTS TO BE R-8 GLASS-FLEX 6'-0" MAXIMUM IN LENGTH, WHERE APPLICABLE.
- COORDINATE EXACT LOCATION OF ALL AIR OUTLETS AND INLETS (DIFFUSERS, REGISTERS AND GRILLES) WITH APPROPRIATE ARCHITECTURAL PLAN, AND VERIFY THEIR LOCATION WITH ARCHITECT ON THE JOB SITE BEFORE INSTALLATION. COLOR AS DIRECTED BY ARCHITECT/OWNER.
- AUTOMATIC TEMPERATURE CONTROL DEVICE FOR REGULATION OF SPACE TEMPERATURE SHALL BE CAPABLE OF BEING SET FROM 55 TO 85°F, AND HAVE THE ABILITY TO OPERATE THE HEATING AND COOLING IN SEQUENCE. CONTROL SHALL BE ADJUSTABLE TO PROVIDE A RANGE OF UP TO 5°F BETWEEN FULL HEATING AND FULL COOLING.
- APPLIANCES DESIGNED TO BE FIXED IN POSITION SHALL BE FASTENED IN PLACE.
- A MAINTENANCE LABEL SHALL BE AFFIXED TO MECHANICAL EQUIPMENT AND A MAINTENANCE MANUAL SHALL BE PROVIDED FOR THE OWNERS USE.
- PROVIDE ACCESS PANEL FOR ALL CEILING MOUNTED EQUIPMENT & YOUNG REGULATORS OR ACCESS PANEL FOR VOLUME DAMPERS.
- PROVIDE MIN. 10'-0" SEPARATION BETWEEN POINT OF EXHAUST AND ANY FRESH AIR INTAKE, OR A/C UNIT OUTSIDE AIR INTAKE.
- PROVIDE FIRE DAMPERS OR SMOKE/FIRE DAMPERS WHERE DUCT PENETRATES FIRE RATED CEILING OR WALL IF APPLICABLE.
- TRANSVERSE JOINTS FOR ALL AIR SUPPLY DUCTS INSTALLED WHERE AIR LEAKAGE WOULD BE NON-BENEFICIAL TO THE OCCUPIED AREA, TEMPERATURE REQUIREMENTS SHALL BE SEALED WITH APPROVED MASTIC OR TAPE.
- ALL DUCT SIZES SHOWN ON THE FLOOR PLANS ARE CLEAR INSIDE DIMENSIONS. CONTRACTOR SHALL ENLARGE DUCT SIZE IN ORDER TO ACCOMMODATE LINING INSIDE OF DUCT.
- THE MECHANICAL CONTRACTOR SHALL SECURE AND PAY FOR ALL REQUIRED PERMITS AND FEES.
- SHOP PRIME ALL MISCELLANEOUS INTERIOR BRACKETS AND HANGERS UNLESS GALVANIZED OR STAINLESS STEEL.
- ENERGY CONSERVATION STANDARDS FOR NEW NONRESIDENTIAL BUILDINGS HAVE BEEN REVIEWED AND DESIGN SUBSTANTIALLY CONFORMS TO THEM.
- EACH SINGLE SYSTEM PROVIDING HEATING OR COOLING AIR IN EXCESS OF 2,000 CFM SHALL BE EQUIPPED WITH AN AUTOMATIC SHUT-OFF. THE SMOKE DETECTOR SHALL BE INSTALLED IN THE RETURN AIR DUCT AHEAD OF THE OSA INTAKE. SEE CODE FOR EXEMPTIONS AND LOCAL AUTHORITY FOR CODE INTERPRETATION, OR AS INDICATED ON PLAN.
- ALL EQUIPMENT AND APPLIANCES ARE LISTED PRODUCTS, AND WILL BE INSTALLED ACCORDING TO THEIR LISTING, AND ALL LISTING INFORMATION WILL BE AVAILABLE FOR INSPECTION.
- REFER TO DETAILS OR GUIDELINES FOR MECHANICAL CONSTRUCTION REQUIREMENTS. INSTALL IN FULL ACCORDANCE WITH PROPER CODES AND GUIDELINES.
- COORDINATE IN THE FIELD THE EXACT LOCATION OF ALL CEILING MOUNTED GRILLES AND DIFFUSERS WITH LIGHT FIXTURES AND (ARCHITECTUAL) REFLECTED CEILING PLAN.
- ALL EXTERIOR BRACKETS, CLAMPS, AND HANGERS SHALL BE HOT DIPPED GALVANIZED. COAT ALL CUT ENDS AND WELDS WITH "ZRC" COLD GALVANIZING COMPOUND.

**MECHANICAL KEYED NOTES**

- LOUVER SHALL BE 48X42 RUSKIN ELBD3751 OR APPROVED EQUIVALENT. CONTRACTOR SHALL INSTALL PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR SHALL COORDINATE LOCATION AND HEIGHT WITH ARCHITECT PRIOR TO CONSTRUCTION.
- CONTRACTOR SHALL USE MANUFACTURER'S RECOMMEND WALL MOUNTING BRACKET. CONTRACTOR SHALL COORDINATE FINAL LOCATION AND HEIGHT OF UNIT HEATER WITH OWNER.
- PROVIDE WITH MANUFACTURER'S SUGGESTED WALL MOUNT THERMOSTAT.
- PROVIDE UNIT WITH MANUFACTURER'S SUGGESTED CLEARANCES FOR ACCESS AND MAINTENANCE. CONTRACTOR SHALL COORDINATE WITH ALL OTHER TRADES PRIOR TO INSTALL OR FABRICATION TO ENSURE PROPER CLEARANCES OF SYSTEMS AND CODE REQUIREMENTS ARE MAINTAINED.
- PROVIDE CONDENSING UNIT WITH ALL PROPER CLEARANCES FOR MAINTENANCE AND OPERATION. REFER TO MANUFACTURER FOR RECOMMENDATIONS. PROVIDE CONDENSING UNIT WITH 4" THICK CONCRETE PAD. COORDINATE FINAL LOCATION WITH OWNER PRIOR TO ANY WORK BEING DONE.
- PROVIDE PROGRAMMABLE THERMOSTAT. COORDINATE FINAL LOCATION WITH OWNER PRIOR TO CONSTRUCTION.
- ROUTE CONDENSATE DRAIN LINE DOWN TO MOP SINK.
- ROUTE EXHAUST AIR DUCT THRU WALL TO WALL EXHAUST VENT. COORDINATE COLOR AND MOUNTING HEIGHT & LOCATION WITH ARCHITECT.
- INSULATE PIPE AS SPECIFIED. REFER TO SPECIFICATIONS.
- REFRIGERANT LIQUID AND SUCTION LINES SIZED PER MANUFACTURER.
- LOUVER SHALL BE 12X12 RUSKIN ELBD3751 OR APPROVED EQUIVALENT. CONTRACTOR SHALL INSTALL PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR SHALL COORDINATE EXACT LOCATION WITH ARCHITECT AND OWNER PRIOR TO CONSTRUCTION.
- CONTRACTOR SHALL COORDINATE EXACT LOCATION OF WALL PROPELLER FAN WITH ARCHITECT AND OWNER PRIOR TO CONSTRUCTION.
- PROVIDE GAS UNIT HEATER WITH MANUFACTURER'S RECOMMEND CONCENTRIC VENTING KIT. COORDINATE WALL/ROOF PENETRATION WITH ARCHITECT AND OWNER PRIOR TO CONSTRUCTION. CONTRACTOR SHALL INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

Project Title: **HILL COUNTY MAINTENANCE BARN**  
 901 FM 308  
 PENELOPE, TEXAS 76676  
 100% REVIEW SET  
 MECHANICAL LAYOUT

Drawn By: MP  
 Checked By: CS  
 Scale: SEE PLANS  
 Date: 06/16/2020

Revisions and Descriptions: \_\_\_\_\_  
 No. \_\_\_\_\_  
 By \_\_\_\_\_  
 Date \_\_\_\_\_  
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STEPHEN C. STEWART  
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 LICENSED PROFESSIONAL ENGINEER  
 STATE OF TEXAS  
 06.16.2020

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Sheet No. **M101**  
 of \_\_\_\_\_  
 Project No. **0843.2002**

CEN-TEX ENGINEERING  
 Texas Reg. F-11794  
 18 S. MAIN ST. SUITE 610  
 Temple, Texas 76701

**HEAT PUMP SPLIT SYSTEM UNIT SCHEDULE**

INDOOR UNIT MARK	OUTDOOR UNIT MARK	MFG.	INDOOR MODEL	OUTDOOR MODEL	EFF. (SEER)	NOMINAL TONNAGE	EVAPORATOR FAN DATA					COOLING DATA					HEATING DATA				ELECTRICAL DATA					
							SUPPLY AIRFLOW	OSA AIRFLOW	ESP (IN. WC.)	HP	RPM	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	EAT (DB/WB) (°F)	LAT (DB/WB) (°F)	OSA (DB/WB) (°F)	HEAT (KW)	HEATING EAT (°F)	HEATING LAT (°F)	OSA (°F)	INDOOR UNIT			OUTDOOR UNIT		
																					V/PHHZ	MCA (AMPS)	MOP (AMPS)	V/PHHZ	MCA (AMPS)	MOP (AMPS)
AHU-1	ACCU-1	DAIKIN	ASPT29	DZ14SA0241	14	2.0	750	75	0.50	3/4	1,050	20.5	19.3	77.8 / 64.0	54.0 / 53.1	105.0 / 76.0	5.0	65.0	84.8	25.0	240/1/60	31.0	35.0	240/1/60	17.1	25.0

- NOTES:  
 1) PROVIDE MANUFACTURER'S HAIL GUARDS FOR ALL OUTDOOR UNITS.  
 2) PROVIDE REFRIGERANT SUCTION AND LIQUID LINE, AND CONDENSATE DRAIN LINE AS REQUIRED BY MANUFACTURER.  
 3) CONTACT DERRICK VAN WEST EQUIPMENT SELECTION ASSISTANCE. DERRICK.VANWEST@HTS.COM OR 214-846-8668

**EXHAUST / SUPPLY FAN SCHEDULE**

MARK	MFG.	MODEL	TYPE	AIRFLOW (CFM)	ESP (IN WC)	MTR. POWER	V/PHHZ	NOTES
EF-1	COOK	AWD	WALL	3,395	0.10	1/3 H.P.	240/1/60	1,3,4
EF-2	COOK	GEMNI	CEILING	50	0.50	46 WATTS	120/1/60	2,3,4
EF-3	COOK	GEMNI	CEILING	50	0.50	46 WATTS	120/1/60	2,3,4

- NOTES:  
 1) FAN SHALL BE INTERLOCKED WITH LOCAL SWITCH.  
 2) FAN SHALL BE INTERLOCKED WITH LOCAL LIGHT OPERATION.  
 3) PROVIDE SPEED CONTROLLER FOR FAN SPEED ADJUSTMENT.  
 4) PROVIDE ALL EXHAUST FANS WITH BACKDRAFT DAMPERS.

**GAS UNIT HEATER SCHEDULE**

MARK	MFG.	MODEL #	HEATING MBH INPUT	HEATING MBH OUTPUT	SUPPLY AIRFLOW	EDB (°F)	LDB (°F)	STAGES	FLA	ELECTRICAL DATA		
										V/PHHZ	MCA (AMPS)	MOP (AMPS)
GUH-1	STERLING	HU050	50.0	48.6	790	40.0	96.7	3	10.8	120/1/60	13.5	20.0
GUH-2	STERLING	HU050	50.0	48.6	790	40.0	96.7	3	10.8	120/1/60	13.5	20.0

- NOTES:  
 1) PROVIDE MANUFACTURER'S RECOMMENDED CONCENTRIC VENTING KIT. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.  
 2) PROVIDE WALL MOUNT THERMOSTAT.  
 3) CONTACT DERRICK VAN WEST AT HTS FOR EQUIPMENT SELECTION ASSISTANCE. DERRICK.VANWEST@HTS.COM OR 214-846-8668.

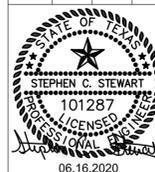
**DIFFUSER, REGISTERS & GRILLES SCHEDULE**

MARK	MFG.	MODEL	SERVES	MATERIAL	DESCRIPTION	FACTORY FINISH	BLOW PATTERN	NOTES
A1	TITUS	250	SUPPLY	STEEL	SQUARE CONE DIFFUSER	ARCH. TO SPEC.	4-WAY	14X10
A2	TITUS	250	SUPPLY	STEEL	SQUARE CONE DIFFUSER	ARCH. TO SPEC.	4-WAY	10X6
B	TITUS	350RL	RETURN	STEEL	LOUVERED GRILLE	ARCH. TO SPEC.	N/A	12X12

- NOTES:  
 1. PROVIDE ALL AIR DEVICES WITH FLAT SURFACE MOUNTING KITS AND BORDERS. COORDINATE SELECTIONS WITH OWNER.

