

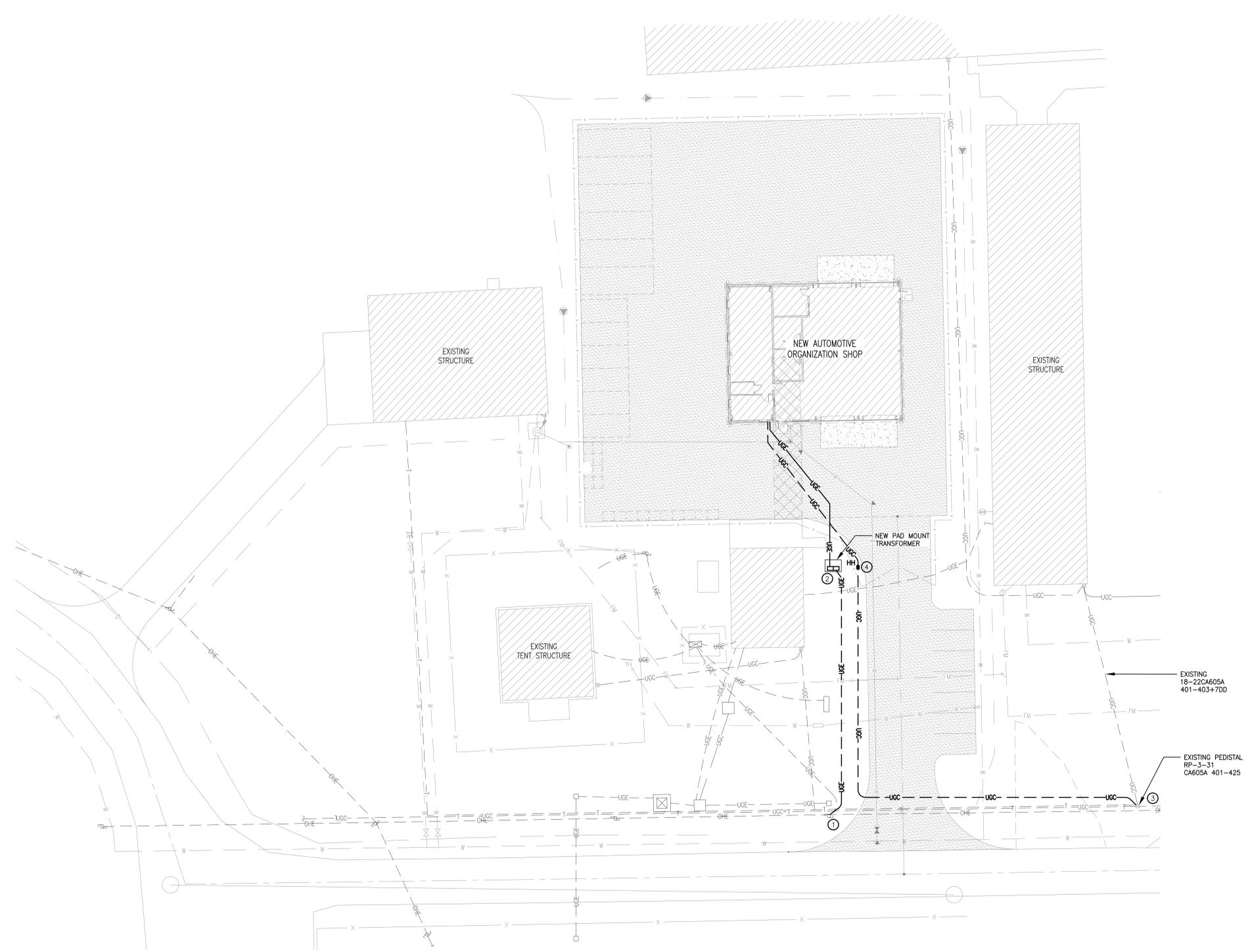
REVISIONS		
SYM	DATE	APPROVED

GENERAL CONSTRUCTION NOTES:

1. THE LOCATION AND DEPTHS OF EXISTING UTILITIES SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SCANNING THE AREA OF WORK TO IDENTIFY TO HIS OWN SATISFACTION THE EXTENT OF UTILITIES PRESENT INCLUDING THE UTILITIES INDICATED TO BE PRESENT, THOSE NOT SHOWN, AND THOSE SHOWN TO BE IN A DIFFERENT LOCATION.
2. PHYSICAL SITE FEATURES OUTSIDE THE AREA OF WORK OR THOSE FEATURES NOT RELEVANT TO THE WORK BEING PERFORMED ARE NOT SHOWN FOR CLARITY.
3. ALL EXISTING VEGETATED AREAS DISTURBED DURING CONSTRUCTION SHALL BE REVEGETATED IN ACCORDANCE WITH THE PROJECT VEGETATION PLAN, SEE DETAIL E, SHEET CG-501.

- NEW WORK ITEMS:**
- 1 PROVIDE (3) 100A FUSED CUTOUPS ON EXISTING POLE TO FEED MV TRANSFORMER RISER. FUSE LINKS SHALL BE RATED 8K. PROVIDE (3) 10KV DISTRIBUTION CLASS ARRESTORS. PROVIDE (3) #2 AWG COPPER TYPE "UD" CABLES WITH 15KV 133% INSULATION AND 1/3 CONCENTRIC NEUTRAL IN 4" CONDUIT TO FEED 150 KVA PADMOUNT TRANSFORMER.
 - 2 PROVIDE 150KVA, 3ø, 12.47KV-120/208V PAD MOUNT TRANSFORMER WITH METERING, SURGE ARRESTORS AND BAY-O-NET FUSING.
 - 3 PROVIDE 25 PAIR COPPER, 24 GAUGE, TYPE PE-39 CABLE IN 4". WITH THREE (3) 1" INNERDUITS FROM COMM PEDISTAL TO BUILDING COMM CABINET. LEAVE 30' SLACK ON BOTH ENDS FOR TERMINATIONS BY BASE TELEPHONE GROUP. PROVIDE 4" C. SPARE WITH PULL STRINGS FROM TELECOM PEDISTAL TO COMM RACK.
 - 4 PROVIDE NEW TELECOMM HANDHOLE.

LEGEND	
SYMBOL	DESCRIPTION
---OHE---	EXISTING OVERHEAD ELECTRICAL PRIMARY
---UGE---	EXISTING UNDERGROUND ELECTRICAL SECONDARY
---UGC---	NEW UNDERGROUND ELECTRICAL SECONDARY
⊙	EXISTING UTILITY POLE
⊙	EXISTING UTILITY POLE WITH TRANSFORMER
—	EXISTING GUY WIRE
---UGC---	UNDERGROUND TELECOM DUCTBANK
---UGC---	EXISTING TELECOM
■ HH	NEW TELECOM HANDHOLE
⊕	EXISTING ELECTRICAL MANHOLE
⊙	EXISTING TELECOM MANHOLE
---D---	EXISTING STORM SEWER
---W---	EXISTING DOMESTIC WATER
---S---	EXISTING GRAVITY SEWER
---FM---	EXISTING SEWER
~~~~~	TREE LINE
—○—	SECURITY FENCE



**DISCLOSURE OF INFORMATION**  
 CONTRACTOR SHALL COMPLY AS FOLLOWS:  
 (A) THE CONTRACTOR SHALL NOT RELEASE TO ANYONE OUTSIDE THE CONTRACTOR'S ORGANIZATION ANY UNCLASSIFIED INFORMATION, REGARDLESS OF MEDIUM (E.G., FILM, TAPE, DOCUMENT), PERTAINING TO ANY PART OF THIS CONTRACT OR ANY PROGRAM RELATED TO THIS CONTRACT, UNLESS:  
 (1) THE CONTRACTING OFFICER HAS GIVEN PRIOR WRITTEN APPROVAL, OR  
 (2) THE INFORMATION IS OTHERWISE IN THE PUBLIC DOMAIN BEFORE THE DATE OF RELEASE  
 (B) REQUESTS FOR APPROVAL SHALL IDENTIFY THE SPECIFIC INFORMATION TO BE RELEASED, THE MEDIUM TO BE USED, AND THE PURPOSE FOR THE RELEASE. THE CONTRACTOR SHALL SUBMIT THIS REQUEST TO THE CONTRACTING OFFICER AT LEAST 45 DAYS BEFORE THE PROPOSED DATE FOR RELEASE.  
 (C) THE CONTRACTOR AGREES TO INCLUDE A SIMILAR REQUIREMENT IN EACH SUBCONTRACT UNDER HIS CONTRACT. SUBCONTRACTORS SHALL SUBMIT REQUESTS FOR AUTHORIZATION TO RELEASE THROUGH THE PRIME CONTRACTOR TO THE CONTRACTING OFFICER.

**A**  
 AUTOMOTIVE SHOP ELECTRICAL SITE PLAN  
 1" = 20'



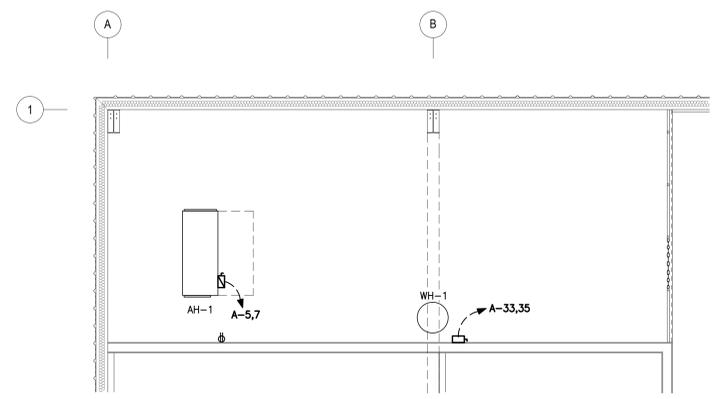
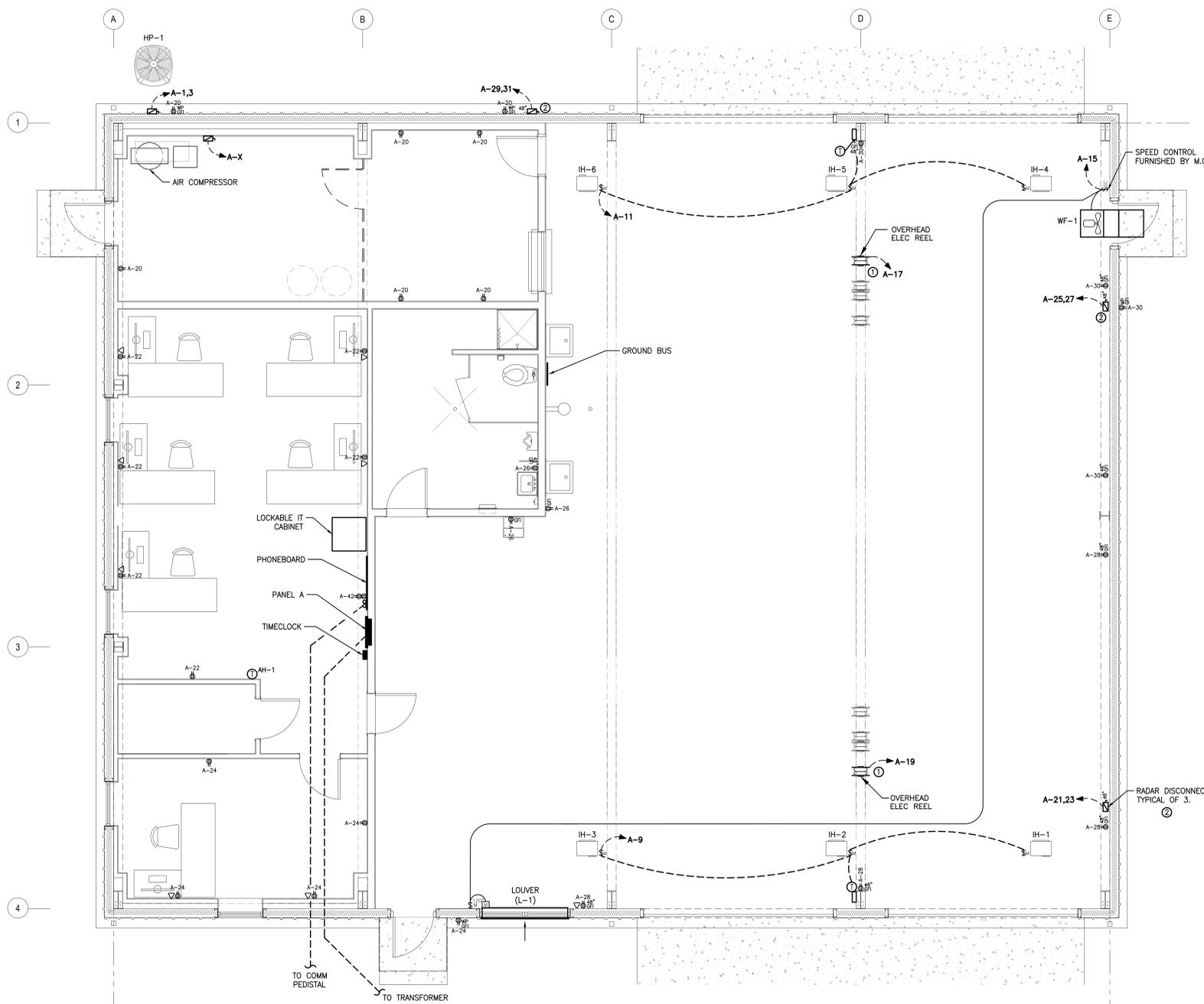
ALL SUPPLIES AND CONSTRUCTION MATERIAL MUST FOLLOW THE STANDARDS IDENTIFIED IN THE BUY AMERICAN ACT (41 U.S.C. Sec10a-10d)  
 ALL CONTRACTORS MUST COMPLY WITH THE REQUIREMENTS UNDER THE DAVIS-BACON ACT (40 U.S.C.A. Sec 276a-2/6a-5)

**EnTech ENGINEERING**  
 NC LIC # C-1132  
 P.O. BOX 11527 GOLDSBORO, NC 27532 TEL: (919) 778-9064

ELECTRICAL DESIGN BY:  
 PROJECT NO. 2115047  
 PROJECT MGR. J.D. HAM  
 DRAWN BY B. JACKSON  
 CHECKED BY

<b>AVOLIS ENGINEERING, P.A.</b> P.O. BOX 15564 NEW BERN, NC 28561 PH. (252) 633-0068, FAX (252) 633-6507 DES. J. C. AVOLIS, P.E. DR. CHK. J. K. AVOLIS, P.E. SUBMITTED BY: DESIGN DR. BRIAN R. MARSHBURN, P.E. APPROVED: PWO OR OICC DATE SIZE CODE IDENT. NO. NAVFAC DRAWING NO.		<b>E-001</b> DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND <b>MARINE CORPS BASE</b> CAMP LEJEUNE, NORTH CAROLINA 16-0058 CONSTRUCT AUTOMOTIVE ORGANIZATION SHOP MACS-2, "DET B" ELECTRICAL SITE PLAN 60016633 CONSTR. CONTR. NO. N40085-16-B-0058
SATISFACTORY TO: DATE SCALE: NOTED SPEC. 05-16-0058	<b>F 80091</b> SHEET 19 OF 32	SEAL 31466 JAMES D. HAM 7-21-16

REVISIONS		
SYM	DATE	APPROVED



**B** MEZZANINE ELECTRICAL POWER PLAN  
1/4"=1'-0"  
NORTH

**INSTALLATION KEY NOTES:**

- ① PROVIDE HEAVY DUTY ELECTRICAL CORD REEL EQUAL TO MODEL "L 5550 123 3A" AS MANUFACTURED BY "REELCRAFT INDUSTRIES".
- ② CONTRACTOR SHALL VERIFY PHASE ROTATION AT DISCONNECT AS PHASE "A", "B" & "C" ANTI-CLOCKWISE. MARK CONDUCTORS WITH PHASING TAPE. PLACE PHASE "A" WIRE ON THE LEFT LUG, PHASE "B" ON THE MIDDLE LUG, AND PHASE "C" ON THE RIGHT LUG. OWNER WILL MAKE WIRING TERMINATIONS ON THE LOAD SIDE OF THE SWITCHES.

**A** AUTOMOTIVE SHOP ELECTRICAL POWER PLAN  
1/4"=1'-0"  
NORTH

ALL SUPPLIES AND CONSTRUCTION MATERIAL MUST FOLLOW THE STANDARDS IDENTIFIED IN THE BUY AMERICAN ACT (41 U.S.C. Sec 101a-10d)  
ALL CONTRACTORS MUST COMPLY WITH THE REQUIREMENTS UNDER THE DAVIS-BACON ACT (40 U.S.C.A. Sec 2752a-2/9a-5)

ELECTRICAL DESIGN BY:

**EnTech ENGINEERING**  
P.O. BOX 11527 GOLDSBORO, NC 27532 TEL: (919) 778-9064

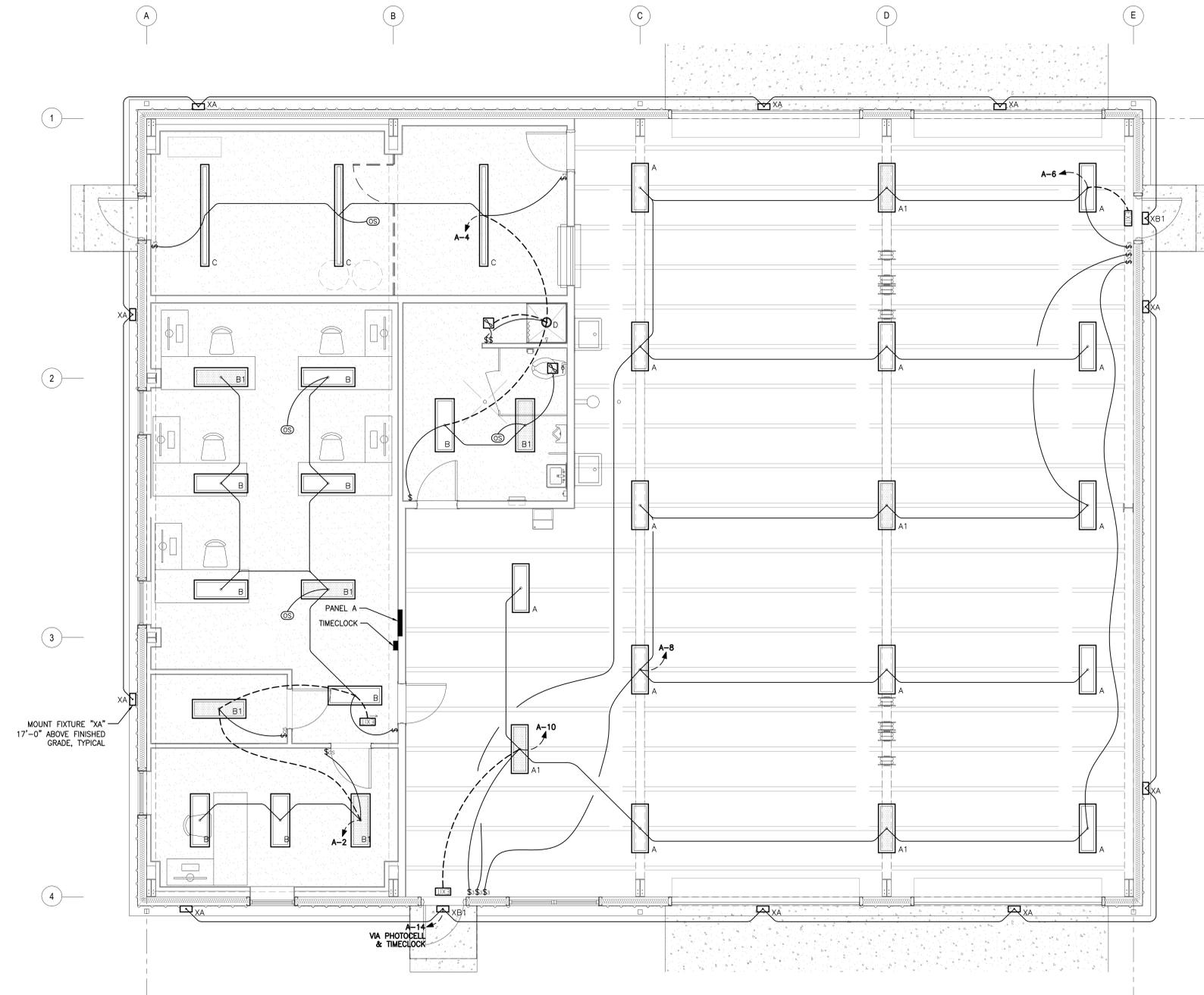
PROJECT NO. 2115047  
PROJECT MGR. J.D. HAM  
DRAWN BY B. JACKSON  
CHECKED BY



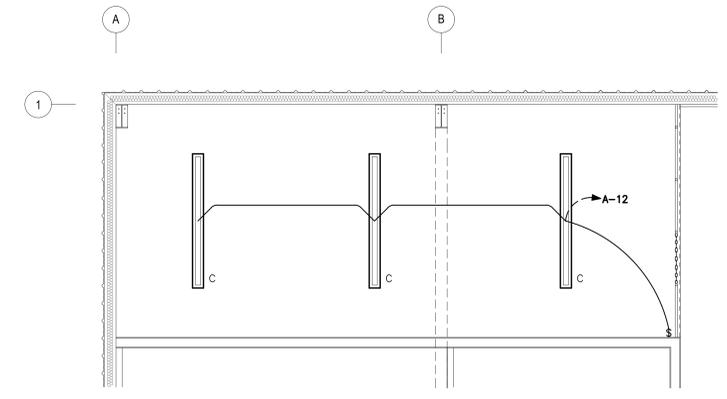
DISCLOSURE OF INFORMATION  
CONTRACTOR SHALL COMPLY AS FOLLOWS:  
(A) THE CONTRACTOR SHALL NOT RELEASE TO ANYONE OUTSIDE THE CONTRACTOR'S ORGANIZATION ANY UNCLASSIFIED INFORMATION, REGARDLESS OF MEDIUM (E.G. FILM, TAPE, DOCUMENT), PERTAINING TO ANY PART OF THIS CONTRACT OR ANY PROGRAM RELATED TO THIS CONTRACT, UNLESS:  
(1) THE CONTRACTING OFFICER HAS GIVEN PRIOR WRITTEN APPROVAL, OR  
(2) THE INFORMATION IS OTHERWISE IN THE PUBLIC DOMAIN BEFORE THE DATE OF RELEASE  
(B) REQUESTS FOR APPROVAL SHALL IDENTIFY THE SPECIFIC INFORMATION TO BE RELEASED, THE MEDIUM TO BE USED, AND THE PURPOSE FOR THE RELEASE. THE CONTRACTOR SHALL SUBMIT HIS REQUEST TO THE CONTRACTING OFFICER AT LEAST 45 DAYS BEFORE THE PROPOSED DATE FOR RELEASE.  
