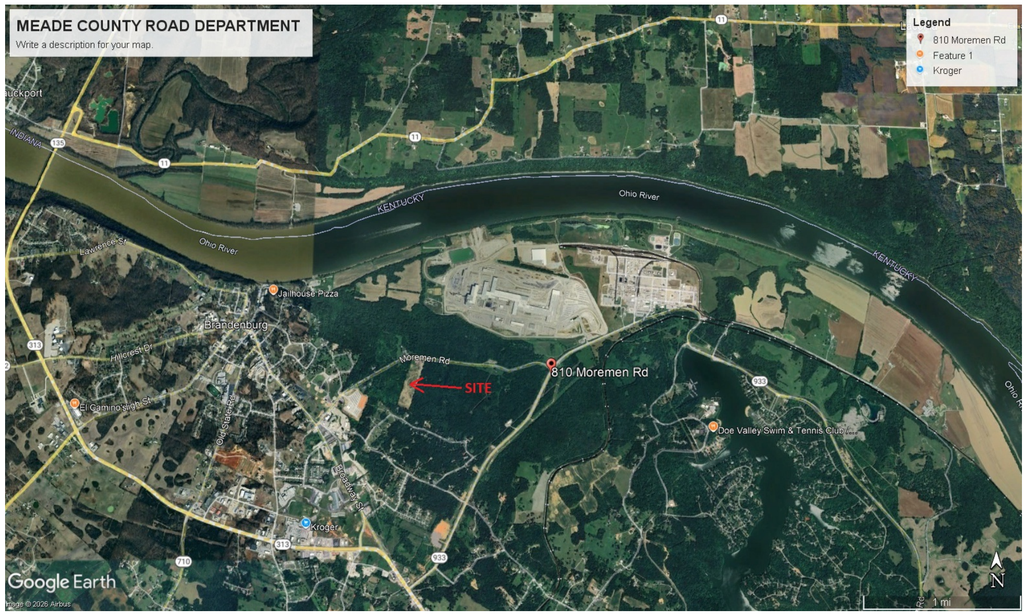
MEADE CO ROAD DEPARTMENT BUILDING

810 MOREMAN ROAD
MEADE COUNTY, KY 40108



EXTERIOR ENVELOPE CONSTRUCTION:

ROOF: METAL ROOFING SYSTEM
ROLL AND METAL PANEL INSULATION: R=30 (MIN)
WALLS: PEMB FRAMING
SPLIT FACE BLOCK (SEE LOCATIONS)
METAL PANEL WALLS
5/8" GYPSUM BOARD
ROLL INSULATION R17

AGENCIES

BUILDING CLASSIFICATION

USE GROUP	**PUBLIC WORKS**
FIRE SUPPRESSION	**NO**
SQUARE FOOTAGE	**2,560 (OFFICE)**
	10,800 (SHOP)
	2,400 (WASH BAY)

Meade County Planning & Zoning
516 Hillcrest Dr. Suite #13
Brandenburg, KY 40108

Commonwealth of Kentucky
Division of Plumbing
The 127 Building, 1047 US 127 South
Frankfort, Kentucky 40601
P. 502.564.3680

UTILITIES

ELECTRICAL
Meade County RECC
Brandenburg, Kentucky 40108
270.422.2162

WATER/SEWER
Meade County Water District
Brandenburg, Kentucky 40108
270.422.5006

GAS:
Louisville Gas and Electric Complany
P.O. Box 32010
Lousiville, Kentucky 40232
502.627.3714

Lincoln Trail Area Development District
Community Asset Planning & Engineering (CAPE)

750 South Provident Way
Elizabethtown, KY 42701

www.ltadd.org

MEP ENGINEER
E.C. ENGINEERING, INC.
P.O. Box 31
Goshen, KY 40026
ecruseeng@gmail.com
502.494.4219

SITE/CIVIL ENGINEER
SMITH ENGINEERING
901 High St, Brandenburg, KY 40108
270.422.2588

STATE OF KENTUCKY
CHARLES A. ALLEN
21469
LICENSED PROFESSIONAL ENGINEER

Charles A. Allen

NO.	DESCRIPTION	BY	DATE

SHEET TITLE:

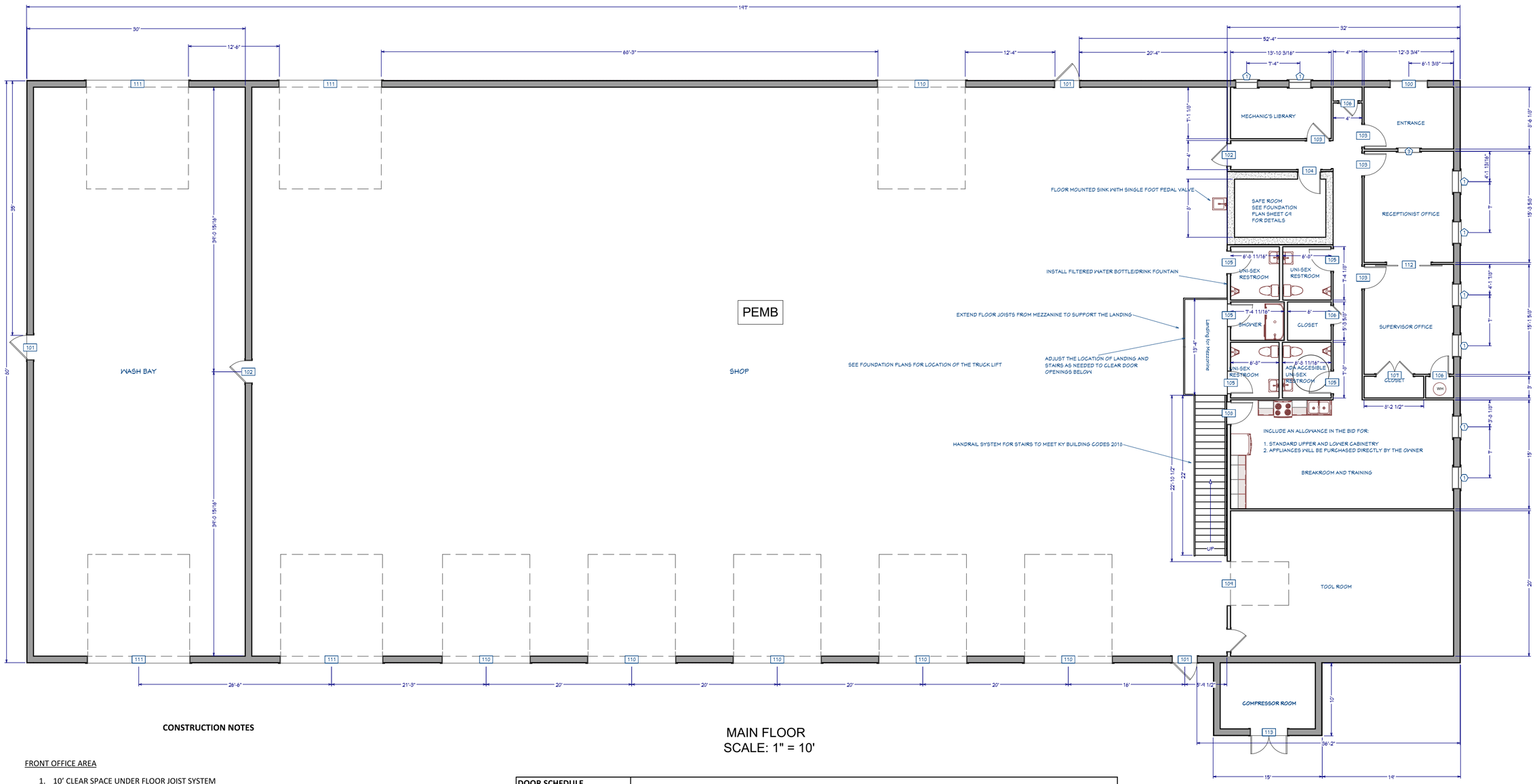
PROJECT DESCRIPTION:
MEADE CO ROAD DEPARTMENT

DRAWINGS PROVIDED BY:
Lincoln Trail Area Development District
Community Asset Planning & Engineering (CAPE)

DATE:
1.22.26

SCALE:

SHEET:
A-1



MAIN FLOOR
SCALE: 1" = 10'

CONSTRUCTION NOTES

FRONT OFFICE AREA

1. 10’ CLEAR SPACE UNDER FLOOR JOIST SYSTEM
2. PROVIDE ACCOUSTIC TILE CEILING AND MAINTAIN A MINIMUM OF 8’ FROM CEILING TO FLOOR. 9’ PREFERRED.
3. INTERIOR FINISH WITH 5/8” TYPE X DRYWALL ON BOTH SIDES OF WALLS ADJACENT TO THE SHOP AREA. ALL OTHER WALLS WILL BE STANDARD 5/8” DRYWALL. PAINT AND STANDARD WOOD TRIM THROUGHOUT. STYLE AND SIZE TO BE DETERMINED BY OWNER.
4. PROVIDE 5/8” TYPE X DRYWALL UNDER THE FLOOR JOISTS TO PROVIDE EXTRA FIRE PROTECTION FOR THE MEZZANINE AREA.
5. BATHROOMS WILL HAVE PORCELAIN TILE FLOORS.
6. ALL OTHER ROOMS WITH HAVE LUXURY VINYL PLANK FLOOR THAT IS SCRATCH RESISTANT AND WATERPROOF.
7. INCLUDE COSTS FOR UPPER AND LOWER CABINETS IN THE BREAKROOM.
8. OWNER WILL PROVIDE ALL FURNITURE.
9. ONE BATHROOM IS TO BE FULLY ADA ACCESSIBLE.
10. TOILETS ARE TO BE ELONGATED. URINALS ARE TO BE WALL MOUNTED.
11. SINKS ARE WALL MOUNTED.
12. STANDARD 5’ SHOWER INSERT LOCATED IN THE SHOWER ROOM.
13. INCLUDE ALL FIXTURES FOR SINKS AND SHOWER.

SHOP AREA

1. STANDARD TROWEL FINISHED CONCRETE FLOORS WITH AN EPOXY COATING.
2. SEE CIVIL PLANS FOR DETAILS REGARDING EQUIPMENT TO BE INCLUDED IN THE PROJECT.
3. NOTE THAT THE FLOOR DRAINS DO **NOT** CONNECT TO THE SEPTIC SYSTEM. THEY DRAIN TO AN OIL/WATER SEPARATOR AND THEN TO A STORWATER BASIN. SEE SITE CIVIL PLANS FOR DETAILS.
4. THE RADIANT FLOOR HEATING SYSTEM INCLUDING THE WOOD BOILER IS AN ALTERNATIVE BID AND SHOULD BE BROKEN OUT OF THE BASE BID. SEE THE MECHANICAL PLANS FOR DETAILS.
5. SEE THE FOUNDATION PLANS FOR THE EXACT LOCATION OF THE TRUCK LIFT.
6. ENSURE THE CONCRETE SLAB SLOPES TO THE CENTER FLOOR DRAINS.

WASH BAY

1. SEE CIVIL PLANS FOR REQUIREMENTS. SLOPE CONCRETE TO THE DRAIN.

DOOR SCHEDULE

NO.	LOCATION	OPENING SIZE	DOOR MATL	FRAME MATL	HARDWARE
100	FRONT (EXT)	PR 5'-0" X 7'-0"	ALUM/FULL GLASS	ALUM	CLOSER, WEATHER STRIP, THRESHOLD, PANIC DEVICE, LOCK)
101	SHOP (EXT)	PR 3'-0" X 7'-0"	ALUM/1/4 GLASS	ALUM	CLOSER, WEATHER STRIP, THRESHOLD, PANIC DEVICE, LOCK)
102	SHOP INTERIOR	PR 3'-0" X 7'-0"	ALUM/1/4 GLASS	ALUM	CLOSER, WEATHER STRIP, THRESHOLD)
103	OFFICE	3'-0" X 7'-0"	SOLID CORE WOOD	HOLLOW METAL	LOCK
104	SAFE ROOM	3'-0" X 7'-0"	ALUM/NO GLASS	ALUM	LOCK
105	UNISEX RESTROOM	3'-0" X 7'-0"	SOLID CORE WOOD	HOLLOW METAL	CLOSER, PUSH/PULL, DOOR STOP, LOCK
106	CLOSET	2'-6" X 7'-0"	SOLID CORE WOOD	HOLLOW METAL	PRIVACY LOCK/DOOR STOP
107	CLOSET	5'-0" X 7'-0"	SOLID CORE WOOD	HOLLOW METAL	PRIVACY LOCK/DOOR STOP
108	BREAKROOM	3-0" X 7'-0"	ALUM/1/4 GLASS	ALUM	PRIVACY LOCK/DOOR STOP
109	TOOL ROOM	6'-0" X 8'-0"	STEEL SERVICE DOOR	STEEL	MANUAL HOIST
110	GARAGE DOOR	12'-0" X 14'-0"	INSULATED STEEL	INSULATED STEEL	COMMERCIAL OPERATOR
111	GARAGE DOOR	14'-0" X 14'-0"	INSULATED STEEL	INSULATED STEEL	COMMERCIAL OPERATOR
112	RECEPTIONIST	6'-0" X 8'-0"	SOLID CORE WOOD	HOLLOW METAL	SLIDING BARN DOOR
113	COMPRESSOR ROOM	5'-0" X 7'-0"	ALUM/NO GLASS	ALUM	LOCK

WINDOW SCHEDULE

MARK	UNIT SIZE	FRAME	GLAZING
1	36" X 48"	ALUM.	TEMPERED, INSULATED, TINTED
2	96" X 36"	ALUM.	TEMPERED, INSULATED, TINTED
3	36" X 48"	ALUM.	NO GLASS

NO.	DESCRIPTION	BY	DATE

SHEET TITLE: BUILDING LAYOUT

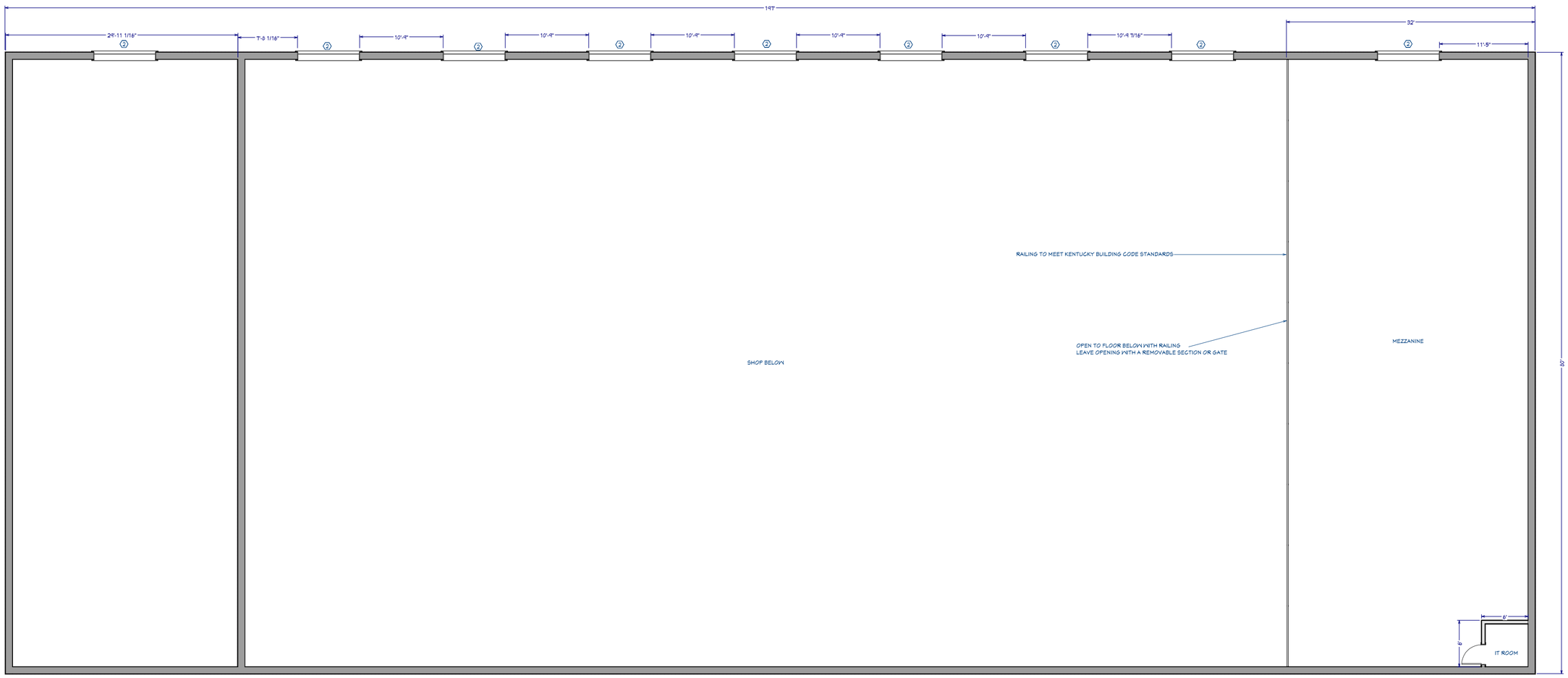
PROJECT DESCRIPTION:
MEADE COUNTY ROAD DEPARTMENT PROJECT

DRAWINGS PROVIDED BY:
Lincoln Trail Area Development District
Community Asset Planning & Engineering (CAPE)

DATE:
1/15/2026

SCALE:

SHEET:
A-2



SECOND FLOOR

SCALE: 1" = 10'

CONSTRUCTION NOTES

1. MEZZANINE AREA SHALL BE DESIGNED BY THE PEMB MANUFACTURER TO SUPPORT A DEAD LOAD OF 150 PSF. THIS ASSUMES THAT MATERIALS SUCH AS BARRELS OF CHEMICALS, PALLETS OF MATERIALS AND OTHER POINT LOADS MAY BE STACKED IN A LOCALIZED AREA.
2. MEZZANINE AREA FLOORING WILL BE THE ADVANTECH SUBLOORING MATERIALS. NO OTHER FINISHED SURFACE MATERIAL REQUIRED.
3. WORK WITH THE ROAD DEPARTMENT SUPERVISOR TO DETERMINE TYPE OF RAILING AND GATE LOCATION.
4. MEZZANINE IS OPEN TO THE FLOOR BELOW.

NO.	DESCRIPTION	BY	DATE

SHEET TITLE: MEZZANINE LAYOUT

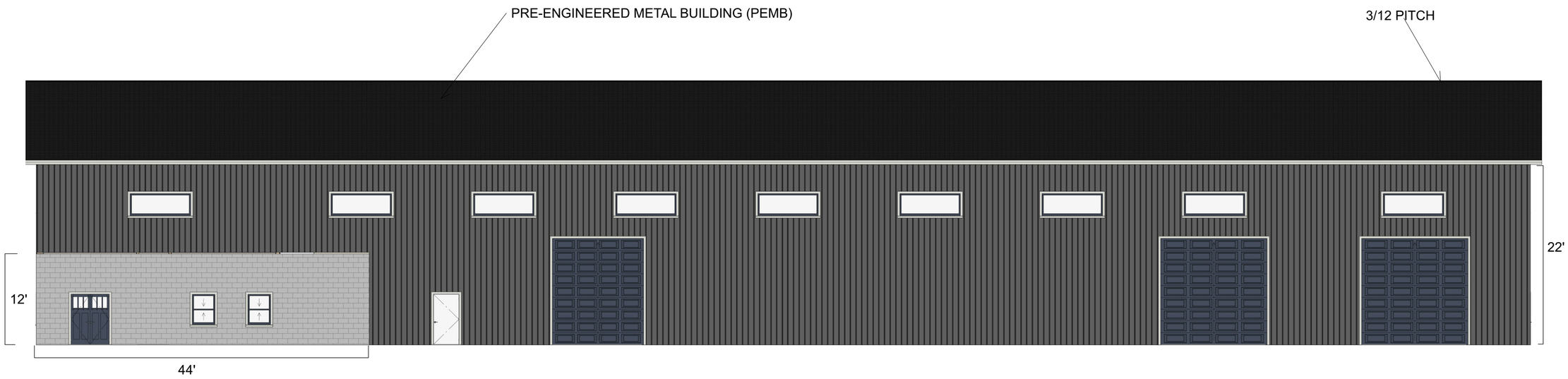
PROJECT DESCRIPTION: MEADE COUNTY ROAD DEPARTMENT PROJECT

DRAWINGS PROVIDED BY: Lincoln Trail Area Development District, Community Asset Planning & Engineering (CAPE)

DATE: 1/15/2026

SCALE:

SHEET: A-3



NORTH ELEVATION
SCALE: 1" = 10'

GENERAL NOTES

1. MATERIALS	ASTM DESCRIPTION	MATERIALS	ASTM DESCRIPTION
STRUCTURAL STEEL PLATE	A529 / A572 / A1011	ROOF AND WALL SHEETING	A653 / A792
HOT ROLLED MILL SHAPES	A36 / A529 / A572 / A500	BOLTS	A307 / A325 / A490
HSS ROUND	A500	CABLE	A475
HSS RECTANGULAR	A500	RODS	A529 / A572
COLD FORM SHAPES	A653 / A1011		

2. STRUCTURAL PRIMER NOTES:
SHOP COAT PRIMER IS INTENDED TO PROTECT THE STEEL FRAMING FOR A SHORT PERIOD OF TIME. STORAGE IN EXTREME COLD TEMPERATURES OR WINTER SNOW CONDITIONS, INCLUDING TRANSPORTATION ON SALTED OR CHEMICALLY TREATED ROADS WILL ADVERSELY AFFECT THE DURABILITY AND LONGEVITY OF THE PRIMER. THE COAT OF SHOP PRIMER DOES NOT PROVIDE THE UNIFORMITY OF APPEARANCE, OR THE DURABILITY AND CORROSION RESISTANCE OF A FIELD APPLIED FINISH COAT OF PAINT OVER A SHOP PRIMER. MINOR ABRASIONS TO THE SHOP COAT PRIMER CAUSED BY HANDLING, LOADING, SHIPPING, UNLOADING AND ERECTION ARE UNAVOIDABLE AND ARE NOT THE RESPONSIBILITY OF THE METAL BUILDING MANUFACTURER. METAL BUILDING MANUFACTURER IS NOT RESPONSIBLE FOR THE DETERIORATION OF THE PRIMER OR CORROSION THAT MAY RESULT FROM ATMOSPHERIC AND ENVIRONMENTAL CONDITIONS NOR THE COMPATIBILITY OF THE PRIMER TO ANY FIELD APPLIED COATING.

3. BUILDING ERECTION NOTES:
THE GENERAL CONTRACTOR AND/OR ERECTOR IS RESPONSIBLE TO SAFELY AND PROPERLY ERECT THE METAL BUILDING SYSTEM IN CONFORMANCE WITH THESE DRAWINGS, OSHA REQUIREMENTS AND EITHER MBMA OR CSA S16 STANDARDS PERTAINING TO PROPER ERECTION. TEMPORARY SUPPORTS SUCH AS GUYS, BRACES, FALSEWORK, CRIBBING OR OTHER ELEMENTS FOR ERECTION ARE TO BE DETERMINED, FURNISHED AND INSTALLED BY THE ERECTOR.THESE SUPPORTS MUST SECURE THE STEEL FRAMING, OR PARTLY ASSEMBLED STEEL FRAMING, AGAINST LOADS COMPARABLE IN INTENSITY TO THOSE FOR WHICH THE STRUCTURE WAS DESIGNED IN ADDITION TO LOADS RESULTING FROM THE ERECTION OPERATION. SECONDARY WALL AND ROOF FRAMING (PURLINS, GIRTS AND/OR JOIST) ARE NOT DESIGNED TO FUNCTION AS A WORKING PLATFORM OR TO PROVIDE AS AN ANCHORAGE POINT FOR A FALL ARREST /SAFETY TIE OFF.\P

4. A325 & A490 BOLT TIGHTENING REQUIREMENTS:
IT IS THE RESPONSIBILITY OF THE ERECTOR TO ENSURE PROPER BOLT TIGHTNESS IN ACCORDANCE WITH APPLICABLE REGULATIONS. FOR PROJECTS IN THE UNITED STATES SEE THE RCSC SPECIFICATION FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS OR FOR PROJECTS IN CANADA, SEE THE CAN/CSA S16 LIMIT STATES DESIGN OF STEEL STRUCTURES FOR MORE INFORMATION.
THE FOLLOWING CRITERIA MAY BE USED TO DETERMINE THE BOLT TIGHTNESS (I.E., "SNUG-TIGHT" OR "FULLY-PRETENSIONED"), UNLESS REQUIRED OTHERWISE BY LOCAL JURISDICTION OR CONTRACT REQUIREMENTS:
A) ALL A490 BOLTS SHALL BE "FULLY-PRETENSIONED".
B) ALL A325 BOLTS IN PRIMARY FRAMING (RIGID FRAMES AND BRACING) MAY BE "SNUG-TIGHT",EXCEPT AS FOLLOWS: "FULLY-PRETENSION" A325 BOLTS IF:
a) BUILDING SUPPORTS A CRANE SYSTEM WITH A CAPACITY GREATER THAN 5 TONS.
b) BUILDING SUPPORTS MACHINERY THAT CREATES VIBRATION, IMPACT OR STRESS-REVERSALS ON THE CONNECTIONS. THE ENGINEER-OF-RECORD FOR THE PROJECT SHOULD BE CONSULTED TO EVALUATE FOR THIS CONDITION.
c) THE PROJECT SITE IS LOCATED IN A HIGH SEISMIC AREA. FOR IBC-BASED CODES,"HIGH SEISMIC AREA" IS DEFINED AS "SEISMIC DESIGN CATEGORY" OF "D", "E", OR "F". SEE THE "BUILDING LOADS" SECTION OF THIS PAGE FOR THE DEFINED SEISMIC DESIGN CATEGORY FOR THIS PROJECT.
d) ANY CONNECTION DESIGNATED IN THESE DRAWINGS AS "A325-SC". "SLIP-CRITICAL (SC)" CONNECTIONS MUST BE FREE OF PAINT, OIL, OR OTHER MATERIALS THAT REDUCE FRICTION AT CONTACT SURFACES. GALVANIZED OR LIGHTLY RUSTED SURFACES ARE ACCEPTABLE.
C)IN CANADA, ALL A325 AND A490 BOLTS SHALL BE "FULLY PRE-TENSIONED", EXCEPT FOR SECONDARY MEMBERS (PURLINS, GIRTS, OPENING FRAMING, ETC.) AND FLANGE BRACES.
SECONDARY MEMBERS (PURLINS, GIRTS, OPENING FRAMING, ETC.) AND FLANGE BRACE CONNECTIONS MAY ALWAYS BE "SNUG-TIGHT", UNLESS INDICATED OTHERWISE IN THESE DRAWINGS.

5. GENERAL DESIGN NOTES:
1) ALL STRUCTURAL STEEL SECTIONS AND WELDED PLATE MEMBERS ARE DESIGNED IN ACCORDANCE WITH ANSI/AISC 360 "SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS" OR THE CAN/CSA S16 "LIMIT STATES DESIGN OF STEEL STRUCTURES", AS REQUIRED BY THE SPECIFIED BUILDING CODE.
2) ALL WELDING OF STRUCTURAL STEEL IS BASED ON EITHER AWS D1.1 "STRUCTURAL WELDING CODE ? STEEL." OR CAN/CSA W59 "WELDED STEEL CONSTRUCTION (METAL ARC WELDING)" , AS REQUIRED BY THE SPECIFIED BUILDING CODE.
3) ALL COLD FORMED MEMBERS ARE DESIGNED IN ACCORDANCE WITH ANSI/AISI 100 OR THE CAN/CSA S136 "SPECIFICATIONS FOR THE DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS" , AS REQUIRED BY THE SPECIFIED BUILDING CODE.
4) ALL WELDING OF COLD FORMED STEEL IS BASED ON AWS D1.3 "STRUCTURAL WELDING CODE - SHEET STEEL" OR CAN/CSA W59 "WELDED STEEL CONSTRUCTION (METAL ARC WELDING)", AS REQUIRED BY THE SPECIFIED BUILDING CODE.
5) THIS MANUFACTURING FACILITY IS IAS AC-472 ACCREDITED AND CAN/CSA A660 AND W47.1 CERTIFIED (IF APPLICABLE) FOR THE DESIGN AND MANUFACTURING OF METAL BUILDING SYSTEMS.
6) IF JOISTS ARE INCLUDED WITH THIS PROJECT, THEY ARE SUPPLIED AS A PART OF THE SYSTEMS ENGINEERED METAL BUILDING AND ARE FABRICATED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 1926.758 OF OSHA SAFETY STANDARDS FOR STEEL ERECTION, DATED JANUARY 18, 2001.

6. GLOSSARY OF ABBREVIATIONS:

A.B. = ANCHOR BOLTS	Max = MAXIMUM	Req'd = REQUIRED
BS = BOTH SIDES	M.B. = MACHINE BOLTS	Rev. = REVISION
B.U. = BUILT-UP	MBS = METAL BUILDING SUPPLIER	SIM = SIMILAR
Dia = DIAMETER	Min = MINIMUM	SL = STEEL LINE
Flg = FLANGE	N/A = NOT APPLICABLE	SLV = SHORT LEG VERTICAL
F.S =FAR SIDE	NIC = NOT IN CONTRACT	TBD = TO BE DETERMINED
Ga. = GAUGE	N.S. = NEAR SIDE	Typ = TYPICAL
H.S.B. = HIGH STRENGTH BOLTS	O.A.L. = OVERALL LENGTH	U.N.O. = UNLESS NOTED OTHERWISE
Ht. = HEIGHT	O.C. = ON CENTER	
LLV = LONG LEG VERTICAL	BS = BOTH SIDES	

?? = PART MARK TO BE DETERMINED AND WILL BE UPDATED ON FOR CONSTRUCTION DRAWINGS

DESIGN CODE: KBC 2018 BUILDING END USE: 4E
ROOF LIVE LOAD: 20 PSF MBMA OCC. CLASS:
NOT REDUCIBLE PER CODE III – Substantial Hazard
GROUND SNOW LOAD: 15 PSF SNOW EXP. FACTOR, Ce: 1
SNOW IMPORTANCE FACTOR, Is: 1.1

WIND: 120 WIND IMPORTANCE FACTOR, Iw: 1
EXPOSURE: C WITHIN HURRICANE COASTLINE ☐ YES ☒ NO

UL 90 ☐ YES ☒ NO RAIN INTENSITY (in/hr) N/A

SEISMIC INFORMATION Ss:0.22, S1:0.144
Design Sds/Sd1: Site Class: D
Seismic Imp. Factor Ie: 1.25 Seismic Design Category:
Analysis Procedure: Equivalent Lateral Force Method
Basic SFRS:

NOTES:
1) COLLATERAL DEAD LOADS, UNLESS OTHERWISE NOTED, ARE ASSUMED TO BE UNIFORMLY DISTRIBUTED. WHEN SUSPENDED SPRINKLER SYSTEMS, LIGHTING, HVAC EQUIPMENT, CEILINGS, ETC., ARE SUSPENDED FROM ROOF MEMBERS, CONSULT THE M.B.S. IF THESE CONCENTRATED LOADS EXCEED 200 POUNDS, OR IF INDIVIDUAL MEMBERS ARE LOADED SIGNIFICANTLY MORE THAN OTHERS.

2) THE DESIGN OF STRUCTURAL MEMBERS SUPPORTING GRAVITY LOADS IS CONTROLLED BY THE MORE CRITICAL EFFECT OF ROOF LIVE LOAD OR ROOF SNOW LOAD, AS DETERMINED BY THE APPLICABLE CODE.

	BUILDING
	MAIN
ROOF DEAD (PSF):	2.9
PRI. COL (PSF):	5
SEC. COL (PSF):	5
SNOW Ct:	1
SNOW Cs:	
ROOF SNOW (PSF):	16.5
WIND ENCLOSURE:	Enclosed
GCpi:	
SEISMIC R:	
SEISMIC Cs:	
BASE SHEAR (KIPS):	

NO.	DESCRIPTION	BY	DATE

SHEET TITLE: ELEVATION VIEW

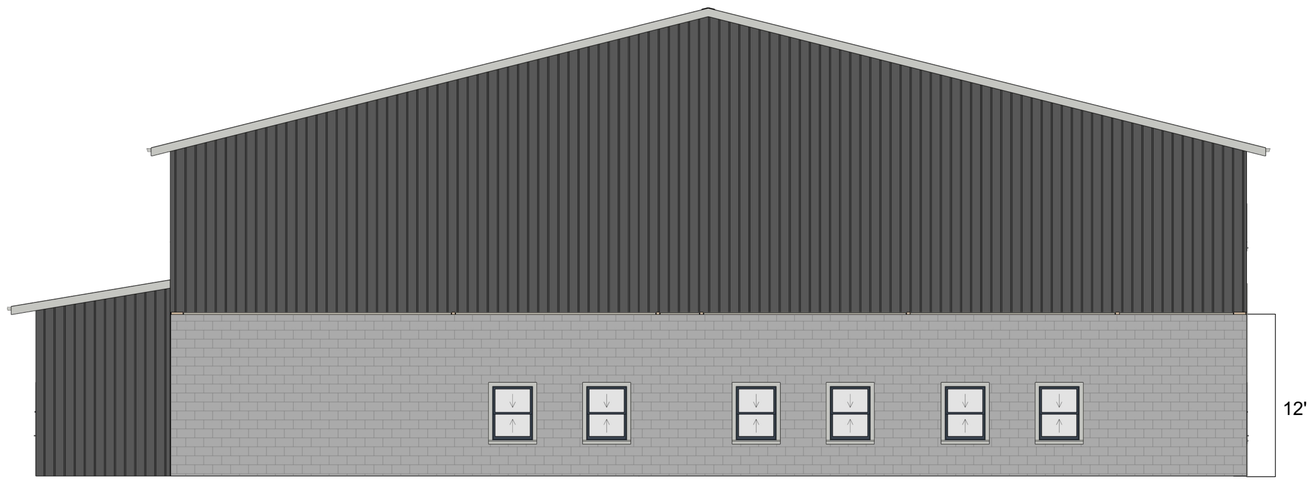
PROJECT DESCRIPTION: MEADE COUNTY ROAD DEPARTMENT PROJECT

DRAWINGS PROVIDED BY: Lincoln Trail Area Development District — Community Asset Planning & Engineering (CAPE)

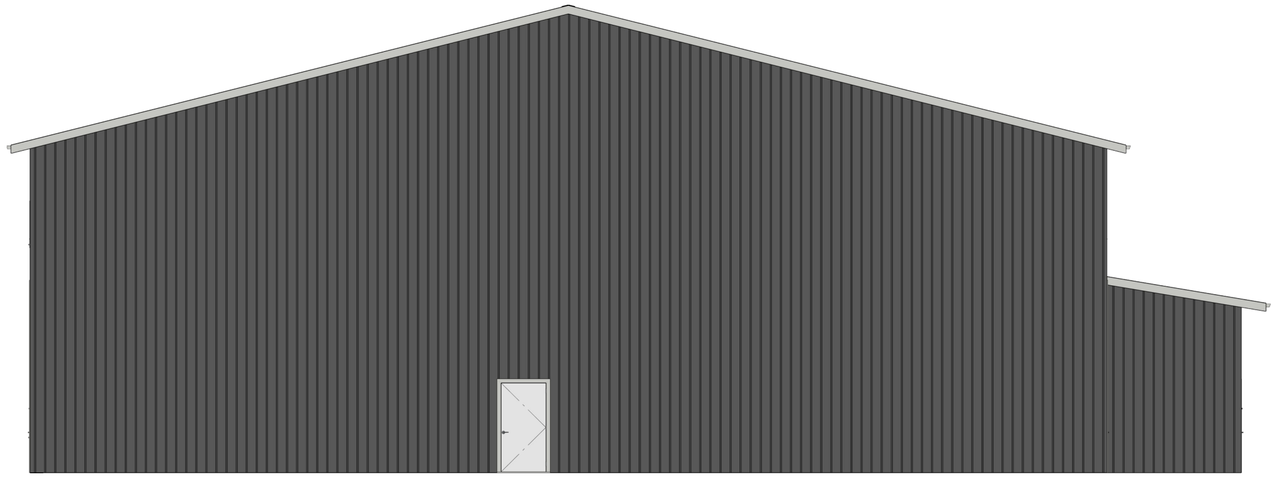
DATE: 1/15/2026

SCALE:

SHEET: A-4



EAST ELEVATION
SCALE: 1/8" = 1'



WEST ELEVATION
SCALE: 1/8" = 1'

SOUTH ELEVATION
SCALE: 1" = 10'

NO.	DESCRIPTION	BY	DATE

SHEET TITLE:
ELEVATION VIEW

PROJECT DESCRIPTION:
MEADE COUNTY ROAD DEPARTMENT PROJECT

DRAWINGS PROVIDED BY:
Lincoln Trail Area Development District
Community Asset Planning & Engineering (CAPE)

DATE:
1/15/2026

SCALE:

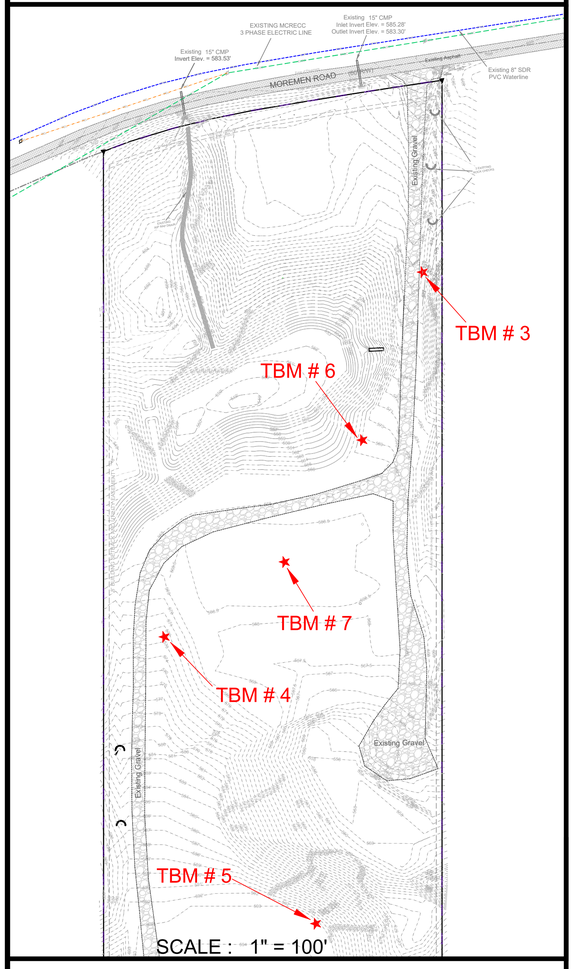
SHEET:
A-5

TBMs - Project Coordinates

TBM #	Northing(Y)	Easting(X)	Elev(Z)	Description
TBM #3	9704.02'	10153.04'	577.77'	ALL TBMs shown on these Plans are: 5/8" Rebar with Blue Cap Stamped WITNESS T.W. SMITH LS 2373
TBM #4	9325.30'	9656.10'	572.86'	
TBM #5	8879.49'	9737.98'	592.13'	
TBM #6	9504.96'	10002.26'	568.87'	
TBM #7	9374.97'	9847.63'	568.89'	

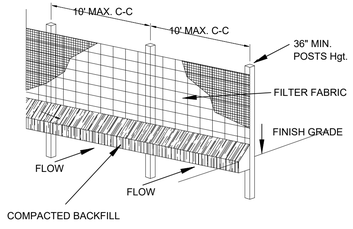
TBM LOCATIONS ON SITE

SCALE : 1" = 100'



SCALE : 1" = 100'

TYPE I SILT FENCE DETAIL



1. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.
2. MAINTENANCE SHALL BE PERFORMED AS NOTED IN THE EROSION CONTROL PLAN. COLLECTED MATERIAL SHALL BE REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

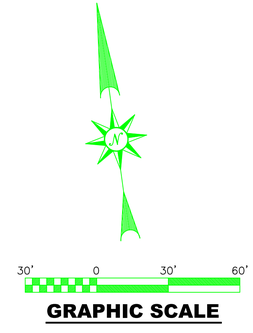
BIDDERS NOTES

1. ALL ASPHALT AND STONE UNDER THE ASPHALT SHOWN IS NOT A PORTION OF THIS BID. THE SUBGRADE SHALL BE CUT TO GRADE AS SHOWN ON THE GRADING PLAN, MINUS THE THICKNESS OF THE STONE AND ASPHALT. THICKNESS VARIES DEPENDING ON LIGHT DUTY AND HEAVY DUTY PAVEMENTS SHOWN.
2. THE ONSITE SEWER DISPOSAL PLAN IS A PORTION OF THIS BID. CONTRACTORS BID SHALL INCLUDE ALL THE WORK SHOWN ON THAT SHEET FOR CONSTRUCTION.
3. ALL SEWER LATERIALS AND SEPTIC SYSTEM INSTALLED SHALL FOLLOW KENTUCKY ONSITE SEWER DISPOSAL SYSTEM CODES, REGULATIONS, AND LAWS.
4. DUE TO THE FACT THE ROCK UNDER THE ASPHALT AND ASPHALT IS NOT A PORTION OF THIS PROJECT BID, IT IS UNSURE WHEN THIS ROCK AND ASPHALT WILL BE CONSTRUCTED. FURTHERMORE, THE UTILITIES SHOWN ON THESE PLANS ARE TO BE CONSTRUCTED AT DEPTH DEEPER THEN THE COMMON UTILITY COVERAGE DEPTH. THESE DEPTH ARE ALREADY A PART OF THE PLANS, AND ARE MENTIONED THROUGHOUT THE PLANS.
5. THIS SET OF PLANS DO NOT CONTAIN A LANDSCAPING PLAN. THE CONTRACTOR SHALL PLACE 6" OF TOPSOIL ON ALL SLOPES, SWALES, DITCHES, AND GRASSY AREAS SHOWN. THEY ARE TO THEN BE SEEDED, AND FULLY COVERED WITH STRAW. SEEDING SHALL CONTAIN 40 LBS OF FESCUE, 40 LBS OF WHEAT, AND 20 LBS OF RYE GRASS PER ACRE MINIMUM.
6. THE CONTRACTOR SHALL PLACE A MINIMUM OF 6" OF TOPSOIL IN BOTH CONCRETE CURBED ISLANDS.

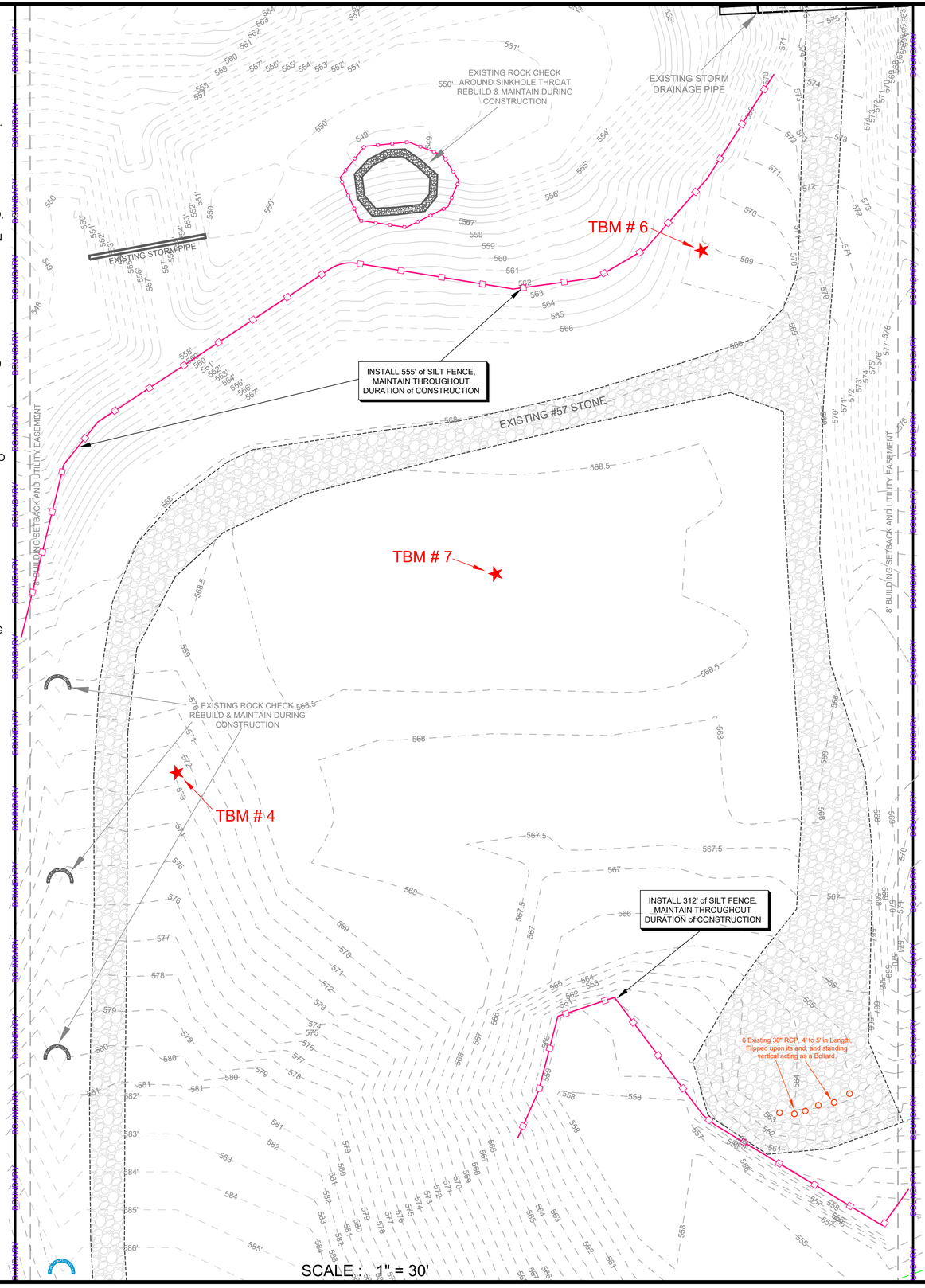
GENERAL NOTES

1.) ALL FILL AREAS SHALL BE COMPACTED IN 8" LIFTS TO 95% DENSITY IN ACCORDANCE WITH STANDARD PROCTOR TEST.
2.) ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED OR REMOVED PRIOR TO THE PLACEMENT OF ANY FILL.
3.) CONTRACTOR SHALL KEEP COUNTY AND/OR STATE ROADWAYS CLEAR OF DEBRIS AND MUD.
4.) PERIMETER SILT FENCE SHALL BE INSTALLED AS NECESSARY TO PREVENT EROSION OF ADJACENT PROPERTIES AND MAINTAINED THROUGHOUT THE PROJECT
5.) CONTRACTOR SHALL CONTACT BUD 811 TO LOCATE ALL UTILITIES PRIOR TO CONSTRUCTION.
6.) CONTRACTOR SHALL PASS PROOF ROLL SPECIFICATIONS OF THE SUBASE PRIOR TO PLACING THE STONE ON THE GRAVEL LOT.
7.) ALL CRUSH STONE BASE SHALL BE COMPACTED WITH A SMOOTH DRUM COMPACTOR.
8.) ALL SLOPES, LANDSCAPE ISLANDS, AND ANY GREEN SPACE WITHIN THE SITE, NOT UNDER ANY TYPE OF PAVEMENT, REQUIRE A MINIMUM OF 6" OF TOPSOIL.
9.) ALL TOPSOIL AND BUILDABLE SOIL ARE TO REMAIN ON SITE.
10.) FOR MORE BOUNDARY OR TOPOGRAPHIC INFORMATION, SEE TOPOGRAPHIC AND BOUNDARY SURVEY COMPLETED NOVEMBER 17TH, 2023 FOR MEADE COUNTY ROAD DEPARTMENT.

D. Toy
739 / 241



GRAPHIC SCALE



SCALE : 1" = 30'

VICINITY MAP

LEGEND

- Utility Pole
- 552 – Existing Contours
- 552 – Proposed Contours
- Proposed Silt Fence
- elev. – Overhead 3Phase Electric
- EXISTING Asphalt Pavement
- EXISTING Concrete Surface
- EXISTING 5/8" REBAR WITH CAP STAMPED T.W.SMITH LS 2373
- UNMARKED POINT IN RIGHT–OF WAY

STATE OF KENTUCKY T.W. SMITH 2373 LICENSED PROFESSIONAL LAND SURVEYOR

STATE OF KENTUCKY TIMOTHY WAYNE SMITH 12270 LICENSED PROFESSIONAL ENGINEER

12-9-25

MEADE COUNTY ROAD DEPARTMENT PROPOSED SITE

800 MOREMAN ROAD
Brandenburg, KY 40108

FOR

MEADE COUNTY FISCAL COURT

524 Hillcrest Drive
Brandenburg, KY 40108

CONSULTANTS

SMITH
ENGINEERING AND LAND SURVEYS, INC.
901 HIGH STREET
BRANDENBURG, KENTUCKY 40108
270-422-2588, 270-547-2588

SCALE: 1" = 30'	DATE: 12-9-25
DRAWN BY: M. O'Reilly	
JOB NO: 23-224	

SHEET TITLE

EXISTING SITE CONDITIONS
WITH EROSION CONTROL DEVICES

C1

TBMs - Project Coordinates

TBM #	Northing(Y)	Easting(X)	Elev(Z)	Description
TBM #3	9704.02'	10153.04'	577.77'	ALL TBMs shown on these Plans are: 5/8" Rebar with Blue Cap Stamped WITNESS T.W. SMITH LS 2373
TBM #4	9325.30'	9656.10'	572.86'	
TBM #5	8879.49'	9737.98'	592.13'	
TBM #6	9504.96'	10002.26'	568.87'	
TBM #7	9374.97'	9847.63'	568.89'	

BIDDERS NOTES

1. ALL ASPHALT AND STONE UNDER THE ASPHALT SHOWN IS NOT A PORTION OF THIS BID. THE SUBGRADE SHALL BE CUT TO GRADE AS SHOWN ON THE GRADING PLAN, MINUS THE THICKNESS OF THE STONE AND ASPHALT. THICKNESS VARIES DEPENDING ON LIGHT DUTY AND HEAVY DUTY PAVEMENTS SHOWN.
2. THE ONSITE SEWER DISPOSAL PLAN IS A PORTION OF THIS BID. CONTRACTORS BID SHALL INCLUDE ALL THE WORK SHOWN ON THAT SHEET FOR CONSTRUCTION.
3. ALL SEWER LATERIALS AND SEPTIC SYSTEM INSTALLED SHALL FOLLOW KENTUCKY ONSITE SEWER DISPOSAL SYSTEM CODES, REGULATIONS, AND LAWS.
4. DUE TO THE FACT THE ROCK UNDER THE ASPHALT AND ASPHALT IS NOT A PORTION OF THIS PROJECT BID, IT IS UNSURE WHEN THIS ROCK AND ASPHALT WILL BE CONSTRUCTED. FURTHERMORE, THE UTILITIES SHOWN ON THESE PLANS ARE TO BE CONSTRUCTED AT DEPTH DEEPER THEN THE COMMON UTILITY COVERAGE DEPTH. THESE DEPTH ARE ALREADY A PART OF THE PLANS, AND ARE MENTIONED THROUGHOUT THE PLANS.
5. THIS SET OF PLANS DO NOT CONTAIN A LANDSCAPING PLAN. THE CONTRACTOR SHALL PLACE 6" OF TOPSOIL ON ALL SLOPES, SWALES, DITCHES, AND GRASSY AREAS SHOWN. THEY ARE TO THEN BE SEEDED, AND FULLY COVERED WITH STRAW. SEEDING SHALL CONTAIN 40 LBS OF FESCUE, 40 LBS OF WHEAT, AND 20 LBS OF RYE GRASS PER ACRE MINIMUM.
6. THE CONTRACTOR SHALL PLACE A MINIMUM OF 6" OF TOPSOIL IN BOTH CONCRETE CURBED ISLANDS.