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 901 FM 308  
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 MECHANICAL SCHEDULES

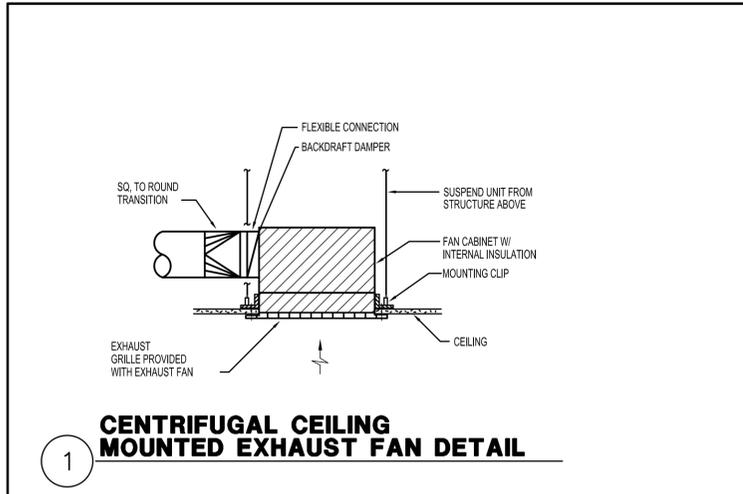
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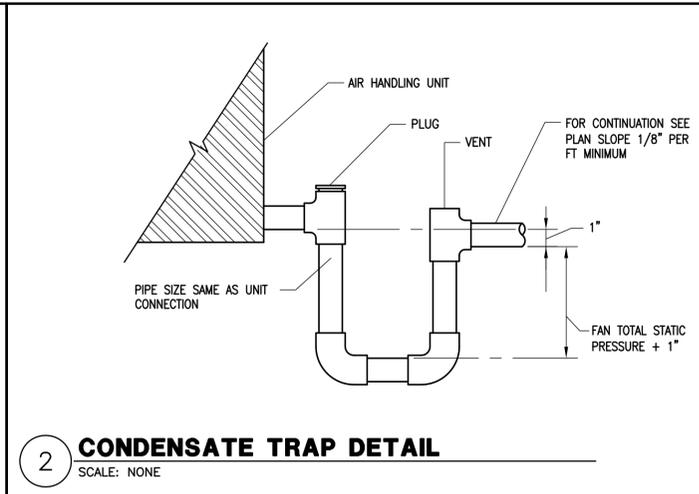
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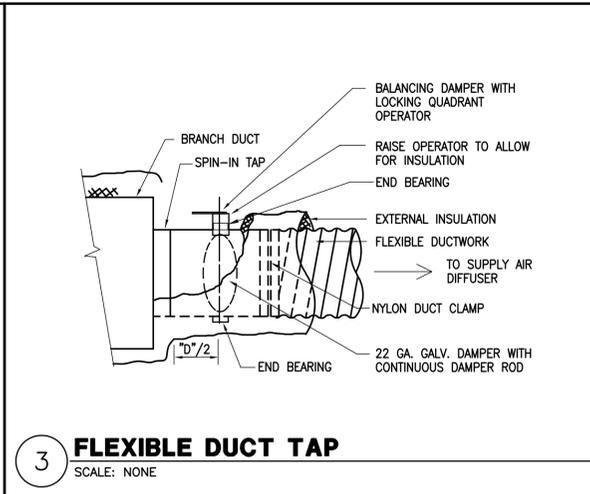
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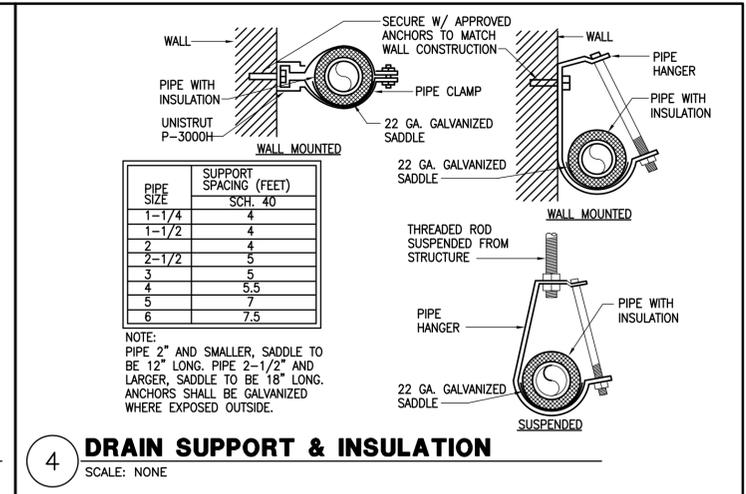
**1 CENTRIFUGAL CEILING MOUNTED EXHAUST FAN DETAIL**  
SCALE: NONE



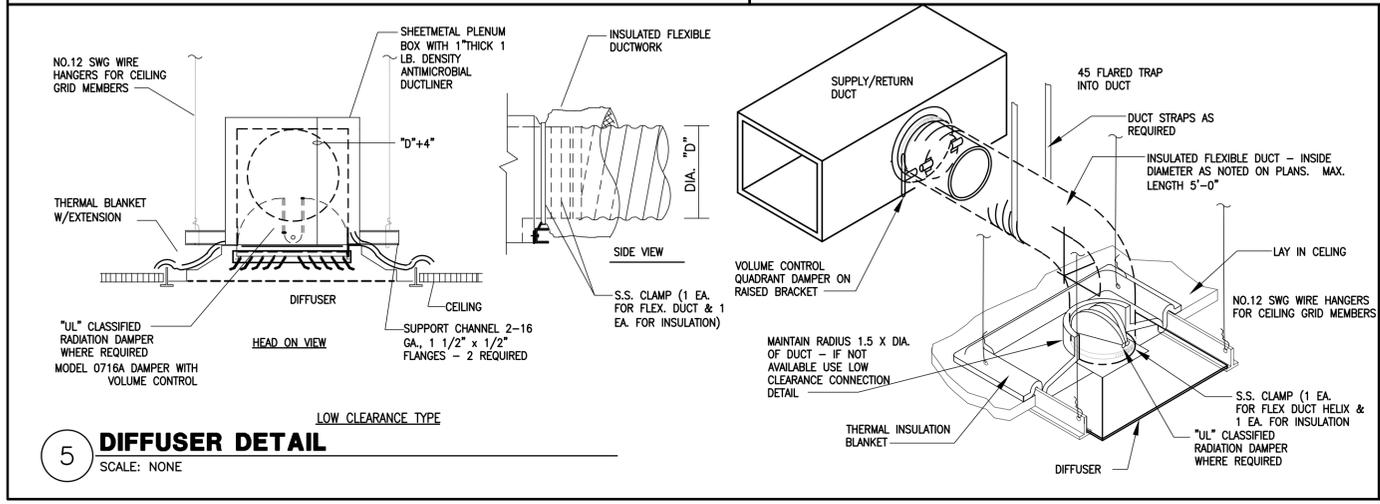
**2 CONDENSATE TRAP DETAIL**  
SCALE: NONE



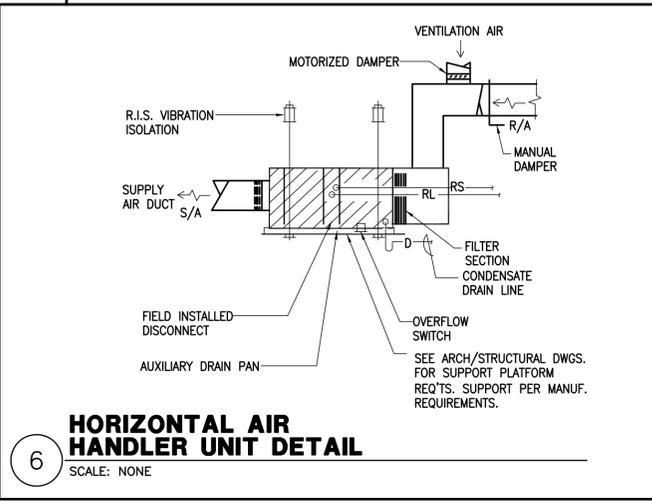
**3 FLEXIBLE DUCT TAP**  
SCALE: NONE



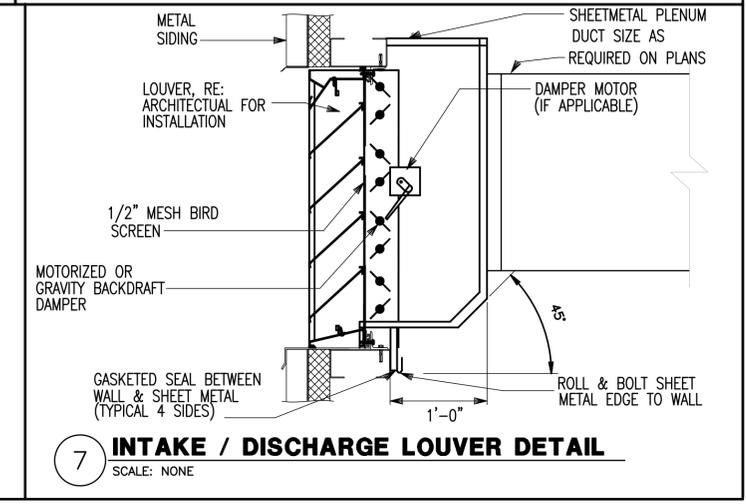
**4 DRAIN SUPPORT & INSULATION**  
SCALE: NONE



**5 DIFFUSER DETAIL**  
SCALE: NONE



**6 HORIZONTAL AIR HANDLER UNIT DETAIL**  
SCALE: NONE



**7 INTAKE / DISCHARGE LOUVER DETAIL**  
SCALE: NONE

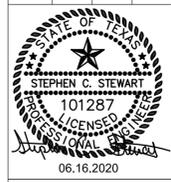
Project Title: **HILL COUNTY MAINTENANCE BARN**  
**901 FM 308**  
**PENELOPE, TEXAS 76676**  
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Drawing Title: **MECHANICAL DETAILS**

Drawn By: MP  
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 Project No. **0843.20002**

CEN-TEX ENGINEERING  
 Texas Reg. F-11794  
 18 S. MAIN ST. SUITE 610  
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**MECHANICAL SPECIFICATIONS**

- 1.1 SCOPE
A. THE WORK OF THIS DIVISION CONSISTS OF PROVIDING LABOR, MATERIALS, PRODUCTS, AND IN PERFORMING ALL OPERATIONS REQUIRED FOR THE COMPLETE OPERATING INSTALLATION OF ALL MECHANICAL AND PLUMBING SYSTEMS IN ACCORDANCE WITH THE SPECIFICATIONS AS WELL AS APPLICABLE DRAWINGS, TERMS, CONDITIONS OF THE CONTRACT AND ALL APPLICABLE CODES AND ORDINANCES GOVERNING THE INSTALLATION OF THE VARIOUS MECHANICAL AND PLUMBING SYSTEMS. ALL WORK SHALL BE FULLY CORRELATED WITH THE WORK OF OTHER TRADES.
B. EACH CONTRACTOR SHALL STUDY THE CONTRACT DOCUMENTS TO DETERMINE THE EXTENT OF WORK PROVIDED UNDER THIS CONTRACT AS WELL AS ASCERTAIN THE DIFFICULTY TO BE ENCOUNTERED IN PERFORMING THE WORK ON THE DRAWINGS AND OUTLINED HEREINAFTER AND IN MAKING CONNECTIONS TO EXISTING UTILITIES, INSTALLING NEW EQUIPMENT AND SYSTEMS AND COORDINATING THE WORK WITH THE OTHER TRADES.
C. EXAMINATION OF THE SITE: THE CONTRACTOR SHALL THOROUGHLY EXAMINE SITE AND SATISFY HIMSELF AS THE CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED. THE CONTRACTOR SHALL VERIFY, AT THE SITE, ALL MEASUREMENTS AFFECTING HIS WORK AND SHALL BE RESPONSIBLE FOR THE CORRECTNESS OF THE SAME. NO EXTRA COMPENSATION WILL BE ALLOWED TO THE CONTRACTOR FOR EXPENSES DUE TO HIS NEGLIGENCE OR FAILURE TO DISCOVER CONDITIONS WHICH AFFECT HIS WORK. NO EXTRA COMPENSATION WILL BE ALLOWED ON ACCOUNT OF DIFFERENCES BETWEEN ACTUAL DIMENSIONS AND THOSE INDICATED ON THE DRAWINGS.
1.2 REGULATORY REQUIREMENTS
A. CODES AND ORDINANCES/PERMIT AND FEES: PERFORM ALL WORK IN ACCORDANCE WITH ALL STATE AND LOCAL CODES AND ORDINATES, THE CURRENT EDITION OF NFPA, THE INTERNATIONAL BUILDING CODE, INTERNATIONAL MECHANICAL CODE, INTERNATIONAL PLUMBING CODE, AND ALL CURRENT SUPPLEMENTS THERETO, AND ANY OTHER AUTHORITIES HAVING JURISDICTION OVER THE WORK. PROCEDURE AND PAY FOR ALL PERMITS, LICENSES, FEES AND CHARGES, AND GIVE ALL NOTICES NECESSARY.
B. IN CASE OF CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND REQUIREMENTS OF ANY CODE OR AUTHORITIES HAVING JURISDICTION, THE MOST STRINGENT REQUIREMENTS OF THE AFOREMENTIONED SHALL BE GOVERNED.
C. SHOULD THE CONTRACTOR PERFORM ANY WORK THAT DOES NOT COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE BUILDING CODES, STATE LAWS, AND LOCAL ORDINANCES AND INDUSTRY STANDARDS, HE SHALL BEAR ALL COSTS ARISING IN CORRECTING THE DEFICIENCIES, AS APPROVED BY THE ARCHITECT.
D. INTENT: THE DRAWINGS SHOW GENERAL ARRANGEMENTS AND THE EXTENT OF THE WORK. THE DRAWINGS DO NOT SHOW, IN MINUTE DETAIL, ALL FEATURES OF THE INSTALLATION. FOLLOW THE DRAWINGS AS CLOSELY AS ACTUAL CONSTRUCTION WILL PERMIT. ALL MATERIAL AND LABOR NECESSARY TO COMPLETE THE WORK IN ACCORDANCE WITH THE INTENT OF THE SPECIFICATIONS AND DRAWINGS SHALL BE FURNISHED BY THE CONTRACTOR WITHOUT ADDITIONAL CHARGE. THE JOB SHALL BE BID AND INSTALLED COMPLETE AND CONSISTENT IN EVERY REQUEST.
1.3 COORDINATION OF WORK
A. EACH CONTRACTOR SHALL COMPARE HIS DRAWINGS AND SPECIFICATIONS WITH THOSE OF OTHER TRADES. ALL WORK SHALL BE INSTALLED IN COOPERATION WITH ALL OTHER TRADES INSTALLING INTERRELATED WORK. BEFORE INSTALLATION, ALL TRADES SHALL MAKE PROPER PROVISIONS TO AVOID INTERFERENCES.
B. EACH CONTRACTOR SHALL COORDINATE THE LOCATION OF HIS SYSTEMS TO THAT ALL OUTSIDE AIR INTAKES, PLUMBING VENTS, AND EXHAUST FANS ARE LOCATED IN SUCH A WAY AS TO PREVENT CROSS-CONTAMINATION. SUCH A DISTANCE SHALL BE NOT LESS THAN 10'-0" FT.
C. LOCATIONS OF CONDUIT, DUCTS, PIPING, SPRINKLER HEADS AND EQUIPMENT SHALL BE ADJUSTED TO ACCOMMODATE THE WORK WITH INTERFERENCES ANTICIPATED AND ENCOUNTERED. EXACT ROUTING AND LOCATION OF SYSTEMS SHALL BE DETERMINED PRIOR TO FABRICATION OR INSTALLATION.
D. OFFSETS AND CHANGES OF DIRECTION IN ALL CONDUIT, DUCTS AND PIPING SYSTEMS SHALL BE MADE AS REQUIRED TO MAINTAIN PROPER HEADROOM AND FITCH OF SLOPING LINES.
1.4 REGULATORY REQUIREMENTS
A. COMPLY WITH ALL CURRENT LOCAL, STATE, AND NATIONAL CODES, INCLUDING THE AMERICANS WITH DISABILITIES ACT (MOST CURRENT EDITION) AND SECURE AND PAY FOR ALL APPLICABLE COSTS, FEES, PERMITS AND LICENSES. NO ADDITIONAL COSTS SHALL BE PAID BY THE OWNER FOR THESE ITEMS.
B. PERFORM ALL WORK WITH HIGHEST REGARD TO SAFETY. EXCAVATE BY HAND AND WITH CAUTION TO LOCATE ALL UTILITIES IN THE BOUNDS OF THE AREA TO BE EXCAVATED PRIOR TO MACHINE EXCAVATING. PROCEED WITH SAFETY AND CAUTION SO THAT NO UTILITY IS DAMAGED OR INTERRUPTED.
C. PRIOR TO BID, VERIFY AND COORDINATE ALL REQUIRED CONNECTIONS AND/OR RELOCATIONS OF UTILITIES WITH UTILITY COMPANIES. PERFORM SUCH WORK IN ACCORDANCE WITH UTILITY COMPANY REGULATIONS. PAY ALL APPLICABLE FEES AND COSTS INCLUDING THOSE FOR ANY EXTENSIONS, RELOCATIONS AND/OR CONNECTIONS.
D. CONTRACTOR SHALL VERIFY LOCATIONS OF ALL ABOVE GROUND AND MARKED UTILITIES.
1.5 SUBMITTALS
A. SUBMITTALS SHALL BE COMPLETE FOR SYSTEM(S) INVOLVED. PROVIDE SUBMITTALS FOR ALL HVAC EQUIPMENT.
B. WHERE EQUIPMENT OF THE ACCEPTABLE MANUFACTURERS REQUIRE DIFFERENT ARRANGEMENT OR CONNECTIONS FROM THOSE SHOWN, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL THE EQUIPMENT TO OPERATE PROPERLY AND IN HARMONY WITH THE ORIGINAL INTENT OF THE DRAWINGS AND SPECIFICATIONS. THE CONTRACTOR SHALL MAKE ALL NECESSARY CHANGES IN ALL AFFECTED RELATED WORK PROVIDED UNDER OTHER SECTIONS INCLUDING LOCATIONS OF ROUGH-IN CONNECTIONS BY OTHER TRADES, CONDUIT SUPPORTS, INSULATION, ETC. ALL CHANGES SHALL BE MADE AT NO INCREASE IN THE CONTRACT AMOUNT OR ADDITIONAL COSTS TO THE OTHER TRADES AND/OR OWNER.
1.6 GUARANTEE
A. ALL EQUIPMENT AND WORK SHALL BE GUARANTEED FOR A PERIOD OF 12 MONTHS AFTER ACCEPTANCE. ANY DEFECTS IN EQUIPMENT OR WORKMANSHIP SHALL BE PROMPTLY REPAIRED OR REPLACED BY THE CONTRACTOR WITHOUT ADDITIONAL EXPENSE TO THE OWNER. THE GUARANTEE PERIOD OF ANY PART OF THE REPAIRED ITEMS SHALL BE EXTENDED FOR A PERIOD OF ONE YEAR FROM THE DATE OF SUCH REPAIR OR REPLACEMENT.
1.7 COMPLETION
A. UPON COMPLETION OF THE MECHANICAL INSTALLATION, DEMONSTRATE TO THE OWNER'S SATISFACTION THAT THE SYSTEMS HAVE BEEN INSTALLED IN A SATISFACTORY MANNER IN ACCORDANCE WITH THE PLANS AND APPLICABLE CODES. SHOW THAT ALL CONTROLS ARE OPERABLE AND ARE PROPERLY ADJUSTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE FINAL SYSTEMS BALANCE, THAT ALL SYSTEMS ARE PROPERLY BALANCED, THAT ALL EQUIPMENT OPERATES PROPERLY, THAT FILTERS AND STRAINERS ARE CLEAN, AND THAT ALL COMPONENTS OF ALL SYSTEMS ARE INSTALLED AND ADJUSTED FOR PROPER OPERATION.