(C) THE CONTRACTOR AGREES TO INCLUDE A SIMILAR REQUIREMENT IN EACH SUBCONTRACT UNDER HIS CONTRACT. SUBCONTRACTORS SHALL SUBMIT REQUESTS FOR AUTHORIZATION TO RELEASE THROUGH THE PRIME CONTRACTOR TO THE CONTRACTING OFFICER.

E-101	
AVOLIS ENGINEERING, P.A. P.O. BOX 15564 NEW BERN, NC 28561 PH. (252) 633-0068, FAX (252) 633-6507 DES. J. C. AVOLIS, P.E. DR. J. K. AVOLIS, P.E. CHECKED BY: BRIAN R. MARSHBURN, P.E. SUBMITTED BY: APPROVED: PWO OR OICC DATE: SIZE: CODE IDENT. NO. NAVFAC DRAWING NO.	
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND <b>MARINE CORPS BASE</b> CAMP LEJEUNE, NORTH CAROLINA 16-0058 CONSTRUCT AUTOMOTIVE ORGANIZATION SHOP MACS-2, "DET B" ELECTRICAL PLANS	
F 80091 SCALE: NOTED SATISFACTORY TO: DATE:	60016634 CONSTR. CONTR. NO. N40085-16-B-0058 SPEC. 05-16-0058 SHEET 20 OF 32

REVISIONS		
SYM	DATE	APPROVED



**A** AUTOMOTIVE SHOP ELECTRICAL LIGHTING PLAN  
 1/4"=1'-0"  
 NORTH



**B** MEZZANINE ELECTRICAL LIGHTING PLAN  
 1/4"=1'-0"  
 NORTH

MOUNT FIXTURE "XA"  
 17'-0" ABOVE FINISHED  
 GRADE, TYPICAL

VIA PHOTOCCELL  
 & TIMECLOCK

ALL SUPPLIES AND CONSTRUCTION MATERIAL MUST FOLLOW THE STANDARDS IDENTIFIED IN THE BUY AMERICAN ACT (41 U.S.C. Sec 101a-10d)  
 ALL CONTRACTORS MUST COMPLY WITH THE REQUIREMENTS UNDER THE DAVIS-BACON ACT (40 U.S.C.A. Sec 276a-2/6a-9)

ELECTRICAL DESIGN BY:

**EnTech ENGINEERING**  
 NC LIC # C-1132  
 P.O. BOX 11527 GOLDSBORO, NC 27532 TEL: (919) 778-9064

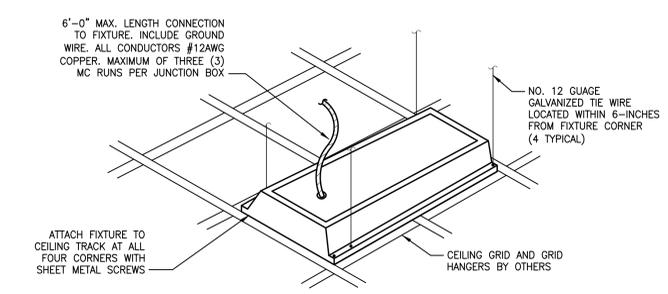
PROJECT NO. 2115047  
 PROJECT MGR. J.D. HAM  
 DRAWN BY B. JACKSON  
 CHECKED BY



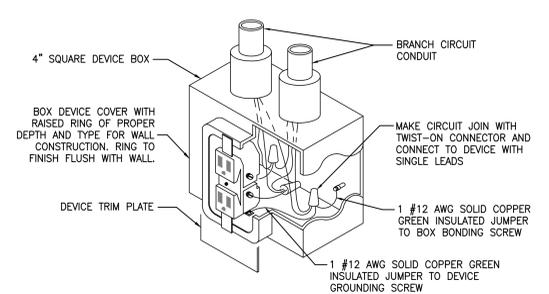
DISCLOSURE OF INFORMATION  
 CONTRACTOR SHALL COMPLY AS FOLLOWS:  
 (A) THE CONTRACTOR SHALL NOT RELEASE TO ANYONE OUTSIDE THE CONTRACTOR'S ORGANIZATION ANY UNCLASSIFIED INFORMATION, REGARDLESS OF MEDIUM (E.G. FILM, TAPE, DOCUMENT), PERTAINING TO ANY PART OF THIS CONTRACT OR ANY PROGRAM RELATED TO THIS CONTRACT, UNLESS:  
 (1) THE CONTRACTING OFFICER HAS GIVEN PRIOR WRITTEN APPROVAL, OR  
 (2) THE INFORMATION IS OTHERWISE IN THE PUBLIC DOMAIN BEFORE THE DATE OF RELEASE  
 (B) REQUESTS FOR APPROVAL SHALL IDENTIFY THE SPECIFIC INFORMATION TO BE RELEASED, THE MEDIUM TO BE USED, AND THE PURPOSE FOR THE RELEASE. THE CONTRACTOR SHALL SUBMIT ITS REQUEST TO THE CONTRACTING OFFICER AT LEAST 45 DAYS BEFORE THE PROPOSED DATE FOR RELEASE.  
 (C) THE CONTRACTOR AGREES TO INCLUDE A SIMILAR REQUIREMENT IN EACH SUBCONTRACT UNDER HIS CONTRACT. SUBCONTRACTORS SHALL SUBMIT REQUESTS FOR AUTHORIZATION TO RELEASE THROUGH THE PRIME CONTRACTOR TO THE CONTRACTING OFFICER.

AVOLIS ENGINEERING, P.A. P.O. BOX 15564 NEW BERN, NC 28561 PH. (252) 633-0068, FAX (252) 633-6507 DES. J. C. AVOLIS, P.E. DR. J. K. AVOLIS, P.E. SUBMITTED BY: DESIGN DR. BRIAN R. MARSHBURN, P.E. APPROVED: PWO OR OICC DATE SATISFACTORY TO: DATE		<p><b>E-102</b></p> <p>DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND  <b>MARINE CORPS BASE</b>        CAMP LEJEUNE, NORTH CAROLINA</p> <p>16-0058 CONSTRUCT AUTOMOTIVE ORGANIZATION SHOP        MACS-2, "DET B"</p> <p>ELECTRICAL PLANS</p> <p>NAVIFAC DRAWING NO. 60016635        CONSTR. CONTR. NO. N40085-16-B-0058</p> <p>SCALE: NOTED SPEC. 05-16-0058</p>	
PROJECT NO. 2115047	PROJECT MGR. J.D. HAM	SIZE F	CODE IDENT. NO. 80091
NAVIFAC DRAWING NO. 60016635	CONSTR. CONTR. NO. N40085-16-B-0058	SHEET 21	OF 32

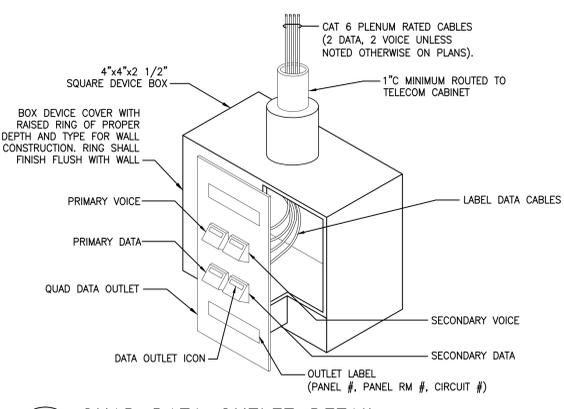
REVISIONS		
SYM	DATE	APPROVED



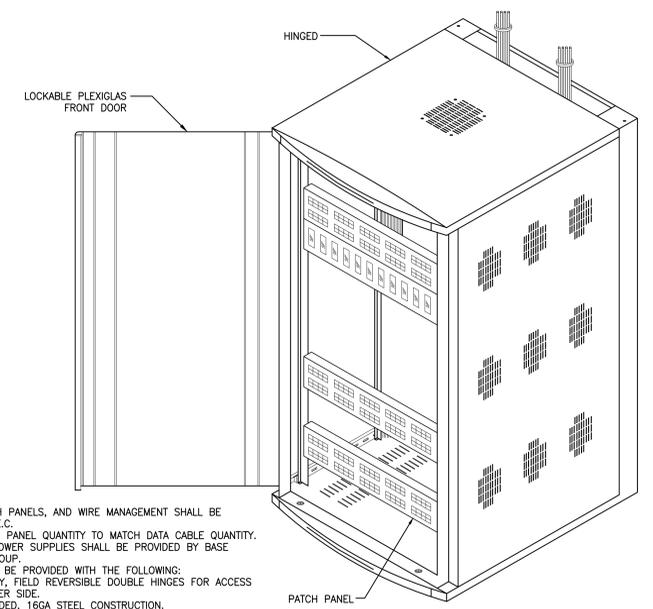
**1** TYPICAL RECESSED FIXTURE SUPPORT DETAIL  
NOT TO SCALE



**2** RECEPTACLE GROUNDING DIAGRAM  
NOT TO SCALE

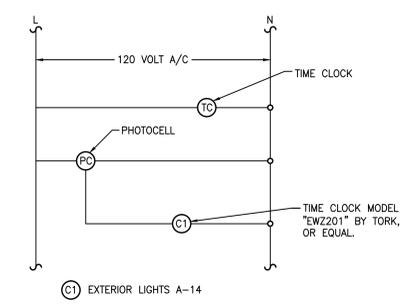


**3** QUAD DATA OUTLET DETAIL  
NOT TO SCALE

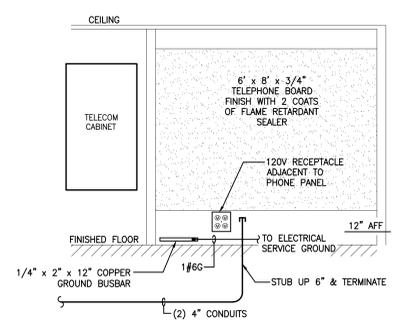


- NOTES:**
- CABINET, PATCH PANELS, AND WIRE MANAGEMENT SHALL BE PROVIDED BY E.C.
  - PROVIDE PATCH PANEL QUANTITY TO MATCH DATA CABLE QUANTITY.
  - SWITCHES & POWER SUPPLIES SHALL BE PROVIDED BY BASE TELEPHONE GROUP.
  - CABINET SHALL BE PROVIDED WITH THE FOLLOWING:
    - HEAVY DUTY, FIELD REVERSIBLE DOUBLE HINGES FOR ACCESS FROM EITHER SIDE.
    - FULLY WELDED, 16GA STEEL CONSTRUCTION.
    - GROUNDING AND BONDING PROVISIONS.
    - ADJUSTABLE RACK ANGLES FOR 19" EQUIPMENT.
    - BLACK POWDER COAT.
    - MINIMUM SIZE: 24"Wx48"Hx30"D
    - LOCKABLE FRONT DOOR.
    - SEE SPECIFICATION 27 10 00 FOR FURTHER REQUIREMENTS.

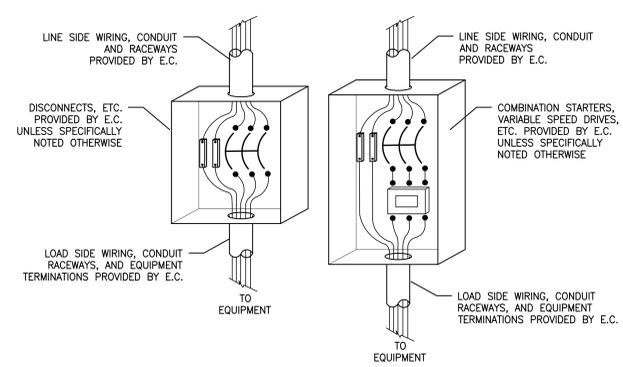
**7** WALL MOUNT CABINET DETAIL  
NOT TO SCALE



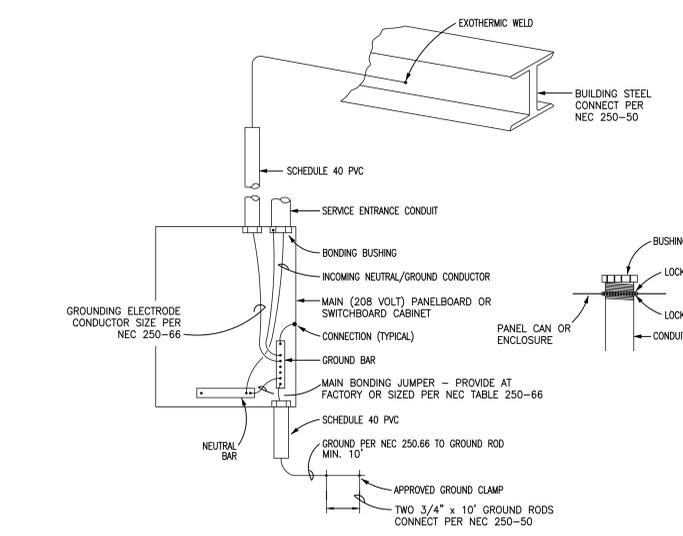
**4** TIME CLOCK DETAIL  
NOT TO SCALE



**5** TELEPHONE SYSTEM  
NOT TO SCALE



**6** ELECTRICAL CONNECTION COORDINATION DETAIL  
NOT TO SCALE

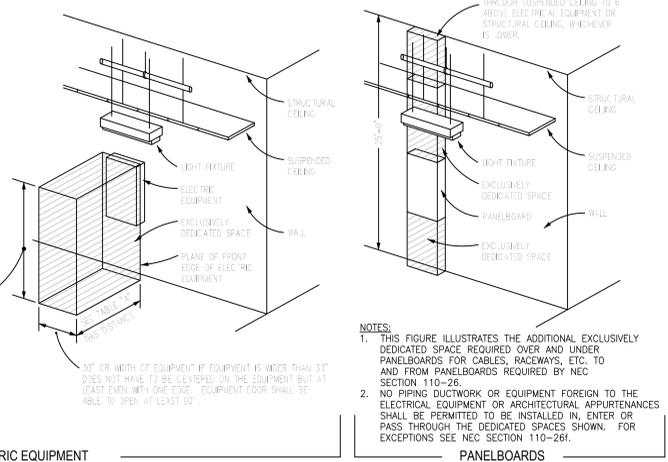


**8** TYPICAL BONDING AND GROUNDING DIAGRAM  
NOT TO SCALE

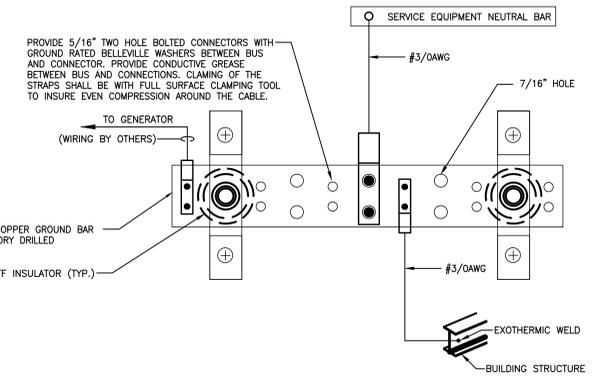
VOLTAGE TO GROUND (NOMINAL)	CONDITION 1	2	3
0-150	0	0	0
151-300	0	3 1/2	4

- WHERE THE "CONDITIONS" ARE AS FOLLOWS:
- EXPOSED LIVE PARTS ON ONE SIDE AND NO LIVE OR GROUND PARTS ON THE OTHER SIDE OF THE WORKING SPACE, OR EXPOSED LIVE PARTS ON BOTH SIDES EFFECTIVELY GUARDED BY SUITABLE WOOD OR OTHER INSULATING MATERIALS. INSULATED WIRE OR INSULATED SUBSIDIARIES OPERATING AT NOT OVER 300 VOLTS SHALL NOT BE CONSIDERED LIVE PARTS.
  - EXPOSED LIVE PARTS ON ONE SIDE AND GROUND PARTS ON THE OTHER SIDE.
  - EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORK SPACE (NOT GUARDED AS PROVIDED IN CONDITION 1) WITH THE OPERATOR BETWEEN.