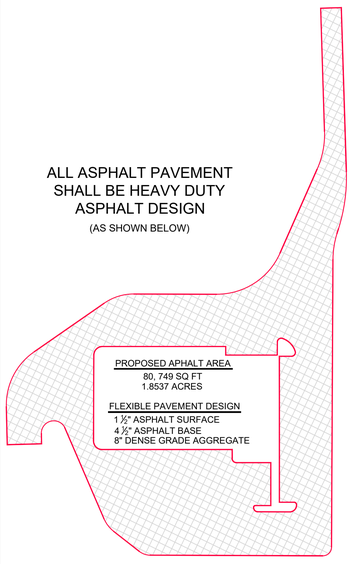
GENERAL NOTES

1) ALL FILL AREAS SHALL BE COMPACTED IN 8" LIFTS TO 95% DENSITY IN ACCORDANCE WITH STANDARD PROCTOR TEST.
2) ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED OR REMOVED PRIOR TO THE PLACEMENT OF ANY FILL.
3.) CONTRACTOR SHALL KEEP COUNTY AND/OR STATE ROADWAYS CLEAR OF DEBRIS AND MUD.
4.) PERIMETER SILT FENCE SHALL BE INSTALLED AS NECESSARY TO PREVENT EROSION OF ADJACENT PROPERTIES AND MAINTAINED THROUGHOUT THE PROJECT
5.) CONTRACTOR SHALL CONTACT BUD 811 TO LOCATE ALL UTILITIES PRIOR TO CONSTRUCTION.
7.) CONTRACTOR SHALL PASS PROOF ROLL SPECIFICATIONS OF THE SUBASE PRIOR TO PLACING THE STONE ON THE GRAVEL LOT.
8.) ALL CRUSH STONE BASE SHALL BE COMPACTED WITH A SMOOTH DRUM COMPACTOR.
9.) ALL SLOPES, LANDSCAPE ISLANDS, AND ANY GREEN SPACE WITHIN THE SITE, NOT UNDER ANY TYPE OF PAVEMENT, REQUIRE A MINIMUM OF 6" OF TOPSOIL.

HEAVY DUTY

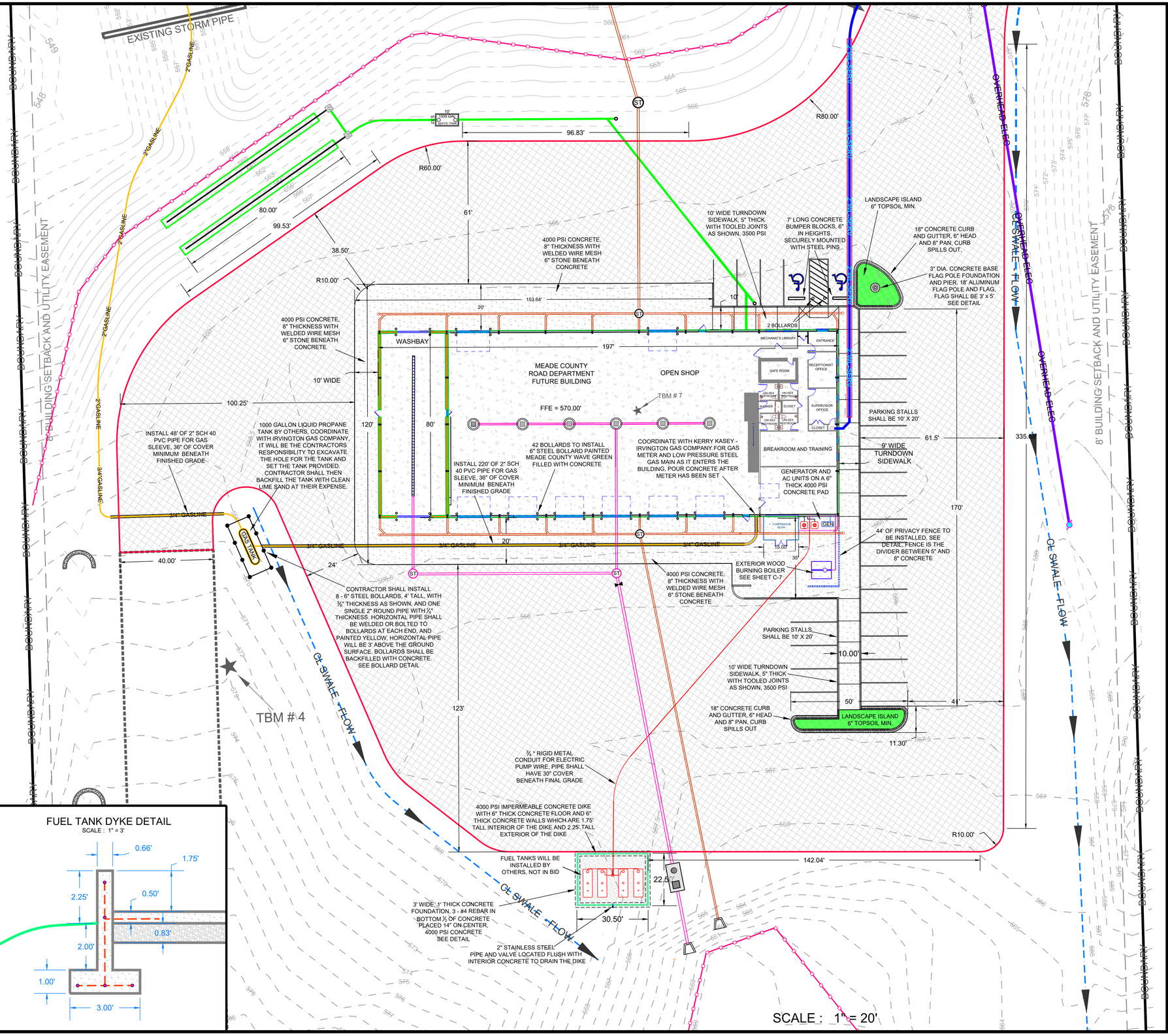
ALL ASPHALT PAVEMENT SHALL BE HEAVY DUTY ASPHALT DESIGN

(AS SHOWN BELOW)



FUEL TANK DYKE DETAIL

SCALE : 1" = 3'



SCALE : 1" = 20'

Lincoln Trail Area Development District ~ established 1968 ~

STATE OF KENTUCKY
TIMOTHY WAYNE SMITH 12270
LICENSED PROFESSIONAL ENGINEER
1-30-26

20' 0 20' 40'

GRAPHIC SCALE

MEADE COUNTY ROAD DEPARTMENT PROPOSED SITE

800 MOREMAN ROAD
Brandenburg, KY 40108

FOR

MEADE COUNTY FISCAL COURT

524 Hillcrest Drive
Brandenburg, KY 40108

CONSULTANTS

SMITH
ENGINEERING AND LAND SURVEYS, INC.
901 HIGH STREET
BRANDENBURG, KENTUCKY 40108
270-422-2588, 270-547-2588

SCALE: 1" = 20'	REVISED DATE : 1-30-26
DRAWN BY: M. O'Reilly	
JOB NO: 23-224	

SHEET TITLE

SITE LAYOUT PLAN

C2

TBMs - Project Coordinates

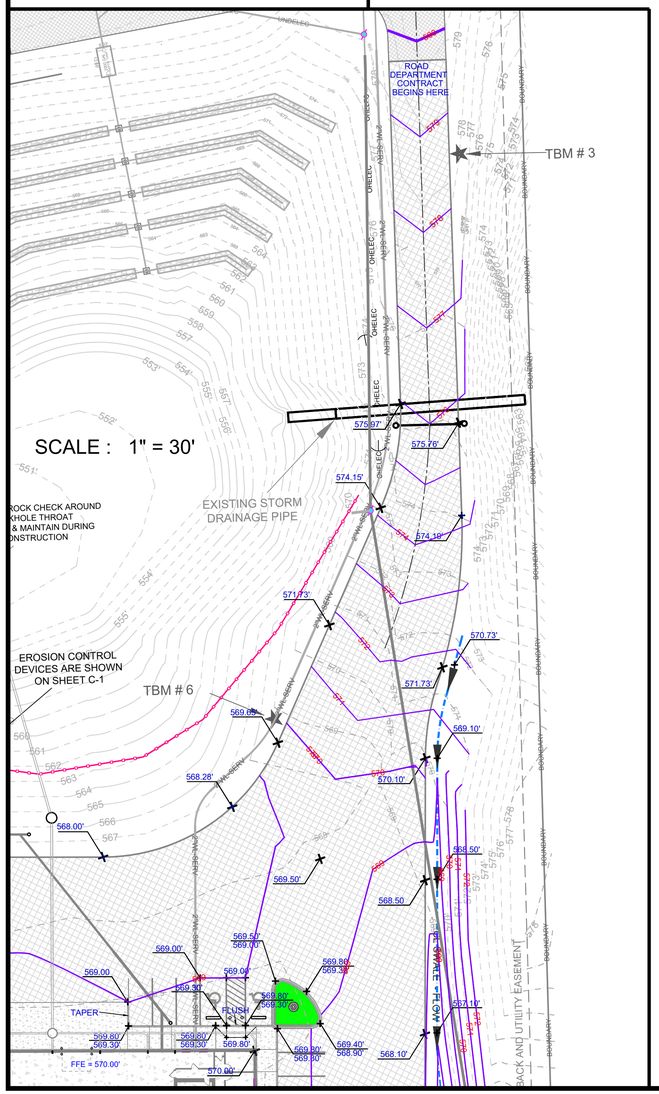
TBM #	Northing(Y)	Easting(X)	Elev(Z)	Description
TBM #3	9704.02'	10153.04'	577.77'	ALL TBMs shown on these Plans are: 5/8" Rebar with Blue Cap Stamped WITNESS T.W. SMITH LS 2373
TBM #4	9325.30'	9656.10'	572.86'	
TBM #5	8879.49'	9737.98'	592.13'	
TBM #6	9504.96'	10002.26'	568.87'	
TBM #7	9374.97'	9847.63'	568.89'	

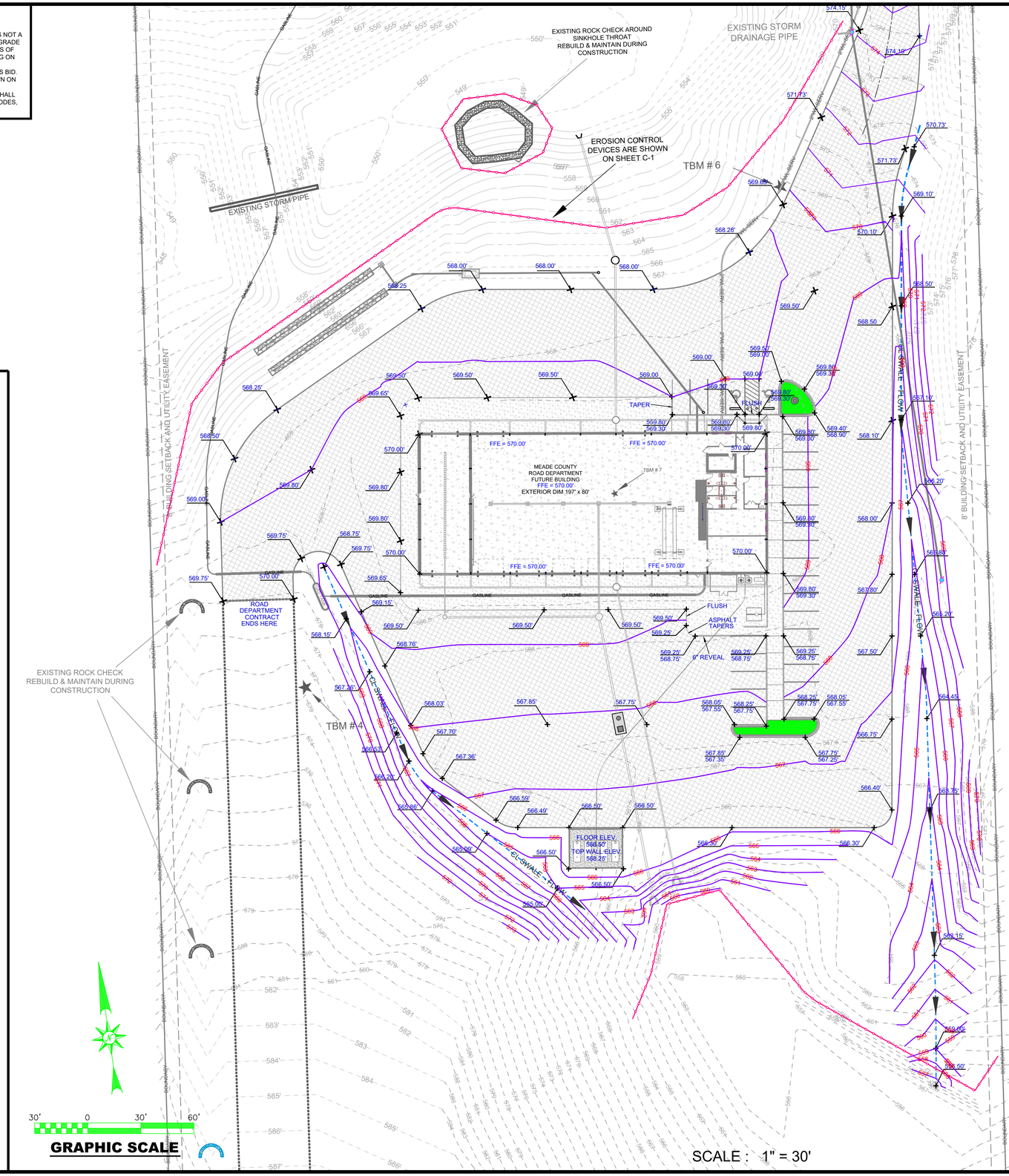
GENERAL NOTES

1) ALL FILL AREAS SHALL BE COMPACTED IN 8" LIFTS TO 95% DENSITY IN ACCORDANCE WITH STANDARD PROCTOR TEST.
2) ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED OR REMOVED PRIOR TO THE PLACEMENT OF ANY FILL.
3.) CONTRACTOR SHALL KEEP COUNTY AND/OR STATE ROADWAYS CLEAR OF DEBRIS AND MUD.
4.) PERIMETER SILT FENCE SHALL BE INSTALLED AS NECESSARY TO PREVENT EROSION OF ADJACENT PROPERTIES AND MAINTAINED THROUGHOUT THE PROJECT
5.) CONTRACTOR SHALL CONTACT BUD 811 TO LOCATE ALL UTILITIES PRIOR TO CONSTRUCTION.
7.) CONTRACTOR SHALL PASS PROOF ROLL SPECIFICATIONS OF THE SUBASE PRIOR TO PLACING THE STONE ON THE GRAVEL LOT.
8.) ALL CRUSH STONE BASE SHALL BE COMPACTED WITH A SMOOTH DRUM COMPACTOR.
9.) ALL SLOPES, LANDSCAPE ISLANDS, AND ANY GREEN SPACE WITHIN THE SITE, NOT UNDER ANY TYPE OF PAVEMENT, REQUIRE A MINIMUM OF 6" OF TOPSOIL.
10.) BOTH CL SWALES SHOWN SHALL BE LINED WITH RIP-RAP ROCK 6" IN DEPTH, AND 6' IN TOTAL WIDTH, 3' EACH SIDE OF CL.

BIDDERS NOTES

1. ALL ASPHALT AND STONE UNDER THE ASPHALT SHOWN IS NOT A PORTION OF THIS BID. THE SUBGRADE SHALL BE CUT TO GRADE AS SHOWN ON THE GRADING PLAN, MINUS THE THICKNESS OF THE STONE AND ASPHALT. THICKNESS VARIES DEPENDING ON LIGHT DUTY AND HEAVY DUTY PAVEMENTS SHOWN.
2. THE ONSITE SEWER DISPOSAL PLAN IS A PORTION OF THIS BID. CONTRACTORS BID SHALL INCLUDE ALL THE WORK SHOWN ON THAT SHEET FOR CONSTRUCTION.
3. ALL SEWER LATERIALS AND SEPTIC SYSTEM INSTALLED SHALL FOLLOW KENTUCKY ONSITE SEWER DISPOSAL SYSTEM CODES, REGULATIONS, AND LAWS.





Lincoln Trail Area Development District
~ established 1968 ~

LEGEND

- Utility Pole
- 582' – Existing Contours
- 582' – Proposed Contours
- PROPOSED Asphalt Pavement
- PROPOSED Concrete Surface
- TOP CURB / TOP PVMT — DOUBLE ELEVATION — SPOT ELEVATION
- TOP PVMT — SINGLE ELEVATION — SPOT ELEVATION

STATE OF KENTUCKY
TIMOTHY WAYNE SMITH
12270
LICENSED PROFESSIONAL ENGINEER
12-9-25

MEADE COUNTY ROAD DEPARTMENT PROPOSED SITE

800 MOREMAN ROAD
Brandenburg, KY 40108

FOR

MEADE COUNTY FISCAL COURT

524 Hillcrest Drive
Brandenburg, KY 40108

CONSULTANTS

SMITH
ENGINEERING AND LAND SURVEYS, INC.
901 HIGH STREET
BRANDENBURG, KENTUCKY 40108
270-422-2588, 270-547-2588

SCALE: 1" = 30'	DATE: 12-9-25
DRAWN BY: M. O'Reilly	
JOB NO: 23-224	

SHEET TITLE

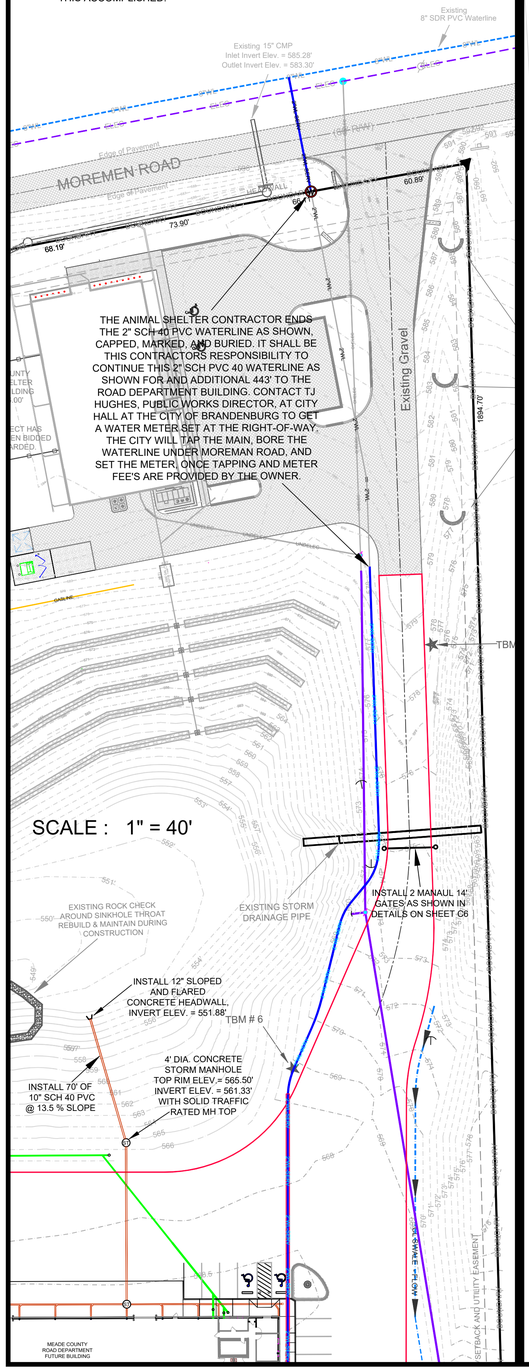
SITE GRADING PLAN

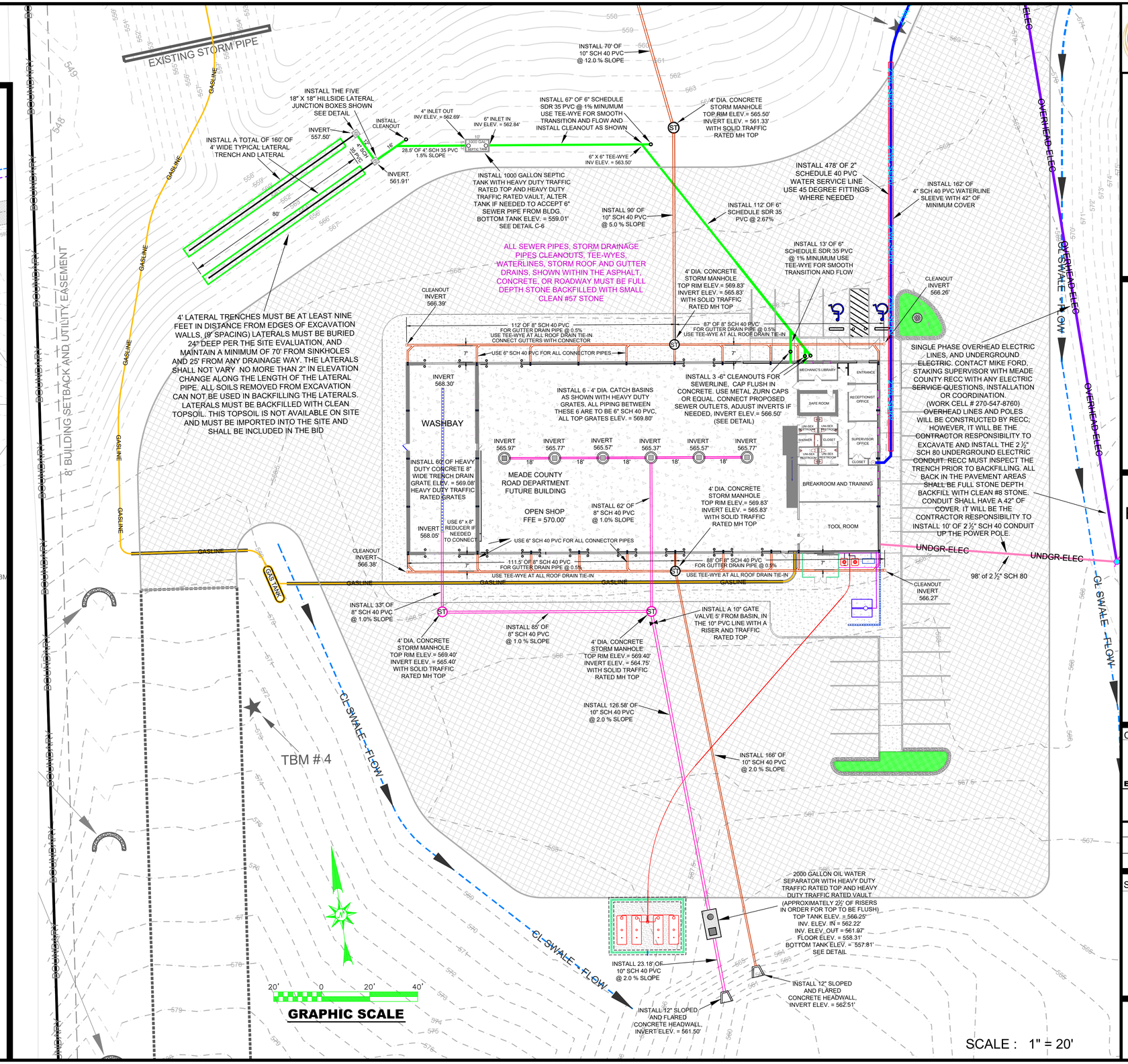
C3

TBMs - Project Coordinates

TBM #	Northing(Y)	Easting(X)	Elev(Z)	Description
TBM #3	9704.02'	10153.04'	577.77'	ALL TBMs shown on these Plans are: 5/8" Rebar with Blue Cap Stamped WITNESS T.W. SMITH LS 2373
TBM #4	9325.30'	9656.10'	572.86'	
TBM #5	8879.49'	9737.98'	592.13'	
TBM #6	9504.96'	10002.26'	568.87'	
TBM #7	9374.97'	9847.63'	568.89'	

1. THE ON-SITE SEWAGE DISPOSAL SYSTEM SHALL FOLLOW ALL PROVISION OF THE SITE EVALUATION BY JESSICA ROGERS WITH THE MEADE COUNTY ENVIRONMENTAL OFFICE, PERFORMED ON APRIL 30TH 2025.
2. I WILL BE THE CONTRACTORS RESPONSIBILITY TO CONTACT THE CITY OF BRANDENBURG CITY HALL TO HAVE THE TWO INCH METER AND VAULT SET AT THE RIGHT-OF WAY. A METER AND TAPPING FEE WILL BE REQUIRED TO GET THIS ACCOMPLISHED.





Lincoln Trail Area Development District
~ established 1968 ~

4" x 5" x 6" WHITE PLASTIC DOWNSPOUT ADAPTER

MATCH STEEL PACKAGE DOWNSPOUT FOR CORRECT DIMENSION

STATE OF KENTUCKY
TIMOTHY WAYNE SMITH
12270
LICENSED PROFESSIONAL ENGINEER
1-30-26

MEADE COUNTY ROAD DEPARTMENT PROPOSED SITE

800 MOREMAN ROAD
Brandenburg, KY 40108

FOR

MEADE COUNTY FISCAL COURT

524 Hillcrest Drive
Brandenburg, KY 40108

CONSULTANTS

SMITH
ENGINEERING AND LAND SURVEYS, INC.
901 HIGH STREET
BRANDENBURG, KENTUCKY 40108
270-422-2588, 270-547-2588

SCALE: 1" = 20'	REVISED DATE : 1-30-26
DRAWN BY: M. O'Reilly	
JOB NO: 23-224	

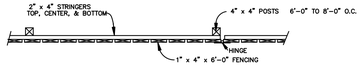
SHEET TITLE

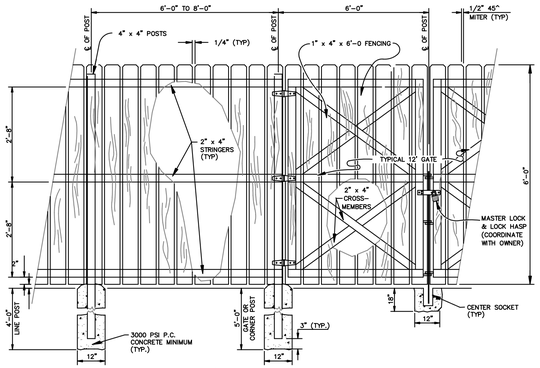
SITE UTILITY PLAN

C4

WOOD FENCE NOTES:

1) ALL POST AND STRINGERS SHALL BE TREATED MATERIAL.
2) ALL FENCE SIDING SHALL BE COMPOSITE MATERIAL, DARK GRAY.
3) ALL METAL FASTENERS SUCH AS BOLTS, NAILS, HINGES, HASPS, AND ETC. SHALL BE HOT DIPPED GALVANIZED.
4) FENCE DIRECTION AS NOTED ON PLANS OR AS DIRECTED BY OWNER.
5) SPLICE STRINGERS AT POSTS ONLY.





PRIVACY FENCE DETAIL

N.T.S.

VINYL SLATS OR COMPOSITE 1" THICKNESS

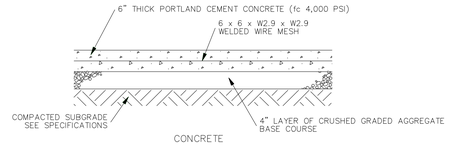
NOTE:
ALL PIPES SHALL BE PAINTED MEADE COUNTY WAVE GREEN

GUARDPOST / BOLLARD

N.T.S.

ZURN CLEANOUT CAP

FOR CLEANOUTS IN ASPHALT OR CONCRETE AREAS A TRAFFIC RATED CAP IS REQUIRED FOR SEWER AND STORM CLEANOUTS
(or equal)

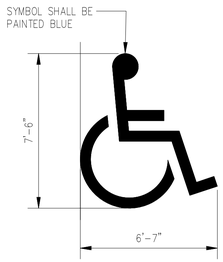


NOTES:

1. PAVEMENT THICKNESSES SHALL BE COMPACTED THICKNESSES.
2. TACK COAT NOT NECESSARY IF SURFACE COURSE PLACED IMMEDIATELY AFTER BINDER.
3. SUBGRADE SHALL BE COMPACTED PER EARTHWORK SPECS.
4. DESIGN CBR = 4.0

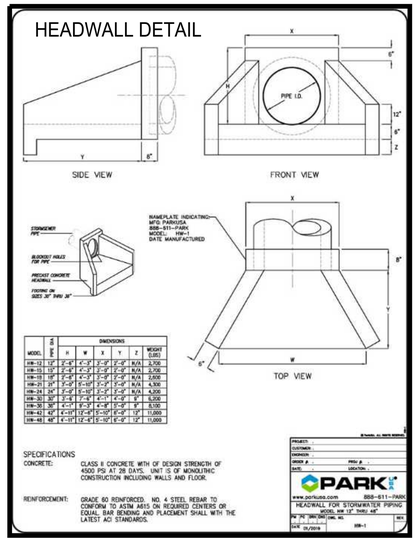
TYPICAL PAVEMENT SECTIONS

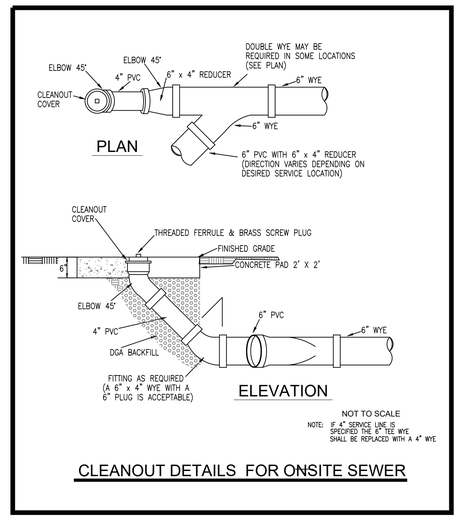
N.T.S.



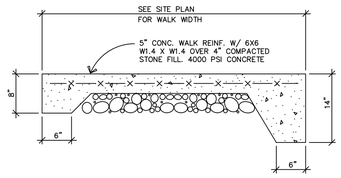
HANDICAP STRIPING SYMBOL DETAIL

HEADWALL DETAIL

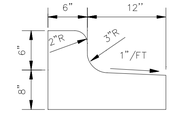




CLEANOUT DETAILS FOR ONSITE SEWER



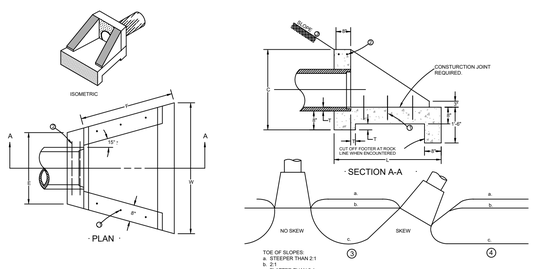
TURNDOWN SIDEWALK



PLACE CONTRACTION JOINTS 15'-0" APART. PLACE 1/2" BITUMINOUS PRE-MOLDED EXPANSION JOINT 60'-0" APART AND AT ALL WALKS, STEPS, BUILDINGS, ETC. THE CURB ON THIS PARTICULAR JOB, SPILLS OUT.

18" CURB AND GUTTER DETAIL

N.T.S.



PIPE DIA. OR EQUIV. DIA.	SHAPE	DIMENSIONS C	E	F	L	W	T	CLASS "A" CONC. C.Y.	REINF. STEEL LBS.
12"	○	1'-9"	2'-6"	2'-3"	3'-6"	4'-0"	2"	0.58	7"
	⬭	2'-0"	2'-9"	2'-9"	4'-0"	4'-9"		0.75	
15"	⬭	1'-9"	3'-0"	2'-6"	3'-6"	4'-9"	2½"	0.68	
18"	○	2'-3"	3'-0"	3'-6"	4'-6"	5'-3"	2½"	0.93	8
	⬭	2'-0"	3'-6"	3'-0"	4'-0"	5'-6"		0.89	
21"	○	2'-6"	3'-3"	4'-0"	5'-0"	6'-0"	2½"	1.14	
	⬭	2'-3"	3'-0"	3'-6"	4'-6"	6'-0"		1.07	9
24"	○	2'-9"	3'-6"	4'-6"	5'-6"	6'-6"	3"	1.35	8
	⬭	2'-6"	4'-0"	4'-0"	5'-0"	6'-9"	3½"	1.30	9
27"	○	3'-0"	3'-9"	5'-0"	6'-0"	7'-0"	3½"	1.57	
	⬭	2'-9"	4'-6"	4'-3"	5'-3"	7'-3"		1.51	10

DIMENSIONS AND QUANTITIES BASED ON CONCRETE PIPE AND WILL VARY INSIGNIFICANTLY FOR CORRUGATED METAL PIPE.

HEADWALL DETAIL

NOTES

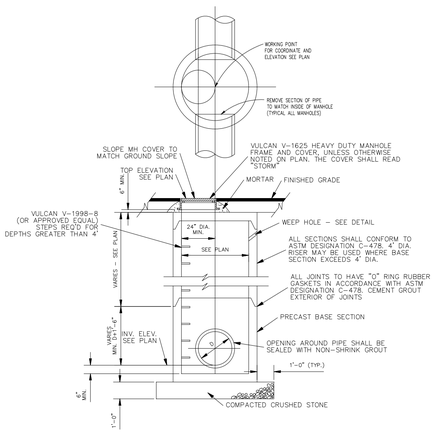
REINFORCING STEEL: MINIMUM GRADE 40, EVENLY SPACED.
(A) 8 X 1'-0" DOWEL BARS.
(B) W X E DIMENSION MINUS 4").
(3) PIPES SHALL BE WARPED TO FIT HEADWALL WHEN PIPE IS SKEWED AND/OR NORMAL SLOPE VARIES FROM 2:1.

VOLUME DISPLACED BY PIPE COMPUTED USING INSIDE DIAMETER OF PIPE.

WING ANGLES AND/OR DIMENSIONS MAY BE ALTERED DURING CONSTRUCTION TO ACCOMMODATE FLOW OF WATER.

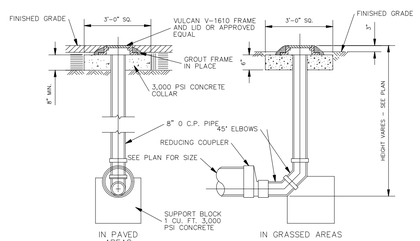
APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE OF HEADWALL SHALL REMAIN VERTICAL.

(4) HEADWALLS ARE FOR CIRCULAR, ARCH, AND HORIZONTAL ELLIPTICAL 12"-27" EQIVALENT PIPE SIZES. SEE STD. DWG. RD1-001, CURRENT EDITION, FOR NONCIRCULAR PIPE EQUIVALENT SIZES.



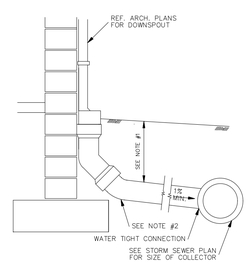
PRECAST STORM MANHOLE DETAIL

N.T.S.



CLEANOUT DETAIL FOR STORM SEWER

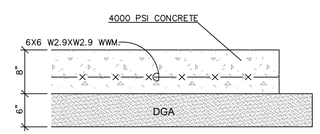
N.T.S.



NOTES:

1. FOR ALL DEPTHS OF COVER LESS THAN TWO (2) FEET, PIPE MUST BE SCHEDULE 40 PVC. FOR DEPTHS OF COVER GREATER THAN TWO (2) FEET, FLEXIBLE PIPE MAY BE USED. REFER TO SPECIFICATIONS FOR ALLOWABLE PIPE TYPES.
2. A WATERTIGHT CONNECTION SHALL BE MAINTAINED WITH ANY TRANSITION FROM SCHEDULE 40 PVC PIPE TO ANY OTHER PIPE TYPE.
3. THE DOWNSPOUT COLLECTOR DRAIN SHALL BE INSTALLED BEFORE THE DOWNSPOUTS ARE INSTALLED ON THE BUILDING. SITEWORK CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK TO AND INCLUDING THE RODENT SCREEN. BUILDING CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONNECTION AT THE POINT OF THE RODENT SCREEN.

DOWNSPOUT COLLECTOR DETAIL



HEAVY DUTY CONCRETE DETAIL

Lincoln Trail Area Development District ~ established 1968 ~

STATE OF KENTUCKY
TIMOTHY WAYNE SMITH
12270
LICENSED PROFESSIONAL ENGINEER
12-9-25

MEADE COUNTY ANIMAL SHELTER

800 MOREMAN ROAD
Brandenburg, KY 40108

FOR

MEADE COUNTY FISCAL COURT

524 Hillcrest Drive
Brandenburg, KY 40108

CONSULTANTS

SMITH
ENGINEERING AND LAND SURVEYS, INC.
901 HIGH STREET
BRANDENBURG, KENTUCKY 40108
270-422-2588, 270-547-2588

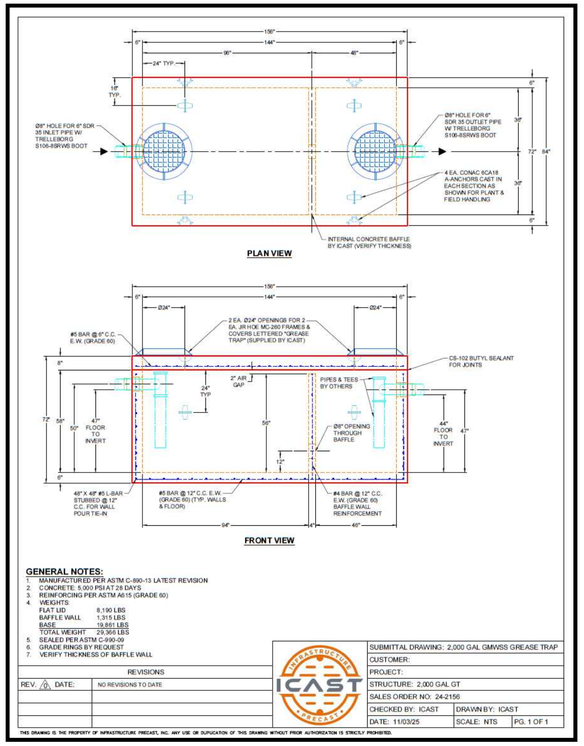
NO SCALE	DATE: 12-9-25
DRAWN BY: M. O'Reilly	
JOB NO: 23-224	

SHEET TITLE

SITE DETAILS ONE

C5

2000 GALLON
OIL-WATER SEPARATOR DETAIL
(or equal)



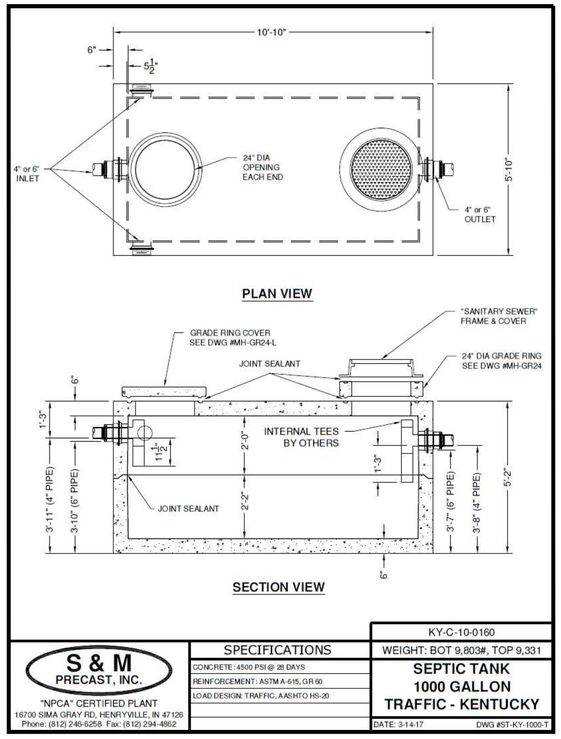
GENERAL NOTES:

1. MANUFACTURED PER ASTM C-890-13 LATEST REVISION
2. CONCRETE: 5,000 PSI AT 28 DAYS
3. REINFORCING PER ASTM A615 (GRADE 60)
4. WEIGHTS:
   FLAT LID 8,190 LBS
   BAFFLE WALL 1,315 LBS
   BASE 19,851 LBS
   TOTAL WEIGHT 29,369 LBS
5. SEALED PER ASTM C-990-09
6. GRADE RINGS BY REQUEST
7. VERIFY THICKNESS OF BAFFLE WALL

REVISIONS	
REV.	DATE: NO REVISIONS TO DATE

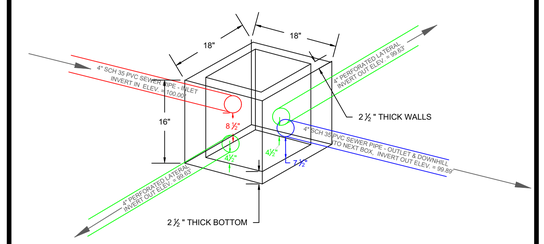
SUBMITTAL DRAWING: 2,000 GAL GMWSS GREASE TRAP	
CUSTOMER:	
PROJECT:	
STRUCTURE: 2,000 GAL GT	
SALES ORDER NO: 24-2156	
CHECKED BY: ICAST	DRAWN BY: ICAST
DATE: 11/03/25	SCALE: NTS PG. 1 OF 1

1000 GALLON
SEPTIC TANK DETAIL
(or equal)



S & M PRECAST, INC. "NPCA" CERTIFIED PLANT 16700 SIMA GRAY RD, HENRYVILLE, IN 47126 Phone: (812) 246-6258 Fax: (812) 294-4862	SPECIFICATIONS	KY-C-10-0160
	CONCRETE: 4500 PSI @ 28 DAYS	WEIGHT: BOT 9,803#, TOP 9,331
	REINFORCEMENT: ASTM A-615, GR 60	SEPTIC TANK 1000 GALLON TRAFFIC - KENTUCKY
	LOAD DESIGN: TRAFFIC, AASHTO HS-20	
		DATE: 3-14-17 DWG #ST-KY-1000-T

HILLSIDE LATERAL JUNCTION BOX

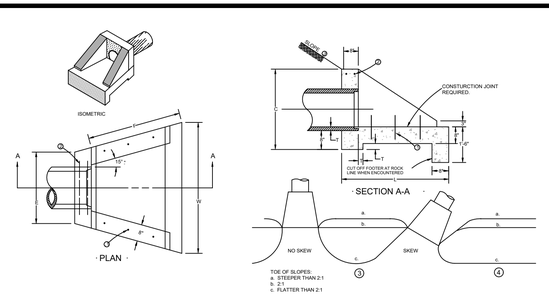


CONCRETE JUNCTION BOXES MAY SLIGHTLY VARY, HOWEVER IT IS MANDATORY THAT THE LATERAL INVERT OUTLET HAS AN ELEVATION 4" LOWER THAN THE OUTLET PIPE WHICH LEADS TO THE NEXT LOWER BOX. THE TOP LATERALS SHALL FILL WITH WASTE WATER 1ST, THEN DIRTY WATER SHALL PRECEDED TO THE NEXT LOWER JUNCTION BOX.

NDS - 24" X 24" CAST IRON CATCH BASIN GRATE FOR CATCH BASINS INSIDE THE BUILDING MOUNTED INTO STEEL FRAME & ENCASED AND SURROUNDED BY SHOP CONCRETE FLOOR

Actual Depth	2 inch	Actual Length	23-7/8 inch
Actual Width	23-7/8 inch	Color	Black
For Use With	24 Inch Square Catch Basins	Material	Iron, Cast Iron
Maximum Flow Rate	602.65 gallon per hour	Product Type	Drainage Grates
Shape	Square	Weight	147 pound
Shipping Dimensions	23.88 H x 23.88 W x 2.00 D	Shipping Weight	147.0 lbs

HEADWALL DETAIL
(NO GRATES REQUIRED)



PIPE DIA. OR EQUIV. DIA.	SHAPE ④	DIMENSIONS C	E	F	L	W	T	CLASS "A" CONC. C.Y.	REINF. STEEL LBS.
12"	○	1'-9"	2'-6"	2'-3"	3'-6"	4'-0"	2"	0.58	7"
	○	2'-0"	2'-9"	2'-9"	4'-0"	4'-9"		.075	
15"	⬭	1'-9"	3'-0"	2'-6"	3'-6"	4'-9"	2½"	0.68	
18"	○	2'-3"	3'-0"	3'-6"	4'-6"	5'-3"	2½"	0.93	8
	⬭	2'-0"	3'-6"	3'-0"	4'-0"	5'-6"		0.89	
	⬭	2'-6"	3'-3"	4'-0"	5'-0"	6'-0"	2½"	1.14	
21"	○	2'-3"	3'-0"	3'-6"	4'-6"	6'-0"		1.07	9
	○	2'-9"	3'-6"	4'-6"	5'-6"	6'-6"	3"	1.35	8
24"	⬭	2'-6"	4'-0"	4'-0"	5'-0"	6'-9"	3½"	1.30	9
	⬭								
27"	○	3'-0"	3'-9"	5'-0"	6'-0"	7'-0"		1.57	
	⬭	2'-9"	4'-6"	4'-3"	5'-3"	7'-3"	3½"	1.51	10

DIMENSIONS AND QUANTITIES BASED ON CONCRETE PIPE AND WALL VARY INSIGNIFICANTLY FOR CORRUGATED METAL PIPE.

NOTES

REINFORCING STEEL: MINIMUM GRADE 40, EVENLY SPACED.

③ SLOPES SHALL BE WARPED TO FIT HEADWALL WHEN PIPE IS SKEWED AND/OR NORMAL SLOPE VARIES FROM 2:1.

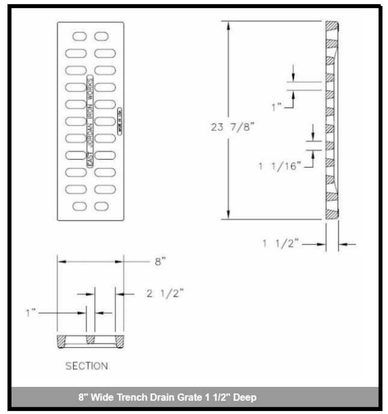
VOLUME DISPLACED BY PIPE COMPUTED USING INSIDE DIAMETER OF PIPE.

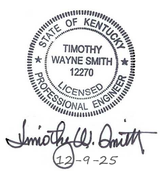
WING ANGLES AND/OR DIMENSIONS MAY BE ALTERED DURING CONSTRUCTION TO ACCOMMODATE FLOW OF WATER.

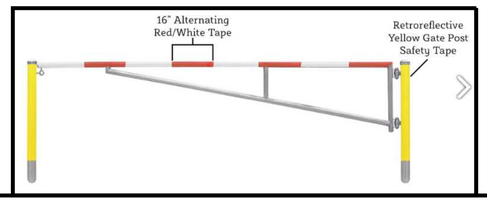
APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE OF HEADWALL SHALL REMAIN VERTICAL.

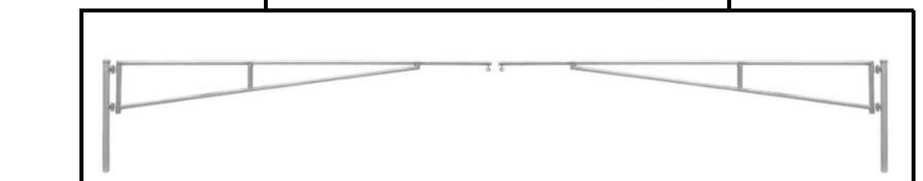
④ HEADWALLS ARE FOR CIRCULAR, ARCH, AND HORIZONTAL ELLIPTICAL 12"-27" EQIOVALENT PIPE SIZES. SEE STD. DWG. RD1-001, CURRENT EDITION, FOR NONCIRCULAR PIPE EQUIVALENT SIZES.