- PRODUCTS
2.1 GENERAL
A. ALL MATERIALS SHALL BE NEW AND OF THE QUALITY SPECIFIED. MATERIALS SHALL BE FREE FROM DEFECTS. MANUFACTURERS SHALL BE AS SPECIFIED HEREIN, OR BY ADDENDA. ALL PIPING EQUIPMENT, ETC., WHICH NEEDS TO BE INSULATED TO CONSERVE HEAT OR COLD, OR TO PREVENT FREEZING OR CONDENSATION, SHALL BE INSULATED. ALL MATERIALS SHALL HAVE THE UNDERWRITERS LABORATORIES, INC. LABEL.

**BASIC MECHANICAL METHODS**

- 1.1 DIMENSION AND FIT
A. CUT MATERIALS ACCURATELY FROM MEASUREMENTS TAKEN ON THE JOB SITE.
B. DO NOT SPRING OR BEND PIPE TO FIT CONDITIONS OR MAKE UP JOINTS.
1.2 SERVICEABILITY OF PRODUCTS
A. FURNISH ALL PRODUCTS TO PROVIDE THE PROPER ORIENTATION OF SERVICEABLE COMPONENTS TO ACCESS SPACE PROVIDED.
B. COORDINATE INSTALLATION OF PIPING, DUCTWORK, EQUIPMENT, SYSTEM COMPONENTS, AND OTHER PRODUCTS TO ALLOW PROPER SERVICE OF ALL ITEMS REQUIRING PERIODIC MAINTENANCE OR REPLACEMENT.
C. REPLACE OR RELOCATE ALL PRODUCTS INCORRECTLY ORDERED OR INSTALLED TO PROVIDE PROPER SERVICEABILITY.
D. PROVIDE ACCESS DOORS AND ACCESS PANELS IN CEILINGS, WALLS, FLOORS, ETC. FOR ACCESS TO TRAPS, VALVES, PRIMERS, DAMPERS, AUTOMATIC DEVICES, AND ALL SERVICEABLE OR OPERABLE EQUIPMENT IN CONCEALED SPACES.
E. PROVIDE VIBRATION ISOLATORS ON ALL EQUIPMENT HAVING MOTORS AND SUPPORTED BY THE BUILDINGS STRUCTURE.
1.3 ROUTING
A. ROUTE ALL PIPELINES AND DUCTWORK PARALLEL WITH BUILDINGS LINES AND AS HIGH AS POSSIBLE.
B. ROUTE PIPING AND DUCTS TO CLEAR ALL DOORS, WINDOWS, AND OTHER OPENINGS AND TO AVOID ALL OTHER PIPES AND DUCTS, LIGHT FIXTURES AND SIMILAR PRODUCTS.
C. PROVIDE UNIONS ADJACENT TO ALL EQUIPMENT AND WHERE REQUIRED FOR DISCONNECT AND MAINTENANCE OF EQUIPMENT.
D. SECURELY FASTEN ALL MECHANICAL/PLUMBING WORK TO THE STRUCTURE TO PREVENT HAZARD HUMAN LIFE AND LIMB, AND TO PREVENT DAMAGE TO PRODUCTS OF CONSTRUCTION UNDER ALL CONDITIONS OF OPERATION.
E. DO ALL SLEEVING, CUTTING, AND PATCHING OF ROUGH CONSTRUCTION FOR PIPING, ALL CUTTING, REPAIRING AND REQUIRED STRUCTURAL REINFORCING FOR INSTALLATION OF THIS WORK SHALL BE DONE IN CONFORMANCE WITH ARCHITECT'S DIRECTIONS AND ANY DAMAGE CAUSED BY CUTTING SHALL BE REPAIRED EQUAL TO ORIGINAL CONDITIONS. NO CUTTING WITHOUT ARCHITECT'S APPROVAL.
F. PLACE ANY SLEEVES, CHASES, CONCRETE INSERTS, ANCHOR BOLTS, ETC., BEFORE CONCRETE IS POURED, AND BE RESPONSIBLE FOR CORRECT LOCATION AND INSTALLATION OF THESE ITEMS.

**VIBRATION AND SEISMIC CONTROL FOR HVAC PIPING AND EQUIPMENT**

- 1.1 PERFORMANCE REQUIREMENTS
A. SEISMIC-RESTRAINT LOADING
a. SITE CLASS AS DEFINED IN THE IBC. AS REQUIRED BY LOCAL JURISDICTION.
b. ASSIGNED SEISMIC USE GROUP OR BUILDING CATEGORY AS DEFINED IN THE IBC. AS REQUIRED BY LOCAL JURISDICTION.

- c. DESIGN SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS (0.2 SECOND).
d. DESIGN SPECTRAL RESPONSE ACCELERATION AT 1-SECOND PERIOD.
1.2 COMPONENTS:
A. VIBRATION ISOLATORS:
a. ISOLATOR PADS: NEOPRENE.
b. MOUNTS: DOUBLE-DEFLECTION TYPE.
c. RESTRAINED MOUNTS: ALL DIRECTIONAL MOUNTINGS WITH SEISMIC RESTRAINT; CAST-DUCTILE-IRON HOUSING.
d. SPRING ISOLATORS: FREESTANDING, LATERALLY STABLE, OPEN-SPRING TYPE.
e. RESTRAINED SPRING ISOLATORS: FREESTANDING, STEEL, OPEN-SPRING TYPE WITH SEISMIC RESTRAINT.
f. HOUSED SPRING MOUNTS: DUCTILE-IRON OR STEEL HOUSING, WITH INTEGRAL, VERTICALLY ADJUSTABLE SEISMIC SNUBBERS.
g. ELASTOMERIC HANGERS: DOUBLE-DEFLECTION TYPE.
h. SPRING HANGERS: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION.
i. SPRING HANGERS WITH VERTICAL-LIMIT STOP: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION AND WITH VERTICAL-LIMIT STOP.
j. PIPE RISER RESILIENT SUPPORT: ALL-DIRECTIONAL, ACOUSTICAL PIPE ANCHOR.
k. RESILIENT PIPE GUIDES.
B. AIR-MOUNTING SYSTEMS:
a. AIR MOUNTS: FREESTANDING, SINGLE OR MULTIPLE, COMPRESSED-AIR BELLOWES.
b. RESTRAINED AIR MOUNTS: HOUSED COMPRESSED-AIR BELLOWES.
C. RESTRAINED VIBRATION ISOLATION ROOF-CURB RAILS: FACTORY-ASSEMBLED, FULLY ENCLOSED, INSULATED, AIR- AND WATERTIGHT CURB RAIL; WITH SPRING ISOLATORS MOUNTED ON ELASTOMERIC ISOLATION PADS, AND SNUBBER BUSHINGS.
D. VIBRATION ISOLATION EQUIPMENT BASES:
a. STEEL BASE: FACTORY-FABRICATED, WELDED, STRUCTURAL-STEEL BASES AND RAILS.
b. INERTIA BASE: FACTORY-FABRICATED, WELDED, STRUCTURAL-STEEL BASES AND RAILS READY FOR FIELD-APPLIED, CAST-IN-PLACE CONCRETE.
E. SEISMIC-RESTRAINT DEVICES:
a. SNUBBERS: WELDED STRUCTURAL-STEEL SHAPES AND REPLACEABLE RESILIENT ISOLATION WASHERS AND BUSHINGS.
b. CHANNEL SUPPORT SYSTEM: MFMA-3 SLOTTED STEEL CHANNELS.
c. RESTRAINT CABLES: STAINLESS-STEEL CABLES.
d. ANCHOR BOLTS: MECHANICAL TYPE, SEISMIC RATED.
e. RESILIENT ISOLATION WASHERS AND BUSHINGS: MOLDED NEOPRENE.

- 1.3 FIELD QUALITY CONTROL
A. TESTING: BY CONTRACTOR.