**9** DEDICATED WORKING SPACE REQUIREMENTS  
NOT TO SCALE



**9** DEDICATED WORKING SPACE REQUIREMENTS  
NOT TO SCALE



**10** GENERATOR GROUND BUS  
NOT TO SCALE

**DISCLOSURE OF INFORMATION**  
CONTRACTOR SHALL COMPLY AS FOLLOWS:  
(A) THE CONTRACTOR SHALL NOT RELEASE TO ANYONE OUTSIDE THE CONTRACTOR'S ORGANIZATION ANY UNCLASSIFIED INFORMATION, REGARDLESS OF MEDIUM (E.G. FILM, TAPE, DOCUMENT), PERTAINING TO ANY PART OF THIS CONTRACT OR ANY PROGRAM RELATED TO THIS CONTRACT, UNLESS:  
(1) THE CONTRACTING OFFICER HAS GIVEN PRIOR WRITTEN APPROVAL, OR  
(2) THE INFORMATION IS OTHERWISE IN THE PUBLIC DOMAIN BEFORE THE DATE OF RELEASE  
(B) REQUESTS FOR APPROVAL SHALL IDENTIFY THE SPECIFIC INFORMATION TO BE RELEASED, THE MEDIUM TO BE USED, AND THE PURPOSE FOR THE RELEASE. THE CONTRACTOR SHALL SUBMIT HIS REQUEST TO THE CONTRACTING OFFICER AT LEAST 45 DAYS BEFORE THE PROPOSED DATE FOR RELEASE.  
(C) THE CONTRACTOR AGREES TO INCLUDE A SIMILAR REQUIREMENT IN EACH SUBCONTRACT UNDER HIS CONTRACT. SUBCONTRACTORS SHALL SUBMIT REQUESTS FOR AUTHORIZATION TO RELEASE THROUGH THE PRIME CONTRACTOR TO THE CONTRACTING OFFICER.

ALL SUPPLIES AND CONSTRUCTION MATERIAL MUST FOLLOW THE STANDARDS IDENTIFIED IN THE BUY AMERICAN ACT (41 U.S.C. Sec 10a-10d)  
ALL CONTRACTORS MUST COMPLY WITH THE REQUIREMENTS UNDER THE DAVIS-BACON ACT (40 U.S.C.A. Sec 276a-2/6a-5)

ELECTRICAL DESIGN BY:

**EnTech ENGINEERING**  
P.O. BOX 11527 GOLDSBORO, NC 27532 TEL: (919) 778-9064

PROJECT NO. 2115047  
PROJECT MGR. J.D. HAM  
DRAWN BY B. JACKSON  
CHECKED BY

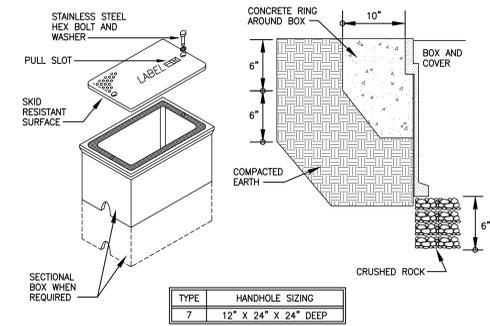
**E-201**

AVOLIS ENGINEERING, P.A.  
P.O. BOX 5554  
NEW BERN, NC 28561  
PH: (252) 633-0068, FAX: (252) 633-6507  
DES. J. C. AVOLIS, P.E.  
DR. CHK. J. K. AVOLIS, P.E.  
SUBMITTED BY:  
DESIGN DR. BRIAN R. MARSHBURN, P.E.  
APPROVED: PWO OR OICC DATE SIZE CODE IDENT. NO. NAVFAC DRAWING NO.  
F 80091 60016636  
CONSTR. CONTR. NO. N40085-16-B-0058

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND  
**MARINE CORPS BASE**  
CAMP LEJEUNE, NORTH CAROLINA  
16-0058 CONSTRUCT AUTOMOTIVE ORGANIZATION SHOP MACS-2, "DET B"  
ELECTRICAL DETAILS

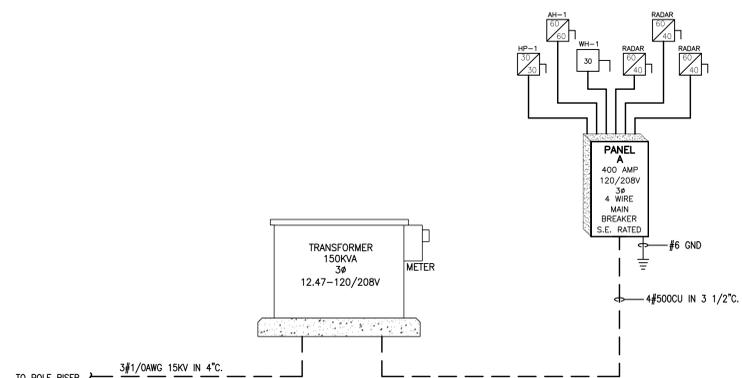
SCALE: NOTED SPEC. 05-16-0058 SHEET 22 OF 32

REVISIONS		
SYM	DATE	APPROVED

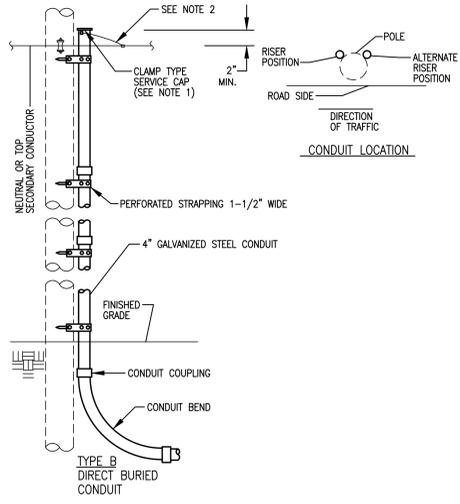


- HANDHOLE REQUIREMENTS**
- HOUSING SHALL BE A POLYMER CONCRETE REINFORCED WITH A HEAVY WEAVE FIBERGLASS REINFORCING WITH COMPRESSIVE STRENGTH OF NO LESS THAN 10,000 PSI.
  - COVER AND BOX SHALL WITHSTAND A SERVICE LOAD OF NO LESS THAN 15,000 LBS OVER A 10" x 10" AREA.
  - PROVIDE STAINLESS STEEL BOLTS AND INSERTS.
  - PROVIDE WITH (2) 2 1/2" MOUSEHOLES.
  - PROVIDE LABEL "ELECTRICAL" FOR POWER HANDHOLES OR "TELEPHONE" FOR TELEPHONE HANDHOLES.

**1 HANDHOLE DETAIL**  
NOT TO SCALE

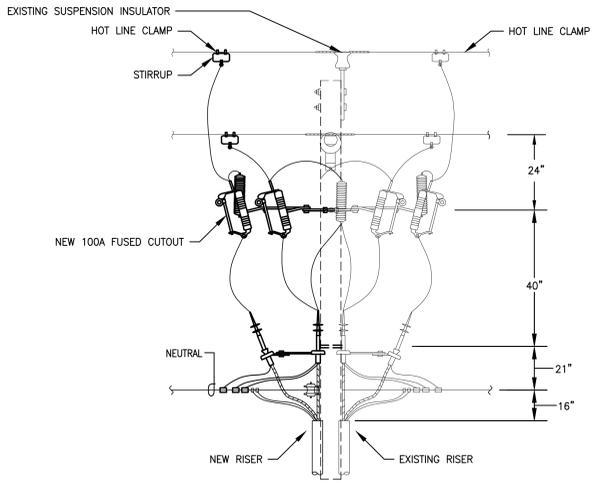


**2 ELECTRICAL RISER**  
NOT TO SCALE



- NOTES**
- ON CONDUIT RISER FOR PRIMARY CIRCUITS, ELIMINATE SERVICE CAP AND PROVIDE GROUNDING TYPE INSULATING BUSHING.
  - BOND CONDUIT TO POLE GROUND AND SYSTEM NEUTRAL (IF EXISTING). SEE GROUNDING NOTES ON SKETCH OH-41.
  - SPACE STRAPS AT MAXIMUM OF 4' INTERVALS.

**3 CONDUIT RISER DETAIL**  
NOT TO SCALE



- NOTES**
- CONNECT BOTTOM LEAD OF ARRESTER DIRECTLY TO POLE GROUND. INTERCONNECT CABLE INSULATION SHIELD DRAIN WIRES AND CONDUIT RISER GROUND TO MULTI-GROUNDED NEUTRAL (IF EXISTING) AND POLE GROUND.

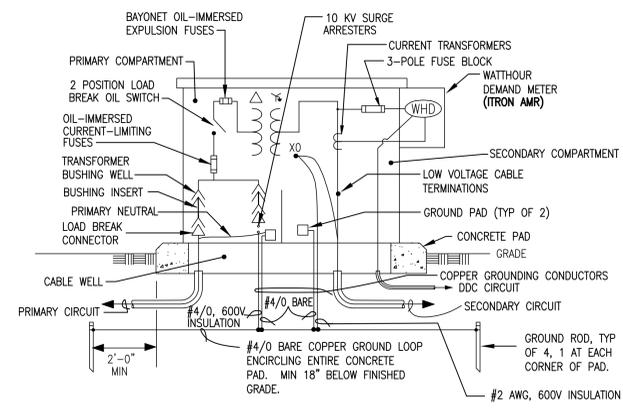
**4 UNDERGROUND TERMINAL DETAIL (15KV)**  
NOT TO SCALE

SERVICE LOAD SUMMARY					
OCCUPANCY TYPE - GARAGE			BUILDING AREA - 4,500 SF		
CONTINUOUS LOAD DESCRIPTION	LOAD (KVA)	NEC REFERENCE	DEMAND FACTOR	NEC REFERENCE	LOAD (KVA)
INDOOR LIGHTING	10.8	TABLE 220.12	100%	TABLE 220.42	10.8
OUTDOOR LIGHTING	2.0	--	100%	--	2.0
GAS RADIANT HEAT	1.5	--	100%	--	1.5
AIR HANDLER ELECTRIC HEAT	7.2	422.12	100%	--	7.2
AIR HANDLER FANS (SPLIT SYSTEMS)	0.7	ARTICLE 440	100%	--	0.7
HVAC OUTDOOR UNIT	3.0	ARTICLE 440	100%	--	3.0
WATER HEATERS	6	422.13	100%	--	6
<b>SUBTOTAL CONTINUOUS LOADS</b>					31.2
					<b>230.42 A 1</b>
					<b>x 125%</b>
					<b>39</b>
<b>NON CONTINUOUS LOAD DESCRIPTION</b>					
RECEPTACLES UP TO 10 KVA	4.5	220.14 1	100% OF 1st 10 KVA		4.5
RECEPTACLES OVER 10 KVA	--	220.14 1	50% ABOVE 10 KVA		--
AIR COMPRESSOR (7.5 HP)	9.6				9.6
(3) 40A DISCONNECT MISC. EQUIPMENT	32.4		(2) OF (3) OPERATIONAL		21.6
DEDICATED RECEPTACLES	3.8		100%		3.8
<b>SUBTOTAL NON-CONTINUOUS LOADS</b>					39.5
<b>TOTAL CONTINUOUS AND NON CONTINUOUS LOADS</b>					<b>78.5</b>
<b>FAULT CURRENT AT TRANSFORMER</b>			<b>SERVICE LOAD</b>		
$\frac{150 \text{ KVA (X-FORMER)}}{0.208 \times \sqrt{3} \times 2.0 \text{ \%Z}} = 20,820 \text{ AMPS}$			$\frac{79 \text{ KVA}}{0.208 \times \sqrt{3}} = 219 \text{ AMPS}$		

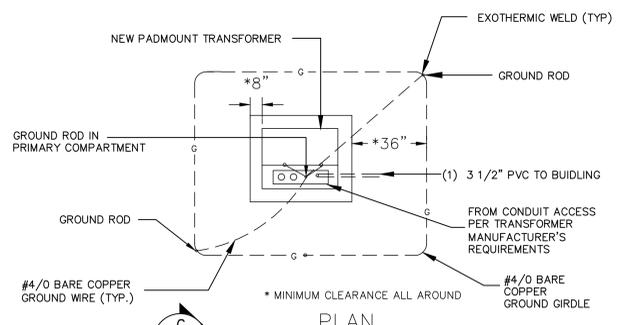
PANELBOARD SCHEDULE												
PANEL A	SURFACE MOUNTED			SERVICE ENTRANCE RATED			400 AMP (FEEDER SIZE)			3Ø, 4 WIRE		
MAIN BREAKER	BOTTOM FEED			10K AIC			120/208 VOLT			BOLT ON BREAKER		
NEMA 1	COPPER BUS			400 AMP (BUS RATING)			400 AMP (BUS RATING)			---		
LOAD SERVED	WIRE SIZE	CONDUIT SIZE	LOAD (AMPS)	CONDUIT NO.	PHASE	CONDUIT NO.	LOAD (AMPS)	CONDUIT SIZE	WIRE SIZE	LOAD SERVED		
HP-1	2#10 & 1#10G	3/4"	14	1	30	2	8	3/4"	2#12 & 1#12G	LIGHTS		
AH-1	2#8 & 1#8G	3/4"	41	3	60	4	6	3/4"	2#12 & 1#12G	LIGHTS		
GAS HEATERS	2#12 & 1#12G	3/4"	15	9	20	10	8	3/4"	2#12 & 1#12G	LIGHTS		
GAS HEATERS	2#12 & 1#12G	3/4"	15	11	20	12	3	3/4"	2#12 & 1#12G	MEZZANINE LIGHTS		
WF-1	2#12 & 1#12G	3/4"	8	13	20	14	8	3/4"	2#12 & 1#12G	EXTERIOR LIGHTS		
CORD REEL	2#12 & 1#12G	3/4"	4	17	20	18	--	--	--	SPARE		
CORD REEL	2#12 & 1#12G	3/4"	4	19	20	20	11	3/4"	2#12 & 1#12G	RECEPTACLES		
RADAR DISC.	3#8 & 1#10G	3/4"	30	21	40	22	9	3/4"	2#12 & 1#12G	RECEPTACLES		
RADAR DISC.	3#8 & 1#10G	3/4"	30	23	40	24	8	3/4"	2#12 & 1#12G	RECEPTACLES		
RADAR DISC.	3#8 & 1#10G	3/4"	30	25	40	26	5	3/4"	2#12 & 1#12G	RECEPTACLES		
RADAR DISC.	3#8 & 1#10G	3/4"	30	27	40	28	6	3/4"	2#12 & 1#12G	RECEPTACLES		
RADAR DISC.	3#8 & 1#10G	3/4"	30	29	40	30	6	3/4"	2#12 & 1#12G	RECEPTACLES		
WATER HEATER	2#8 & 1#10G	3/4"	29	33	20	34	--	--	--	SPARE		
SPARE	--	--	--	37	20	36	--	--	--	SPARE		
SPARE	--	--	--	39	20	38	--	--	--	SPARE		
SPARE	--	--	--	41	20	40	5	3/4"	2#12 & 1#12G	WATER COOLER		
SPARE	--	--	--	42	20	42	3	3/4"	2#12 & 1#12G	PHONEBOARD		

COORDINATE HVAC BREAKERS AND WIRE SIZES WITH HVAC SUBMITTALS  
COORDINATE BREAKERS AND WIRE SIZES FOR OWNER FURNISHED EQUIPMENT WITH SUBMITTALS  
PROVIDE SEPARATE NEUTRALS FOR ALL CIRCUITS.

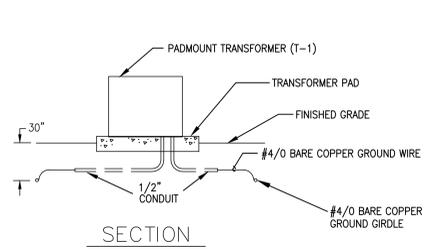
GROSS PHASE TOTALS (AMPS) A = 171 B = 160 C = 181



**5 PAD-MOUNTED TRANSFORMER DETAIL**  
NOT TO SCALE



**6 TRANSFORMER DETAIL**  
NOT TO SCALE



ALL SUPPLIES AND CONSTRUCTION MATERIAL MUST FOLLOW THE STANDARDS IDENTIFIED IN THE BUY AMERICAN ACT (41 U.S.C. Sec 101a-10d)

ALL CONTRACTORS MUST COMPLY WITH THE REQUIREMENTS UNDER THE DAVIS-BACON ACT (40 U.S.C.A. Sec 216a-2/6a-5)

ELECTRICAL DESIGN BY:

**EnTech ENGINEERING**  
NC LIC # C-1132  
P.O. BOX 11527 GOLDSBORO, NC 27532 TEL: (919) 778-9064

PROJECT NO. 211504-7  
PROJECT MGR. J.D. HAM  
DRAWN BY B. JACKSON  
CHECKED BY

SEAL 31466  
JAMES D. HAM  
7-21-76

DISCLOSURE OF INFORMATION  
CONTRACTOR SHALL COMPLY AS FOLLOWS:  
(A) THE CONTRACTOR SHALL NOT RELEASE TO ANYONE OUTSIDE THE CONTRACTOR'S ORGANIZATION ANY UNCLASSIFIED INFORMATION, REGARDLESS OF MEDIUM (E.G. FILM, TAPE, DOCUMENT), PERTAINING TO ANY PART OF THIS CONTRACT OR ANY PROGRAM RELATED TO THIS CONTRACT, UNLESS:  
(1) THE CONTRACTING OFFICER HAS GIVEN PRIOR WRITTEN APPROVAL, OR  
(2) THE INFORMATION IS OTHERWISE IN THE PUBLIC DOMAIN BEFORE THE DATE OF RELEASE  
(B) REQUESTS FOR APPROVAL SHALL IDENTIFY THE SPECIFIC INFORMATION TO BE RELEASED, THE MEDIUM TO BE USED, AND THE PURPOSE FOR THE RELEASE. THE CONTRACTOR SHALL SUBMIT THIS REQUEST TO THE CONTRACTING OFFICER AT LEAST 45 DAYS BEFORE THE PROPOSED DATE FOR RELEASE.  
(C) THE CONTRACTOR AGREES TO INCLUDE A SIMILAR REQUIREMENT IN EACH SUBCONTRACT UNDER HIS CONTRACT. SUBCONTRACTORS SHALL SUBMIT REQUESTS FOR AUTHORIZATION TO RELEASE THROUGH THE PRIME CONTRACTOR TO THE CONTRACTING OFFICER.

**E-301**

AVOLIS ENGINEERING, P.A.  
P.O. BOX 15504  
NEW BERN, NC 28561  
PH: (252) 633-0068, FAX: (252) 633-6507  
DES. J. C. AVOLIS, P.E.  
DR.

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND  
**MARINE CORPS BASE**  
CAMP LEJEUNE, NORTH CAROLINA  
16-0058 CONSTRUCT AUTOMOTIVE ORGANIZATION SHOP MACS-2, DET B  
ELECTRICAL SCHEDULES

APPROVED: PWO OR OICC DATE SIZE CODE IDENT. NO. NAVFAC DRAWING NO.  