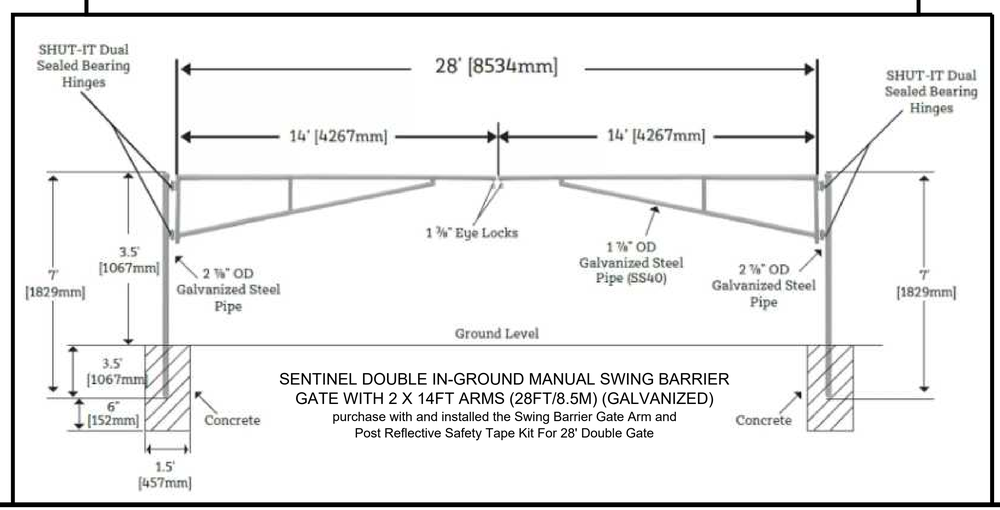
8" WIDE TRENCH DRAIN GRATE
HEAVY DUTY CAST IRON, TRAFFIC RATED











SENTINEL DOUBLE IN-GROUND MANUAL SWING BARRIER GATE WITH 2 X 14FT ARMS (28FT/8.5M) (GALVANIZED)
purchase with and installed the Swing Barrier Gate Arm and Post Reflective Safety Tape Kit For 28' Double Gate

Lincoln Trail Area Development District ~ established 1968 ~

MEADE COUNTY ANIMAL SHELTER
800 MOREMAN ROAD
Brandenburg, KY 40108

FOR

MEADE COUNTY FISCAL COURT
524 Hillcrest Drive
Brandenburg, KY 40108

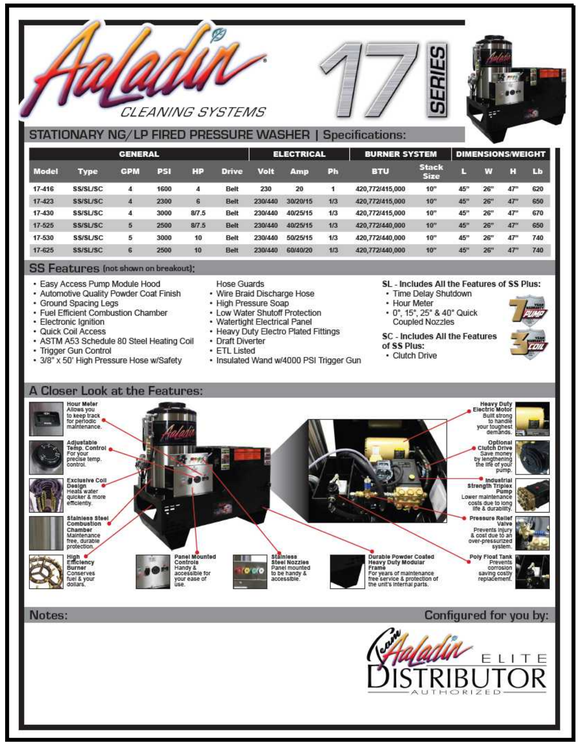
CONSULTANTS
—SMITH—
ENGINEERING AND LAND SURVEYS, INC.
901 HIGH STREET
BRANDENBURG, KENTUCKY 40108
270-422-2588, 270-547-2588

NO SCALE	DATE: 12-9-25
DRAWN BY: M. O'Reilly	
JOB NO: 23-224	

SHEET TITLE

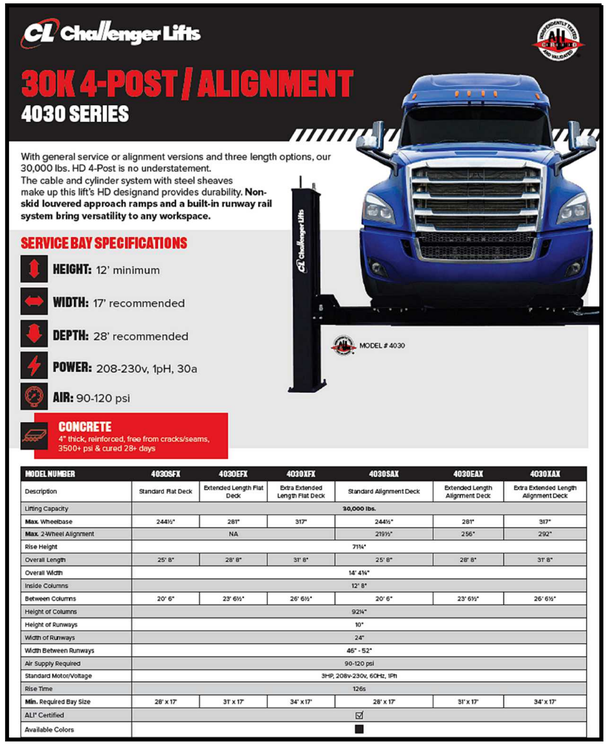
SITE DETAILS TWO

C6



PRESSURE WASHING SYSTEM
TO BE PURCHASED AND INSTALLED

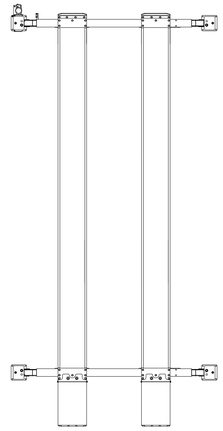
- AALADIN MODEL # 17530
- REMOTE CONTROL FOR WASHER
- HOSE REEL
- 100' OF HIGH PRESSURE HOSE



MODEL NUMBER	4030SFX	4030EFX	4030XFX	4030SAX	4030EAX	4030XAX
Description	Standard Flat Deck	Extended Length Flat Deck	Extra Extended Length Flat Deck	Standard Alignment Deck	Extended Length Alignment Deck	Extra Extended Length Alignment Deck
Lifting Capacity	30,000 lbs.					
Max. Wheelbase	244½"	281"	317"	244½"	281"	317"
Max. 2-Wheel Alignment	NA			219½"	256"	292"
Rise Height	71¾"					
Overall Length	25' 8"	29' 8"	31' 8"	25' 8"	29' 8"	31' 8"
Overall Width	14' 4¼"					
Inside Columns	12' 8"					
Between Columns	20' 6"	23' 6½"	26' 6½"	20' 6"	23' 6½"	26' 6½"
Height of Columns	92¼"					
Height of Runways	10"					
Width of Runways	24"					
Width Between Runways	46" - 52"					
Air Supply Required	90-120 psi					
Standard Motor/Voltage	3HP, 208v-230v, 60Hz, 1Ph					
Rise Time	126s					
Min. Required Bay Size	28' x 17'	31' x 17'	34' x 17'	28' x 17'	31' x 17'	34' x 17'
ALI® Certified	☑					
Available Colors	■					

TRUCK LIFT TO BE
PURCHASED AND INSTALLED

- CHALLENGER LIFT MODEL # 4030EFX
- TWO ROLLING JACK 15K AIR HYDRAULIC
- INTERNAL AIR LINE KIT FOR DUEL ROLLING JACK OPERATION 4030 SERIES
- TWO RECHARGEABLE LIGHT KIT SETS



AIR COMPRESSOR
AND ACCESSORIES TO BE
PURCHASED AND INSTALLED

- 120 GALLON VERTICAL C-AIRE COMPRESSOR WITH SINGLE PHASE ELECTRIC AND 230/208 VOLTAGE
- AFTERCOOLER
- AUTO TANK DRAIN
- INSTALLATION KIT

MULTI PASS					
7200MP	7300MP	7350MP	7400MP	7500MP
1,450 lbs	1,800 lbs	2,050 lbs	2,500 lbs	4,000 lbs
49" x 61" x 87"	53" x 70" x 90"	55" x 77" x 96"	61" x 81" x 100"	89" x 102" x 110"
30"	38"	44"	48"	60"
6"	6"	6"	8"	10"
20" x 20"	20" x 20"	20" x 24"	24" x 24"	42" x 30"
(1) 1-1/4"	(2) 1-1/4"	(2) 1-1/4"	(2) 1-1/4"	(4) 1-1/4"
140 gal	180 gal	260 gal	320 gal	600 gal
60 cfm	60 cfm	60 cfm	60 cfm	60 cfm
150 cfm	150 cfm	150 cfm	150 cfm	2 x 150 cfm
2,000 - 3,000	4,000 - 6,000	6,000 - 8,000	8,000 - 10,000	18,000 - 20,000
165,000	275,000	350,000	400,000	750,000
R30	R30	R30	R30	R30
YES	YES	YES	YES	YES
Optional	Optional	Optional	Optional	Optional
-	-	-	-	-

WOOD BURNING BOILER TO
PURCHASED AND INSTALLED

- EXTERIOR WOOD BOILER MODEL # 7500MP

Lincoln Trail
Area Development District
~ established 1968 ~

STATE OF KENTUCKY
TIMOTHY WAYNE SMITH 12270
LICENSED PROFESSIONAL ENGINEER
12-9-25

MEADE COUNTY
ANIMAL SHELTER
800 MOREMAN ROAD
Brandenburg, KY 40108

FOR

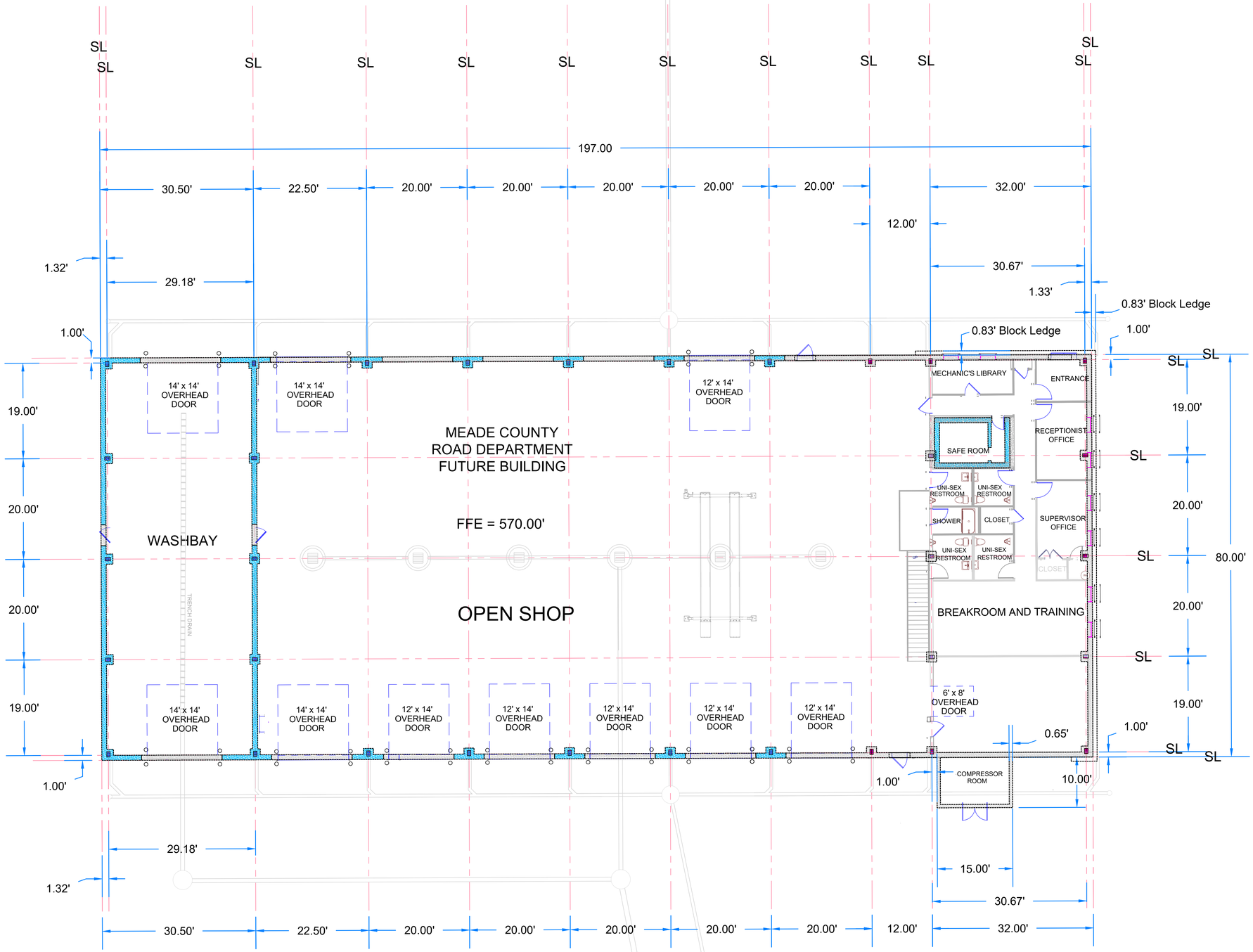
MEADE COUNTY
FISCAL COURT
524 Hillcrest Drive
Brandenburg, KY 40108

CONSULTANTS
SMITH
ENGINEERING AND LAND SURVEYS, INC.
901 HIGH STREET
BRANDENBURG, KENTUCKY 40108
270-422-2588, 270-547-2588

NO SCALE | DATE: 12-9-25
DRAWN BY: M. O'Reilly
JOB NO: 23-224

SHEET TITLE
SPECIFIED EQUIPMENT DETAILS

C7



SL = STEEL LINE

SCALE : 1" = 10'

Lincoln Trail
Area Development District
~ established 1968 ~

STATE OF KENTUCKY
TIMOTHY WAYNE SMITH
12270
LICENSED PROFESSIONAL ENGINEER
12-09-25

10' 0 10' 20'

GRAPHIC SCALE

MEADE COUNTY ROAD DEPARTMENT PROPOSED SITE

800 MOREMAN ROAD
Brandenburg, KY 40108

FOR

MEADE COUNTY FISCAL COURT

524 Hillcrest Drive
Brandenburg, KY 40108

CONSULTANTS

SMITH
ENGINEERING AND LAND SURVEYS, INC.
901 HIGH STREET
BRANDENBURG, KENTUCKY 40108
270-422-2588, 270-547-2588

SCALE: 1" = 10'	DATE: 12-9-25
DRAWN BY: M. O'Reilly	
JOB NO: 23-224	

SHEET TITLE

STEEL LINE PLAN

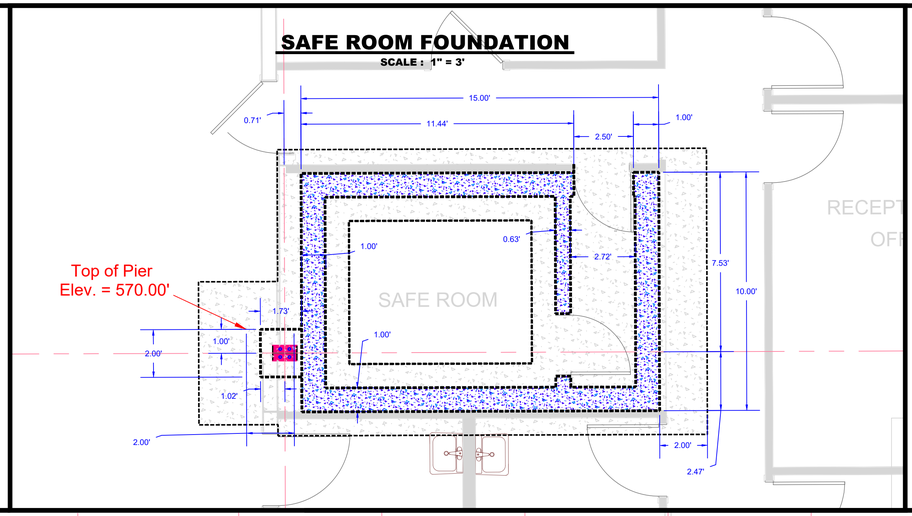
C8

GENERAL NOTES

1. SOIL BEARING CAPACITY OF 3000 PSF HAVE BEEN PROVIDED BY A GEOTECHNICAL ENGINEER FOR FOUNDATION DESIGN.
2. ALL CONCRETE FOR FOOTINGS, PIERS, WALLS, AND FLOORS SHALL BE 4000 PSI CONCRETE.
3. ALL CONCRETE AT FINISH FLOOR ELEVATIONS SHALL HAVE A SLEEK EYE PLEASING FINISH, AS WELL AS ANY CONCRETE THAT CAN BE SEEN AFTER COMPLETION.
4. ALL REBARS THAT ARE CONTINUOUS IN THE FOOTINGS, PIERS, WALLS AND FLOORS SHALL OVERLAP FOR A MINIMUM OF 3'.
5. ANY CHANGES TO THE DESIGN AMONG THE CONTRACTOR AND OWNER WILL BE AT THEIR OWN DISCRETION AND RESPONSIBILITY.

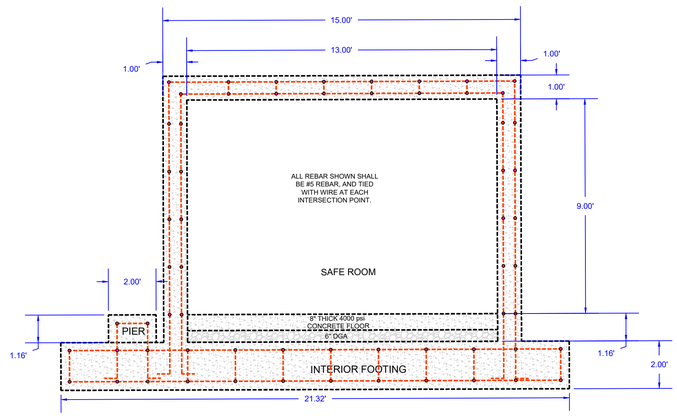
SAFE ROOM FOUNDATION

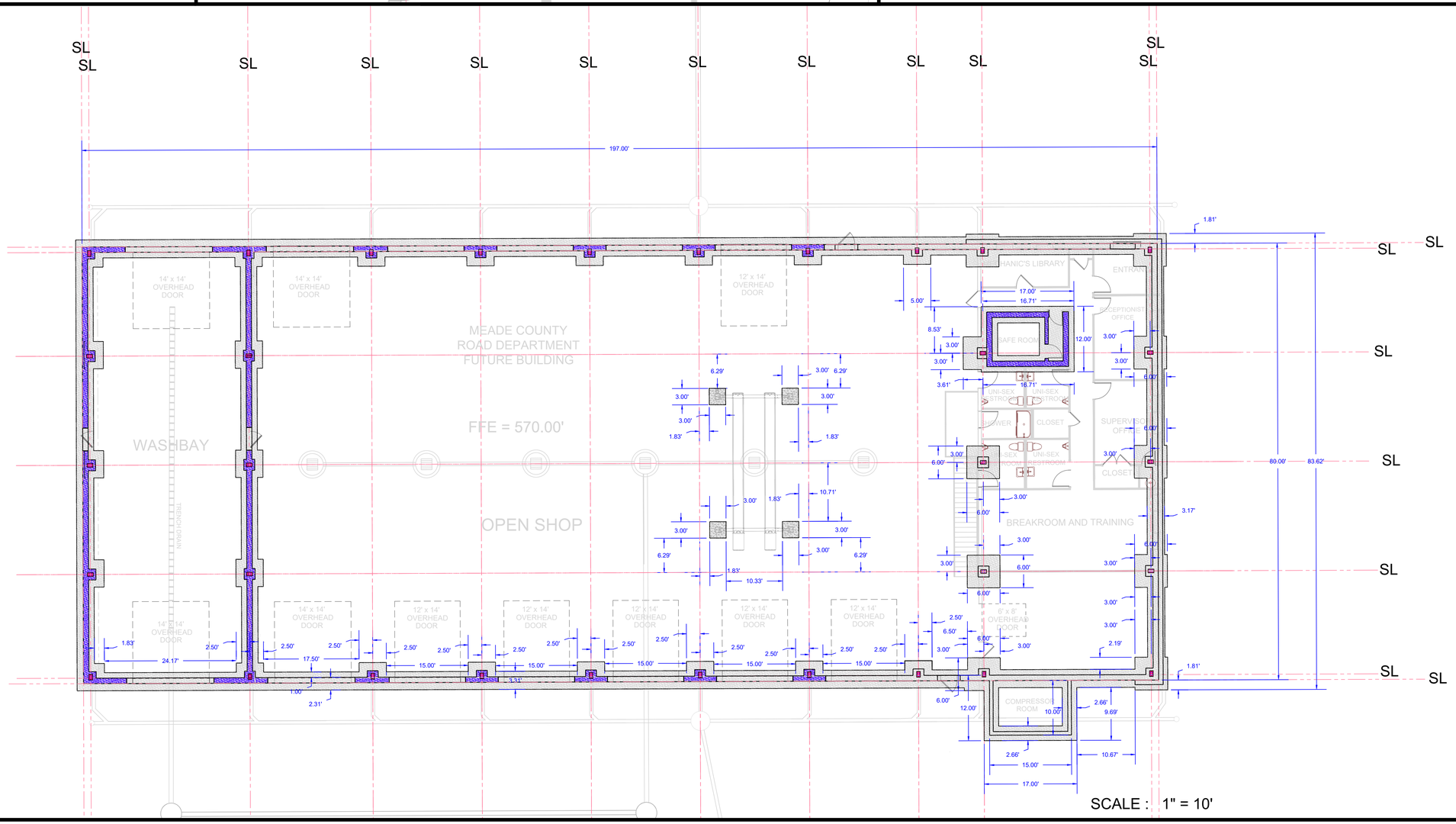
SCALE : 1" = 3'



SAFE ROOM FOUNDATION

SCALE : 1" = 3'





Lincoln Trail Area Development District
~ established 1968 ~

STATE OF KENTUCKY
TIMOTHY WAYNE SMITH 12270
LICENSED PROFESSIONAL ENGINEER
12-09-25

MEADE COUNTY ROAD DEPARTMENT PROPOSED BUILDING

800 MOREMAN ROAD
Brandenburg, KY 40108

FOR

MEADE COUNTY FISCAL COURT
524 Hillcrest Drive
Brandenburg, KY 40108

CONSULTANTS

SMITH
ENGINEERING AND LAND SURVEYS, INC.
901 HIGH STREET
BRANDENBURG, KENTUCKY 40108
270-422-2588, 270-547-2588

SCALE: 1" = 10'	DATE: 12-9-25
DRAWN BY: M. O'Reilly	
JOB NO: 23-224	

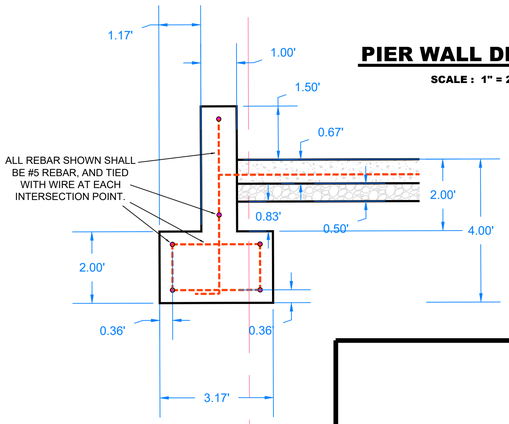
SHEET TITLE

FOUNDATION PLAN

C9

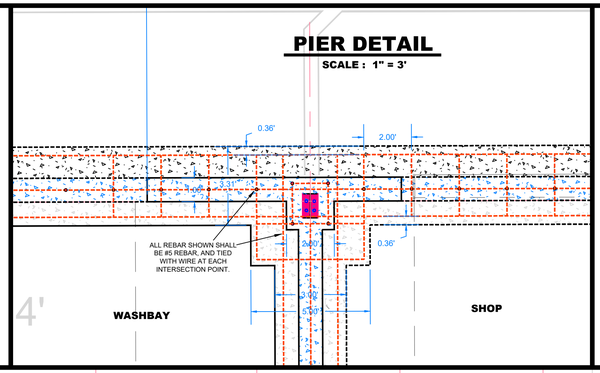
PIER WALL DETAIL

SCALE : 1" = 2'



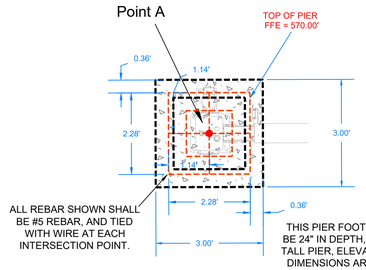
PIER DETAIL

SCALE : 1" = 3'



LIFT FOUNDATION

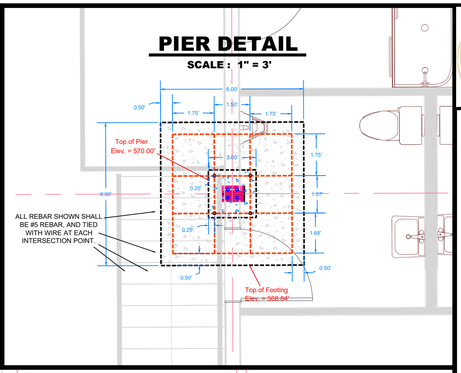
SCALE : 1" = 2'



THIS PIER FOOTING SHALL BE 24" IN DEPTH, WITH A 14" TALL PIER, ELEVATIONS AND DIMENSIONS ARE SHOWN.

PIER DETAIL

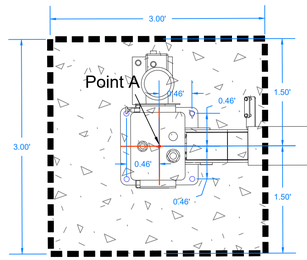
SCALE : 1" = 3'



LIFT ANCHOR PLATE

ALL 4 ANCHOR PLATES BOLTING PATTERNS ARE THE SAME. ALL POINTS A,B,C,&D ARE LOCATED IDENTICALLY IN EACH PLATE

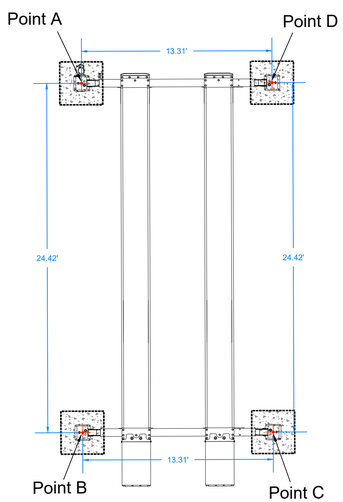
SCALE : 1" = 1'

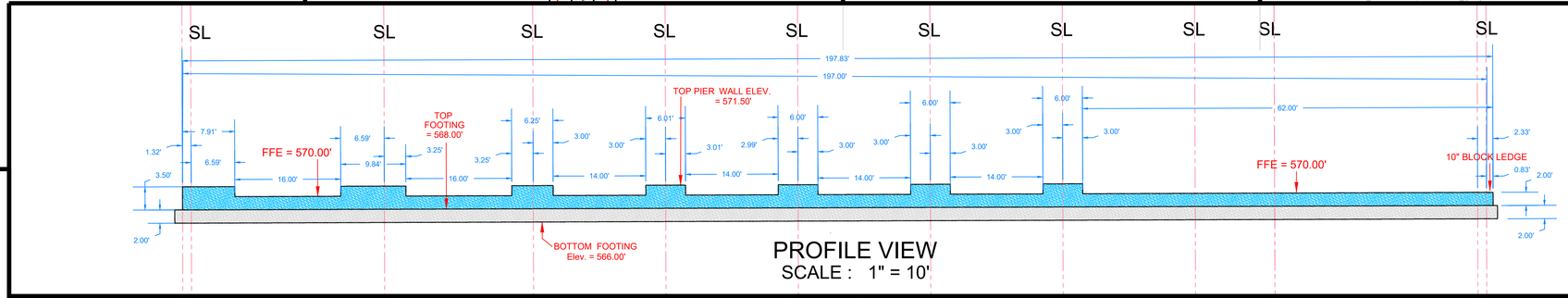


LIFT FOUNDATION

CENTERLINE

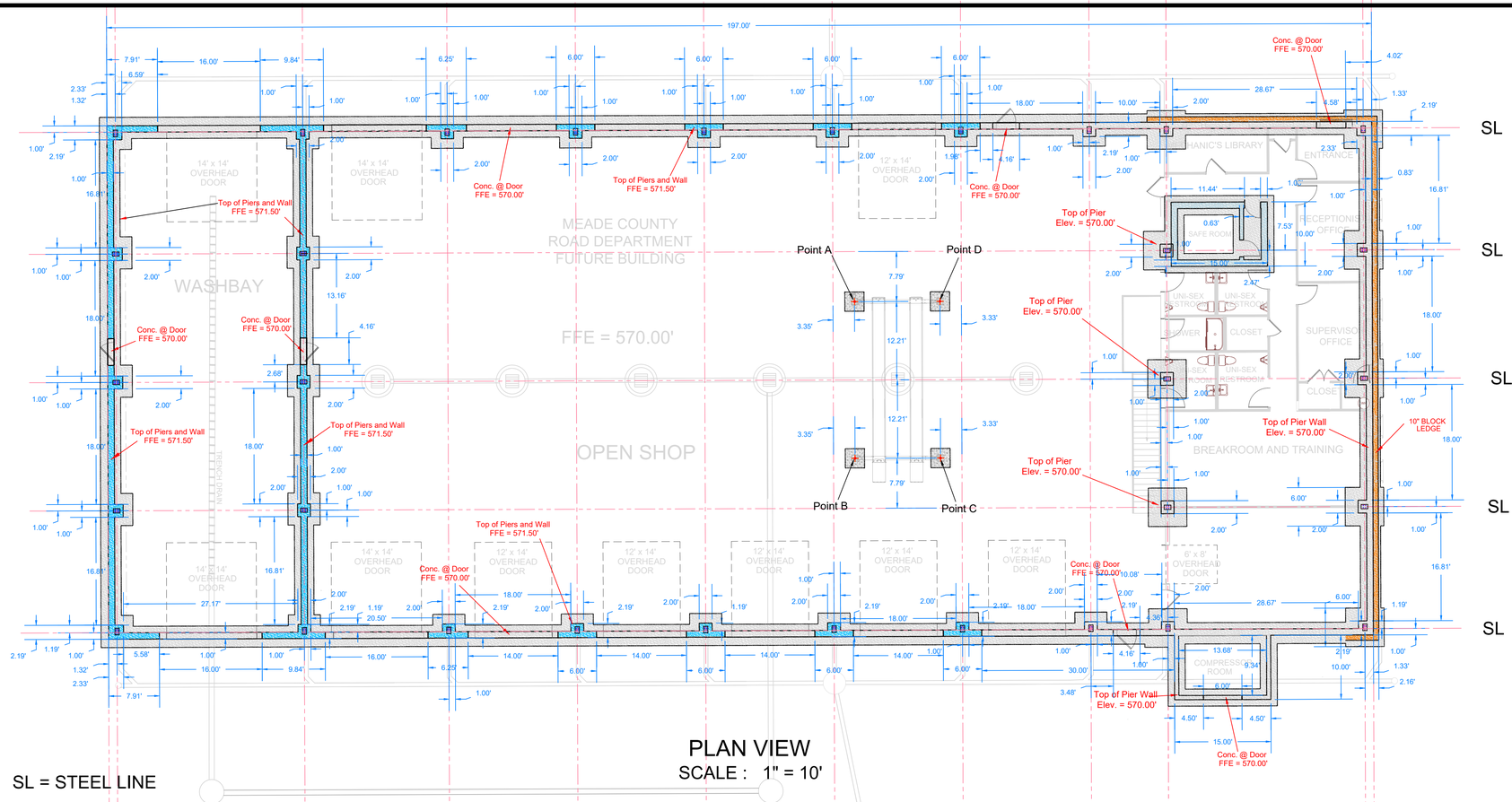
SCALE : 1" = 5'





PROFILE VIEW

SCALE : 1" = 10'



SL = STEEL LINE

PLAN VIEW

SCALE : 1" = 10'

Lincoln Trail Area Development District
~ established 1968 ~

STATE OF KENTUCKY
TIMOTHY WAYNE SMITH 12270
LICENSED PROFESSIONAL ENGINEER
12-09-25

MEADE COUNTY ROAD DEPARTMENT PROPOSED BUILDING
800 MOREMAN ROAD
Brandenburg, KY 40108

FOR

MEADE COUNTY FISCAL COURT
524 Hillcrest Drive
Brandenburg, KY 40108

CONSULTANTS

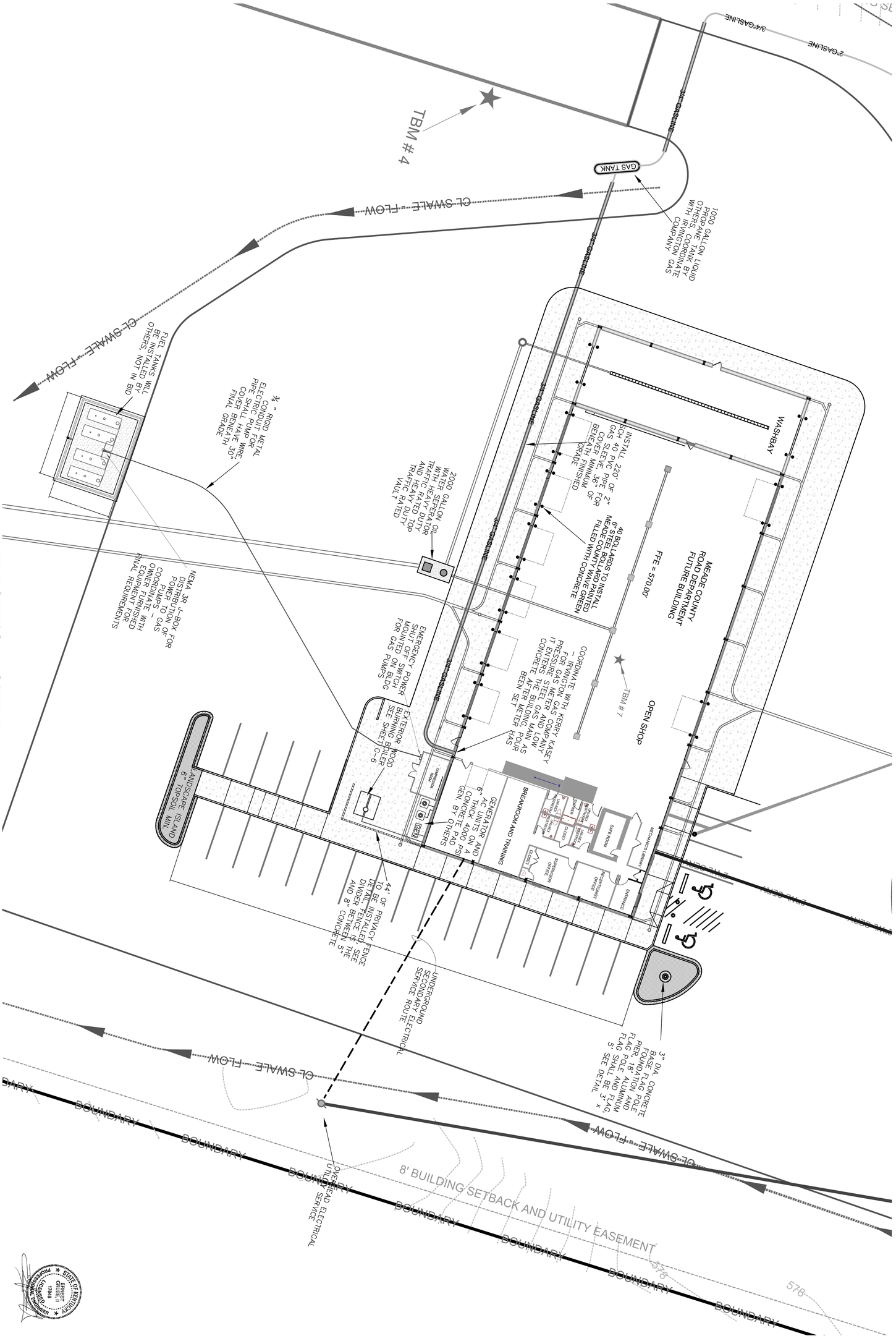
SMITH
ENGINEERING AND LAND SURVEYS, INC.
901 HIGH STREET
BRANDENBURG, KENTUCKY 40108
270-422-2588, 270-547-2588

SCALE: 1" = 10'	DATE: 12-09-25
DRAWN BY: M. O'Reilly	
JOB NO: 23-224	

SHEET TITLE

CONCRETE PIER & CONCRETE PIER WALL PLAN

C10



ELECTRICAL SITE PLAN

1/16"=1'-0"

G:\Shared drives\Engineering\Logos\Engineering Header Transparent Bkgrnd.png	Meade County Road Department	DRAWN BY	CE	DATE	REVISION
		CHECKED BY	CA		
		APPROVED BY	CA		
JOB#:	ES-001	DATE:			
SCALE		SHEET X OF X	ELECTRICAL SITE PLAN		

LIGHTING SHEET NOTES

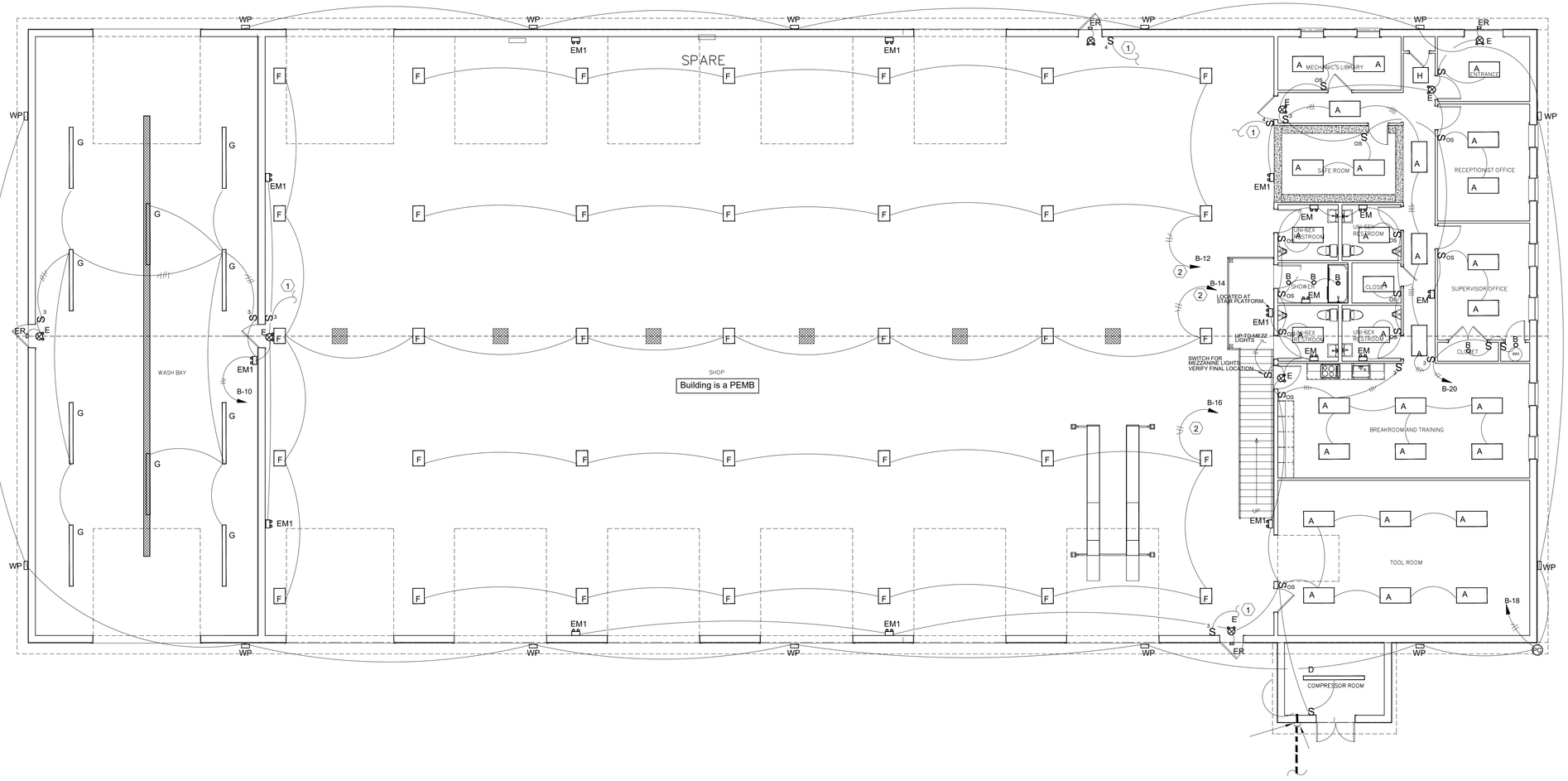
1. ROUTE SWITCH WIRING TO LIGHTING CONTROL CONTACTOR. REFER TO LIGHTING CONTROL WIRING DIAGRAM .
2. ROUTE CIRCUIT HOMERUN TO PANEL VIA LIGHTING CONTACTOR. REFER TO LIGHTING CONTROL WIRING DIAGRAM .

LIGHTING SYMBOL LEGEND

- S — SINGLE POLE 20 AMP SWITCH MOUNTED AT 44" AFF
- OS S — DUAL TECHNOLOGY OCCUPANCY SENSOR SWITCH MOUNTED AT 44" EQUAL TO WATTSTOPPER # DSW-302 -W
- 3 S — 3-WAY LIGHT SWITCH MOUNTED AT 44" AFF
- PC — LINE VOLTAGE PHOTOCELL TO CONTROL EXTERIOR LIGHTING -PROVIDE J-BOX MOUNTED AT BUILDING EAVE ABOVE LIGHT MOUNTING HEIGHT
- EMT OR MC CABLE WITH 3- #12 UNLESS OTHERWISE INDICATED
- CIRCUIT HOME RUN TO POWER PANEL

LIGHTING GENERAL NOTES

1. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE.
2. WIRE ALL EMERGENCY LIGHTING FIXTURES AHEAD OF LOCAL AREA SWITCHING.
3. COORDINATE EXACT FIXTURE PLACEMENT WITH OTHER EQUIPMENT IN THE CEILING SPACE.
4. MINIMUM WIRE SIZE SHALL BE #12 COPPER. MAXIMUM 3 CIRCUITS PER HOME RUN EACH SHALL HAVE SEPARATE NEUTRAL
5. UTILIZE SURFACE MC CABLE IN HIGHBAY AREAS OF SHOP AND MEZZANINE AND ABOVE CEILINGS IN OFFICE AREAS. USE SURFACE EMT CONDUIT FOR ANYTHING SURFACE MOUNTED BELOW 10' IN SHOP AREA.



STATE OF KENTUCKY
ERNEST CRUISE, II
17848
LICENSED PROFESSIONAL ENGINEER

DRAWN BY	CE	REVISION	
CHECKED BY	CA	DATE	
APPROVED BY	CA		

Meade County Road Department

LIGHTING PLAN FIRST LEVEL

G:\Shared drives\Engineering\Logos\Engineering Header Transparent Bkgrnd.png

JOB#:

E-001

DATE:

SHEET X OF X

SCALE

POWER SHEET NOTES

1. PROVIDE S/O CORD CONNECTION TO LIFT EQUIPMENT FROM CEILING FOR POWER VERIFY FINAL REQUIREMENTS WITH ACTUAL EQUIPMENT FURNISHED.

2. WIRE MOTORIZED DAMPER TO INTERLOCK WITH ASSOCIATED EXHAUST FAN. PROVIDE 120VOLT CONTROL CIRCUIT TO DAMPER ACTUATORS AND CONTROL WIRING TO EXHAUST FAN. REFER TO MECHANICAL PLANS FOR SEQUENCE OF OPERATIONS AND DETAILS.

3. 50 AMP 2 POLE RECEPTACLE TO SERVER WELDER. VERIFY FINAL TYPE WITH WELDING EQUIPMENT.

4. 50 AMP 2 POLE RECEPTACLE FOR STEAM/PRESSURE WASHER FOR THE PURPOSES OF BIDDING. VERIFY

5. VERIFY FINAL POWER REQUIREMENTS AND WIRING OF HVLS FANS WITH OWNER FURNISHED EQUIPMENT. FOR THE PURPOSES OF BIDDING ASSUME 20 AMP 240V CIRCUIT AND 6 CONTROL WIRES TO CONTROLLERS.

6. WOOD FIRED BOILER AND ASSOCIATED WIRING AND CONDUIT ARE PART OF AN ADD ALTERNATE FOR THE PROJECT. PROVIDE SEPARATE PRICING FOR WORK ASSOCIATED WITH BOILER AND WATER DISTRIBUTION PUMPS.

POWER SYMBOL LEGEND

	20 AMP DUPLEX RECEPTACLE MOUNTED AT 18" AFF UNLESS OTHERWISE NOTED
	20 AMP QUAD RECEPTACLE MOUNTED AT 48"
	SINGLE GANG OUTLET FOR TELEPHONE/DATA WITH 3/4" CONDUIT STUB TO ACCESSIBLE POINT ABOVE CEILING- WIRING BY OTHERS
S_M	FRACTIONAL HORSEPOWER MOTOR DISCONNECT SWITCH
GFI	GROUND FAULT TYPE RECEPTACLE
AC	ABOVE COUNTER MOUNTING OF DEVICE
	JUNCTION BOX FOR POWER CONNECTION TO EQUIPMENT
WP	WEATHERPROOF IN USE COVER FOR RECEPTACLE
	CIRCUIT HOMERUN TO POWER PANEL- REFER TO PANEL SCHEDULE FOR WIRE SIZE
	MC CABLE OR EMT CONDUIT RUN
	MOTOR SYMBOL
	DISCONNECT SWITCH (NON FUSED) SIZED PER LOAD SERVED- NEMA 3R WHERE OUTSIDE
MD	MOTORIZED DAMPER- COORDINATE WITH MECHANICAL CONTRACTOR FOR REQUIREMENTS

GENERAL POWER NOTES

1. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE.

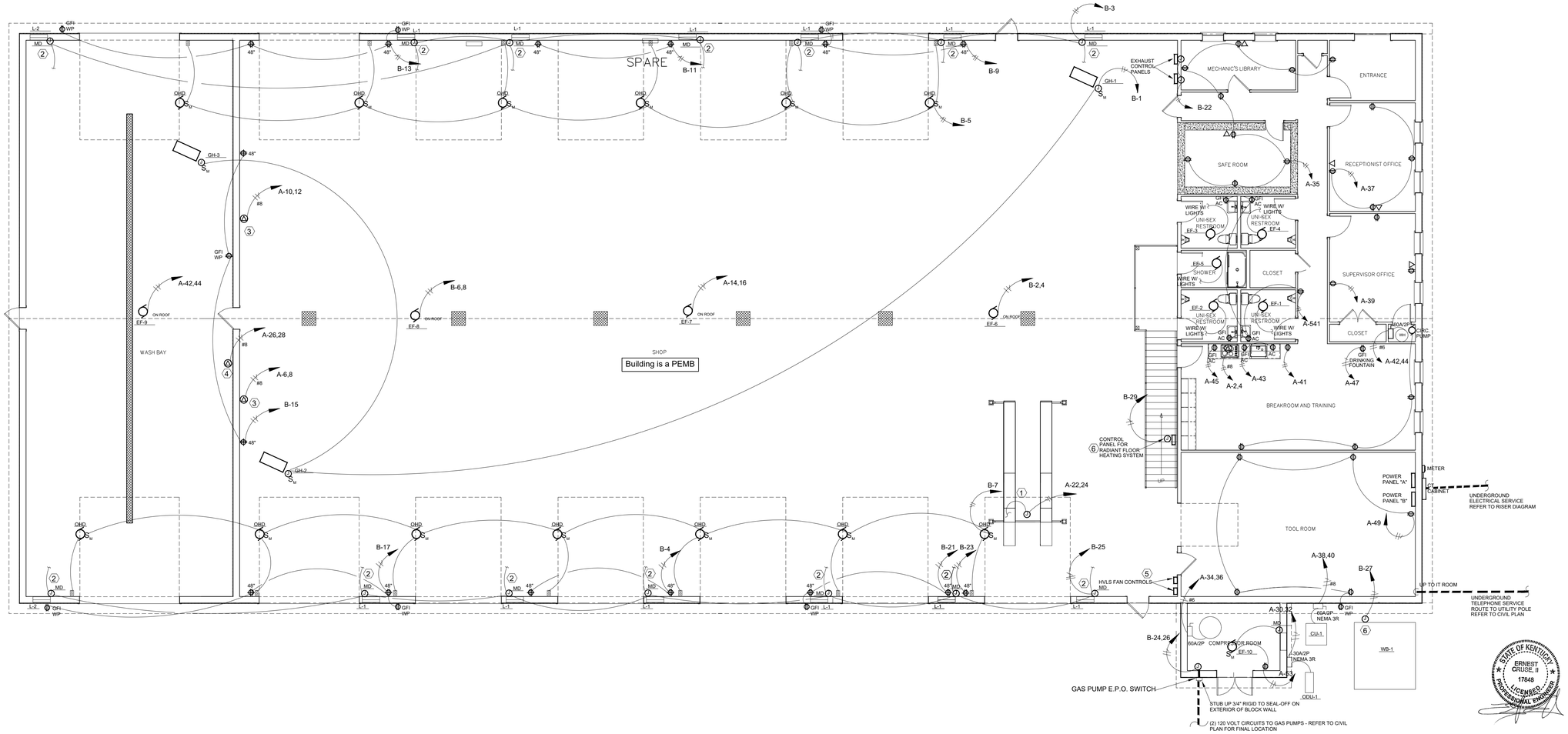
2. MINIMUM WIRE SIZE SHALL BE #12 COPPER. COORDINATE WITH EQUIPMENT ACTUAL WIRE SIZES BASED ON EQUIPMENT NAME PLATE RATINGS.

3. ALL EXPOSED CONDUIT BELOW 10' SHALL BE EMT TYPE. MC CABLE ALLOWED ABOVE CEILINGS AND IN STRUCTURAL AREA OF CEILINGS. SCHEDULE 40 PVC FOR U.G. CONDUIT.