**AIR DISTRIBUTION**

- 1.1 FILTERS
A. MANUFACTURERS: AAF OR APPROVED EQUIVALENT.
a. PLEATED FILTERS MERV-8, OR AS NOTED ON THE DRAWINGS.
1.2 DUCTWORK
A. MATERIALS:
a. STEEL DUCTS: GALVANIZED STEEL SHEET, LOCK-FORMING QUALITY, MINIMUM GAUGE PER SMACNA STANDARDS.
b. INSULATED FLEXIBLE DUCTS: FLEXIBLE DUCT WRAPPED WITH FLEXIBLE GLASS FIBER INSULATION, ENCLOSED BY R-8 METALIZED VAPOR BARRIER JACKET.
c. SEALANT: NON-HARDENING, WATER RESISTANT, FIRE RESISTIVE, USED ALONE OR WITH TAPE.
B. METAL DUCTWORK:
a. FABRICATE AND SUPPORT IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE EXCEPT AS INDICATED.
b. CONSTRUCT T'S, BENDS, AND ELBOWS WITH RADIUS OF 1-1/2 TIMES WIDTH OF DUCT ON CENTER LINE. WHERE NOT POSSIBLE PROVIDE TURNING VANES.
c. INCREASE DUCT SIZES GRADUALLY, NOT EXCEEDING 30 DEGREES DIVERGENCE AND 45 DEGREES CONVERGENCE.
d. CONNECT FLEXIBLE DUCTS TO METAL DUCTS WITH DRAW BANDS.
e. USE CRIMP JOINTS WITH OR WITHOUT BEAD FOR JOINING ROUND DUCT SIZES 8 INCHES AND SMALLER WITH CRIMP IN DIRECTION OF AIR FLOW.
f. DUCT SCHEDULE:
f.a. SUPPLY DUCTS CONNECTED TO CONSTANT-VOLUME AIR-HANDLING UNITS, SINGLE ZONE VARIABLE-VOLUME AIR-HANDLING UNITS, AND SECONDARY DUCTWORK AFTER TERMINAL UNITS:
f.a.i. PRESSURE CLASS: POSITIVE 2-INCH WG.
f.a.ii. MINIMUM SMACNA SEAL CLASS: B
f.a.iii. SMACNA LEAKAGE CLASS FOR RECTANGULAR: 12
f.a.iv. SMACNA LEAKAGE CLASS FOR ROUND: 12
f.b. SUPPLY DUCTS CONNECTED TO VARIABLE-VOLUME AIR-HANDLING UNITS:
f.b.i. PRESSURE CLASS: POSITIVE 4-INCH WG.
f.b.ii. MINIMUM SMACNA SEAL CLASS: B
f.b.iii. SMACNA LEAKAGE CLASS FOR RECTANGULAR: 6
f.b.iv. SMACNA LEAKAGE CLASS FOR ROUND: 6
f.c. RETURN DUCTS CONNECTED TO VARIABLE AND CONSTANT-VOLUME AIR-HANDLING UNITS:
f.c.i. PRESSURE CLASS: POSITIVE OR NEGATIVE 2-INCH WG.
f.c.ii. MINIMUM SMACNA SEAL CLASS: B
f.c.iii. SMACNA LEAKAGE CLASS FOR RECTANGULAR: 12
f.c.iv. SMACNA LEAKAGE CLASS FOR ROUND: 12
f.d. EXHAUST DUCTS
f.d.i. PRESSURE CLASS: POSITIVE OR NEGATIVE 2-INCH WG.
f.d.ii. MINIMUM SMACNA SEAL CLASS: B IF NEGATIVE, A IF POSITIVE.
f.d.iii. SMACNA LEAKAGE CLASS FOR RECTANGULAR: 12
f.d.iv. SMACNA LEAKAGE CLASS FOR ROUND: 6
f.e. OUTSIDE AIR DUCTS:
f.e.i. PRESSURE CLASS: POSITIVE OR NEGATIVE 2-INCH WG.
f.e.ii. MINIMUM SMACNA SEAL CLASS: B
f.e.iii. SMACNA LEAKAGE CLASS FOR RECTANGULAR: 12
f.e.iv. SMACNA LEAKAGE CLASS FOR ROUND: 12
g. SEISMIC-RESTRAINT DEVICES
1. CHANNEL SUPPORT SYSTEM.
2. GALVANIZED STEEL RESTRAINT CABLES.
3. HANGER ROD STIFFENER: STEEL TUBE OR STEEL SLOTTED-SUPPORT-SYSTEM SLEEVE WITH INTERNALLY BOLTED CONNECTIONS OR REINFORCING STEEL ANGLE CLAMPED TO HANGER ROD.

- 1.3 VOLUME CONTROL DAMPERS
C. PROVIDE ALL BRANCHES AND DUCT TAKE-OFFS, FABRICATE IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE, AND AS INDICATED.
D. FABRICATE SPLITTER DAMPERS OF MATERIAL SAME GAGE AS DUCT TO 24 INCHES SIZE IN EITHER DIRECTION, OR TWO GAGES HEAVIER FOR LARGER SIZES. SECURE WITH CONTINUOUS HINGE OR ROD. OPERATE WITH MINIMUM 1/4 INCH DIAMETER ROD.
E. FABRICATE SINGLE BLADE DAMPERS FOR DUCT SIZES TO 12X30 INCH.
F. EXCEPT IN ROUND DUCTWORK 12 INCHES AND SMALLER, PROVIDE END BEARINGS.
G. PROVIDE LOCKING, INDICATING QUADRANT REGULATORS ON SINGLE AND MULTI-BLADE DAMPERS. WHERE WIDTH EXCEEDS 30 INCHES PROVIDE REGULATOR AT BOTH ENDS.

- 1.4 FLEXIBLE DUCT CONNECTIONS
A. UL LISTED FIRE-RETARDANT NEOPRENE COATED WOVEN GLASS FIBER FABRIC TO NFPA 90, APPROXIMATELY 3 INCHES (75 MM) WIDE, CRIMPED INTO METAL EDGING STRIP.

- 1.5 AIR OUTLETS
A. MANUFACTURERS: PRICE, TITUS, TUTTLE AND BAILEY, KRUEGER, OR APPROVED EQUIVALENT.
B. DIFFUSERS/REGISTERS/GRILLES: PROVIDE AIR DEVICE TYPE, OPERATION, COLOR, ETC. AS SCHEDULED.

- 2.1 INSTALLATION
A. INSTALL PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
B. INSTALL FLEXIBLE CONNECTIONS SPECIFIED BETWEEN FAN INLET AND DISCHARGE DUCTWORK. FLEXIBLE CONNECTORS SHALL NOT BE IN TENSION WHILE RUNNING.
C. PROVIDE BACK DRAFT DAMPERS ON DISCHARGE OF EXHAUST FANS AND AS INDICATED.
D. PREVENT PASSAGE OF UNFILTERED AIR AROUND FILTERS WITH FELT, RUBBER, OR NEOPRENE GASKETS.
E. LOCATE DUCTS WITH SUFFICIENT SPACE AROUND EQUIPMENT TO ALLOW NORMAL OPERATING AND MAINTENANCE ACTIVITIES.
F. PROVIDE FLEXIBLE CONNECTIONS IMMEDIATELY ADJACENT TO EQUIPMENT IN DUCTS ASSOCIATED WITH FANS AND MOTORIZED EQUIPMENT.
G. CHECK LOCATION OF AIR OUTLETS AND INLETS AND MAKE NECESSARY ADJUSTMENTS IN POSITION TO CONFORM TO ARCHITECTURAL FEATURES, SYMMETRY, AND LIGHTING ARRANGEMENTS.
H. PROVIDE BALANCING DAMPERS ON DUCT TAKE-OFF TO DIFFUSERS, AND GRILLES AND REGISTERS, REGARDLESS OF WHETHER DAMPERS ARE SPECIFIED AS PART OF THE DIFFUSER, OR GRILLE AND REGISTER ASSEMBLY.

**MECHANICAL INSULATION**

- 1.1 SCOPE
A. GENERAL: FURNISH ALL LABOR AND MATERIALS NECESSARY FOR THE COMPLETE INSTALLATION OF THERMAL INSULATION ON ALL HOT AND COLD PIPING SURFACE AND DUCTWORK INSTALLED UNDER THIS CONTRACT WHICH REQUIRE INSULATIONS FOR HEAT OR COLD CONSERVATION; FREEZE PROTECTION, PREVENTION OF CONDENSATION OR DRIPPINGS; COMFORT FOR OCCUPANTS; EFFICIENCY OR BASE OF OPERATION. MECHANICAL INSULATION SHALL BE COMPLETE AND EFFECTIVE THROUGHOUT THE PROJECT.
B. SYSTEMS TO RECEIVE INSTALLATION INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO:
a. HYDRONIC WATER LINES (SUPPLY AND RETURN).
b. CONDENSATE DRAINAGE.
c. HORIZONTAL RAIN LEADERS AND ROOF DRAINS.
d. REFRIGERANT LINES (BOTH HIGH AND LOW PRESSURES).
e. PIPING ACCESSORIES AND SPECIALTIES.
f. DUCTWORK

- 1.2 PIPE INSULATION
A. ALL ABOVE GRADE INSULATION SHALL HAVE COMPOSITE (INSULATION, JACKET OR FACING, ALL ADHESIVE OR CEMENT USED TO ADHERE THE JACKET TO THE INSULATION) FIRE AND SMOKE HAZARD RATINGS AS TESTED UNDER PROCEDURE ASTM E-84 AND NFPA 225.
B. APPROVED MANUFACTURERS: CERTAINEED, OMENS/CORNING, JOHNS-MANVILLE, UPIJOHN, ARMSTRONG, OR APPROVED EQUIVALENT.
C. LOCATE INSULATION AND COVER SEAMS IN LEAST VISIBLE LOCATIONS.
D. NEATLY FINISH INSULATION AT SUPPORTS, PROTRUSIONS, AND INTERRUPTIONS.
E. PROVIDE INSULATED DUAL TEMPERATURE PIPES OR COLD PIPES CONVEYING FLUIDS BELOW AMBIENT TEMPERATURE WITH VAPOR BARRIER JACKETS. FINISH WITH GLASS CLOTH AND VAPOR BARRIER ADHESIVE. INSULATE COMPLETE SYSTEM.
F. FOR INSULATED PIPES CONVEYING FLUIDS ABOVE AMBIENT TEMPERATURE, PROVIDE STANDARD JACKETS. BEVEL AND SEAL ENDS OF INSULATION AT EQUIPMENT, FLANGES, AND UNIONS.
G. PROVIDE INSERT BETWEEN SUPPORT SHIELD AND PIPING ON PIPING 2 INCHES (50 MM) DIAMETER OR LARGER. FABRICATE OF CORK OR OTHER HEAVY DENSITY INSULATING MATERIAL SUITABLE FOR TEMPERATURE, NOT LESS THAN 6 INCHES (150 MM) LONG.
H. SCHEDULE:
a. CONDENSATE DRAINS: 1" FLEXIBLE ELASTOMERIC. PROVIDE ALUMINUM JACKETING ON PIPING EXPOSED TO WEATHER.
b. REFRIGERANT LINES: 1" FLEXIBLE ELASTOMERIC, PROVIDE ALUMINUM JACKETING ON PIPING EXPOSED TO WEATHER.

- 1.3 DUCTWORK INSULATION
A. MANUFACTURERS: KNAUF, OR APPROVED EQUIVALENT.
B. FIBERGLASS BLANKET INSULATION: GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 553, TYPE II AND ASTM C 1290, TYPE III WITH FACTORY-APPLIED FSK JACKET. FACTORY-APPLIED JACKET REQUIREMENTS ARE SPECIFIED IN "FACTORY-APPLIED JACKETS" ARTICLE.
a. "K" (KSI) VALUE: 0.29 AT 75 DEGREES F (0.042 AT 24 DEGREES C).
b. DENSITY: 0.75 LB/CU FT (24 KG/CU M).
c. VAPOR BARRIER JACKET: ALUMINUM-FOIL, FIBERGLASS-REINFORCED SCRIM WITH KRAFT-PAPER BACKING, COMPLYING WITH ASTM C 1136, TYPE II.
C. INSULATION PINS AND HANGERS:
a. METAL, ADHESIVELY ATTACHED, PERFORATED-BASE INSULATION HANGERS: BASEPLATE WELDED TO PROJECTING SPINDLE THAT IS CAPABLE OF HOLDING INSULATION OF THICKNESS INDICATED, SECURELY IN POSITION INDICATED WHEN SELF-LOCKING WASHER IS IN PLACE. COMPLY WITH THE FOLLOWING REQUIREMENTS:
i. EXHAUST DUCTS EXPOSED TO OUTDOOR AIR: 1-1/2"
ii. VENTILATION DUCTS: 2"
iii. SUPPLY DUCTS: 2"
iv. RETURN DUCTS IN UNCONDITIONED SPACES: 1-1/2"

- 1.4 INSTALLATION
A. INSTALL MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
B. CONTINUE INSULATION VAPOR BARRIER THROUGH PENETRATIONS.
C. MASTICS
a. MATERIALS SHALL BE COMPATIBLE WITH INSULATION MATERIALS, JACKETS, AND SUBSTRATES; COMPLY WITH MIL-PRF-19565C, TYPE II.
i. FOR INDOOR APPLICATIONS, USE MASTICS THAT HAVE A VOC CONTENT OF 50 G/L OR LESS WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24).

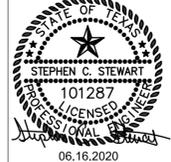
**SYSTEM TESTING, ADJUSTING, AND BALANCING**

- A. TESTING, ADJUSTING AND BALANCING OF ALL WORK SHALL BE MADE BY AN INDEPENDENT AABC OR NEBB CONTRACTOR WHO IS CURRENTLY LICENSED. THE HVAC CONTRACTOR SHALL INSTALL NEW FILTERS IN ALL UNITS PRIOR TO THE AIR BALANCE. THE COMPLETE AIR BALANCE SHALL TAKE PLACE WITH OUTSIDE AIR DAMPERS IN MINIMUM POSITION.
B. BALANCE AIR AND WATER QUANTITIES TO WITHIN +/- 5% OF THAT INDICATED ON THE DRAWINGS. ANY REQUIRED CHANGES IN SHEAVES, BELTS, PULLEYS, OR THE ADDITION OF DAMPERS REQUIRED TO ACHIEVE SPECIFIED FLOW RATES SHALL BE PERFORMED BY THE HVAC CONTRACTOR WITH NO ADDITIONAL COST.
C. THE BALANCE REPORT SHALL INCLUDE AS A MINIMUM THE FOLLOWING INFORMATION:
A. CERTIFICATION NUMBER AND SIGNATURE OF BALANCING CONTRACTOR.
B. INSTRUMENTATION LIST WITH LAST CALIBRATION DATES.
C. MAKE AND MODEL NUMBERS OF ALL HVAC EQUIPMENT.
D. AIR CFM AND STATIC PRESSURE READINGS (DISCHARGE AND SUCTION) AS MEASURED BY PITOT TUBE DUCT TRAVERSE AT THE UNIT.
E. MOTOR NAMEPLATE DATA WITH ACTUAL FIELD VOLTAGE AND AMPERAGE READINGS FOR EACH LEG.
F. MOTOR AND FAN RPM'S, SHEAVE SIZES AND BELT SIZES.
G. OUTSIDE, RETURN, MIXED AND SUPPLY AIR TEMPERATURES AT FULL COOLING AND HEATING.
H. WATER BALANCE DATA INCLUDING GPM WITH INLET AND OUTLET TEMPERATURE AND PRESSURE READINGS (WHERE APPLICABLE)
I. MAKE AND MODEL NUMBERS OF ALL AIR DISTRIBUTION EQUIPMENT.
J. FINAL BALANCED AIR VOLUMES AT ALL OUTLETS (INCLUDING RETURNS WHERE DUCTED).
K. INDEXED PLAN WITH DIFFUSER AND RETURN LOCATIONS.
E. ALL CONTROL SEQUENCES SHALL BE TESTED (INTERLOCKED EQUIPMENT, SMOKE DETECTORS, SMOKE EVACUATION, ECONOMIZER, ETC.) AND OPERATING STATUS RECORDED IN THE REPORT.
F. THREE COPIES OF THE BALANCE REPORT SHALL BE SUBMITTED THROUGH THE GENERAL CONTRACTOR TO THE TENANT'S CONSTRUCTION MANAGER FOR APPROVAL.
G. THE BALANCING CONTRACTOR SHALL PERFORM ALL APPLICABLE TESTING AND BALANCING FUNCTIONS AS REQUIRED FOR THE SYSTEM DESIGNED IN THESE DRAWINGS. THE BALANCING CONTRACTOR SHALL RECHECK ANY ITEMS THAT THE TENANT DEEMS NECESSARY AT NO ADDITIONAL COST TO THE TENANT.
H. CONTROLS CONTRACTOR SHALL PROVIDE, AT NO COST, ALL NECESSARY SOFTWARE AND HARDWARE REQUIRED FOR SYSTEM BALANCE AND VERIFICATION OF CONTROLS. CONTROLS CONTRACTOR SHALL BE PRESENT AND ASSIST TEST & BALANCE CONTRACTOR DURING CONTROLS VERIFICATION. PRIOR TO START OF TEST & BALANCE, THE CONTROLS CONTRACTOR SHALL VERIFY ALL CONTROLS ARE OPERATIONAL AND ALL INPUT VALUES HAVE BEEN ENTERED PER DESIGN DOCUMENTATION. CONTROLS CONTRACTOR SHALL PROVIDE CONTROL SYSTEM START-UP SHEETS VERIFYING CONTROLS OPERATION PRIOR TO THE START OF TEST & BALANCE.
I. FINAL BALANCE REPORT SHALL BE INCLUDED IN THE OPERATION AND MAINTENANCE MANUALS.