F 80091 60016637  
CONSTR. CONTR. NO. N40085-16-B-0058

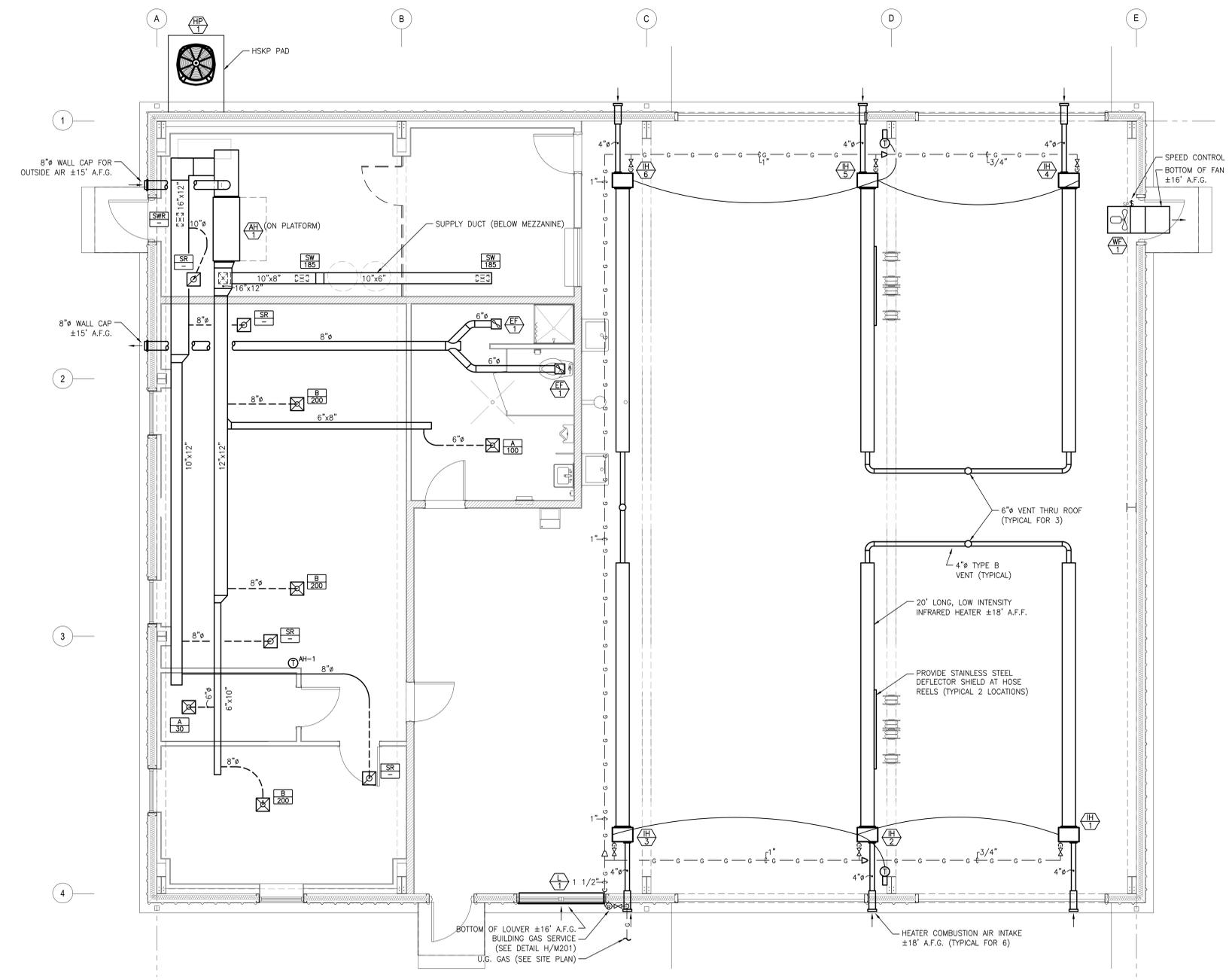
SATISFACTORY TO: DATE DATE SCALE: NOTED SPEC. 05-16-0058 SHEET 23 OF 32



REVISIONS		
SYM	DATE	APPROVED

GAS PIPING DESIGN TABLE				
PIPING MATERIAL:	SCH 40 CS	BLDG HEATING EQUIP:	390 MBH	
DEVELOPED LENGTH:	120 FT			
REQ'D HEADER SIZE:	1 1/2"			
SERVICE TYPE	SYSTEM PRESSURE	PRESSURE DROP	INPUT CAPACITY	
NATURAL	0.5 PSI	0.5 IN WC	390 MBH	368 CFH

NOTE: GAS PIPING SIZED BASE ON NC FUEL GAS CODE.



**AUTOMOTIVE SHOP MECHANICAL PLAN**  
 1/4"=1'-0"  
 NORTH

**DISCLOSURE OF INFORMATION**  
 CONTRACTOR SHALL COMPLY AS FOLLOWS:  
 (A) THE CONTRACTOR SHALL NOT RELEASE TO ANYONE OUTSIDE THE CONTRACTOR'S ORGANIZATION ANY UNCLASSIFIED INFORMATION, REGARDLESS OF MEDIUM (E.G., FILM, TAPE, DOCUMENT), PERTAINING TO ANY PART OF THIS CONTRACT OR ANY PROGRAM RELATED TO THIS CONTRACT, UNLESS:  
 (1) THE CONTRACTING OFFICER HAS GIVEN PRIOR WRITTEN APPROVAL, OR  
 (2) THE INFORMATION IS OTHERWISE IN THE PUBLIC DOMAIN BEFORE THE DATE OF RELEASE  
 (B) REQUESTS FOR APPROVAL SHALL IDENTIFY THE SPECIFIC INFORMATION TO BE RELEASED, THE MEDIUM TO BE USED, AND THE PURPOSE FOR THE RELEASE. THE CONTRACTOR SHALL SUBMIT ITS REQUEST TO THE CONTRACTING OFFICER AT LEAST 45 DAYS BEFORE THE PROPOSED DATE FOR RELEASE.  
 (C) THE CONTRACTOR AGREES TO INCLUDE A SIMILAR REQUIREMENT IN EACH SUBCONTRACT UNDER HIS CONTRACT. SUBCONTRACTORS SHALL SUBMIT REQUESTS FOR AUTHORIZATION TO RELEASE THROUGH THE PRIME CONTRACTOR TO THE CONTRACTING OFFICER.

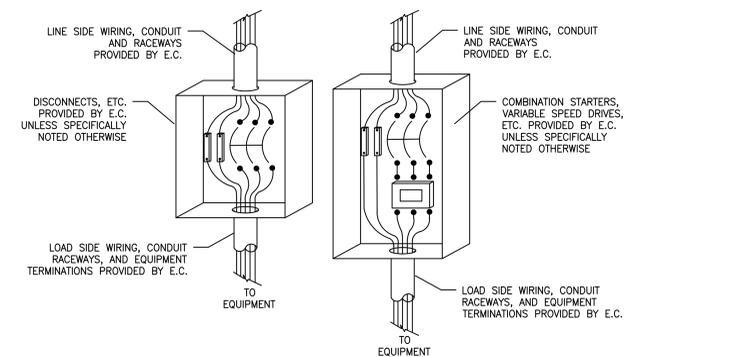
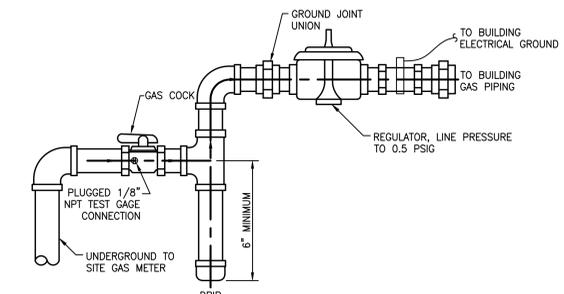
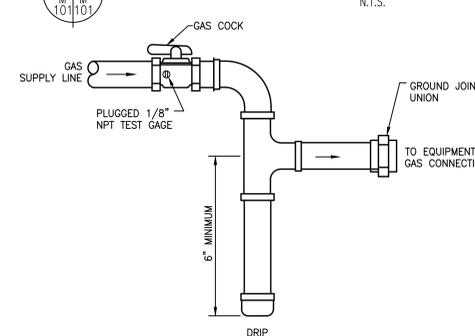
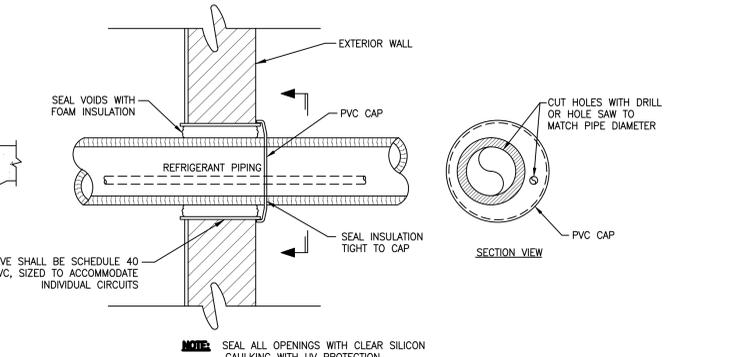
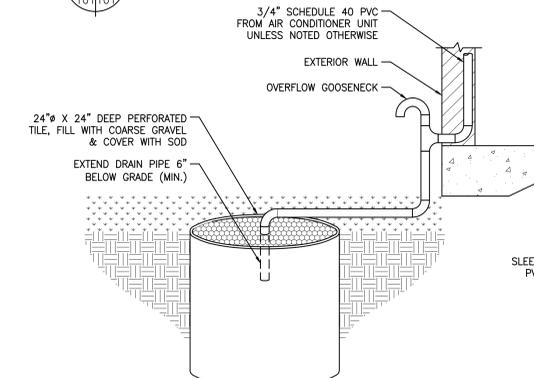
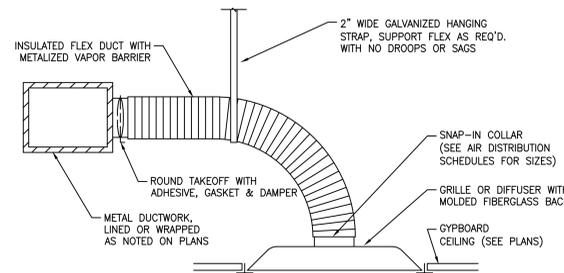
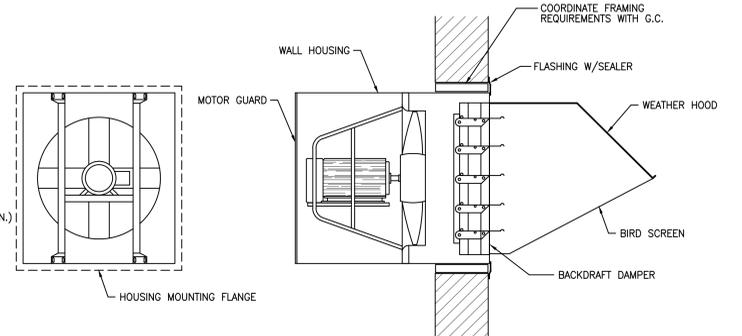
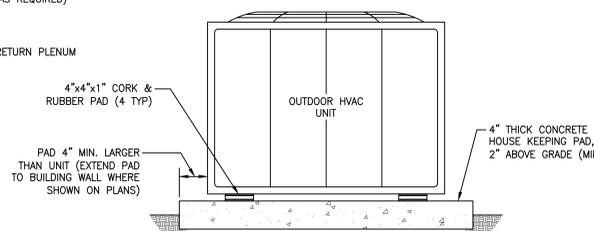
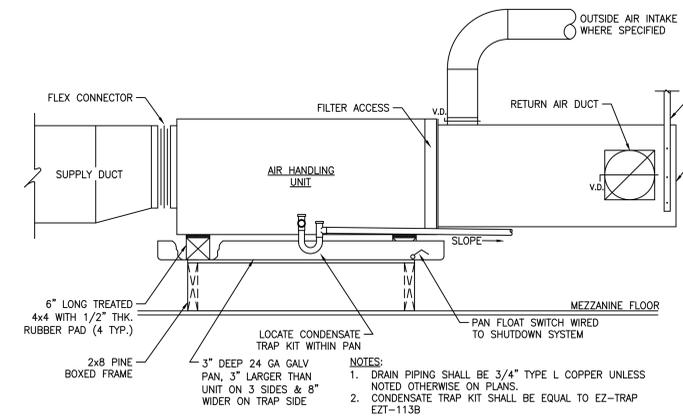
ALL SUPPLIES AND CONSTRUCTION MATERIAL MUST FOLLOW THE STANDARDS IDENTIFIED IN THE BUY AMERICAN ACT (41 U.S.C. Sec 10a-10d)  
 ALL CONTRACTORS MUST COMPLY WITH THE REQUIREMENTS UNDER THE DAVIS-BACON ACT (40 U.S.C.A. Sec 276a-2/6a-5)

**EnTech ENGINEERING**  
 NC LIC # C-1132  
 P.O. BOX 11527 GOLDSBORO, NC 27532 TEL: (919) 778-9064

ELECTRICAL DESIGN BY:  
 PROJECT NO. 215047  
 PROJECT MGR. J.D. HAM  
 DRAWN BY D. HILL  
 CHECKED BY

<b>M-101</b> AVOLIS ENGINEERING, P.A. P.O. BOX 15564 NEW BERN, NC 28561 PH. (252) 633-0068, FAX (252) 633-6507 DES. J. C. AVOLIS, P.E. DR. J. K. AVOLIS, P.E. SUBMITTED BY: BRIAN R. MARSHBURN, P.E. APPROVED: PWO OR OICC DATE:		DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND <b>MARINE CORPS BASE</b> CAMP LEJEUNE, NORTH CAROLINA 16-0058 CONSTRUCT AUTOMOTIVE ORGANIZATION SHOP MACS-2, "DET B" MECHANICAL PLANS NAVFAC DRAWING NO. 60016639 CONSTR. CONTR. NO. N40085-16-B-0058
PROJECT NO. 215047 PROJECT MGR. J.D. HAM DRAWN BY D. HILL CHECKED BY	DATE:	SIZE: F CODE IDENT. NO: 80091 SCALE: NOTED SPEC. 05-16-0058 SHEET 25 OF 32

REVISIONS		
SYM	DATE	APPROVED



**DISCLOSURE OF INFORMATION**  
CONTRACTOR SHALL COMPLY AS FOLLOWS:  
(A) THE CONTRACTOR SHALL NOT RELEASE TO ANYONE OUTSIDE THE CONTRACTOR'S ORGANIZATION ANY UNCLASSIFIED INFORMATION, REGARDLESS OF MEDIUM (E.G. FILM, TAPE, DOCUMENT), PERTAINING TO ANY PART OF THIS CONTRACT OR ANY PROGRAM RELATED TO THIS CONTRACT, UNLESS:  
(1) THE CONTRACTING OFFICER HAS GIVEN PRIOR WRITTEN APPROVAL, OR  
(2) THE INFORMATION IS OTHERWISE IN THE PUBLIC DOMAIN BEFORE THE DATE OF RELEASE  
(B) REQUESTS FOR APPROVAL SHALL IDENTIFY THE SPECIFIC INFORMATION TO BE RELEASED, THE MEDIUM TO BE USED, AND THE PURPOSE FOR THE RELEASE. THE CONTRACTOR SHALL SUBMIT THIS REQUEST TO THE CONTRACTING OFFICER AT LEAST 45 DAYS BEFORE THE PROPOSED DATE FOR RELEASE.  
(C) THE CONTRACTOR AGREES TO INCLUDE A SIMILAR REQUIREMENT IN EACH SUBCONTRACT UNDER HIS CONTRACT. SUBCONTRACTORS SHALL SUBMIT REQUESTS FOR AUTHORIZATION TO RELEASE THROUGH THE PRIME CONTRACTOR TO THE CONTRACTING OFFICER.

ALL SUPPLIES AND CONSTRUCTION MATERIAL MUST FOLLOW THE STANDARDS IDENTIFIED IN THE BUY AMERICAN ACT (41 U.S.C. Sec 101a-10d)  
ALL CONTRACTORS MUST COMPLY WITH THE REQUIREMENTS UNDER THE DAVIS-BACON ACT (40 U.S.C.A. Sec 276a-2/6a-5)

**EnTech ENGINEERING**  
P.O. BOX 11527 GOLDSBORO, NC 27532 TEL: (919) 778-9064

ELECTRICAL DESIGN BY:  
PROJECT NO. 215047  
PROJECT MGR. J.D. HAM  
DRAWN BY D. HILL  
CHECKED BY

**M-201**

AVOLIS ENGINEERING, P.A. LICENSE NO. C07078  
P.O. BOX 15564 NEW BERN, NC 28561 PH: (252) 633-0068 FAX: (252) 633-6507  
DES. J. C. AVOLIS, P.E.  
CHK. J. K. AVOLIS, P.E.  
SUBMITTED BY:  
DESIGN DR. BRIAN R. MARSHBURN, P.E.  
APPROVED: PWO OR OICC DATE SIZE CODE IDENT. NO. NAVFAC DRAWING NO. 60016640  
CONSTR. CONTR. NO. N40085-16-B-0058

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND  
**MARINE CORPS BASE**  
CAMP LEJEUNE, NORTH CAROLINA  
16-0058 CONSTRUCT AUTOMOTIVE ORGANIZATION SHOP MACS-2, "DET B"  
MECHANICAL DETAILS

SCALE: NOTED SPEC. 05-16-0058 SHEET 26 OF 32

REVISIONS		
SYM	DATE	APPROVED

**MECHANICAL NOTES:**

- MECHANICAL PLANS ARE INTENDED TO PROVIDE INFORMATION FOR INSTALLATION OF A COMPLETE OPERATING MECHANICAL SYSTEM. PROVIDE ALL ESSENTIAL LABOR, MATERIALS & DEVICES REQUIRED TO PRODUCE A QUALITY END PRODUCT.
- CONTRACTOR SHALL REVIEW & BECOME FAMILIAR WITH THE WORK OF ALL TRADES FOR PURPOSES OF COORDINATION AND ROUTING. CONTRACTOR SHALL PROVIDE REQUIRED PLANNING, COORDINATION AND SEQUENCING OF HVAC INSTALLATION WITH BUILDING COMPONENTS AND OTHER TRADES.
- ALL WORK SHALL COMPLY WITH LOCAL, STATE & NATIONAL CODES. WORKMANSHIP SHALL MEET OR EXCEED INDUSTRY STANDARDS.
- PROTECT ALL NEW MATERIALS FROM THE WEATHER IN STORAGE TRAILERS OR PROVIDE SUITABLE COVERING.
- FABRICATE AND INSTALL DUCT PER SMACNA STANDARDS FOR 2-INCH WC WITH GALVANIZED METAL (26 GAUGE MINIMUM). ALL RADIUS ELBOWS & TEES SHALL HAVE CENTERLINE RADIUS OF 1.5 X DUCT WIDTH. ALL SQUARE ELBOWS & TEES SHALL HAVE TURNING VANES. PRIOR TO FABRICATION, MECHANICAL CONTRACTOR SHALL FIELD VERIFY STRUCTURAL OBSTRUCTIONS & CEILING SPACE LIMITATIONS AND MAKE NECESSARY DUCT MODIFICATIONS INCLUDING CHANGING OF ASPECT RATIOS, ADDING OFFSETS, AND SHIFTING LOCATIONS. PROTECT DUCT BY STORING IN A CLEAN AND DRY ENVIRONMENT PRIOR TO INSTALLATION. COVER ENDS OF EXPOSED WORK AT THE END OF EVERY SHIFT.
- ALL DUCT JOINTS, SEAMS & BRANCH TAKEOFFS SHALL BE SEALED AIR-TIGHT WITH DUCT SEALANT EQUAL TO HARDCAST IRON-GRIP.
- ROUND RUNOUTS SHALL HAVE SIDE TAKEOFFS WITH GASKET & DAMPER. RECTANGULAR BRANCH DUCTS SHALL HAVE 45 DEGREE TAPS WITH AIR EXTRACTOR AND ALL TEES SHALL HAVE SPLITTER DAMPERS. PROVIDE ANY OTHER DEVICES REQUIRED TO BALANCE AIR SYSTEM.
- FLEX DUCT SHALL BE FACTORY INSULATED, HAVE ACOUSTICAL INNER CORE AND HAVE METALIZED VAPOR BARRIER. BOTH ENDS SHALL BE SECURED WITH NYLON BANDS AND METALIZED DUCT TAPE PER MFG'S RECOMMENDATIONS AND IN ACCORDANCE WITH U.L. 181B.
- RIGID ROUND AND RECTANGULAR DUCT SHALL BE EXTERNALLY INSULATED WITH 3/4 LB. DENSITY FIBERGLASS BLANKET WITH FSK VAPOR BARRIER. STAPLE AND SEAL ALL JOINTS WITH 3-INCH WIDE METALIZED DUCT TAPE EQUAL TO SHURFLEX SF-683.
- INSULATE & SEAL ALL GRILLE & DIFFUSER NECKS TO MAINTAIN VAPOR BARRIER AND ELIMINATE CONDENSATION.