4. COORDINATE WITH MECHANICAL CONTRACTOR FOR REQUIRED CONTROL WIRING ASSOCIATED WITH HVAC EQUIPMENT.

5. PROVIDE PANELBOARD CIRCUIT DIRECTORIES WHICH MATCH FIELD WIRING/CIRCUITING FOR EACH POWER DISTRIBUTION PANEL.

6. COORDINATE WITH LOCAL UTILITY TO VERIFY AVAILABLE FAULT CURENT AND PROVIDE CODE REQUIRED LABELS ON NEW ELECTRICAL SERVICE EQUIPMENT.



STATE OF KENTUCKY
ERNEST CRUISE, II
17848
LICENSED PROFESSIONAL ENGINEER

DRAWN BY	CE
CHECKED BY	CA
APPROVED BY	CA
DATE	
REVISION	

Meade County Road Department

POWER PLAN FIRST LEVEL

G:\Shared drives\Engineering\Logos\Engineering Header Transparent Bkgrnd.png

JOB#:

E-002

DATE:

SHEET X OF X

SCALE

POWER SHEET NOTES

1. PROVIDE S/O CORD CONNECTION TO LIFT EQUIPMENT FROM CEILING FOR POWER VERIFY FINAL REQUIREMENTS WITH ACTUAL EQUIPMENT FURNISHED.

2. WIRE MOTORIZED DAMPER TO INTERLOCK WITH ASSOCIATED EXHAUST FAN. PROVIDE 120VOLT CONTROL CIRCUIT TO DAMPER ACTUATORS AND CONTROL WIRING TO EXHAUST FAN. REFER TO MECHANICAL PLANS FOR SEQUENCE OF OPERATIONS AND DETAILS.

3. 50 AMP 2 POLE RECEPTACLE TO SERVER WELDER. VERIFY FINAL TYPE WITH WELDING EQUIPMENT.

4. 50 AMP 2 POLE RECEPTACLE FOR STEAM/PRESSURE WASHER FOR THE PURPOSES OF BIDDING. VERIFY

5. VERIFY FINAL POWER REQUIREMENTS AND WIRING OF HVLS FANS WITH OWNER FURNISHED EQUIPMENT. FOR THE PURPOSES OF BIDDING ASSUME 20 AMP 240V CIRCUIT AND 6 CONTROL WIRES TO CONTROLLERS.

6. WOOD FIRED BOILER AND ASSOCIATED WIRING AND CONDUIT ARE PART OF AN ADD ALTERNATE FOR THE PROJECT. PROVIDE SEPARATE PRICING FOR WORK ASSOCIATED WITH BOILER AND WATER DISTRIBUTION PUMPS.

POWER SYMBOL LEGEND

- 20 AMP DUPLEX RECEPTACLE MOUNTED AT 18" AFF UNLESS OTHERWISE NOTED
- 20 AMP QUAD RECEPTACLE MOUNTED AT 48"
- SINGLE GANG OUTLET FOR TELEPHONE/DATA WITH 3/4" CONDUIT STUB TO ACCESSIBLE POINT ABOVE CEILING- WIRING BY OTHERS
- S_M FRACTIONAL HORSEPOWER MOTOR DISCONNECT SWITCH
- GFI GROUND FAULT TYPE RECEPTACLE
- AC ABOVE COUNTER MOUNTING OF DEVICE
- (J) JUNCTION BOX FOR POWER CONNECTION TO EQUIPMENT
- WP WEATHERPROOF IN USE COVER FOR RECEPTACLE
- CIRCUIT HOMERUN TO POWER PANEL- REFER TO PANEL SCHEDULE FOR WIRE SIZE
- MC CABLE OR EMT CONDUIT RUN
- MOTOR SYMBOL
- DISCONNECT SWITCH (NON FUSED) SIZED PER LOAD SERVED- NEMA 3R WHERE OUTSIDE
- MD MOTORIZED DAMPER- COORDINATE WITH MECHANICAL CONTRACTOR FOR REQUIREMENTS

GENERAL POWER NOTES

1. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE.

2. MINIMUM WIRE SIZE SHALL BE #12 COPPER. COORDINATE WITH EQUIPMENT ACTUAL WIRE SIZES BASED ON EQUIPMENT NAME PLATE RATINGS.

3. ALL EXPOSED CONDUIT BELOW 10' SHALL BE EMT TYPE. MC CABLE ALLOWED ABOVE CEILINGS AND IN STRUCTURAL AREA OF CEILINGS. SCHEDULE 40 PVC FOR U.G. CONDUIT.

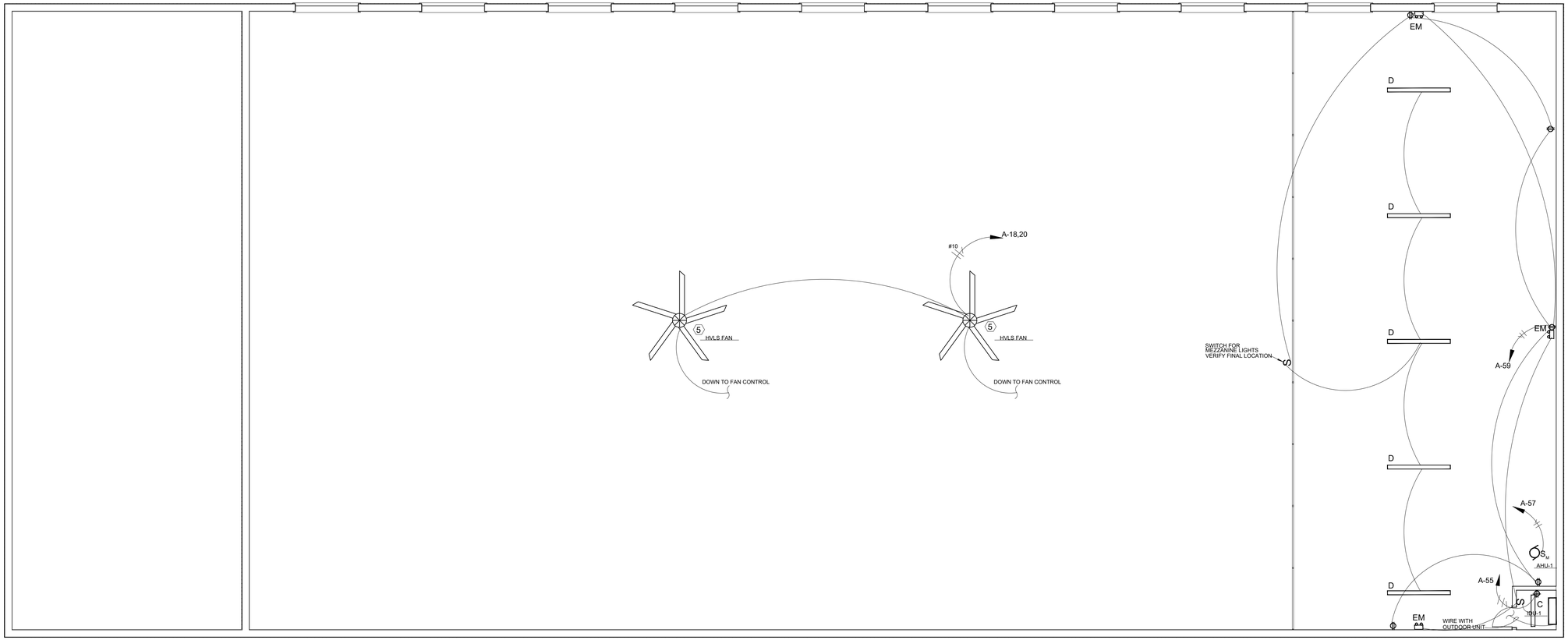
4. COORDINATE WITH MECHANICAL CONTRACTOR FOR REQUIRED CONTROL WIRING ASSOCIATED WITH HVAC EQUIPMENT.

5. PROVIDE PANELBOARD CIRCUIT DIRECTORIES WHICH MATCH FIELD WIRING/CIRCUITING FOR EACH POWER DISTRIBUTION PANEL.

6. COORDINATE WITH LOCAL UTILITY TO VERIFY AVAILABLE FAULT CURENT AND PROVIDE CODE REQUIRED LABELS ON NEW ELECTRICAL SERVICE EQUIPMENT.

LIGHTING GENERAL NOTES

1. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE.
2. WIRE ALL EMERGENCY LIGHTING FIXTURES AHEAD OF LOCAL AREA SWITCHING.
3. COORDINATE EXACT FIXTURE PLACEMENT WITH OTHER EQUIPMENT IN THE CEILING SPACE.
4. MINIMUM WIRE SIZE SHALL BE #12 COPPER. MAXIMUM 3 CIRCUITS PER HOME RUN EACH SHALL HAVE SEPARATE NEUTRAL.
5. UTILIZE SURFACE MC CABLE IN HIGHBAY AREAS OF SHOP AND MEZZANINE AND ABOVE CEILINGS IN OFFICE AREAS. USE SURFACE EMT CONDUIT FOR ANYTHING SURFACE MOUNTED BELOW 10' IN SHOP AREA.



REVISION	DATE	DRAWN BY	CHECKED BY	APPROVED BY
		CE	CA	CA

Meade County Road Department

MEZZANINE LIGHTING AND POWER PLAN

G:\Shared drives\Engineering\Logos\Engineering Header Transparent Bkgrnd.png

JOB#:

SCALE

DATE:

SHEET X OF X

E-003

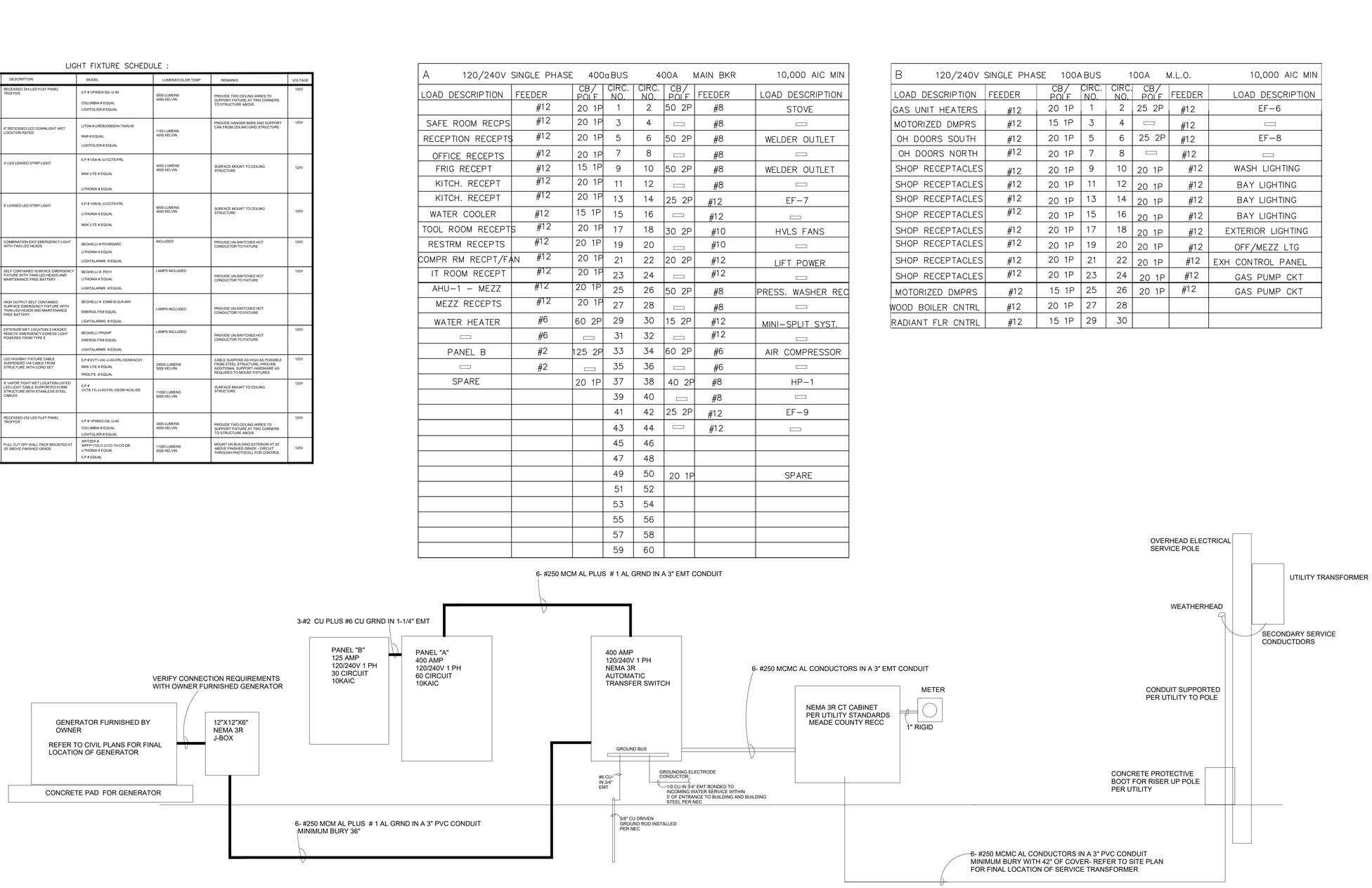
STATE OF KENTUCKY
ERNEST CRUSE, II
17848
LICENSED PROFESSIONAL ENGINEER

LIGHT FIXTURE SCHEDULE :

TYPE	DESCRIPTION	MODEL	LUMENS/COLOR TEMP	REMARKS	VOLTAGE
A	RECESSED 2X4 LED FLAT PANEL TROFFER	ILP # VPAN24-55L-U-40 COLUMBIA # EQUAL LIGHTOLIER # EQUAL	5500 LUMENS 4000 KELVIN	PROVIDE TWO CEILING WIRES TO SUPPORT FIXTURE AT TWO CORNERS TO STRUCTURE ABOVE	120V
B	6" RECESSED LED DOWNLIGHT WET LOCATION RATED	LITON # LREBL5602W-T4G/LHS RAB # EQUAL LIGHTOLIER # EQUAL	1100 LUMENS 4000 KELVIN	PROVIDE HANGER BARS AND SUPPORT CAN FROM CEILING GRID STRUCTURE	120V
C	4' LED LENSED STRIP LIGHT	ILP # VS4-4L-U-CCTS-FRL MAX LITE # EQUAL LITHONIA # EQUAL	4000 LUMENS 4000 KELVIN	SURFACE MOUNT TO CEILING STRUCTURE	120V
D	8' LENSED LED STRIP LIGHT	ILP # VS8-9L-U-CCTS-FRL LITHONIA # EQUAL MAX LITE # EQUAL	9000 LUMENS 4000 KELVIN	SURFACE MOUNT TO CEILING STRUCTURE	120V
E	COMBINATION EXIT EMERGENCY LIGHT WITH TWO LED HEADS	BEGHELLI # PCHRSARC LITHONIA # EQUAL LIGHTALARMS # EQUAL	INCLUDED	PROVIDE UN-SWITCHED HOT CONDUCTOR TO FIXTURE	120V
EM	SELF CONTAINED SURFACE EMERGENCY FIXTURE WITH TWIN LED HEADS AND MAINTENANCE FREE BATTERY.	BEGHELLI # PSH1 LITHONIA # EQUAL LIGHTALARMS # EQUAL	LAMPS INCLUDED	PROVIDE UN-SWITCHED HOT CONDUCTOR TO FIXTURE	120V
EM1	HIGH OUTPUT SELF CONTAINED HIGH OUTPUT EMERGENCY FIXTURE WITH TWIN LED HEADS AND MAINTENANCE FREE BATTERY	BEGHELLI # ESM618-2LR-9WI EMERGILITE# EQUAL LIGHTALARMS # EQUAL	LAMPS INCLUDED	PROVIDE UN-SWITCHED HOT CONDUCTOR TO FIXTURE	
ER	EXTERIOR WET LOCATION 2 HEADED REMOTE EMERGENCY EGRESS LIGHT POWERED FROM TYPE E	BEGHELLI PR2WP EMERGILITE# EQUAL LIGHTALARMS # EQUAL	LAMPS INCLUDED	PROVIDE UN-SWITCHED HOT CONDUCTOR TO FIXTURE	120V
F	LED HIGHBAY FIXTURE CABLE SUSPENDED VIA CABLE FROM STRUCTURE WITH CORD SET	ILP # EVT-1-24L-U-50-FRL-DE3W/ACSY MAX LITE # EQUAL PROLITE # EQUAL	24000 LUMENS 5000 KELVIN	CABLE SUSPEND AS HIGH AS POSSIBLE FROM STEEL STRUCTURE; PROVIDE ADDITIONAL SUPPORT HARDWARE AS REQUIRED TO MOUNT FIXTURES	120V
G	8' VAPOR TIGHT WET LOCATION LISTED LED LIGHT CABLE SUPPORTED FORM STRUCTURE WITH STAINLESS STEEL CABLES	ILP # VVTB-11L-U-50-FRL-DE/3W-AC4L/SS	11000 LUMENS 5000 KELVIN	SURFACE MOUNT TO CEILING STRUCTURE	120V
H	RECESSED 2X2 LED FLAT PANEL TROFFER	ILP # VPAN22-33L-U-40 COLUMBIA # EQUAL LIGHTOLIER # EQUAL	3300 LUMENS 4000 KELVIN	PROVIDE TWO CEILING WIRES TO SUPPORT FIXTURE AT TWO CORNERS TO STRUCTURE ABOVE	120V
WP	FULL CUT OFF WALL PACK MOUNTED AT 20' ABOVE FINISHED GRADE	SPITZER # WPFP-110LC-U-CC-T4-CO-DB LITHONIA # EQUAL ILP # EQUAL	11000 LUMENS 5000 KELVIN	MOUNT ON BUILDING EXTERIOR AT 20' ABOVE FINISHED GRADE - CIRCUIT THROUGH PHOTOCELL FOR CONTROL	120V

A 120/240V SINGLE PHASE 400a BUS 400A MAIN BKR 10,000 AIC MIN							
LOAD DESCRIPTION	FEEDER	CB/ POLE	CIRC. NO.	CIRC. NO.	CB/ POLE	FEEDER	LOAD DESCRIPTION
	#12	20 1P	1	2	50 2P	#8	STOVE
SAFE ROOM RECPS	#12	20 1P	3	4		#8	
RECEPTION RECEPTS	#12	20 1P	5	6	50 2P	#8	WELDER OUTLET
OFFICE RECEPTS	#12	20 1P	7	8		#8	
FRIG RECEPT	#12	15 1P	9	10	50 2P	#8	WELDER OUTLET
KITCH. RECEPT	#12	20 1P	11	12		#8	
KITCH. RECEPT	#12	20 1P	13	14	25 2P	#12	EF-7
WATER COOLER	#12	15 1P	15	16		#12	
TOOL ROOM RECEPTS	#12	20 1P	17	18	30 2P	#10	HVLS FANS
RESTRM RECEPTS	#12	20 1P	19	20		#10	
COMPR RM RECPT/FAN	#12	20 1P	21	22	20 2P	#12	LIFT POWER
IT ROOM RECEPT	#12	20 1P	23	24		#12	
AHU-1 - MEZZ	#12	20 1P	25	26	50 2P	#8	PRESS. WASHER REC
MEZZ RECEPTS	#12	20 1P	27	28		#8	
WATER HEATER	#6	60 2P	29	30	15 2P	#12	MINI-SPLIT SYST.
	#6		31	32		#12	
PANEL B	#2	125 2P	33	34	60 2P	#6	AIR COMPRESSOR
	#2		35	36		#6	
SPARE		20 1P	37	38	40 2P	#8	HP-1
			39	40		#8	
			41	42	25 2P	#12	EF-9
			43	44		#12	
			45	46			
			47	48			
			49	50	20 1P		SPARE
			51	52			
			53	54			
			55	56			
			57	58			
			59	60			

B 120/240V SINGLE PHASE 100A BUS 100A M.L.O. 10,000 AIC MIN							
LOAD DESCRIPTION	FEEDER	CB/ POLE	CIRC. NO.	CIRC. NO.	CB/ POLE	FEEDER	LOAD DESCRIPTION
GAS UNIT HEATERS	#12	20 1P	1	2	25 2P	#12	EF-6
MOTORIZED DMPRS	#12	15 1P	3	4		#12	
OH DOORS SOUTH	#12	20 1P	5	6	25 2P	#12	EF-8
OH DOORS NORTH	#12	20 1P	7	8		#12	
SHOP RECEPTACLES	#12	20 1P	9	10	20 1P	#12	WASH LIGHTING
SHOP RECEPTACLES	#12	20 1P	11	12	20 1P	#12	BAY LIGHTING
SHOP RECEPTACLES	#12	20 1P	13	14	20 1P	#12	BAY LIGHTING
SHOP RECEPTACLES	#12	20 1P	15	16	20 1P	#12	BAY LIGHTING
SHOP RECEPTACLES	#12	20 1P	17	18	20 1P	#12	EXTERIOR LIGHTING
SHOP RECEPTACLES	#12	20 1P	19	20	20 1P	#12	OFF/MEZZ LTG
SHOP RECEPTACLES	#12	20 1P	21	22	20 1P	#12	EXH CONTROL PANEL
SHOP RECEPTACLES	#12	20 1P	23	24	20 1P	#12	GAS PUMP CKT
MOTORIZED DMPRS	#12	15 1P	25	26	20 1P	#12	GAS PUMP CKT
WOOD BOILER CNTRL	#12	20 1P	27	28			
RADIANT FLR CNTRL	#12	15 1P	29	30			



POWER RISER DIAGRAM
NOT TO SCALE

STATE OF KENTUCKY
ERNEST CRUSE, II
17848
LICENSED
PROFESSIONAL ENGINEER

DATE	REVISION

DRAWN BY CE
CHECKED BY CA
APPROVED BY CA

Meade County Road Department

RISER AND SCHEDULES

G:\Shared drives\Engineering\Logos\Engineering Header Transparent Bkgrnd.png

DATE:
SHEET X OF X

E-004

JOB#:
SCALE

GENERAL NOTES:

A. REFER TO SPECIFICATIONS AND THE CONTRACT DOCUMENTS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

B. ALL MECHANICAL WORK SHALL BE PERFORMED BY A LICENSED MECHANICAL CONTRACTOR.

C. ALL WORK SHALL BE COORDINATED AND SCHEDULED WITH THE CONSTRUCTION MANAGER (CM) OR GENERAL CONTRACTOR (GC), OTHER TRADES, THE OWNER, AND RELATED UTILITY COMPANIES. ALL WORK SHALL COINCIDE WITH THE CONSTRUCTION PHASING PER THE CONTRACT DOCUMENTS OR CONSTRUCTION DOCUMENTS AND/OR AS MODIFIED BY THE CM/GC AND APPROVED BY THE OWNER AND DESIGN TEAM. THE MECHANICAL CONTRACTOR SHALL COORDINATE AND DEVELOP A PHASING PLAN WHERE ONE IS NOT EXPLICITLY SHOWN AND SHALL ENSURE THAT SAID PHASING PLAN IS APPROVED PRIOR TO PROCEEDING WITH WORK. ANY AND ALL DEMOLITION SHALL NOT PERMIT INTERRUPTION OF SERVICE IN AN OCCUPIED BUILDING UNLESS COORDINATED AND APPROVED.

D. ALL DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENTS OR GEOMETRICAL RELATIONSHIPS OF DUCTWORK, PIPING, EQUIPMENT, AND SERVICES. THEY ARE NOT INTENDED TO SPECIFY OR SHOW EVERY OFFSET, SEQUENCE, DEVICE, OPTION, FITTING, VALVE, OR COMPONENT. CONTRACTOR TO PROVIDE ANY ADDITIONAL DUCT OR PIPING OFFSETS AND/OR FITTINGS, INCLUDING DIVIDED DUCTS AND FLATTENED DUCTS, REQUIRED FOR PROPER INSTALLATION AND TO MAINTAIN CLEARANCES AS ENCOUNTERED IN THE FIELD.

E. THE MECHANICAL CONTRACTOR SHALL OBTAIN A COPY OF THE ENTIRE SET OF CONTRACT DOCUMENTS PRIOR TO BID AND SHALL COORDINATE ROUTING AND INSTALLATION OF MECHANICAL DUCTWORK, PIPING, AND EQUIPMENT WITH ALL OTHER DISCIPLINES AND TRADES INCLUDING BUT NOT LIMITED TO CIVIL, ARCHITECTURAL, STRUCTURAL, FIRE SUPPRESSION, PLUMBING, AND ELECTRICAL.

F. REFER TO THE ENTIRE SET OF CONTRACT DOCUMENTS FOR DETAILS OF CONSTRUCTION AND INSTALLATION REQUIREMENTS. FURNISH ALL LABOR, MATERIAL, AND EQUIPMENT REQUIRED FOR COMPLETION AND OPERATION OF A FULLY FUNCTIONAL MECHANICAL SYSTEM AND IN ACCORDANCE WITH ALL APPLICABLE CODES AND STANDARDS INCLUDING BUT NOT LIMITED TO BUILDING CODE, ASHRAE, IMC, IECC, SMACNA, AND NFPA.

G. THE EXACT LOCATIONS OF ALL EQUIPMENT, DUCTS, DIFFUSERS, ETC. SHALL BE COORDINATED WITH ALL OTHER TRADES. CEILING MOUNTED LIGHTING AND ELECTRICAL REQUIREMENTS TAKE PRECEDENCE OVER CEILING MOUNTED MECHANICAL EQUIPMENT. SEE ARCHITECTURAL REFLECTED CEILING PLANS FOR CEILING GRID AND LIGHTING LAYOUT FOR COORDINATION OF FINAL DIFFUSER LOCATIONS.

H. THE MECHANICAL DRAWINGS REFLECT A “BASIS OF DESIGN” HVAC SYSTEM THAT HAS BEEN DESIGNED AROUND SPECIFIC PRODUCTS/MANUFACTURER'S (SEE SCHEDULES). THE SELECTION OF A “BASIS OF DESIGN” HAS INFLUENCED THE DESIGNS OF OTHER TRADES (ELECTRICAL, STRUCTURAL, ETC.). THE CONTRACTOR MAY USE “NON-BASIS OF DESIGN” PRODUCTS/MANUFACTURER'S AS PERMITTED BY THE SPECIFICATIONS AND/OR CONTRACT DOCUMENTS. COORDINATION OF ALL MODIFICATIONS TO EACH DISCIPLINE WHICH RESULT FROM THE USE OF “NON-BASIS OF DESIGN” EQUIPMENT OR MATERIALS SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR. IF “NON-BASIS OF DESIGN” MANUFACTURERS, SIZES, OR MODEL NUMBERS ARE BID, SUBMITTED, OR INSTALLED; IT IS THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR AND ALL OF HIS OR HER SUBCONTRACTORS TO COORDINATE ALL DIFFERENCES PRIOR TO BID. ALL COSTS OF ALL TRADES ASSOCIATED WITH THE USE OF “NON-BASIS OF DESIGN” EQUIPMENT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR AND SHALL BE INCLUDED IN THE BID. SUBSEQUENTLY, ANY ADDITIONAL COST BORE BY THE ENGINEER (MECHANICAL, ELECTRICAL, ETC) TO ACCOMMODATE "NON-BASIS OF DESIGN" EQUIPMENT SHALL BE BORE BY THE CONTRACTOR AND PAID TO THE ENGINEER OF RECORD DURING SUBMITTALS.

I. NON-BASIS OF DESIGN EQUIPMENT OR MATERIALS AS ALLOWED BY THE SPECIFICATIONS AND/OR CONTRACT DOCUMENTS, WHICH ARE INSTALLED AND SUBSEQUENTLY VIEWED UNSATISFACTORY BY THE OWNER AND/OR ENGINEER WITHIN THE WARRANTY PERIOD, SHALL BE REMOVED COMPLETELY BY THE CONTRACTOR AND REPLACED WITH THE ORIGINAL DESIGN OR CORRECTED AS DIRECTED BY THE ENGINEER WITHOUT ADDITIONAL COST TO THE OWNER.

J. CONTRACTOR SHALL VISIT THE JOB SITE, FIELD VERIFY FIT, COORDINATE WITH OTHER TRADES, AND BECOME FAMILIAR WITH ALL PROJECT CONDITIONS PRIOR TO FABRICATING DUCTWORK, INSTALLING EQUIPMENT, ETC. NO ALLOWANCES WILL BE MADE FOR LACK THEREOF.

K. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION FOR ALL PERMITS, TESTING, AND INSPECTIONS.

L. THE ENTIRE MECHANICAL INSTALLATION SHALL BE AS REQUIRED TO MAINTAIN FIRE/SMOKE RATINGS AND/OR “UL” ASSEMBLY RATINGS AS REQUIRED BY THE CONTRACT DOCUMENTS AND AS SHOWN ON THE ARCHITECTURAL. SEAL AROUND ALL PENETRATIONS THROUGH ALL FIRE/SMOKE SEPARATIONS AND/OR “UL” RATED ASSEMBLIES. COORDINATE ALL PENETRATIONS WITH THE CONSTRUCTION MANAGER AND/OR GENERAL CONTRACTOR. PROVIDE ADDITIONAL FIRE DAMPERS, SMOKE DETECTORS, AND SMOKE DAMPERS (INCLUSIVE OF WIRING) AS REQUIRED FOR A FULLY FUNCTIONAL AND CODE COMPLIANT SYSTEM.

M. ALL DUCTWORK, PIPING, AND MECHANICAL EQUIPMENT SHALL BE SUPPORTED DIRECTLY FROM THE STRUCTURE. NO OTHER TRADES, I.E. ELECTRICAL, CEILING, PLUMBING, ETC., SHALL BE SUSPENDED, HUNG, OR SUPPORTED FROM MECHANICAL DUCTWORK OR MECHANICAL PIPING.

N. ALL BUILDING PENETRATIONS MUST BE COORDINATED WITH THE ARCHITECT AND SHALL BE FLASHED AND SEALED WEATHER-TIGHT. ALL MATERIALS AND COLORS MUST BE PRE-APPROVED BY THE ARCHITECT. NEW OPENINGS AND/OR PENETRATIONS FOR MECHANICAL ITEMS SHALL BE CUT, SLEEVED, ETC. BY THE MECHANICAL CONTRACTOR. ALL OPENINGS SHALL BE CORE DRILLED OR SAW-CUT. NO “HAMMER DRILLING” WILL BE ALLOWED.

O. ROUTE DUCTWORK AS HIGH AS POSSIBLE TO FACILITATE ACCESS TO ABOVE CEILING SPACE. COORDINATE ROUTING WITH OTHER SERVICES AND TRADES. PROVIDE ADDITIONAL DUCTWORK, OFFSETS, ETC. TO ACCOMMODATE FIELD CONDITIONS AS REQUIRED FOR A COMPLETE AND FUNCTIONING SYSTEM AT NO ADDITIONAL COST. ADDITIONAL OFFSETS REQUIRE APPROVAL FROM THE ENGINEER. ROUTE DUCTWORK BETWEEN JOISTS WHERE POSSIBLE.

P. ALL AIR DEVICES LOCATED ABOVE GYPBOARD OR HARD CEILINGS SHALL HAVE ACCESSIBLE BALANCING DAMPERS.

Q. ALL DUCTWORK SHALL BE CONSTRUCTED AND INSTALLED PER SMACNA HVAC DUCT CONSTRUCTION STANDARDS.

R. PROVIDE AND INSTALL DUCT ACCESS DOORS FOR INSPECTION OF ALL INSTALLED FIRE DAMPERS AS DIRECTED BY SMACNA HVAC CONSTRUCTION STANDARDS.

S. MAXIMUM FLEXIBLE DUCT LENGTH SHALL BE 5'-0". ALL FLEXIBLE DUCT SHALL CONFORM TO THE REQUIREMENTS OF UL 181 FLEXIBLE AIR DUCTS. SUPPORT TO ELIMINATE SAGGING AND KINKING. INSULATED FLEXIBLE DUCTS SHALL MEET MINIMUM R-VALUES REQUIRED BY THE IECC.

T. ALL HVAC EQUIPMENT TO BE INSTALLED PER MANUFACTURER'S REQUIREMENTS. UTILIZE FACTORY FILTERS DURING CONSTRUCTION.

U. THE MECHANICAL CONTRACTOR SHALL BALANCE SYSTEM TO AIR QUANTITIES INDICATED ON PLANS AND PROVIDE OWNERS REPRESENTATIVES WITH COMPLETE NEBB/AABC BALANCE REPORT. THE MECHANICAL CONTRACTOR SHALL PROVIDE AS MANY ADDITIONAL SITE VISITS BY THE LICENSED TAB CONTRACTOR AS REQUIRED BY THE ENGINEER FOR A COMPLETE AND FUNCTIONING AND APPROVED SYSTEM IN COMPLIANCE WITH THE CONTRACT DOCUMENTS.

V. PROVIDE A MANUAL VOLUME DAMPER AT ALL BRANCH TAKE-OFFS ON SUPPLY AND RETURN. COORDINATE ADDITIONAL MANUAL VOLUME DAMPER LOCATIONS REQUIRED FOR A FULLY FUNCTIONAL SYSTEM WITH THE ENGINEER PRIOR TO ORDER, FABRICATION, OR INSTALLATION.

W. ALL DUCT DIMENSIONS SHOWN ARE INTERIOR “CLEAR” DUCT DIMENSIONS.

X. MAINTAIN 10'-0" MINIMUM CLEARANCE BETWEEN OUTDOOR AIR INTAKES AND EXHAUST, PLUMBING VENTS, ETC. AND/OR AS REQUIRED BY THE BUILDING CODE, WHICHEVER IS MORE STRINGENT.

Y. MAINTAIN 10'-0" MINIMUM CLEARANCE FROM EDGE OF ROOFTOP EQUIPMENT TO ROOF EDGE UNLESS RAILING OR PARAPET OF SUFFICIENT HEIGHT IS TO BE PROVIDED IN ACCORDANCE WITH ALL APPLICABLE CODES INCLUDING BUT NOT LIMITED TO: IBC, IMC, LOCAL CODES, OSHA GUIDELINES (WHERE APPLICABLE). REFER TO ARCHITECTURAL.

Z. ALL CONTROL WIRING AND CONDUIT SHALL COMPLY WITH NEC.

AA. MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR AND DRAWINGS FOR CONNECTIONS AND LOCATION OF ALL EQUIPMENT.

AB. CONTRACTOR SHALL PROVIDE ADDITIONAL OFFSETS OR BENDS IN PIPING AS REQUIRED TO ALLOW FOR EXPANSION AND CONTRACTION DUE TO TEMPERATURE CHANGES AND DIFFERENCES IN THE AMBIENT TEMPERATURE WHEN PIPING AND EQUIPMENT IS INSTALLED.

AC. ALL ROOF PENETRATIONS SHALL BE IN COMPLIANCE WITH THE ROOFING MANUFACTURER'S GUIDELINES AND THE AMERICAN ROOFING COUNCIL. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE AS NECESSARY TO MAINTAIN ALL WARRANTIES.

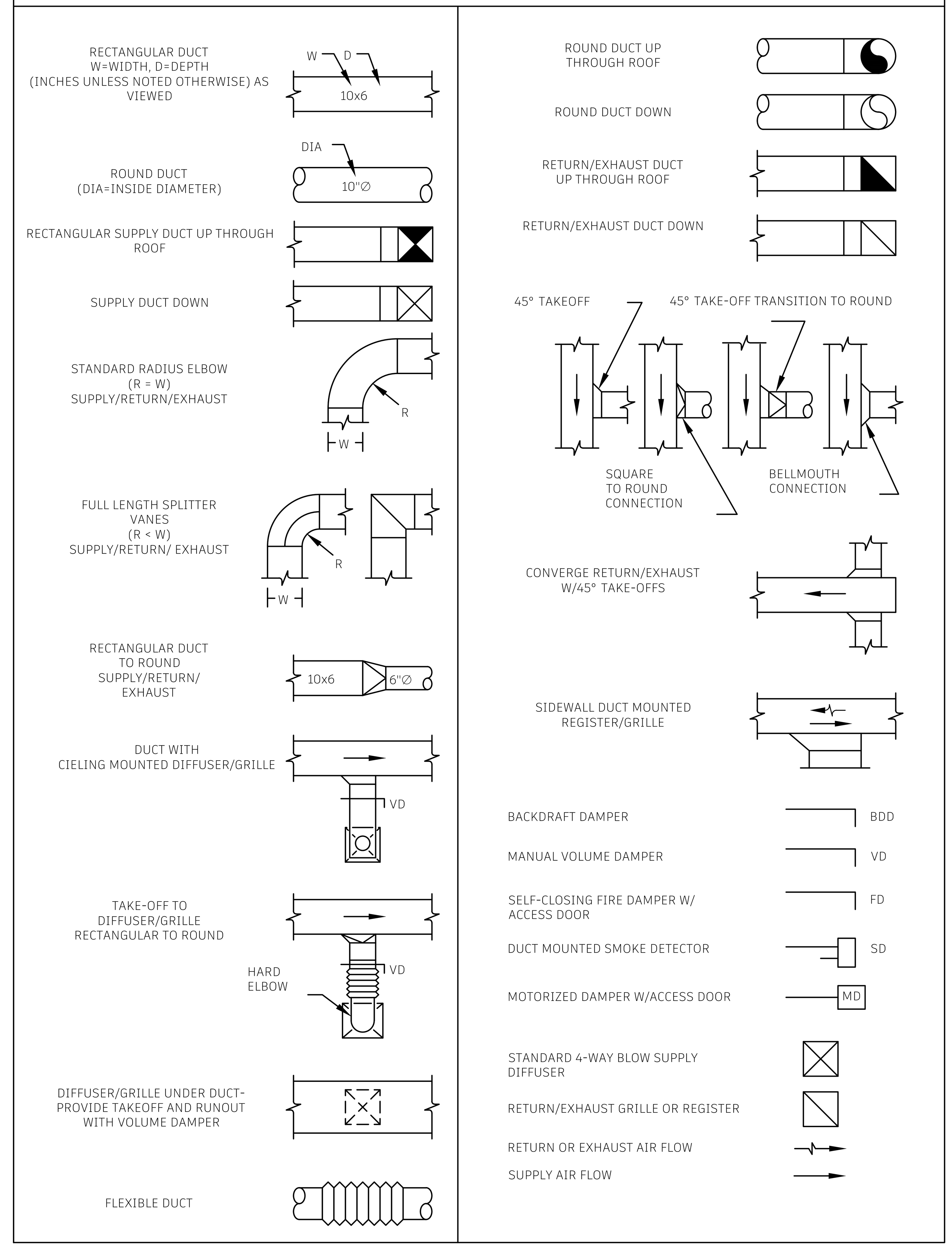
AD. STRUCTURAL MEMBERS SHALL NOT BE CUT OR COMPROMISED IN ANY WAY.

AE. DO NOT BLOCK ACCESS TO HVAC OR ELECTRICAL EQUIPMENT. DO NOT INSTALL PIPING, DUCTWORK, OR EQUIPMENT OVER ELECTRICAL PANELS/SWITCHGEAR OR THE 30" x 42" (W x D) CLEARANCE IN FRONT OF THESE ELECTRICAL ITEMS. COORDINATE ADDITIONAL REQUIREMENTS WITH NEC.

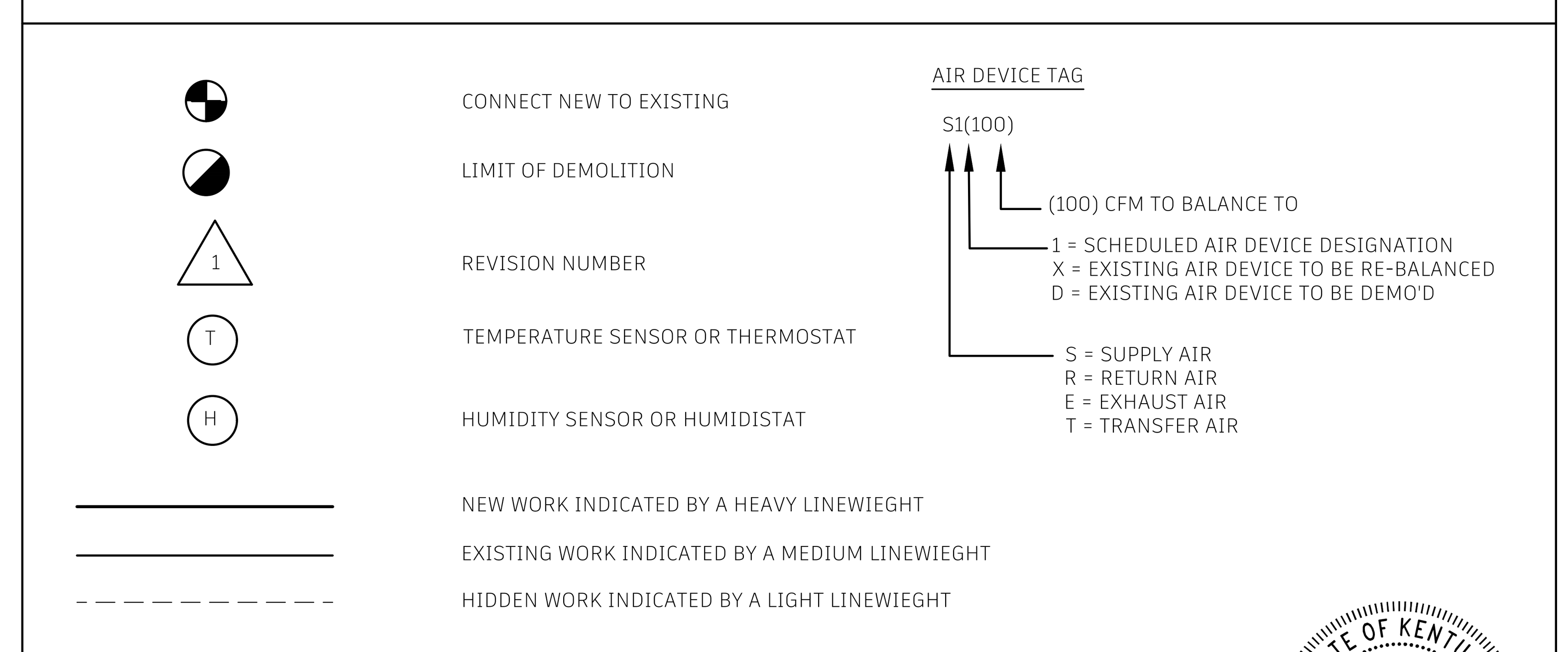
ABBREVIATIONS

GENERAL	
AFF	ABOVE FINISHED FLOOR
AMP	AMPERE
ARCH	ARCHITECT
BHP	BRAKE HORSEPOWER
BTU	BRITISH THERMAL UNIT
BTUH	BTU PER HOUR
CFM	CUBIC FEET PER MINUTE
DB	DRY BULB TEMPERATURE
DEG	DEGREE
DDC	DIRECT DIGITAL CONTROL
DIA	DIAMETER
DIM	DIMENSION
DP	DIFFERENTIAL PRESSURE
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
ECM	ELECTRONIC COMMUTATED MOTOR
ELEC	ELECTRICAL
ESP	EXTERNAL STATIC PRESSURE
EX	EXISTING
F	FAHRENHEIT
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FT	FEET
FT-HD	FEET HEAD
G	GAS
GA	GAUGE
GAL	GALLONS
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GPM	GALLONS PER MINUTE
HD	HEAD
HP	HORSEPOWER
HZ	HERTZ (FREQUENCY, CYCLES PER SECOND)
IN	INCHES
KW	KILOWATT
L	LENGTH
LAT	LEAVING AIR TEMPERATURE
MAX	MAXIMUM
MBH	THOUSAND BTUH
MCA	MINIMUM CIRCUIT AMPS
MECH	MECHANICAL
MIN	MINIMUM
N/A	NOT APPLICABLE
NC	NOISE CRITERIA
No.	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
OA	OUTSIDE AIR
PD	PRESSURE DROP
PH	PHASE
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
RA	RETURN AIR
RPM	REVOLUTIONS PER MINUTE
SEN	SENSIBLE
SHC	SENSIBLE HEAT CAPACITY
SP	STATIC PRESSURE
SPECS	SPECIFICATIONS
SQ	SQUARE
SF	SQUARE FEET
SUP	SUPPLY
T	TEMPERATURE
TEMP	TEMPERATURE
TSTAT	THERMOSTAT
TON	12,000 BTUH COOLING CAPACITY
TYP	TYPICAL
V	VOLTS (ELECTRICAL)
WB	WET BULB TEMPERATURE
DUCTWORK	
EA	EXHAUST AIR
E	EXHAUST GRILLE
FD	FIRE DAMPER (W/ ACCESS DOOR)
MD	MOTOR OPERATED DAMPER
MUA	MAKE-UP AIR
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
RA	RETURN AIR
R	RETURN GRILLE
SA	SUPPLY AIR
S	SUPPLY GRILLE
TSP	TOTAL STATIC PRESSURE (IN. WG)
VD	VOLUME DAMPER
EQUIPMENT	
DDC	DIRECT DIGITAL CONTROL
EF	EXHAUST FAN
MERV	MINIMUM EFFICIENCY REPORTING VALUE
MUA	MAKE-UP AIR UNIT
RTU	ROOF TOP UNIT

DUCTWORK



GENERAL SYMBOLOGY



STATE OF KENTUCKY
MALLORY L. P. ANDERSON
36770
LICENSED
PROFESSIONAL ENGINEER

REVISION	
DATE	
DRAWN BY	MA
CHECKED BY	MA
APPROVED BY	MA

Meade County Road Department

MECHANICAL GENERAL NOTES AND LEGEND

Lincoln Trail

DATE:

SHEET X OF X

M-001

JOB#:

SCALE

STATE OF KENTUCKY
MALLORY L. P. ANDERSON
36770
LICENSED
PROFESSIONAL ENGINEER

AIR DEVICE SCHEDULE

MARK	MANUFACTURER	MODEL	MAX CFM	MODULE	MOUNTING	DUCT RUN OUT SIZE	REMARKS
S-1	PRICE	SCD	100	24X24	LAY-IN	6"Ø	1-6
S-2	PRICE	SCD	200	24X24	LAY-IN	8"Ø	1-6
S-3	PRICE	SCD	300	24X24	LAY-IN	10"Ø	1-6
S-4	PRICE	SCD	450	24X24	LAY-IN	12"Ø	1-6
R-1	PRICE	80	150	24X24	LAY-IN	8x8	1-3,5,6
R-2	PRICE	80	250	24X24	LAY-IN	10x10	1-3,5,6
R-3	PRICE	80	600	24X24	LAY-IN	12x12	1-3,5,6

REMARKS:
1. PROVIDE WITH WHITE FINISH
2. COORDINATE AIR DEVICE LOCATIONS WITH REFLECTED CEILING PLANS PRIOR TO INSTALLATION. LIGHTING HAS PRIORITY OVER HVAC.
3. PROVIDE SQUARE TO ROUND ADAPTER AS REQUIRED.
4. PROVIDE WITH INSULATED BACK.
5. N.C. SHALL NOT EXCEED 20.
6. PROVIDE WITH APPROPRIATE ACCESSORIES FOR MOUNTING TYPE INDICATED. REFER TO RCP FOR CEILING TYPE.
OTHER ACCEPTABLE MANUFACTURERS INCLUDE: TITUS, NAILOR. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

HIGH VOLUME LOW SPEED FAN SCHEDULE

MARK	MANUFACTURER	MODEL	DIAMETER (FT)	WEIGHT (LBS)	AIRFLOW (CFM)	DRIVE TYPE	RPM	ELECTRICAL			REMARKS
								V/Ø/Hz	WATTS	FLA	
HVLS-1	GREENHECK	DC-5-12-13LV	12	140	44,114	DIRECT	91	230/1/60	175	5	ALL
HVLS-2	GREENHECK	DC-5-12-13LV	12	140	44,114	DIRECT	91	230/1/60	175	5	ALL

REMARKS:
1. HEAVY DUTY FRAME WITH PROTECTIVE FINISH AND EXTRUDED ALUMINUM AIRFOILS.
2. PROVIDE WITH REMOTE-MOUNTED, WIRED COMBINATION ON/OFF SWITCH AND SPEED CONTROLLERS. REFER TO FLOOR PLANS FOR LOCATIONS.
3. HIGH EFFICIENCY DIRECT DRIVE MOTOR.
4. FACTORY MOUNTED AND WIRED VARIABLE FREQUENCY DRIVE.
5. HEAVY DUTY SAFETY RESTRAINT CABLE.
6. OWNER TO SELECT COLOR FINISH.
7. PROVIDE WITH 72" DOWNROD. COORDINATE MOUNTING HEIGHT WITH DUCTWORK, STRUCTURE, LIGHT FIXTURES, ETC.
8. PROVIDE WITH DISCONNECT SWITCH.
9. PROVIDE WITH LOW VOLTAGE, NORMALLY CLOSED FIRE ALARM RELAY.
OTHER ACCEPTABLE MANUFACTURERS INCLUDE: CARNES, COOK. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

VENTILATION SCHEDULE - 2015 IMC

UNIT	AREA SERVED	AREA (SQ FT)	ROOM TYPE	CFM/SQ FT	NO. OF OCCUPANTS	CFM/PERSON	EXHAUST AIR (CFM)	TOTAL OUTSIDE AIR REQUIRED (CFM)	TOTAL OUTSIDE AIR PROVIDED (CFM)
AHU-1/CU-1	BREAKROOM	517	OFFICE SPACES	0.06	10	5	-	55	240
	ENTRANCE	114	MAIN ENTRY LOBBY	0.06	1	5	-	9	
	HALLWAY	273	CORRIDOR	0.06	-	-	-	14	
	MECHANICS LIBRARY	120	STORAGE	0.12	-	-	-	14	
	RECEPTION	194	OFFICE SPACES	0.06	2	5	-	22	
	SUPERVISOR	228	OFFICE SPACES	0.06	2	5	-	24	
	RESTROOM	78	TOILET ROOM	-	-	-	70	-	
	RESTROOM	59	TOILET ROOM	-	-	-	70	-	
	RESTROOM	66	TOILET ROOM	-	-	-	70	-	
	RESTROOM	132	TOILET ROOM	-	-	-	70	-	
	SHOWER	239	TOILET ROOM	-	-	-	70	-	
	SAFE ROOM	169	OFFICE SPACES	0.06	5	5	-	35	
	TOOL ROOM	706	OFFICE SPACES	0.06	4	5	-	62	
-	WAREHOUSE	12,779	NATURAL VENTILATION						