Table with 2 columns: No., Revisions and Descriptions. Includes copyright notice for 2018 MRB Group.

Project Title: HILL COUNTY MAINTENANCE BARN
901 FM 308
PENELOPE, TEXAS 76676
100% REVIEW SET
MECHANICAL SPECIFICATIONS

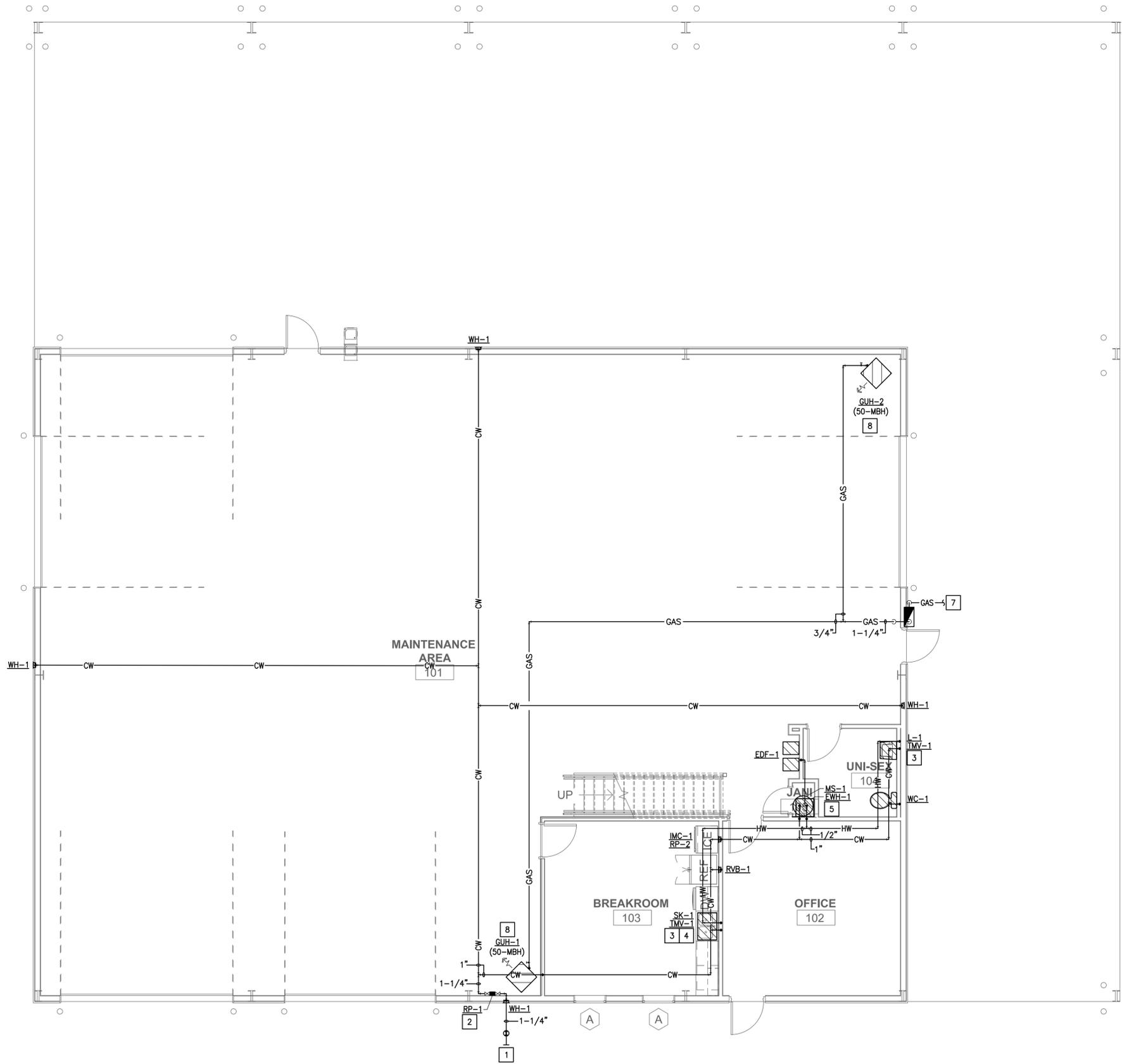
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Scale: SEE PLANS
Date: 06/16/2020



06.16.2020

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Sheet No. M401
Project No. 0843.20002



**1 PLUMBING DOMESTIC WATER & NATURAL GAS LAYOUT**  
 SCALE: 3/16" = 1'-0"

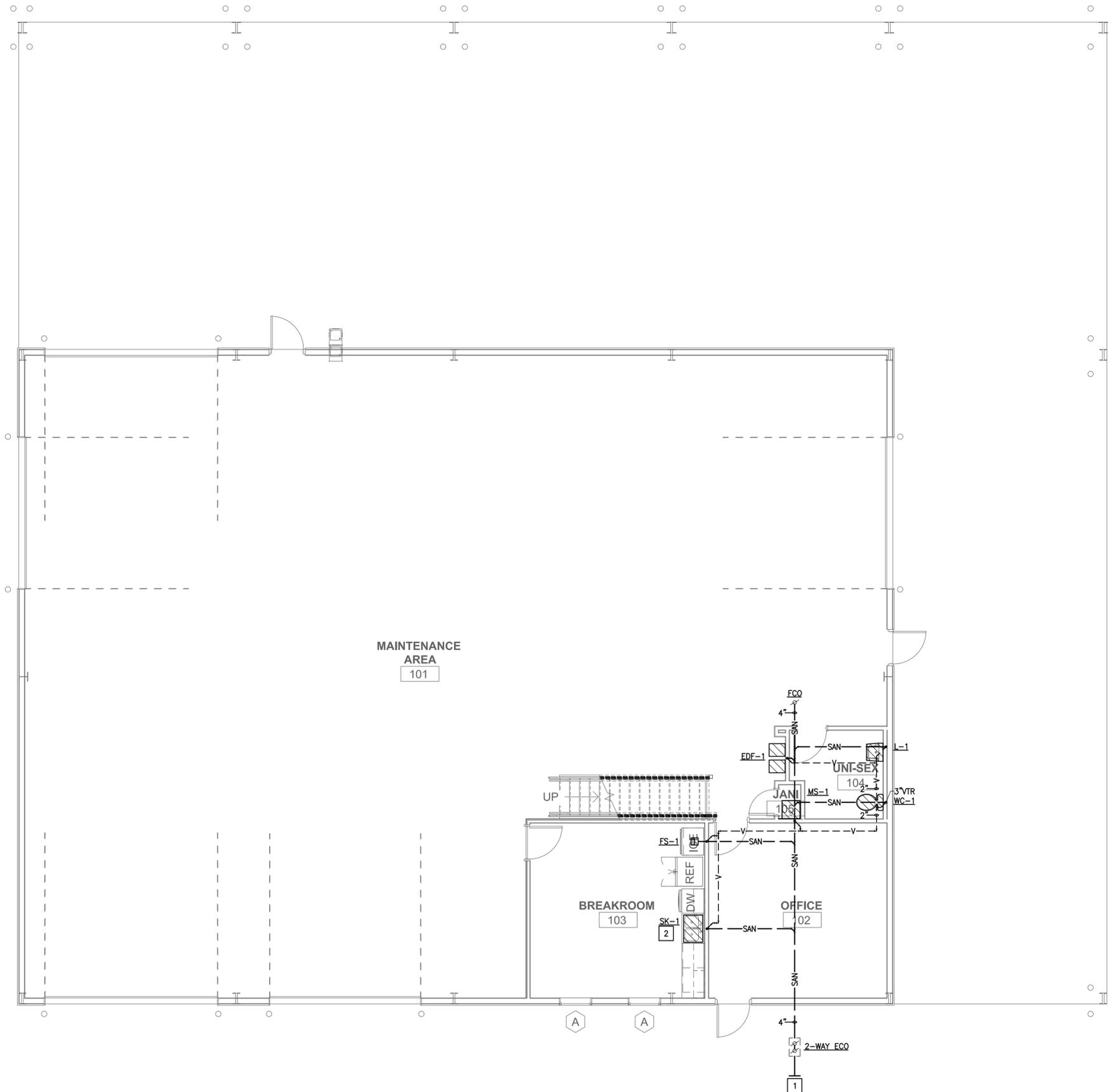
**PLUMBING GENERAL NOTES:**

- COORDINATE CONNECTION OF BUILDING DOMESTIC WATER AND SANITARY WASTE UTILITIES WITH LOCAL UTILITY PROVIDERS AND PROVIDE CONNECTIONS IN ACCORDANCE WITH THEIR REQUIREMENTS.
- COORDINATE SIZE, TYPE, AND LOCATION OF DOMESTIC WATER METER ON SITE WITH LOCAL UTILITY PROVIDER. PROVIDE IN ACCORDANCE WITH THEIR REQUIREMENTS.
- REFER TO ARCHITECTURAL DRAWINGS FOR BUILDING FINISHED FLOOR ELEVATION.
- FIELD VERIFY EXACT LOCATION, SIZE, DEPTH, DIRECTION OF FLOW, CAPACITY, PIPE MATERIAL AND CONDITION OF SITE DOMESTIC WATER AND SANITARY WASTE PIPING PRIOR TO BEGINNING CONSTRUCTION TO ENSURE THAT PROPER CONNECTIONS TO AND EXTENSION OF SUCH UTILITIES CAN BE MADE.
- COORDINATE FINAL INVERT ELEVATIONS OF BUILDING SANITARY OUTFALLS AND SITE PIPING WITH SITE UTILITY CONTRACTOR PRIOR TO CONSTRUCTION AND MAKE ADJUSTMENTS AS REQUIRED TO ENSURE PROPER CONNECTIONS TO SITE UTILITIES.
- PRIOR TO BEGINNING CONSTRUCTION, COORDINATE PLUMBING BACKFLOW PREVENTION REQUIREMENTS WITH THE LOCAL CODE AUTHORITY AND PROVIDE AS DIRECTED.
- CONTRACTOR SHALL COORDINATE ROUTING OF PIPING BELOW SLAB WITH COLUMN FOOTINGS, GRADE BEAMS, UNDERGROUND PLUMBING AND ELECTRICAL UTILITIES, AND OTHER SUB-SURFACE BUILDING ELEMENTS.
- CONTRACTOR SHALL COORDINATE ROUTING OF PIPING IN CEILING SPACES WITH MECHANICAL AND ELECTRICAL EQUIPMENT, DUCTWORK AND CONDUIT. SHOULD A CONFLICT OCCUR THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER PRIOR TO INSTALLING AN ALTERNATE PIPING PLAN.
- MAINTAIN MINIMUM 10'-0" DISTANCE BETWEEN VENT TERMINALS THROUGH ROOF AND ALL FRESH AIR INTAKES.
- COORDINATE ALL FIXTURE AND EQUIPMENT LOCATIONS AND CONNECTION REQUIREMENTS WITH LATEST ARCHITECTURAL DRAWINGS, SPECIFICATIONS, AND MANUFACTURER RECOMMENDATIONS PRIOR TO ANY ROUGH-INS.
- DO NOT ROUGH-IN FROM THESE DRAWINGS. REFER TO LATEST ARCHITECTURAL DRAWINGS FOR DIMENSIONED LOCATIONS.
- CONTRACTOR TO COORDINATE ALL WORK WITH THE WORK OF OTHER TRADES TO AVOID CONFLICTS AND TO MINIMIZE INTERRUPTION OF SERVICES.
- ALL WORK, METHODS AND INSTALLATIONS INVOLVED IN THE PLUMBING DESIGN SHALL BE IN ACCORDANCE WITH THE CITY BUILDING CODE AND INSPECTION REGULATIONS AND ALL OTHER OFFICIALS HAVING JURISDICTION.
- UPON COMPLETION OF WORK, THOROUGHLY ROD OUT AND FLUSH ALL SANITARY PIPING TO ENSURE IT IS FREE FROM BLOCKAGES.
- CONTRACTOR SHALL PROVIDE SINK TAIL PIECE(S) FOR HVAC CONDENSATE AS REQUIRED BY MECHANICAL CONTRACTOR. COORDINATE REQUIREMENTS WITH MECHANICAL DRAWINGS AND MECHANICAL CONTRACTOR PRIOR TO CONSTRUCTION.