- CONDENSATE TRAPS FOR ALL AC UNITS SHALL BE SIZED AS RECOMMENDED BY UNIT MFG. CONDENSATE PIPING SHALL BE TYPE L COPPER ROUTED TO DRYWELL. INSULATE WITH FLEXIBLE ELASTOMERIC INSULATION. SEAL ALL JOINTS AND SEAMS TO PREVENT CONDENSATION.
- REFRIGERANT PIPING SHALL BE TYPE ADR COPPER WITH SILVER SOLDERED JOINTS. INSTALL PER EQUIPMENT INSTALLATION INSTRUCTIONS. INSULATION SHALL BE FLEXIBLE ELASTOMERIC INSULATION. SEAL ALL JOINTS AND SEAMS TO PREVENT CONDENSATION. PROTECT EXTERIOR INSULATION FROM SOLAR DETERIORATION WITH UV COATING.
- GAS PIPING SHALL BE A-53 SCHEDULE 40 BLACK STEEL WITH MALLEABLE FITTINGS. PIPING BELOW GRADE SHALL HAVE FRP COATING AND ABOVE GRADE SHALL BE PRIMED & PAINTED. GROUND ALL GAS PIPING ABOVE GRADE & WITHIN BUILDING. PROVIDE MAGNETIC MARKER TAPE 12-INCHES ABOVE ALL BELOW GRADE PIPING.
- ALL PIPING SHALL BE SUPPORTED & SECURED WITH SUITABLE HANGERS, STRAPS OR PIPE STANDS. SUPPORT WITH NO DROOPS OR SAGS. ALL HANGERS AND ATTACHMENTS SHALL BE PLATED, GALVANIZED OR PAINTED. PROVIDE ISOLATION ON PIPING OF DISSIMILAR MATERIALS.
- POWER WIRING, DISCONNECTS & STARTERS NOT FURNISHED WITH HVAC EQUIPMENT AND FINAL CONNECTIONS SHALL BE BY THE E.C.
- CONTROL WIRING, RELAYS AND INTERLOCKING DEVICES SHALL BE PROVIDED BY THE M.C.
- TEMPERATURE CONTROLS FOR EACH HEATING-COOLING SYSTEM SHALL CONSIST OF AN ELECTRONIC PROGRAMMABLE HEATING-COOLING THERMOSTAT WITH HEAT-OFF-COOL-AUTO SYSTEM SWITCH & AUTO-ON FAN SWITCH. MOUNT THERMOSTATS 48-INCHES A.F.F.
- INSTALL EQUIPMENT TO FACILITATE SERVICING, MAINTENANCE & REPAIR IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS AS WELL AS SPECIFIC INSTRUCTIONS ON PLANS.
- PROVIDE CONCRETE HOUSEKEEPING PADS FOR ALL GROUND & FLOOR MOUNTED EQUIPMENT. UNLESS NOTED OTHERWISE ALL PADS SHALL BE 4" THICK & 4" LARGER THAN EQUIPMENT ON ALL SIDES. PADS SHALL BE 3000 PSI CONCRETE.
- CONTRACTOR SHALL BALANCE AIR SYSTEM TO QUANTITIES INDICATED ON PLANS AND PROVIDE TYPE WRITTEN REPORT WITH O&M MANUALS.
- ALL EQUIPMENT & SYSTEMS SHALL BE WASHED, MECHANICAL AREAS CLEANED AND PAINTED SURFACES TOUCHED UP TO MATCH FACTORY APPLIED FINISHES. ALL DUCT SYSTEMS AND AIR HANDLERS SHALL BE VACUUMED AND WIPED CLEAN ON THE INSIDE PRIOR TO TURNING THE PROJECT OVER TO THE OWNER. SYSTEMS THAT HAVE NOT BEEN ADEQUATELY PROTECTED DURING INSTALLATION WILL REQUIRE CLEANING AGAIN AT THE END OF THE PROJECT.
- CONTRACTOR SHALL INSTALL A NEW SET OF MERV 8 PLATED FILTERS BEFORE TURNING BUILDING OVER TO OWNER.
- CONTRACTOR SHALL PROVIDE BUILDING OWNER WITH A COMPLETE OPERATING & MAINTENANCE MANUAL INCLUDING EQUIPMENT BASIC DATA, CONTROL INFORMATION, ROUTINE MAINTENANCE ACTIONS AND SERVICE AGENCIES NAME, PHONE NUMBER & ADDRESS.
- GUARANTEE ALL EQUIPMENT, MATERIALS AND INSTALLATION FREE OF DEFECTS FOR A PERIOD OF 1-YEAR AFTER RECEIVING CERTIFICATE OF OCCUPANCY. EXTENDED GUARANTEES ON EQUIPMENT SHALL BE AS PUBLISHED ON MANUFACTURE'S EXTENDED WARRANTIES.

MECHANICAL PIPING INSULATION TABLE						
SERVICE	LOCATION	MATERIAL TYPE	JACKET TYPE	PIPE SIZE	THICKNESS	REMARKS
REFRIGERATION SUCTION PIPING	BUILDING ENVELOPE	CLOSED CELL ELASTOMERIC	NONE	ALL	3/4"	SEAL ALL JOINTS & SEAMS TO PREVENT CONDENSATION
	EXTERIOR	CLOSED CELL ELASTOMERIC	NONE	ALL	1 1/2"	PROVIDE WITH WHITE UV PROTECTIVE COATING
A/C CONDENSATE PIPING	BUILDING ENVELOPE	CLOSED CELL ELASTOMERIC	NONE	ALL	3/4"	-

NOTES: ALL PIPE HANGERS AND SUPPORTS ON COLD PIPING SHALL BE OF CLEVIS TYPE ON OUTSIDE OF INSULATION TO MAINTAIN VAPOR BARRIER.

MECHANICAL DUCT INSULATION TABLE							
SERVICE	LOCATION	MATERIAL TYPE	JACKET TYPE	DUCT LINER	R-VALUE	THICKNESS	REMARKS
RIGID METAL SUPPLY DUCT	BUILDING ENVELOPE	FIBERGLASS BLANKET	FSK	1"	R-6.0	2.2"	R-VALUE BASED ON NOMINAL RATING AS INSTALLED
RIGID METAL RETURN DUCT	BUILDING ENVELOPE	FIBERGLASS BLANKET	FSK	1"	R-6.0	2.2"	R-VALUE BASED ON NOMINAL RATING AS INSTALLED
RIGID METAL OUTSIDE AIR DUCT	BUILDING ENVELOPE	FIBERGLASS BLANKET	FSK		R-6.0	2.2"	R-VALUE BASED ON NOMINAL RATING AS INSTALLED
EXHAUST DUCT	ALL	(NONE REQUIRED)					
FLEXIBLE SUPPLY DUCT	BUILDING ENVELOPE	FIBERGLASS	REINFORCED METALIZED PROTECTIVE BARRIER		R-6.0	2"	
FLEXIBLE RETURN DUCT	BUILDING ENVELOPE	FIBERGLASS	REINFORCED METALIZED PROTECTIVE BARRIER		R-6.0	2"	
ACOUSTICAL LINER (NOISE ATTENUATION)	AT EACH UNIT	FIBERGLASS DUCT LINER				1/2"	TERMINATE 10' FROM UNIT OR AFTER 1st ELBOW

HVAC LEGEND	
	RIGID RECTANGULAR DUCT
	RIGID ROUND DUCT
	FLEXIBLE DUCT
	OFFSET UP IN DIRECTION OF AIR FLOW
	OFFSET DOWN IN DIRECTION OF AIR FLOW
	90° ELBOW WITH TURNING VANES
	FLEXIBLE CONNECTION
	MANUAL VOLUME DAMPER
	MOTOR OPERATED DAMPER
	SIDEWALL GRILLE WITH 45° TAP
	BRANCH DUCT WITH 45° TAP
	SUPPLY DIFFUSER WITH ROUND NECK
	RETURN/EXHAUST GRILLE W/ROUND NECK
	INLINE DUCT FAN
	CEILING EXHAUST FAN
	WALL THERMOSTAT FOR SYSTEM NO. 3
	AIR DISTRIBUTION MARK "B", 200 CFM
	EQUIPMENT MARK (SEE SCHEDULES)
	FLOW DIRECTION ARROW
	CONDENSATE PIPING
	REFRIGERANT PIPING
ABBREVIATIONS:	
G.C.	GENERAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
E.C.	ELECTRICAL CONTRACTOR
AF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
UNO	UNLESS NOTED OTHERWISE
BOD	BOTTOM OF DUCT
TOD	TOP OF DUCT

MECHANICAL ENERGY SUMMARY	
MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT	
METHOD OF COMPLIANCE:	
ENERGY CODE	PRESCRIPTIVE <input checked="" type="checkbox"/> PERFORMANCE <input type="checkbox"/>
ASHRAE 90.1	PRESCRIPTIVE <input checked="" type="checkbox"/> PERFORMANCE <input type="checkbox"/>
THERMAL ZONE	3A
EXTERIOR DESIGN CONDITIONS	
WINTER DRY BULB	13°F
SUMMER DRY BULB	93°F
INTERIOR DESIGN CONDITIONS	
WINTER DRY BULB	74°F
SUMMER DRY BULB	75°F
RELATIVE HUMIDITY	50%
BUILDING HEATING LOAD	21 MBH / 240 MBH SHOP
BUILDING COOLING LOAD	2.9 TONS / NO COOLING
MECHANICAL CONDITIONING SYSTEM	
UNITARY	
DESCRIPTION OF UNIT	SPLIT HEAT PUMP / GAS RADIANT
HEATING EFFICIENCY	8.2 HSPF / 86%
COOLING EFFICIENCY	15 SEER / N/A
HEAT OUTPUT OF UNIT	40 MBH / 335 MBH
COOLING OUTPUT OF UNIT	3.0 TONS / N/A

HEAT PUMP (INDOOR UNIT) SCHEDULE																					
MARK	SA	CFM	DA	CFM	EXT	SP	MTR	HP	EAT	(DB/WB)	TOT	CAP	SEN	CAP	AUX. HEAT	VOLT/PH	FLA	MCA	MOCP	WEIGHT	
AH-1	1100	150	0.75"	1/2	78°/66°	35	MBH	26	MBH	7.2	KW	208/1Ø	41	51	60A	120	LBS.				

- NOTES:
- PROVIDE THE FOLLOWING OPTIONS AND ACCESSORIES:
    - SINGLE POINT WIRING CONNECTION
    - 3XV MATCHING CONDENSER CAPACITY
    - 7-DAY PROGRAMMABLE THERMOSTAT WITH LOCKOUT FUNCTION AND CLEAR LOCKING COVER
    - ECM FAN MOTORS

HEAT PUMP (OUTDOOR UNIT) SCHEDULE												
MARK	EAT	(DB)	NOM	CAP	VOLT/PH	FLA	MCA	MOCP	MIN. RATING	HSPF	WEIGHT	
HP-1	95°	3.0	TONS	208/1Ø	14	18	30A	15.0	SEER	8.2	250	LBS.

- NOTES:
- PROVIDE THE FOLLOWING OPTIONS AND ACCESSORIES:
    - 5 YEAR COMPRESSOR WARRANTY
    - COMPRESSOR ANTI SHORT CYCLE DELAY
    - CRANKCASE HEATERS
    - HIGH AND LOW PRESSURE SWITCHES
    - OUTDOOR THERMOSTAT
    - LOW AMBIENT CONTROL TO 55°

WALL FAN SCHEDULE								
MARK	TYPE	CFM	SP	MTR	HP	VOLT/PH	SONES	WEIGHT
WF-1	WALL	4000	0.25"	3/4	208/1Ø	14	105	LBS.

- NOTES:
- PROVIDE WITH:
    - DISCHARGE DAMPER (MOTOR OPERATED) WITH END SWITCH
    - WALL COLLAR (FLUSH EXTERIOR) AND WEATHER HOOD
    - DISCONNECT SWITCH
    - DIRECT DRIVE ECM MOTOR WITH REMOTE SPEED CONTROL AND CONTROL TRANSFORMER
    - AMCA CERTIFIED RATING
  - INTERLOCK WF-1 WITH LOUVER L-1 BY E.C..
  - NOISE LEVEL SHALL NOT EXCEED 25 SONES.

LOUVER SCHEDULE					
MARK	SERVICE	SIZE	CFM	FREE AREA	MATERIAL
L-1	INTAKE	80"Wx24"H	4000	8	SF MINIMUM ALUM

- NOTES:
- PROVIDE WITH BIRD SCREEN & KYNAR FINISH.
  - PROVIDE MOTOR OPERATED DAMPER (120V/1Ø) INTERLOCK WITH EF-1 CONTROL
  - 5" DEEP EXTRUDED ALUMINUM WITH DRAIN CHANNEL
  - BLADE CONSTRUCTION DESIGN FOR WIND DRIVEN RAIN APPLICATIONS.

EXHAUST FAN SCHEDULE													
MARK	TYPE	CFM	SP	MTR	HP	VOLT/PH	FLA	REF. MANF.	MODEL	SONES	WEIGHT	NOTES	
EF-1	CEILING	100	0.1"	ROW	120/1Ø	1	1	GREENHECK	SP-BT10	2.4	10	LBS.	1

- NOTES:
- INTERLOCK CEILING FANS WITH LIGHT SWITCHES BY E.C.

INFRARED HEATER SCHEDULE							
MARK	INPUT CAP.	MIN. EFF.	FUEL	LENGTH	NOTES	WEIGHT	
IH-1	65,000	86%	NAT.	20'	1,2,3	140	LBS.
IH-2	65,000	86%	NAT.	20'	1,2,3	140	LBS.
IH-3	65,000	86%	NAT.	20'	1,2,3	140	LBS.
IH-4	65,000	86%	NAT.	20'	1,2,3	140	LBS.
IH-5	65,000	86%	NAT.	20'	1,2,3	140	LBS.
IH-6	65,000	86%	NAT.	20'	1,2,3	140	LBS.

- NOTES:
- PROVIDE WITH:
    - THIRD PARTY LISTING
    - TWO STAGE FIRING WITH BURNER INSPECTION PORT
    - POLISHED ALUMINUM REFLECTORS
    - TOTALLY ENCLOSED CONTROLS - 24 VOLT WITH TRANSFORMERS
    - INDICATOR LIGHTS
    - CHAIN KITS
    - 6" COMMON ROOF TERMINATION AND TYPE "B" VENTING PER PAIR OF HEATERS
    - PROVIDE SINGLE SIDE SHIELDS AT CORD & HOSE REEL LOCATION WHERE REQUIRED
    - PROVIDE ROOF VENT CAPS AS RECOMMENDED BY HEATER MANUFACTURER
  - PROVIDE 1 YEAR BURNER AND 5 YEAR TUBE WARRANTY
  - PROVIDE WITH FLOW SWITCH AND PRE-PURGE CYCLE.

AIR DISTRIBUTION SCHEDULE										
MARK	CFM	RANGE	TYPE	FACE	NECK	PATTERN	MAT'L	FINISH	NOTES	
A	0-100		LOUVER FACE-SURFACE MOUNT	12x12	6Ø	4-WAY	STEEL	WHITE	1,2	
B	100-200		LOUVER FACE-SURFACE MOUNT	12x12	8Ø	4-WAY	STEEL	WHITE	1,2	
SR	0-1000		PERFORATED RETURN/EXHAUST-SURFACE MOUNT	12x12	SEE PLANS		STEEL	WHITE	1	
SW	100-200		SIDEWALL GRILLE	12x6	12x6		DBL DEFL	ALUM	WHITE	1,3
SWR	400-600		SIDEWALL RETURN	24x8	24x8			STEEL	WHITE	1,3

- NOTES:
- VERIFY AIR DISTRIBUTION TYPE WITH ARCHITECTURAL REFLECTED CEILING PLAN.
  - PROVIDE SUPPLY GRILLES WITH 12x12 FACE AND REMOVABLE CORE.
  - PROVIDE WITH FACE BARS PARALLEL TO SHORT DIMENSION.

DISCLOSURE OF INFORMATION  
 CONTRACTOR SHALL COMPLY AS FOLLOWS:  
 (A) THE CONTRACTOR SHALL NOT RELEASE TO ANYONE OUTSIDE THE CONTRACTOR'S ORGANIZATION ANY UNCLASSIFIED INFORMATION, REGARDLESS OF MEDIUM (E.G. FILM, TAPE, DOCUMENT), PERTAINING TO ANY PART OF THIS CONTRACT OR ANY PROGRAM RELATED TO THIS CONTRACT, UNLESS:  
 (1) THE CONTRACTING OFFICER HAS GIVEN PRIOR WRITTEN APPROVAL, OR  
 (2) THE INFORMATION IS OTHERWISE IN THE PUBLIC DOMAIN BEFORE THE DATE OF RELEASE  
 (B) REQUESTS FOR APPROVAL SHALL IDENTIFY THE SPECIFIC INFORMATION TO BE RELEASED, THE MEDIUM TO BE USED, AND THE PURPOSE FOR THE RELEASE. THE CONTRACTOR SHALL SUBMIT THIS REQUEST TO THE CONTRACTING OFFICER AT LEAST 45 DAYS BEFORE THE PROPOSED DATE FOR RELEASE.  
 (C) THE CONTRACTOR AGREES TO INCLUDE A SIMILAR REQUIREMENT IN EACH SUBCONTRACT UNDER HIS CONTRACT. SUBCONTRACTORS SHALL SUBMIT REQUESTS FOR AUTHORIZATION TO RELEASE THROUGH THE PRIME CONTRACTOR TO THE CONTRACTING OFFICER.

ALL SUPPLIES AND CONSTRUCTION MATERIAL MUST FOLLOW THE STANDARDS IDENTIFIED IN THE BUY AMERICAN ACT (41 U.S.C. Sec 10a-10d)  
 ALL CONTRACTORS MUST COMPLY WITH THE REQUIREMENTS UNDER THE DAVIS-BACON ACT (40 U.S.C.A. Sec 276a-2/6a-5)

ELECTRICAL DESIGN BY:

**EnTech ENGINEERING**  
 P.O. BOX 11527 GOLDSBORO, NC 27532 TEL: (919) 778-9064

PROJECT NO. 2115047  
 PROJECT MGR. J.D. HAM  
 DRAWN BY D. HILL  
 CHECKED BY

**M-301**

AVOLIS ENGINEERING, P.A.  
 P.O. BOX 5554  
 NEW BERN, NC 28561  
 PH. (252) 633-0068, FAX (252) 633-6507  
 DES. J. C. AVOLIS, P.E.