GAS FIRED UNIT HEATER SCHEDULE

MARK	MANUFACTURER	MODEL	CFM	LP GAS INFORMATION		FAN MOTOR ELECTRICAL			FLUE SIZE	REMARKS
				INPUT (MBH)	OUTPUT (MBH)	HP	RPM	V/Ø/Hz		
GH-1	MODINE	PDP-250	3700	250	205	1/3	1625	115/1/60	6"	ALL
GH-2	MODINE	PDP-250	3700	250	205	1/3	1625	115/1/60	6"	ALL
GH-3	MODINE	PDP-150	2180	150	124	1/8	1625	115/1/60	4"	ALL

REMARKS:
1. PROVIDE FLUE AS REQUIRED BY MANUFACTURER AND ROUTE PER PLANS
2. PROVIDE WALL MOUNTED THERMOSTAT
3. INSTALL AS HIGH AS POSSIBLE. MOUNT PER MANUFACTURER'S REQUIREMENTS.
4. PROVIDE WITH NATURAL GAS TO LP FIELD CONVERTER KIT.
OTHER ACCEPTABLE MANUFACTURERS INCLUDE: TRANE, REZNOR, STERLING. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

LOUVER SCHEDULE

MARK	MANUFACTURER	MODEL	INTAKE / RELIEF	SIZE			CFM	PRESSURE DROP (IN)	FREE AREA (SQ FT)	VELOCITY (FPM)	REMARKS
				WIDTH	HEIGHT	DEPTH					
L-1	GREENHECK	ECD-601	INTAKE	48	48	6	5980	0.094	7.32	817	1-6
L-2	GREENHECK	ECD-601	INTAKE	48	48	6	5616	0.083	7.32	767	1-6
L-3	GREENHECK	ESD-635	INTAKE	16	16	6	350	0.06	0.6	613	1,3,7

REMARKS:
1. LOUVER COLOR SELECTED BY ARCHITECT
2. COORDINATE ALL LOUVER LOCATIONS AND SIZES WITH PEMB.
3. ALUMINUM CONSTRUCTION WITH DRAINABLE BLADES
4. MAXIMUM NC LEVEL OF 25
5. COMBINATION LOUVER-DAMPER. PROVIDE WITH FACTORY MOUNTED ACTUATOR INTERLOCKED WITH EXHAUST FAN OPERATION.
6. COORDINATE 120V ACTUATOR REQUIREMENTS WITH ELECTRICAL CONTRACTOR.
7. PROVIDE WITH MOTORIZED DAMPER. INTERLOCK WITH EF-10 OPERATION.
OTHER ACCEPTABLE MANUFACTURERS INCLUDE: RUSKIN, GREENHECK. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

WOOD FIRED BOILER SCHEDULE (ALTERNATE BID)

MARK	MANUFACTURER	MODEL	SERVICE	HEATING OUTPUT (BTUH)	WATER CAP. (GALLONS)	TURBO FAN (CFM)	COMBUSTION FAN (CFM)	CHIMNEY SIZE
WB-1	CROWN ROYAL	7350MP	RADIANT FLOOR SYSTEM	350,000	260	60	150	6"

EXHAUST FAN SCHEDULE

MARK	MANUFACTURER	MODEL	CFM	ESP (IN H20)	DRIVE TYPE	RPM	ELECTRICAL				REMARKS
							V/Ø/Hz	HP	FLA	MOCP	
EF-1	GREENHECK	SP-A110	75	0.3	DIRECT	950	115/1/60	-	0.2	15	1,2,5,6
EF-2	GREENHECK	SP-A110	75	0.3	DIRECT	950	115/1/60	-	0.2	15	1,2,5,6
EF-3	GREENHECK	SP-A110	75	0.3	DIRECT	950	115/1/60	-	0.2	15	1,2,5,6
EF-4	GREENHECK	SP-A110	75	0.3	DIRECT	950	115/1/60	-	0.2	15	1,2,5,6
EF-5	GREENHECK	SP-A110	75	0.3	DIRECT	950	115/1/60	-	0.2	15	1,2,5,6
EF-6	GREENHECK	RBUMO-2H54-30	23,760	0.2	BELT	455	230/1/60	3	17	-	1-4,8,9
EF-7	GREENHECK	RBUMO-2H54-30	23,760	0.2	BELT	455	230/1/60	3	17	-	1-4,8,9
EF-8	GREENHECK	RBUMO-2H54-30	23,760	0.2	BELT	455	230/1/60	3	17	-	1-4,8,9
EF-9	GREENHECK	RBUMO-1L36-15	11,240	0.2	BELT	542	230/1/60	1-1/2	10	-	1-4,8,9
EF-10	GREENHECK	CSP-A510-VG	350	0.5	DIRECT	1,193	115/1/60	-	3	15	1,2,6,7

REMARKS:
1. PROVIDE WITH UNIT MOUNTED DISCONNECT
2. PROVIDE WITH UNIT MOUNTED SPEED CONTROL
3. ALL EXHAUST FAN TO OPERATE SIMULTANEOUSLY VIA CARBON MONOXIDE AND NITROGEN DIOXIDE SENSORS.
4. PROVIDE WITH MANUAL OVERRIDE OPERATION BUTTON OPERATION.
5. FAN TO OPERATE WITH LIGHTS.
6. MOUNT FROM STURCTURE WITH VIBRATION ISOLATION HARDWARE.
7. PROVIDE WITH THERMOSTAT. FAN TO OPERATE BASED ON THERMOSTAT. INTERLOCK WITH MOTORIZED DAMPER FOR L-3.
8. PROVIDE WITH RDIGE ROOF CURB.
9. INTERLOCK OPERATION WITH LOUVERS.
OTHER ACCEPTABLE MANUFACTURERS INCLUDE: CARNES, COOK. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

SPLIT SYSTEM SCHEDULE

MARK		AREA SERVED	MANUFACTURER	MODEL (IDU)	MODEL (ODU)	NOMINAL TONNAGE	SUPPLY FAN		SEER2	COOLING CAPACITY @ 95/75F (BTU/hr)	SENS. COOLING CAPACITY @ 95/75F (BTU/hr)	LP GAS HEATING		ELECTRICAL - AHU			ELECTRICAL - HP/CU			REMARKS
							SUPPLY AIRFLOW (CFM)	OUTSIDE AIR (CFM)				INPUT (MBH)	OUTPUT (MBH)	V/Ø/Hz	MCA	MOCP	V/Ø/Hz	MCA	MOCP	
IDU-1	ODU-1	IT ROOM	CARRIER	45MHHAC09	37MHRAC09	0.75	250	-	20.5	9,500	-	-	-	-	-	-	208/1/60	9.9	15	1-7
AHU-1	CU-1	OFFICES	FRASER - JOHNSTON	CTF48C5CFS1 / TM8V080	XC648E2S11	4	1600	240	15.0	46	29	80	63	115/1/60	13	15	208/1/60	27.3	45	1-6, 8-11

REMARKS:
1. FURNISH WITH PROGRAMMABLE WIRED REMOTE CONTROLLER / THERMOSTAT.
2. E.C. TO PROVIDE AND INSTALL DISCONNECT.
3. SINGLE POINT POWER CONNECTION.
4. PROVIDE WITH WATER-LEVEL MONITORING DEVICE (FLOAT SWITCH). DEVICE SHALL BE INSTALLED INSIDE THE PRIMARY DRAIN PAN AND SHALL BE INTERLOCKED TO SHUT DOWN UNIT.
5. PROVIDE LIQUID LINE SPECIALTIES INCLUDING FILTER DRIER, SIGHT GLASS, TXV, SOLENOID VALVE, 24V 1ph CONTROL WIRE BY CONTROLS CONTRACTOR.
6. CONDENSATE PIPING ROUTED AS NOTED ON PLANS.
7. PROVIDE WITH LOW AMBEINT COOLING CAPIBILITY DOWN TO 0 DEG AMBIENT.
8. VERTICAL AIR HANDLER WITH GAS HEAT. PROVIDE WITH LP CONVERSION KIT.
9. PROVIDE WITH INSULATED, DOUBLE WALL GALVANIZED OR STAINLESS STEEL DRAIN PAN.
10. PROVIDE WITH 2" FILTER.
11. PROVIDE WITH COMBUSTION AIR / FLUE VENT PIPING.
REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. OTHER ACCEPTABLE MANUFACTURERS INCLUDE : MITSUBISHI, LG, DAIKIN, TRANE, AAON, JCI, CARRIER

REVISION
DATE
DRAWN BY CE
CHECKED BY CA
APPROVED BY CA

Meade County Road Department

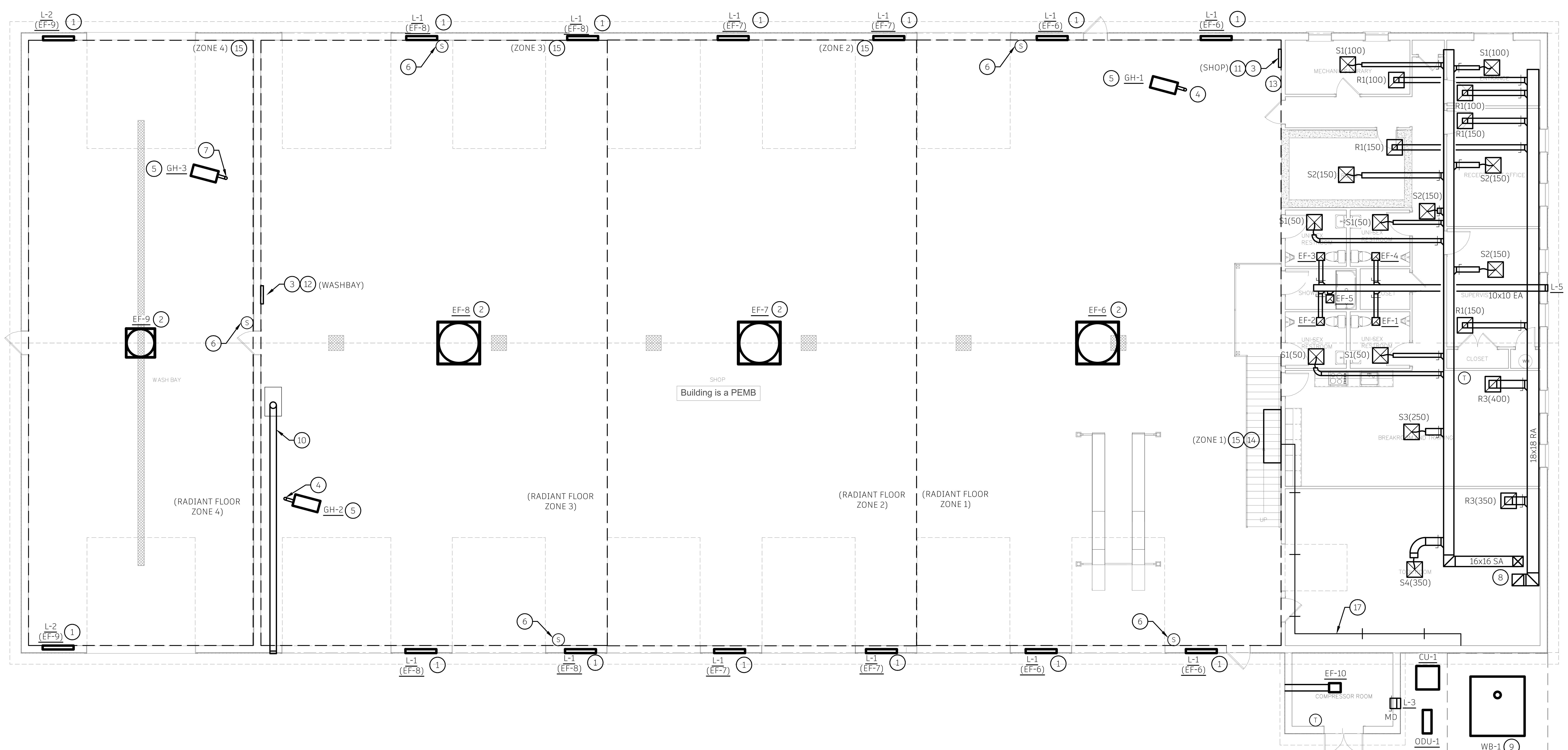
MECHANICAL SCHEDULES

Lincoln Trail Area Development District

DATE:
SHEET X OF X

M-002

JOB#:
SCALE



1 MECHANICAL PLAN
1/8" = 1'-0"

KEYNOTES:

1. LOUVER OPERATION INTERLOCKED WITH EXHAUST FAN OPERATION. PARENTHESIS DENOTES ASSOCIATED EXHAUST FAN.
2. EXHAUST FANS SHALL OPERATE BASED ON CARBON MONOXIDE AND NITROGEN DIOXIDE SENSORS, OR USER INPUT. REFER TO SPECIFICATIONS SHEET FOR SEQUENCING INFORMATION. CONTROLS CONTRACTOR TO PROVIDE CONTROLS AS REQUIRED FOR FULL OPERATION OF SEQUENCE, INCLUDING MASTER CONTROL PANEL AND ARMSTRONG MONITORING SYSTEM. ASSOCIATED LOUVERS SHALL BE OPENED DURING EXHAUST FAN OPERATION.
3. CONTROL PANEL AND AUDIO/VISUAL ALARM FOR EXHAUST FANS, LOUVERS AND ARMSTRONG SENSORS. REFER TO SEQUENCES OF OPERATION. ONE PANEL FOR WASH BAY, ONE PANEL FOR SHOP.
4. 6"∅ FLUE VENT ROUTED THROUGH ROOF. TERMINATE PER MANUFACTURER'S RECOMMENDATIONS.
5. HEATER SUPPORTED FROM STRUCTURE ABOVE PER MANUFACTURER'S REQUIREMENTS.
6. LOCATION OF ARMSTRONG COMBINATION CO/NO2 SENSOR. SENSOR LOCATED APPROXIMATELY 60" A.F.F.
7. 5"∅ FLUE VENT ROUTED THROUGH ROOF. TERMINATE PER MANUFACTURER'S RECOMMENDATIONS.
8. SUPPLY AND RETURN DUCTWORK ROUTED TO AHU-1 ON MEZZANINE ABOVE.
9. WOOD-BURNING BOILER PART OF ALTERNATE BID. MAINTAIN PROPER CLEARANCES PER MANUFACTURER.
10. 10" STACK FOR POWER WASHER. PROVIDE DUCTWORK, ROUTING, AND TERMINATION PER MANUFACTURER'S REQUIREMENTS. VERIFY FINAL LOCATION OF PRESSURE WASHER PRIOR TO INSTALLATION.
11. LOCATION OF (3) FRANKLIN BAS MOTOR STARTERS, FOR EF-6, EF-7 AND EF-8.
12. LOCATION OF (1) FRANKLIN BAS MOTOR STARTER FOR EF-9.
13. LOCATION OF CONTROLS FOR HVLS-1 AND HVLS-2.
14. APPROXIMATE LOCATION OF RADIANT FLOOR SYSTEM CONTROL PANEL/SKID. PIPING ROUTED IN SLAB FROM BOILER. PART OF ALTERNATE BID.
15. APPROXIMATE LOCATION OF RADIANT FLOOR SYSTEM MANIFOLD AND ASSOCIATED THERMOSTAT. PART OF ALTERNATE BID.
16. RADIANT FLOOR SYSTEM INCLUDES 5/8" TUBING ON 12" CENTERS. SIZE OF BOILER AND ASSOCIATED RADIANT FLOOR SYSTEM BASED ON UNDERSLAB INSULATION R5 AND WALLS/ROOF INSULATION R13. FINAL EQUIPMENT SHALL BE VERIFIED WITH PEMB INSULATION VALUES. PART OF ALTERNATE BID.
17. 1-1/2 PEX PIPING WITH RUBBER INSULATION ROUTED TO/FROM BOILER AND RADIANT FLOOR SYSTEM CONTROL SKID WITHIN NON-PERFORATED CORRUGATED PIPING. PART OF ALTERNATE BID.

DATE	REVISION

DRAWN BY CE
CHECKED BY CA
APPROVED BY CA

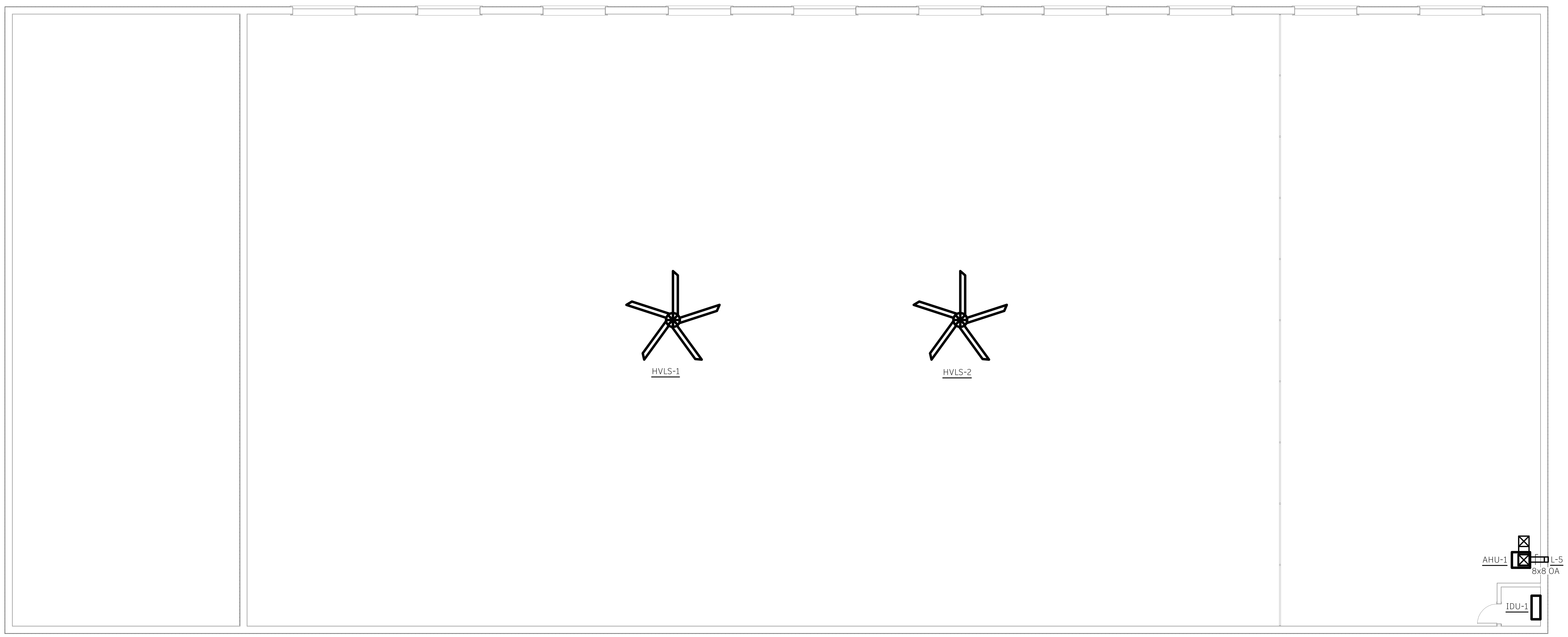
Meade County Road Department

MECHANICAL PLAN

Lincoln Trail Area Development District

M-101

DATE:
SHEET X OF X
JOB#:
SCALE



1 MECHANICAL PLAN - MEZZANINE
1/8" = 1'-0"

STATE OF KENTUCKY
MALLORY L. P. ANDERSON
36770
LICENSED PROFESSIONAL ENGINEER

REVISION	DATE

DRAWN BY	CE
CHECKED BY	CA
APPROVED BY	CA

Meade County Road Department

MECHANICAL PLAN

Lincoln Trail Area Development District

DATE:	SHEET X OF X
M-101	
JOB#:	SCALE

SECTION 23 01 00 - GENERAL PROVISIONS FOR MECHANICAL

PART 1 - GENERAL

1.1 SUMMARY

A. THIS SECTION COVERS THE GENERAL ARRANGEMENT OF THE MECHANICAL SYSTEMS AND RELATED ITEMS TO COMPLETE THE WORK AS SHOWN ON THE DRAWINGS AND AS SPECIFIED HEREIN.

B. THE GENERAL AND SPECIAL CONDITIONS AND ALL OTHER CONTRACT DOCUMENTS ARE APPLICABLE TO WORK UNDER THIS SECTION OF THE SPECIFICATIONS. ALL THE WORK UNDER THIS SECTION OF THE SPECIFICATIONS SHALL BE GOVERNED BY ANY ALTERNATES AND UNIT PRICES CALLED FOR IN THE FORM OF PROPOSAL INSOFAR AS THEY AFFECT THIS PORTION OF THE WORK.

C. THE MECHANICAL CONTRACTOR, HEREIN REFERRED TO AS "CONTRACTOR" UNLESS NOTED OTHERWISE, SHALL FAMILIARIZE HIMSELF WITH THE WORK OF ALL OTHER TRADES, GENERAL TYPE CONSTRUCTION AND THE RELATIONSHIP OF HIS WORK TO OTHER SECTIONS. HE SHALL EXAMINE ALL WORKING DRAWINGS, SPECIFICATIONS AND CONDITIONS AFFECTING HIS WORK. THE CONTRACTOR SHALL VISIT THE PREMISES AND THOROUGHLY FAMILIARIZE HIMSELF WITH ALL DETAILS OF THE WORK AND WORKING CONDITIONS, VERIFY ALL DIMENSIONS IN THE FIELD AND ADVISE THE ENGINEER OF ANY DISCREPANCY BEFORE PERFORMING ANY WORK.

D. THE WORK SHALL INCLUDE COMPLETE TESTING OF ALL EQUIPMENT AND PIPING AT THE COMPLETION OF THE WORK AND MAKING ANY MINOR CONNECTION CHANGES OR ADJUSTMENTS NECESSARY FOR THE PROPER FUNCTIONING OF THE SYSTEM AND EQUIPMENT.

E. THE CONTRACTOR SHALL PERFORM ALL NECESSARY TEMPORARY WORK DURING CONSTRUCTION.

F. WORK UNDER THIS SECTION SHALL CONFORM TO ALL GOVERNING CODES, ORDINANCES AND REGULATIONS OF THE CITY, COUNTY AND STATE.

G. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ERRORS IN FABRICATION, FOR THE CORRECT FITTING, INSTALLATION AND ERECTION OF THE VARIOUS MECHANICAL SYSTEMS AS SHOWN ON THE DRAWINGS.

H. ANY MATERIALS, LABOR, EQUIPMENT, OR SERVICES NOT MENTIONED SPECIFICALLY HEREIN WHICH MAY BE NECESSARY TO COMPLETE ANY PART OF THE MEP/FP SYSTEMS IN A SUBSTANTIAL MANNER AND IN COMPLIANCE WITH THE REQUIREMENTS STATED, IMPLIED, OR INTENDED IN THE PLANS AND/OR SPECIFICATIONS, SHALL BE INCLUDED IN THE BID AS PART OF THIS CONTRACT.

I. THE CONTRACTOR SHALL HOLD HARMLESS AND INDEMNIFY THE ENGINEER, ARCHITECT, EMPLOYEES, OFFICERS, AGENTS AND CONSULTANTS FROM ALL CLAIMS, LOSS, DAMAGE, ACTIONS, CAUSES OF ACTIONS, EXPENSE AND/OR LIABILITY RESULTING FROM, BROUGHT FOR, OR ON ACCOUNT OF ANY PERSONAL INJURY OR PROPERTY DAMAGE RECEIVED OR SUSTAINED BY ANY PERSON, PERSONS, (INCLUDING THIRD PARTIES), OR ANY PROPERTY GROWING OUT OF, OCCURRING, OR ATTRIBUTABLE TO ANY WORK PERFORMED UNDER OR RELATED TO THIS CONTRACT, RESULTING IN WHOLE OR IN PART FROM THE NEGLIGENCE OF THE CONTRACTOR, ANY SUB-CONTRACTOR, ANY EMPLOYEE, AGENT OR REPRESENTATIVE.

1.2 SCOPE

A. THIS BRANCH OF THE WORK INCLUDES COORDINATION WITH ALL REASONABLE UTILITY COMPANIES; AGENCY REVIEW FEES AND ALL INSPECTION FEES; ALL LABOR, MATERIALS, TOOLS, EXCAVATION AND BACKFILL AND ALL EQUIPMENT NECESSARY FOR THE INSTALLATION OF ALL HEATING, VENTILATING AND AIR CONDITIONING, SYSTEM AS SHOWN ON THE DRAWINGS AND SPECIFICATIONS AND/OR AS REQUIRED FOR COMPLETE AND OPERATING SYSTEMS. THE WORK SHALL INCLUDE STARTING, BALANCING, AND THE NECESSARY AND REQUIRED TESTS TO INSURE THE PROPER OPERATION OF THE COMPLETE SYSTEM.

B. IN GENERAL (AS A MINIMUM) ALL MATERIALS AND EQUIPMENT MUST BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS; AND PROVIDED WITH ALL REQUIRED CONTROLS, INTERNAL FUSING, RELAYS, PIPING CONNECTIONS, ELECTRICAL CONNECTIONS, DUCTWORK CONNECTIONS, ETC., TO PROVIDE FOR COMPLETE AND OPERABLE SYSTEMS.

C. THE ARCHITECT AND ENGINEER DO NOT DEFINE THE SCOPE OF INDIVIDUAL TRADES, SUB-CONTRACTORS, MATERIAL SUPPLIERS AND VENDORS. ANY SHEET NUMBERING SYSTEM OR SPECIFICATION NUMBERING SYSTEM USED WHICH IDENTIFIES DISCIPLINES IS SOLELY FOR THE ARCHITECT AND ENGINEER'S CONVENIENCE AND IS NOT INTENDED TO DEFINE A SUB-CONTRACTOR'S SCOPE OF WORK. INFORMATION REGARDING INDIVIDUAL TRADES, SUB-CONTRACTORS, MATERIAL SUPPLIERS AND VENDORS MAY BE DETAILED, DESCRIBED, AND INDICATED AT DIFFERENT LOCATIONS THROUGHOUT THE CONTRACT DOCUMENTS. NO CONSIDERATION WILL BE GIVEN TO REQUESTS FOR CHANGE ORDERS FOR FAILURE TO OBTAIN AND REVIEW THE COMPLETE SET OF CONTRACT DOCUMENTS WHEN PREPARING BIDS, PRICES, AND QUOTATIONS. UNLESS STATED OTHERWISE, THE SUBDIVISION AND ASSIGNMENT OF WORK UNDER THE VARIOUS SECTIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR HOLDING THE PRIME CONTRACT.

D. IT IS THE RESPONSIBILITY OF THE BIDDER TO COMPLETELY REVIEW THE CONTRACT DOCUMENTS. ANY INTERPRETATION AS TO DESIGN INTENT OR SCOPE SHALL BE PROVIDED BY THE ENGINEER / ARCHITECT. SHOULD AN INTERPRETATION BE REQUIRED, THE BIDDER SHALL REQUEST A CLARIFICATION NOT LESS THAN TEN (10) DAYS PRIOR TO THE SUBMISSION OF THE PROPOSAL SO THAT THE CONDITION MAY BE CLARIFIED BY ADDENDUM. IN THE EVENT OF ANY CONFLICT, DISCREPANCY, OR INCONSISTENCY DEVELOPS; THE INTERPRETATION OF THE ENGINEER SHALL BE FINAL.

E. THE CONTRACTOR SHALL GIVE WRITTEN NOTICE OF ANY MATERIALS OR APPARATUS BELIEVED INADEQUATE OR UNSUITABLE; IN VIOLATION OF LAWS, ORDINANCES, CODES, RULES, OR REGULATIONS OF AUTHORITIES HAVING JURISDICTION; AND ANY NECESSARY ITEMS OF WORK OMITTED A MINIMUM OF TEN (10) DAYS PRIOR TO BID. IN THE ABSENCE OF SUCH WRITTEN NOTICE AND BY THE ACT OF SUBMITTING A BID, IT SHALL BE UNDERSTOOD THAT THE CONTRACTOR HAS INCLUDED THE COST OF ALL REQUIRED ITEMS IN THE BID, AND THAT WILL BE RESPONSIBLE FOR THE APPROVED SATISFACTORY FUNCTIONING OF THE ENTIRE SYSTEM WITHOUT EXTRA COMPENSATIONS.

F. AS-BUILT DRAWINGS

F.A. THE CONTRACTOR SHALL DELIVER TO THE ENGINEER AT THE COMPLETION OF THE WORK, ONE (1) PRINT OF "AS-BUILT" DRAWINGS, SHOWING LEGIBLY AND ACCURATELY, PLUMBING AND PIPING SYSTEMS WITH EQUIPMENT LOCATIONS SHOWN AS ACTUALLY INSTALLED. CHANGES IN ORIGINAL PLANS SHALL BE NEATLY SHOWN IN RED PENCIL. EACH PRINT SHALL BE SIGNED BY THE SUB-CONTRACTOR WHO HAS DONE THE WORK.

F.B. DURING CONSTRUCTION, THE CONTRACTOR SHALL RETAIN A SET OF BLUE LINE DRAWINGS ON THE SITE FOR RECORDING ALL CHANGES. THESE DRAWINGS SHALL BE AVAILABLE FOR INSPECTION BY THE ENGINEER.

F.C. OPERATION AND MAINTENANCE DATA: SUBMIT (3) SETS OF OPERATING AND MAINTENANCE MANUALS PRIOR TO THE COMPLETION OF THE PROJECT. PROVIDE ON-SITE DEMONSTRATION OF ALL SYSTEMS TO OWNER AFTER SYSTEMS ARE FULLY OPERATIONAL. O&M MANUALS SHALL INCLUDE ALL COMPONENTS (DIFFUSERS, VALVES, ETC.) AS WELL AS SYSTEM DESCRIPTIONS OF ALL SYSTEMS WITH FLOW DIAGRAMS, WIRING DIAGRAMS, WRITTEN WARRANTEES, RECOMMENDED SPARE PARTS AND ROUTINE MAINTENANCE REQUIREMENTS WITH RECOMMENDED INTERVALS FOR ALL MOVING EQUIPMENT AND CONTROLS

1.3 DRAWINGS AND SPECIFICATIONS

A. CONTRACT DRAWINGS FOR WORK UNDER THIS SECTION ARE IN PART DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF WORK AND INDICATE THE GENERAL ARRANGEMENT OF EQUIPMENT, PIPING AND THE APPROXIMATE SIZE AND LOCATION OF EQUIPMENT AND OUTLETS. THE CONTRACTOR SHALL FOLLOW THESE DRAWINGS IN LAYING OUT HIS WORK AND SHALL VERIFY SPACES IN WHICH HIS WORK WILL BE INSTALLED, INDICATING TO THE ENGINEER WHERE ANY CONFLICTS OR OVERLAPPING OF SYSTEMS OCCUR. ANY ITEM OF WORK NOT CLEARLY INCLUDED, SPECIFIED AND/OR SHOWN, ERRORS OR CONFLICT BETWEEN PLANS (MECHANICAL, ARCHITECTURAL, STRUCTURAL OR ELECTRICAL), SPECIFICATIONS, CODES AND FIELD CONDITIONS, SHALL BE CLARIFIED BY A WRITTEN REQUEST TO THE ARCHITECT BY THE BIDDER BEFORE BIDDING; OTHERWISE, THE BIDDER SHALL, AT HIS OWN EXPENSE, SUPPLY THE PROPER LABOR AND MATERIALS TO INCLUDE THESE ITEMS OF WORK AND TO MAKE GOOD ANY DAMAGES OR DEFECTS IN HIS WORK CAUSED BY SUCH ERROR, OMISSION OR CONFLICT. UNDER NO CIRCUMSTANCES SHALL A CONTRACTOR SCALE THE DRAWINGS FOR THE LOCATION OF EQUIPMENT AND WORK.

B. IN THE EVENT THERE IS A CONFLICT WITHIN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY. IF A CLARIFICATION IS NOT GIVEN, THE CONTRACTOR SHALL BID THE MORE STRINGENT OF THE TWO REQUIREMENTS.

C. SHOULD CONFLICT, OVERLAP OR DUPLICATION OF WORK BETWEEN THE VARIOUS TRADES BECOME EVIDENT, THIS SHALL BE CALLED TO THE ATTENTION OF THE ENGINEER. NEITHER TRADE SHALL ASSUME TO BE RELIEVED OF THE WORK WHICH IS SPECIFIED UNDER THEIR BRANCH UNTIL INSTRUCTIONS IN WRITING ARE RECEIVED FROM THE ENGINEER.

D. WHERE JOB CONDITIONS REQUIRE REASONABLE CHANGES IN INDICATED LOCATIONS AND ARRANGEMENT, PROPOSED DEPARTURES SHALL BE SUBMITTED WITH DETAILED DRAWINGS TO THE ENGINEER FOR APPROVAL BEFORE ANY OF THE PROPOSED WORK IS COMMENCED. ALL APPROVED DEPARTURES SHALL BE MADE AT NO ADDITIONAL COST TO THE OWNER.

E. THE DRAWINGS AND THE SPECIFICATIONS ARE INTENDED TO INDICATE COMPLETE AND WORKING SYSTEMS, UNLESS SPECIFICALLY INDICATED TO THE CONTRARY. THE WORK INCLUDES THE FURNISHING, INSTALLING, AND CONNECTING OF A COMPLETE WORKING INSTALLATION IN EACH CASE TO THE FULL EXTENT SET FORTH IN THE DRAWINGS AND HEREIN SPECIFIED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETE FUNCTIONING SYSTEM, UNLESS SPECIFICALLY NOTED OTHERWISE.

F. THE DRAWINGS AND SPECIFICATIONS CONSTITUTE THE CONTRACT DOCUMENTS AND SHALL BE CONSIDERED AS COOPERATIVE. WORK AND MATERIAL INCLUDED IN EITHER, THOUGH NOT MENTIONED IN BOTH, SHALL BE A PART OF THE WORK TO BE ACCOMPLISHED AND SHALL BE CARRIED OUT COMPLETELY IN AS THOROUGH MANNER AS IF COVERED BY BOTH. ALL ITEMS SHOWN ON THE DRAWINGS AND/OR LISTED IN THE SPECIFICATIONS SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR UNLESS SPECIFICALLY NOTED THAT IT WILL BE PROVIDED AND/OR INSTALLED BY OTHERS. IN THE EVENT THERE IS A CONFLICT WITHIN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY. IF A CLARIFICATION IS NOT GIVEN, THE CONTRACTOR SHALL BID THE MORE STRINGENT OF THE TWO REQUIREMENTS.

G. BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS AND ACCESSORIES THAT MAY BE REQUIRED. THE CONTRACTOR SHALL CAREFULLY INVESTIGATE THE STRUCTURAL AND FINISH CONDITIONS AFFECTING ALL HIS WORK AND SHALL ARRANGE SUCH WORK, ACCORDINGLY, FURNISHING SUCH FITTINGS, PIPE, TRAPS, VALVES, AND ACCESSORIES AS MAY BE REQUIRED TO MAKE A FUNCTIONAL INSTALLATION AT NO ADDITIONAL COST TO THE OWNER..

H. EACH CONTRACTOR SHALL REFER TO THE ARCHITECTURAL AND STRUCTURAL DRAWINGS AND SPECIFICATIONS FOR THE GENERAL CONSTRUCTION OF THE BUILDING, FOR FLOOR AND CEILING HEIGHTS, FOR LOCATION OF WALLS, PARTITIONS, BEAMS ETC., AND SHALL BE GUIDED ACCORDINGLY FOR THE SETTING OF ALL SLEEVES AND EQUIPMENT.

I. UNDER NO CIRCUMSTANCES SHALL A CONTRACTOR SCALE THE DRAWINGS FOR THE LOCATIONS OF EQUIPMENT AND WORK.

J. COORDINATION: CONFER WITH ALL OTHER TRADES RELATIVE TO LOCATION OF ALL APPARATUS AND EQUIPMENT TO BE INSTALLED AND SELECT LOCATIONS SO AS NOT TO CONFLICT WITH OR HINDER THE PROGRESS OF THE WORK OF OTHER SECTIONS. WORK INSTALLED THAT CREATES INTERFERENCE OR RESTRICTS ACCESS REQUIRED BY CODE (INCLUDING CLEARANCES TO ELECTRICAL COMPONENTS) OR TO CONDUCT MAINTENANCE AND/OR ADJUSTMENTS SHALL BE MODIFIED AT ADDITIONAL COST TO THE OWNER.

K. CODES, STANDARDS, AUTHORITIES AND PERMITS: CODES, LAWS AND ORDINANCES PROVIDE A BASIS FOR THE MINIMUM INSTALLATION CRITERIA. THESE DRAWINGS AND SPECIFICATIONS ILLUSTRATE THE SCOPE REQUIRED FOR THIS PROJECT, WHICH MAY EXCEED MINIMUM CODE, LAW AND STANDARDS CRITERIA. GIVE NOTICES, FILE PLANS, OBTAIN PERMITS AND LICENSES, PAY FEES AND BACKCHARGES AND OBTAIN NECESSARY APPROVALS FROM AUTHORITIES HAVING JURISDICTION AS REQUIRED FOR THE EXECUTION OF ALL WORK ASSOCIATED WITH THIS PROJECT. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITIONS OF: 1) THE STATE BUILDING, ELECTRICAL, MECHANICAL, AND ENERGY CODES, 2) SMACNA, NFPA, ANSI/ASHRAE, ASME, UL, AND NEMA STANDARDS, 3) ALL OTHER APPLICABLE CODES, REGULATIONS, STANDARDS AND LAWS OF LOCAL, STATE AND FEDERAL GOVERNMENT AND OTHER AUTHORITIES HAVING JURISDICTION, AND 4) APPLICABLE BASE BUILDING STANDARDS AND SPECIFICATIONS.

1.4 EXAMINATION OF SITE

A. BIDDERS SHALL VISIT THE SITE BEFORE SUBMITTING PROPOSALS TO SATISFY THEMSELVES AS TO THE NATURE AND SCOPE OF THE WORK AND ANY DIFFICULTIES ATTENDING TO THE EXECUTION.

B. THE SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE. LATER CLAIMS FOR LABOR, EQUIPMENT, MATERIALS, ETC., REQUIRED FOR DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE, WILL NOT BE RECOGNIZED.

1.5 CUTTING AND PATCHING

A. ALL CUTTING AND PATCHING REQUIRED IN CONNECTION WITH THE INSTALLATION OF THIS WORK, AND WORK DUE TO ERRORS, DEFECTIVE WORK, ILL-TIMED WORK, OR TARDINESS IN PROPERLY DESIGNATING SIZE AND LOCATION IN SUFFICIENT TIME OR BY FAILURE TO NOTIFY OTHER TRADES, SHALL BE DONE UNDER THIS SECTION, BUT ONLY IN THE MANNER DIRECTED BY THE ENGINEER SO AS TO PREVENT OR MINIMIZE DAMAGE TO INSTALLED WORK. DAMAGE AS A RESULT OF CUTTING FOR INSTALLATION, SHALL BE REPAIRED BY MECHANICS SKILLED IN THE TRADE INVOLVED, AT NO ADDITIONAL EXPENSE TO THE OWNER.

B. NO CUTTING OF STRUCTURAL MEMBERS WILL BE PERMITTED, EXCEPT WHEN PRIOR PERMISSION OF THE ENGINEER HAS BEEN OBTAINED. THIS WORK MUST CONFORM IN EVERY RESPECT TO THE SURROUNDING FINISH AND TO THE QUALITY OF WORKMANSHIP AND MATERIALS USED.

C. PIERCING OF ANY WATERPROOFING OR ROOFING SHALL BE DONE ONLY BY THE TRADE INVOLVED. AFTER THE PART PIERCING THE WATERPROOFING HAS BEEN SET IN PLACE, THE OPENING MADE FOR THIS PURPOSE SHALL BE FILLED AND MADE ABSOLUTELY WATERTIGHT TO THE SATISFACTION OF THE ENGINEER.

D. SEE SECTION: 230517 - SLEEVING, CUTTING, PATCHING AND REPAIRING - MECHANICAL

1.6 FIRE AND SMOKE-STOPPING

A. FIRE-STOPPING AND SMOKE-STOPPING SHALL BE PROVIDED AROUND ALL PIPING AND DUCTWORK PENETRATIONS OF FIRE RATED AND/OR SMOKE-RATED FLOORS, WALLS, CEILINGS, OR OTHER BARRIERS.

B. THE MATERIALS USED SHALL BE UL 263 OR UL 1479 CLASSIFIED AND MEET ASTM E814 STANDARDS AND BE RATED FOR ASSEMBLIES WHERE APPLIED.

C. CLEAN SURFACES TO BE IN CONTACT WITH PENETRATION SEAL MATERIALS, OF DIRT, GREASE, OIL, LOOSE MATERIALS, RUST, OR OTHER SUBSTANCES THAT MAY AFFECT PROPER FITTING, ADHESION, OR THE REQUIRED FIRE RESISTANCE.

D. INSTALL PENETRATION SEAL MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTION.

E. SEAL HOLES OR VOIDS MAY BE PENETRATIONS TO ENSURE AN EFFECTIVE FIRE AND/OR SMOKE BARRIER.

F. PROTECT MATERIALS FROM DAMAGE ON SURFACES SUBJECT TO TRAFFIC.

G. STOP INSULATION FLUSH WITH WALL ON INSULATED PIPE AND SEAL EDGES.

H. ALL EXPOSED PIPING PASSING THROUGH FLOORS, CEILINGS AND WALLS IN FINISHED AREAS SHALL BE FITTED WITH A CHROME PLATED ESCUTCHEON OF SUFFICIENT OUTSIDE DIAMETER TO AMPLY COVER THE SLEEVED OPENING AND AD INSIDE DIAMETER TO CLOSELY FIT THE PIPE AROUND WHICH IT IS INSTALLED.

I. GALVANIZED SHEET METAL COLLARS SHALL BE PROVIDED AROUND ALL DUCTS, EQUIPMENT, ETC., EXPOSED IN FINISHED AREAS. WHERE SUCH OPENINGS ARE FINISHED AND THE SPACE AROUND THE UNIT IS SMALL, THE COLLAR MAY BE OMITTED WITH THE APPROVAL OF THE ARCHITECT.

1.7 ACCESS PANELS

A. THE MECHANICAL CONTRACTOR SHALL FURNISH ALL OTHER ACCESS PANELS NEEDED FOR ACCESS TO VALVES, OPEN RECEPTACLES, VENTS, FIRE DAMPERS, MECHANICAL UNITS, ETC., IN INACCESSIBLE LOCATIONS INSTALLED UNDER THIS DIVISION OF THE WORK.

B. ACCESS PANELS SHALL HAVE A MINIMUM SIZE OF 12" X 12" AND SHALL BE CENTERED BENEATH EQUIPMENT FOR ACCESSIBILITY AND MAINTENANCE. ACCESS PANELS MUST BE OF ADEQUATE SIZE TO SERVICE, OBSERVE, REMOVE, AND MAINTAIN EQUIPMENT.

C. ACCESS PANELS SHALL BE EQUAL TO THE TYPES SPECIFIED UNDER THE ARCHITECTURAL SPECIFICATIONS. AS A MINIMUM THE ACCESS PANELS SHALL BE EQUIVALENT TO ACUDOR PRODUCTS, CENDREX, INC., MIFAB, INC., LANE-AIRE MANUFACTURING, 14 GAUGE WITH VANDAL PROOF LOCK AND FRAME AS SELECTED BY ARCHITECT. ACCESS PANELS SHALL BE FIRE RATED WHEN INSTALLED IN FIRE RATED CONSTRUCTION.

D. ACCESS PANELS SHALL HAVE A PRIMED WHITE FINISH.

E. CEILING TYPES

1. IN AREAS WITH SUSPENDED ACOUSTICAL TILE CEILINGS (INSTALLED ON EXPOSED METAL GRID SUSPENSION SYSTEM SO THAT THE TILE MAY BE READILY REMOVED), EQUIPMENT, VALVES, ETC., INSTALL ABOVE THESE CEILINGS WILL BE CONSIDERED TO BE ACCESSIBLE.

2. ALL PLASTERED CEILINGS OR CEILINGS HAVING CONCEALED SPLINE TYPE OF SUSPENSION SYSTEM WILL BE CONSIDERED AS NOT REMOVABLE FOR ACCESSIBILITY TO EQUIPMENT; THEREFORE, ACCESS PANELS WILL BE REQUIRED.

3. SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR THE TYPES OF CEILINGS THROUGHOUT THE BUILDING.

F. ACCESS PANELS SHALL BE INSTALLED BY SUB-CONTRACTOR SPECIALIZED IN ACCESS PANEL INSTALLATION.

1.8 WARRANTY AND SERVICE

A. ALL EQUIPMENT SHALL BE WARRANTED FOR A PERIOD OF AT LEAST ONE (1) YEAR FROM THE DATE OF INSTALL, AS EVIDENCED BY DATE OF SUBSTANTIAL COMPLETION FOR THE ENTIRE PROJECT.

1.10 SAFETY PRECAUTIONS: LIFE SAFETY AND ACCIDENT PREVENTION SHALL BE A PRIMARY CONSIDERATION. COMPLY WITH ALL OF THE SAFETY REQUIREMENTS OF THE OWNER AND OSHA THROUGHOUT THE ENTIRE CONSTRUCTION PERIOD OF THE PROJECT. FURNISH, PLACE AND MAINTAIN PROPER GUARDS AND ANY OTHER NECESSARY CONSTRUCTION REQUIRED TO SECURE SAFETY OF LIFE AND PROPERTY.

SECTION 23 05 48 - VIBRATION CONTROL FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

A. THIS SPECIFICATION INCLUDES VIBRATION ISOLATION, EQUIPMENT BALANCING REQUIREMENTS AND SOUND LEVEL CRITERIA FOR EQUIPMENT SPACES AND EXTERIOR MOUNTED EQUIPMENT.

B. MECHANICAL AND ELECTRICAL EQUIPMENT AND ASSOCIATED PIPING AND DUCTWORK SHALL BE MOUNTED ON VIBRATION ISOLATORS AS SPECIFIED AND/OR REQUIRED TO MINIMIZE TRANSMISSION OF VIBRATION AND STRUCTURE-BORNE NOISE TO BUILDING STRUCTURE OR SPACES.

C. ALL ROTATING EQUIPMENT SHALL BE BALANCED BOTH STATICALLY AND DYNAMICALLY. THE EQUIPMENT WHEN MOUNTED AND PLACED IN OPERATION SHALL NOT EXCEED A SELF-EXCITED VIBRATION VELOCITY OF 0.10 INCHES PER SECOND IN THE VERTICAL, HORIZONTAL, OR AXIAL DIRECTIONS WHEN MEASURED WITH A VIBRATION METER ON THE BEARING CAPS OR AT THE EQUIPMENT MOUNTING FEET IF THE BEARINGS ARE CONCEALED.

D. SECTION INCLUDES: ELASTOMERIC ISOLATORS, SUSPENSION TYPE ISOLATORS, FLEXIBLE CONNECTIONS

1.2 ACTION SUBMITTALS

A. SHOP DRAWINGS: FOR EACH TYPE OF PRODUCT.

1.3 VIBRATION

A. ISOLATION SYSTEM SHALL BE STABLE DURING STARTING AND STOPPING OF EQUIPMENT WITHOUT EXCESSIVE TRANSVERSE OR ECCENTRIC MOVEMENT.

B. THE INSTALLED VIBRATION ISOLATION SYSTEM SHALL HAVE A MAXIMUM LATERAL MOTION UNDER START-UP AND SHUT-DOWN CONDITIONS OF 0.25 INCH. MOTIONS IN EXCESS SHALL BE RESTRAINED BY APPROVED SPRING TYPE MOUNTINGS.

C. ALL ELECTRICAL AND PIPING CONNECTIONS SHALL BE SUFFICIENTLY FLEXIBLE TO PERMIT PROPER ISOLATION.

D. ISOLATION COMPONENTS SHALL BE SELECTED FOR THE LOWEST OPERATING SPEED OF THE EQUIPMENT.

E. ISOLATORS, INCLUDING SPRINGS, EXPOSED TO WEATHER SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.

F. ISOLATORS SHALL BE SELECTED AND LOCATED TO PRODUCE UNIFORM LOADING AND DEFLECTION EVEN WHEN EQUIPMENT WEIGHT IS NOT EVENLY DISTRIBUTED.

G. THE TYPE OF ISOLATION, BASE AND MINIMUM DEFLECTION SHALL BE AS REQUIRED FOR EACH SPECIFIC APPLICATION WHEN SUPPORTED ON A SOLID CONCRETE SLAB, 6 INCHES TOTAL THICK MINIMUM. VIBRATION ISOLATORS WITH A DEFLECTION GREATER THAN THE MINIMUM SPECIFIED SHALL BE SUBMITTED FOR APPROVAL IF THEY ARE NEEDED TO MEET THE NOISE CRITERIA.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. MASON INDUSTRIES, AMBER/BOOTH COMPANY, VIBRATION ELIMINATION CO., INC.

2.2 ELASTOMERIC ISOLATORS

A. ELASTOMERIC ISOLATORS SHALL BE ONE OF THE FOLLOWING:

1. NEOPRENE ISOLATION MOUNTS OF THE STRAIGHT-LINE DEFLECTION CURVE TYPE. THE ISOLATION MOUNTS SHALL BE MANUFACTURED WITH BOLT HOLES FOR BOLTING TO EQUIPMENT BASE. BOTTOM STEEL PLATES FOR MOUNTING TO SUBBASE SHALL BE PROVIDED WHERE REQUIRED TO PREVENT MOVEMENT OF EQUIPMENT. THESE ISOLATORS SHALL BE MOLDED IN BLACK OIL-RESISTANT NEOPRENE AND COLOR CODED. ALL METAL PARTS SHALL BE EMBEDDED IN NEOPRENE.

2. NEOPRENE PADS SHALL BE OF CROSS-RIBBED OR WAFFLE DESIGN, 5/16-INCH MINIMUM THICKNESS. WHERE CONCENTRATED LOAD BEARING IS ENCOUNTERED, STEEL BEARING PLATES SHALL BE BONDED TO THE NEOPRENE PADS. THE NEOPRENE PADS SHALL BE SIZED FOR A LOAD OF 50 PSI.