**PLUMBING KEYED NOTES:**

- UTILITY CONTRACTOR SHALL PROVIDE NEW 1" WATER METER. PROVIDE A 1-1/4" DOMESTIC WATER SERVICE LINE FROM WATER METER TO BUILDING ENTRY. ESTIMATED PEAK FLOW = 16.0 GPM. MINIMUM WATER PRESSURE REQUIREMENT: 50 PSI RESIDUAL AT PEAK FLOW AT 5'-0" MARK FROM BUILDING LIMITS. PROVIDE SHUT-OFF VALVE IN VALVE BOX BELOW GRADE, REFER TO DETAIL SHEET. COORDINATE WATER METER TAP WITH THE CITY UTILITY DEPARTMENT PRIOR TO CONSTRUCTION.
- INSTALL 1" WATTS LF-009 REDUCED PRESSURE BACKFLOW DEVICE (RP-1) WITH INLET STRAINER ON WALL AT 48" A.F.F. TO LOWEST POINT OF DEVICE. COORDINATE ALL BACKFLOW REQUIREMENTS WITH THE CITY UTILITY DEPARTMENT AND MANUFACTURER PRIOR TO CONSTRUCTION.
- PROVIDE THERMOSTATIC MIXING VALVE (TMV-1) TO TEMPER HOT WATER SUPPLY TO ALL INDICATED FIXTURES TO A MAXIMUM OF 110°F.
- PROVIDE DEDICATED HOT WATER VALVE FOR DISHWASHER.
- CONTRACTOR SHALL INSTALL WATER HEATER ON WALL BRACKET ABOVE MOP SINK. COORDINATE FINAL LOCATION WITH ARCHITECT/OWNER PRIOR TO CONSTRUCTION. ROUTE T&P RELIEF AND DRAIN LINES TO MOP SINK BELOW. FOLLOW ALL MANUFACTURER'S INSTALLATION INSTRUCTIONS. PROVIDE 3/4" COLD AND HOT WATER CONNECTIONS.
- PROVIDE ICE MACHINE WITH 1/2" WATTS LF-009 REDUCED PRESSURE BACKFLOW DEVICE (RP-2). INSTALL IN ACCORDANCE WITH CITY UTILITY AND MANUFACTURER REQUIREMENTS. CONTRACTOR SHALL ROUTE ICE MACHINE AND BACKFLOW DEVICE DRAIN LINES TO FLOOR SINK.
- NEW 4-OZ NATURAL GAS SERVICE, METER, AND REGULATOR SET. COORDINATE METER LOCATION AND INSTALLATION IN ADVANCE WITH LOCAL GAS PROVIDER. MAKE ADJUSTMENTS AS REQUIRED. TOTAL CONNECTED LOAD: 250 CFH. NATURAL GAS SERVICE LINE TO METER BY LOCAL UTILITY PROVIDER.
- 3/4" GAS LINE TO GAS UNIT HEATER. COORDINATE ALL REQUIREMENTS WITH MANUFACTURER PRIOR TO CONSTRUCTION. PROVIDE MANUFACTURER'S COMBUSTION AIR AND FLUE GAS VENTING TERMINATION KIT.

Project Title: <b>HILL COUNTY MAINTENANCE BARN</b>		901 FM 308		PENELOPE, TEXAS 76676		100% REVIEW SET		PLUMBING DOMESTIC WATER	
Drawn By: MP		Checked By: CS		Scale: SEE PLANS		Date: 06/16/2020		No. of Revisions and Descriptions	
		SHEET NO. <b>P101</b> of _____ Project No. <b>0843.20002</b>							
<b>MRB group</b> Engineering, Architecture & Surveying 5250 South 31st Street, Temple, Texas 76708 Phone: 254-771-2054 Corporate Office: The Calver Road, Suite 100, Rochester, New York 14620 Phone: 585-381-9250 TBP# Firm Number: F-10615 www.mrbgroup.com		CEN-TEX ENGINEERING Texas Reg. F-11794 18 S. MAIN ST. SUITE 610 Temple, Texas 76701							



**1 PLUMBING SANITARY WASTE & VENT LAYOUT**  
 SCALE: 3/16" = 1'-0"

**PLUMBING GENERAL NOTES:**

1. COORDINATE CONNECTION OF BUILDING DOMESTIC WATER AND SANITARY WASTE UTILITIES WITH LOCAL UTILITY PROVIDERS AND PROVIDE CONNECTIONS IN ACCORDANCE WITH THEIR REQUIREMENTS.
2. COORDINATE SIZE, TYPE, AND LOCATION OF DOMESTIC WATER METER ON SITE WITH LOCAL UTILITY PROVIDER. PROVIDE IN ACCORDANCE WITH THEIR REQUIREMENTS.
3. REFER TO ARCHITECTURAL DRAWINGS FOR BUILDING FINISHED FLOOR ELEVATION.
4. FIELD VERIFY EXACT LOCATION, SIZE, DEPTH, DIRECTION OF FLOW, CAPACITY, PIPE MATERIAL AND CONDITION OF SITE DOMESTIC WATER AND SANITARY WASTE PIPING PRIOR TO BEGINNING CONSTRUCTION TO ENSURE THAT PROPER CONNECTIONS TO AND EXTENSION OF SUCH UTILITIES CAN BE MADE.
5. COORDINATE FINAL INVERT ELEVATIONS OF BUILDING SANITARY OUTFALLS AND SITE PIPING WITH SITE UTILITY CONTRACTOR PRIOR TO CONSTRUCTION AND MAKE ADJUSTMENTS AS REQUIRED TO ENSURE PROPER CONNECTIONS TO SITE UTILITIES.
6. PRIOR TO BEGINNING CONSTRUCTION, COORDINATE PLUMBING BACKFLOW PREVENTION REQUIREMENTS WITH THE LOCAL CODE AUTHORITY AND PROVIDE AS DIRECTED.
7. CONTRACTOR SHALL COORDINATE ROUTING OF PIPING BELOW SLAB WITH COLUMN FOOTINGS, GRADE BEAMS, UNDERGROUND PLUMBING AND ELECTRICAL UTILITIES, AND OTHER SUB-SURFACE BUILDING ELEMENTS.
8. CONTRACTOR SHALL COORDINATE ROUTING OF PIPING IN CEILING SPACES WITH MECHANICAL AND ELECTRICAL EQUIPMENT, DUCTWORK AND CONDUIT. SHOULD A CONFLICT OCCUR THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER PRIOR TO INSTALLING AN ALTERNATE PIPING PLAN.
9. MAINTAIN MINIMUM 10'-0" DISTANCE BETWEEN VENT TERMINALS THROUGH ROOF AND ALL FRESH AIR INTAKES.
10. COORDINATE ALL FIXTURE AND EQUIPMENT LOCATIONS AND CONNECTION REQUIREMENTS WITH LATEST ARCHITECTURAL DRAWINGS, SPECIFICATIONS, AND MANUFACTURER RECOMMENDATIONS PRIOR TO ANY ROUGH-INS.
11. DO NOT ROUGH-IN FROM THESE DRAWINGS. REFER TO LATEST ARCHITECTURAL DRAWINGS FOR DIMENSIONED LOCATIONS.
12. CONTRACTOR TO COORDINATE ALL WORK WITH THE WORK OF OTHER TRADES TO AVOID CONFLICTS AND TO MINIMIZE INTERRUPTION OF SERVICES.
13. ALL WORK, METHODS AND INSTALLATIONS INVOLVED IN THE PLUMBING DESIGN SHALL BE IN ACCORDANCE WITH THE CITY BUILDING CODE AND INSPECTION REGULATIONS AND ALL OTHER OFFICIALS HAVING JURISDICTION.
14. UPON COMPLETION OF WORK, THOROUGHLY ROD OUT AND FLUSH ALL SANITARY PIPING TO ENSURE IT IS FREE FROM BLOCKAGES.
15. CONTRACTOR SHALL PROVIDE SINK TAIL PIECE(S) FOR HVAC CONDENSATE AS REQUIRED BY MECHANICAL CONTRACTOR. COORDINATE REQUIREMENTS WITH MECHANICAL DRAWINGS AND MECHANICAL CONTRACTOR PRIOR TO CONSTRUCTION.

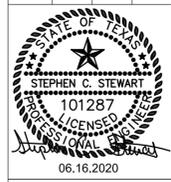
**PLUMBING KEYED NOTES:**

- 1 4" SANITARY WASTE LINE. REFER TO CIVIL DRAWINGS FOR CONTINUATION.
- 2 PROVIDE SINK TAIL-PIECE FOR DISHWASHER.

No.	Revisions and Descriptions	By	Date

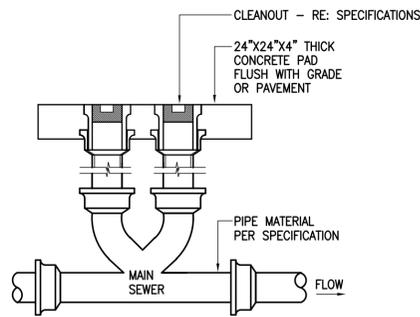
Project Title: **HILL COUNTY MAINTENANCE BARN**  
 901 FM 308  
 PENELOPE, TEXAS 76676  
 100% REVIEW SET  
 Drawing Title: **PLUMBING DOMESTIC WATER**

Drawn By: MP  
 Checked By: CS  
 Scale: SEE PLANS  
 Date: 06/16/2020

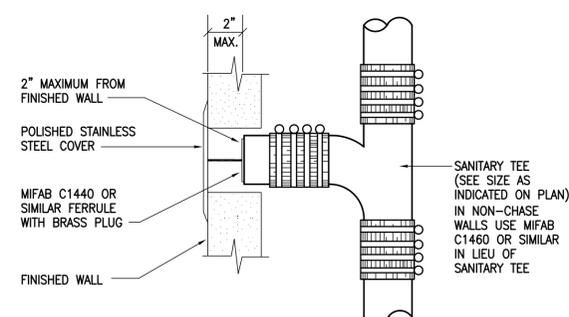


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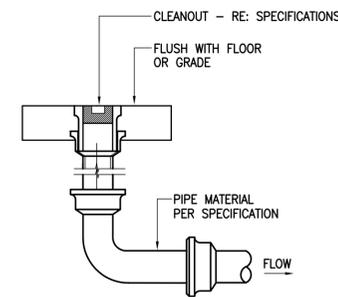
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 Project No. **0843.20002**