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND  
**MARINE CORPS BASE**  
 CAMP LEJEUNE, NORTH CAROLINA

16-0058 CONSTRUCT AUTOMOTIVE ORGANIZATION SHOP MACS-2, 'DET B'

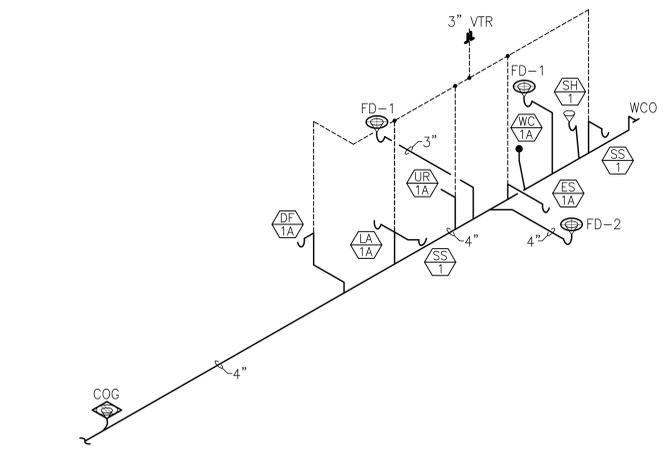
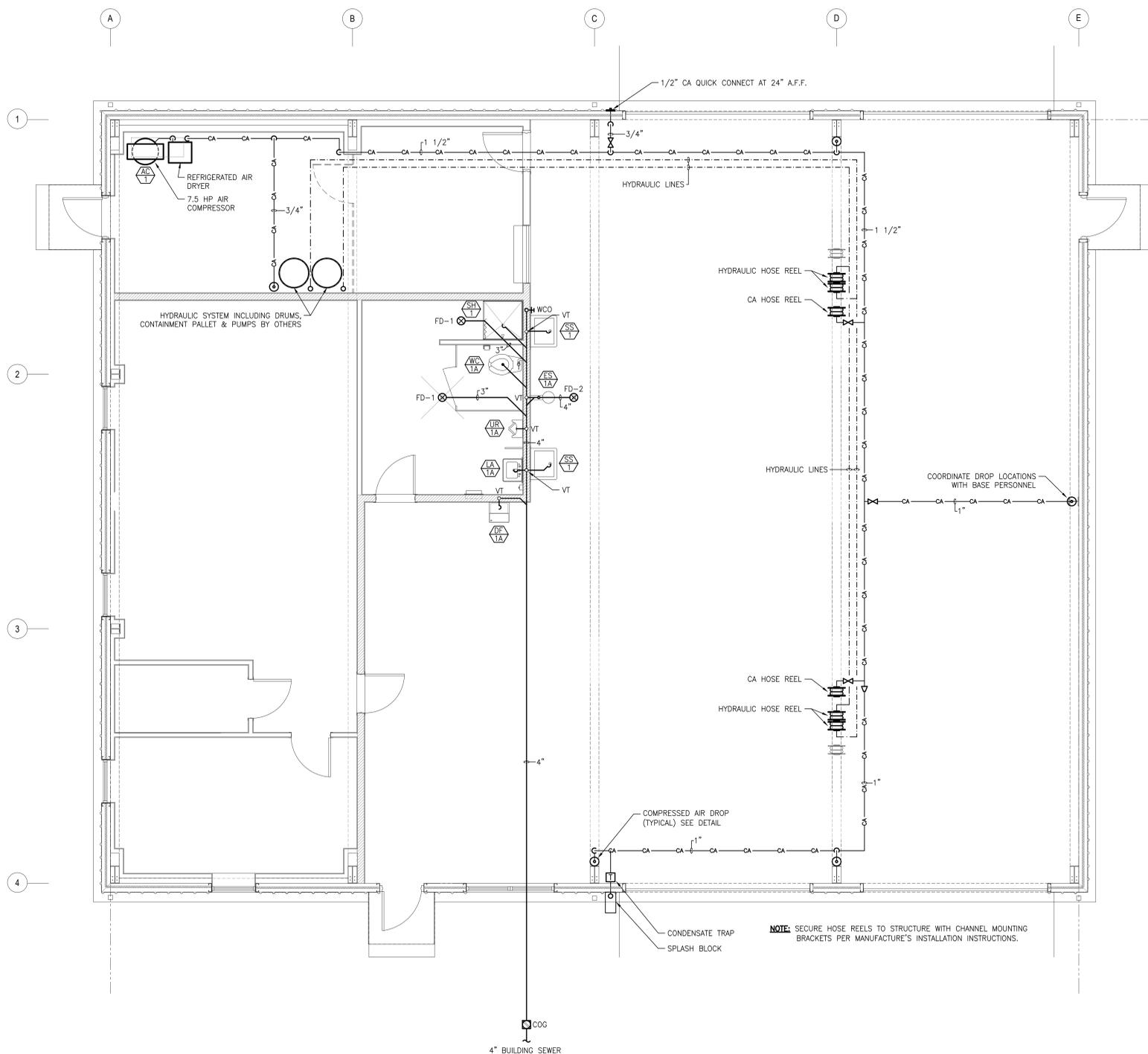
MECHANICAL SCHEDULES

APPROVED: PWO OR OICC DATE SIZE CODE IDENT. NO. NAVFAC DRAWING NO.  
 80091 60016641

SATISFACTORY TO: DATE CONSTR. CONTR. NO. N40085-16-B-0058

SCALE: NOTED SPEC. 05-16-0058 SHEET 27 OF 32

REVISIONS		
SYM	DATE	APPROVED



**B** AUTOMOTIVE SHOP PLUMBING DWV PIPING RISER  
P I P 101101 N.T.S.

**A** AUTOMOTIVE SHOP PLUMBING DWV & CA PIPING PLAN  
P I P 101101 1/4"=1'-0" NORTH

**NOTE:** SECURE HOSE REELS TO STRUCTURE WITH CHANNEL MOUNTING BRACKETS PER MANUFACTURE'S INSTALLATION INSTRUCTIONS.

ALL SUPPLIES AND CONSTRUCTION MATERIAL MUST FOLLOW THE STANDARDS IDENTIFIED IN THE BUY AMERICAN ACT (41 U.S.C. Sec10a-10d)  
ALL CONTRACTORS MUST COMPLY WITH THE REQUIREMENTS UNDER THE DAVIS-BACON ACT (40 U.S.C.A. Sec 276a-2/6a-9)

ELECTRICAL DESIGN BY:



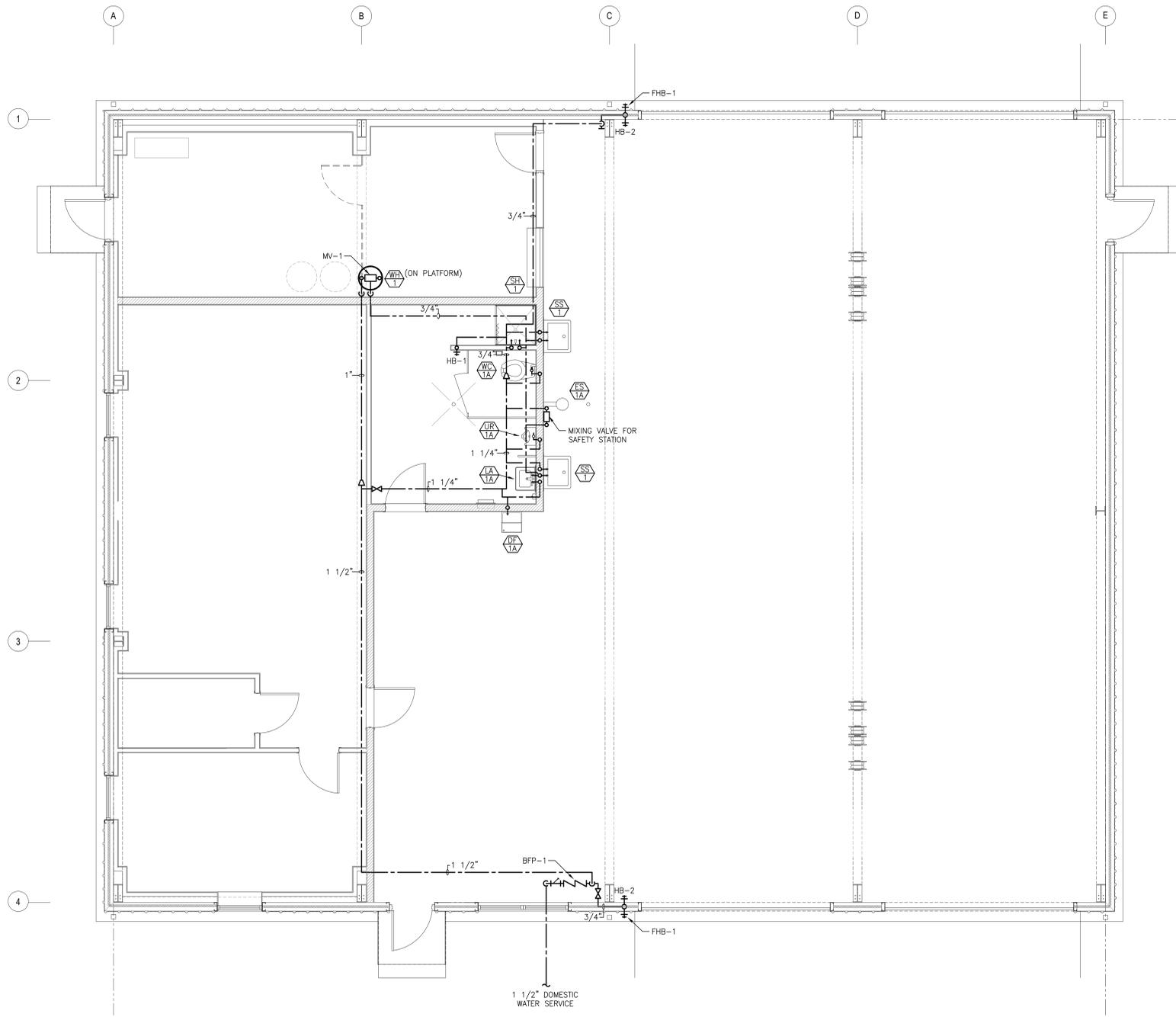
PROJECT NO. 2115047  
PROJECT MGR. J.D. HAM  
DRAWN BY D. HILL  
CHECKED BY

P.O. BOX 11527 GOLDSBORO, NC 27532 TEL: (919) 778-9064

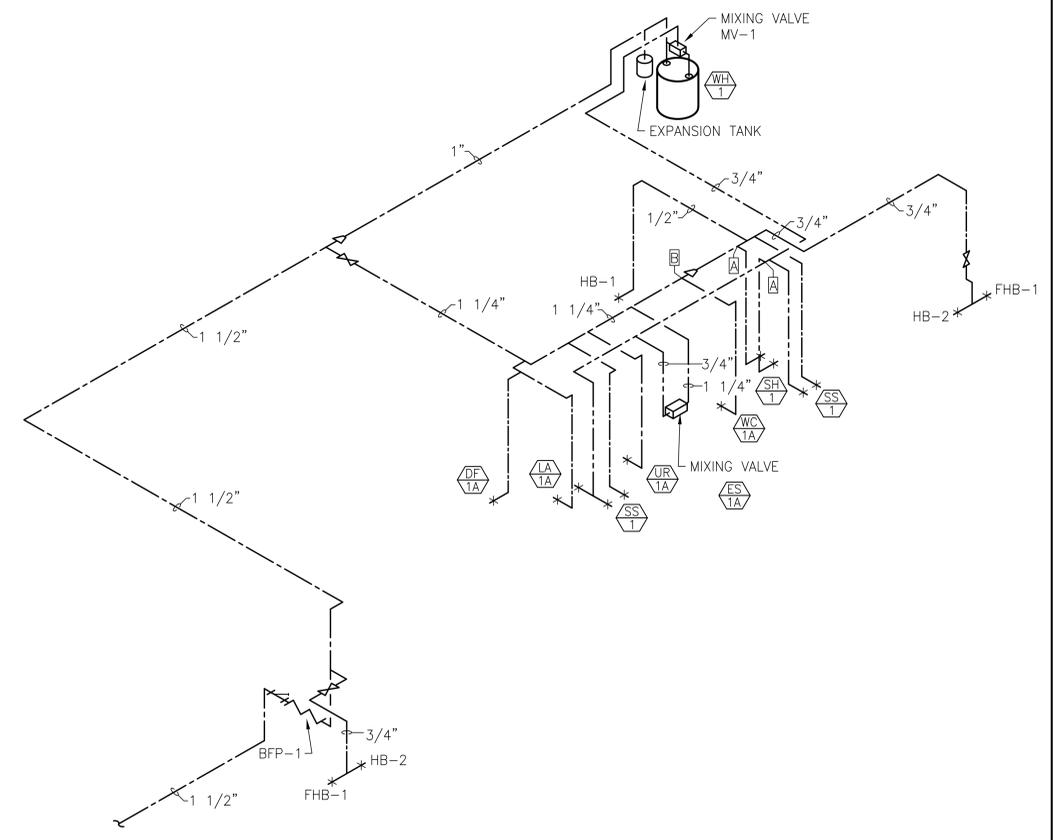
**DISCLOSURE OF INFORMATION**  
CONTRACTOR SHALL COMPLY AS FOLLOWS:  
(A) THE CONTRACTOR SHALL NOT RELEASE TO ANYONE OUTSIDE THE CONTRACTOR'S ORGANIZATION ANY UNCLASSIFIED INFORMATION, REGARDLESS OF MEDIUM (E.G. FILM, TAPE, DOCUMENT), PERTAINING TO ANY PART OF THIS CONTRACT OR ANY PROGRAM RELATED TO THIS CONTRACT, UNLESS:  
(1) THE CONTRACTING OFFICER HAS GIVEN PRIOR WRITTEN APPROVAL, OR  
(2) THE INFORMATION IS OTHERWISE IN THE PUBLIC DOMAIN BEFORE THE DATE OF RELEASE  
(B) REQUESTS FOR APPROVAL SHALL IDENTIFY THE SPECIFIC INFORMATION TO BE RELEASED, THE MEDIUM TO BE USED, AND THE PURPOSE FOR THE RELEASE. THE CONTRACTOR SHALL SUBMIT ITS REQUEST TO THE CONTRACTING OFFICER AT LEAST 45 DAYS BEFORE THE PROPOSED DATE FOR RELEASE.  
(C) THE CONTRACTOR AGREES TO INCLUDE A SIMILAR REQUIREMENT IN EACH SUBCONTRACT UNDER HIS CONTRACT. SUBCONTRACTORS SHALL SUBMIT REQUESTS FOR AUTHORIZATION TO RELEASE THROUGH THE PRIME CONTRACTOR TO THE CONTRACTING OFFICER.

<b>P-101</b> <small>AVOLIS ENGINEERING, P.A.</small> <small>P.O. BOX 15564 NEW BERN, NC 28561 PH.(252) 633-0068 FAX (252) 633-6507</small> <small>DES. J. C. AVOLIS, P.E.</small> <small>DR. J. K. AVOLIS, P.E.</small> <small>SUBMITTED BY:</small> <small>DESIGN DR. BRIAN R. MARSHBURN, P.E.</small> <small>APPROVED: PWO OR OICC</small>		<small>DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND</small> <b>MARINE CORPS BASE</b> <small>CAMP LEJEUNE, NORTH CAROLINA</small> 16-0058 CONSTRUCT AUTOMOTIVE ORGANIZATION SHOP MACS-2, "DET B" <b>PLUMBING PLANS</b> <small>NAVIFAC DRAWING NO. 60016642</small> <small>CONSTR. CONTR. NO. N40085-16-B-0058</small>	
<small>PROJECT NO. 2115047</small> <small>PROJECT MGR. J.D. HAM</small> <small>DRAWN BY D. HILL</small> <small>CHECKED BY</small>	<small>DATE</small> <small>DATE</small>	<small>SIZE</small> <b>F</b>	<small>CODE IDENT. NO.</small> <b>80091</b> <small>SCALE: NOTED</small>
<small>SATISFACTORY TO:</small>	<small>DATE</small>	<small>SPEC. 05-16-0058</small>	<small>SHEET 28 OF 32</small>

REVISIONS		
SYM	DATE	APPROVED



**A** AUTOMOTIVE SHOP PLUMBING WATER PIPING PLAN  
 1/4"=1'-0"  
 NORTH



**B** AUTOMOTIVE SHOP PLUMBING WATER PIPING RISER  
 N.T.S.

ALL SUPPLIES AND CONSTRUCTION MATERIAL MUST FOLLOW THE STANDARDS IDENTIFIED IN THE BUY AMERICAN ACT (41 U.S.C. Sec 101a-10d)  
 ALL CONTRACTORS MUST COMPLY WITH THE REQUIREMENTS UNDER THE DAVIS-BACON ACT (40 U.S.C.A. Sec 276a-2/6a-9)

ELECTRICAL DESIGN BY:



PROJECT NO. 2119047  
 PROJECT MGR. J.D. HAM  
 DRAWN BY D. HILL  
 CHECKED BY

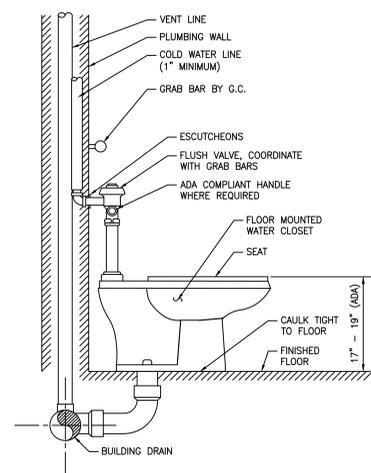
P.O. BOX 11527 GOLDSBORO, NC 27532 TEL: (919) 778-9064

DISCLOSURE OF INFORMATION  
 CONTRACTOR SHALL COMPLY AS FOLLOWS:  
 (A) THE CONTRACTOR SHALL NOT RELEASE TO ANYONE OUTSIDE THE CONTRACTOR'S ORGANIZATION ANY UNCLASSIFIED INFORMATION, REGARDLESS OF MEDIUM (E.G. FILM, TAPE, DOCUMENT), PERTAINING TO ANY PART OF THIS CONTRACT OR ANY PROGRAM RELATED TO THIS CONTRACT, UNLESS:  
 (1) THE CONTRACTING OFFICER HAS GIVEN PRIOR WRITTEN APPROVAL, OR  
 (2) THE INFORMATION IS OTHERWISE IN THE PUBLIC DOMAIN BEFORE THE DATE OF RELEASE  
 (B) REQUESTS FOR APPROVAL SHALL IDENTIFY THE SPECIFIC INFORMATION TO BE RELEASED, THE MEDIUM TO BE USED, AND THE PURPOSE FOR THE RELEASE. THE CONTRACTOR SHALL SUBMIT THIS REQUEST TO THE CONTRACTING OFFICER AT LEAST 45 DAYS BEFORE THE PROPOSED DATE FOR RELEASE.  
 (C) THE CONTRACTOR AGREES TO INCLUDE A SIMILAR REQUIREMENT IN EACH SUBCONTRACT UNDER HIS CONTRACT. SUBCONTRACTORS SHALL SUBMIT REQUESTS FOR AUTHORIZATION TO RELEASE THROUGH THE PRIME CONTRACTOR TO THE CONTRACTING OFFICER.

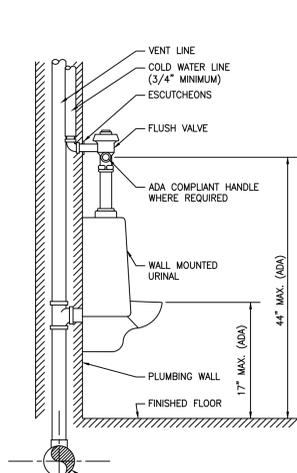
AVOLIS ENGINEERING, P.A. P.O. BOX 15564 NEW BERN, NC 28561 PH. (252) 633-0068, FAX (252) 633-6507 DES. J. C. AVOLIS, P.E. DR. J. K. AVOLIS, P.E. SUBMITTED BY: DESIGN DR. BRIAN R. MARSHBURN, P.E. APPROVED: PWO OR OICC DATE SATISFACTORY TO: DATE		DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND <b>MARINE CORPS BASE</b> CAMP LEJEUNE, NORTH CAROLINA 16-0058 CONSTRUCT AUTOMOTIVE ORGANIZATION SHOP MACS-2, "DET B" PLUMBING PLANS NAVFAC DRAWING NO. 60016643 CONSTR. CONTR. NO. N40085-16-B-0058	
PROJECT NO. 2119047 PROJECT MGR. J.D. HAM DRAWN BY D. HILL CHECKED BY		SCALE: NOTED SPEC. 05-16-0058	SHEET 29 OF 32

P-102

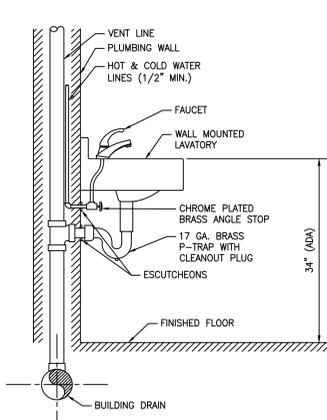
REVISIONS		
SYM	DATE	APPROVED



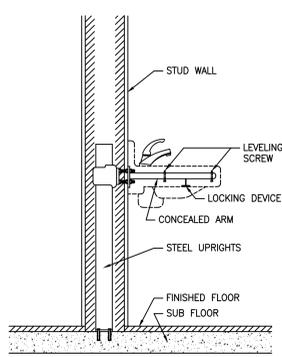
**A WATER CLOSET DETAIL**  
N.T.S.