2.3 SUSPENSION TYPE ISOLATION

A. SUSPENSION TYPE SPRING ISOLATION FOR PIPING SYSTEM OR EQUIPMENT HANGERS SHALL BE A COMBINATION OF SPRING AND NEOPRENE IN SERIES. THE SPRING AND ELASTOMER COMBINATION SHALL BE ENCASED IN A STRUCTURALLY STABLE STEEL BRACKET. SPRING DIAMETERS SHALL BE LARGE ENOUGH TO PERMIT A 15-DEGREE ANGULAR MISALIGNMENT OF THE ROD WITHOUT RUBBING ON THE HANGER BOX.

B. SUSPENSION TYPE ELASTOMERIC ISOLATORS SHALL BE DOUBLE DEFLECTION. ISOLATORS SHALL BE MOUNTED IN AN OPEN STEEL BRACKET WITH OPENINGS FOR HANGER ROD CONNECTIONS. THE HANGER ROD SHALL BE SEPARATED FROM CONTACT WITH THE HANGER BRACKET BY A NEOPRENE GROMMET. THE NEOPRENE ISOLATOR SHALL HAVE A MINIMUM DEFLECTION OF 0.35 INCH.

C. WHERE REQUIRED, PIPE HANGERS SHALL BE EQUIPPED WITH A METHOD OF HOLDING THE PIPING AT A FIXED ELEVATION DURING INSTALLATION AND A SECONDARY ADJUSTMENT TO TRANSFER THE LOAD TO THE SPRING AND MAINTAIN THE SAME ELEVATION. DEFLECTION SHALL BE CLEARLY INDICATED BY A PERMANENT POINTER AND SCALE.

D. DUCT ISOLATION HANGERS SHALL CONSIST OF SPRING AND NEOPRENE GROMMET, OR MOUNT ENCASED IN A STEEL BRACKET WITH SUITABLE MEANS OF CONNECTING TO DUCTS AND BUILDING STRUCTURE.

2.4 FLEXIBLE CONNECTIONS

A. FLEXIBLE HOSE SHALL BE DESIGNED FOR AN OPERATING TEMPERATURE OF 50 DEGREES F ABOVE THE MAXIMUM SYSTEM DESIGN TEMPERATURE AND FOR A WORKING PRESSURE OF NOT LESS THAN 125 PSIG OR 150 PERCENT OF THE SYSTEM OPERATING PRESSURE WHICHEVER IS GREATER.

B. METAL FLEXIBLE HOSE SHALL BE GRADE E PHOSPHOR BRONZE, MONEL OR STAINLESS STEEL CORRUGATED TUBE COVERED WITH COMPARABLE BRONZE OR STAINLESS BRAID RESTRAINING AND PRESSURE COVER. STAINLESS STEEL GRADE SHALL BE 304. LIVE LENGTHS OF FLEXIBLE METAL HOSE SHALL GENERALLY BE NOT LESS THAN RECOMMENDED BY THE MANUFACTURER FOR CONTINUOUS VIBRATION APPLICATION.

PART 3 - EXECUTION

3.1 PROVIDE EQUIPMENT AND PIPING VIBRATION ISOLATION WHERE REQUIRED BY EQUIPMENT MANUFACTURER AND WHERE CALLED FOR ON DRAWINGS.

3.2 TYPE OF VIBRATION ISOLATORS TO BE PROVIDED SHALL BE BASED AS FOLLOWS:

1. STATIC DEFLECTION UP TO 1/4 INCH - SINGLE DEFLECTION NEOPRENE MOUNTING OR PADS.

2. STATIC DEFLECTION 5/16 INCH TO 3/8 INCH - DOUBLE DEFLECTION NEOPRENE MOUNTINGS.

3. STATIC DEFLECTION ABOVE 3/8 INCH - SPRING ISOLATORS.

3.3 FURNISH VIBRATION ISOLATION FOR ALL PIPING CONNECTED TO EQUIPMENT MOUNTED ON VIBRATION ISOLATION. EQUIPMENT THAT HAS INTERNALLY ISOLATED UNITS (COMPRESSORS, ETC.) SHALL BE CONSIDERED SEPARATELY AS TO ISOLATION REQUIREMENTS.

3.4 FLEXIBLE CONNECTIONS

A. FLEXIBLE CONNECTIONS SHALL BE PROVIDED FOR ALL CONNECTIONS INDICATED ON DRAWINGS, MANUFACTURED OF MATERIALS SUITABLE FOR THE OPERATING TEMPERATURES AND PRESSURES OF THE FLUID OR GAS IT IS CONVEYING.

B. FLEXIBLE HOSE SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS INCLUDING PLACEMENT IN THE PIPELINE WITHOUT DAMAGE, MISALIGNMENT OR CHANGE IN ITS NORMAL LENGTH. PRIOR TO FILLING THE SYSTEM, THE ALIGNMENT AND LENGTH SHALL BE CHECKED BY LOOSENING THE FLANGE BOLTS TO DETERMINE THE INSTALLATION CONDITIONS. THE PIPING INSTALLATION SHALL BE CORRECTED IF NECESSARY AND THE FLEXIBLE HOSE REPLACED IF DAMAGED, AT NO COST TO THE OWNER.

SECTION 23 05 93 - TEST, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL SPECIFICATIONS

1.1 DESCRIPTION OF WORK

A. THE TOTAL SYSTEM BALANCE SHALL BE PERFORMED BY AN INDEPENDENT TEST AND BALANCE FIRM THAT SPECIALIZES IN TESTING AND BALANCING OF HVAC SYSTEMS.

B. THIS SPECIALTY FIRM SHALL PERFORM THE FOLLOWING:

1. ON-GOING JOB SITE INSPECTIONS OF EQUIPMENT, CONTROLS, AND METERING DEVICES DURING CONSTRUCTION TO VERIFY CONFORMANCE WITH DESIGN SPECIFICATIONS.

2. AIR SYSTEM BALANCE: OUTSIDE AIR SYSTEMS, SUPPLY AIR SYSTEMS, RETURN AIR SYSTEMS, EXHAUST AIR SYSTEMS

3. CONTROL SYSTEMS VERIFICATION

PART 2 - EXECUTION

2.1 AIR SYSTEM TEST AND BALANCE PROCEDURES

A. FAN SPEEDS: TEST AND ADJUST FAN RPM TO ACHIEVE DESIGN CFM REQUIREMENTS.

B. CURRENT AND VOLTAGE: MEASURE AND RECORD MOTOR CURRENT AND VOLTAGE.

C. PITOT TUBE TRAVERSE: PERFORM A PITOT TUBE TRAVERSE OF MAIN SUPPLY AND RETURN DUCTS TO OBTAIN TOTAL CFM. IF A PITOT TUBE TRAVERSE IS NOT PRACTICAL, THE SUMMATION OF THE OUTLETS OR INLETS MAY BE USED. AN EXPLANATION OF WHY A TRAVERSE WAS NOT MADE MUST APPEAR ON THE APPROPRIATE DATA SHEET.

D. OUTSIDE AIR: TEST AND ADJUST SYSTEM MINIMUM OUTSIDE AIR BY PITOT TUBE TRAVERSE. IF A PITOT TUBE TRAVERSE IS NOT PRACTICAL, THE PERCENTAGE OF OUTSIDE AIR MAY BE DETERMINED BY CALCULATIONS FROM THE RETURN AIR, OUTSIDE AIR, AND MIXED AIR TEMPERATURE. MAKE ALLOWANCES FOR HEAT OF COMPRESSION AND MOTOR HEAT WHERE APPLICABLE.

E. STATIC PRESSURE: TEST AND RECORD SYSTEM STATIC PRESSURES, INCLUDING SUCTION AND DISCHARGE STATIC PRESSURE PROFILE OF EACH FAN.

F. AIR TEMPERATURE: TAKE WET BULB AND DRY BULB AIR TEMPERATURES ON THE ENTERING AND LEAVING SIDE OF EACH COOLING COIL. DRY BULB TEMPERATURES SHALL BE TAKEN ON THE ENTERING AND LEAVING SIDE OF EACH HEATING COIL.

G. ZONE DUCTS (SUPPLY AND RETURN): ADJUST ZONE DUCTS TO WITHIN DESIGN CFM REQUIREMENTS. AT LEAST ONE ZONE BALANCING DAMPER SHALL BE COMPLETELY OPEN.

H. MAIN DUCTS: ADJUST MAIN DUCTS TO WITHIN DESIGN CFM REQUIREMENTS. MULTI-DIFFUSER BRANCH DUCTS SHALL HAVE AT LEAST ONE OUTLET OR INLET VOLUME DAMPER COMPLETELY OPEN.

I. BRANCH DUCTS: ADJUST BRANCH DUCTS TO WITHIN DESIGN CFM REQUIREMENTS. MULTI-DIFFUSER BRANCH DUCTS SHALL HAVE AT LEAST ONE OUTLET OR INLET VOLUME DAMPER COMPLETELY OPEN.

J. TOLERANCE - TEST AND BALANCE EACH DIFFUSER, GRILLE, AND REGISTER TO WITHIN 10 PERCENT OF DESIGN REQUIREMENT.

K. IDENTIFICATION: IDENTIFY THE LOCATION AND AREA OF EACH GRILLE, DIFFUSER, REGISTER, AND TERMINAL BOX. THIS INFORMATION SHALL BE RECORDED ON AIR OUTLET DATA SHEETS.

L. DESCRIPTION: RECORD THE SIZE AND TYPE OF EACH DIFFUSER, GRILLE, AND REGISTER ON AIR OUTLET DATA SHEETS.

M. MINIMIZING DRAFTS: ADJUST ALL DIFFUSERS, GRILLES, AND REGISTERS TO MINIMIZE DRAFTS IN ALL AREAS.

N. EXHAUST FANS: MEASURE EXHAUST FAN STATIC PRESSURE, TOTAL CFM, MAKEUP AIR AND FAN RPM. MEASURE MOTOR OPERATING VOLTAGE AND AMPERAGE.

O. MEASURE EXHAUST FAN STATIC PRESSURES, TOTAL CFM, MAKEUP AIR AND FAN RPM.

P. MEASURE MOTOR OPERATING VOLTAGE AND AMPERAGE.

Q. RECORD THE SPECIFIED AGAINST THE ACTUAL SUPPLIED HORSEPOWER AND ELECTRICAL CHARACTERISTICS OF ALL MOTORS.

2.2 CONTROL SYSTEMS VERIFICATION

A. VERIFY THAT ALL CONTROL DEVICES ARE PROPERLY CONNECTED.

B. VERIFY THAT ALL DAMPERS, VALVES, AND OTHER CONTROLLED DEVICES ARE OPERATED BY THE INTENDED CONTROLLER.

C. VERIFY THAT ALL DAMPERS AND VALVES ARE IN THE POSITION INDICATED BY THE CONTROLLER (OPEN, CLOSED OR MODULATING).

D. VERIFY THE INTEGRITY OF VALVES AND DAMPERS IN TERMS OF TIGHTNESS OF CLOSE-OFF AND FULL-OPEN POSITIONS. THIS INCLUDES DAMPERS IN MULTIZONE UNITS.

E. CHECK THAT ALL VALVES ARE PROPERLY INSTALLED IN THE PIPING SYSTEM IN RELATION TO DIRECTION OF FLOW AND LOCATION.

F. CHECK THE CALIBRATION OF ALL CONTROLLERS.

G. VERIFY THE PROPER APPLICATION OF ALL NORMALLY OPEN AND NORMALLY CLOSED VALVES.

H. CHECK THE LOCATION OF ALL THERMOSTATS AND HUMIDISTATS FOR POTENTIAL ERRATIC OPERATION FROM OUTSIDE INFLUENCES SUCH AS SUNLIGHT, DRAFTS, OR COLD WALLS.

I. CHECK THE LOCATIONS OF ALL SENSORS TO DETERMINE WHETHER THEIR POSITION WILL ALLOW THEM TO SENSE ONLY THE INTENDED TEMPERATURES OR PRESSURES OF THE MEDIA. CONTROL CONTRACTOR WILL RELOCATE AS DEEMED NECESSARY BY THE TAB AGENCY.

J. CHECK THE SEQUENCE OF OPERATION THAT ANY CONTROL MODE IS IN ACCORDANCE WITH APPROVED SHOP DRAWINGS. VERIFY THAT ONLY MINIMUM SIMULTANEOUS HEATING AND COOLING OCCURS.

K. VERIFY THAT ALL CONTROLLER SET POINTS MEET THE DESIGN INTENT.

L. CHECK ALL DAMPERS FOR FREE TRAVEL.

M. VERIFY THE OPERATION OF ALL INTERLOCK SYSTEMS.

N. PERFORM ALL SYSTEM VERIFICATION TO ASSURE THE SAFETY OF THE SYSTEM AND ITS COMPONENTS.

2.3 RECORD AND REPORT DATA

A. THE TEST AND BALANCE REPORT SHALL BE COMPLETE WITH LOGS, DATA AND RECORDS AS REQUIRED HEREIN. ALL LOGS, DATA AND RECORDS SHALL BE TYPED ON WHITE BOND PAPER AND BOUND. THE REPORT SHALL BE CERTIFIED ACCURATE AND COMPLETE BY THE TESTING AND BALANCING (TAB) AGENCY'S CERTIFIED TEST AND BALANCE ENGINEER.

SECTION 23 34 23 - POWER VENTILATORS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. ROOF EXHAUST FANS

1.2 ACTION SUBMITTALS

A. SHOP DRAWINGS: FOR EACH TYPE OF PRODUCT INDICATED.

1.3 CLOSEOUT SUBMITTALS

A. APPROVED SHOP DRAWINGS: FOR ALL FANS AND RELATED COMPONENTS. PROVIDE IN OPERATION AND MAINTENANCE MANUAL.

B. OPERATION AND MAINTENANCE DATA: FOR FANS TO INCLUDE IN OPERATION, AND MAINTENANCE MANUALS.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING: TWIN CITY, CARNES COMPANY, GREENHECK FAN CORPORATION., LOREN COOK COMPANY.

2.2 GENERAL

A. PROVIDE ALL FANS WITH DISCONNECT.

B. PROVIDE ALL FANS WITH MOTOR STARTERS. SEE SECTION 230100 FOR DETAILS.

C. INTEGRAL PHASE RELAY SHALL BE PROVIDED AS A PART OF ALL THREE PHASE MOTOR STARTERS. RELAY SHALL SHUT MOTOR DOWN ON PHASE LOSS OR PHASE UNBALANCE AND AUTOMATICALLY RESET WHEN NORMAL PHASING IS RESTORED. PHASE FAILURE RELAY SHALL HAVE ADJUSTABLE RESTART TIME CAPABILITIES. MECHANICAL CONTRACTOR SHALL COORDINATE STAGGERED RESTART TIMES AS REQUIRED.

D. SEE DRAWINGS OR SPECIFICATION SECTION 230900 - INSTRUMENTATION AND CONTROLS FOR HVAC FOR CONTROL OF FANS.

2.3 ROOF EXHAUST FAN

A. ROOF EXHAUST FANS SHALL BE OF THE CENTRIFUGAL, BELT OR DIRECT DRIVEN TYPE AS SPECIFIED. THE FAN HOUSING SHALL BE CONSTRUCTED OF HEAVY GAUGE ALUMINUM MOUNTED ON A RIGID SUPPORT STRUCTURE. THE SHROUD SHALL HAVE A ROLLED BEAD AND INTERNAL STRUCTURAL MEMBERS. THE FAN WHEEL SHALL BE OF THE ALUMINUM BACKWARD CURVED, CENTRIFUGAL TYPE WITH INLET VENTURI FOR MAXIMUM PERFORMANCE. WHEELS SHALL BE DYNAMICALLY AND STATICALLY BALANCED. MOTORS AND CENTRIFUGAL WHEELS SHALL BE MOUNTED ON VIBRATION ISOLATORS.

B. MOTORS SHALL BE ISOLATED FROM THE EXHAUST AIRSTREAM. AIR FOR COOLING THE MOTOR SHALL BE TAKEN INTO THE MOTOR COMPARTMENT FROM A LOCATION FREE FROM CONTAMINANTS. MOTORS SHALL BE READILY ACCESSIBLE FOR MAINTENANCE.

C. A DISCONNECT SWITCH SHALL BE FACTORY INSTALLED AND WIRED FROM THE FAN MOTOR TO THE DISCONNECT JUNCTION BOX. A CONDUIT CHASE SHALL BE PROVIDED FOR RUNNING ELECTRICAL WIRING THROUGH THE CURB CAP INTO THE POWER COMPARTMENT.

D. ALL FANS SHALL BEAR THE AMCA CERTIFIED RATINGS PERFORMANCE SEAL FOR BOTH AIR AND SOUND PERFORMANCE.

E. PROVIDE WITH GRAVITY BACK DRAFT DAMPERS.

F. PROVIDE FACTORY ROOF CURB TO MATCH THE SLOPE OF THE ROOF, MINIMUM 12-INCH HEIGHT.

PART 3 - EXECUTION

3.1 INSTALLATION

A. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

B. INSTALL EQUIPMENT IN A MANNER TO PROVIDE REQUIRED CLEARANCES FOR PROPER OPERATION AND MAINTENANCE.

C. FOR ROOF MOUNTED FANS, SECURE ROOF EXHAUSTERS WITH LAG SCREWS TO ROOF CURB.

SECTION 23 34 39 - HIGH VOLUME LOW SPEED FANS

PART 1- GENERAL

1.1 WORK INCLUDED

A. HVLS - HIGH VOLUME, LOW SPEED FANS.

1.2 ACTION SUBMITTALS

A. SHOP DRAWINGS: PRODUCT DATA: FOR EACH TYPE OF PRODUCT.

1.3 CLOSEOUT SUBMITTALS

A. APPROVED SHOP DRAWINGS: FOR ALL FANS AND RELATED COMPONENTS. PROVIDE IN OPERATION AND MAINTENANCE MANUAL.

B. OPERATION AND MAINTENANCE DATA: FOR FANS TO INCLUDE IN OPERATION, AND MAINTENANCE MANUALS.

1.4 QUALITY ASSURANCE

A. PERFORMANCE RATINGS SHALL CONFORM TO AMCA STANDARD 211. FANS MUST BE TESTED IN ACCORDANCE WITH ANSI/AMCA STANDARD 230-15 IN AN AMCA ACCREDITED LABORATORY. FANS SHALL BE CERTIFIED TO BEAR THE AMCA SEAL FOR CIRCULATING FAN PERFORMANCE.

B. ENTIRE FAN ASSEMBLY SHALL BE UL/CUL-LISTED TO UNDERWRITERS LABORATORY (UL) STANDARD 507 AND CSA STANDARD 22.2 NO. 113 TO ENSURE COMPLIANCE WITH THE MOST CURRENT INTERNATIONAL TESTING STANDARDS. INTERTEK/ETL CERTIFICATION TO UL STANDARD 507 AND CSA STANDARD 22.2 NO. 113 SHALL NOT BE ACCEPTED.

C. FANS SHALL BE COMPLIANT WITH NFPA 13 - STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS, NFPA 72 - NATIONAL FIRE ALARM AND SIGNALING CODE, AND NFPA 70 - NATIONAL ELECTRICAL CODE (NEC).

D. FAN CONTROLS SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC) AND UNDERWRITERS LABORATORY (UL) STANDARDS.

E. GOOD WORKMANSHIP SHALL BE EVIDENT IN ALL ASPECTS OF THE FAN'S CONSTRUCTION. FIELD BALANCING OF THE FAN'S AIRFOILS AND HUB SHALL NOT BE REQUIRED.

F. ALL FAN MOTORS AND VARIABLE FREQUENCY DRIVES (VFDS) SHALL BE FACTORY-TESTED PRIOR TO SHIPMENT.

1.5 WARRANTY

A. WARRANTY: MANUFACTURER AND INSTALLER AGREE TO REPAIR OR REPLACE COMPONENTS OF FANS THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN SPECIFIED WARRANTY PERIOD.

1. WARRANTY PERIOD:

a. FOR MOTOR, INCLUDING CONTROLS: [FIVE] [SEVEN] [10] <INSERT NUMBER> YEAR(S) FROM DATE OF SUBSTANTIAL COMPLETION.

b. FOR PARTS, INCLUDING BLADES AND HUB: [FIVE] [SEVEN] [10] <INSERT NUMBER> YEAR(S) FROM DATE OF SUBSTANTIAL COMPLETION.

c. FOR LABOR: [ONE] [TWO] <INSERT NUMBER> YEAR(S) FROM DATE OF SUBSTANTIAL COMPLETION.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING: BIG ASS FANS, BLUE GIANT EQUIPMENT CORPORATION, CAPTIVEAIRE, GREENHECK

2.2 HIGH-VOLUME, LOW-SPEED FANS

A. GENERAL DESCRIPTION:

1. HIGH VOLUME, LOW SPEED (HVLS) PROPELLER FANS SHALL BE LICENSED TO BEAR THE AMCA CERTIFIED RATING SEAL FOR CIRCULATING FAN PERFORMANCE TO ENSURE PERFORMANCE AS CATALOGED IN THE FIELD. UNLICENSED HVLS FANS SHALL NOT BE ACCEPTED.

2. ENTIRE FAN ASSEMBLY (WITH OR WITHOUT THE OPTIONAL LED LIGHT KIT) SHALL BE UL/CUL-LISTED TO UNDERWRITERS LABORATORY (UL) STANDARD 507 AND CSA STANDARD 22.2 NO. 113 TO ENSURE COMPLIANCE WITH THE MOST CURRENT INTERNATIONAL TESTING STANDARDS. INTERTEK/ETL CERTIFICATION TO UL STANDARD 507 AND CSA STANDARD 22.2 NO. 113 SHALL NOT BE ACCEPTED.

3. MAXIMUM CONTINUOUS OPERATING TEMPERATURE OF 104° FAHRENHEIT (40° CELSIUS).

4. DESIGNED FOR FORWARD (COUNTER-CLOCKWISE WHEN VIEWED FROM FLOOR) AND REVERSE (CLOCKWISE WHEN VIEWED FROM FLOOR) OPERATION CAPABILITIES, FOR COMFORT COOLING AND DESTRATIFICATION APPLICATIONS.

5. EACH FAN SHALL BEAR A PERMANENTLY AFFIXED MANUFACTURER'S MYLAR NAMEPLATE CONTAINING THE MODEL NUMBER, INDIVIDUAL SERIAL NUMBER, AND ELECTRICAL REQUIREMENTS OF THE FAN.

B. IMPELLER:

1. IMPELLER SHALL BE CONSTRUCTED OF AERODYNAMIC EXTRUDED ALUMINUM AIRFOIL BLADES CONNECTED TO MACHINED ALUMINUM STRUTS THAT ARE RIGIDLY ATTACHED TO A HEAVY-DUTY, LASER-CUT ALUMINUM HUB. ALL CONNECTIONS SHALL BE MADE USING A MINIMUM OF SAE GRADE 8 HARDWARE.

2. AIRFOIL BLADES SHALL BE INTERLOCKED WITH ONE ANOTHER AND THE IMPELLER HUB VIA A HEAVY-DUTY STEEL AIRFOIL RETAINING RING FOR SAFETY. AIRFOIL RETAINING RING SHALL BE CONSTRUCTED OF HEAVY GAUGE STEEL AND INSTALLED AT THE FACTORY TO ENSURE PROPER FUNCTION. FIELD-INSTALLED AIRFOIL RETAINERS SHALL NOT BE ACCEPTED.

3. AIRFOIL BLADES SHALL BE PROVIDED WITH A CLEAR ANODIZED FINISH AS STANDARD TO PREVENT EXCESSIVE BUILDUP OF DUST AND REDUCE MATERIAL REFLECTIVITY WHICH CAN BE DISORIENTING TO BUILDING OCCUPANTS.

4. AIRFOIL BLADES SHALL BE OPTIMIZED FOR MAXIMUM AIRFLOW, FAN EFFICIENCY, AND COVERAGE AREA.

5. AIRFOIL BLADES SHALL BE INTERNALLY REINFORCED TO MINIMIZE BLADE DEFLECTION WHILE THE FAN IS IN STANDBY OR IN OPERATION.

6. AIRFOIL BLADES SHALL BE DESIGNED FOR MINIMAL WEIGHT IN ORDER TO MAXIMIZE FAN EFFICIENCY.

STATE OF KENTUCKY
MALLORY L. P.
ANDERSON
36770
LICENSED PROFESSIONAL ENGINEER

REVISION	DATE

DRAWN BY CE
CHECKED BY CA
APPROVED BY CA

Meade County Road Department

MECHANICAL SPECIFICATIONS

Lincoln Trail
Area Development District
~ established 1968 ~
750 S. Provident Way • Elizabethtown, KY 42701
Phone: 270-769-2393 • TDD: 800-247-2510 • Fax: 270-769-2993
Equal Opportunity Employer M/F/D/V/SO

DATE:
SHEET X OF X
M-801
JOB#:
SCALE

C. MOTOR:

1. MOTORS SHALL BE OF THE HIGH TORQUE, LOW SPEED DIRECT DRIVE TYPE, CAREFULLY MATCHED TO THE FAN LOAD AND FURNISHED AT THE SPECIFIED VOLTAGE AND PHASE. HIGH SPEED MOTORS PROVIDED WITH A GEARBOX TO REDUCE THE OPERATING SPEED OF THE FAN SHALL NOT BE PERMITTED.
2. MOTORS SHALL BE AN EXTERNAL ROTOR DESIGN. INTERNAL ROTOR MOTORS SHALL NOT BE PERMITTED.
3. MOTORS SHALL BE OF THE BRUSHLESS DC TYPE FOR MAXIMUM EFFICIENCY AND SPEED CONTROLLABILITY. NO OTHER MOTOR TYPE SHALL BE ACCEPTED.
4. MOTORS SHALL INCLUDE PLUG-AND-PLAY CONNECTORS FOR ALL WIRING TO THE VARIABLE FREQUENCY DRIVE. MOTORS THAT REQUIRE THESE WIRING CONNECTIONS TO BE STRIPPED AND TERMINATED IN THE FIELD SHALL NOT BE PERMITTED.
5. MOTORS SHALL INCLUDE AN INTERNALLY-MOUNTED THERMISTOR FOR CONTINUOUS MONITORING OF THE MOTOR'S INTERNAL TEMPERATURE.
6. MOTORS SHALL INCLUDE CLASS B INSULATION.

D. VARIABLE FREQUENCY DRIVE

1. VFD SHALL BE FACTORY PROGRAMMED AND MOUNTED ON THE DOWNTUBE OF THE FAN.
2. VFD SHALL BE FACTORY-WIRED FOR POWER INPUT VIA A STANDARD 3 FT. WIRING PIGTAIL WITH FACTORY-INSTALLED ELECTRICAL PLUG LOCATED AT THE TOP OF THE DOWNTUBE FOR EASE OF INSTALLATION. FIELD WIRING OF THE VFD SHALL NOT BE PERMITTED.
3. VFD SHALL BE FACTORY-WIRED FOR COMMUNICATION WITH FAN CONTROLS VIA A FACTORY-INSTALLED CAT-5E CABLE AND 3-WAY RJ45 SPLITTER LOCATED AT THE TOP OF THE DOWNTUBE FOR EASE OF INSTALLATION. FIELD STRIPPING AND TERMINATING OF CAT-5E CABLE SHALL NOT BE ACCEPTED FOR COMMUNICATIONS WIRING.
4. VFD SHALL BE DESIGNED FOR MODBUS RS-485 COMMUNICATION WITH CONTROL DEVICES VIA THE MODBUS RTU COMMUNICATION PROTOCOL.
5. VFD SHALL BE UL LISTED FOR SINGLE PHASE OR THREE PHASE INPUT AT THE SPECIFIED VOLTAGE.
6. VFD SHALL INCLUDE TWO THERMISTORS FOR CONTINUOUS MONITORING OF VFD'S INTERNAL AND EXTERNAL TEMPERATURE.
7. VFD SHALL INCLUDE SENSORS FOR CONTINUOUS MONITORING OF VOLTAGE AND CURRENT.
8. VFD SHALL INCLUDE INTELLIGENT PROTECTION SYSTEMS TO PREVENT FAILURES CAUSED BY OVER/UNDER-VOLTAGE, OVER-CURRENT, OVER-TEMPERATURE, OVER-SPEED, AND FAN IMPACT. VFDS WITHOUT THESE PROTECTION FEATURES SHALL NOT BE PERMITTED.

E. UNIVERSAL MOUNTING & DOWNTUBE:

1. FANS SHALL BE PROVIDED WITH A UNIVERSAL CEILING MOUNT THAT IS DESIGNED FOR FAST AND SECURE INSTALLATION ON A VARIETY OF BUILDING STRUCTURES. UNIVERSAL CEILING MOUNT SHALL BE CONSTRUCTED OF HEAVY GAUGE, BOLTED AND WELDED STEEL AND SHALL INCLUDE A PIVOTING KNUCKLE JOINT WITH TWO AXES OF ROTATION TO ACCOMMODATE ANY CEILING PITCH. THE KNUCKLE JOINT SHALL BE CONSTRUCTED OF WELDED STEEL TUBING AND REINFORCED WITH A REDUNDANT STEEL SLEEVE FOR SAFETY.
2. DOWNTUBE SHALL BE CONSTRUCTED OF HEAVY GAUGE STEEL TO PROVIDE A STRUCTURAL CONNECTION BETWEEN THE UNIVERSAL CEILING MOUNT AND FAN MOTOR. DOWNTUBE SHALL ALSO INCLUDE A WELDED GUY WIRE CONNECTION RING FOR FAST AND SECURE INSTALLATION OF GUY WIRES.
3. UNIVERSAL CEILING MOUNT AND DOWNTUBE SHALL BE POWDER-COATED FOR CORROSION RESISTANCE AND AESTHETIC APPEARANCE.
4. STANDARD DROP LENGTH BETWEEN TOP OF UNIVERSAL CEILING MOUNT AND TOP OF AIRFOIL BLADES SHALL BE 3.5 FEET. OPTIONAL DROP LENGTHS ARE ALSO AVAILABLE IN ONE FOOT INCREMENTS BETWEEN 4 AND 10 FEET.
5. ALL HARDWARE SHALL BE A MINIMUM OF SAE GRADE 8.

F. SAFETY RETENTION CABLES:

1. THE FAN SHALL BE EQUIPPED WITH THE MANUFACTURER PROVIDED SAFETY CABLES AND INSTALLED PER THEIR RECOMMENDATIONS.
2. ALL CABLES AND MOUNTING HARDWARE SHALL MEET THE MINIMUM SIZE, MATERIAL AND LOAD RATING AS SPECIFIED BY THE MANUFACTURER.
3. FIELD FABRICATED SAFETY CABLES AND ASSOCIATED HARDWARE ARE NOT PERMITTED.

G. GUY WIRES

1. FANS SHALL INCLUDE 5/64 INCH BRAIDED GALVANIZED STEEL GUY WIRES DESIGNED TO PREVENT LATERAL MOVEMENT OF THE FAN WHEN INSTALLED.
2. GUY WIRES SHALL BE SECURED TO THE BUILDING STRUCTURE VIA THE INCLUDED BEAM CLAMPS AND PRE-INSTALLED QUICK CONNECT CLIPS FOR EASE OF INSTALLATION.
3. GUY WIRES SHALL BE SECURED TO THE FAN AND TENSIONED VIA THE INCLUDED GRIPPLE® CONNECTORS WITH TURNBUCKLES FOR EASE OF INSTALLATION. GUY WIRES THAT ARE SECURED VIA U-CLAMPS OR OTHER CONNECTION MEANS SHALL NOT BE PERMITTED.

H. FIRE CONTROL PANEL INTEGRATION

1. FANS SHALL INCLUDE A NORMALLY CLOSED RELAY FOR INTEGRATION WITH A BUILDING'S FIRE CONTROL PANEL. NORMALLY CLOSED RELAY SHALL BE COMPATIBLE WITH 24 VDC/VAC AND 115 VAC CONTROL SIGNALS. FANS SHALL ALSO INCLUDE A FACTORY-WIRED EMERGENCY STOP LANDING POINT THAT IS TERMINATED AT THE TOP OF THE DOWNTUBE TO SIMPLIFY FIELD-WIRING BETWEEN THE NORMALLY CLOSED RELAY AND THE FACTORY-MOUNTED VFD.

I. DISCONNECT SWITCHES

1. NEMA RATED
2. POSITIVE ELECTRICAL SHUT-OFF.
3. ABILITY TO LOCK IN THE OPEN OR CLOSED POSITION.
4. SHIPPED LOOSE FOR FIELD MOUNTING.

J. FAN CONTROLS

1. TYPE: KEYPAD CONTROL
2. CAPABLE OF OPERATING ONE OR MULTIPLE FANS VIA MODBUS RTU COMMUNICATION PROTOCOL.

PART 3 - EXECUTION

3.1 EXAMINATION

A. EXAMINE CONDITIONS FOR COMPLIANCE WITH REQUIREMENTS FOR INSTALLATION TOLERANCES AND OTHER CONDITIONS AFFECTING HVLS FAN PERFORMANCE, MAINTENANCE, AND OPERATIONS.

1. FAN LOCATIONS INDICATED ON DRAWINGS ARE APPROXIMATE. DETERMINE EXACT LOCATIONS BEFORE ROUGHING-IN FOR MOUNTING, CONTROL, AND ELECTRICAL CONNECTIONS.

B. EXAMINE ROUGHING-IN FOR MOUNTING LOCATION, ANCHOR-BOLT SIZES, AND LOCATIONS, TO VERIFY ACTUAL LOCATIONS FOR MOUNTING CONNECTIONS BEFORE INSTALLATION OF FAN.

C. EXAMINE AREAS FOR SUITABLE CONDITIONS WHERE FAN WILL BE INSTALLED.

D. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

3.2 INSTALLATION OF HIGH-VOLUME LOW-SPEED FANS

A. INSTALL FAN ACCORDING TO MANUFACTURER'S PUBLISHED INSTRUCTIONS.

B. COMPLY WITH NECA 1 AND NFPA 70.

C. COMPLY WITH NFPA 13 FOR INSTALLATION OF HVLS FANS AND MAXIMUM ALLOWABLE FAN DIAMETER. CENTER HVLS FANS BETWEEN FOUR ADJACENT SPRINKLERS. MINIMUM VERTICAL CLEARANCE FROM HVLS FAN TO SPRINKLER DEFLECTOR IS 3 FEET (0.9 M).

D. COMPLY WITH NFPA 72 AND INTERLOCK HVLS FANS TO SHUT DOWN UPON RECEIVING AN ALARM FROM FIRE ALARM SYSTEM.

E. EQUIPMENT MOUNTING:

1. ANCHOR FAN TO BUILDING STRUCTURE WITH MANUFACTURER'S RECOMMENDED MOUNTING BRACKET FOR INSTALLED CONDITION.
2. CONSULT A LICENSED PROFESSIONAL STRUCTURAL ENGINEER FOR MOUNTING METHODS AND APPROVAL FOR MOUNTING TO THE STRUCTURE. STRUCTURE MUST BE ABLE TO WITHSTAND THE TORQUE AND FORCES GENERATED BY THE FAN.
3. COMPLY WITH REQUIREMENTS FOR HANGERS AND SUPPORTS SPECIFIED IN SECTION 230529 "HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT."
4. COMPLY WITH REQUIREMENTS FOR VIBRATION ISOLATION DEVICES SPECIFIED IN SECTION 230548.13 "VIBRATION CONTROLS FOR HVAC."

F. INSTALL UNIT TO PERMIT ACCESS FOR MAINTENANCE.

G. INSTALL PARTS AND ACCESSORIES SHIPPED LOOSE.

3.3 ELECTRICAL CONNECTIONS

A. CONNECT WIRING ACCORDING TO SECTION 260519 "ELECTRICAL POWER CONDUCTORS AND CABLES."

B. GROUND EQUIPMENT ACCORDING TO SECTION 260526 "GROUNDING AND BONDING.

C. INSTALL ELECTRICAL DEVICES FURNISHED BY MANUFACTURER, BUT NOT FACTORY MOUNTED, ACCORDING TO NFPA 70 AND NECA 1.

D. INSTALL POWER WIRING TO FIELD-MOUNTED ELECTRICAL DEVICES, FURNISHED BY FAN MANUFACTURER, BUT NOT FACTORY MOUNTED.

3.4 CONTROL CONNECTIONS

A. CONNECT CONTROL WIRING TO FIELD-MOUNTED CONTROL DEVICES.

B. CONNECT CONTROL INTERLOCK WIRING BETWEEN HVLS FAN AND OTHER EQUIPMENT TO PROVIDE A COMPLETE AND FUNCTIONING SYSTEM.

C. CONNECT CONTROL WIRING BETWEEN FAN UNIT CONTROL INTERFACE AND CONTROL SYSTEM TO PROVIDE REMOTE CONTROL AND MONITORING.

D. INSTALL CONTROL DEVICES FURNISHED BY MANUFACTURER, BUT NOT FACTORY MOUNTED.

E. INSTALL CONTROL WIRING TO FIELD-MOUNTED CONTROL DEVICES, FURNISHED BY FAN MANUFACTURER, BUT NOT FACTORY MOUNTED.

F. PROTECT INSTALLED UNITS FROM DAMAGE CAUSED BY OTHER WORK.

3.5 FIELD QUALITY CONTROL

A. MANUFACTURER'S FIELD SERVICE: ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO TEST AND INSPECT COMPONENTS, ASSEMBLIES, AND EQUIPMENT INSTALLATIONS, INCLUDING CONNECTIONS.

B. PERFORM THE FOLLOWING TESTS AND INSPECTIONS WITH THE ASSISTANCE OF A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE:

1. FAN OPERATIONAL TEST: AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, START UNITS TO CONFIRM PROPER MOTOR ROTATION AND UNIT OPERATION.
2. TEST AND ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND EQUIPMENT.

C. FAN OR COMPONENTS WILL BE CONSIDERED DEFECTIVE IF FAN OR COMPONENTS DO NOT PASS TESTS AND INSPECTIONS.

D. PREPARE AND SUBMIT TEST AND INSPECTION REPORTS.

3.6 STARTUP SERVICE

A. ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO PERFORM STARTUP SERVICE.

1. COMPLETE INSTALLATION AND STARTUP CHECKS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.
2. VERIFY THAT FAN IS SECURE ON MOUNTINGS AND SUPPORTING DEVICES AND THAT CONNECTIONS TO ELECTRICAL SYSTEMS ARE COMPLETE. VERIFY THAT PROPER THERMAL-OVERLOAD PROTECTION IS INSTALLED IN MOTORS, CONTROLLERS AND SWITCHES
3. VERIFY PROPER MOTOR ROTATION DIRECTION AND FREE FAN ROTATION.
4. CHECK BEARING LUBRICATION.
5. VERIFY PROPER FAN ROTATION. SET ROTATION SELECTOR TO BLOW VERTICALLY DOWNWARD DURING HEATING SEASON, AND VERTICALLY UPWARD DURING COOLING SEASON.

3.7 ADJUSTING

A. COMPLY WITH REQUIREMENTS IN SECTION 230593 "TESTING, ADJUSTING, AND BALANCING FOR HVAC" FOR AIR-HANDLING SYSTEM TESTING, ADJUSTING, AND BALANCING.

3.8 CLEANING

A. CLEAN EQUIPMENT EXTERNALLY; REMOVE COATINGS APPLIED FOR PROTECTION DURING SHIPPING AND STORAGE, FOREIGN MATERIAL, AND OILY RESIDUE ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. FOLLOWING MANUFACTURER'S CLEANING PROCEDURES, AND CLEAN WITH MANUFACTURER-RECOMMENDED CLEANING PRODUCTS.

3.9 DEMONSTRATION

A. ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST, OPERATE, AND MAINTAIN HVLS FANS

SECTION 23 37 13 - AIR DISTRIBUTION DEVICES

PART 1- GENERAL

1.1 WORK INCLUDED

A. DIFFUSERS, REGISTERS/GRILLES, LOUVERS

1.2 ACTION SUBMITTALS

A. SHOP DRAWINGS: FOR EACH TYPE OF PRODUCT.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. MANUFACTURER LISTED IN SCHEDULE IS FOR DESIGN SELECTION ONLY.

B. REGISTERS, GRILLES, AND DIFFUSERS: PRICE, NAILOR, TITUS

C. LOUVERS: GREENHECK, RUSKIN

2.2 RECTANGULAR CEILING DIFFUSERS

A. SQUARE, STAMPED, MULTICORE TYPE DIFFUSER TO DISCHARGE AIR IN FIXED 360-DEGREE PATTERN, OR ADJUSTABLE PATTERN AS SPECIFIED.

B. PROVIDE FOR SURFACE MOUNT AND INVERTED T-BAR WHERE SHOWN. IN PLASTER CEILINGS, PROVIDE PLASTER FRAME AND CEILING FRAME.

C. FABRICATE OF ALUMINUM WITH BAKED ENAMEL FINISH.

D. PROVIDE RADIAL OPPOSED BLADES DAMPER ADJUSTABLE FROM DIFFUSER FACE FOR SURFACE MOUNTED UNIT WHERE SPECIFIED.

2.3 CEILING GRID CORE EXHAUST AND RETURN REGISTERS/GRILLES

A. FIXED GRILLES OF 1/2 X 1/2 X 1-INCH LOUVERS.

B. FABRICATE MARGIN FRAME WITH COUNTERSUNK SCREW MOUNTING OR LAY-IN FRAME FOR SUSPENDED GRID CEILINGS AS SHOWN IN SCHEDULE ON DRAWINGS.

C. FABRICATE OF ALUMINUM WITH FACTORY CLEAR LACQUER FINISH.

D. WHERE SCHEDULED PROVIDE INTEGRAL, GANG-OPERATED OPPOSED BLADE DAMPERS WITH REMOVABLE KEY OPERATOR, OPERABLE FROM FACE.

E. ALL LOUVER-FACED GRILLES SHALL BE PROVIDED WITH PATTERN CONTROLLER BLADES UNLESS SCHEDULED OTHERWISE ON THE DRAWINGS.

2.4 LOUVERS

A. PROVIDE LOUVERS WITH BLADES ON 37.5- OR 45-DEGREE SLOPE, HEAVY CHANNEL FRAME, BIRD SCREEN WITH ½ INCH SQUARE MESH FOR EXHAUST AND 3/4 INCH FOR INTAKE.

B. FABRICATE OF EXTRUDED ALUMINUM, WELDED ASSEMBLY WITH FACTORY BAKE-ENAMEL FINISH.

C. FURNISH WITH REQUIRED FLANGE TO MATCH INSTALLATION REQUIRED.

PART 3 - EXECUTION

3.1 INSTALLATION

A. FURNISH AND INSTALL WHERE SHOWN ON DRAWINGS ALL REGISTERS, GRILLES, DIFFUSERS AND LOUVERS IN ACCORDANCE WITH THE TABULATION IN THE SCHEDULE ON DRAWINGS.

B. PROVIDE ACCESSORIES AND MODIFICATIONS AS INDICATED IN SCHEDULE NOTES.

C. INSTALL ITEMS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

D. INSTALL IN LOCATIONS AS SHOWN ON DRAWINGS. ITEMS HAVE BEEN LOCATED AS SHOWN TO PROVIDE MAXIMUM PERFORMANCE. COORDINATE WITH ARCHITECTURAL FEATURES AND NOTIFY ARCHITECT/ENGINEER OF ANY CONFLICTS.

E. INSTALL DIFFUSERS TO DUCTWORK WITH AIR TIGHT CONNECTION.

F. PROVIDE ACCESSIBLE 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.

SECTION 23 54 16.13 - GAS-FIRED FURNACES

PART 1- GENERAL

1.1 SUMMARY

A. SECTION INCLUDES: GAS-FIRED, NONCONDENSING CONDENSING FURNACES AND ACCESSORIES COMPLETE WITH CONTROLS, AIR FILTERS, REFRIGERATION COMPONENTS.

1.2 ACTION SUBMITTALS

A. SHOP DRAWINGS: FOR EACH TYPE OF PRODUCT.

1.3 QUALITY ASSURANCE

A. ASHRAE COMPLIANCE: APPLICABLE REQUIREMENTS IN ASHRAE 62.1, SECTION 5 - "SYSTEMS AND EQUIPMENT" AND SECTION 7 - "CONSTRUCTION AND STARTUP."

B. ASHRAE/IES 90.1 COMPLIANCE: APPLICABLE REQUIREMENTS IN ASHRAE/IES 90.1, SECTION 6 - "HEATING, VENTILATING, AND AIR-CONDITIONING."

C. COMPLY WITH NFPA 70.

1.4 WARRANTY

A. SPECIAL WARRANTY: MANUFACTURER AGREES TO REPAIR OR REPLACE THE FOLLOWING COMPONENTS OF FURNACES THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN SPECIFIED WARRANTY PERIOD:

1. WARRANTY PERIOD, COMMENCING ON DATE OF SUBSTANTIAL COMPLETION:
   a. FURNACE HEAT EXCHANGER: 20 YEARS.
   b. INTEGRATED IGNITION AND BLOWER CONTROL CIRCUIT BOARD: FIVE YEARS.
   c. DRAFT-INDUCER MOTOR: FIVE YEARS.
   d. REFRIGERATION COMPRESSORS: 5 YEARS.
   e. EVAPORATOR AND CONDENSER COILS: FIVE YEARS.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. LG, FRASER - JOHNSTON, TRANE, CARRIER, DAIKIN, YORK, LENNOX, JCI.

2.2 GAS-FIRED FURNACES, CONDENSING

A. CABINET: STEEL.

1. CABINET INTERIOR AROUND HEAT EXCHANGER SHALL BE FACTORY-INSTALLED INSULATION.
2. LIFT-OUT PANELS SHALL EXPOSE BURNERS AND ALL OTHER ITEMS REQUIRING ACCESS FOR MAINTENANCE.
3. FACTORY PAINT EXTERNAL CABINETS IN MANUFACTURER'S STANDARD COLOR.
4. AIRSTREAM SURFACES: SURFACES IN CONTACT WITH THE AIRSTREAM SHALL COMPLY WITH REQUIREMENTS IN ASHRAE 62.1.

B. FAN: CENTRIFUGAL, FACTORY BALANCED, RESILIENT MOUNTED, DIRECT DRIVE.

1. SPECIAL MOTOR FEATURES: MULTI-TAPPED, MULTISPEED WITH INTERNAL THERMAL PROTECTION AND PERMANENT LUBRICATION.
2. SPECIAL MOTOR FEATURES: ELECTRONICALLY CONTROLLED MOTOR (ECM) CONTROLLED BY INTEGRATED FURNACE/BLOWER CONTROL.

C. TYPE OF GAS: LIQUID PROPANE.

D. HEAT EXCHANGER:

1. PRIMARY: STAINLESS STEEL.
2. SECONDARY: STAINLESS STEEL.

E. BURNER:

1. GAS VALVE: 100 PERCENT SAFETY MODULATING MAIN GAS VALVE, MAIN SHUTOFF VALVE, PRESSURE REGULATOR, SAFETY PILOT WITH ELECTRONIC FLAME SENSOR, LIMIT CONTROL, TRANSFORMER, AND COMBINATION IGNITION/FAN TIMER CONTROL BOARD.
2. IGNITION: ELECTRIC PILOT IGNITION, WITH HOT-SURFACE IGNITER OR ELECTRIC SPARK IGNITION.

F. GAS-BURNER SAFETY CONTROLS:

1. ELECTRONIC FLAME SENSOR: PREVENTS GAS VALVE FROM OPENING UNTIL PILOT FLAME IS PROVEN; STOPS GAS FLOW ON IGNITION FAILURE.
2. FLAME ROLLOUT SWITCH: INSTALLED ON BURNER BOX; PREVENTS BURNER OPERATION.
3. LIMIT CONTROL: FIXED STOP AT MAXIMUM PERMISSIBLE SETTING; DE-ENERGIZES BURNER ON EXCESSIVE BONNET TEMPERATURE; AUTOMATIC RESET.

G. COMBUSTION-AIR INDUCER: CENTRIFUGAL FAN WITH THERMALLY PROTECTED MOTOR AND SLEEVE BEARINGS PRE-PURGES HEAT EXCHANGER AND VENTS COMBUSTION PRODUCTS; PRESSURE SWITCH PREVENTS FURNACE OPERATION IF COMBUSTION-AIR INLET OR FLUE OUTLET IS BLOCKED.

H. FURNACE CONTROLS: SOLID-STATE BOARD INTEGRATES IGNITION, HEAT, COOLING, AND FAN SPEEDS; ADJUSTABLE FAN-ON AND FAN-OFF TIMING; TERMINALS FOR CONNECTION TO ACCESSORIES.

I. ACCESSORIES:

1. COMBINATION COMBUSTION-AIR INTAKE AND VENT: PVC PLASTIC FITTING TO COMBINE COMBUSTION-AIR INLET AND VENT THROUGH OUTSIDE WALL OR ROOF AS SPECIFIED.
2. CPVC PLASTIC VENT MATERIALS:
   a. CPVC PLASTIC PIPE: SCHEDULE 40, COMPLYING WITH ASTM F 441/F 441M.
   b. CPVC PLASTIC FITTINGS: SCHEDULE 40, COMPLYING WITH ASTM F 438, SOCKET TYPE.
   c. CPVC SOLVENT CEMENT: ASTM F 493.
3. PVC PLASTIC VENT MATERIALS:
   a. PVC PLASTIC PIPE: SCHEDULE 40, COMPLYING WITH ASTM D 1785.
   b. PVC PLASTIC FITTINGS: SCHEDULE 40, COMPLYING WITH ASTM D 2466, SOCKET TYPE.
   c. PVC SOLVENT CEMENT: ASTM D 2564.

2.3 THERMOSTATS

A. CONTROLS SHALL COMPLY WITH REQUIREMENTS IN ASHRAE/IES 90.1, "CONTROLS."

B. SOLID-STATE THERMOSTAT: WALL-MOUNTED, PROGRAMMABLE, MICROPROCESSOR-BASED UNIT WITH AUTOMATIC SWITCHING FROM HEATING TO COOLING, PREFERENTIAL RATE CONTROL, SEVEN-DAY PROGRAMMABILITY WITH MINIMUM OF FOUR TEMPERATURE PRESETS PER DAY AND BATTERY BACKUP PROTECTION AGAINST POWER FAILURE FOR PROGRAM SETTINGS.