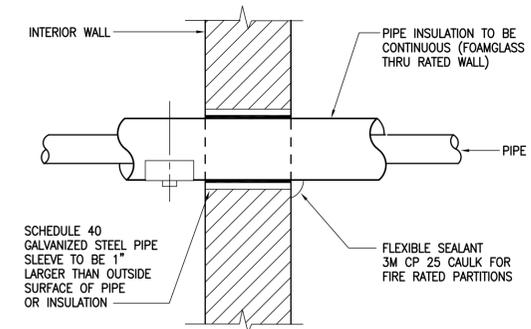
**1 TWO-WAY EXTERIOR CLEANOUT**  
SCALE: NONE



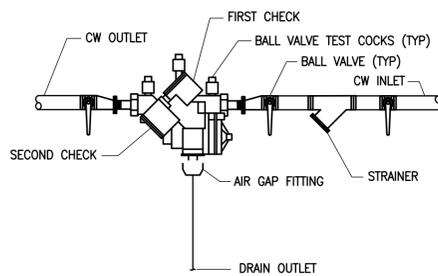
**2 WALL CLEANOUT**  
SCALE: NONE



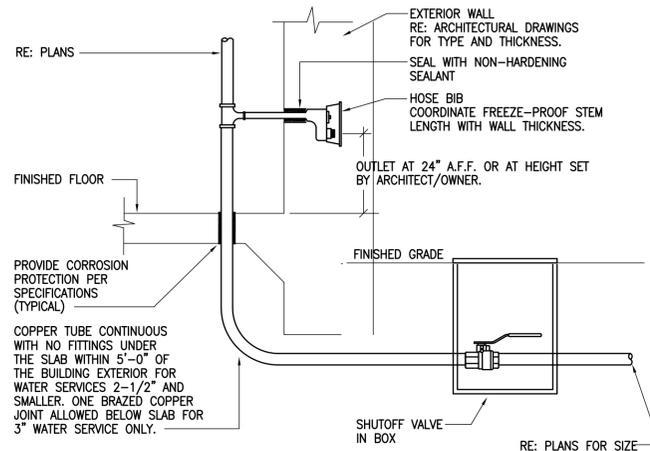
**3 FLOOR CLEANOUT**



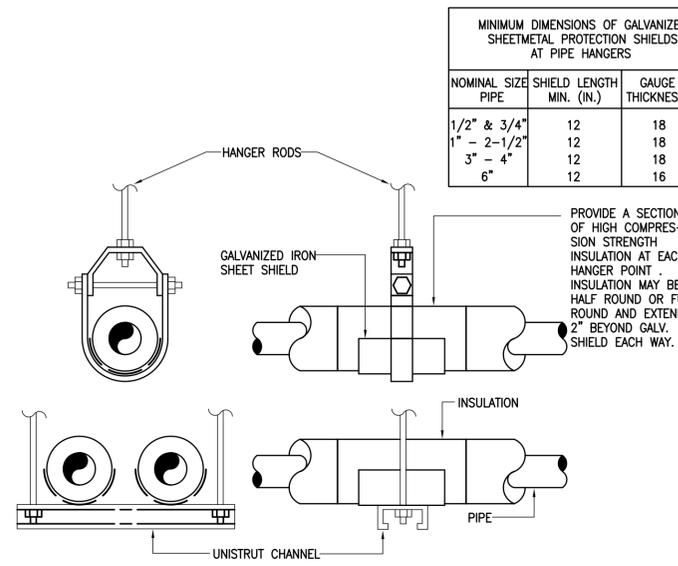
**4 INTERIOR WALL PENETRATION**  
SCALE: NONE



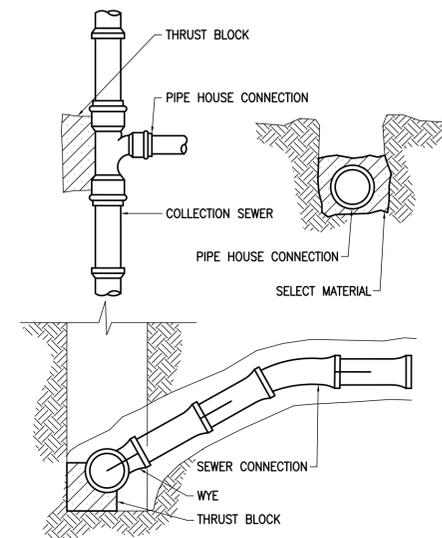
**5 BACKFLOW PREVENTER**  
SCALE: NONE



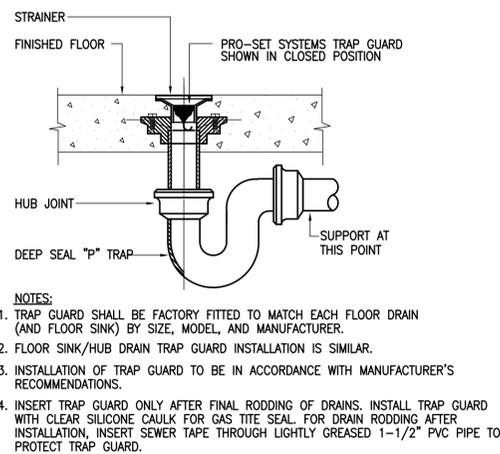
**6 DOMESTIC WATER SERVICE ENTRY**  
SCALE: NONE



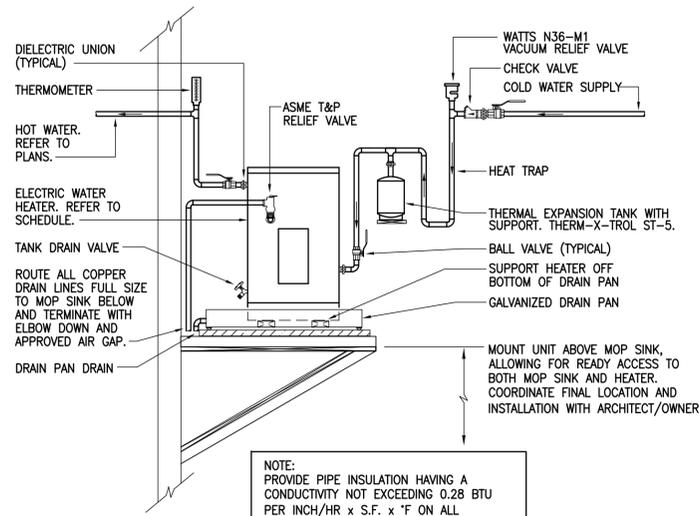
**7 HANGER FOR WATER PIPING**  
SCALE: NONE



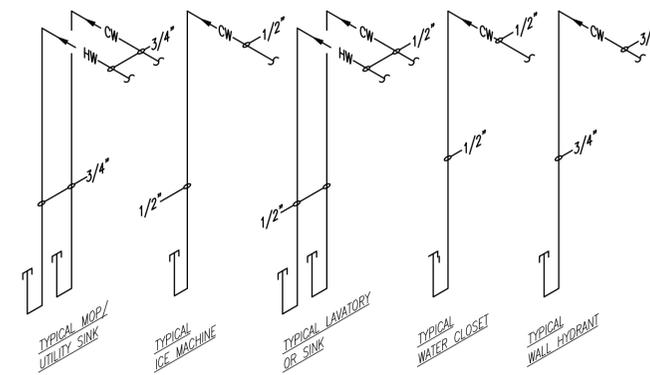
**8 SANITARY SEWER CONNECTION**  
SCALE: NONE



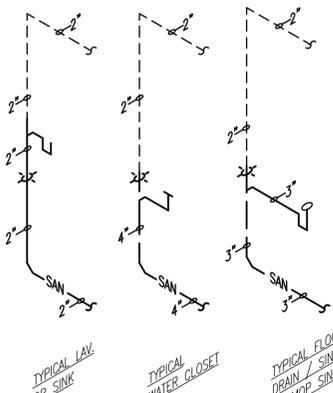
**9 FLOOR DRAIN/SINK WITH TRAP SEAL PROTECTION**  
SCALE: NONE



**10 ELECTRIC WATER HEATER PIPING**  
SCALE: NONE



**11 TYPICAL DOMESTIC WATER RISERS**  
SCALE: NONE



**12 TYPICAL WASTE AND VENT RISERS**  
SCALE: NONE

Project Title: **HILL COUNTY MAINTENANCE BARN**  
901 FM 308  
PENELOPE, TEXAS 76676  
100% REVIEW SET

PLUMBING DETAILS

Drawn By: MP  
Checked By: CS  
Scale: SEE PLANS  
Date: 06/16/2020

Sheet No. **P301**  
Project No. **0843.20002**

CEN-TEX ENGINEERING  
Texas Reg. F-11794  
18 S. MAIN ST. SUITE 610  
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SYMBOL	DESCRIPTION
	SANITARY OR WASTE PIPING ABOVE GRADE (SAN)
	SANITARY OR WASTE PIPING BELOW GRADE (SAN)
	VENT PIPING ABOVE OR BELOW GRADE (V)
	COLD WATER PIPING (CW)
	FIRE PROTECTION WATER PIPING (FIRE)
	HOT WATER PIPING (HW)
	HOT WATER RETURN PIPING (HWR)
	NATURAL GAS PIPING (G)
	GAS VENT PIPING (GV)
	FLOW DIRECTIONAL ARROW
	SHUT-OFF VALVE
	BALL VALVE (BV)
	BUTTERFLY VALVE
	GAS PLUG VALVE (GPV)
	HORIZONTAL SWING CHECK
	UNION
	Y-STRAINER
	REDUCER OR INCREASER
	ECCENTRIC REDUCER
	REDUCED PRESSURE BACKFLOW PREVENTER (RPZ)
	PIPING DOWN
	RISE OR DROP PIPING
	PIPING UP -OR- PIPING UP & DOWN
	CAP ON END OF PIPE
	CLEANOUT (WALL OR CEILING) (CO)
	FLOOR CLEANOUT (FCO)
	EXTERIOR CLEANOUT WITH 18"x18"x4" CONCRETE PAD (ECO)
	TWO-WAY CLEANOUT (PROVIDE 18"x24"x4" CONCRETE PAD OUTSIDE)
	PRESSURE REDUCING VALVE (PRV)
	BRANCH CONNECTION OUT OF TOP
	BRANCH CONNECTION OUT OF BOTTOM
	BRANCH CONNECTION OUT OF SIDE
	WYE & 1/8TH BEND BRANCH CONNECTION
	WYE BRANCH CONNECTION
	HOSE BIBB
	PRESSURE GAUGE WITH COCK
	THERMOMETER
	GAS PRESSURE REGULATOR
	TEST COCK
	GAS METER
	WALL HYDRANT
	VALVE IN RISE
	ASME TEMPERATURE & PRESSURE RELIEF VALVE
	VACUUM RELIEF VALVE
	ANGLE VALVE
	REFER TO KEYED NOTE
	FLOOR SINK (FS)
	FLOOR DRAIN (FD)
	FLOOR DRAIN WITH P-TRAP (FD)
	FLOOR DRAIN WITH P-TRAP AT 45° ANGLE (FD)
	HUB DRAIN (HD)
	ACCESS PANEL FOR TRAP PRIMER
	ACCESS PANEL LOCATION SYMBOL
	SHOCK ABSORBER WITH ACCESS PANEL
	AIR CHAMBER
	EXISTING
	CONNECT NEW TO EXISTING
	DELTA CHANGE SYMBOL
	RISER FLAG

NOTE: NOT ALL SYMBOLS MAY APPLY TO THIS PROJECT.

PLUMBING SCOPE & SPECIFICATION
<p><b>THE WORK OF THIS SECTION SHALL INCLUDE, BUT NOT BE LIMITED TO:</b></p> <p>A. A DOMESTIC HOT AND COLD WATER DISTRIBUTION SYSTEM TO SERVE ALL FIXTURES, AND EQUIPMENT.</p> <p>B. SANITARY SOIL WASTE AND VENT SYSTEMS TO SERVE ALL FIXTURES AND EQUIPMENT.</p> <p>C. NATURAL GAS SYSTEM TO SERVE ALL FIXTURES AND EQUIPMENT.</p> <p>DRAWINGS ARE DIAGRAMMATIC; CONFIRM DIMENSIONS AND LOCATIONS IN THE FIELD, ADVISE OF MAJOR DISCREPANCIES, GUARANTEE LABOR AND MATERIALS FOR ONE YEAR. ADHERE TO ALL APPLICABLE LOCAL CODES AND REGULATIONS. CONTRACTOR SHALL OBTAIN REQUIRED PERMITS AND PAY ALL FEES.</p> <p><b>VALVES</b></p> <p>VALVES SHALL BE MANUFACTURED BY NIBCO, HAMMOND, POWELL, STOCKHAM, WATTS OR EQUIVALENT APPROVED BY THE ENGINEER.</p> <p>BALL VALVES SHALL HAVE CAST BRONZE BODY, BLOWOUT PROOF STEMS, FULL SIZE PORT, 316 STAINLESS STEEL TRIM, TEFLON SEAT AND SEAL AND THRUST WASHERS. VALVES 2" AND SMALLER SHALL BE NIBCO T-585-70-66 OR APPROVED EQUIVALENT.</p> <p><b>UNIONS</b></p> <p>UNIONS IN COPPER OR BRASS LINES SHALL BE BRASS, THREADED PATTERN UNIONS.</p> <p><b>EXCAVATION</b></p> <p>EXCAVATE TRENCHES FOR UNDERGROUND PIPING TO THE REQUIRED DEPTH. CUT THE BOTTOM OF THE TRENCH OR EXCAVATION TO UNIFORM GRADE. EXCAVATE 6" BELOW GRADE, FILL WITH BEDDING MATERIAL (SAND) AND TAMP WELL. LAY OUT ALIGNMENT OF PIPE TRENCHES TO AVOID OBSTRUCTIONS, PROVIDE ASSURANCE THAT PROPOSED ROUTE OF PIPE WILL NOT INTERFERE WITH BUILDING FOUNDATION BEFORE ANY CUTTING IS BEGUN. SHOULD INTERFERENCE BE FOUND, CONTACT THE ARCHITECT/ENGINEER BEFORE PROCEEDING.</p> <p><b>BACKFILL</b></p> <p>BACKFILL SHALL NOT BE PLACED UNTIL THE WORK HAS BEEN INSPECTED, TESTED AND APPROVED. USE SUITABLE FRIABLE SOILS AS BACKFILL MATERIAL. DO NOT USE PEAT, SILT, MUCK, DEBRIS OR OTHER ORGANIC MATERIALS. DEPOSIT BACKFILL IN UNIFORM LAYERS. PLACE BACKFILL MATERIAL IN UNIFORM LAYERS, 8" MAXIMUM LOOSE MEASURE. COMPACT TO NOT LESS THAN 95% OF MAXIMUM SOIL DENSITY AS DETERMINED BY ASTM D698 STANDARD PROCTOR.</p> <p><b>PLUMBING PIPING HANGER SPACING</b></p> <p>REFER TO PIPING MANUFACTURER AND IPC REQUIREMENTS. MAXIMUM SPACING SHALL BE 10 FOOT.</p> <p><b>CLEANING, TESTING AND ADJUSTING</b></p> <p>THIS CONTRACTOR SHALL FURNISH ALL LABOR, TOOLS, INSTRUCTIONS, AND SUPERVISION REQUIRED FOR THE PERFORMANCE OF ALL TESTS, CLEANING, AND MAKING NECESSARY ADJUSTMENTS TO OPERATION OF ALL FIXTURES AND EQUIPMENT.</p> <p><b>PIPING INSULATION</b></p> <p>ALL COLD &amp; HOT WATER PIPING, FITTINGS AND VALVES SHALL BE INSULATED WITH NOMINAL 1" WALL THICKNESS FIBERGLASS PIPE INSULATION, OR AN APPROVED EQUAL HAVING FLAME SPREAD RATING OF 25 OR LESS AND A SMOKE DENSITY OF 50 OR LESS WHEN TESTED BY ASTM E-84 METHOD.</p> <p>PIPE INSULATION SHALL BE INSTALLED ACCORDING TO THE PROCEDURES OUTLINED BY THE MANUFACTURER.</p> <p>FITTING COVER INSULATION SHALL BE FABRICATED AND INSTALLED ACCORDING TO THE MANUFACTURER'S RECOMMENDED PROCEDURES. SWEAT FITTINGS SHALL BE INSULATED WITH MITER CUT PIECES OF FIBERGLASS PIPE INSULATION THE SAME SIZE AS ADJACENT PIPING. THREADED FITTINGS SHALL BE INSULATED WITH SLEEVED FITTING COVERS FABRICATED FROM MITER CUT PIECES OF FIBERGLASS PIPE INSULATION ACCORDING TO THE MANUFACTURER'S SLEEVING SIZE RECOMMENDATIONS AND SHALL BE OVERLAPPED 2" AND SEALED TO THE ADJACENT PIPE INSULATION. ALL VALVES SHALL BE INSULATED WITH CUT PIECES OF FIBERGLASS PIPE INSULATIONS. ALL JOINTS AND MITER CUT PIECES ARE TO BE SEALED PER MANUFACTURER'S RECOMMENDATIONS.</p> <p>SUPPORTING HANGERS SHALL BE DESIGNED TO RESIST COMPRESSION; SUPPORTING DEVICES SUCH AS SHORT WOOD DOWELS OR WOOD BLOCKS SHALL BE USED IN COMBINATION WITH GALVANIZED SHEET METAL HANGER SHIELDS. THE WOOD SUPPORTING DEVICES SHALL BE THE SAME THICKNESS AS THE INSULATION AND SEALED TO THE INSULATION WITH FACTORY APPROVED CONTACT ADHESIVE.</p> <p>INSTALL THERMAL INSULATION ON CLEAN, DRY SURFACES AFTER ALL TESTING AND INSPECTION IS COMPLETED. INSTALLATION SHALL BE IN STRICT ACCORDANCE WITH THESE SPECIFICATIONS AND WITH MANUFACTURER'S INSTRUCTIONS.</p>