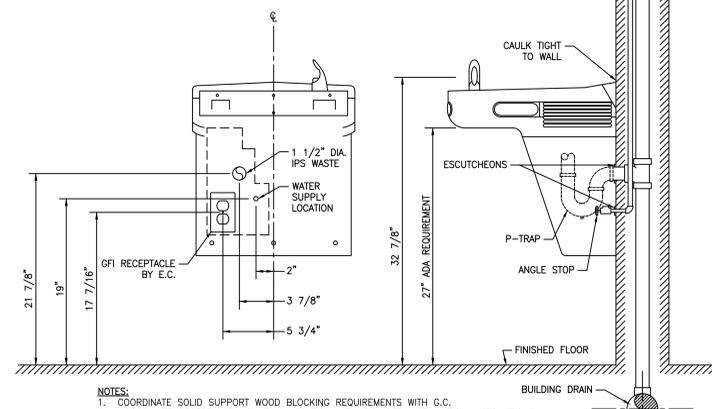
**B WALL MOUNTED URINAL DETAIL**  
N.T.S.



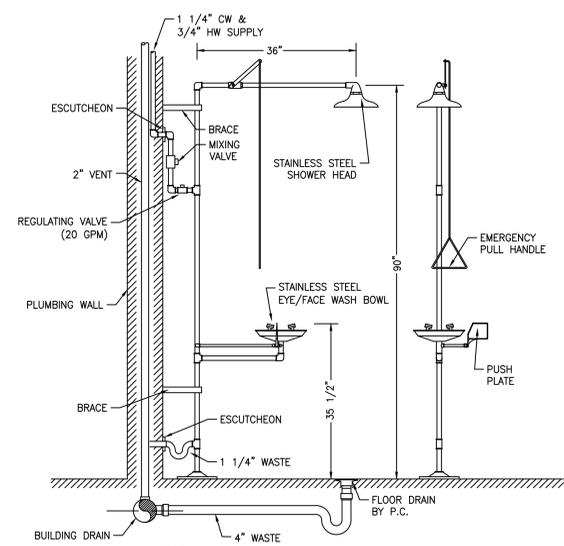
**C WALL MOUNTED LAVATORY DETAIL**  
N.T.S.



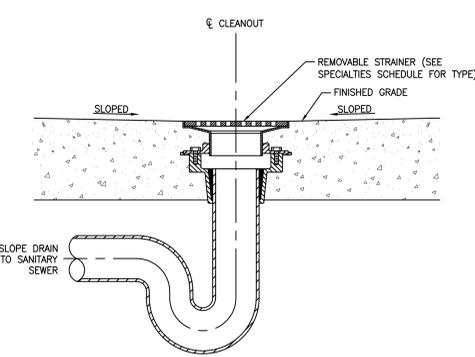
**D LAVATORY SUPPORT DETAIL**  
N.T.S.



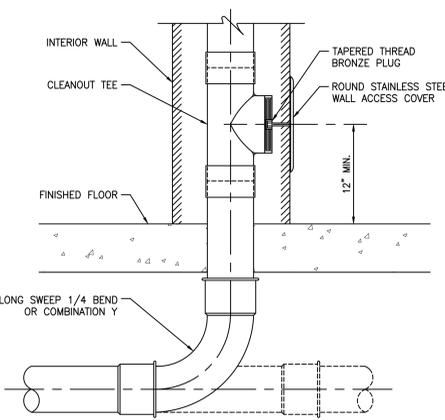
**E WALL MOUNTED ELECTRIC WATER COOLER DETAIL**  
N.T.S.



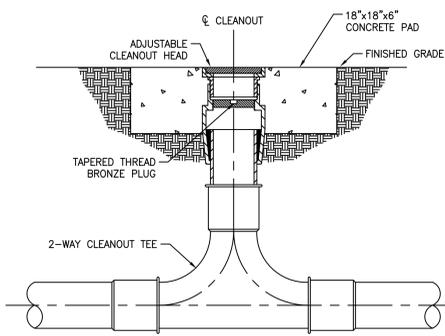
**F EMERGENCY SHOWER & EYE WASH DETAIL**  
N.T.S.



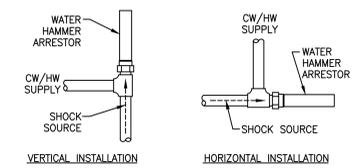
**G FLOOR DRAIN DETAIL**  
N.T.S.



**H WALL CLEANOUT DETAIL**  
N.T.S.



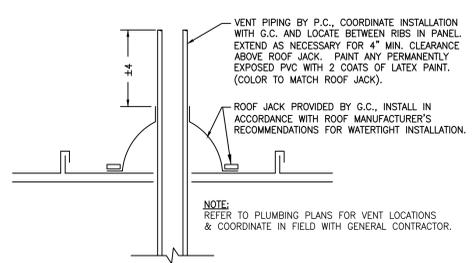
**I CLEANOUT ON GRADE DETAIL**  
N.T.S.



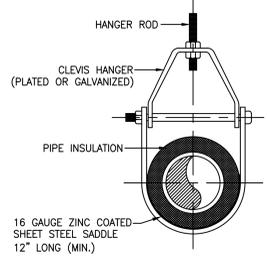
WATER HAMMER SIZING TABLE		
SIZE	FIXTURE UNITS	*PDI UNITS
1/2"	1-11	A
3/4"	12-32	B
1"	33-60	C
1 1/4"	61-113	D
1 1/2"	114-154	E
2"	155-330	F

*PLUMBING & DRAINAGE INSTITUTE STANDARD PDI-WH201.  
NOTE: SEE PLANS FOR LOCATIONS OF WATER HAMMER ARRESTORS.

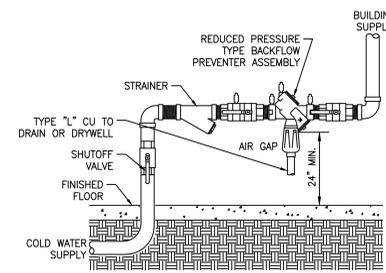
**J WATER HAMMER ARRESTOR DETAIL**  
N.T.S.



**K VENT DETAIL**  
N.T.S.



**L PIPE HANGER DETAIL**  
N.T.S.



**M BACKFLOW PREVENTER DETAIL**  
N.T.S.

ALL SUPPLIES AND CONSTRUCTION MATERIAL MUST FOLLOW THE STANDARDS IDENTIFIED IN THE BUY AMERICAN ACT (41 U.S.C. Sec10a-10d)  
ALL CONTRACTORS MUST COMPLY WITH THE REQUIREMENTS UNDER THE DAVIS-BACON ACT (40 U.S.C.A. Sec 276a-2/6a-5)

ELECTRICAL DESIGN BY:

**EnTech ENGINEERING**  
P.O. BOX 11527 GOLDSBORO, NC 27532 TEL: (919) 778-9064

PROJECT NO. 211904-7  
PROJECT MGR. J.D. HAM  
DRAWN BY D. HILL  
CHECKED BY

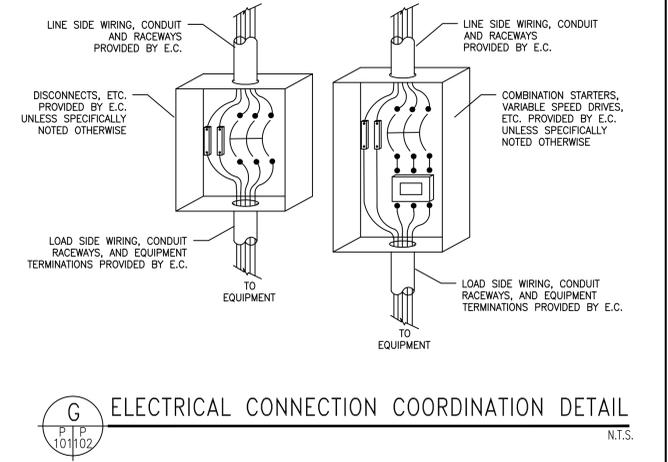
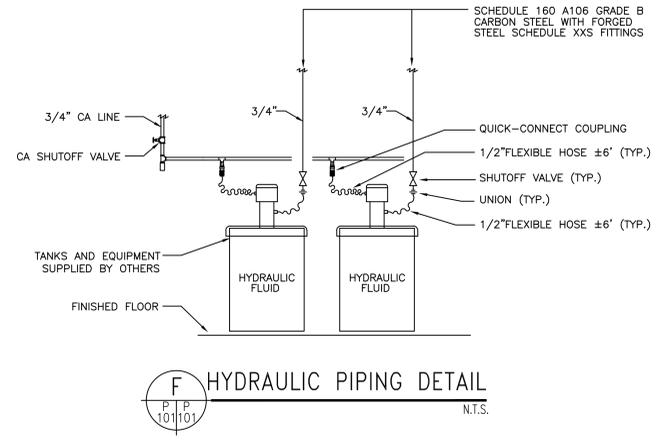
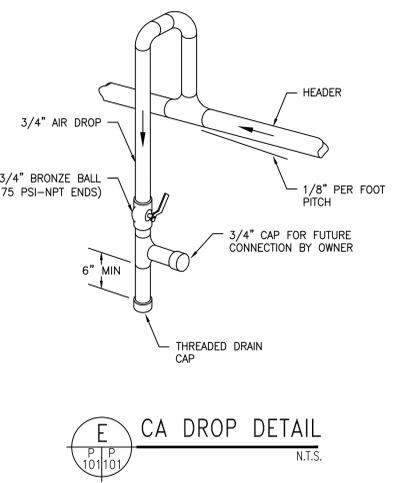
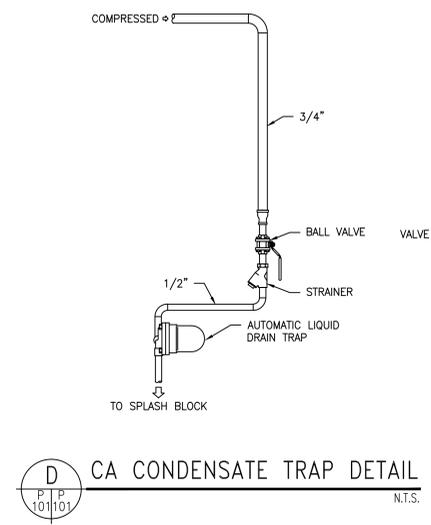
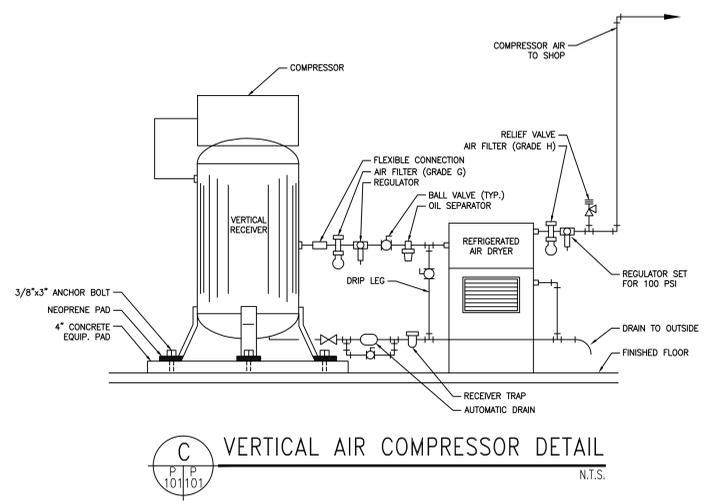
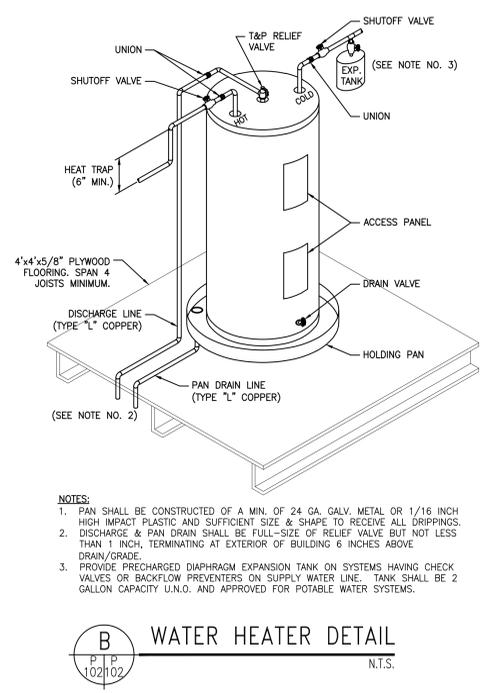
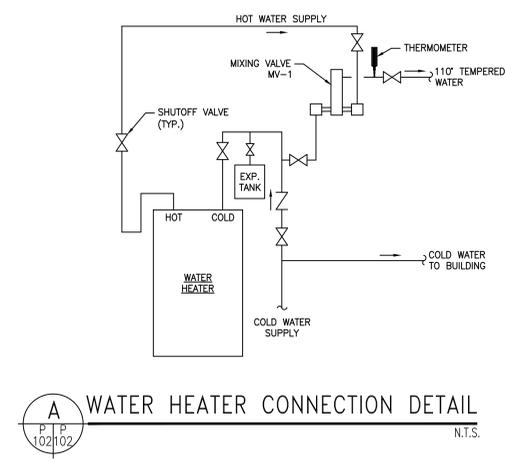
**P-201**

AVOLIS ENGINEERING, P.A.  
P.O. BOX 15564  
NEW BERN, NC 28561  
PH.(252) 633-0068, FAX (252) 633-6507  
DES. J. C. AVOLIS, P.E.  
DR.  
CHK. J. K. AVOLIS, P.E.  
SUBMITTED BY:  
DESIGN DR. BRIAN R. MARSHBURN, P.E.  
APPROVED: PWO OR OICC DATE SIZE CODE IDENT. NO. NAVFAC DRAWING NO.  
**F 80091** 60016644  
SATISFACTORY TO: DATE DATE CONSTR. CONTR. NO. N40085-16-B-0058

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND  
**MARINE CORPS BASE**  
CAMP LEJUNE, NORTH CAROLINA  
16-0058 CONSTRUCT AUTOMOTIVE ORGANIZATION SHOP MACS-2, "DET B"  
PLUMBING DETAILS

SCALE: NOTED SPEC. 05-16-0058 SHEET 30 OF 32

REVISIONS		
SYM	DATE	APPROVED



DISCLOSURE OF INFORMATION  
CONTRACTOR SHALL COMPLY AS FOLLOWS:  
(A) THE CONTRACTOR SHALL NOT RELEASE TO ANYONE OUTSIDE THE CONTRACTOR'S ORGANIZATION ANY UNCLASSIFIED INFORMATION, REGARDLESS OF MEDIUM (E.G. FILM, TAPE, DOCUMENT), PERTAINING TO ANY PART OF THIS CONTRACT OR ANY PROGRAM RELATED TO THIS CONTRACT, UNLESS:  
(1) THE CONTRACTING OFFICER HAS GIVEN PRIOR WRITTEN APPROVAL, OR  
(2) THE INFORMATION IS OTHERWISE IN THE PUBLIC DOMAIN BEFORE THE DATE OF RELEASE  
(B) REQUESTS FOR APPROVAL SHALL IDENTIFY THE SPECIFIC INFORMATION TO BE RELEASED, THE MEDIUM TO BE USED, AND THE PURPOSE FOR THE RELEASE. THE CONTRACTOR SHALL SUBMIT THIS REQUEST TO THE CONTRACTING OFFICER AT LEAST 45 DAYS BEFORE THE PROPOSED DATE FOR RELEASE.  
(C) THE CONTRACTOR AGREES TO INCLUDE A SIMILAR REQUIREMENT IN EACH SUBCONTRACT UNDER HIS CONTRACT. SUBCONTRACTORS SHALL SUBMIT REQUESTS FOR AUTHORIZATION TO RELEASE THROUGH THE PRIME CONTRACTOR TO THE CONTRACTING OFFICER.

ALL SUPPLIES AND CONSTRUCTION MATERIAL MUST FOLLOW THE STANDARDS IDENTIFIED IN THE BUY AMERICAN ACT (41 U.S.C. Sec 101a-10d)  
ALL CONTRACTORS MUST COMPLY WITH THE REQUIREMENTS UNDER THE DAVIS-BACON ACT (40 U.S.C.A. Sec 276a-2/6a-5)

ELECTRICAL DESIGN BY:

PROJECT NO. 2119047  
PROJECT MGR. J.D. HAM  
DRAWN BY D. HILL  
CHECKED BY

**P-202**

AVOLIS ENGINEERING, P.A.  
P.O. BOX 15564  
NEW BERN, NC 28561  
PH. (252) 633-0068, FAX (252) 633-6507

DEPT. OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND  
**MARINE CORPS BASE**  
CAMP LEJEUNE, NORTH CAROLINA

DES. J. C. AVOLIS, P.E.  
CHK. J. K. AVOLIS, P.E.  
SUBMITTED BY:  
DESIGN DIR. BRIAN R. MARSHBURN, P.E.

16-0058 CONSTRUCT AUTOMOTIVE ORGANIZATION SHOP MACS-2, "DET B"

PLUMBING DETAILS

APPROVED: PWO OR OICC DATE SIZE CODE IDENT. NO. NAVFAC DRAWING NO.  
80091 60016645

SATISFACTORY TO: DATE SPEC. 05-16-0058 SHEET 31 OF 32

REVISIONS		
SYM	DATE	APPROVED

PLUMBING LEGEND		
SYMBOL	ABBR	DESCRIPTION
---	CW	COLD WATER LINE
---	HW	HOT WATER LINE
---	W	SOIL OR WASTE LINE
---	VT	VENT LINE
---	VTR	VENT THRU ROOF
---	WCO	WALL CLEANOUT
---	FCO	FLOOR CLEANOUT
---	COG	CLEANOUT ON GRADE
---	FD	ROUND FLOOR DRAIN
---	HB	HOSE BIBB/HYDRANT
---	FHB	FROSTPROOF HOSE BIBB/HYDRANT
---	WA	WATER ARRESTOR (PDI SIZE "A")
---	CA	COMPRESSED AIR PIPING
---	---	COMPRESSED AIR DROP
---	---	COMPRESSED AIR CONDENSATE TRAP
---	---	HYDRAULIC LINE
---	---	HOSE REEL
---	---	CHECK VALVE
---	---	SHUTOFF VALVE
---	BFP	BACKFLOW PREVENTER
---	RV	PRESSURE RELIEF VALVE
---	STR	STRAINER
---	---	UNION
---	---	THERMOMETER
---	PG	PRESSURE GAUGE WITH COCK
---	---	CONCENTRIC REDUCER
---	---	FLOW DIRECTION ARROW
---	---	FIXTURE MARK (SEE SCHEDULE)
---	G.C.	GENERAL CONTRACTOR
---	P.C.	PLUMBING CONTRACTOR
---	M.C.	MECHANICAL CONTRACTOR
---	E.C.	ELECTRICAL CONTRACTOR
---	AFT	ABOVE FINISHED FLOOR
---	AFG	ABOVE FINISHED GRADE
---	BFG	BELOW FINISHED GRADE

**PLUMBING NOTES:**

- PLUMBING PLANS ARE INTENDED TO PROVIDE INFORMATION FOR INSTALLATION OF A COMPLETE PLUMBING SYSTEM. PROVIDE ALL ESSENTIAL LABOR, MATERIALS & DEVICES REQUIRED TO PRODUCE A QUALITY END PRODUCT.