2.4 AIR FILTRATION SECTION

A. GENERAL REQUIREMENTS FOR AIR FILTRATION SECTION:

1. COMPLY WITH NFPA 90A.
2. MINIMUM MERV ACCORDING TO ASHRAE 52.2.
3. FILTER-HOLDING FRAMES: ARRANGED FOR FLAT OR ANGULAR ORIENTATION, WITH ACCESS DOORS ON BOTH SIDES OF UNIT. FILTERS SHALL BE REMOVABLE FROM ONE SIDE OR LIFTED OUT FROM ACCESS PLENUM.

B. DISPOSABLE PANEL FILTERS:

1. FACTORY-FABRICATED, VISCOUS-COATED, FLAT-PANEL TYPE.
2. THICKNESS: 1 INCH.
3. MEDIA: INTERLACED GLASS FIBERS SPRAYED WITH NONFLAMMABLE ADHESIVE AND ANTIMICROBIAL AGENT.

2.5 REFRIGERATION COMPONENTS

A. GENERAL REFRIGERATION COMPONENT REQUIREMENTS:

1. REFRIGERATION COMPRESSOR, COILS, AND SPECIALTIES SHALL BE DESIGNED TO OPERATE WITH CFC-FREE REFRIGERANTS.
2. ENERGY EFFICIENCY: EQUAL TO OR GREATER THAN PRESCRIBED BY ASHRAE/IES 90.1.

B. REFRIGERANT COIL: COPPER TUBES MECHANICALLY EXPANDED INTO ALUMINUM FINS AND THERMAL-EXPANSION VALVE. COMPLY WITH AHRI 210/240. MATCH SIZE WITH FURNACE. INCLUDE CONDENSATE DRAIN PAN WITH ACCESSIBLE DRAIN OUTLET COMPLYING WITH ASHRAE 62.1.

1. REFRIGERANT COIL ENCLOSURE: STEEL, MATCHING FURNACE AND EVAPORATOR COIL, WITH ACCESS PANEL AND FLANGES FOR INTEGRAL MOUNTING AT OR ON FURNACE CABINET AND GALVANIZED SHEET METAL DRAIN PAN COATED WITH BLACK ASPHALTIC BASE PAINT.
2. CONDENSATE OVERFLOW SWITCH

C. REFRIGERANT LINE KITS: ANNEALED-COPPER SUCTION AND LIQUID LINES FACTORY CLEANED, DRIED, PRESSURIZED WITH NITROGEN, SEALED, AND WITH SUCTION LINE INSULATED. PROVIDE IN STANDARD LENGTHS FOR INSTALLATION WITHOUT JOINTS, EXCEPT AT EQUIPMENT CONNECTIONS.

1. THIS PIPING SHALL BE CAPPED THROUGHOUT THE CONSTRUCTION TO PREVENT ANY FOREIGN MATERIALS FROM ENTERING THE PIPING. FITTINGS SHALL BE WROUGHT COPPER SOLDER JOINT TYPE. DRY NITROGEN SHALL BE BLED THROUGH PIPING WHILE JOINTS ARE BEING BRAZED. JOINTS SHALL BE AS FOLLOWS:
   a. COPPER TO BRASS - SILVER SOLDER.
   b. COPPER TO COPPER - SILFOS.
2. JOINTS: COPPER TUBING CONNECTIONS SHALL BE MADE UP WITH 95/5 TIN ANTIMONY SOLDER OR SILFOS, IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER OR AS SPECIFIED HEREINAFTER.
3. REFRIGERANT PIPING INSULATION: ARMSTRONG ARMAFLEX INSULATION ½" THICK WITH FITTINGS COVERED WITH MITERED SECTIONS OF INSULATION AND SEALED WITH 520 ADHESIVE. ALL INSULATION ON OUTDOOR INSTALLATION SHALL BE ADDITIONALLY PROTECTED WITH TWO (2) COATS OF ARMAFLEX VINYL-LACQUER TYPE FINISH.
   a. COMPLY WITH ASTM C 534/C 534M, TYPE I.
   b. FLEXIBLE ELASTOMERIC: CLOSED-CELL, SPONGE- OR EXPANDED-RUBBER MATERIALS. COMPLY WITH ASTM C 534/C 534M, TYPE I, 1 INCH THICK.

D. AIR-COOLED COMPRESSOR-CONDENSER UNIT:

3. CASING: STEEL, FINISHED WITH BAKED ENAMEL, WITH REMOVABLE PANELS FOR ACCESS TO CONTROLS, WEEP HOLES FOR WATER DRAINAGE, AND MOUNTING HOLES IN BASE. PROVIDE BRASS SERVICE VALVES, FITTINGS, AND GAGE PORTS ON EXTERIOR OF CASING.
4. COMPRESSOR: HERMETICALLY SEALED SCROLL TYPE.
   a. CRANKCASE HEATER.
   b. VIBRATION ISOLATION MOUNTS FOR COMPRESSOR.
   c. COMPRESSOR MOTOR SHALL HAVE THERMAL- AND CURRENT-SENSITIVE OVERLOAD DEVICES, START CAPACITOR, RELAY, AND CONTACTOR.
   d. TWO-SPEED COMPRESSOR MOTORS SHALL HAVE MANUAL-RESET HIGH-PRESSURE SWITCH AND AUTOMATIC-RESET LOW-PRESSURE SWITCH.
   e. REFRIGERANT: R-410A.
3. REFRIGERANT COIL: COPPER TUBE, WITH MECHANICALLY BONDED ALUMINUM FINS, COMPLYING WITH AHRI 210/240, AND WITH LIQUID SUB-COOLER.
4. HEAT-PUMP COMPONENTS: REVERSING VALVE AND LOW-TEMPERATURE AIR CUT-OFF THERMOSTAT.
5. FAN: ALUMINUM-PROPELLER TYPE, DIRECTLY CONNECTED TO MOTOR.
6. MOTOR: PERMANENTLY LUBRICATED, WITH INTEGRAL THERMAL-OVERLOAD PROTECTION.
7. HIGH- AND LOW-PRESSURE SWITCHES.
8. HIGH CAPACITY LIQUID AIR DRIER.
9. LOW AMBIENT KIT: PERMITS OPERATION DOWN TO 45 DEG F.

E. CONDENSATE DRAIN

1. FURNACE AND COIL CONDENSATE DRAINS SHALL BE SCHEDULE 40 PVC, ASTM-D1784.
2. FITTINGS: PVC, ASTM D-1785 AND 2466.
3. JOINTS: SOLVENT WELD.

PART 3 - EXECUTION

3.1 EXAMINATION

A. EXAMINE AREAS AND CONDITIONS, WITH INSTALLER PRESENT, FOR COMPLIANCE WITH REQUIREMENTS FOR INSTALLATION TOLERANCES AND OTHER CONDITIONS AFFECTING PERFORMANCE OF THE WORK.

B. EXAMINE FACTORY-INSTALLED INSULATION BEFORE FURNACE INSTALLATION. REJECT UNITS THAT ARE WET, MOISTURE DAMAGED, OR MOLD DAMAGED.

C. EXAMINE ROUGHING-IN FOR GAS AND REFRIGERANT PIPING SYSTEMS TO VERIFY ACTUAL LOCATIONS OF PIPING CONNECTIONS BEFORE EQUIPMENT INSTALLATION.

D. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

3.2 INSTALLATION

A. INSTALL GAS-FIRED FURNACES AND ASSOCIATED FUEL AND VENT FEATURES AND SYSTEMS ACCORDING TO NFPA 54.

B. SUSPENDED UNITS: SUSPEND FROM STRUCTURE USING THREADED RODS, SPRING HANGERS, AND BUILDING ATTACHMENTS. SECURE RODS TO UNIT HANGER ATTACHMENTS. ADJUST HANGERS SO UNIT IS LEVEL AND PLUMB.

1. INSTALL SEISMIC RESTRAINTS TO LIMIT MOVEMENT OF FURNACE BY RESISTING CODE-REQUIRED SEISMIC ACCELERATION.

C. BASE-MOUNTED UNITS: SECURE UNITS TO SUBSTRATE. PROVIDE OPTIONAL BOTTOM CLOSURE BASE IF REQUIRED BY INSTALLATION CONDITIONS.

1. ANCHOR FURNACE TO SUBSTRATE TO RESIST CODE-REQUIRED SEISMIC ACCELERATION.

D. CONTROLS: INSTALL THERMOSTATS AT MOUNTING HEIGHT OF 48 INCHES ABOVE FLOOR.

E. WIRING METHOD: INSTALL CONTROL WIRING IN ACCESSIBLE CEILING SPACES AND IN GYPSUM BOARD PARTITIONS WHERE UNENCLOSED WIRING METHOD MAY BE USED. CONCEAL CONTROL WIRING EXCEPT IN UNFINISHED SPACES.

F. INSTALL GROUND-MOUNTED, COMPRESSOR-CONDENSER COMPONENTS ON 4-INCH THICK, REINFORCED CONCRETE BASE; 4 INCHES LARGER ON EACH SIDE THAN UNIT.

G. INSTALL ROOF-MOUNTED COMPRESSOR-CONDENSER COMPONENTS ON EQUIPMENT SUPPORTS AS SPECIFIED. ANCHOR UNITS TO SUPPORTS WITH REMOVABLE, CADMIUM-PLATED FASTENERS.

3.3 CONNECTIONS

A. GAS PIPING INSTALLATION REQUIREMENTS ARE SPECIFIED IN SECTION 221000 "PLUMBING PIPING AND VALVES." DRAWINGS INDICATE GENERAL ARRANGEMENT OF PIPING, FITTINGS, AND SPECIALTIES. CONNECT GAS PIPING WITH UNION OR FLANGE AND APPLIANCE CONNECTOR VALVE.

B. INSTALL PIPING ADJACENT TO EQUIPMENT TO ALLOW SERVICE AND MAINTENANCE.

C. VENT CONNECTION, NONCONDENSING, GAS-FIRED FURNACES: CONNECT TYPE B VENTS TO FURNACE VENT CONNECTION AND EXTEND OUTDOORS.

D. VENT AND OUTSIDE-AIR CONNECTION, CONDENSING, GAS-FIRED FURNACES: CONNECT PLASTIC PIPING VENT MATERIAL TO FURNACE CONNECTIONS AND EXTEND OUTDOORS. TERMINATE VENT OUTDOORS WITH A CAP AND IN AN ARRANGEMENT THAT WILL PROTECT AGAINST ENTRY OF BIRDS, INSECTS, AND DIRT.

1. REAM ENDS OF PIPES AND TUBES AND REMOVE BURRS. BEVEL PLAIN ENDS OF STEEL PIPE.
2. REMOVE SCALE, SLAG, DIRT, AND DEBRIS FROM INSIDE AND OUTSIDE OF PIPE AND FITTINGS BEFORE ASSEMBLY.
3. PLASTIC PIPING SOLVENT-CEMENT JOINTS: CLEAN AND DRY JOINING SURFACES. JOIN PIPE AND FITTINGS ACCORDING TO THE FOLLOWING:
   a. COMPLY WITH ASTM F 402 FOR SAFE-HANDLING PRACTICE OF CLEANERS, PRIMERS, AND SOLVENT CEMENTS.
   b. CPVC PIPING: JOIN ACCORDING TO ASTM D 2846/D 2846M, APPENDIX.
   c. PVC PRESSURE PIPING: JOIN SCHEDULE NUMBER ASTM D 1785 PVC PIPE AND PVC SOCKET FITTINGS ACCORDING TO ASTM D 2672. JOIN OTHER-THAN-SCHEDULE-NUMBER PVC PIPE AND SOCKET FITTINGS ACCORDING TO ASTM D 2855.
4. SLOPE PIPE VENT BACK TO FURNACE OR TO OUTSIDE TERMINAL.

E. CONNECT DUCTS TO FURNACE WITH FLEXIBLE CONNECTOR. COMPLY WITH REQUIREMENTS IN SECTION 233300 "DUCTWORK ACCESSORIES."

F. CONNECT REFRIGERANT TUBING KITS TO REFRIGERANT COIL IN FURNACE AND TO AIR-COOLED COMPRESSOR-CONDENSER UNIT.

1. FLARED JOINTS: USE ASME B16.26 FITTING AND FLARED ENDS, FOLLOWING PROCEDURES IN CDA'S "COPPER TUBE HANDBOOK."
2. SOLDERED JOINTS: APPLY ASTM B 813, WATER-FLUSHABLE FLUX, UNLESS OTHERWISE INDICATED, TO TUBE END. CONSTRUCT JOINTS ACCORDING TO ASTM B 828 OR CDA'S "COPPER TUBE HANDBOOK," USING LEAD-FREE SOLDER ALLOY COMPLYING WITH ASTM B 32.
3. BRAZED JOINTS: CONSTRUCT JOINTS ACCORDING TO AWS'S "BRAZING HANDBOOK," "PIPE AND TUBE" CHAPTER, USING COPPER-PHOSPHORUS BRAZING FILLER METAL COMPLYING WITH AWS A5.8/A5.8M.

3.4 FIELD QUALITY CONTROL

A. PERFORM THE FOLLOWING TESTS AND INSPECTIONS:

1. PERFORM ELECTRICAL TEST AND VISUAL AND MECHANICAL INSPECTION.
2. LEAK TEST: AFTER INSTALLATION, CHARGE SYSTEMS WITH REFRIGERANT AND TEST FOR LEAKS. REPAIR LEAKS, REPLACE LOST REFRIGERANT, AND RETEST UNTIL NO LEAKS EXIST.
3. OPERATIONAL TEST: AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, START UNITS TO CONFIRM PROPER OPERATION, PRODUCT CAPABILITY, AND COMPLIANCE WITH REQUIREMENTS.
4. VERIFY THAT FAN WHEEL IS ROTATING IN THE CORRECT DIRECTION AND IS NOT VIBRATING OR BINDING.
5. TEST AND ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND EQUIPMENT.

B. VERIFY THAT VIBRATION ISOLATION AND FLEXIBLE CONNECTIONS PROPERLY DAMPEN VIBRATION TRANSMISSION TO STRUCTURE.

3.5 STARTUP SERVICE

A. COMPLETE INSTALLATION AND STARTUP CHECKS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS AND PERFORM THE FOLLOWING:

1. INSPECT FOR PHYSICAL DAMAGE TO UNIT CASINGS.
2. VERIFY THAT ACCESS DOORS MOVE FREELY AND ARE WEATHERTIGHT.
3. CLEAN UNITS AND INSPECT FOR CONSTRUCTION DEBRIS.
4. VERIFY THAT ALL BOLTS AND SCREWS ARE TIGHT.
5. ADJUST VIBRATION ISOLATION AND FLEXIBLE CONNECTIONS.
6. VERIFY THAT CONTROLS ARE CONNECTED AND OPERATIONAL.

B. ADJUST FAN BELTS TO PROPER ALIGNMENT AND TENSION.

C. START UNIT ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS AND COMPLETE MANUFACTURER'S OPERATIONAL CHECKLIST.

D. MEASURE AND RECORD AIRFLOWS.

E. VERIFY PROPER OPERATION OF CAPACITY CONTROL DEVICE.

F. AFTER STARTUP AND PERFORMANCE TEST, LUBRICATE BEARINGS.

MALLORY L. P. ANDERSON
36770

REVISION	DATE

DRAWN BY CE
CHECKED BY CA
APPROVED BY CA

Meade County Road Department

MECHANICAL SPECIFICATIONS

Lincoln Trail
Area Development District
~ established 1968 ~
750 S. Provident Way • Elizabethtown, KY 42701
Phone: 270-769-2393 • TDD: 800-247-2510 • Fax: 270-769-2993
Equal Opportunity Employer M/F/D/V/SO

DATE:

SHEET X OF X

M-801

JOB#:

SCALE

3.6 ADJUSTING

A. ADJUST INITIAL TEMPERATURE SET POINTS.

B. SET CONTROLS, BURNER, AND OTHER ADJUSTMENTS FOR OPTIMUM HEATING PERFORMANCE AND EFFICIENCY. ADJUST HEAT-DISTRIBUTION FEATURES, INCLUDING SHUTTERS, DAMPERS, AND RELAYS, TO PROVIDE OPTIMUM HEATING PERFORMANCE AND SYSTEM EFFICIENCY.

3.7 CLEANING

A. AFTER COMPLETING INSTALLATION, CLEAN FURNACES INTERNALLY ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.

B. INSTALL NEW FILTERS IN EACH FURNACE WITHIN 14 DAYS AFTER SUBSTANTIAL COMPLETION.

d.

SECTION 23 55 33 - GAS FIRED UNIT HEATERS

PART 1- GENERAL

1.1 WORK INCLUDED

A. GAS FIRED UNIT HEATERS

1.2 ACTION SUBMITTALS

A. SHOP DRAWINGS: PRODUCT DATA: FOR EACH TYPE OF PRODUCT.

1.3 CLOSEOUT SUBMITTALS

A. APPROVED SHOP DRAWINGS: FOR EACH UNIT HEATER AND RELATED COMPONENTS. PROVIDE IN OPERATION AND MAINTENANCE MANUAL.

B. OPERATION AND MAINTENANCE DATA: FOR EACH UNIT HEATER TO INCLUDE IN OPERATION AND MAINTENANCE MANUALS.

1.4 QUALITY ASSURANCE

A. ALL ELECTRICAL COMPONENTS AND ACCESSORIES SHALL BE LISTED AND LABELED PER REQUIREMENTS OF NFPA 70, ARTICLE 100.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. REZNOR, MODINE, TRANE, STERLING

2.2 GAS FIRED UNIT HEATERS

A. GAS FIRED, SEPARATED COMBUSTION UNIT HEATER: PROVIDE (82%, 83%) HIGH-EFFICIENCY, SEPARATED-COMBUSTION, POWER VENTED, GAS-FIRED UNIT HEATERS. THE UNIT SHALL BE DESIGNED FOR USE IN A BUILDING WITH NEGATIVE PRESSURES UP TO 0.15" W.C. AND FOR USE IN BUILDING WHERE A NON-EXPLOSIVE ATMOSPHERE EXIST THAT IS DUST LADEN AND/OR CONTAINS MILDLY CORROSIVE FUMES.

B. THE HEATER SHALL BE EQUIPPED WITH A MULTI-CELL, 4 PASS SERPENTINE STYLE STEEL HEAT EXCHANGER. HEAT EXCHANGER TUBES SHALL BE PRESS FABRICATED OF (CORROSION RESISTANT ALUMINIZED STEEL). ALL HEAT EXCHANGERS SHALL BE FABRICATED WITH NO WELDING OR BRAZING, ONLY TOOL PRESSED MECHANICAL JOINTS. ALL HEAT EXCHANGER CELLS SHALL BE DESIGNED WITH AN AERODYNAMIC CROSS SECTION TO PROVIDE MAXIMUM AIRFLOW.

C. THE UNITS SHALL INCORPORATE A SINGLE, ONE-PIECE BURNER ASSEMBLY WITH A SINGLE ORIFICE. THE BURNER SHALL HAVE A CONTINUOUS WOUND CLOSE PRESSED STAINLESS-STEEL RIBBON SEPARATING THE FLAME FROM THE BURNER INTERIOR. ALL UNITS SHALL HAVE A SINGLE VENTURI TUBE AND ORIFICE SUPPLYING FUEL TO A ONE-PIECE BURNER HOUSING. EACH HEAT EXCHANGER CELL SHALL USE BALANCED DRAFT INDUCTION TO MAINTAIN OPTIMUM FLAME CONTROL.

D. CONTROLS SHALL INCLUDE A (SINGLE-STAGE) GAS VALVE; DIRECT SPARK MULTI-TRY IGNITION WITH ELECTRONIC FLAME SUPERVISION WITH 100% LOCKOUT INTEGRALLY CONTROLLED VIA A PRINTED CIRCUIT CONTROL BOARD. THE CONTROL BOARD SHALL ALSO INCORPORATE DIAGNOSTIC LIGHTS, DIP SWITCHES FOR FAN OVERRUN SETTINGS, AND A RELAY FOR FAN ONLY OPERATION. ALL UNITS SHALL BE EQUIPPED WITH A SAFETY LIMIT SWITCH.

E. ALL CONTROLS SHALL BE ENCLOSED IN THE SEALED CONTROLLED COMPARTMENT TO PROTECT THEM FROM ACCIDENTAL DAMAGE, DUST, AND ATMOSPHERIC CORROSION.

F. COMBUSTION AIR AND VENTING

1. THE UNIT SHALL HAVE A FACTORY-INSTALLED POWER VENTER DEVICE TO DRAW COMBUSTION AIR FROM OUTSIDE OF THE BUILDING. THE OUTSIDE AIR SHALL ENTER THE UNIT THROUGH A FACTORY-INSTALLED ROUND INLET AIR TERMINAL ON THE REAR OF THE HEATER. THE CONTROL COMPARTMENT SHALL BE SEALED, AND THE ACCESS DOOR SHALL BE GASKETED TO PREVENT DIRT, LENT, DUST, OR OTHER CONTAMINANTS PRESENT IN THE HEATED SPACE FROM INJURING A UNIT. THE CONTROL COMPARTMENT DOOR SHALL BE EQUIPPED WITH A SAFETY INTERLOCK SWITCH TO PREVENT OPERATION WHEN THE DOOR IS OPEN.

2. THE COMBUSTION AIR SUPPLY PIPE AND FLUE EXHAUST PIPE SHALL BE RUN IN PARALLEL FROM THE HEATER TO A FACTORY SUPPLIED CONCENTRIC ADAPTOR ASSEMBLY, WHICH ALLOWS FOR A SINGLE WALL OR ROOF PENETRATION TO THE VERTICAL AIR INLET AND VENT TERMINAL.

3. THE COMBUSTION AIR/VENTING SYSTEM SHALL INCLUDE A VIBRATION ISOLATED POWER VENTER MOTOR AND WHEEL ASSEMBLY AND A COMBUSTION AIR PRESSURE SWITCH.

G. ELECTRICAL

1. OPERATION SHALL BE CONTROLLED BY AN INTEGRATED CIRCUIT BOARD THAT INCLUDES LED DIAGNOSTIC INDICATOR LIGHTS. SUPPLY VOLTAGE CONNECTIONS SHALL BE MADE IN A SEALED JUNCTION BOX. 24-VOLT CONTROLLED CONNECTIONS SHALL BE MADE ON AN EXTERNALLY MOUNTED TERMINAL STRIP WITH CONNECTIONS (W1, W2, R, AND G). ALL INTERNAL WIRING BOTH LINED AND CONTROLLED VOLTAGES, SHALL BE TERMINATED BY INSULATED TERMINAL CONNECTORS TO MINIMIZE SHOCK HAZARD DURING SERVICE.

2. ALL UNITS WILL BE EQUIPPED WITH A BUILT-IN DISCONNECT SWITCH.

H. CABINET

1. THE CABINET SHALL BE LOW PROFILE WITH A PRE-COAT OR POWDER-COAT PAINT FINISH. FINISH SHALL BE A MINIMUM 80 GLOSS ON G30 GALVANIZED STEEL. THE CABINET SHALL BE CONSTRUCTED SO THAT SCREWS ARE NOT VISIBLE FROM THE BOTTOM, FRONT, OR SIDES, EXCEPT FOR SERVICE PANEL AND ACCESSORIES. UNIT CONSTRUCTION SHALL INCORPORATE A BEVELED FRONT CORNER ON CONTROL SIDE FOR ADDITIONAL CABINET RIGIDITY. ALL UNITS SHALL BE MANUFACTURED WITH A TOOL DRAWN SUPPLY AIR ORIFICE ON THE REAR PANEL TO REDUCE FAN INLET NOISE.

2. THE UNIT SHALL BE DESIGNED FOR CEILING SUSPENSION FEATURING 3/8"-16 FEMALE THREADS (HANGER KITS FOR 1" PIPE) AT BOTH 2-POINT AND 4-POINT LOCATIONS WITH NO ADDITIONAL ADAPTOR KITS.

3. THE CABINET SHALL BE EQUIPPED WITH PAINTED, ROLLED-FORMED HORIZONTAL LOUVERS. LOUVERS SHALL BE SPRING HELD AND ADJUSTABLE FOR DIRECTING AIR FLOW.

4. THE CABINET SHALL BE EQUIPPED WITH A FULL SAFETY FAN GUARD WITH NO MORE THAN HALF-INCH GRILL SPACING. THE (ENCLOSED) MOTOR AND FAN ASSEMBLY SHALL BE RESILIENTLY MOUNTED TO THE CABINET TO REDUCE CABINET NOISE.

5. THE UNIT SHALL BE DESIGNED WITH A FULL OPENING SERVICE ACCESS PANEL COMPLETE WITH SCREW CLOSURE ATTACHMENT AND LIFTING HANDLE FOR REMOVAL. SERVICE PANEL SHALL BE FULLY GASKETED AND EQUIPPED WITH A SAFETY INTERLOCK SWITCH. ALL COMPONENTS IN THE GAS TRAIN, ALL STANDARD ELECTRICAL CONTROLS, AND THE POWER VENTER SHALL BE WITHIN THE SEALED SERVICE COMPARTMENT.

2.3 CERTIFICATIONS

A. UNITS SHALL BE MANUFACTURED IN AN ISO9002 CERTIFIED FACILITY. MANUFACTURER MUST HAVE A MINIMUM OF 50 YEARS' EXPERIENCE IN THE MANUFACTURER OF GAS-FIRED UNIT HEATERS.

PART 3 - EXECUTION

3.1 INSTALLATION

A. INSTALL ALL UNITS AND ACCESSORIES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

B. INSTALL ALL UNITS IN A MANNER TO PROVIDE CLEARANCES FOR PROPER OPERATION ACCESSIBILITY AND MAINTENANCE.

C. COORDINATE ELECTRICAL AND GAS CONNECTIONS REQUIRED.

3.2 DEMONSTRATION

A. PROVIDE OWNER'S MAINTENANCE PERSONAL TRAINING AS REQUIRED TO ADJUST, OPERATE AND MAINTAIN HEATERS.

SECTION 23 81 26 - SPLIT SYSTEM AIR CONDITIONERS

PART 1- GENERAL

1.1 SUMMARY

A. SECTION INCLUDES SPLIT-SYSTEM AIR-CONDITIONING AND/OR HEAT-PUMP UNITS CONSISTING OF SEPARATE EVAPORATOR-FAN AND COMPRESSOR-CONDENSER COMPONENTS AND REFRIGERANT PIPING AND CONTROLS.

1.2 ACTION SUBMITTALS

A. SHOP DRAWINGS: FOR EACH TYPE OF PRODUCT INDICATED.

1.3 QUALITY ASSURANCE

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

B. ASHRAE COMPLIANCE:

1. FABRICATE AND LABEL REFRIGERATION SYSTEM TO COMPLY WITH ASHRAE 15, "SAFETY STANDARD FOR REFRIGERATION SYSTEMS."

2. ASHRAE COMPLIANCE: APPLICABLE REQUIREMENTS IN ASHRAE 62.1, SECTION 4 - "OUTDOOR AIR QUALITY," SECTION 5 - "SYSTEMS AND EQUIPMENT," SECTION 6 - " PROCEDURES," AND SECTION 7 - "CONSTRUCTION AND SYSTEM START-UP."

C. ASHRAE/IES COMPLIANCE: APPLICABLE REQUIREMENTS IN ASHRAE/IES 90.1.

1.4 COORDINATION

A. COORDINATE SIZES AND LOCATIONS OF CONCRETE BASES WITH ACTUAL EQUIPMENT PROVIDED.

B. COORDINATE SIZES AND LOCATIONS OF ROOF CURBS, EQUIPMENT SUPPORTS, AND ROOF PENETRATIONS WITH ACTUAL EQUIPMENT PROVIDED.

1.5 WARRANTY

A. SPECIAL WARRANTY: MANUFACTURER'S STANDARD FORM IN WHICH MANUFACTURER AGREES TO REPAIR OR REPLACE COMPONENTS OF SPLIT-SYSTEM AIR-CONDITIONING UNITS THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN SPECIFIED WARRANTY PERIOD.

1. WARRANTY PERIOD:

a. FOR COMPRESSOR: FIVE YEARS FROM DATE OF SUBSTANTIAL COMPLETION.

b. FOR PARTS: ONE YEAR FROM DATE OF SUBSTANTIAL COMPLETION.

c. FOR LABOR: ONE YEAR FROM DATE OF SUBSTANTIAL COMPLETION.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. LG, FRASER - JOHNSTON, TRANE, CARRIER, DAIKIN, YORK, LENNOX, JCI.

2.2 INDOOR UNITS

A. EVAPORATOR-FAN COMPONENTS:

1. AIRFLOW: UP-FLOW/HORIZONTAL/MULTI-POSITION

2. CHASSIS: PRE-PAINTED ENAMEL HEAVY GAUGE GALVANIZED STEEL WITH FLANGED EDGES, REMOVABLE PANELS FOR SERVICING, AND INSULATION ON BACK OF PANEL.

3. INSULATION: FACED, GLASS-FIBER DUCT LINER.

4. CONDENSATE DRAIN PANS:

a. FABRICATED WITH TWO PERCENT SLOPE IN AT LEAST TWO PLANES TO COLLECT CONDENSATE FROM COOLING COILS (INCLUDING COIL PIPING CONNECTIONS, COIL HEADERS, AND RETURN BENDS) AND TO DIRECT WATER TOWARD DRAIN CONNECTION.

1) LENGTH: EXTEND DRAIN PAN DOWNSTREAM FROM LEAVING FACE TO COMPLY WITH ASHRAE 62.1.

b. DRAIN CONNECTION: LOCATED AT LOWEST POINT OF PAN AND SIZED TO PREVENT OVERFLOW. TERMINATE WITH THREADED NIPPLE ON ONE END OF PAN.

c. PAN-TOP SURFACE COATING: ASPHALTIC WATERPROOFING COMPOUND.

5. REFRIGERANT COIL: COPPER TUBE, WITH MECHANICALLY BONDED ALUMINUM FINS AND THERMAL-EXPANSION VALVE. COMPLY WITH ARI 206/110.

6. ELECTRIC COIL: HELICAL, NICKEL-CHROME, RESISTANCE-WIRE HEATING ELEMENTS; WITH REFRACTORY CERAMIC SUPPORT BUSHINGS, AUTOMATIC-RESET THERMAL CUTOUT, BUILT-IN MAGNETIC CONTACTORS, MANUAL-RESET THERMAL CUTOUT, AIRFLOW PROVING DEVICE, AND ONE-TIME FUSES IN TERMINAL BOX FOR OVERCURRENT PROTECTION.

7. DIRECT DRIVE FAN:

a. STATICALLY AND DYNAMICALLY BALANCED BEFORE INSTALLATION.

b. RESILIENTLY MOUNTED MOTOR.

c. EASILY REMOVABLE FOR SERVICE.

d. TIME DELAY FAN RELAY.

8. FAN MOTORS:

a. COMPLY WITH NEMA DESIGNATION, TEMPERATURE RATING, SERVICE FACTOR, ENCLOSURE TYPE, AND EFFICIENCY REQUIREMENTS.

b. MULTITAPPED, MULTISPEED WITH INTERNAL THERMAL PROTECTION AND PERMANENT LUBRICATION.

c. PERMANENTLY LUBRICATED, BALL-BEARING MOTORS WITH BUILT-IN THERMAL-OVERLOAD PROTECTION.

d. WIRING TERMINATIONS: CONNECT MOTOR TO CHASSIS WIRING WITH PLUG CONNECTION

9. AIR FILTRATION SECTION:

a. GENERAL REQUIREMENTS FOR AIR FILTRATION SECTION:

1) COMPLY WITH NFPA 90A.

2) MINIMUM MERV ACCORDING TO ASHRAE 52.2.

3) FILTER-HOLDING FRAMES: ARRANGED FOR FLAT OR ANGULAR ORIENTATION, WITH ACCESS DOORS ON BOTH SIDES OF UNIT. FILTERS SHALL BE REMOVABLE FROM ONE SIDE OR LIFTED OUT FROM ACCESS PLENUM.

b. DISPOSABLE PANEL FILTERS:

1) FACTORY-FABRICATED, VISCOUS-COATED, FLAT-PANEL TYPE.

2) THICKNESS: 1 INCH.

10. MEDIA: INTERLACED GLASS FIBERS SPRAYED WITH NONFLAMMABLE ADHESIVE AND ANTIMICROBIAL AGENT.

2.3 OUTDOOR UNITS

A. AIR-COOLED, COMPRESSOR-CONDENSER COMPONENTS:

1. CASING: STEEL, FINISHED WITH BAKED ENAMEL IN COLOR, WITH REMOVABLE PANELS FOR ACCESS TO CONTROLS, WEEP HOLES FOR WATER DRAINAGE, AND MOUNTING HOLES IN BASE. PROVIDE BRASS SERVICE VALVES, FITTINGS, AND GAGE PORTS ON EXTERIOR OF CASING. PROVIDE COIL PROTECTION PANELS.

2. COMPRESSOR: HERMETICALLY SEALED WITH CRANKCASE HEATER AND MOUNTED ON VIBRATION ISOLATION DEVICE. COMPRESSOR MOTOR SHALL HAVE THERMAL- AND CURRENT-SENSITIVE OVERLOAD DEVICES, START CAPACITOR, RELAY, AND CONTACTOR.

a. COMPRESSOR TYPE: SCROLL.

b. TWO-SPEED COMPRESSOR MOTOR WITH MANUAL-RESET HIGH-PRESSURE SWITCH AND AUTOMATIC-RESET LOW-PRESSURE SWITCH.

c. REFRIGERANT: R-410A.

d. REFRIGERANT COIL: COPPER TUBE, WITH MECHANICALLY BONDED ALUMINUM FINS AND LIQUID SUBCOOLER. COMPLY WITH ARI 206/110.

3. HEAT-PUMP COMPONENTS: REVERSING VALVE AND LOW-TEMPERATURE-AIR CUTOFF THERMOSTAT.

4. FAN: ALUMINUM-PROPELLER TYPE, DIRECTLY CONNECTED TO MOTOR.

5. MOTOR: PERMANENTLY LUBRICATED, WITH INTEGRAL THERMAL-OVERLOAD PROTECTION.

6. HIGH- AND LOW-PRESSURE SWITCHES.

7. HIGH-CAPACITY LIQUID AIR DRIER.

8. LOW AMBIENT KIT: PERMITS OPERATION DOWN TO 45 DEG F.

2.4 ACCESSORIES

A. CONTROL EQUIPMENT AND SEQUENCE OF OPERATION ARE SPECIFIED IN SECTION 230900 "INSTRUMENTATION AND CONTROLS FOR HVAC".

B. THERMOSTAT: TO CONTROL COMPRESSOR AND EVAPORATOR FAN, WITH THE FOLLOWING FEATURES:

1. COMPRESSOR TIME DELAY.

2. 7-DAY/24-HOUR TIME CONTROL OF SYSTEM STOP AND START.

3. LIQUID-CRYSTAL DISPLAY INDICATING TEMPERATURE, SET-POINT TEMPERATURE, TIME SETTING, OPERATING MODE, AND FAN SPEED.

4. FAN-SPEED SELECTION INCLUDING AUTO SETTING.

C. AUTOMATIC-RESET TIMER TO PREVENT RAPID CYCLING OF COMPRESSOR.

D. CONDENSATE OVERFLOW SWITCH

E. REFRIGERANT LINE KITS: ANNEALED-COPPER SUCTION AND LIQUID LINES FACTORY CLEANED, DRIED, PRESSURIZED WITH NITROGEN, SEALED, AND WITH SUCTION LINE INSULATED. PROVIDE IN STANDARD LENGTHS FOR INSTALLATION WITHOUT JOINTS, EXCEPT AT EQUIPMENT CONNECTIONS.

1. THIS PIPING SHALL BE CAPPED THROUGHOUT THE CONSTRUCTION TO PREVENT ANY FOREIGN MATERIALS FROM ENTERING THE PIPING. FITTINGS SHALL BE WROUGHT COPPER SOLDER JOINT TYPE. DRY NITROGEN SHALL BE BLED THROUGH PIPING WHILE JOINTS ARE BEING BRAZED. JOINTS SHALL BE AS FOLLOWS:

a. COPPER TO BRASS - SILVER SOLDER.

b. COPPER TO COPPER - SILFOS.

2. JOINTS: COPPER TUBING CONNECTIONS SHALL BE MADE UP WITH 95/5 TIN ANTIMONY SOLDER OR SILFOS, IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER OR AS SPECIFIED HEREINAFTER.

3. REFRIGERANT PIPING INSULATION: ARMSTRONG ARMAFLEX INSULATION 1/2" THICK WITH FITTINGS COVERED WITH MITERED SECTIONS OF INSULATION AND SEALED WITH ARMAFLEX 520 ADHESIVE. ALL INSULATION ON OUTDOOR INSTALLATION SHALL BE ADDITIONALLY PROTECTED WITH TWO (2) COATS OF ARMAFLEX WB PIGMENTED ACRYLIC LATEX FINISH.

a. COMPLY WITH ASTM C 534/C 534M, TYPE I.

F. CONDENSATE DRAIN PIPING

1. COPPER TUBING: ASTM B88, TYPE L, M OR DWV HARD DRAWN.

a. FITTINGS: ANSI/ASME B16.18 BRONZE SAND CASTINGS, ANSI B16.22 WROUGHT COPPER, ANSI/ASME B16.23 CAST BRASS, OR ANSI/ASME B16.29 SOLDER WROUGHT COPPER.

b. JOINTS: ASTM B32, SOLDER, GRADE 95TA OR GROOVED JOINTS WITH EPDM GASKETS.

2. PVC PIPE: ASTM D1785, SCHEDULE 40 AND SCHEDULE 80.

a. FITTINGS: ASTM D2466 FOR SCHEDULE 40 PIPE, OR ASTM D2467 FOR SCHEDULE 80 PIPE.

b. JOINTS: ASTM D2564 AND ASTM D2855, SOLVENT WELD.

3. CONDENSATE DRAIN PIPING INSULATION: FLEXIBLE ELASTOMERIC INSULATION: 1/2" CLOSED-CELL, SPONGE- OR EXPANDED-RUBBER MATERIALS. COMPLY WITH ASTM C534, TYPE I FOR TUBULAR MATERIALS.

PART 3 - EXECUTION

3.1 INSTALLATION

A. INSTALL UNITS' LEVEL AND PLUMB.

B. INSTALL EVAPORATOR-FAN COMPONENTS USING MANUFACTURER'S STANDARD MOUNTING DEVICES SECURELY FASTENED TO BUILDING STRUCTURE.

C. INSTALL ROOF-MOUNTED, COMPRESSOR-CONDENSER COMPONENTS ON EQUIPMENT SUPPORTS AS SPECIFIED. ANCHOR UNITS TO SUPPORTS WITH REMOVABLE, CADMIUM-PLATED FASTENERS.

D. EQUIPMENT MOUNTING:

1. INSTALL GROUND-MOUNTED, COMPRESSOR-CONDENSER COMPONENTS ON CAST-IN-PLACE CONCRETE EQUIPMENT BASE(S).

E. INSTALL AND CONNECT PRE-CHARGED REFRIGERANT TUBING TO COMPONENT'S QUICK-CONNECT FITTINGS. INSTALL TUBING TO ALLOW ACCESS TO UNIT.

3.2 CONNECTIONS

A. PIPING INSTALLATION REQUIREMENTS ARE SPECIFIED IN OTHER SECTIONS. DRAWINGS INDICATE GENERAL ARRANGEMENT OF PIPING, FITTINGS, AND SPECIALTIES.

B. WHERE PIPING IS INSTALLED ADJACENT TO UNIT, ALLOW SPACE FOR SERVICE AND MAINTENANCE OF UNIT.

C. DUCT CONNECTIONS: DUCT INSTALLATION REQUIREMENTS ARE SPECIFIED IN SECTION 233113 "DUCTWORK AND DUCTWORK INSULATION." DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF DUCTS. CONNECT SUPPLY AND RETURN DUCTS TO SPLIT-SYSTEM AIR-CONDITIONING UNITS WITH FLEXIBLE DUCT CONNECTORS. FLEXIBLE DUCT CONNECTORS ARE SPECIFIED IN SECTION 233300 "DUCTWORK ACCESSORIES."

3.3 FIELD QUALITY CONTROL

A. MANUFACTURER'S FIELD SERVICE: ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO INSPECT, TEST, AND ADJUST COMPONENTS, ASSEMBLIES, AND EQUIPMENT INSTALLATIONS, INCLUDING CONNECTIONS.

B. PERFORM TESTS AND INSPECTIONS.

1. MANUFACTURER'S FIELD SERVICE: ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO INSPECT COMPONENTS, ASSEMBLIES, AND EQUIPMENT INSTALLATIONS, INCLUDING CONNECTIONS, AND TO ASSIST IN TESTING.

C. TESTS AND INSPECTIONS:

1. LEAK TEST: AFTER INSTALLATION, CHARGE SYSTEM AND TEST FOR LEAKS. REPAIR LEAKS AND RETEST UNTIL NO LEAKS EXIST.

2. OPERATIONAL TEST: AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, START UNITS TO CONFIRM PROPER MOTOR ROTATION AND UNIT OPERATION.

3. TEST AND ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND EQUIPMENT.

D. REMOVE AND REPLACE MALFUNCTIONING UNITS AND RETEST AS SPECIFIED ABOVE.

E. PREPARE TEST AND INSPECTION REPORTS.

3.4 STARTUP SERVICE

A. ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO PERFORM STARTUP SERVICE.

1. COMPLETE INSTALLATION AND STARTUP CHECKS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.

3.5 DEMONSTRATION

A. ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST, OPERATE, AND MAINTAIN UNITS.

SEQUENCE OF OPERATION: EF-6 THROUGH EF-9, LOUVERS

EF-6 THROUGH EF-8 SHALL OPERATE SIMULATANEOUSLY. EF-9 SHALL OPERATE INDEPENDENTLY. THERE SHALL BE TWO CONTROL PANELS - ONE FOR WASHBAY, ONE FOR SHOP. OPERATION OF EXHAUST FAN SHALL BE VIA CONTROL PANEL, LOCATED PER PLANS. EXHAUST FAN CONTROL SHALL HAVE THREE MODES: AUTO, ON, OFF.

1. "AUTO" MODE SHALL PRIORITIZE ARMSTRONG MONITORING SYSTEM (SEE BELOW).
2. "ON" MODE SHALL INITIATE START OF (3) EXHAUST FANS FOR SHOP (OR ONE EXHAUST FAN FOR WASHBAY). START OF EXHAUST FAN SHALL INITIATE OPENING OF ALL ASSOCIATED LOUVERS.

ASSOCIATED LOUVERS, AS INDICATED ON THE PLANS, SHALL REMAIN OPEN WHILE EXHAUST FANS ARE OPERATING.

PROVIDE TWO ARMSTRONG CONTROL PANEL AND (5) REMOTE SENSORS AS INDICATED ON DRAWINGS. ARMSTRONG MONITORING SYSTEM (CONTROL PANEL) SHALL BE MODEL AMC-1BZ2. SENSORS (CO AND NO2) SHALL BE MODEL AMC 1222-2. PROVIDE WITH REMOTE AUDIO/VISUAL ALARM.

PROVIDE EF-6 THROUGH EF-9 WITH FRANKLIN BUILDING AUTOMATION STARTER. ARMSTRONG FUME DETECTION SYSTEM SHALL SEND CALL TO INITIATE START OF EXHAUST FANS UPON FUME DETECTION. STARTER SHALL SEND CALL FOR LOUVERS TO OPEN.

STATE OF KENTUCKY
MALLORY L. P. ANDERSON
36770
LICENSED PROFESSIONAL ENGINEER

REVISION	
DATE	
DRAWN BY	CE
CHECKED BY	CA
APPROVED BY	CA

Meade County Road Department

MECHANICAL SPECIFICATIONS

Lincoln Trail Area Development District

DATE:

SHEET X OF X

M-801

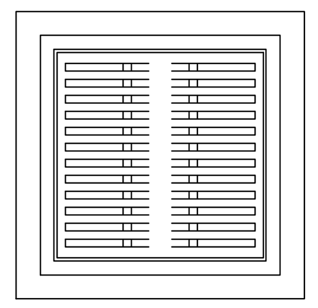
JOB#:

SCALE

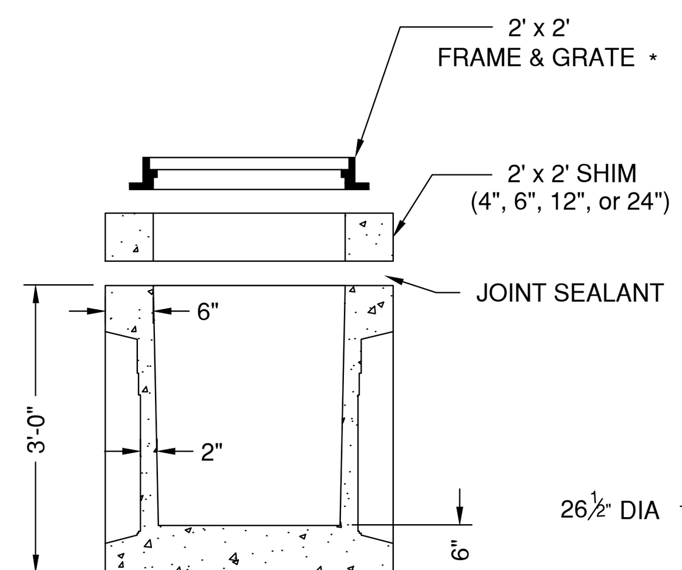
DB

TOP SLAB AVAILABLE FOR ALTERNATE CASTING SIZES

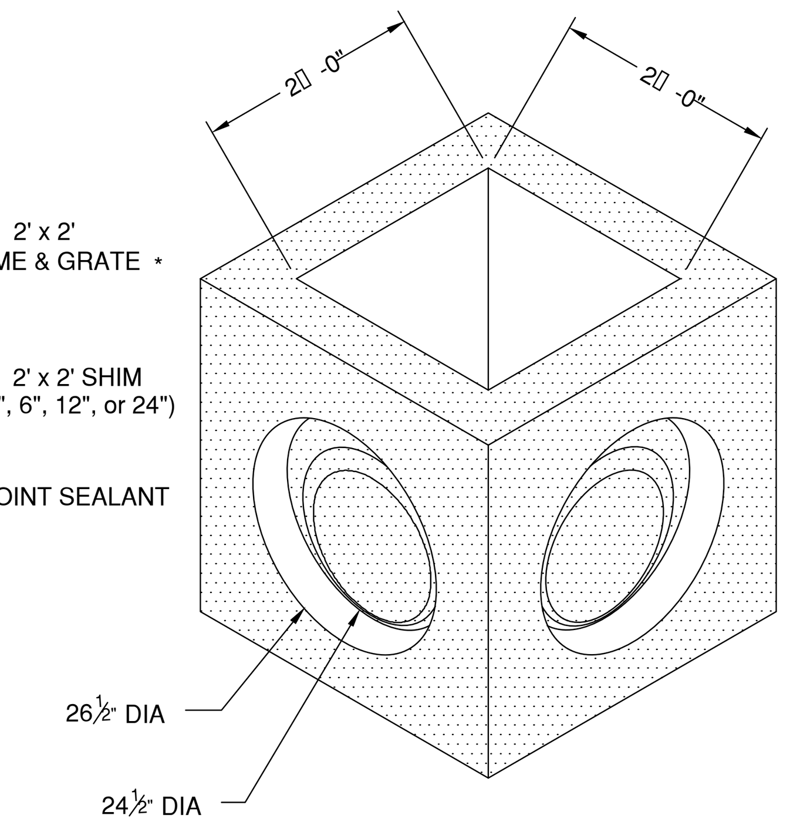
2' x 2' COMPONENTS		
SIZE (ID)	HEIGHT (ID)	WEIGHT
* BASE	30"	2,018#
* SHIM	4"	250#
SHIM	6"	375#
SHIM	12"	750#
SHIM	24"	1,500#
FRAME & GRATE	4"	244#



PLAN VIEW



SECTION VIEW



ISOMETRIC VIEW

MAX PIPE SIZE
15" RCP/18" HDPE

S & M PRECAST, INC. "NPCA" CERTIFIED PLANT 16700 SIMA GRAY RD, HENRYVILLE, IN 47126 Phone: (812) 246-6258 Fax: (812) 294-4862	SPECIFICATIONS	WEIGHT: See Chart
	CONCRETE: 4500 PSI @ 28 DAYS	**2' x 2' KNOCKOUT CATCH BASIN**
	REINFORCEMENT: ASTM A-615, GR 60	
	DESIGN LOAD: AASHTO HS-20	
		DATE: 11-18-16 DWG #CB-KO-2424

PLUMBING FIXTURE SCHEDULE

C-1	WHITE FLOOR SET ADA, ELONGATED, TANK TYPE TOILET – WHITE OPEN FRONT SEAT LESS COVER – ANGLE CHROME COMPRESSION STOP WITH ESCUTCHEON – BRAIDED CLOSET SUPPLY – BRASS CLOSET BOLTS, NUTS AND WASHER SET – WAX RING SEAL
L-1	WHITE WALL HUNG ADA 20"X18" CHINA LAVATORY – FLOOR MOUNTED CARRIER AND WALL HANGING BRACKET – SINGLE LEVER CHROME ADA LAVATORY FAUCET – CHROME GRID DRAIN – CHROME ANGLE COMPRESSION STOPS WITH ESCUTCHEON – BRAIDED LAVATORY SUPPLIES – PVC TUBULAR P– TRAP – TEMPERING VALVE PER CODE – TRAP AND STOP PROTECTOR KIT PER CODE
U-1	WHITE WALL HUNG CONCEALED TRAP ADA URINAL– MANUAL FLUSH VALVE WITH VAC. BRKR. – URINAL WASTE CONNECTION KIT –WATER HAMMER ARRESTOR.
S-1	ADA UNDER COUNTER MOUNT 25" X 22" STAINLESS STEEL SINGLE BOWL SINK – ADA SINGLE LEVER KITCHEN SINK FAUCET – BASKET STRAINER – CHROME ANGLE COMPRESSION STOPS WITH ESCUTCHEONS – BRAIDED SINK SUPPLIES – PVC TUBULAR P – TRAP DISHWASHER CONNECTION.
SH-1	WHITE ADA ROLL IN ACRYLIC SHOWER UNIT WITH FOLD UP SEAT, GRAB BARS PER CODES – SINGLE LEVER CHROME ANTI SCALD PRESSURE BALANCED SHOWER ONLY VALVE WITH HAND HELD SHOWER HEAD, 60" HOSE AND SLIDE BAR – ¾" DAM AT ENTRANCE
MSB	FIAT OR MUSTEE 24X24X10 MOP BASIN WITH WALL MOUNT ROUGH CHROME MOP SINK FAUCET WITH INTEGRAL STOPS AND INTEGRAL VACUUM BREAKER – PAIL HOOK ON SPOUT WITH WALL BRACE – 2" DRAIN – MOP RACK – 60" HOSE – IF REQUIRED, PROTECTIVE WALL PANELS SHALL BE PROVIDED AND INSTALLED BY OTHERS.
FD	3" OR 4" PVC BODY FLOOR DRAIN WITH ADJUSTABLE CHROME METAL STRAINER
CO	3" OR 4" PVC FLOOR CLEANOUT WITH ADJUSTABLE CHROME METAL TOP
TWCO	6" TWO WAY CLEANOUT FITTINGE WITH 4" CO RISER TO GRADE.PROVIDE 10" CAST IRON MANHOLE TO HOUSE 4" CO AT GRADE. IF IN GRASS, PROVIDE A 6" THICK 18" X 18" CONCRETE SLAB AT GRADE.
HWH	LIGHT COMMERCIAL GRADE A.O. SMITH LTE 80 D – 80 GALLON ELECTRIC WATER HEATER – TWO 6000 WATT ELEMENTS – ORDER TO BE 240 VOLT SINGLE PHASE – HWH TO BE FITTED WITH RELIEF VALVE, CODE APPROVED RELIEF DISCHARGE AND THERMAL EXPANSION TANK
RCP	GRUNFOS OR EQUAL, STAINLESS STEEL OR ALL BRONZE CONSTRUCTION HOT WATER RECIRCULATION PUMP – CONTROLLED BY TIME CLOCK AND SURFACE MOUNTED AQUASTAT
CIR STR	CIRCUIT SETTER BALANCE VALVE
TP	PRIME RITE OR EQUAL TRAP PRIMER VALVE. INSTALL ON ALL DRAINS WHERE REQUIRED BY CODE. PROVIDE RATED ACCESS PANEL AS REQUIRED.
ACC	PAINTABLE , LOCKABLE ACCESS PANEL, RATED FOR WALL WHERE BEING INSTALLED, SHALL BE OF ADEQUATE SIZE TO PROVIDE SPACE NECESSARY FOR VALVE MAINTENANCE.
HB	ROUGH BRASS ¾" HOSE BIBB FITTED WITH VACUUM BREAKER
FPHB	WOODFORD 65 C FROST PROOF WALL HYDRANT WITH INTEGRAL VACUUM BREAKER – ORDER HYDRANT LENGTH TO SUIT WALL OF INSTALLATION – SECURE PIPING AND HYDRANT TO STRUCTURE,TO PREVENT MOVEMENT AND MAINTAIN POSITIVE DRAINAGE TO THE EXTERIOR
RPZ	2"WATTS REDUCED PRESSURE PRINCIPLE BACK FLOW PREVENTOR WITH AIR GAP DRAIN FITTING AND STRAINER – PIPE DISCHARGE TO EXTERIOR OR NEAREST FLOOR DRAIN
A/C	OWNER IS TO PROVIDE NEW 7.5 H.P. AIR COMPRESSOR – COMPRESSOR TO REGULATED TO MAXIMUM 100 PSI OPERATING PRESSURE. FILED VERIFY DIRECTION OF BLOW DOWN DISCHARGE WITH OWNER. ANCHOR COMPRESSOR TO CONCRETE FLOOR, PER MANUFACTURER'S RECOMMENDATIONS.
TD	12" WIDE PRE–FORMED POLYESTER MATERIALS ACCO TRENCH DRAIN OR EQUAL WITH DUCTILE GRATING AND PROPER ACCY. PROVIDE ACCO CATCH BASIN, (CB) WITH DUCTILE IRON GRATING ,IN MID LENGTH OF TRENCH DRAIN, TO ALLOW FOR DRAINAGE SLOPING, IN BOTH DIRECTIONS TO CATCH BASIN.
DB	2FT X 2FT X 2FT 10 IN DEEP PRE–CAST CONCRETE DRAIN BOX WITH 4" SHIM AND CAST IRON FRAME AND REMOVABLE GRATE (S&M PRECAST CONCRETE PRODUCTS)
OWS	1000 GAL. PRECAST OIL WATER SEPARATOR, PER PROVIDED DETAIL. FIELD LOCATE WITH GENERAL CONTRACTOR. PROVIDE MANHOLE RISERS AND CAST IRON FRAME AND COVER TO 1" ABOVE GRADE. (S&M PRECAST CONCRETE PRODUCTS)
WHA	WATER HAMMER ARRESTOR ON QUICK CLOSING VALVES.