PIPE MATERIAL LIST
<p><b>DOMESTIC WATER PIPING SHALL BE:</b></p> <p>ABOVE SLAB INSIDE THE BUILDING SHALL BE SEAMLESS ASTM B 88 TYPE L COPPER WATER TUBE WITH WROUGHT COPPER FITTINGS, ANSI B16.22. SOLDER MATERIAL SHALL BE 99.8% LEAD FREE AND COMPLIANT WITH THE "SAFE WATER DRINKING ACT". THE USE OF DRILLED-T CONNECTIONS IS NOT PERMITTED. PEX TUBING CONFORMING TO ALL STANDARD APPLICABLE CODE REQUIREMENTS FOR COMMERCIAL APPLICATIONS IS APPROVED AS ALTERNATE TO COPPER.</p> <p>BELOW SLAB SHALL BE ASTM B 88 TYPE K COPPER WATER TUBE WITH WROUGHT COPPER FITTINGS, ANSI B16.22. ALL JOINTS SHALL BE BRAZED.</p> <p><b>CONDENSATE AND INDIRECT DRAIN PIPING SHALL BE:</b></p> <p>TYPE M COPPER TUBING UP TO 1" ID, TYPE DWV TUBING AND COPPER FITTINGS FOR 1-1/4" AND LARGER SIZES, AND 95-5 SOLDER JOINTS. PEX TUBING CONFORMING TO ALL STANDARD APPLICABLE CODE REQUIREMENTS FOR COMMERCIAL APPLICATIONS IS APPROVED AS ALTERNATE.</p> <p><b>SANITARY SOIL &amp; GREASE WASTE AND VENT PIPING SHALL BE:</b></p> <p>ABOVE SLAB INSIDE BUILDING SHALL BE SCHEDULE 40 DWV POLYVINYL CHLORIDE PIPE AND FITTINGS CONFORMING TO ASTM D-1784-82 WITH SOLVENT WELDED JOINTS. IN AIR SUPPLY OR RETURN PLENUMS, AND/OR WHERE FIRE RATED WALLS, PARTITIONS, OR FLOORS ARE PENETRATED, CONTRACTOR SHALL PROVIDE NO-HUB CAST IRON SYSTEM CONFORMING TO CISPI STANDARD NO. 301-75. NEOPRENE GASKETS SHALL CONFORM TO ASTM STANDARD C564-75.</p> <p>BELOW SLAB SHALL BE SCHEDULE 40 DWV POLYVINYL CHLORIDE PIPE AND FITTINGS CONFORMING TO ASTM D-1784-82 WITH SOLVENT WELDED JOINTS.</p> <p><b>NATURAL GAS PIPING SHALL BE</b></p> <p>ABOVE GRADE SHALL BE SCHEDULE 40 BLACK STEEL, SEAMLESS, OR ELECTRIC RESISTANCE WELDED, ASTM A-53 WITH WELDED JOINTS AND STEEL FITTINGS OF THE SAME THICKNESS AS PIPE. PIPING 2 INCHES AND SMALLER MAY BE SCHEDULE 40 BLACK STEEL PIPE WITH MALLEABLE IRON 150 PSI CLASS FITTINGS ANSI B16.3, BANDED AIR TESTED, AND SCREWED JOINTS. ALL GAS PIPING AND FITTINGS OUTDOORS SHALL BE PAINTED WITH TWO COATS OF BRUSHED ON RUST PREVENTATIVE SILVER PAINT. ONE COAT OF RUST PREVENTATIVE PRIMER SHALL BE APPLIED TO THE PIPE IMMEDIATELY AFTER INSTALLATION.</p>

ELECTRIC WATER HEATER						
ITEM NO.	TOTAL KW INPUT	GALS. PER HR. RECOVERY RATE 80°F RISE	STORAGE CAPACITY (GALLONS)	ELECTRICAL REQUIRED	STORED WATER TEMP	MANUFACTURER COMMENT
EWH-1	4.5	23.0	47.0	240V/1Ø/60HZ 18.8 AMPS	140°	RHEEM ELDS52
<p><b>NOTES:</b></p> <p>1. PROVIDE HOT WATER EXPANSION TANK DOWNSTREAM OF CHECK VALVE ON COLD WATER SUPPLY. THERM-X-TROL ST-5.</p>						

THERMOSTATIC MIXING VALVES							
ITEM NO.	INLET HOT WATER TEMP (°F)	OUTLET MIXED WATER TEMP (°F)	MINIMUM FLOW (GPM)	DESIGN FLOW (GPM)	PRESSURE DROP @ DESIGN FLOW (PSI)	VALVE FINISH	MANUFACTURER / MODEL NO.
TMV-1	140°	110°	0.5	0.5-2.5	5.0	ROUGH BRONZE	WATTS USC-B-M1
<p><b>NOTES:</b></p> <p>1. MAKE WATER CONNECTIONS TO THERMOSTATIC MIXING VALVE(S) IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.</p> <p>2. PROVIDE PIPE INCREASERS AND/OR VALVES AS REQUIRED.</p>							

SHOCK ARRESTORS			
P.D.I. SYMBOL	FIXTURE UNITS	CHAMBER LENGTH	SWEAT CONNECTION
A	1-11	9-5/8"	1/2"
B	12-32	11-3/4"	3/4"
C	33-60	14-11/18"	1"
D	61-113	12-3/8"	1"
E	114-154	15-3/8"	1"
F	155-330	17-3/8"	1"

PLAN MARK	WASTE /TRAP	VENT	CW	HW	DESCRIPTION
WC-1	4"	2"	1/2"	--	WATER CLOSET: AMERICAN STANDARD: CADET 3 RIGHT HEIGHT 3378.128ST.020 (T.A.S. COMPLIANT). FLOOR MOUNTED, WHITE VITREOUS CHINA, ELONGATED BOWL, 16-1/2" HIGH, FULLY GLAZED 2-1/8" TRAPWAY, 1.28-GPF, 12" ROUGH-IN. TOILET SEAT: AMERICAN STANDARD OPEN FRONT, LESS COVER, HIGH IMPACT SOLID PLASTIC, SELF SUSTAINING CHECK HINGES.
L-1	2"	2"	1/2"	1/2"	WALL HUNG LAVATORY: AMERICAN STANDARD "LUCERNE" 0356.421 (T.A.S. COMPLIANT) WALL HUNG, WHITE VITREOUS CHINA, 20-1/2" X 18-1/4" FAUCET: DELTA #2529E-LGHGWHDF WITH 0.5GPM AERATOR. ROUGH-INS, FAUCET INSTALLATION, AND FINAL CONNECTIONS BY PLUMBING CONTRACTOR. PLUMBING CONTRACTOR TO PROVIDE STRAINER, ESCUTCHEONS AT WALL, SUPPLIES AND STOPS, ETC. AS REQUIRED IN ORDER TO PROPERLY INSTALL FIXTURE. CARRIER: PROVIDE AMERICAN STANDARD WALL HANGER.
SK-1	2"	2"	1/2"	1/2"	SINK: ELKAY ELUHAD281655PD (T.A.S. COMPLIANT). UNDERMOUNTED, 18 GAUGE TYPE 304 STAINLESS STEEL, 30-1/2" X 18-1/2" X 5-3/8" DEEP, SINGLE COMPARTMENT, DRAIN OUTLET OFF-CENTER TO REAR OF BASIN. FAUCET: DELTA 9113-DST ROUGH-INS, FAUCET INSTALLATION, AND FINAL CONNECTIONS BY PLUMBING CONTRACTOR. PLUMBING CONTRACTOR TO PROVIDE STRAINER, ESCUTCHEONS AT WALL, SUPPLIES AND STOPS, ETC. AS REQUIRED IN ORDER TO PROPERLY INSTALL FIXTURE.
MS-1	3"	2"	3/4"	3/4"	MOP SINK: FIAT PRODUCTS: MSB-2424. MOP SINK BASIN, 24" X 24" X 10" HIGH, MOLDED STONE, AND GRID STRAINER DRAIN. PROVIDE STAINLESS STEEL WALL GUARDS IN QUANTITY AS REQUIRED TO PROTECT ADJACENT WALLS. FAUCET: CHICAGO #897-RCF WALL MOUNTED 26" ABOVE TOP EDGE OF BASIN, ALL BRASS SUPPLY FAUCET, 10" SPOUT WITH WALL BRACE AND PAIL HOOK, 3/4" MALE HOSE THREADED OUTLET AND VACUUM BREAKER, LEVER HANDLES, INTERGRAL STOP ARMS, WALL FLANGES, 1/2" FEMALE THREADED INLETS AND ADJUSTABLE CENTERS.
RVB-1	--	--	1/2"	--	REFRIGERATOR VALVE BOX: GUY GRAY BIM-875. REFRIGERATOR VALVE BOX, 10-3/4" X 9", 16 GAUGE STEEL W/EPOXY FINISH, 5/8" O.D. SWEAT CONNECTION.
EDF-1	2"	2"	1/2"	--	DRINK FOUNTAIN: ELKAY FZH20 #FMBFTLWSSK (T.A.S. COMPLIANT). WALL HUNG, SPLIT-LEVEL, VANDAL-RESISTANT BUBBLERS, STAINLESS STEEL, NON-FILTERED, 8-GPH COOLER WITH BOTTLE FILLER. ROUGH-INS, INSTALLATION, AND FINAL CONNECTIONS BY PLUMBING CONTRACTOR. PLUMBING CONTRACTOR TO PROVIDE ESCUTCHEONS AT WALL, SUPPLIES AND STOPS, ETC. AS REQUIRED IN ORDER TO PROPERLY INSTALL FIXTURE. CARRIER: PROVIDE MANUFACTURER'S RECOMMENDED CARRIER.
IMC-1	--	--	1/2"	--	ICE MACHINE CONNECTION: 1/2" WATER SUPPLY VALVE AT WALL. PROVIDE AQUA PURE AP510 WATER FILTER.
WH-1	--	--	3/4"	--	WALL HYDRANT: MIFAB MHY-20. CONCEALED BOX TYPE, NON-FREEZE, 3/4" MALE HOSE THREAD OUTLET, SELF-DRAINING WITH ANTI-SIPHON VACUUM BREAKER.
RP-1	--	--	1-1/4"	--	BUILDING MAIN BACKFLOW DEVICE: 1" WATTS LF-009 REDUCED PRESSURE ZONE TYPE WITH TWO IN-LINE INDEPENDENT CHECK VALVES WITH AN INTERMEDIATE RELIEF VALVE. COMPLETE WITH TWO FULL PORTED BALL VALVE SHUT-OFFS AND BALL TYPE TEST COCKS. INSTALL BACKFLOW DEVICE ON WALL AT 48" A.F.F. IN ACCORDANCE WITH UTILITY DEPARTMENT AND MANUFACTURER REQUIREMENTS. PROVIDE WITH INLET STRAINER. ROUTE DRAIN THRU WALL TO EXTERIOR.
RP-2	--	--	1/2"	--	BACKFLOW DEVICE: 1/2" WATTS LF-009 REDUCED PRESSURE ZONE TYPE WITH TWO IN-LINE INDEPENDENT CHECK VALVES WITH AN INTERMEDIATE RELIEF VALVE. COMPLETE WITH TWO FULL PORTED BALL VALVE SHUT-OFFS AND BALL TYPE TEST COCKS. PROVIDE WITH AIR GAP FITTING AND ROUTE DRAIN PIPE TO FLOOR SINK. INSTALL PER MANUFACTURER'S WRITTEN INSTRUCTIONS AND FOLLOW ALL APPLICABLE CODE REQUIREMENTS.
FS-1	2"	2"	--	--	FLOOR SINK: MIFAB FSS22-30. BOTTOM OUTLET PVC BODY, 8" SQUARE PVC GRATE AND RIM, ANCHOR FLANGE, 6" DEEP SUMP WITH DOME BOTTOM STRAINER. PROVIDE PRO-SET SYSTEMS, INC. TRAP GUARD FACTORY FITTED TO MATCH EACH FLOOR DRAIN BY SIZE, MODEL, AND MANUFACTURER.
WCO	REFER TO PLANS	--	--	--	WALL CLEANOUT: MIFAB C1440-RD6. CAST IRON CLEANOUT FERRULE WITH BRONZE RAISED HEAD PLUG AND ROUND STAINLESS STEEL COVER PLATE WITH CENTER SECURING SCREW.
FCO	REFER TO PLANS	--	--	--	FLOOR CLEANOUT: MIFAB C1100-R-1. FOR CARPETED FLOORS PROVIDE MIFAB C1100-RC. CAST IRON BODY WITH SECONDARY O-RING TEST SEAL AND ADJUSTABLE COMBINED ACCESS COVER/ PLUG TOP ASSEMBLY WITH PRIMARY GASKET SEAL, AND ROUND SCORAIATED NICKEL BRONZE COVER.
ECO	REFER TO PLANS	--	--	--	EXTERIOR CLEANOUT: MIFAB C1100-YR-4. EXTERIOR CLEANOUT TO GRADE, CAST IRON BODY WITH SECONDARY SECONDARY O-RING TEST SEAL AND ADJUSTABLE COMBINED ACCESS COVER/PLUG TOP ASSEMBLY WITH PRIMARY GASKET SEAL, AND ROUND SCORAIATED VANDAL RESISTANT DUCTILE IRON TRACTOR TYPE COVER. IF LOCATED IN ASPHALT OR DIRT PROVIDE 18" X 18" X 4" CONCRETE PAD FOR SINGLE CLEANOUT AND 24" X 18" X 4" CONCRETE PAD FOR DOUBLE CLEANOUT.

NOTE:  
1. CONTRACTOR SHALL VERIFY ALL PLUMBING FIXTURES SELECTIONS WITH OWNER/ARCHITECT PRIOR TO PURCHASE AND INSTALLATION.

Project Title: **HILL COUNTY MAINTENANCE BARN**  
**901 FM 308**  
**PENELOPE, TEXAS 76676**  
**100% REVIEW SET**

No. \_\_\_\_\_  
 Revisions and Descriptions \_\_\_\_\_  
 By \_\_\_\_\_  
 Date \_\_\_\_\_

06.16.2020

Drawn By: **MRB**  
 Checked By: **CS**  
 Scale: SEE PLANS  
 Date: 06/16/2020

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Sheet No. **P401**

Project No. **0843.20002**

of \_\_\_\_\_

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