- CONTRACTOR SHALL REVIEW & BECOME FAMILIAR WITH THE WORK OF ALL TRADES FOR PURPOSES OF COORDINATION AND ROUTING. CONTRACTOR SHALL PROVIDE REQUIRED PLANNING, COORDINATION AND SEQUENCING OF PLUMBING INSTALLATION WITH BUILDING COMPONENTS AND OTHER TRADES.
- COORDINATE CONNECTION OF PLUMBING SYSTEMS WITH SITE UTILITIES AND SERVICES. P.C. SHALL EXTEND WATER SUPPLY LINE 5-FEET OUTSIDE OF BUILDING AND EXTEND BUILDING DRAIN 10-FEET OUTSIDE OF BUILDING & PROVIDE 2-WAY CLEANOUT.
- COORDINATE VENT THRU ROOF (VTR) LOCATIONS WITH OUTSIDE AIR INTAKES OF HVAC UNITS TO MAINTAIN A MINIMUM CLEARANCE OF 20 FEET.
- CONTRACTOR SHALL COORDINATE LOCATION & TYPE OF VTR BOOTHS WITH G.C.. CONTRACTOR SHALL FURNISH & INSTALL THE REQUIRED BOOTHS. G.C. SHALL ENGAGE ROOFING CONTRACTOR TO ASSURE WEATHER-TIGHTNESS OF INSTALLATION. ANY EXPOSED PVC PIPING SHALL BE PAINTED WITH 2-COATS OF ENAMEL PAINT - COLOR SELECTED BY ARCHITECT.
- COORDINATE INSTALLATION OF PLUMBING LINES WITH WALLS SO THAT ALL LINES ARE PLACED WITHIN WALLS DURING WALL CONSTRUCTION. CUTTING AND PATCHING OF WALLS IN PLACE IS NOT PERMITTED.
- ALL WORK SHALL COMPLY WITH LOCAL, STATE & ADA CODES. WORKMANSHIP SHALL MEET OR EXCEED INDUSTRY STANDARDS.
- PROTECT ALL NEW MATERIALS FROM THE WEATHER IN STORAGE TRAILERS OR PROVIDE SUITABLE COVERING.
- DRAIN, WASTE & VENT (DWV) PIPING SHALL BE ASTM D 2665, SOLID-WALL, SCHEDULE 40 PVC WITH SOLVENT-WELDED SOCKET TYPE FITTINGS (FOAM CORE PIPING IS NOT ACCEPTABLE).
- ABOVE GRADE/SLAB WATER PIPING SHALL BE ASTM B 88, HARD DRAWN, TYPE L COPPER WITH SOLDERED OR BRAZED WROUGHT-COPPER FITTINGS.
- BELOW GRADE/SLAB WATER PIPING (INSIDE OF BUILDING) SHALL BE ASTM B 88, SOFT ANNEALED, TYPE K COPPER WITH SOLDERED OR BRAZED WROUGHT-COPPER FITTINGS. MINIMIZE JOINTS BELOW SLAB.
- DOMESTIC WATER SERVICE PIPING: (SEE SITE PLANS).
- WATER PIPE & FITTINGS AND LEAD FREE SOLDER & FLUX SHALL BE IN ACCORDANCE WITH NC PLUMBING CODE SECTION 605.
- INDIVIDUAL SUPPLY AND DRAIN CONNECTIONS SIZES ARE NOT INDICATED ON PLANS FOR CLARITY. SIZE EACH TO SUIT RESPECTIVE FIXTURE.
- WATER PIPING ON OUTSIDE WALLS AND IN CEILING SHALL BE LOCATED BETWEEN BUILDING INSULATION AND CONDITIONED SPACE.
- PROVIDE SHUTOFF VALVES AT EACH MAIN BRANCH LINE. VALVES SHALL BE INSTALLED IN A READILY ACCESSIBLE LOCATION. PROVIDE CEILING ACCESS DOORS WHERE REQUIRED TO ACCESS SERVICEABLE VALVES LOCATED ABOVE CYPBOARD CEILINGS.
- UNLESS NOTED OTHERWISE ALL VALVES SHALL BE FULL PORT BRONZE OR BRASS BALL VALVES WITH THREADED OR SWEAT CONNECTIONS AS APPLICABLE TO THE CONNECTING PIPING.
- PROTECT COPPER PIPING FROM DIRECT CONTACT WITH MASONRY OR DISSIMILAR METAL.
- HANGERS, SUPPORTS, ANCHORS AND CLIPS SHALL BE COPPER PLATED OR PROVIDED WITH ELECTROLYTIC ISOLATION MATERIAL ON COPPER PIPING. ALL OTHER HANGERS AND SUPPORTS SHALL BE PAINTED OR GALVANIZED.
- PIPING PASSING THROUGH CONCRETE/MASONRY WALLS OR FLOORS SHALL BE PROTECTED AGAINST EXTERNAL CORROSION BY PROTECTIVE SHEATHING OR WRAPPING.
- INSTALL SCHEDULE 40 GALVANIZED PIPE OR DUCTILE IRON PIPE SLEEVE TWO SIZES LARGER AT PENETRATIONS THROUGH FOUNDATION WALLS. SEAL SLEEVE TIGHT TO FOUNDATION WALL.
- PROVIDE MECHANICAL WATER HAMMER ARRESTORS AS SHOWN ON PLANS OR WATER RISER.
- PROVIDE INSULATION EQUAL TO MCGUIRE PROWRAP ON P-TRAP ASSEMBLIES AND HOT & COLD WATER PIPING FOR LAVATORIES WITH EXPOSED PIPING.
- VERIFY FINAL LOCATIONS FOR ROUGH-INS WITH FIELD MEASUREMENTS AND WITH THE REQUIREMENTS OF THE ACTUAL EQUIPMENT TO BE CONNECTED.
- INSTALL PLUMBING FIXTURES AND EQUIPMENT LEVEL & PLUMB. ROUTE PIPING PARALLEL & PERPENDICULAR TO OTHER BUILDING SYSTEMS AND COMPONENTS.
- INSTALL EQUIPMENT TO FACILITATE SERVICING, MAINTENANCE & REPAIR IN ACCORDANCE WITH MFG'S WRITTEN INSTALLATION INSTRUCTIONS AS WELL AS SPECIFIC INSTRUCTIONS ON PLANS.
- ALL FIXTURES & EXPOSED SURFACES SHALL BE WASHED & CLEANED AND PAINTED SURFACES SHALL BE TOUCHED UP TO MATCH FACTORY APPLIED FINISHES.
- DWV AND WATER DISTRIBUTION PIPING SHALL BE TESTED IN ACCORDANCE WITH NC PLUMBING CODE SECTION 312.
- POTABLE WATER PIPING SHALL BE PURGED AND DISINFECTED. FLUSH SYSTEM WITH CLEAN, POTABLE WATER. ISOLATE AND FILL SYSTEM WITH WATER/CHLORINE SOLUTION WITH AT LEAST 200 PPM OF CHLORINE. ALLOW TO STAND FOR THREE HOURS. FLUSH SYSTEM WITH CLEAN, POTABLE WATER UNTIL CHLORINE SOLUTION IS REMOVED. SUBMIT WATER SAMPLE REPORT TO AUTHORITY HAVING JURISDICTION.
- GUARANTEE ALL EQUIPMENT, MATERIALS AND INSTALLATION FREE OF DEFECTS FOR A PERIOD OF 1-YEAR AFTER RECEIVING CERTIFICATE OF OCCUPANCY.

**AIR COMPRESSOR AND DRYER SPECIFICATION:**

- AIR COMPRESSOR SHALL MEET ALL OSHA, CAGI, ASME STANDARDS AND COMPONENTS WILL INCLUDE:
  - MOUNTED AND WIRED NEMA 1 MAGNETIC STARTER
  - VIBRATION ISOLATION
  - LOW OIL MONITOR
  - AUTO CONDENSATE DRAIN
  - AIR COOLED AFTERCOOLER
  - 5 YEAR COMPRESSOR WARRANTY
  - COMPRESSOR SHIPPED WITH LUBRICANT (NO "STARTUP KIT" REQUIRED)
- REFRIGERATED COMPRESSED AIR DRYER SHALL BE BUILT TO ISO 8573.1 AIR QUALITY STANDARDS AND CLASS RATINGS. IN ADDITION DRYER SHALL INCLUDE:
  - INTEGRAL FILTER
  - 3-VALVE BY-PASS
  - 2 YEAR WARRANTY (5 YEARS ON HEAT EXCHANGER)
- COMPRESSED AIR PIPING SHALL BE ASTM A 53 HOT-DIP ZINC COATED SCHEDULE 40 STEEL PIPE WITH ROLL GROOVING CONFORMING TO GRUWLOCK STANDARDS. GROOVED FITTINGS SHALL BE ASTM A 153 HOT-DIP GALVANIZED. 2 1/2-INCH AND SMALLER PIPING MAY BE THREADED AND HAVE MALLEABLE-IRON FITTINGS. LABEL ALL ABOVE GROUND PIPING.
- HOSE REELS SHALL BE HEAVY DUTY SPRING RETRACTABLE TYPE FORMED FROM HIGH-GRADE STEEL. REELS SHALL INCLUDE 50-FT OF 1/2" PVC HOSE. PROVIDE MOUNTING BRACKETS FOR CONNECTION TO BUILDING STEEL.

**LUBRICATION EQUIPMENT SPECIFICATIONS:**

- HYDRAULIC LINES: SUPPLY LINES ARE TO BE SCHEDULE 160 A106 GRADE B WITH FORGED STEEL FITTING. CONNECTIONS ARE TO BE "PINCH" TYPE COMPRESSION FITTINGS. EACH SUPPLY SHALL ORIGINATE AND TERMINATE WITH CARBON STEEL SERVICE VALVE. VALVES SHALL BE FULL PORT BALL FOR FLUID LUBRICANTS AND NEEDLE TYPE FOR GREASE. TUBING SHALL BE SUPPORTED AT 10' INTERVALS.
- HOSE REELS SHALL BE HEAVY DUTY SPRING RETRACTABLE TYPE FORMED FROM HIGH-GRADE STEEL FOR HYDRAULIC SERVICE. INCLUDE 50-FT OF 1/2" HOSE RATED AT 2000 PSI. PROVIDE MOUNTING BRACKETS FOR CONNECTION TO BUILDING STEEL.

PLUMBING PIPING INSULATION TABLE						
SERVICE	LOCATION	MATERIAL TYPE	JACKET TYPE	PIPE SIZE	THICKNESS	REMARKS
DOMESTIC WATER	BUILDING ENVELOPE	PREFORMED GLASS FIBER	ASJ	COLD 1/2" OR LESS COLD 3/4" - 1 1/2" HOT 1/2" OR LESS HOT 3/4"	1/2" 1"	-
	UNCONDITIONED SPACE	PREFORMED GLASS FIBER	ASJ	ALL	1 1/2"	R-VALUE: 6.5 MINIMUM

- NOTES:**
- ALL PIPE HANGERS AND SUPPORTS ON COLD PIPING SHALL BE OF CLEVIS TYPE ON OUTSIDE OF INSULATION TO MAINTAIN VAPOR BARRIER.

PLUMBING FIXTURE SCHEDULE						
FIX. NO.	DESCRIPTION	CW	HW	DRAIN	FAUCETS, VALVES & ACCESSORIES	NOTES
WC-1A	WATER CLOSET FLUSH VALVE TYPE, FLOOR MOUNTED, ELONGATED LOW-CONSUMPTION (1.28 GPF) FULLY GLAZED 2" MIN. BALL PASS TRAPWAY MEETS ASME A112.19.2M & 19.6M ADA (+/-17" RIM HEIGHT)		1"	3"	FIXTURE: SEE SPECIFICATIONS MANUAL FLUSH VALVE: SEE SPECIFICATIONS SEAT: SEE SPECIFICATIONS (OPEN FRONT LESS COVER) MATERIAL: VITREOUS CHINA COLOR: WHITE	FLUSH HANDLE SHALL BE ON RIGHT HAND OR LEFT HAND AS REQUIRED TO MEET ADA (SEE DETAIL)
UR-1A	URINAL FLUSH VALVE TYPE, WALL MOUNTED, WASHOUT ULTRA LOW-CONSUMPTION (0.5 GPF) MEETS ASME A112.19.2M & 19.6M ADA & NON-ADA APPLICATIONS	3/4"		1 1/2"	FIXTURE: SEE SPECIFICATIONS MANUAL FLUSH VALVE: SEE SPECIFICATIONS MATERIAL: VITREOUS CHINA COLOR: WHITE	REFER TO ARCHITECTURAL DWGS FOR SPECIFIC MOUNTING HEIGHTS
LA-1A	WALL HUNG LAVATORY 21"x18" WITH BACK SPLASH SHIELDS MEETS ASME A112.19.2M ADA COMPLIANT	3/8"	3/8"	1 1/4"	FIXTURE: SEE SPECIFICATIONS FAUCET: SEE SPECIFICATIONS STRAINER: SEE SPECIFICATIONS CARRIER: SEE SPECIFICATIONS MATERIAL: ENAMELED CAST IRON COLOR: WHITE	REFER TO DETAIL DWGS FOR SPECIFIC MOUNTING HEIGHTS
DF-1A	ELECTRIC WATER COOLER SINGLE LEVEL WALL MOUNT WITH STAINLESS STEEL CABINET ADA COMPLIANT	3/8"		1 1/4"	FIXTURE: SEE SPECIFICATIONS BUBBLER: FLEXI-GUARD ANTI-MICROBIAL SAFETY TYPE CABINET FINISH: STAINLESS STEEL OPTION ELECTRICAL: 4 AMPS @ 120V/1PH	
SS-1	SERVICE SINK 27"x27"x16" DEEP 14 GA 304 STAINLESS STEEL	1/2"	1/2"	1 1/2"	FIXTURE: SEE SPECIFICATIONS FAUCET: SEE SPECIFICATIONS STRAINER: SEE SPECIFICATIONS	
SH-1	SHOWER APPROX. 36"x36" ONE-PIECE ACRYLIC	1/2"	1/2"	2"	FIXTURE: SEE SPECIFICATIONS VALVE & TRIM: SEE SPECIFICATIONS PROVIDE WITH BRASS DRAIN, SOAP DISH & CURTAIN ROD	SEE PLANS TO DETERMINE RH OR LH CONFIGURATION
ES-1A	EMERGENCY SAFETY STATION FLOOR MOUNTED WITH STAINLESS STEEL SHOWER HEAD & BOWL MEETS ANSI Z358.1 ADA COMPLIANT	1/2"		1 1/2"	FIXTURE: SEE SPECIFICATIONS PROVIDE WITH ANSI-COMPLIANT IDENTIFICATION SIGN PROVIDE WITH TEMPERING UNIT	

PLUMBING SPECIALTIES SCHEDULE		
MARK	DESCRIPTION	NOTES
WCO	WALL CLEANOUT WITH BRONZE PLUG & S.S. COVER	SEE PLANS FOR SIZES
WAH	WATER HAMMER ARRESTOR	
FD-1	3" AREA FLOOR DRAIN	
FD-2	4" AREA FLOOR DRAIN	
MV-1	THERMOSTATIC MIXING VALVE (SETPOINT: 110°F)	8.0 GPM @ 20 PSI PRESSURE DROP
EXP	WATER HEATER EXPANSION TANK	
BFP-1	BACKFLOW PREVENTER (RPZ) - DOMESTIC WATER	PROVIDE WITH METAL HANDLE
FHB-1	FROSTFREEZE WALL FAUCET WITH BACKFLOW PROTECTION	PROVIDE WITH TEE KEY
HB-1	WALL FAUCET WITH ANTI-SIPHON PROTECTION	PROVIDE WITH TEE KEY
HB-2	WALL FAUCET WITH BACKFLOW PROTECTION	PROVIDE WITH METAL HANDLE OPTION

ELECTRIC WATER HEATER SCHEDULE										
MARK	SIZE	GPH	TEMP. RISE	KW	IRONT/PH	FLA	CW CONN.	HW CONN.	OPERATING WEIGHT	SIZE HTxDIA
WH-1	150-GAL	31.0	80°F	6.0	1208V/1P	29.0	3/4"	3/4"	550 LBS	55"x21"

**NOTES:**

- SET OUTLET WATER TEMPERATURE AT 140°F.
- PROVIDE WITH 3-YEAR TANK WARRANTY AND 1-YEAR PARTS WARRANTY.

AIR COMPRESSOR SCHEDULE									
MARK	HP	VOLT/PH	TANK SIZE	CONFIGURATION	CAP. @ 175PSIG	DIMENSIONS	WEIGHT	TANK OUTLET	AIR DRYER
AC-11	7.5	208/1P	80-GAL	VERTICAL	24.0 CFM	33"x24"x77"H	545 LBS	3/4"	YES

LOAD/DEMAND TABLE									
FIXTURE TYPE	QTY.	DRAIN FIXTURE UNITS		WATER SUPPLY FIXTURE UNITS		CW & HW	HOT TOTAL	SUPPLY TOTAL	
		DRAIN	TOTAL	COLD	HOT				
WATER CLOSET (VALVE)	1	4.0	4.0	10.0		10.0		10.0	
URINAL (3/4" INLET)	1	2.0	2.0	5.0		5.0		5.0	
LAVATORY (SMALL P.O.)	1	1.0	1.0	1.5	1.5	2.0	1.5	2.0	
DRINKING FOUNTAIN	1	0.5	0.5	0.25		0.25		0.25	
SERVICE SINK	2	3.0	6.0	2.25	2.25	3.0	4.5	6.0	
SHOWER	1	2.0	2.0	1.5	1.5	2.0	1.5	2.0	
TOTAL LOAD (FIXTURE UNITS)				15.5	TOTAL LOAD (FIXTURE UNITS)		7.5	25.25	
MINIMUM LINE SIZE				3"	TOTAL DEMAND (GPM)		12.5	38.0	
APPLIED LINE SIZE				4"	MINIMUM LINE SIZE		3/4"	1 1/2"	
					APPLIED LINE SIZE		3/4"	1 1/2"	

ALL SUPPLIES AND CONSTRUCTION MATERIAL MUST FOLLOW THE STANDARDS IDENTIFIED IN THE BUY AMERICAN ACT (41 U.S.C. Sec 101a-10d)

ALL CONTRACTORS MUST COMPLY WITH THE REQUIREMENTS UNDER THE DAVIS-BACON ACT (40 U.S.C.A. Sec 276a-2/6a-5)

ELECTRICAL DESIGN BY:



PROJECT NO. 2115047  
PROJECT MGR. J.D. HAM  
DRAWN BY D. HILL  
CHECKED BY

**P-301**

AVOLIS ENGINEERING, P.A.  
P.O. BOX 1556  
NEW BERN, NC 28561  
PH: (252) 633-0068, FAX: (252) 633-6507  
DES. J. C. AVOLIS, P.E.  
DR.  
CHK. J. K. AVOLIS, P.E.  
SUBMITTED BY:  
DESIGN DR. BRIAN R. MARSHBURN, P.E.

DEPARTMENT OF THE NAVY - NAVAL FACILITIES ENGINEERING COMMAND  
**MARINE CORPS BASE**  
CAMP LEJEUNE, NORTH CAROLINA  
16-0058 CONSTRUCT AUTOMOTIVE ORGANIZATION SHOP  
MACS-2, "DET B"

PLUMBING SCHEDULES

APPROVED: PWO OR OICC DATE SIZE CODE IDENT. NO. NAVFAC DRAWING NO.  
F 80091 60016646  
CONSTR. CONTR. NO. N40085-16-B-0058

SATISFACTORY TO: DATE SCALE: NOTED SPEC. 05-16-0058 SHEET 32 OF 32