PLUMBING SHEET NOTES:

1. PROJECT CONSISTS OF A NEW PRE–ENGINEERED METAL BUILDING, FOR MEADE CO. ROAD DEPARTMENT SERVICE HEADQUARTERS.
2. DRAWINGS FOR PLUMBING ON THE PROJECT ARE DIAGRAMMATIC IN NATURE. THERE MAY NEED TO BE ADDITIONAL OFFSETS AND/OR FITTINGS FOR A COMPLETE INSTALLATION. THESE ITEMS ARE TO BE INCLUDED IN THE PRICING OF THE PLUMBING FOR THE PROJECT.
3. THERE SHALL BE NO COMPENSATION FOR WORK NOT AUTHORIZED IN WRITING, BY THE PROPER AUTHORITY IN CHARGE.
4. PROJECT SEWAGE SHALL BE TREATED WITH AN ON–SITE SEPTIC SYSTEM AND LATERAL. DESIGN, PERMITTING, FEES AND INSTALLATION OF THIS SHALL NOT BE A PART OF THE PLUMBING SCOPE. 6" PVC SANITARY SEWER AND 4" BAY DRAIN SEWER FROM THE BUILDING, SHALL BE PERMITTED, INSPECTED AND INSTALLED BY THE PLUMBER, TO THE OIL WATER SEPARATOR AND TO SEPTIC TANK.
5. SEPTIC TANK AND LATERAL FIELD SHALL BE INSTALLED BY A MEADE COUNTY CERTIFIED SUB–SURFACE SEWAGE INSTALLER.
6. THE FOLLOWING SHALL BE PARAMETERS FOR FIXTURES FOR THE PLUMBING ON THE PROJECT, ALL SUBJECT TO APPROVALS. THESE MAY BE SUBMITTED ELECTRONICALLY TO ARCHITECT FOR REVIEW, ACCEPTANCE OR REJECTION.

*** ADD ALTERNATE : ADJACENT TO MSB ***

7. PROVIDE PRICING FOR ADDITION OF A BRADLEY 36" STAINLESS STEEL SEMI– CIRCULAR ,THREE STATION HAND WASH FOUNTAIN, WITH FOOT OPERATED CONTROLS. WITHIN THIS PRICING , PROVIDE FOR ADDITIONAL 2" WASTE, 1 1/2" VENT AND ¾" HOT AND COLD WATER PIPING, LIQUID SOAP DISPENSER , ADDITIONAL PERMIT OPENING FEE, LABOR AND MATERIALS TO PERFORM THE COMPLETE INSTALLATION.
8. PLUMBING CONTRACTOR SHALL PROVIDE PLUMBING PERMIT AND INSPECTIONS.
9. PLAN COPIES, SUBMITTAL FOR STATE PLUMBING REVIEW AND ANY RELATED FEES FOR SAME SHALL BE PROVIDED AND PERFORMED BY GENERAL CONTRACTOR OR ARCHITECT.
10. WASTE AND VENT SYSTEM SHALL BE PVC SCHEDULE 40 DWV SOLVENT WELD, INSTALLED AND SUPPORTED PER ALL CODES AND MANUFACTURER'S RECOMMENDATIONS.
11. THERE SHALL BE NO "NON–METALLIC" PIPING INSTALLED IN PLENUM RATED SPACES, PER ALL CODES.
12. DOMESTIC WATER PIPING ON INTERIOR SHALL BE PEX, AQUA PEX, WIRSBO.
13. ALL WATER VALVES SHALL BE BALL TYPE, AND SHALL BE LEAD FREE. ANY SOLDER USED ON PROJECT SHALL BE LEAD FREE.
14. THROUGH OUT THE PROJECT, MAINTAIN A SET OF PLUMBING DRAWINGS, TO BE ALTERED AND NOTED AS TO CHANGES IN ACTUAL ROUTING OF PLUMBING CONSTRUCTION. THESE SHALL BECOME "RECORD DRAWINGS" FOR THE PROJECT WITH A HARD COPY AND ELECTRONIC COPY OF SAME, SHALL PROVIDED TO OWNER AT TIME OF PROJECT CLOSE OUT, FOR FUTURE REFERENCE.
15. IN ADDITION, TAG ALL VALVES WITH A 1" BRASS NUMBERED DISC AND BEADED CHAIN AND PROVIDE A VALVE CHART WITH LOCATIONS, TO OWNER AT TIME OF PROJECT CLOSEOUT.
16. PROVIDE ON CORPORATE STATIONERY OR A LETTER FROM THE STATE PLUMBING DEPARTMENT, INDICATION OF THE DATE OF FINAL PLUMBING INSPECTION. THIS DATE SHALL SERVE AS THE START DATE OF THE ONE YEAR PARTS AND LABOR WARRANTY PERIOD FOR THE PROJECT PLUMBING.
17. FOR ANY PLUMBING PRODUCTS OR MATERIALS SUPPLIED ON THE PROJECT, ALL STANDARD MANUFACTURER'S WARRANTIES SHALL APPLY.
18. FITTINGS AND JOINING METHODS SHALL BE SO AS TO BE COMPATIBLE WITH TYPE OF WATER PIPING SELECTED.
19. INSTALL WATER PIPING PER ALL CODES AND MANUFACTURER'S RECOMMENDATIONS.
20. IF PEX IS USED ON WATER PIPING, MAXIMUM LENGTH OF ½" BRANCH PIPING SHALL BE 3 LINEAL FEET. INCREASE TO NEXT SIZE IF LONGER THAN 3FT.
21. ALL PIPING SYSTEMS SHALL BE TESTED AND INSPECTED, PRIOR TO CONCEALMENT OR COVERING.
22. WATER PIPING TO BE FITTED WITH ½" WALL FLEXIBLE WATER PIPING INSULATION.
23. ALL SYSTEMS TO BE INSTALLED SO AS TO BE PROTECTED FROM AND PREVENT FREEZING. INSTALL PIPING ON HEATED SIDE OF INSULATION.
24. DISINFECT WATER PIPING PRIOR TO COMMISSIONING TO SERVICE. ENSURE THAT ALL DISINFECTION SOLUTION HAS BEEN PROPERLY FLUSHED FROM SYSTEM.
25. AVOID INSTALLING WASTE OR WATER PIPING OVER ELECTRICAL EQUIPMENT, IF POSSIBLE.
26. DO NOT BACKFILL WITH FROZEN MATERIALS. TRENCHES BENEATH PAVEMENT OR THE BUILDING SHALL BE TAMPED AS MAY BE NECESSARY, SO AS TO PREVENT FUTURE SETTLEMENT IN THE EXCAVATED AREA. BACKFILL TO SUB GRADE WITH CLEAN SHARP GRANULAR FILL.
27. SPOILS FROM PLUMBING EXCAVATIONS SHALL BE STOCKPILED ON SITE FOR REMOVAL AND DISPOSAL BY OTHERS.
28. IF ROCK MAY BE ENCOUNTERED DURING PLUMBING EXCAVATION, NOTIFY GENERAL CONTRACTOR SUPERINTENDENT IMMEDIATELY, TO PLAN FOR REMOVAL AND DISPOSAL OF SAME. COST FOR THIS OPERATION SHALL NOT BE A PART OF THE PLUMBING QUOTATION.
29. PROVIDE DIELECTRIC UNIONS FOR CONNECTIONS FOR DISSIMILAR METALS.
30. NO UNIONS IN ANY PIPING SYSTEM SHALL BE INSTALLED IN A CONCEALED MANNER.
31. PROVIDE UNIONS AND LINE SIZE DRIP LEG AT ALL PROPANE GAS EQUIPMENT CONNECTIONS.
32. AIR PIPING AND PROPANE GAS PIPING SYSTEMS, SHALL BE SCHEDULE 40 BLACK PIPE WITH STANDARD BLACK MALLEABLE FITTINGS.
33. PROPANE GAS SYSTEM SHALL HAVE AGA APPROVED GAS VALVES AT ALL EQUIPMENT CONNECTIONS.
34. PROPANE GAS SYSTEM SHALL BE INSTALLED BY PERSON HAVING A KY. PROPANE INSTALLERS LICENSE. PIPING TO BE INSPECTED PER AGA REGULATIONS, AND ALL REGULATIONS OF LOCAL GAS PROVIDING UTILITY COMPANY.
35. AIR SYSTEM BALL VALVES SHALL BE RATED AT 200 PSI MINIMUM.
36. AIR PIPING BRANCHES SHALL CONNECT TO TOP OF 1" AIR MAIN, SO AS TO MINIMIZE CONDENSATE TO 1" AIR OUTLETS. SLOPE AIR MAIN BACK TO COMPRESSOR. PIPE THIS AUTOMATIC BLOW DOWN DISCHARGE TO EXTERIOR IN A SAFE MANNER. OWNER SHALL PROVIDE ANY NEEDED REGULATORS, GAUGES OR QUICK DISCONNECT FITTINGS, AS MAY BE REQUIRED FOR OWNER'S EQUIPMENT.
37. AIR OUTLETS TO BE PER DETAIL, MOUNTED 48" ABOVE FINISH FLOOR , SECURED TO THE STRUCTURE AS MAY BE REQUIRED.
38. OWNER TO PROVIDE ALADIN SGRE0317 10HP 3000PSI PRESSURE WASHER WITH WAND AND HOSE 3/4" WATER SUPPLY AND 800,000 BTU PROPANE CONNECTION REQUESTED – CONNECT TO 10" VENT PER CODE – DISCONNECTED ON HVAC DRAWING.

STATE OF KENTUCKY
ERNEST CRUSE, II
17848
LICENSED PROFESSIONAL ENGINEER

REVISION	DATE

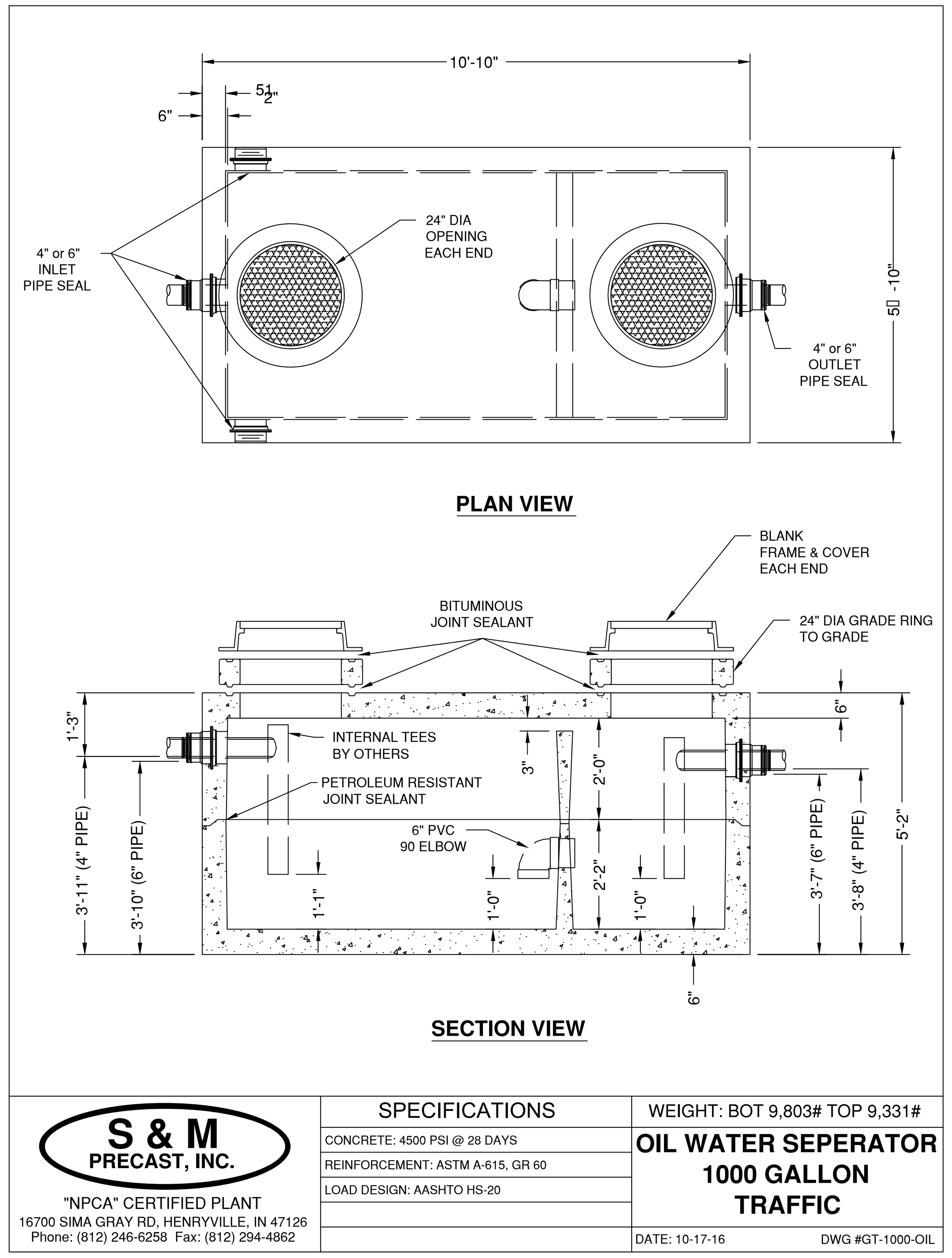
DRAWN BY JMK
CHECKED BY SS/EC
APPROVED BY EC

Meade County Road Department

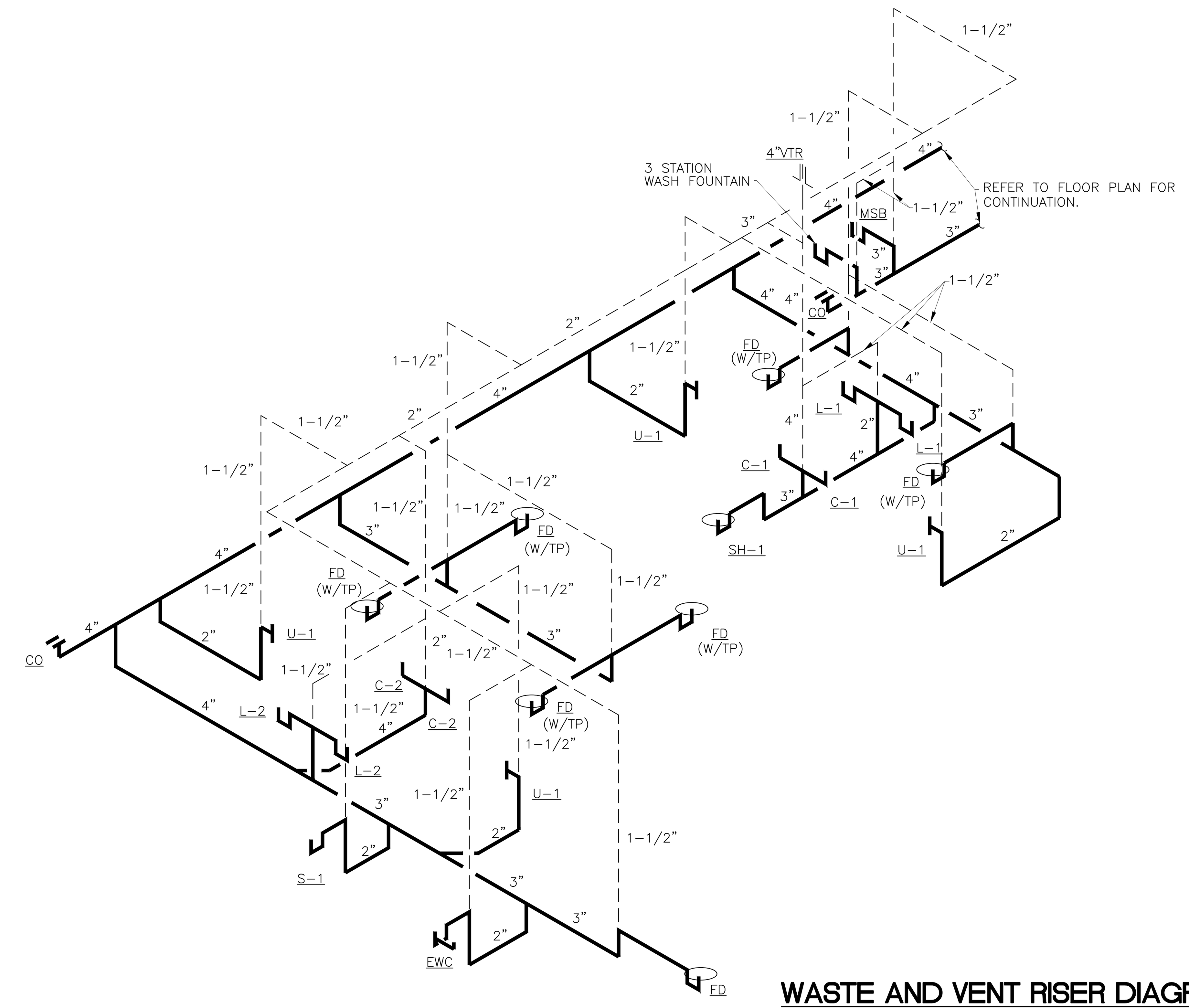
PLUMBING INFORMATION

Lincoln Trail Area Development District – established 1968 –

DATE: 10.06.25
SHEET 1 OF 8
JOB#:
SCALE
P001

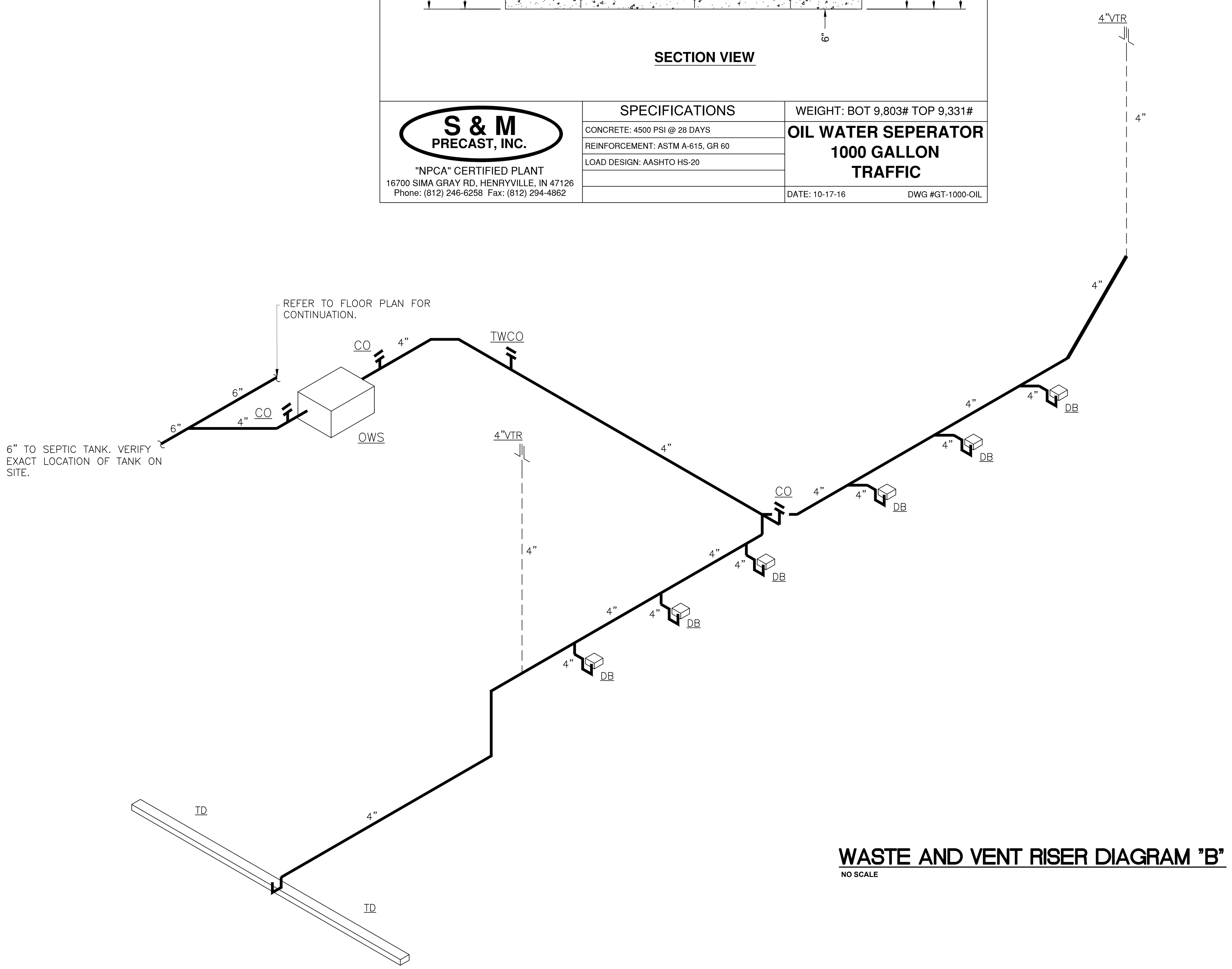


10'-10"
6"
5 1/2"
4" or 6" INLET PIPE SEAL
24" DIA OPENING EACH END
4" or 6" OUTLET PIPE SEAL
5'-10"
PLAN VIEW
BLANK FRAME & COVER EACH END
BITUMINOUS JOINT SEALANT
24" DIA GRADE RING TO GRADE
INTERNAL TEES BY OTHERS
PETROLEUM RESISTANT JOINT SEALANT
6" PVC 90 ELBOW
1'-3"
3'-11" (4" PIPE)
3'-10" (6" PIPE)
3'-7" (6" PIPE)
3'-8" (4" PIPE)
5'-2"
2'-0"
2'-2"
1'-1"
1'-0"
SECTION VIEW
S & M PRECAST, INC.
"NPCA" CERTIFIED PLANT
16700 SIMA GRAY RD, HENRYVILLE, IN 47126
Phone: (812) 246-6258 Fax: (812) 294-4862
SPECIFICATIONS
CONCRETE: 4500 PSI @ 28 DAYS
REINFORCEMENT: ASTM A-615, GR 60
LOAD DESIGN: AASHTO HS-20
WEIGHT: BOT 9,803# TOP 9,331#
OIL WATER SEPERATOR
1000 GALLON
TRAFFIC
DATE: 10-17-16
DWG #GT-1000-OIL



WASTE AND VENT RISER DIAGRAM "A"

NO SCALE



WASTE AND VENT RISER DIAGRAM "B"

NO SCALE

STATE OF KENTUCKY
ERNEST CRUSE, II
17848
LICENSED PROFESSIONAL ENGINEER

REVISION	
DATE	
DRAWN BY	JMK
CHECKED BY	SS/EC
APPROVED BY	EC

Meade County Road Department

PLUMBING - WASTE & VENT RISER

Lincoln Trail Area Development District

DATE: 10.08.25

SHEET 2 OF 8

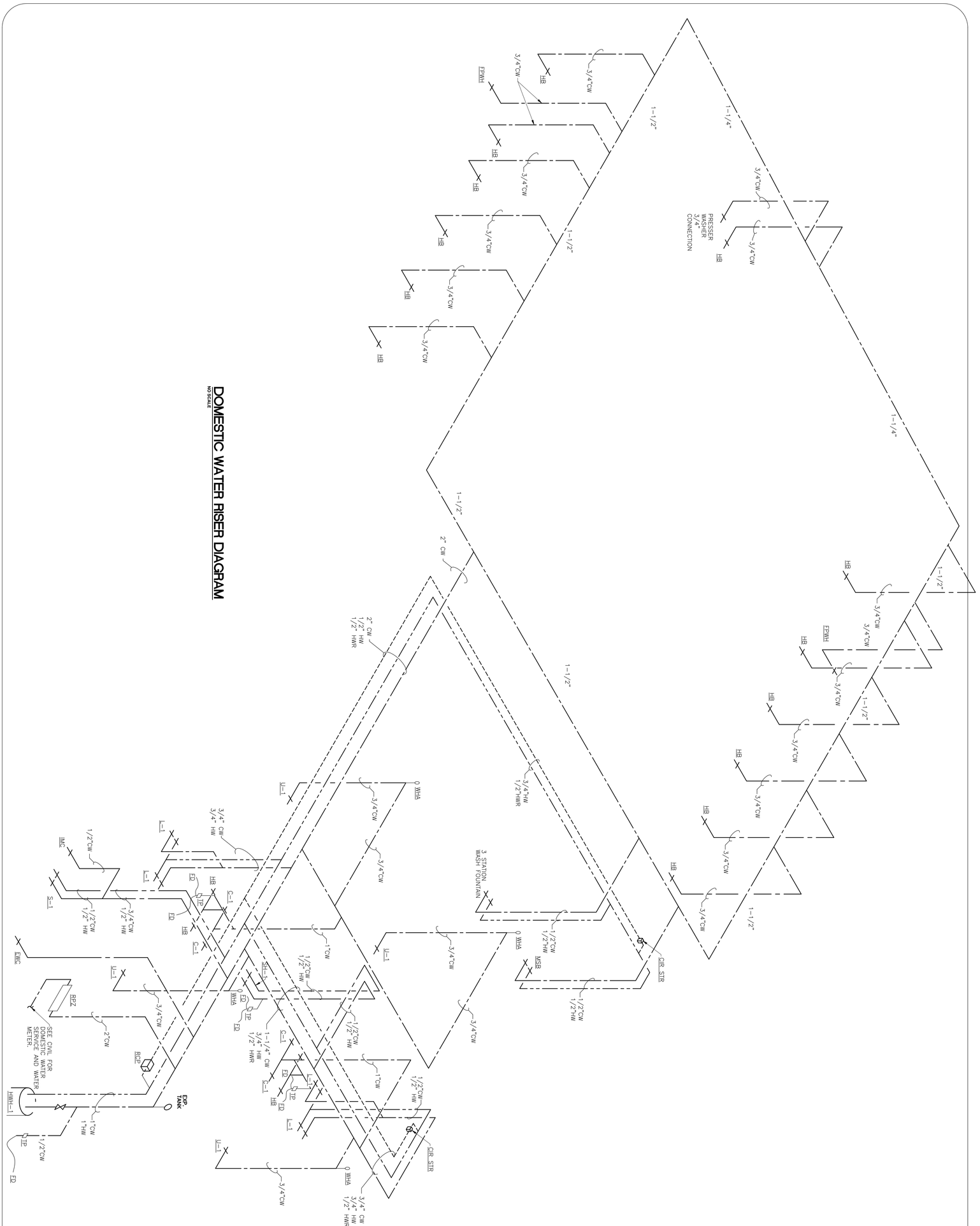
JOB#:

SCALE

P002

DOMESTIC WATER RISER DIAGRAM

NO SCALE



Lincoln Trail Area Development District - established 1968 - 102 S. Provident Way • Elizabethtown, KY 42701 Phone: 270-769-2393 • TDD: 800-247-3328 • Fax: 270-769-2992 Equal Opportunity Employer M/F/D/V/SO	Meade County Road Department		DRAWN BY	JMK	DATE	REVISION
			CHECKED BY	SS/EC		
			APPROVED BY	EC		
JOB#:	PLUMBING - DOMESTIC WATER RISER	DATE: 10.08.25				
SCALE P003		SHEET 3 OF 8				

AIR OUTLET DETAIL

NO SCALE

COMPRESSED AIR RISER DIAGRAM

NO SCALE

PROPANE GAS RISER DIAGRAM

NO SCALE

STATE OF KENTUCKY
ERNEST CRUSE, II
17848
LICENSED PROFESSIONAL ENGINEER

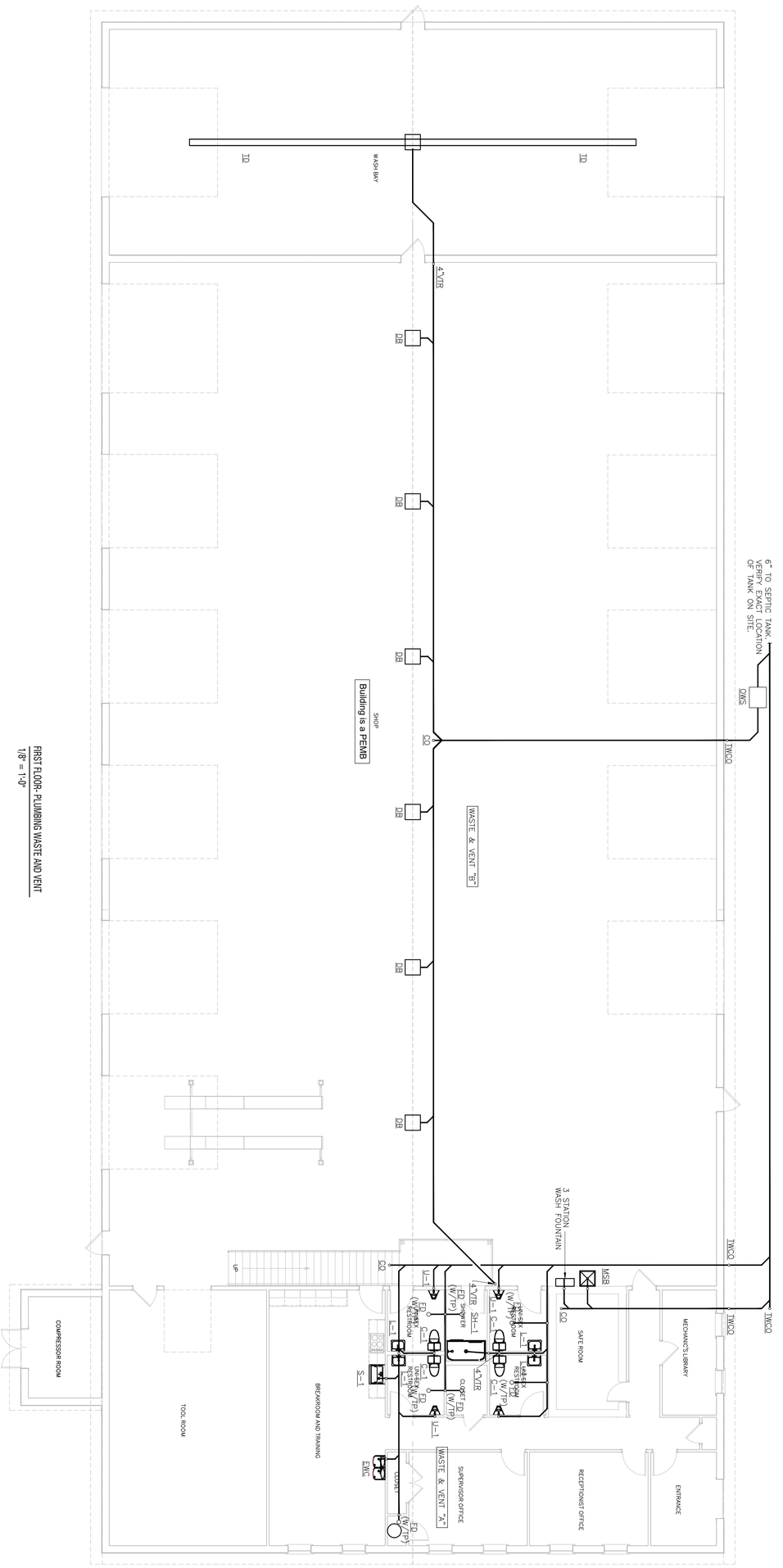
REVISION	
DATE	
DRAWN BY	JMK
CHECKED BY	SS/EC
APPROVED BY	EC

Meade County Road Department

PLUMBING - GAS AND AIR RISERS

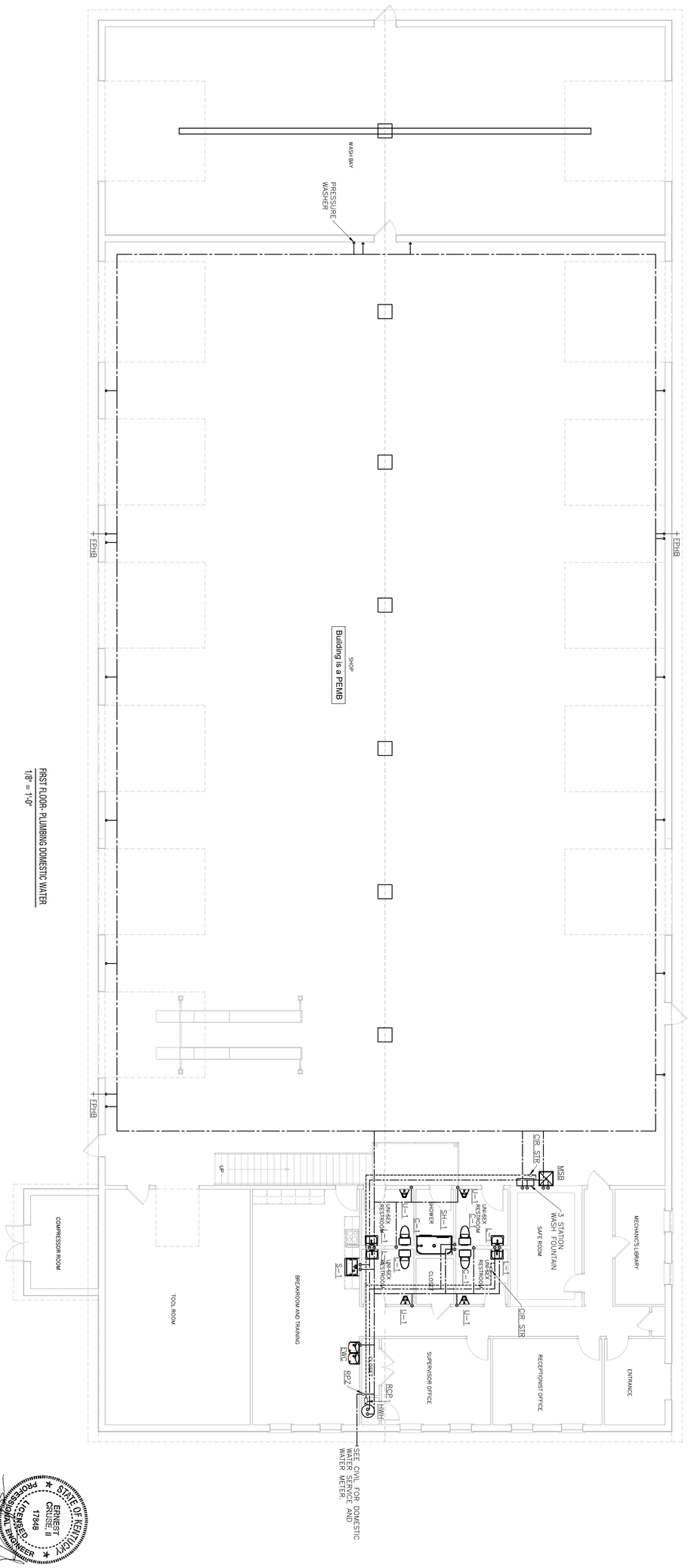
Lincoln Trail
Area Development District
~ established 1968 ~
750 S. Provident Way • Elizabethtown, KY 42701
Phone: 270-769-2393 • TDD: 800-247-2510 • Fax: 270-769-2993
Equal Opportunity Employer M/F/D/V/SO

DATE: 10.08.25
SHEET 4 OF 8
P004
JOB#:
SCALE



FIRST FLOOR- PLUMBING WASTE AND VENT
1/8" = 1'-0"

Lincoln Trail Area Development District – established 1968 – 102 S. Provident Way • Elizabethtown, KY 42701 Phone: 270-769-2393 • TDD: 800-247-3328 • Fax: 270-769-2992 Equal Opportunity Employer M/F/D/V/ADO	Meade County Road Department	DRAWN BY	JMK	DATE	REVISION
		CHECKED BY	SS/EC		
		APPROVED BY	EC		
JOB#:	PLUMBING FLOOR PLAN WASTE & VENT				
SCALE P101	DATE: 10.08.25 SHEET 5 OF 8				



FIRST FLOOR- PLUMBING DOMESTIC WATER
1/8" = 1'-0"

Lincoln Trail Area Development District
- established 1968 -
102 S. Provident Way • Elizabethtown, KY 42701
Phone: 270-769-2371 • TDD: 800-247-3328 • Fax: 270-769-2002
Equal Opportunity Employer M/F/D/V/SO

Meade County Road Department

PLUMBING FLOOR PLAN DOMESTIC WATER

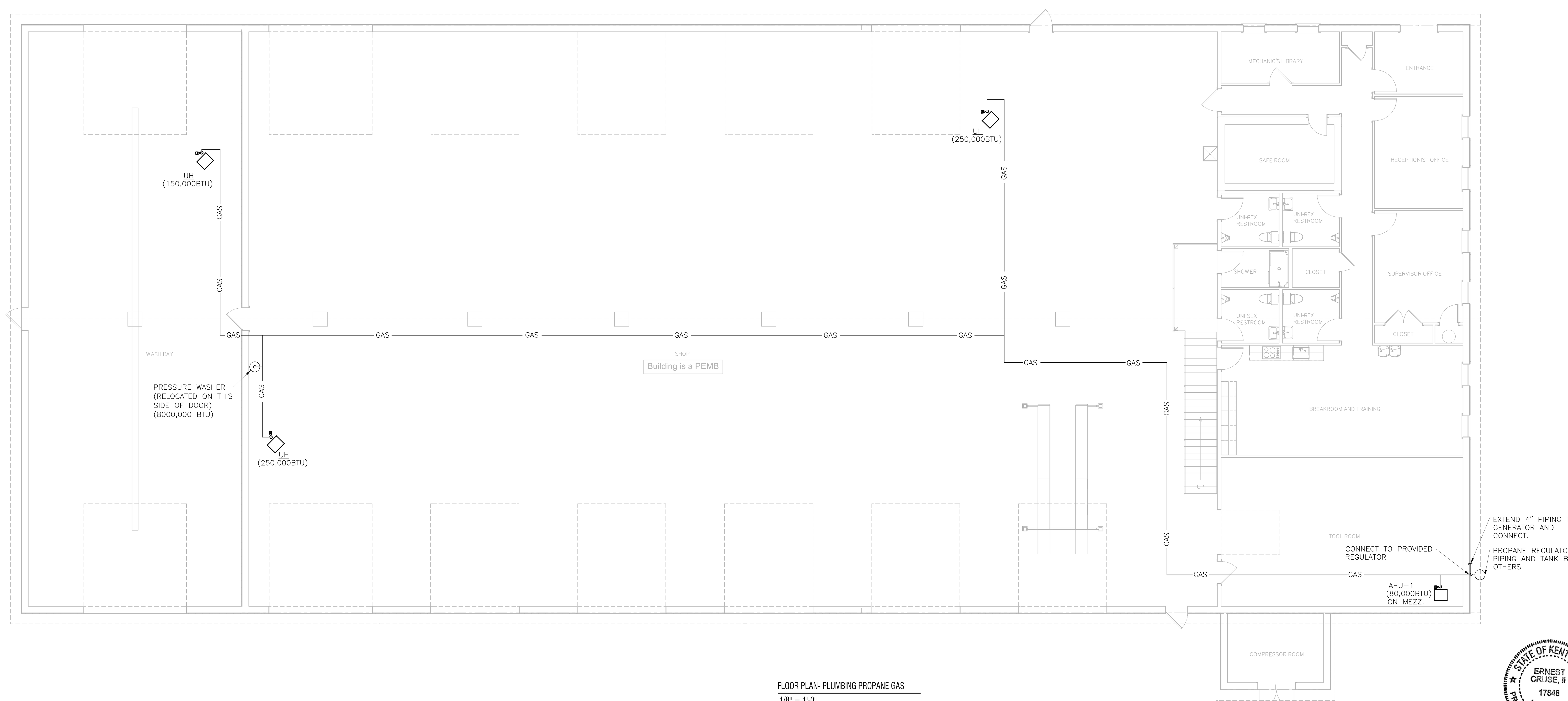
		DATE	REVISION
DRAWN BY	JMK		
CHECKED BY	SS/EC		
APPROVED BY	EC		

JOB#:

SCALE P102

DATE: 10.08.25

SHEET 6 OF 8



FLOOR PLAN- PLUMBING PROPANE GAS
1/8" = 1'-0"

STATE OF KENTUCKY
ERNEST CRUSE, II
17848
LICENSED
PROFESSIONAL ENGINEER

DATE	REVISION

DRAWN BY JMK
CHECKED BY SS/EC
APPROVED BY EC

Meade County Road Department

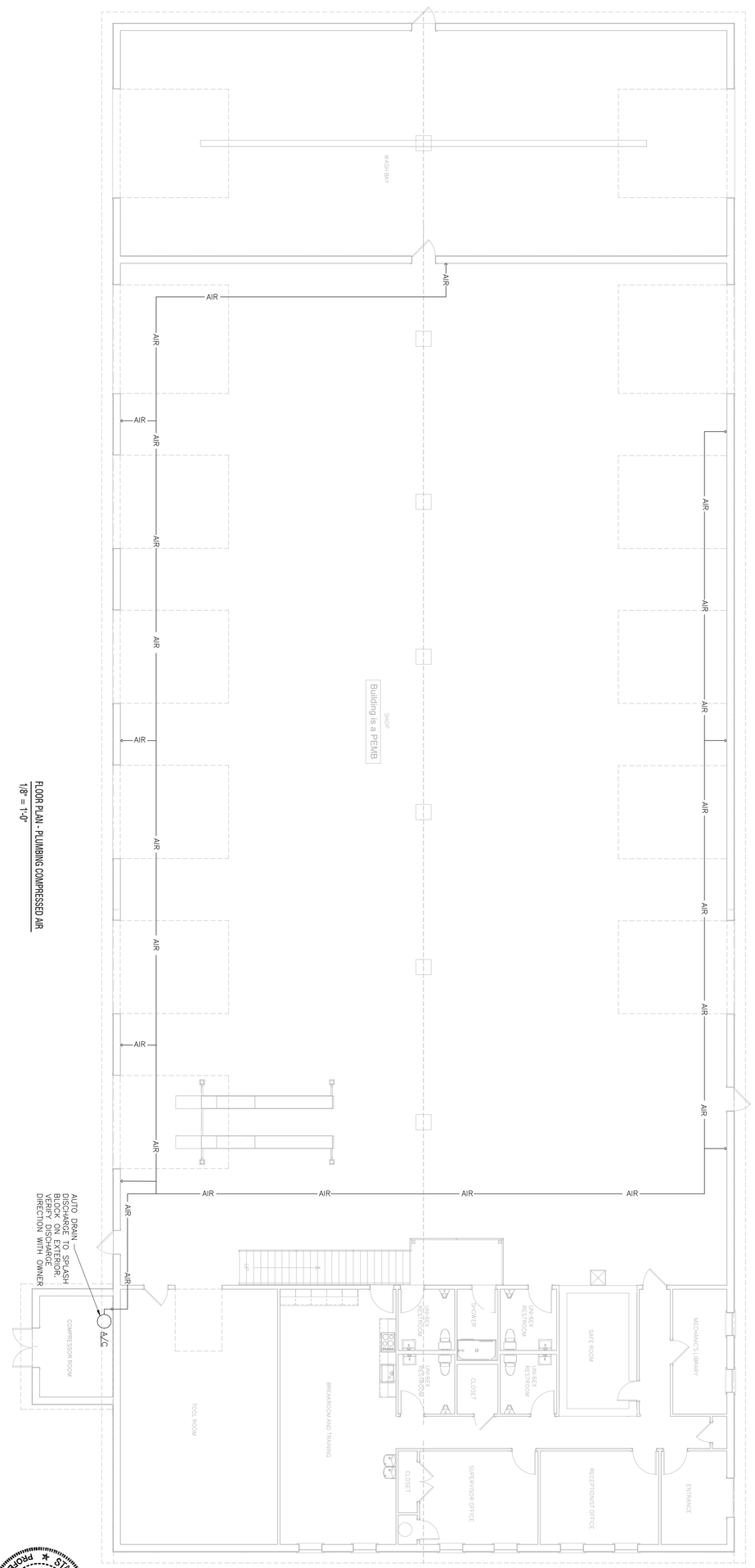
PLUMBING FLOOR PLAN PROPANE GAS

Lincoln Trail Area Development District

DATE: 10.08.25
SHEET 7 OF 8

P103

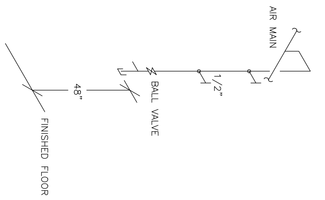
JOB#:
SCALE



FLOOR PLAN - PLUMBING COMPRESSED AIR
1/8" = 1'-0"

AIR OUTLET DETAIL

NO SCALE



Lincoln Trail Area Development District
- established 1968 -
102 S. President Way • Elizabethtown, KY 42701
Phone: 270-769-2371 • TDD: 800-247-3328 • Fax: 270-769-2002
Equal Opportunity Employer M/F/D/V/SO

Meade County Road Department

PLUMBING FLOOR PLAN COMPRESSED AIR

		DATE	REVISION
DRAWN BY	JMK		
CHECKED BY	SS/EC		
APPROVED BY	EC		

JOB#:

SCALE

P104

DATE: 10.08.25

SHEET 8 OF 8